May 09, 2022

Mr. Christopher Carthy, Chairman
and Members of the Planning Board
Town of North Castle
17 Bedford Road
Armonk, NY 10504

RE: JMC Project 20101
The Summit Club at Armonk Residential
Bedford Road (Route 22)
Town of North Castle, NY

Response to Town Comments Resubmission

Dear Chairman Carthy and Members of the Planning Board:

On behalf of the owner and applicant, Summit Club Partners, LLC, we are pleased to submit the following documents for your continued review of the Site Plan Application for the proposed residential development on The Summit Club residential property:

1. JMC Drawings:

Dwg. No.	Title	Rev. #	Date
C-000	Cover Sheet	6	05/09/2022
C-010	Overall Existing Conditions Map	6	05/09/2022
C-011	Existing Conditions Map (South)	6	05/09/2022
C-012	Existing Conditions Map (North)	6	05/09/2022
C-020	Site Demolition & Tree Removal Plan (South)	6	05/09/2022
C-021	Site Demolition & Tree Removal Plan (North)	6	05/09/2022
C-022	Site Tree Removal Table	6	05/09/2022
C-100A	Overall Site Layout and Phasing Plan	6	05/09/2022
C-100	Site Layout Plan (South)	6	05/09/2022
C-101	Site Layout Plan (North)	6	05/09/2022
C-102	Fire Truck Access Plan	6	05/09/2022
C-103	Utility Complex Plans	1	05/09/2022
C-200	Site Grading Plan (South)	6	05/09/2022
C-201	Site Grading Plan (North)	6	05/09/2022
C-202	Road Profiles Plan	6	05/09/2022
C-900	Construction Details	6	05/09/2022
C-901	Construction Details	6	05/09/2022
C-902	Construction Details	6	05/09/2022
C-903	Construction Details	6	05/09/2022

C-904	Construction Details	2	05/09/2022
C-905	Construction Details		05/09/2022
PSP-1	Preliminary Subdivision Plat	6	05/09/2022
IPP-1	Integrated Plot Plan	6	05/09/2022

2. Granoff Architects Drawings:

Dwg. No.	Title	Rev. #/Date	
Landscape:			
LS 102.1	Entry Signage	11	05/09/2022
Residential Building – Plan Type 'A':			
A 100.A	Garage Floor Plan	2	05/09/2022
A 101.A	First Floor Plan	2	05/09/2022
A 102.A	Second Floor Plan	2	05/09/2022
A 103.A	Third Floor Plan	2	05/09/2022
A 300.A	Building Elevations	2	05/09/2022
A 301.A	Building Elevations	2	05/09/2022
A 302.A	Building Elevations	2	05/09/2022
A 303.A	Building Elevations	2	05/09/2022
A 304.A	Building Elevations - Materials	2	05/09/2022
Residential Building – Plan Type 'B':			
A 100.B	Garage Floor Plan	2	05/09/2022
A 101.A	First Floor Plan	2	05/09/2022
A 102.B	Second Floor Plan	2	05/09/2022
A 103.B	Third Floor Plan	2	05/09/2022
A 300.B	Building Elevations	2	05/09/2022
A 301.B	Building Elevations	2	05/09/2022
A 302.B	Building Elevations	2	05/09/2022
A 303.B	Building Elevations	2	05/09/2022
A 304.B	Building Elevations - Materials	2	05/09/2022

3. R&M Engineering Documents:

   a. Submission Cover Letter, dated 04/26/2022 (Planning Board)
   b. Submission Cover Letter, dated 04/26/2022 (NYSDEC)
   c. NYSDEC Short Environmental Assessment Form, dated 04/29/2022
   d. NYSDEC SPDES Application Form, dated 04/26/2022
   e. SPDES Site Plan, dated 04/2022
   f. Engineering Report: Sewage Treatment Plant Replacement, dated 04/26/2022

4. "Report on Subsurface Soil and Foundation Investigation: Brynwood Club Development", prepared by Carlin-Simpson & Associates, last revised 10/16/2013.

The revisions depicted on the above noted plans reflect responses to comments outlined in the Town of North Castle Planning Department Memorandum, dated April 4, 2022. For ease of review, we have repeated and enumerated the comments in italic print, followed by our responses:

<u>Town of North Castle Planning Department, dated April 4, 2022</u>

<u>General Comments</u>

<u>Comment No. 1</u>

The submitted plans contain several items relating to the golf club, including, pro shop, parking lot, roadway improvements, guest cottages, etc. The Applicant has confirmed that the current application is only seeking approval of the residential component and that the golf course site plan and special use permit will be officially processed at a later date.

<u>Response No. 1</u>

The site plans have been revised to only depict the "Residential Phase" development improvements, which includes the following:

- Six (6) residential buildings
- Amenities complex (building & pool)
- Tennis court complex
- Utilities complex (water supply buildings/infrastructure, new STP & re-use of existing STP as storage)
- Guardhouse
- Roadways

<u>Comment No. 2</u>

The proposed 10 foot tall tennis court fence exceeds the maximum fence height of six feet. Any fence exceeding six feet in height will require a variance from the Zoning Board of Appeals.

<u>Response No. 2</u>

The comment is so noted. We will process an application with the Zoning Board of Appeals upon referral by the Planning Board.

<u>Comment No. 3</u>

The floor plans should be revised to depict which seven of the 72 units will be designated as AFFH units.

<u>Response No. 3</u>

Granoff Architects has re-submitted the floor plans and highlighted the chart and units that are planned to be AFFH units.

Phase I:

Building 1	Unit 101-3 bedroom
Building 2	Unit 102-2 bedroom
Building 3	Unit 102-2 bedroom

Phase II:

Building 4	Unit 102-2 bedroom
	Unit 101-3 bedroom
Building 5	Unit 102-2 bedroom
Building 6	Unit 102-2 bedroom

Comment No. 4

The site plan should be revised to depict a lighting/photometric plan for review that conforms to the minimum requirements of Section 355-45.M of the Town Code. All proposed site lighting should be depicted on this plan.

Response No. 4

Awaiting calculations from the manufacturer at this time. Proposed lighting will conform to meet the minimum requirements.

Comment No. 5

A golf course community must be affiliated with an adjoining membership club which is subject to a Town Board special use permit. Such affiliation shall be established by the requirement that, except for the initial developer/sponsor of the golf course community and successor sponsors/owners of units which have not yet been sold for owner occupancy, the owner of a dwelling unit of the golf course community must for the duration of ownership be a member (whether individually or as a family) of the membership club. The terms and conditions of membership shall be determined by the membership club.

The golf course of the affiliated membership club functions as the open space for the golf course community, and preservation of that open space is a basis for the permitted density of a golf course community. Accordingly, as a condition of site development plan approval of a golf course community, the affiliated membership club shall record in the Westchester County Clerk's office a permanent conservation easement pursuant to which the membership club agrees that the property on which the golf course is located shall be used solely as a golf course or as open space. The conservation easement shall be in form and substance reasonably acceptable to the Town Board and Town Attorney.

Response No. 5

The owners of the market-rate residences will all be members of The Summit Club which has reopened as of April, 2021. A Temporary Special Use Permit for the club/golf course operations, including the temporary facilities was approved by the Town Board on 02/24/2021.

The golf course lot is already subject to a recorded Declaration providing that the golf course lot can only be used as a golf course/club or as open space. The landowner, Summit Club Partners, LLC, will enter into a permanent conservation easement and file it with the Westchester County Clerk's office.

Comment No. 6

The Applicant will need to file the previously discussed conservation easement prior to the issuance of the first building permit.

Response No. 6

The comment is so noted.

Comment No. 7

The Applicant has indicated that chipping would be required during construction. At this time, the Applicant should provide details for review by the Planning Board.

Response No. 7

Based on the subsurface geotechnical exploration conducted at the property, rock is present in the proposed redevelopment area and blasting and/or chipping will be required to remove the rock during construction. All rock removal processes shall meet all applicable Town of North Castle. Additional information related to blasting and/or rock chipping in accordance with Town Code Chapter 22 "Blasting, Explosives and Chipping, last revised 11/18/2020 will be provided under separate cover. Based on the current design and available geotechnical information, we estimate approximately 12,000 cubic yards of rock to be removed for construction of the project. Refer to "Report on Subsurface Soil and Foundation Investigation: Brynwood Club Development", prepared by Carlin-Simpson & Associates, last revised 10/16/2013.

Comment No. 8

The Applicant has indicated that rock processing would be proposed on the site. Additional details should be submitted regarding the proposed operation at this time.

Response No. 8

Based on the subsurface geotechnical exploration conducted at the property, rock is present in the proposed redevelopment area. Once removed, the rock will be processed on-site and used for construction. A note has been added to the site plans. All rock processing operations shall meet all applicable Town of North Castle and Westchester County Department of Health requirements. Additional information related to on-site rock processing in accordance with all local and WCDH requirements will be provided under separate cover. As indicated above, based on the current design and available geotechnical information, we estimate approximately 12,000 cubic yards of rock to be removed for construction of the project. Refer to "Report on Subsurface Soil and Foundation Investigation: Brynwood Club Development", prepared by Carlin-Simpson & Associates, last revised 10/16/2013.

Comment No. 9

The Town charges a fee in lieu of providing recreation facilities. The Applicant believes that sufficient on-site recreational facilities are being provided to meet the demand of the project, and has requested a credit be given for the market rate homes. The residents of the AFFH units would not be required to be members of the Club and would likely use Town recreation facilities. Therefore, the required $1,000 per unit fee in lieu should be paid by the Applicant for the AFFH units.

Response No. 9

The comment is so noted.

Comment No. 10

The site plan depicts 65,300 square feet of Town-regulated steep slope disturbance.

Response No. 10

The current site plans have been revised to depict +/-62,000 square feet (1.42 acres) of Town-regulated steep slope disturbance.

Comment No. 11

The site plan depicts the removal of 250 Town-regulated trees.

Response No. 11

The current site plans have been revised to depict the removal of 238 Town-regulated trees.

Comment No. 12

The Applicant has retained the services of a hydrogeologist/water system consultant to design a new on-site water system. The Applicant shall keep the Planning Board apprised on the status of the design.

Response No. 12

The applicant has retained the services of a hydrogeologist/water system consultant who is currently working on the design of the new on-site water system. The new water system will be sized appropriately to accommodate the proposed residential, golf club and various amenities facilities.

According to the project Hydrogeologist/Water Supply Consultant (WSP), the next step for the project potable water system will be to conduct a 72-hour yield test of the three on-site wells with a full NYS Part 5 water sample for each well. After the 72-hour test is completed, WSP will revise the 50% plans and specifications that have been developed and previously provided to the Town. Once the plans and specifications have been updated and further developed, they will be submitted to the Town of North Castle (Sal Misiti), it's consultants and the WCDH. Please refer to drawings prepared by WSP USA submitted in our previous submission.

Comment No. 13

The Applicant has retained the services of a sewage treatment plant consultant to design a new sewage treatment plant. The existing sewage treatment plan is proposed to be converted into a storage building that will be reviewed during the golf club SUP/site plan review. The Applicant shall keep the Planning Board apprised on the status of the design.

Response No. 13

The applicant has retained the services of a sewage treatment plant consultant (R&M Engineering) who is currently working on the design of the new sewage treatment plant. As indicated above, the existing STP building will be reused as an equipment storage building. Instead, a new sewage treatment plant is proposed within the hillside between the existing driveway leading to the STP building and the south side of the existing driving range. The new plant has been sized appropriately to accommodate the proposed residential, golf club and various amenities facilities. Refer to drawings prepared by R&M Engineering.

Comment No. 14

The Applicant has stated that signage is proposed for the project. The location and design of the signage should be included on the plans at this time.

Response No. 14

New entrance signage will be proposed on the new decorative stone walls proposed at the entrance to the site. Additional signage will be provided throughout the interior of the development area as required (traffic control, directional, etc.). The design of the proposed entrance signage will be prepared and provided under separate cover. Refer to drawing LS 102.1, prepared by Granoff Architects for Entry Signage detail.

Comment No. 15

Pursuant to Section 355-34.1(5)(b) of the Town Code, within multifamily developments, the affordable AFFH units shall be physically integrated into the design of the development and shall be distributed among various sizes (efficiency, one-, two-, three- and four-bedroom units) in the same proportion as all other units in the development. The plan should identify which units will be AFFH and demonstrate that the unit sizes are equally distributed among the various sizes.

Response No. 15

The chart has been revised. See plan residential sheets.

Comment No. 16

Pursuant to Section 355-24.I.1 of the Town Code AFFH units shall be marketed in accordance with the Westchester County Fair Affordable Housing Affirmative Marketing Plan.

Response No. 16

The comment is so noted.

Comment No. 17

Pursuant to Section 355-24-I.2 of the Town Code, the maximum monthly rent for an affordable AFFH unit and the maximum gross sales price for an AFAH unit shall be established in accordance with US Department of Housing and Urban Development guidelines as published in the current edition of the Westchester County Area Median Income AMI Sales Rent Limits available from the County of Westchester.

Response No. 17

The comment is so noted.

Comment No. 18

Pursuant to Section 355-24-I.3 of the Town Code, units designated as affordable AFFH units shall remain affordable for a minimum of 50 years from date of initial certificate of occupancy for rental properties and from date of original sale for ownership units.

Response No. 18

The comment is so noted.

Comment No. 19

Pursuant to Section 355-24-I.4 of the Town Code, a property containing any affordable AFFH units shall be restricted using a mechanism such as declaration of restrictive covenants in recordable form acceptable to the Town which shall ensure that the affordable AFFH unit shall remain subject to affordable regulations for the minimum 50-year period of affordability. The covenants shall require that the unit be the primary residence of the resident household selected to occupy the unit upon approval such declaration shall be recorded against the property containing the affordable AFFH unit prior to the issuance of a Certificate of Occupancy for the development.

Response No. 19

The comment is so noted. The applicant will comply.

Comment No. 20

Pursuant to Section 355-34.I(6)(a) of the Town Code the Applicant shall submit an exhibit demonstrating that the proposed AFFH units meet the minimum size requirements and are not less than 80% of the of *average floor area of market rate units.*

Response No. 20

The AFF units are not less than 80% of the average Market Rate floor area. See charts and notes on the submitted floor plans.

We trust the attached documents and above responses are sufficient for your review and we respectfully request placement on the May 23rd Planning Board agenda. Thank you for your consideration.

If you have any questions or require additional information, please do not hesitate to contact our office at (914) 273-5225.

Sincerely,

JMC Planning Engineering Landscape Architecture & Land Surveying, PLLC

Paul Sysak

Paul R. Sysak, RLA
Project Manager

cc: Adam R. Kaufman, AICP
Joseph M. Cermele, PE, CFM
Roland Baroni, Esq.
Jeffrey B. Mendell
Mark P. Weingarten, Esq.
Peter J. Wise, Esq.
Rich S. Granoff, AIA, LEED AP
Kenneth S. Andersen, AIA

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SITE PLAN APPROVAL DRAWINGS

THE SUMMIT CLUB AT ARMONK (RESIDENTIAL PHASE)

TAX MAP SECTION 101.02 | BLOCK 1 | LOT 28.1 & 28.2
WESTCHESTER COUNTY
568 & 570 BEDFORD ROAD (NY-22)
TOWN OF NORTH CASTLE, NEW YORK

Applicant/Owner:
SUMMIT CLUB PARTNERS, LLC
568 BEDFORD ROAD (NY-22)
ARMONK, NY 10504
(914) 391-2900

Architect/Landscape Architect:
GRANOFF ARCHITECTS
330 RAILROAD AVENUE
GREENWICH, CT 06830
(203) 625-9460

Attorney:
DELBELLO DONNELLAN WEINGARTEN WISE & WIEDERKEHR, LLP
THE GATEWAY BUILDING
ONE NORTH LEXINGTON AVENUE
WHITE PLAINS, NY 10601
(914) 681-0200

Lighting Consultant:
APEX LIGHTING SOLUTIONS
20-30 BEAVER ROAD
WETHERSFIELD, CT 06109
(860) 632-8766

Water Distribution System Consultant:
WSP
ONE PENN PLAZA, 2ND FLOOR, 250 W 34TH STREET
NEW YORK, NY 10119
(212) 465-5000

Sewage Treatment Plant Consultant:
R&M ENGINEERING
50 ELM STREET
HUNTINGTON, NY 11743
(631) 271-0576

Site Planner/Civil Engineer/Surveyor:
JMC PLANNING, ENGINEERING, LANDSCAPE ARCHITECTURE, & LAND SURVEYING PLLC
120 BEDFORD ROAD
ARMONK, NY 10504
(914) 273-5225

PROPOSED BUILDING AREA SUMMARY (GROSS FLOOR AREA):

AMENITIES BUILDING:
FIRST FLOOR: 2,946 SF
LOWER LEVEL: 2,913 SF
TOTAL FOR AMENITIES BUILDING: 5,859 SF

RESIDENTIAL BUILDINGS (#1–6):
EACH CONDO FLOOR: 12,350 S.F. (3 STORIES TOTAL = 37,050 SF)
EACH GARAGE PARKING LEVEL: 16,605 SF
TOTAL PER BUILDING (#1–6): 53,655 SF

TOTAL FOR ALL RESIDENTIAL BUILDINGS (#1–6): 321,930 SF

RESIDENTIAL UNIT PHASING DECLARATION:

IN DECEMBER, 2019, IN CONSIDERATION OF THE ADOPTION BY THE TOWN OF THE AMENDMENT, THE APPLICANT RECORDED A DECLARATION PURSUANT TO WHICH THE APPLICANT MAY, SUBJECT TO SITE PLAN APPROVAL, CONSTRUCT ON THE DEVELOPMENT LOT A FIRST PHASE OF THE COMMUNITY ("PHASE 1"), WHICH MAY CONSIST OF UP TO THIRTY–SIX (36) RESIDENCES, WHICH MAY BE FEE–SIMPLE HOMES AND/OR CONDOMINIUM UNITS WITHOUT LIMITATION REGARDING FORM OF OWNERSHIP OF THE RESIDENCES, AND A SECOND PHASE OF THE COMMUNITY ("PHASE 2"), WHICH MAY CONSIST OF UP TO THIRTY–SEVEN (37) RESIDENCES, WHICH MAY BE FEE–SIMPLE HOMES AND/OR CONDOMINIUM UNITS WITHOUT LIMITATION REGARDING FORM OF OWNERSHIP OF THE RESIDENCES; PROVIDED THAT UNLESS THE AGGREGATE AVERAGE OF THE GROSS SALES PRICES OF THE MARKET–RATE PHASE 1 CONDOMINIUM UNITS IS $700.00 PER SQUARE FOOT OR MORE, THE PHASE 2 CONDOMINIUM RESIDENCES ARE REQUIRED TO BE "55 AND OLDER" AGE–RESTRICTED HOUSING AS PERMITTED UNDER APPLICABLE FEDERAL LAW AND REGULATIONS. THE DECLARATION ALSO REQUIRES PHASE 1 TO INCLUDE FOUR (4) ON–SITE AFFORDABLE UNITS, AND PHASE 2 TO INCLUDE THREE (3) ON–SITE AFFORDABLE UNITS. HOWEVER, THE APPLICANT IS PERMITTED TO AT ANY TIME ELECT TO RELOCATE ALL OR A PORTION OF THE AFFORDABLE UNITS OFF–SITE WITHIN AREAS IN THE ARMONK HAMLET THAT ARE SERVED BY PUBLIC SEWER AND WATER, AND THEREBY REDUCE THE ON–SITE AFFORDABLE UNITS AND SUBSTITUTE MARKET–RATE UNITS THEREFORE ON A ONE–TO–ONE BASIS, PROVIDED THAT IN NO EVENT SHALL THE TOTAL NUMBER OF RESIDENTIAL UNITS ON THE PROPERTY EXCEED SEVENTY–THREE (73).

GENERAL CONSTRUCTION NOTES APPLY TO ALL WORK HEREIN:

1. PRIOR TO CONSTRUCTION, THE CONTRACTOR SHALL CALL 811 "DIG SAFELY" (1–800–962–7962) TO HAVE UNDERGROUND UTILITIES LOCATED. EXPLORATORY EXCAVATIONS SHALL COMPLY WITH CODE 753 REQUIREMENTS. NO WORK SHALL COMMENCE UNTIL ALL THE OPERATORS HAVE NOTIFIED THE CONTRACTOR THAT THEIR UTILITIES HAVE BEEN LOCATED. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE PRESERVATION OF ALL PUBLIC AND PRIVATE UNDERGROUND AND SURFACE UTILITIES AND STRUCTURES AT OR ADJACENT TO THE SITE OF CONSTRUCTION, INSOFAR AS THEY MAY BE ENDANGERED BY THE CONTRACTOR'S OPERATIONS. THIS SHALL HOLD TRUE WHETHER OR NOT THEY ARE SHOWN ON THE CONTRACT DRAWINGS. IF THEY ARE SHOWN ON THE DRAWINGS, THEIR LOCATIONS ARE NOT GUARANTEED EVEN THOUGH THE INFORMATION WAS OBTAINED FROM THE BEST AVAILABLE SOURCES, AND IN ANY EVENT, OTHER UTILITIES ON THESE PLANS MAY BE ENCOUNTERED IN THE FIELD. THE CONTRACTOR SHALL, AT HIS OWN EXPENSE, IMMEDIATELY REPAIR OR REPLACE ANY STRUCTURES OR UTILITIES THAT HE DAMAGES, AND SHALL CONSTANTLY PROCEED WITH CAUTION TO PREVENT UNDUE INTERRUPTION OF UTILITY SERVICE.

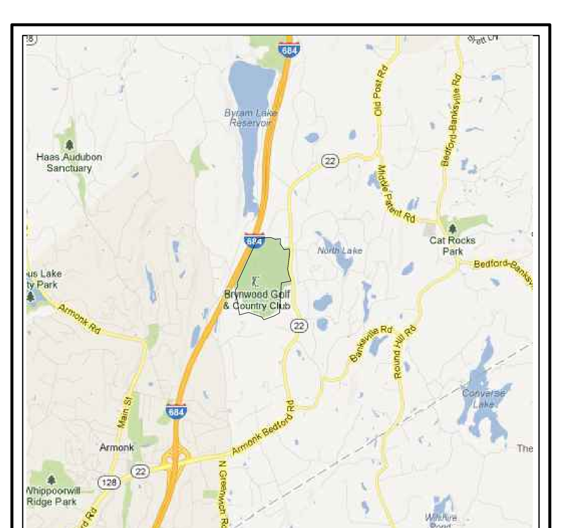
2. CONTRACTOR SHALL HAND DIG TEST PITS TO VERIFY THE LOCATION OF ALL EXISTING UNDERGROUND UTILITIES PRIOR TO THE START OF CONSTRUCTION. CONTRACTOR SHALL VERIFY EXISTING UTILITIES DEPTHS AND ADVISE OF ANY CONFLICTS WITH PROPOSED UTILITIES. IF CONFLICTS ARE PRESENT. THE OWNER'S FIELD REPRESENTATIVE, JMC, PLLC AND THE APPLICABLE MUNICIPALITY OR AGENCY SHALL BE NOTIFIED IN WRITING. THE EXISTING/PROPOSED UTILITIES RELOCATION SHALL BE DESIGNED BY JMC, PLLC.

3. CONTRACTOR IS RESPONSIBLE FOR OBTAINING ANY AND ALL LOCAL PERMITS REQUIRED.

4. ALL WORK SHALL BE DONE IN STRICT COMPLIANCE WITH ALL APPLICABLE NATIONAL, STATE, AND LOCAL CODES, STANDARDS, ORDINANCES, RULES, AND REGULATIONS. ALL CONSTRUCTION WORK SHALL BE PERFORMED IN ACCORDANCE WITH ALL SAFETY CODES. APPLICABLE SAFETY CODES MEAN THE LATEST EDITION INCLUDING ANY AND ALL AMENDMENTS, REVISIONS, AND ADDITIONS THERETO, TO THE FEDERAL DEPARTMENT OF LABOR, OCCUPATIONAL SAFETY AND HEALTH ADMINISTRATION'S OCCUPATIONAL SAFETY AND HEALTH STANDARDS (OSHA); AND APPLICABLE SAFETY, HEALTH REGULATIONS AND BUILDING CODES FOR CONSTRUCTION IN THE STATE OF NEW YORK. THE CONTRACTOR SHALL BE RESPONSIBLE FOR GUARDING AND PROTECTING ALL OPEN EXCAVATIONS IN ACCORDANCE WITH THE PROVISION OF SECTION 107–05 (SAFETY AND HEALTH REQUIREMENTS) OF THE NYSDOT STANDARD SPECIFICATIONS. IF THE CONTRACTOR PERFORMS ANY HAZARDOUS CONSTRUCTION PRACTICES, ALL OPERATIONS IN THE AFFECTED AREA SHALL BE DISCONTINUED AND IMMEDIATE ACTION SHALL BE TAKEN TO CORRECT THE SITUATION TO THE SATISFACTION OF THE APPROVAL AUTHORITY HAVING JURISDICTION.

5. CONTRACTOR SHALL MAINTAIN ACCESS TO ALL PROPERTIES AFFECTED BY THE SCOPE OF WORK SHOWN HEREON AT ALL TIMES TO THE SATISFACTION OF THE OWNERS REPRESENTATIVE. RAMPING CONSTRUCTION TO PROVIDE ACCESS MAY BE CONSTRUCTED WITH SUBBASE MATERIAL EXCEPT THAT TEMPORARY ASPHALT CONCRETE SHALL BE PLACED AS DIRECTED BY THE ENGINEER. THE CONTRACTOR SHALL BE RESPONSIBLE FOR PROVIDING SAFE PEDESTRIAN ACCESS AT ALL TIMES.

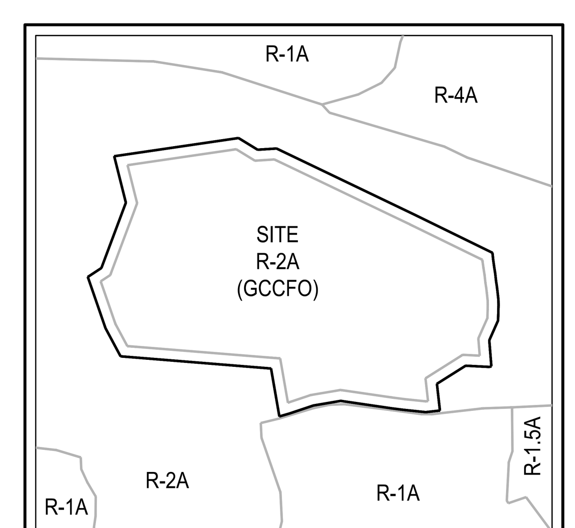
6. CONTRACTOR SHALL MAINTAIN THE INTEGRITY OF EXISTING PAVEMENT TO REMAIN.



SITE LOCATION MAP
SCALE: 1" = 1,000'
SOURCE: GOOGLE MAPS/2020

LEGEND

— — — —	SITE PROPERTY LINE
— — — — (grey)	ZONING BOUNDARY
R-4A	4–ACRE RESIDENTIAL ZONE
R-2A	2–ACRE RESIDENTIAL ZONE
R-1.5A	1.5–ACRE RESIDENTIAL ZONE
R-1A	1–ACRE RESIDENTIAL ZONE
GCCFO	GOLF COURSE COMMUNITY FLOATING OVERLAY DISTRICT



ZONING MAP
SCALE: 1" = 5,000'

ZONING COMPLIANCE CHART

SECTION 101.02, BLOCK 1, LOT 28.1 & 28.2 (2/08/7.C1A)
ZONES "R–2A" – "ONE FAMILY RESIDENCE DISTRICT (2 ACRES)"
"GCCFO"– "GOLF COURSE COMMUNITY FLOATING OVERLAY DISTRICT"
PROPOSED USE: GOLF COURSE COMMUNITY
FIRE/AMBULANCE DISTRICT: ARMONK FIRE DEPARTMENT (NORTH CASTLE DISTRICT #2)
WATER DISTRICT: NORTH CASTLE WATER DISTRICT #2
SCHOOL DISTRICT: BYRAM HILLS CENTRAL SCHOOL DISTRICT
SEWER DISTRICT: ON–SITE SEWAGE TREATMENT PLANT (SPDES PERMIT)

DESCRIPTION	REQUIRED/ PERMITTED (R–2A)	REQUIRED/ PERMITTED (GCCFO)	EXISTING	PROPOSED/ PROVIDED (LOT 1) (9)	PROPOSED/ PROVIDED (LOT 2)	PROPOSED/ PROVIDED (LOT 3)	PROPOSED/ PROVIDED (LOT 4)
LOT AREA (ACRES)	2.0 MIN. (1)	SEE NOTE 1	±156.30 (5)	±135.34	±20.96	±2.95	±0.25
LOT STREET FRONTAGE (FEET)	150 MIN. (1)	SEE NOTE 1	1,519.70	1,519.70 (1)	1,519.70 (1)	1,519.70 (1)	1,519.70 (1)
LOT WIDTH (FEET)	150 MIN. (1)	SEE NOTE 1	±2,300	±2,300 (1)	±2,300 (1)	±2,300 (1)	±2,300 (1)
LOT DEPTH (FEET)	150 MIN. (1)	SEE NOTE 1	±1,805	±1,805 (1)	±1,805 (1)	±1,805 (1)	±1,805 (1)
PRINCIPAL BUILDING MINIMUM YARDS (FEET)							
FRONT	50 (1)	SEE NOTE 1	±123.1	±313.72 (1)	±252.91 (1)	±817.74 (1)	±1,132.50 (1)
SIDE	30 (1)	SEE NOTE 1	±287.8	±99.78 (1)	±110.68 (1)	±1,468.17 (1)	±1,869.34 (1)
REAR	50 (1)	SEE NOTE 1	±1,645.5	±1,755.63 (1)	±874.18 (1)	±1,095.77 (1)	±1,249.79 (1)
MAXIMUM BUILDING COVERAGE (%)	8 (1)	3.5 (1)	0.72 (6)	0.33 (1)(7)	1.33 (1)(7)	0.01 (1)(7)	0.01 (1)(7)
MAXIMUM BUILDING HEIGHT (STORIES / FEET)	NA / 30	3 / 39.5 (2)	3 / < 39.5	3 / < 39.5	3 / < 39.5	3 / < 39.5	3 / < 39.5
PARKING SPACES							
STANDARD PARKING SPACES	2 PER DWELLING UNIT	SEE NOTE 3	–	124/160 (8)	168	–	–
ACCESSIBLE PARKING SPACES	N/A	–	–	5/8 (8)	12	–	–
COMPACT PARKING SPACES	N/A	–	–	–/72 (8)	–	–	–
TOTAL PARKING SPACES	2 PER DWELLING UNIT	–	180	129/240 (8)	180	–	–
LOADING SPACES	N/A	SEE NOTE 4	–	1	1	–	–

NOTES:

1. IN THE GCCFO DISTRICT, THE LOT, DIMENSIONAL, AND PARKING REQUIREMENTS FOR A GOLF COURSE COMMUNITY IN THIS SECTION SHALL SUPERSEDE THE SCHEDULE OF RESIDENCE DISTRICT REGULATIONS (§ 355–21 OF THIS CHAPTER). LOT SIZE, LOT CONFIGURATION AND OTHER LOT DIMENSIONAL REQUIREMENTS WITHIN A GCCFO DISTRICT SHALL BE DETERMINED BY THE PLANNING BOARD IN CONJUNCTION WITH SUBDIVISION APPROVAL. LOT SIZE, LOT CONFIGURATION AND OTHER LOT DIMENSIONAL REQUIREMENTS OF LOTS WITHIN A GCCFO DISTRICT SHALL BE BASED UPON THE PLANNING BOARD'S CONSIDERATION OF THE CHARACTER OF THE NEIGHBORHOOD IN WHICH THE GCCFO DISTRICT WILL BE LOCATED; THE GCCFO DISTRICT'S RELATIONSHIP TO ADJOINING DISTRICTS, PROPERTIES AND LAND USES; THE GCCFO DISTRICT'S TOPOGRAPHY; AND SUCH OTHER FACTORS THE PLANNING BOARD MAY DETERMINE TO BE APPROPRIATE. THE LOTS AND/OR PARCELS THAT TOGETHER COMPRISE A GOLF COURSE COMMUNITY SITE ARE NOT REQUIRED TO BE CONTIGUOUS, PROVIDED THAT EACH SUCH LOT AND/OR PARCEL ADJOINS THE AFFILIATED MEMBERSHIP CLUB. ALL LOT, DIMENSIONAL, AND PARKING REQUIREMENTS IN THIS SECTION, INCLUDING BUT NOT LIMITED TO MAXIMUM DENSITY, MAXIMUM BUILDING COVERAGE, MINIMUM YARDS AND REQUIRED OFF–STREET PARKING, SHALL APPLY TO THE LAND AREA IN THE GCCFO DISTRICT AS A WHOLE, NOTWITHSTANDING THAT THE GOLF COURSE COMMUNITY SITE MAY BE COMPRISED OF MORE THAN ONE LOT AND/OR PARCEL, OR THAT THE SITE MAY FROM TIME TO TIME BE SUBDIVIDED OR RESUBDIVIDED, AND ALL DETERMINATIONS AND CALCULATIONS RELATING TO SUCH REQUIREMENTS SHALL BE MADE WITH REFERENCE TO THE BOUNDARIES OF THE ENTIRE LAND AREA IN THE GCCFO DISTRICT AND AS THOUGH SUCH AREA IS A SINGLE LOT (AS DEFINED IN § 355–4 OF THIS CHAPTER), EVEN THOUGH IT IS OR WILL BE COMPRISED OF MORE THAN ONE LOT AND/OR PARCEL.

2. THE MAXIMUM BUILDING HEIGHT SHALL BE THREE STORIES AND 39 1/2 FEET TO THE MEAN LEVEL OF THE PRIMARY ROOF, MEASURED FROM THE LEVEL OF THE FINISHED GRADE AT THE MAIN ENTRY TO THE BUILDING.

3. RESIDENTIAL PARKING CALCULATIONS

   MARKET–RATE DWELLING UNITS REQUIREMENT: "OTHER MULTIFAMILY DWELLING UNITS": 2 FOR EACH DWELLING UNIT, PLUS ½ FOR EACH BEDROOM IN EXCESS OF 2, PLUS 10% VISITOR PARKING.

   65 TOTAL MARKET–RATE DWELLING UNITS: (49) 2–BEDROOM UNITS, (16) 3–BEDROOM UNITS
   65 (DWELLING UNITS) X 2 = 130 PARKING SPACES
   16 (3–BEDROOM UNITS) X .5 = 8 PARKING SPACES
   10% VISITOR PARKING: 138 X .10 = 13.8 (14) PARKING SPACES
   TOTAL REQUIRED PARKING FOR MARKET–RATE UNITS: 152 PARKING SPACES

   AFFH DWELLING UNITS REQUIREMENT: "MIDDLE–INCOME DWELLING UNITS AND AFFH UNITS": 1 FOR EACH DWELLING UNIT, PLUS ½ FOR EACH BEDROOM.

   7 TOTAL AFFH DWELLING UNITS: (5) 2–BEDROOM UNITS, (2) 3–BEDROOM UNITS
   7 (DWELLING UNITS) X 1 = 7 PARKING SPACES
   16 (TOTAL BEDROOMS) X .5 = 8 PARKING SPACES
   TOTAL REQUIRED PARKING FOR MARKET–RATE UNITS: 15 PARKING SPACES

   GOLF COURSE/CLUB PARKING CALCULATIONS

   GOLF COURSE/CLUB REQUIREMENT: "GOLF OR COUNTRY CLUBS": 1 FOR EACH 3 MEMBERS, PLUS 1 FOR EACH 3 SEATS IN THE MEETING AND/OR DINING ROOMS.

   600 TOTAL MEMBERSHIPS:
   600 (MEMBERSHIPS) / 3 = 200 PARKING SPACES
   286 TOTAL SEATS: (232 RESTAURANT SEATS + 54 BAR SEATS)
   286 (SEATS) / 3 = 95.3 (96) = PARKING SPACES
   TOTAL REQUIRED PARKING FOR GOLF COURSE/CLUB: 296 PARKING SPACES

   TOTAL REQUIRED PARKING: 167 RESIDENTIAL + 296 GOLF COURSE/CLUB = 463 SPACES
   TOTAL PROVIDED PARKING: 180 RESIDENTIAL + 240 GOLF COURSE/CLUB + 65 GOLF CLUB RESIDENT CREDIT (1 SPACE/UNIT) = 485 SPACES

4. FOR WHOLESALE BUSINESS, INDUSTRY, STORAGE, WAREHOUSE AND OTHER COMMERCIAL ESTABLISHMENTS, A MINIMUM OF ONE SPACE FOR EACH ESTABLISHMENT, AND ONE ADDITIONAL SPACE FOR EACH 10,000 SQUARE FEET OF GROSS FLOOR AREA OR MAJOR PORTION THEREOF IN EXCESS OF 4,000 SQUARE FEET OF GROSS FLOOR AREA.

5. CURRENTLY THE GOLF COURSE LOT IS ±135.34 ACRES AND THE RESIDENTIAL LOT IS ±20.96 ACRES.

6. TOTAL EXISTING BUILDING COVERAGE CALCULATED BASED ON ALL EXISTING BUILDINGS ON THE PROPERTY, INCLUDING PREVIOUSLY DEMOLISHED STRUCTURES.

7. BUILDING COVERAGE BREAKDOWN:

   LOT 1: (FUTURE GOLF COURSE PHASE)
   CLUBHOUSE BUILDING: ±8,070.06 S.F.
   COTTAGES: 10 X 1,500.00 S.F.
   TOTAL LOT 1 BUILDING COVERAGE: ±23,070.06 S.F.

   LOT 2:
   RESIDENTIAL AMENITIES BUILDING: ±2,939.39 S.F.
   RESIDENTIAL BUILDINGS: 6 X ±14,420.17 S.F.
   GATE HOUSE: ±903 S.F.
   TENNIS PAVILION: ±375 S.F.
   TOTAL LOT 2 BUILDING COVERAGE: ±90,738.41 S.F.

   LOT 3:
   SEWAGE TREATMENT PLANT: ±699.58 S.F.
   TOTAL LOT 3 BUILDING COVERAGE: ±699.58 S.F.

   LOT 4:
   WATER TREATMENT BUILDING: ±640.00 S.F.
   WATER HOLDING TANK: ±571.36 S.F.
   TOTAL LOT 4 BUILDING COVERAGE: ±1,211.36 S.F.

8. THE PROPOSED/PROVIDED PARKING COUNT IS BASED ON THE TEMPORARY CLUBHOUSE FACILITIES INSTALLED/CONSTRUCTED IN 2021.

9. ANTICIPATED DEVELOPMENT SCOPE FOR FUTURE GOLF COURSE PHASE.

APPROVED BY TOWN OF NORTH CASTLE PLANNING BOARD RESOLUTION, DATED ________

________ DATE: ________
CHRISTOPHER CARTHY, CHAIRMAN,
TOWN OF NORTH CASTLE PLANNING BOARD

ENGINEERING DRAWINGS REVIEWED BY TOWN CONSULTING ENGINEER

________ DATE: ________
JOSEPH M. CERMELE, P.E.
KELLARD SESSIONS CONSULTING, P.C.
CONSULTING TOWN ENGINEER

APPROVED BY TOWN OF NORTH CASTLE PLANNING BOARD RESOLUTION, DATED ________

________ DATE: ________
CHRISTOPHER CARTHY, CHAIRMAN,
TOWN OF NORTH CASTLE PLANNING BOARD

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JOSEPH M. CERMELE, P.E.
KELLARD SESSIONS CONSULTING, P.C.
CONSULTING TOWN ENGINEER

SUBSURFACE UTILITY LOCATIONS ARE BASED ON A COMPILATION OF FIELD EVIDENCE, AVAILABLE RECORD PLANS AND/OR UTILITY MARK-OUTS. THE LOCATION OR COMPLETENESS OF UNDERGROUND INFORMATION CANNOT BE GUARANTEED. VERIFY THE ACTUAL LOCATION OF ALL UTILITIES PRIOR TO EXCAVATION OR CONSTRUCTION.

811 Know what's below. Call before you dig.

ANY ALTERATION OF PLANS, SPECIFICATIONS, PLATS AND REPORTS BEARING THE SEAL OF A LICENSED PROFESSIONAL ENGINEER OR LICENSED LAND SURVEYOR IS A VIOLATION OF SECTION 7209 OF THE NEW YORK STATE EDUCATION LAW, EXCEPT AS PROVIDED FOR BY SECTION 7209, SUBSECTION 2.

No.	Revision	Date	By
1.	RESPONSE TO TOWN COMMENTS	01/11/2021	NC
2.	RESPONSE TO TOWN COMMENTS	03/08/2021	NC
3.	RESPONSE TO TOWN COMMENTS	06/14/2021	NC
4.	RESPONSE TO TOWN COMMENTS	01/10/2022	NC
5.	RESPONSE TO TOWN COMMENTS	03/28/2022	NC
6.	RESPONSE TO TOWN COMMENTS	05/09/2022	NC

Previous Editions Obsolete

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JMC Site Development Consultants, LLC
John Meyer Consulting, Inc.
120 BEDFORD ROAD • ARMONK, NY 10504
voice 914.273.5225 • fax 914.273.2102
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Drawn: NC Approved: AG
Scale: NOT TO SCALE
Date: 11/23/2020
Project No: 20101
20101-COVER COVER COVER.scr
Drawing No: C–000

LEGEND

- EXISTING PROPERTY LINE
- ADJACENT PROPERTY LINE
- LIMIT OF REGULATED WETLAND BUFFER AREA
- EXISTING WETLAND LINE AND DELINEATION
- EXISTING BUILDING LINE
- EXISTING PAVEMENT EDGE
- EXISTING CURB LINE
- EXISTING CONTOUR
- EXISTING INDEX CONTOUR
- EXISTING STONE WALL
- EXISTING RETAINING WALL
- EXISTING GUIDE RAIL
- EXISTING FENCE
- EXISTING TREE
- EXISTING TREE LINE
- EXISTING STORM DRAIN LINE
- EXISTING SANITARY LINE
- EXISTING WATER LINE
- EXISTING GAS LINE
- EXISTING OVERHEAD WIRES
- EXISTING ELECTRIC LINE
- EXISTING DRAIN INLET
- EXISTING MANHOLE
- EXISTING FIRE HYDRANT
- EXISTING GAS VALVE
- EXISTING WATER VALVE
- EXISTING UTILITY POLE
- EXISTING LIGHT POLE
- EXISTING SIGN
- EXISTING WELL LOCATION AND DESIGNATION
- EXISTING GREEN-WASTE DEBRIS PILE
- EXISTING TOWN-REGULATED STEEP SLOPE AREA (GREATER THAN 25%)

NOTES:

1. EXISTING CONDITIONS DEPICTED ON THIS PLAN HAVE BEEN TAKEN FROM SURVEY TITLED, "TOPOGRAPHIC MAP," PREPARED BY JMC, LAST REVISED 03/06/2013, SUPPLEMENTED WITH AN UPDATED SURVEY LAST REVISED 01/17/2022. PORTIONS OF EXISTING TOPOGRAPHY HAVE BEEN PROVIDED BY WESTCHESTER COUNTY GIS.
2. GEOTECHNICAL BORING/TEST PIT LOCATIONS DEPICTED ON THIS PLAN WERE TAKEN FROM THE GEOTECHNICAL REPORT ENTITLED, "REPORT ON SUBSURFACE SOIL AND FOUNDATION INVESTIGATION", DATED 10/16/2013, PREPARED BY CARLIN-SIMPSON & ASSOCIATES.

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ARCHITECT:
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330 RAILROAD AVENUE
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OVERALL EXISTING CONDITIONS MAP

THE SUMMIT CLUB AT ARMONK (RESIDENTIAL PHASE)
568 & 570 BEDFORD ROAD (NY-22)
TOWN OF NORTH CASTLE, NEW YORK

APPROVED BY TOWN OF NORTH CASTLE PLANNING BOARD RESOLUTION, DATED ________

________ DATE: ________
CHRISTOPHER CARTHY, CHAIRMAN,
TOWN OF NORTH CASTLE PLANNING BOARD

ENGINEERING DRAWINGS REVIEWED BY TOWN CONSULTING ENGINEER

________ DATE: ________
JOSEPH M. CERMELE, P.E.
KELLARD SESSIONS CONSULTING, P.C.
CONSULTING TOWN ENGINEER

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Scale: 1" = 100'	
Date: 11/23/2020	
Project No: 20101	
20101-EXISTING	EX OV / EXIST.scr
Drawing No: C-010	

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LEGEND

- EXISTING PROPERTY LINE
- ADJACENT PROPERTY LINE
- LIMIT OF REGULATED WETLAND BUFFER AREA
- EXISTING WETLAND LINE AND DELINEATION
- EXISTING BUILDING LINE
- EXISTING PAVEMENT EDGE
- EXISTING CURB LINE
- EXISTING CONTOUR
- EXISTING INDEX CONTOUR
- EXISTING STONE WALL
- EXISTING RETAINING WALL
- EXISTING GUIDE RAIL
- EXISTING FENCE
- EXISTING TREE
- EXISTING TREE LINE
- EXISTING STORM DRAIN LINE
- EXISTING SANITARY LINE
- EXISTING WATER LINE
- EXISTING GAS LINE
- EXISTING OVERHEAD WIRES
- EXISTING ELECTRIC LINE
- EXISTING DRAIN INLET
- EXISTING MANHOLE
- EXISTING FIRE HYDRANT
- EXISTING GAS VALVE
- EXISTING WATER VALVE
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JMC

EXISTING CONDITIONS MAP (SOUTH)

THE SUMMIT CLUB AT ARMONK (RESIDENTIAL PHASE)

568 & 570 BEDFORD ROAD (NY-22)
TOWN OF NORTH CASTLE, NEW YORK

APPROVED BY TOWN OF NORTH CASTLE PLANNING BOARD RESOLUTION, DATED ______

______ DATE: ______
CHRISTOPHER CARTHY, CHAIRMAN,
TOWN OF NORTH CASTLE PLANNING BOARD

ENGINEERING DRAWINGS REVIEWED BY TOWN CONSULTING ENGINEER

______ DATE: ______
JOSEPH M. CERMELE, P.E.
KELLARD SESSIONS CONSULTING, P.C.
CONSULTING TOWN ENGINEER

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Date:	11/23/2020		
Project No:	20101		
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Drawing No:	C-011		

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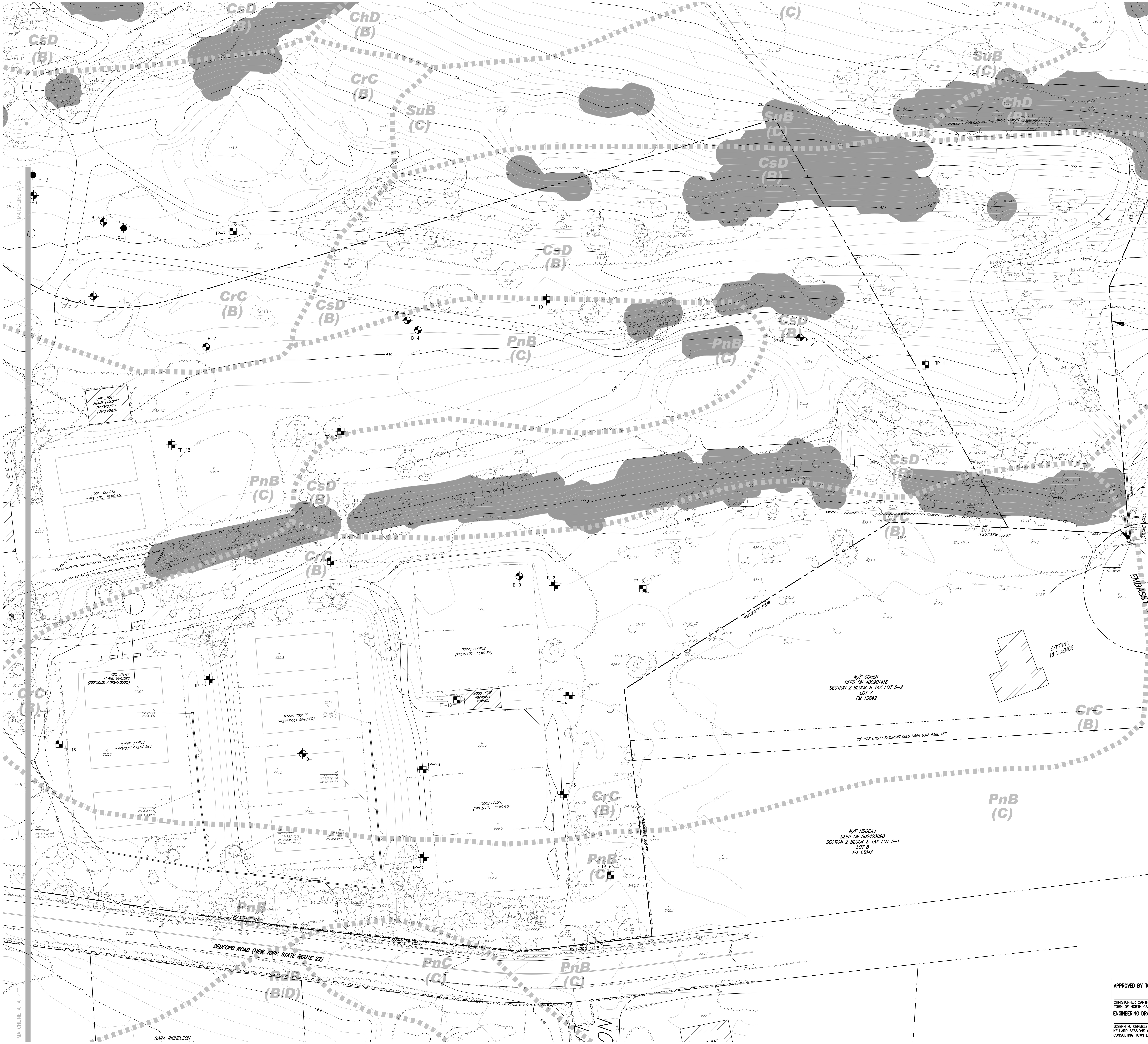

LEGEND

	EXISTING PROPERTY LINE
	ADJACENT PROPERTY LINE
	LIMIT OF REGULATED WETLAND BUFFER AREA
	EXISTING WETLAND LINE AND DELINEATION
	EXISTING BUILDING LINE
	EXISTING PAVEMENT EDGE
	EXISTING CURB LINE
172	EXISTING CONTOUR
170	EXISTING INDEX CONTOUR
	EXISTING STONE WALL
	EXISTING RETAINING WALL
	EXISTING GUIDE RAIL
	EXISTING FENCE
	EXISTING TREE
	EXISTING TREE LINE
	EXISTING STORM DRAIN LINE
	EXISTING SANITARY LINE
W	EXISTING WATER LINE
G	EXISTING GAS LINE
OHW	EXISTING OVERHEAD WIRES
E	EXISTING ELECTRIC LINE
	EXISTING DRAIN INLET
	EXISTING MANHOLE
	EXISTING FIRE HYDRANT
GV	EXISTING GAS VALVE
WV	EXISTING WATER VALVE
	EXISTING UTILITY POLE
	EXISTING LIGHT POLE
	EXISTING SIGN
W6	EXISTING WELL LOCATION AND DESIGNATION
	EXISTING GREEN–WASTE DEBRIS PILE
	EXISTING TOWN–REGULATED STEEP SLOPE AREA (GREATER THAN 25%)

NOTES:

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EXISTING CONDITIONS MAP (NORTH)

THE SUMMIT CLUB AT ARMONK (RESIDENTIAL PHASE)
568 & 570 BEDFORD ROAD (NY–22)
TOWN OF NORTH CASTLE, NEW YORK

APPROVED BY TOWN OF NORTH CASTLE PLANNING BOARD RESOLUTION, DATED ________

________ DATE: ________
CHRISTOPHER CARTHY, CHAIRMAN,
TOWN OF NORTH CASTLE PLANNING BOARD

ENGINEERING DRAWINGS REVIEWED BY TOWN CONSULTING ENGINEER

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JOSEPH M. CERMELE, P.E.
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CONSULTING TOWN ENGINEER

Drawn: NC	Approved: AG
Scale: 1" = 30'	
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Drawing No: C–012	

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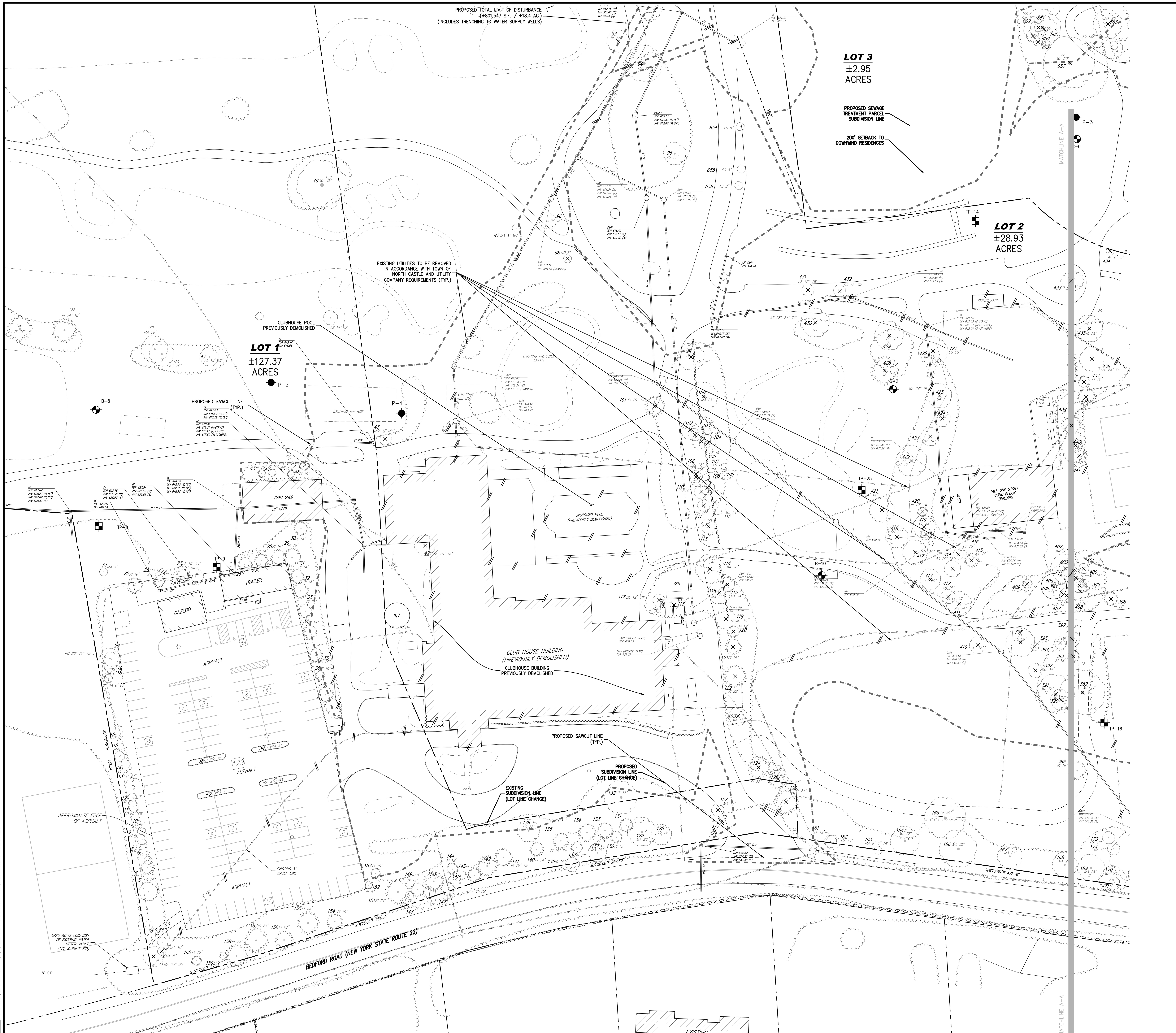

LEGEND

- EXISTING PROPERTY LINE
- ADJACENT PROPERTY LINE
- LIMIT OF REGULATED WETLAND BUFFER AREA
- EXISTING WETLAND LINE AND DELINEATION
- EXISTING BUILDING LINE
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- EXISTING STONE WALL
- EXISTING RETAINING WALL
- EXISTING GUIDE RAIL
- EXISTING FENCE
- EXISTING TREE
- EXISTING TREE TO BE REMOVED
- EXISTING TREE LINE
- EXISTING STORM DRAIN LINE
- EXISTING SANITARY LINE
- EXISTING WATER LINE
- EXISTING GAS LINE
- EXISTING OVERHEAD WIRES
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- EXISTING GAS VALVE
- EXISTING WATER VALVE
- EXISTING UTILITY POLE
- EXISTING LIGHT POLE
- EXISTING SIGN
- EXISTING WELL LOCATION AND DESIGNATION
- EXISTING FEATURE TO BE REMOVED
- PROPOSED SAWCUT LINE
- PROPOSED LIMIT OF DISTURBANCE

TOTAL NUMBER OF TREES TO BE REMOVED: 238

NOTES:

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3. CONTRACTOR SHALL OBTAIN ALL NECESSARY PERMITS AND ADHERE TO ALL REQUIREMENTS OF AGENCIES HAVING JURISDICTION OVER ROCK CRUSHING OPERATIONS. PORTABLE ROCK CRUSHING EQUIPMENT USED IN WESTCHESTER COUNTY IS SUBJECT TO PERMITTING BY THE WESTCHESTER COUNTY DEPARTMENT OF HEALTH (WCDOH). THE ROCK CRUSHING EQUIPMENT MUST MAINTAIN A VALID AND CURRENT PERMIT IN ACCORDANCE WITH REQUIREMENTS SET FORTH IN CHAPTER 873, ARTICLE XIII, SECTIONS 873.1303.1 AND 873.1306.1 OF THE WESTCHESTER COUNTY CODE. IN ADDITION TO COUNTY INSPECTION OF THE EQUIPMENT, THESE REGULATIONS REQUIRE MITIGATION MEASURES TO CONTROL THE POTENTIAL FOR FUGITIVE PARTICULATE EMISSIONS (STONE DUST).
4. THE CONTRACTOR SHALL VERIFY THE LOCATION OF EXISTING UTILITIES TO BE DEMOLISHED AND EXISTING UTILITIES TO BE PROTECTED. IF ANY DISCREPANCIES ARE FOUND, THE CONTRACTOR SHALL NOTIFY THE GENERAL CONTRACTOR AND JMC PRIOR TO THE START OF CONSTRUCTION.
5. PRIOR TO THE START OF ANY DEMOLITION THE CONTRACTOR SHALL OBTAIN ALL NECESSARY PERMITS AND/OR APPROVALS FROM THE TOWN OF NORTH CASTLE AND ALL OTHER AUTHORITIES HAVING JURISDICTION. CONTRACTOR SHALL PAY ALL OUTSTANDING FEES, CHARGES, AND DEPOSITS TO ACQUIRE SAID PERMITS. NO DEMOLITION SHALL COMMENCE UNTIL A PERMIT HAS BEEN OBTAINED FROM THE TOWN.
6. THE CONTRACTOR SHALL COORDINATE THE DISCONNECTION OF ALL UTILITIES WITH THE UTILITY COMPANY HAVING JURISDICTION PRIOR TO THE START OF DEMOLITION. CONFIRMATION OF DISCONNECTED UTILITIES SHALL BE PROVIDED TO THE TOWN OF NORTH CASTLE BUILDING DEPARTMENT IN ACCORDANCE WITH THEIR REQUIREMENTS. LETTERS FROM THE APPROPRIATE UTILITIES STATING THAT GAS AND ELECTRIC HAVE BEEN CUT OFF SHALL BE PROVIDED TO THE TOWN.
7. THE CONTRACTOR SHALL OBTAIN, AND PROVIDE A COPY TO THE TOWN, A SEWER PLUG PERMIT INDICATING THAT A LICENSED PLUMBER HAS PLUGGED ALL EXISTING SEWER LINES TO THE EXISTING BUILDING. THE CONTRACTOR SHALL OBTAIN, AND PROVIDE A COPY TO THE TOWN, A WATER USE PERMIT INDICATING THAT A LICENSED PLUMBER HAS CUT AND SEALED ALL EXISTING WATER SERVICE TO THE EXISTING BUILDING.
8. ANY UNSUITABLE MATERIAL FOUND ON–SITE DURING DEMOLITION/CONSTRUCTION, AS DETERMINED BY THE PROJECT'S GEOTECHNICAL ENGINEER, SHALL BE PROPERLY DISPOSED OF OFF–SITE IN A MANNER APPROVED BY ALL AUTHORITIES HAVING JURISDICTION AND REPLACED WITH SUITABLE MATERIAL AS REQUIRED.
9. ALL DEMOLITION AND/OR CONSTRUCTION WITHIN THE RIGHT–OF–WAY, INCLUDING STREETS AND SIDEWALKS, SHALL BE PERFORMED IN ACCORDANCE WITH TOWN/STATE REQUIREMENTS.
10. ALL CONSTRUCTION/DEMOLITION DEBRIS NOT PROPOSED TO BE RECYCLED SHALL BE REMOVED AND LEGALLY DISPOSED OF OFF–SITE IN ACCORDANCE WITH THE REGULATIONS OF ALL LOCAL, STATE AND FEDERAL AGENCIES HAVING JURISDICTION.
11. EXISTING CONCRETE MAY BE STORED ON SITE, AND RECYCLED FOR USE AS COMPACTED FILL. ALL MATERIAL TO BE USED AS FILL SHALL BE APPROVED BY THE PROJECT GEOTECHNICAL ENGINEER.
12. PRIOR TO THE START OF SITE DEMOLITION, EROSION AND SEDIMENT CONTROL DEVICES SHALL BE INSTALLED IN ACCORDANCE WITH TOWN REQUIREMENTS, AS REQUIRED AND/OR DIRECTED BY THE TOWN OF NORTH CASTLE OR JMC.
13. EXISTING DRAINAGE PATTERNS ON SITE SHALL BE MAINTAINED TO THE MAXIMUM EXTENT PRACTICABLE.
14. ALL EXISTING UTILITY CASTINGS WHICH ARE TO REMAIN SHALL BE REMOVED AND RESET TO THE NEW PROPOSED GRADES IN ACCORDANCE WITH THE DIRECTIONS OF THE OWNER'S FIELD REPRESENTATIVE. EXISTING CASTINGS WHICH ARE DAMAGED OR UNFIT FOR INSTALLATION IN THE NEW CONSTRUCTION, AS DETERMINED BY THE OWNER'S FIELD REPRESENTATIVE, SHALL BE REPLACED.
15. ALL EXISTING SIDEWALKS, CURBS, PAVEMENT, ETC. TO REMAIN, WHICH ARE DISTURBED OR DAMAGED DUE TO THE NEW CONSTRUCTION, ARE TO BE REPLACED WITH MATERIALS CONSISTENT WITH EXISTING CONDITIONS.
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18. THE CONTRACTOR SHALL EXTERMINATE RODENTS AS REQUIRED BY WESTCHESTER COUNTY DEPARTMENT OF HEALTH AND MENTAL HYGIENE. A LETTER FROM THE HEALTH DEPARTMENT CERTIFYING THAT A LICENSED EXTERMINATOR HAS TREATED THE EXISTING BUILDING SHALL BE PROVIDED TO THE TOWN DEPARTMENT OF BUILDINGS.
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20. THE CONTRACTOR SHALL PROVIDE VERIFICATION TO THE TOWN THAT FIVE (5)

APPROVED BY TOWN OF NORTH CASTLE PLANNING BOARD RESOLUTION, DATED ________

________________________ DATE: ____________

CHRISTOPHER CARTHY, CHAIRMAN,
TOWN OF NORTH CASTLE PLANNING BOARD

ENGINEERING DRAWINGS REVIEWED BY TOWN CONSULTING ENGINEER

________________________ DATE: ____________

JOSEPH M. CERMELE, P.E.
KELLARD SESSIONS CONSULTING, P.C.
CONSULTING TOWN ENGINEER

No.	Revision	Date	By
1.	RESPONSE TO TOWN COMMENTS	01/11/2021	NC
2.	RESPONSE TO TOWN COMMENTS	03/08/2021	NC
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6.	RESPONSE TO TOWN COMMENTS	05/09/2022	NC

Previous Editions Obsolete

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568 BEDFORD ROAD (NY–22)
ARMONK, NY 10504

ARCHITECT:
GRANOFF ARCHITECTS
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GREENWICH, CT 06830

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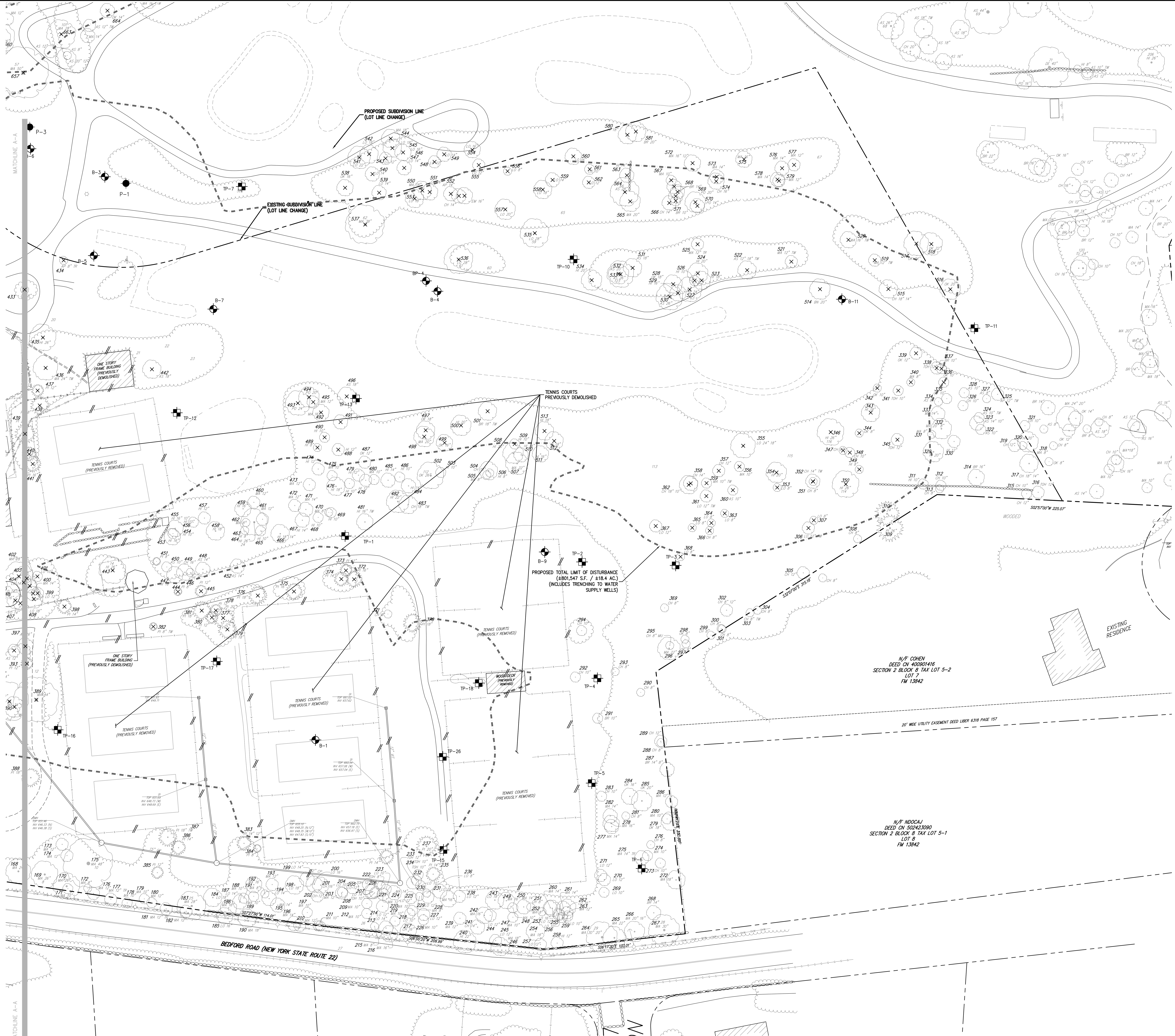
voice 914.273.5225 • fax 914.273.2102
www.jmcpllc.com

SITE DEMOLITION & TREE REMOVAL PLAN (SOUTH)

THE SUMMIT CLUB AT ARMONK (RESIDENTIAL PHASE)

568 & 570 BEDFORD ROAD (NY–22)
TOWN OF NORTH CASTLE, NEW YORK

Drawn: NC Approved: AG
Scale: 1" = 30'
Date: 11/23/2020
Project No: 20101
20101–DEMO | DEMO SOUTH | GRAD.scr
Drawing No:
C–020



LEGEND

- EXISTING PROPERTY LINE
- ADJACENT PROPERTY LINE
- LIMIT OF REGULATED WETLAND BUFFER AREA
- EXISTING WETLAND LINE AND DELINEATION
- EXISTING BUILDING LINE
- EXISTING PAVEMENT EDGE
- EXISTING CURB LINE
- EXISTING CONTOUR
- EXISTING INDEX CONTOUR
- EXISTING STONE WALL
- EXISTING RETAINING WALL
- EXISTING GUIDE RAIL
- EXISTING FENCE
- EXISTING TREE
- EXISTING TREE TO BE REMOVED
- EXISTING TREE LINE
- EXISTING STORM DRAIN LINE
- EXISTING SANITARY LINE
- EXISTING WATER LINE
- EXISTING GAS LINE
- EXISTING OVERHEAD WIRES
- EXISTING ELECTRIC LINE
- EXISTING DRAIN INLET
- EXISTING MANHOLE
- EXISTING FIRE HYDRANT
- EXISTING GAS VALVE
- EXISTING WATER VALVE
- EXISTING UTILITY POLE
- EXISTING LIGHT POLE
- EXISTING SIGN
- EXISTING WELL LOCATION AND DESIGNATION
- EXISTING FEATURE TO BE REMOVED
- PROPOSED SAWCUT LINE
- PROPOSED LIMIT OF DISTURBANCE

TOTAL NUMBER OF TREES TO BE REMOVED: 238

NOTES:

1. EXISTING CONDITIONS DEPICTED ON THIS PLAN HAVE BEEN TAKEN FROM SURVEY TITLED, "TOPOGRAPHIC MAP," PREPARED BY JMC, LAST REVISED 03/06/2013. PORTIONS OF EXISTING TOPOGRAPHY HAVE BEEN PROVIDED BY WESTCHESTER COUNTY GIS.
2. GEOTECHNICAL BORING/TEST PIT LOCATIONS DEPICTED ON THIS PLAN WERE TAKEN FROM THE GEOTECHNICAL REPORT ENTITLED, "REPORT ON SUBSURFACE SOIL AND FOUNDATION INVESTIGATION", DATED 10/16/2013, PREPARED BY CARLIN-SIMPSON & ASSOCIATES.
3. CONTRACTOR SHALL OBTAIN ALL NECESSARY PERMITS AND ADHERE TO ALL REQUIREMENTS OF AGENCIES HAVING JURISDICTION OVER ROCK CRUSHING OPERATIONS. PORTABLE ROCK CRUSHING EQUIPMENT USED IN WESTCHESTER COUNTY IS SUBJECT TO PERMITTING BY THE WESTCHESTER COUNTY DEPARTMENT OF HEALTH (WCDOH). THE ROCK CRUSHING EQUIPMENT MUST MAINTAIN A VALID AND CURRENT PERMIT IN ACCORDANCE WITH REQUIREMENTS SET FORTH IN CHAPTER 873, ARTICLE XIII, SECTIONS 873.1303.1 AND 873.1306.1 OF THE WESTCHESTER COUNTY CODE. IN ADDITION TO COUNTY INSPECTION OF THE EQUIPMENT, THESE REGULATIONS REQUIRE MITIGATION MEASURES TO CONTROL THE POTENTIAL FOR FUGITIVE PARTICULATE EMISSIONS (STONE DUST).
4. THE CONTRACTOR SHALL VERIFY THE LOCATION OF EXISTING UTILITIES TO BE DEMOLISHED AND EXISTING UTILITIES TO BE PROTECTED. IF ANY DISCREPANCIES ARE FOUND, THE CONTRACTOR SHALL NOTIFY THE GENERAL CONTRACTOR AND JMC PRIOR TO THE START OF CONSTRUCTION.
5. PRIOR TO THE START OF ANY DEMOLITION THE CONTRACTOR SHALL OBTAIN ALL NECESSARY PERMITS AND/OR APPROVALS FROM THE TOWN OF NORTH CASTLE AND ALL OTHER AUTHORITIES HAVING JURISDICTION. CONTRACTOR SHALL PAY ALL OUTSTANDING FEES, CHARGES, AND DEPOSITS TO ACQUIRE SAID PERMITS. NO DEMOLITION SHALL COMMENCE UNTIL A PERMIT HAS BEEN OBTAINED FROM THE TOWN.
6. THE CONTRACTOR SHALL COORDINATE THE DISCONNECTION OF ALL UTILITIES WITH THE UTILITY COMPANY HAVING JURISDICTION PRIOR TO THE START OF DEMOLITION. CONFIRMATION OF DISCONNECTED UTILITIES SHALL BE PROVIDED TO THE TOWN OF NORTH CASTLE BUILDING DEPARTMENT IN ACCORDANCE WITH THEIR REQUIREMENTS. LETTERS FROM THE APPROPRIATE UTILITIES STATING THAT GAS AND ELECTRIC HAVE BEEN CUT OFF SHALL BE PROVIDED TO THE TOWN.
7. THE CONTRACTOR SHALL OBTAIN, AND PROVIDE A COPY TO THE TOWN, A SEWER PLUG PERMIT INDICATING THAT A LICENSED PLUMBER HAS PLUGGED ALL EXISTING SEWER LINES TO THE EXISTING BUILDING. THE CONTRACTOR SHALL OBTAIN, AND PROVIDE A COPY TO THE TOWN, A WATER USE PERMIT INDICATING THAT A LICENSED PLUMBER HAS CUT AND SEALED ALL EXISTING WATER SERVICE TO THE EXISTING BUILDING.
8. ANY UNSUITABLE MATERIAL FOUND ON-SITE DURING DEMOLITION/CONSTRUCTION, AS DETERMINED BY THE PROJECT'S GEOTECHNICAL ENGINEER, SHALL BE PROPERLY DISPOSED OF OFF-SITE IN A MANNER APPROVED BY ALL AUTHORITIES HAVING JURISDICTION AND REPLACED WITH SUITABLE MATERIAL AS REQUIRED.
9. ALL DEMOLITION AND/OR CONSTRUCTION WITHIN THE RIGHT-OF-WAY, INCLUDING STREETS AND SIDEWALKS, SHALL BE PERFORMED IN ACCORDANCE WITH TOWN/STATE REQUIREMENTS.
10. ALL CONSTRUCTION/DEMOLITION DEBRIS NOT PROPOSED TO BE RECYCLED SHALL BE REMOVED AND LEGALLY DISPOSED OF OFF-SITE IN ACCORDANCE WITH THE REGULATIONS OF ALL LOCAL, STATE AND FEDERAL AGENCIES HAVING JURISDICTION.
11. EXISTING CONCRETE MAY BE STORED ON SITE, AND RECYCLED FOR USE AS COMPACTED FILL. ALL MATERIAL TO BE USED AS FILL SHALL BE APPROVED BY THE PROJECT GEOTECHNICAL ENGINEER.
12. PRIOR TO THE START OF SITE DEMOLITION, EROSION AND SEDIMENT CONTROL DEVICES SHALL BE INSTALLED IN ACCORDANCE WITH TOWN REQUIREMENTS, AS REQUIRED AND/OR DIRECTED BY THE TOWN OF NORTH CASTLE OR JMC.
13. EXISTING DRAINAGE PATTERNS ON SITE SHALL BE MAINTAINED TO THE MAXIMUM EXTENT PRACTICABLE.
14. ALL EXISTING UTILITY CASTINGS WHICH ARE TO REMAIN SHALL BE REMOVED AND RESET TO THE NEW PROPOSED GRADES IN ACCORDANCE WITH THE DIRECTIONS OF THE OWNER'S FIELD REPRESENTATIVE. EXISTING CASTINGS WHICH ARE DAMAGED OR UNFIT FOR INSTALLATION IN THE NEW CONSTRUCTION, AS DETERMINED BY THE OWNER'S FIELD REPRESENTATIVE, SHALL BE REPLACED.
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__________ DATE: ______

CHRISTOPHER CARTHY, CHAIRMAN,
TOWN OF NORTH CASTLE PLANNING BOARD

ENGINEERING DRAWINGS REVIEWED BY TOWN CONSULTING ENGINEER

__________ DATE: ______

JOSEPH M. CERMELE, P.E.
KELLARD SESSIONS CONSULTING, P.C.
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SITE DEMOLITION & TREE REMOVAL PLAN (NORTH)

THE SUMMIT CLUB AT ARMONK (RESIDENTIAL PHASE)

568 & 570 BEDFORD ROAD (NY-22)
TOWN OF NORTH CASTLE, NEW YORK

Drawn:	NC	Approved:	AG
Scale:	1" = 30'		
Date:	11/23/2020		
Project No:	20101		
20101-DEMO	DEMO NORTH	GRAD.scr	
Drawing No:	C-021		

NOT FOR CONSTRUCTION

TREE REMOVAL SUMMARY

NUMBER	SPECIES	DIAMETER	REMAIN/REMOVE	NUMBER	SPECIES	DIAMETER	REMAIN/REMOVE	NUMBER	SPECIES	DIAMETER	REMAIN/REMOVE	NUMBER	SPECIES	DIAMETER	REMAIN/REMOVE	NUMBER	SPECIES	DIAMETER	REMAIN/REMOVE	NUMBER	SPECIES	DIAMETER	REMAIN/REMOVE
1	MAPLE	20" MU	REMOVE	112	MAPLE	24"	REMOVE	223	LOCUST	10"	REMAIN	334	ASH	8"	REMAIN	445	PINE	12"	REMOVE	555	LOCUST	12"	REMOVE
2	MAPLE	8"	REMOVE	113	CHERRY	14"	REMOVE	224	MAPLE	14"	REMAIN	335	CHERRY	10"	REMOVE	446	HICKORY	8"	REMAIN	556	LOCUST	8"	REMOVE
3	SASSAFRASS	10"	REMAIN	114	MAPLE	28"	REMOVE	225	LOCUST	12"	REMAIN	336	OAK	10"	REMOVE	447	HICKORY	16"	REMAIN	557	LOCUST	20"	REMOVE
4	LOCUST	8"	REMAIN	115	MAPLE	14"	REMOVE	226	MAPLE	10"	REMAIN	337	BIRCH	10"	REMOVE	448	ASH	14"	REMAIN	558	LOCUST	18"	REMOVE
5	LOCUST	18"	REMAIN	116	MAPLE	22"	REMOVE	227	LOCUST	12"	REMAIN	338	TREE OF HEAVEN	12"	REMOVE	449	CHERRY	16"	REMAIN	559	LOCUST	14"	REMOVE
6	PINE	14"	REMAIN	117	DECIDUOUS	12" TW	REMOVE	228	MAPLE	8"	REMAIN	339	TREE OF HEAVEN	12"	REMOVE	450	ASH	10"	REMAIN	560	LOCUST	16"	REMOVE
7	LOCUST	8"	REMAIN	118	MAPLE	8"	REMOVE	229	LOCUST	12"	REMAIN	340	MAPLE	8"	REMOVE	451	PINE	8"	REMAIN	561	LOCUST	10"	REMOVE
8	LOCUST	8"	REMAIN	119	HICKORY	20"-16"	REMOVE	230	LOCUST	10"	REMAIN	341	TREE OF HEAVEN	10"	REMOVE	452	ASH	14"	REMAIN	562	LOCUST	12"	REMOVE
9	LOCUST	10"	REMAIN	120	PINE	12"	REMOVE	231	LOCUST	18"	REMAIN	342	OAK	10"	REMOVE	453	HICKORY	16"	REMAIN	563	HICKORY	14"	REMOVE
10	LOCUST	8"	REMAIN	121	PINE	16"	REMOVE	232	TREE OF HEAVEN	10"	REMAIN	343	HICKORY	18"	REMOVE	454	HICKORY	10"	REMAIN	564	ASH	28"	REMOVE
11	LOCUST	10" TW	REMAIN	122	PINE	22"	REMOVE	233	TREE OF HEAVEN	12"	REMAIN	344	OAK	8"	REMOVE	455	HICKORY	16"-10"	REMAIN	565	MAPLE	20"	REMOVE
12	LOCUST	8"	REMAIN	123	MAPLE	18"	REMOVE	234	TREE OF HEAVEN	10"	REMAIN	345	OAK	12"	REMOVE	456	HICKORY	10"	REMAIN	566	CHERRY	14"	REMOVE
13	POPLAR	20"	REMAIN	124	PINE	22"	REMOVE	235	PINE	14"	REMAIN	346	HICKORY	26"	REMOVE	457	HICKORY	12"	REMAIN	567	MAPLE	10"	REMOVE
14	LOCUST	10"	REMAIN	125	PINE	20"	REMOVE	236	LOCUST	8"	REMAIN	347	CHERRY	8"	REMOVE	458	HICKORY	18"	REMAIN	568	BIRCH	14"	REMOVE
15	MAPLE	10"	REMAIN	126	PINE	24"	REMOVE	237	PINE	20"	REMAIN	348	CHERRY	10"	REMOVE	459	HICKORY	16"	REMAIN	569	POPLAR	20"	REMOVE
16	LOCUST	10"	REMAIN	127	MAPLE	12"	REMOVE	238	LOCUST	12"	REMAIN	349	HICKORY	8"	REMOVE	460	MAPLE	12"	REMAIN	570	POPLAR	14"	REMOVE
17	MAPLE	8"	REMAIN	128	LOCUST	20"	REMAIN	239	MAPLE	12"	REMAIN	350	HICKORY	26"	REMOVE	461	MAPLE	12"	REMAIN	571	BIRCH	10"	REMOVE
18	MAPLE	8"	REMAIN	129	MAPLE	28"	REMAIN	240	HICKORY	22"	REMAIN	351	CHERRY	8"	REMOVE	462	MAPLE	8"	REMAIN	572	MAPLE	16"-12"	REMOVE
19	POPLAR	14"	REMAIN	130	PINE	12"	REMAIN	241	CHERRY	14"	REMAIN	352	CHERRY	14" TW	REMOVE	463	HICKORY	8"	REMAIN	573	MAPLE	14"	REMOVE
20	POPLAR	20"-16" TW	REMAIN	131	PINE	14"	REMAIN	242	MAPLE	16"	REMAIN	353	LOCUST	8"	REMOVE	464	HICKORY	26"	REMAIN	574	CHERRY	16"	REMOVE
21	MAPLE	8"	REMAIN	132	LOCUST	32"	REMAIN	243	LOCUST	18"	REMAIN	354	HICKORY	20"	REMOVE	465	HICKORY	10"	REMAIN	575	MAPLE	16"	REMOVE
22	PINE	16"	REMAIN	133	PINE	16"	REMAIN	244	LOCUST	12"	REMAIN	355	LOCUST	24"-18"	REMOVE	466	HICKORY	18"-14"	REMAIN	576	MAPLE	14"	REMOVE
23	PINE	12"	REMAIN	134	PINE	18"	REMAIN	245	LOCUST	12"	REMAIN	356	MAPLE	10"	REMOVE	467	HICKORY	14"	REMAIN	577	MAPLE	12"	REMOVE
24	PINE	14"	REMAIN	135	PINE	16" TW	REMAIN	246	MAPLE	18"	REMAIN	357	CHERRY	12"	REMOVE	468	HICKORY	10"	REMAIN	578	MAPLE	14"	REMOVE
25	ASH	16"-14"	REMAIN	136	LOCUST	22"	REMAIN	247	MAPLE	10"	REMAIN	358	CHERRY	14"	REMOVE	469	HICKORY	10"	REMAIN	579	MAPLE	12"	REMOVE
26	PINE	14"	REMAIN	137	MAPLE	18"	REMAIN	248	MAPLE	10"	REMAIN	359	MAPLE	10" TW	REMOVE	470	MAPLE	8"	REMAIN	580	HICKORY	18"	REMOVE
27	PINE	14"	REMAIN	138	PINE	12"	REMAIN	249	MAPLE	16"	REMAIN	360	ASH	10"	REMOVE	471	MAPLE	14"	REMAIN	581	BIRCH	20"	REMOVE
28	PINE	16"	REMAIN	139	HICKORY	14"	REMAIN	250	MAPLE	14"	REMAIN	361	LOCUST	12" TW	REMOVE	472	MAPLE	12"	REMAIN	582	MAPLE	24"	REMAIN
29	PINE	18"	REMAIN	140	PINE	14"	REMAIN	251	CHERRY	8"	REMAIN	362	CHERRY	18"-10"	REMOVE	473	MAPLE	12"	REMAIN	583	MAPLE	16"	REMAIN
30	PINE	14"	REMAIN	141	PINE	18" TW	REMAIN	252	MAPLE	8"	REMAIN	363	LOCUST	8"	REMOVE	474	HICKORY	12"	REMAIN	584	MAPLE	14"	REMAIN
31	PINE	14"	REMAIN	142	PINE	20"	REMAIN	253	LOCUST	16"	REMAIN	364	LOCUST	8"	REMOVE	475	MAPLE	10"	REMAIN	585	MAPLE	12"	REMAIN
32	PINE	16"	REMAIN	143	PINE	14"	REMAIN	254	MAPLE	18"	REMAIN	365	LOCUST	8"	REMOVE	476	HICKORY	18"	REMAIN	586	MAPLE	10"	REMAIN
33	PINE	14"	REMAIN	144	PINE	12"	REMAIN	255	LOCUST	12"	REMAIN	366	CHERRY	8"	REMOVE	477	HICKORY	10"	REMAIN	587	MAPLE	18"	REMAIN
34	PINE	14"	REMAIN	145	ASH	24"	REMAIN	256	LOCUST	10"	REMAIN	367	LOCUST	12"	REMOVE	478	HICKORY	12"	REMAIN	588	MAPLE	24"	REMAIN
35	PINE	14"	REMAIN	146	PINE	20"	REMAIN	257	LOCUST	12"	REMAIN	368	LOCUST	8"	REMOVE	479	HICKORY	12"	REMAIN	589	MAPLE	24"	REMAIN
36	PINE	10"	REMAIN	147	PINE	14"	REMAIN	258	HICKORY	12"	REMAIN	369	CHERRY	8"	REMAIN	480	MAPLE	10"	REMAIN	590	OAK	18"	REMAIN
37	PINE	16"	REMAIN	148	PINE	12"	REMAIN	259	LOCUST	10"	REMAIN	370	PINE	18"	REMAIN	481	HICKORY	16" TW	REMAIN	591	MAPLE	24"	REMAIN
38	MAPLE	6"	REMAIN	149	PINE	14"	REMAIN	260	MAPLE	14"	REMAIN	371	CHERRY	8"	REMAIN	482	HICKORY	22"	REMAIN	592	MAPLE	10"	REMAIN
39	MAPLE	6"	REMAIN	150	ASH	8"	REMAIN	261	MAPLE	14"	REMAIN	372	PINE	16"	REMOVE	483	CHERRY	18" TW	REMAIN	593	MAPLE	16"	REMAIN
40	MAPLE	4"	REMAIN	151	PINE	24"	REMAIN	262	LOCUST	16"	REMAIN	373	PINE	12"	REMOVE	484	HICKORY	14"	REMAIN	594	MAPLE	18"	REMAIN
41	MAPLE	4"	REMAIN	152	PINE	8"	REMAIN	263	MAPLE	12"	REMAIN	374	PINE	14"	REMOVE	485	HICKORY	14"	REMAIN	595	MAPLE	12"	REMAIN
42	DECIDUOUS	20"-16"	REMOVE	153	PINE	10"	REMAIN	264	MAPLE	30"-20"	REMAIN	375	PINE	16"	REMOVE	486	HICKORY	10"	REMAIN	596	MAPLE	12"	REMAIN
43	PINE	10"	REMAIN	154	PINE	16"	REMAIN	265	MAPLE	22"	REMAIN	376	PINE	18"	REMOVE	487	OAK	12"	REMAIN	597	MAPLE	28"	REMAIN
44	PINE	10"	REMAIN	155	PINE	22"	REMAIN	266	MAPLE	20"-16"	REMAIN	377	PINE	20"	REMOVE	488	HICKORY	12"	REMOVE	598	ELM	14"	REMAIN
45	PINE	8"	REMAIN	156	PINE	18"	REMAIN	267	MAPLE	28"-30"	REMAIN	378	PINE	12"	REMOVE	489	HICKORY	8"	REMOVE	599	MAPLE	28"	REMAIN
46	PINE	10"	REMAIN	157	PINE	24"	REMAIN	268	BIRCH	14"	REMAIN	379	PINE	18"	REMOVE	490	HICKORY	10"	REMOVE	600	MAPLE	8"	REMAIN
47	ASH	18"-16"	REMAIN	158	PINE	22"	REMAIN	269	LOCUST	10"	REMAIN	380	PINE	12"	REMOVE	491	ASH	14"	REMOVE	601	MAPLE	26"	REMAIN
48	JAPANESE MAPLE	12" MU	REMOVE	159	CEDAR	8"	REMAIN	270	LOCUST	12"	REMAIN	381	PINE	18"	REMOVE	492	MAPLE	16"	REMOVE	602	MAPLE	18"	REMAIN
49	MAPLE	48"	REMAIN	160	PINE	10"	REMAIN	271	LOCUST	12"	REMAIN	382	PINE	8" TW	REMOVE	493	POPLAR	24"	REMOVE	603	TREE OF HEAVEN	10"-6"	REMAIN
50	MAPLE	32"	REMAIN	161	MAPLE	12"	REMAIN	272	MAPLE	18"	REMAIN	383	PINE	14" -12"	REMAIN	494	POPLAR	20"	REMOVE	604	MAPLE	18"	REMAIN
51	PINE	16"	REMAIN	162	MAPLE	14"	REMAIN	273	CHERRY	10"	REMAIN	384	PINE	8"	REMAIN	495	MAPLE	12"	REMOVE	605	MAPLE	26"	REMAIN
52	PINE	14"	REMAIN	163	MAPLE	8"-6" TW	REMAIN	274	MAPLE	10"	REMAIN	385	PINE	12"	REMAIN	496	ASH	18"	REMOVE	606	MAPLE	22"	REMAIN
53	PINE	12"	REMAIN	164	MAPLE	28"	REMAIN	275	MAPLE	14" TR	REMAIN	386	PINE	14"	REMAIN	497	OAK	18"	REMOVE	607	MAPLE	10"	REMAIN
54	PINE	8"	REMAIN	165	HICKORY	40"	REMAIN	276	CHERRY	8"	REMAIN	387	PINE	18" TW	REMAIN	498	MAPLE	20"	REMOVE	608	MAPLE	10"	REMAIN
55	PINE	10"	REMAIN	166	MAPLE	36"	REMAIN	277	MAPLE	14"	REMAIN	388	PINE	18"	REMAIN	499	OAK	16"	REMOVE	609	MAPLE	8"	REMAIN
56	PINE	8"	REMAIN	167	MAPLE	24"	REMAIN	278	MAPLE	16"	REMAIN	389	MAPLE	44"	REMOVE	500	HICKORY	20"	REMOVE	610	MAPLE	8"	REMAIN
57	PINE	8"	REMAIN	168	MAPLE	24"	REMAIN	279	OAK	18"	REMAIN	390	MAPLE	24"	REMOVE	501	BIRCH	18" TW	REMOVE	611	MAPLE	10"	REMAIN
58	PINE	10"	REMAIN	169	MAPLE	26"	REMAIN	280	MAPLE	10"	REMAIN	391	MAPLE	38"	REMOVE	502	OAK	26"	REMAIN	612	MAPLE	16"	REMAIN
59	PINE	8"	REMAIN	170	MAPLE	26"	REMAIN	281	CHERRY	8"	REMAIN	392	MAPLE	14"	REMOVE	503	HICKORY	10"	REMAIN	613	MAPLE	18"	REMAIN
60	PINE	12"	REMAIN	171	MAPLE	10"	REMAIN	282	MAPLE	14"	REMAIN	393	PINE	12"	REMOVE	504	CHERRY	18"	REMAIN	614	MAPLE	20"	REMAIN
61	PINE	10"	REMAIN	172	MAPLE	8"	REMAIN	283	CHERRY	10"	REMAIN	394	ASH	12"	REMOVE	505	MAPLE	8"	REMAIN	615	MAPLE	18"	REMAIN
62	PINE	8"	REMAIN	173	MAPLE	12"	REMAIN	284	OAK	16"	REMAIN	395	ASH	8"	REMOVE	506	HICKORY	8"	REMAIN	616	MAPLE	8"	REMAIN
63	MAPLE	18"	REMAIN	174	MAPLE	12"	REMAIN	285	OAK	20"	REMAIN	396	ASH	28"	REMOVE	507	MAPLE	22"	REMAIN	617	MAPLE	8"	REMAIN
64	MAPLE	18"	REMAIN	175	MAPLE	48"	REMAIN	286	MAPLE	12"	REMAIN	397	ASH	16"	REMOVE	508	HICKORY	20"	REMOVE	618	MAPLE	14"	REMAIN
65	MAPLE	12"	REMAIN	176	MAPLE	12"	REMAIN	287	BIRCH	14"-8"	REMAIN	398	PINE	14"	REMOVE	509	HICKORY	10"	REMOVE	619	HICKORY	16"	REMAIN
66	MAPLE	10"	REMAIN	177	MAPLE	12"	REMAIN	288	CHERRY	8"	REMAIN	399	LOCUST	12"	REMOVE	510	HICKORY	14"	REMAIN	620	MAPLE	26"	REMAIN
67	MAPLE	14"-6"	REMAIN	178	MAPLE	10"	REMAIN	289	CHERRY	12"	REMAIN	400	MAPLE	14"	REMOVE	511	HICKORY	16"	REMAIN	621	MAPLE	18"	REMAIN
68	MAPLE	10"	REMAIN	179	MAPLE	10"	REMAIN	290	CHERRY	8"	REMAIN	401	LOCUST	10"	REMOVE	512	HICKORY	18"	REMOVE	622	OAK	28"	REMAIN
69	MAPLE	8"	REMAIN	180	MAPLE	12"	REMAIN	291	BIRCH	10"	REMAIN	402	MAPLE	28"	REMOVE	513	HICKORY	18"	REMOVE	623	MAPLE	26"	REMAIN
70	MAPLE	14"	REMAIN	181	MAPLE	12" TR	REMAIN	292	CHERRY	10"	REMAIN	403	LOCUST	8"	REMOVE	514	BUTTERNUT	20"	REMOVE	624	MAPLE	20"	REMAIN
71	MAPLE	12"	REMAIN	182	MAPLE	12"	REMAIN	293	CHERRY	8"	REMAIN	404	LOCUST	14"	REMOVE	515	CHERRY	18"-14"	REMOVE	625	MAPLE	6"	REMAIN
72	DECIDUOUS	8"	REMAIN	183	MAPLE	28"	REMAIN	294	CHERRY	10"	REMAIN	405	LOCUST	14"	REMOVE	516	OAK	20"	REMOVE	626	OAK	26"	REMAIN
73	DECIDUOUS	12"	REMAIN	184	LOCUST	18"	REMAIN	295	CHERRY	8" MU	REMAIN	406	LOCUST	16"	REMOVE	517	OAK	24"	REMOVE	627	MAPLE	8"	REMAIN
74	MAPLE	10"	REMAIN	185	LOCUST	16"	REMAIN	296	MAPLE	22"	REMAIN	407	LOCUST	14"	REMOVE	518	OAK	22"	REMOVE	628	OAK	20"	REMAIN
75	MAPLE	30"	REMAIN	186	MAPLE	16"	REMAIN	297	OAK	8"	REMAIN	408	LOCUST	18"	REMOVE	519	MAPLE	12" TW	REMOVE	629	OAK	48"	REMAIN
76	LOCUST	10"	REMAIN	187	LOCUST	14"	REMAIN	298	OAK	8"	REMAIN	409	PINE	10" MU	REMOVE	520	MAPLE	16" TW	REMOVE	630	BIRCH	14"	REMAIN
77	LOCUST	12"-6"	REMAIN	188	MAPLE	10"	REMAIN	299	CHERRY	8"	REMAIN	410	ASH	16"	REMOVE	521	MAPLE	12" TW	REMOVE	631	OAK	44"	REMAIN
78	MAPLE	12"	REMAIN	189	MAPLE	10"	REMAIN	300	CHERRY	8"	REMAIN	411	ASH	24"	REMOVE	522	ASH	12"-18" TW	REMOVE	632	OAK	40"	REMAIN
79	MAPLE	14"	REMAIN	190	MAPLE	18"	REMAIN	301	CHERRY	8"	REMAIN	412	CHERRY	14"	REMOVE	523	HICKORY	18"	REMOVE	633	OAK	34"	REMAIN
80	POPLAR	6"	REMAIN	191	MAPLE	8"	REMAIN	302	CHERRY	8"-12"	REMAIN	413	LOCUST	20"	REMOVE	524	HICKORY	20"	REMOVE	634	OAK	8"	REMAIN
81	DECIDUOUS	10"	REMAIN	192	MAPLE	16"	REMAIN	303	CHERRY	8" TW	REMAIN	414	ASH	16"-12"	REMOVE	525	MAPLE	12" TR	REMOVE	635	BIRCH	12"TW	REMAIN
82	MAPLE	16"	REMAIN	193	MAPLE	12"	REMAIN	304	CHERRY	8"	REMAIN	415	LOCUST	14"	REMOVE	526	HICKORY	10"	REMOVE	636	HICKORY	8"	REMAIN
83	DECIDUOUS	16"	REMAIN	194	LOCUST	14"	REMAIN	305	CHERRY	12"	REMAIN	416	LOCUST	10"	REMOVE	527	HICKORY	24"	REMOVE	637	OAK	38"	REMAIN
84	OAK	10"	REMAIN	195	MAPLE	14"	REMAIN	306	LOCUST	12" TW	REMOVE	417	MAPLE	24" TR	REMOVE	528	OAK	18"	REMOVE	638	MAPLE	8"	REMAIN
85	MAPLE	28"	REMAIN	196	MAPLE	14"	REMAIN	307	LOCUST	8"	REMOVE	418	CHERRY	22"	REMOVE	529	HICKORY	16"	REMOVE	639	OAK	10"	REMAIN
86	MAPLE	16"	REMAIN	197	MAPLE	10"	REMAIN	308	CHERRY	8"	REMAIN	419	LOCUST	22"	REMOVE	530	ASH	26"	REMOVE	640	BIRCH	8"	REMAIN
87	MAPLE	12"-14"	REMAIN	198	LOCUST	18"	REMAIN	309	PINE	26"	REMAIN	420	PINE	10" TW	REMOVE	531	ASH	18"	REMOVE	641	OAK	30"	REMAIN
88	MAPLE	18"	REMAIN	199	LOCUST	14"	REMAIN	310	PINE	24"	REMAIN	421	CHERRY	24"-14"	REMOVE	532	ASH	20"	REMOVE	642	MAPLE	16"	REMAIN
89	MAPLE	28"	REMAIN	200	LOCUST	16"	REMAIN	311	HICKORY	10"	REMAIN	422	LOCUST	30"	REMOVE	533	ASH	26"	REMOVE	643	ASH	14"	REMAIN
90	ASH	16"	REMAIN	201	CHERRY	16"	REMAIN	312	CHERRY	10"	REMAIN	423	LOCUST	18"-16"	REMOVE	534	HICKORY	20"	REMOVE	644	MAPLE	8"	REMAIN
91	MAPLE	16"	REMAIN	202	CHERRY	12"	REMAIN	313	CHERRY	8"	REMAIN	424	LOCUST	16"	REMOVE	535	LOCUST	28"	REMOVE	645	MAPLE	12"	REMAIN
92	CHERRY	24"	REMOVE	203	MAPLE	12"	REMAIN	314	BIRCH	16"	REMAIN	425	MAPLE	24" TR	REMOVE	536	LOCUST	28"	REMOVE	646	MAPLE	24"	REMAIN
93	HICKORY	22"	REMOVE	204	LOCUST	10"	REMAIN	315	CHERRY	10"	REMAIN	426	BIRCH	8"	REMOVE	537	MAPLE	38"	REMOVE	647	MAPLE	10"	REMAIN
94	OAK	36"	REMAIN	205	LOCUST	12"	REMAIN	316	TREE OF HEAVEN	12"	REMAIN	427	LOCUST	28"	REMOVE	538	OAK	16"	REMOVE	648	MAPLE	10"	REMAIN
95	ASH	22"	REMAIN	206	TREE OF HEAVEN	12"	REMAIN	317	CHERRY	18"-14"	REMAIN	428	SPRUCE	28"	REMOVE	539	LOCUST	14"	REMOVE	649	ASH	18"	REMAIN
96	DECIDUOUS	16" MU	REMAIN	207	LOCUST	14"	REMAIN	318	MAPLE	8"	REMAIN	429	LOCUST	28"	REMOVE	540	LOCUST	14"	REMOVE	650	MAPLE	20"	REMAIN
97	MAPLE	8" MU	REMAIN	208	TREE OF HEAVEN	10"	REMAIN	319	CHERRY	12"	REMAIN	430	ASH	28"-24" TW	REMOVE	541	LOCUST	22"	REMOVE	651	BIRCH	16"	REMAIN
98	DO	8"	REMOVE	209	MAPLE	10"	REMAIN	320	HICKORY	20"	REMAIN	431	APPLE	12" TW	REMOVE	542	LOCUST	18"	REMOVE	652	CHERRY	8"	REMAIN
99	MAPLE	26"	REMOVE	210	MAPLE	12"	REMAIN	321	CHERRY	10"	REMAIN	432	BIRCH	12" TR	REMOVE	543	LOCUST	12"	REMOVE	653	POPLAR	16"	REMAIN
100	MAPLE	28"	REMOVE	211	MAPLE	10"	REMAIN	322	ASH	10"	REMAIN	433	DW	8"	REMOVE	544	MAPLE	18"	REMOVE	654	ASH	8"	REMAIN
101	PINE	20"-16"	REMOVE	212	MAPLE	10"	REMAIN	323	ASH	14"-10"	REMAIN	434	APPLE	8" TR	REMOVE	545	LOCUST	18"	REMOVE	655	ASH	8"	REMAIN
102	ASH	18"	REMOVE	213	LOCUST	14"	REMAIN	324	ASH	10" TW	REMAIN	435	HICKORY	26"	REMOVE	546	LOCUST	16"	REMOVE	656	ASH	8"	REMAIN
103	ASH	12"	REMOVE	214	LOCUST	12"	REMAIN	325	APPLE	12" TW	REMAIN	436	MAPLE	24" TW	REMOVE	547	LOCUST	14"	REMOVE	657	MAPLE	50"	REMOVE
104	ASH	18"	REMOVE	215	MAPLE	8"	REMAIN	326	CHERRY	10"	REMAIN	437	PINE	12"	REMOVE	548	LOCUST	12"	REMOVE	658	MAPLE	8"	REMOVE
105	ASH	16"	REMOVE	216	MAPLE	16"	REMAIN	327	ASH	8"	REMAIN	438	PINE	18"	REMOVE	549	LOCUST	14"	REMOVE	659	OAK	12"	REMOVE
106	CHERRY	12"	REMOVE	217	CHERRY	16"	REMAIN	328	ASH	10"	REMAIN	439	PINE	20"	REMOVE	550	MAPLE	18"	REMOVE	660	OAK	26"	REMOVE
107	ASH	14"	REMOVE	218	LOCUST	10"	REMAIN	329	HICKORY	20"	REMAIN	440	PINE	14"	REMOVE	551	CHERRY	16"	REMOVE	661	MAPLE	8"	REMOVE
108	CHERRY	18"	REMOVE	219	MAPLE	10"	REMAIN	330	HICKORY	12"	REMAIN	441	PINE	16"	REMOVE	552	APPLE	14"	REMOVE	662	COTTONWOOD	36"	REMOVE
109	ASH	14"	REMOVE	220	MAPLE	10"	REMAIN	331	MAPLE	8"	REMAIN	442	ASH	18"	REMOVE	553	LOCUST	18"	REMOVE	663	MAPLE	28"	REMOVE
110	CHERRY	14"	REMOVE	221	MAPLE	12"	REMAIN	332	MAPLE	20"-8"	REMAIN	443	HICKORY	26"	REMOVE	554	LOCUST	16"	REMOVE	664	OAK	14"	REMOVE
111	CHERRY	12"	REMOVE	222	TREE OF HEAVEN	8"	REMAIN	333	MAPLE	14"	REMAIN	444	PINE	8"	REMOVE	TOTAL NUMBER OF TREES TO BE REMOVED: 238							

No.	Revision	Date	By
1.	RESPONSE TO TOWN COMMENTS	01/11/2021	NC
2.	RESPONSE TO TOWN COMMENTS	03/08/2021	NC
3.	RESPONSE TO TOWN COMMENTS	06/14/2021	NC
4.	RESPONSE TO TOWN COMMENTS	01/10/2022	NC
5.	RESPONSE TO TOWN COMMENTS	03/28/2022	NC
6.	RESPONSE TO TOWN COMMENTS	05/09/2022	NC

Previous Editions Obsolete

APPLICANT/OWNER:
SUMMIT CLUB PARTNERS, LLC
568 BEDFORD ROAD (NY-22)
ARMONK, NY 10504

ARCHITECT:
GRANOFF ARCHITECTS
30 RAILROAD AVENUE
GREENWICH, CT 06830

JMC Planning, Engineering, Landscape Architecture & Land Surveying, PLLC
JMC Site Development Consultants, LLC
John Meyer Consulting, Inc.
120 BEDFORD ROAD • ARMONK, NY 10504
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JMC

SITE TREE REMOVAL TABLE

THE SUMMIT CLUB AT ARMONK
(RESIDENTIAL PHASE)
568 & 570 BEDFORD ROAD (NY-22)
TOWN OF NORTH CASTLE, NEW YORK

APPROVED BY TOWN OF NORTH CASTLE PLANNING BOARD RESOLUTION, DATED ________

________________________ DATE: ________________
CHRISTOPHER CARTHY, CHAIRMAN,
TOWN OF NORTH CASTLE PLANNING BOARD

ENGINEERING DRAWINGS REVIEWED BY TOWN CONSULTING ENGINEER

________________________ DATE: ________________
JOSEPH M. CERMELE, P.E.
KELLARD SESSIONS CONSULTING, P.C.
CONSULTING TOWN ENGINEER

Drawn:	NC	Approved:	AG
Scale:	1" = 30'		
Date:	11/23/2020		
Project No:	20101		
20101-DEMO	TREE REMOVAL	GRAD.scr	

Drawing No:
C-022

NOT FOR CONSTRUCTION

LANDSCAPE AREA LEGEND

- PROPOSED PARKING AREA (±98,556 S.F.)
- PROPOSED INTERIOR PARKING LANDSCAPED AREA (±26,967 S.F.)

PROPOSED INTERIOR PARKING LANDSCAPED AREA CALCULATION:

TOTAL PROPOSED INTERIOR PARKING LANDSCAPED AREA / TOTAL PROPOSED PARKING AREA → 26,967 S.F. / 98,556 S.F. X 100 = ±27.3%

PHASING NOTES:

1. IN DECEMBER, 2019, IN CONSIDERATION OF THE ADOPTION BY THE TOWN OF THE AMENDMENT, THE APPLICANT RECORDED A DECLARATION PURSUANT TO WHICH THE APPLICANT MAY, SUBJECT TO SITE PLAN APPROVAL, CONSTRUCT ON THE DEVELOPMENT LOT A FIRST PHASE OF THE COMMUNITY ("PHASE 1 "), WHICH MAY CONSIST OF UP TO THIRTY-SIX (36) RESIDENCES, WHICH MAY BE FEE-SIMPLE HOMES AND/OR CONDOMINIUM UNITS WITHOUT LIMITATION REGARDING FORM OF OWNERSHIP OF THE RESIDENCES, AND A SECOND PHASE OF THE COMMUNITY ("PHASE 2"), WHICH MAY CONSIST OF UP TO THIRTY-SEVEN (37) RESIDENCES, WHICH MAY BE FEE-SIMPLE HOMES AND/OR CONDOMINIUM UNITS WITHOUT LIMITATION REGARDING FORM OF OWNERSHIP OF THE RESIDENCES; PROVIDED THAT UNLESS THE AGGREGATE AVERAGE OF THE GROSS SALES PRICES OF THE MARKET-RATE PHASE 1 CONDOMINIUM UNITS IS $700.00 PER SQUARE FOOT OR MORE, THE PHASE 2 CONDOMINIUM RESIDENCES ARE REQUIRED TO BE "55 AND OLDER" AGE-RESTRICTED HOUSING AS PERMITTED UNDER APPLICABLE FEDERAL LAW AND REGULATIONS. THE DECLARATION ALSO REQUIRES PHASE 1 TO INCLUDE FOUR (4) ON-SITE AFFORDABLE UNITS, AND PHASE 2 TO INCLUDE THREE (3) ON-SITE AFFORDABLE UNITS. HOWEVER, THE APPLICANT IS PERMITTED TO AT ANY TIME ELECT TO RELOCATE ALL OR A PORTION OF THE AFFORDABLE UNITS OFF-SITE WITHIN AREAS IN THE ARMONK HAMLET THAT ARE SERVED BY PUBLIC SEWER AND WATER, AND THEREBY REDUCE THE ON-SITE AFFORDABLE UNITS AND SUBSTITUTE MARKET-RATE UNITS THEREFOR ON A ONE-TO-ONE BASIS, PROVIDED THAT IN NO EVENT SHALL THE TOTAL NUMBER OF RESIDENTIAL UNITS ON THE PROPERTY EXCEED SEVENTY-THREE (73).
2. REFER TO DRAWING C-402 FOR SEQUENCE OF CONSTRUCTION.

UNIT / BEDROOM COUNT Revised 1-24-22				AFFH Units	
BUILDING 1 (3 STORY)	12 UNITS	(3) 3 BEDROOMS & (9) 2 BEDROOMS	27 BEDROOMS/BLDG	(1) 2 BEDROOM	PHASE II
BUILDING 2 (3 STORY)	12 UNITS	(3) 3 BEDROOMS & (9) 2 BEDROOMS	27 BEDROOMS/BLDG	(1) 2 BEDROOM	
BUILDING 3 (3 STORY)	12 UNITS	(3) 3 BEDROOMS & (9) 2 BEDROOMS	27 BEDROOMS/BLDG	(1) 3 BEDROOM	
BUILDING 4 (3 STORY)	12 UNITS	(3) 3 BEDROOMS & (9) 2 BEDROOMS	27 BEDROOMS/BLDG	(1) 2 BEDROOM (1) 3 BEDROOM	PHASE I
BUILDING 5 (3 STORY)	12 UNITS	(3) 3 BEDROOMS & (9) 2 BEDROOMS	27 BEDROOMS/BLDG	(1) 2 BEDROOM	
BUILDING 6 (3 STORY)	12 UNITS	(3) 3 BEDROOMS & (9) 2 BEDROOMS	27 BEDROOMS/BLDG	(1) 2 BEDROOM	
TOTALS	72 UNITS	(18) 3 BEDROOMS & (54) 2 BEDROOMS	162 BEDROOMS	7 AFFH UNITS	
DENSITY UNITS	39 UNITS	(18) 3 BEDROOMS = 12 DENSITY UNITS (54) 2 BEDROOMS = 27 DENSITY UNITS	(18 /3) X 2= 12 54 /2 = 27		
DWELLING UNITS	72 UNITS				

Density Unit Calculation:
Site:
Lot 1= 129.95872 acres
Lot 2= 26.34421 acres
Total Site =156.30293 acres x 43,560sf/ac = (6,808,555.6308 sf) / 133,000=51.1921476
51 Density Units Available
39 Density Units Proposed (COMPLIES)

Dwelling Unit Calculation:
Site:
Total Site Area=156.30293 acres / 1.8 Acres = 86.834961
87 Dwelling Units Available (88 Studied in the EIS)
72 Dwelling Units Proposed (COMPLIES)
73 Dwelling Units Previously Approved

Minimum Unit Sizes:
Market Rate Units
- Efficiency: 450 sf Min. N/A
- One-Bedroom: 700 sf Min. N/A
- Two-Bedroom: 900 sf 2,377 sf is smallest (complies)
- Three-Bedroom: 1,100 sf 2,997 sf is smallest (complies)

AFFH Units
- Efficiency: 450 sf Min. N/A
- One-Bedroom: 700 sf Min. 2,377 sf is smallest (complies)
- Two-Bedroom: 900 sf 2,997 sf is smallest (complies)
- Three-Bedroom: 1,100 sf N/A

Density Unit Definition:
A density unit is defined as being equal to one or a proportionate combination of the following:

A. One one-family detached dwelling unit.
B. One dwelling unit containing four or more bedrooms in a permitted type of dwelling other than a one-family detached unit.
C. One and one-half dwelling units containing three bedrooms each in permitted dwellings other than one-family detached units.
D. Two dwelling units containing two bedrooms each in permitted dwellings other than one-family detached units.
E. Two and one-half dwellings containing one bedroom or less each in permitted dwellings other than one-family detached units.
F. Three efficiency dwelling units in permitted dwellings other than one-family detached units

[2]Density. The maximum permitted density shall not exceed one density unit, as defined in § 355-4 of this chapter, per 133,000 square feet of the aggregate total lot area (as defined in § 355-4 of this chapter) in the GCCFO District and one dwelling unit, as defined in § 355-4 of this chapter, per 1.8 acres of the aggregate total lot area (as defined in § 355-4 of this chapter) in the GCCFO District.
[2]
Editor's Note: Former Subsection D(1), regarding lots and dwelling units in the GCCFO District, was repealed 3-27-2019 by L.L. No. 2-2019. This local law also renumbered former Subsections D(2) through D(6) as Subsections D(1) through D(5), respectively

Project Summary Comparison Table

	DEIS plan	FEIS Alternative 2	Modified Project (New Residential Development)
Market-Rate Condominiums	80	80	See Unit/Bedroom Count Table
Fair and Affordable Units	8	8*	See Unit/Bedroom Count Table
Total Residential Units	**88**	**88**	See Unit/Bedroom Count Table
Golf Cottages (4 BR)	5	10	See Unit/Bedroom Count Table
Golf Residences (2 BR)	55	70	See Unit/Bedroom Count Table
Golf Residences (2 BR)	6	0	See Unit/Bedroom Count Table
Club Villas (3 BR)	14	0	See Unit/Bedroom Count Table
Affordable Units (2 BR)	6	7*	See Unit/Bedroom Count Table
Affordable Units (3 BR)	1	0	See Unit/Bedroom Count Table
Affordable Units (4 BR)	1	1*	See Unit/Bedroom Count Table
Total Bedrooms	**209**	**198**	**162**
Buffer on Bedford Road	**25 feet**	**100 feet**	**100 feet**
Open Space	141.6 acres	141.6 acres	127.37 acres
Impervious Area	17.5 ac. (6.6 ac. *New* impervious)	16.7 acres (5.8 ac. *New* impervious)	11.2 acres (5.2 ac. *New* impervious)
Length of Private Road	3,750 lf	3,258 lf	2,262 lf
Steep Slope Impact	2.75 acres	2.75 acres	±1.42 acres
Trees to be Removed	879 trees	813 trees	238 trees
Wetland Impacts	add 1.25 acres of new wetland enhancements	add 1.25 acres of new wetland enhancements	N/A
Wetland Buffer Impacts	4.34 acres	4.59 acres	N/A
Trip Generation (Peak)	47 AM / 55 PM	47 AM / 55 PM (or less)	47 AM / 55 PM (or less)
Additional Water Demand	29,775 gpd	28,325 gpd	40,903 gpd
Additional Wastewater Generation	29,775 gpd	28,325 gpd	40,903 gpd
Annual Tax and Mitigation Payment Revenue	$1,493,223	$2,598,230	$2,598,230
Total Population	185-204	183-191	156-157 (1)
School Children – Local Experience	10	9	4-5 (2)
School Children – Rutgers & Local Experience	20	17	16-18 (2)
Visual Impacts	4 new residential buildings along Bedford Road, with landscaping in 25-foot buffer.	5 new detached single family Golf Cottages along Bedford Road; portion of internal road close to Route 22 eliminated; landscaping added in 100 foot buffer along Bedford Road. (100' buffer extends around the perimeter of the Site.) Repair to stone wall on Windmill Farms side of Route 22	6 new residential buildings with tennis courts and amenities building more than 100 feet from Bedford Road.

NOTES:

1. RUTGERS MULTIPLIERS (TOTAL POPULATION)

   FOR THE 49 2-BEDROOM UNITS, MULTIPLIER OF 1.88 = 92.12; 5 2-BEDROOM AFFH UNITS, MULTIPLIER OF 2.05 = 10.25; TOTAL 102.37
   RUTGERS UNIVERSITY RESIDENTIAL DEMOGRAPHIC MULTIPLIERS (JUNE 2006): NEW YORK, OWNERSHIP UNITS IN BUILDINGS WITH 5+ UNITS, COSTING MORE THAN $329,500
   FOR THE 16 3-BEDROOM UNITS, MULTIPLIER OF 3.00 = 48; 2 3-BEDROOM AFFH UNITS, MULTIPLIER OF 3.00 = 6; TOTAL 54
   RUTGERS UNIVERSITY RESIDENTIAL DEMOGRAPHIC MULTIPLIERS (JUNE 2006): NEW YORK, OWNERSHIP UNITS IN BUILDINGS WITH 5+ UNITS, ALL VALUES (3 BEDROOMS)
   TOTAL POPULATION= 156-157 PERSONS
   LOCAL EXPERIENCE FROM THE DEIS
   APPROXIMATELY 2.3 PERSONS AVERAGE PER UNIT TIMES 72 UNITS EQUALS 167-168 PERSONS

2. RUTGERS MULTIPLIERS (PUBLIC SCHOOL CHILDREN)

   FOR THE 49 MARKET RATE 2-BEDROOM UNITS, MULTIPLIER OF 0.05 = 2.45; 5 2-BEDROOM AFFH UNITS, MULTIPLIER OF 0.15 = 0.75; TOTAL 3.2
   RUTGERS UNIVERSITY RESIDENTIAL DEMOGRAPHIC MULTIPLIERS (JUNE 2006): NEW YORK, SCHOOL AGE CHILDREN IN PUBLIC SCHOOLS, OWNERSHIP UNITS IN BUILDINGS WITH 5+ UNITS, COSTING MORE THAN $329,500 (2 BEDROOM)
   FOR THE 16 3-BEDROOM UNITS, MULTIPLIER OF 0.49 = 7.84; 2 3-BEDROOM AFFH UNITS, MULTIPLIER OF 0.49 = 0.98; TOTAL 8.82
   RUTGERS UNIVERSITY RESIDENTIAL DEMOGRAPHIC MULTIPLIERS (JUNE 2006): NEW YORK, SCHOOL AGE CHILDREN IN PUBLIC SCHOOLS, OWNERSHIP UNITS IN BUILDINGS WITH 5+ UNITS, ALL VALUES (3 BEDROOMS)
   TOTAL= 12-13 SCHOOL-AGE CHILDREN
   LOCAL EXPERIENCE
   0.06 SCHOOL-CHILDREN PER UNIT TIMES 72 UNITS EQUALS 4-5 SCHOOL-AGE CHILDREN

LEGEND

- EXISTING PROPERTY LINE
- ADJACENT PROPERTY LINE
- EXISTING SETBACK LINE
- EXISTING WETLAND LINE AND DELINEATION
- EXISTING BUILDING LINE
- EXISTING PAVEMENT EDGE
- EXISTING CURB LINE
- EXISTING STONE WALL
- EXISTING GUIDE RAIL
- EXISTING FENCE
- EXISTING TREE AND DESIGNATION
- EXISTING TREE LINE
- EXISTING PAINT
- EXISTING UTILITY POLE
- EXISTING LIGHT POLE
- EXISTING SIGN
- PROPOSED BUILDING LINE
- PROPOSED BUILDING OVERHANG
- PROPOSED CONCRETE CURB
- PROPOSED SAWCUT LINE
- PROPOSED ACCESSIBLE PARKING SPACES WITH NUMBER OF SPACES INDICATED (REFER TO STRIPING DETAILS)
- PROPOSED PARKING SPACES WITH NUMBER OF SPACES INDICATED (REFER TO STRIPING DETAILS)
- PROPOSED CONCRETE SIDEWALK
- PROPOSED HEAVY DUTY PAVEMENT
- PROPOSED DECORATIVE PAVERS
- PROPOSED RETAINING WALL (DESIGN BY OTHERS)
- PROPOSED FENCE
- PROPOSED 2-4" WIDE YELLOW LINES 8"O.C.
- PROPOSED 12" WIDE WHITE STOP LINE
- PROPOSED ARROW MARKING ON PAVEMENT
- TRAFFIC SIGN LOCATION & DESIGNATION
- PEDESTRIAN CROSSING

NOTES:

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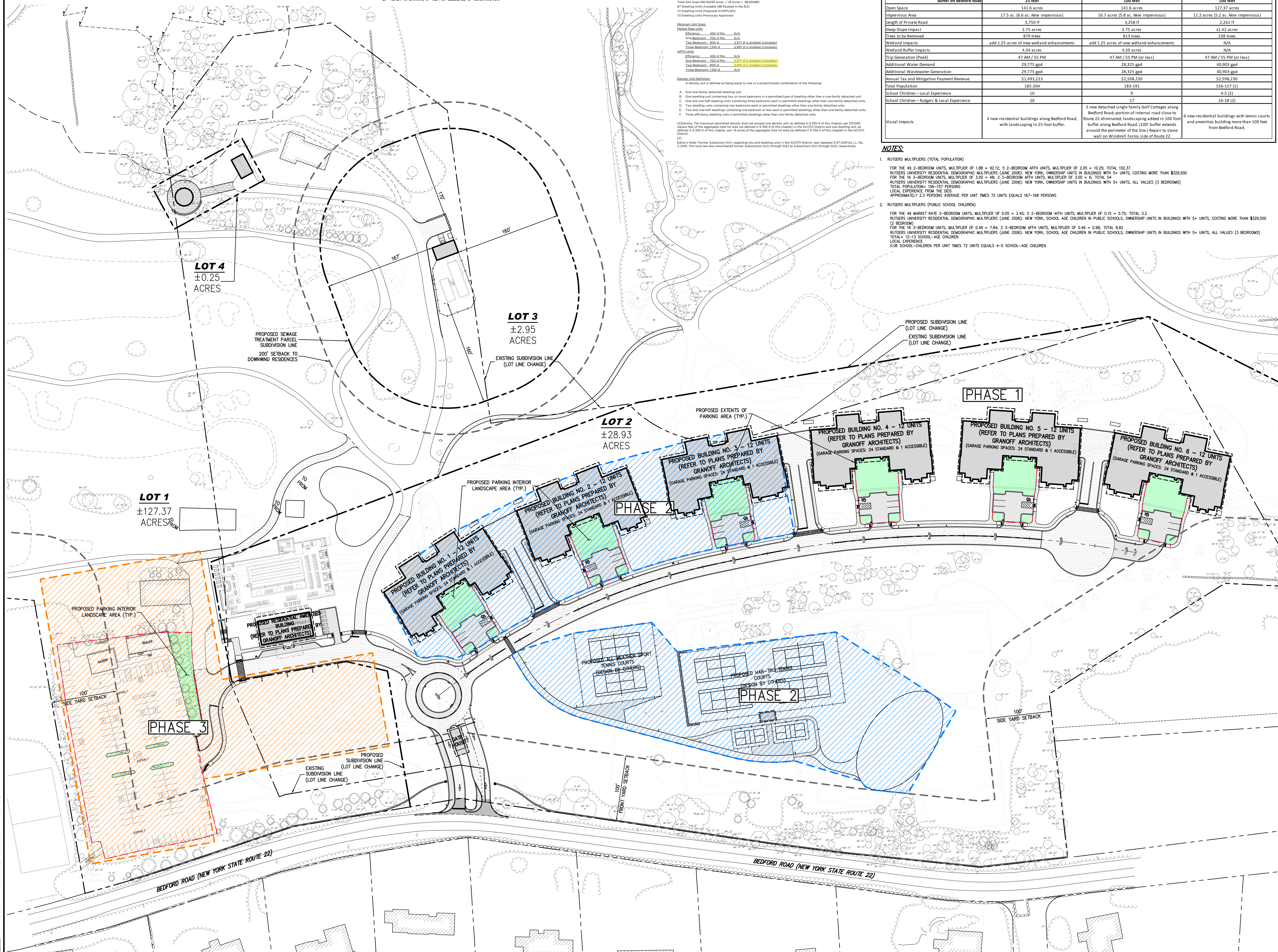

No.	Revision	Date	By
1.	RESPONSE TO TOWN COMMENTS	01/11/2021	NC
2.	RESPONSE TO TOWN COMMENTS	03/08/2021	NC
3.	RESPONSE TO TOWN COMMENTS	06/14/2021	NC
4.	RESPONSE TO TOWN COMMENTS	01/10/2022	NC
5.	RESPONSE TO TOWN COMMENTS	03/28/2022	NC
6.	RESPONSE TO TOWN COMMENTS	05/09/2022	NC

Previous Editions Obsolete

APPLICANT/OWNER:
SUMMIT CLUB PARTNERS, LLC
568 BEDFORD ROAD (NY-22)
ARMONK, NY 10504

ARCHITECT:
GRANOFF ARCHITECTS
330 RAILROAD AVENUE
GREENWICH, CT 06830

JMC Planning, Engineering, Landscape Architecture & Land Surveying, PLLC
JMC Site Development Consultants, LLC
John Meyer Consulting, Inc.
120 BEDFORD ROAD • ARMONK, NY 10504
voice 914.273.5225 • fax 914.273.2102
www.jmcpllc.com

OVERALL SITE LAYOUT AND PHASING PLAN

THE SUMMIT CLUB AT ARMONK (RESIDENTIAL PHASE)
568 & 570 BEDFORD ROAD (NY-22)
TOWN OF NORTH CASTLE, NEW YORK

APPROVED BY TOWN OF NORTH CASTLE PLANNING BOARD RESOLUTION, DATED ________

________ DATE: ________
CHRISTOPHER CARTHY, CHAIRMAN,
TOWN OF NORTH CASTLE PLANNING BOARD

ENGINEERING DRAWINGS REVIEWED BY TOWN CONSULTING ENGINEER

________ DATE: ________
JOSEPH M. CERMELE, P.E.
KELLARD SESSIONS CONSULTING, P.C.
CONSULTING TOWN ENGINEER

Drawn: NC		Approved: AG	
Scale:	1" = 30'		
Date:	11/23/2020		
Project No:	20101		
20101-LAYOUT	LAYOUT OV	LAY.scr	
Drawing No:	C-100A		

LEGEND

	EXISTING PROPERTY LINE
	ADJACENT PROPERTY LINE
	EXISTING SETBACK LINE
WLF-63 WLF-64 WLF-65	EXISTING WETLAND LINE AND DELINEATION
	EXISTING BUILDING LINE
	EXISTING PAVEMENT EDGE
	EXISTING CURB LINE
	EXISTING STONE WALL
	EXISTING GUIDE RAIL
	EXISTING FENCE
T10 M	EXISTING TREE AND DESIGNATION
	EXISTING TREE LINE
	EXISTING PAINT
	EXISTING UTILITY POLE
	EXISTING LIGHT POLE
	EXISTING SIGN
	PROPOSED BUILDING LINE
	PROPOSED BUILDING OVERHANG
	PROPOSED CONCRETE CURB
	PROPOSED SAWCUT LINE
2H	PROPOSED ACCESSIBLE PARKING SPACES WITH NUMBER OF SPACES INDICATED (REFER TO STRIPING DETAILS)
5	PROPOSED PARKING SPACES WITH NUMBER OF SPACES INDICATED (REFER TO STRIPING DETAILS)
	PROPOSED CONCRETE SIDEWALK
	PROPOSED HEAVY DUTY PAVEMENT
	PROPOSED DECORATIVE PAVERS
	PROPOSED RETAINING WALL (DESIGN BY OTHERS)
	PROPOSED FENCE
Y	PROPOSED 2-4" WIDE YELLOW LINES 8"O.C.
	PROPOSED 12" WIDE WHITE STOP LINE
	PROPOSED ARROW MARKING ON PAVEMENT
A	TRAFFIC SIGN LOCATION & DESIGNATION
	PEDESTRIAN CROSSING

NOTES:

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SIGN TABLE

DESIGNATION NUMBER	SIGN	SIZE	DESCRIPTION	MOUNTING TYPE	MOUNTING HEIGHT	REGULATORY	REFLECTORIZED
A	STOP	30"X30"	WHITE ON RED	STEEL CHANNEL	7'-0"	R1-1	X
B	RESERVED PARKING	12"X18"	GREEN & BLUE ON WHITE	STEEL CHANNEL	7'-0"	R7-8	X
C	RESERVED PARKING / VAN ACCESSIBLE	12"X18" 12"X6"	GREEN & BLUE ON WHITE	STEEL CHANNEL	7'-0"	R7-8 R7-8A	X
D	NO PARKING ANY TIME	12"X18"	RED ON WHITE	STEEL CHANNEL	7'-0"	NYP1-2	X
E	YIELD	30"X30"X30"	RED ON WHITE	STEEL CHANNEL	7'-0"	R1-2	X
F	YIELD / SINGLE LANE	30"X30"X30" 30"X30"	RED ON WHITE BLACK ON YELLOW	STEEL CHANNEL	6'-0"	R1-2 NYW3-15	X
G		30"X24"	BLACK ON WHITE	STEEL CHANNEL	7'-0"	R6-4	X
H	SINGLE LANE	30"X30"	BLACK ON WHITE	STEEL CHANNEL	7'-0"	NYW3-15	X
I		30"X30" 24"X12"	BLACK ON YELLOW	STEEL CHANNEL	7'-0"	W11-2 W16-7PL	X

No.	Revision	Date	By
1.	RESPONSE TO TOWN COMMENTS	01/11/2021	NC
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JMC

SITE LAYOUT PLAN (SOUTH)

THE SUMMIT CLUB AT ARMONK (RESIDENTIAL PHASE)
568 & 570 BEDFORD ROAD (NY-22)
TOWN OF NORTH CASTLE, NEW YORK

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APPROVED BY TOWN OF NORTH CASTLE PLANNING BOARD RESOLUTION, DATED ________

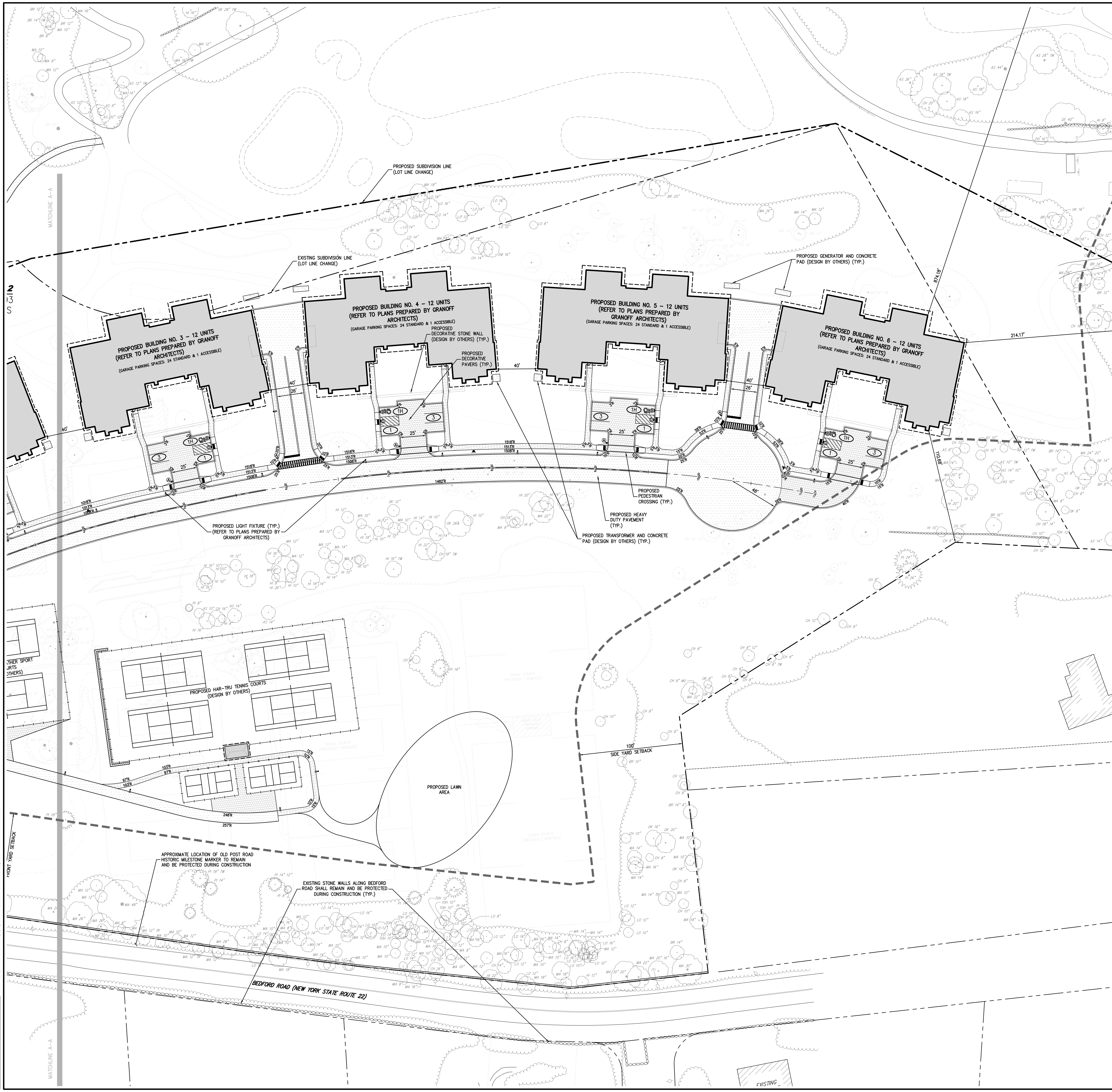
________ DATE: ________
CHRISTOPHER CARTHY, CHAIRMAN,
TOWN OF NORTH CASTLE PLANNING BOARD

ENGINEERING DRAWINGS REVIEWED BY TOWN CONSULTING ENGINEER

________ DATE: ________
JOSEPH M. CERMELE, P.E.
KELLARD SESSIONS CONSULTING, P.C.
CONSULTING TOWN ENGINEER

Drawn: NC Approved: AG
Scale: 1" = 30'
Date: 11/23/2020
Project No: 20101
20101-LAYOUT LAYOUT SOUTH LAY.scr
Drawing No:
C-100

NOT FOR CONSTRUCTION



LEGEND

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SITE LAYOUT PLAN (NORTH)

THE SUMMIT CLUB AT ARMONK
(RESIDENTIAL PHASE)
568 & 570 BEDFORD ROAD (NY–22)
TOWN OF NORTH CASTLE, NEW YORK

APPROVED BY TOWN OF NORTH CASTLE PLANNING BOARD RESOLUTION, DATED ________

________________________ DATE: ________
CHRISTOPHER CARTHY, CHAIRMAN,
TOWN OF NORTH CASTLE PLANNING BOARD

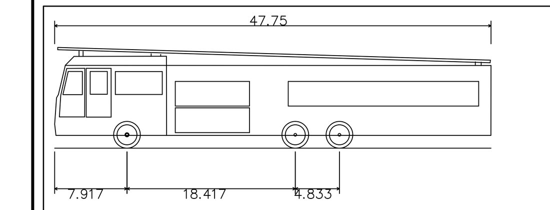
ENGINEERING DRAWINGS REVIEWED BY TOWN CONSULTING ENGINEER

________________________ DATE: ________
JOSEPH M. CERMELE, P.E.
KELLARD SESSIONS CONSULTING, P.C.
CONSULTING TOWN ENGINEER

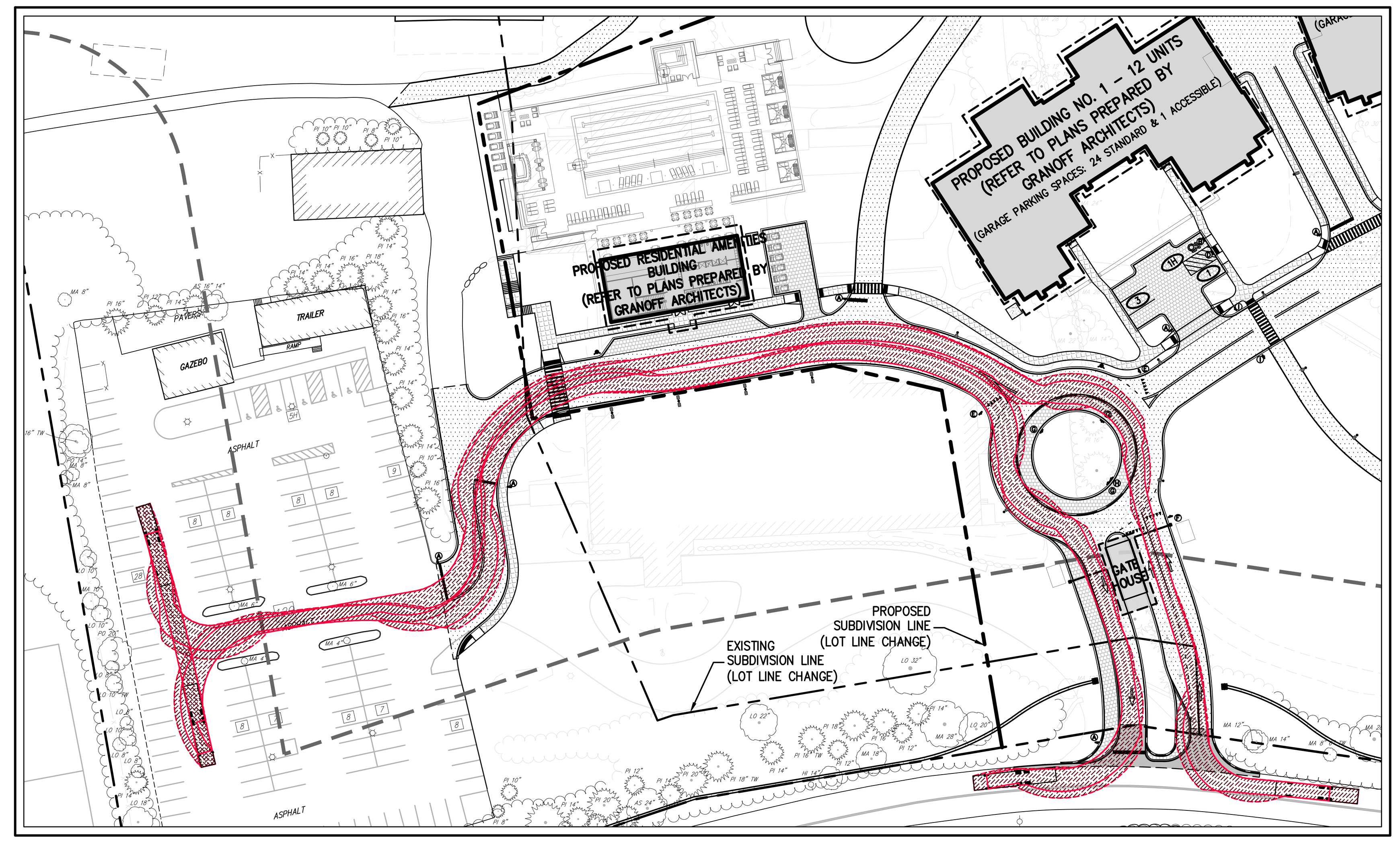
Drawn:	NC	Approved:	AG
Scale:	1" = 30'		
Date:	11/23/2020		
Project No:	20101		
20101-LAYOUT	LAYOUT NORTH	LAY.scr	

Drawing No: C–101

FIRE TRUCK PROFILE

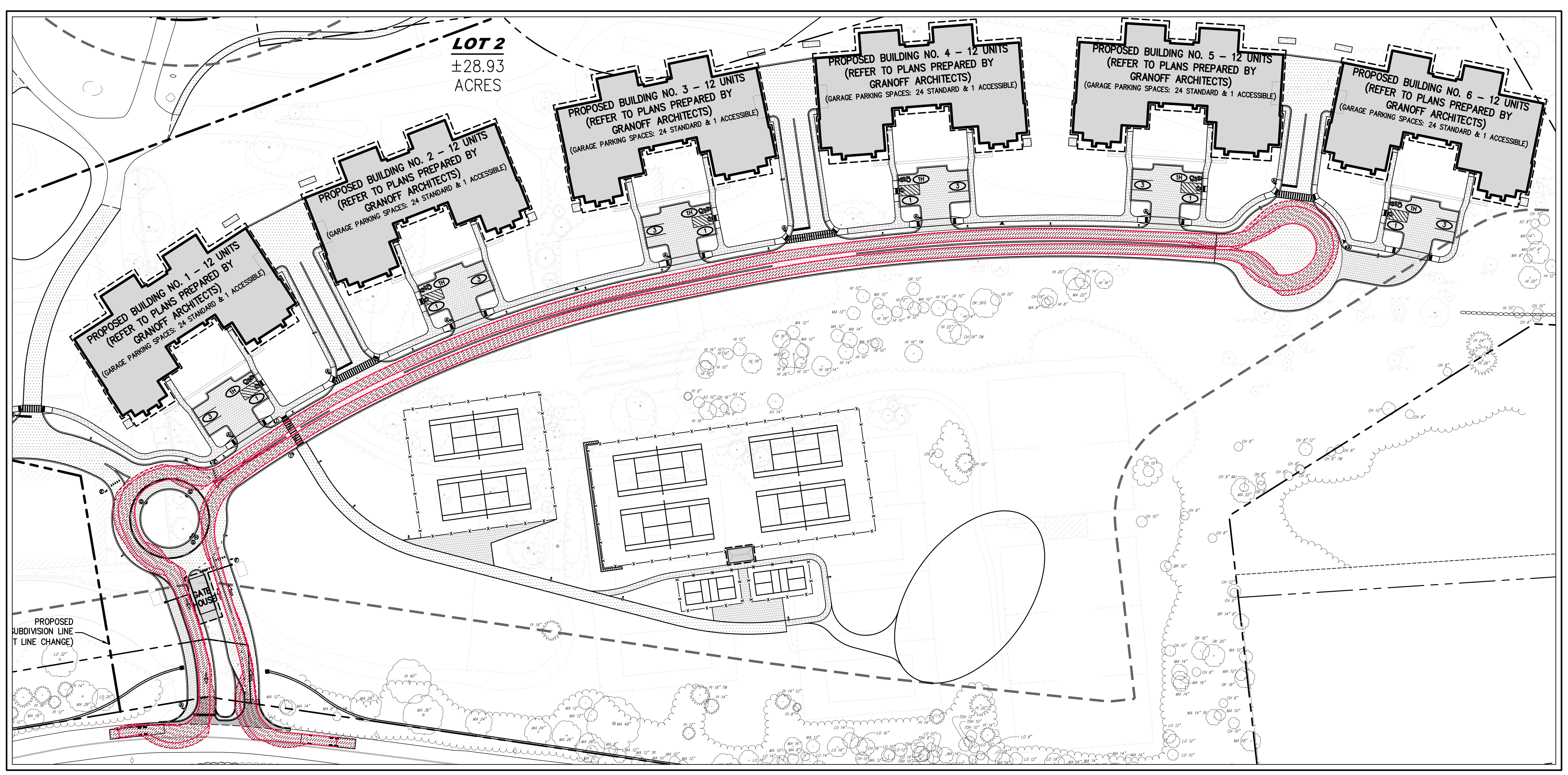


E-ONE HP95 Mid Mount	
Overall Length	47.750ft
Overall Width	8.333ft
Overall Body Height	11.000ft
Min Body Ground Clearance	1.393ft
Track Width	8.333ft
Lock-to-lock time	6.00s
Max Wheel Angle	45.00°



ROAD A FIRE TRUCK TURNING ANALYSIS

SCALE: 1" = 50'



ROAD B FIRE TRUCK TURNING ANALYSIS

SCALE: 1" = 50'

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FIRE TRUCK ACCESS PLAN

THE SUMMIT CLUB AT ARMONK (RESIDENTIAL PHASE)
568 & 570 BEDFORD ROAD (NY-22)
TOWN OF NORTH CASTLE, NEW YORK

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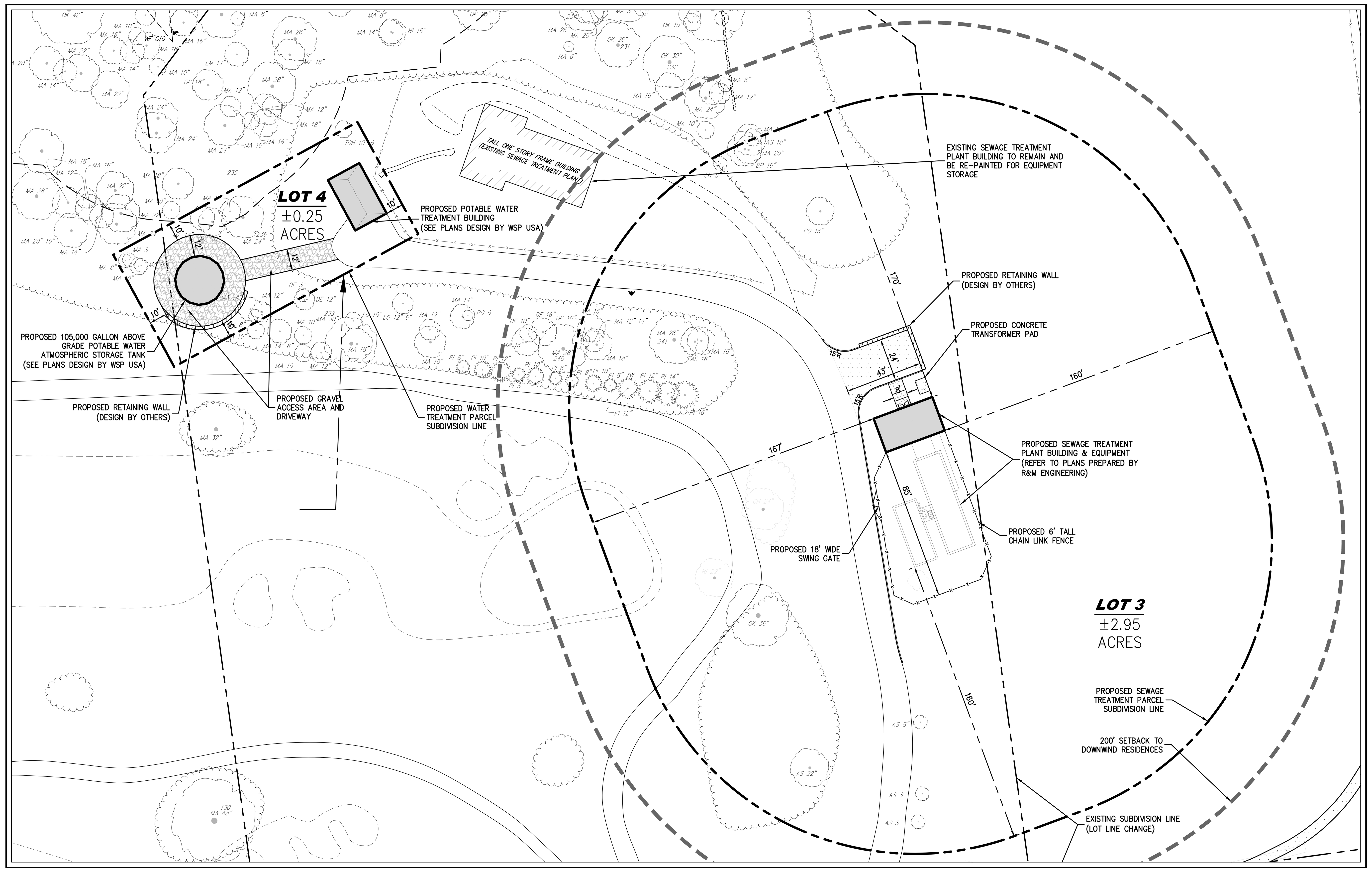
CHRISTOPHER CARTHY, CHAIRMAN,
TOWN OF NORTH CASTLE PLANNING BOARD

ENGINEERING DRAWINGS REVIEWED BY TOWN CONSULTING ENGINEER

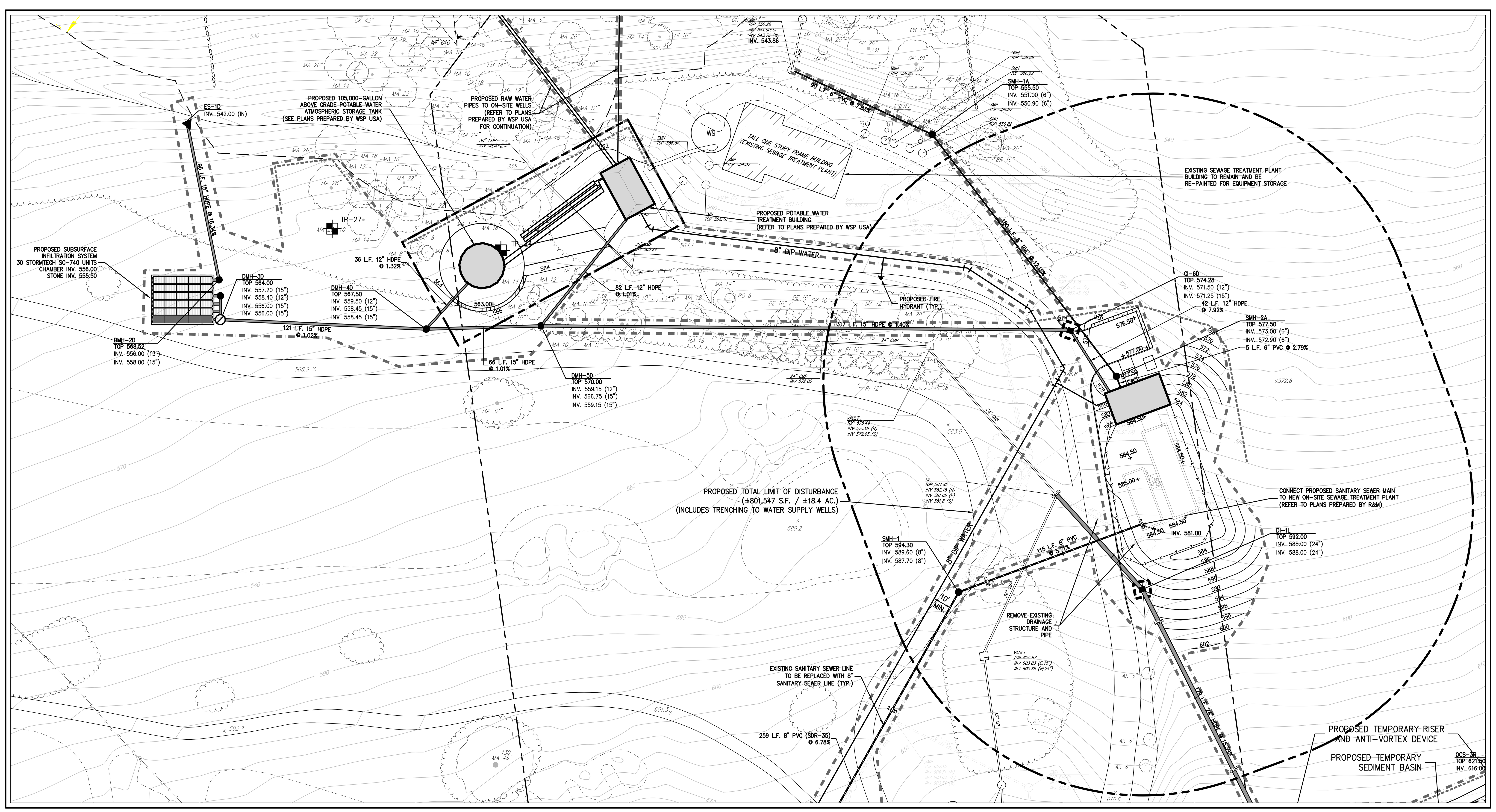
________ DATE: ________
JOSEPH M. CERMELE, P.E.
KELLARD SESSIONS CONSULTING, P.C.
CONSULTING TOWN ENGINEER

Drawn: NC		Approved: AG	
Scale:	AS SHOWN		
Date:	11/23/2020		
Project No:	20101		
20101-LAYOUT	TRUCK TURNING	LAY.scr	
Drawing No:	C-102		

NOT FOR CONSTRUCTION



LAYOUT PLAN
SCALE: 1" = 30'



GRADING, UTILITIES, AND EROSION & SEDIMENT CONTROL PLAN
SCALE: 1" = 30'

No.	Revision	Date	By
1.	RESPONSE TO TOWN COMMENTS	05/09/2022	NC

APPLICANT/OWNER:
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568 BEDFORD ROAD (NY-22)
ARMONK, NY 10504

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UTILITY COMPLEX PLANS

THE SUMMIT CLUB AT ARMONK
(RESIDENTIAL PHASE)
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TOWN OF NORTH CASTLE, NEW YORK

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JOSEPH M. CERMELE, P.E.
KELLARD SESSIONS CONSULTING, P.C.
CONSULTING TOWN ENGINEER

Drawn: NC	Approved: AG
Scale: AS SHOWN	
Date: 03/28/2022	
Project No: 20101	
20101-SE UTIL COMPLEX (C-103) SE.scr	
Drawing No: C-103	

NOT FOR CONSTRUCTION

LEGEND

- EXISTING PROPERTY LINE
- ADJACENT PROPERTY LINE
- EXISTING EASEMENT LINE
- EXISTING WETLAND LINE AND DELINEATION
- EXISTING BUILDING OVERHANG
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- EXISTING CURB LINE
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- EXISTING INDEX CONTOUR
- EXISTING STONE WALL
- EXISTING RETAINING WALL
- EXISTING GUIDE RAIL
- EXISTING FENCE
- EXISTING DRAIN INLET
- EXISTING MANHOLE
- EXISTING UTILITY POLE
- EXISTING LIGHT POLE
- EXISTING SIGN
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- PROPOSED CONCRETE CURB
- PROPOSED CONCRETE SIDEWALK
- PROPOSED DROP CURB AND RAMP
- 200 — PROPOSED FINISHED GRADE
- 191.00 — PROPOSED SPOT GRADE
- SMH — PROPOSED SANITARY SEWER MANHOLE
- MH — PROPOSED STORM DRAIN MANHOLE
- CI — PROPOSED TYPE CI DRAIN INLET
- DI — PROPOSED TYPE DI DRAIN INLET
- PROPOSED HEADWALL
- OCS — PROPOSED SUBSURFACE DRAINAGE OUTLET CONTROL STRUCTURE
- PROPOSED RETAINING WALL (DESIGN BY OTHERS)
- DP-2 — BORING LOCATION AND DESIGNATION
- PROPOSED LIMIT OF DISTURBANCE

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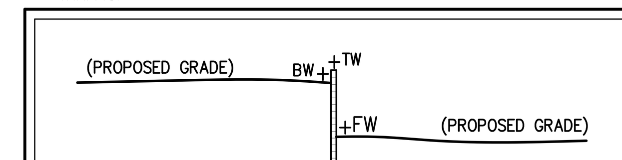
2. GEOTECHNICAL BORING/TEST PIT LOCATIONS DEPICTED ON THIS PLAN WERE TAKEN FROM THE GEOTECHNICAL REPORT ENTITLED, "REPORT ON SUBSURFACE SOIL AND FOUNDATION INVESTIGATION", DATED 10/16/2013, PREPARED BY CARLIN-SIMPSON & ASSOCIATES.
3. ALL STORMWATER MANAGEMENT PRACTICES SHALL REMAIN UNDISTURBED AND BE PROTECTED FROM HEAVY MACHINERY TRAFFIC DURING CONSTRUCTION. HOWEVER DURING CONSTRUCTION OF THE PRACTICE THE CONTRACTOR SHALL MINIMIZE AND AVOID HEAVY MACHINERY TRAFFIC TO THE MAXIMUM EXTENT PRACTICABLE. THERE SHALL BE NO STORAGE OF MATERIALS WITHIN AREAS TO BE USED FOR STORMWATER MANAGEMENT PRACTICES. THE CONTRACTOR SHALL INSTALL CONSTRUCTION FENCE AROUND THE PRACTICE TO DISCOURAGE VEHICLE TRAFFIC.



RETAINING WALL SPOT GRADE LEGEND

CUT & FILL ANALYSIS		
	REQUIRED CUT (CUBIC YARDS)	REQUIRED FILL (CUBIC YARDS)
OVERALL	52,900	48,000
PHASE 1	29,200	35,400
PHASE 2	17,000	11,400
PHASE 3	6,700	1,200

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SITE GRADING PLAN (SOUTH)

THE SUMMIT CLUB AT ARMONK (RESIDENTIAL PHASE)

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Drawn:	NC	Approved:	AG
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Date:	11/23/2020		
Project No:	20101		
20101-GRADING	GRAD SOUTH	GRAD.scr	
Drawing No:	C-200		

NOT FOR CONSTRUCTION

NOT FOR CONSTRUCTION

LEGEND

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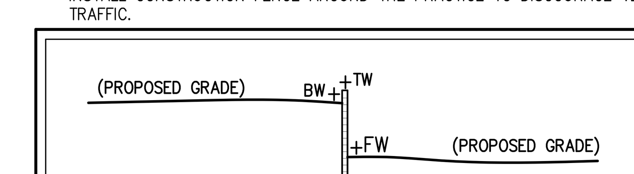
2. GEOTECHNICAL BORING/TEST PIT LOCATIONS DEPICTED ON THIS PLAN WERE TAKEN FROM THE GEOTECHNICAL REPORT ENTITLED, "REPORT ON SUBSURFACE SOIL AND FOUNDATION INVESTIGATION", DATED 10/16/2013, PREPARED BY CARLIN–SIMPSON & ASSOCIATES.
3. ALL STORMWATER MANAGEMENT PRACTICES SHALL REMAIN UNDISTURBED AND BE PROTECTED FROM HEAVY MACHINERY TRAFFIC DURING CONSTRUCTION. HOWEVER DURING CONSTRUCTION OF THE PRACTICE THE CONTRACTOR SHALL MINIMIZE AND AVOID HEAVY MACHINERY TRAFFIC TO THE MAXIMUM EXTENT PRACTICABLE. THERE SHALL BE NO STORAGE OF MATERIALS WITHIN AREAS TO BE USED FOR STORMWATER MANAGEMENT PRACTICES. THE CONTRACTOR SHALL INSTALL CONSTRUCTION FENCE AROUND THE PRACTICE TO DISCOURAGE VEHICLE TRAFFIC.



RETAINING WALL SPOT GRADE LEGEND

CUT & FILL ANALYSIS		
	REQUIRED CUT (CUBIC YARDS)	REQUIRED FILL (CUBIC YARDS)
OVERALL	52,900	48,000
PHASE 1	29,200	35,400
PHASE 2	17,000	11,400
PHASE 3	6,700	1,200

No.	Revision	Date	By
1.	RESPONSE TO TOWN COMMENTS	01/11/2021	NC
2.	RESPONSE TO TOWN COMMENTS	03/08/2021	NC
3.	RESPONSE TO TOWN COMMENTS	06/14/2021	NC
4.	RESPONSE TO TOWN COMMENTS	01/10/2022	NC
5.	RESPONSE TO TOWN COMMENTS	03/28/2022	NC
6.	RESPONSE TO TOWN COMMENTS	05/09/2022	NC

Previous Editions Obsolete

APPLICANT/OWNER:
SUMMIT CLUB PARTNERS, LLC
568 BEDFORD ROAD (NY–22)
ARMONK, NY 10504

ARCHITECT:
GRANOFF ARCHITECTS
330 RAILROAD AVENUE
GREENWICH, CT 06830

JMC Planning, Engineering, Landscape Architecture & Land Surveying, PLLC
JMC Site Development Consultants, LLC
John Meyer Consulting, Inc.
120 BEDFORD ROAD • ARMONK, NY 10504
voice 914.273.5225 • fax 914.273.2102
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SITE GRADING PLAN (NORTH)

THE SUMMIT CLUB AT ARMONK (RESIDENTIAL PHASE)
568 & 570 BEDFORD ROAD (NY–22)
TOWN OF NORTH CASTLE, NEW YORK

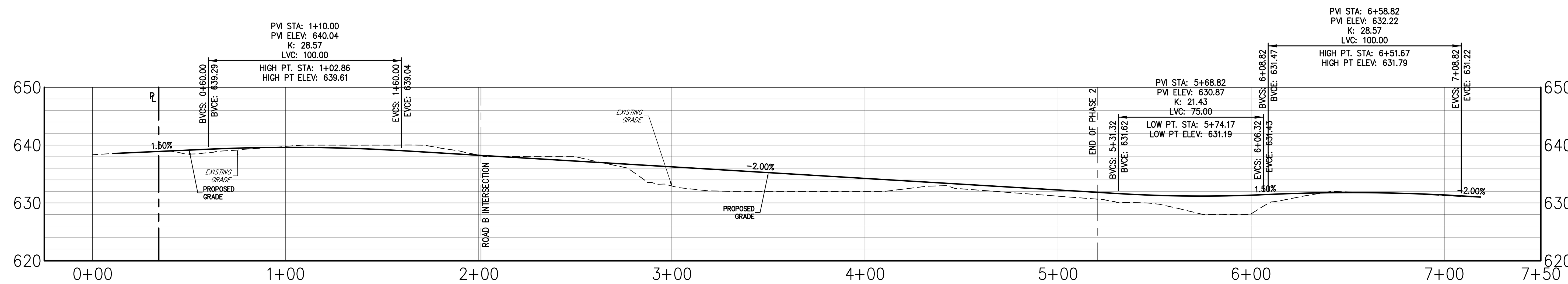
APPROVED BY TOWN OF NORTH CASTLE PLANNING BOARD RESOLUTION, DATED ________

________ DATE: ________
CHRISTOPHER CARTHY, CHAIRMAN,
TOWN OF NORTH CASTLE PLANNING BOARD

ENGINEERING DRAWINGS REVIEWED BY TOWN CONSULTING ENGINEER

________ DATE: ________
JOSEPH M. CERMELE, P.E.
KELLARD SESSIONS CONSULTING, P.C.
CONSULTING TOWN ENGINEER

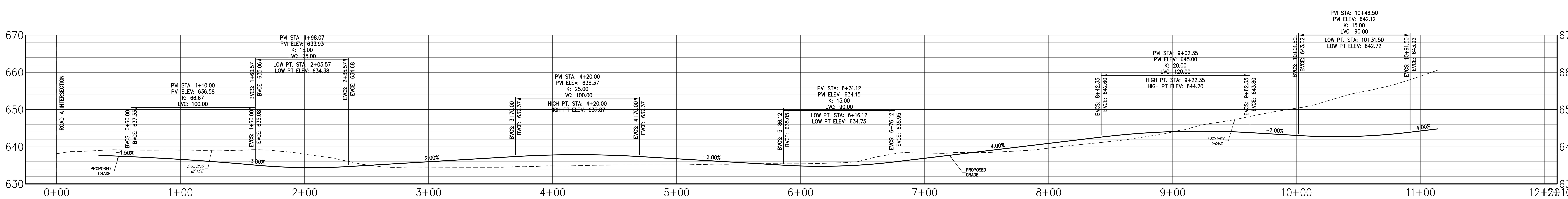
Drawn: NC Approved: AG
Scale: 1" = 30'
Date: 11/23/2020
Project No: 20101
20101-GRADING | GRAD NORTH | GRAD.scr
Drawing No: C–201



ROAD A PROFILE

HORIZONTAL: 1" = 30'

VERTICAL: 1" = 10'



ROAD B PROFILE

HORIZONTAL: 1" = 30'

VERTICAL: 1" = 10'

No.	Revision	Date
1.	RESPONSE TO TOWN COMMENTS	01/11/2021
2.	RESPONSE TO TOWN COMMENTS	03/08/2021
3.	RESPONSE TO TOWN COMMENTS	06/14/2021
4.	RESPONSE TO TOWN COMMENTS	01/10/2022
5.	RESPONSE TO TOWN COMMENTS	03/28/2022
6.	RESPONSE TO TOWN COMMENTS	05/09/2022

Previous Editions Obsolete

APPLICANT/OWNER: SUMMIT CLUB PARTNERS, LLC
568 BEDFORD ROAD (NY-22)
ARMONK, NY 10504

ARCHITECT: GRANOFF ARCHITECTS
330 RAILROAD AVENUE
GREENWICH, CT 06830

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ROAD PROFILES PLAN

THE SUMMIT CLUB AT ARMONK
(RESIDENTIAL PHASE)
568 & 570 BEDFORD ROAD (NY-22)
TOWN OF NORTH CASTLE, NEW YORK

ANY ALTERATION OF PLANS, SPECIFICATIONS, PLATS AND REPORTS BEARING THE SEAL OF A LICENSED PROFESSIONAL ENGINEER OR LICENSED LAND SURVEYOR IS A VIOLATION OF SECTION 7209 OF THE NEW YORK STATE EDUCATION LAW, EXCEPT AS PROVIDED FOR BY SECTION 7209, SUBSECTION 2.

APPROVED BY TOWN OF NORTH CASTLE PLANNING BOARD RESOLUTION, DATED ______

______ DATE: ______
CHRISTOPHER CARTHY, CHAIRMAN,
TOWN OF NORTH CASTLE PLANNING BOARD

ENGINEERING DRAWINGS REVIEWED BY TOWN CONSULTING ENGINEER

______ DATE: ______
JOSEPH M. CERMELE, P.E.
KELLARD SESSIONS CONSULTING, P.C.
CONSULTING TOWN ENGINEER

Drawn: NC Approved: AG
Scale: AS SHOWN
Date: 11/23/2020
Project No: 20101
Drawing No: C-202

NOT FOR CONSTRUCTION

LEGEND

- EXISTING PROPERTY LINE
- ADJACENT PROPERTY LINE
- EXISTING EASEMENT LINE
- EXISTING BUILDING OVERHANG
- EXISTING BUILDING LINE
- EXISTING PAVEMENT EDGE
- EXISTING CURB LINE
- EXISTING CONTOUR
- EXISTING INDEX CONTOUR
- EXISTING STONE WALL
- EXISTING RETAINING WALL
- EXISTING GUIDE RAIL
- EXISTING FENCE
- EXISTING STORM DRAIN LINE AND SIZE
- EXISTING SANITARY LINE AND SIZE
- EXISTING WATER LINE
- EXISTING GAS LINE
- EXISTING OVERHEAD WIRES
- EXISTING DRAIN INLET
- EXISTING MANHOLE
- EXISTING FIRE HYDRANT
- EXISTING GAS VALVE
- EXISTING WATER VALVE
- EXISTING UTILITY POLE
- EXISTING LIGHT POLE
- EXISTING SIGN
- PROPOSED BUILDING LINE
- PROPOSED CONCRETE CURB
- PROPOSED CONCRETE SIDEWALK
- PROPOSED DROP CURB AND RAMP
- SMH — PROPOSED SANITARY SEWER MANHOLE
- MH — PROPOSED STORM DRAIN MANHOLE
- CI — PROPOSED TYPE CI DRAIN INLET
- DI — PROPOSED TYPE DI DRAIN INLET
- PROPOSED HEADWALL
- OCS — PROPOSED SUBSURFACE DRAINAGE OUTLET CONTROL STRUCTURE
- PROPOSED HYDRANT
- 15" HDPE — PROPOSED STORM DRAIN LINE & SIZE
- 8" PVC — PROPOSED SANITARY SEWER LINE & SIZE
- 6" WATER — PROPOSED WATER LINE & SIZE
- PROPOSED GAS LINE
- E/T/C — PROPOSED ELECTRIC/TELEPHONE/CABLE
- PROPOSED WATER VALVE
- PROPOSED GAS VALVE
- PROPOSED RETAINING WALL (DESIGN BY OTHERS)

NOTES:

1. EXISTING CONDITIONS DEPICTED ON THIS PLAN HAVE BEEN TAKEN FROM SURVEY TITLED, "TOPOGRAPHIC MAP," PREPARED BY JMC, LAST REVISED 03/06/2013, SUPPLEMENTED WITH AN UPDATED SURVEY LAST REVISED 01/17/2022. PORTIONS OF EXISTING TOPOGRAPHY HAVE BEEN PROVIDED BY WESTCHESTER COUNTY GIS.
2. ALL STORMWATER MANAGEMENT PRACTICES SHALL REMAIN UNDISTURBED AND BE PROTECTED FROM HEAVY MACHINERY TRAFFIC DURING CONSTRUCTION. HOWEVER DURING CONSTRUCTION OF THE PRACTICE THE CONTRACTOR SHALL MINIMIZE AND AVOID HEAVY MACHINERY TRAFFIC TO THE MAXIMUM EXTENT PRACTICABLE. THERE SHALL BE NO STORAGE OF MATERIALS WITHIN AREAS TO BE USED FOR STORMWATER MANAGEMENT PRACTICES. THE CONTRACTOR SHALL INSTALL CONSTRUCTION FENCE AROUND THE PRACTICE TO DISCOURAGE VEHICLE TRAFFIC.
3. UNLESS OTHERWISE SPECIFIED, PIPE FOR STORM DRAINS SHALL BE HIGH DENSITY POLYETHYLENE PIPE (HDPE) WITH A SMOOTH INTERIOR AND ANNULAR EXTERIOR CORRUGATIONS IN ACCORDANCE WITH ASTM F-2648. JOINTS SHALL BE WATERTIGHT IN ACCORDANCE WITH ASTM D-3212.
4. UNLESS OTHERWISE SPECIFIED, PIPE FOR SANITARY SEWER GRAVITY LINES SHALL BE POLYVINYL CHLORIDE PIPE (PVCP), SDR-35, WITH PUSH-ON JOINTS IN ACCORDANCE WITH ASTM D-3034 AND D-3212.
5. UNLESS OTHERWISE SPECIFIED, PIPE FOR WATER LINES SHALL BE DOUBLE CEMENT-LINED DUCTILE IRON PIPE (DIP), CLASS 52, WITH PUSH-ON JOINTS IN ACCORDANCE WITH AWWA C-150, C-151, C-104 AND C-111.
6. ELECTRIC, TELEPHONE, FIRE ALARM AND CABLE TELEVISION LINES SHALL BE INSTALLED UNDERGROUND IN CONDUIT IN ACCORDANCE WITH THE REQUIREMENTS OF THE UTILITY COMPANY HAVING JURISDICTION.

No.	Revision	Date	By
1.	RESPONSE TO TOWN COMMENTS	01/11/2021	NC
2.	RESPONSE TO TOWN COMMENTS	03/08/2021	NC
3.	RESPONSE TO TOWN COMMENTS	06/14/2021	NC
4.	RESPONSE TO TOWN COMMENTS	01/10/2022	NC
5.	RESPONSE TO TOWN COMMENTS	03/28/2022	NC
6.	RESPONSE TO TOWN COMMENTS	05/09/2022	NC

Previous Editions Obsolete

APPLICANT/OWNER:
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568 BEDFORD ROAD (NY-22)
ARMONK, NY 10504

ARCHITECT:
GRANOFF ARCHITECTS
330 RAILROAD AVENUE
GREENWICH, CT 06830

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John Meyer Consulting, Inc.
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voice 914.273.5225 • fax 914.273.2102
www.jmcpllc.com

JMC

SITE UTILITIES PLAN (SOUTH)

THE SUMMIT CLUB AT ARMONK
(RESIDENTIAL PHASE)
568 & 570 BEDFORD ROAD (NY-22)
TOWN OF NORTH CASTLE, NEW YORK

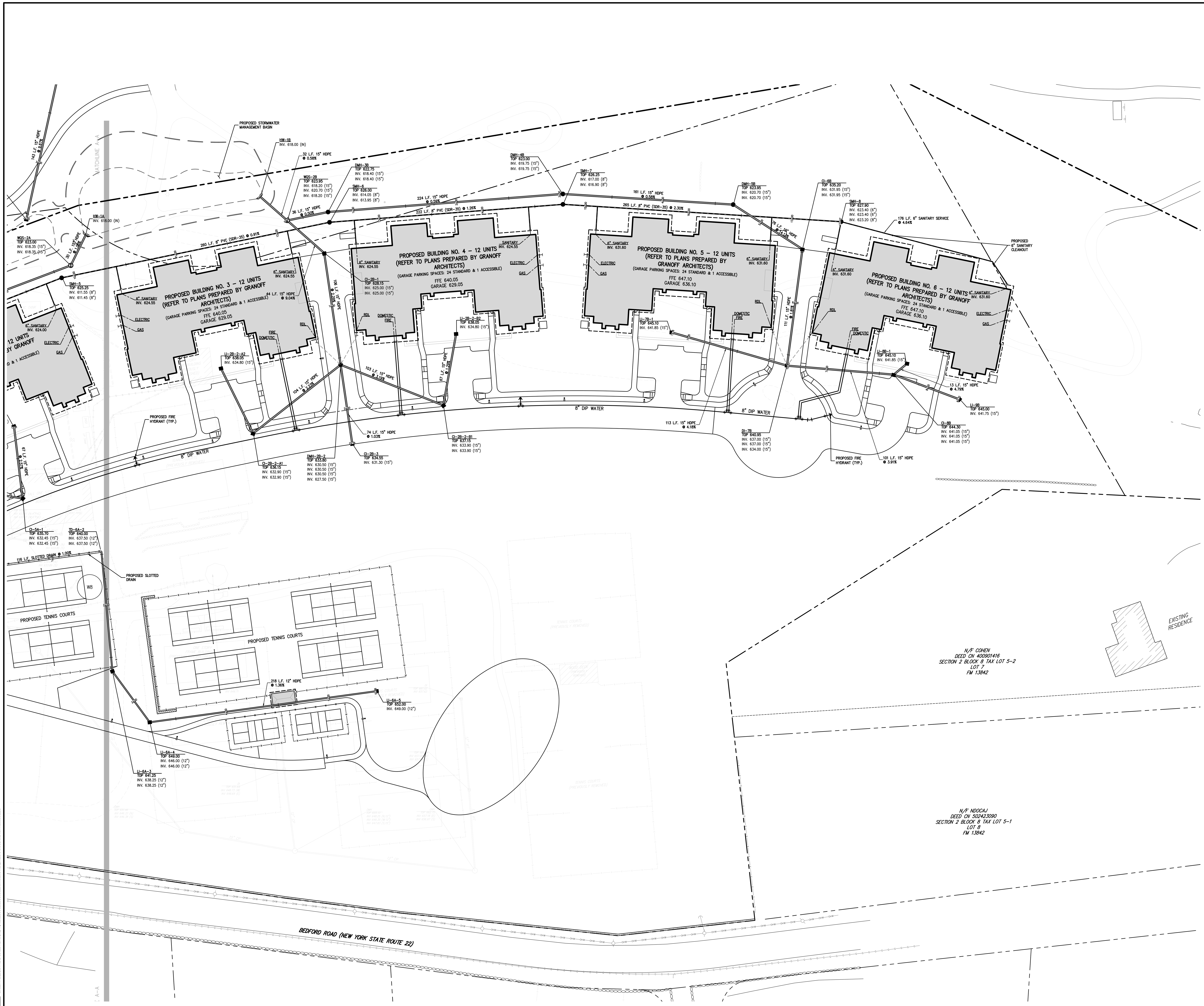
APPROVED BY TOWN OF NORTH CASTLE PLANNING BOARD RESOLUTION, DATED ________

________ DATE: ________
CHRISTOPHER CARTHY, CHAIRMAN,
TOWN OF NORTH CASTLE PLANNING BOARD

ENGINEERING DRAWINGS REVIEWED BY TOWN CONSULTING ENGINEER

________ DATE: ________
JOSEPH M. CERMELE, P.E.
KELLARD SESSIONS CONSULTING, P.C.
CONSULTING TOWN ENGINEER

Drawn: NC	Approved: AG	
Scale: 1" = 30'		
Date: 11/23/2020		
Project No: 20101		
20101-UTILITIES	UTIL SOUTH	UTIL.scr
Drawing No: C-300		



LEGEND

- EXISTING PROPERTY LINE
- ADJACENT PROPERTY LINE
- EXISTING EASEMENT LINE
- EXISTING BUILDING OVERHANG
- EXISTING BUILDING LINE
- EXISTING PAVEMENT EDGE
- EXISTING CURB LINE
- EXISTING CONTOUR
- EXISTING INDEX CONTOUR
- EXISTING STONE WALL
- EXISTING RETAINING WALL
- EXISTING GUIDE RAIL
- EXISTING FENCE
- EXISTING STORM DRAIN LINE AND SIZE
- EXISTING SANITARY LINE AND SIZE
- EXISTING WATER LINE
- EXISTING GAS LINE
- EXISTING OVERHEAD WIRES
- EXISTING DRAIN INLET
- EXISTING MANHOLE
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- EXISTING GAS VALVE
- EXISTING WATER VALVE
- EXISTING UTILITY POLE
- EXISTING LIGHT POLE
- EXISTING SIGN
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- PROPOSED CONCRETE SIDEWALK
- PROPOSED DROP CURB AND RAMP
- PROPOSED SANITARY SEWER MANHOLE
- PROPOSED STORM DRAIN MANHOLE
- PROPOSED TYPE CI DRAIN INLET
- PROPOSED TYPE DI DRAIN INLET
- PROPOSED HEADWALL
- PROPOSED SUBSURFACE DRAINAGE OUTLET CONTROL STRUCTURE
- PROPOSED HYDRANT
- PROPOSED STORM DRAIN LINE & SIZE
- PROPOSED SANITARY SEWER LINE & SIZE
- PROPOSED WATER LINE & SIZE
- PROPOSED GAS LINE
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No.	Revision	Date	By
1.	RESPONSE TO TOWN COMMENTS	01/11/2021	NC
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4.	RESPONSE TO TOWN COMMENTS	01/10/2022	NC
5.	RESPONSE TO TOWN COMMENTS	03/28/2022	NC
6.	RESPONSE TO TOWN COMMENTS	05/09/2022	NC

Previous Editions Obsolete

APPLICANT/OWNER:
SUMMIT CLUB PARTNERS, LLC
568 BEDFORD ROAD (NY-22)
ARMONK, NY 10504

ARCHITECT:
GRANOFF ARCHITECTS
330 RAILROAD AVENUE
GREENWICH, CT 06830

JMC Planning, Engineering, Landscape Architecture & Land Surveying, PLLC
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John Meyer Consulting, Inc.
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voice 914.273.5225 • fax 914.273.2102
www.jmcpllc.com

SITE UTILITIES PLAN (NORTH)

THE SUMMIT CLUB AT ARMONK (RESIDENTIAL PHASE)
568 & 570 BEDFORD ROAD (NY-22)
TOWN OF NORTH CASTLE, NEW YORK

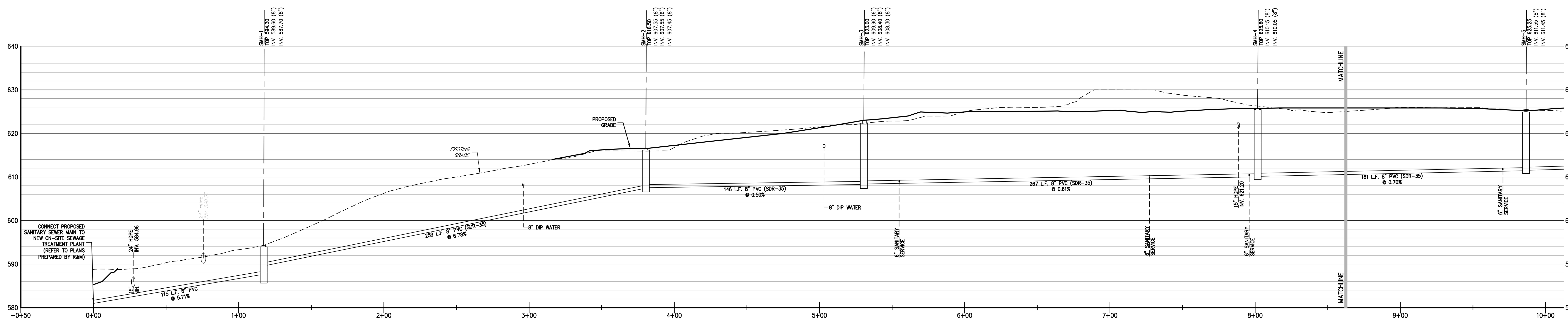
APPROVED BY TOWN OF NORTH CASTLE PLANNING BOARD RESOLUTION, DATED ________

________ DATE: ________
CHRISTOPHER CARTHY, CHAIRMAN,
TOWN OF NORTH CASTLE PLANNING BOARD

ENGINEERING DRAWINGS REVIEWED BY TOWN CONSULTING ENGINEER

________ DATE: ________
JOSEPH M. CERMELE, P.E.
KELLARD SESSIONS CONSULTING, P.C.
CONSULTING TOWN ENGINEER

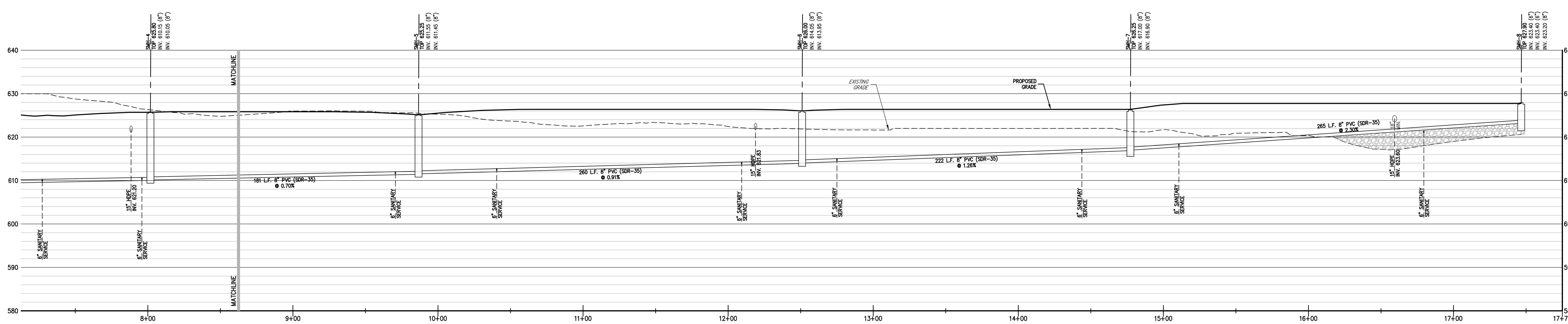
Drawn: NC	Approved: AG	
Scale: 1" = 30'		
Date: 11/23/2020		
Project No: 20101		
20101-UTILITIES	UTIL NORTH	UTIL.scr
Drawing No: C-301		



STP TO SMH-8 PROFILE

HORIZONTAL: 1" = 30'

VERTICAL: 1" = 10'



STP TO SMH-8 PROFILE

HORIZONTAL: 1" = 30'

VERTICAL: 1" = 10'

No.	Revision	Date	By
1.	RESPONSE TO TOWN COMMENTS	01/11/2021	NC
2.	RESPONSE TO TOWN COMMENTS	03/08/2021	NC
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4.	RESPONSE TO TOWN COMMENTS	01/10/2022	NC
5.	RESPONSE TO TOWN COMMENTS	03/28/2022	NC
6.	RESPONSE TO TOWN COMMENTS	05/09/2022	NC

Previous Editions Obsolete

APPLICANT/OWNER:
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ARMONK, NY 10504

ARCHITECT:
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SANITARY SEWER PROFILE

THE SUMMIT CLUB AT ARMONK (RESIDENTIAL PHASE)
568 & 570 BEDFORD ROAD (NY-22)
TOWN OF NORTH CASTLE, NEW YORK

APPROVED BY TOWN OF NORTH CASTLE PLANNING BOARD RESOLUTION, DATED ________

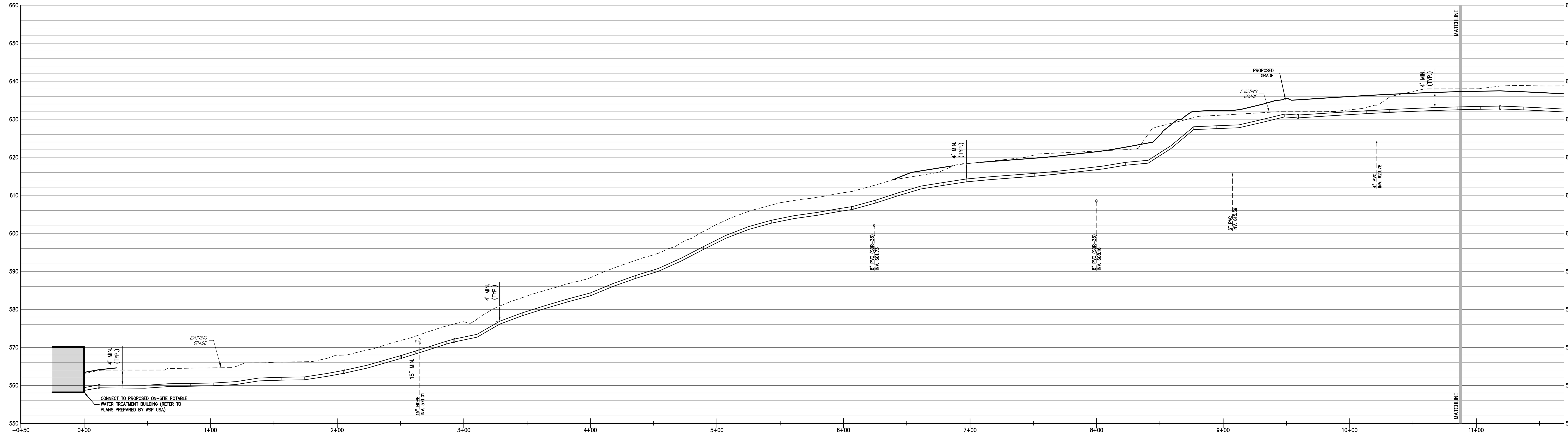
________ DATE: ________
CHRISTOPHER CARTHY, CHAIRMAN,
TOWN OF NORTH CASTLE PLANNING BOARD

ENGINEERING DRAWINGS REVIEWED BY TOWN CONSULTING ENGINEER

________ DATE: ________
JOSEPH M. CERMELE, P.E.
KELLARD SESSIONS CONSULTING, P.C.
CONSULTING TOWN ENGINEER

Drawn: NC Approved: AG
Scale: AS SHOWN
Date: 11/23/2020
Project No: 20101
Drawing No: C-302

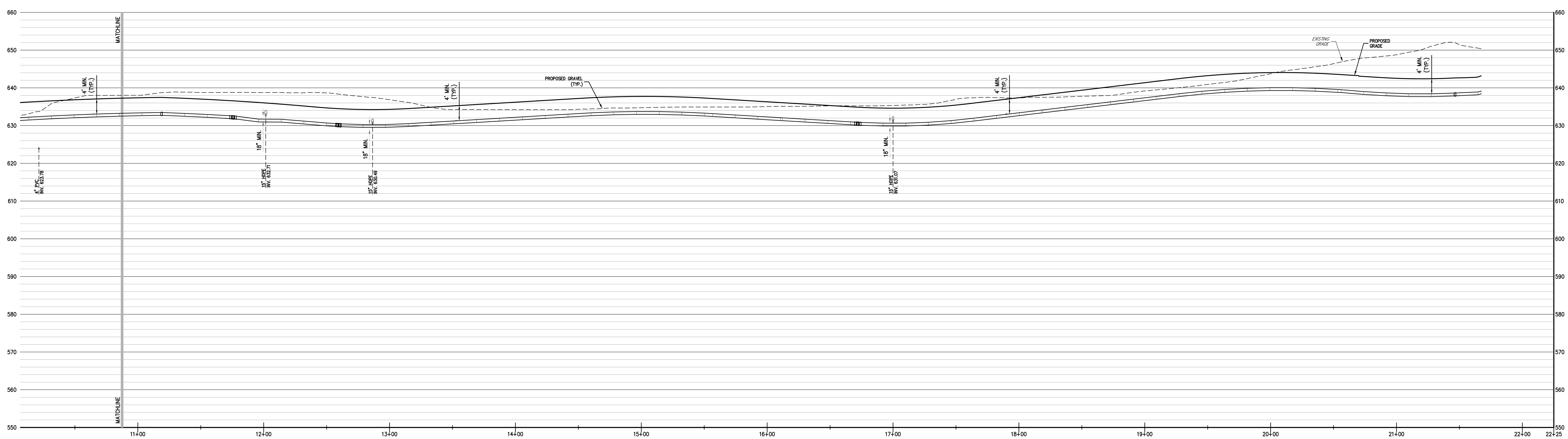
NOT FOR CONSTRUCTION



WATER MAIN PROFILE

HORIZONTAL: 1" = 30'

VERTICAL: 1" = 10'



WATER MAIN PROFILE

HORIZONTAL: 1" = 30'

VERTICAL: 1" = 10'

No.	Revision	Date	By
1.	RESPONSE TO TOWN COMMENTS	01/11/2021	NC
2.	RESPONSE TO TOWN COMMENTS	03/08/2021	NC
3.	RESPONSE TO TOWN COMMENTS	06/14/2021	NC
4.	RESPONSE TO TOWN COMMENTS	01/10/2022	NC
5.	RESPONSE TO TOWN COMMENTS	03/28/2022	NC
6.	RESPONSE TO TOWN COMMENTS	05/09/2022	NC

Previous Editions Obsolete

APPLICANT/OWNER:
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568 BEDFORD ROAD (NY-22)
ARMONK, NY 10504

ARCHITECT:
GRANOFF ARCHITECTS
330 RAILROAD AVENUE
GREENWICH, CT 06830

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John Meyer Consulting, Inc.
120 BEDFORD ROAD • ARMONK, NY 10504
voice 914.273.5225 • fax 914.273.2102
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WATER MAIN PROFILE

THE SUMMIT CLUB AT ARMONK (RESIDENTIAL PHASE)
568 & 570 BEDFORD ROAD (NY-22)
TOWN OF NORTH CASTLE, NEW YORK

APPROVED BY TOWN OF NORTH CASTLE PLANNING BOARD RESOLUTION, DATED ________

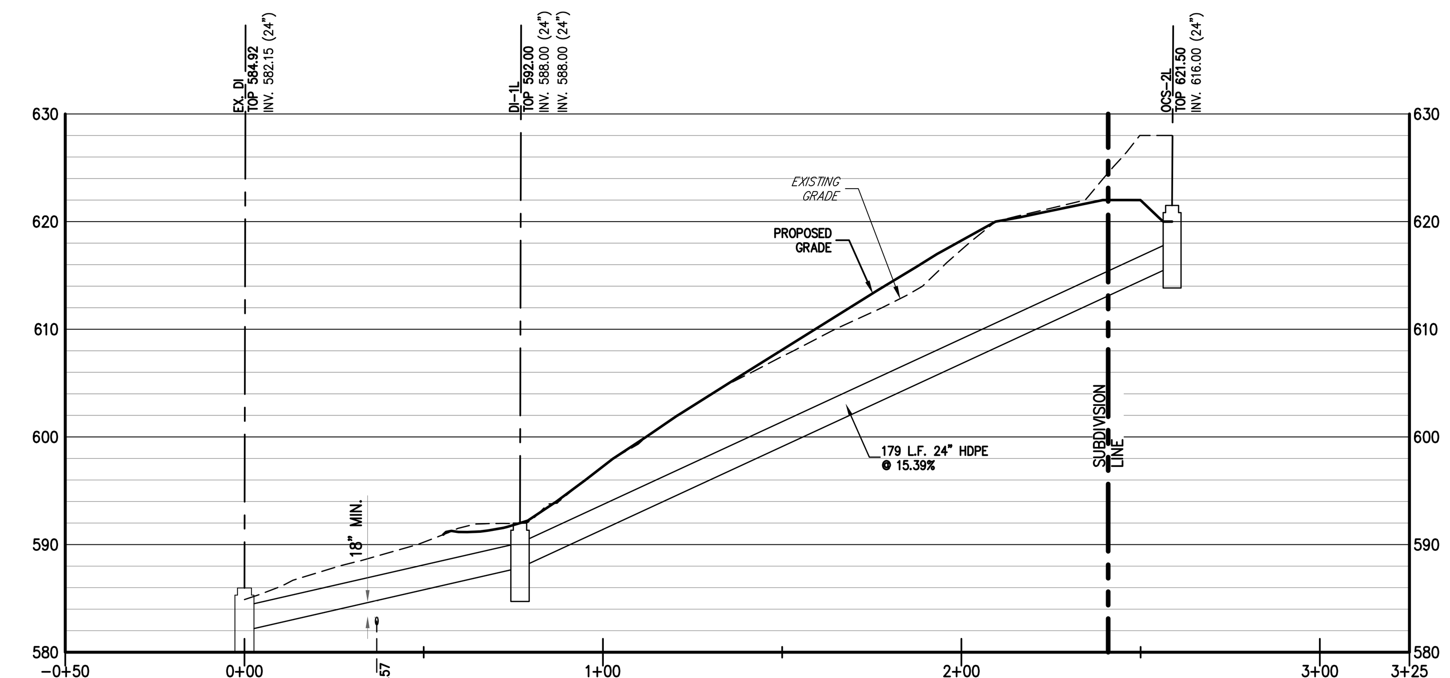
________ DATE: ________
CHRISTOPHER CARTHY, CHAIRMAN,
TOWN OF NORTH CASTLE PLANNING BOARD

ENGINEERING DRAWINGS REVIEWED BY TOWN CONSULTING ENGINEER

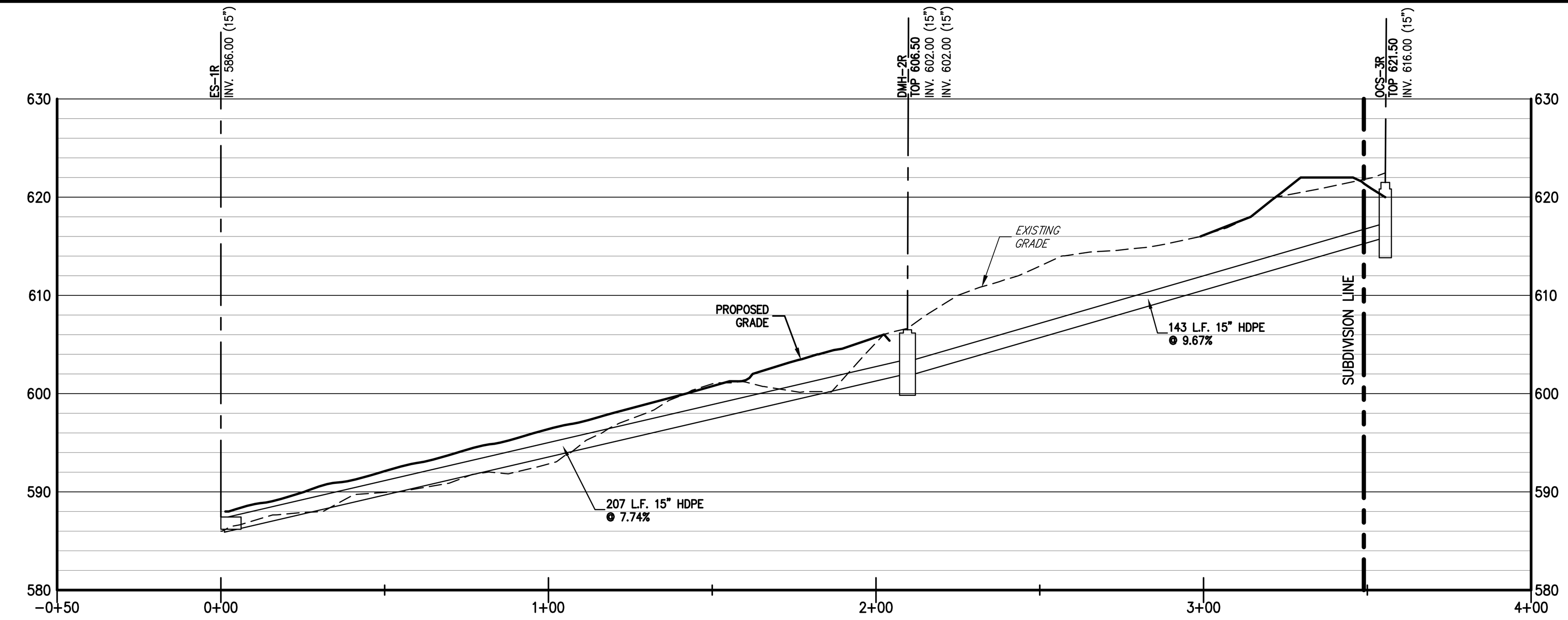
________ DATE: ________
JOSEPH M. CERMELE, P.E.
KELLARD SESSIONS CONSULTING, P.C.
CONSULTING TOWN ENGINEER

Drawn: NC		Approved: AG	
Scale:	AS SHOWN		
Date:	11/23/2020		
Project No:	20101		
20101-UTILITIES	WATER PROFILE	UTIL.scr	
Drawing No:	C-303		

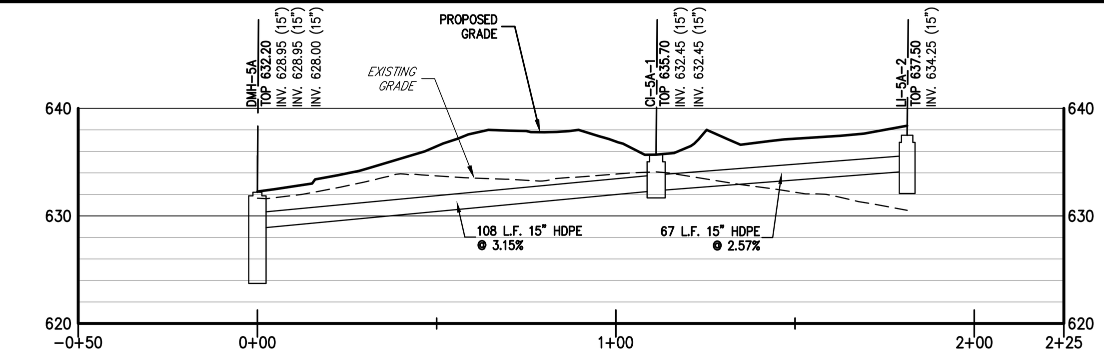
NOT FOR CONSTRUCTION



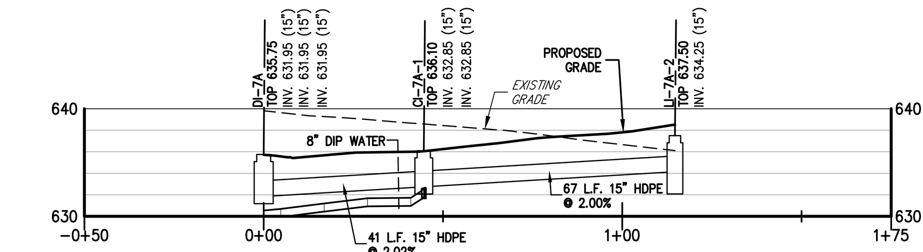
EX. DI TO OCS-2L PROFILE
HORIZONTAL: 1" = 30'
VERTICAL: 1" = 10'



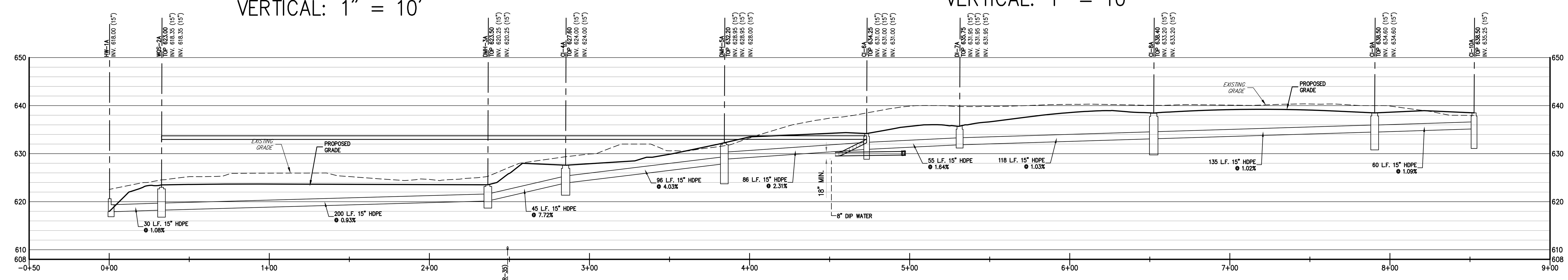
ES-1R TO OCS-3R PROFILE
HORIZONTAL: 1" = 30'
VERTICAL: 1" = 10'



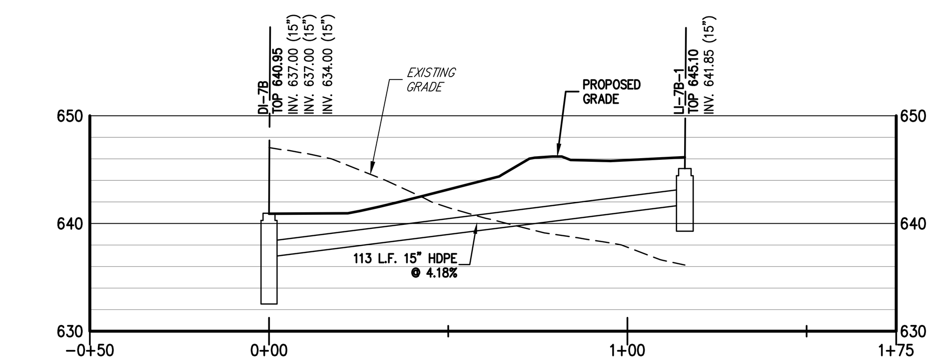
DMH-5A TO CI-5A-2 PROFILE
HORIZONTAL: 1" = 30'
VERTICAL: 1" = 10'



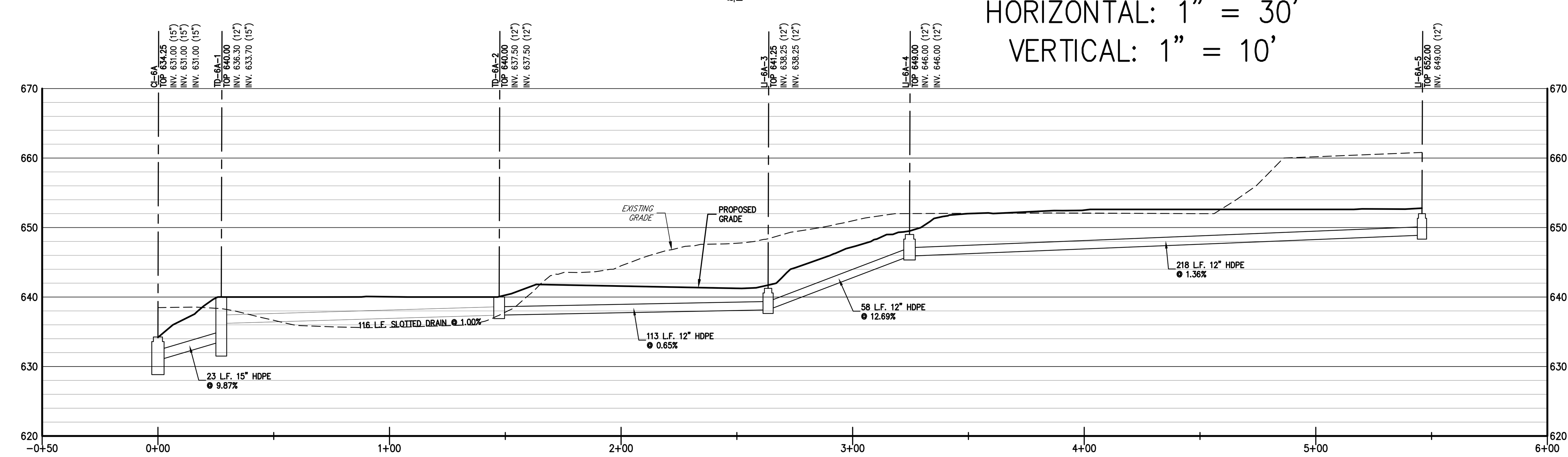
DI-7A TO LI-7A-2 PROFILE
HORIZONTAL: 1" = 30'
VERTICAL: 1" = 10'



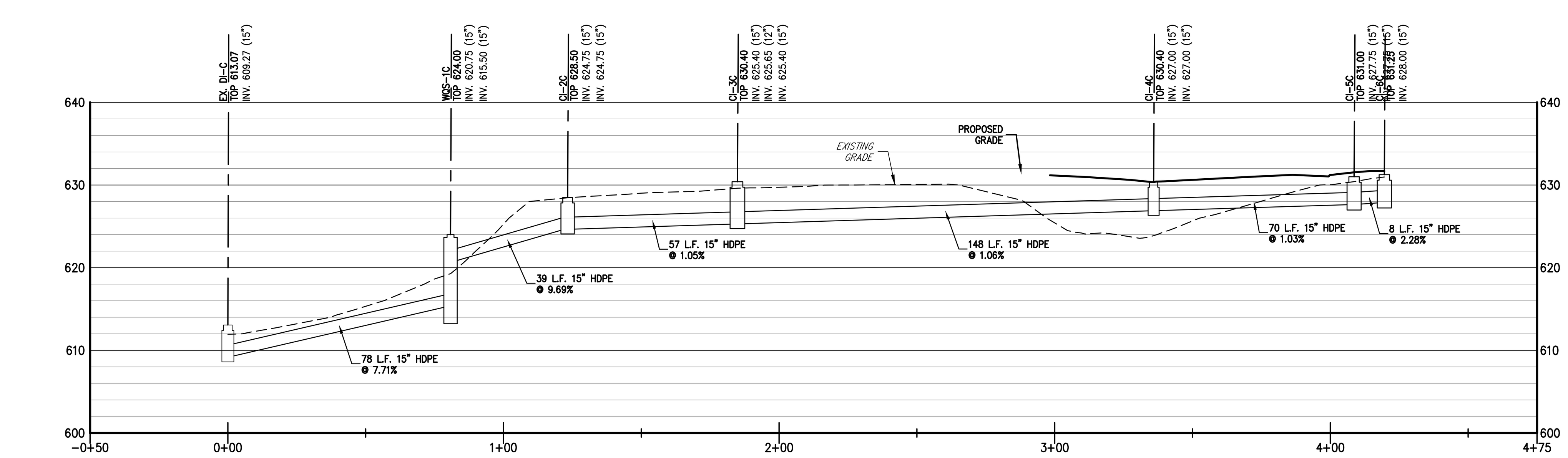
HW-1A TO CI-10A PROFILE
HORIZONTAL: 1" = 30'
VERTICAL: 1" = 10'



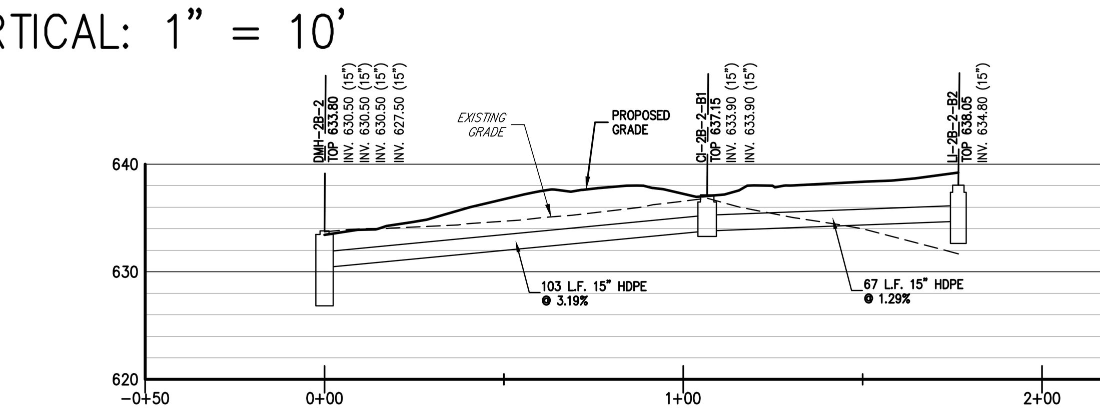
DI-7B TO LI-7B-1 PROFILE
HORIZONTAL: 1" = 30'
VERTICAL: 1" = 10'



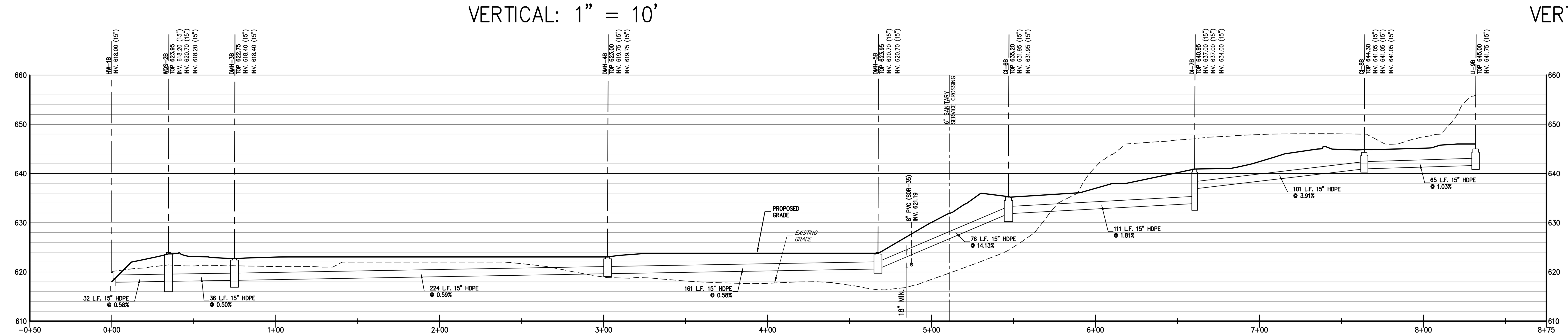
CI-6A TO LI-6A-5 PROFILE
HORIZONTAL: 1" = 30'
VERTICAL: 1" = 10'



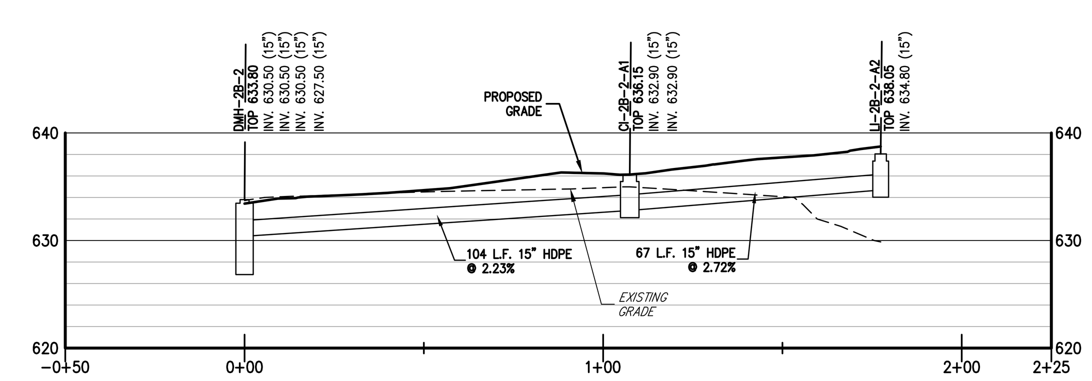
EX. DI-C TO CI-5C PROFILE
HORIZONTAL: 1" = 30'
VERTICAL: 1" = 10'



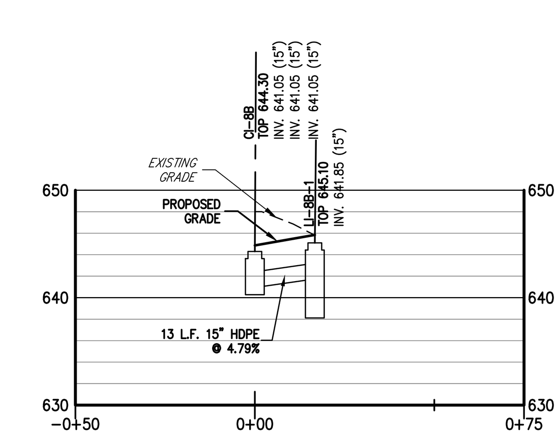
DMH-2B-2 TO LI-2B-2-B2 PROFILE
HORIZONTAL: 1" = 30'
VERTICAL: 1" = 10'



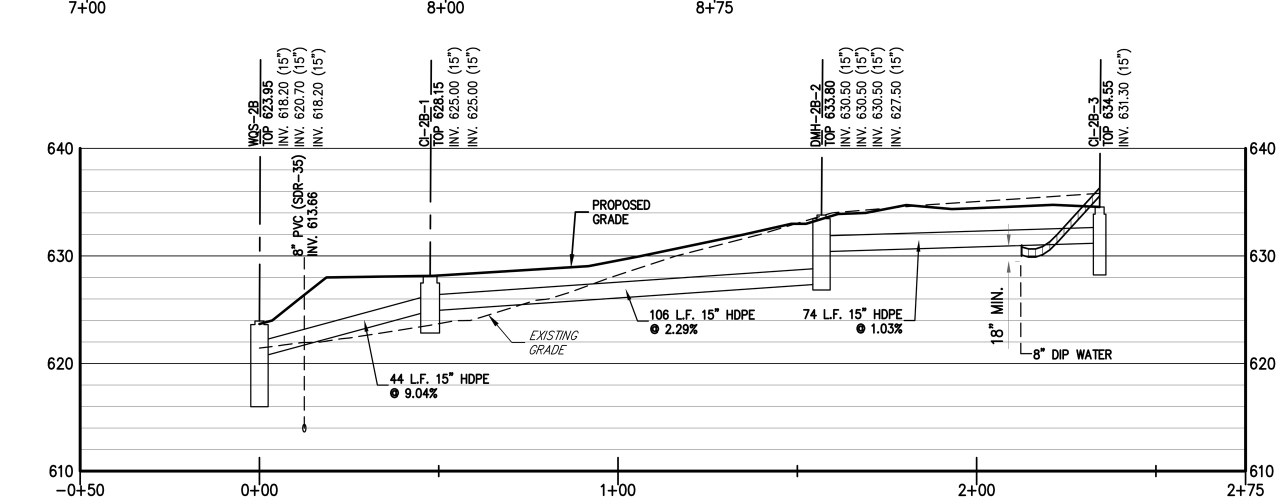
HW-1B TO LI-9B PROFILE
HORIZONTAL: 1" = 30'
VERTICAL: 1" = 10'



DMH-2B-2 TO LI-2B-2-A2 PROFILE
HORIZONTAL: 1" = 30'
VERTICAL: 1" = 10'



CI-8B TO LI-8B-1 PROFILE
HORIZONTAL: 1" = 30'
VERTICAL: 1" = 10'



WQS-2B TO CI-2B-3 PROFILE
HORIZONTAL: 1" = 30'
VERTICAL: 1" = 10'

No.	Revision	Date	By
1.	RESPONSE TO TOWN COMMENTS	01/11/2021	NC
2.	RESPONSE TO TOWN COMMENTS	03/08/2021	NC
3.	RESPONSE TO TOWN COMMENTS	06/14/2021	NC
4.	RESPONSE TO TOWN COMMENTS	01/10/2022	NC
5.	RESPONSE TO TOWN COMMENTS	03/28/2022	NC
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Previous Editions Obsolete

APPLICANT/OWNER:
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568 BEDFORD ROAD (NY-22)
ARMONK, NY 10504

ARCHITECT:
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GREENWICH, CT 06830

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John Meyer Consulting, Inc.
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voice 914.273.5225 • fax 914.273.2102
www.jmcpllc.com

STORM SEWER PROFILES
THE SUMMIT CLUB AT ARMONK (RESIDENTIAL PHASE)
568 & 570 BEDFORD ROAD (NY-22)
TOWN OF NORTH CASTLE, NEW YORK

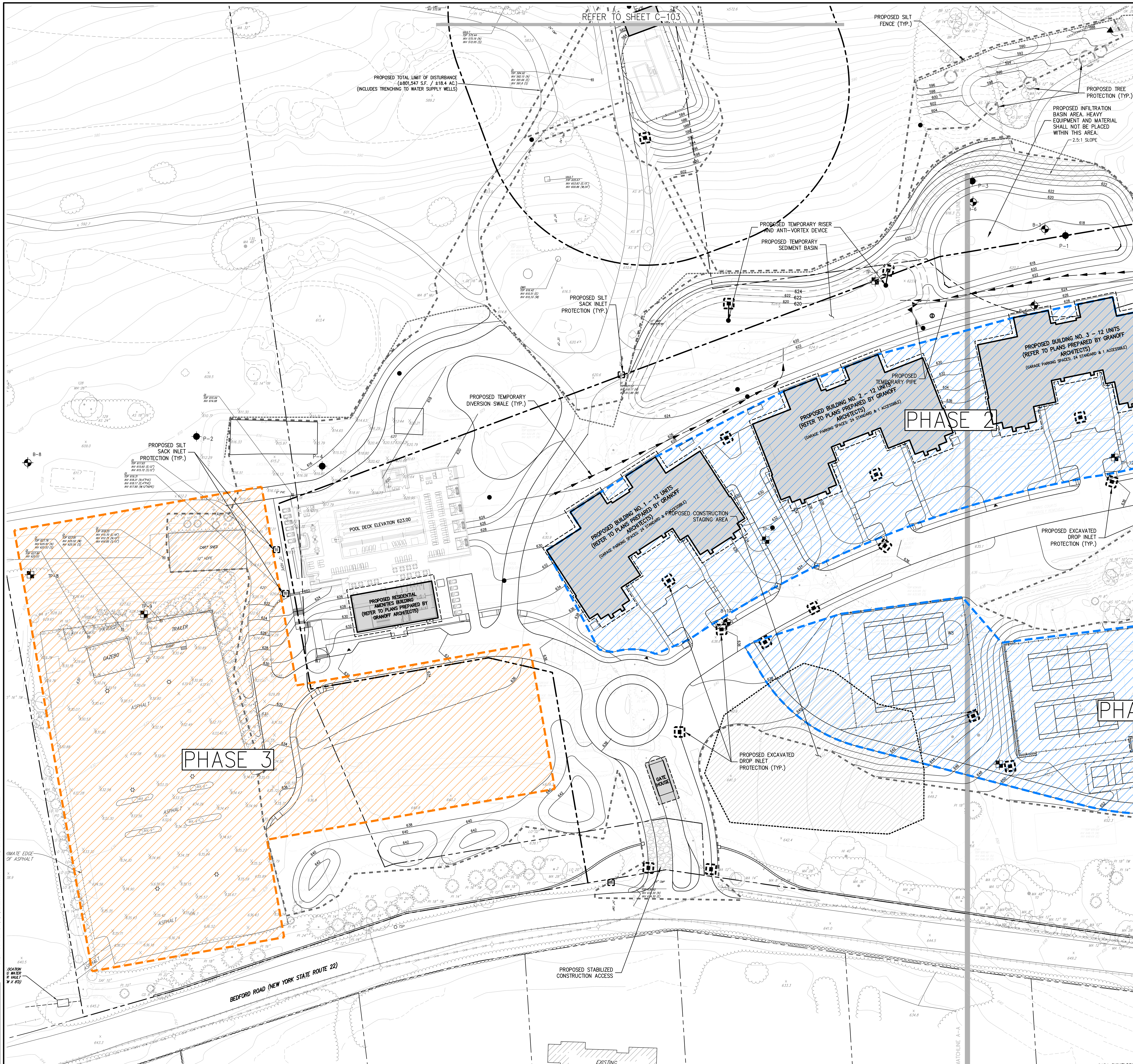
APPROVED BY TOWN OF NORTH CASTLE PLANNING BOARD RESOLUTION, DATED ________

________ DATE: ________
CHRISTOPHER CARTHY, CHAIRMAN,
TOWN OF NORTH CASTLE PLANNING BOARD

ENGINEERING DRAWINGS REVIEWED BY TOWN CONSULTING ENGINEER

________ DATE: ________
JOSEPH M. CERMELE, P.E.
KELLARD SESSIONS CONSULTING, P.C.
CONSULTING TOWN ENGINEER

Drawn:	NC	Approved:	AG
Scale:	AS SHOWN		
Date:	11/23/2020		
Project No:	20101		
20101-UTILITIES	STORM PROFILES	UTIL.scr	
Drawing No:	C-304		



LEGEND

- PROPOSED INLET PROTECTION
- PROPOSED CONSTRUCTION FENCE
- PROPOSED SILT FENCE
- PROPOSED LIMIT OF DISTURBANCE
- PROPOSED STABILIZED CONSTRUCTION ENTRANCE
- PROPOSED STOCKPILE AREA
- PROPOSED TEMPORARY SEDIMENT BASIN
- PROPOSED TEMPORARY SWALE
- PROPOSED TREE PROTECTION
- PROPOSED TEMPORARY RISER & ANTI-VORTEX DEVICE

NOTES:

1. EXISTING CONDITIONS DEPICTED ON THIS PLAN HAVE BEEN TAKEN FROM SURVEY TITLED, "TOPOGRAPHIC MAP," PREPARED BY JMC, PLLC, LAST REVISED 03/06/2013, SUPPLEMENTED WITH AN UPDATED SURVEY LAST REVISED 01/17/2022. PORTIONS OF EXISTING TOPOGRAPHY HAVE BEEN PROVIDED BY WESTCHESTER COUNTY GIS.

2. THIS PLAN IS FOR TEMPORARY EROSION AND SEDIMENT CONTROL INFORMATION ONLY.

3. PRIOR TO BEGINNING ANY CLEARING, GRUBBING OR EXCAVATION, ALL EROSION AND SEDIMENT CONTROL MEASURES SHALL BE INSTALLED IN ACCORDANCE WITH ALL THE PLANS AND SPECIFICATIONS. EROSION AND SEDIMENT CONTROL MEASURES SHALL BE MAINTAINED UNTIL THE SITE IS STABILIZED. FINAL STABILIZATION OF LANDSCAPED AREAS SHALL BE IN ACCORDANCE WITH THE LANDSCAPE PLAN.

4. THE CONTRACTOR SHALL INSPECT AND MAINTAIN ON-SITE EROSION AND SEDIMENT CONTROL MEASURES ON A DAILY BASIS. ALL COLLECTED SEDIMENT WITHIN SEDIMENT BARRIERS SHALL BE REMOVED PERIODICALLY AS REQUIRED TO MAINTAIN THE FUNCTION OF THE SEDIMENT BARRIERS. ALL SEDIMENT COLLECTED SHALL BE RESPREAD ON-SITE WITHIN STABILIZED AREAS AS DIRECTED BY THE OWNERS REPRESENTATIVE.

5. THE CONTRACTOR SHALL INSPECT DOWNSTREAM CONDITIONS FOR EVIDENCE OF SEDIMENTATION ON A WEEKLY BASIS, AFTER EACH RAINSTORM, AND AS MAY BE REQUIRED OR DIRECTED BY ALL APPLICABLE APPROVALS AND PERMITS. THE CONTRACTOR SHALL IMMEDIATELY PROVIDE A WRITTEN REPORT ON FINDINGS OF SEDIMENT IN DOWNSTREAM AREAS TO ALL AUTHORITIES HAVING JURISDICTION AND MAKE REPAIRS AS REQUIRED OR DIRECTED.

6. ADDITIONAL EROSION AND SEDIMENT CONTROL MEASURES SHALL BE INSTALLED BY THE CONTRACTOR AS REQUIRED/WARRANTED BY FIELD CONDITIONS AND AS DIRECTED BY THE OWNERS REPRESENTATIVE, JMC, AND/OR ANY AUTHORITY HAVING JURISDICTION.

7. STOCKPILING OF CONSTRUCTION MATERIAL SHALL BE PLACED ON-SITE IN THE AREA DESIGNATED ON THIS PLAN OR AS APPROVED BY THE OWNERS REPRESENTATIVE. STOCKPILED EXCAVATED MATERIAL SHALL HAVE TWO ROWS OF SILT FENCE LOCATED AROUND ITS PERIMETER. ALL STOCKPILED MATERIAL SHALL BE MAINTAINED IN AN ORDERLY MANNER SO AS NOT TO IMPEDE ON PEDESTRIAN AND/OR VEHICULAR TRAFFIC CIRCULATION ROUTES.

7. DUST SHALL BE CONTROLLED BY SPRINKLING OR OTHER APPROVED METHODS AS NECESSARY, OR AS DIRECTED BY THE OWNERS REPRESENTATIVE.

8. ALL STORMWATER MANAGEMENT PRACTICES SHALL REMAIN UNDISTURBED AND BE PROTECTED FROM HEAVY MACHINERY TRAFFIC DURING CONSTRUCTION. HOWEVER DURING CONSTRUCTION OF THE PRACTICE THE CONTRACTOR SHALL MINIMIZE AND AVOID HEAVY MACHINERY TRAFFIC TO THE MAXIMUM EXTENT PRACTICABLE. THERE SHALL BE NO STORAGE OF MATERIALS WITHIN AREAS TO BE USED FOR STORMWATER MANAGEMENT PRACTICES. THE CONTRACTOR SHALL INSTALL CONSTRUCTION FENCE AROUND THE PRACTICE TO DISCOURAGE VEHICLE TRAFFIC.

9. ALL EXPOSED SLOPES AND GRADED/DISTURBED AREAS, THAT WILL NOT BE FURTHER DISTURBED WITHIN 14 CALENDAR DAYS (7 DAYS FOR CONSTRUCTION SITES THAT EITHER DIRECTLY DISCHARGE TO ONE OF THE 303(d) SEGMENTS LISTED IN APPENDIX E OF THE GENERAL PERMIT OR ARE LOCATED WITHIN ONE OF THE WATERSHEDS LISTED IN APPENDIX C OF THE GENERAL PERMIT), SHALL BE TEMPORARILY SEEDED WITHIN 24 HOURS OF DISTURBANCE, IN ACCORDANCE WITH THE NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION (NYSDEC) "EROSION AND SEDIMENT CONTROL GUIDELINES" AND THE ANSI A300 "BEST MANAGEMENT PRACTICES FOR TREE AND SHRUB PLANTING, TRANSPLANTING, MAINTENANCE AND CARE," PREPARED BY THE INTERNATIONAL SOCIETY OF ARBORICULTURE (ISA), LATEST EDITIONS, AS FOLLOWS:
   A. SEED MIXTURE AND RATE OF APPLICATION:
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10. ALL SEEDED AREAS SHALL BE FERTILIZED, RESEEDED, AND MULCHED AS NECESSARY TO MAINTAIN VIGOROUS, DENSE VEGETATIVE COVER.

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CUT & FILL ANALYSIS		
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www.jmcpllc.com

SITE EROSION & SEDIMENT CONTROL PLAN (SOUTH)

THE SUMMIT CLUB AT ARMONK (RESIDENTIAL PHASE)

568 & 570 BEDFORD ROAD (NY-22)
TOWN OF NORTH CASTLE, NEW YORK

APPROVED BY TOWN OF NORTH CASTLE PLANNING BOARD RESOLUTION, DATED ________

________ DATE: ________
CHRISTOPHER CARTHY, CHAIRMAN,
TOWN OF NORTH CASTLE PLANNING BOARD

ENGINEERING DRAWINGS REVIEWED BY TOWN CONSULTING ENGINEER

________ DATE: ________
JOSEPH M. CERMELE, P.E.
KELLARD SESSIONS CONSULTING, P.C.
CONSULTING TOWN ENGINEER

Drawn:	NC	Approved:	AG
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Date:	11/23/2020		
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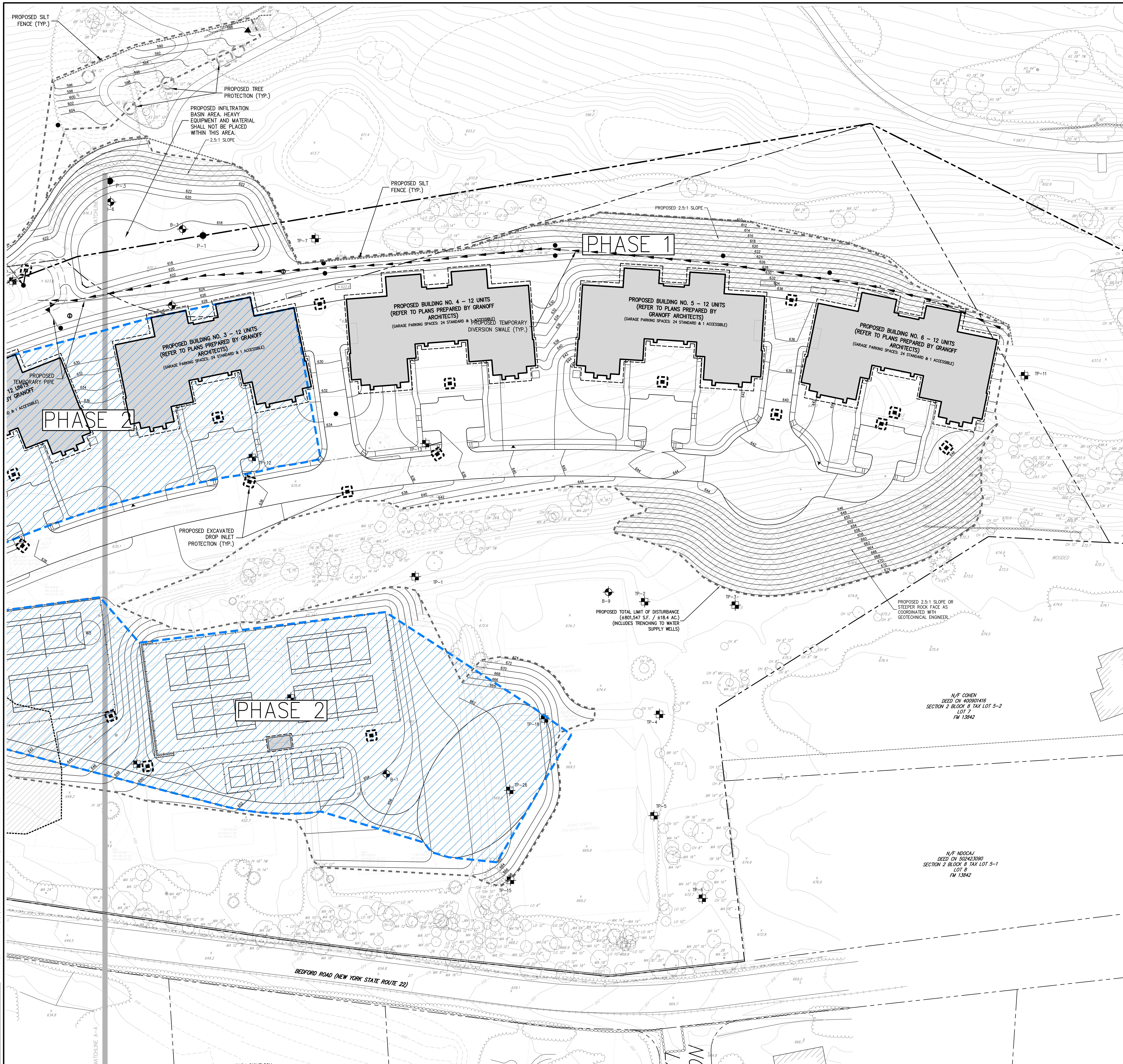
20101-SE	E&S SOUTH	SE.scr	

Drawing No: C-400



LEGEND

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SITE EROSION & SEDIMENT CONTROL PLAN (NORTH)

THE SUMMIT CLUB AT ARMONK
(RESIDENTIAL PHASE)
568 & 570 BEDFORD ROAD (NY-22)
TOWN OF NORTH CASTLE, NEW YORK

APPROVED BY TOWN OF NORTH CASTLE PLANNING BOARD RESOLUTION, DATED ________

________ DATE: ________
CHRISTOPHER CARTHY, CHAIRMAN,
TOWN OF NORTH CASTLE PLANNING BOARD

ENGINEERING DRAWINGS REVIEWED BY TOWN CONSULTING ENGINEER

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JOSEPH M. CERMELE, P.E.
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CONSULTING TOWN ENGINEER

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20101-SE	E&S NORTH	SE.scr	

Drawing No: C-401

DISTURBANCE AUTHORIZATION, PHASING OF THE PROJECT AND SEQUENCING OF CONSTRUCTION

THE FOLLOWING SECTION DESCRIBES THE CONSTRUCTION PHASING PROPOSED FOR THIS PROJECT AND THE SEQUENCING OF THE INSTALLATION OF EROSION AND SEDIMENT CONTROLS AND THE PROPOSED CONSTRUCTION.

THE PLAN DIVIDES THE SITE INTO THREE (3) AREAS TO BE IMPACTED BY DEVELOPMENT. THE AREA OF PROPOSED GROUND DISTURBANCE WITHIN EACH OF THE THREE (3) AREAS TO BE DISTURBED BY THE RESIDENTIAL, RESIDENTIAL AMENITIES COMPLEX, AND FUTURE PERMANENT CLUBHOUSE IMPROVEMENTS WILL BE MORE THAN FIVE (5) ACRES. THEREFORE, AND IN ACCORDANCE WITH NYSDEC SPDES GENERAL PERMIT NO. GP-0-20-001 EFFECTIVE JANUARY 29, 2020 THE OPERATOR SHALL HAVE A QUALIFIED PROFESSIONAL CONDUCT AN ASSESSMENT OF THE SITE PRIOR TO THE COMMENCEMENT OF CONSTRUCTION AND CERTIFY THAT THE APPROPRIATE EROSION AND SEDIMENT CONTROLS, AS SHOWN ON THE SEDIMENT & EROSION CONTROL PLANS, HAVE BEEN ADEQUATELY INSTALLED TO ENSURE OVERALL PREPAREDNESS OF THE SITE FOR THE COMMENCEMENT OF CONSTRUCTION. IN ADDITION, THE OPERATOR SHALL HAVE A QUALIFIED PROFESSIONAL CONDUCT TWO (2) SITE INSPECTIONS AT LEAST EVERY SEVEN (7) CALENDAR DAYS.

PRIOR TO THE COMMENCEMENT OF CONSTRUCTION ACTIVITY, THE OWNER OR OPERATOR SHALL IDENTIFY THE CONTRACTOR(S) AND SUBCONTRACTOR(S) THAT WILL BE RESPONSIBLE FOR INSTALLING, CONSTRUCTING, REPAIRING, REPLACING, INSPECTING AND MAINTAINING THE EROSION AND SEDIMENT CONTROL PRACTICES INCLUDED IN THE SWPPP; AND THE CONTRACTOR(S) AND SUBCONTRACTOR(S) THAT WILL BE RESPONSIBLE FOR CONSTRUCTING THE POST-CONSTRUCTION STORMWATER MANAGEMENT PRACTICES INCLUDED IN THE SWPPP. THE OWNER OR OPERATOR SHALL HAVE EACH OF THE CONTRACTORS AND SUBCONTRACTORS IDENTIFY AT LEAST ONE PERSON FROM THEIR COMPANY THAT WILL BE RESPONSIBLE FOR IMPLEMENTATION OF THE SWPPP. THIS PERSON SHALL BE KNOWN AS THE TRAINED CONTRACTOR. THE OWNER OR OPERATOR SHALL ENSURE THAT AT LEAST ONE TRAINED CONTRACTOR IS ON SITE ON A DAILY BASIS WHEN SOIL DISTURBANCE ACTIVITIES ARE BEING PERFORMED.

THE OWNER OR OPERATOR SHALL HAVE EACH OF THE CONTRACTORS AND SUBCONTRACTORS IDENTIFIED ABOVE SIGN A COPY OF THE CERTIFICATION STATEMENT PROVIDED BEFORE THEY COMMENCE ANY CONSTRUCTION ACTIVITY.

CONSTRUCTION ACCESS AND VEHICLE TRAVEL ON SITE

THE SITE ACCESS FOR CONSTRUCTION VEHICLE TRAFFIC WILL BE VIA THE EXISTING DRIVEWAY ALONG BEDFORD ROAD (NY 22). THIS ENTRANCE SHALL BE POSTED WITH "CONSTRUCTION ACCESS" SIGNS VISIBLE IN BOTH DIRECTIONS OF ONCOMING TRAFFIC. WHERE PRACTICAL, THE EXISTING PAVED DRIVEWAY AND GOLF CART PATHS WHICH TRAVERSE THE SITE WILL BE USED FOR THE CONSTRUCTION VEHICLES.

A PRIMARY CONSTRUCTION STAGING AREA AND EQUIPMENT STORAGE AREA WILL BE ESTABLISHED AND LOCATED IN THE EXISTING LAWN AREA NEXT TO THE EXISTING ENTRANCE DRIVE.
CONSTRUCTION VEHICLES SHALL NOT DISTURB ANY AREAS BEYOND THE CONSTRUCTION PHASE BEING WORKED AT THE TIME EXCEPT UNDER THE STRICT SUPERVISION OF THE OWNER'S FIELD REPRESENTATIVE AND ENCIRCLED WITH 6 FOOT TALL CHAIN LINK SECURITY FENCING.

SEQUENCE OF CONSTRUCTION

THE CONTRACTOR SHALL FOLLOW THE SEQUENCE OF CONSTRUCTION OPERATION DESCRIBED BELOW AND AS NOTED ON THE PLANS.

CONSTRUCTION PHASE 1 (~13.0 AC.)

RESIDENTIAL BUILDINGS #4,5,6, AMENITIES COMPLEX, POOL, ROADWAYS, SIDEWALKS, ENTRANCE DRIVE, WATER SYSTEM AND SEWAGE TREATMENT PLANT.

1. STAKE OUT ALL LIMITS OF DISTURBANCE. (AREAS SHALL BE DELINEATED WITH ORANGE CONSTRUCTION FENCE)
2. TAG ALL EXISTING TREES TO BE REMOVED (TREES SHALL BE DELINATED WITH COLORED CONSTRUCTION TAPE)
3. CUT EXISTING TREES TO BE REMOVED.
4. INSTALL CONSTRUCTION ACCESS, SILT FENCE (DOWNHILL OF ALL DISTURBANCE AREAS), INLET PROTECTION AND OTHER NECESSARY EROSION AND SEDIMENT CONTROLS, INCLUDING THE INSTALLATION OF THE TEMPORARY SEDIMENT BASIN AND TEMPORARY SWALES.
5. COORDINATE INSPECTION OF INITIAL EROSION CONTROLS AND TREE REMOVAL BY TOWN CONSULTING ENGINEER AND JMC.
6. DEMOLITION OF EXISTING BUILDINGS AND SITE FEATURES AS REQUIRED.
7. STRIP AND STOCKPILE TOPSOIL. REMOVE STUMPS FROM CUT TREES.
8. BEGIN BUILDING AND ROADWAY CONSTRUCTION, ROUGH GRADING.
9. INSTALL STORM DRAIN SYSTEM COMPLETE (IMMEDIATELY INSTALL INLET PROTECTION ON ALL INLETS).
10. INSTALL WATER SYSTEM AND SEWAGE TREATMENT PLANT IMPROVEMENTS.
11. INSTALL PUBLIC UTILITIES (WATER, SANITARY SEWER, GAS, ELECTRIC, AND TELEPHONE) AS REQUIRED.
12. INSTALL CONCRETE AND ASPHALT CONCRETE PAVEMENT COMPLETE.
13. FINISH GRADING, REDISTRIBUTE TOPSOIL AND ESTABLISH VEGETATION AND/OR LANDSCAPING.
14. CLEAN PAVEMENTS AND STORM DRAIN SYSTEM OF ALL ACCUMULATED SEDIMENT IN CONJUNCTION WITH THE REMOVAL OF ALL TEMPORARY SEDIMENT AND EROSION CONTROL DEVICES.
15. COMPLETE SITE AND BUILDING CONSTRUCTION.
16. REMOVE TEMPORARY EROSION AND SEDIMENT CONTROL MEASURES AS APPLICABLE ONCE VEGETATION IS ESTABLISHED (80% GRASS SPROUT OVER ENTIRE AREA).

CONSTRUCTION PHASE 2 (~4.7 AC.)

RESIDENTIAL BUILDINGS #1,2,3 AND TENNIS COURTS

1. STAKE OUT ALL LIMITS OF DISTURBANCE. (AREAS SHALL BE DELINEATED WITH ORANGE CONSTRUCTION FENCE)
2. TAG ALL EXISTING TREES TO BE REMOVED (TREES SHALL BE DELINATED WITH COLORED CONSTRUCTION TAPE)
3. CUT EXISTING TREES TO BE REMOVED.
4. INSTALL CONSTRUCTION ACCESS, SILT FENCE (DOWNHILL OF ALL DISTURBANCE AREAS), INLET PROTECTION AND OTHER NECESSARY EROSION AND SEDIMENT CONTROLS, INCLUDING THE TEMPORARY SWALE BEHIND THE BUILDINGS.
5. COORDINATE INSPECTION OF INITIAL EROSION CONTROLS AND TREE REMOVAL BY TOWN CONSULTING ENGINEER AND JMC.
6. DEMOLITION OF EXISTING BUILDINGS AND SITE FEATURES AS REQUIRED.
7. STRIP AND STOCKPILE TOPSOIL. REMOVE STUMPS FROM CUT TREES.
8. BEGIN BUILDING AND ROADWAY/PARKING LOT CONSTRUCTION, ROUGH GRADING.
9. INSTALL STORM DRAIN SYSTEM COMPLETE (IMMEDIATELY INSTALL INLET PROTECTION ON ALL INLETS).
10. INSTALL PUBLIC UTILITIES (WATER, SANITARY SEWER, GAS, ELECTRIC, AND TELEPHONE) AS REQUIRED.
11. INSTALL CONCRETE AND ASPHALT CONCRETE PAVEMENT COMPLETE.
12. FINISH GRADING, REDISTRIBUTE TOPSOIL AND ESTABLISH VEGETATION AND/OR LANDSCAPING.
13. CLEAN PAVEMENTS AND STORM DRAIN SYSTEM OF ALL ACCUMULATED SEDIMENT IN CONJUNCTION WITH THE REMOVAL OF ALL TEMPORARY SEDIMENT AND EROSION CONTROL DEVICES.
14. COMPLETE SITE AND BUILDING CONSTRUCTION.
15. REMOVE TEMPORARY EROSION AND SEDIMENT CONTROL MEASURES AS APPLICABLE ONCE VEGETATION IS ESTABLISHED (80% GRASS SPROUT OVER ENTIRE AREA).

CONSTRUCTION PHASE 3 (~5.9 AC.)

CLUBHOUSE, PARKING LOT EXPANSION, GUEST COTTAGES AND NEW MAINTENANCE BUILDING

1. STAKE OUT ALL LIMITS OF DISTURBANCE. (AREAS SHALL BE DELINEATED WITH ORANGE CONSTRUCTION FENCE)
2. TAG ALL EXISTING TREES TO BE REMOVED (TREES SHALL BE DELINATED WITH COLORED CONSTRUCTION TAPE)
3. CUT EXISTING TREES TO BE REMOVED.
4. INSTALL CONSTRUCTION ACCESS, SILT FENCE (DOWNHILL OF ALL DISTURBANCE AREAS), INLET PROTECTION AND OTHER NECESSARY EROSION AND SEDIMENT CONTROLS.
5. COORDINATE INSPECTION OF INITIAL EROSION CONTROLS AND TREE REMOVAL BY TOWN CONSULTING ENGINEER AND JMC.
6. DEMOLITION OF EXISTING BUILDINGS AND SITE FEATURES AS REQUIRED.
7. STRIP AND STOCKPILE TOPSOIL. REMOVE STUMPS FROM CUT TREES.
8. BEGIN BUILDING AND PARKING LOT CONSTRUCTION, ROUGH GRADING.
9. INSTALL STORM DRAIN SYSTEM COMPLETE (IMMEDIATELY INSTALL INLET PROTECTION ON ALL INLETS).
10. INSTALL PUBLIC UTILITIES (WATER, SANITARY SEWER, GAS, ELECTRIC, AND TELEPHONE) AS REQUIRED.
11. INSTALL CONCRETE AND ASPHALT CONCRETE PAVEMENT COMPLETE.
12. FINISH GRADING, REDISTRIBUTE TOPSOIL AND ESTABLISH VEGETATION AND/OR LANDSCAPING.
13. CLEAN PAVEMENTS AND STORM DRAIN SYSTEM OF ALL ACCUMULATED SEDIMENT IN CONJUNCTION WITH THE REMOVAL OF ALL TEMPORARY SEDIMENT AND EROSION CONTROL DEVICES.
14. COMPLETE SITE AND BUILDING CONSTRUCTION.
15. REMOVE TEMPORARY EROSION AND SEDIMENT CONTROL MEASURES AS APPLICABLE ONCE VEGETATION IS ESTABLISHED (80% GRASS SPROUT OVER ENTIRE AREA).

GENERAL NOTES

1. ALL SEDIMENT AND EROSION CONTROL MEASURES SHALL BE INSTALLED AND MAINTAINED IN ACCORDANCE WITH ALL THE PLANS, PRIOR TO BEGINNING ANY CLEARING, GRUBBING OR EXCAVATION.
2. SILT FENCE SHALL BE INSTALLED AS SHOWN ON THE DRAWINGS PRIOR TO BEGINNING ANY CLEARING AND GRUBBING OR EARTHWORK.
3. EXPOSED SLOPES AND ALL GRADED AREAS SHALL BE SEEDED IMMEDIATELY UPON COMPLETION OF ITS CONSTRUCTION AS DIRECTED BY THE OWNER'S FIELD REPRESENTATIVE.
4. GRASS SEED MIX FOR SEDIMENT AND EROSION CONTROL MAY BE APPLIED BY EITHER MECHANICAL OR HYDROSEEDING METHODS. HYDROSEEDING SHALL BE PERFORMED IN ACCORDANCE WITH THE AMERICAN NURSERY AND LANDSCAPE ASSOCIATION, AMERICAN STANDARD FOR NURSERY STOCK, LATEST EDITION.
5. SEEDED AREAS HAVING A GRADED SLOPE OF 25% OR LESS SHALL BE MULCHED WITH STRAW AT A RATE OF 2 TONS PER ACRE (90 LBS. PER 1,000 S.F.) SUCH THAT THE MULCH FORMS A CONTINUOUS BLANKET.
6. SEDIMENT AND EROSION CONTROL MEASURES SHALL BE INSPECTED AND MAINTAINED ON A DAILY BASIS BY THE CONTRACTOR. ALL COLLECTED SEDIMENT WITHIN SEDIMENT BARRIERS SHALL BE REMOVED PERIODICALLY TO MAINTAIN THE FUNCTION OF THE SEDIMENT BARRIER. ALL SEDIMENT COLLECTED SHALL BE RESPREAD ON-SITE WITHIN STABILIZED AREAS AS DIRECTED BY THE OWNERS FIELD REPRESENTATIVE.
7. DUST SHALL BE CONTROLLED BY SPRINKLING OR OTHER APPROVED METHODS AS NECESSARY, OR AS DIRECTED BY THE CONTRACTOR.
8. ALL FILLS SHALL BE COMPACTED TO PROVIDE STABILITY OF MATERIAL AND TO PREVENT SETTLEMENT.
9. EXCAVATIONS AND FILLS SHALL NOT ENDANGER ADJOINING PROPERTIES, NOR DIVERT WATER ONTO THE PROPERTY OF OTHERS.
10. THE CONTRACTOR SHALL INSPECT DOWNSTREAM CONDITIONS FOR EVIDENCE OF SEDIMENTATION ON A TWICE A WEEK BASIS AND AFTER RAINSTORMS.
11. AS WARRANTED BY FIELD CONDITIONS, SPECIAL ADDITIONAL SEDIMENT AND EROSION CONTROL MEASURES SHALL BE INSTALLED BY THE CONTRACTOR AS REQUIRED.
12. STOCKPILING OF CONSTRUCTION MATERIAL SHALL BE PLACED ON-SITE IN THE AREA DESIGNATED. STOCKPILED EXCAVATED MATERIAL SHALL HAVE SILT FENCE LOCATED AROUND PERIMETER. ALL STOCKPILED MATERIAL SHALL BE MAINTAINED IN AN ORDERLY MANNER SO AS NOT TO IMPEDE ON EXISTING TRAFFIC CIRCULATION ROUTES.
13. THIS PLAN IS FOR SEDIMENT AND EROSION CONTROL INFORMATION ONLY.
14. THE CONTRACTOR SHALL BE RESPONSIBLE FOR ADDITIONAL EROSION CONTROL MEASURES AS MAY BE REQUIRED BY THE OWNER'S FIELD REPRESENTATIVE AND/OR THE TOWN OF NORTH CASTLE.
15. THE CONTRACTOR SHALL BE RESPONSIBLE FOR COMPLIANCE WITH NYSDEC RULES AND REGULATIONS AS SET FORTH BY SPDES GENERAL PERMIT GP-0-20-001 FOR DISCHARGES ASSOCIATED WITH CONSTRUCTION ACTIVITIES EFFECTIVE 01/29/2020.
16. IN AREAS WHERE SOIL DISTURBANCE ACTIVITY HAS TEMPORARILY OR PERMANENTLY CEASED, THE APPLICATION OF SOIL STABILIZATION MEASURES SHALL BE INITIATED BY THE END OF THE NEXT BUSINESS DAY AND COMPLETED WITHIN SEVEN (7) DAYS FROM THE DATE THE CURRENT SOIL DISTURBANCE ACTIVITY CEASED. THE SOIL STABILIZATION MEASURES SELECTED SHALL BE IN CONFORMANCE WITH THE TECHNICAL STANDARD, NYS STANDARDS AND SPECIFICATIONS FOR EROSION AND SEDIMENT CONTROL, DATED AUGUST 2005.
17. THE OWNER OR OPERATOR SHALL INSTALL ANY ADDITIONAL SITE SPECIFIC PRACTICES NEEDED TO PROTECT WATER QUALITY.
18. CONTRACTOR SHALL UTILIZE EXISTING PAVED AREAS WHERE PRACTICAL AND AS MAY BE DIRECTED BY THE OWNER'S FIELD REPRESENTATIVE FOR ACCESS ROUTES THROUGH THE DURATION OF CONSTRUCTION. DAMAGE TO EXISTING CART PATHS CAUSED BY CONSTRUCTION ACTIVITIES SHALL BE REPAIRED UPON COMPLETION OF THE PROJECT.

No.	Revision	Date	By
1.	RESPONSE TO TOWN COMMENTS	01/11/2021	NC
2.	RESPONSE TO TOWN COMMENTS	03/08/2021	NC
3.	RESPONSE TO TOWN COMMENTS	06/14/2021	NC
4.	RESPONSE TO TOWN COMMENTS	01/10/2022	NC
5.	RESPONSE TO TOWN COMMENTS	03/28/2022	NC
6.	RESPONSE TO TOWN COMMENTS	05/09/2022	NC

Previous Editions Obsolete

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TOWN OF NORTH CASTLE, NEW YORK

APPROVED BY TOWN OF NORTH CASTLE PLANNING BOARD RESOLUTION, DATED ________

________ DATE: ________
CHRISTOPHER CARTHY, CHAIRMAN,
TOWN OF NORTH CASTLE PLANNING BOARD

ENGINEERING DRAWINGS REVIEWED BY TOWN CONSULTING ENGINEER

________ DATE: ________
JOSEPH M. CERMELE, P.E.
KELLARD SESSIONS CONSULTING, P.C.
CONSULTING TOWN ENGINEER

Drawn:	NC	Approved:	AG
Scale:	NOT TO SCALE		
Date:	11/23/2020		
Project No:	20101		
20101-SE	E&S NOTES	SE.scr	

Drawing No: C-402

APPROVED BY TOWN OF NORTH CASTLE PLANNING BOARD RESOLUTION, DATED ______

______ DATE: ______

CHRISTOPHER CARTHY, CHAIRMAN,
TOWN OF NORTH CASTLE PLANNING BOARD

ENGINEERING DRAWINGS REVIEWED BY TOWN CONSULTING ENGINEER

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JOSEPH M. CERMELE, P.E.
KELLARD SESSIONS CONSULTING, P.C.
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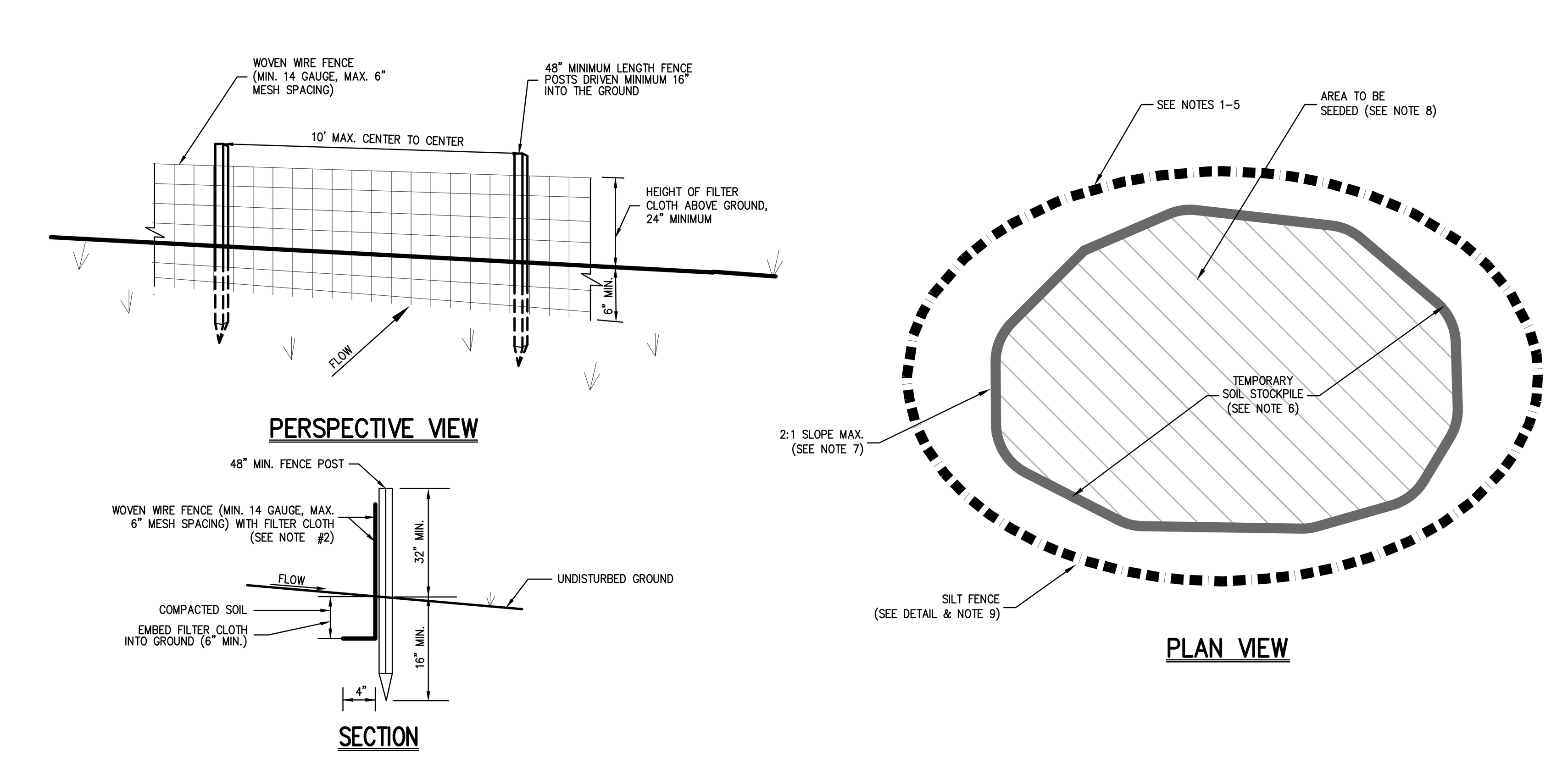
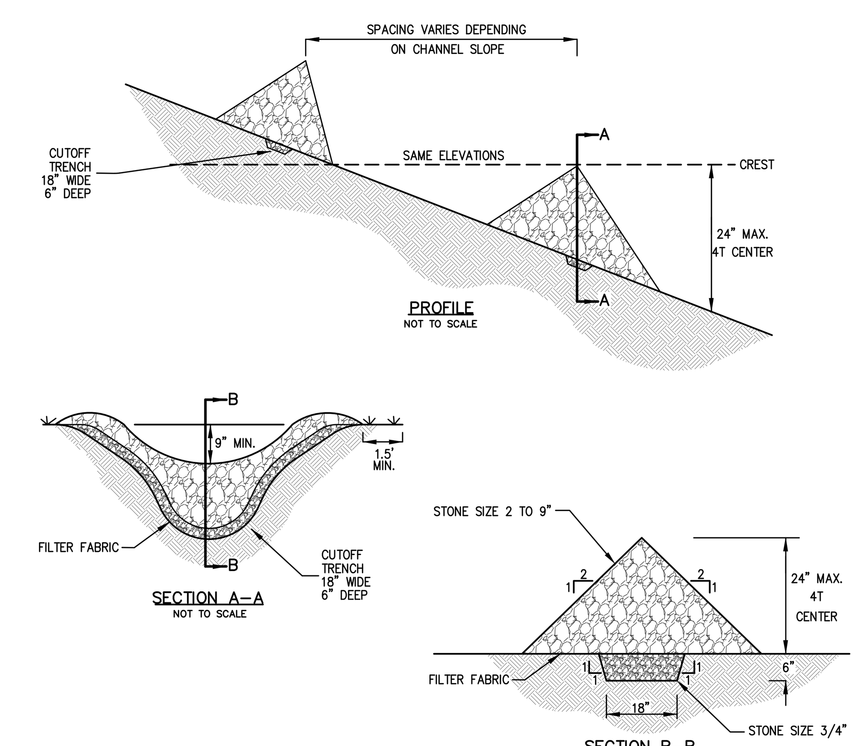


NOTES:

1. WOVEN WIRE FENCE SHALL BE FASTENED SECURELY TO FENCE POSTS WITH WIRE TIES OR STAPLES. POSTS SHALL BE STEEL, EITHER T OR U TYPE OR HARDWOOD.
2. FILTER CLOTH SHALL BE FASTENED SECURELY TO WOVEN WIRE FENCE WITH TIES SPACED EVERY 24" AT TOP AND MID SECTION. FENCE SHALL BE WOVEN WIRE, 6" MAXIMUM MESH OPENING.
3. WHEN TWO SECTIONS OF FILTER CLOTH ADJOIN EACH OTHER, THEY SHALL BE OVERLAPPED BY SIX INCHES AND FOLDED. FILTER CLOTH SHALL BE EITHER FILTER X, MIRAFI 100X, STABLINKA T140N, OR APPROVED EQUAL.
4. PREFABRICATED UNITS SHALL BE GEOFAB, ENVIROFENCE, OR APPROVED EQUAL.
5. MAINTENANCE SHALL BE PERFORMED AS NEEDED AND MATERIAL REMOVED AND REPLACED WHEN "BULGES" DEVELOP IN THE SILT FENCE.
6. THE AREA CHOSEN FOR ALL TEMPORARY SOIL STOCKPILES SHALL BE DRY AND STABLE.
7. ALL STOCKPILED SOIL SHALL NOT CONTAIN SLOPES GREATER THAN 2:1.
8. UPON COMPLETION OF SOIL STOCKPILING, EACH PILE SHALL BE SEEDED WITHIN 24 HOURS. PERENNIAL OR ANNUAL RYEGRASS SHALL BE PLANTED DURING SPRING, SUMMER OR EARLY FALL. WINTER RYE (CEREAL RYE) SHALL BE PLANTED DURING LATE FALL OR EARLY WINTER.
9. ALL STOCKPILES SHALL BE PROTECTED WITH SILT FENCING INSTALLED AROUND THE PERIMETER.

TEMPORARY SOIL STOCKPILE WITH SILT FENCE — 1

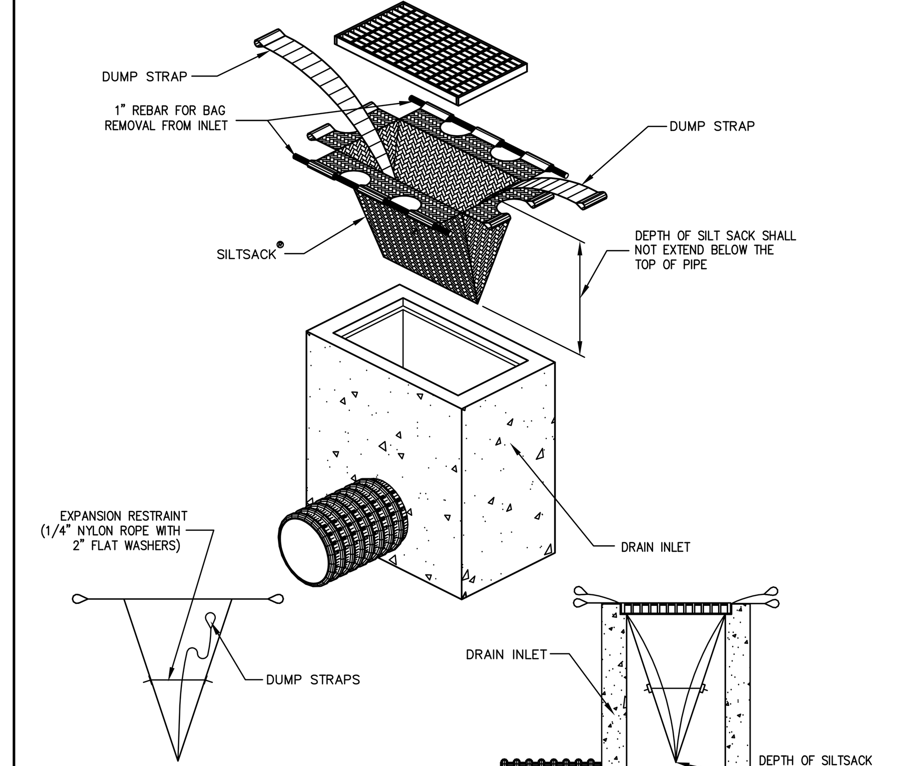


CONSTRUCTION SPECIFICATIONS:

1. STONE WILL BE PLACED ON A FILTER FABRIC FOUNDATION TO THE LINES, GRADES AND LOCATIONS SHOWN IN THE PLAN.
2. SET SPACING OF CHECK DAMS TO ASSURE THAT THE ELEVATIONS OF THE CREST OF THE DOWNSTREAM DAM IS AT THE SAME ELEVATION OF THE TOE OF THE UPSTREAM DAM.
3. EXTEND THE STONE A MINIMUM OF 1.5 FEET BEYOND THE DITCH BANK TO PREVENT CUTTING AROUND THE DAM.
4. PROTECT THE CHANNEL DOWNSTREAM OF THE LOWEST CHECK DAM FROM SCOUR AND EROSION WITH STONE OR LINER AS APPROPRIATE.
5. ENSURE THAT CHANNEL APPURTENANCES SUCH AS CULVERT ENTRANCES BELOW CHECK DAMS ARE NOT SUBJECT TO DAMAGE OR BLOCKAGE FROM DISPLACED STONES.

MAXIMUM DRAINAGE AREA 2 ACRES.

STONE CHECK DAM — 2



BAG DETAIL

HI-FLOW SILT SACK AS MANUFACTURED BY ACF ENVIRONMENTAL OR APPROVED EQUAL®

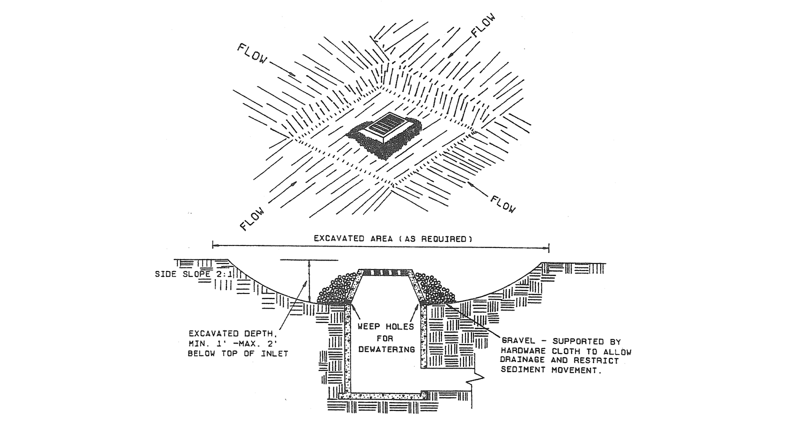
(FOR AREAS OF MODERATE TO HEAVY PRECIPITATION AND RUN-OFF)

PROPERTIES	TEST METHOD	UNITS
GRAB TENSILE STRENGTH	ASTM D-4632	265 LBS
GRAB TENSILE ELONGATION	ASTM D-4632	20 %
PUNCTURE	ASTM D-4833	135 LBS
MULLEN BURST	ASTM D-3786	420 PSI
TRAPEZOID TEAR	ASTM D-4533	45 LBS
UV RESISTANCE	ASTM D-4355	90 %
APPARENT OPENING SIZE	ASTM D-4751	20 US SIEVE
FLOW RATE	ASTM D-4491	200 GAL/MIN/SQ FT
PERMITTIVITY	ASTM D-4491	1.5 SEC -1

NOTE:
CURB INLETS SHALL BE TYPE B WITH CURB DEFLECTOR.

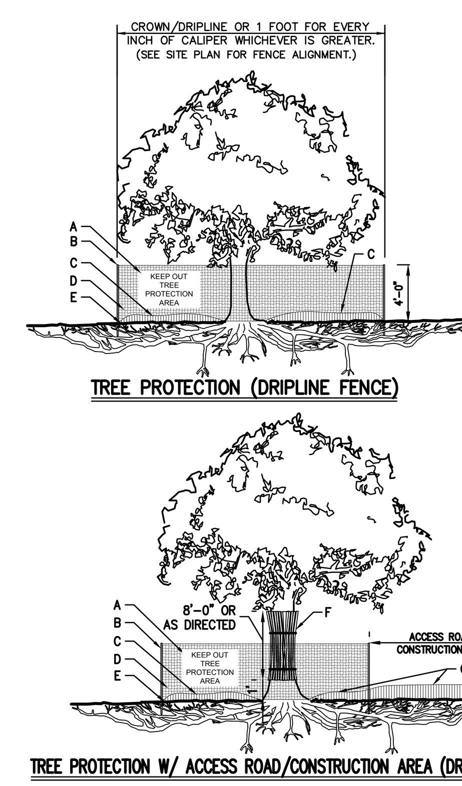
INSTALLATION DETAIL

MANUFACTURED INSERT INLET PROTECTION — 3



1. CLEAR THE AREA OF ALL DEBRIS THAT WILL HINDER EXCAVATION.
2. GRADE APPROACH TO THE INLET UNIFORMLY AROUND THE BASIN.
3. WEEP HOLES SHALL BE PROCTECTED BY/STONE.
4. PROVIDE FREQUENT INSPECTION AND MAINTENANCE. REMOVE ACCUMULATED SEDIMENT AND REPAIR OR REPLACE INLET PROTECTION TO MAINTAIN EFFECTIVENESS OF THE INSTALLATION.
5. UPON STABILIZATION OF CONTRIBUTING DRAINAGE AREA. SEAL WEEP HOLES FILL BASIN WITH STABLE SOIL TO FINAL GRADE. COMPACT IT PROPERLY AND STABILIZE WITH PERMANET SEEDING.

EXCAVATED DROP INLET PROTECTION — 4



TREE PROTECTION (DRIPLINE FENCE)

A	8.5"X11" SIGN LAMINATED IN PLASTIC SPACED EVERY 50' ALONG FENCE
B	2"X6" STEEL POSTS OR APPROVED EQUAL.
C	5" THICK LAYER OF MULCH.
D	TREE PROTECTION FENCE: HIGH DENSITY POLYETHYLENE FENCING WITH 3.5" X 1.5" OPENINGS; COLOR ORANGE. STEEL POSTS INSTALLED AT 8' O.C.
E	MAINTAIN EXISTING GRADE WITHIN THE TREE PROTECTION FENCE UNLESS OTHERWISE INDICATED ON THE PLANS.
F	INSTALL ROUGH SAWN WOOD WHERE AND AS DIRECTED BY PROJECT LANDSCAPE ARCHITECT OR PROFESSIONAL ARBORIST. SEE CHART FOR WOOD SIZE BOUND WITH 9 GAUGE WIRE.
G	8"-12" THICK LAYER OF MULCH ON MAINTENANCE ROAD. 5" THICK LAYER INSIDE TREE PROTECTION AREA.

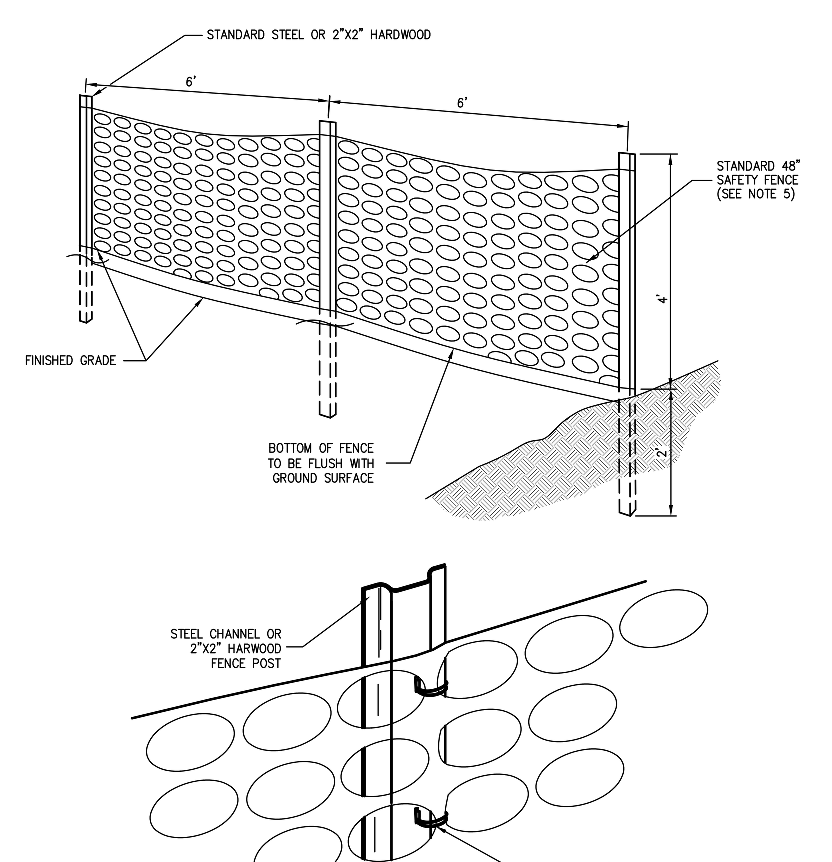
TREE DIAMETER	ROUGH SAWN WOOD SIZE
<12"	2"X2"
13"-24"	2"X4"
>25"	2"X6"

TREE PROTECTION W/ ACCESS ROAD/CONSTRUCTION AREA (DRIPLINE FENCE)

NOTES:

1. SEE SPECIFICATIONS FOR ADDITIONAL TREE PROTECTION REQUIREMENTS.
2. IF THERE IS NO EXISTING IRRIGATION, SEE SPECIFICATIONS FOR WATERING REQUIREMENTS.
3. NO PRUNING SHALL BE PERFORMED EXCEPT BY APPROVED ARBORIST.
4. NO EQUIPMENT SHALL OPERATE INSIDE THE PROTECTIVE FENCING INCLUDING DURING FENCE INSTALLATION AND REMOVAL.
5. SEE SITE PLANS FOR IDENTIFICATIONS/LOCATIONS OF INDIVIDUAL TREES TO BE PROTECTED.
6. ALL EXCAVATION WITHIN THE CROWN/DRIPLINE OF ANY TREE SHALL BE PERFORMED UNDER THE DIRECT SUPERVISION OF THE PROJECT LANDSCAPE ARCHITECT OR PROFESSIONAL ARBORIST. SPECIAL MEASURES, SUCH AS THE USE OF AN AIR SPADE MAY BE REQUIRED.
7. THE CONTRACTOR MAY PROPOSE THE USE OF ENGINEERED MATTING OR OTHER ENGINEERED PRODUCTS IN LIEU OF MULCH, WHICH SHALL BE SUBJECT TO THE REVIEW AND APPROVAL OF ALL AUTHORITIES HAVING JURISDICTION.

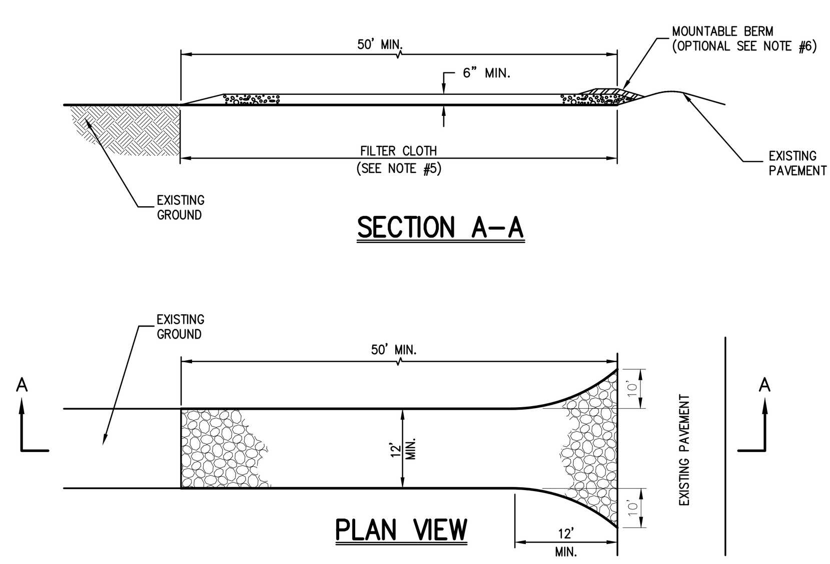
TREE PROTECTION — 5



NOTES:

1. SPACE SUPPORT FENCE POSTS AT 6 FOOT INTERVALS.
2. DRIVE SUPPORT POSTS 2 FEET INTO GROUND.
3. FIRMLY FASTEN FENCE MATERIAL IN PLACE BY WIRING TO FENCE POST WHILE MAINTAINING TENSION ACROSS FULL HEIGHT OF FENCE. WIRING SHALL BE DONE IN A MANNER THAT WILL PREVENT SAGGING OF FENCE MATERIAL.
4. PROVIDE PERIODIC INSPECTION AND MAINTENANCE OF FENCE INCLUDING REPAIRS AS NECESSARY AND REQUIRED.
5. PLASTIC FENCE SHALL BE INTERNATIONAL ORANGE COLOR, AS MANUFACTURED BY ADPI ENTERPRISES, INC. OR APPROVED EQUAL.
6. REMOVE CONSTRUCTION FENCE AS DIRECTED BY THE OWNER'S FIELD REPRESENTATIVE.

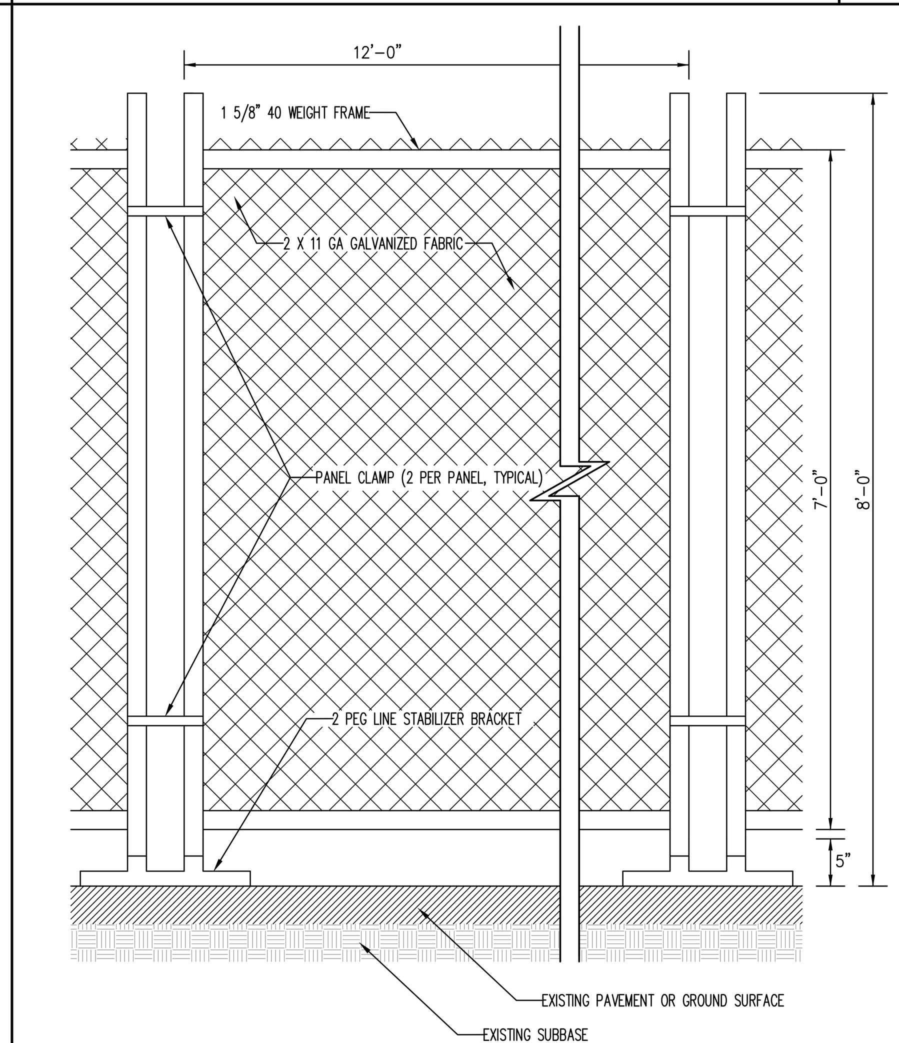
CONSTRUCTION FENCE — 6



NOTES

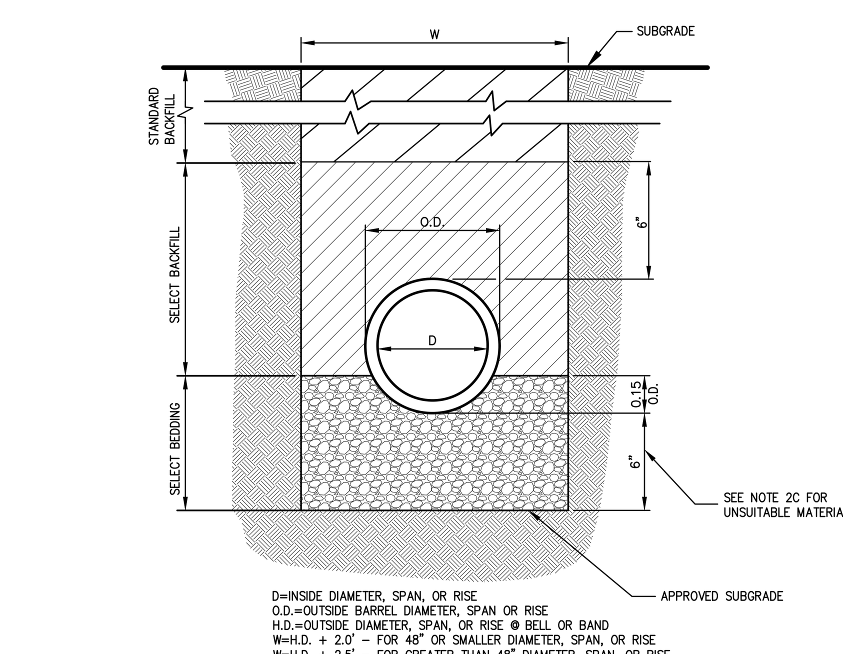
1. STONE SIZE – USE 1" TO 4" STONE, OR RECLAIMED OR RECYCLED CONCRETE EQUIVALENT.
2. LENGTH – AS REQUIRED, BUT NOT LESS THAN 50 FEET.
3. THICKNESS – NOT LESS THAN SIX (6) INCHES.
4. WIDTH – 12 FOOT MINIMUM, BUT NOT LESS THAN THE FULL WIDTH AT POINTS WHERE INGRESS OR EGRESS OCCURS. 24 FOOT MINIMUM IF SINGLE ENTRANCE TO SITE.
5. FILTER CLOTH TO BE PLACED OVER THE ENTIRE WIDTH AND LENGTH OF AREA PRIOR TO PLACING OF STONE.
6. SURFACE WATER – ALL SURFACE WATER FLOWING OR DIVERTED TOWARD CONSTRUCTION ENTRANCES SHALL BE PIPED BENEATH THE ENTRANCE. IF PIPING IS IMPRACTICAL, A MOUNTABLE BERM WITH 5:1 SLOPES WILL BE PERMITTED.
7. MAINTENANCE – THE ENTRANCE SHALL BE MAINTAINED IN A CONDITION WHICH WILL PREVENT TRACKING OR FLOWING OF SEDIMENT ONTO PUBLIC RIGHTS-OF-WAY. THIS MAY REQUIRE PERIODIC TOP DRESSING WITH ADDITIONAL STONE AS CONDITIONS DEMAND AND REPAIR AND/OR CLEANOUT OF ANY MEASURE USED TO TRAP SEDIMENT. ALL SEDIMENT SPILLED, DROPPED, WASHED OR TRACKED ONTO PUBLIC RIGHTS-OF-WAY MUST BE REMOVED IMMEDIATELY.
8. WASHING – WHEELS SHALL BE CLEANED TO REMOVE SEDIMENT PRIOR TO ENTRANCE ONTO PUBLIC RIGHTS-OF-WAY. WHEN WASHING IS REQUIRED, IT SHALL BE DONE ON AN AREA STABILIZED WITH STONE AND WHICH DRAINS INTO AN APPROVED SEDIMENT TRAPPING DEVICE.
9. PERIODIC INSPECTION AND NEEDED MAINTENANCE SHALL BE PROVIDED AFTER EACH RAIN.

STABILIZED CONSTRUCTION ENTRANCE — 7



NOTE:
STABILIZED BRACKET TO BE HOT DIPPED GALVANIZED STEEL PIPE.

TEMPORARY CHAIN LINK CONSTRUCTION FENCE — 8

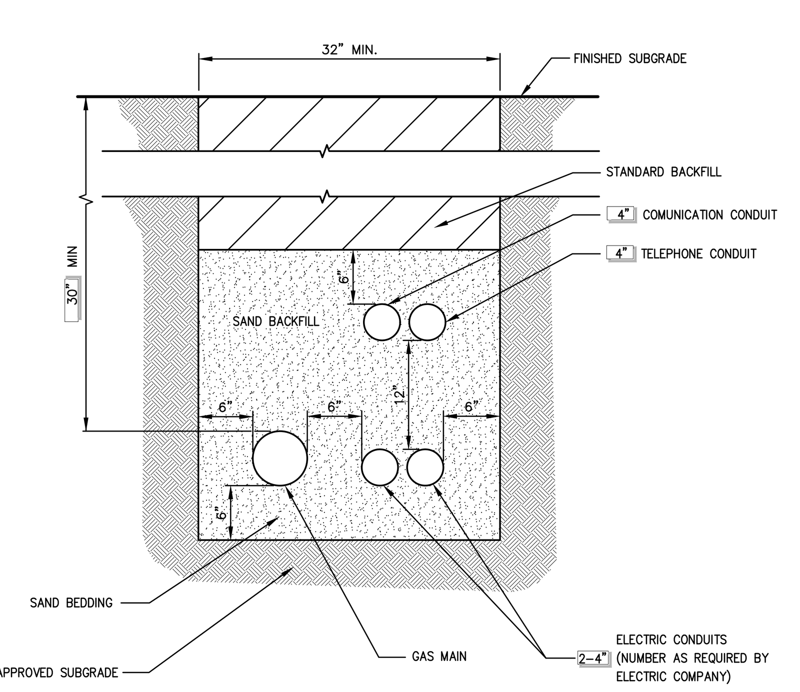


D=INSIDE DIAMETER, SPAN, OR RISE
O.D.=OUTSIDE BARREL DIAMETER, SPAN OR RISE
H.D.=OUTSIDE DIAMETER, SPAN, OR RISE @ BELL OR BAND
W=H.D. + 2.0' – FOR 48" OR SMALLER DIAMETER, SPAN, OR RISE
W=H.D. + 2.5' – FOR GREATER THAN 48" DIAMETER, SPAN, OR RISE

NOTES:

1. FOR TYPE II TRENCH, MATERIAL FOR SELECT BEDDING AND SELECT BACKFILL SHALL BE:
   A. EITHER SAND OR CRUSHED STONE IF NO WATER IS ENCOUNTERED IN TRENCH.
   B. 3/4"CRUSHED STONE IF WATER IS ENCOUNTERED IN TRENCH.
2. TYPE II TRENCH SHALL BE USED IN ALL OF THE FOLLOWING CASES:
   A. FOR ALL CORRUGATED POLYETHYLENE DRAIN PIPE (CPDP) AND PVC PIPE AND CONDUIT INSTALLATION.
   B. WHEN ROCK OR HARDPAN IS ENCOUNTERED IN BOTTOM OF TRENCH.
   C. WHEN UNSUITABLE MATERIAL IS ENCOUNTERED IN BOTTOM OF TRENCH. IN SUCH CASE DEPTH OF UNDERCUTTING SHALL BE AS DIRECTED BY THE ENGINEER WITH 6" MINIMUM.
3. FOR ALL TRENCH EXCAVATION IN FILL AREAS, ALL EMBANKMENTS SHALL BE CONSTRUCTED TO A MINIMUM OF 2 FEET ABOVE THE OUTSIDE TOP (AT THE BELL) OF THE PIPE PRIOR TO BEGINNING ANY TRENCH EXCAVATION.
4. BACKFILL FOR PIPE AND CONDUIT SHALL BE PLACED EVENLY AND CAREFULLY AROUND AND OVER THE PIPE OR CONDUIT IN SIX (6) INCH MAXIMUM LAYERS. EACH LAYER SHALL BE THOROUGHLY AND CAREFULLY COMPACTED UNTIL TWELVE (12) INCHES OF COVER EXISTS OVER THE PIPE OR CONDUIT. THE REMAINDER OF THE BACKFILL MAY THEN BE PLACED AND COMPACTED IN A MAXIMUM OF TWELVE (12) INCH LAYERS. EACH LAYER SHALL BE COMPACTED BY APPROVED MECHANICAL TAMPING MACHINES. UNLESS OTHERWISE SPECIFIED BACKFILL SHALL BE COMPACTED TO NOT LESS THAN 92% MAXIMUM MODIFIED DENSITY IN ACCORDANCE WITH ASTM DESIGNATION D-1557 IN THE MANNER HEREIN DESCRIBED. BACKFILL SHALL PROCEED UP TO THE LINES AND GRADES AS SHOWN ON THE DRAWINGS.

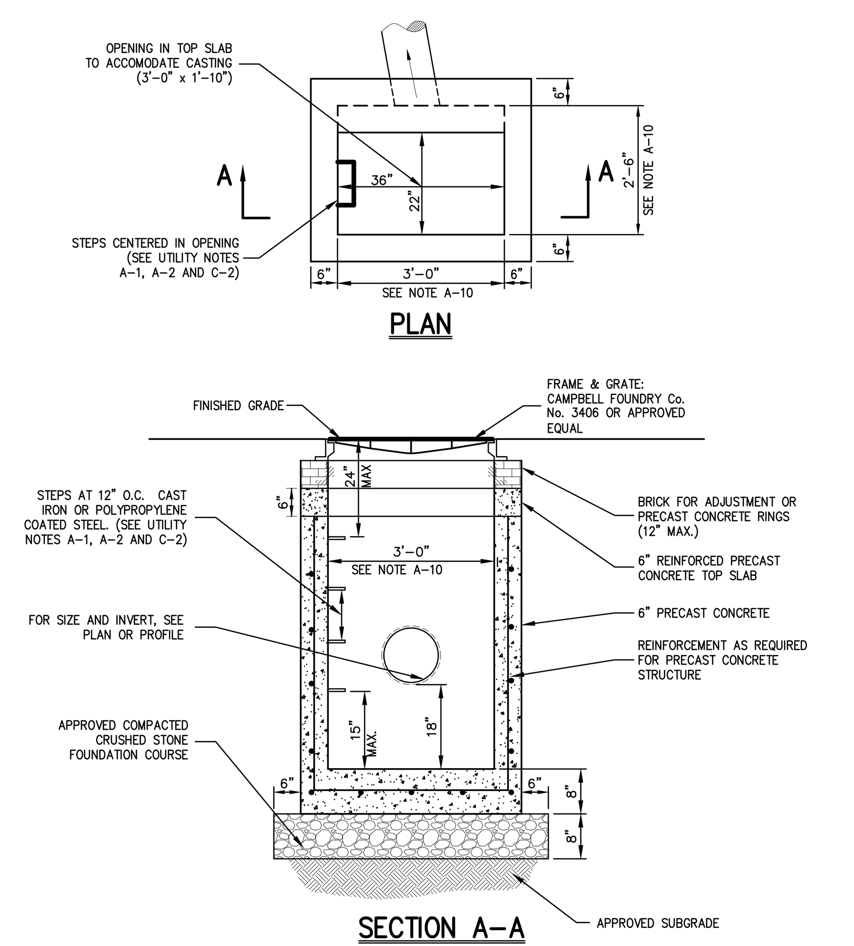
TYPE II TRENCH — 9



NOTES:

1. UTILITIES TO BE INSTALLED IN ACCORDANCE WITH THE REGULATIONS AND REQUIREMENTS OF THE UTILITY COMPANY HAVING JURISDICTION.
2. BACKFILL FOR PIPE AND CONDUIT SHALL BE PLACED EVENLY AND CAREFULLY AROUND AND OVER THE PIPE OR CONDUIT IN SIX (6) INCH MAXIMUM LAYERS. EACH LAYER SHALL BE THOROUGHLY AND CAREFULLY COMPACTED UNTIL TWELVE (12) INCHES OF COVER EXISTS OVER THE PIPE OR CONDUIT. THE REMAINDER OF THE BACKFILL MAY THEN BE PLACED AND COMPACTED IN A MAXIMUM OF TWELVE (12) INCH LAYERS. EACH LAYER SHALL BE COMPACTED BY APPROVED MECHANICAL TAMPING MACHINES. UNLESS OTHERWISE SPESIFIED BACKFILL SHALL BE COMPACTED TO NOT LESS THAN 92% MAXIMUM MODIFIED DENSITY IN ACCORDANCE WITH ASTM DESIGNATION D-1557 IN THE MANNER HEREIN DESCRIBED. BACKFILL SHALL PROCEED UP TO THE LINES AND GRADES AS SHOWN ON THE DRAWINGS.

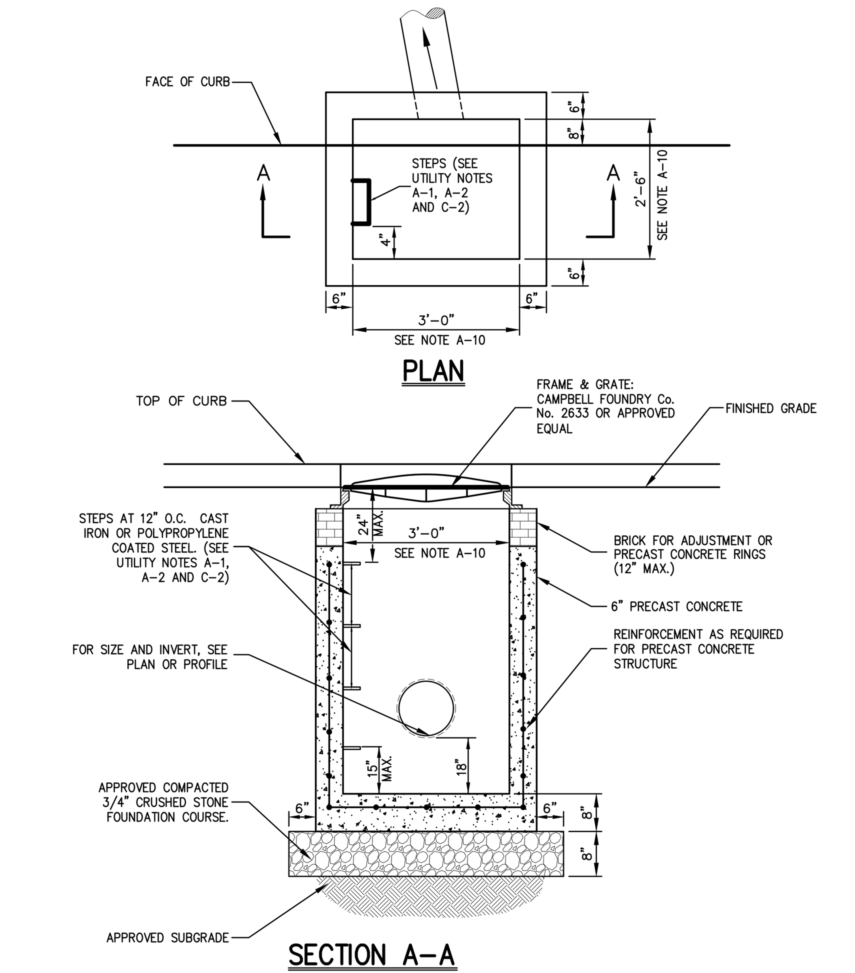
UTILITY TRENCH DETAIL — 10



NOTE

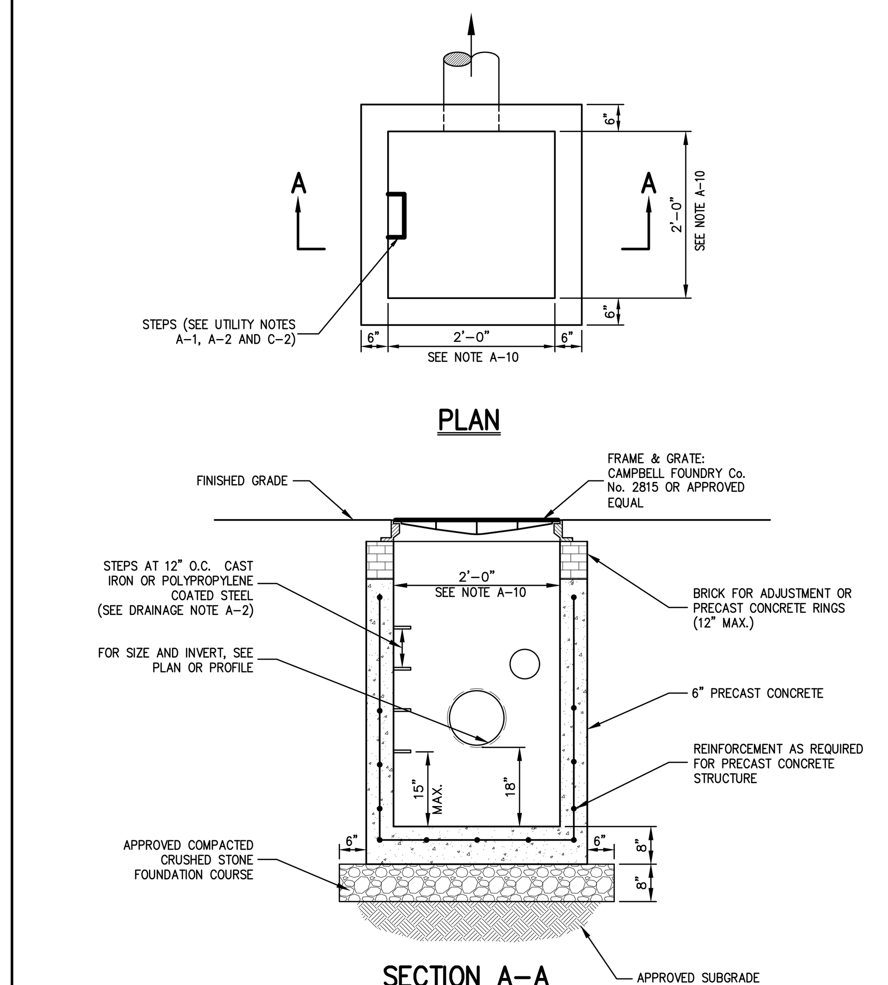
1. REINFORCE PRECAST CONCRETE TOP SLAB AND REINFORCE PRECAST CONCRETE STRUCTURE SHALL BE DESIGNED TO ACCOMMODATE AN H-20 DESIGN LOAD.
2. SEE NOTES PERTAINING TO DRAIN INLETS UNDER UTILITY NOTES ON DRAWING C-900.

DRAIN INLET (TYPE DI) — 11
(WITH SUMP-W/O FINGER UNDERDRAINS)



NOTE:
1. SEE NOTES PERTAINING TO DRAIN INLETS UNDER UTILITY NOTES ON DRAWING C-900.

DRAIN INLET (TYPE CI) — 12
(WITH SUMP-W/O FINGER UNDERDRAINS)



NOTE
1. SEE NOTES PERTAINING TO DRAIN INLETS UNDER UTILITY NOTES ON DRAWING C-900.

LAWN INLET (TYPE LI) — 13
(WITH SUMP)

NOTES PERTAINING TO DRAIN INLETS

A-1 STEPS WILL NOT BE REQUIRED IN INLETS LESS THAN FOUR (4) FEET IN DEPTH. STEPS WILL BE REQUIRED IN INLETS FOUR (4) FEET OR GREATER IN DEPTH. DEPTHS FOR DRAIN INLETS SHALL BE MEASURED FROM FINISHED GRADE TO INSIDE BOTTOM OF STRUCTURE (INCLUDING SUMP AS APPLICABLE).

A-2 WHEN STEPS ARE REQUIRED, STEPS SHALL COMPLY WITH THE SAME REQUIREMENTS OF ASTM STANDARD C-478, ARTICLE 13 ENTITLED "MANHOLE STEPS & LADDERS".

A-3 FOR MASONRY STRUCTURES, THE FIRST COURSE OF MASONRY SHALL BE SET IN THE CONCRETE FOUNDATION BEFORE THE CONCRETE HAS SET. CONCRETE FOUNDATION SHALL BE CLASS "A"(4000 psi) CONCRETE, TWELVE (12) INCHES THICK AND SHALL EXTEND SIX (6) INCHES BEYOND THE OUTSIDE FACE THE STRUCTURE.

A-4 IT SHALL BE THE CONTRACTOR'S RESPONSIBILITY TO FURNISH AND CONSTRUCT THE PROPER SIZE STRUCTURE INCLUDING THE NECESSARY OPENINGS TO ACCOMMODATE THE WORK AS SHOWN ON THE PLANS OR ORDERED BY THE ENGINEER, AT NO ADDITIONAL COST TO THE OWNER.

A-5 ALL NECESSARY PATCHING FOR DRAIN STRUCTURES SHALL BE ACCOMPLISHED WITH NON-SHRINKING CEMENT MORTAR GROUT, APPROVED EQUAL TO SIKA-SET AS MANUFACTURED BY THE SIKA CHEMICAL CORP.

A-6 FOUNDATIONS FOR PRECAST CONCRETE STRUCTURES SHALL BE SET ON A COMPACTED LAYER OF APPROVED CRUSHED STONE HAVING A MINIMUM COMPACTED THICKNESS OF EIGHT (8) INCHES.

A-7 ALL PIPES SHALL BE CUT FLUSH WITH THE INSIDE WALL OF THE STRUCTURE.

A-8 PROVIDE REINFORCED CONCRETE TOP SLAB FOR OVERSIZED DRAIN INLETS WITH PROPER SIZE OPENING TO ACCOMMODATE INSTALLATION OF FRAME & GRATE.

A-9 FOR MASONRY STRUCTURES GREATER THAN TEN (10) FEET IN DEPTH, THICKNESS OF MASONRY WALLS SHALL BE INCREASED TO TWELVE (12) INCHES.

A-10 FOR ALL STRUCTURES GREATER THAN 10 FEET IN DEPTH, STRUCTURES SHALL PROVIDE MINIMUM INSIDE DIMENSIONS OF 4 FEET X 4 FEET.

NOTES PERTAINING TO MANHOLES

B-1 PRECAST CONCRETE MANHOLES SHALL COMPLY WITH ASTM STANDARD C-478. MANHOLE JOINTS SHALL COMPLY WITH ASTM STANDARD C-443.

B-2 FOR PRECAST CONCRETE MANHOLES FIVE (5) FEET OR LESS IN HEIGHT, TOP CONE SECTION SHALL BE REPLACED WITH PRECAST REINFORCED CONCRETE SLAB (6" MIN. THICKNESS) WITH OPENING OF SUFFICIENT SIZE TO ACCOMMODATE MANHOLE CASTING.

B-3 FOR MANHOLES 10 FEET OR MORE IN DEPTH, MANHOLE DIAMETER SHALL BE FIVE (5) FEET.

B-4 TERMINAL MANHOLE FLOORS SHALL BE SLOPED TOWARD OUTFALL PIPE.

B-5 INVERT CHANNELS FOR PRECAST CONCRETE MANHOLES SHALL BE CONSTRUCTED OF CONCRETE.

B-6 NOTES A-1, A-2, A-4, A-5, A-6 & A-7 UNDER "NOTES PERTAINING TO DRAIN INLETS" ABOVE SHALL APPLY TO MANHOLES.

NOTES PERTAINING TO PRECAST CONCRETE STRUCTURES FOR STORM DRAINS, SANITARY SEWERS AND WATER LINES

C-1 ALL PRECAST CONCRETE STRUCTURES SHALL BE DESIGNED TO ACCOMMODATE AN H-20 DESIGN LOAD.

C-2 STEPS SHALL BE LOCATED WITHIN STRUCTURE TO AVOID PLACEMENT OVER PIPES WHEN PRACTICABLE.

UTILITY NOTES — 14

No.	Revision	Date	By
1.	RESPONSE TO TOWN COMMENTS	01/11/2021	NC
2.	RESPONSE TO TOWN COMMENTS	03/08/2021	NC
3.	RESPONSE TO TOWN COMMENTS	06/14/2021	NC
4.	RESPONSE TO TOWN COMMENTS	01/10/2022	NC
5.	RESPONSE TO TOWN COMMENTS	03/28/2022	NC
6.	RESPONSE TO TOWN COMMENTS	05/09/2022	NC

Previous Editions Obsolete

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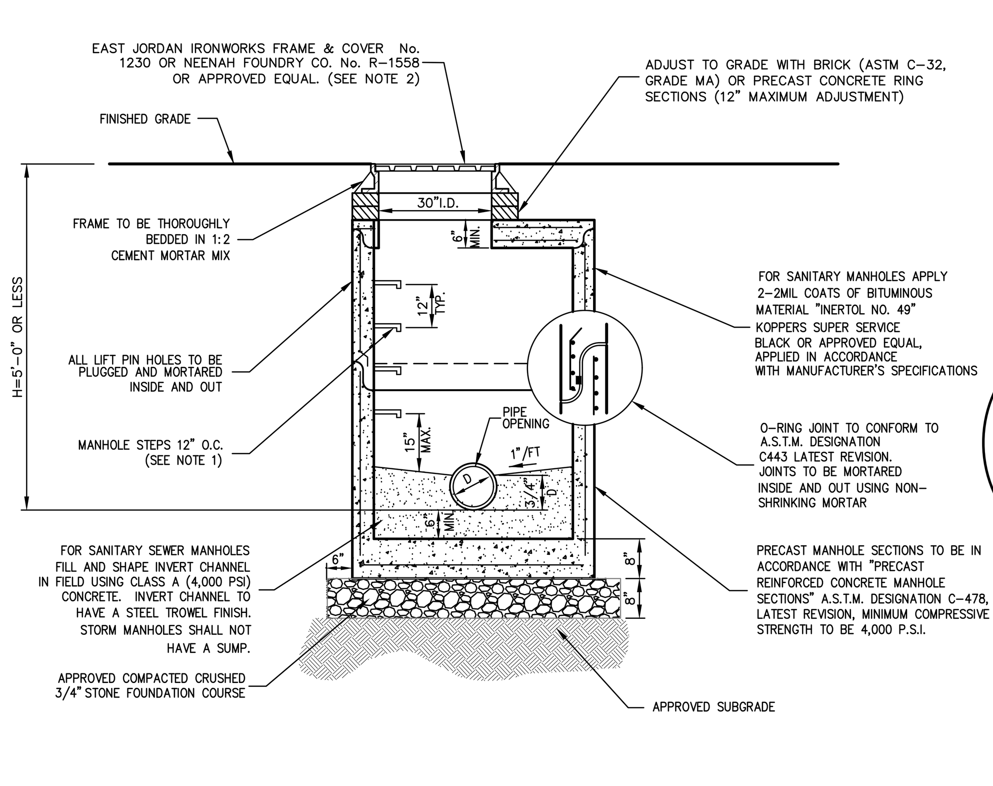
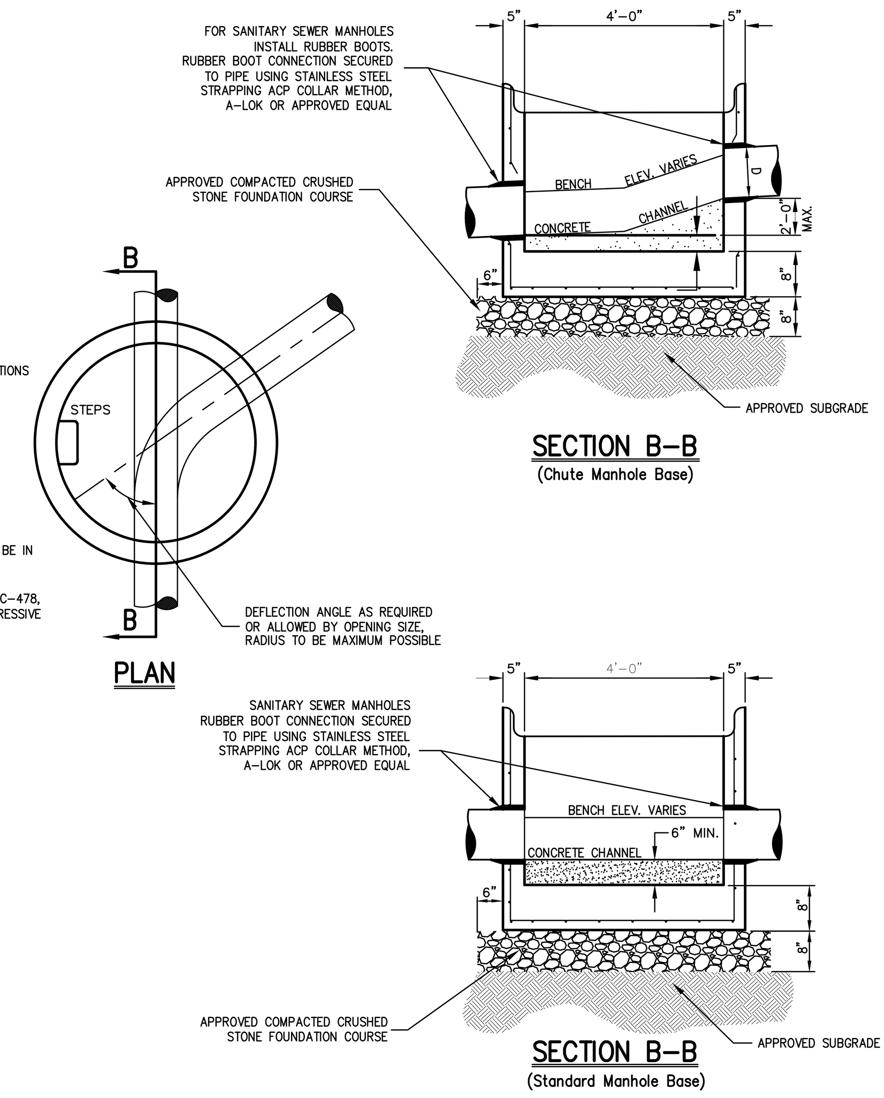
CONSTRUCTION DETAILS
THE SUMMIT CLUB AT ARMONK (RESIDENTIAL PHASE)
568 & 570 BEDFORD ROAD (NY-22)
TOWN OF NORTH CASTLE, NEW YORK

Drawn:	NC Approved: AG
Scale:	NOT TO SCALE
Date:	11/23/2020
Project No:	20101
20101-DETAILS	DET-1
Drawing No:	C-900

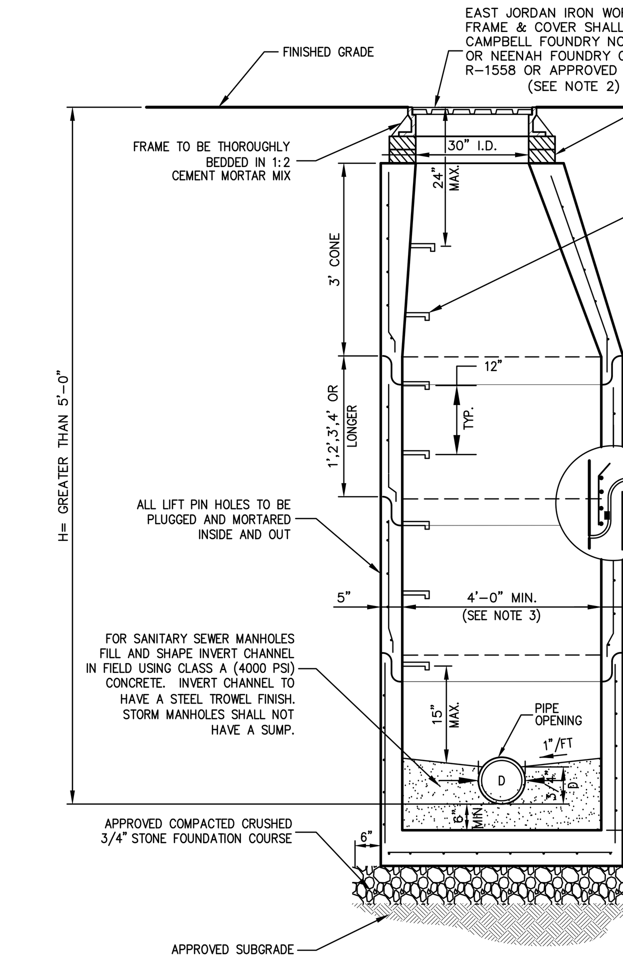
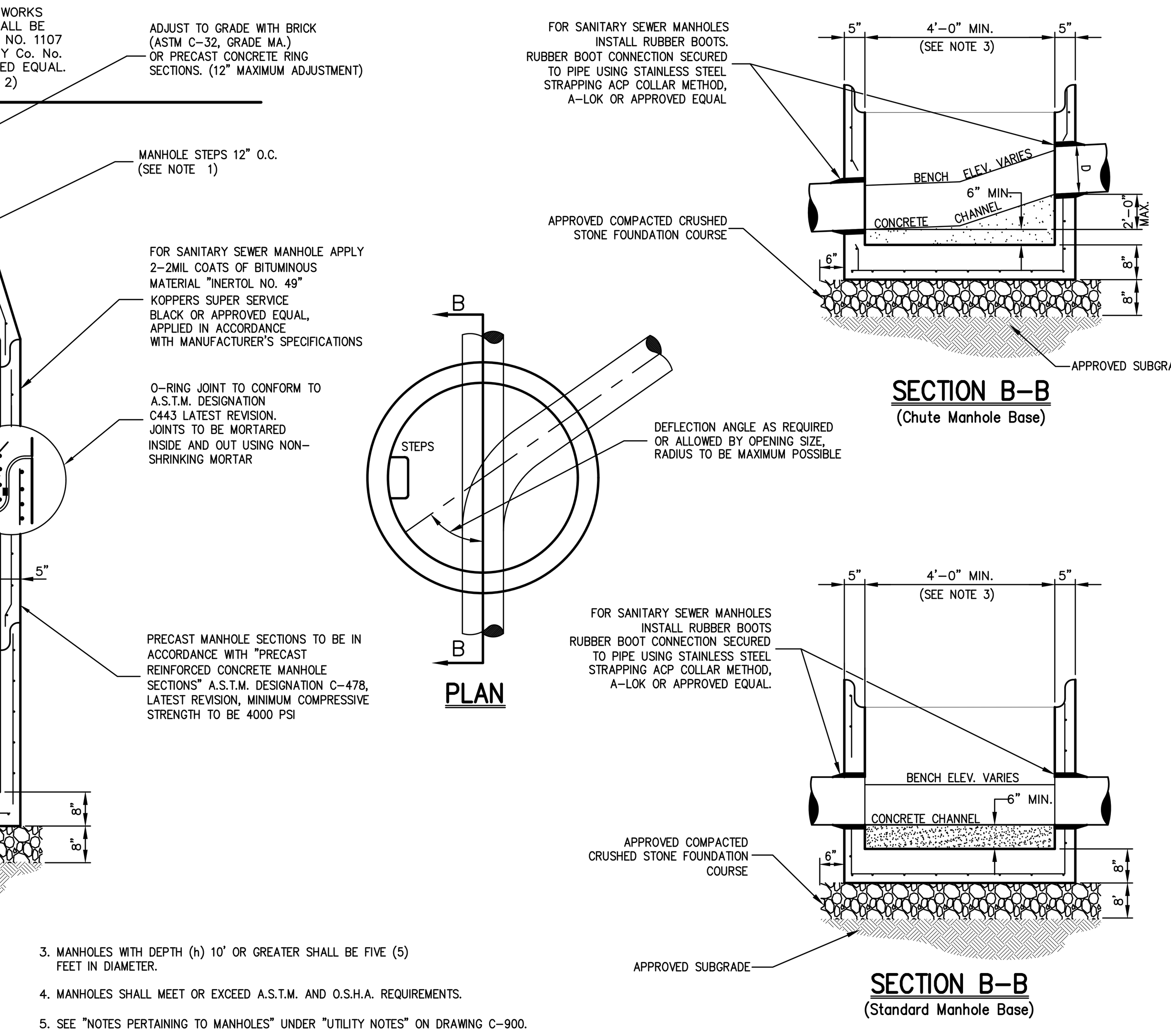



NOTES:

1. MANHOLE STEPS SHALL BE CAST IRON NEENAH No. R-1981-0 OR CAMPBELL FOUNDRY No. 2588-1 OR POLYPROPYLENE COATED STEEL (SEE SPECIFICATIONS) OR APPROVED EQUAL.
2. UNLESS OTHERWISE SPECIFIED, SANITARY SEWER MANHOLES SHALL HAVE LETTERS "SEWER" AND STORM DRAIN MANHOLES SHALL HAVE LETTERS "DRAIN" CAST ON COVER. THE COVERS SHALL HAVE VENT HOLES.
3. MANHOLES SHALL MEET OR EXCEED A.S.T.M. AND O.S.H.A. REQUIREMENTS.
4. SEE "NOTES PERTAINING TO MANHOLES" UNDER "UTILITY NOTES" ON DRAWING C-900.

MANHOLE (TYPE A)
(H < 5'-0")

15

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2. UNLESS OTHERWISE SPECIFIED, SANITARY SEWER MANHOLES SHALL HAVE LETTERS "SEWER" AND STORM DRAIN MANHOLES SHALL HAVE LETTERS "DRAIN" CAST ON COVER. THE COVERS SHALL HAVE VENT HOLES.
3. MANHOLES WITH DEPTH (h) 10' OR GREATER SHALL BE FIVE (5) FEET IN DIAMETER.
4. MANHOLES SHALL MEET OR EXCEED A.S.T.M. AND O.S.H.A. REQUIREMENTS.
5. SEE "NOTES PERTAINING TO MANHOLES" UNDER "UTILITY NOTES" ON DRAWING C-900.

MANHOLE (TYPE B)
(H > 5'-0")<10'-0")

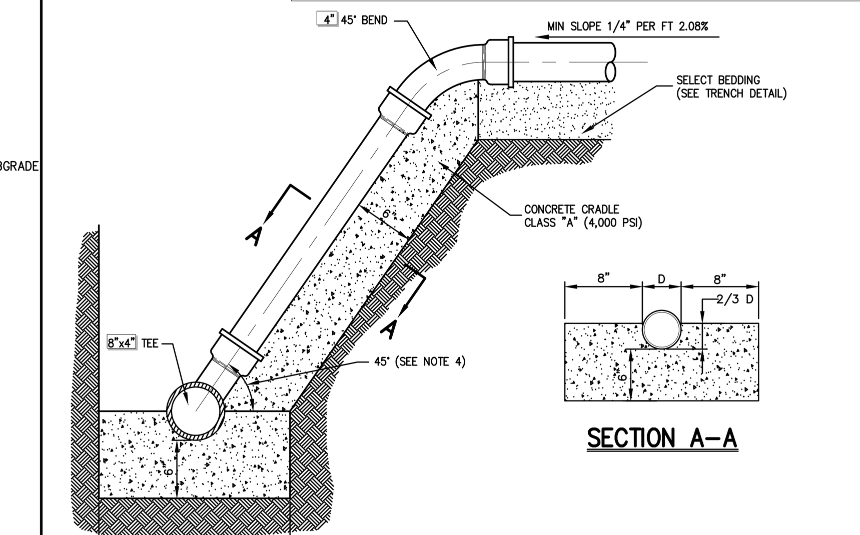
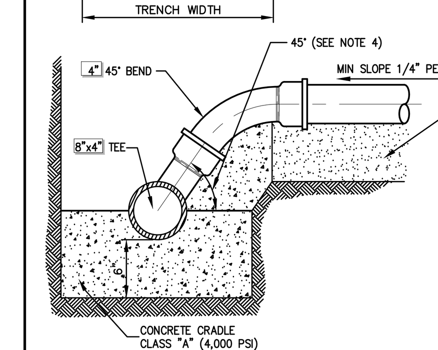
16

APPROVED BY TOWN OF NORTH CASTLE PLANNING BOARD RESOLUTION, DATED ________

________ DATE: ________
CHRISTOPHER CARTHY, CHAIRMAN,
TOWN OF NORTH CASTLE PLANNING BOARD

ENGINEERING DRAWINGS REVIEWED BY TOWN CONSULTING ENGINEER

________ DATE: ________
JOSEPH M. CERMELE, P.E.
KELLARD SESSIONS CONSULTING, P.C.
CONSULTING TOWN ENGINEER

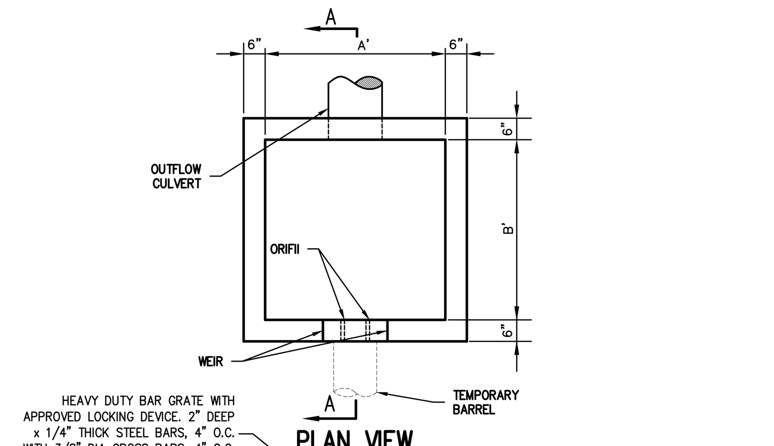



NOTES:

1. ALL SERVICE LINES SHALL HAVE A MINIMUM OF FOUR (4) FEET OF COVER.
2. SERVICE LINE LOCATION, GRADE AND ALIGNMENT SHALL BE AS SHOWN ON DRAWINGS OR AS DIRECTED BY THE OWNER'S FIELD REPRESENTATIVE.
3. WHERE SERVICE LINES ARE TO BE DEAD-ENDED, CONTRACTOR SHALL INSTALL APPROVED WATERTIGHT AND PRESSURE-TIGHT PLUGS.
4. IF MINIMUM COVER CANNOT BE ATTAINED WHILE MAINTAINING MINIMUM SLOPE, THE ANGLE OF CONNECTION MAY BE REDUCED TO 22.5°, IF APPROVED BY THE OWNER'S FIELD REPRESENTATIVE AND GOVERNING BODY WITH JURISDICTION.
5. SANITARY SEWER SERVICE LINE INCLUDING FITTINGS SHALL BE PVC, SDR 35.

SANITARY SEWER SERVICE CONNECTION

17

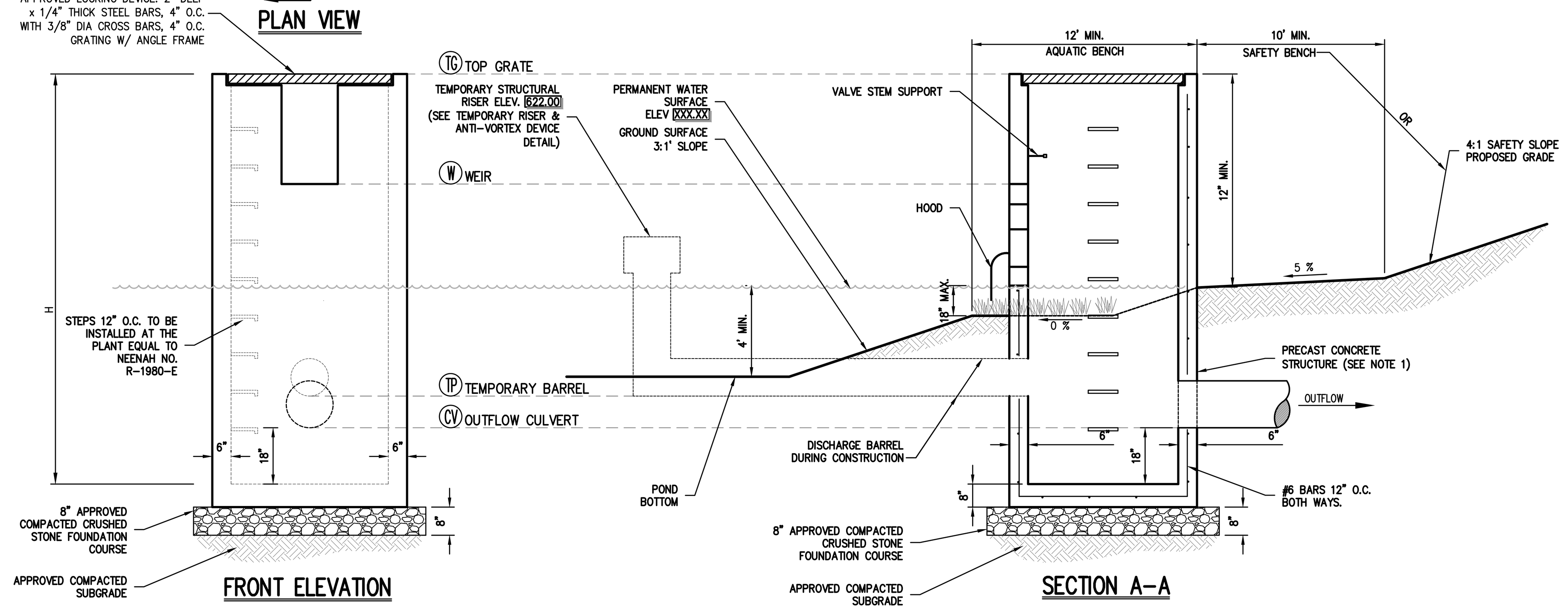


STRUCTURE CHART

BASIN	STRUCTURE	STRUCTURE			RECT. WEIR		CIRCULAR ORIFICE				OUTLET CULVERT		POND DRAIN		TEMPORARY	
		SIZE	HEIGHT	(TG)	(W)		(O1)		(O2)		(CV)		(PD)		(TP)	
No.	No.	A' x B'	H'	TOP GRATE	LENGTH	ELEV.	DIA.	INVERT ELEV.	DIA.	INVERT ELEV.	DIA.	INVERT ELEV.	DIA.	INVERT ELEV.	DIA.	INVERT ELEV.
DB-1C-2B	OCS-2L	4.00'X4.00'	5.50	621.50	3.0'	620.00	N/A	N/A	N/A	N/A	24"	616.00	N/A	N/A	24"	621.00
DB-1C-2B	OCS-3R	4.00'X4.00'	5.50	621.50	3.0'	620.00	N/A	N/A	N/A	N/A	15"	616.00	N/A	N/A	24"	621.00

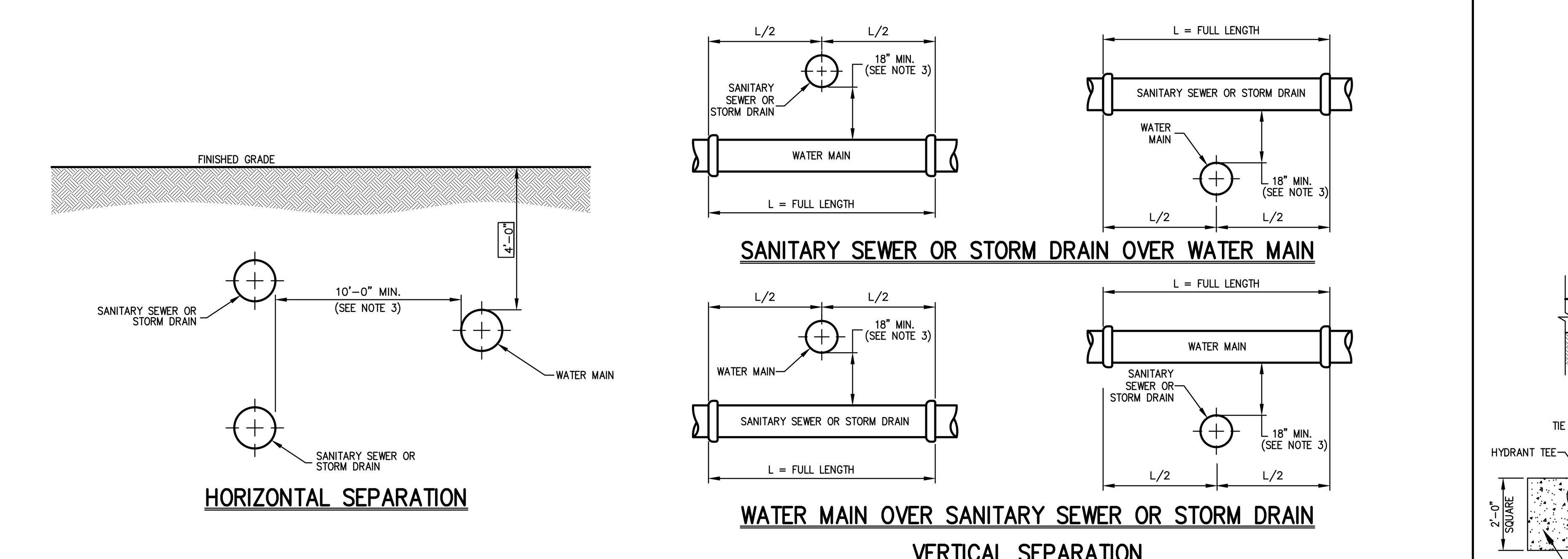
NOTES:

1. PRECAST CONCRETE STRUCTURE SHALL BE DESIGNED TO ACCOMMODATE AN H-20 DESIGN LOAD.
2. UNDERDRAINS ARE NOT REQUIRED IN BASIN
3. SEE UTILITY NOTES A-4 TO A-7 ON DRAWING C-900.



OUTLET CONTROL STRUCTURE

18

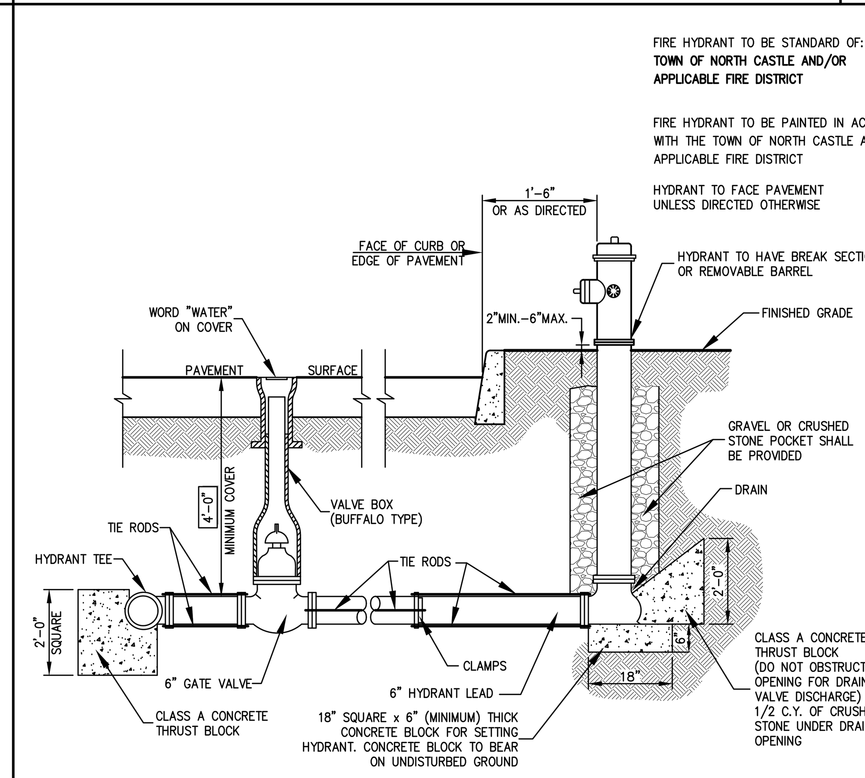


NOTES:

1. NORMAL CONDITIONS:
   A. WHENEVER A WATER MAIN MUST CROSS OVER OR UNDER A SANITARY SEWER OR STORM DRAIN, THE PIPES SHALL BE LAID TO PROVIDE A VERTICAL SEPARATION BETWEEN THEM OF AT LEAST 18 INCHES, AS MEASURED FROM THE BOTTOM OF THE HIGHER PIPE TO THE CROWN OF THE LOWER PIPE.
   B. FULL LENGTH OF WATER PIPE MUST BE CENTERED AT THE POINT OF CROSSING; NO JOINTS WILL BE PERMITTED AT THE POINT OF CROSSING.
2. WATER MAIN CROSSING UNDER SANITARY SEWERS:
   A. VERTICAL SEPARATION OF 18 INCHES MUST BE PROVIDED.
   B. ADEQUATE STRUCTURAL SUPPORT MUST BE PROVIDED FOR THE SANITARY SEWER TO PREVENT EXCESSIVE DEFLECTION OF JOINTS AND SETTLING.
   C. FULL LENGTH OF WATER PIPE MUST BE CENTERED AT THE POINT OF CROSSING; NO JOINTS WILL BE PERMITTED AT THE POINT OF CROSSING.
3. IF DURING CONSTRUCTION IT IS FOUND THAT THE REQUIRED SEPARATION OF WATER MAINS, SANITARY SEWERS, STORM SEWERS AND BUILDING SANITARY SEWERS CANNOT BE MET, THE CONTRACTOR OR HIS AUTHORIZED REPRESENTATIVE SHALL IN WRITING ADVISE JOHN MEYER CONSULTING OF THE SPECIFIC CONDITIONS ENCOUNTERED. APPROVAL OF ALTERNATIVE SEPARATION CRITERIA SHALL BE OBTAINED FROM THE TOWN OF NORTH CASTLE PRIOR TO INSTALLATION.

SEPARATION OF WATER AND SANITARY SEWER/STORM DRAIN LINES

19

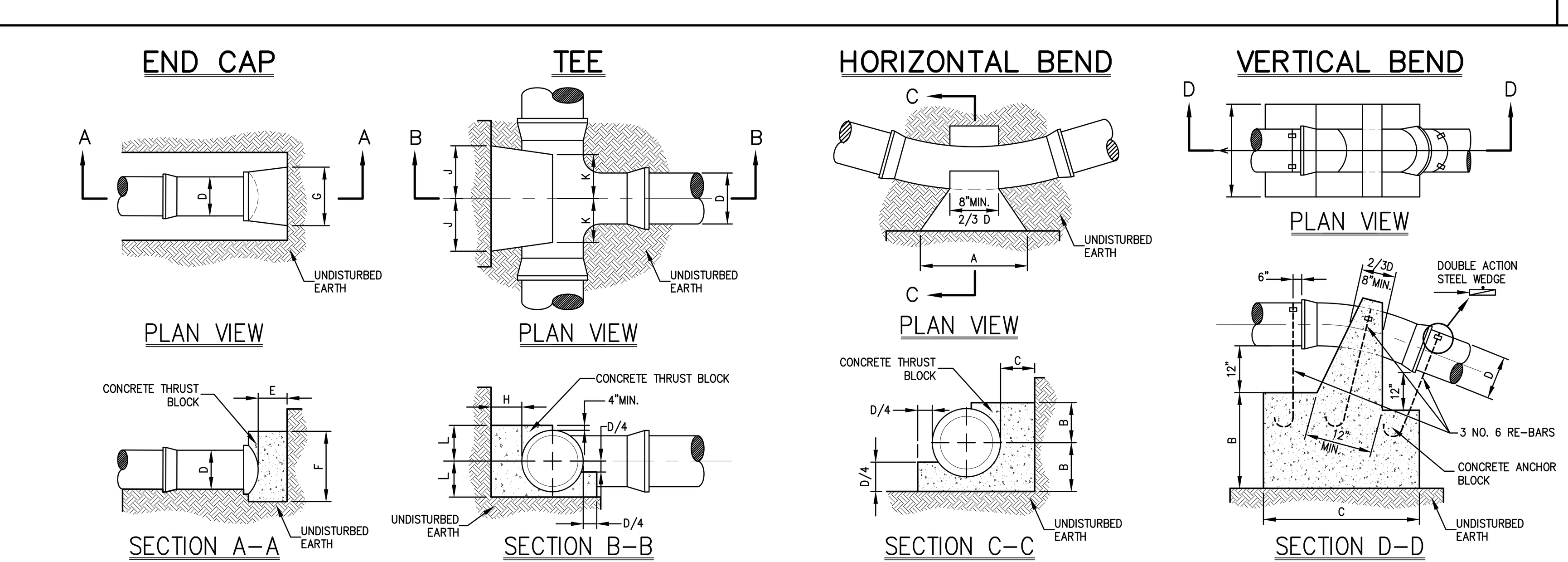


NOTES:

1. ALL CONCRETE THRUST BLOCKS SHALL BEAR ON UNDISTURBED GROUND.
2. RODDING SHALL CONSIST OF TWO 3/4" THREADED STEEL TIE RODS WITH NUTS AND WASHERS COMPLETE WITH ALL NECESSARY AND REQUIRED CLAMPS, CAREFULLY AND THOROUGHLY COVERED WITH ASPHALT OR OTHER ACCEPTABLE CORROSIVE RETARDING MATERIAL. IN GENERAL, THE METHOD AND TYPES OF MATERIAL REQUIRED IN THE INSTALLATION OF CLAMPS AND THE RODS SHALL BE IN ACCORDANCE WITH THE LATEST NATIONAL FIRE PROTECTION STANDARDS.
3. HYDRANT DRAINS SHALL NOT BE CONNECTED TO OR WITHIN TEN (10) FEET OF SANITARY SEWERS OR STORM DRAINS.
4. IF GROUND WATER IS FOUND WITHIN SEVEN (7) FEET OF THE SURFACE, HYDRANT DRAINS ARE TO BE PLUGGED. WHEN DRAINS ARE TO BE PLUGGED, THE BARRELS MUST BE PUMPED DRY AFTER USE DURING FREEZING WEATHER. SUCH HYDRANTS SHALL BE IDENTIFIED WITH A VISIBLE MARKING AS APPROVED BY THE WATER AUTHORITY.

HYDRANT INSTALLATION

20



END CAP CHART

D	4"	6"	8"	10"	12"
E	6"	6"	8"	8"	10"
F	12"	12"	1'-4"	1'-8"	2'-0"
G	1'-5"	1'-5"	2'-0"	2'-5"	3'-0"

TEE CHART

D	4"	6"	8"	10"	12"
H	6"	7"	9"	10"	12"
L	8"	8"	10"	12"	1'-3"
J	7"	7"	9"	12"	1'-2"
K	6"	6"	8"	8"	8"

HORIZONTAL BEND CHART

BEND (DEGREES)		DIAMETER (D) 4"	6"	8"	10"	12"
1/32 (11¼°)	A	8"	8"	8"	10"	12"
	B	7"	7"	8"	9"	10"
	C	7"	7"	7"	8"	8"
1/16 (22½°)	A	9"	9"	12"	1'-6"	1'-9"
	B	7"	7"	8"	9"	10"
	C	8"	8"	9"	10"	11"
1/8 (45°)	A	1'-3"	1'-3"	1'-8"	2'-1"	2'-6"
	B	7"	7"	8"	9"	11"
	C	8"	8"	9"	10"	11"
1/4 (90°)	A	2'-0"	2'-0"	2'-6"	3'-0"	3'-6"
	B	7"	7"	9"	12"	1'-3"
	C	2'-0"	2'-0"	1'-9"	1'-8"	1'-7"

VERTICAL BEND CHART

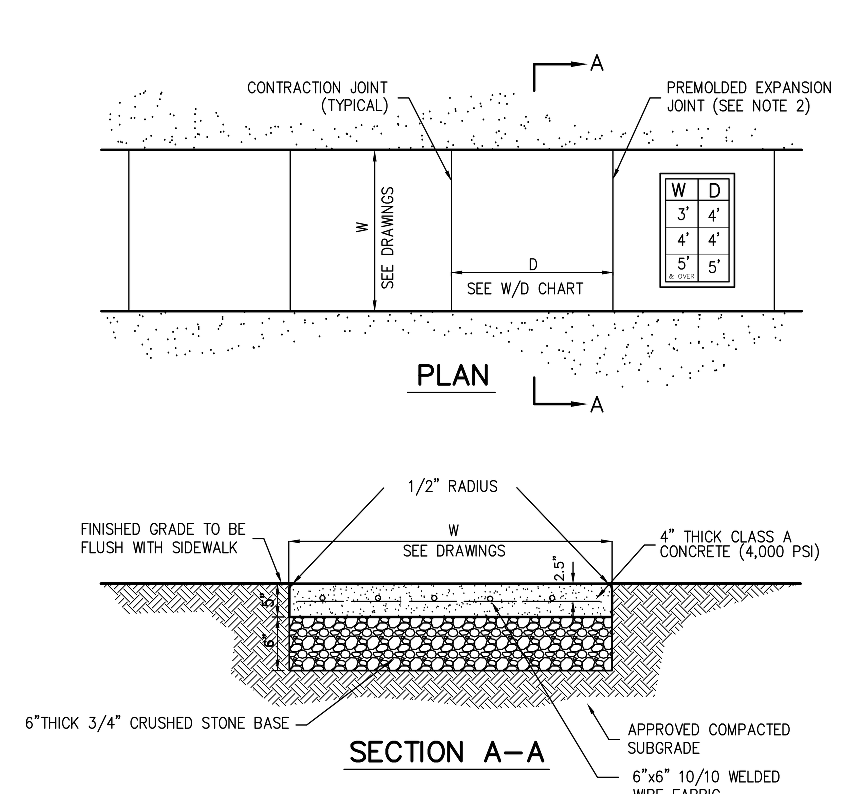
BEND (DEGREES)		DIAMETER (D) 4"	6"	8"	10"	12"	16"
1/32 (11¼°)	A	1'-6"	1'-6"	2'-0"	2'-6"	3'-0"	3'-6"
	B	1'-3"	1'-3"	1'-9"	1'-3"	2'-0"	2'-0"
	C	2'-0"	2'-0"	2'-6"	2'-9"	3'-0"	4'-0"
1/16 (22½°)	A	2'-0"	2'-0"	3'-4"	3'-8"	4'-0"	4'-4"
	B	1'-9"	1'-9"	2'-3"	2'-6"	2'-6"	2'-6"
	C	2'-6"	2'-6"	2'-8"	4'-0"	4'-0"	5'-6"
1/8 (45°)	A	2'-6"	2'-6"	3'-0"	4'-0"	4'-6"	5'-2"
	B	2'-6"	2'-6"	2'-9"	3'-0"	3'-6"	4'-0"
	C	3'-0"	3'-0"	4'-0"	4'-6"	4'-9"	6'-6"

NOTES:

1. ALL CONCRETE TO BE CLASS A (4,000 PSI).
2. ALL DIMENSIONS ARE MINIMUMS; ALL ANCHOR AND THRUST BLOCKS SHALL BEAR ON UNDISTURBED EARTH.
3. IN ALL CASES SHOWN, MEASUREMENT "D" REFERS TO THE INSIDE PIPE DIAMETER.
4. ANCHOR AND THRUST BLOCK DIMENSIONS SHOWN ARE MINIMUM FOR 100 PSI WATER PRESSURE AND SOIL RESISTANCE OF 2 KIPS PER SQ FT. CONTRACTOR SHALL ADJUST FOR OTHER CONDITIONS AND SUBMIT FOR APPROVAL.
5. IF THE OWNER OF THE WATER SYSTEM REQUIRES A METHOD THAT RESTRAINS INDIVIDUAL JOINTS, EACH JOINT THAT FALLS WITHIN THE MINIMUM RESTRAINED LENGTH, MEASURED FROM THE CENTER OF THE FITTING, AS SHOWN ON THESE SHEETS SHALL BE RESTRAINED, AND SHALL WITHSTAND THE MAXIMUM PRESSURE APPLIED TO THE SYSTEM.
6. CLASS A CONCRETE SHALL NOT BE PLACED UNDER WATER. THE CONTRACTOR SHALL DEWATER THE EXCAVATION OR PLACE TYPE G CONCRETE USING APPROPRIATE UNDERWATER PLACEMENT TECHNIQUES.
7. CONCRETE FOR THRUST BLOCKS SHALL NOT BE ALLOWED TO COVER OR INTERFERE WITH JOINT OR RESTRAINT HARDWARE, PLASTIC SHEETING OR BUILDING FELT MAY BE PLACED OVER PIPE OR FITTINGS TO PREVENT CONCRETE FROM ADHERING TO SURFACES.
8. FOR BENDS, BEARING AREA SHALL BE PARALLEL TO THE EDGE OF THE FITTING AT THE FITTING MIDPOINT.
9. FOR TEES, BEARING AREA SHALL BE PERPENDICULAR TO THE BRANCH (SINGLE LEG) AXIS.
10. FOR REDUCERS, BEARING AREA SHALL BE PERPENDICULAR TO THE FITTING AXIS. THE MINIMUM THICKNESS ALONG THE FITTING AXIS SHALL BE 1'-0" OR THE LENGTH BETWEEN THE BELLS, WHICHEVER IS SMALLER.
11. THRUST RESTRAINTS FOR SIZES OR FITTINGS NOT SHOWN ON THESE SHEETS WILL BE DESIGNED ON A CASE BY CASE BASIS, AND WILL BE SHOWN IN THE CONTRACT DOCUMENTS.

ANCHOR AND THRUST BLOCKS

21

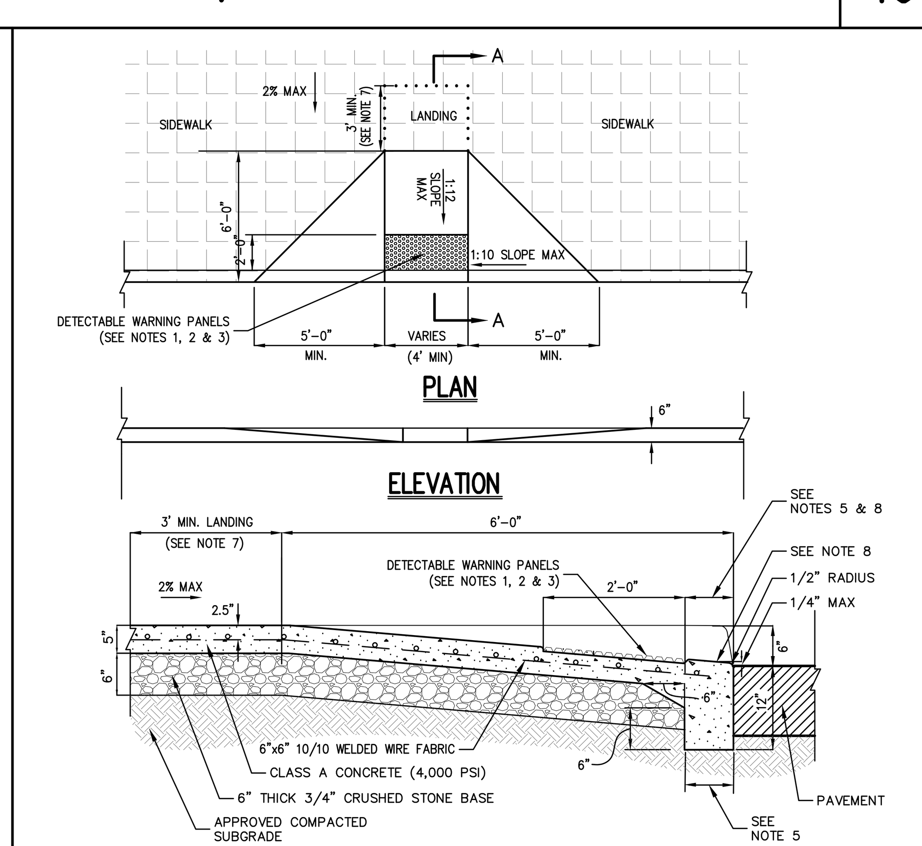


NOTES:

1. SIDEWALK CROSS SLOPE SHALL BE 1% MIN. TO 2% MAX.
2. PROVIDE 1/2" PREMOLDED EXPANSION JOINTS AT 20' INTERVALS UNLESS OTHERWISE DIRECTED.
3. REINFORCING SHALL NOT EXTEND THROUGH EXPANSION JOINTS.
4. SIDEWALK SHALL HAVE LIGHT BROOM FINISH

CONCRETE SIDEWALK

22

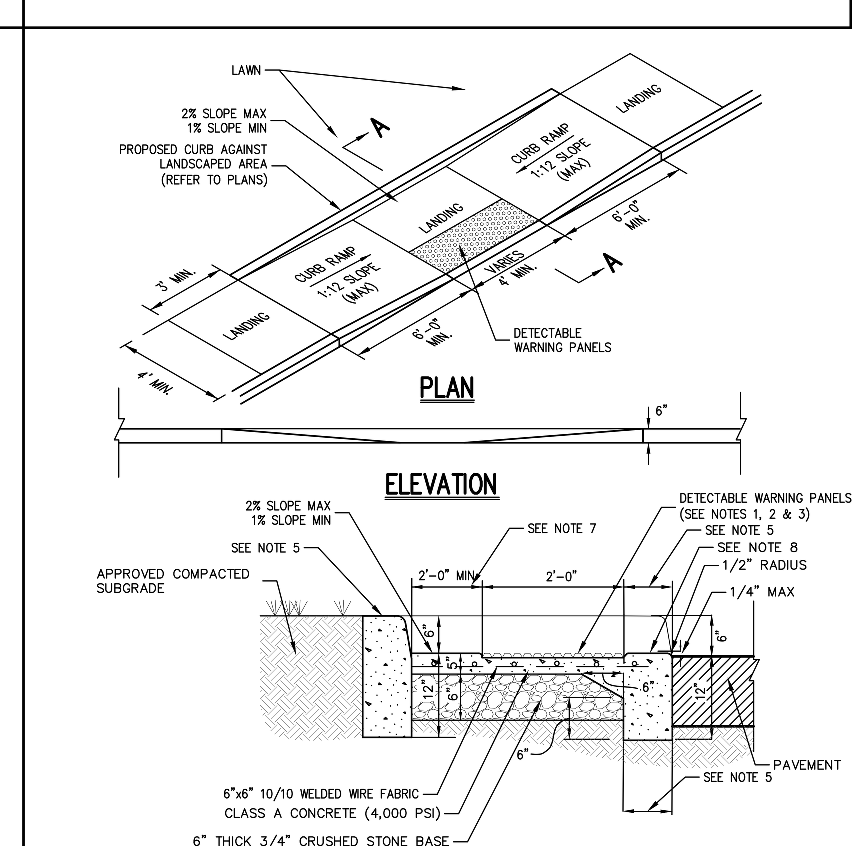


NOTES:

1. RAMPS SHALL HAVE CAST IN PLACE DETECTABLE/TACTILE WARNING SURFACE TILES AS MANUFACTURED BY ARMOR-TILE (OR APPROVED EQUAL) AND SHALL CONSIST OF RAISED TRUNCATED DOMES WITH A DIAMETER OF NOMINAL 0.9 INCHES, A HEIGHT OF NOMINAL 0.2 INCHES AND A CENTER TO CENTER SPACING OF NOMINAL 2.35 INCHES.
2. DETECTABLE WARNING PANELS SHALL CONTRAST VISUALLY WITH ADJOINING SURFACES, EITHER LIGHT-ON-DARK OR DARK-ON-LIGHT IN ACCORDANCE WITH SECTION 4.29.2, FEDERAL REGISTER, VOLUME 56, NO. 144, RULES AND REGULATIONS, APPENDIX A TO PART 36 – STANDARDS FOR ACCESSIBLE DESIGN (AMERICANS WITH DISABILITIES ACT), LATEST EDITION.
3. 24" WIDTH OF PANELS TO BE INSTALLED DIRECTLY BEHIND CURB AND IN ACCORDANCE WITH MANUFACTURER'S SPECIFICATIONS.
4. A MINIMUM OF 3 FEET CLEAR SHALL BE MAINTAINED AT ANY PERMANENT OBSTACLE IN ACCESSIBLE ROUTE (I.E., HYDRANTS, UTILITY POLES, TREE WELLS, SIGNS, ETC.).
5. CURB TREATMENT VARIES, SEE PLANS FOR CURB TYPE AND SEE CURB DETAIL FOR DIMENSIONS.
6. RAMP, CURB AND ADJACENT PAVEMENTS SHALL BE GRADED TO PREVENT PONDING.
7. WHEN LANDING OF RAMP ADJOINS A DOORWAY THEN THE MINIMUM DOORWAY MANEUVERING AREA SHALL BE AT LEAST THE WIDTH OF THE DOORWAY AND SHALL HAVE A MINIMUM DEPTH OF:
   MANUAL SWING DOORS = 60" MIN.
   FULL POWERED AUTOMATIC SLIDING DOORS = 48" MIN.
8. CONTRACTOR TO ENSURE TOP OF CURB MATCHES SLOPE OF RAMP.

DROP CURB & RAMP (TYPE A)
(WITH DETECTABLE WARNING)

23



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5. CURB TREATMENT VARIES, SEE PLANS FOR CURB TYPE AND SEE CURB DETAIL FOR DIMENSIONS.
6. RAMP, CURB AND ADJACENT PAVEMENTS SHALL BE GRADED TO PREVENT PONDING.
7. WHEN LANDING OF RAMP ADJOINS A DOORWAY THEN THE MINIMUM DOORWAY MANEUVERING AREA SHALL BE AT LEAST THE WIDTH OF THE DOORWAY AND SHALL HAVE A MINIMUM DEPTH OF:
   MANUAL SWING DOORS = 60" MIN.
   FULL POWERED AUTOMATIC SLIDING DOORS = 48" MIN.
8. CONTRACTOR TO ENSURE TOP OF CURB MATCHES SLOPE OF RAMP.

DROP CURB & RAMP (TYPE B)
(WITH DETECTABLE WARNING)

24

No.	Revision	Date	By
1.	RESPONSE TO TOWN COMMENTS	01/11/2021	NC
2.	RESPONSE TO TOWN COMMENTS	03/08/2021	NC
3.	RESPONSE TO TOWN COMMENTS	06/14/2021	NC
4.	RESPONSE TO TOWN COMMENTS	01/10/2022	NC
5.	RESPONSE TO TOWN COMMENTS	03/28/2022	NC
6.	RESPONSE TO TOWN COMMENTS	05/09/2022	NC

Previous Editions Obsolete

APPLICANT/OWNER:
SUMMIT CLUB PARTNERS, LLC
568 BEDFORD ROAD (NY-22)
ARMONK, NY 10504

ARCHITECT:
GRANOFF ARCHITECTS
30 RAILROAD AVENUE
GREENWICH, CT 06830

JMC Planning, Engineering, Landscape Architecture & Land Surveying, PLLC
JMC Site Development Consultants, LLC
John Meyer Consulting, Inc.
120 BEDFORD ROAD • ARMONK, NY 10504

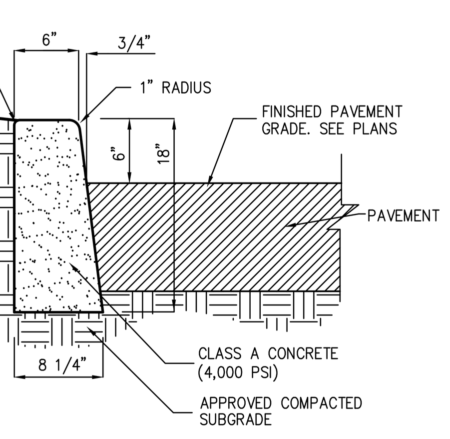
JMC

CONSTRUCTION DETAILS
THE SUMMIT CLUB AT ARMONK
(RESIDENTIAL PHASE)
568 & 570 BEDFORD ROAD (NY-22)
TOWN OF NORTH CASTLE, NEW YORK

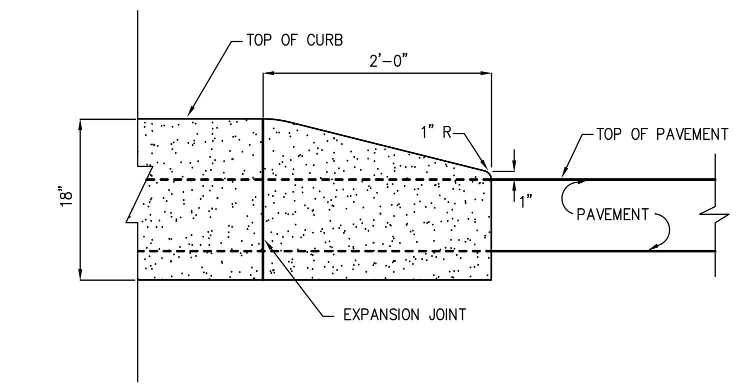
Drawn: NC Approved: AG
Scale: NOT TO SCALE
Date: 11/23/2020
Project No: 20101
Drawing No: C-901

NOTES:

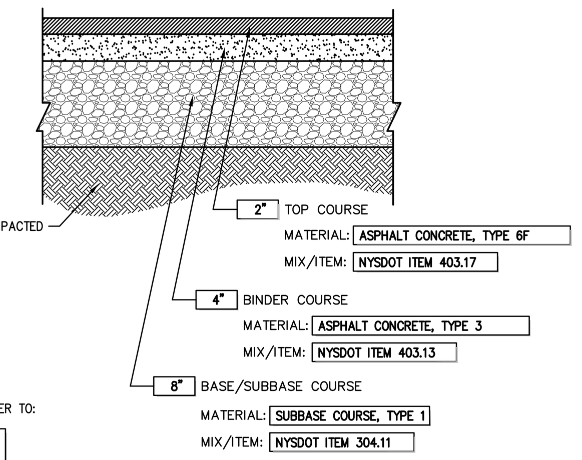
1. INSTALL 1/2" PREMOLDED BITUMINOUS EXPANSION JOINT EVER 20 FEET.
2. UNLESS DIRECTED OTHERWISE, EXPANSION JOINTS SHALL ALSO BE INSTALLED AT THE PC AND PT OF ALL RADIUS CURB.
3. EACH EXPANSION JOINT SHALL BE LEFT EXPOSED AND NOT COVERED WITH A SKIM COAT OF CONCRETE.
4. INSTALL CONSTRUCTION JOINTS MID-WAY BETWEEN EXPANSION JOINTS SO THAT LENGTH OF CURB SEGMENTS WILL BE TEN (10) FEET.
5. LENGTH OF CURB SEGMENTS AT CLOSURES MAY BE VARIED BUT SHALL NOT BE LESS THAN FOUR (4) FEET.
6. WHEN INSTALLED ADJACENT TO SIDEWALK OR CONCRETE PAVEMENT, MATCH EXPANSION JOINTS.



CAST-IN-PLACE CONCRETE CURB — 25



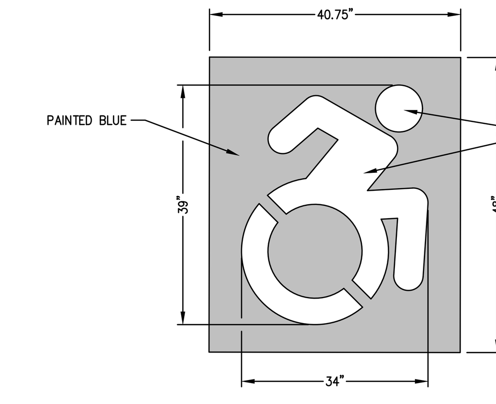
CONCRETE CURB ENDING — 26



NOTES:

1. THICKNESSES INDICATED REFER TO COMPACTED MEASURE.
2. MATERIAL AND MIX/ITEM NUMBERS REFER TO: NEW YORK STATE DEPARTMENT OF TRANSPORTATION STANDARD SPECIFICATIONS

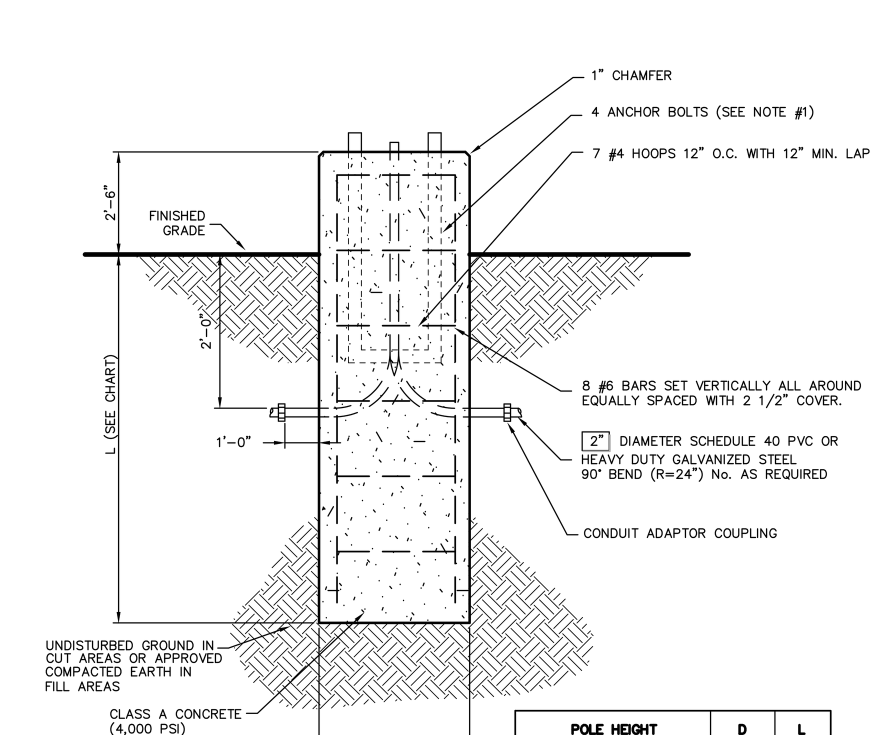
SITE PAVEMENT (HEAVY DUTY) — 27



NOTES:

1. SYMBOL SHALL BE THERMOPLASTIC TYPE OR PAINTED WITH STENCIL.

PAINTED ACCESSIBLE SYMBOL — 28

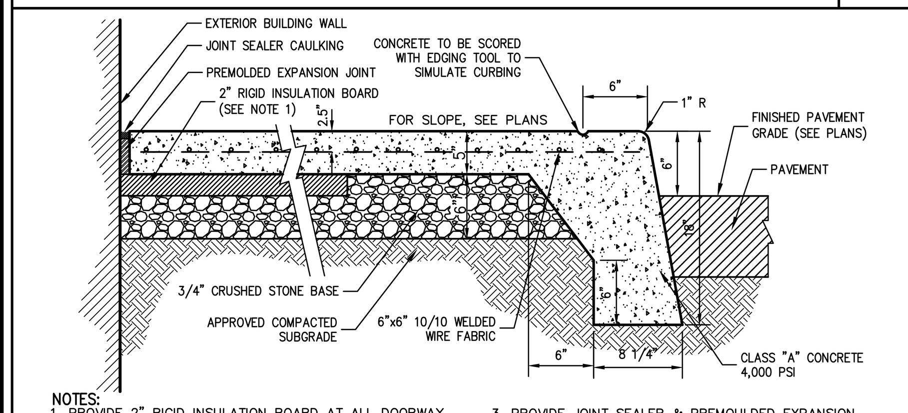


POLE HEIGHT	D	L
UP TO & INCLUDING 25FT	24"	5'-0"
25FT TO & INCLUDING 30FT	30"	5'-0"
30FT TO & INCLUDING 40FT	30"	6'-6"

NOTES:

1. IT SHALL BE THE CONTRACTOR'S RESPONSIBILITY TO CHECK AND VERIFY ALL ANCHOR BOLT DIMENSIONS (SIZE, BOLT CIRCLE, ETC.) WITH THE CONTRACTOR WHO WILL BE INSTALLING THE LIGHTING STANDARD PRIOR TO INSTALLATION OF THE FOUNDATIONS.
2. CHAMFER EXPOSED EDGES OF ALL FOUNDATIONS.
3. PROVIDE INSULATED GROUNDING BUSHING ON EXPOSED ENDS (IN BASE OF POLE) OF ALL GALVANIZED STEEL BENDS.
4. POLES AND LUMINAIRES WILL BE FURNISHED AND INSTALLED BY OTHERS.

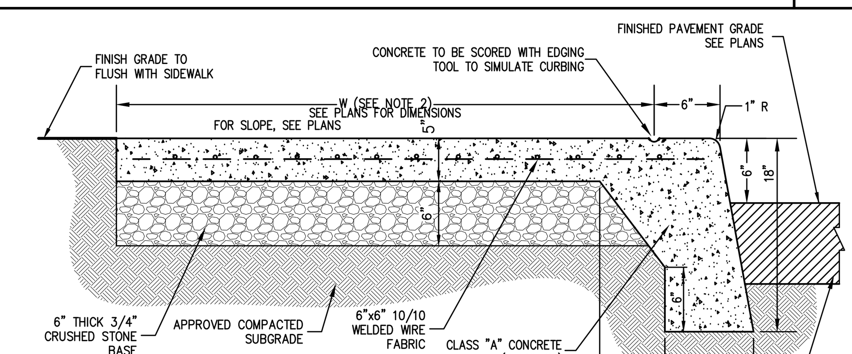
LIGHTING STANDARD FOUNDATION (ROUND) — 33



NOTES:

1. PROVIDE 2" RIGID INSULATION BOARD AT ALL DOORWAY OPENINGS AND EXTEND 8' MIN. IN ALL DIRECTIONS OR TO CONSTRUCTION/CONTRACTION JOINT, WHICHEVER IS GREATER.
2. JOINT SEALER CAULKING SHALL BE PSI-641 LOW MODULUS SILICONE SEALANT, BY POLYMERIC SYSTEMS INC. OR APPROVED EQUAL. PREMOULDED EXPANSION JOINT SHALL BE FLEXCELL OR APPROVED EQUAL.
3. PROVIDE JOINT SEALER & PREMOULDED EXPANSION JOINT AT ALL BLDG. WALLS, CONSTRUCTION JOINTS AND OTHER FIXED OBJECTS (HYDRANTS, LIGHT POLES, ETC.)
4. SIDEWALK SHALL HAVE LIGHT BROOM FINISH
5. SIDEWALK CROSS SLOPE SHALL BE 1% MIN. 2% MAX.
6. FOR SIDEWALK WIDTH SEE PLAN. SIDEWALK SHALL HAVE A 3' MIN. WIDTH CLEAR FROM BACK OF CURBING.

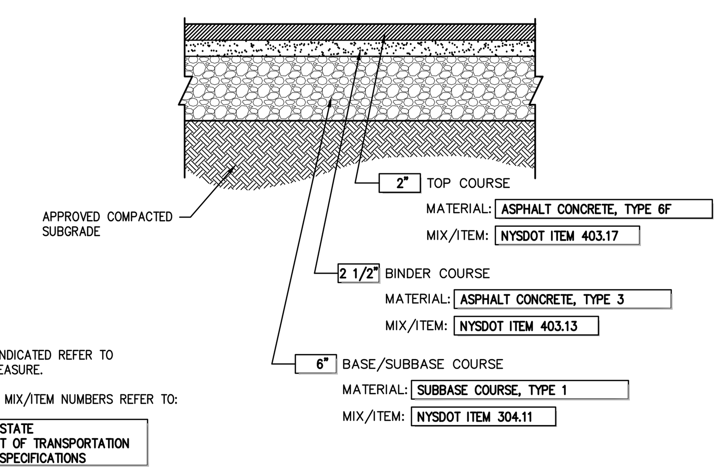
BUILDING PERIMETER MONOLITHIC CURB & SIDEWALK — 29



NOTES

1. SIDEWALK CROSS SLOPE SHALL BE 1% MIN. TO 2% MAX.
2. FOR SIDEWALK WIDTH SEE PLAN. SIDEWALK SHALL HAVE A 3' MIN. WIDTH CLEAR FROM BACK OF CURBING.
3. PROVIDE JOINT SEALER & PREMOULDED EXPANSION JOINT AT ALL BLDG. WALLS, CONSTRUCTION JOINTS AND OTHER FIXED OBJECTS (HYDRANTS, LIGHT POLES, ETC.)
4. SIDEWALK SHALL HAVE LIGHT BROOM FINISH.
5. PROVIDE 1/2" PREMOULDED EXPANSION JOINTS AT 20 FOOT INTERVALS UNLESS OTHERWISE DIRECTED.
6. REINFORCEMENT SHALL NOT EXTEND THROUGH EXPANSION JOINTS.

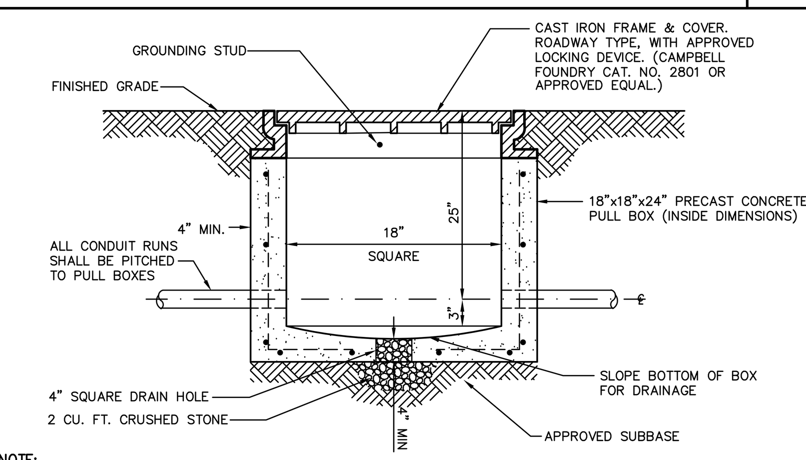
MONOLITHIC CONCRETE CURB AND SIDEWALK — 30



NOTES:

1. THICKNESSES INDICATED REFER TO COMPACTED MEASURE.
2. MATERIAL AND MIX/ITEM NUMBERS REFER TO: NEW YORK STATE DEPARTMENT OF TRANSPORTATION STANDARD SPECIFICATIONS

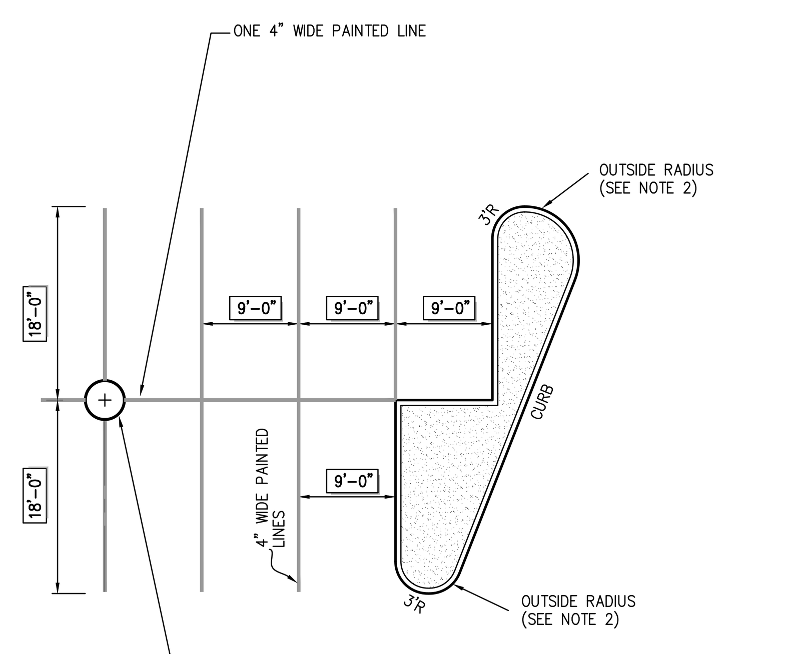
SITE PAVEMENT (LIGHT DUTY) — 31



NOTE:

PRECAST CONCRETE PULL BOX TO BE DESIGNED FOR H-20 DESIGN LOAD.

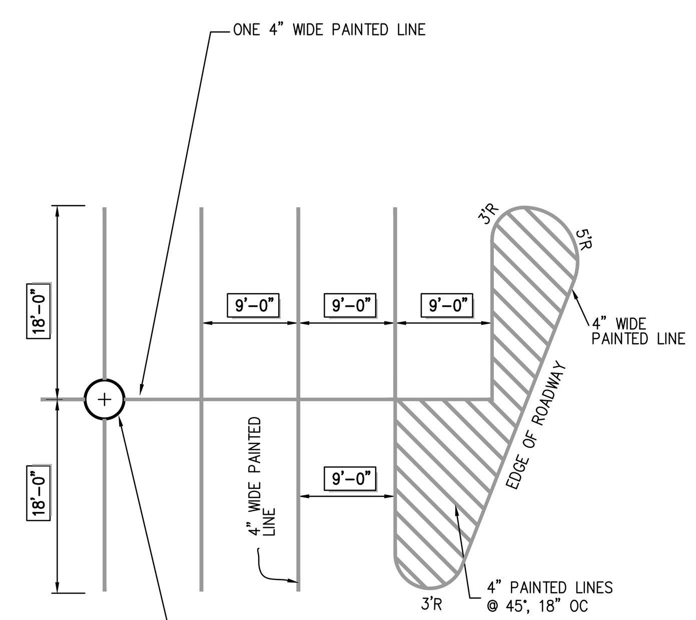
ELECTRICAL PULL BOX — 32



NOTES

1. COLOR OF PAINT SHALL BE WHITE.
2. OUTSIDE RADIUS MAY VARY DEPENDING ON SHAPE OF ISLAND. RADIUS SHALL BE AS SHOWN ON LAYOUT PLAN.

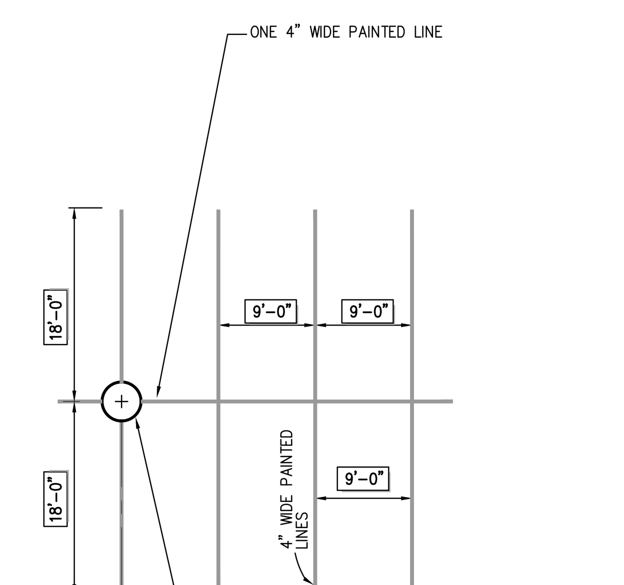
90° PARKING (SINGLE STRIPING-CURBED END) — 34



NOTE

1. COLOR OF PAINT SHALL BE WHITE.

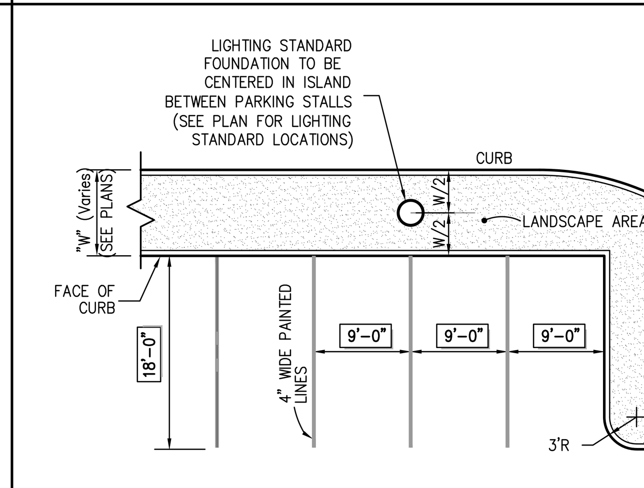
90° PARKING (SINGLE STRIPING-PAINTED END) — 35



NOTE

1. COLOR OF PAINT SHALL BE WHITE.

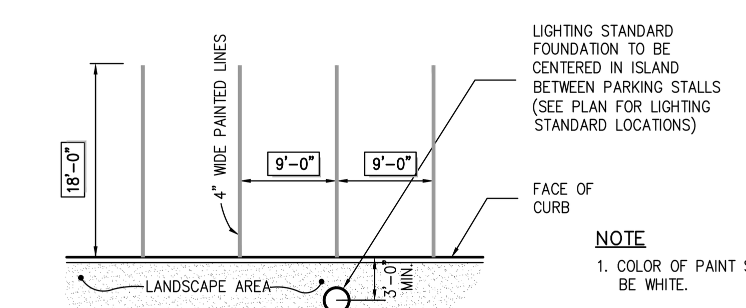
90° PARKING (SINGLE STRIPING – W/O CURBED ISLAND) — 36



NOTES

1. COLOR OF PAINT SHALL BE WHITE.
2. OUTSIDE RADIUS MAY VARY DEPENDING ON SHAPE OF ISLAND. RADIUS SHALL BE AS SHOWN ON LAYOUT PLAN.

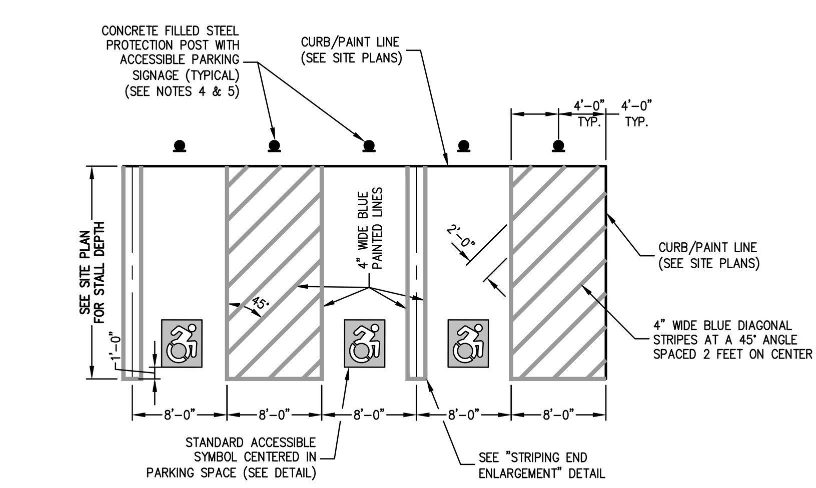
90° PARKING (SINGLE STRIPING – CURBED ISLAND AND CURBED END) — 37



NOTE

1. COLOR OF PAINT SHALL BE WHITE.

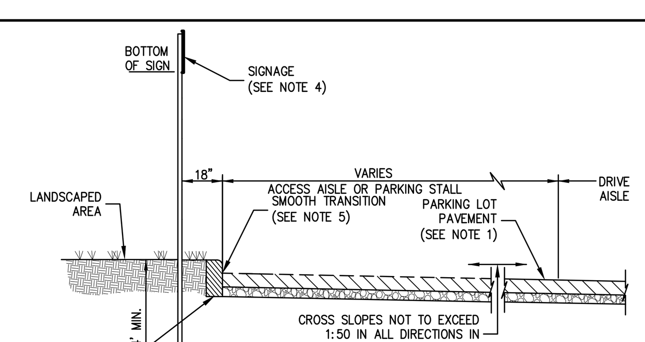
90° PARKING (SINGLE STRIPING – CURBED PERIMETER) — 38



NOTES:

1. WIDTH MEASUREMENTS OF ACCESSIBLE PARKING SPACES AND ACCESS AISLES (CROSS HATCHED AREA ADJACENT TO ACCESSIBLE PARKING SPACE) SHALL BE MADE FROM THE CENTERLINE OF THE MARKINGS.
2. SLOPES IN ACCESSIBLE PARKING SPACES AND ACCESS AISLES SHALL NOT EXCEED 2.0% IN ANY DIRECTION MEASURED WITH A 2 FOOT SMART LEVEL AS SPECIFIED IN "DIMENSIONAL TOLERANCES IN CONSTRUCTION AND FOR SURFACE ACCESSIBILITY", BY UNITED STATES ACCESS BOARD, LATEST EDITION.
3. GROUND SURFACES FOR ACCESSIBLE PARKING SPACES AND ACCESS AISLES SERVING THEM SHALL BE STABLE, FIRM AND SLIP RESISTANT. ACCESS AISLES SHALL BE AT THE SAME LEVEL AS THE ACCESSIBLE PARKING SPACES THEY SERVE.
4. SEE SITE PLANS/SIGN TABLE FOR SIGN DESIGNATIONS, LOCATIONS AND SPECIFICATIONS.
5. SEE ACCESSIBLE PARKING SIGN DETAIL FOR CONCRETE FILLED STEEL PROTECTION POST WITH ACCESSIBLE PARKING SIGNAGE AS APPLICABLE.

ACCESSIBLE PARKING (DOUBLE STRIPING – NEW YORK) — 39



TYPICAL SECTION

NOTES:

1. THIS SHEET IS INTENDED TO DEPICT THE DIMENSIONAL REQUIREMENTS OF TYPICAL ACCESSIBLE PARKING SPACES. THE SIDEWALK, CURBING, AND PAVEMENT MATERIAL SHALL BE AS SPECIFIED ELSEWHERE IN THE CONTRACT DOCUMENTS.
2. LOCATION – PARKING SPACES FOR USE BY PERSONS WITH DISABILITIES SHALL BE IN THE SPACES CLOSEST TO THE NEAREST ACCESSIBLE BUILDING OR FACILITY ENTRANCE ON AN ACCESSIBLE ROUTE.
3. SURFACE SLOPES – SLOPES AT ACCESSIBLE PARKING SPACES, ACCESS AISLES, AND ADJOINING WALKWAYS SHALL NOT EXCEED 1:50 IN ANY DIRECTION.
4. SIGNAGE – EACH ACCESSIBLE PARKING SPACE SHALL BE MARKED BY PERMANENTLY INSTALLED ABOVE GROUND SIGNS WHICH DISPLAY THE INTERNATIONAL SYMBOL OF ACCESS. EACH ACCESS AISLE SHALL BE MARKED BY PERMANENTLY INSTALLED ABOVE GROUND SIGNS INDICATING THAT PARKING IS NOT PERMITTED IN THE AISLE. SIGNS SHALL NOT BLOCK THE ACCESSIBLE CLEAR WIDTH OF ADJACENT WALKWAYS, SIGNS LOCATED WHERE THEY MAY BE HIT BY VEHICLES BEING PARKED SHALL BE INSTALLED AS SHOWN IN THE PROTECTION POST BASE DETAIL. THE BOTTOMS OF THE SIGNS LOCATED ON POST INSTALLED IN PAVED AREAS SHALL BE AT LEAST 7' ABOVE THE WALKWAY SURFACE. THE BOTTOMS OF SIGNS LOCATED IN UNPAVED AREAS SHALL BE 7' ABOVE THE ADJACENT PAVEMENT SURFACE.
5. A SMOOTH, FLUSH TRANSITION MUST BE PROVIDED BETWEEN ALL PEDESTRIAN WALKWAYS AND THE ACCESSIBLE PARKING SPACES AND AISLES.
6. VEHICLE SIDE FACE OF CONCRETE BUMPER BLOCKS SHALL BE SET 2' BACK FROM EDGE OF PARKING STALL. CONCRETE BLOCKS SHALL NOT BE INSTALLED WITHIN ACCESS AISLES.

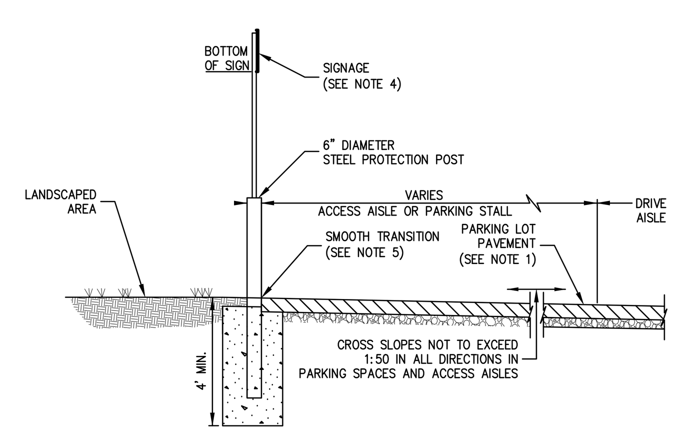
APPROVED BY TOWN OF NORTH CASTLE PLANNING BOARD RESOLUTION, DATED ______

______ DATE: ______
CHRISTOPHER CARTHY, CHAIRMAN,
TOWN OF NORTH CASTLE PLANNING BOARD

ENGINEERING DRAWINGS REVIEWED BY TOWN CONSULTING ENGINEER

______ DATE: ______
JOSEPH M. CERMELE, P.E.
KELLARD SESSIONS CONSULTING, P.C.
CONSULTING TOWN ENGINEER

TYPICAL ACCESSIBLE PARKING STALL AND AISLE (TYPE A) — 40

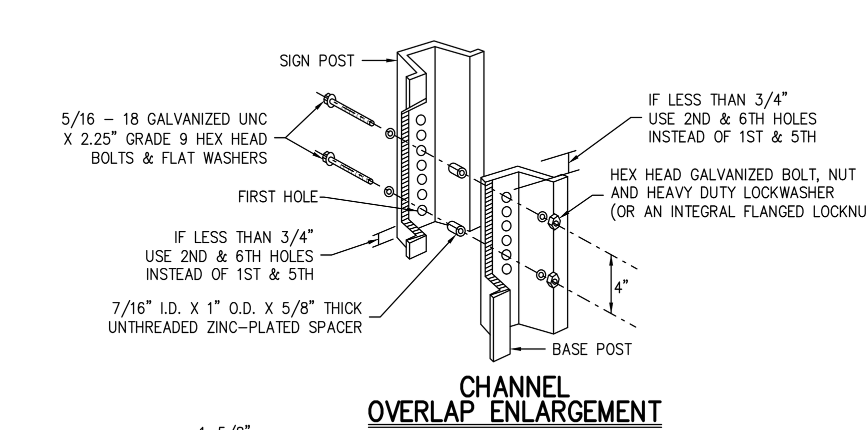


TYPICAL SECTION

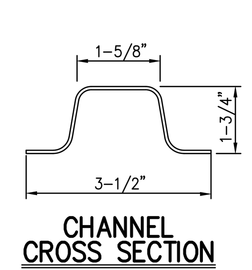
NOTES:

1. THIS SHEET IS INTENDED TO DEPICT THE DIMENSIONAL REQUIREMENTS OF TYPICAL ACCESSIBLE PARKING SPACES. THE SIDEWALK, CURBING, AND PAVEMENT MATERIAL SHALL BE AS SPECIFIED ELSEWHERE IN THE CONTRACT DOCUMENTS.
2. LOCATION – PARKING SPACES FOR USE BY PERSONS WITH DISABILITIES SHALL BE IN THE SPACES CLOSEST TO THE NEAREST ACCESSIBLE BUILDING OR FACILITY ENTRANCE ON AN ACCESSIBLE ROUTE.
3. SURFACE SLOPES – SLOPES AT ACCESSIBLE PARKING SPACES, ACCESS AISLES, AND ADJOINING WALKWAYS SHALL NOT EXCEED 1:50 IN ANY DIRECTION.
4. SIGNAGE – EACH ACCESSIBLE PARKING SPACE SHALL BE MARKED BY PERMANENTLY INSTALLED ABOVE GROUND SIGNS WHICH DISPLAY THE INTERNATIONAL SYMBOL OF ACCESS. EACH ACCESS AISLE SHALL BE MARKED BY PERMANENTLY INSTALLED ABOVE GROUND SIGNS INDICATING THAT PARKING IS NOT PERMITTED IN THE AISLE. SIGNS SHALL NOT BLOCK THE ACCESSIBLE CLEAR WIDTH OF ADJACENT WALKWAYS, SIGNS LOCATED WHERE THEY MAY BE HIT BY VEHICLES BEING PARKED SHALL BE INSTALLED AS SHOWN IN THE PROTECTION POST BASE DETAIL. THE BOTTOMS OF THE SIGNS LOCATED ON POST INSTALLED IN PAVED AREAS SHALL BE AT LEAST 7' ABOVE THE WALKWAY SURFACE. THE BOTTOMS OF SIGNS LOCATED IN UNPAVED AREAS SHALL BE 7' ABOVE THE ADJACENT PAVEMENT SURFACE.
5. A SMOOTH, FLUSH TRANSITION MUST BE PROVIDED BETWEEN ALL PEDESTRIAN WALKWAYS AND THE ACCESSIBLE PARKING SPACES AND AISLES.

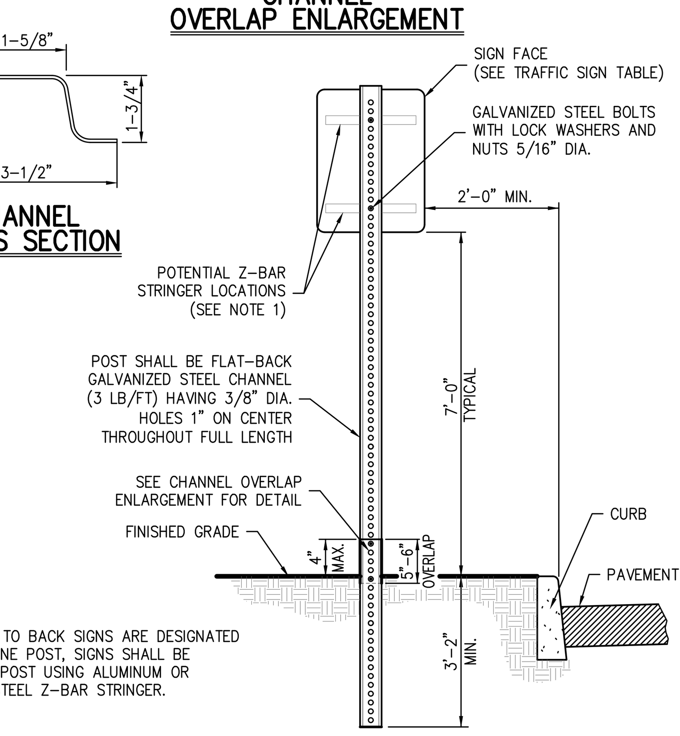
TYPICAL ACCESSIBLE PARKING STALL AND AISLE (TYPE C) — 41

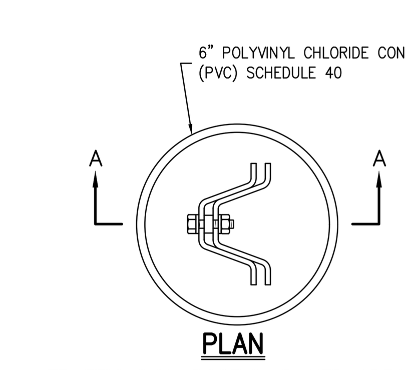


CHANNEL OVERLAP ENLARGEMENT

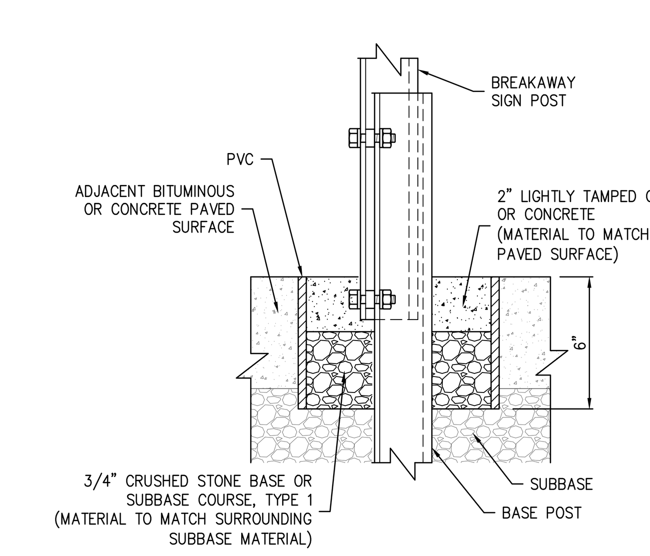


CHANNEL CROSS SECTION





PLAN
TRAFFIC SIGN POST IN PAVED AREAS

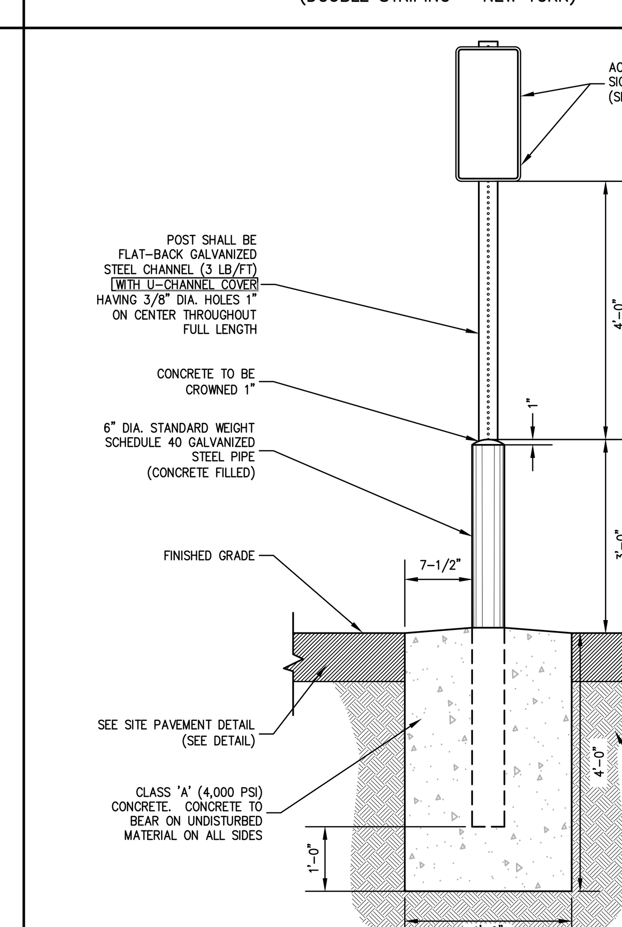


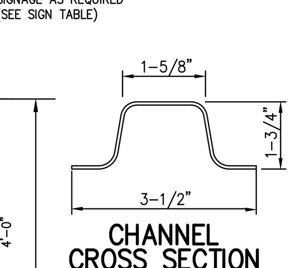
SECTION A–A
TRAFFIC SIGN POST IN PAVED AREAS

NOTE:

1. WHEN BACK TO BACK SIGNS ARE DESIGNATED TO SHARE ONE POST, SIGNS SHALL BE AFFIXED TO POST USING ALUMINUM OR STAINLESS STEEL Z-BAR STRINGER.

TRAFFIC SIGN POST (BREAKAWAY STEEL CHANNEL) — 42





CHANNEL CROSS SECTION

NOTES:

1. GALVANIZED STEEL CHANNEL SHALL BE EMBEDDED A MIN. OF 3 FT. INTO THE CONCRETE
2. POSTS FOR HANDICAP PARKING STALLS AND ACCESS AISLES SHALL BE PAINTED BLUE AS FOLLOWS:
   A. SOLVENT CLEAN TO REMOVE OIL, GREASE AND OTHER CONTAMINANTS.
   B. APPLY METAL PRIMER FOR GALVANIZED SURFACES.
   C. APPLY TWO (2) FINISH COATS OF APPROVED EXTERIOR PAINT FOR METAL SURFACES.
3. CONTRACTOR SHALL BE RESPONSIBLE FOR COORDINATING THE INSTALLATION OF THE PARKING SIGNS, BOLLARDS AND FOUNDATIONS WITH THE DESIGN AND INSTALLATION OF THE SITE SIDEWALKS, CURBING, PAVEMENT AND ANY OTHER SITE FEATURES SHOWN ON THE PLANS.
4. FASTEN SIGN TO POSTS WITH GALVANIZED STEEL BOLTS, LOCK WASHERS, AND NUTS (5/16" DIA.)
5. U-CHANNEL COVERS FOR POSTS SHALL BE BLUE WITH WHITE STRIPE FOR HANDICAP PARKING STALLS AND HANDICAP ACCESS AISLES.

ACCESSIBLE PARKING SIGN DETAIL — 43

No.	Revision	Date	By
1.	RESPONSE TO TOWN COMMENTS	01/11/2021	NC
2.	RESPONSE TO TOWN COMMENTS	03/08/2021	NC
3.	RESPONSE TO TOWN COMMENTS	06/14/2021	NC
4.	RESPONSE TO TOWN COMMENTS	01/10/2022	NC
5.	RESPONSE TO TOWN COMMENTS	03/28/2022	NC
6.	RESPONSE TO TOWN COMMENTS	05/09/2022	NC

Previous Editions Obsolete

APPLICANT/OWNER:
SUMMIT CLUB PARTNERS, LLC
568 BEDFORD ROAD (NY-22)
ARMONK, NY 10504

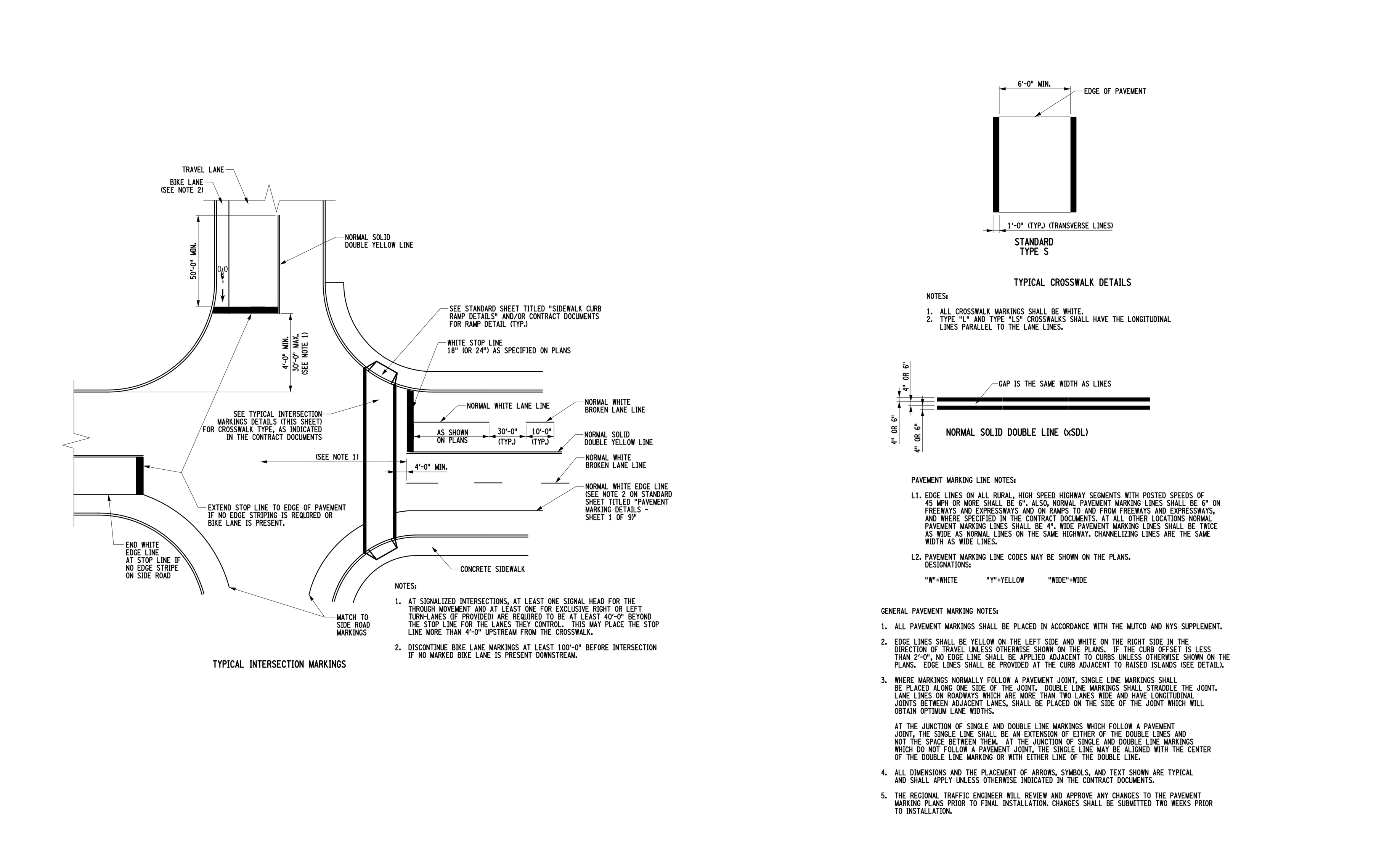
ARCHITECT:
GRANOFF ARCHITECTS
330 RAILROAD AVENUE
GREENWICH, CT 06830

JMC Planning, Engineering, Landscape Architecture & Land Surveying, PLLC
JMC Site Development Consultants, LLC
John Meyer Consulting, Inc.
120 BEDFORD ROAD • ARMONK, NY 10504
voice 914.273.5225 • fax 914.273.2102
www.jmcpllc.com
JMC

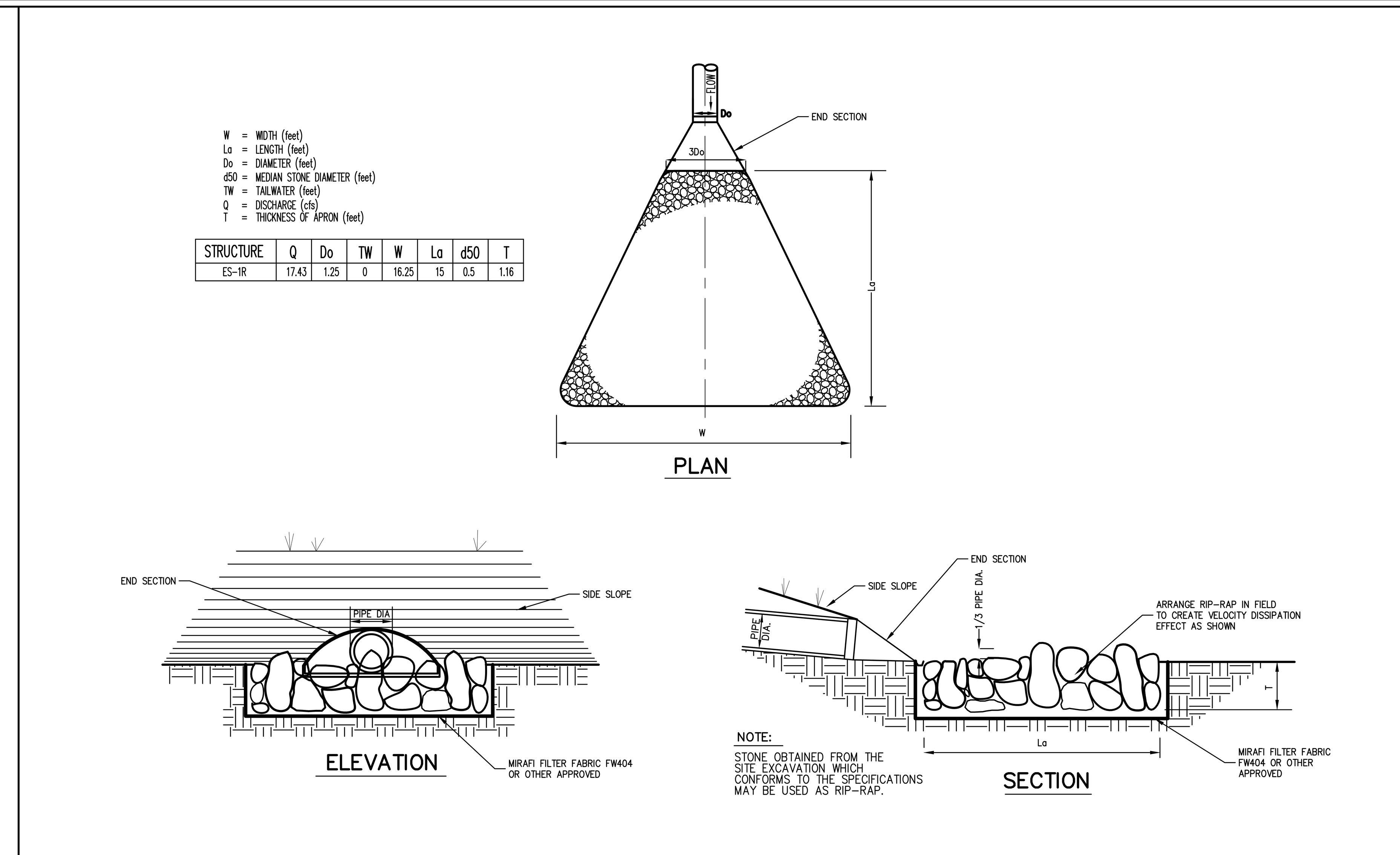
CONSTRUCTION DETAILS

THE SUMMIT CLUB AT ARMONK (RESIDENTIAL PHASE)
568 & 570 BEDFORD ROAD (NY-22)
TOWN OF NORTH CASTLE, NEW YORK

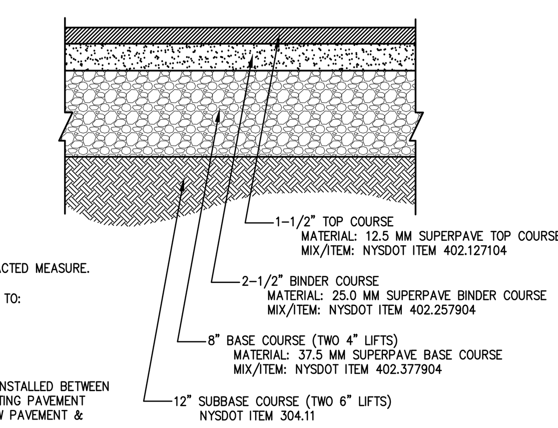
Drawn: NC Approved: AG
Scale: NOT TO SCALE
Date: 11/23/2020
Project No: 20101
20101-DETAILS DET-3 –
Drawing No: C-902



PAVEMENT MARKINGS 44



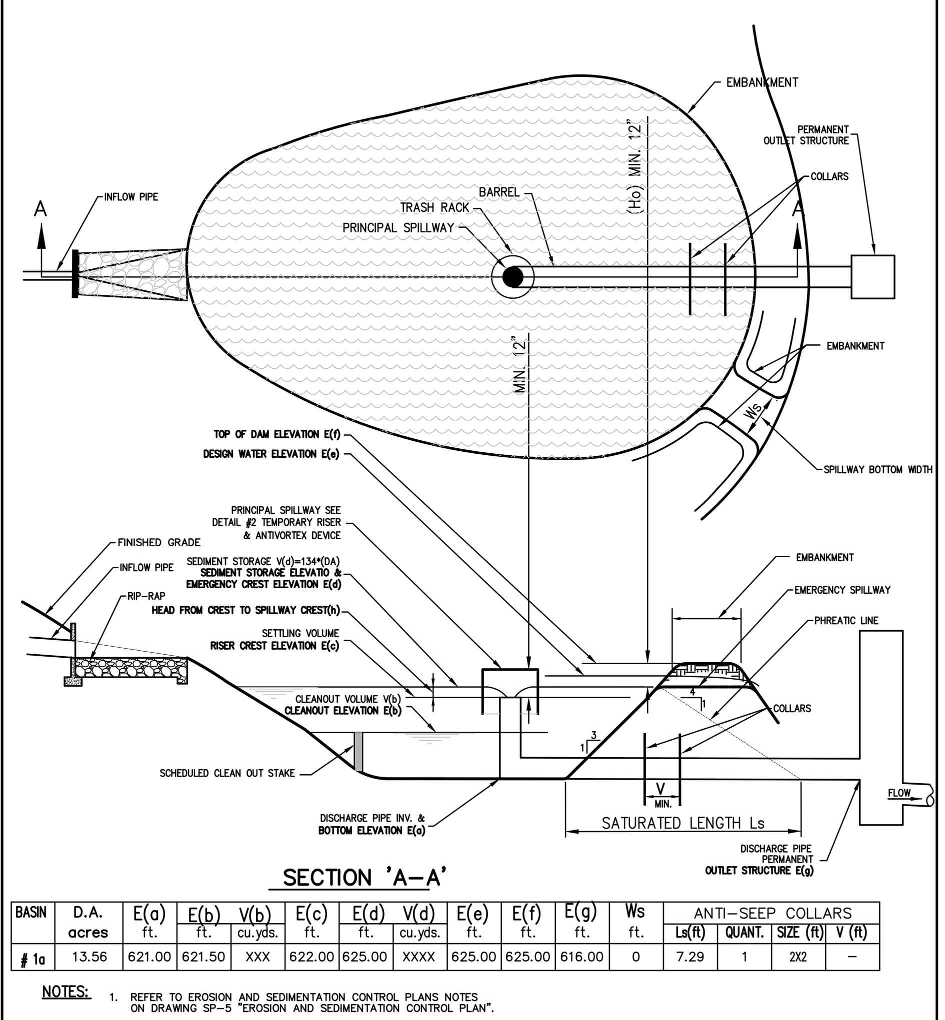
RIP–RAP APRON/ENERGY DISSIPATOR 45



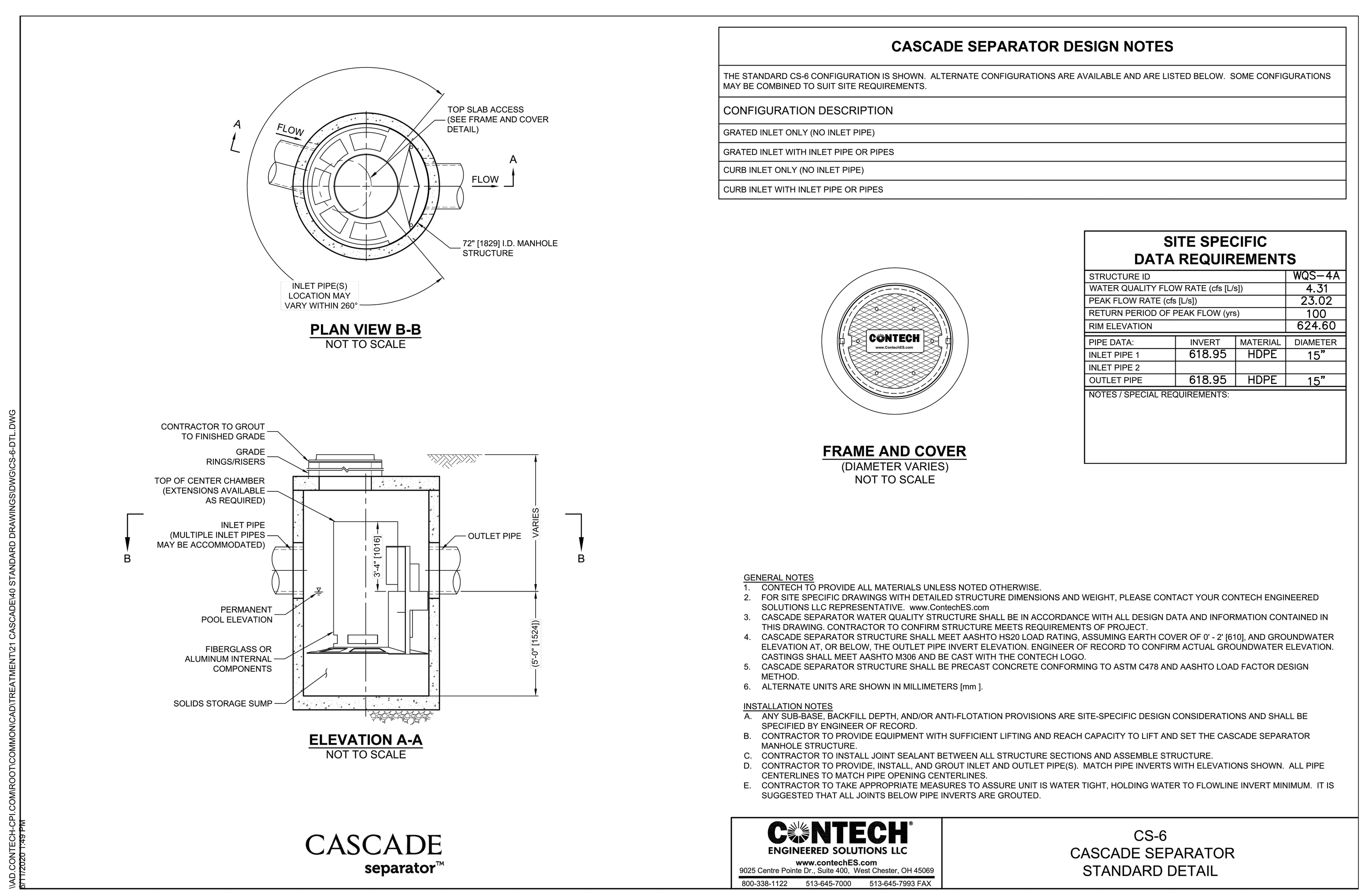
NOTES:

1. THICKNESSES INDICATED REFER TO COMPACTED MEASURE.
2. MATERIAL AND MIX/ITEM NUMBERS REFER TO: NEW YORK STATE DEPARTMENT OF TRANSPORTATION STANDARD SPECIFICATIONS
3. TACK COATS (ITEM 407.0102) SHALL BE INSTALLED BETWEEN ALL SUPERPAVE COURSES, BETWEEN EXISTING PAVEMENT COURSES & OVERLAYS AND BETWEEN NEW PAVEMENT & EXISTING PAVEMENT EDGES.
4. ASPHALT PAVEMENT JOINT ADHESIVE (ITEM 418.7603) SHALL BE INSTALLED AT ALL TOP COURSE PAVEMENT EDGES.

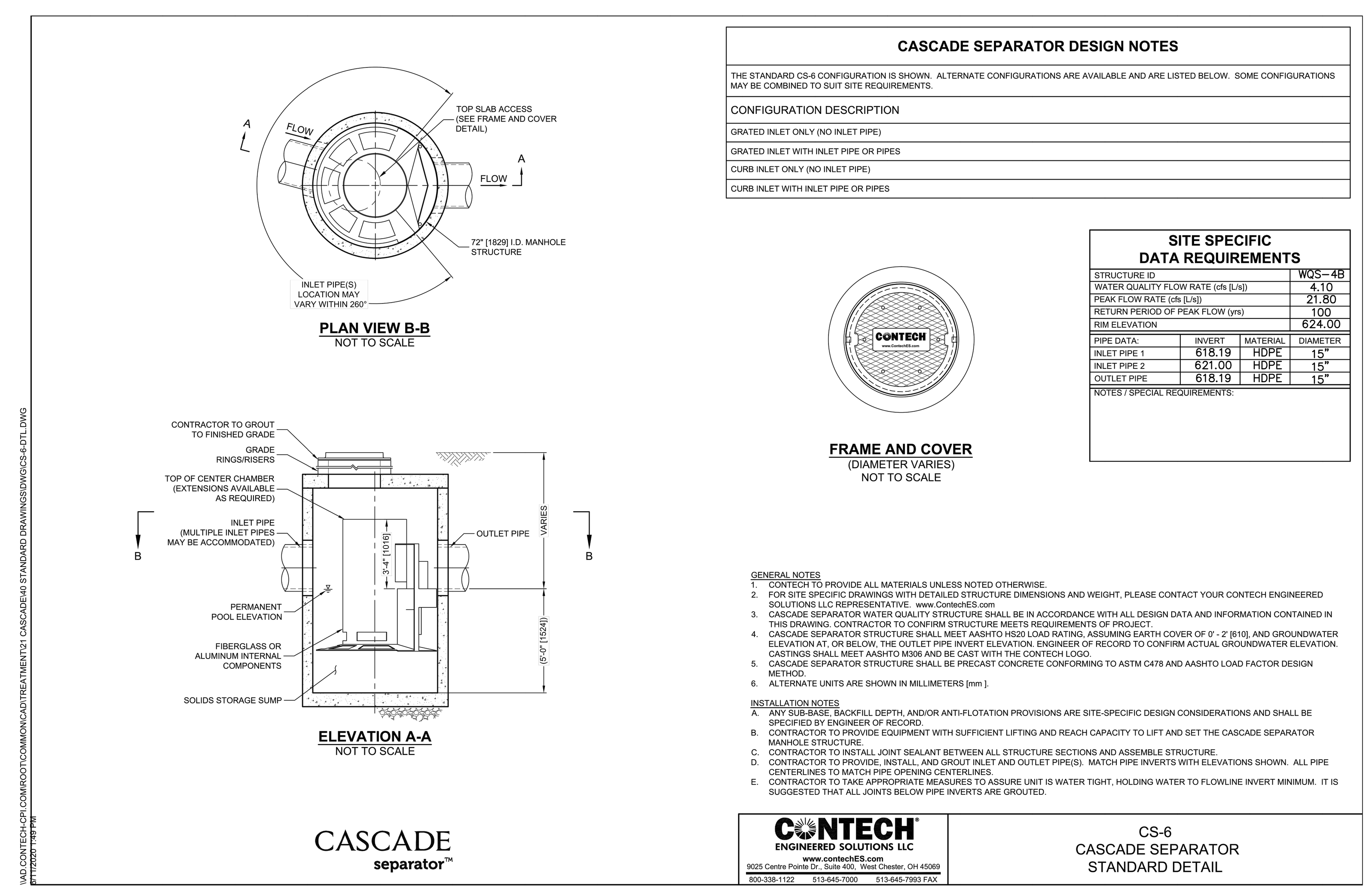
NYSDOT FULL DEPTH PAVEMENT SECTION 46



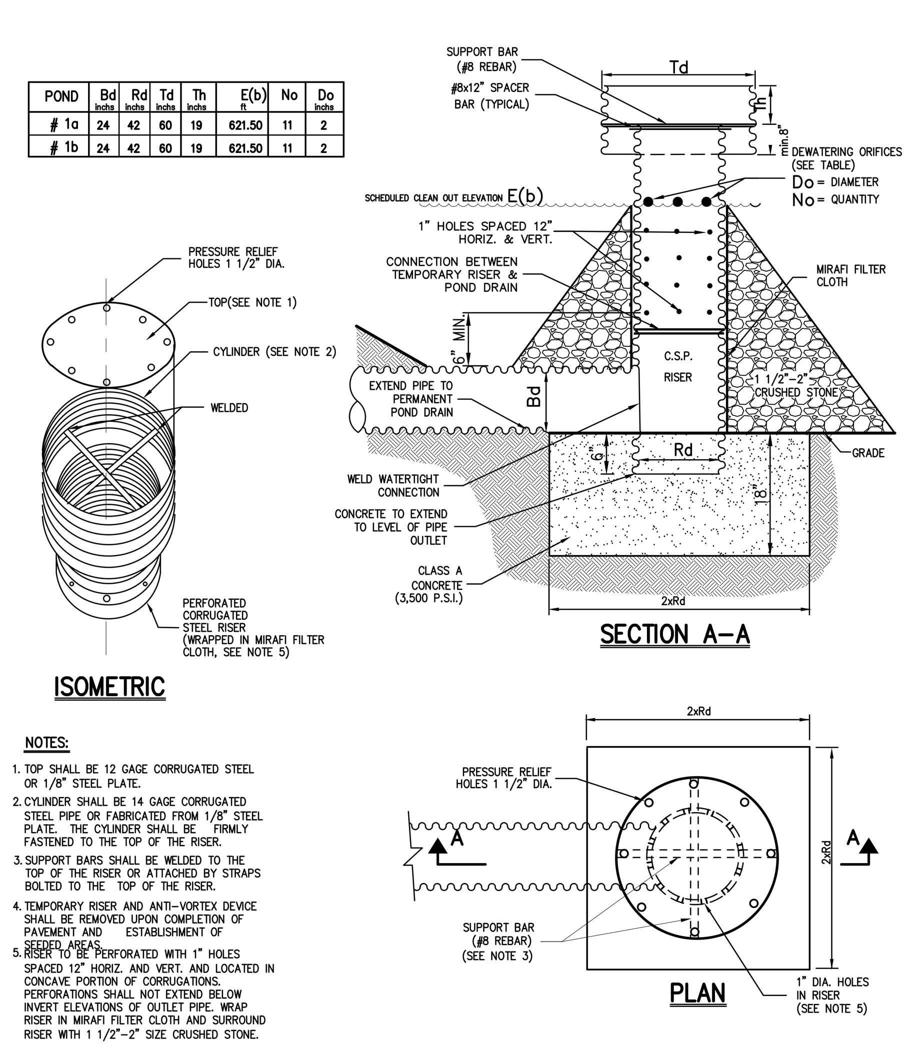
TEMPORARY SEDIMENT BASIN DETAIL 47



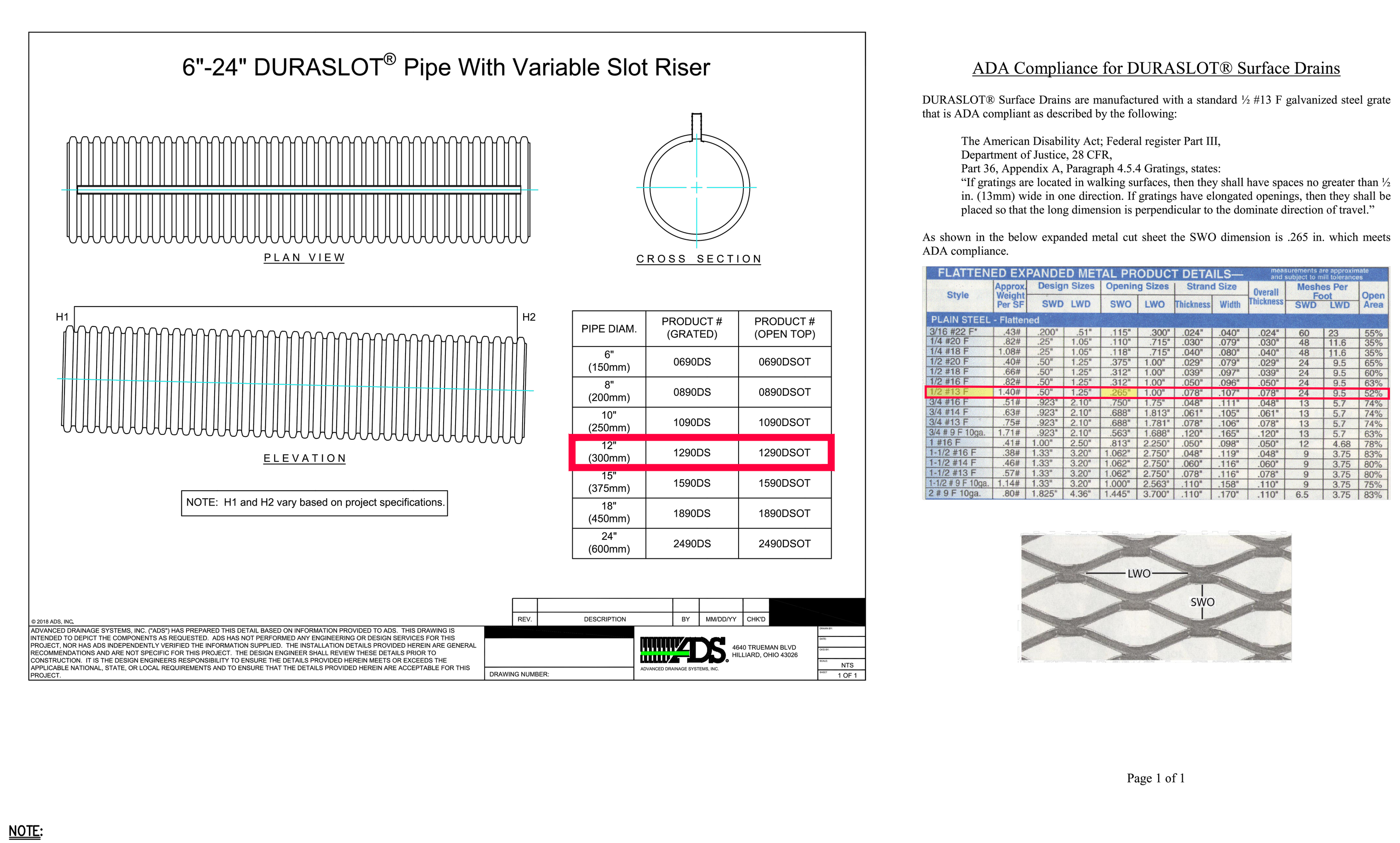
WQS–4A 48



WQS–4B 49

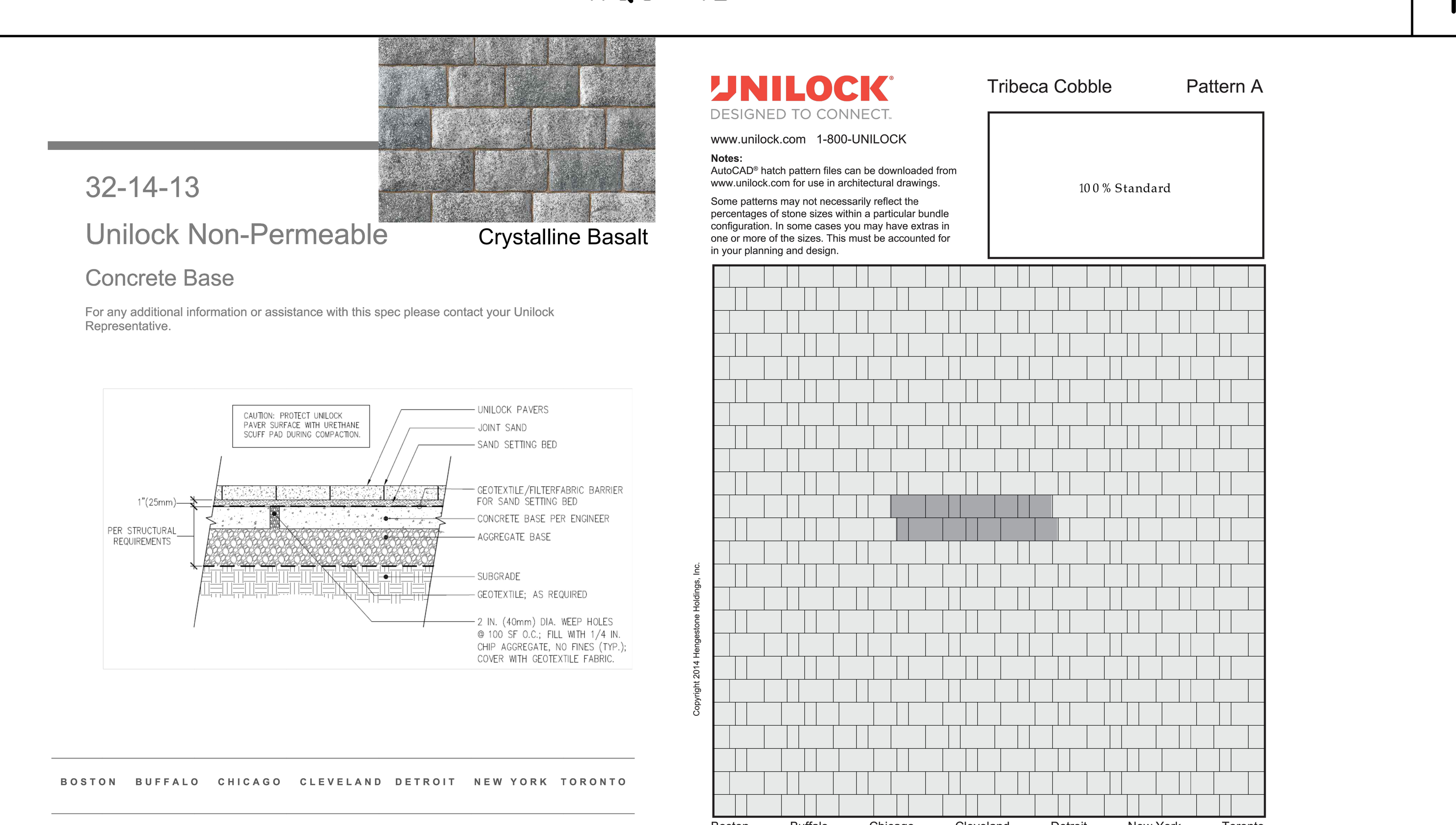


TEMPORARY RISER & ANTI–VORTEX DEVICE 50



NOTE:
1. ADA COMPLIANT GRATE SHALL HAVE STAINLESS STEEL FINISH.

12" DURASLOT PIPE WITH VARIABLE SLOT RISER WITH ADA COMPLIANT GRATE 51



APPROVED BY TOWN OF NORTH CASTLE PLANNING BOARD RESOLUTION, DATED ____

DATE: ____

CHRISTOPHER CARTHY, CHAIRMAN,
TOWN OF NORTH CASTLE PLANNING BOARD

ENGINEERING DRAWINGS REVIEWED BY TOWN CONSULTING ENGINEER

DATE: ____

JOSEPH M. CERMELE, P.E.
KELLARD SESSIONS CONSULTING, P.C.
CONSULTING TOWN ENGINEER

DECORATIVE PAVER 52

No.	Revision	Date	By
1.	RESPONSE TO TOWN COMMENTS	01/11/2021	NC
2.	RESPONSE TO TOWN COMMENTS	03/08/2021	NC
3.	RESPONSE TO TOWN COMMENTS	06/14/2021	NC
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5.	RESPONSE TO TOWN COMMENTS	03/28/2022	NC
6.	RESPONSE TO TOWN COMMENTS	05/09/2022	NC

Previous Editions Obsolete

APPLICANT/OWNER:
SUMMIT CLUB PARTNERS, LLC
568 BEDFORD ROAD (NY–22)
ARMONK, NY 10504

ARCHITECT:
GRANOFF ARCHITECTS
330 RAILROAD AVENUE
GREENWICH, CT 06830

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voice 914.273.5225 • fax 914.273.2102
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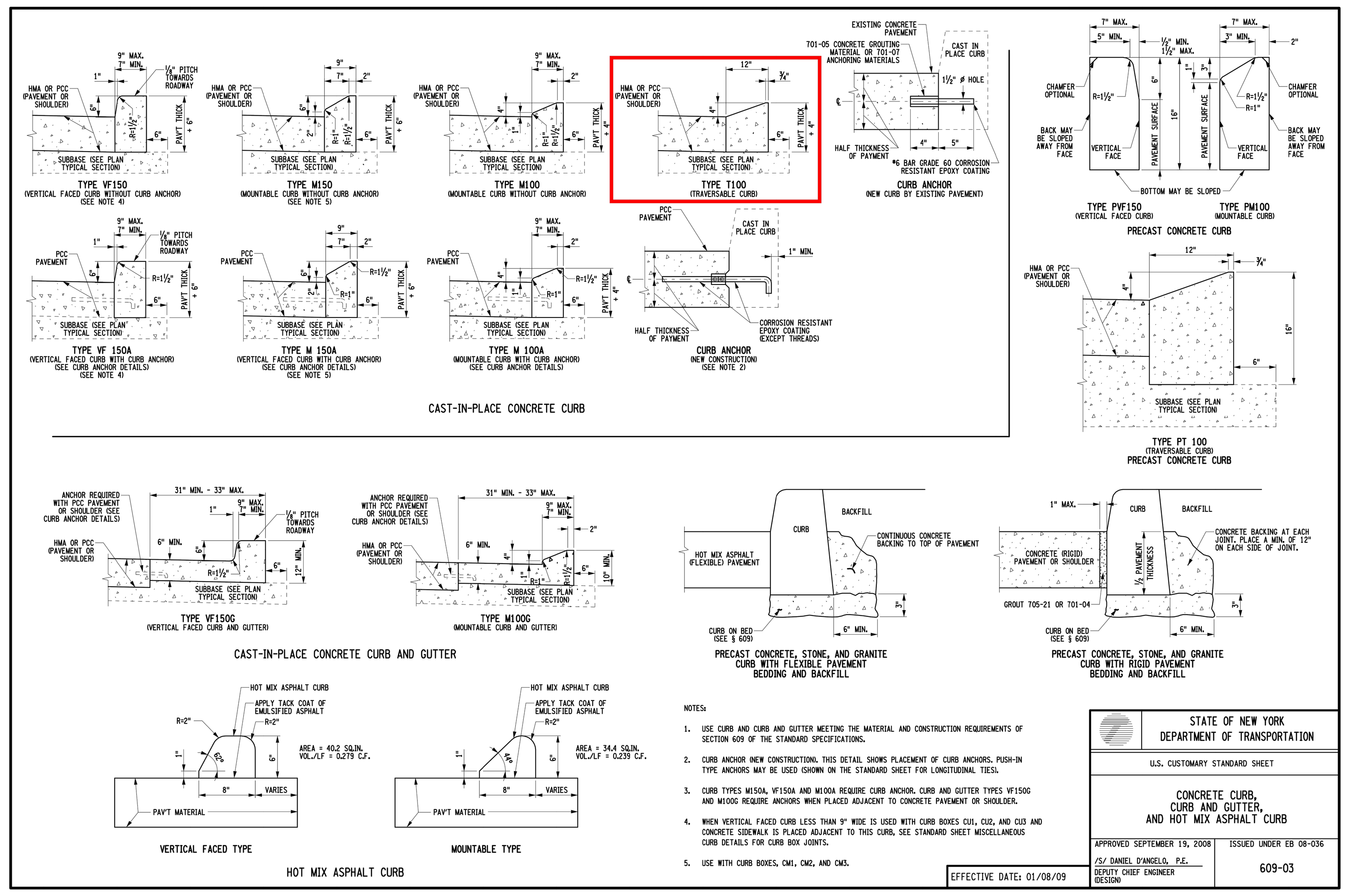
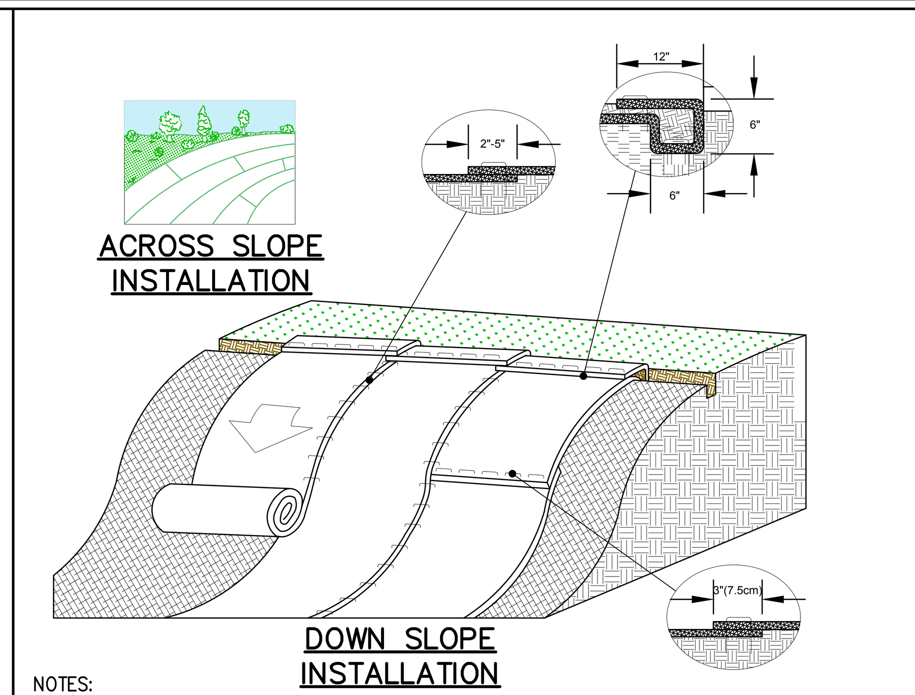
CONSTRUCTION DETAILS

THE SUMMIT CLUB AT ARMONK (RESIDENTIAL PHASE)
568 & 570 BEDFORD ROAD (NY–22)
TOWN OF NORTH CASTLE, NEW YORK

Drawn: NC Approved: AG
Scale: NOT TO SCALE
Date: 11/23/2020
Project No: 20101
20101-DETAILS DET–4 –
Drawing No: C–903



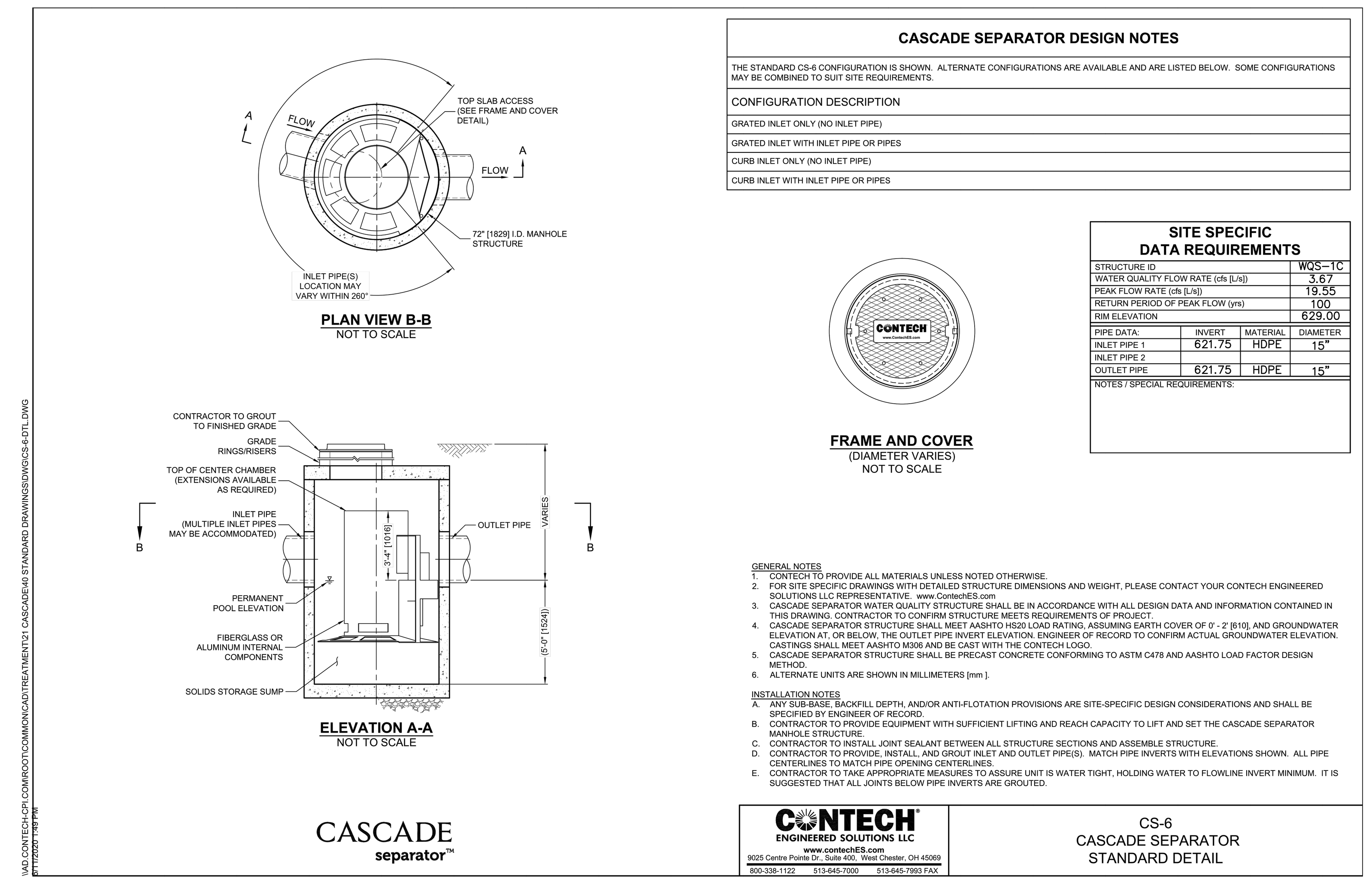
4" MOUNTABLE CONCRETE CURB | 53



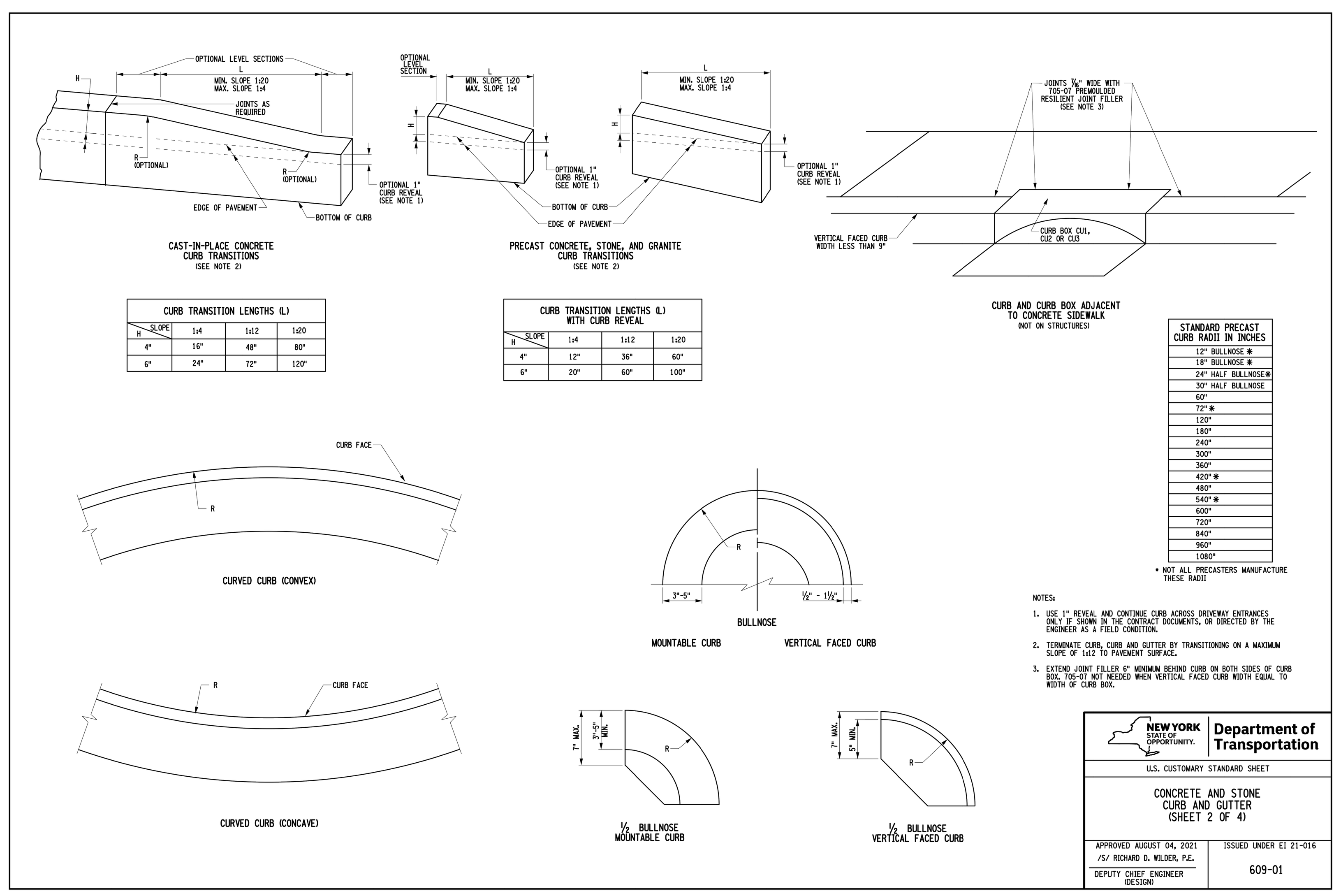
NOTES:

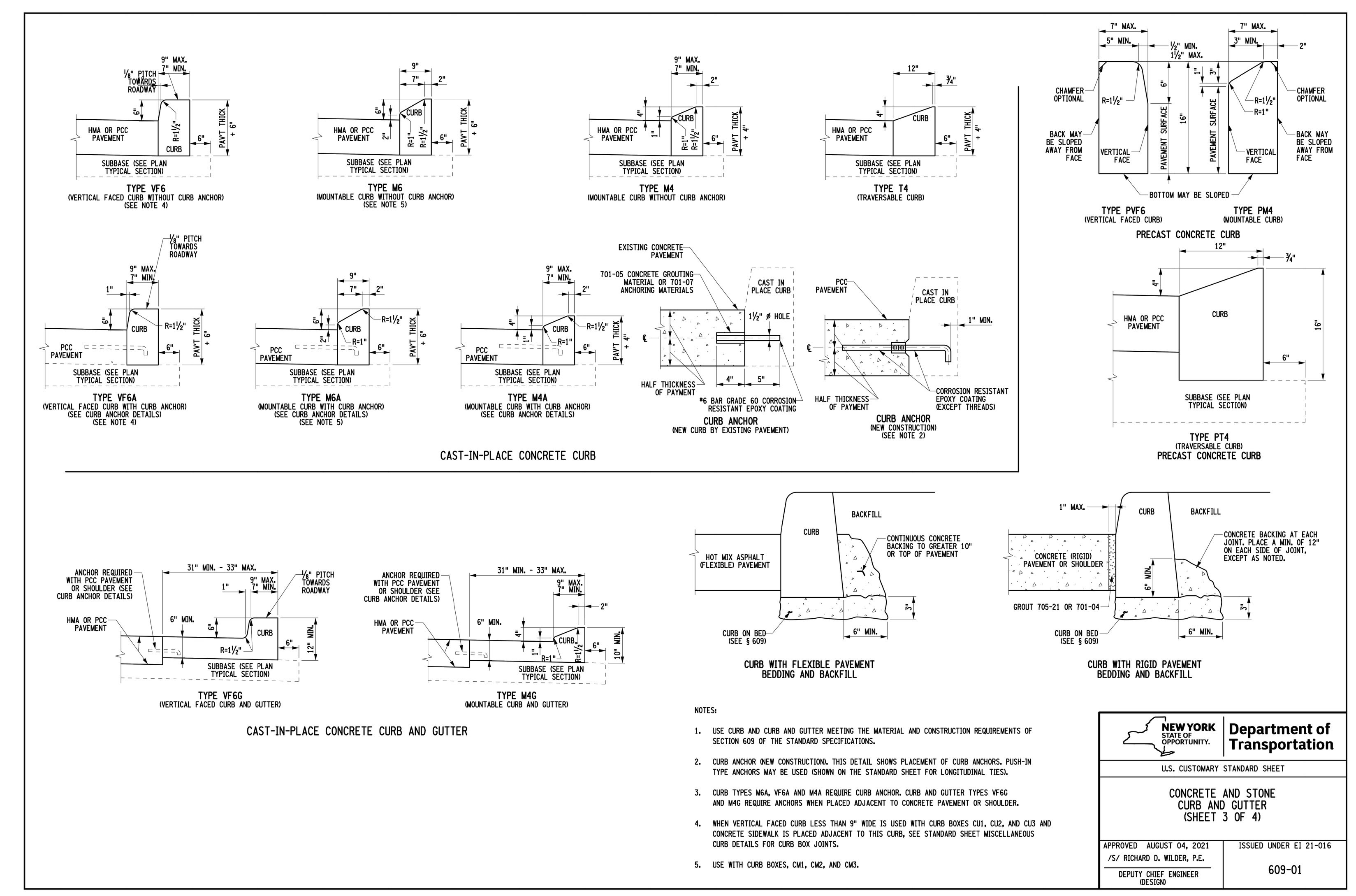
1. PREPARE SOIL BEFORE INSTALLING ROLLED EROSION CONTROL PRODUCTS (RECPS), INCLUDING ANY NECESSARY APPLICATION OF LIME, FERTILIZER, AND SEED.
2. BEGIN AT THE TOP OF THE SLOPE BY ANCHORING THE RECPS IN A 6" DEEP X 6" WIDE TRENCH WITH APPROXIMATELY 12" OF RECPS EXTENDED BEYOND THE UP-SLOPE PORTION OF THE TRENCH. ANCHOR THE RECPS WITH A ROW OF STAPLES/STAKES APPROXIMATELY 12" APART IN THE BOTTOM OF THE TRENCH. BACKFILL AND COMPACT THE TRENCH AFTER STAPLING. APPLY SEED TO THE COMPACTED SOIL AND FOLD THE REMAINING 12" PORTION OF RECPS BACK OVER THE SEED AND COMPACTED SOIL. SECURE RECPS OVER COMPACTED SOIL WITH A ROW OF STAPLES/STAKES SPACED APPROXIMATELY 12" APART ACROSS THE WIDTH OF THE RECPS.
3. ROLL THE RECPS EITHER DOWN OR HORIZONTALLY ACROSS THE SLOPE. RECPS WILL UNROLL WITH APPROPRIATE SIDE AGAINST THE SOIL SURFACE. ALL RECPS MUST BE SECURELY FASTENED TO SOIL SURFACE BY PLACING STAPLES/STAKES IN APPROPRIATE LOCATIONS AS SHOWN IN THE STAPLE PATTERN GUIDE.
4. THE EDGES OF PARALLEL RECPS MUST BE STAPLED WITH APPROXIMATELY 2" – 5" OVERLAP DEPENDING ON THE RECPS TYPE.
5. CONSECUTIVE RECPS SPLICED DOWN THE SLOPE MUST BE END OVER END (SHINGLE STYLE) WITH AN APPROXIMATE 3" OVERLAP. STAPLE THROUGH OVERLAPPED AREA, APPROXIMATELY 12" APART ACROSS ENTIRE RECPS WIDTH.
6. IN LOOSE SOIL CONDITIONS, THE USE OF STAPLE OR STAKE LENGTHS GREATER THAN 6" MAY BE NECESSARY TO PROPERLY SECURE THE RECP'S.
7. MATERIAL FOR THE RECP SHALL BE EAST COAST EROSION CONTROL ECS-2B BIODEGRADABLE DOUBLE NET STRAW OR APPROVED EQUAL.

ROLLED EROSION CONTROL MATTING | 54

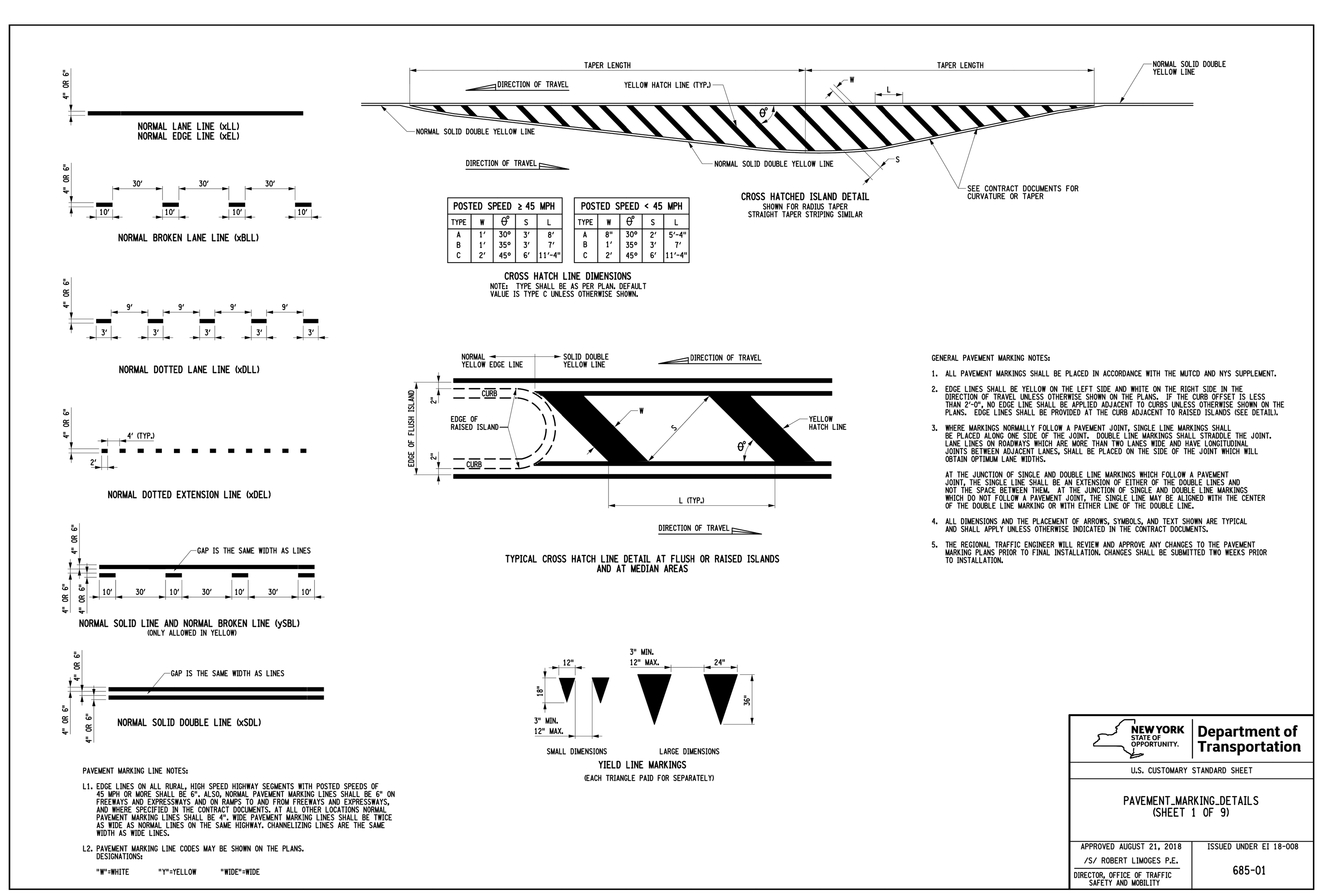


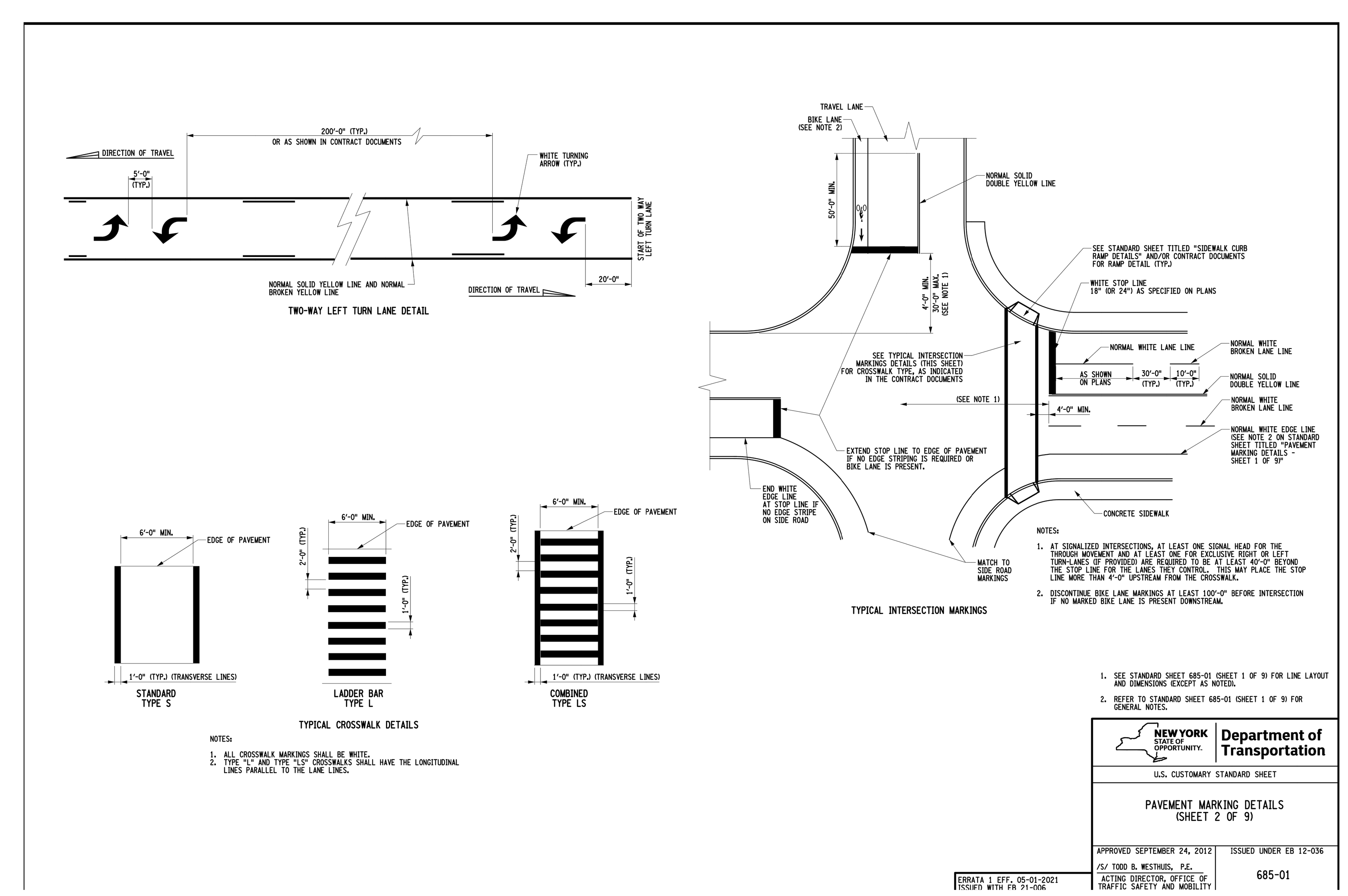
WQS-1C | 55





NYSDOT CURB DETAILS | 56 | X





APPROVED BY TOWN OF NORTH CASTLE PLANNING BOARD RESOLUTION, DATED ______

______ DATE: ______

CHRISTOPHER CARTHY, CHAIRMAN,
TOWN OF NORTH CASTLE PLANNING BOARD

ENGINEERING DRAWINGS REVIEWED BY TOWN CONSULTING ENGINEER

______ DATE: ______

JOSEPH M. CERMELE, P.E.
KELLARD SESSIONS CONSULTING, P.C.
CONSULTING TOWN ENGINEER

NYSDOT PAVEMENT MARKING DETAILS | 57 | X

No.	Revision	Date	By
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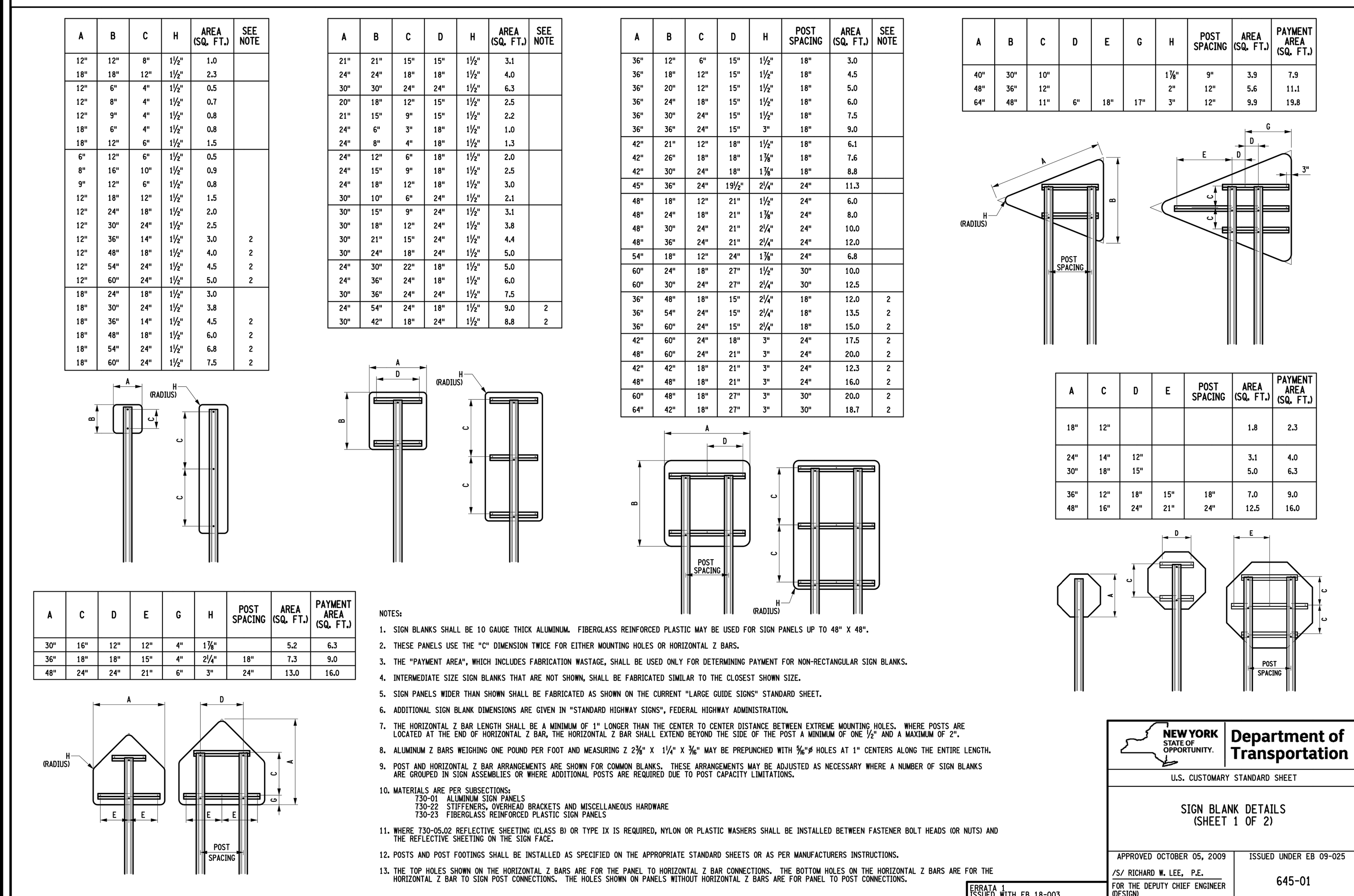
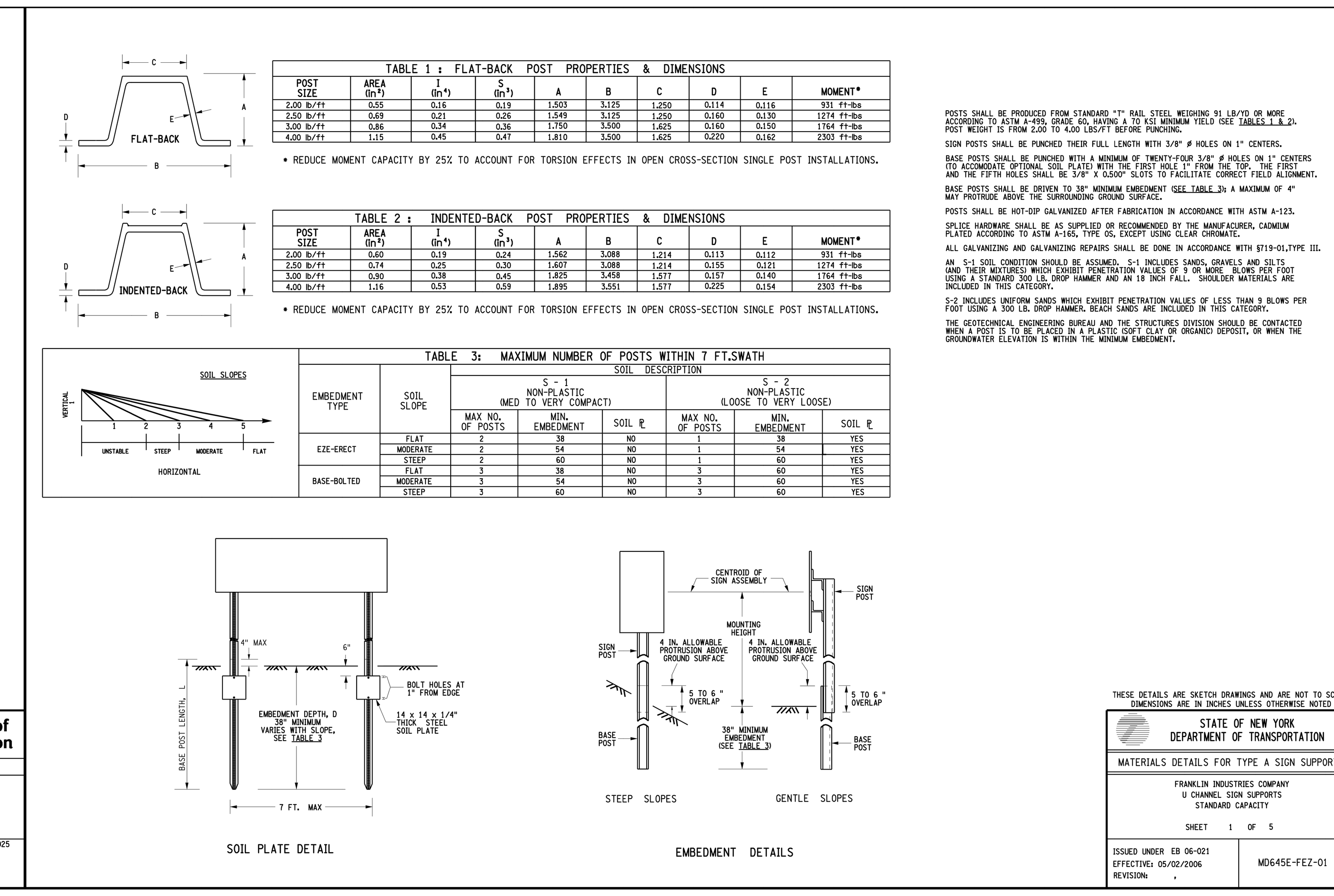
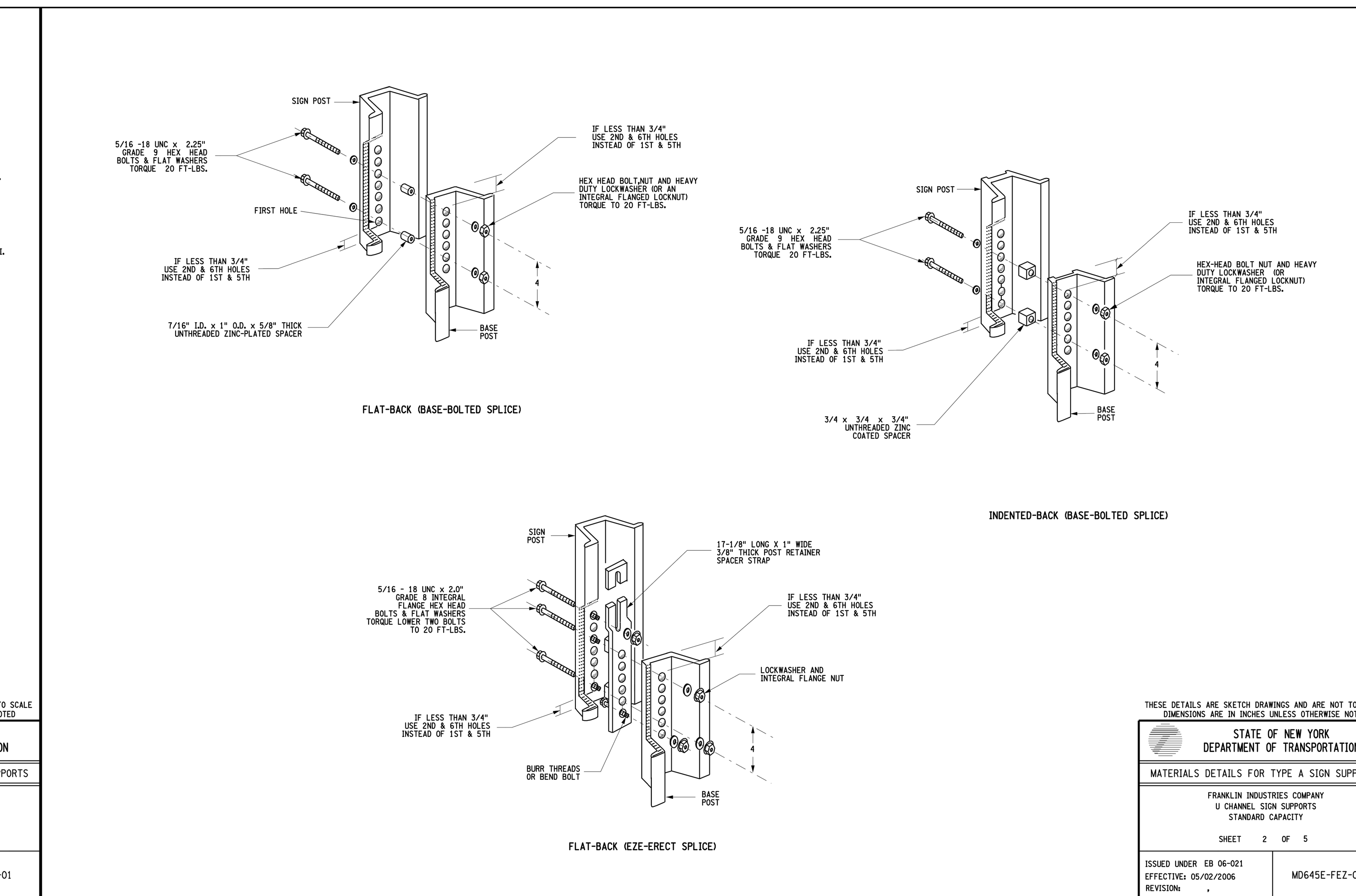
Project No: 20101
20101-DETAILS DET-5 –
Drawing No: C-904







NYSDOT TRAFFIC SIGN DETAILS

58

X X X X X

X X X X X

APPROVED BY TOWN OF NORTH CASTLE PLANNING BOARD RESOLUTION, DATED ________

________ DATE: ________

CHRISTOPHER CARTHY, CHAIRMAN,
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Project No:	20101
Drawing No:	C-905

ZONING COMPLIANCE CHART

SECTION 101.02, BLOCK 1, LOT 28.1 & 28.2 (2/08/7.C1A)
ZONES "R-2A" – "ONE FAMILY RESIDENCE DISTRICT (2 ACRES)"
"GCCFO"– "GOLF COURSE COMMUNITY FLOATING OVERLAY DISTRICT"
PROPOSED USE: GOLF COURSE COMMUNITY
FIRE/AMBULANCE DISTRICT: ARMONK FIRE DEPARTMENT (NORTH CASTLE DISTRICT #2)
WATER DISTRICT: NORTH CASTLE WATER DISTRICT #2
SCHOOL DISTRICT: BYRAM HILLS CENTRAL SCHOOL DISTRICT
SEWER DISTRICT: ON-SITE SEWAGE TREATMENT PLANT (SPDES PERMIT)

DESCRIPTION	REQUIRED/ PERMITTED (R-2A)	REQUIRED/ PERMITTED (GCCFO)	EXISTING	PROPOSED/ PROVIDED (LOT 1) (9)	PROPOSED/ PROVIDED (LOT 2)	PROPOSED/ PROVIDED (LOT 3)	PROPOSED/ PROVIDED (LOT 4)
LOT AREA (ACRES)	2.0 MIN. (1)	SEE NOTE 1	±156.30 (5)	±135.34	±20.96	±2.95	±0.25
LOT STREET FRONTAGE (FEET)	150 MIN. (1)	SEE NOTE 1	1,519.70	1,519.70 (1)	1,519.70 (1)	1,519.70 (1)	1,519.70 (1)
LOT WIDTH (FEET)	150 MIN. (1)	SEE NOTE 1	±2,300	±2,300 (1)	±2,300 (1)	±2,300 (1)	±2,300 (1)
LOT DEPTH (FEET)	150 MIN. (1)	SEE NOTE 1	±1,805	±1,805 (1)	±1,805 (1)	±1,805 (1)	±1,805 (1)
PRINCIPAL BUILDING MINIMUM YARDS (FEET)							
FRONT	50 (1)	SEE NOTE 1	±123.1	±313.72 (1)	±252.91 (1)	±817.74 (1)	±1,132.50 (1)
SIDE	30 (1)	SEE NOTE 1	±287.8	±99.78 (1)	±110.68 (1)	±1,468.17 (1)	±1,869.34 (1)
REAR	50 (1)	SEE NOTE 1	±1,645.5	±1,755.63 (1)	±874.18 (1)	±1,095.77 (1)	±1,249.79 (1)
MAXIMUM BUILDING COVERAGE (%)	8 (1)	3.5 (1)	0.72 (6)	0.33 (1)(7)	1.33 (1)(7)	0.01 (1)(7)	0.01 (1)(7)
MAXIMUM BUILDING HEIGHT (STORIES / FEET)	NA / 30	3 / 39.5 (2)	3 / < 39.5	3 / < 39.5	3 / < 39.5	3 / < 39.5	3 / < 39.5
PARKING SPACES							
STANDARD PARKING SPACES	2 PER DWELLING UNIT	SEE NOTE 3	–	124/160 (8)	168	–	–
ACCESSIBLE PARKING SPACES	N/A	–	–	5/8 (8)	12	–	–
COMPACT PARKING SPACES	N/A	–	–	–/72 (8)	–	–	–
TOTAL PARKING SPACES	2 PER DWELLING UNIT	–	180	129/240 (8)	180	–	–
LOADING SPACES	N/A	SEE NOTE 4	–	1	1	–	–

NOTES:

1. IN THE GCCFO DISTRICT, THE LOT, DIMENSIONAL, AND PARKING REQUIREMENTS FOR A GOLF COURSE COMMUNITY IN THIS SECTION SHALL SUPERSEDE THE SCHEDULE OF RESIDENCE DISTRICT REGULATIONS (§ 355-21 OF THIS CHAPTER). LOT SIZE, LOT CONFIGURATION AND OTHER LOT DIMENSIONAL REQUIREMENTS WITHIN A GCCFO DISTRICT SHALL BE DETERMINED BY THE PLANNING BOARD IN CONJUNCTION WITH SUBDIVISION APPROVAL. LOT SIZE, LOT CONFIGURATION AND OTHER LOT DIMENSIONAL REQUIREMENTS OF LOTS WITHIN A GCCFO DISTRICT SHALL BE BASED UPON THE PLANNING BOARD'S CONSIDERATION OF THE CHARACTER OF THE NEIGHBORHOOD IN WHICH THE GCCFO DISTRICT WILL BE LOCATED; THE GCCFO DISTRICT'S RELATIONSHIP TO ADJOINING DISTRICTS, PROPERTIES AND LAND USES; THE GCCFO DISTRICT'S TOPOGRAPHY; AND SUCH OTHER FACTORS THE PLANNING BOARD MAY DETERMINE TO BE APPROPRIATE. THE LOTS AND/OR PARCELS THAT TOGETHER COMPRISE A GOLF COURSE COMMUNITY SITE ARE NOT REQUIRED TO BE CONTIGUOUS, PROVIDED THAT EACH SUCH LOT AND/OR PARCEL ADJOINS THE AFFILIATED MEMBERSHIP CLUB. ALL LOT, DIMENSIONAL, AND PARKING REQUIREMENTS IN THIS SECTION, INCLUDING BUT NOT LIMITED TO MAXIMUM DENSITY, MAXIMUM BUILDING COVERAGE, MINIMUM YARDS AND REQUIRED OFF-STREET PARKING, SHALL APPLY TO THE LAND AREA IN THE GCCFO DISTRICT AS A WHOLE, NOTWITHSTANDING THAT THE GOLF COURSE COMMUNITY SITE MAY BE COMPRISED OF MORE THAN ONE LOT AND/OR PARCEL, OR THAT THE SITE MAY FROM TIME TO TIME BE SUBDIVIDED OR RESUBDIVIDED, AND ALL DETERMINATIONS AND CALCULATIONS RELATING TO SUCH REQUIREMENTS SHALL BE MADE WITH REFERENCE TO THE BOUNDARIES OF THE ENTIRE LAND AREA IN THE GCCFO DISTRICT AND AS THOUGH SUCH AREA IS A SINGLE LOT (AS DEFINED IN § 355-4 OF THIS CHAPTER), EVEN THOUGH IT IS OR WILL BE COMPRISED OF MORE THAN ONE LOT AND/OR PARCEL.
2. THE MAXIMUM BUILDING HEIGHT SHALL BE THREE STORIES AND 39 1/2 FEET TO THE MEAN LEVEL OF THE PRIMARY ROOF, MEASURED FROM THE LEVEL OF THE FINISHED GRADE AT THE MAIN ENTRY TO THE BUILDING.
3. RESIDENTIAL PARKING CALCULATIONS

   MARKET-RATE DWELLING UNITS REQUIREMENT: "OTHER MULTIFAMILY DWELLING UNITS": 2 FOR EACH DWELLING UNIT, PLUS ½ FOR EACH BEDROOM IN EXCESS OF 2, PLUS 10% VISITOR PARKING.

   65 TOTAL MARKET-RATE DWELLING UNITS: (49) 2-BEDROOM UNITS, (16) 3-BEDROOM UNITS
   65 (DWELLING UNITS) X 2 = 130 PARKING SPACES
   16 (3-BEDROOM UNITS) X .5 = 8 PARKING SPACES
   10% VISITOR PARKING: 138 X .10 = 13.8 (14) PARKING SPACES
   TOTAL REQUIRED PARKING FOR MARKET-RATE UNITS: 152 PARKING SPACES

   AFFH DWELLING UNITS REQUIREMENT: "MIDDLE-INCOME DWELLING UNITS AND AFFH UNITS": 1 FOR EACH DWELLING UNIT, PLUS ½ FOR EACH BEDROOM.

   7 TOTAL AFFH DWELLING UNITS: (5) 2-BEDROOM UNITS, (2) 3-BEDROOM UNITS
   7 (DWELLING UNITS) X 1 = 7 PARKING SPACES
   16 (TOTAL BEDROOMS) X .5 = 8 PARKING SPACES
   TOTAL REQUIRED PARKING FOR MARKET-RATE UNITS: 15 PARKING SPACES

   GOLF COURSE/CLUB PARKING CALCULATIONS

   GOLF COURSE/CLUB REQUIREMENT: "GOLF OR COUNTRY CLUBS": 1 FOR EACH 3 MEMBERS, PLUS 1 FOR EACH 3 SEATS IN THE MEETING AND/OR DINING ROOMS.

   600 TOTAL MEMBERSHIPS:
   600 (MEMBERSHIPS) / 3 = 200 PARKING SPACES
   286 TOTAL SEATS: (232 RESTAURANT SEATS + 54 BAR SEATS)
   286 (SEATS) / 3 = 95.3 (96) = PARKING SPACES
   TOTAL REQUIRED PARKING FOR GOLF COURSE/CLUB: 296 PARKING SPACES

   TOTAL REQUIRED PARKING: 167 RESIDENTIAL + 296 GOLF COURSE/CLUB = 463 SPACES
   TOTAL PROVIDED PARKING: 180 RESIDENTIAL + 240 GOLF COURSE/CLUB + 65 GOLF CLUB RESIDENT CREDIT (1 SPACE/UNIT) = 485 SPACES
4. FOR WHOLESALE BUSINESS, INDUSTRY, STORAGE, WAREHOUSE AND OTHER COMMERCIAL ESTABLISHMENTS, A MINIMUM OF ONE SPACE FOR EACH ESTABLISHMENT, AND ONE ADDITIONAL SPACE FOR EACH 10,000 SQUARE FEET OF GROSS FLOOR AREA OR MAJOR PORTION THEREOF IN EXCESS OF 4,000 SQUARE FEET OF GROSS FLOOR AREA.
5. CURRENTLY THE GOLF COURSE LOT IS ±135.34 ACRES AND THE RESIDENTIAL LOT IS ±20.96 ACRES.
6. TOTAL EXISTING BUILDING COVERAGE CALCULATED BASED ON ALL EXISTING BUILDINGS ON THE PROPERTY, INCLUDING PREVIOUSLY DEMOLISHED STRUCTURES.
7. BUILDING COVERAGE BREAKDOWN:

   LOT 1: (FUTURE GOLF COURSE PHASE)

   CLUBHOUSE BUILDING: ±8,070.06 S.F.
   COTTAGES: 10 X 1,500.00 S.F.

   TOTAL LOT 1 BUILDING COVERAGE: ±23,070.06 S.F.

   LOT 2:

   RESIDENTIAL AMENITIES BUILDING: ±2,939.39 S.F.
   RESIDENTIAL BUILDINGS: 6 X ±14,420.17 S.F.
   GATE HOUSE: ±903 S.F.
   TENNIS PAVILION: ±375 S.F.

   TOTAL LOT 2 BUILDING COVERAGE: ±90,738.41 S.F.

   LOT 3:

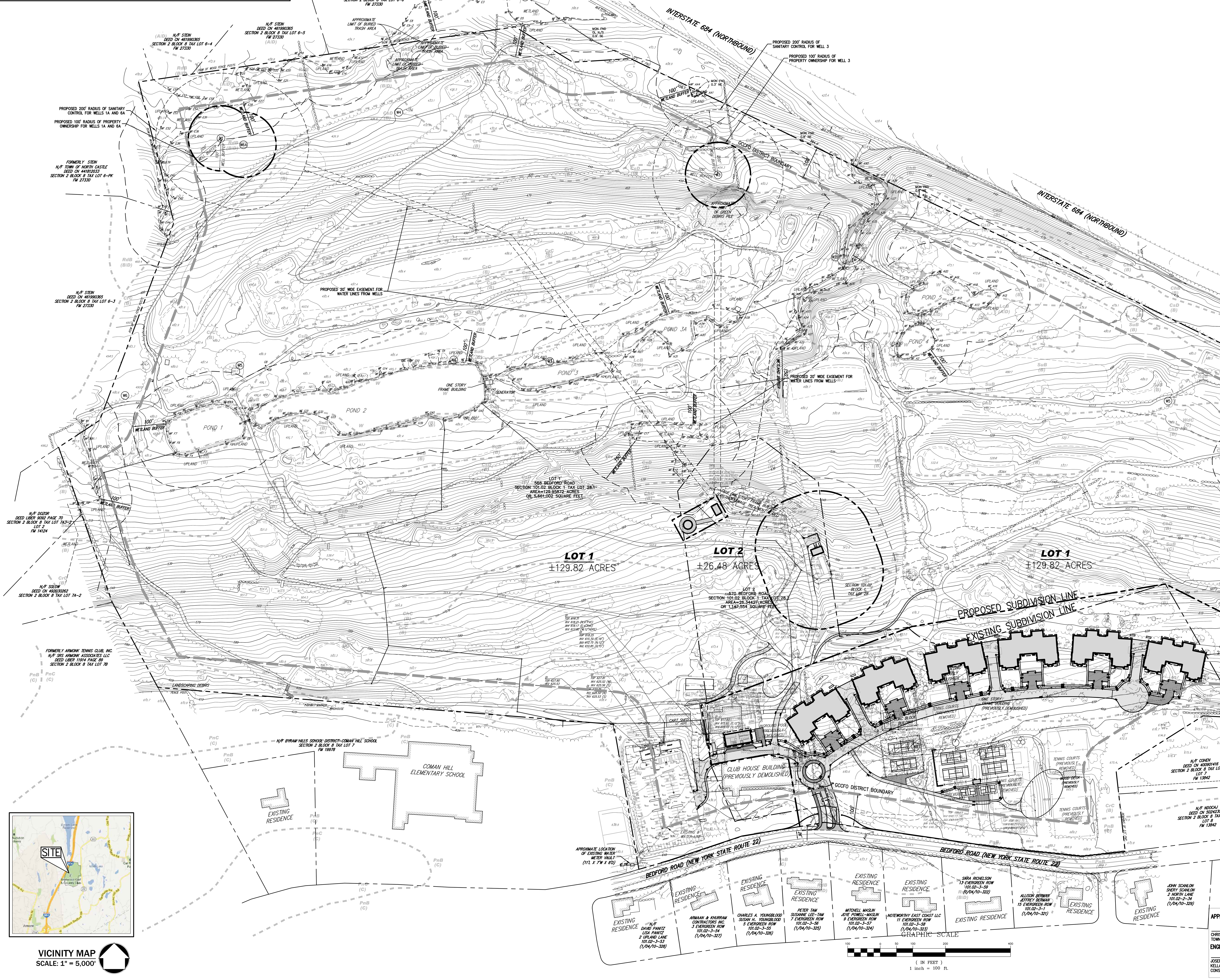
   SEWAGE TREATMENT PLANT: ±699.58 S.F.

   TOTAL LOT 3 BUILDING COVERAGE: ±699.58 S.F.

   LOT 4:

   WATER TREATMENT BUILDING: ±640.00 S.F.
   WATER HOLDING TANK: ±571.36 S.F.

   TOTAL LOT 4 BUILDING COVERAGE: ±1,211.36 S.F.
8. THE PROPOSED/PROVIDED PARKING COUNT IS BASED ON THE TEMPORARY CLUBHOUSE FACILITIES INSTALLED/CONSTRUCTED IN 2021.
9. ANTICIPATED DEVELOPMENT SCOPE FOR FUTURE GOLF COURSE PHASE.



VICINITY MAP
SCALE: 1" = 5,000'

NOT FOR CONSTRUCTION

LEGEND

- EXISTING PROPERTY LINE
- ADJACENT PROPERTY LINE
- LIMIT OF REGULATED WETLAND BUFFER AREA
- EXISTING WETLAND LINE AND DELINEATION
- EXISTING BUILDING LINE
- EXISTING PAVEMENT EDGE
- EXISTING CURB LINE
- EXISTING STONE WALL
- EXISTING RETAINING WALL
- EXISTING GUIDE RAIL
- EXISTING FENCE
- EXISTING TREE
- EXISTING TREE LINE
- EXISTING GREEN-WASTE DEBRIS PILE

NOTES:

1. EXISTING CONDITIONS DEPICTED ON THIS PLAN HAVE BEEN TAKEN FROM SURVEY TITLED, "SURVEY OF PROPERTY," PREPARED BY JMC, LAST REVISED 02/28/2013, SUPPLEMENTED WITH AN UPDATED SURVEY LAST REVISED 01/17/2022. PORTIONS OF EXISTING TOPOGRAPHY HAVE BEEN PROVIDED BY WESTCHESTER COUNTY GIS.

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568 & 570 BEDFORD ROAD (NY-22)
TOWN OF NORTH CASTLE, NEW YORK

APPROVED BY TOWN OF NORTH CASTLE PLANNING BOARD RESOLUTION, DATED ________

________ DATE: ________
CHRISTOPHER CARTHY, CHAIRMAN,
TOWN OF NORTH CASTLE PLANNING BOARD

ENGINEERING DRAWINGS REVIEWED BY TOWN CONSULTING ENGINEER

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JOSEPH M. CERMELE, P.E.
KELLARD SESSIONS CONSULTING, P.C.
CONSULTING TOWN ENGINEER

Drawn: DK	Approved: AG
Scale: 1" = 100'	
Date: 11/23/2020	
Project No: 20101	
20101-SUBDIVISION PRELIM SUBDIV PLAT EXIST-SUB.scr	
Drawing No: PSP-1	

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- EXISTING CONTOUR
- EXISTING INDEX CONTOUR
- EXISTING STONE WALL
- EXISTING RETAINING WALL
- EXISTING GUIDE RAIL
- EXISTING FENCE
- EXISTING TREE
- EXISTING TREE LINE
- EXISTING STORM DRAIN LINE
- EXISTING SANITARY LINE
- EXISTING WATER LINE
- EXISTING GAS LINE
- EXISTING OVERHEAD WIRES
- EXISTING ELECTRIC LINE
- EXISTING DRAIN INLET
- EXISTING MANHOLE
- EXISTING FIRE HYDRANT
- EXISTING GAS VALVE
- EXISTING WATER VALVE
- EXISTING UTILITY POLE
- EXISTING LIGHT POLE
- EXISTING SIGN
- TOWN-REGULATED STEEP SLOPES
- EXISTING WELL LOCATION AND DESIGNATION
- EXISTING GREEN-WASTE DEBRIS PILE

NOTES:

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Drawn: JE	Approved: AG
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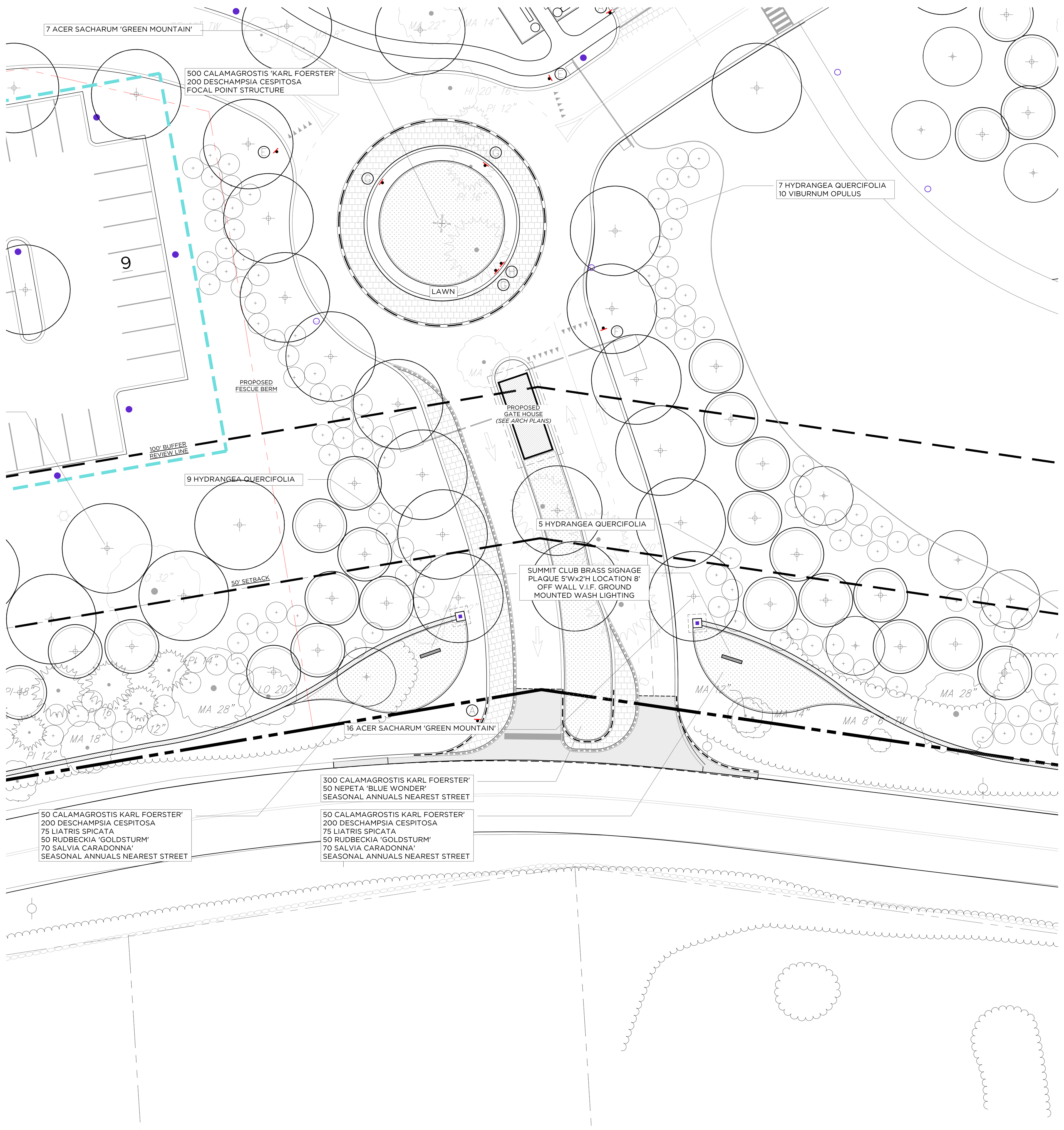
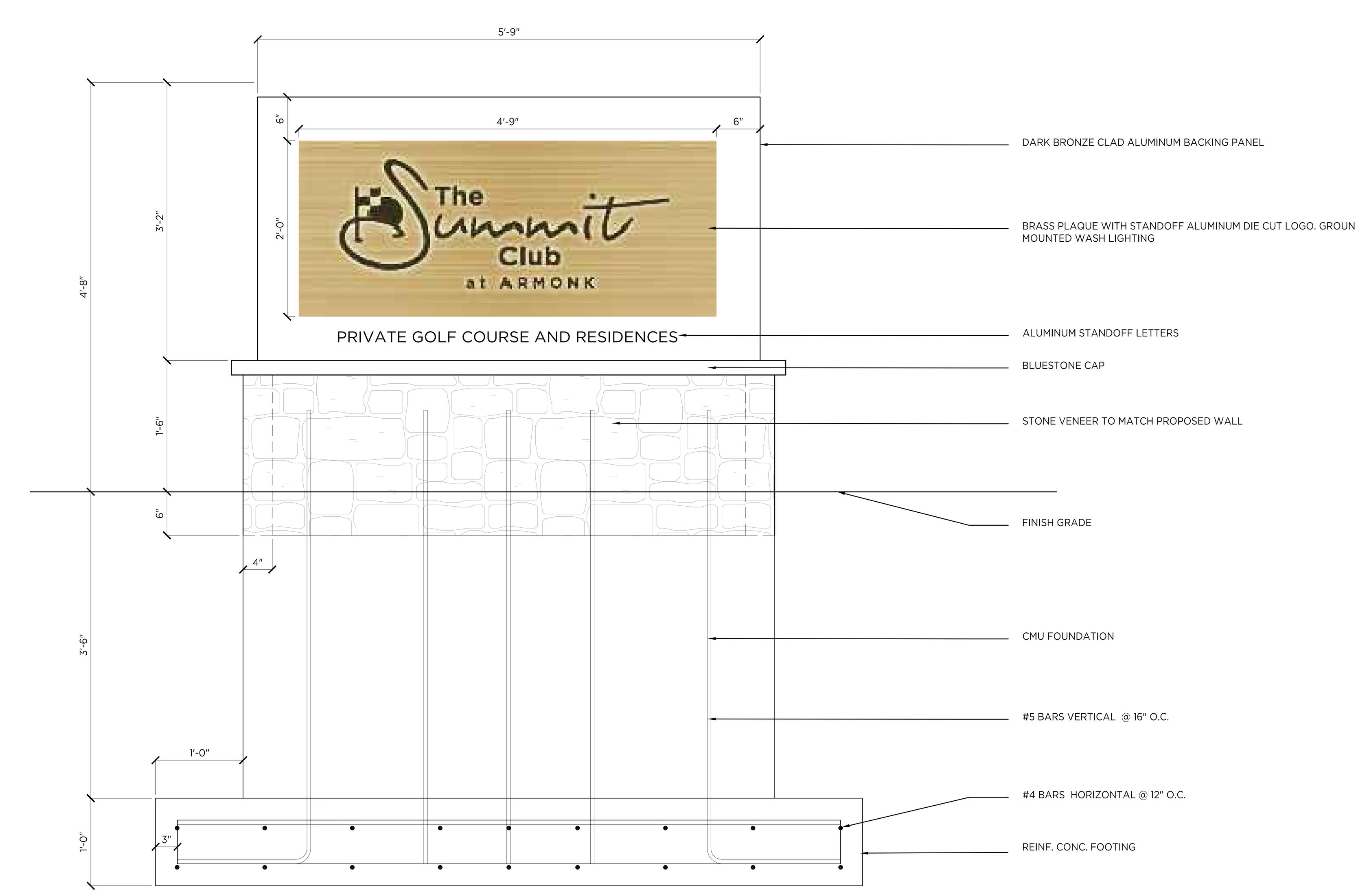
Drawing No: IPP-1	

NOT FOR CONSTRUCTION



PARTIAL SITE PLAN - ENTRY SIGNAGE

1" = 20'-0"



NOTES:
- PROVIDE SHOP DRAWINGS FOR APPROVAL
- FINAL LOCATION TO BE DETERMINED IN FIELD

1 ENTRY MONUMENT SIGNAGE DETAL

SCALE: 1" = 1' - 0"

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203.625.9460
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CONSULTANTS
Landscape Architect:
Granoff Architects
330 Railroad Ave
Greenwich, CT, 06830

Civil:
JMC Site Development Consultants
120 Bedford Road
Armonk, NY, 10504

REVISIONS

#	DATE	REVISION DESCRIPTION	BY:
1	11.23.20	PLANNING BOARD SUBMISSION	KA
2	01.11.21	ARB SUBMISSION	KA
3	03.08.21	ARB SUBMISSION	KA
4	05.09.21	ARB SUBMISSION	KA
5	06.14.21	PLANNING BOARD SUBMISSION	KA
6	07.12.21	PLANNING BOARD SUBMISSION	KA
7	11.23.21	EDIT, PROSHOP LAYOUT SCHEM	JS
8	1.10.22	PLANNING BOARD SUBMISSION	KA
9	3.28.22	PLANNING BOARD SUBMISSION	KA
10	4.15.22	SPA TERRACE EDIT	JS
11	5.9.22	SIGNAGE DETAIL	JS

PHASE

SUBMITAL

PROJECT NAME

SUMMIT CLUB PARTNERS LLC

ARMONK, NY

JOB NO.: **20035**

DRAWN BY: **JS** PROJ. MANAGER: **KA**

DATE: **03.28.22** SCALE:

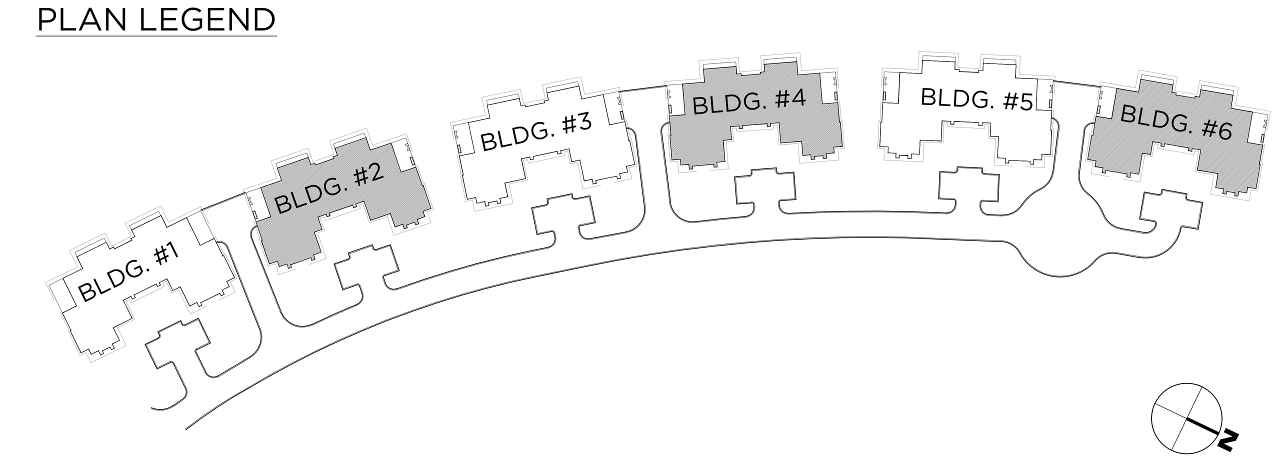
DRAWING TITLE

ENTRY SIGNAGE

DRAWING NO.

LS102.1

PLAN LEGEND



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REVISIONS

#	DATE	REVISION DESCRIPTION	BY:
1	03/28/2022	PLANNING BOARD SUBMISSION	KA
2	05/09/2022	PLANNING BOARD SUBMISSION	KA

PHASE

PLANNING BOARD SUBMISSION

PROJECT NAME

SUMMIT CLUB PARTNERS LLC - RESIDENCES

ARMONK, NY

JOB NO.: ----

DRAWN BY: JT   PROJ. MANAGER: KA

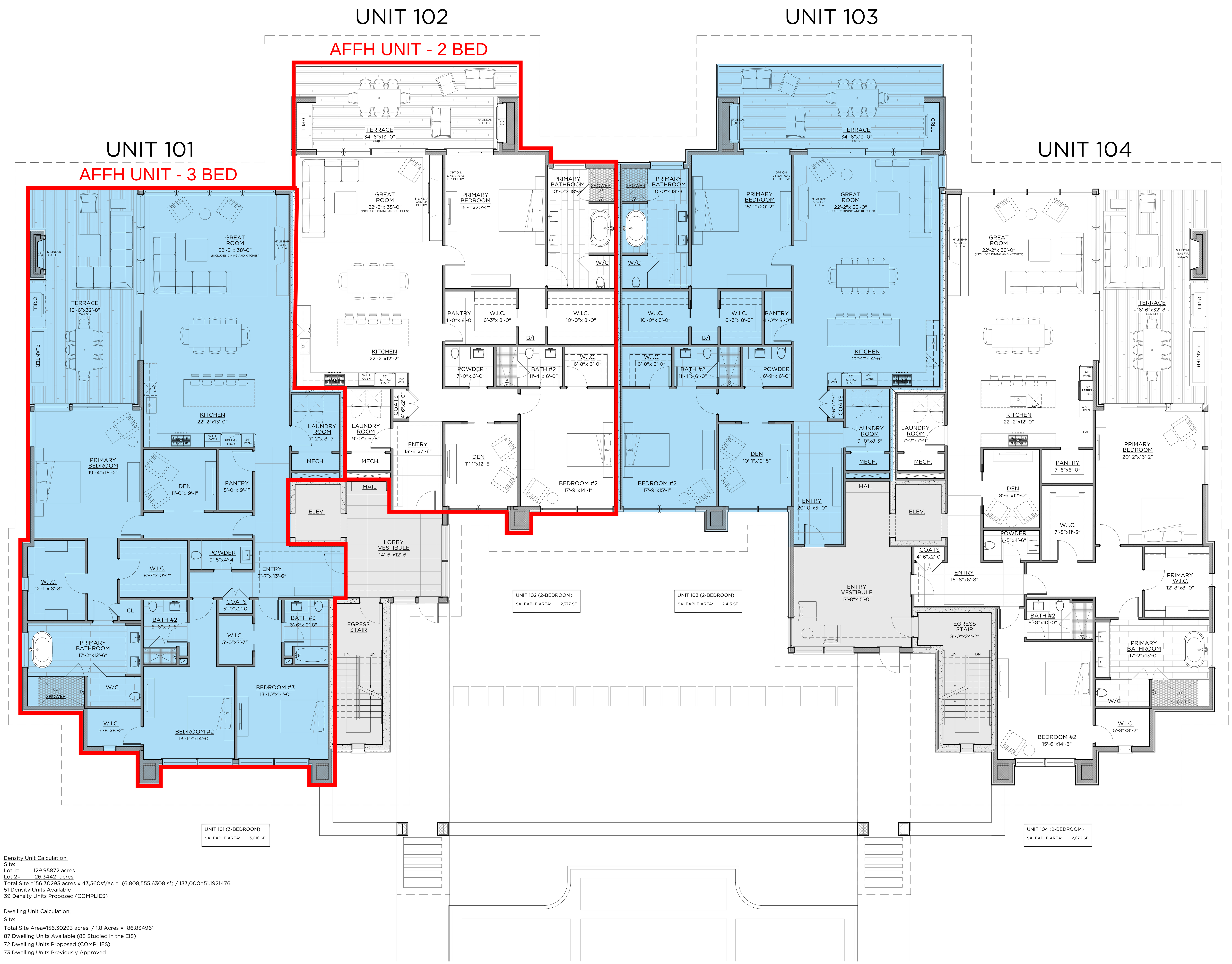
DATE: 05/09/2022   SCALE: AS NOTED

DRAWING TITLE

GARAGE LEVEL PLAN

DRAWING NO.

A-100.A



Density Unit Calculation:
Site:
Lot 1= 129.95872 acres
Lot 2= 26.34421 acres
Total Site =156.30293 acres x 43,560sf/ac = (6,808,555.6308 sf) / 133,000=51.1921476
51 Density Units Available
39 Density Units Proposed (COMPLIES)

Dwelling Unit Calculation:
Site:
Total Site Area=156.30293 acres / 1.8 Acres = 86.834961
87 Dwelling Units Available (88 Studied in the EIS)
72 Dwelling Units Proposed (COMPLIES)
73 Dwelling Units Previously Approved

Minimum Unit Sizes:
Market Rate Units
Efficiency: 450 sf Min. N/A
One-Bedroom: 700 sf Min. N/A
Two-Bedroom: 900 sf 2,377 sf is smallest (complies)
Three-Bedroom: 1,100 sf 2,997 sf is smallest (complies)
AFFH Units***
Efficiency: 450 sf Min. N/A
One-Bedroom: 700 sf Min. N/A
Two-Bedroom: 900 sf 2,377 sf is smallest (complies)
Three-Bedroom: 1,100 sf 2,997 sf is smallest (complies)

***AFFH UNITS IDENTICAL TO MARKET RATE UNITS.

Density Unit Definition:
A density unit is defined as being equal to one or a proportionate combination of the following:

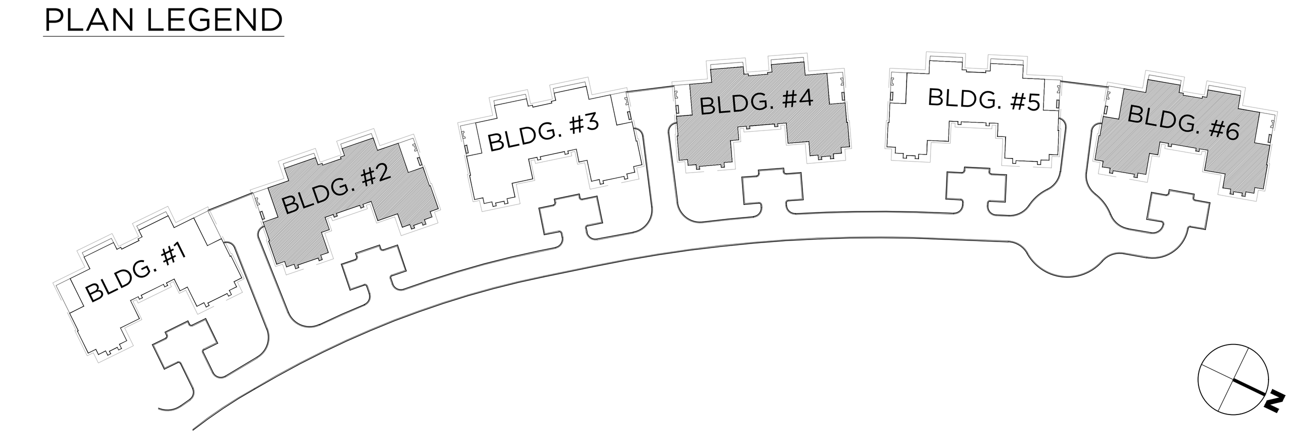
A. One one-family detached dwelling unit.
B. One dwelling unit containing four or more bedrooms in a permitted type of dwelling other than a one-family detached unit.
C. One and one-half dwelling units containing three bedrooms each in permitted dwellings other than one-family detached units.
D. Two dwelling units containing two bedrooms each in permitted dwellings other than one-family detached units.
E. Two and one-half dwellings containing one bedroom or less each in permitted dwellings other than one-family detached units.
F. Three efficiency dwelling units in permitted dwellings other than one-family detached units

[2]Density. The maximum permitted density shall not exceed one density unit, as defined in § 355-4 of this chapter, per 133,000 square feet of the aggregate total lot area (as defined in § 355-4 of this chapter) in the GCCFO District and one dwelling unit, as defined in § 355-4 of this chapter, per 1.8 acres of the aggregate total lot area (as defined in § 355-4 of this chapter) in the GCCFO District.
[2]
Editor's Note: Former Subsection D(1), regarding lots and dwelling units in the GCCFO District, was repealed 3-27-2019 by L.L. No. 2-2019. This local law also renumbered former Subsections D(2) through D(6) as Subsections D(1) through D(5), respectively

AFFH UNIT MIX

UNIT / BEDROOM COUNT Revised 3-28-22		MARKET RATE Units	AFFH Units	TOTAL bedrooms	
BUILDING 1 (3 STORY)	12 UNITS	(2) 3 BEDROOMS & (9) 2 BEDROOMS	(1) 3 BEDROOM (UNIT 101)	27 BEDROOMS/BLDG	PHASE II
BUILDING 2 (3 STORY)	12 UNITS	(3) 3 BEDROOMS & (8) 2 BEDROOMS	(1) 2 BEDROOM (UNIT 102)	27 BEDROOMS/BLDG	
BUILDING 3 (3 STORY)	12 UNITS	(3) 3 BEDROOMS & (8) 2 BEDROOMS	(1) 2 BEDROOM (UNIT 102)	27 BEDROOMS/BLDG	
BUILDING 4 (3 STORY)	12 UNITS	(2) 3 BEDROOMS & (8) 2 BEDROOMS	(1) 2 BEDROOM (UNIT 102) (1) 3 BEDROOM (UNIT 101)	27 BEDROOMS/BLDG	PHASE I
BUILDING 5 (3 STORY)	12 UNITS	(3) 3 BEDROOMS & (8) 2 BEDROOMS	(1) 2 BEDROOM (UNIT 102)	27 BEDROOMS/BLDG	
BUILDING 6 (3 STORY)	12 UNITS	(3) 3 BEDROOMS & (8) 2 BEDROOMS	(1) 2 BEDROOM (UNIT 102)	27 BEDROOMS/BLDG	
TOTALS	72 UNITS	(16) 3 BEDROOMS & (49) 2 BEDROOMS	(2) 3 BEDROOMS & (5) 2 BEDROOMS	162 BEDROOMS	
		65 MARKET RATE UNITS	7 AFFH UNITS		
DENSITY UNITS	39 UNITS	(18) 3 BEDROOMS = 12 DENSITY UNITS (54) 2 BEDROOMS = 27 DENSITY UNITS	(18 /3) X 2= 12 54 /2 = 27		
DWELLING UNITS	72 UNITS				

PLAN LEGEND



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REVISIONS

#	DATE	REVISION DESCRIPTION	BY:
1	03/28/2022	PLANNING BOARD SUBMISSION	KA
2	05/09/2022	PLANNING BOARD SUBMISSION	KA

PHASE
PLANNING BOARD SUBMISSION

PROJECT NAME
SUMMIT CLUB PARTNERS LLC - RESIDENCES
ARMONK, NY

JOB NO.: ----
DRAWN BY: JT PROJ. MANAGER: KA
DATE: 05/09/2022 SCALE: AS NOTED

DRAWING TITLE
FIRST FLOOR PLAN

DRAWING NO.
A-101.A

<u>Density Unit Calculation:</u>
Site:
Lot 1= 129.95872 acres
Lot 2= 26.34421 acres
Total Site =156.30293 acres x 43,560sf/ac = (6,808,555.6308 sf) / 133,000=51.1921476
51 Density Units Available
39 Density Units Proposed (COMPLIES)

<u>Dwelling Unit Calculation:</u>
Site:
Total Site Area=156.30293 acres / 1.8 Acres = 86.834961
87 Dwelling Units Available (88 Studied in the EIS)
72 Dwelling Units Proposed (COMPLIES)
73 Dwelling Units Previously Approved

<u>Minimum Unit Sizes:</u>
<u>Market Rate Units</u>

Efficiency:	450 sf Min.	N/A
One-Bedroom:	700 sf Min.	N/A
Two-Bedroom:	900 sf	2,377 sf is smallest (complies)
Three-Bedroom:	1,100 sf	2,997 sf is smallest (complies)

<u>AFFH Units***</u>

Efficiency:	450 sf Min.	N/A
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***AFFH UNITS IDENTICAL TO MARKET RATE UNITS.

<u>Density Unit Definition:</u>
A density unit is defined as being equal to one or a proportionate combination of the following:

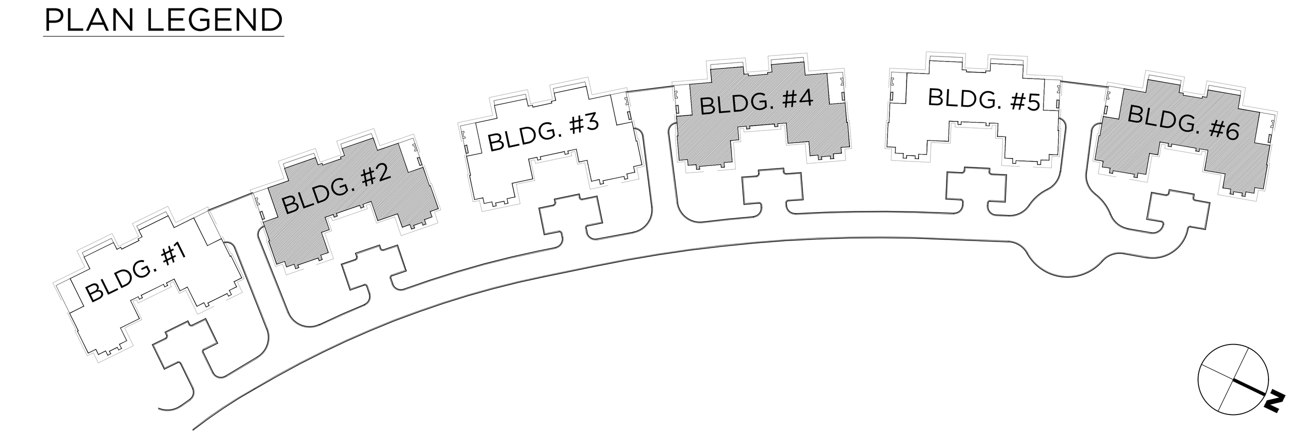
A. One one-family detached dwelling unit.
B. One dwelling unit containing four or more bedrooms in a permitted type of dwelling other than a one-family detached unit.
C. One and one-half dwelling units containing three bedrooms each in permitted dwellings other than one-family detached units.
D. Two dwelling units containing two bedrooms each in permitted dwellings other than one-family detached units.
E. Two and one-half dwellings containing one bedroom or less each in permitted dwellings other than one-family detached units.
F. Three efficiency dwelling units in permitted dwellings other than one-family detached units

[2]Density. The maximum permitted density shall not exceed one density unit, as defined in § 355-4 of this chapter, per 133,000 square feet of the aggregate total lot area (as defined in § 355-4 of this chapter) in the GCCFO District and one dwelling unit, as defined in § 355-4 of this chapter, per 1.8 acres of the aggregate total lot area (as defined in § 355-4 of this chapter) in the GCCFO District.
[2]
Editor's Note: Former Subsection D(1), regarding lots and dwelling units in the GCCFO District, was repealed 3-27-2019 by L.L. No. 2-2019. This local law also renumbered former Subsections D(2) through D(6) as Subsections D(1) through D(5), respectively

UNIT / BEDROOM COUNT Revised 3-28-22		MARKET RATE Units	AFFH Units	TOTAL bedrooms	
BUILDING 1 (3 STORY)	12 UNITS	(2) 3 BEDROOMS & (9) 2 BEDROOMS	(1) 3 BEDROOM (UNIT 101)	27 BEDROOMS/BLDG	PHASE II
BUILDING 2 (3 STORY)	12 UNITS	(3) 3 BEDROOMS & (8) 2 BEDROOMS	(1) 2 BEDROOM (UNIT 102)	27 BEDROOMS/BLDG	
BUILDING 3 (3 STORY)	12 UNITS	(3) 3 BEDROOMS & (8) 2 BEDROOMS	(1) 2 BEDROOM (UNIT 102)	27 BEDROOMS/BLDG	
BUILDING 4 (3 STORY)	12 UNITS	(2) 3 BEDROOMS & (8) 2 BEDROOMS	(1) 2 BEDROOM (UNIT 102) (1) 3 BEDROOM (UNIT 101)	27 BEDROOMS/BLDG	PHASE I
BUILDING 5 (3 STORY)	12 UNITS	(3) 3 BEDROOMS & (8) 2 BEDROOMS	(1) 2 BEDROOM (UNIT 102)	27 BEDROOMS/BLDG	
BUILDING 6 (3 STORY)	12 UNITS	(3) 3 BEDROOMS & (8) 2 BEDROOMS	(1) 2 BEDROOM (UNIT 102)	27 BEDROOMS/BLDG	
TOTALS	72 UNITS	(16) 3 BEDROOMS & (49) 2 BEDROOMS	(2) 3 BEDROOMS & (5) 2 BEDROOMS	162 BEDROOMS	
		65 MARKET RATE UNITS	7 AFFH UNITS		

DENSITY UNITS	39 UNITS	(18) 3 BEDROOMS = 12 DENSITY UNITS (54) 2 BEDROOMS = 27 DENSITY UNITS	(18 /3) X 2= 12 54 /2 = 27
DWELLING UNITS	72 UNITS		

PLAN LEGEND



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CONSULTANTS

REVISIONS

#	DATE	REVISION DESCRIPTION	BY:
1	03/28/2022	PLANNING BOARD SUBMISSION	KA
2	05/09/2022	PLANNING BOARD SUBMISSION	KA

PHASE
PLANNING BOARD SUBMISSION

PROJECT NAME
SUMMIT CLUB PARTNERS LLC - RESIDENCES
ARMONK, NY

JOB NO.: ----
DRAWN BY: JT PROJ. MANAGER: KA
DATE: 05/09/2022 SCALE: AS NOTED

DRAWING TITLE
SECOND FLOOR PLAN

DRAWING NO.
A-102.A

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CONSULTANTS

Density Unit Calculation:
Site:
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Lot 2= 26.34421 acres
Total Site =156.30293 acres x 43,560sf/ac = (6,808,555.6308 sf) / 133,000=51.1921476
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AFFH Units***

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UNIT / BEDROOM COUNT Revised 3-28-22		MARKET RATE Units	AFFH Units	TOTAL bedrooms	
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BUILDING 3 (3 STORY)	12 UNITS	(3) 3 BEDROOMS & (8) 2 BEDROOMS	(1) 2 BEDROOM (UNIT 102)	27 BEDROOMS/BLDG	
BUILDING 4 (3 STORY)	12 UNITS	(2) 3 BEDROOMS & (8) 2 BEDROOMS	(1) 2 BEDROOM (UNIT 102) (1) 3 BEDROOM (UNIT 101)	27 BEDROOMS/BLDG	PHASE I
BUILDING 5 (3 STORY)	12 UNITS	(3) 3 BEDROOMS & (8) 2 BEDROOMS	(1) 2 BEDROOM (UNIT 102)	27 BEDROOMS/BLDG	
BUILDING 6 (3 STORY)	12 UNITS	(3) 3 BEDROOMS & (8) 2 BEDROOMS	(1) 2 BEDROOM (UNIT 102)	27 BEDROOMS/BLDG	
TOTALS	72 UNITS	(16) 3 BEDROOMS & (49) 2 BEDROOMS	(2) 3 BEDROOMS & (5) 2 BEDROOMS	162 BEDROOMS	
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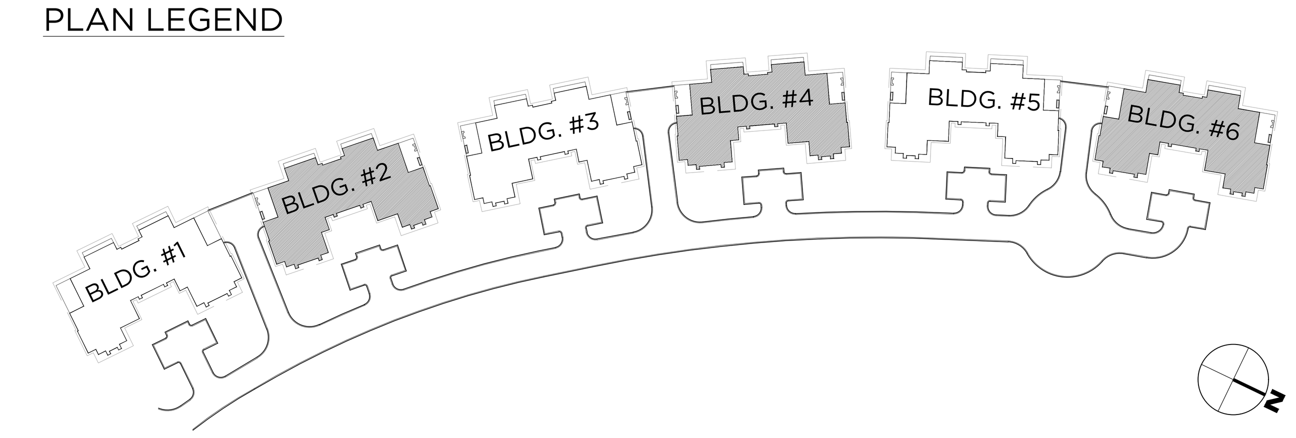
DWELLING UNITS	72 UNITS		

PLAN LEGEND



REVISIONS

#	DATE	REVISION DESCRIPTION	BY:
1	03/28/2022	PLANNING BOARD SUBMISSION	KA
2	05/09/2022	PLANNING BOARD SUBMISSION	KA

PHASE
PLANNING BOARD SUBMISSION

PROJECT NAME
SUMMIT CLUB PARTNERS LLC - RESIDENCES
ARMONK, NY

JOB NO.: ----
DRAWN BY: JT PROJ. MANAGER: KA
DATE: 05/09/2022 SCALE: AS NOTED

DRAWING TITLE
THIRD FLOOR PLAN

DRAWING NO.
A-103.A

1 EAST ELEVATION
12-UNIT: COLOR SCHEME 'SAND' 3/32" = 1'-0"

2 EAST ELEVATION - VIEW
12-UNIT: COLOR SCHEME 'SAND' N.T.S.

3 EAST ELEVATION
12-UNIT: COLOR SCHEME 'SLATE' 3/32" = 1'-0"

4 EAST ELEVATION - VIEW
12-UNIT: COLOR SCHEME 'SLATE' N.T.S.

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CONSULTANTS

REVISIONS

#	DATE	REVISION DESCRIPTION	BY:
1	03/28/2022	PLANNING BOARD SUBMISSION	KA
2	05/09/2022	PLANNING BOARD SUBMISSION	KA

PHASE
PLANNING BOARD SUBMISSION

PROJECT NAME
SUMMIT CLUB PARTNERS LLC - RESIDENCES
ARMONK, NY

JOB NO.: ----
DRAWN BY: JT PROJ. MANAGER: KA
DATE: 05/09/2022 SCALE: AS NOTED

DRAWING TITLE
BUILDING ELEVATIONS

DRAWING NO.
A-300.A

1 NORTH ELEVATION
12-UNIT: COLOR SCHEME 'SAND' 3/32" = 1'-0"

2 NORTH ELEVATION - VIEW
12-UNIT: COLOR SCHEME 'SAND' N.T.S.

3 NORTH ELEVATION
12-UNIT: COLOR SCHEME 'SLATE' 3/32" = 1'-0"

4 NORTH ELEVATION - VIEW
12-UNIT: COLOR SCHEME 'SLATE' N.T.S.

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REVISIONS

#	DATE	REVISION DESCRIPTION	BY:
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PHASE
PLANNING BOARD SUBMISSION

PROJECT NAME
SUMMIT CLUB PARTNERS LLC - RESIDENCES
ARMONK, NY

JOB NO.: ----
DRAWN BY: JT PROJ. MANAGER: KA
DATE: 05/09/2022 SCALE: AS NOTED

DRAWING TITLE
BUILDING ELEVATIONS

DRAWING NO.
A-301.A

1 WEST ELEVATION
12-UNIT: COLOR SCHEME 'SAND' 3/32" = 1'-0"

2 WEST ELEVATION - VIEW
12-UNIT: COLOR SCHEME 'SAND' N.T.S.

3 WEST ELEVATION
12-UNIT: COLOR SCHEME 'SLATE' 3/32" = 1'-0"

4 WEST ELEVATION - VIEW
12-UNIT: COLOR SCHEME 'SLATE' N.T.S.

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CONSULTANTS

REVISIONS

#	DATE	REVISION DESCRIPTION	BY:
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PHASE
PLANNING BOARD SUBMISSION

PROJECT NAME
SUMMIT CLUB PARTNERS LLC - RESIDENCES
ARMONK, NY

JOB NO.: ----
DRAWN BY: JT PROJ. MANAGER: KA
DATE: 05/09/2022 SCALE: AS NOTED

DRAWING TITLE
BUILDING ELEVATIONS

DRAWING NO.
A-302.A

1 SOUTH ELEVATION
12-UNIT: COLOR SCHEME 'SAND' 3/32" = 1'-0"

2 SOUTH ELEVATION - VIEW
12-UNIT: COLOR SCHEME 'SAND' N.T.S.

3 SOUTH ELEVATION
12-UNIT: COLOR SCHEME 'SLATE' 3/32" = 1'-0"

4 SOUTH ELEVATION - VIEW
12-UNIT: COLOR SCHEME 'SLATE' N.T.S.

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CONSULTANTS

REVISIONS

#	DATE	REVISION DESCRIPTION	BY:
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2	05/09/2022	PLANNING BOARD SUBMISSION	KA

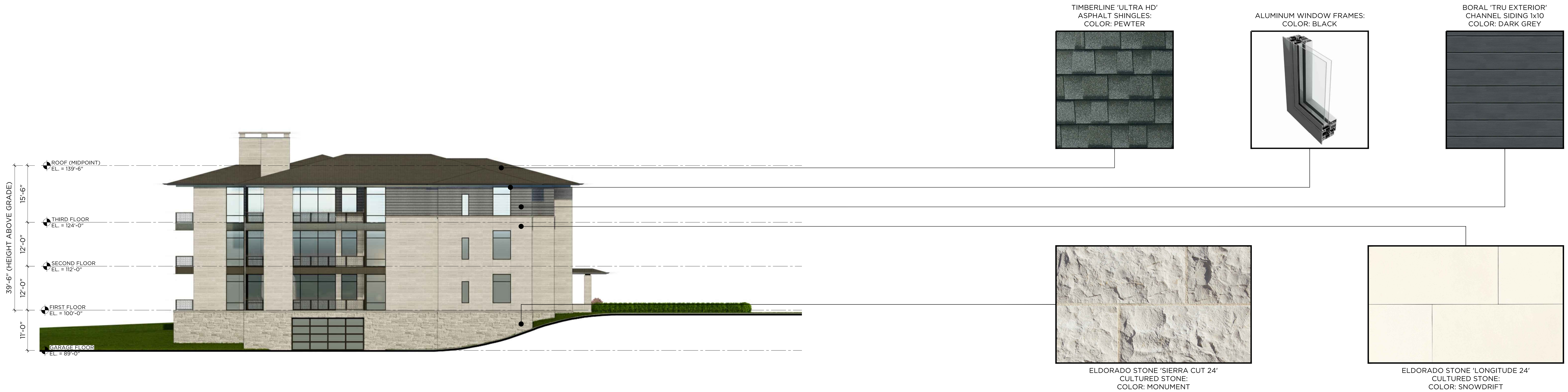
PHASE
PLANNING BOARD SUBMISSION

PROJECT NAME
SUMMIT CLUB PARTNERS LLC - RESIDENCES
ARMONK, NY

JOB NO.: ----
DRAWN BY: JT PROJ. MANAGER: KA
DATE: 05/09/2022 SCALE: AS NOTED

DRAWING TITLE
BUILDING ELEVATIONS

DRAWING NO.
A-303.A



1 SOUTH ELEVATION 3/32" = 1'-0"

2 SOUTH ELEVATION 3/32" = 1'-0"

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GREENWICH, CT 06830
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CONSULTANTS

REVISIONS

#	DATE	REVISION DESCRIPTION	BY:
1	03/28/2022	PLANNING BOARD SUBMISSION	KA
2	05/09/2022	PLANNING BOARD SUBMISSION	KA

PHASE
PLANNING BOARD SUBMISSION

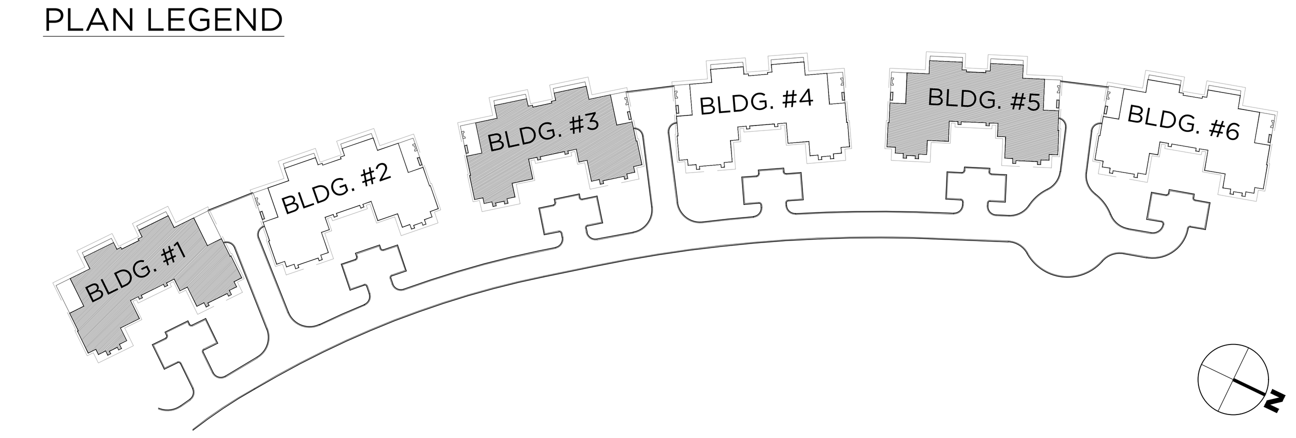
PROJECT NAME
SUMMIT CLUB PARTNERS LLC - RESIDENCES
ARMONK, NY

JOB NO.: ----
DRAWN BY: JT PROJ. MANAGER: KA
DATE: 05/09/2022 SCALE: AS NOTED

DRAWING TITLE
BUILDING ELEVATIONS

DRAWING NO.
A-304.A

PLAN LEGEND



GRANOFF ARCHITECTS

330 RAILROAD AVENUE
GREENWICH, CT 06830

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CONSULTANTS

REVISIONS

#	DATE	REVISION DESCRIPTION	BY:
1	03/28/2022	PLANNING BOARD SUBMISSION	KA
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PHASE

PLANNING BOARD SUBMISSION

PROJECT NAME

SUMMIT CLUB PARTNERS LLC - RESIDENCES

ARMONK, NY

JOB NO.: ----

DRAWN BY: JT   PROJ. MANAGER: KA

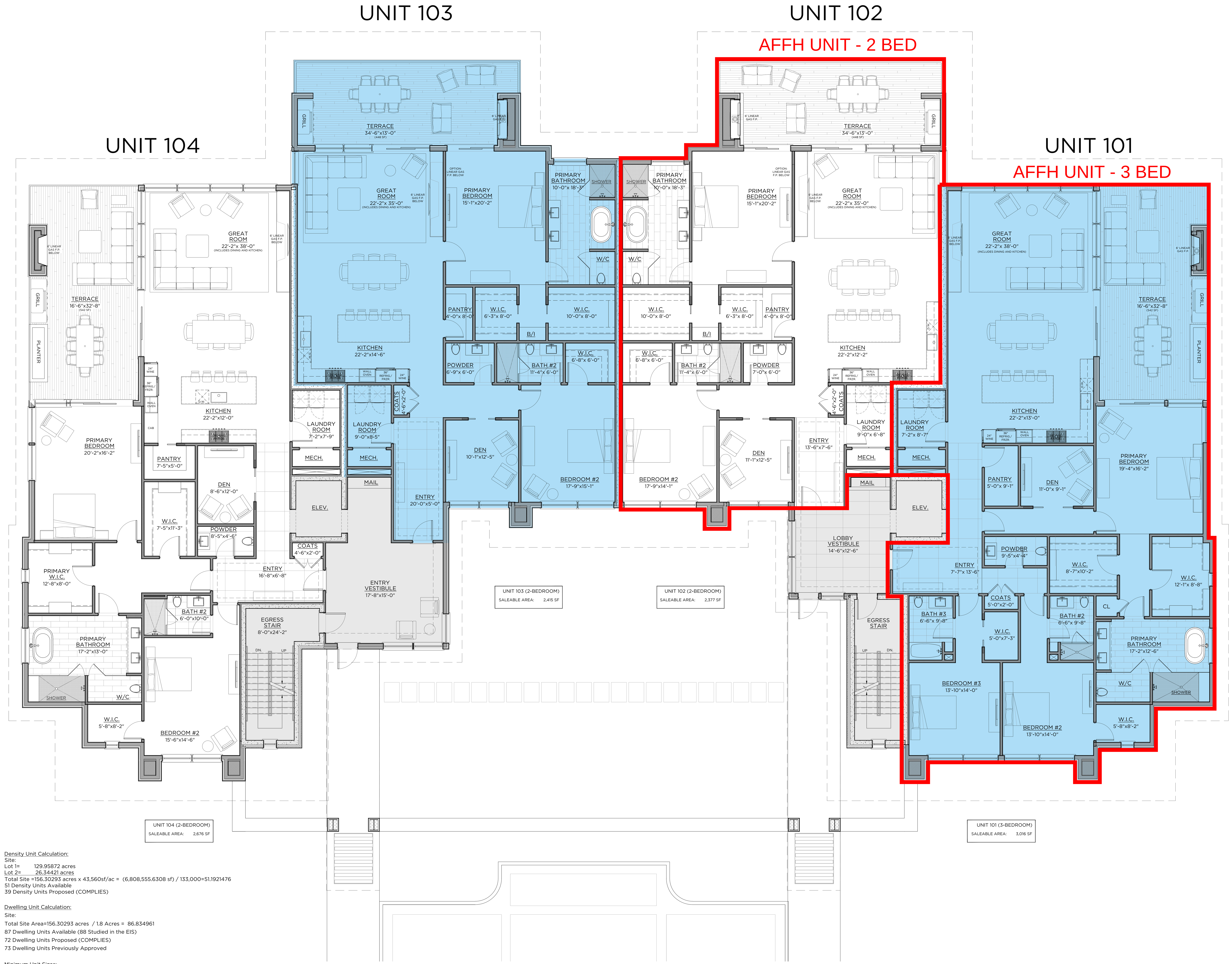
DATE: 05/09/2022   SCALE: AS NOTED

DRAWING TITLE

GARAGE LEVEL PLAN

DRAWING NO.

A-100.B



Density Unit Calculation:
Site:
Lot 1= 129.95872 acres
Lot 2= 26.34421 acres
Total Site =156.30293 acres x 43,560sf/ac = (6,808,555.6308 sf) / 133,000=51.1921476
51 Density Units Available
39 Density Units Proposed (COMPLIES)

Dwelling Unit Calculation:
Site:
Total Site Area=156.30293 acres / 1.8 Acres = 86.834961
87 Dwelling Units Available (88 Studied in the EIS)
72 Dwelling Units Proposed (COMPLIES)
73 Dwelling Units Previously Approved

Minimum Unit Sizes:
Market Rate Units

Efficiency:	450 sf Min.	N/A
One-Bedroom:	700 sf Min.	N/A
Two-Bedroom:	900 sf	2,377 sf is smallest (complies)
Three-Bedroom:	1,100 sf	2,997 sf is smallest (complies)

AFFH Units***

Efficiency:	450 sf Min.	N/A
One-Bedroom:	700 sf Min.	N/A
Two-Bedroom:	900 sf	2,377 sf is smallest (complies)
Three-Bedroom:	1,100 sf	2,997 sf is smallest (complies)

***AFFH UNITS IDENTICAL TO MARKET RATE UNITS.

Density Unit Definition:

A density unit is defined as being equal to one or a proportionate combination of the following:

A. One one-family detached dwelling unit.
B. One dwelling unit containing four or more bedrooms in a permitted type of dwelling other than a one-family detached unit.
C. One and one-half dwelling units containing three bedrooms each in permitted dwellings other than one-family detached units.
D. Two dwelling units containing two bedrooms each in permitted dwellings other than one-family detached units.
E. Two and one-half dwellings containing one bedroom or less each in permitted dwellings other than one-family detached units.
F. Three efficiency dwelling units in permitted dwellings other than one-family detached units

[2]Density. The maximum permitted density shall not exceed one density unit, as defined in § 355-4 of this chapter, per 133,000 square feet of the aggregate total lot area (as defined in § 355-4 of this chapter) in the GCCFO District and one dwelling unit, as defined in § 355-4 of this chapter, per 1.8 acres of the aggregate total lot area (as defined in § 355-4 of this chapter) in the GCCFO District.

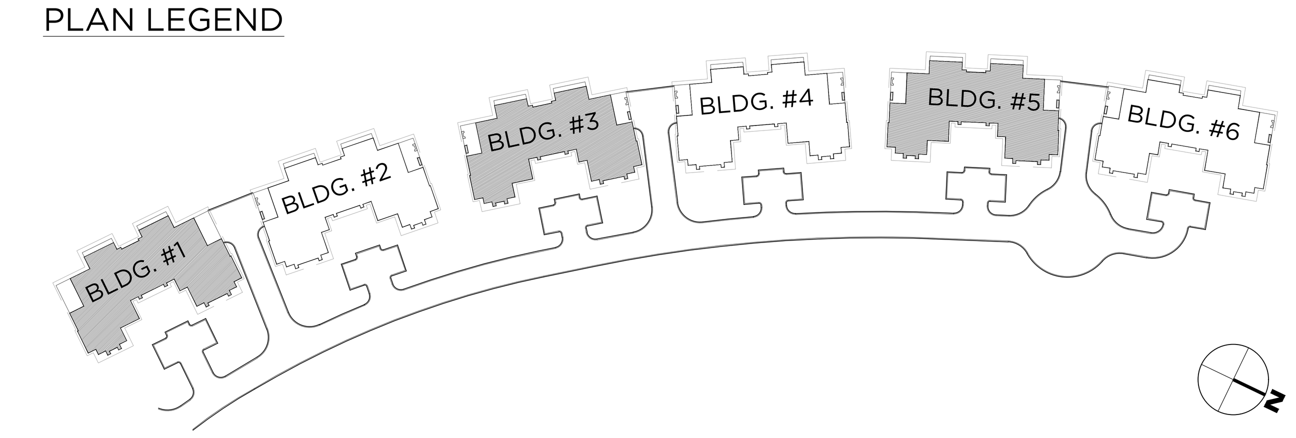
[2]

Editor's Note: Former Subsection D(1), regarding lots and dwelling units in the GCCFO District, was repealed 3-27-2019 by L.L. No. 2-2019. This local law also renumbered former Subsections D(2) through D(6) as Subsections D(1) through D(5), respectively

AFFH UNIT MIX

UNIT / BEDROOM COUNT Revised 3-28-22		MARKET RATE Units	AFFH Units	TOTAL bedrooms	
BUILDING 1 (3 STORY)	12 UNITS	(2) 3 BEDROOMS & (9) 2 BEDROOMS	(1) 3 BEDROOM (UNIT 101)	27 BEDROOMS/BLDG	PHASE II
BUILDING 2 (3 STORY)	12 UNITS	(3) 3 BEDROOMS & (8) 2 BEDROOMS	(1) 2 BEDROOM (UNIT 102)	27 BEDROOMS/BLDG	PHASE II
BUILDING 3 (3 STORY)	12 UNITS	(3) 3 BEDROOMS & (8) 2 BEDROOMS	(1) 2 BEDROOM (UNIT 102)	27 BEDROOMS/BLDG	PHASE II
BUILDING 4 (3 STORY)	12 UNITS	(2) 3 BEDROOMS & (8) 2 BEDROOMS	(1) 2 BEDROOM (UNIT 102) (1) 3 BEDROOM (UNIT 101)	27 BEDROOMS/BLDG	PHASE I
BUILDING 5 (3 STORY)	12 UNITS	(3) 3 BEDROOMS & (8) 2 BEDROOMS	(1) 2 BEDROOM (UNIT 102)	27 BEDROOMS/BLDG	PHASE I
BUILDING 6 (3 STORY)	12 UNITS	(3) 3 BEDROOMS & (8) 2 BEDROOMS	(1) 2 BEDROOM (UNIT 102)	27 BEDROOMS/BLDG	PHASE I
TOTALS	72 UNITS	(16) 3 BEDROOMS & (49) 2 BEDROOMS	(2) 3 BEDROOMS & (5) 2 BEDROOMS	162 BEDROOMS	
		65 MARKET RATE UNITS	7 AFFH UNITS		
DENSITY UNITS	39 UNITS	(18) 3 BEDROOMS = 12 DENSITY UNITS (54) 2 BEDROOMS = 27 DENSITY UNITS	(18 /3) X 2= 12 54 /2 = 27		
DWELLING UNITS	72 UNITS				

PLAN LEGEND



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#	DATE	REVISION DESCRIPTION	BY:
1	03/28/2022	PLANNING BOARD SUBMISSION	KA
2	05/09/2022	PLANNING BOARD SUBMISSION	KA

PHASE
PLANNING BOARD SUBMISSION

PROJECT NAME
SUMMIT CLUB PARTNERS LLC - RESIDENCES
ARMONK, NY

JOB NO.: ----
DRAWN BY: JT PROJ. MANAGER: KA
DATE: 05/09/2022 SCALE: AS NOTED

DRAWING TITLE
FIRST FLOOR PLAN

DRAWING NO.
A-101.B

UNIT 204 (2-BEDROOM)
SALEABLE AREA: 2,654 SF

UNIT 201 (3-BEDROOM)
SALEABLE AREA: 2,997 SF

Density Unit Calculation:
Site:
Lot 1= 129.95872 acres
Lot 2= 26.34421 acres
Total Site =156.30293 acres x 43,560sf/ac = (6,808,555.6308 sf) / 133,000=51.1921476
51 Density Units Available
39 Density Units Proposed (COMPLIES)

Dwelling Unit Calculation:
Site:
Total Site Area=156.30293 acres / 1.8 Acres = 86.834961
87 Dwelling Units Available (88 Studied in the EIS)
72 Dwelling Units Proposed (COMPLIES)
73 Dwelling Units Previously Approved

Minimum Unit Sizes:
Market Rate Units

Efficiency:	450 sf Min.	N/A
One-Bedroom:	700 sf Min.	N/A
Two-Bedroom:	900 sf	2,377 sf is smallest (complies)
Three-Bedroom:	1,100 sf	2,997 sf is smallest (complies)

AFFH Units***

Efficiency:	450 sf Min.	N/A
One-Bedroom:	700 sf Min.	N/A
Two-Bedroom:	900 sf	2,377 sf is smallest (complies)
Three-Bedroom:	1,100 sf	2,997 sf is smallest (complies)

***AFFH UNITS IDENTICAL TO MARKET RATE UNITS.

Density Unit Definition:
A density unit is defined as being equal to one or a proportionate combination of the following:

A. One one-family detached dwelling unit.
B. One dwelling unit containing four or more bedrooms in a permitted type of dwelling other than a one-family detached unit.
C. One and one-half dwelling units containing three bedrooms each in permitted dwellings other than one-family detached units.
D. Two dwelling units containing two bedrooms each in permitted dwellings other than one-family detached units.
E. Two and one-half dwellings containing one bedroom or less each in permitted dwellings other than one-family detached units.
F. Three efficiency dwelling units in permitted dwellings other than one-family detached units

[2]Density. The maximum permitted density shall not exceed one density unit, as defined in § 355-4 of this chapter, per 133,000 square feet of the aggregate total lot area (as defined in § 355-4 of this chapter) in the GCCFO District and one dwelling unit, as defined in § 355-4 of this chapter, per 1.8 acres of the aggregate total lot area (as defined in § 355-4 of this chapter) in the GCCFO District.
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Editor's Note: Former Subsection D(1), regarding lots and dwelling units in the GCCFO District, was repealed 3-27-2019 by L.L. No. 2-2019. This local law also renumbered former Subsections D(2) through D(6) as Subsections D(1) through D(5), respectively

UNIT / BEDROOM COUNT Revised 3-28-22		MARKET RATE Units	AFFH Units	TOTAL bedrooms	
BUILDING 1 (3 STORY)	12 UNITS	(2) 3 BEDROOMS & (9) 2 BEDROOMS	(1) 3 BEDROOM (UNIT 101)	27 BEDROOMS/BLDG	PHASE II
BUILDING 2 (3 STORY)	12 UNITS	(3) 3 BEDROOMS & (8) 2 BEDROOMS	(1) 2 BEDROOM (UNIT 102)	27 BEDROOMS/BLDG	
BUILDING 3 (3 STORY)	12 UNITS	(3) 3 BEDROOMS & (8) 2 BEDROOMS	(1) 2 BEDROOM (UNIT 102)	27 BEDROOMS/BLDG	
BUILDING 4 (3 STORY)	12 UNITS	(2) 3 BEDROOMS & (8) 2 BEDROOMS	(1) 2 BEDROOM (UNIT 102) (1) 3 BEDROOM (UNIT 101)	27 BEDROOMS/BLDG	PHASE I
BUILDING 5 (3 STORY)	12 UNITS	(3) 3 BEDROOMS & (8) 2 BEDROOMS	(1) 2 BEDROOM (UNIT 102)	27 BEDROOMS/BLDG	
BUILDING 6 (3 STORY)	12 UNITS	(3) 3 BEDROOMS & (8) 2 BEDROOMS	(1) 2 BEDROOM (UNIT 102)	27 BEDROOMS/BLDG	
TOTALS	72 UNITS	(16) 3 BEDROOMS & (49) 2 BEDROOMS	(2) 3 BEDROOMS & (5) 2 BEDROOMS	162 BEDROOMS	
		65 MARKET RATE UNITS	7 AFFH UNITS		

DENSITY UNITS	39 UNITS	(18) 3 BEDROOMS = 12 DENSITY UNITS (54) 2 BEDROOMS = 27 DENSITY UNITS	(18 /3) X 2= 12 54 /2 = 27
DWELLING UNITS	72 UNITS		

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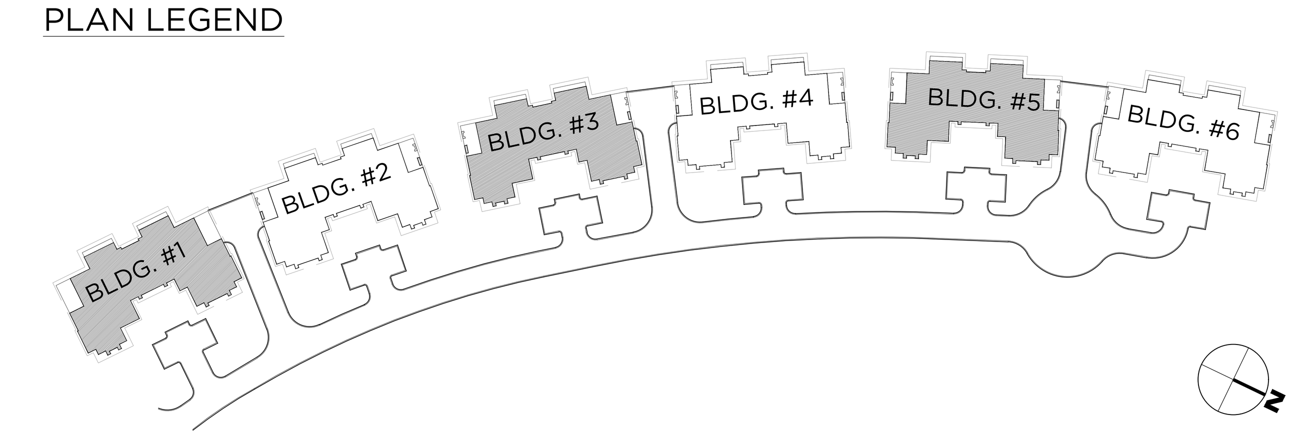

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2	05/09/2022	PLANNING BOARD SUBMISSION	KA

PHASE
PLANNING BOARD SUBMISSION

PROJECT NAME
SUMMIT CLUB PARTNERS LLC - RESIDENCES
ARMONK, NY

JOB NO.: ----
DRAWN BY: JT PROJ. MANAGER: KA
DATE: 05/09/2022 SCALE: AS NOTED

DRAWING TITLE
SECOND FLOOR PLAN

DRAWING NO.
A-102.B

Density Unit Calculation:
Site:
Lot 1= 129.95872 acres
Lot 2= 26.34421 acres
Total Site =156.30293 acres x 43,560sf/ac = (6,808,555.6308 sf) / 133,000=51.1921476
51 Density Units Available
39 Density Units Proposed (COMPLIES)

Dwelling Unit Calculation:
Site:
Total Site Area=156.30293 acres / 1.8 Acres = 86.834961
87 Dwelling Units Available (88 Studied in the EIS)
72 Dwelling Units Proposed (COMPLIES)
73 Dwelling Units Previously Approved

Minimum Unit Sizes:
Market Rate Units
Efficiency: 450 sf Min. N/A
One-Bedroom: 700 sf Min. N/A
Two-Bedroom: 900 sf 2,377 sf is smallest (complies)
Three-Bedroom: 1,100 sf 2,997 sf is smallest (complies)
AFFH Units***
Efficiency: 450 sf Min. N/A
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***AFFH UNITS IDENTICAL TO MARKET RATE UNITS.

Density Unit Definition:
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UNIT / BEDROOM COUNT Revised 3-28-22		MARKET RATE Units	AFFH Units	TOTAL bedrooms	
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BUILDING 2 (3 STORY)	12 UNITS	(3) 3 BEDROOMS & (8) 2 BEDROOMS	(1) 2 BEDROOM (UNIT 102)	27 BEDROOMS/BLDG	
BUILDING 3 (3 STORY)	12 UNITS	(3) 3 BEDROOMS & (8) 2 BEDROOMS	(1) 2 BEDROOM (UNIT 102)	27 BEDROOMS/BLDG	
BUILDING 4 (3 STORY)	12 UNITS	(2) 3 BEDROOMS & (8) 2 BEDROOMS	(1) 2 BEDROOM (UNIT 102) (1) 3 BEDROOM (UNIT 101)	27 BEDROOMS/BLDG	PHASE I
BUILDING 5 (3 STORY)	12 UNITS	(3) 3 BEDROOMS & (8) 2 BEDROOMS	(1) 2 BEDROOM (UNIT 102)	27 BEDROOMS/BLDG	
BUILDING 6 (3 STORY)	12 UNITS	(3) 3 BEDROOMS & (8) 2 BEDROOMS	(1) 2 BEDROOM (UNIT 102)	27 BEDROOMS/BLDG	
TOTALS	72 UNITS	(16) 3 BEDROOMS & (49) 2 BEDROOMS	(2) 3 BEDROOMS & (5) 2 BEDROOMS	162 BEDROOMS	
		65 MARKET RATE UNITS	7 AFFH UNITS		

DENSITY UNITS	39 UNITS	(18) 3 BEDROOMS = 12 DENSITY UNITS (54) 2 BEDROOMS = 27 DENSITY UNITS	(18 /3) X 2= 12 54 /2 = 27
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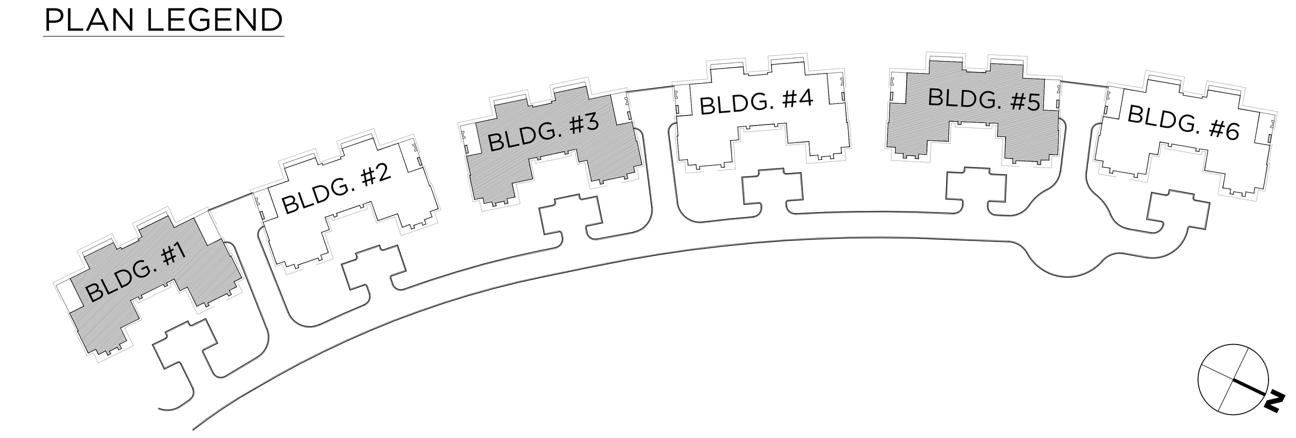

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PROJECT NAME
SUMMIT CLUB PARTNERS LLC - RESIDENCES
ARMONK, NY

JOB NO.: ----
DRAWN BY: JT PROJ. MANAGER: KA
DATE: 05/09/2022 SCALE: AS NOTED

DRAWING TITLE
THRID FLOOR PLAN

DRAWING NO.
A-103.B

1 EAST ELEVATION
12-UNIT: COLOR SCHEME 'SAND' 3/32" = 1'-0"

2 EAST ELEVATION - VIEW
12-UNIT: COLOR SCHEME 'SAND' N.T.S.

3 EAST ELEVATION
12-UNIT: COLOR SCHEME 'SLATE' 3/32" = 1'-0"

4 EAST ELEVATION - VIEW
12-UNIT: COLOR SCHEME 'SLATE' N.T.S.

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PROJECT NAME
SUMMIT CLUB PARTNERS LLC - RESIDENCES
ARMONK, NY

JOB NO.: ----
DRAWN BY: JT PROJ. MANAGER: KA
DATE: 05/09/2022 SCALE: AS NOTED

DRAWING TITLE
BUILDING ELEVATIONS

DRAWING NO.
A-300.B

1 NORTH ELEVATION
12-UNIT: COLOR SCHEME 'SAND' 3/32" = 1'-0"

2 NORTH ELEVATION - VIEW
12-UNIT: COLOR SCHEME 'SAND' N.T.S.

3 NORTH ELEVATION
12-UNIT: COLOR SCHEME 'SLATE' 3/32" = 1'-0"

4 NORTH ELEVATION - VIEW
12-UNIT: COLOR SCHEME 'SLATE' N.T.S.

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PHASE
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PROJECT NAME
SUMMIT CLUB PARTNERS LLC - RESIDENCES
ARMONK, NY

JOB NO.: ----
DRAWN BY: JT PROJ. MANAGER: KA
DATE: 05/09/2022 SCALE: AS NOTED

DRAWING TITLE
BUILDING ELEVATIONS

DRAWING NO.
A-301.B

1 WEST ELEVATION
12-UNIT: COLOR SCHEME 'SAND' 3/32" = 1'-0"

2 WEST ELEVATION - VIEW
12-UNIT: COLOR SCHEME 'SAND' N.T.S.

3 WEST ELEVATION
12-UNIT: COLOR SCHEME 'SLATE' 3/32" = 1'-0"

4 WEST ELEVATION - VIEW
12-UNIT: COLOR SCHEME 'SLATE' N.T.S.

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PHASE
PLANNING BOARD SUBMISSION

PROJECT NAME
SUMMIT CLUB PARTNERS LLC - RESIDENCES
ARMONK, NY

JOB NO.: ----
DRAWN BY: JT PROJ. MANAGER: KA
DATE: 05/09/2022 SCALE: AS NOTED

DRAWING TITLE
BUILDING ELEVATIONS

DRAWING NO.
A-302.B

1 SOUTH ELEVATION
12-UNIT: COLOR SCHEME 'SAND' 3/32" = 1'-0"

2 SOUTH ELEVATION - VIEW
12-UNIT: COLOR SCHEME 'SAND' N.T.S.

3 SOUTH ELEVATION
12-UNIT: COLOR SCHEME 'SLATE' 3/32" = 1'-0"

4 SOUTH ELEVATION - VIEW
12-UNIT: COLOR SCHEME 'SLATE' N.T.S.

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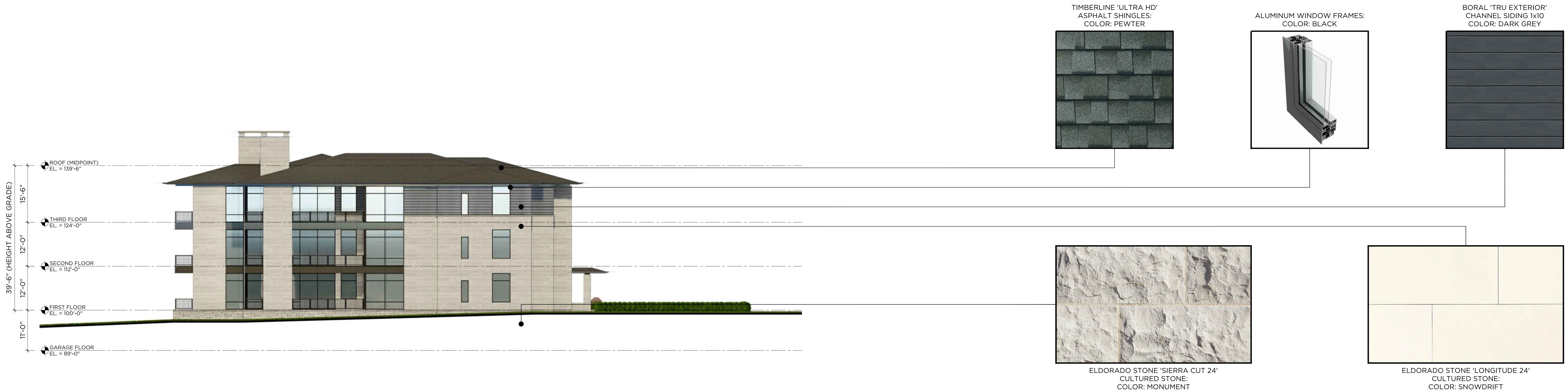
PHASE
PLANNING BOARD SUBMISSION

PROJECT NAME
SUMMIT CLUB PARTNERS LLC - RESIDENCES
ARMONK, NY

JOB NO.: ----
DRAWN BY: JT PROJ. MANAGER: KA
DATE: 05/09/2022 SCALE: AS NOTED

DRAWING TITLE
BUILDING ELEVATIONS

DRAWING NO.
A-303.B



1 SOUTH ELEVATION
3/32" = 1'-0"

2 SOUTH ELEVATION
3/32" = 1'-0"

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PROJECT NAME
SUMMIT CLUB PARTNERS LLC - RESIDENCES
ARMONK, NY

JOB NO.: ----
DRAWN BY: JT PROJ. MANAGER: KA
DATE: 05/09/2022 SCALE: AS NOTED

DRAWING TITLE
BUILDING ELEVATIONS

DRAWING NO.
A-304.B

R&M ENGINEERING

Christopher W. Robinson, PE President
Wayne A. Muller, PE Vice President

Matthew P. Scheiner, PE Partner
Matthew K. Aylward, PE Partner
Gino Tedesco, Associate

April 26, 2022

Town of North Castle Planning Board
17 Bedford Road
Armonk, NY 10504

Attention: Mr. Christopher Carthy, Chairman
and Members of the Planning Board

RE: The Summit Club at Armonk
Sewage Treatment Plant Replacement
SCTM: 101.2-1-28.1 & 28.2
R&M No. 2021-201

Dear Chairman Carthy and Members of the Planning Board:

Enclosed herewith for your review and comment, please find the Engineering Design Report describing the proposed replacement and expansion of the existing sewage treatment plant (STP) for the anticipated development of The Summit Club at Armonk, formerly known as Brynwood Golf and Country Club.

In addition to the Engineering Design Report, the Short Environmental Assessment Form prepared for the STP has been included in the submission package. Both referenced documents have been concurrently submitted to the NYS Department of Environmental Conservation (NYS DEC) for the State Pollutant Discharge Elimination System (SPDES) review process required to obtain the proposed STP's discharge permit. Preparation and submission of the technical plans and specifications to the Planning Board and Westchester County Department of Health will be subsequent to NYS DEC conceptual approval of the report.

If you have any questions regarding the above or require any additional information, please do not hesitate to contact us.

Sincerely,
R&M Engineering

Matthew P. Scheiner, P.E.
Partner

MPS/snm
Encl.
cc: Jeffrey Mendell – Summit Club Partners, LLC (via email)
Paul Sysak, RLA, ASLA – JMC Site Development Consultants (via email)
David Lombardi, P.E. – JMC (via email)

R&M ENGINEERING

Christopher W. Robinson, PE President
Wayne A. Muller, PE Vice President

Matthew P. Scheiner, PE Partner
Matthew K. Aylward, PE Partner
Gino Tedesco, Associate

April 26, 2022

New York State Department of Environmental Conservation
Regional Permit Administrator
21 South Putt Corners Road
New Paltz, NY 12561-1620

Attention: Mike Grosso
Environmental Analyst

RE: The Summit Club at Armonk
Sewage Treatment Plant Replacement
SCTM: 101.2-1-28.1 & 28.2
R&M No. 2021-201

Dear Mr. Grosso:

Enclosed herewith is the submission package for the proposed replacement and expansion of the existing sewage treatment plant (STP) for the anticipated development of The Summit Club at Armonk, formerly known as Brynwood Golf and Country Club. For your review and comment, please find the following:

- Engineering Report describing the proposed STP design sized for 45,000 gallons per day
- State Pollutant Discharge Elimination System (SPDES) Application Form
- SPDES Site Plan
- Short Environmental Assessment Form for the STP

Concerning the Short Environmental Assessment Form, an Environmental Impact Statement (EIS) was previously prepared for the project and the Town of North Castle Planning Board issued the State Environmental Quality Review Act (SEQRA) Findings Statement on April 22, 2015. All other required attachments for the SPDES application can be found in the appendices of the Engineering Report.

Heather McVeigh from the Westchester County Department of Health (WCDH) has been included on the submission so that her office is aware of the review timeline and permit approval status. Following NYS DEC approval, technical plans and specifications will be prepared and submitted through WCDH.

If you have any questions regarding the above or require any additional information, please do not hesitate to contact us.

Sincerely,
R&M Engineering

Matthew P. Scheiner, P.E.
Partner

MPS/snm
Encl.
cc: Heather McVeigh – Westchester County Department of Health (via email)
Jeffrey Mendell – Summit Club Partners, LLC (via email)
Paul Sysak, RLA, ASLA – JMC Site Development Consultants (via email)
David Lombardi, P.E. – JMC (via email)

Short Environmental Assessment Form
Part 1 - Project Information

Instructions for Completing

Part 1 – Project Information. The applicant or project sponsor is responsible for the completion of Part 1. Responses become part of the application for approval or funding, are subject to public review, and may be subject to further verification. Complete Part 1 based on information currently available. If additional research or investigation would be needed to fully respond to any item, please answer as thoroughly as possible based on current information.

Complete all items in Part 1. You may also provide any additional information which you believe will be needed by or useful to the lead agency; attach additional pages as necessary to supplement any item.

Part 1 – Project and Sponsor Information		
R&M Engineering, Matthew P. Scheiner, PE		
Name of Action or Project: The Summit Club at Armonk STP Replacement		
Project Location (describe, and attach a location map): 568 & 570 Bedford Road, Armonk NY		
Brief Description of Proposed Action: Replacement of the existing STP for the redevelopment of existing golf course to include 72 Townhouse Units, clubhouse, and new amenities complex.		
Name of Applicant or Sponsor: R&M Engineering, Matthew P. Scheiner, PE	Telephone: (631) 271-0576 E-Mail: mscheiner@rmengineering.com	
Address: 50 Elm Street		
City/PO: Huntington	State: NY	Zip Code: 11743

	NO	YES
1. Does the proposed action only involve the legislative adoption of a plan, local law, ordinance, administrative rule, or regulation? If Yes, attach a narrative description of the intent of the proposed action and the environmental resources that may be affected in the municipality and proceed to Part 2. If no, continue to question 2.	☑	☐
2. Does the proposed action require a permit, approval or funding from any other government Agency? If Yes, list agency(s) name and permit or approval:	☑	☐

3. a. Total acreage of the site of the proposed action? ± 156 acres
   b. Total acreage to be physically disturbed? ± 3 acres
   c. Total acreage (project site and any contiguous properties) owned or controlled by the applicant or project sponsor? ± 156 acres

4. Check all land uses that occur on, are adjoining or near the proposed action:

☐ Urban ☐ Rural (non-agriculture) ☐ Industrial ☑ Commercial ☑ Residential (suburban)
☐ Forest ☐ Agriculture ☐ Aquatic ☑ Other(Specify): Institutional, open space, golf course.
☐ Parkland

	NO	YES	N/A
5. Is the proposed action,			
a. A permitted use under the zoning regulations?	☐	☑	☐
b. Consistent with the adopted comprehensive plan?	☐	☑	☐

	NO	YES
6. Is the proposed action consistent with the predominant character of the existing built or natural landscape?	☐	☑
7. Is the site of the proposed action located in, or does it adjoin, a state listed Critical Environmental Area? If Yes, identify: ______________________	☑	☐
8. a. Will the proposed action result in a substantial increase in traffic above present levels?	☑	☐
b. Are public transportation services available at or near the site of the proposed action?	☑	☐
c. Are any pedestrian accommodations or bicycle routes available on or near the site of the proposed action?	☑	☐
9. Does the proposed action meet or exceed the state energy code requirements? If the proposed action will exceed requirements, describe design features and technologies: ______________________	☐	☑
10. Will the proposed action connect to an existing public/private water supply? If No, describe method for providing potable water: ______________________ A new on-site water system will be provided and sized accordingly to accommodate the proposed residential golf club and amenity facilities.	☑	☐
11. Will the proposed action connect to existing wastewater utilities? If No, describe method for providing wastewater treatment: ______________________ A replacement on-site STP will be provided to serve the golf course and residential/amenities facilities.	☑	☐
12. a. Does the project site contain, or is it substantially contiguous to, a building, archaeological site, or district which is listed on the National or State Register of Historic Places, or that has been determined by the Commissioner of the NYS Office of Parks, Recreation and Historic Preservation to be eligible for listing on the State Register of Historic Places? An Archeology Survey was prepared for the existing EIS with No Significant Findings.	☑	☐
b. Is the project site, or any portion of it, located in or adjacent to an area designated as sensitive for archaeological sites on the NY State Historic Preservation Office (SHPO) archaeological site inventory?	☐	☑
13. a. Does any portion of the site of the proposed action, or lands adjoining the proposed action, contain wetlands or other waterbodies regulated by a federal, state or local agency?	☐	☑
b. Would the proposed action physically alter, or encroach into, any existing wetland or waterbody?	☑	☐
If Yes, identify the wetland or waterbody and extent of alterations in square feet or acres: ______________________ The site includes 6.56 acres of freshwater wetlands and 26.01 ac of freshwater wetland buffers. The project requires disturbance of 0 acres of the wetlands/wetland buffer. Unnamed federal waters are also located on the parcel.		

14. Identify the typical habitat types that occur on, or are likely to be found on the project site. Check all that apply:

☐ Shoreline ☐ Forest ☐ Agricultural/grasslands ☑ Early mid-successional

☑ Wetland ☐ Urban ☑ Suburban

	NO	YES
15. Does the site of the proposed action contain any species of animal, or associated habitats, listed by the State or Federal government as threatened or endangered?	☑	☐
16. Is the project site located in the 100-year flood plan?	☐	☑
17. Will the proposed action create storm water discharge, either from point or non-point sources? If Yes,	☐	☑
a. Will storm water discharges flow to adjacent properties?	☐	☑
b. Will storm water discharges be directed to established conveyance systems (runoff and storm drains)? If Yes, briefly describe: Stormwater runoff will be conveyed into existing stormwater insfrastructure or continue to flow overland on the golf course.	☐	☑
18. Does the proposed action include construction or other activities that would result in the impoundment of water or other liquids (e.g., retention pond, waste lagoon, dam)? If Yes, explain the purpose and size of the impoundment: Proposed stormwater management facilities.	☐	☑
19. Has the site of the proposed action or an adjoining property been the location of an active or closed solid waste management facility? If Yes, describe:	☑	☐
20. Has the site of the proposed action or an adjoining property been the subject of remediation (ongoing or completed) for hazardous waste? If Yes, describe:	☑	☐

I CERTIFY THAT THE INFORMATION PROVIDED ABOVE IS TRUE AND ACCURATE TO THE BEST OF MY KNOWLEDGE

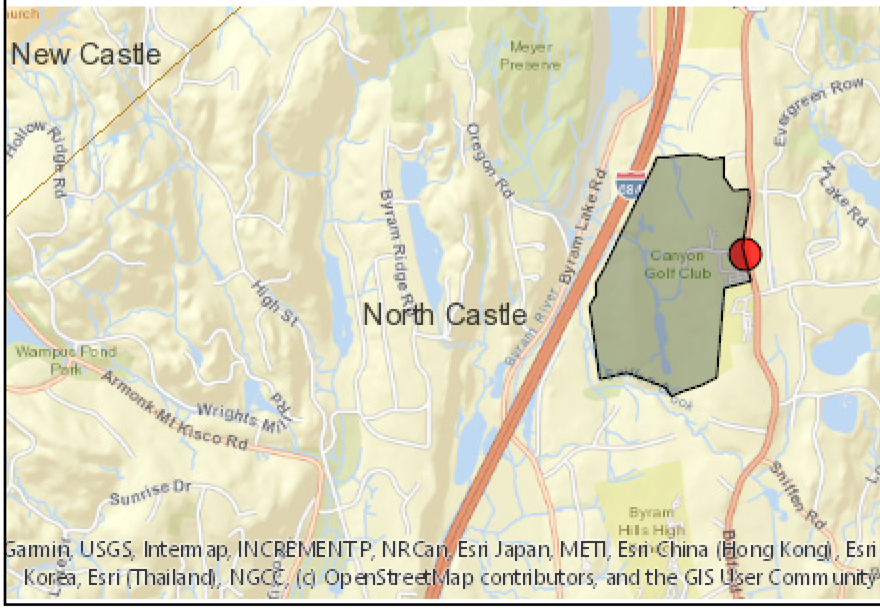
Applicant/sponsor/name: R&M Engineering, Matthew P. Scheiner, PE Date: 4/29/22

Signature: [signature] Title: Partner

PRINT FORM

EAF Mapper Summary Report

Tuesday, April 26, 2022 4:16 PM



Disclaimer: The EAF Mapper is a screening tool intended to assist project sponsors and reviewing agencies in preparing an environmental assessment form (EAF). Not all questions asked in the EAF are answered by the EAF Mapper. Additional information on any EAF question can be obtained by consulting the EAF Workbooks. Although the EAF Mapper provides the most up-to-date digital data available to DEC, you may also need to contact local or other data sources in order to obtain data not provided by the Mapper. Digital data is not a substitute for agency determinations.

Part 1 / Question 7 [Critical Environmental Area]	No
Part 1 / Question 12a [National or State Register of Historic Places or State Eligible Sites]	No
Part 1 / Question 12b [Archeological Sites]	Yes
Part 1 / Question 13a [Wetlands or Other Regulated Waterbodies]	Yes - Digital mapping information on local and federal wetlands and waterbodies is known to be incomplete. Refer to EAF Workbook.
Part 1 / Question 15 [Threatened or Endangered Animal]	No
Part 1 / Question 16 [100 Year Flood Plain]	Yes
Part 1 / Question 20 [Remediation Site]	No

NEW YORK STATE OF OPPORTUNITY | Department of Environmental Conservation

State Pollutant Discharge Elimination System (SPDES) Application Form: Private, Commercial & Institutional (P/C/I) Discharge of Treated Sanitary Sewage

(●) New Application　　( ) Renewal Application　　( ) Modification Application

SPDES Number [ ] NY########　　**DEC Authorization** [ ] #-####-#####

Applicant/Owner Information

Type of Ownership: (●) Corporate ( ) Individual ( ) Partnership ( ) Public

Name: Summit Club Partners LLC.

Taxpayer ID: 27-1055677

Mailing Address: 568 Bedford Road c/o Jeffrey B. Mendell

City: Armonk　State: NY　Zip: 10504

Phone: (914) 391-2900　Email: jbmendell@gmail.com

Contact/Agent Information

Name: R&M Engineering, Matthew P. Scheiner, PE

Title: Partner

Mailing Address: 50 Elm Street

City: Huntington　State: NY　Zip: 11743

Phone: (631) 271-0576　Email: mscheiner@rmengineering.com

Facility Information

Facility Name: The Summit Club at Armonk

Nature of Business or Facility: Golf Course & Townhouse Units

Population Served: 600

Street Address: 568-570 Bedford Road

City: Armonk　State: NY　Zip: 10504

Municipality: (●) Town ( ) Village ( ) City

Municipality Name: North Castle

County: WESTCHESTER

Additional Facility Location Information (if needed):

Tax Map Information — Section: 101.02　Block: 1　Lot: 28.1 & 28.2

Certification: I hereby affirm under penalty of perjury that the information provided on this form and any attached supplemental forms is true to the best of my knowledge and belief. False statements made herein are punishable as a Class A misdemeanor pursuant to section 210.45 of the Penal Law.

Signature of Applicant/Owner	Printed Name	Title	Date
[signature]	JEFFREY B. MENDELL	MANAGER	4/26/22

Applicable discharge data on the following pages must be completed. Discharges from this facility are not authorized until this application form is attached to the permit signed and authorized by the New York State Department of Environmental Conservation or its designated agency.

SPDES Application for P/C/I Discharge of Treated Sanitary Sewage

Discharges To Surfacewater - 1 of 1

Facility Name The Summit Club at Armonk

SPDES Number ____ **DEC Authorization** ____

To Add or Remove outfalls, click on the Green + or the Red X respectively. + X

Complete this page of the application if your facility has any discharges to surface water. Complete this form for each surface water outfall.

Discharge Data

Outfall No. 001

Outfall Status ○ Proposed ○ Replacement ○ Existing ◉ Expansion

Design Flow 45,000 Gal/Day

Outfall Location (end of pipe or conveyance)

Latitude 41 o 8 ' 57 "

Longitude 73 o 41 ' 27 "

Type of Treatment

Modified extended aeration treatment process.

Frequency of Discharge Months/Year 12 Days/Week 7

Name of Receiving Water	Classification	Water Index Number
Tributary to Byram River, Byram River	D, B(T)	(MW 3.6) LIS -13

SPDES Application for P/C/I Discharge of Treated Sanitary Sewage

Discharges to Surface Water

Facility Name The Summit Club at Armonk

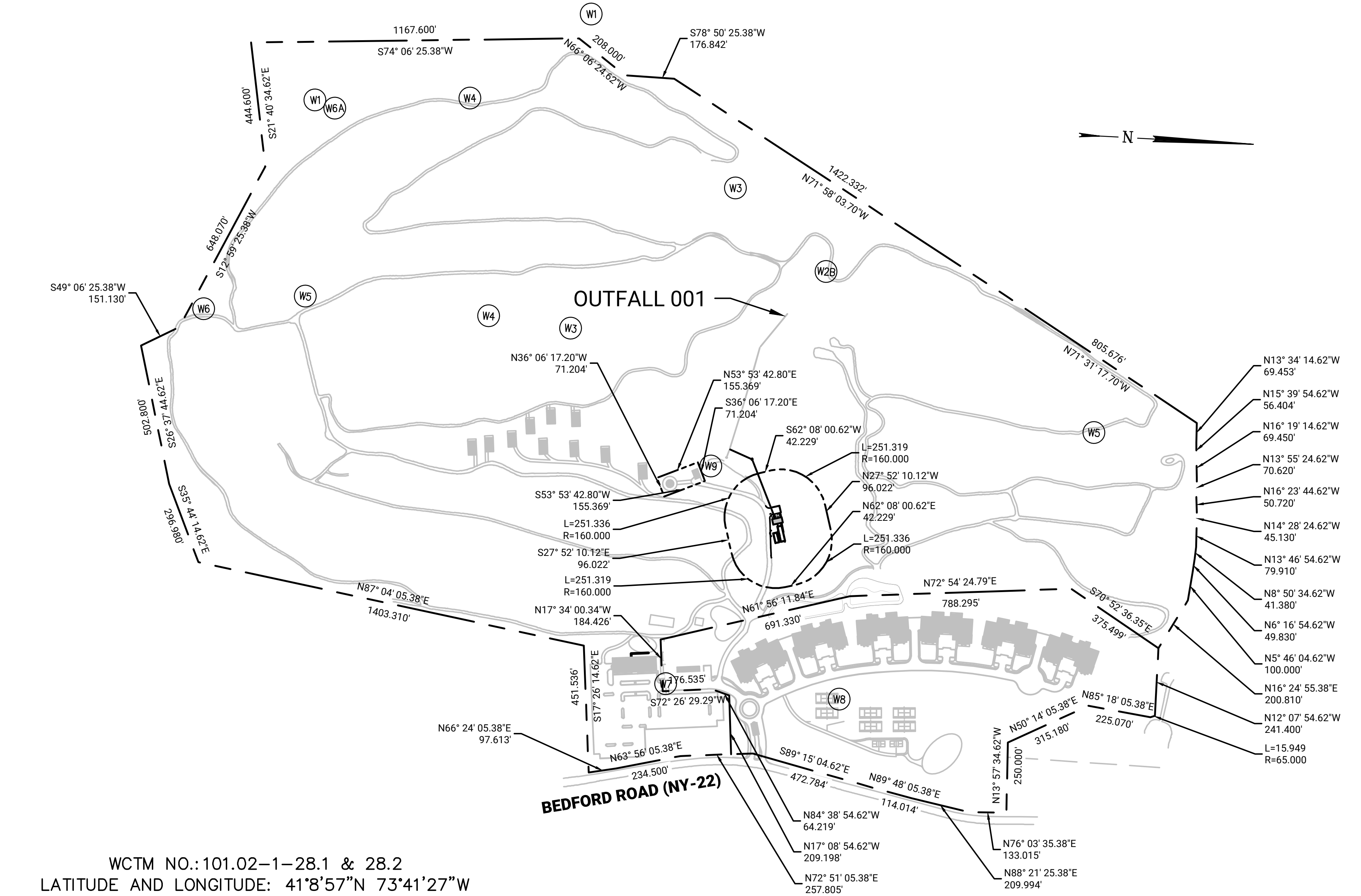
SPDES Number   **DEC Authorization**

Outfall No. 001

Sampling Information

Include the following sampling information. Please indicate whether the values listed are from sampling results (include the date), estimated from the treatment system design as installed, or estimated from the proposed treatment system design.

Plant Design Pollutant Information	Influent		Effluent		Number of Samples or Source of Estimate
	mg/l	lbs/day	mg/l	lbs/day	
BOD5	240		5.0		Prop. Treatment System Design
Suspended solids	240		10.0		Prop. Treatment System Design
Percent removal, BOD/TSS					
pH, Range			6.5-8.5		Prop. Treatment System Design
Settleable solids, ml/l			0.1		Prop. Treatment System Design
Solids, total dissolved					
Dissolved oxygen					
Ammonia, as N	13.0		1.8		Prop. Treatment System Design
Nitrogen, Total, as N					
Phosphorus, Total, as P	8.0		1.0		Prop. Treatment System Design
Fecal Coliform, MPN			200 No.	/100mL	Prop. Treatment System Design
Total Residual Chlorine (if used)	n/a				n/a
Temperature, Degrees F, Summer			70		Prop. Treatment System Design
Temperature, Degrees F, Winter					



WCTM NO.:101.02–1–28.1 & 28.2
LATITUDE AND LONGITUDE: 41°8'57"N 73°41'27"W

THE SUMMIT CLUB AT ARMONK **STP REPLACEMENT** **TOWN OF NORTH CASTLE, WESTCHESTER COUNTY, NEW YORK**	R&M ENGINEERING
SPDES SITE PLAN	

Robinson & Muller Engineers, P.C.
50 Elm Street
Huntington, NY 11743
Office: (631) 271-0576
Fax: (631) 271-0592
www.rmengineering.com

DATE:	APRIL 2022
SCALE:	1"=500'
JOB No.:	2021-201
SHEET:	1

R&M ENGINEERING

ENGINEERING REPORT

For

THE SUMMIT CLUB AT ARMONK

Sewage Treatment Plant Replacement

Armonk
Town of North Castle
Westchester County, NY 10504

R&M Job No.: 2021-201

Prepared for

Summit Club Partners, LLC
568 Bedford Road (NY-22)
Armonk, NY 10504

Signature of Engineer

Matthew P. Scheiner, P.E.
Printed Name

Partner, R&M Engineering
Title

April 26, 2022
Date

FOREWORD

This Engineering report has been prepared in compliance with the requirements of the *New York State Design Standards for Intermediate Sized Wastewater Treatment Systems* (issued by New York State Department of Environmental Conservative (NYSDEC)), requirements of Chapter 873, Article VIII of the Westchester County Sanitary Code and in general follows the guidelines of the *Recommended Standards For Wastewater Facilities* (Ten State Standards).

This Engineering Report has been prepared to address the complete replacement of the existing Sewage Treatment Plant (STP) to serve the proposed redevelopment of the property to update the existing golf course with a new clubhouse, amenities complex, and residential community comprised of 72 townhomes. The parcel for The Summit Club at Armonk project is located east of Interstate 684 and approximately 720 feet north of Blair Road in Armonk, Town of North Castle, New York.

TABLE OF CONTENTS

(All Drawings are located at the end of this document.)

SECTION I

GENERAL INFORMATION

Project Name:	The Summit Club at Armonk STP Replacement
Applicant:	Summit Club Partners, LLC c/o Mr. Jeffrey Mendell 568 Bedford Road Armonk, New York 10504
Project Description:	The applicant proposes to redevelop the existing golf course to also include 72 townhouse units, clubhouse, and a new amenities complex including a pool, spas, restaurant, and bar and lounge. The existing sewage treatment plant (STP) will be replaced, with the STP relocated and capacity upsized to meet the treatment and disposal needs of the golf course and proposed community as well as additional future expansion of the residential space.
Project Location:	The total site area where The Summit Club at Armonk development is proposed is 156.29 acres at 568 & 570 Bedford Road in Armonk, NY. The parcel for the Summit Club redevelopment is located east of Interstate 684 and approximately 720 feet north of Blair Road in Armonk, Town of North Castle, New York.
Consulting Engineer:	Robinson & Muller Engineers, P.C. 50 Elm Street Huntington, N.Y. 11743 Phone: (631) 271 – 0576, Fax: (631) 271 - 0592 E-Mail: MScheiner@rmengineering.com

SECTION II

INTRODUCTION

General

This Engineering Report has been prepared for The Summit Club at Armonk project, the development of a housing community of 72 townhomes and golf and country club. There are also future plans for expansion of the residential complex with additional townhomes and private guest cottages. A projected flow of 45,000 gpd shall be used as the basis of design when accounting for contributions to the existing STP from the proposed and potential future development. The project site is the Summit Club golf course in Armonk, Town of North Castle, New York.

The total project site area for the Summit Club development is 156.29 acres. The existing STP is situated on the site between the ninth hole green and fairway bunker within the existing framed building. This building will be used in the redevelopment as an equipment storage building. As such, a replacement STP is proposed within the hillside between the existing driveway to the existing STP building and the south side of the existing driving range.

Project Site

The overall existing site where the STP will be located varies in elevation from approximately 640 feet above mean sea level (AMSL) in the northeast portion of the property to 400 feet AMSL in the western portions of the property. The STP will be in the southeast portion of the property where the ground surface is proposed to be approximately 534-574 feet AMSL. Based on the subsurface soil and foundation investigation report by Carlin-Simpson & Associates in Appendix A, groundwater was only encountered in one of ten borings taken and four of eleven test pits excavated, reflecting variation in the location of long-term water table at the project site. Based on the information available from the investigation, it is assumed that the flow direction in the project site area is generally to the west.

The subject parcel for the STP and residential complex is a part of lot 101.02-1-28.2 (568 Bedford Road) and the golf course is on parcel 101.02-1-28.1 (570 Bedford Road). There are fourteen (14) currently private wells onsite, which are at least 50 feet away from the STP outfall line. The STP shall be serviced by a dedicated 1” water service line that runs from the proposed potable water treatment building adjacent to the existing STP building.

SECTION III

PROPOSED TREATMENT PLANT CAPACITY

SANITARY SEWAGE FLOW

The average daily design flow for sewage is the average of the daily volumes of sewage to be received at the STP for a continuous twelve (12) month period. For the community and golf club, the flow is determined by the criteria from Table B3 – Typical Per-Unit Hydraulic Loading Rates from the Department of Environmental Conservation (NYS DEC) "Design Standards for Wastewater Treatment Works, Intermediate Sized Sewage Facilities" (2014 Edition) as follows:

1.	Townhomes	162 Bedrooms	@ 110 gpd/Bedroom	=	17,820 gpd
2.	Bar & Grill	35 Seats	@ 16 gpd/Seat*	=	560 gpd
3.	Restaurant	252 Seats	@ 28 gpd/Seat*	=	7,056 gpd
4.	Golf Tournament	144 Golfers	@ 16 gpd/Golfer*	=	2,304 gpd
5.	Country Club	20 Employees	@ 12 gpd/Employee*	=	240 gpd
6.	Golf Course (GC)	15 Employees	@ 12 gpd/Employee*	=	180 gpd
7.	Seasonal GC Staff	12 Bedrooms	@ 60 gpd/Bedroom*	=	720 gpd
8.	Pool	257 Swimmers	@ 8 gpd/Swimmer*	=	2,053 gpd
9.	Spas	24 Swimmers	@ 8 gpd/Swimmer*	=	192 gpd
10.	Excess Pool Deck	170 Swimmers	@ 8 gpd/Swimmer*	=	1,363 gpd
11.	STP Equipment Washdown/Lab	——	55 gpd	=	55 gpd
	Proposed Total Flow			=	**32,543 gpd**
	Future Total Flow (Including Add'tl Guest Cottages + Townhomes)			=	**8,360 gpd**
	Total Average Daily Design Flow			=	**40,903 gpd**
	SAY			=	**45,000 gpd**

*These identified per-unit hydraulic loading rates in the above table have been reduced by 20% because they follow the guidelines set in the NYS DEC design standards for establishments with water-saving plumbing fixtures.

In the table above, items 1-9 result in a proposed flow of 32,543 gpd and the breakdown also includes planned future flows with a maximum contribution of 12,457 gpd. Therefore, a maximum average daily design flow of 45,000 gpd will be used to size the STP for the purposes of this report.

The State Pollutant Discharge Elimination System (SPDES) Permit No. 0069299 for the existing STP established an effluent limitation for flow of 0.016 MGD (16,000 gpd), while the actual flows are minimal and taken care of with temporary facilities while the golf course is closed for renovations. Since this report will evaluate and involve the complete replacement of the existing STP, the flow through the STP is proposed to increase to 45,000 gpd. With the existing discharge permit being expired and the increase in flow, a new SPDES Permit will be obtained from the NYS DEC as required.

In accordance with “Figure 1” of the Ten State Standards, the peak hourly flow for a population of approximately 600 (45,000 gpd ÷ 75 gpd per person) is 3.93 times the average daily flow rate. Peak hourly flow is therefore calculated to be 45,000 gpd x 3.93 = 176,850 gpd (122.81 gpm, say 123 gpm).

SECTION IV

INFLUENT SEWAGE CHARACTERISTICS

The standard influent untreated sewage design characteristics provided in the New York State Department of Environmental Conservation (NYS DEC) "Design Standards for Wastewater Treatment Works, Intermediate Sized Sewage Facilities" (2014 Edition) are as follows:

BOD_5:	155-286 mg/L
TSS:	155-330 mg/L
TP:	6-12 mg/L
Ammonia:	4-13 mg/L
FOG:	70-105 mg/L

Based on the above influent sewage characteristics and influent flow of 45,000 gallons per day, the influent loads that the expanded STP shall be capable of treating have been calculated as follows:

lbs. of pollutants = mg / L pollutant x 8.34 lb. / gal. x flow (Q) in gals. / day x 10^{-6}

BOD_5:	240 mg/L x 8.34 lb. /gal. x 45,000 gpd x 10^{-6}	=	90.07	lb. BOD_5 / day
TSS:	240 mg/L x 8.34 lb. /gal. x 45,000 gpd x 10^{-6}	=	90.07	lb. SS / day
TKN:	40 mg/L x 8.34 lb. /gal. x 45,000 gpd x 10^{-6}	=	15.01	lb. TKN/day
TP:	8 mg/L x 8.34 lb. /gal. x 45,000 gpd x 10^{-6}	=	3.00	lb. TP/day

SECTION V

EFFLUENT REQUIREMENTS

The treated effluent from the proposed Summit Club community and golf club will discharge to surface water, an onsite tributary to Byram River classified by NYS DEC as a Class D stream. Class D streams do not typically support any uses for drinking water, public swimming, fishing or fish propagation due to inconsistencies in flow and effluent dilution ratio. Therefore, the receiving tributary is classified as an “intermittent stream,” which has typical effluent limits as specified in Table B-4B of the NYS DEC standards.

Consequently, we expect that the State Pollutant Discharge Elimination System (SPDES) permit to align with these limits. The 30-day arithmetic average flow limit listed on the permit will be the design flow of 45,000 GPD, and the preliminary effluent limits for the parcel provided by the NYS DEC Division of Water Quality specific to the project are outlined below:

BOD_5:	5.0 mg/L Daily Max.
TSS:	10.0 mg/L Daily Max.
Settleable Solids:	0.1 mg/L Daily Max.
Ammonia (Summer):	0.9 mg/L Daily Max.
Ammonia (Winter):	1.8 mg/L Daily Max.
Phosphorus:	1.0 mg/L Monthly Average
Fecal Coliform:	400 No./100 mL (7-day geometric mean)
Fecal Coliform:	200 No./100 mL (30-day geometric mean)

The daily maximum limit for the Summer is applicable between June 1st through October 31st each calendar year, while the limit for Winter applies November 1st through May 31st. Based on the selected Purestream Biologically Engineered Single Sludge Treatment (BESST) process for the STP replacement, the following effluent quality is anticipated:

BOD_5:	< 5.0 mg/L
TSS:	< 10.0 mg/L
Ammonia:	< 0.9 mg/L
Phosphorus:	< 1.0 mg/L
Fecal Coliform:	< 200 No./100 mL (30-day geometric mean)

The effluent quality is expected to meet or exceed the effluent requirements.

SECTION VI

TREATMENT OPTIONS

Based on density restrictions, formal sewage treatment must be provided for the proposed project. Generally, two options are available:

- Off-Site Treatment and
- On-Site Treatment.

Off-Site Treatment

Off-site treatment requires that there be an existing STP which:

- is sufficiently close to the project site to allow for economical transfer of sanitary sewage flow from the project site to the host STP site;
- has sufficient uncommitted excess capacity for the expected proposed and future sanitary sewage flow (if any); and
- is capable of treating the sewage to the required effluent quality.

After reviewing the site and the surrounding area, no STP sites were found that could potentially serve as an optimal alternative to replacing the existing STP and have the capacity to receive sewage from the Summit Club golf course and residential complex, and therefore we have concluded that it is not feasible to use an off-site treatment option.

On-Site Treatment

Some onsite treatment plants use extended aeration process or Rotating Biological Contactors (RBCs) followed by a deep bed denitrification filter(s). Other STPs use Sequencing Batch Reactors (SBR), Membrane Bio-Reactors (MBR), and the Biologically Engineered Single Sludge Treatment (BESST) process.

The BESST process was selected for the project based upon its record of process stability and ability to consistently achieve the NYS DEC & Westchester County sanitary sewage design goals for treatment of sanitary sewage.

Sanitary sewage will be transported to the STP from the residences and amenities complex via an 8” PVC gravity collection and conveyance system designed by JMC, PLLC.

Description of Selected BESST Treatment Process:

The BESST process is a continuous flow modified extended aeration process. Sewage enters first into the anoxic chamber where it mixes with Return Activated Sludge (RAS) from the clarifier. The nitrogen removal process is completed here as nitrite (NO_2-N) and nitrate (NO_3-N) produced in the aeration zone are converted to nitrogen gas (N_2). Some of the influent BOD_5 is consumed in this denitrification process. The dissolved oxygen (DO) level is maintained below 0.2 mg/l, and submerged mixers keep mixed liquor suspended solids (MLSS) in suspension.

The mixed liquor is transferred by gravity from the anoxic chamber to the far end of the aeration chamber through a submerged transfer pipe. BOD_5 removal and nitrification take place here as the mixed liquor is aerated by fine bubble air diffusers. The aerated mixed liquor then flows into the bottom of the clarifier by means of a baffle.

In the clarifier, solids settle to the bottom as the supernatant flows over the effluent weir and is gravity discharged to the effluent recharge system. Waste Activated Sludge (WAS) sludge is returned to the sludge holding tanks.

SECTION VII
TREATMENT FACILITY DESIGN

Drawing No. 1 – STP Site Plan shows the proposed location of the STP and effluent piping connecting into the existing outfall line that discharges to surface water. Drawing No. 2 - Hydraulic Profile illustrates the proposed hydraulic flow profile of sewage and sludge flows through the STP through the existing sewer manhole that will be used as the connection point into the outfall line.

The proposed sewage treatment and disposal facilities will consist of an equalization tank, a 45,000 gpd BESST process train including a sludge holding tank, an influent screening device and constant head box on a precast concrete access slab, a proposed flow metering effluent manhole, approximately 300 feet of 6" PVC piping to reach the existing outfall piping, and a proposed 20-ft by 35-ft masonry STP building containing a tertiary filter and two (2) UV treatment units. Each step of the process and the required support systems are described below.

All side walls, end walls, bottom, and partitions of the BESST process and equalization tanks shall be of structural grade ASTM-A36 steel plate and all internal piping will be constructed of type 316 stainless steel. There shall be full grating over each of the BESST tanks, including the tertiary filter within the building, and two (2) stairs for Operator access to the BESST process tank and tertiary filter that extend above grade. The perimeter of the process tank and filter will be equipped with galvanized steel safety handrails and kickplate at top of tank elevation.

Influent Equalization Tank

The 8" diameter PVC gravity sewer line has a proposed invert into the equalization tank set at 4.25 feet below the top of tank elevation. The existing flow equalization tank will be equipped with two (2) Goulds Model 3887 non-clog submersible pumps to convey sanitary sewage out of the tank to the anoxic tank internal to the BESST process train. Each pump will have the capacity to handle at a minimum the peak influent flow of 45 gpm at 13.26 ft. TDH. Pump performance curves can be found in Appendix B.

The equalization volume in the tank will be provided between the lead pump "off" elevation to the lag pump "on" elevation, consisting of a proportion of the daily average flow, sludge holding tank volume, and tertiary filter volume.

Equalization Volume Required	=	20% of Daily Average Flow + 25% Sludge Holding Tank Volume + 5% Daily Flow Filter Volume
	=	45,000 x 0.20 + 13,757 x 0.25 + 45,000 x 0.05
Total Required Equalization Volume	=	14,689.25 gallons (1,963.80 cu. ft.)

The minimum vertical difference between "Lag Pump On" float level elevation and the "Lead Off" float level elevation shall be 5.0 ft. This will provide a total equalization storage volume of 15,051 gallons, which is well above the minimum calculated above.

The applicable criteria of Chapter 60 "Screening, Grit Removal and Flow Equalization" of the Ten State Standards including general criteria and the special considerations and standards for flow equalization structures. The 34'-0" x 12'-0" x 7'-0" SWD equalization tank has full grating over the tank with removable panels for operator access. Operation of the pumps will be controlled by use of a pressure transducer, and all pressure transducer and tank elevations are shown below:

Float	**Height**
Top of Equalization Tank	585.75
Approximate Grade El.	585.50
Influent Line El.	581.50
High Water Level Alarm	581.25
Lag Pump On	580.75
Lag Pump Off	578.75
Lead Pump On	577.75
Lead Pump Off	575.75
Low Water Level Alarm	575.25
Bottom of Equalization Tank	573.75

Table – Equalization Pump Float Levels

Influent Screening Device

The two (2) explosion proof submersible raw sewage pumps specified in the previous section will pump the sewage from the equalization tank to a covered fine bar screen via two (2) 3" diameter force mains. The bar screen shall be mounted on the precast concrete access slab that is located between the proposed equalization and BESST process tank. See Drawing No. 1 – STP Site Plan for proposed location of the access slab. The screen will have the capacity to process the flow from both equalization pumps in the event that they run simultaneously. The screened solids will be disposed of manually. The selected screening device is a model MB 260T by Or-Tec, Inc. with a 2 mm screen opening. The screened influent will pass through a constant head box prior to being conveyed to the anoxic tank via gravity.

Anoxic Compartment

See Appendix C – Manufacturer's Process Calculations for Anoxic Compartment calculations.

The equalized sewage will enter the anoxic compartment where it will mix with the return activated sludge (RAS) which is returned from the bottom of the clarifier by means of air lift pumps. This anoxic compartment will act as a selector conditioning zone for the microorganisms which will consume the pollutants in the sewage. Some of the influent BOD_5 will be consumed by the denitrifying bacteria as they complete the nitrogen removal process (Denitrification) and convert nitrate (NO_3) to nitrogen gas (N_2). Two (2) electric submersible mixers on slide rail assemblies with manual hoists will be provided within the anoxic compartment to prevent settling. The mixed liquor will flow into the far end of the bottom of the aeration compartment through a submerged transfer pipe.

The BESST anoxic zone will be 14'-0" wide by 4'-0" long (plan view at the water level), and have a 10'-6" effective depth (12'-0" total sidewall depth). The total volume of the anoxic zone shared between the two trains shall be 993.85 cu.ft. (7,434.0 gallons) . With a design flow of 45,000 GPD, the detention time will be 3.96 hours.

Aeration Compartment

See Appendix C – Manufacturer's Process Calculations for Aeration Compartment calculations.

The mixed liquor will be aerated by a fine bubble air diffusion system to provide process oxygen and prevent solids settlement. The remaining BOD_5 will be removed and the nitrification process which begins as ammonia (NH_3) is converted to nitrite (NO_2) and nitrate (NO_3). The mixed liquor will then flow into the bottom of each clarifier by means of a baffle design integral to the clarifier. Return sludge will be removed from the bottom of each clarifier and pumped to the anoxic zone by means of air lift pumps. Oxygen levels in each aeration compartment will be controlled by utilizing a portable hand-held D.O. monitoring probe and adjusting the manual VFD's on each blower.

The air requirement for the aeration tanks is determined by the manufacturer based on the oxygen and air consumption rates, including a safety factor of 5 scfm. The calculation is outlined below:

Air Flow Rate Required:

$$Oxygen = Q((S_O - S_R)/0.68) - 1.42P_X + 4.57Q(N_O - N)$$

$$Oxygen = 170.33((0.24 - 0.0037)/0.68) - 1.42(14.004) + 4.57(170.33)(0.04 - 0.001)$$

$$Oxygen = 69.655\ kg\ O_2/day$$

$$Air = O_2(\frac{c_S}{c_S - 2})(\frac{o_K}{0.024a})$$

$$Air = 69.655(\frac{8.1224}{8.1224 - 2}))(\frac{1.30}{0.024 * 30})$$

$$Air = 166.85\ Nm^3/h$$

$$Air = \left(166.85\frac{Nm^3}{h} * 35.31\frac{m^3}{ft^3} * \frac{1\ min}{60\ hr}\right) = 98.19\ cfm + 5\ cfm =$$

$$Air = 103.19\ cfm$$

Therefore, for each aeration tank the required amount of air is 51.60 cfm, and the air provided for the aeration tanks will come from the main process blower. See Appendix C for a breakdown of the manufacturer's BESST calculations as well as a list of inputs for the above calculations.

Each proposed aeration compartment will be 14'-0" wide by 9'-2 ½" long (plan view at the water level), and have a 10'-6" effective depth (12'-0" total sidewall depth). The aeration volume in each treatment train will be 1,757.69 cu.ft. (13,147.5 gallons), for a total volume of 3,515.37 cu.ft. (26,295 gallons). With the design flow of 45,000 GPD, the detention time will be 14.02 hours. The combined detention time for the anoxic zones and the aeration zones will be 17.98 hrs.

Clarifier

See Appendix C – Manufacturer's Process Calculations for Clarifier calculations.

The clarifier has a triangular cross-section. Mixed liquor will enter the clarifier through the baffle at the bottom of the clarifier and flow upward. As the mixed liquor rises, heavier solids settle out, and in effect, form a blanket which filters out colloids and very fine particles. A distinct interface forms between the supernatant and the sludge blanket. An air lift pump will be used to remove the activated sludge from the bottom of the clarifier and either discharge it to the anoxic chamber or waste it to the sludge storage tanks. Nitrified return activated sludge (RAS) will be recycled to the anoxic chamber to maintain the biomass concentration required for the treatment process. The RAS rate is proposed to be 4 times the design flow rate for the STP (45,000 GPD x 4 / 1440 min/day / 2 process trains = 62.50 gpm per process train).

Since there are two (2) sludge airlifts rated at 13 scfm each and two (2) skimmer airlifts rated at 5 scfm, the required amount of air for the airlift lines is 36 scfm. The airlift calculations from the manufacturer and performance curves are shown in Appendix C.

Periodically, waste activated sludge (WAS) will be pumped to the sludge storage tanks to control the solids retention time (SRT) of the biomass. FOG and skimmings will be transferred through the airlift system back to the sludge holding tanks. The design SRT is 29.2 days. An air lift skimmer will be used to remove floatables such as light plastics, fats and oils from the surface of the clarifier. Clarifier supernatant flows over a weir into a trough and flows by gravity to the tertiary filter.

Each clarifier will measure 14'-0" wide by 11'-0" long (plan view at the water level), and have a 10'-6" effective depth (12'-0" total sidewall depth). Each clarifier has a volume of 811.76 cu.ft. (6,072 gallons), for a total of 1,623.53 cu.ft. (12,144 gallons). Detention time in the clarifiers at average flow of 45,000 gpd will be 6.48 hrs. The combined detention time for the anoxic zones, the aeration zones, and the clarifiers will be 24.46 hrs. Surface loading rate will be 146.10 GPD/sq.ft. (45,000 gpd/(2 units X 154 sq.ft. per unit) and weir loading rate will be 1,607.14 GPD/Ft. (45,000 GPD/(2 Units X 14'-0" L)). These values are within the limitations set forth by the Ten States Standards.

<u>Blowers</u>

1. <u>Process Air / Airlift Blowers</u>
   A total of two (2) blowers, each with a minimum capacity of 148 scfm, will be provided for the aeration tanks and sludge airlifts, which is greater than the required capacity of 138.19 cfm (103.19 cfm + 36.0 cfm = 138.19 cfm) for both tanks, See Appendix C – Manufacturer's Process Calculations for the aeration and airlift calculations. One (1) blower will act as the duty blower, and the standby blower will as function as a common spare for the aeration/airlift, the equalization tank, sludge holding tank, and tertiary filter. The blower selected for this duty is the Kaeser Model BB69C with a 10.0 HP motor. See Appendix D for blower performance data. Each blower will be supplied with a manual VFD control system with an electrical bypass. High and low pressure switches will be provided with manual valves to accommodate usage of the standby blower.

2. <u>Equalization Tank / Sludge Holding Tank Air Blowers</u>
   Two (2) blowers, each with a minimum capacity of 74 scfm, will be dedicated for the equalization and sludge holding tanks. This minimum capacity is greater than the required capacities of the equalization tanks and sludge holding tank of 18.81 cfm and 55.22 cfm, respectively. The blower selected is the Kaeser Model BB52C, with a 5.0 HP motor, see Appendix D for blower performance data. Each blower will be supplied with a manual VFD control system with an electrical bypass. High and low pressure switches will be provided with manual valves to accommodate usage of the standby blower.

3. <u>Tertiary Filter Air Blower</u>
   One (1) duty blower, with a minimum capacity of 160 scfm, will be provided for the tertiary filter, which is greater than the required capacity of 126.40 cfm, based on an air supply rate of 4 cfm/sq. ft. of filter beds. The total square footprint of the proposed filter beds is 31.6 square feet. The blower selected is the Kaeser Model BB69C, with a 10.0 HP motor, See Appendix D for blower performance data. High and low pressure switches will be provided with manual valves to accommodate usage of the standby blower.

The blowers will be provided with sound enclosures and will be housed in the proposed STP control building.

Tertiary Filtration and Disinfection

To meet the stringent effluent BOD_5 and TSS limits for the STP outlined in Section V, a dual-media, dual-bed auto backwash tertiary filter and ultraviolet disinfection will be provided following the BESST extended aeration process. The tertiary filter unit to be provided as a pre-designed unit is the PURESTREAM PST-31.5 that includes filter beds, a clear well chamber, and backwash capabilities to treat secondary effluent to meet the design limits.

Drawings of the tertiary filter unit are included in Drawing No. 3 – Manufacturer's STP Layout. All side walls, bottom, and partitions of the filter will be of structural grade ¼" steel plate, the internal air scour lines will be Schedule 40 perforated PVC pipe, and the backwash surge and backwash pump piping is Schedule 40 PVC pipe with iron pipe fittings.

Disinfection of the effluent from the tertiary filter will be achieved using two (2) Enaqua Model M4 ultraviolet disinfection system units that will also be located in the proposed STP control building. The proposed in-line units will be installed in a flow-through configuration and fed by gravity from the filter. Isolation valves will be provided on the incoming lines to control flow in the event of maintenance, replacement, or repair work on one unit. See Appendix E regarding additional information on the UV disinfection system specified.

Effluent Flow Metering

A flow meter will be provided at a common location in the proposed 5' diameter sampling manhole and effluent flow meter chamber. The instrumentation will provide a visual readout of instantaneous flow using a flow totalizer and a flow recorder and will be located in a dry location adjacent to the control equipment in the proposed STP control building.

Effluent Recharge

The treated effluent from the STP is discharged to Byram River from an existing outfall to the tributary located in the northwest region of the subject parcel. The replacement STP will be connected into the existing buried 6" diameter SDR-35 PVC outfall line at an existing manhole west of the existing STP building. The effluent recharge piping and structures shall remain intact downstream of the referenced manhole, and no sufficient evidence exists to warrant a modification of the existing outfall location.

Sludge Holding Tank

The sludge holding tank will be used to hold wasted sludge prior to disposal and will be provided as a part of the main treatment process tank. Sludge holding tank sizing is based on an equivalent sewage flow of 75 gpd per capita and 3 cubic feet of sludge per capita per month. For the equivalent population of 600 people (45,000 gpd ÷ 75 gpd/capita) and 3 cubic feet of sludge per capita per month, the required tank volume is 1,800 cu.ft. (600 people X 3 cu.ft./capita), or 13,464.0 gallons. The sludge holding zone will measure 14'-0" wide by 9'-9" long (plan view at the water level) with a 10'-6" SWD (12'-0" total sidewall depth), providing a total volume of 1,839.17 cu. ft. (13,757 gallons). This will provide 39.17 cu. ft. (293.00 gal) greater than the 1,800 cu. ft needed of sludge storage, or approximately 30.65 days of storage capacity.

Air will be supplied to the sludge holding tank at a minimum rate of 30 cfm per 1000 cu. ft. of tank volume via non-clog coarse bubble diffusers to keep the contents aerobic to avoid septic odors and contents of the sludge holding tanks in the completely mixed condition. Consequently, the total air supply rate will be as follows:

CFM = 1,839.17 cu.ft. x 30 cfm/1000 cu. ft.
= **55.17 cfm**

Sludge and scum removal will be via scavenger truck to an approved off-site treatment facility, while the sludge supernatant will be returned by gravity flow to the anoxic zone of the treatment process. Each pump provided will be the Goulds Model 3887 submersible sewage pump, which will provide a minimum capacity of 76 gpm at 14.12 ft. TDH to elevate the sludge supernatant back to the equalization tank so decanted liquid can be rescreened prior to entering the treatment tanks. The sludge decant pump will be controlled by a dedicated control panel, which will contain a start timer, a stop timer, and a float override. Pump performance curves can be found in Appendix B.

Chemical Dosing

Dosing of alum to the aeration compartments of the BESST system is required to comply with the Total Phosphorus effluent limit dictated by the SPDES permit. A suitably sized chemical metering pump and storage tank with containment will be provided.

STP Control Building

The proposed STP control building will contain the tertiary filter, two (2) UV units, five (5) blowers, and spare mechanical equipment, electrical panels and controls.

A laboratory area will be provided within the building for the Operator, which shall include an emergency eyewash and safety shower installed as per 10 State Standards requirements. The structure will provide the necessary protection of the process controls and blowers from the elements (cold weather, rain, frost) and a dry, heated environment with proper ventilation for operating personnel for operation and maintenance functions, process testing, and record-keeping. Sufficient lighting shall be provided for safe working conditions.

The laboratory area of the STP control building will provide space to store instruments and test kits for process monitoring. The instruments and test kits to be provided will include:

* Portable dissolved oxygen meter
* pH meter
* Temperature meter or thermometer
* 1-liter graduated cylinders for settleability tests
* Hach DR900 colorimeter for Ammonia, Nitrite and Nitrate Measurement

Sufficient storage within the STP control building has been allotted for tools, spare parts, and lubricants as well as drawer space for the operator to store maintenance logs and treatment plant records. Spare parts and lubricants will be provided as part of the facility construction. Required logs and records will be discussed in detail in the facility Operation and Maintenance Manual to be prepared by the Engineer of Record during the construction period.

A new asphalt driveway will be paved on the west side of the STP control building to allow for Operator and visitor parking as well as a turnaround point for sludge pump trucks.

Standby Power

A standby gas generator will provide power to all the STP equipment during utility power outages. The generator will be pad mounted outside the STP control building in a louvered enclosure and will be provided with residential grade silencer.

Miscellaneous Facility Design Features

Separation Distances - Table B-1 “Recommended Minimum Aerial Separation Distance from Treatment Facility” of the NYS DEC standards for Intermediate Sized Wastewater Treatment Systems requires a 200-ft. minimum radial distance to existing downwind dwellings from STP treatment processes enclosed in a building. Table B-1 also requires a 150-ft. minimum separation distance from the treatment units to neighboring property lines with residential use. The above requirements are met for the replacement STP process as shown in the proposed site plan in Figure 1.

Table B-2 “Minimum Horizontal Separation Distances” presents the 50-ft. distance requirement for sewer piping from drilled wells. The existing private wells on the parcel are all located greater than 50 feet from the proposed gravity sewer piping for the replacement STP.

Water Supply - There shall be a 1” diameter water service for the STP that taps into the water supply distribution system from the proposed water treatment plant approximately 55 ft south of the existing STP building. A reduced pressure backflow preventer will be provided on the water supply into the treatment plant to protect the community water supply from possible contamination.

Ventilation - Ventilation will be provided to maintain a dry, comfortable condition inside the control building. Six (6) air changes per hour will be provided.

Testing - The design documents will contain provisions for structure, piping and equipment testing in accordance with the NYS DEC Standards and the requirements outlined in 10 State Standards. This will include structure water tightness testing, piping pressure testing, and operational testing of equipment (including pumps, controls, and alarms).

Certifications - Manufacturers certifications of successful equipment testing and Engineer of Record certification of installation and testing will be provided in accordance with the provisions of Sections F and G of the NYS DEC Standards.

Sampling Locations - Wastewater samples are to be taken at the plant influent (equalization tank) and the plant effluent (flow meter chamber). The sample locations are identified in the SPDES process flow diagram presented in Appendix F – Sampling Locations.

APPENDIX A

SOIL BORING RESULTS

BY CARLIN-SIMPSON & ASSOCIATES

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13 February 2013
Revised 16 October 2013

Brynwood Partners, LLC
c/o Corigin Holdings
505 Fifth Avenue, 22nd Floor
New York, NY 10017

Attn: Ms. Megan Maciejowski

Re: Report on Subsurface Soil and Foundation Investigation
Brynwood Club Development
Bedford Road
Town of North Castle, NY (12-175)

Dear Ms. Maciejowski:

In accordance with our proposals dated 20 November 2012 and 9 September 2013 and your subsequent authorization, we have completed a Subsurface Soil and Foundation Investigation for the referenced site. The purpose of this study is to preliminarily determine the nature and engineering properties of the subsurface soil and bedrock as well as the groundwater conditions for the planned development, to recommend a practical foundation scheme, to determine the allowable bearing capacity of the site soils, and to determine the subsurface soil and groundwater conditions and soil permeability in the new stormwater management areas.

We understand that the planned construction will consist of 21 new structures, roadways, parking areas, retaining walls, tennis courts, underground utilities, and a stormwater management system. To guide us in our study, you have provided us with a site plan that indicates the existing site conditions and the location of the planned new development.

Our scope of work for this project included the following:

1. Reviewed the proposed layout, the existing site conditions, the expected soil conditions, and planned this study.

2. Retained General Borings, Inc. to advance 11 test borings at the subject site.

3. Retained Traficante Contracting Inc. to excavate 18 test pits at the subject site.

4. Inspected ten (10) supplemental test pits that were excavated at the site by Brynwood Club personnel.

5. Laid out the boring and test pit locations in the field, provided full time inspection of the explorations, obtained soil samples, and prepared detailed logs and a Boring and Test Pit Location Plan.

6. Performed three (3) field percolation tests and one (1) borehole permeability test.

7. Performed soil identification tests on selected soil samples in our laboratory.

8. Analyzed the field and laboratory test data and prepared this report containing the results of this study.

SITE DESCRIPTION

The project site is located on the Brynwood Club property on Bedford Road in North Castle, Westchester County, New York. The subject property is currently occupied by a golf club with a clubhouse building, tennis courts, and a few smaller out-structures. The proposed development area is also occupied by an asphalt paved parking lot and driveways as well as grass lawn areas and wooded areas. There are numerous existing underground utilities located throughout the property.

Within the proposed development area, the existing site grades vary from approximately elevation +610.0 at the southwest corner of the subject site and the westernmost portion of the site, to elevation +640.0 on the east side of the existing clubhouse building, to elevation +674.5 in the existing tennis court area in the northeastern portion of the property.

SUBSURFACE CONDITIONS

To determine the subsurface soil, bedrock, and groundwater conditions, we advanced 11 test borings and 28 test pits at the site. The borings and test pits were performed at the locations shown on the enclosed Boring and Test Pit Location Plan. Detailed logs have been prepared and are included in this report. Our field engineer visually identified all soil samples and selected soil samples were tested in our laboratory. The results of these tests are also included in this report.

Soil

The soil descriptions shown on the boring and test pit logs are based on the Burmister Classification System. In this system, the soil is divided into three components: Sand (S), Silt ($) and Gravel (G). The major component is indicated in all capital letters, the

lesser in lower case letters. The following modifiers indicate the quantity of each lesser component:

Modifier	**Quantity**
trace (t)	0 -10%
little (l)	10% - 20%
some (s)	20% - 35%
and (a)	35% - 50%

The subsurface soil conditions observed in the borings and test pits can be summarized as follows:

Stratum 1
Topsoil

The surface layer at most of the boring and test pit locations consists of brown topsoil that typically ranges from about 0’3” to 1’6” in thickness.

Stratum 2
Existing Fill

Beneath the topsoil and at the surface in three (3) of the borings (B-6, B-8, and B-9) and ten (10) of the test pits (TP-2, TP-9, TP-10, TP-12, TP-14, TP-16, TP-19, TP-21, TP-26, and TP-28) is existing fill that consists of loose to medium dense brown coarse to fine SAND, little (to and) Silt, trace (to some) coarse to fine Gravel. Cobbles, boulders, topsoil, roots, and debris were also present within the fill at some of the test locations. The existing fill was encountered to depths ranging from 1’0” to more than 9’0” beneath the existing ground surface. Test pits TP-9 and TP-28 were terminated in the fill at final depths of 6’9” and 9’0” beneath the ground surface, respectively.

Stratum 3
Sandy Silt or Silty Sand

Underlying the topsoil and existing fill is virgin soil that is comprised of medium dense to dense brown, light brown, or gray brown SILT some (to and), coarse to fine Sand, trace (to little) coarse to fine Gravel or coarse to fine SAND, little (to and) Silt, trace (to and) coarse to fine Gravel, with occasional cobbles and boulders. The Sandy Silt or Silty Sand stratum continued to depths ranging from 2’0” to 12’0” below the existing ground surface. Boring B-8 and test pits TP-8, TP-10, TP-12, TP-19, TP-20, TP-22, and TP-26 were terminated in this stratum at final depths ranging from 5’0” to 12’0” beneath the ground surface.

Stratum 4
Sand or Sandy Gravel

Below the Sandy Silt or Silty Sand at several test locations is completely weathered Gneiss bedrock that generally consists of dense to very dense brown or gray brown coarse to fine SAND, little (to some) Silt, trace (to some) coarse to fine Gravel or coarse to fine GRAVEL and, coarse to fine Sand, trace Silt. Where encountered in the borings and test pits, the completely weathered bedrock was present at depths ranging from 2’0” to 7’0” beneath the ground surface and continued to depths ranging from 4’7” to 15’2” below the existing ground surface.

Stratum 5 Gneiss Bedrock	Gneiss bedrock was encountered at 27 of the 39 test locations. Where encountered in the borings and test pits, gneiss bedrock was observed at depths ranging from 1’8” to 15’2” beneath the existing ground surface. In general, the quality of the bedrock will improve with depth. At boring B-10, the bedrock was cored between the depths of 2’0” and 7’0”. The core recovery was 86% and the Rock Quality Designation (RQD) of the recovered core was 53%. This indicates that the quality of the upper five (5) feet of the Gneiss bedrock is fair. The Gneiss bedrock is moderately weathered and in a blocky and seamy condition.

Groundwater

Observations for groundwater were made during sampling and upon completion of the drilling operations at each boring location. In auger drilling operations, water is not introduced into the boreholes, and the groundwater position can often be determined by observing water flowing into or out of the boreholes. Furthermore, visual observation of the soil samples retrieved during the auger drilling and in the test pits can often be used in evaluating the groundwater conditions.

Groundwater was encountered in test pit TP-8 at a depth of 4’1” (+609.9), in test pit TP-13 at a depth of 4’10” (+631.2), in boring B-8 at a depth of 3’3” (+608.3), in test pit TP-22 at a depth of 4’6” (+470.5), and in test pit TP-28 at a depth of 8’0” (+491.0) beneath the ground surface. Groundwater was not encountered in any of the other borings or test pits that were performed at the subject site during this investigation.

Variations in the location of the long-term water table may occur as a result of changes in precipitation, evaporation, surface water runoff, and other factors not immediately apparent at the time of this exploration. Based on the site conditions, trapped groundwater may be encountered in the silty site soils and/or along the soil/rock interface during wet periods. Proper groundwater control measures will be required in the event that trapped water is encountered in the site excavations.

Bedrock

Bedrock was encountered in 27 of the 39 explorations that were performed at the site during this investigation. Completely weathered bedrock was encountered at ten (10) test locations at depths ranging from 2’0” to 7’0” below the existing ground surface. Harder bedrock was encountered in the remaining locations and below the completely weathered rock at depths ranging from 1’8” to 15’2” beneath the ground surface. These depths correspond to bedrock elevations ranging between approximately elevation +471.0 and elevation +669.8.

Based on the boring and test pit data and the site plans provided to this office, bedrock was encountered above the planned finished floor elevation in portions of the site. The observed depth to bedrock at each boring and test pit location is summarized in Table 1 in the following section of this report.

The bedrock encountered at the site consists of weathered Gneiss. Based on our experience, the in-situ bedrock will range from highly weathered, fractured rock to massive, intact rock. Penetration into the bedrock with excavation equipment will depend of the degree of weathering and fracturing in the rock. We anticipate that the ”rippability” of the bedrock will be variable and very limited. Based on our observations, harder rock will be encountered and blasting and/or the use of hydraulic hammers will be required to excavate the harder, intact bedrock. Rock removal is discussed further in a separate section of this report.

EVALUATION

At the time of this report, the proposed layout, the proposed finished floor elevations, and the site grading were preliminary. Therefore, the following evaluation is preliminary in nature and has been generalized for the expected development. The recommendations below are intended for planning purposes only and are not intended for final design and construction. Additional subsurface investigation will be required for the proposed buildings and retaining walls. Preliminarily, we estimate that an additional 12 to 15 explorations will be required for this project. Once the site plans have been further developed, a copy shall be forwarded to our office so that we can review it along with the recommendations in this report. At that time, we will provide specific recommendations for additional subsurface investigation. After the supplemental investigation has been completed, additional geotechnical recommendations will be provided for the project site. As a result, the recommendations within this report are subject to change.

Based on the preliminary site plans, we understand that the planned construction will consist of 21 new structures that will include seven (7) golf residences, seven (7) club villas, five (5) golf cottages, one (1) fairway residences building, and one (1) clubhouse building. The proposed construction will also include new asphalt paved roadways and parking areas, retaining walls, tennis courts, underground utilities, and a stormwater management system.

The grading plan provided to this office indicates that the proposed finished floor elevations vary across the site. In addition, the fairway residences, golf cottages, and golf residences will have basements. Based on the existing and proposed grades, cuts ranging up to approximately 14’0” and fills ranging up to approximately 10’0” are expected to achieve the proposed floor slab subgrade elevations. In the proposed pavement areas, cuts ranging up to approximately 6’0” and fills ranging up to approximately 8’0” are expected to achieve the proposed pavement subgrade elevations.

The boring and test pit data indicates that there is existing fill (Stratum 2) present in portions of the site to depths ranging from 1’0” to more than 9’0” below the existing ground surface. The existing fill generally consists of loose to medium dense Sand with varying amounts of Silt and Gravel and occasional cobbles, boulders, topsoil, roots, and debris. Underlying the existing fill is medium dense to dense Sandy Silt or Silty Sand (Stratum 3). The Sandy Silt or Silty Sand is underlain by dense to very dense completely weathered Gneiss bedrock (Stratum 4) in areas followed by more competent Gneiss bedrock (Stratum 5), which was encountered at depths ranging from 2’0” to 15’2” beneath the existing ground surface. The existing fill and bedrock observations are summarized in Table 1 below.

Table 1 - Summary of Boring and Test Pit Data

Boring or Test Pit No.	Approximate Ground Surface Elevation	Depth to Bottom of Existing Fill (Elevation)	Depth to Weathered Bedrock (Elevation)	Depth to Bedrock or Auger Refusal (Elevation)
B-1	+661.0	NE	5’0” (+656.0)	8’0” (+653.0)
B-2	+628.0	NE	NE	7’0” (+621.0)
B-3	+620.0	NE	2’0” (+618.0)	4’9” (+615.3)
B-4	+628.0	NE	2’0” (+626.0)	10’6” (+617.5)
B-5	+623.0	NE	2’0” (+621.0)	8’6” (+614.5)
B-6	+617.0	1’0” (+616.0)	NE	5’6” (+611.5)
B-7	+628.0	NE	5’0” (+623.0)	15’2” (+612.8)
B-8	+609.0	5’6” (+603.5)	NE	NE to 12’0”
B-9	+674.0	7’0” (+667.0)	7’0” (+667.0)	7’6” (+666.5)
B-10	+638.8	NE	NE	2’0” (+636.8)
B-11	+640.0	NE	4’0” (+636.0)	5’6” (+634.5)
TP-1	+662.0	NE	NE	2’0” (+660.0)
TP-2	+672.0	1’10” (+670.2)	NE	4’4” (+667.7)
TP-3	+672.0	NE	NE	2’2” (+669.8)
TP-4	+672.0	NE	NE	3’6” (+668.5)
TP-5	+670.0	NE	3’8” (+666.3)	4’9” (+665.3)
TP-6	+672.0	NE	2’10” (+669.2)	4’7” (+667.4)
TP-7	+620.0	NE	NE	2’8” (+617.3)
TP-8	+614.0	NE	NE	NE to 5’0”
TP-9	+628.0	>6’9” (<+621.3)	NE	NE to 6’9”
TP-10	+625.0	3’0” (+622.0)	NE	NE to 8’0”
TP-11	+642.0	NE	3’9” (+638.3)	6’0” (+636.0)
TP-12	+635.0	5’0” (+630.0)	NE	NE to 6’6”
TP-13	+636.0	NE	NE	7’5” (+628.6)
TP-14	+625.0	5’0” (+620.0)	NE	5’0” (+620.0)
TP-15	+668.0	NE	NE	1’8” (+666.3)
TP-16	+651.0	1’10” (+649.2)	NE	4’10” (+646.2)
TP-17	+655.0	NE	NE	NE to 1’0”
TP-18	+670.0	NE	NE	NE to 7’0”
TP-19	+427.0	2’5” (+424.6)	NE	NE to 7’0”
TP-20	+415.0	NE	NE	NE to 8’0”
TP-21	+478.0	1’4” (+476.7)	NE	7’0” (+471.0)
TP-22	+475.0	NE	NE	NE to 7’6”
TP-23	+496.0	NE	NE	3’10” (+492.2)
TP-24	+564.0	NE	NE	6’8” (+557.3)
TP-25	+633.0	NE	NE	3’4” (+629.7)
TP-26	+669.0	5’6” (+663.5)	NE	NE to 8’0”

Boring or Test Pit No.	Approximate Ground Surface Elevation	Depth to Bottom of Existing Fill (Elevation)	Depth to Weathered Bedrock (Elevation)	Depth to Bedrock or Auger Refusal (Elevation)
TP-27	+561.0	NE	NE	4’4” (+556.7)
TP-28	+499.0	>9’0” (<+490.0)	NE	NE to 9’0”

Notes: NE – Not Encountered
B-8: Groundwater at +608.3
TP-8: Groundwater at +609.9
TP-9: Terminated in the Existing Fill
TP-13: Groundwater at +631.2
TP-22: Groundwater at +470.5
TP-28: Groundwater at +491.0
TP-28: Terminated in the Existing Fill

Removal of Existing Structures from New Building and Pavement Areas

Building Areas

The site plan indicates that existing structures are present in some of the proposed building areas. The existing structures will be removed as part of the proposed development. All debris resulting from the demolition of these items must be completely removed from the new building areas, extending at least ten (10) feet beyond the new building limits, where practical. This shall include the complete removal of all foundations, walls, slabs, utilities, sidewalks, pavement, and miscellaneous debris. Where the removal of existing items or associated materials extends below the planned building, the resulting excavations shall be backfilled with new compacted fill as described below.

Existing utilities, where they are encountered within the planned building areas, should be either abandoned or rerouted around the new structures. Once the utility has been rerouted or abandoned, the section of pipe and any associated structure within the building areas should be completely removed. The removal of the pipe and structure must also include any loose fill around the pipe or structure. After the pipe, associated structure, and associated loose backfill have been removed, the resulting excavation shall be backfilled with new controlled fill as described below.

New compacted fill shall consist of either suitable on-site soil or imported sand and gravel. Imported sand and gravel fill shall contain less than 20% by weight passing a No. 200 sieve. The fill shall be placed in layers not exceeding one (1) foot in loose thickness. In the proposed building area, new fill shall be compacted to at least 95% of its Maximum Modified Dry Density (ASTM D1557). Each layer shall be compacted, tested, and approved prior to placing subsequent layers.

Pavement Areas

In the proposed pavement areas, any existing structures and debris resulting from the demolition of the structures must be completely removed from the new pavement areas, extending at least five (5) feet beyond the new paving limits, where practical. The

excavations resulting from the removal of existing items shall be backfilled using controlled compacted fill. New fill shall consist of either suitable on-site soil or imported sand and gravel placed in one (1) foot loose layers and compacted to at least 92% of its Maximum Modified Dry Density (ASTM D1557).

Implications of Existing Fill

The boring and test pit data indicates that existing fill is present in portions of the site. Where encountered in the borings and test pits, the fill extended to depths ranging from 1'0" to more than 9'0" beneath the existing ground surface. These depths correspond to elevations ranging from approximately +424.6 to elevation +670.2. The depth of the existing fill is expected to be variable and may be deeper in unexplored areas of the site and around the existing site buildings.

The existing fill is not an acceptable bearing material for the new building foundations or floor slabs. The consistency and density of the fill material are not predictable. Certain areas may contain clean dense soils while other areas may contain loose material, topsoil, and/or debris. The existing fill creates the possibility of intolerable differential settlements under loading.

To eliminate the potential for damaging differential settlements, we recommend that the existing fill be completely removed from the new building areas. Based on the existing grades and the proposed finished floor elevations, we expect that some of the existing fill will be removed during the planned building excavations. However, existing fill is expected to be encountered below the planned subgrade elevation in portions of the site. Undercutting of the subgrade will be required in these areas to remove the existing fill or otherwise unsuitable materials from the building areas. The over-excavated areas shall then be replaced with new structural fill, as necessary, to achieve the planned subgrade elevations.

To further evaluate the existing fill conditions in and around the planned building areas, we recommend that a series of supplemental test pits be performed at the time of construction. The test pits should be conducted under the full time observation of a Carlin-Simpson & Associates representative. These test pits will allow us to confirm the consistency, thickness, and horizontal limits of the existing fill material.

Provided that the existing fill and any other unsuitable materials encountered during construction are removed, it is our opinion that the new structural fill and virgin soils can adequately support the new building foundations and floor slabs.

Rock Removal - Blasting Issues

As discussed above, bedrock was encountered at 27 of the 39 test locations during this study. The bedrock was encountered at depths ranging from 1'8" to 15'2" beneath the ground surface. These depths correspond to bedrock elevations ranging between approximately elevation +611.5 and elevation +669.8. Based on the site plans provided to this office, bedrock was encountered above the planned finished floor elevation in portions of the site. Bedrock may also be encountered at higher elevations in the unexplored areas of the site.

The bedrock encountered in the borings and test pits consists of weathered Gneiss. Based on our experience, the in-situ bedrock will range from highly weathered, fractured rock to massive, intact rock. To excavate the rock, the upper 1’0” to 5’0” of rock may be “rippable” by using large construction equipment. The use of hydraulic hammers and/or blasting will be required in order to achieve deeper excavations. Zones of weathered rock may exist deeper than 5’0” but conditions are expected to be highly variable. Hard rock will be encountered during construction.

In order to develop the site, rock removal will be required in areas to achieve the proposed grades. Rock removal may also be required for the new pavement and utilities in portions of the site. Rock blasting will likely be required to achieve the proposed grades in areas. Nearby buildings and existing underground utilities could be affected by the blasting.

The Blasting Contractor should avoid over-blasting the rock. Over-blasting will disturb the deeper intact rock that will be used as bearing material for the proposed foundations and floor slab.

The blasting operation will be monitored by a seismologist using a seismograph. The Peak Particle Velocity emanating from any blast will be restricted to 2.0 in/sec. Each blast will be monitored to insure that this criteria is not exceeded.

The U.S. Bureau of Mines [Nicholas et al (1971)] has established that a threshold of 4.0 in/sec will likely crack plaster and thus they recommend that the safe vibrational criterion be 2.0 in/sec. This criterion has been used successfully in the industry. Each blast will be monitored independently to insure that this criterion is not exceeded. The monitoring results shall be provided to the Blasting Contractor as soon as possible so that the blasting program can be modified if necessary.

We recommend that a minimum of four (4) monitoring points be established, to the north, east, south and west of the planned blast area. The seismograph sensors should be placed near the closest structure and at any structures identified during the pre-blast survey that are considered to be susceptible to vibration damage.

Prior to the start of any construction, a Blasting Management Plan shall be prepared by the Blasting Contractor for this project. This plan shall be in accordance with State regulations and the Explosive Materials Code, NFPA No. 495, National Fire Prevention Association. Additionally, all blasting should adhere to the provisions of 29 CFR Ch. XVII Section 1910.109 for explosives and blasting agents and to all local requirements.

Prior to any blasting work being done, a licensed professional engineer shall be retained to perform a detailed pre-blast survey of existing structures located within 500 feet of the planned blast area. The pre-blast survey shall be conducted in accordance with the requirements of local authorities. A copy of all reports prepared by the licensed engineer shall be submitted to the Town Engineer and the Owner’s representative in a timely manner.

Prior to the beginning of blasting, a notice will be sent to all residential and commercial property owners within a 500 foot radius of the blast area. This notification will

be given at least 48 hours before blasting takes place. A contact person will be established and named in this notice to respond to all concerns raised by nearby residents during the blasting phase of the project. The contact person will respond to any inquiries within 24 hours.

Preparation of New Building Areas and Removal of Existing Fill

In order to prepare the building areas for construction, all surface materials such as topsoil, asphalt, and surface vegetation shall be removed from the planned building areas, extending at least ten (10) feet beyond the new construction limits, where feasible.

The boring data indicates that existing fill is present within portions the proposed building areas. Fill material may also be present in other unexplored portions of the site. Where encountered in the test borings, the existing fill extended to depths ranging from about 1'0" to 7'0" below the existing ground surface. As shown in Table 1 above, the approximate bottom of the fill material ranges from elevation +603.5 to elevation +670.2. The existing fill is expected to vary in thickness across the site and may extend deeper in the unexplored areas and around the existing site structures.

After the surface materials are removed, the existing fill shall be excavated from the new building areas. The removal of the existing fill from the new building areas shall extend through the existing fill, down to the virgin soil or weathered bedrock. At the bottom of the excavation, the removal of the unsuitable material shall extend horizontally beyond the building lines a minimum distance of three (3) feet plus a distance equal to the depth of the excavation below the planned finished floor elevation. For example, if the removal of the existing fill extends vertically five (5) feet below the planned finished floor elevation, the excavation must extend horizontally a minimum of eight (8) feet (3 feet plus 5 feet) beyond the new building line at that location.

The removal of the existing fill from the planned building areas shall be performed under the full time observation of Carlin-Simpson & Associates. The on-site representative from Carlin-Simpson & Associates shall direct the Contractor during this operation to ensure that all of the unsuitable material has been removed from the proposed building areas.

During the removal of the unsuitable material from the building areas, the Contractor should segregate the potentially re-usable existing fill material from the non-reusable fill (i.e. debris and topsoil). The on-site representative from Carlin-Simpson & Associate shall evaluate the suitability of the excavated materials for use as structural fill during the excavation and prior to its re-use. Potentially usable fill should be stockpiled and covered with tarps or plastic sheeting for protection from excess moisture. Any fill material that is wet must be dried prior to its re-use.

After the surface materials and existing fill have been removed and prior to the placement of new structural fill, the exposed subgrade must be graded level and proofrolled by several passes of a vibratory drum roller. The proofrolling operation is necessary to densify the underlying soils. Carlin-Simpson & Associates shall be retained to observe the proofrolling of the subgrade. If any soft or otherwise unsuitable soils are noted, the

unsuitable material shall be removed and replaced with new structural fill. Carlin-Simpson & Associates shall be responsible for determining what material, if any, is to be removed and will direct the contractor during this operation.

New structural fill required to achieve final grades shall consist of either suitable on-site soil or imported sand and gravel. Imported fill shall contain less than 20% by weight passing a No. 200 sieve. The structural fill shall be placed in layers not exceeding one (1) foot in loose thickness and each layer shall be compacted to at least 95% of its Maximum Modified Dry Density (ASTM D1557). Each layer must be compacted, tested, and approved prior to placing subsequent layers. The suitability of the excavated soil for reuse as structural fill is discussed in a following section of this report.

After the installation of structural fill has been completed to the required subgrade elevations, the virgin soil and new structural fill may be used to support the proposed building foundations and floor slabs.

New Building Foundations

According to the boring data, the foundation bearing materials will consist of medium dense to dense virgin soil, weathered bedrock, and new structural fill. Foundations for the proposed structures may be designed as a shallow spread footing bearing on the virgin soil, weathered bedrock, or new structural fill utilizing a net allowable bearing pressure of 4,000 psf (2.0 TSF).

Exterior footings shall bear at a depth of at least 42 inches below finished outside grade for protection from frost. Interior column footings may bear on the virgin soil, weathered bedrock, or new structural fill just below the floor slab provided the building is heated during winter. Column footings shall have a minimum dimension of 30 inches. The wall footings shall have a minimum width of 18 inches.

Prior to the placement of formwork, reinforcement steel, and concrete, the bearing subgrade soil shall be cleaned of all loose soil and compacted with several passes of a small vibratory drum trench compactor (i.e. Wacker Model RT560), a heavy vibratory plate tamper (i.e. Wacker BPU 3545A or equivalent), or "jumping jack" style tamper (i.e. Wacker Model BS 600). This must be performed under the inspection of a representative from Carlin-Simpson & Associates. If instability is observed during the compaction of the bearing subgrade, the soft soil shall be removed and replaced with new compacted fill.

Where rock is encountered in the foundation excavations, "Special Construction Procedures" must be employed. When continuous wall footings or closely spaced column footings (20 feet or less) bear on dissimilar material (i.e. rock and soil) the potential for differential movement exists. A footing bearing in rock will not move, whereas a footing bearing on soil will settle slightly due to the compressive nature of all soils when subjected to new loads. The area between movement and non-movement will develop a (shear) stress point. Cracks in foundations and walls will be the result from such movement. Therefore, continuous wall footings must bear either entirely on rock or entirely on soil for any individual building. Alternatively, for larger structures, transition zones can be constructed to create a gradual transition from a soil to a rock bearing subgrade.

Adjacent column footings greater than 20 feet apart may bear on dissimilar material (i.e. soil and rock). Any individual column footing must bear entirely on the same type bearing material (i.e. all soil or all rock).

Where rock and soil both exist at the bearing elevation within a foundation excavation, the footings must either be lowered to bear entirely on rock, or a minimum of 18 inches of rock must be removed from below planned footing bottom. The over-excavated 18 inches must then be filled with a granular material having a maximum particle size of ½-inch and containing at least 15% but not more than 30% material by weight passing a No. 200 sieve. The fill shall be placed in six (6) inch layers and each layer shall be compacted to at least 95% of its Maximum Modified Dry Density (ASTM D1557). This procedure will create a "cushion" atop the rock and reduce the potential for differential movement. For soft, rippable rock, this procedure will not be required.

If during the excavation for continuous foundations, the transition from soil to rock is gradual (i.e. from medium dense soil to dense weathered rock to very dense rock) over a distance of 20 feet or more, the "Special Construction Procedures" may not be required. This would have to be evaluated in the field on a case-by-case basis by the representative from Carlin-Simpson & Associates at the time of construction.

Where the transition from rock to soil is abrupt within the excavation for continuous wall foundations, transition zones can be constructed by over-excavating the rock in steps and increasing the "soil cushion" thickness over a distance of 24 feet or more. To construct the transition zone, the bedrock is over-excavated in a series of steps, each step being six (6) inches in depth and at least eight (8) feet in length. The first step is six (6) inches deep, the second step is 12 inches deep, and the final step is 18 inches deep. The over-excavation is then backfilled with the soil cushion material described above.

Floor Slab

After the footings and foundation walls are installed, fill will be required to backfill the excavations and to raise grades in the building areas to the slab subgrade elevations. New fill for the floor slab shall consist of either suitable on-site soil or imported sand and gravel containing less than 20% material by weight passing a No. 200 sieve. The fill shall be placed in layers not exceeding one (1) foot in loose thickness and each layer shall be compacted to at least 92% of its Maximum Modified Dry Density (ASTM D1557). Fill layers shall be compacted, tested, and approved before placing subsequent layers.

The floor may be designed as a slab on grade, bearing on virgin soil, weathered bedrock, bedrock, or new structural fill. We recommend a Modulus of Subgrade Reaction (k) of 200 pounds per cubic inch (pci) be used for design. A six (6) inch layer of 3/4-inch crushed stone is recommended beneath the concrete slab for additional support and drainage. In the event that the floor slab is constructed directly on Gneiss bedrock, a minimum of 12 inches of crushed stone or DGA should be provided beneath the floor slab for drainage and to act as a cushion on the rock. Sump pits and pumps are recommended where basements are planned.

Settlement

Settlement of individual footings, designed in accordance with recommendations presented in this report, is expected to be within tolerable limits for the proposed structure. For footings placed on natural soils or new compacted fill approved by Carlin-Simpson & Associates and constructed in accordance with the requirements outlined in this report, maximum total settlement is expected to be on the order of 1/2-inch or less. Maximum differential settlement between adjacent columns or load bearing walls is expected to be half the total settlement.

The above settlement values are based on our engineering experience with similar soil conditions and the anticipated structural loading, and are to guide the Structural Engineer with his design. To minimize difficulties during the foundation installation phase, it is critical that Carlin-Simpson & Associates be retained to observe the foundation bearing surfaces and to confirm the recommended bearing pressures and that the existing fill and unsuitable materials have been removed from beneath the new foundations.

Foundation Walls

In the event that foundation walls are required, the soil adjacent to the building walls will exert a horizontal pressure against the walls. This pressure is based on the soil density and Coefficient of Earth Pressure at Rest (k_o), which is applicable to non-yielding building walls. We estimate that the backfill material will have an in-place (moist) density of about 130 pcf and a k_o of 0.5. Based on these properties, the soil will produce an Equivalent Fluid Pressure of 65 pcf against the building walls.

For sliding, the coefficient of friction between concrete and the virgin site soils or new structural fill is 0.45. For clean sound rock, a friction coefficient of 0.55 can be used. Where passive lateral earth pressure is to be included in the design of the wall, a design value of 195 psf/ft may be used. This is based on a Coefficient of Passive Earth Pressure (k_p) of 3.0, an in-place soil backfill density of 130 pcf, and a factor of safety of 2.0.

Where foundation walls are required, we recommend that a footing drain be placed around the exterior of the new structure to prevent water from accumulating against the foundation wall. This drain may consist of a minimum four (4) inch diameter, rigid wall perforated PVC pipe surrounded by at least 12 inches of 3/4-inch clean crushed stone. The stone shall be wrapped in a geotextile fabric, Mirafi 140N or equivalent. The foundation drainpipe should be extended to daylight or to the stormwater collection system. The outside face of the foundation wall, where it extends below grade, must be damp proofed or waterproofed.

The foundation walls should be backfilled with suitable structural fill placed in layers up to one (1) foot in loose thickness. The new fill should be compacted with a vibratory drum trench compactor (i.e. Wacker Model RT560), a heavy vibratory plate tamper (i.e. Wacker BPU 3545A or equivalent) or "jumping jack" style tamper (i.e. Wacker Model BS 600) to at least 92% of its Maximum Modified Dry Density (ASTM D1557). Heavy equipment should not be operated near the wall as damage to the wall could occur.

Outside the structure, the backfill placed adjacent to the foundation walls and above the footing drain shall consist of either clean crushed stone or an imported sand and gravel mixture containing less than 10% by weight passing a No. 200 sieve and placed in layers not exceeding one (1) foot in thickness. This clean sand and gravel or crushed stone backfill shall extend a minimum of one (1) foot horizontally from the back face of the foundation walls, and shall extend vertically up the wall face to two (2) feet below the finished ground surface elevation.

Beyond this point, the foundation walls should be backfilled with suitable soil placed in layers up to one (1) foot in thickness. The new fill should be compacted with a vibratory drum trench compactor (i.e. Wacker Model RT560), a heavy vibratory plate tamper (i.e. Wacker BPU 3545A or equivalent), or "jumping jack" style tamper (i.e. Wacker Model BS 600) to at least 92% of its Maximum Modified Dry Density (ASTM D1557). Heavy equipment should not be operated near the walls as damage to the walls could occur. Material excavated from the cut areas on site will be suitable for reuse as compacted fill, provided that it remains relatively dry enough to be adequately compacted to the required density and does not contain any debris or organic material (i.e. topsoil and roots).

Seismic Design Considerations

From site-specific test boring data, the Site Class was determined from Table 1615.1.1 of the New York State Building Code. The site-specific data used to determine the Site Class typically includes soil test borings to determine Standard Penetration resistances (N-values). Based on the average N-values in the upper 100 feet of soil profile, the site can be classified as Site Class C – Very Dense Soil and Soft Rock Profile.

New structures should be designed to resist stress produced by lateral forces computed in accordance with Section 1615 of the New York State Building Code. The values in Table 2 shall be used for this project. Based on the information obtained from the borings, it is our opinion that the potential for liquefaction of the native soils at the site due to earthquake activity is relatively low.

Table 2 – Seismic Design Parameter Values

Mapped Spectral Response Acceleration for Short Periods, [Fig 1615 (1)]	S_S=0.347g
Mapped Spectral Response Acceleration at 1-Second Period, [Fig 1615 (2)]	S_{S1}=0.070g
Site Coefficient [Table 1615.1.2 (1)]	F_a=1.20
Site Coefficient [Table 1615.1.2 (2)]	F_v=1.70
Max Considered Earthquake Spectral Response for Short Periods [Eq 16-16]	S_{MS}=0.416g
Max Considered Earthquake Spectral Respond at 1-Second Period [Eq 16-17]	S_{M1}=0.119g
Design Spectral Response Acceleration for Short Periods [Eq 16-18]	S_{DS}=0.278g
Design Spectral Response Acceleration for 1-Second Period [Eq 16-19]	S_{D1}=0.079g

Site Retaining Walls

In order to develop the site, retaining walls will be required in areas. The site retaining walls may be designed as either cast-in-place steel reinforced concrete walls or geogrid reinforced modular block (MSE) walls. The preliminary site plans show five (5)

retaining walls. The maximum exposed height of these walls ranges from approximately seven (7) feet to 12 feet but the top and bottom wall elevations were not finalized at the time of this report.

The following recommendations are preliminary in nature based on the boring and test pit data from other areas of the project site during this investigation. The recommendations below are intended for planning purposes only and are not intended for final design and construction. A supplemental subsurface investigation is required for the proposed retaining walls so that additional design recommendations can be provided.

In the event that existing fill materials are present within the proposed wall areas, these materials must be completely removed from the limits of new wall construction. The removal of the topsoil or other unsuitable fill materials shall extend horizontally a minimum distance of five (5) feet beyond the front face of the new wall or extend horizontally a minimum distance equivalent to the vertical depth of the required excavation below the proposed wall base or foundation bearing elevation, whichever is greater. This is required to ensure that all unsuitable material has been removed from beneath the wall base or foundation zone of influence, which shall be defined by an imaginary plane projecting downward and away from the front edge of the wall base or foundation on a one horizontal to one vertical (1H:1V) projection.

The foundations for the new retaining wall may be placed on the virgin soil, weathered bedrock, or on new compacted fill approved by Carlin-Simpson & Associates. New compacted fill shall consist of either suitable on-site soil or imported sand and gravel. Imported fill shall contain less than 20% by weight passing the No. 200 sieve. The fill shall be placed in one (1) foot thick loose layers and compacted to at least 95% of its Maximum Modified Dry Density. Preliminarily, the footings or base of the wall can be designed using a net design bearing pressure of 4,000 psf (2.0 TSF).

For MSE walls, the wall base or foundation must be adequately embedded for internal and global stability. The embedment depth will be determined by the Wall Design Engineer. For reinforced concrete walls, the footing or base of the wall shall bear at least 42 inches below finished grade of the outside face of the wall for protection from frost. The wall foundation or base may bear at shallower depths when installed directly on the bedrock since rock is not susceptible to frost. Where both soil and rock are encountered within the wall foundation or base excavation, the “Special Construction Procedures” discussed above for the building foundations must be utilized.

Drains must be provided behind the retaining walls to prevent the buildup of hydrostatic pressure against the walls. The drain should consist of a 4-inch diameter perforated PVC pipe, surrounded with 3/4-inch clean crushed stone and wrapped in a geotextile fabric, Mirafi 140N or equivalent. The drain should be installed behind the base or foundation of the retaining wall to collect the water behind the wall and be connected into the site stormwater collection system or extended to daylight beyond the wall area.

Backfill placed directly behind the retaining walls shall consist of either suitable on-site soil or imported sand and gravel containing less than 20% by weight passing a No. 200 sieve. Each layer shall be compacted using a hand guided mechanical tamper to 92% of its

Maximum Modified Dry Density (ASTM D1557). Excessive compaction adjacent to the retaining walls must be avoided. Layers shall be tested and approved before placing subsequent layers. Large compaction equipment must not be used within ten (10) feet of the new walls to prevent potential damage to the walls.

The soil adjacent to the site retaining walls will exert a horizontal pressure against the walls. This pressure is based on the soil density and the Coefficient of Active Earth Pressure (k_a). We estimate that the backfill material will have an in-place (moist) density of about 130 pcf and an angle of internal friction (ϕ) of 30^o. For design, soil cohesion is assumed to be zero for the foundation soil, retained soil, and reinforced backfill. The active earth pressure coefficient (k_a) is 0.33 provided the grade behind the wall is level. Based on these properties, the retained soil will produce an Equivalent Fluid Pressure of 42.9 pcf against the retaining walls. If a sloping grade exists behind the new walls, the k_a and the Equivalent Fluid Pressure must be adjusted accordingly. In addition, any surcharge loads from structures, vehicles, or other retaining walls (i.e. tiered walls) must be considered in the wall design.

For sliding, the friction coefficient between mass concrete and the virgin site soils or new compacted fill is 0.45. For clean sound rock, a friction coefficient of 0.55 can be used. Where passive lateral earth pressure is to be included in the design of the wall, a maximum design value of 195 psf/ft may be used. This is based on a Coefficient of Passive Earth Pressure (k_p) of 3.0, an in-place soil backfill density of 130 pcf, and a factor of safety of 2.0.

The Wall Design Engineer shall prepare a complete wall design (i.e. drawings, specifications, and calculations), which shall be designed and sealed by a Professional Engineer registered in the State of New York and submitted to Carlin-Simpson & Associates for review and approval. MSE retaining walls shall be designed in accordance with the recommendations of the NCMA Design Manual for Segmental Retaining Walls (Current Edition).

The MSE wall design shall consider the internal stability of the reinforced soil mass and shall be in completed accordance with acceptable engineering practice. In addition, external stability, including sliding, overturning, and bearing, as well as global slope stability shall be evaluated in accordance with acceptable engineering practice.

The MSE Wall Designer Engineer shall be responsible for determining the required geogrid reinforcement lengths and elevations based on his stability analysis (including global stability) and the properties of the geogrid reinforcement used in the design. We anticipate that in the critical areas of the wall, global stability will be the controlling design criteria for the design of the geogrid reinforcement.

Stormwater Management Areas

We understand that the planned development will include one or more stormwater management areas. The preliminary grading plan shows a proposed infiltration basin with a forebay in the western portion of the project site. The plan also indicates that the basin will have a bottom elevation at +610.0. We also understand that there is an alternate stormwater

management area in the southwestern portion of the site, near the proposed fairway residences building. In addition, stormwater management areas will likely be required throughout the golf course property. However, at the time this report was prepared, the proposed stormwater management system had not been designed and the location, grades, and invert elevations of the system had not been finalized.

During this study, four (4) borings, one (1) test pit, one (1) borehole permeability test, and four (4) percolation tests were performed within or near the planned stormwater management areas. An addition ten (10) test pits (TP-19 through TP-28) were excavated at potential stormwater management areas throughout the golf course property. The tests were performed at the locations shown on the attached Boring and Test Pit Location Plan. The proposed test depths were provided by the project Site Engineer. The test depths were modified, however, based on the depth to bedrock encountered at the test locations.

The soil conditions encountered within the proposed infiltration basin area consist of a surface layer of topsoil (Stratum 1), approximately 0’6” to 0’9” in thickness, followed by existing fill (Stratum 2) in boring B-6. Below the topsoil and fill is virgin soil that consists of layers of Sandy Silt, Silty Sand, Sandy Gravel, Gravelly Sand, or Silty Gravelly Sand (Strata 3 and 4) followed by Gneiss bedrock (Stratum 5). Bedrock was encountered in the proposed infiltration basin area at depths ranging from 2’8” to 8’6” beneath the ground surface. These depths correspond to bedrock elevations ranging between elevation +611.5 and elevation +617.3, which is above the proposed bottom elevation of the infiltration basin.

In the alternate stormwater management area, the topsoil was underlain by approximately 5’6” of existing fill (Stratum 2) followed by layers of Sandy Silt and Silty Sand (Stratum 3). Groundwater was encountered in this portion of the site at depths ranging from 0’6” to 3’3” below the ground surface, which corresponds to groundwater levels ranging from approximately elevation +608.3 to elevation +613.2.

The subsurface soil and groundwater conditions encountered in the potential stormwater management areas throughout the golf course property vary across the site. The boring and test pit observations are summarized in Table 1 above.

In December 2012 and January 2013, permeability tests were performed within the proposed stormwater management areas. One (1) borehole permeability test (BP-4) and four (4) percolation tests (P-1 through P-4) were performed. The infiltration rates at the test locations are summarized in Table 3 below.

Table 3 – Field Permeability Test Results

Permeability Test No.	Permeability Test Depth (Elevation)	Permeability Rate	Soil Description
BP-4	7’0” (+621.0)	2.4 in/hour	Brown coarse to fine SAND, little Silt, some (+) coarse to fine Gravel
P-1	3’6” (+616.5)	>20 in/hour	Brown coarse to fine GRAVEL and, coarse to fine Sand, trace Silt
P-2	1’8” (+610.3)	NR	*Groundwater encountered 0’6” below the ground surface*

Permeability Test No.	Permeability Test Depth (Elevation)	Permeability Rate	Soil Description
P-3	2’8” (+613.3)	>20 in/hour	Brown coarse to fine SAND, some Silt, and (-) coarse to fine Gravel
P-4	2’0” (+613.0)	NR	*Groundwater encountered 1’10” below the ground surface*

NR – Not Recorded

Based on the field tests, the virgin soil in the areas of tests P-1 and P-3 has a permeability rate that exceeds 20 inches per hour. However, these tests were performed at elevations of +616.5 and +613.3, which are approximately 6’6” and 3’3” higher than the planned bottom of the proposed infiltration basin. Bedrock was encountered at depths of 4’9” (+615.3) and 5’6” (+611.5) below the surface at these test locations. In the event the virgin soil in the areas of tests P-1 and P-3 can be utilized for the stormwater management system, a permeability rate of 10 inches per hour should be used for preliminary design. This design permeability rate includes a factor of safety of 2.0.

Field permeability tests could not be performed at test locations P-2 and P-4 during this study since groundwater was encountered at depths of 0’6” (+611.5) and 1’10” (+613.2) below the ground surface, respectively. Should stormwater management areas be planned in other portions of the site, they must be evaluated on a case-by-case basis.

The stormwater management system should be designed in accordance with the applicable New York State Department of Conservation (NYSDEC) regulations and the New York State Stormwater Management Design Manual (August 2010). The testing requirements are outlined in Appendix D of the manual. The testing that was performed during this preliminary study was for initial feasibility testing for the stormwater management areas. Therefore, additional testing within the proposed subsurface system areas will be required to confirm the soil conditions and infiltration rates at the bottom of the system and to finalize the design of the system.

Pavement

We understand that the proposed construction will also include new asphalt paved driveways and parking areas. Based on the preliminary grading plan provided to this office, cuts ranging up to approximately 6’0” and fills ranging up to approximately 8’0” are anticipated to achieve the proposed pavement subgrade elevations. To prepare the new pavement areas, the existing surface materials (i.e. topsoil, vegetation, asphalt, etc.) must be removed from the planned pavement areas.

After all surface materials have been removed; the exposed subgrade that is either at or below the planned subgrade elevation shall be proofrolled with a large vibratory drum roller (i.e. Dynapac 250 or equivalent) to densify the underlying soils. The on-site representative from Carlin-Simpson & Associates shall witness the proofrolling operation. If any excessive movement is noted during the proofrolling, the soft or unsuitable soil shall be removed and replaced with new compacted fill.

Areas where existing fill is encountered shall be compacted in place. Carlin-Simpson & Associates must evaluate these areas for the presence of soft or unsuitable material within the existing fill matrix. Portions of this fill may have to be removed and replaced with new compacted fill. Carlin-Simpson & Associates will determine this during construction.

Where new fill is required to achieve final grades, it shall consist of either suitable on-site soil or imported sand and gravel. Imported sand and gravel shall contain less than 20% by weight passing a No. 200 sieve. New fill shall be placed in layers not exceeding one (1) foot in loose thickness and each layer shall be compacted to at least 92% of its Maximum Modified Dry Density (ASTM D1557). After the planned subgrade has been proofrolled and new compacted fill has been placed as required, the new pavement subbase may be placed on the existing site soils and new compacted fill.

When new fill is placed on a sloped subgrade, the fill layers must be benched a minimum of three (3) feet into the existing embankment. Fill layers shall be placed in horizontal layers, beginning at the base of the slope. End dumping over the top of a slope is not permitted.

The new pavement subbase may be placed on engineer-approved densified existing fill, virgin soil, or new compacted fill. A minimum of six (6) inches of dense graded aggregate (DGA) is recommended for the subbase layer for drainage and additional pavement support. We recommend that the following pavement sections be used for the parking lots and driveways. These pavement sections are subject to local government approval.

<u>Parking Lots (Light Duty)</u>

1 ½”	Asphalt Wearing Surface Course	NYSDOT, Type 6F
2”	Asphalt Base Course	NYSDOT, Type 1
6”	Stone Subbase (DGA)	NYSDOT, Type 4
	Approved Compacted Subgrade (Minimum CBR = 10)	

<u>Driveways (Medium Duty)</u>

1 ½”	Asphalt Wearing Surface Course	NYSDOT, Type 6F
2 ½”	Asphalt Base Course	NYSDOT, Type 1
8”	Stone Subbase (DGA)	NYSDOT, Type 4
	Approved Compacted Subgrade (Minimum CBR = 10)	

Based on the boring and test pit data, we anticipate that the existing site soils and new compacted fill will provide a CBR value that is equal to or greater than 10, which can adequately support the above pavement sections.

<u>Utilities</u>

New utilities may bear in the virgin soil, existing fill, new compacted fill, weathered rock, or rock. The bottom of all trenches should be excavated clean so a hard bottom is provided for pipe support. If any soft areas or unsuitable existing fill conditions are

encountered during the construction operation, these materials must be removed and replaced with new compacted fill.

In the event that the trench bottom becomes soft due to the inflow of surface or trapped water, the soft soil shall be removed and the excavation filled with a minimum of six (6) inches of 3/4-inch clean crushed stone to provide a firm base for support of the pipe. Sump pits and pumps should be adequate to keep the excavations dry.

After the utility is installed, the trench must be backfilled with compacted fill. The fill shall consist of suitable on-site soil or imported sand and gravel containing less than 20% by weight passing a No. 200 sieve. Large rock fragments must not be placed directly against the pipe. Controlled compacted fill shall be placed in one (1) foot loose layers and each layer shall be compacted to at least 92% of its Maximum Modified Dry Density (ASTM D1557). The backfill must be free of topsoil, debris and large boulders or rock fragments.

Temporary Construction Excavations

Temporary construction excavations shall be conducted in accordance with the most recent OSHA guidelines or applicable federal, state, or local codes. Based on the results of the borings and test pits, we believe the site soils and rock would have the following classifications as defined by OSHA guidelines.

Soil/Rock Type	Possible Classification
On Site Fill	Type "C"
Virgin Sandy Soils	Type "B" or "C"
Weathered or Intact Bedrock	Type "A" or Stable Rock

Further evaluation of the site soil deposits will be required in the field by a qualified person at the time of the excavation to determine the proper OSHA classification and allowable slope configuration. Temporary support (i.e. sheeting and shoring) should be used for any excavation that cannot be sloped or benched in accordance with the applicable regulations.

Suitability of the In-Situ Soils for Use as Compacted Fill

The suitability of each soil stratum for use as compacted fill is discussed below.

Stratum 1 Topsoil — Topsoil is not suitable for use as compacted fill. During construction, it may be stockpiled on site for later use in the landscaped areas or removed from the site.

Stratum 2 Existing Fill — The existing fill that was encountered at the site generally consists of brown coarse to fine Sand, little (to and) Silt, trace (to some) coarse to fine Gravel with occasional cobbles, boulders, topsoil, roots, and debris. Some of the existing fill may be suitable for use as compacted fill at the site

provided that it remains relatively dry for optimum compaction and that any debris (i.e. concrete, wood, etc.) and organic material (i.e. topsoil, roots, etc.) have been removed prior to its reuse.

Strata 3 & 4
Sandy Silt, Silty Sand, Sand, or Sandy Gravel

The virgin site soils that may be excavated during construction consist of layers of Sandy Silt, Silty Sand, Sand or Sandy Gravel with occasional cobbles and boulders. This material is generally suitable for use as compacted fill, provided that it remains relatively dry for optimum compaction. Large cobbles and boulders shall not be used as new structural fill in the proposed building areas or in utility trenches.

Stratum 5
Gneiss Bedrock

Excavated rock may also be used as fill material for the building and paved areas provided that the material conforms to the required gradation, is well-graded, and has been approved prior to use by Carlin-Simpson & Associates. All rock fill must be well blended with smaller rock fragments and/or soil. Open voids within the rock fill matrix must be avoided. Small boulders up to 24 inches in diameter may be placed in parking lot fills deeper than ten (10) feet below the finished pavement. Boulders must not be clustered and must be sufficiently surrounded with soil fill. We recommend that the boulders and excavated rock be processed by a crusher to provide suitable fill material for the building and pavement areas.

Rock fill shall be placed in 12-inch loose layers and compacted with multiple passes of a large vibratory roller to a firm and non-yielding state as determined by the on-site representative from Carlin-Simpson & Associates. Rock fill should not be used where it will interfere with the installation of foundations or utilities. Also, it shall not be used as backfill directly against concrete walls or utilities. Use of rock fill within the planned building and pavement areas shall be limited to the gradations limitations provided in Table 4 below.

Table 4 - Gradation Limitations for Rock Fill

Area	Location	Maximum Particle Size
Building Area	Within 4 feet of Finished Floor	3 inches
	More than 4 feet below Finished Floor	12 inches
Pavement Area	Within 4 feet of Finished Grade	6 inches
	More than 4 feet below Finished Grade	18 inches
	More than 10 feet below Finished Grade	24 inches

Proper moisture conditioning of the soil will be required. In the event that the on-site material is too wet at the time of placement and cannot be adequately compacted, the soil should be aerated and allowed to dry or the material removed and a drier cleaner fill material used. In the event that the on-site material is too dry at the time of placement and cannot be adequately compacted, water may be needed to increase the soil moisture content for proper compaction.

The in-situ soils which exist throughout the site may become soft and weave if exposed to excessive moisture and construction traffic. The instability will occur quickly when exposed to these elements and it will be difficult to stabilize the subgrade. We recommend that adequate site drainage be implemented early in the construction schedule and if the subgrade becomes wet, the Contractor should limit construction activity until the soil has dried.

GENERAL

The findings, conclusions and recommendations presented in this report represent our professional opinions concerning subsurface conditions at the site. The opinions presented are relative to the dates of our site work and should not be relied on to represent conditions at later dates or at locations not explored. The opinions included herein are based on information provided to us, the data obtained at specific locations during the study and our past experience. If additional information becomes available that might impact our geotechnical opinions, it will be necessary for Carlin-Simpson & Associates to review the information, reassess the potential concerns, and re-evaluate our conclusions and recommendations. Additional subsurface exploration may be required.

Regardless of the thoroughness of a geotechnical exploration, there is the possibility that conditions between borings and test pits will differ from those encountered at specific boring or test pit locations, that conditions are not as anticipated by the designers and/or the contractors, or that either natural events or the construction process have altered the subsurface conditions. These variations are an inherent risk associated with subsurface conditions in this region and the approximate methods used to obtain the data. These variations may not be apparent until construction.

The professional opinions presented in this geotechnical report are not final. Field observations and foundation installation monitoring by the geotechnical engineer, as well as soil density testing and other quality assurance functions associated with site earthwork and foundation construction, are an extension of this report. Therefore, Carlin-Simpson & Associates should be retained by the Owner to observe all earthwork and foundation construction, to document that the conditions anticipated in this study actually exist, and to finalize or amend our conclusions and recommendations Carlin-Simpson & Associates is not responsible or liable for the conclusions and recommendations presented in this report if Carlin-Simpson & Associates does not perform these observation and testing services.

Therefore, in order to preserve continuity in this project, the Owner must retain the services of Carlin-Simpson & Associates to provide full time geotechnical related monitoring and testing during construction. At a minimum, this shall include the observation and testing of the following: 1) the removal of existing fill and unsuitable soil, where required; 2) the proofrolling of the subgrade soil prior to the placement of new compacted fill; 3) the placement and compaction of controlled fill; 4) the excavation for the building foundations; 5) the preparation of the subgrade for the floor slabs and pavement areas; and 6) the construction of the proposed retaining walls.

This report has been prepared in accordance with generally accepted geotechnical engineering practice. No other warranty is expressed or implied. The evaluations and

recommendations presented in this report are based on the available project information, as well as on the results of the exploration. Carlin-Simpson & Associates should be given the opportunity to review the final drawings and site plans for this project to determine if changes to the recommendations outlined in this report are needed. Should the nature of the project change, these recommendations should be re-evaluated.

This report is provided for the exclusive use of Brynwood Partners, LLC and the project specific design team and may not be used or relied upon in connection with other projects or by other third parties. Carlin-Simpson & Associates disclaims liability for any such third party use or reliance without express written permission. Use of this report or the findings, conclusions or recommendations by others will be at the sole risk of the user. Carlin-Simpson & Associates is not responsible or liable for the interpretation by others of the data in this report, nor their conclusions, recommendations or opinions.

If the conditions encountered during construction vary significantly from those stated in this report, this office should be notified immediately so that additional recommendations can be made.

Thank you for allowing us to assist you with this project. Should you have any questions or comments, please contact this office.

Very truly yours,

CARLIN-SIMPSON & ASSOCIATES

MEREDITH R. ANKE, P.E.
Project Engineer

ROBERT B. SIMPSON, P.E.

File No. 12-175

CARLIN - SIMPSON & ASSOCIATES Sayreville, NJ	TEST BORING LOG	BORING NUMBER B-1

Project:	Proposed Renovations, Byrnwood Club Development, North Castle, NY	SHEET NO.:	1 of 1
Client:	JBM Realty	JOB NUMBER:	12-175
Drilling Contractor:	General Borings, Inc.	ELEVATION:	+661.0

GROUNDWATER					CASING	SAMPLE	CORE	TUBE		
									DATUM:	
DATE	TIME	DEPTH	CASING	TYPE	HSA	SS			START DATE:	18 Dec 12
No water encountered				DIA.	3 1/4"	1 3/8"			FINISH DATE:	18 Dec 12
				WGHT		140#			DRILLER:	T. McGovern
				FALL		30"			INSPECTOR:	JB

Depth (ft.)	Casing Blows per Foot	Sample No.	Blows on Sample Spoon per 6"	Sym	IDENTIFICATION	REMARKS
			7		**Clay Tennis Court** 0'6"	
1		S-1	9		Br $ a (+), cf S, l (-) mf G	Rec = 17" moist
			12			
2			14			
			19		same	
3		S-2	23		**Brown SILT and (+), coarse to fine**	Rec = 15"
			50/3"		**Sand, little (-) medium to fine Gravel**	moist
4						possible weathered rock in tip
5					5'0"	
			29		Br cf S, l (+) $ (completely weathered gneiss)	
6		S-3	75/4"			Rec = 6"
					Brown coarse to fine SAND, little (+)	moist
7					**Silt (completely weathered Gneiss)**	
		S-4	70/3"			Rec = 3"
8					8'0"	moist
					End of Boring @ 8'0"	Auger refusal @ 8'0"
9						
10						
11						
12						
13						
14						
15						
16						
17						
18						
19						
20						
21						
22						

CARLIN - SIMPSON & ASSOCIATES Sayreville, NJ	TEST BORING LOG	BORING NUMBER B-2

Project:	Proposed Renovations, Byrnwood Club Development, North Castle, NY	SHEET NO.:	1 of 1
Client:	JBM Realty	JOB NUMBER:	12-175
Drilling Contractor:	General Borings, Inc.	ELEVATION:	+628.0

GROUNDWATER					CASING	SAMPLE	CORE	TUBE	DATUM:	
DATE	TIME	DEPTH	CASING	TYPE	HSA	SS			START DATE:	18 Dec 12
No water encountered				DIA.	3 1/4"	1 3/8"			FINISH DATE:	18 Dec 12
				WGHT		140#			DRILLER:	T. McGovern
				FALL		30"			INSPECTOR:	JB

Depth (ft.)	Casing Blows per Foot	Sample No.	Blows on Sample Spoon per 6"	Sym	IDENTIFICATION	REMARKS
			2		**Topsoil** 0'6"	
1		**S-1**	3		Br $ a (+), cf S, t mf G	Rec = 15"
			2			moist
2			2			
			3		same	
3		**S-2**	9			Rec = 16"
			11		**Brown SILT and (+), coarse to fine**	moist
4			15		**Sand, trace medium to fine Gravel**	
5						
			10		same	
6		**S-3**	12			Rec = 17"
			16			moist
7			50/3"		7'0"	weathered rock in tip
					End of Boring @ 7'0"	Auger refusal @ 7'0"
8						
9						
10						
11						
12						
13						
14						
15						
16						
17						
18						
19						
20						
21						
22						

CARLIN - SIMPSON & ASSOCIATES Sayreville, NJ	TEST BORING LOG	BORING NUMBER B-3
Project: Proposed Renovations, Byrnwood Club Development, North Castle, NY		SHEET NO.: 1 of 1
Client: JBM Realty		JOB NUMBER: 12-175
Drilling Contractor: General Borings, Inc.		ELEVATION: +620.0

GROUNDWATER					CASING	SAMPLE	CORE	TUBE	DATUM:
DATE	TIME	DEPTH	CASING	TYPE	HSA	SS			START DATE: 18 Dec 12
No water encountered				DIA.	3 1/4"	1 3/8"			FINISH DATE: 18 Dec 12
				WGHT		140#			DRILLER: T. McGovern
				FALL		30"			INSPECTOR: JB

Depth (ft.)	Casing Blows per Foot	Sample No.	Blows on Sample Spoon per 6"	Sym	IDENTIFICATION	REMARKS
			3		**Topsoil** 0'6"	
1		S-1	6		Br $ a (-), cf S, t mf G	Rec = 17"
			6		**Brown SILT and (-), coarse to fine**	moist
2			14		**Sand, trace medium to fine Gravel** 2'0"	
		S-2	25/5"		Lt br cf G a, cf S, t $ (completely weathered gneiss)	Rec = 5"
3					**Light brown coarse to fine GRAVEL**	moist
					and, coarse to fine Sand, trace	
4					**Silt (completely weathered Gneiss)**	
			23		Br cf G s, cf S, t $ (completely weathered gneiss)	
5		S-3	75/3"		4'9"	Rec = 6"
					End of Boring @ 4'9"	moist
6						Auger refusal @ 4'9"
7						
8						
9						
10						
11						
12						
13						
14						
15						
16						
17						
18						
19						
20						
21						
22						

CARLIN - SIMPSON & ASSOCIATES Sayreville, NJ	TEST BORING LOG	BORING NUMBER B-4
Project: Proposed Renovations, Byrnwood Club Development, North Castle, NY		SHEET NO.: 1 of 1
Client: JBM Realty		JOB NUMBER: 12-175
Drilling Contractor: General Borings, Inc.		ELEVATION: +628.0

GROUNDWATER					CASING	SAMPLE	CORE	TUBE	
DATE	TIME	DEPTH	CASING	TYPE	HSA	SS			DATUM:
No water encountered				DIA.	3 1/4"	1 3/8"			START DATE: 18 Dec 12
				WGHT		140#			FINISH DATE: 18 Dec 12
				FALL		30"			DRILLER: T. McGovern
									INSPECTOR: JB

Depth (ft.)	Casing Blows per Foot	Sample No.	Blows on Sample Spoon per 6"	Sym	IDENTIFICATION	REMARKS
			2		**Topsoil** 0'6"	
1		**S-1**	1		Br cf S, a $, t f G	Rec = 14"
			2		**Brown coarse to fine SAND, and**	moist
2			2		**Silt, trace fine Gravel** 2'0"	
			10		Gr cf S t $, a cf G (completely weathered gneiss)	
3		**S-2**	20			Rec = 13"
			45			moist
4			35			weathered rock 3'-4'
5						
			9		Br cf S, l $, s (+) cf G (completely weathered gneiss)	
6		**S-3**	11			Rec = 17"
			13		**Brown coarse to fine SAND, little**	moist
7			10		**Silt, some (+) coarse to fine Gravel**	
			18		same **(completely weathered Gneiss)**	
8		**S-4**	26			Rec = 14"
			30			moist
9			43			
10						
		S-5	75/6"		same 10'6"	Refusal on spoon @ 10'6"
11					**End of Boring @ 10'6"**	
12						
13						
14						
15						
16						
17						
18						
19						
20						
21						
22						

CARLIN - SIMPSON & ASSOCIATES Sayreville, NJ	TEST BORING LOG	BORING NUMBER B-5

Project:	Proposed Renovations, Byrnwood Club Development, North Castle, NY	SHEET NO.:	1 of 1
Client:	JBM Realty	JOB NUMBER:	12-175
Drilling Contractor:	General Borings, Inc.	ELEVATION:	+623.0

GROUNDWATER					CASING	SAMPLE	CORE	TUBE	DATUM:	
DATE	TIME	DEPTH	CASING	TYPE	HSA	SS			START DATE:	18 Dec 12
No water encountered				DIA.	3 1/4"	1 3/8"			FINISH DATE:	18 Dec 12
				WGHT		140#			DRILLER:	T. McGovern
				FALL		30"			INSPECTOR:	JB

Depth (ft.)	Casing Blows per Foot	Sample No.	Blows on Sample Spoon per 6"	Sym	IDENTIFICATION	REMARKS
			2		Br cf S, s (+) $, t f G	
1		S-1	2		**Brown coarse to fine SAND,**	Rec = 17"
			3		**some (+) Silt, trace fine Gravel**	moist
2			13		2'0"	
			22		Br cf S, l $, s cf G	
3		S-2	10			Rec = 17"
			16		**Brown coarse to fine SAND, little**	moist
4			26		**Silt, some coarse to fine Gravel**	weathered rock in tip
					(completely weathered Gneiss)	
5						
			23		same, weathered gneiss	
6		S-3	62			Rec = 18"
			55			moist
7			81			weathered rock
8						
					8'6"	Auger refusal @ 8'6"
9					**End of Boring @ 8'6"**	
10						
11						
12						
13						
14						
15						
16						
17						
18						
19						
20						
21						
22						

CARLIN - SIMPSON & ASSOCIATES Sayreville, NJ	TEST BORING LOG	BORING NUMBER B-6

Project:	Proposed Renovations, Byrnwood Club Development, North Castle, NY	SHEET NO.:	1 of 1
Client:	JBM Realty	JOB NUMBER:	12-175
Drilling Contractor:	General Borings, Inc.	ELEVATION:	+617.0

GROUNDWATER					CASING	SAMPLE	CORE	TUBE	DATUM:	
DATE	TIME	DEPTH	CASING	TYPE	HSA	SS			START DATE:	19 Dec 12
No water encountered				DIA.	3 1/4"	1 3/8"			FINISH DATE:	19 Dec 12
				WGHT		140#			DRILLER:	T. McGovern
				FALL		30"			INSPECTOR:	KWA

Depth (ft.)	Casing Blows per Foot	Sample No.	Blows on Sample Spoon per 6"	Sym	IDENTIFICATION		REMARKS
			2		**Topsoil**	0'6"	
1		S-1	6		FILL (Br cf S, l $)	1'0"	Rec = 10"
			5		**FILL (Brown coarse to fine SAND,**		moist
2			10		**little Silt)**		
			12		Br cf S, s $, a (-) cf G		
3		S-2	11				Rec = 11"
			11		same		moist
4			52		**Brown coarse to fine SAND, some**		
					Silt, and (-) coarse to fine Gravel		
5							
		S-3	75/2"			5'6"	No recovery
6					**End of Boring @ 5'6"**		Auger refusal @ 5'6"
7							
8							
9							
10							
11							
12							
13							
14							
15							
16							
17							
18							
19							
20							
21							
22							

CARLIN - SIMPSON & ASSOCIATES Sayreville, NJ	TEST BORING LOG	BORING NUMBER B-7
Project: Proposed Renovations, Byrnwood Club Development, North Castle, NY		SHEET NO.: 1 of 1
Client: JBM Realty		JOB NUMBER: 12-175
Drilling Contractor: General Borings, Inc.		ELEVATION: +628.0

GROUNDWATER					CASING	SAMPLE	CORE	TUBE	DATUM:
DATE	TIME	DEPTH	CASING	TYPE	HSA	SS			START DATE: 19 Dec 12
No water encountered				DIA.	3 1/4"	1 3/8"			FINISH DATE: 19 Dec 12
				WGHT		140#			DRILLER: T. McGovern
				FALL		30"			INSPECTOR: KWA

Depth (ft.)	Casing Blows per Foot	Sample No.	Blows on Sample Spoon per 6"	Sym	IDENTIFICATION	REMARKS
			2		**Topsoil** 0'6"	
1		S-1	4		Br cf S, l $,l f G	Rec = 18"
			4			moist
2			5			
			13		same	
3		S-2	28		**Brown coarse to fine SAND,**	Rec = 17"
			21		**little Silt, little fine Gravel**	moist
4			22			
5					5'0"	
			12		Br cf S, l $, t f G (completely weathered gniess)	
6		S-3	14			Rec = 15"
			19			moist
7			28		**Brown coarse to fine SAND, little**	very dense augering 7'-10'
					Silt, trace fine Gravel (completely	
8					**weathered Geniss)**	
9						
10						
			75		same	
11		S-4	50/3"			Rec = 6"
						moist
12						very dense augering 10'-15'
13						
14						
15						
		S-4	50/2"		same 15'2"	No recovery
16					**End of Boring @ 15'2"**	Spoon bouncing @ 15'2"
17						
18						
19						
20						
21						
22						

CARLIN - SIMPSON & ASSOCIATES Sayreville, NJ	TEST BORING LOG	BORING NUMBER B-8
Project: Proposed Renovations, Byrnwood Club Development, North Castle, NY		SHEET NO.: 1 of 1
Client: JBM Realty		JOB NUMBER: 12-175
Drilling Contractor: General Borings, Inc.		ELEVATION: +609.0

GROUNDWATER					CASING	SAMPLE	CORE	TUBE	DATUM:	
DATE	TIME	DEPTH	CASING	TYPE	HSA	SS			START DATE:	19 Dec 12
19 Dec 12	1130	3'3"	None	DIA.	3 1/4"	1 3/8"			FINISH DATE:	19 Dec 12
				WGHT		140#			DRILLER:	T. McGovern
				FALL		30"			INSPECTOR:	KWA

Depth (ft.)	Casing Blows per Foot	Sample No.	Blows on Sample Spoon per 6"	Sym	IDENTIFICATION	REMARKS
			2		**Brown Topsoil** 0'6"	
1		S-1	4		FILL (Br cf S, a $, t cf G)	Rec = 4"
			8			moist
2			7			
			10		FILL (same)	
3		S-2	11			No recovery
			11		**FILL (Brown coarse to fine SAND,**	moist
4			13		**and Silt, trace coarse to fine Gravel)**	
5						
			13		FILL (same) 5'6"	
6		S-3	8		Mtld gr, or br Cy $ s, cf S, w/t roots	Rec = 18"
			7		**Mottled gray, orange brown Clayey**	moist
7			8		**SILT some, coarse to fine Sand, with** 7'0"	
			8		**roots**	
8		S-4	8		Gr br cf S, s (+) $, l cf G	Rec = 15"
			7			wet
9			8		**Gray brown coarse to fine SAND,**	
					some (+) Silt, little coarse to fine	
10					**Gravel**	
			15		same, l cf G	
11		S-5	25			Rec = 16"
			26			wet
12			35		12'0"	
					End of Boring @ 12'0"	
13						
14						
15						
16						
17						
18						
19						
20						
21						
22						

CARLIN - SIMPSON & ASSOCIATES Sayreville, NJ	TEST BORING LOG	BORING NUMBER B-9

Project:	Proposed Renovations, Byrnwood Club Development, North Castle, NY	SHEET NO.:	1 of 1
Client:	JBM Realty	JOB NUMBER:	12-175
Drilling Contractor:	General Borings, Inc.	ELEVATION:	+674.0

GROUNDWATER					CASING	SAMPLE	CORE	TUBE	DATUM:	
DATE	TIME	DEPTH	CASING	TYPE	HSA	SS			START DATE:	19 Dec 12
No water encountered				DIA.	3 1/4"	1 3/8"			FINISH DATE:	19 Dec 12
				WGHT		140#			DRILLER:	T. McGovern
				FALL		30"			INSPECTOR:	KWA

Depth (ft.)	Casing Blows per Foot	Sample No.	Blows on Sample Spoon per 6"	Sym	IDENTIFICATION	REMARKS
			8		Clay Tennis Court 0'6"	
1		S-1	8		FILL (Br cf S, s $, s (+) cf G)	Rec = 17"
			8			moist
2			17			
			17		FILL (same)	
3		S-2	12			Rec = 15"
			7		FILL (Brown coarse to fine Sand,	moist
4			13		some Silt, some (+) coarse to fine	
					Gravel)	
5						
			10		FILL (Br cf S, s $, l cf G)	
6		S-3	4			Rec = 15"
			5			moist
7			11		7'0"	
		S-4	50/3"		Highly to moderately weathered 7'6"	Rec = 3"
8					Gneiss	moist
					Eknd of Boring @ 7'6"	Auger refusal @ 7'0"
9						
10						
11						
12						
13						
14						
15						
16						
17						
18						
19						
20						
21						
22						

CARLIN - SIMPSON & ASSOCIATES Sayreville, NJ	TEST BORING LOG	BORING NUMBER B-10
Project: Proposed Renovations, Byrnwood Club Development, North Castle, NY		SHEET NO.: 1 of 1
Client: JBM Realty		JOB NUMBER: 12-175
Drilling Contractor: General Borings, Inc.		ELEVATION: +638.8

GROUNDWATER					CASING	SAMPLE	CORE	TUBE	DATUM:
DATE	TIME	DEPTH	CASING	TYPE	HSA	SS			START DATE: 19 Dec 12
No water encountered				DIA.	3 1/4"	1 3/8"			FINISH DATE: 19 Dec 12
				WGHT		140#			DRILLER: T. McGovern
				FALL		30"			INSPECTOR: JB

Depth (ft.)	Casing Blows per Foot	Sample No.	Blows on Sample Spoon per 6"	Sym	IDENTIFICATION	REMARKS
			2		**Topsoil** 0'1"	
1		S-1	3		Br cf $ s, cf S, l cf G	Rec = 15"
			6		**Brown coarse to fine SILT some, coarse to**	moist
2			50/3"		**fine Sand, little coarse to fine Gravel** 2'0"	Auger refusal @ 2'0"
3						
		Run #1			**Gray, white Gneiss**	Run #1
4						2'0"-7'0"
						Run = 60"
5					5'0"	Rec = 52" = 86%
					Soil seam	RQD = 53%
6					5'8"	
					Gray, white Gneiss	
7					7'0"	
					End of Boring @ 7'0"	
8						
9						
10						
11						
12						
13						
14						
15						
16						
17						
18						
19						
20						
21						
22						

CARLIN - SIMPSON & ASSOCIATES Sayreville, NJ	TEST BORING LOG	BORING NUMBER B-11

Project: Proposed Renovations, Byrnwood Club Development, North Castle, NY

Client: JBM Realty

Drilling Contractor: General Borings, Inc.

SHEET NO.:	1 of 1
JOB NUMBER:	12-175
ELEVATION:	+640.0
DATUM:	
START DATE:	19 Dec 12
FINISH DATE:	19 Dec 12
DRILLER:	T. McGovern
INSPECTOR:	KWA

GROUNDWATER

DATE	TIME	DEPTH	CASING
No water encountered			

	CASING	SAMPLE	CORE	TUBE
TYPE	HSA	SS		
DIA.	3 1/4"	1 3/8"		
WGHT		140#		
FALL		30"		

Depth (ft.)	Casing Blows per Foot	Sample No.	Blows on Sample Spoon per 6"	Sym	IDENTIFICATION	REMARKS
			2		**Topsoil**	
1		S-1	3		0'9"	Rec = 20"
			3		Br cf S, l (+) $	moist
2			7			
			5		same, dk br	
3		S-2	6		**Brown coarse to fine SAND,**	Rec = 17"
			8		**little (+) Silt**	moist
4			23		4'0"	
5					**Completely to highly weathered Gneiss**	
6					5'6"	Auger refusal @ 5'6"
					End of Boring @ 5'6"	
7						
8						
9						
10						
11						
12						
13						
14						
15						
16						
17						
18						
19						
20						
21						
22						

Byrnwood Club Development
Bedford Road
Town of New Castle, NY
(12-175)

3 January 2013

TEST PIT LOGS

TP-1	Elevation +662		
0-0’9”	Brown Topsoil		
0’9”-2’0”	Brown coarse to fine SAND, and Silt, trace (+) medium to fine Gravel	medium dense	moist
2’0”	Gneiss bedrock No water encountered		

TP-2	Elevation +672		
0-1’10”	FILL (Brown coarse to fine SAND, some silt, little (-) coarse to fine Gravel, with topsoil)	medium dense	moist
1’10”-4’4”	Light brown coarse to fine SAND, some (+) Silt	medium dense	moist
4’4”	Gneiss bedrock No water encountered		

TP-3	Elevation +672		
0-0’9”	Dark brown Topsoil with surface debris		
0’9”-2’2”	Brown coarse to fine SAND, some Silt	medium dense	moist
2’2”	Gneiss bedrock No water encountered		

Byrnwood Club Development
Bedford Road
Town of New Castle, NY
(12-175)

3 January 2013

TEST PIT LOGS

TP-4	Elevation +672		
0-0'6"	Brown Topsoil		
0'6"-3'6"	Brown coarse to fine SAND, and (-) Silt, some coarse to fine Gravel	medium dense	moist
3'6"	Gneiss bedrock No water encountered		

TP-5	Elevation +670		
0-0'7"	Brown Topsoil		
0'7"-3'8"	Light brown coarse to fine SAND, some (+) Silt	medium dense	moist
3'8"-4'9"	Brown coarse to fine SAND, some Silt (completely weathered gneiss)	dense	moist
4'9"	Gneiss bedrock No water encountered		

Byrnwood Club Development
Bedford Road
Town of New Castle, NY
(12-175)

3 January 2013

TEST PIT LOGS

TP-6	Elevation +672		
0-0’10”	Brown Topsoil		
0’10”-2’10”	Light brown coarse to fine SAND, some (-) Silt, little coarse to fine Gravel	medium dense	moist
2’10”-4’7”	Brown coarse to fine SAND, some Silt, little coarse to fine Gravel (completely weathered gneiss)	dense	moist
4’7”	Gneiss bedrock No water encountered		

TP-7	Elevation +620		
0-0’9”	Brown Topsoil		
0’9”-2’8”	Brown coarse to fine SAND, some Silt, trace coarse to fine Gravel	medium dense	moist
2’8”	Probable Gneiss bedrock		
	Test pit abandoned No water encountered		

TP-8	Elevation +614		
0-0’8”	Dark brown Topsoil		
0’8”-5’0”	Mottled orange brown, gray coarse to fine SAND, and (-) Silt	medium dense	moist
	Groundwater encountered @ 4’1”	slow inflow	

Byrnwood Club Development
Bedford Road
Town of New Castle, NY
(12-175)

3 January 2013

TEST PIT LOGS

TP-9	Elevation +628		
0-0'4"	Topsoil		
0'4"-6'9"	FILL (Brown coarse to fine SAND, some (+) Silt, some (+) coarse to fine Gravel, with cobbles and boulders)	medium dense	moist
6'9"	FILL (Gray coarse to fine SAND, trace (+) Silt)	medium dense	moist
	Possible cover over for utility Test pit was abandoned		
	No water encountered		

TP-10	Elevation +625		
0-0'4"	Topsoil		
0'4"-3'0"	FILL (Boulders with topsoil)	loose	moist
3'0"-8'0"	Brown coarse to fine SAND, some (+) Silt	medium dense	moist
	No water encountered		

Byrnwood Club Development
Bedford Road
Town of New Castle, NY
(12-175)

3 January 2013

TEST PIT LOGS

TP-11	Elevation +642		
0-0'6"	Brown Topsoil		
0'6"-3'9"	Brown coarse to fine SAND, some Silt, little coarse to fine Gravel, with occasional cobbles and boulders	medium dense	moist
3'9"-6'0"	Brown coarse to fine SAND, little (+) Silt, some coarse to fine Gravel (completely weathered gneiss)	dense	moist
6'0"	Weathered Gneiss bedrock No water encountered		

TP-12	Elevation +635		
0-0'6"	Brown Topsoil		
0'6"-5'0"	FILL (Brown coarse to fine SAND, some (+) Silt, little (-) coarse to fine Gravel, with trace of debris)	loose	moist
5'0"-6'6"	Orange brown, gray coarse to fine SAND and Silt	dense	moist
	Refusal on boulder No water encountered		

Byrnwood Club Development
Bedford Road
Town of New Castle, NY
(12-175)

4 January 2013

TEST PIT LOGS

TP-13	Elevation +636		
0-0’9”	Brown Topsoil with roots		
0’9”-6’3”	Brown coarse to fine SAND, and Silt, little coarse to fine Gravel	medium dense	moist
6’3”-7’5”	Brown coarse to fine SAND, some (+) Silt, little (-) coarse to fine Gravel	dense	moist
7’5”	Gneiss bedrock		
	Groundwater encountered @ 4’10”	slow inflow	

TP-14	Elevation +625		
0-0’3”	Brown Topsoil		
0’3”-3’4”	FILL (Gray brown coarse to fine SAND, some Silt, little coarse to fine Gravel, with cobbles and boulders)	loose	moist
3’4”-5’0”	FILL (Brown coarse to fine SAND, little Silt)	medium dense	moist
5’0”	Gneiss bedrock No water encountered		

Byrnwood Club Development
Bedford Road
Town of New Castle, NY
(12-175)

4 January 2013

TEST PIT LOGS

TP-15	Elevation +668		
0-0'3"	Brown Topsoil		
0'3"-1'8"	Brown coarse to fine SAND, some (+) Silt, some (-) coarse to fine Gravel, with occasional cobbles and boulders	medium dense	moist
1'8"	Gneiss bedrock No water encountered		

TP-16	Elevation +651		
0-0'8"	Dark brown Topsoil		
0'8"-1'10"	FILL (Brown coarse to fine SAND, some (+) Silt, trace medium to fine Gravel, with cobbles)	medium dense	moist
1'10"-4'10"	Brown coarse to fine SAND, some (+) Silt, trace medium to fine Gravel	medium dense	moist
4'10"	Gneiss bedrock No water encountered		

Byrnwood Club Development
Bedford Road
Town of New Castle, NY
(12-175)

4 January 2013

TEST PIT LOGS

TP-17	Elevation +655		
0-0'3"	Topsoil		
0'3"-1'0"	Brown coarse to fine SAND, some (+) Silt, little coarse to fine Gravel	medium dense	moist
	Encountered irrigation pipes Test pit abandoned No water encountered		

TP-18	Elevation +670		
0-0'10"	Brown Topsoil		
0'10"-7'0"	Brown SILT and, coarse to fine Sand, little (-) medium to fine Gravel	medium dense	moist
	No water encountered		

Brynwood Club Development
Bedford Road
Town of North Castle, NY
(12-175)

13 September 2013

TEST PIT LOGS

TP-19

0-2’5”	FILL (Brown coarse to fine SAND, some Silt, some coarse to fine Gravel, with topsoil, cobbles, boulders)	loose	moist
2’5”-7’0”	Brown coarse to fine SAND, some Silt, little coarse to fine Gravel	medium dense	moist
	No water encountered		

TP-20

0-0’6”	Brown Topsoil		
0’6”-4’3”	Brown, orange brown coarse to fine SAND, some Silt, little coarse to fine Gravel	medium dense	moist
4’3”-8’0”	Orange brown coarse to fine SAND, little (-) Silt, some coarse to fine Gravel, with occasional cobbles	medium dense	moist
	No water encountered		

Brynwood Club Development
Bedford Road
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(12-175)

13 September 2013

TEST PIT LOGS

TP-21

0-0'6"	Dark brown Topsoil		
0'6"-1'4"	FILL (Brown coarse to fine SAND, some (-) Silt, trace medium to fine Gravel, with few roots)	medium dense	moist
1'4"-7'0"	Brown coarse to fine SAND, little Silt, trace (+) coarse to fine Gravel, with occasional cobbles	medium dense	moist
7'0"	Possible weathered bedrock		
	No water encountered		

TP-22

0-1'6"	Dark brown Topsoil, with roots		
1'6"-2'8"	Mottled gray brown, orange brown Clayey SILT, little medium to fine Sand	medium dense	moist
2'8"-3'6"	Brown coarse to fine SAND, some (+) Silt, little medium to fine Gravel	medium dense	moist
3'6"-6'0"	Brown coarse to fine SAND, little (+) Silt, come coarse to fine Gravel	medium dense	wet
6'0"-7'6"	Gray brown SILT little, coarse to fine Sand, trace medium to fine Gravel	medium dense	wet
	Groundwater encountered @ 4'6"	slow inflow	

Brynwood Club Development
Bedford Road
Town of North Castle, NY
(12-175)

13 September 2013

TEST PIT LOGS

TP-23

0-0'7"	Brown Topsoil		
0'7"-3'10"	Brown coarse to fine SAND, and (-) Silt, little (-) coarse to fine Gravel	dense	moist
3'10"	Weathered bedrock		
	No water encountered		

TP-24

0-0'8"	Brown Topsoil		
0'8"-6'8"	Brown coarse to fine SAND, some (+) Silt, little (-) coarse to fine Gravel, with occasional cobbles	medium dense	moist
6'8"	Possible weathered bedrock or boulder		
	No water encountered		

TP-25

0-0'4"	Brown Topsoil		
0'4"-3'4"	Brown coarse to fine SAND, and Silt, trace medium to fine Gravel	medium dense	moist
3'4"	Possible bedrock or boulder		
	No water encountered		

Brynwood Club Development
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(12-175)

13 September 2013

TEST PIT LOGS

TP-26

0-0’6”	Brown Topsoil		
0’6”-2’8”	FILL (Brown coarse to fine SAND, some (-) Silt, little coarse to fine Gravel, with cobbles and boulders)	medium dense	moist
2’8”-4’0”	FILL (Brown Topsoil, with trace roots)		
4’0”-5’6”	FILL (Dark gray brown Clayey SILT, and, coarse to fine Sand, with trace roots, trace debris)	medium stiff	moist
5’6”-8’0”	Brown coarse to fine SAND, and (-) Silt, trace coarse to fine Gravel	medium dense	moist
	No water encountered		

TP-27

0-0’9”	Brown Topsoil, with roots		
0’9”-4’4”	Light brown coarse to fine SAND, little Silt, trace coarse to fine Gravel	medium dense	dry
4’4”	Probable weathered bedrock		
	No water encountered		

Brynwood Club Development
Bedford Road
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(12-175)

13 September 2013

TEST PIT LOGS

TP-28

0-0'4"	Brown Topsoil		
0'4"-8'6"	FILL (Brown coarse to fine SAND, little Silt, little coarse to fine Gravel, with organics, debris)	loose	moist
8'6"-9'0"	FILL (Gray coarse to fine SAND, some Silt, little coarse to fine Gravel, with organics)	medium dense	wet
	Groundwater encountered @ 8'0"		

Byrnwood Club Development
Bedford Road
Town of New Castle, NY
(12-175)

18 -19 December 2012

Borehole Permeability Test (B-4)

Ground Surface Elevation: +628.0
Top of Casing Elevation: +631.5
Bottom of Test Hole Elevation: +621.0
Test Hole Depth from Ground Surface Elevation: 7’0” (84”)

Pre-Soak:

Start Date: 18 Dec 2012 Time: 1545 Water Level*: 4’4”
End Date: 19 Dec 2012 Time: 0900 Water Level*: 7’1”

33” drop H_2O in 1035 minutes (17 hr. 15 min.) = 0.03 inches per minute

Test:

Start Date: 19 Dec 2012 Time: 1000 Water Level*: 4’3”
End Date: 19 Dec 2012 Time: 1515 Water Level*: 5’3.5”

12.5” drop H_2O in 315 minutes (5 hr. 15 min.) = 0.04 inches per minute

Time	Water Level*	Interval Water Level Drop (Inches)	Cumulative Water Level Drop (Inches)
1000	4’3”	0	0
1100	4’6”	3	3
1200	4’8”	2	5
1300	4’10”	2	7
1400	5’1”	3	10
1515	5’3.5”	2.5	12.5

Water Level* - Depth below top of casing (elevation +631.5)

Byrnwood Club Development
Bedford Road
Town of New Castle, NY
(12-175)

3 January 2013

Percolation Test P-1
(Elevation +620)

Test hole depth 42” from ground surface elevation

Pre-Soak

0-10 min, 22” drop of H2O (pipe drained)
22” drop H2O in 10 minutes = 2.20 inches per minute

Test Run #1

5 min, 15” drop H2O (re-filled pipe)

Test Run #2

5 min, 14” drop H2O (re-filled pipe)

Test Run #3

5 min, 12” drop H2O (re-filled pipe)

Final Test Reading

Start @ 1245, 14” from top of pipe
Finish @ 1300, 36” drop from top of pipe (pipe drained)
22” drop H2O in 15 minutes = 1.46 inches per minute

Percolation Hole P-2
(Elevation + 612)

Test hole depth 20” from ground elevation
Groundwater @ 0’6” below surface
Percolation test unable to be performed

Byrnwood Club Development
Bedford Road
Town of New Castle, NY
(12-175)

3 January 2013

Percolation Test P-3
(Elevation + 616)

Test hole depth 32” from ground surface elevation

Pre-Soak

0-24 min, 17” drop of H2O (pipe drained)
17” drop H2O in 24 minutes = 0.71 inches per minute

Test Run #1

5 min, 5” drop H2O (re-filled pipe)

Test Run #2

5 min, 5” drop H2O (re-filled pipe)

Test Run #3

5 min, 4” drop H2O (re-filled pipe)

Final Test Reading

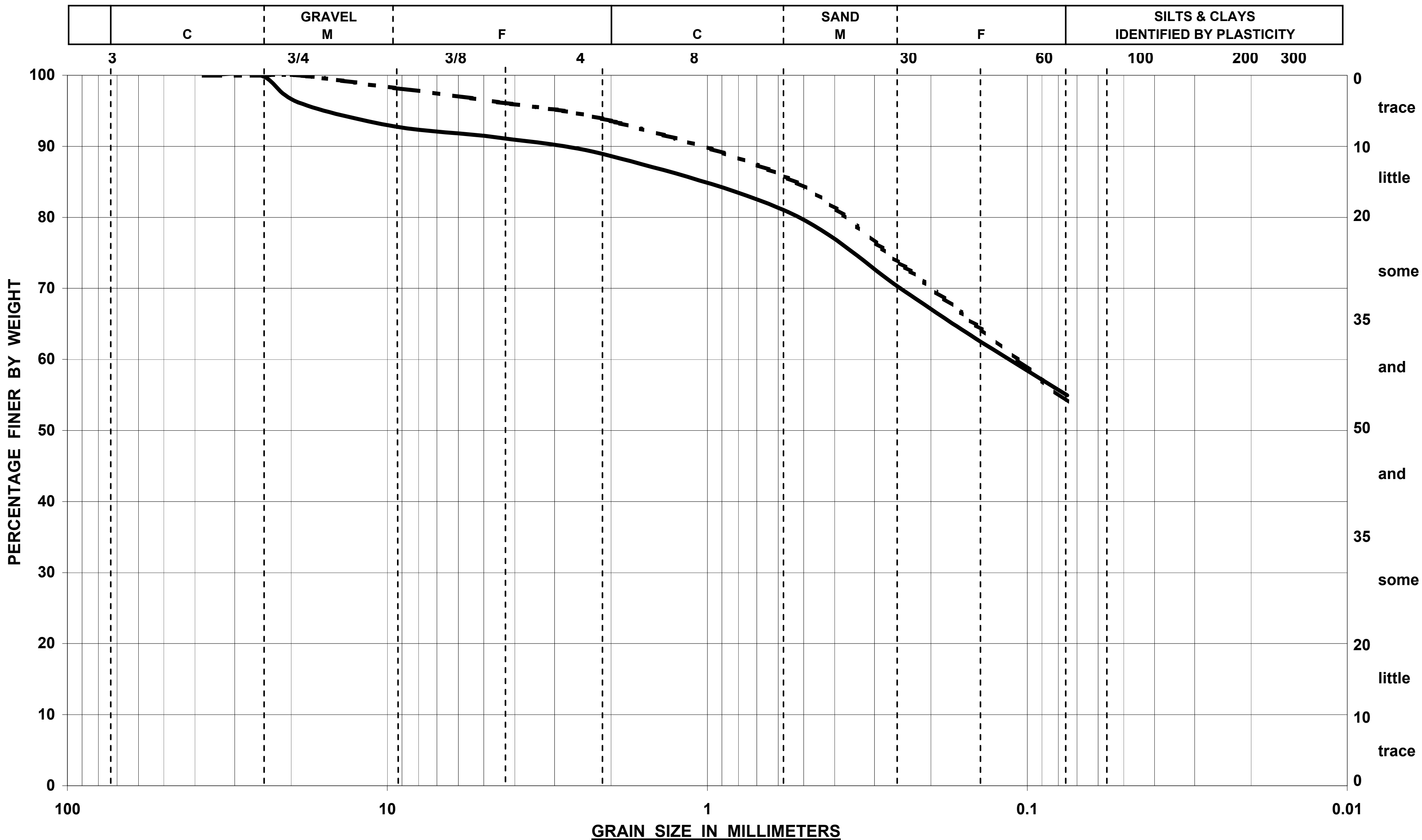
Start @ 1535, 15” from top of pipe
Finish @ 1605, 28” drop from top of pipe
13” drop H2O in 30 minutes = 0.43 inches per minute

Percolation Hole P-4
(Elevation + 615)

Test hole depth 24” from ground elevation
Groundwater @ 1’10” below surface
Percolation test unable to be performed

CARLIN-SIMPSON & ASSOCIATES
SAYREVILLE, NJ 08872

SIEVE ANALYSIS

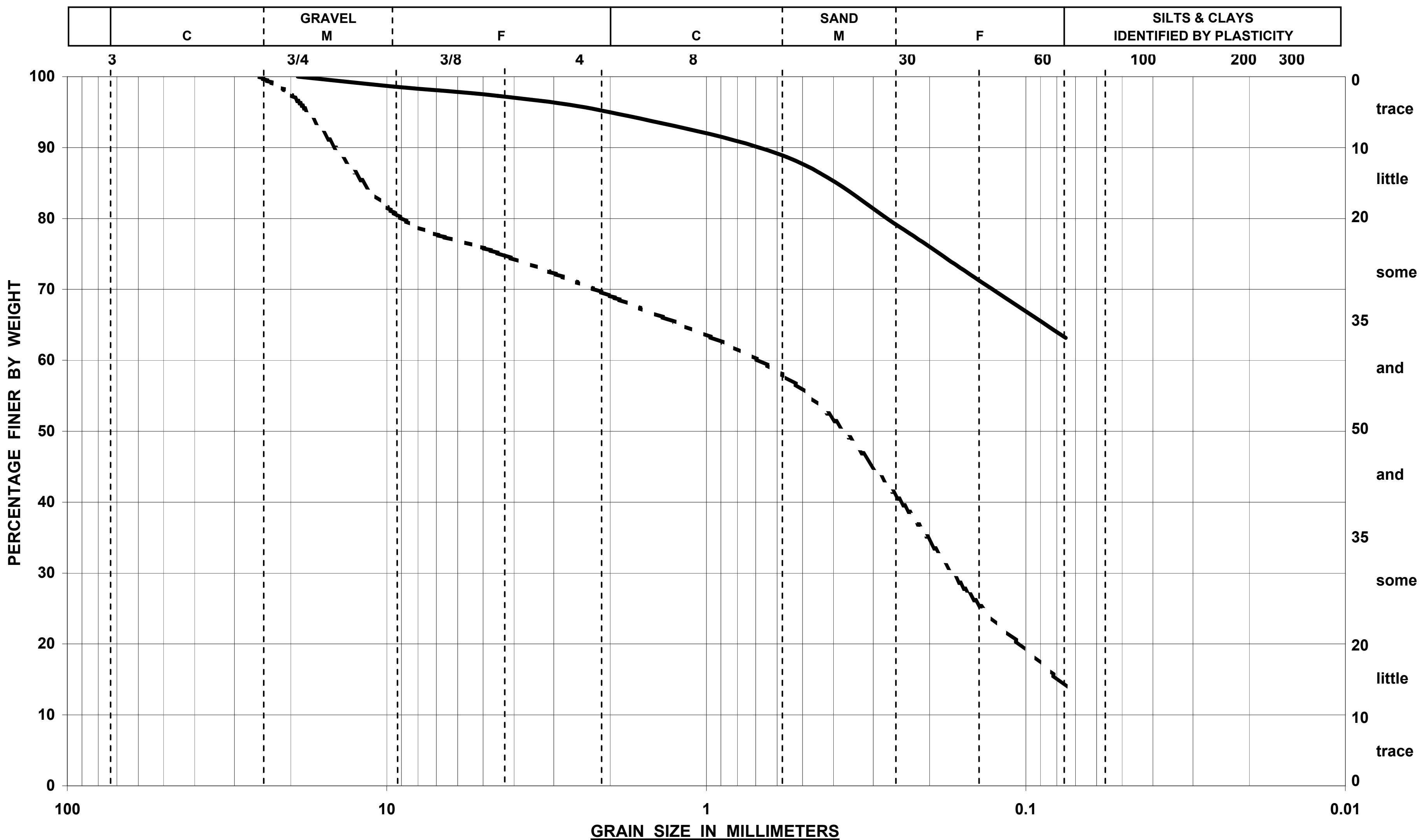


SYMBOL	BORING	SAMPLE	DEPTH	DESCRIPTION	NAT MC
——— (solid line)	B-1	S-1	0' 0" - 2' 0"	Brown SILT and (+), coarse to fine Sand, little (-) medium to fine Gravel	14.0%
— - (dashed line)	B-2	S-2	2' 0" - 4' 0"	Brown SILT and (+), coarse to fine Sand, trace medium to fine Gravel	14.2%

PROJECT Brynwood Club, Bedford Road, North Castle, NY **BY** MW **DATE** 7-Jan-13 **JOB NO** 12-175

CARLIN-SIMPSON & ASSOCIATES
SAYREVILLE, NJ 08872

SIEVE ANALYSIS

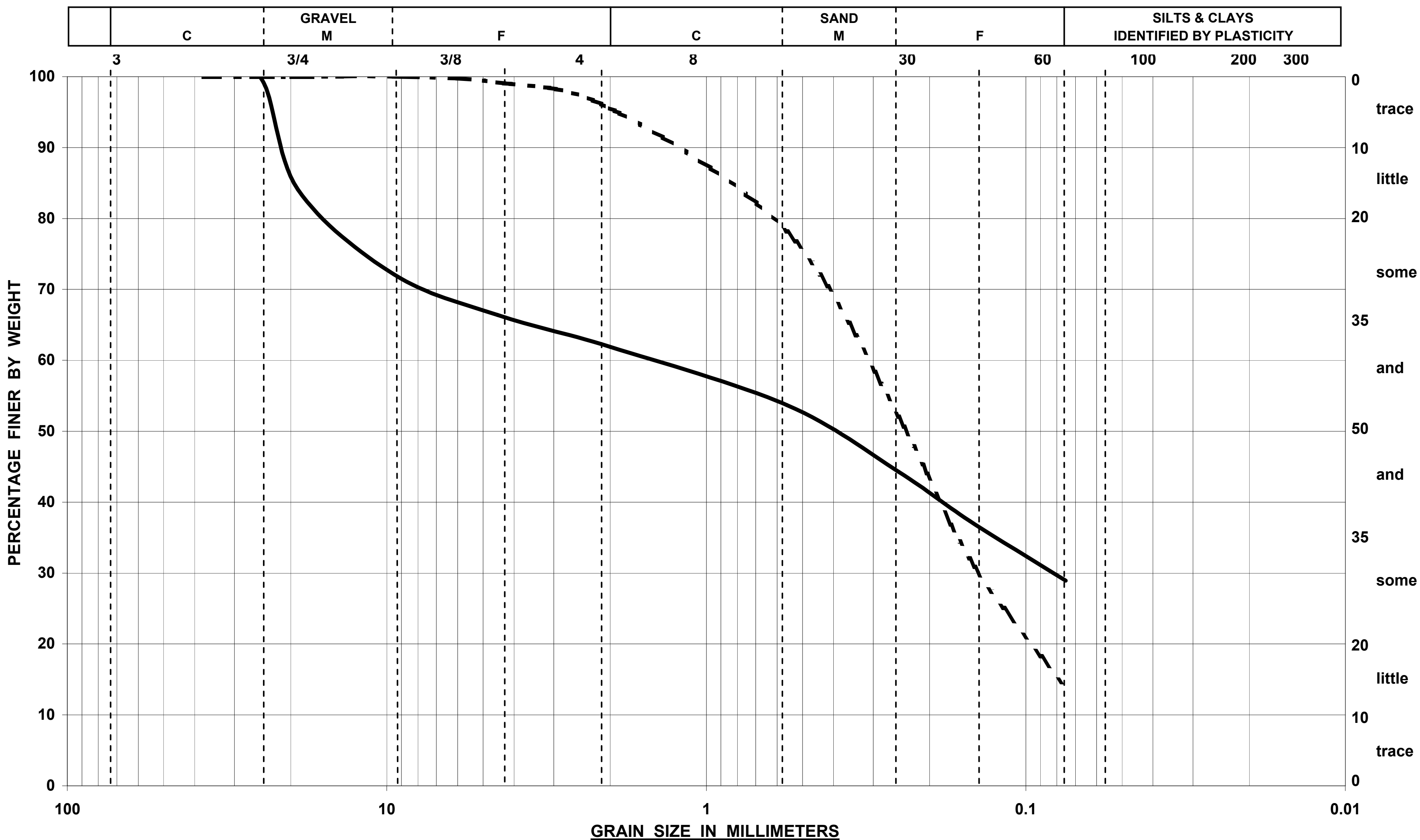


SYMBOL	BORING	SAMPLE	DEPTH	DESCRIPTION	NAT MC
———	B-3	S-1	0' 0" - 2' 0"	Brown SILT and (-), coarse to fine Sand, trace medium to fine Gravel	24.2%
— -	B-4	S-3	5' 0" - 7' 0"	Brown coarse to fine SAND, little Silt, some (+) medium to fine Gravel	12.1%

PROJECT Brynwood Club, Bedford Road, North Castle, NY **BY** MW **DATE** 7-Jan-13 **JOB NO** 12-175

CARLIN-SIMPSON & ASSOCIATES
SAYREVILLE, NJ 08872

SIEVE ANALYSIS

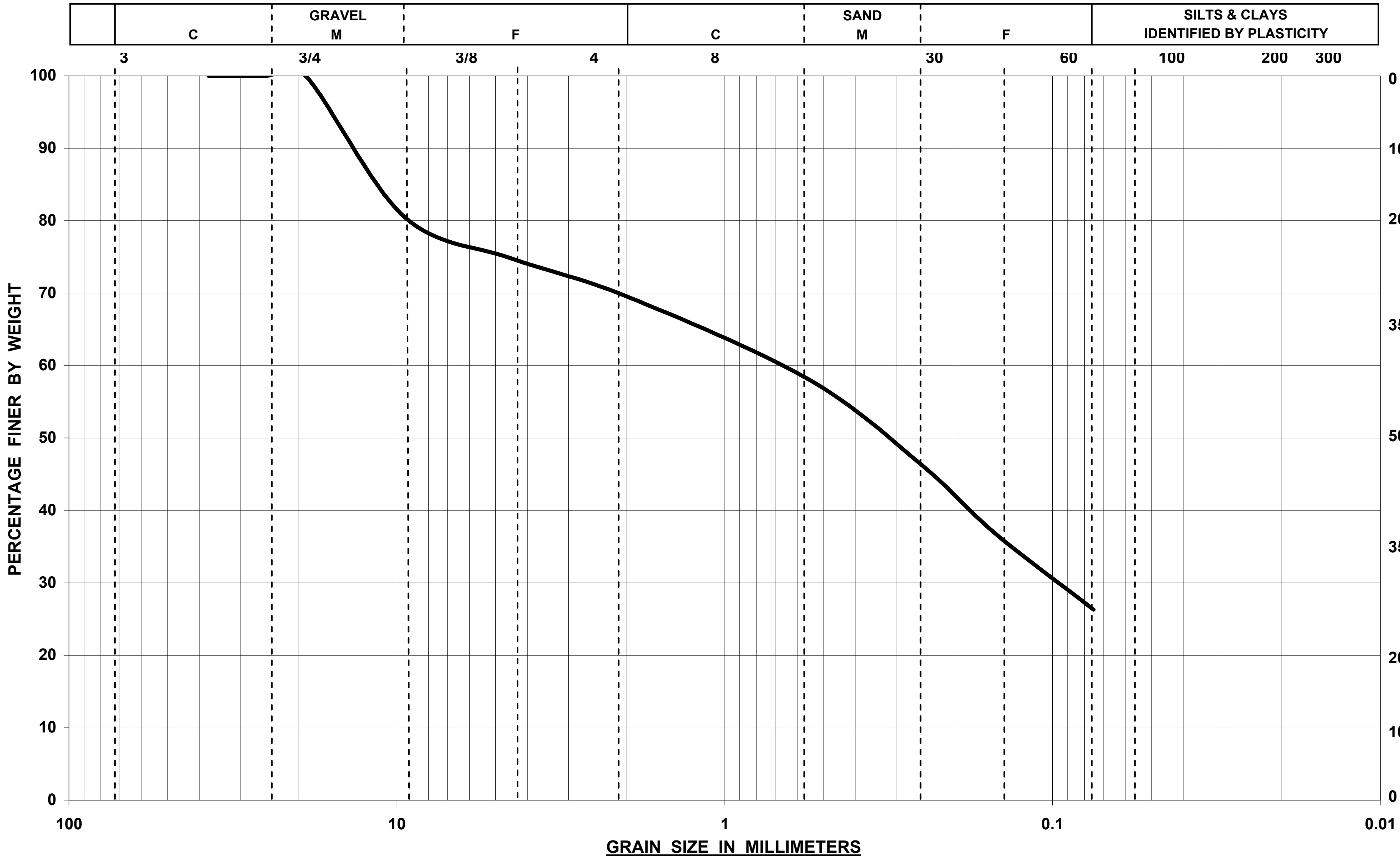


SYMBOL	BORING	SAMPLE	DEPTH	DESCRIPTION	NAT MC
———	B-6	S-2	2' 0" - 4' 0"	Brown coarse to fine Sand, some Silt, and (-) coarse to fine Gravel	9.9%
— -	B-7	S-3	5' 0" - 7' 0"	Brown coarse to fine SAND, little Silt, trace fine Gravel	8.7%

PROJECT Brynwood Club, Bedford Road, North Castle, NY **BY** MW **DATE** 10-Jan-13 **JOB NO** 12-175

CARLIN-SIMPSON & ASSOCIATES
SAYREVILLE, NJ 08872

SIEVE ANALYSIS

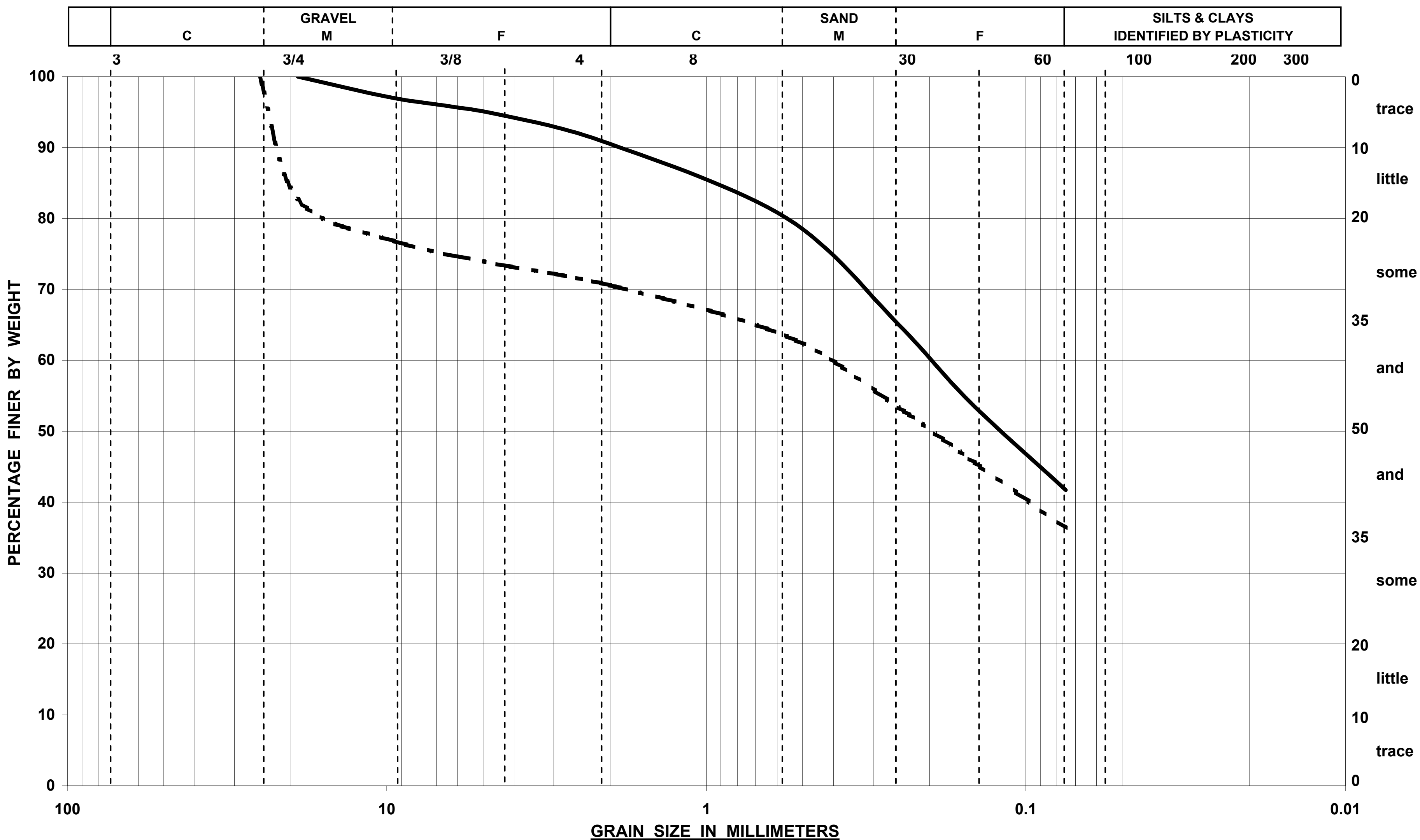


SYMBOL	BORING	SAMPLE	DEPTH	DESCRIPTION	NAT MC
——	B-9	S-2	2' 0" - 4' 0"	FILL (brown coarse to fine Sand, some Silt, some (+) medium to fine Gravel	15.0%

PROJECT Brynwood Club, Bedford Road, North Castle, NY BY MW DATE 7-Jan-13 JOB NO 12-175

CARLIN-SIMPSON & ASSOCIATES
SAYREVILLE, NJ 08872

SIEVE ANALYSIS

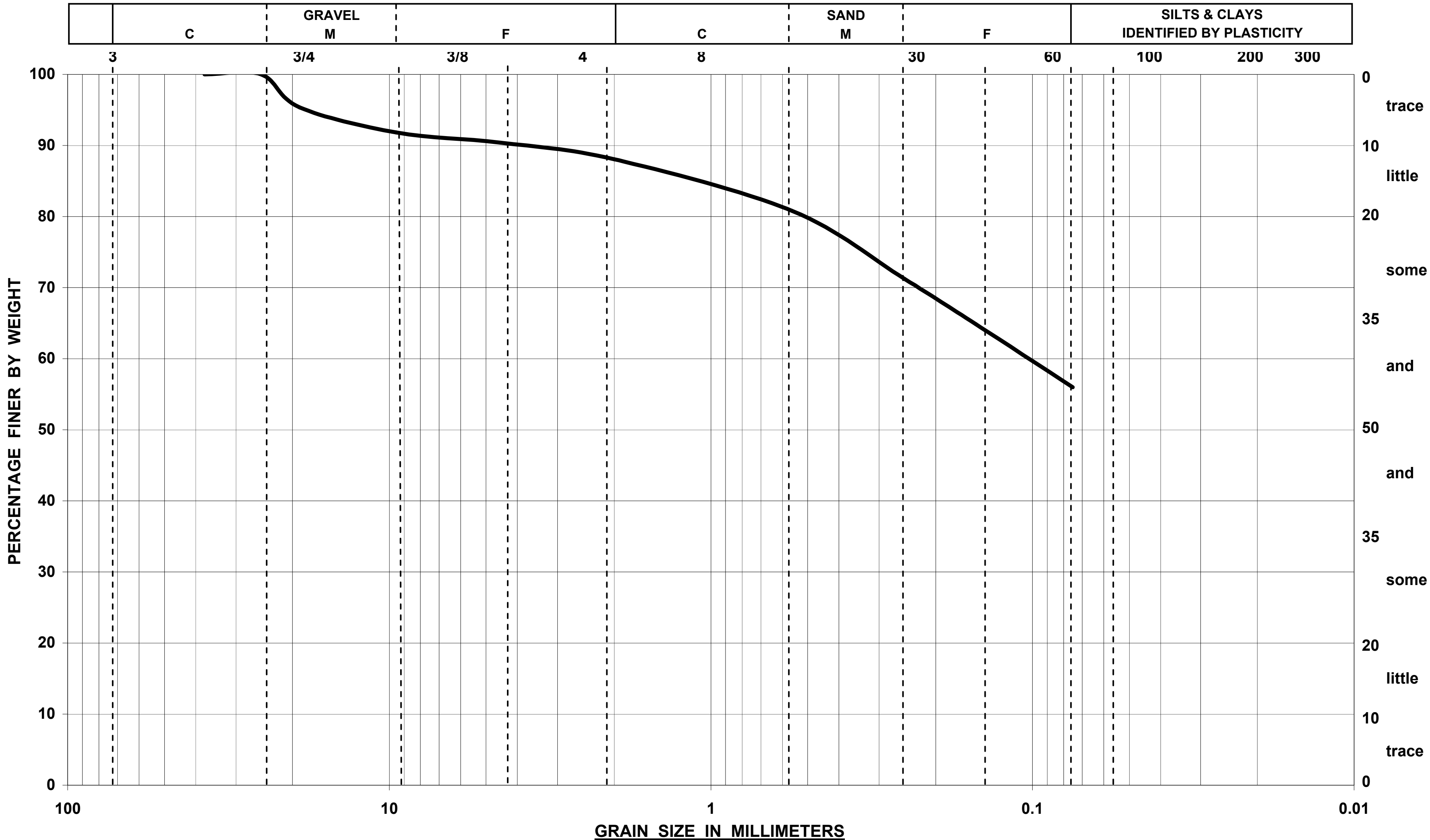


SYMBOL	Test Pit	SAMPLE	DEPTH	DESCRIPTION	NAT MC
——— (solid)	TP-1	S-1		Brown coarse to fine SAND, and Silt, trace (+) medium to fine Gravel	18.2%
— - (dashed)	TP-4	S-1		Brown coarse to fine Sand, and (-) Silt, some coarse to fine Gravel	14.0%

PROJECT Brynwood Club, Bedford Road, North Castle, NY **BY** MW **DATE** 7-Jan-13 **JOB NO** 12-175

CARLIN-SIMPSON & ASSOCIATES
SAYREVILLE, NJ 08872

SIEVE ANALYSIS



SYMBOL	Test Pit	SAMPLE	DEPTH	DESCRIPTION	NAT MC
——	TP-18	S-1	0' 10" - 7' 0"	Brown SILT and, coarse to fine Sand, little (-) medium to fine Gravel	18.0%

PROJECT Brynwood Club, Bedford Road, North Castle, NY **BY** MW **DATE** 7-Jan-13 **JOB NO** 12-175

GENERAL NOTES:

1. GENERAL LAYOUT WAS OBTAINED FROM A DRAWING PREPARED BY JOHN MEYER CONSULTING, PC ENTITLED "TEST PIT PLAN, BRYNWOOD CLUB, BEDFORD ROAD (NY 22), TOWN OF NORTH CASTLE NEW YORK," DRAWING TP-1, DATED DECEMBER 17, 2012.
2. BORING, TEST PIT, PERMEABILITY TEST, AND PERCOLATION TEST LOCATIONS WERE LAID OUT IN THE FIELD BY CARLIN-SIMPSON & ASSOCIATES (CSA).
3. BORINGS (B-1 THROUGH B-11) WERE PERFORMED BY GENERAL BORINGS INC. ON 18 & 19 DECEMBER 2012 UNDER THE FULL TIME INSPECTION OF CSA.
4. THE BOREHOLE PERMEABILITY TEST (BP-4) WAS PERFORMED BY CSA ON 18 & 19 DECEMBER 2012.
5. PERCOLATION TESTS (P-1, P-2, AND P-3) WERE PERFORMED BY CSA ON 3 JANUARY 2013.
6. TEST PITS (TP-1 THROUGH TP-18) WERE PERFORMED BY TRAFICANTE CONTRACTING, INC ON 3 & 4 JANUARY 2013 UNDER THE FULL TIME INSPECTION OF CSA.
7. TEST PITS (TP-19 THROUGH TP-28) WERE PERFORMED BY BRYNWOOD CLUB PERSONNEL IN SEPTEMBER 2013 UNDER THE FULL TIME INSPECTION OF CSA.
8. LOCATIONS ARE APPROXIMATE.

LEGEND:

- BORING LOCATION (DEC. 2012)
- TEST PIT LOCATION (JAN. 2013)
- TEST PIT LOCATION (SEPT. 2013)
- PERCOLATION TEST LOCATION (JAN. 2013)
- BOREHOLE PERMEABILITY TEST LOCATION (DEC. 2012)

ROBERT B. SIMPSON, P.E.
PROFESSIONAL ENGINEER

LICENSE NO. ______ SIGNATURE ______

BORING & TEST PIT LOCATION PLAN

BRYNWOOD CLUB DEVELOPMENT
NORTH CASTLE, NEW YORK

DRAWN	SCALE
MRA	1" = 120'
CHECKED	DATE
RBS	16 OCT 13
PROJECT NO.	DWG NO.
12-175	FIG -1
APPROVED	

CARLIN-SIMPSON AND ASSOCIATES
61 Main Street
Sayreville, NJ 08872

Consulting Geotechnical and Environmental Engineers

APPENDIX B

PUMP PERFORMANCE CURVES

EQUALIZATION TANK

1. SELECT SYSTEM HEAD POINTS				FLOW IN GPM:	20.00	35.00	45.00	65.00	85.00
2A. FORCE MAIN DATA :									
PIPE TYPE :		SCH. 40 SS							
C FACTOR :		120							
NOMINAL DIA. (in.) :		3							
INSIDE DIA. (in.) :		3							
INSIDE DIA. (ft.) :		0.25							
ID AREA (sq. ft.) :		0.049							
LENGTH (ft.)		15							
'E HYDRAULIC VALUES									
FLOW RATE (gpm)	(cfs)	VELOCITY (fps)	VEL. HEAD (ft.)						
20	0.0446	0.91	0.01		0.01				
35	0.0780	1.59	0.04			0.04			
45	0.1003	2.04	0.06				0.06		
65	0.1448	2.95	0.14					0.14	
85	0.1894	3.86	0.23						0.23
2. TOTAL VELOCITY HEAD LOSS (STEP 2A + STEP 2B).......					0.01	0.04	0.06	0.14	0.23

3. PIPE LOSS

A. 3" DIAMETER SCH. 40 SS HEAD LOSS

@ GPM	HAZEN & WILLIAMS (ft.)					
20	0.03	0.03				
35	0.08		0.08			
45	0.12			0.12		
65	0.24				0.24	
85	0.39					0.39
3. SUM OF ALL PIPE LOSS (ft.)		0.03	0.08	0.12	0.24	0.39

4. MINOR LOSSES

A. 3" DIAMETER SCH. 40 SS HEAD LOSS

QUANTITY	TYPE OF LOSS	k FACTOR	k total
1	inlet	0.50	0.50
1	outlet	1.00	1.00
5	90 - elbow	0.51	2.55
0	45 - elbow	0.27	0.00
0	22.5 - elbow		0.00
0	tee (thru)	0.34	0.00
0	tee (branch)	1.02	0.00
0	gate valve	0.14	0.00
0	plug valve	1.00	0.00
0	butterfly valve		0.00
0	check valve	1.70	0.00
0	special control valve		0.00
0	wye fitting		0.00
1	reducer	0.33	0.33
		K TOTAL	4.38

@ GPM	VELOCITY HEAD (ft.)	K TOTAL	LOSS (ft.)					
20	0.01	4.38	0.06	0.06				
35	0.04	4.38	0.17		0.17			
45	0.06	4.38	0.28			0.28		
65	0.14	4.38	0.59				0.59	
85	0.23	4.38	1.01					1.01
4. SUM OF ALL MINOR LOSSES (ft.).				0.06	0.17	0.28	0.59	1.01
5. SUM OF ALL LOSSES (STEP 2 + STEP 3+ STEP 4).				0.10	0.29	0.47	0.97	1.64

6. STATIC HEAD

a. MAX. STATIC.	12.79	12.79	12.79	12.79	12.79
b. MIN. STATIC.	6.79	6.79	6.79	6.79	6.79

7. TOTAL DYNAMIC HEAD (TDH)

a. TDH max. .(STEP 5 + STEP 6a).	12.88	13.07	13.26	13.75	14.42
b. TDH max. .(STEP 5 + STEP 6b).	6.88	7.07	7.26	7.75	8.42

8. SYSTEM HEAD CURVES

C VALUE = 14 120

FLOW (GPM)	TDH max. (FT.)	TDH min. (FT.)
0	12.79	6.79
20	12.88	6.88
35	13.07	7.07
45	13.26	7.26
65	13.75	7.75
85	14.42	8.42

TECHNICAL BROCHURE
B3887BF R2

WS_BF Series

Model 3887BF

SUBMERSIBLE SEWAGE PUMP

BUILT IN THE
USA
ENGINEERED,
ASSEMBLED & TESTED

GOULDS
WATER TECHNOLOGY
a xylem brand

FEATURES

Impeller: Cast iron, semi-open, non-clog, dynamically balanced with pump out vanes for mechanical seal protection.

Casing: Cast iron flanged volute type for maximum efficiency. Designed for easy installation on A10-20 slide rail or base elbow rail systems.

Mechanical Seal: SILICON CARBIDE VS. SILICON CARBIDE sealing faces for superior abrasive resistance, stainless steel metal parts, BUNA-N elastomers.

Shaft: Corrosion-resistant, 300 series stainless steel. Threaded design. Locknut on all models to guard against component damage on accidental reverse rotation.

Fasteners: 300 series stainless steel.

Capable of running dry without damage to components.

Designed for continuous operation when fully submerged.

EXTENDED WARRANTY AVAILABLE FOR RESIDENTIAL APPLICATIONS.

AGENCY LISTINGS

Tested to UL 778 and CSA 22.2 108 Standards
By Canadian Standards Association
File #LR38549

APPLICATIONS

Specifically designed for the following uses:

- Homes
- Water transfer
- Sewage systems
- Light industrial
- Dewatering/Effluent
- Commercial applications

Anywhere waste or drainage must be disposed of quickly, quietly and efficiently.

SPECIFICATIONS

Pump

- Solids handling capabilities: 2" maximum
- Capacities: up to 185 GPM
- Total heads: up to 38 feet TDH
- Discharge size: 2" NPT threaded companion flange as standard. 3" option available but must be ordered separately. (Order no. A1-3)
- Temperature: 104°F (40°C) continuous
  140°F (60°C) intermittent.

MOTORS

- Fully submerged in high grade turbine oil for lubrication and efficient heat transfer. All ratings are within the working limits of the motor.
- Class B insulation

Single phase (60 Hz):

- Capacitor start motors for maximum starting torque.
- Built-in overload with automatic reset.
- SJTOW or STOW severe duty oil and water resistant power cords.
- ⅓ – 1 HP models have NEMA three prong grounding plugs.

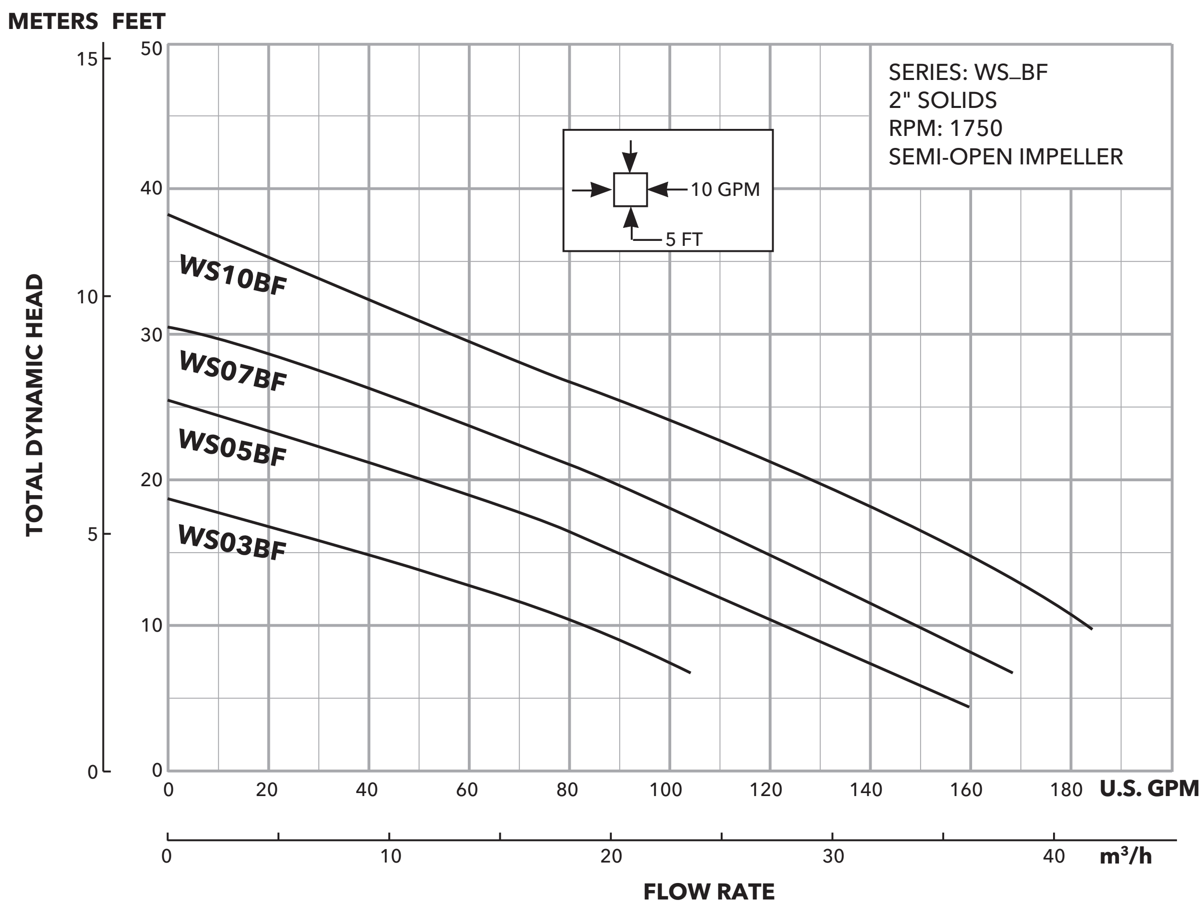
Three phase (60 Hz):

- Class 10 overload protection must be provided in separately ordered starter unit.
- STOW power cords all have bare lead cord ends.

- **Bearings:** Upper and lower heavy duty ball bearing construction.
- **Designed for Continuous Operation:** Pump ratings are within the motor manufacturer's recommended working limits, can be operated continuously without damage when fully submerged.
- **Power Cable:** Severe duty rated, oil and water resistant. Epoxy seal on motor end provides secondary moisture barrier in case of outer jacket damage and to prevent oil wicking. Standard cord is 20'. Optional lengths are available.
- **Motor Cover O-ring:** Assures positive sealing against contaminants and oil leakage.

MOTOR AND MODEL INFORMATION

Order Number	HP	Phase	Volts	RPM	Impeller Diameter (in.)	Maximum Amps	Locked Rotor Amps	KVA Code	Full Load Efficiency	Resistance		Weight (lbs.)
										Start	Line-Line	
WS0311BF	0.33	1	115	1750	4.69	10.7	30.0	M	54	11.9	1.7	63
WS0318BF			208			6.8	19.5	K	51	9.1	4.2	
WS0312BF			230			4.9	14.1	L	53	14.5	8.0	
WS0511BF	0.5		115		5.00	14.5	31.1	J	55	9.3	1.4	65
WS0518BF			208			8.0	19.5	K	51	9.1	4.2	
WS0512BF			230			7.3	16.5	J	54	11.7	5.6	
WS0538BF		3	200			3.8	12.3	K	75	–	6.7	
WS0532BF			230			3.3	9.7	K	75	–	9.9	
WS0534BF			460			1.7	4.9	K	75	–	39.4	
WS0537BF			575			1.4	4.3	K	68	–	47.8	
WS0718BF	0.75	1	208		5.38	11.0	39.0	K	65	2.6	1.4	85
WS0712BF			230			9.4	24.8	J	57	4.8	2.3	
WS0738BF		3	200			4.1	21.2	H	74	–	4.3	
WS0732BF			230			3.6	17.3	J	76	–	5.6	
WS0734BF			460			1.8	8.9	J	76	–	22.4	
WS0737BF			575			1.5	7.3	J	71	–	29.2	
WS1018BF	1	1	208		5.75	14.0	39.0	K	65	2.6	1.4	
WS1012BF			230			12.3	30.5	H	60	4.3	1.8	
WS1038BF		3	200			6.0	21.2	H	74	–	4.3	
WS1032BF			230			5.8	17.3	J	76	–	5.6	
WS1034BF			460			2.9	8.9	J	76	–	22.4	
WS1037BF			575			2.4	7.3	J	71	–	29.2	



PERFORMANCE RATINGS (gallons per minute)

	Order No.	WS03BF	WS05BF	WS07BF	WS10BF
	HP ▶	⅓	½	¾	1
	RPM ▶	1750	1750	1750	1750
Total Head Feet of Water	10 ▶	80	122	145	183
	15	36	90	116	152
	20	–	50	86	123
	25	–	–	48	95
	30	–	–	–	58
	35	–	–	–	20

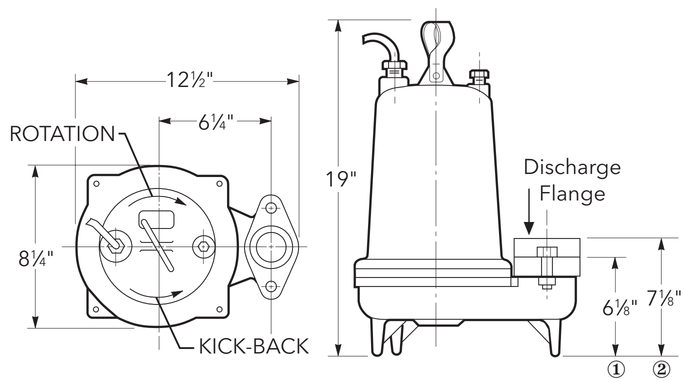
COMPONENTS

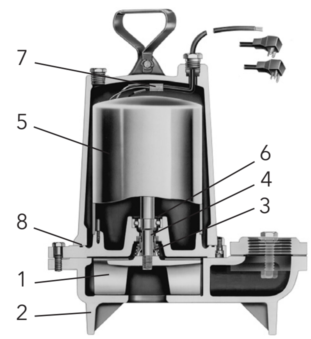
Item No.	Description
1	Impeller
2	Casing
3	Mechanical Seal
4	Motor Shaft
5	Motor
6	Ball Bearings
7	Power Cable
8	Casing O-Ring

* For available repair parts, see repair parts book.

DIMENSIONS

(All dimensions are in inches. Do not use for construction purposes.)





Discharge Flange:

① 2" NPT standard

② 3" NPT optional (order an A1-3)

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Let's Solve Water

Xylem Inc.
2881 East Bayard Street Ext., Suite A
Seneca Falls, NY 13148
Phone: (866) 325-4210
Fax: (888) 322-5877
www.gouldswatertechnology.com

SLUDGE DECANT PUMP

1. SELECT SYSTEM HEAD POINTS				FLOW IN GPM:	55.00	70.00	76.00	95.00	115.00
2A. FORCE MAIN DATA :									
	PIPE TYPE :	SCH 80 PVC							
	C FACTOR :	120							
	NOMINAL DIA. (in.) :	3							
	INSIDE DIA. (in.) :	3.042							
	INSIDE DIA. (ft.) :	0.25							
	ID AREA (sq. ft.) :	0.050							
	LENGTH (ft.)	25							
›E HYDRAULIC VALUES									
FLOW RATE (gpm)	(cfs)	VELOCITY (fps)	VEL. HEAD (ft.)						
55	0.1225	2.43	0.09		0.09				
70	0.1560	3.09	0.15			0.15			
76	0.1693	3.36	0.17				0.17		
95	0.2117	4.20	0.27					0.27	
115	0.2562	5.08	0.40						0.40
2. TOTAL VELOCITY HEAD LOSS (STEP 2A + STEP 2B).......					0.09	0.15	0.17	0.27	0.40

3. PIPE LOSS

A 3'' DIAMETER SCH 80 PVC HEADLOSS						
@ GPM	HAZEN & WILLIAMS (ft.)					
55	0.27	0.27				
70	0.43		0.43			
76	0.50			0.50		
95	0.76				0.76	
115	1.08					1.08
3. SUM OF ALL PIPE LOSS (ft.)		0.27	0.43	0.50	0.76	1.08

4. MINOR LOSSES

A 3" DIAMETER SCH 80 PVC HEADLOSS

QUANTITY	TYPE OF LOSS	k FACTOR	k total
1	inlet	0.50	0.50
1	outlet	1.00	1.00
3	90 - elbow	0.51	1.53
	45 - elbow	0.27	0.00
0	22.5 - elbow		0.00
0	tee (thru)	0.34	0.00
0	tee (branch)	1.02	0.00
0	gate valve	0.14	0.00
0	plug valve	1.00	0.00
0	butterfly valve		0.00
0	check valve	1.70	0.00
0	special control valve		0.00
0	wye fitting		0.00
0	reducer	0.33	0.00
		K TOTAL	3.03

@ GPM	VELOCITY HEAD (ft.)	K TOTAL	LOSS (ft.)					
55	0.09	3.03	0.28	0.28				
70	0.15	3.03	0.45		0.45			
76	0.17	3.03	0.53			0.53		
95	0.27	3.03	0.83				0.83	
115	0.40	3.03	1.21					1.21
4. SUM OF ALL MINOR LOSSES (ft.).				0.28	0.45	0.53	0.83	1.21
5. SUM OF ALL LOSSES (STEP 2 + STEP 3+ STEP 4).				0.64	1.03	1.20	1.86	2.69

6. STATIC HEAD

a. MAX. STATIC	12.92	12.92	12.92	12.92	12.92
b. MIN. STATIC	10.50	10.50	10.50	10.50	10.50

7. TOTAL DYNAMIC HEAD (TDH)

a. TDH max. (STEP 5 + STEP 6a)	13.56	13.95	14.12	14.78	15.61
b. TDH max. (STEP 5 + STEP 6b)	11.14	11.53	11.70	12.36	13.19

8. SYSTEM HEAD CURVES

C VALUE = 14 120

FLOW (GPM)	TDH max. (FT.)	TDH min. (FT.)
0	12.92	10.50
55	13.56	11.14
70	13.95	11.53
76	14.12	11.70
95	14.78	12.36
115	15.61	13.19

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B3887BF R2

WS_BF Series

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Shaft: Corrosion-resistant, 300 series stainless steel. Threaded design. Locknut on all models to guard against component damage on accidental reverse rotation.

Fasteners: 300 series stainless steel.

Capable of running dry without damage to components.

Designed for continuous operation when fully submerged.

EXTENDED WARRANTY AVAILABLE FOR RESIDENTIAL APPLICATIONS.

AGENCY LISTINGS

Tested to UL 778 and CSA 22.2 108 Standards
By Canadian Standards Association
File #LR38549

APPLICATIONS

Specifically designed for the following uses:

- Homes
- Water transfer
- Sewage systems
- Light industrial
- Dewatering/Effluent
- Commercial applications

Anywhere waste or drainage must be disposed of quickly, quietly and efficiently.

SPECIFICATIONS

Pump

- Solids handling capabilities: 2" maximum
- Capacities: up to 185 GPM
- Total heads: up to 38 feet TDH
- Discharge size: 2" NPT threaded companion flange as standard. 3" option available but must be ordered separately. (Order no. A1-3)
- Temperature: 104°F (40°C) continuous
  140°F (60°C) intermittent.

MOTORS

- Fully submerged in high grade turbine oil for lubrication and efficient heat transfer. All ratings are within the working limits of the motor.
- Class B insulation

Single phase (60 Hz):

- Capacitor start motors for maximum starting torque.
- Built-in overload with automatic reset.
- SJTOW or STOW severe duty oil and water resistant power cords.
- ⅓ – 1 HP models have NEMA three prong grounding plugs.

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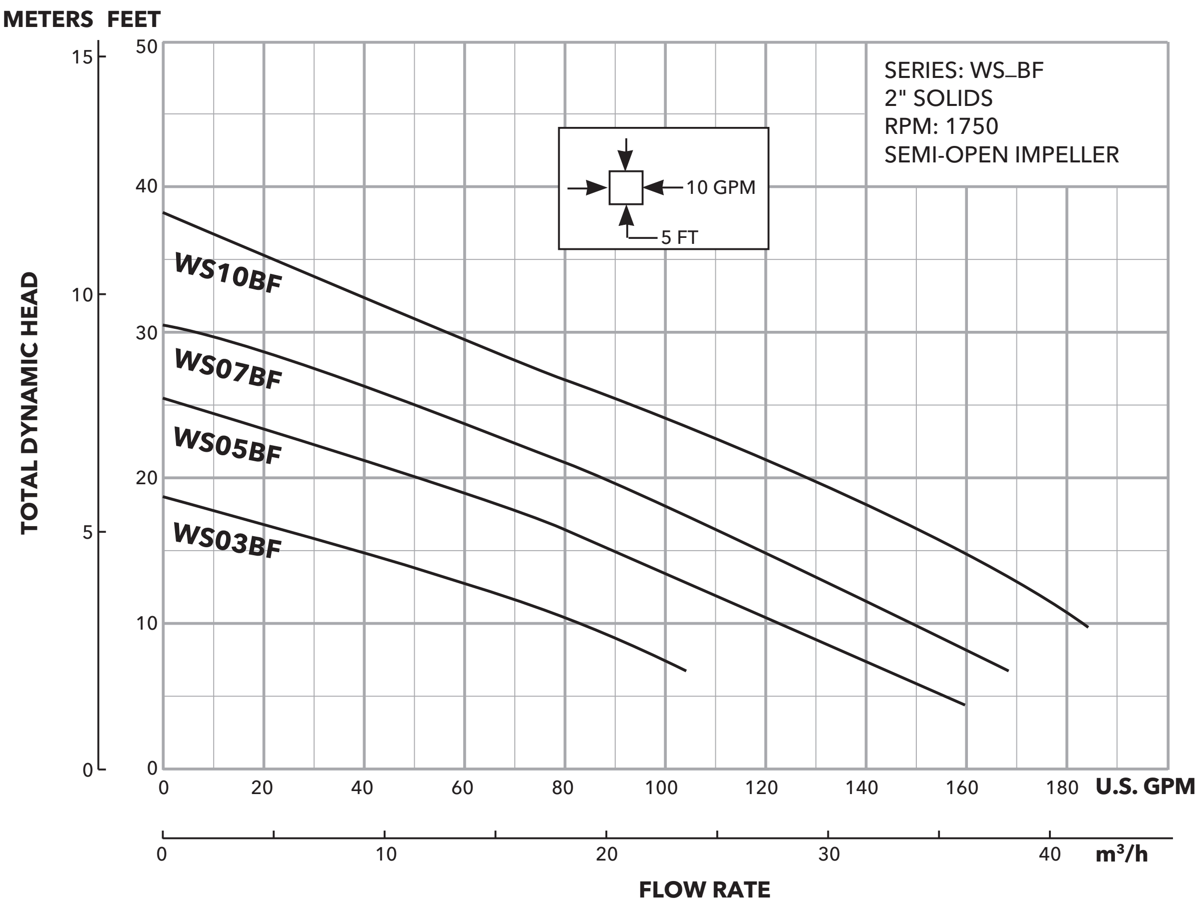
- **Power Cable:** Severe duty rated, oil and water resistant. Epoxy seal on motor end provides secondary moisture barrier in case of outer jacket damage and to prevent oil wicking. Standard cord is 20'. Optional lengths are available.
- **Motor Cover O-ring:** Assures positive sealing against contaminants and oil leakage.

MOTOR AND MODEL INFORMATION

Order Number	HP	Phase	Volts	RPM	Impeller Diameter (in.)	Maximum Amps	Locked Rotor Amps	KVA Code	Full Load Efficiency	Resistance		Weight (lbs.)
										Start	Line-Line	
WS0311BF	0.33	1	115	1750	4.69	10.7	30.0	M	54	11.9	1.7	63
WS0318BF			208			6.8	19.5	K	51	9.1	4.2	
WS0312BF			230			4.9	14.1	L	53	14.5	8.0	
WS0511BF	0.5		115		5.00	14.5	31.1	J	55	9.3	1.4	65
WS0518BF			208			8.0	19.5	K	51	9.1	4.2	
WS0512BF			230			7.3	16.5	J	54	11.7	5.6	
WS0538BF		3	200			3.8	12.3	K	75	–	6.7	
WS0532BF			230			3.3	9.7	K	75	–	9.9	
WS0534BF			460			1.7	4.9	K	75	–	39.4	
WS0537BF			575			1.4	4.3	K	68	–	47.8	
WS0718BF	0.75	1	208		5.38	11.0	39.0	K	65	2.6	1.4	85
WS0712BF			230			9.4	24.8	J	57	4.8	2.3	
WS0738BF		3	200			4.1	21.2	H	74	–	4.3	
WS0732BF			230			3.6	17.3	J	76	–	5.6	
WS0734BF			460			1.8	8.9	J	76	–	22.4	
WS0737BF			575			1.5	7.3	J	71	–	29.2	
WS1018BF	1	1	208		5.75	14.0	39.0	K	65	2.6	1.4	
WS1012BF			230			12.3	30.5	H	60	4.3	1.8	
WS1038BF		3	200			6.0	21.2	H	74	–	4.3	
WS1032BF			230			5.8	17.3	J	76	–	5.6	
WS1034BF			460			2.9	8.9	J	76	–	22.4	
WS1037BF			575			2.4	7.3	J	71	–	29.2	



PERFORMANCE RATINGS (gallons per minute)

Order No.		WS03BF	WS05BF	WS07BF	WS10BF
	HP ▶	⅓	½	¾	1
	RPM ▶	1750	1750	1750	1750
Total Head Feet of Water	10 ▶	80	122	145	183
	15	36	90	116	152
	20	–	50	86	123
	25	–	–	48	95
	30	–	–	–	58
	35	–	–	–	20

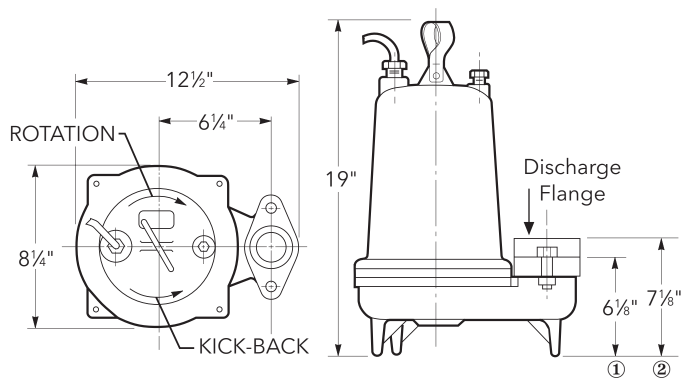
COMPONENTS

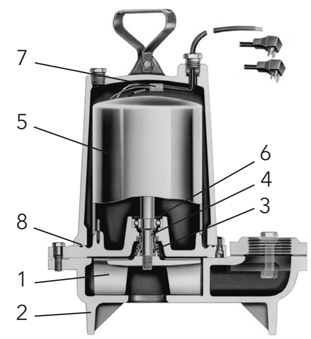
Item No.	Description
1	Impeller
2	Casing
3	Mechanical Seal
4	Motor Shaft
5	Motor
6	Ball Bearings
7	Power Cable
8	Casing O-Ring

* For available repair parts, see repair parts book.

DIMENSIONS

(All dimensions are in inches. Do not use for construction purposes.)





Discharge Flange:

① 2" NPT standard

② 3" NPT optional (order an A1-3)

Xylem Inc.
2881 East Bayard Street Ext., Suite A
Seneca Falls, NY 13148
Phone: (866) 325-4210
Fax: (888) 322-5877
www.gouldswatertechnology.com

APPENDIX C

MANUFACTURER’S PROCESS CALCULATIONS

PES Project #	BJB-022522-SC(Rev5)	Date:	4/7/22
Job Name:	Summit Club		
QTY & Flow			

BESST DESIGN CALCULATIONS

1) $\mathbf{B_x}$ Actual Sludge Load [kg BOD_5 / kg VSS / d]

$\mathbf{B_x}$ = $B \times 1.02^{(tmin-20)}$
$\mathbf{B_x}$ = $0.120 \times 1.02^{(10 - 20)}$
$\mathbf{B_x}$ = 0.0984 kg BOD_5 / kg VSS / d

2) **A** Sludge Age [days]

A = $(1 / (YB_x)) \times (1-0.5((YB_x) / k_{ac})) + (Sqrt(1 + ((YB_x) / 2k_{ac})^2))$
A = (1/ (0.60 x 0.0984)) x (1- 0.5 x((0.60 x 0.0984) / 0.090))+
(Sqrt (1 + (0.60 x 0.0984) / (2x 0.090 $)^2$))
A = 29.1936 days

3) $\mathbf{k_d}$ Actual Rate of Decay [d^{-1}]

$\mathbf{k_d}$ = $k_{ac} / (1 + Ak_{ac})$
$\mathbf{k_d}$ = 0.090 / (1+ (29.1936) (0.090))
$\mathbf{k_d}$ = 0.0248 d^{-1}

4) **X** Sludge Concentration [kg ss / m^3]

X = 1000 x V_x / KI
X = 1000 x 0.600) / 100
X = 6.0000 kg ss / m^3

PES Project #	BJB-022522-SC(Rev5)	Date:	4/7/22
Job Name:	Summit Club		
QTY & Flow	0		

BESST DESIGN CALCULATIONS, Cont'd.

5) $\mathbf{X_v}$ Volatile Suspended Solids Concentration [kg VSS / m^3]

$\mathbf{X_v}$ = (X)(p)
$\mathbf{X_v}$ = 6.0000 x 0.65
$\mathbf{X_v}$ = 3.9000 kg VSS / m^3

6) **v** Actual Hydraulic Loading [m / h]

v = Lesser of v_l or v_c, where v_l = 1
$\mathbf{v_c}$ = $(N_x / X) \times e^{0.03(tmin-20)}$
$\mathbf{v_c}$ = (6.0000 / 6.0000) ($e^{0.03 *(10 - 20)}$)
$\mathbf{v_c}$ = 0.7408 m / h

7) $\mathbf{V_B}$ Aeration Volume [m^3]

$\mathbf{S_R}$ = S_T - (0.966(p)(NL))
$\mathbf{V_B}$ = $(Q(S_O - S_R)) / X_v B_x$
$\mathbf{V_B}$ = ((170.326)(0.2400 - 0.0037) / (3.900)(0.0984)
$\mathbf{V_B}$ = 104.82 m^3

8) $\mathbf{S_S}$ Clarifier Surface Area [m^2]

$\mathbf{S_S}$ = $((Q_Q)(Q) / 24v$
$\mathbf{S_S}$ = ((3)(170.326) / (24 * 0.7408)
$\mathbf{S_S}$ = 28.739 m^2

9) $\mathbf{V_S}$ Clarifier Volume [m^3]

$\mathbf{V_S}$ = S_S / SV
$\mathbf{V_S}$ = 28.739 / 0.63
$\mathbf{V_S}$ = 45.618 m^3

PES Project #	BJB-022522-SC(Rev5)	Date:	4/7/22
Job Name:	Summit Club		
QTY & Flow	0		

BESST DESIGN CALCULATIONS, Cont'd.

10) $\mathbf{P_X}$ Net Mass of Volatile Suspended Solids Produced [kg VSS / d]

$\mathbf{P_X}$ = $(Y / (1 + Ak_d))(Q)(S_O - S_R)$
$\mathbf{P_X}$ = (0.60 / (1 + (29.1936) (0.0248)) (170.33)(0.2400 - 0.0037)
$\mathbf{P_X}$ = 14.004 kg VSS / d

11) $\mathbf{P_t}$ Sludge Production [kg ss / d]

$\mathbf{P_t}$ = P_X / p
$\mathbf{P_t}$ = 14.004 / 0.6500
$\mathbf{P_t}$ = 21.544 kg ss / d

12) $\mathbf{V_N}$ Nitrification Volume [m^3]

$\mathbf{V_N}$ = $(Q(N_O - N)) / (p_N m_U X_V)$
$\mathbf{V_N}$ = (170.326 (0.0400 - 0.0010)) / ((0.0450)(0.6085)(3.9000))
$\mathbf{V_N}$ = 62.149 m^3

13) $\mathbf{V_D}$ Denitrification Volume [m^3]

$\mathbf{V_D}$ = $(QN_OY) / (0.75 m_Z X_V)$
$\mathbf{V_D}$ = (170.33 ((0.0400)(0.60))) / (0.75 (0.0750)(3.9000))
$\mathbf{V_D}$ = 18.634 m^3

14) $\mathbf{V_A}$ Volume of Aeration [m^3]

$\mathbf{V_A}$ = Larger of V_{AB} or V_N
$\mathbf{V_{AB}}$ = $V_B - V_D((1 + Ak_d) / (2.77(Am_Z)))$
$\mathbf{V_{AB}}$ = 104.82 - 18.634 ((1 + (29.1936)(0.0248)) /
(2.77 (29.1936)(0.0750))
$\mathbf{V_{AB}}$ = 99.526
$\mathbf{V_A}$ = 99.526 m^3

PES Project #	BJB-022522-SC(Rev5)	Date:	4/7/22
Job Name:	Summit Club		
QTY & Flow	0		

BESST DESIGN CALCULATIONS, Cont'd.

15) $\mathbf{V_T}$ Total Volume of Reactor [m^3]

$\mathbf{V_T}$ = $V_A + V_D + V_S$
$\mathbf{V_T}$ = 99.526 + 18.634 + 45.618
$\mathbf{V_T}$ = 163.78 m^3

16) $\mathbf{O_2}$ Oxygen Consumption [kg O_2 / d]

$\mathbf{O_2}$ = $Q((S_O - S_R) / 0.68) - 1.42P_X + 4.57Q(N_O - N)$
$\mathbf{O_2}$ = 170.33 ((0.2400 - 0.0037) / 0.68) - 1.42 (14.004)
+ 4.57 (170.33) (0.0400 - 0.0010)
$\mathbf{O_2}$ = 69.655 kg O_2 / d

17) **Nm** Air Consumption [Nm^3 / h]

Nm = $O_2(c_S / (c_S - 2))(o_k / (0.024a))$
Nm = 69.655 (8.1224 / (8.1224 - 2))
(1.3000 / (0.024 (30)))
Nm = 166.85 Nm^3 / h

BESST PROGRAM AND FORMULA LISTING

The following variable and formula lists represent the program listing for the computer model used to design and size the BESST system. Not all of the formulas are listed due to copyright and patent protection. Formulas that are NOT shown are mainly sub-formulas of those listed. For formula verification see Metcalf & Eddy: Wastewater Engineering; and K.R. Imhoff: Taschenbuch def Stadtenwasterung. 28. Auflage, Oldenbou Munchen - Wien 1993.

INPUT VALUES

1.)	**B**	**Sludge Load (kg BOD / kg VSS)**	**0.03 to 0.20**
2.)	N_X	**Flux Flow (kg ds / m^2 / h)** function of temperature (use @ 20 degrees Celsius)	**6.00**
3.)	V_L	**Limit Hydraulic Loading (m / h)**	**0.99 to 1.1**
4.)	V_X	**Sludge Volume (mL / L)**	**4.0 to 0.7**
5.)	**KI**	**Sludge Index (mL / g)**	**70 to 120**
6.)	**p**	**Volatile Suspended Solids (%)**	**0.62 to 0.68**
7.)	**Y**	**Maximum Yield Coefficient (kg VSS / kg BOD)**	**0.53 to 0.6**
8.)	k_{ac}	**Decay Rate (d)** constant	**0.09**
9.)	**Q**	**Flow Rate (m^3 / d)**	
10.)	Q_Q	**Flow Variation**	**1.5 to 3**
11.)	S_O	**Influent BOD (kg / m^3)**	
12.)	S_T	**Effluent BOD (kg / m^3)**	
13.)	N_O	**Influent Ammonia (kg / m^3)**	
14.)	**N**	**Effluent Ammonia (kg / m^3)** typically	**0.005**

INPUT VALUES

15.)	**N_3**	**Effluent Nitrates N-NO_3 (kg / m^3)**	typically	**0.001 to 0.015**
16.)	**NL_O**	**Influent TSS (kg / m^3)**		
17.)	**NL**	**Effluent TSS (kg / m^3**		
18.)	**min**	**Minimum Water Temperature (^oC)**		
19.)	**max**	**Maximum Water Temperature (^oC)**		
20.)	**a**	**Oxygen Transfer Coefficient (g / Nm^3)**		**15 to 50**
21.)	**SV**	**Ratio, Separation Surface to Separation Volume**		
22.)	**m_i**	**Specific Growth Rate of Nitrificants**	constant	**1.37**
23.)	**pH**	**pH**		**6.0 to 8.0**
24.)	**m_{id}**	**Specific Growth Rate of Denitrificants**	constant	**0.1 to 0.3**
25.)	**O_k**	**Peak Load of Aeration**	constant	**1.3**

Nitrification and Denitrification

Nitrogen is removed by the nitrification and denitrification processes. Nitrification is autotropic and all Purestream *ES*, LLC integrated bioreactors are designed for complete nitrification of ammonia to NO_3 (pleas see Metcalf & Eddy, Third Edition, Chapter 11-6).

Denitrification, however, is heterotropic and requires a carbon source. Conventional plants' "separate sludge denitrification" requires that carbon is added, typically in the form of methanol. This adds to operating costs, and if used in excess, to increased BOD_5 content. BESST technology's "single-sludge denitrification" approach uses an endogenous carbon source to maintain dentrifiers. Influent is combined with nitrified mixe liquor in the anoxic compartment providing the carbon source needed for denitrification. Relatively high mixe liquor recycle rates are employed and sufficient denitrification retention times provided.

Total nitrogen reduction (**N_T**) is a subject of not only providing sufficient anoxic volume for denitrification and keeping temperature above a certain minimum, but also a function of Recycled Activated Sludge (RAS) flow rate. The efficiency of **N_T** reduction is expressed as follows:

$$\eta = (1 - 1/(1 + n)) \times 100$$

Where n = RAS flow multiple of average flow Q.

The following are typical efficiencies and RAS flow multiples used / required:

	n	η (%)
Domestic	2	66
	3	75
	4	80
Slaughterhouse Wastewater	14	93
Hog Manure	29	97

Phosphorous Reduction

BESST technology delivers not only high efficiency reduction of organic matter, but also increased efficiency of phosphorous removal. Two processes, biological and chemical precipitation are employed with advantage

The mechanics of biological phosphorous removal, known as "Luxury Uptake", are due to exposure of activated sludge to alternating oxic and anoxic conditions. Under these conditions, the cells store more energy in the form of phosphorous than needed for their survival. If strictly oxic conditions are maintained during subsequent clarification, phosphorous will be retained by the cells and will eventually be removed with the excess sludge. Unlike most other methods of clarification, these conditions are maintained by the BESST process, and biological phosphorous reduction to less than 3 mg/L are readily achievable.

The basic reaction involved in the precipitation of phosphorous with iron is as follows:

$$Fe^{+3} + H_n(PO_4)^{n-3} \blacklozenge \quad FePO_4 + nH^+$$

In the case of iron, 1 mole will precipitate 1 mole of phosphate. The advantage of the process is its low chemical consumption, close to stoichiometric, and consequently, the reduction of ballast sludge production. Followed by microfiltration, reductions to 0.5 mg/L are possible.

If yet further reduction of phosphorous is required, ferric sulfate precipitation after the bioreactor followed by microfiltration must be used.

February 28, 2022
Project: Summit Club 45,000 gpd

SLUDGE AIRLIFT CALCULATIONS AND DATA

A. Maximum flow at six times average daily flow

$\frac{45,000 \times 6}{1440}$ = 188 GPM total

B. Two (2) 4" airlifts provided, each rated at 94 GPM

C. See performance curve attached for 4" airlift

At Lift (H_L) = 1'
Flow = 94 GPM
Submergence (H_S) = 9'

% Subm. = $\frac{9}{10} \times 100 = 90\%$
Required Air = 12 CFM per airlift

At Lift (H_L) = 2'
Flow = 94 GPM
Submergence (H_S) = 9'

% Subm. = $\frac{9}{11} \times 100 = 81.8\%$
Required Air = 18 CFM per airlift

At actual lift (H_L) = 1.5', use 15 CFM per sludge airlift

D. Minimum flow at four times average daily flow

$\frac{45,000 \times 4}{1440}$ = 125 GPM total

E. Two (2) 4" airlifts provided, each rated at 63 GPM

F. See performance curve attached for 4" airlift

At Lift (H_L) = 1'
Flow = 63 GPM
Submergence (H_S) = 9'

% Subm. = $\frac{9}{10} \times 100 = 90\%$
Required Air = 10 CFM per airlift

At Lift (H_L) = 2'
Flow = 63 GPM
Submergence (H_S) = 9'

% Subm. = $\frac{9}{11} \times 100 = 81.8\%$
Required Air = 16 CFM per airlift

At actual lift (H_L) = 1.5', use 13 CFM per sludge airlift

February 28, 2022
Project: Summit Club 45,000 gpd

SKIMMER AIRLIFT CALCULATIONS AND DATA

A. Maximum flow at two times average daily flow

$$\frac{45{,}000 \times 2}{1440} = 63 \text{ GPM total}$$

B. Two (2) 2.5" airlifts provided, each rated at 32 GPM

C. See performance curve attached for 2.5" airlift

At Lift (H_L) = 1'
Flow = 32 GPM
Submergence (H_S) = 5'

% Subm. = $\frac{5}{6} \times 100 = 83.3\%$
Required Air = 3 CFM per airlift

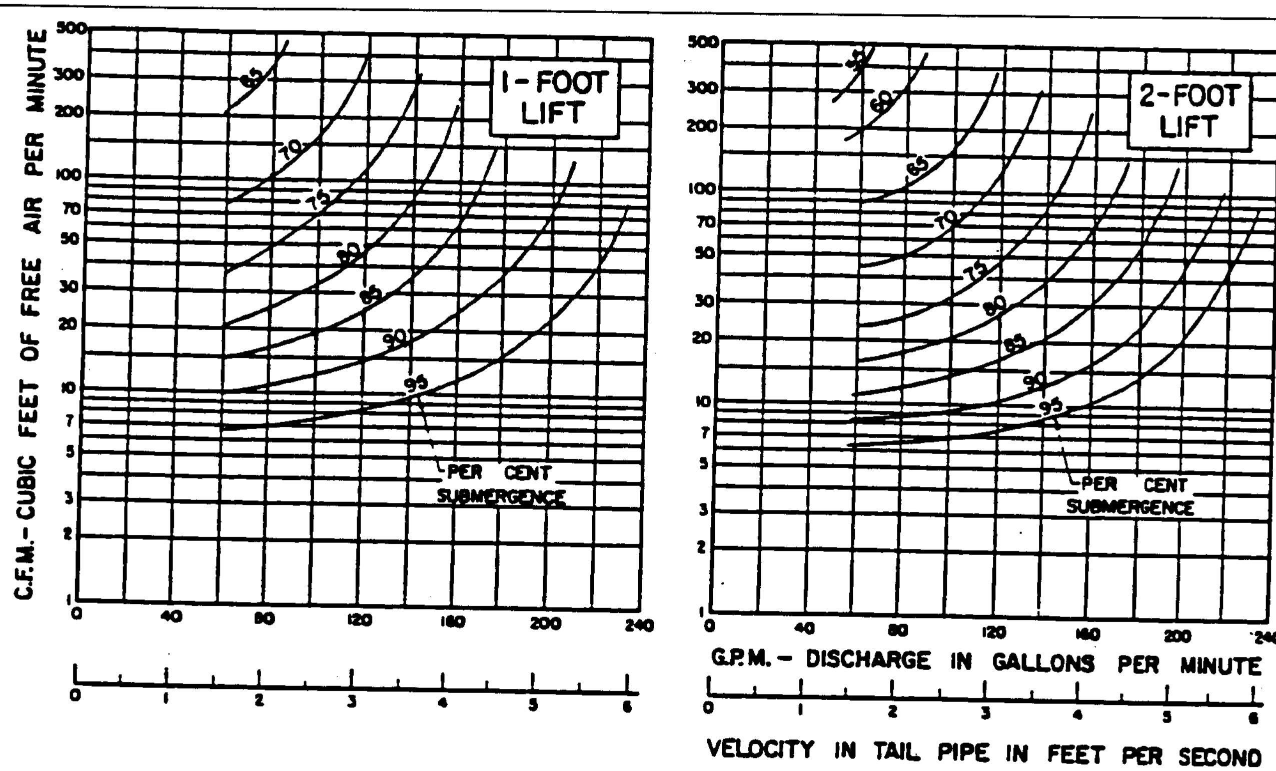
At Lift (H_L) = 2'
Flow = 32 GPM
Submergence (H_S) = 5'

% Subm. = $\frac{5}{7} \times 100 = 71.4\%$
Required Air = 7 CFM

At actual lift (H_L) = 1.5', use 5 CFM per sludge airlift

WasteWater Treatment Systems

TYPICAL PERFORMANCE CURVES FOR A 4-INCH AIR LIFT



NOTES:

1. THE AIR LIFT PERFORMANCE CURVES ON THIS CHART ARE TYPICAL FOR PUMPING CLEAR WATER AND ARE INTENDED TO BE USED FOR ESTIMATING.
2. THE PER CENT SUBMERGENCE = $\frac{H_S}{H_S + H_L} \times 100$.
3. IT IS SUGGESTED THAT THE CURVES BE NOT EXTENDED BEYOND THE LIMITS SHOWN BECAUSE THE APPROXIMATE MAXIMUM DISCHARGE FOR EACH CONDITION IS INDICATED.
4. FOR LIFTS BETWEEN THOSE INDICATED ON THIS CHART USE A STRAIGHT ARITHMETIC PROPORTION WHEN INTERPOLATING VALUES.

EXAMPLE 1:

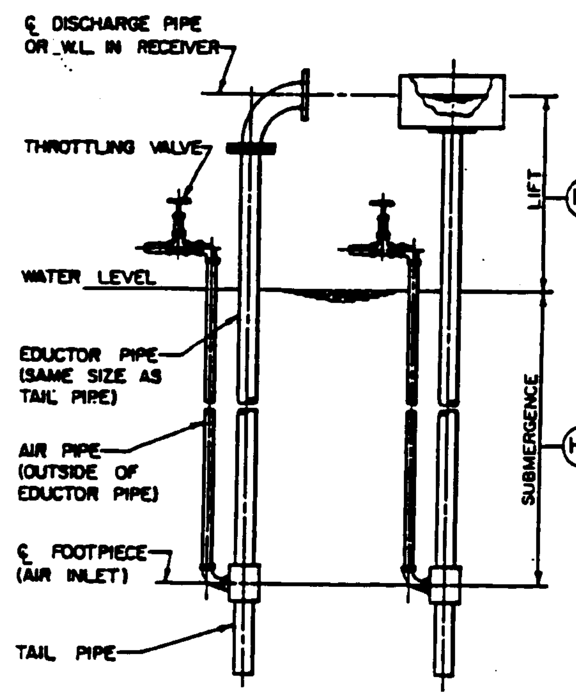
GIVEN: LIFT, H_L = 5'; SUBM., H_S = 13'.
DESIRED DISCH. = 100 G.P.M.

FIND: PER CENT SUBMERGENCE = $\frac{13}{13+5} \times 100 = 72$
AIR REQ'D. = 24 C.F.M. (FREE AIR)
VELOCITY IN 4" TAIL PIPE = 2.6 F.P.S.

EXAMPLE 2:

GIVEN: LIFT, H_L = 5.5'; SUBM., H_S = 12.5'.
DESIRED VEL. IN 4" TAIL PIPE = 3.0 F.P.S.

FIND: DISCH. FROM 4" AIR LIFT = 117 G.P.M.
PER CENT SUBM. = $\frac{12.5}{12.5+5.5} \times 100 = 69.3$.
AIR REQ'D.
= (AIR @ H=5') − $\frac{5.5-5.0}{7.0-5.0}$ (DIFF. AIR @ H=5' & 7'.
= 40 − 0.25(40 − 30)
= 38 C.F.M. (FREE AIR).



TYPICAL AIR LIFTS FOR WHICH CURVES ARE APPLICABLE

purestream inc.
WASTEWATER TREATMENT EQUIPMENT
P.O. Box 68 Florence, KY 41022-0068 Phone (859) 371-9898 Fax (859) 371-3577

engineering data sheet

Chicago PUMP section 8630.4

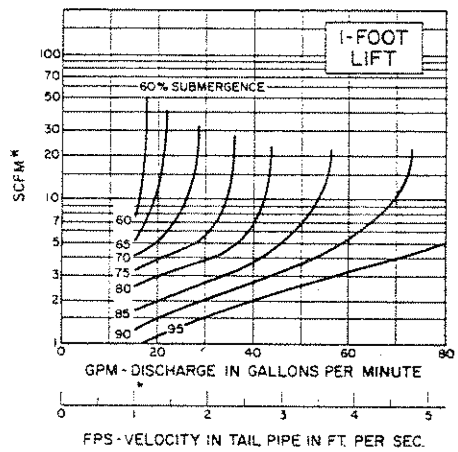
JAN., 1972

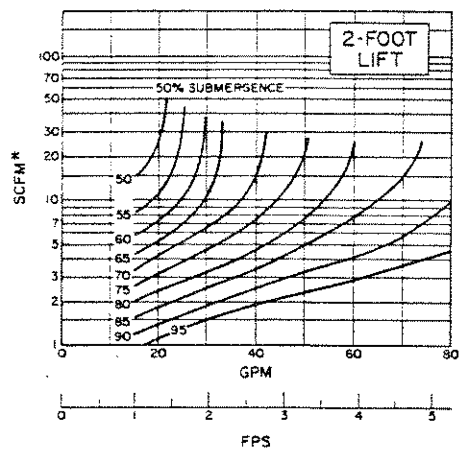
K-6291-2.5

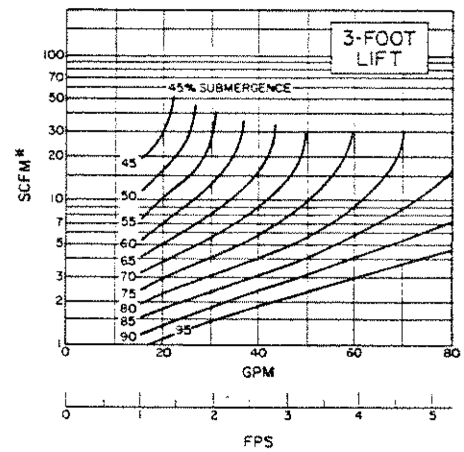
TYPICAL PERFORMANCE CURVES

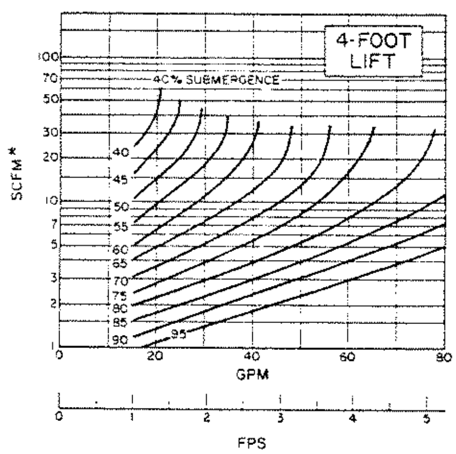
AIR LIFT PUMP

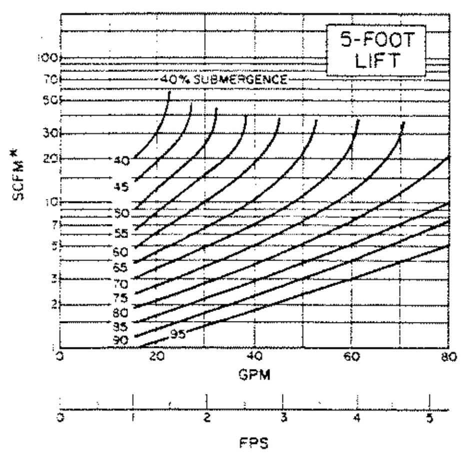
$2\frac{1}{2}$" SIZE

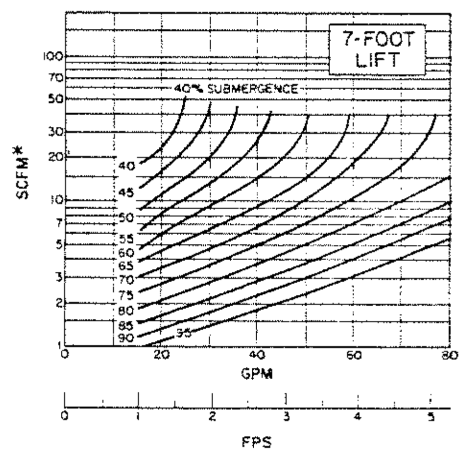


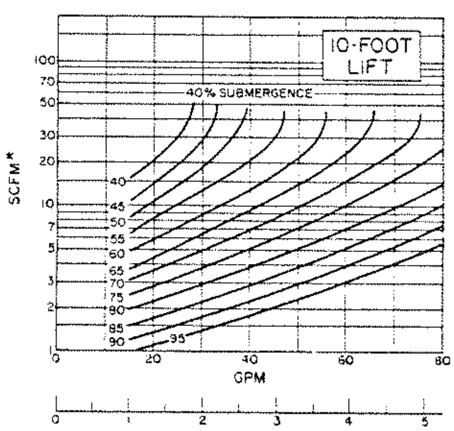












NOTES:

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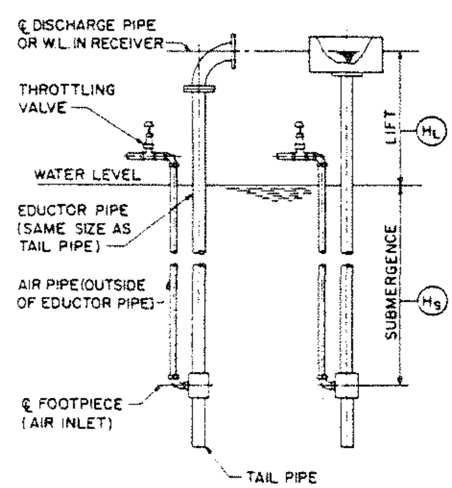
2. THE PER CENT SUBMERGENCE $= \frac{H_S}{H_S + H_L} \times 100$
3. IT IS SUGGESTED THAT THE CURVES NOT BE EXTENDED BEYOND THE LIMITS SHOWN BECAUSE THE APPROXIMATE MAXIMUM DISCHARGE FOR EACH CONDITION IS INDICATED.
4. FOR LIFTS BETWEEN THOSE INDICATED ON THIS CHART USE A STRAIGHT ARITHMETIC PROPORTION WHEN INTERPOLATING VALUES.

EXAMPLE:

GIVEN: LIFT, $H_L = 3'$, SUBM, $H_S = 12'$
DESIRED DISCH. = 40 GPM

FIND: PER CENT SUBMERGENCE $= \frac{12'}{12' + 3'} \times 100 = 80\%$
AIR REQ'D = 4 SCFM
VELOCITY IN $2\frac{1}{2}$" TAIL PIPE = 2.6 FPS

* STANDARD CUBIC FEET OF AIR PER MINUTE AT 14.7 PSIA AND 70° F.



APPENDIX D

BLOWER PERFORMANCE DATA

PROCESS BLOWER

OMEGA PLUS ROTARY BLOWERS
- RECOMMENDATIONS BLOWERS -

Customer: Summit Club-Process/Airlift

Prepared By: David W. Martine

INPUT DATA:

Operating mode: Gauge pressure

Flow medium : Humid Air

Kind of package: Com-paK Plus on frequency control

Specific heat constant κ : 1.40

Inlet temperature: 90 °F

Specific weight at standard conditions : 0.0760 lb/ ft³

Inlet pressure: 14.7 psia

Pressure difference : 6.0 psig

Inlet flow: 160 icfm

Discharge pressure : 20.7 psia

Air humidity: 80 [%]

Technical data:

Package: BB 69C

Blower: OMEGA 22P

Motor power: 10.0 hp

Operating voltage: 208V/60Hz

Blower speed(60Hz): 5125 rpm

Connection ANSI:2

% of maximum speed: 86

Blower: OMEGA 22P

Performance data:	**min. frequency**	**Design point**	**max. frequency**	
Frequency:	18.0	55.4	60.0	Hz
Speed:	1540	4730	5130	rpm
Inlet air flow Q1*:	32	160	176	icfm
Inlet air flow Q1 (standard): Standard conditions 14.7psia, 68°F and 0 % RH	30	148	163	scfm
Discharge temperature*:	216	167	165	°F
Blower shaft power*:	2.1	6.0	6.6	bhp
Motor shaft power :			7.2	bhp

		without sound enclosure	with sound enclosure
Sound pressure level**:	**at fmax**	82dB(A)	69dB(A)
Sound pressure level**:	**at 60 Hz**	82dB(A)	69dB(A)
Sound power level**:	**at 60 Hz**	96dB(A)	85dB(A)
Dimension [inches] (W x L x H)		26x 26 x 38	31x 38 x 47
Estimated Weight		ca. 386 lbs	ca. 672 lbs

IGBT Frequency controlled **208V ± 5 % 60 Hz**

The stated control range can vary depending on manufacturer and type of the frequency converter.
Standard motor with impulse peak resistance in accordance with IEC 60034-1 for operation with a IGBT frequency converter.

*** Performance data to DIN ISO 1217, PART 1, ANNEX C**
**** Measured to DIN EN ISO 2151, figures ± 3 dB(A), with sound isolated pipework.**

Motor shaft power includes belt losses in addition to dirty filter losses of 0.6 psig (40 mbar)

Customer: Summit Club-Process/Airlift

Prepared By: David W. Martine

Kind of package: Com-paK Plus on frequency control

Operating mode: Gauge pressure

Inlet temperature: 90 °F

Inlet pressure: 14.7 psia

Input inlet flow: 160 icfm

Valve set pressure: **10.4** **psig**

Package: **BB 69C**

Blower: OMEGA 22P

Motor power: 10.0 hp

Operating voltage: 208V/60Hz

Blower speed(60Hz): 5125 rpm

Connection ANSI 2

% of maximum speed: 86

Fan voltage 208V/3Ph/60Hz

NOTE: ACCESSORIES SHOWN ARE INTENDED FOR AIR USE ONLY.

Accessories:

		yes	no
Unloaded start up valve:	AFM5	☐	☒
Check plate:	2 1/2"	☒	☐

Instrument/ sensor:

	yes	no
Temperature gauge with switch point:	☒	☐
Pressure gauge:	☒	☐
Filter differential pressure switch:	☐	☒
oil level sensor	☐	☒
speed monitor	☐	☒
Auxiliary heating:	☐	☒
Omega P-GRD:	☐	☒

	yes	no
Sound enclosure:	☒	☐
Suction from ambient:	☒	☐
Suction from pipe:	☐	☒

Optional for package with sound enclosure

	yes	no
Sound enclosure for outdor installation:	☐	☒

Frequency converter (FC):

	yes	no
Frequency converter (FC) by customer:	☒	☐
Kaeser FC type OFC:	☐	☒

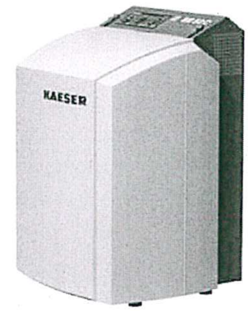
Standard equipment with s. encl.: 1x 2" Blowoff valve, pressure gauge, filter with maintenance indicator

Standard equipment without s. encl.: 1x 2" Blowoff valve, filter with maintenance indicator

Comments for project:

BB52C

Package	Blower	Horsepower
BB52C	Omega 21P	3,5,7.5,10



Electrical Data Drive Motor												
						wye-delta starting (2-wire per phase)			direct online (1-wire per phase)		
Hp	Voltage (3ph/60Hz)	FLA +/- 10%	Nominal Eff	Insulation Class	Enclosure Type	Jumper Connection	Disconnect Fuse	Wire Size (75°C or higher)	Jumper Connection	Disconnect Fuse	Wire Size (75°C or higher)
3	208	9.1	86.5	F	TEFC	YY -> ΔΔ	10 AMP	14 AWG	ΔΔ	10 AMP	14 AWG
	230	8.2				YY -> ΔΔ	10 AMP	14 AWG	ΔΔ	10 AMP	14 AWG
	460	4.1				Y -> Δ	6 AMP	14 AWG	Δ	6 AMP	14 AWG
5	208	13.5	88.5	F	TEFC	YY -> ΔΔ	20 AMP	14 AWG	ΔΔ	20 AMP	12 AWG
	230	12.2				YY -> ΔΔ	15 AMP	14 AWG	ΔΔ	20 AMP	14 AWG
	460	6.1				Y -> Δ	10 AMP	14 AWG	Δ	10 AMP	14 AWG
7.5	208	18.4	89.9	F	TEFC	YY -> ΔΔ	25 AMP	14 AWG	ΔΔ	30 AMP	10 AWG
	230	17.6				YY -> ΔΔ	25 AMP	14 AWG	ΔΔ	30 AMP	10 AWG
	460	8.8				Y -> Δ	10 AMP	14 AWG	Δ	15 AMP	14 AWG
10	208	25	90.8	F	TEFC	YY -> ΔΔ	35 AMP	14 AWG	ΔΔ	40 AMP	8 AWG
	230	23				YY -> ΔΔ	30 AMP	14 AWG	ΔΔ	35 AMP	8 AWG
	460	11.5				Y -> Δ	20 AMP	14 AWG	Δ	20 AMP	12 AWG

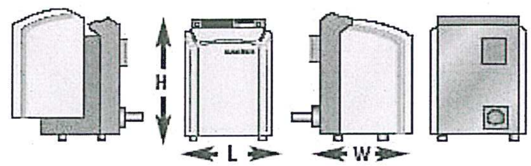
Notes:
1. Disconnect fuses should be of dual element time delay design.
2. Breaker should be suitable for a heavy duty starting load and of inverse time delay design that complies to regulations outlined in NEC 430.52
3. Fuse and wire sizes determined in accordance to NEC 240.6, 430.52 and tables 250.122, 430.248, 430.250, 430.252.

Enclosure Fan Data								
Power	Voltage (60Hz)	Phase (60Hz)	Current Draw	Jumper Connection	Quantity	Enclosure Type	Fan Type	Flow
110W	115	1	3.42	Capacitor	1	TEFC	Radial	280 CFM
80W	230	1	0.60	Capacitor	1	TEFC	Radial	280 CFM
80W	208	3	0.61	Δ	1	TEFC	Radial	280 CFM
120W	230	3	0.68	Δ	1	TEFC	Radial	280 CFM
120W	460	3	0.37	Y	1	TEFC	Radial	280 CFM
120W	575	3	0.28	Y	1	TEFC	Radial	280 CFM

Notes:
1.) Nominal power in Watts.
2.) Current in A (+/- 10%).
3.) Default fan selection is 230/460V. If other voltage is required, it must be noted at time of order.
4.) Fan requires separate power supply.
5.) Fan should run at the same time as main motor. If fan is able to run for 15 minutes after machine is turned off, it will improve thermal conditions inside enclosure.

BB52C

Oil System Data	
Drive End Capacity	0.15 quarts
Gear End Capacity	0.13 quarts
Oil Type (Synthetic)	SB 220



Package Connections

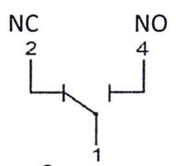
Hp	Cable Entry		Length (in.) L	Width (in.) W	Height (in.) H	Floor (sq ft)	Weight (lb)	Connection Size (in.)	Type
	Drive Motor	Fan Motor							
3	3 x 1" NPT	2 × M16	31 1/2	28 3/8	44	6 1/5	382	2	Tube
5							424	2	Tube
7.5							463	2	Tube
10							474	2	Tube

Safety Devices

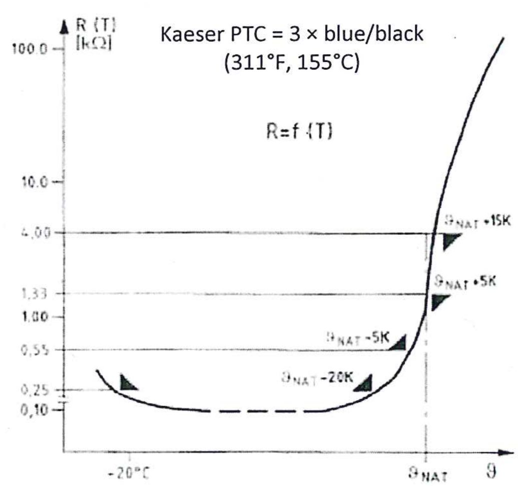
Discharge Temperature Gauge with Switch	Motor Winding PTC's

Range: 120 - 400°F (50 - 200°C)

Switching point: adjustable
Switching: 1 = common, 2 = NC, 4 = NO
Contacts: 5A / 24VDC non-inductive



Blower discharge temperature switch should be wired into control system to shut down blower operation when switch point is achieved.

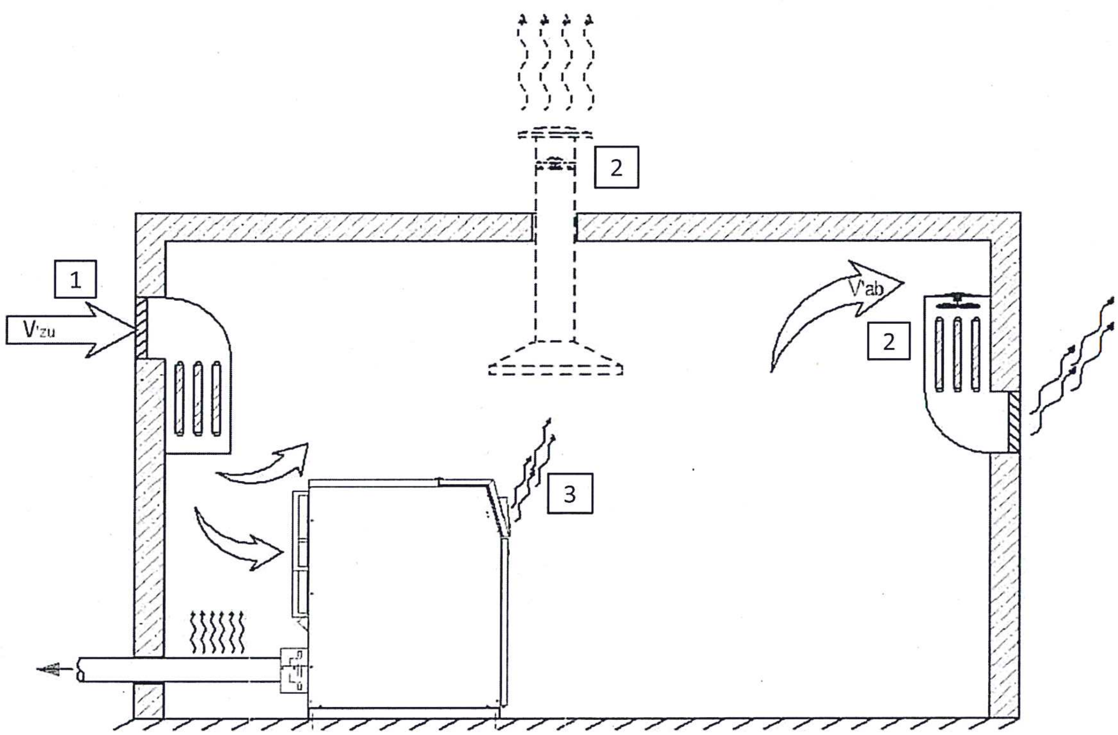


Motor winding PTC's require use of a control module. Kaeser part number 7.2710.2 can be purchased and integrated into control scheme for this purpose.

BB52C

Ventilation of Blower Room		
Air Inlet Opening	1	1.0 sq. ft
Cooling Fan Capacity (forced ventilation)	2	500 CFM
Max Heat Rejection	3	4,700 BTU / HR

Ventilation values based on 190 CFM @ 15 PSIG ΔP, 20Hp and ambient inlet. Max. room temp. = 104ºF and cooling air temp = 95ºF. Discharge piping length = 5 ft.



It is recommended to extract the exhaust air from the upper third of the room as this is where the heat collects. The room ventilation openings should be arranged that the current of cooling air flowing through the room passes over the blower inlet and exhaust ports and, if possible, should leave no stagnant air in the room. (A thermal short circuit must be avoided, i.e. discharged cooling air must not find its way to the cooling air inlet.)
The blower must not be positioned so near to a wall that the inflow of cooling air is obstructed.

Pipework should be insulated against heat emission.

If the blower station is located in the middle of a large hall its exhaust air can be extracted by means of a duct positioned above the exhaust port (illustrated in broken lines).

EQUALIZATION TANK &

SLUDGE HOLDING TANK BLOWER

OMEGA PLUS ROTARY BLOWERS
- RECOMMENDATIONS BLOWERS -

Customer: Summit Club-EQ_Sludge Holding **Prepared By:** David W. Martine

INPUT DATA:

Operating mode:	Gauge pressure	Flow medium :	Humid Air	
Kind of package:	Com-paK Plus on frequency control	Specific heat constant κ :	1.40	
Inlet temperature:	90 °F	Specific weight at standard conditions :	0.0760	lb/ ft³
Inlet pressure:	14.7 psia	Pressure difference :	6.0	psig
Inlet flow:	**80 icfm**			
		Discharge pressure :	20.7	psia
		Air humidity:	80	[%]

Technical data:

Package: **BB 52C**
Blower: OMEGA 21P
Motor power: 5.0 hp
Operating voltage: 208V/60Hz

Blower speed(60Hz): 3490 rpm
Connection ANSI:2"
% of maximum speed: 56
Blower: OMEGA 21P

Performance data:	**min. frequency**	**Design point**	**max. frequency**	
Frequency:	22.0	58.4	60.0	Hz
Speed:	1280	3400	3490	rpm
Inlet air flow Q1*:	14	80	85	icfm
Inlet air flow Q1 (standard):	13	74	79	scfm
Standard conditions 14.7psia, 68°F and 0 % RH				
Discharge temperature*:	253	172	172	°F
Blower shaft power*:	1.5	3.5	3.5	bhp
Motor shaft power :			3.9	bhp

		without sound enclosure	with sound enclosure
Sound pressure level**:	**at fmax**	82dB(A)	72dB(A)
Sound pressure level**:	**at 60 Hz**	82dB(A)	72dB(A)
Sound power level**:	**at 60 Hz**	97dB(A)	87dB(A)
Dimension [inches] (W x L x H)		31x 31 x 37	31x 31 x 44
Estimated Weight		ca. 260 lbs	ca. 414 lbs

IGBT Frequency controlled **208V ± 5 % 60 Hz**

The stated control range can vary depending on manufacturer and type of the frequency converter. Standard motor with impulse peak resistance in accordance with IEC 60034-1 for operation with a IGBT frequency converter.

*** Performance data to DIN ISO 1217, PART 1, ANNEX C**
**** Measured to DIN EN ISO 2151, figures ± 3 dB(A), with sound isolated pipework.**

Motor shaft power includes belt losses in addition to dirty filter losses of 0.6 psig (40 mbar)

Customer: Summit Club-EQ_Sludge Holding **Prepared By:** David W. Martine

Kind of package: Com-paK Plus on frequency control Operating mode: Gauge pressure

Inlet temperature: 90 °F
Inlet pressure: 14.7 psia
Input inlet flow: 80 icfm

Valve set pressure: **9.6** **psig**

Package: **BB 52C**
Blower: OMEGA 21P
Motor power: 5.0 hp
Operating voltage: 208V/60Hz

Blower speed(60Hz): 3490 rpm
Connection ANSI 2"
% of maximum speed: 56
Fan voltage 208V/3Ph/60Hz

NOTE: ACCESSORIES SHOWN ARE INTENDED FOR AIR USE ONLY.

Accessories:

		yes	no
Unloaded start up valve:	AFM4	☐	☒
Check plate:	G2"	☒	☐
Instrument/ sensor:			
Temperature gauge with switch point:		☒	☐
Pressure gauge:		☒	☐
Filter differential pressure switch:		☐	☒
oil level sensor		☐	☒
speed monitor		☐	☒
Auxiliary heating:		☐	☒
Omega P-GRD:		☐	☒

	yes	no
Sound enclosure:	☒	☐
Suction from ambient:	☒	☐
Suction from pipe:	☐	☒
Optional for package with sound enclosure		
Sound enclosure for outdor installation:	☐	☒
Frequency converter (FC):		
Frequency converter (FC) by customer:	☒	☐
Kaeser FC type OFC:	☐	☒

Standard equipment with s. encl.: 1x 1 1/4" Blowoff valve, pressure gauge, filter with maintenance indicator

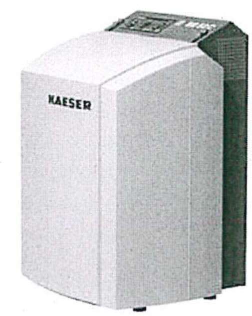
Standard equipment without s. encl.: 1x 1 1/4" Blowoff valve, filter with maintenance indicator

Comments for project:

KAESER OMEGA BLOWERS

Kaeser Com-paK Installation Data Sheet

BB52C



Package	Blower	Horsepower
BB52C	Omega 21P	3,5,7.5,10

Electrical Data Drive Motor

						wye-delta starting (2-wire per phase)			direct online (1-wire per phase)		
Hp	Voltage (3ph/60Hz)	FLA +/- 10%	Nominal Eff	Insulation Class	Enclosure Type	Jumper Connection	Disconnect Fuse	Wire Size (75°C or higher)	Jumper Connection	Disconnect Fuse	Wire Size (75°C or higher)
3	208	9.1	86.5	F	TEFC	YY -> ΔΔ	10 AMP	14 AWG	ΔΔ	10 AMP	14 AWG
	230	8.2				YY -> ΔΔ	10 AMP	14 AWG	ΔΔ	10 AMP	14 AWG
	460	4.1				Y -> Δ	6 AMP	14 AWG	Δ	6 AMP	14 AWG
5	208	13.5	88.5	F	TEFC	YY -> ΔΔ	20 AMP	14 AWG	ΔΔ	20 AMP	12 AWG
	230	12.2				YY -> ΔΔ	15 AMP	14 AWG	ΔΔ	20 AMP	14 AWG
	460	6.1				Y -> Δ	10 AMP	14 AWG	Δ	10 AMP	14 AWG
7.5	208	18.4	89.9	F	TEFC	YY -> ΔΔ	25 AMP	14 AWG	ΔΔ	30 AMP	10 AWG
	230	17.6				YY -> ΔΔ	25 AMP	14 AWG	ΔΔ	30 AMP	10 AWG
	460	8.8				Y -> Δ	10 AMP	14 AWG	Δ	15 AMP	14 AWG
10	208	25	90.8	F	TEFC	YY -> ΔΔ	35 AMP	14 AWG	ΔΔ	40 AMP	8 AWG
	230	23				YY -> ΔΔ	30 AMP	14 AWG	ΔΔ	35 AMP	8 AWG
	460	11.5				Y -> Δ	20 AMP	14 AWG	Δ	20 AMP	12 AWG

Notes:
1. Disconnect fuses should be of dual element time delay design.
2. Breaker should be suitable for a heavy duty starting load and of inverse time delay design that complies to regulations outlined in NEC 430.52
3. Fuse and wire sizes determined in accordance to NEC 240.6, 430.52 and tables 250.122, 430.248, 430.250, 430.252.

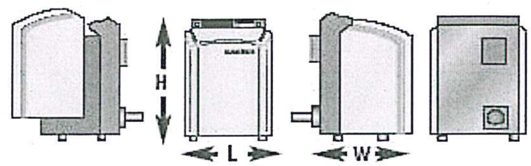
Enclosure Fan Data

Power	Voltage (60Hz)	Phase (60Hz)	Current Draw	Jumper Connection	Quantity	Enclosure Type	Fan Type	Flow
110W	115	1	3.42	Capacitor	1	TEFC	Radial	280 CFM
80W	230	1	0.60	Capacitor	1	TEFC	Radial	280 CFM
80W	208	3	0.61	Δ	1	TEFC	Radial	280 CFM
120W	230	3	0.68	Δ	1	TEFC	Radial	280 CFM
120W	460	3	0.37	Y	1	TEFC	Radial	280 CFM
120W	575	3	0.28	Y	1	TEFC	Radial	280 CFM

Notes:
1.) Nominal power in Watts.
2.) Current in A (+/- 10%).
3.) Default fan selection is 230/460V. If other voltage is required, it must be noted at time of order.
4.) Fan requires separate power supply.
5.) Fan should run at the same time as main motor. If fan is able to run for 15 minutes after machine is turned off, it will improve thermal conditions inside enclosure.

BB52C

Oil System Data	
Drive End Capacity	0.15 quarts
Gear End Capacity	0.13 quarts
Oil Type (Synthetic)	SB 220



Package Connections

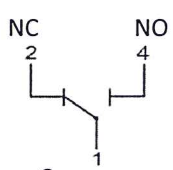
Hp	Cable Entry		Length (in.) L	Width (in.) W	Height (in.) H	Floor (sq ft)	Weight (lb)	Connection Size (in.)	Type
	Drive Motor	Fan Motor							
3	3 x 1" NPT	2 × M16	31 1/2	28 3/8	44	6 1/5	382	2	Tube
5							424	2	Tube
7.5							463	2	Tube
10							474	2	Tube

Safety Devices

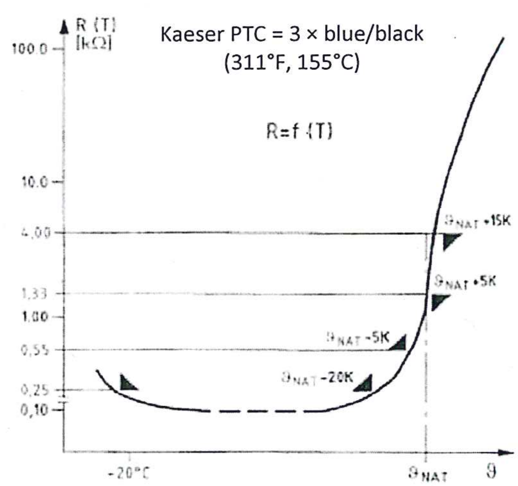
Discharge Temperature Gauge with Switch	Motor Winding PTC's

Range: 120 - 400°F (50 - 200°C)

Switching point: adjustable
Switching: 1 = common, 2 = NC, 4 = NO
Contacts: 5A / 24VDC non-inductive



Blower discharge temperature switch should be wired into control system to shut down blower operation when switch point is achieved.

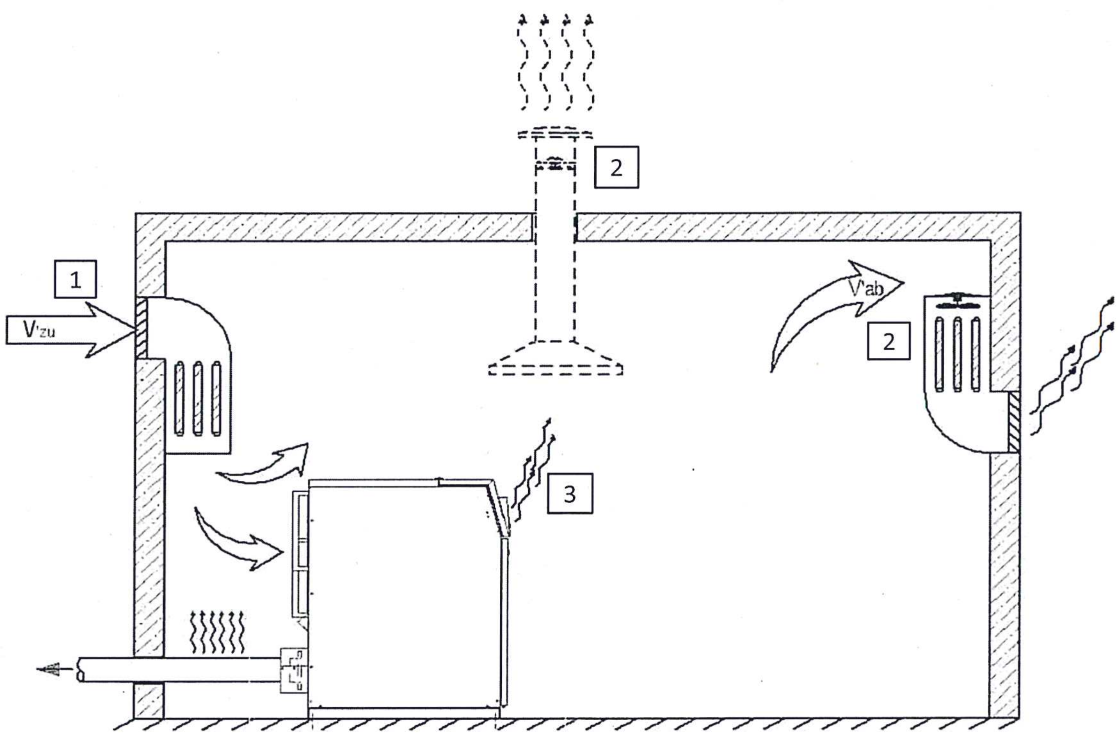


Motor winding PTC's require use of a control module. Kaeser part number 7.2710.2 can be purchased and integrated into control scheme for this purpose.

BB52C

Ventilation of Blower Room		
Air Inlet Opening	1	1.0 sq. ft
Cooling Fan Capacity (forced ventilation)	2	500 CFM
Max Heat Rejection	3	4,700 BTU / HR

Ventilation values based on 190 CFM @ 15 PSIG ΔP, 20Hp and ambient inlet. Max. room temp. = 104ºF and cooling air temp = 95ºF. Discharge piping length = 5 ft.



It is recommended to extract the exhaust air from the upper third of the room as this is where the heat collects. The room ventilation openings should be arranged that the current of cooling air flowing through the room passes over the blower inlet and exhaust ports and, if possible, should leave no stagnant air in the room. (A thermal short circuit must be avoided, i.e. discharged cooling air must not find its way to the cooling air inlet.)
The blower must not be positioned so near to a wall that the inflow of cooling air is obstructed.

Pipework should be insulated against heat emission.

If the blower station is located in the middle of a large hall its exhaust air can be extracted by means of a duct positioned above the exhaust port (illustrated in broken lines).

TERTIARY FILTER BLOWER

KAESER
OMEGA BLOWERS

OMEGA PLUS ROTARY BLOWERS
- PACKAGE RECOMMENDATIONS -

04/19/22

Customer: Summit Club-Tertiary Filter **Prepared By:** David W. Martine

INPUT DATA:

Operating mode:	Gauge pressure		Flow medium:	Humid Air	
Kind of package:	Com-paK Plus		Specific heat constant κ	1.40	
Inlet temperature :	90	°F	Specific weight at standard conditions :	0.076	lb/ ft³
Inlet pressure :	14.7	psi	Pressure difference :	7.0	psig
Air humidity:	80	[%]	Discharge pressure :	21.7	psi

Technical data:

NOTE: ACCESSORIES SHOWN ARE INTENDED FOR AIR USE ONLY.

Package:	**BB 69C**	Blower speed:	5125	rpm
Blower: OMEGA	22P	Connection ANSI:	2 1/2"	
Motor power:	10.0 hp	% of maximum speed:	85	
Operating voltage:	208V/60Hz	Volumetric efficiency:	0.84	

Performance data:

Blower: OMEGA 22P	max. load		design point	
Pressure difference Δp:	8.8	psig	7.0	psig
Inlet flow Q1*:	169	icfm	173	icfm
Inlet air flow Q1 (standard) : Standard conditions 14.7 psia, 68°F and 0 % RH			160	scfm
Discharge temperature*:	205	°F	180	°F
Motor shaft power :	9.9	bhp	8.2	bhp
Blower shaft power*:			7.5	bhp

	without sound enclosure	with sound enclosure
Sound pressure level** :	82 dB(A)	69 dB(A)
Sound power level** :	96 dB(A)	85 dB(A)
Dimension [inches] (W x L x H)	26x 26 x 38	31x 38 x 47
Estimated Weight	ca. 386 lbs	ca. 672 lbs

*** Performance data to DIN ISO 1217, part 1, annex C**

****Measured to DIN EN ISO 2151, figures ± 3 dB(A), with sound isolated pipework**

Motor shaft power includes belt losses in addition to dirty filter losses of 0.6 psig (40 mbar).

KAESER OMEGA BLOWERS

OMEGA PLUS ROTARY BLOWERS - PACKAGE RECOMMENDATIONS -

Customer: Summit Club-Tertiary Filter **Prepared By:** David W. Martine

Kind of package: Com-paK Plus

Operating mode: Gauge pressure

Inlet temperature : 90 °F

Inlet pressure : 14.7 psi

Input inlet flow: 160 icfm

Valve set pressure: 10.4 psig

Package: BB 69C

Blower: OMEGA 22P

Motor power: 10.0 hp

Operating voltage: 208V/60Hz

Blower speed: 5125 rpm

Connection ANSI: 2 1/2"

% of maximum speed: 85

Fan voltage: 208V/3Ph/60Hz

NOTE: ACCESSORIES SHOWN ARE INTENDED FOR AIR USE ONLY.

Accessories:

	yes	no
Unloaded start up valve: AFM5	☐	☒
Check plate: 2 1/2"	☒	☐
Instruments/ sensor:		
Temperature gauge with switch point:	☒	☐
Pressure gauge:	☒	☐
Filter differential pressure switch:	☐	☒
oil level sensor:	☐	☒
speed monitor:	☐	☒

	yes	no
Sound enclosure:	☒	☐
Inlet silencer-suction from ambient:	☒	☐
Inlet silencer-suction from pipe:	☐	☒
Optional for package with sound enclosure		
Sound enclosure for outdor installation:	☐	☒
Auxiliary heating:	☐	☒
Omega P-GRD:	☐	☒

Standard equipment with s. encl.: 1x 2" Blowoff valve, pressure gauge, filter with maintenance indicator

Standard equipment without s. encl.: 1x 2" Blowoff valve, filter with maintenance indicator

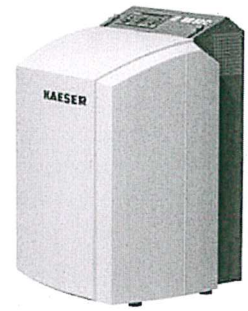
Comments for project:

KAESER OMEGA BLOWERS

Kaeser Com-paK Installation Data Sheet

BB52C

Package	Blower	Horsepower
BB52C	Omega 21P	3,5,7.5,10



Electrical Data Drive Motor

						wye-delta starting (2-wire per phase)			direct online (1-wire per phase)		
Hp	Voltage (3ph/60Hz)	FLA +/- 10%	Nominal Eff	Insulation Class	Enclosure Type	Jumper Connection	Disconnect Fuse	Wire Size (75°C or higher)	Jumper Connection	Disconnect Fuse	Wire Size (75°C or higher)
3	208	9.1	86.5	F	TEFC	YY -> ΔΔ	10 AMP	14 AWG	ΔΔ	10 AMP	14 AWG
	230	8.2				YY -> ΔΔ	10 AMP	14 AWG	ΔΔ	10 AMP	14 AWG
	460	4.1				Y -> Δ	6 AMP	14 AWG	Δ	6 AMP	14 AWG
5	208	13.5	88.5	F	TEFC	YY -> ΔΔ	20 AMP	14 AWG	ΔΔ	20 AMP	12 AWG
	230	12.2				YY -> ΔΔ	15 AMP	14 AWG	ΔΔ	20 AMP	14 AWG
	460	6.1				Y -> Δ	10 AMP	14 AWG	Δ	10 AMP	14 AWG
7.5	208	18.4	89.9	F	TEFC	YY -> ΔΔ	25 AMP	14 AWG	ΔΔ	30 AMP	10 AWG
	230	17.6				YY -> ΔΔ	25 AMP	14 AWG	ΔΔ	30 AMP	10 AWG
	460	8.8				Y -> Δ	10 AMP	14 AWG	Δ	15 AMP	14 AWG
10	208	25	90.8	F	TEFC	YY -> ΔΔ	35 AMP	14 AWG	ΔΔ	40 AMP	8 AWG
	230	23				YY -> ΔΔ	30 AMP	14 AWG	ΔΔ	35 AMP	8 AWG
	460	11.5				Y -> Δ	20 AMP	14 AWG	Δ	20 AMP	12 AWG

Notes:
1. Disconnect fuses should be of dual element time delay design.
2. Breaker should be suitable for a heavy duty starting load and of inverse time delay design that complies to regulations outlined in NEC 430.52
3. Fuse and wire sizes determined in accordance to NEC 240.6, 430.52 and tables 250.122, 430.248, 430.250, 430.252.

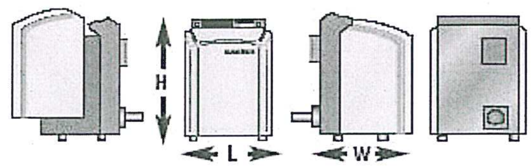
Enclosure Fan Data

Power	Voltage (60Hz)	Phase (60Hz)	Current Draw	Jumper Connection	Quantity	Enclosure Type	Fan Type	Flow
110W	115	1	3.42	Capacitor	1	TEFC	Radial	280 CFM
80W	230	1	0.60	Capacitor	1	TEFC	Radial	280 CFM
80W	208	3	0.61	Δ	1	TEFC	Radial	280 CFM
120W	230	3	0.68	Δ	1	TEFC	Radial	280 CFM
120W	460	3	0.37	Y	1	TEFC	Radial	280 CFM
120W	575	3	0.28	Y	1	TEFC	Radial	280 CFM

Notes:
1.) Nominal power in Watts.
2.) Current in A (+/- 10%).
3.) Default fan selection is 230/460V. If other voltage is required, it must be noted at time of order.
4.) Fan requires separate power supply.
5.) Fan should run at the same time as main motor. If fan is able to run for 15 minutes after machine is turned off, it will improve thermal conditions inside enclosure.

BB52C

Oil System Data	
Drive End Capacity	0.15 quarts
Gear End Capacity	0.13 quarts
Oil Type (Synthetic)	SB 220



Package Connections

Hp	Cable Entry		Length (in.) L	Width (in.) W	Height (in.) H	Floor (sq ft)	Weight (lb)	Connection Size (in.)	Type
	Drive Motor	Fan Motor							
3	3 x 1" NPT	2 × M16	31 1/2	28 3/8	44	6 1/5	382	2	Tube
5							424	2	Tube
7.5							463	2	Tube
10							474	2	Tube

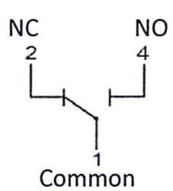
Safety Devices

Discharge Temperature Gauge with Switch	Motor Winding PTC's

Discharge Temperature Gauge with Switch

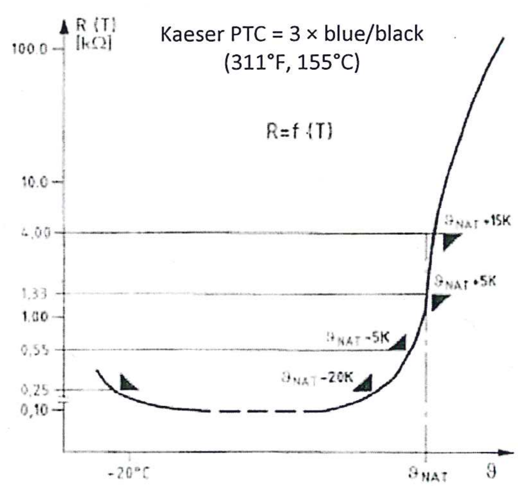
Range: 120 - 400°F (50 - 200°C)

Switching point: adjustable
Switching: 1 = common, 2 = NC, 4 = NO
Contacts: 5A / 24VDC non-inductive



Blower discharge temperature switch should be wired into control system to shut down blower operation when switch point is achieved.

Motor Winding PTC's

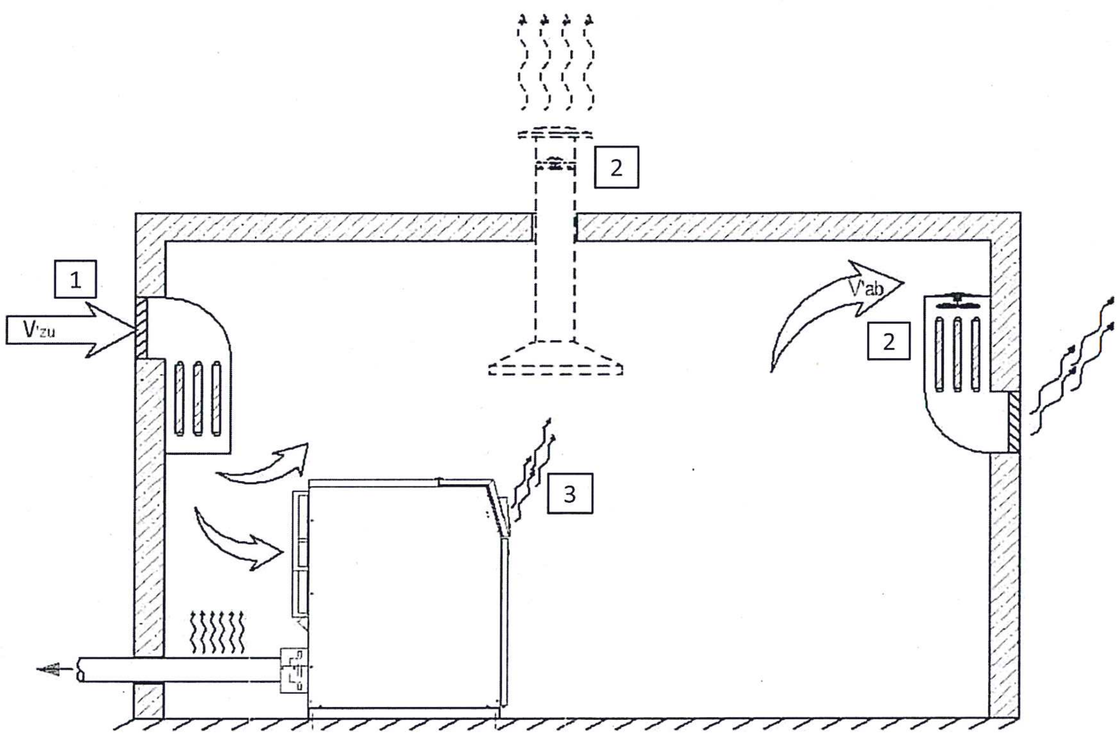


Motor winding PTC's require use of a control module. Kaeser part number 7.2710.2 can be purchased and integrated into control scheme for this purpose.

BB52C

Ventilation of Blower Room		
Air Inlet Opening	1	1.0 sq. ft
Cooling Fan Capacity (forced ventilation)	2	500 CFM
Max Heat Rejection	3	4,700 BTU / HR

Ventilation values based on 190 CFM @ 15 PSIG ΔP, 20Hp and ambient inlet. Max. room temp. = 104ºF and cooling air temp = 95ºF. Discharge piping length = 5 ft.



It is recommended to extract the exhaust air from the upper third of the room as this is where the heat collects. The room ventilation openings should be arranged that the current of cooling air flowing through the room passes over the blower inlet and exhaust ports and, if possible, should leave no stagnant air in the room. (A thermal short circuit must be avoided, i.e. discharged cooling air must not find its way to the cooling air inlet.)
The blower must not be positioned so near to a wall that the inflow of cooling air is obstructed.

Pipework should be insulated against heat emission.

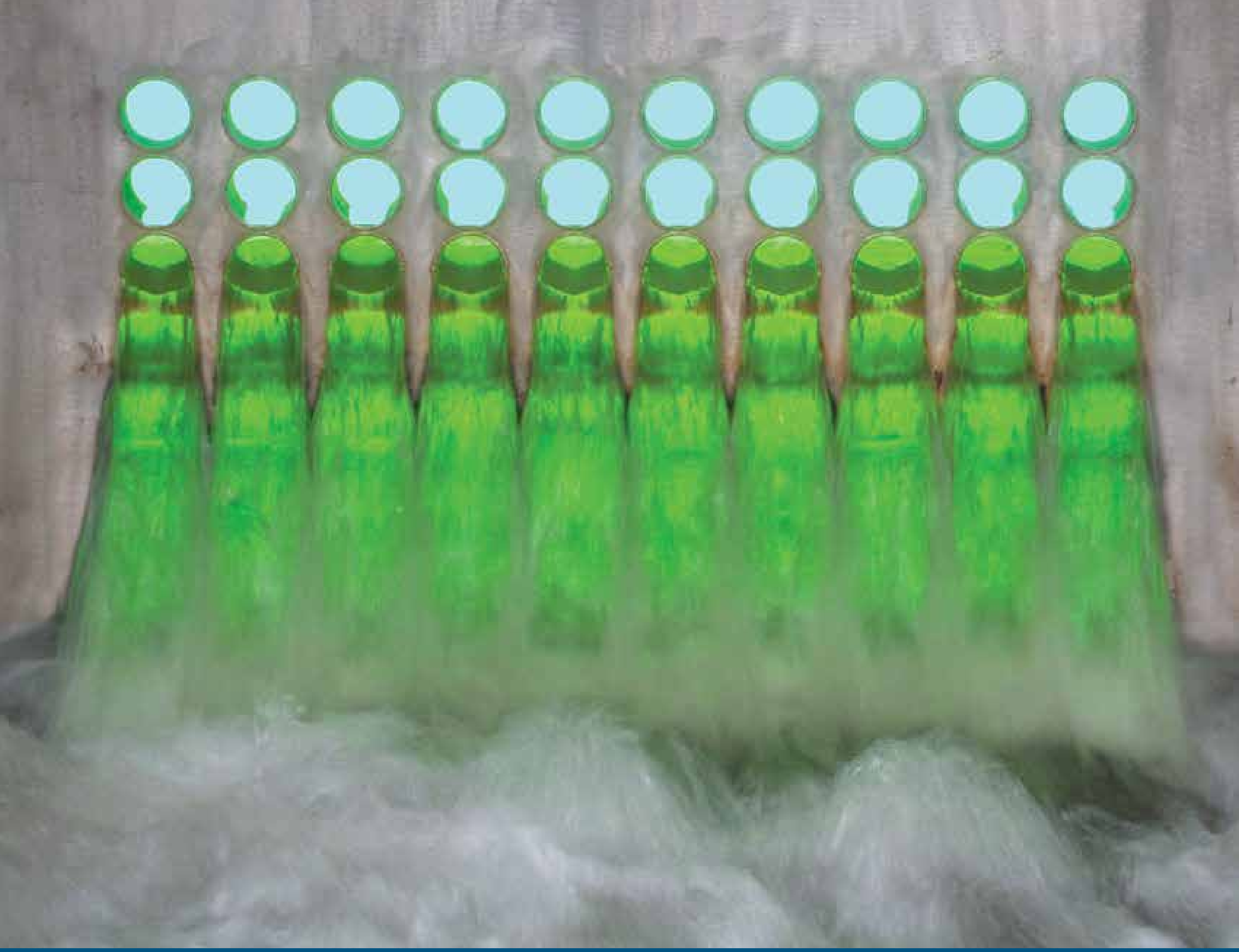
If the blower station is located in the middle of a large hall its exhaust air can be extracted by means of a duct positioned above the exhaust port (illustrated in broken lines).

APPENDIX E

DISINFECTION EQUIPMENT CUTS

Non-contact UV disinfection systems

Dry · Simple · Intelligent · Energy Efficient



ENAQUA™
A GRUNDFOS COMPANY

Designed and manufactured in USA

The right choice

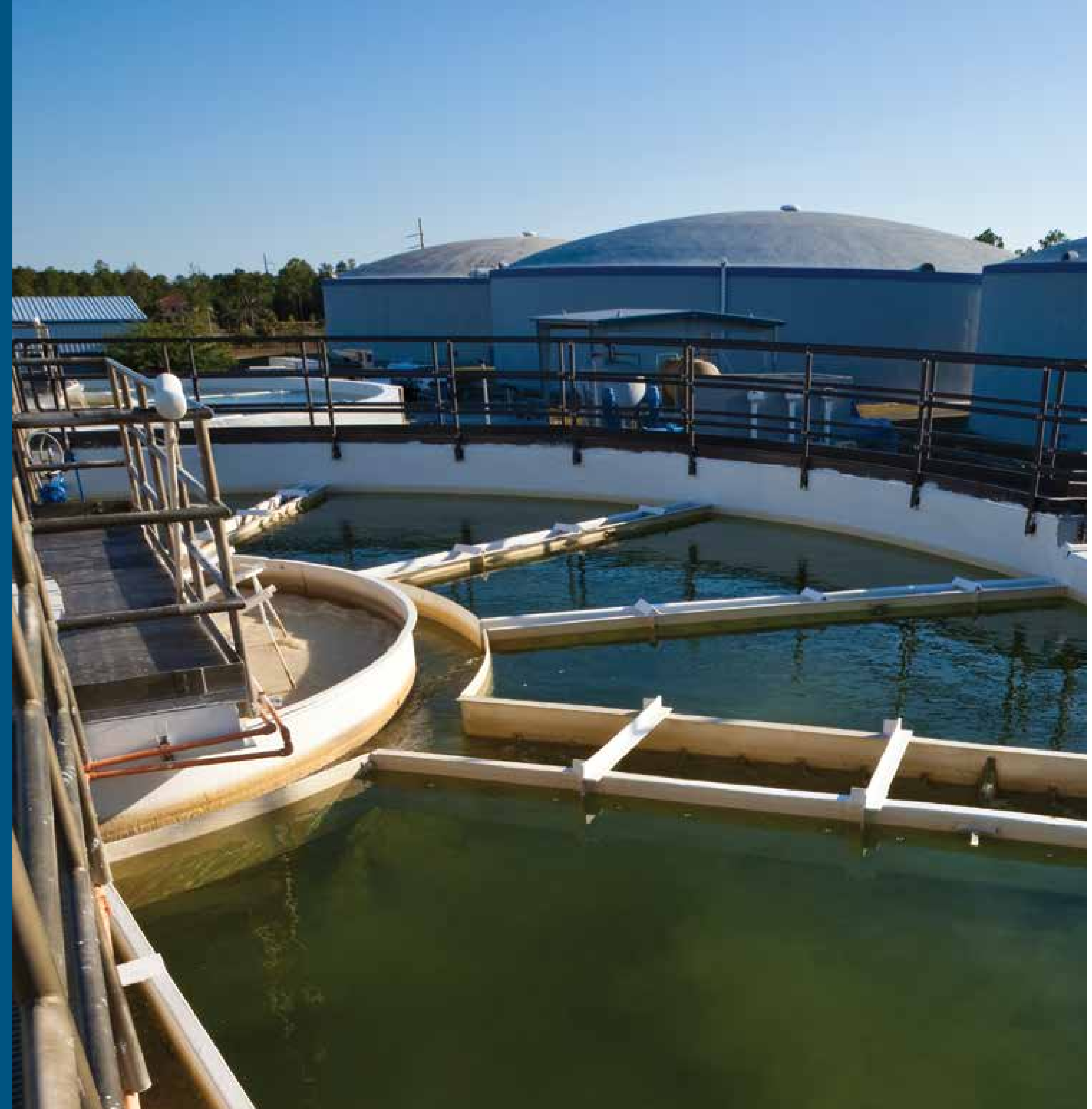
UV is the most cost effective and environmental friendly disinfection solution for wastewater.

About UV Disinfection

Ultraviolet light irradiation is a proven disinfection process using short wave length 254nm Ultraviolet (UV) energy to inactivate harmful microorganisms. UV radiation disrupts the DNA of pathogenic organisms such as bacteria, viruses and molds, leaving them unable to reproduce. UV has been used to disinfect various types of effluent from low-quality combined sewer overflow (CSO) to high-quality tertiary effluent since early 1900's.

UV – The preferred disinfection method in municipal wastewater

To comply federal Clean Water Act, and other regulations for indicator organisms, municipal wastewater must be disinfected before discharging or reusing. There are multiple options for chemical disinfection, but only one non-chemical disinfection technology. UV is the preferred disinfection method for municipal wastewater discharge or water reuse applications various chemical disinfection technologies. Currently more than 20% of wastewater treatment plants in the United States use UV as their preferred disinfection technology and this percentage has been increasing year over year.



Enaqua – a history of innovation

1985	1990	1992	1993	1997	1999	2003	2007	2009	2012	2013	2015	2017
Enaqua founded									**Acquisition by Grundfos**			
First Non-Contact UV System Water Technology Consulting	Patented Non-Contact Opaque Fluid UV System	Chemical Recovery RO Systems Brackish Water RO Systems	Municipal UV Waste-water System	Distribution of Membrane Products	Large Municipal UV Waste-water Systems	Seawater De-salination RO Systems	UV Web-based Control System	UV / UF / RO Municipal Waste-water Systems	Ensure Dosing System(EDS)* SMART Lamps*	$11 Million UV/ UF/ RO Chemical Recovery System	Validation test NWRI Title 22 and T1	Approval for CA Title 22 recycled water

*Patent pending

Advantages & benefits

Compared to conventional chlorination

	Ultraviolet light	Sodium hypochlorite	Chlorine gas
Disinfection effectiveness	High	High*	High*
Disinfection by products	No	Yes	Yes
Safety risks	Low	High	High
De-chlorination required	No	Yes	Yes
Contact channel	Small	Large	Large
pH dependency, Corrosion	No	Yes	Yes
O&M Cost	Low	High	Medium
Capital Investment	Medium	Low	High

**Cryptosporidium and Giardia are resistant against chlorination*

Third party validated technology, approved for CA Title 22 Recycled Water.

Enaqua is the first non-contact UV system supplier to have applied and received Third Party Validation, as a result of continuous efforts improving the Non-Contact UV disinfection technology. The validation testing and reports were conducted in 2015 by Carollo Engineers in accordance with the following protocols:

1. UV - Disinfection Guidelines for Drinking Water and Water Reuse (National Water Research Institute [NWRI]), August 2012
   • 53% to 80.0 % UVT range validated*
2. Uniform Protocol for Wastewater UV Validation Applications (International Ultraviolet Association [IUVA], 2011) – 36.0% to 81.0% UVT validated range*
   • MS2 Bacteriophage
   • T1 Coliphage

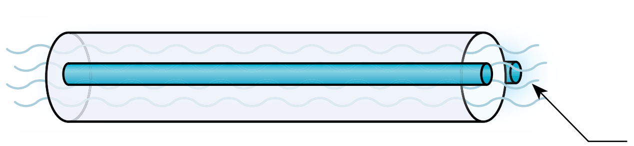
**Please contact Enaqua for validation range, parameters, and other technical details.*

UV made simple – features at a glance

All of Enaqua's Non-Contact UV disinfection systems are built out of standard modules with high customization flexibility. The UV reactors are offered for both In-pipe or In-Channel configurations with variable plug & play inlets and outlets (page 10).

The systems are very easy to install as they are prefabricated and self-contained.

1 SMART Lamps
Cost efficient non-amalgam SMART lamp (page 9)



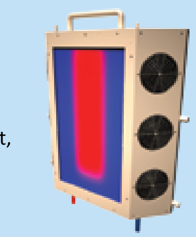
AFP™ Tubes
Fouling resistant virtually self-maintaining (page 6)

2 Ensure Dosing System (EDS)
Intelligent monitoring, control and FAIL SAFE ensures compliance at all times (page 8)

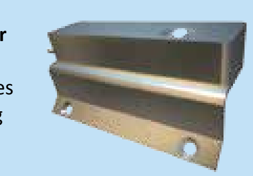
3 Electrical panel
Simple, compact and operator friendly HMI

4 Flow & Level pacing
Optimize energy consumption & life of consumables

5 Heat Exchange System
Controls reactor temperature for optimal UVC output using Effluent, plant W3 water, Potable, or Closed Loop system



6 UV Intensity Monitor
UV Sensor placed outside of AFP™ tubes – Dry without fouling



7 Individually fused and switched lamp racks
No cranes required, simple maintenance (page 7)

Single lamp ballast
Non-prorated Warranty up to 24 on/off cycles per day

8 Controlled Water Level Downstream
No level control mechanism required – simple hydraulic design

Always dry – AFP™ Non-Contact UV Technology

Enaqua – The Pioneer in cost effective Non-Contact UV design

Enaqua's innovative non-contact UV technology means no more repairing and replacing submerged components. Effluent flows through Enaqua's AFP tubes leaving the UV lamps, electronics and other components- accessible, and easy to maintain in the dry body of the UV reactor.

AFP™ tubes – The secret behind the performance

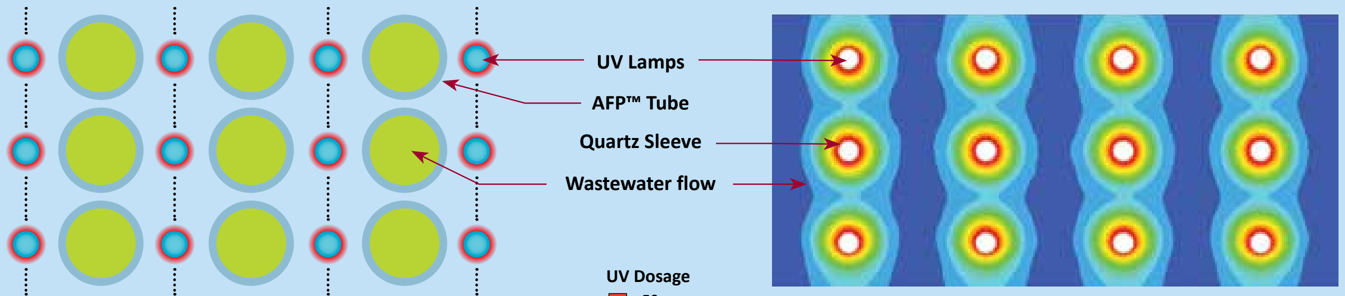
AFP stands for "Activated Fluoropolymer" which Enaqua specifically developed for Non-Contact UV applications:

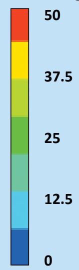
- High transmissivity of UVC
- AFP Tubes have no micro-structure-hence very resistant to scaling and fouling
- Durable, flexible, and fracture resistant material
- Long term UVC stability and Chemical resistance
- Multiple plants with over 20+ years of continuous operation

Technologies in comparison

ENAQUA AFP™
Non-Contact Technology

Quartz Sleeve UV
traditional Contact Technology

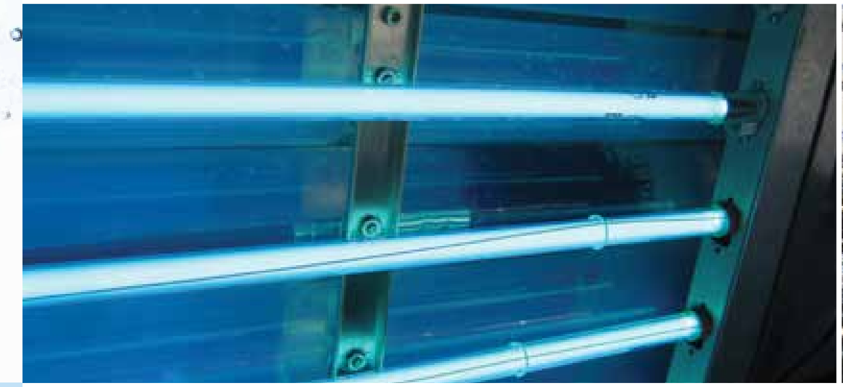
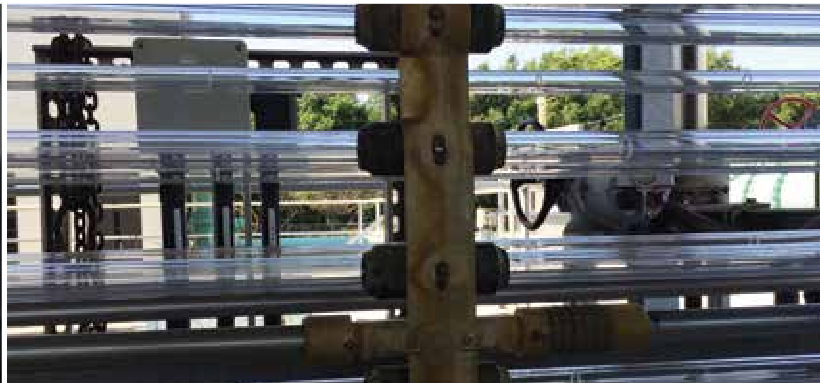




ENAQUA AFP™	Quartz Sleeve UV
Low cost high output lamps	High cost amalgam lamps
No quartz sleeves	Fragile quartz sleeves with risk of mercury and glass contamination
Fouling and Scaling Resistant AFP tube	Fouling-prone quartz sleeves
Turbulent flow provides self-cleaning of AFP™ tube	Cleaning system required
No AFP tube replacement needed under normal operating conditions	Quartz sleeves need to be replaced over time
Simple pipe hydraulics makes UV disinfection easy to predict	Channel hydraulics makes UV disinfection less predictable
Level Control Devices typically not required	Level control devices increase footprint

Simple – maintenance made clean, fast and easy

Enaqua's Non-Contact UV technology system maintenance is simple:

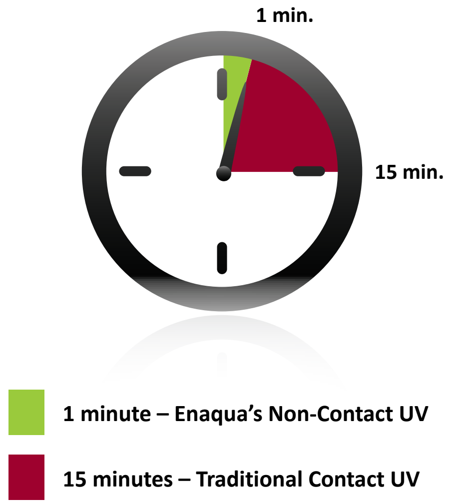
Enaqua's Non-Contact UV	Traditional Contact UV
	
	

No more:

- High cost amalgam lamps
- Dirty and fouled quartz sleeves
- Problems with quartz cleaning devices
- Need to interrupt or remove any hydraulic seals
- Heavy duty cranes required for system maintenance
- Minimize Civil and Structural construction costs
- Time consuming lamp replacements
- Algae growth on the lamp racks
- Quartz sleeves to break and replace*
- SCADA programming

*No AFP™ tube replacement under normal conditions (20+ year history)

Typical lamp replacement time



Intelligence – you don't want to miss...

Where Energy Efficiency matters

The Ensure Dosing System (EDS) is the most comprehensive monitoring and control system in the industry.

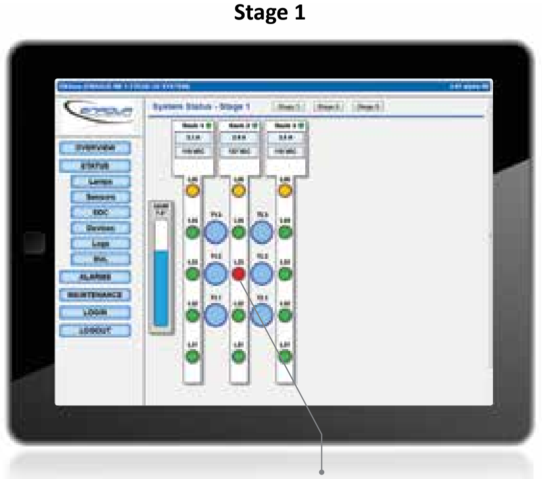
SCADA built in – Full system control and performance monitoring wherever and whenever you want:

- No special hardware and software requirements
- Simple connection via web browser
- Multiple Levels of Access
- Remote monitoring and control via Internet
- Stand-alone WiFi control e.g. with iPad®
- SCADA integration with ModBUS TCP/IP
- Remote troubleshooting
- Email and text notification

Fail Safe – Intuitive protection

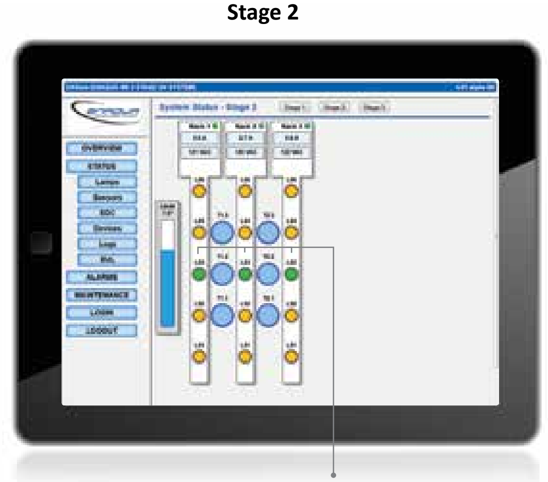
Enaqua's FAIL SAFE intelligence ensures compliance at all times. In case a lamp in one stage fails, the system will command selected lamps in a redundant stage to power-on to compensate for any UV dosage reduction (see application example).

Stage 1

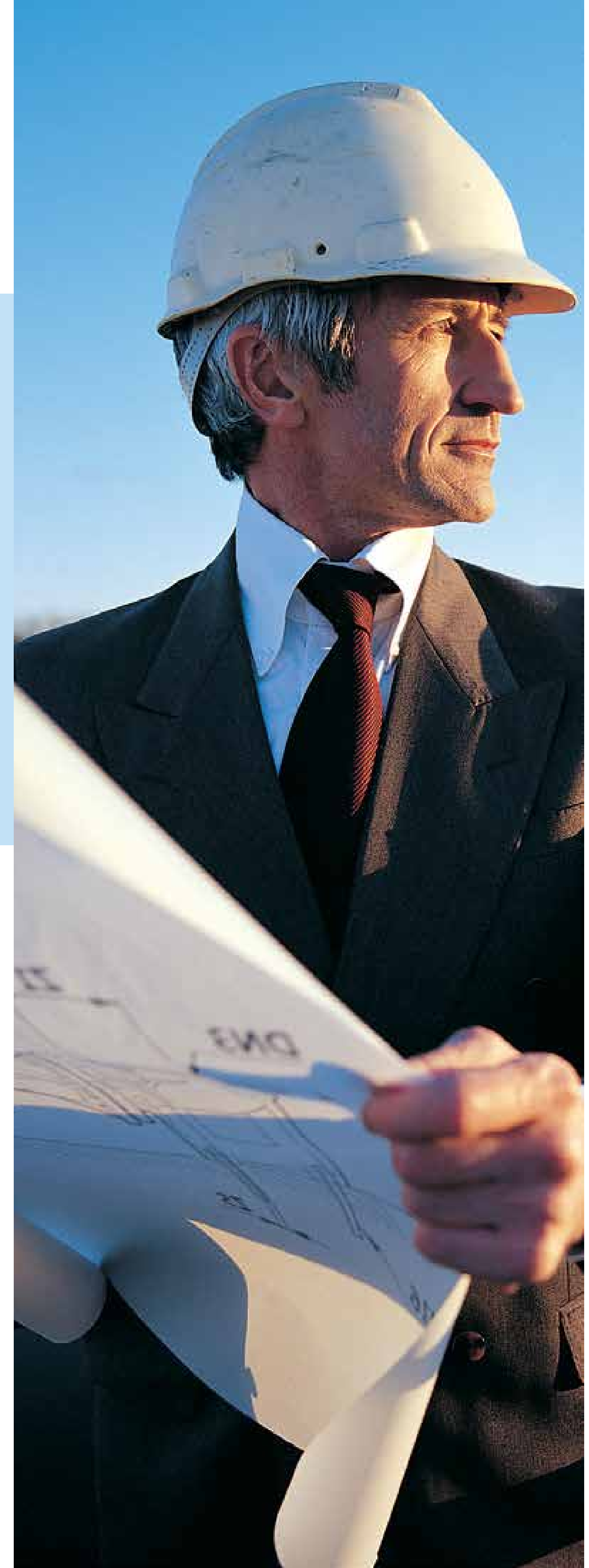


Lamp fault in stage 1: Alarm Alerts

Stage 2

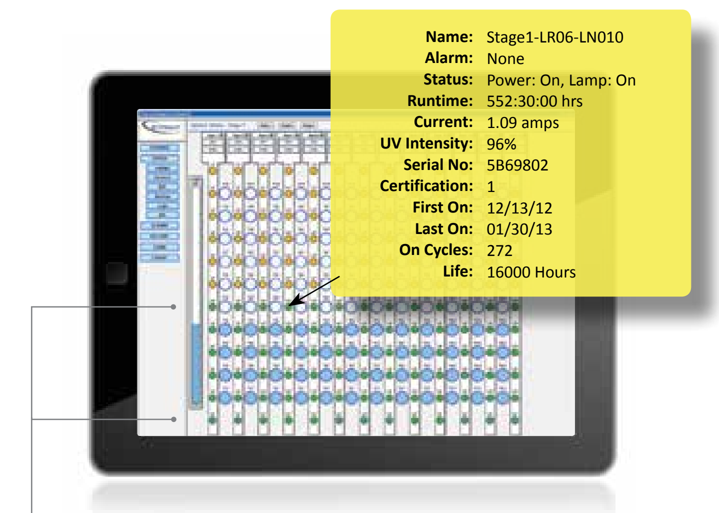


Automatically energizes ONLY selective lamps in Stage 2 to ensure disinfection while optimizing use of energy and consumables



SMART Lamps – Advanced lamp control

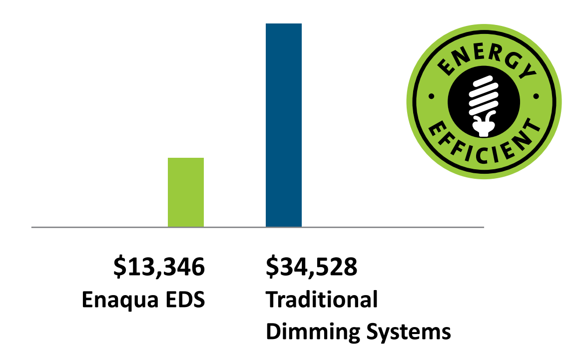
Enaqua's Low Pressure High Output (LPHO) lamps are equipped with a unique Smart Lamp Technology, a microchip integrated with the lamp connector identifies each UV lamp with a unique ID, monitors and logs lamp status, run time, lamp cycles, etc.



Flow & Level Pacing – Best energy efficiency

Enaqua's Flow & Level Pacing system automatically turns on only lamps which are required. This improves lamp and ballast life and reduces power consumption compared to systems that use "dimming".

Annual Energy Cost Comparison



Actual comparison of bid guaranteed UV energy costs for Wastewater Plant, Peak 28MGD, Average 6MGD, $0.10/kWh.

Features and functions

For specific selection and sizing please contact Enaqua

		M3	M4	M5	C-Series	D-Series	E-Series
Maximum F low and Pressure							
Flow Range*1	MGD	0.03 - 0.12	0.04 - 0.17	0.2 - 0.5	0.5 - 10	0.5 - 21	0.5 - 27
	gpm	20 - 80	30 - 120	140 - 350	350 - 6944	350 - 14600	380 - 18500
	m3/h	5 - 18	6.8 - 27	32 - 80	80 - 1600	80 - 3300	80 - 4200
Max. Operating Pressure	psi	40*2	40*2	40*2	20	15	10
	bar	2.8	2.8	2.8	1.4	1.0	0.7
Mechanical data							
Max. Number of AFP™ Tubes	pcs	2	2	6	180	160	140
Max. UV Lamps per Stage	pcs	8			228	204	180
Inlet and Outlet Configuration	inch	Flange 2	Flange 4, 6	Flange 8, 10	In-Channel or Flange Options		
Wetted Materials		AFP™, 304SS Option: 316SS, PVC, CPVC		AFP™, 304SS Option: 316SS			
Multistage Design		–	–	Option	Option	Option	
Electrical data							
Operating Voltage at 50/60 Hz	V, 1PH	120, 220			220		
	V, 3PH	–		220, 380, 415, 480*3			
Ballast Type		Auto Ranging 110-277 VAC 50/60 Hz with 5 Year Warranty					
Controls							
LCD Status Display		✓	✓	✓	Option	Option	Option
Hand-Off-Automatic Switch		✓*4	✓*4	✓	✓	✓	✓
Control Light: Alarm/Running		–	–	✓	Option	Option	Option
Individual Lamp Rack Fuse and Switch		✓	✓	✓	✓	✓	✓
UV Status LEDs in Lamp Racks		–	✓	✓	✓	✓	✓
Ensure Dosing System (EDS)		Option	Option	Option	✓	✓	✓
SMART Lamps		✓	✓	✓	✓	✓	✓
Flow & Level Pacing		–	–	–	Option	Option	Option
Fail Safe		Option	Option	Option	Option	Option	Option
UV Sensor		Option	Option	Option	✓	✓	✓
Heat Exchange System (Lamp Temperature Control)		Ambient Air Exchange			Air to Air. Air to Liquid using Effluent, plant W3 water, Potable, or Closed Loop system		

*1 Design consideration 65% UVT, ~30 mJ/cm², Contact Enaqua for more details
*2 Max pressure for High Pressure Option: 80 psi (5.5 bar)
*3 Three-phase voltage requires neutral wire
*4 On/Off switch only

M Series UV reactors

– compact uv reactors ideal for small treatment plants for surface discharge, reuse, and industrial applications.

M3 Series
Flow rates up to 80 gpm (18.2 m³/ h)

M4 Series
Flow rates up to 120 gpm (27.25 m³/ h)

M5 Series
Flow rates up to 360 gpm (81.8 m³/ h)

C1, C2, C3 & D1, D2, D3 UV series reactors

– medium size uv reactors for surface discharge, reuse, and industrial applications.

C1 & D1 Series
In pipe UV reactors , single or double banks- for Flow rates up to 2.0 MGD (315.4 m³/ h).

C2 & D2 Series
In pipe UV reactors, single or double banks- for Flow rates up to 4.2 MGD (662.5 m³/ h).

C3 & D3 Series
In pipe UV reactors, single or double banks- for Flow rates up to 6.0 MGD (946.4 m³/ h).

4 – 11 Series UV reactors

– large uv reactors offered "in-pipe" or " in-channel" configurations.

C Series "In pipe" or "In Channel"
Multi Bank UV reactors for Flow rates up to 24.0 + MGD . Applications– UV disinfection for surface discharge, Reuse, industrial appli-cation, Etc.

C Series "In Pipe " Reactor

C Series "In Channel" Reactor

D Series "In pipe" or "In Channel"
Multi Bank UV reactors for Flow rates up to 36 + MGD . Applications– UV disinfec-tion for surface discharge, CSO, Industrial Applications, Etc.

D Series "In Pipe " Reactor

D Series "In Channel" Reactor

E Series "In Channel"
Multi Bank UV reactors for Flow rates up to 100 + MGD . Applications– UV disinfection for surface discharge, CSO, Etc.

Designed and manufactured in USA

Enaqua – UV made simple
Non-contact UV disinfection

- The **Engineer's Choice** for State-of-the-Art Technology
- The **City Manager's Choice** for Low Capital Cost
- The **Superintendent's Choice** for Low O&M Cost
- The **Operator's Choice** for Simple Operation
- The **Contractor's Choice** for Simple Installation
- The **Finance Director's Choice** for Lowest 20 Years Capital and Operations Cost Potential

ENAQUA
1350 Specialty Drive, Ste. D/F
Vista, CA 92081 USA
Tel: +1.760.599.2644
Fax: +1.760.599.2642
www.enaqua.com

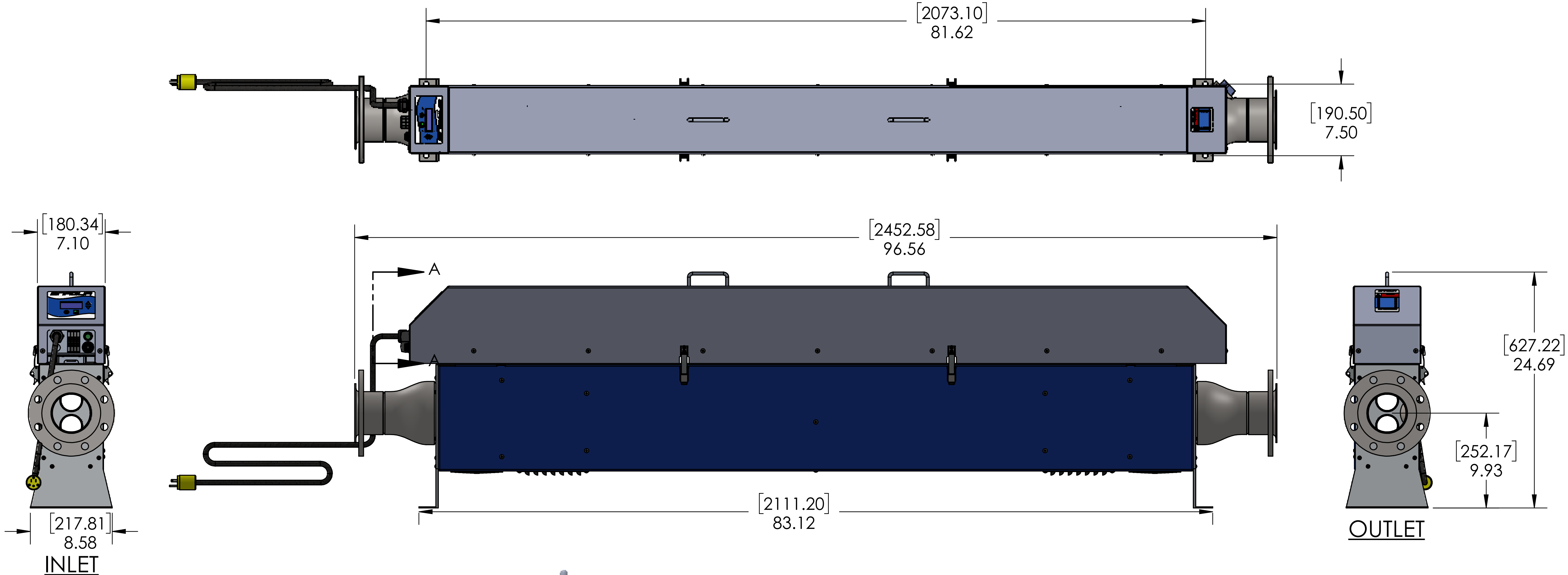
ENAQUA INFO
info@enaqua.com

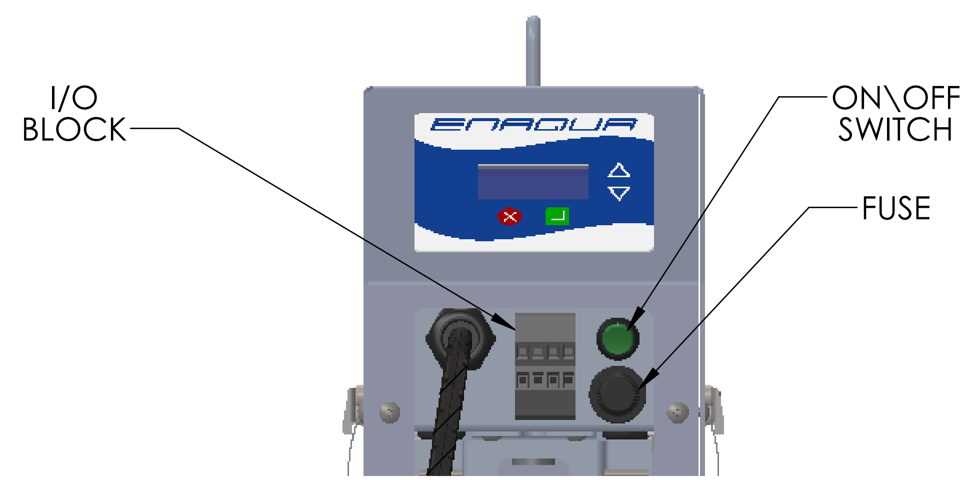
ENAQUA SERVICE
service@enaqua.com

ENAQUA SALES
sales@enaqua.com

A GRUNDFOS COMPANY

		REVISIONS		
ECM	REV.	DESCRIPTION	DATE	APPROVED
	A	INITIAL RELEASE	10/29/2019	DSM
	B	UPDATED MODEL	10/29/2019	DSM





SECTION A-A
SCALE 1 : 4

NOTES (UNLESS OTHERWISE SPECIFIED):

1. REMOVE ALL SHARP EDGES AND BURRS.
2. DRAWING IS IN ACCORDANCE WITH ASME Y14.5-2009.
3. ALL DIMENSIONS ARE IN INCHES AND/OR [MILLIMETERS].

UNLESS OTHERWISE SPECIFIED:
DIMENSIONS ARE IN INCHES[mm]

TOLERANCES:
X.X ± .1[2.54]
X.XX ± .03[.76]
X.XXX ± .010[.25]
FRACTIONS: X/X ± 1/16[1.59]

ANGLES:
X ± 1°[25.4]
.X ± .5°[12.7]
.XX ± .25°[6.4]

ERP NO.: M4-P8M
SERIES: M SERIES
MATERIAL:
FINISH:
DO NOT SCALE DRAWING

APPROVALS		
TITLE	NAME	DATE
DRAWN BY	D MCBAIN	10/29/2019
DWG. Q.A.		
BUYER CKD.		
MFG. APPR.		
ENG. APPR.		

WEIGHT (LBS.): 123.95

ENAQUA
A GRUNDFOS COMPANY
1350 SPECIALTY DRIVE, STE. D/F, VISTA,CA 92081

TITLE: M4:P8M

SIZE	DWG. NO.	REV
B	M4-P8M	B

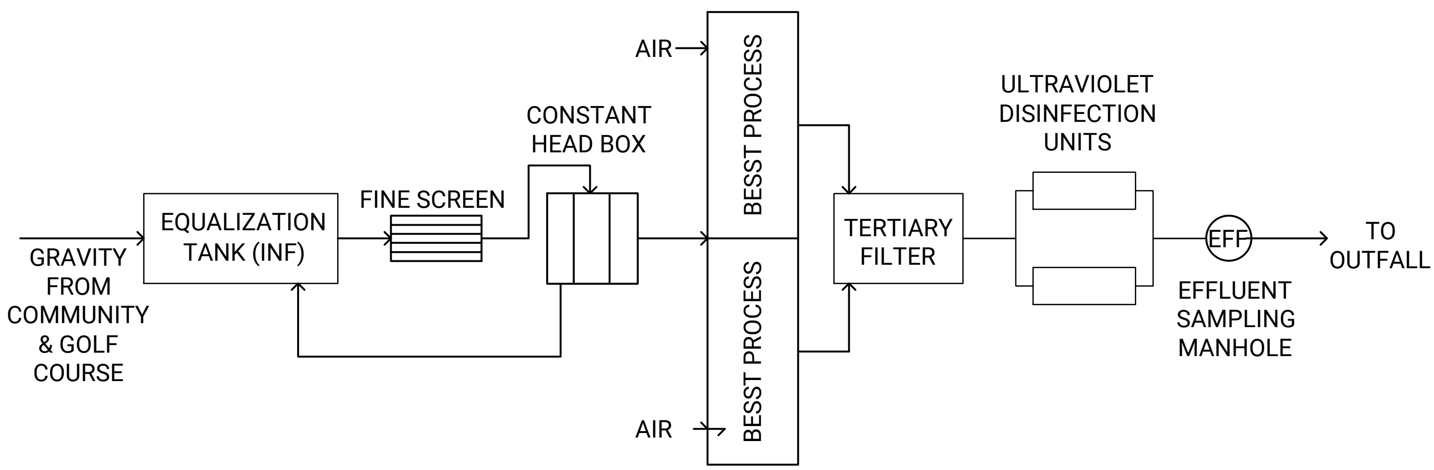
SCALE: 3:32 SHEET 1 OF 1

APPENDIX F

SAMPLING LOCATIONS

PROCESS CONTROL MONITORING LOCATIONS

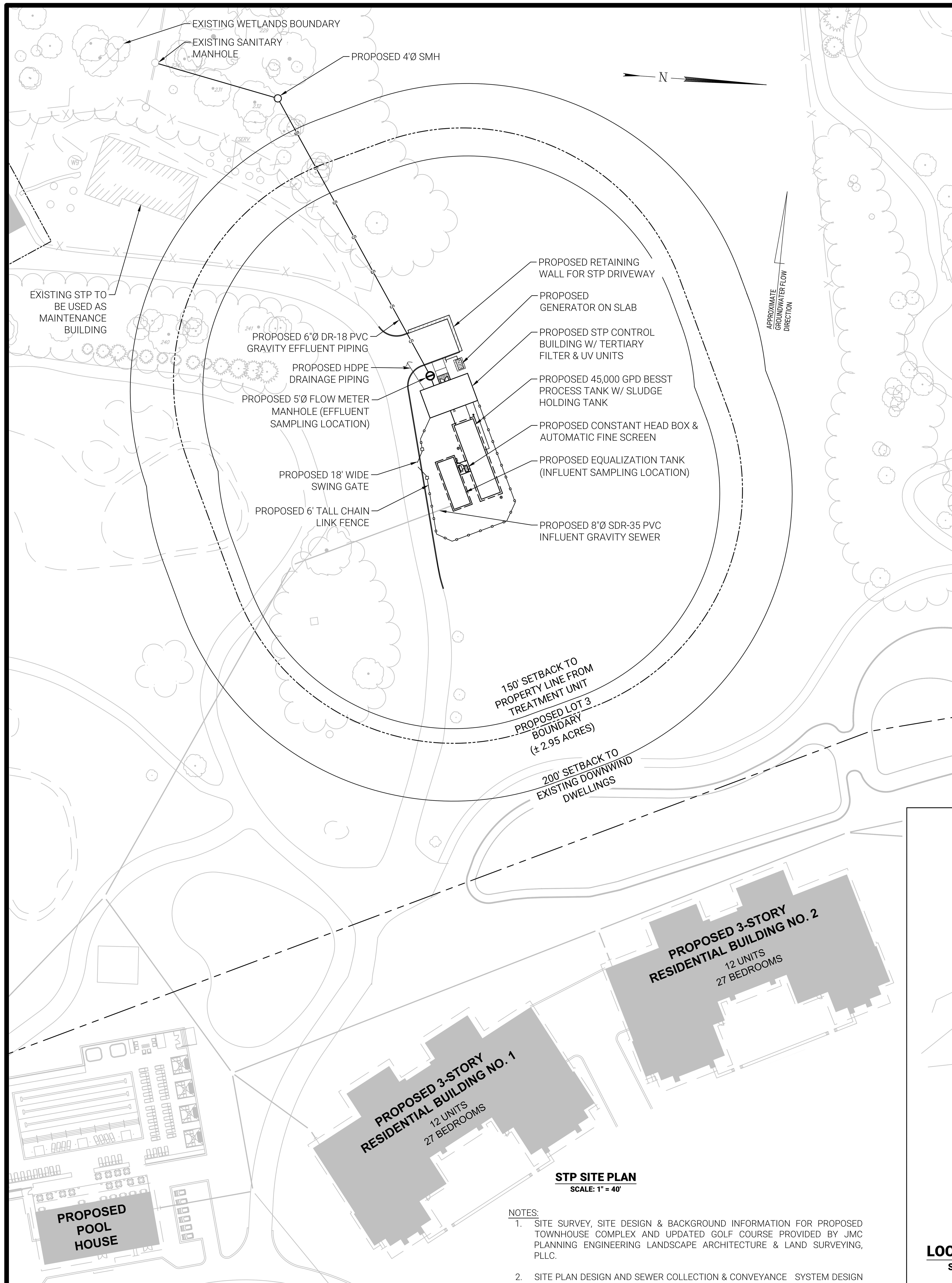
Permittee shall take samples and measurements to meet the monitoring requirements at the locations indicated below.



PROCESS CONTROL MONITORING LOCATION DESCRIPTION
Influent (INF): Sample taken in influent pump station
Effluent (EFF): Sample taken in effluent sampling manhole

DRAWING No. 1

STP SITE PLAN



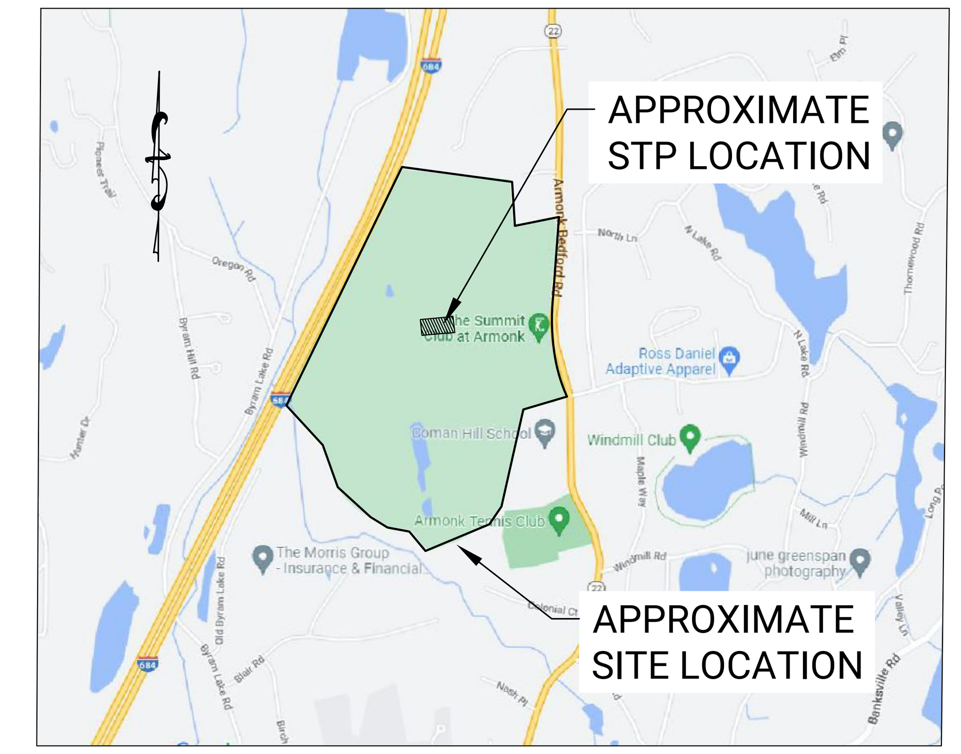
STP SITE PLAN
SCALE: 1" = 40'

NOTES:
1. SITE SURVEY, SITE DESIGN & BACKGROUND INFORMATION FOR PROPOSED TOWNHOUSE COMPLEX AND UPDATED GOLF COURSE PROVIDED BY JMC PLANNING ENGINEERING LANDSCAPE ARCHITECTURE & LAND SURVEYING, PLLC.
2. SITE PLAN DESIGN AND SEWER COLLECTION & CONVEYANCE SYSTEM DESIGN BY JMC PLLC.

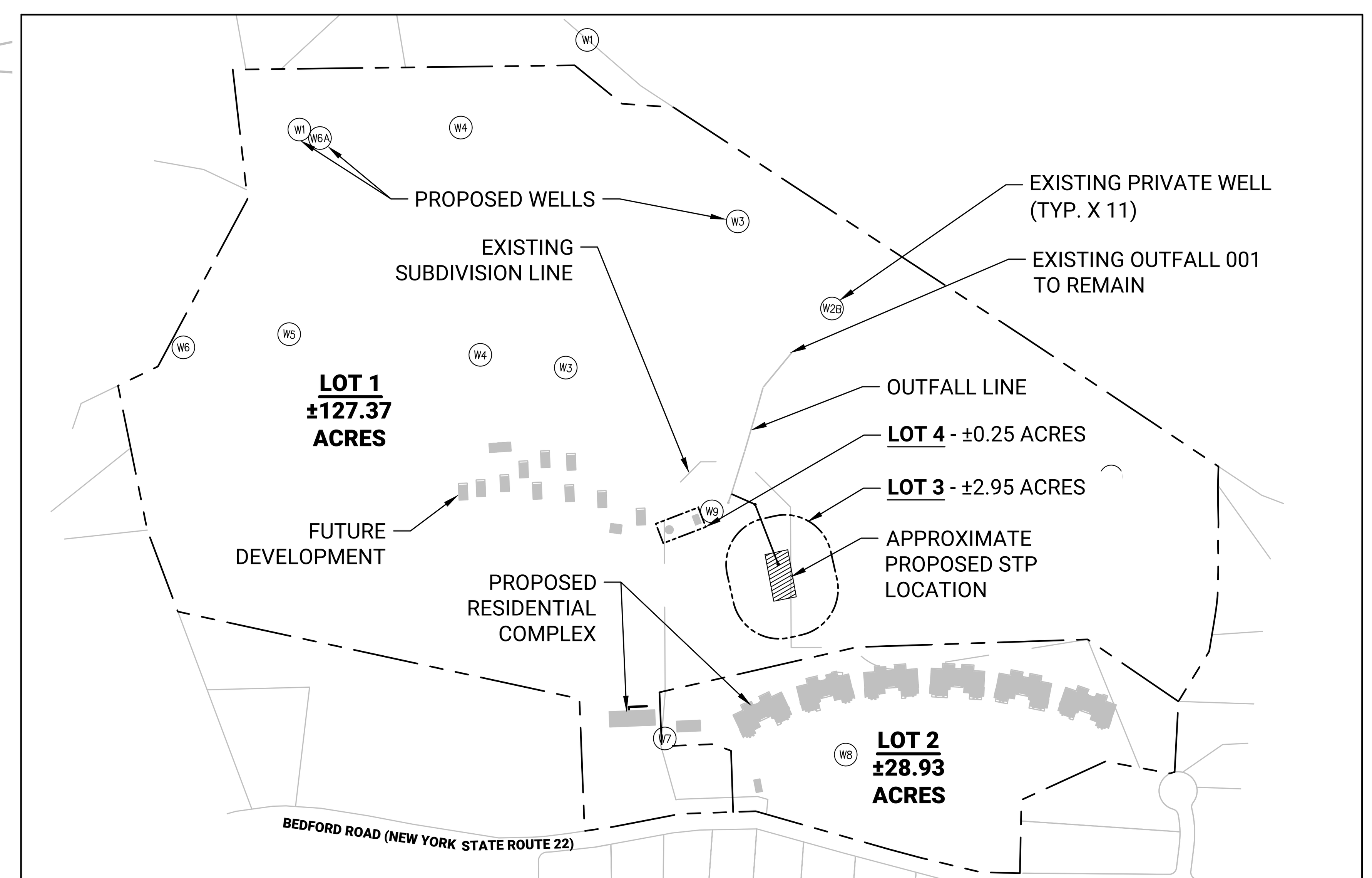
DESIGN SANITARY FLOW:

USE	AREA (s.f.)	EMPLOYEES	SEATS/ STATIONS	GOLFERS	BEDROOMS	SWIMMERS	USAGE RATE (gpd/units)**	USAGE (gpd)
Townhomes	-	-	-	-	162	-	110.0	17,820
Bar/Lounge	-	-	35	-	-	-	16.0	560
Restaurant	-	-	252	-	-	-	28.00	7,056
Golf Tournament	-	-	-	144	-	-	16.0	2,304
Country Club	-	20	-	-	-	-	12.0	240
Golf Course	-	15	-	-	-	-	12.0	180
Seasonal GC Staff	-	-	-	-	12	-	60.00	720
Pool	3,850	-	-	-	-	257	8.00	2,053
Spas	240	-	-	-	-	24	8	192
Excess Pool Deck	8,517	-	-	-	-	170	8	1,363
WWTP	-	-	-	-	-	-	55	55
Proposed Total Flow	-	-	-	-	-	-	-	32,543
Future Townhomes	-	-	-	-	36	-	110	3,960
Future Guest Cottages	-	-	-	-	40	-	110	4,400
Future Total Flow	-	-	-	-	-	-	-	8,360
Total Design Flow	12,607	35	287	144	174	451	-	40,903
SAY	-	-	-	-	-	-	-	45,000

**NOTES:
1. THE PROJECTED FLOW RATES ARE BASED ON THE TYPICAL PER-UNIT HYDRAULIC LOADING RATES FROM TABLE B-3 IN "NEW YORK STATE DESIGN STANDARDS FOR INTERMEDIATE SIZED WASTEWATER TREATMENT SYSTEMS," 2014.
2. HYDRAULIC LOADING RATES ARE DECREASED BY 20 PERCENT IN INSTALLATIONS SERVING PREMISES EQUIPPED WITH WATER-SAVING PLUMBING FIXTURES AS DICTATED BY SECTION B.6.B IN THE NYS DEC DESIGN STANDARDS.



KEY MAP
SCALE: 1"=1500'



LOCATION MAP
SCALE: 1"=400'

WCDH APPROVAL STAMP

No.	REVISION DESCRIPTION	DATE	BY

OWNER:
SUMMIT CLUB PARTNERS, LLC
568 BEDFORD ROAD (NY-22)
ARMONK, NY 10504

APPLICANT:
SUMMIT CLUB PARTNERS, LLC
568 BEDFORD ROAD (NY-22)
ARMONK, NY 10504

STATE OF NEW YORK · MATTHEW P. SCHEINER · 087181 · LICENSED PROFESSIONAL ENGINEER

Matthew P. Scheiner, P.E.
NY State License No. 087181

STP SITE PLAN

THE SUMMIT CLUB AT ARMONK SEWAGE TREATMENT PLANT

SITUATED IN
ARMONK
TOWN OF NORTH CASTLE,
WESTCHESTER COUNTY, NEW YORK

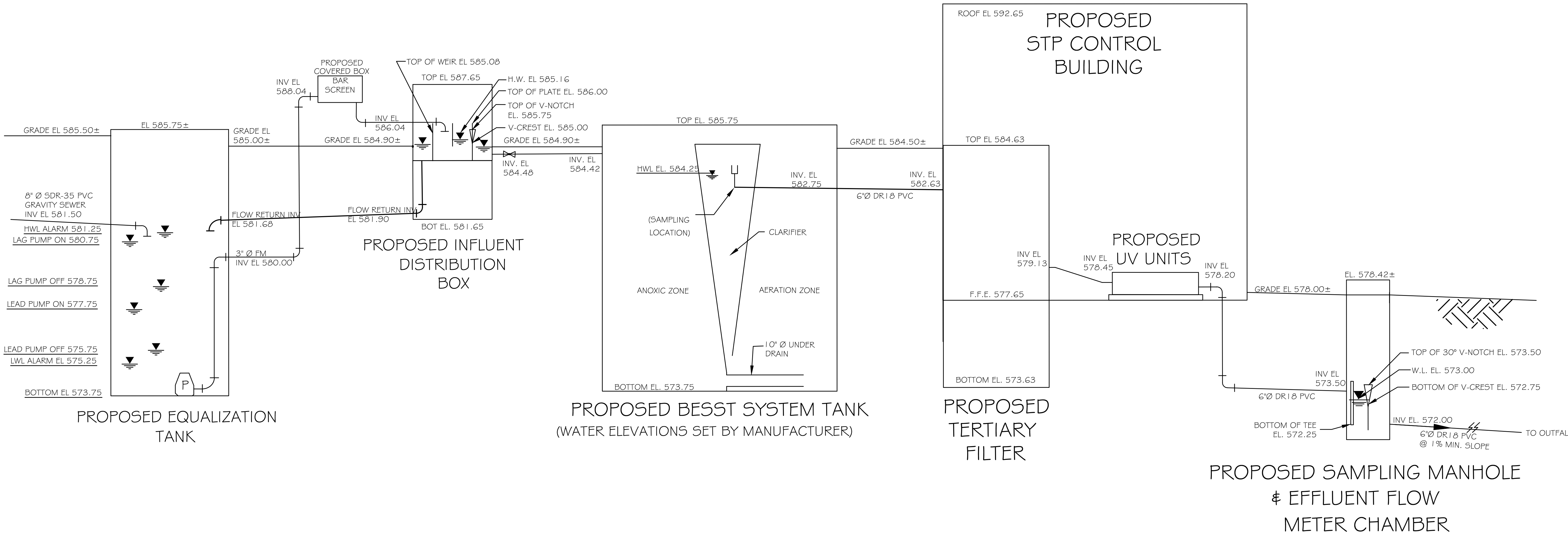
WCTM: DISTRICT 003, SECTION 101.02, BLOCK 1, LOT 28.1 & 28.2

R&M ENGINEERING
Robinson & Muller Engineers, P.C.
50 Elm Street
Huntington, NY 11743
Office: (631) 271-0576
Fax: (631) 271-0592
www.rmengineering.com

DWN. BY: SNM	CHK'D. BY: MPS	SCALE: AS NOTED	SHEET:
DATE: APRIL 2022	DATE: APRIL 2022	JOB No.: 2021-201	1

DRAWING No. 2

HYDRAULIC PROFILE



HYDRAULIC PROFILE

SCALE: N.T.S.

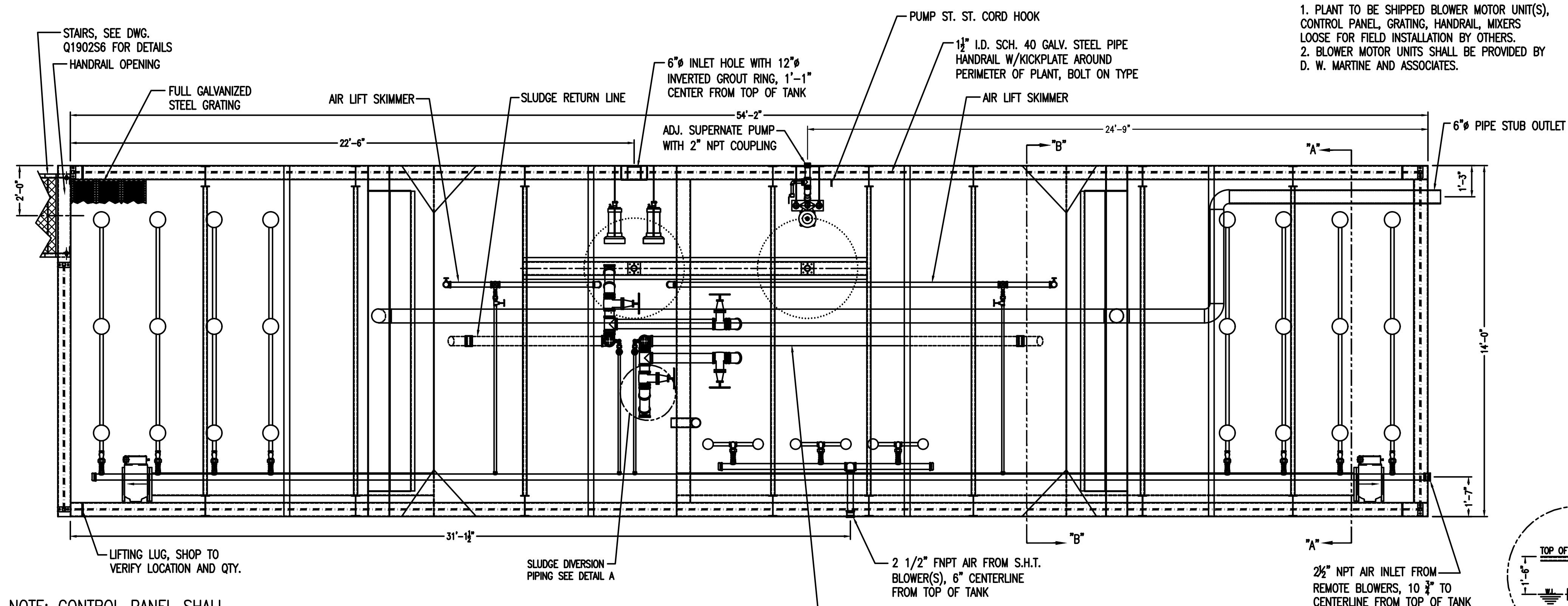
SUMMIT CLUB SEWAGE TREATMENT PLANT REPLACEMENT **TOWN OF NORTH CASTLE, WESTCHESTER COUNTY, NEW YORK**	DATE: APRIL 2022
STP HYDRAULIC PROFILE	SCALE: NOT TO SCALE
	JOB No.: 2021-201
	SHEET: 2

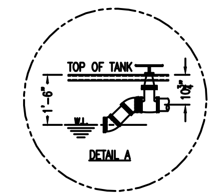
R&M ENGINEERING
Robinson & Muller Engineers, P.C.
50 Elm Street
Huntington, NY 11743
Office: (631) 271-0576
Fax: (631) 271-0592
www.rmengineering.com

DRAWING No. 3

MANUFACTURER’S STP LAYOUT

NOTES:
1. PLANT TO BE SHIPPED BLOWER MOTOR UNIT(S), CONTROL PANEL, GRATING, HANDRAIL, MIXERS LOOSE FOR FIELD INSTALLATION BY OTHERS.
2. BLOWER MOTOR UNITS SHALL BE PROVIDED BY D. W. MARTINE AND ASSOCIATES.

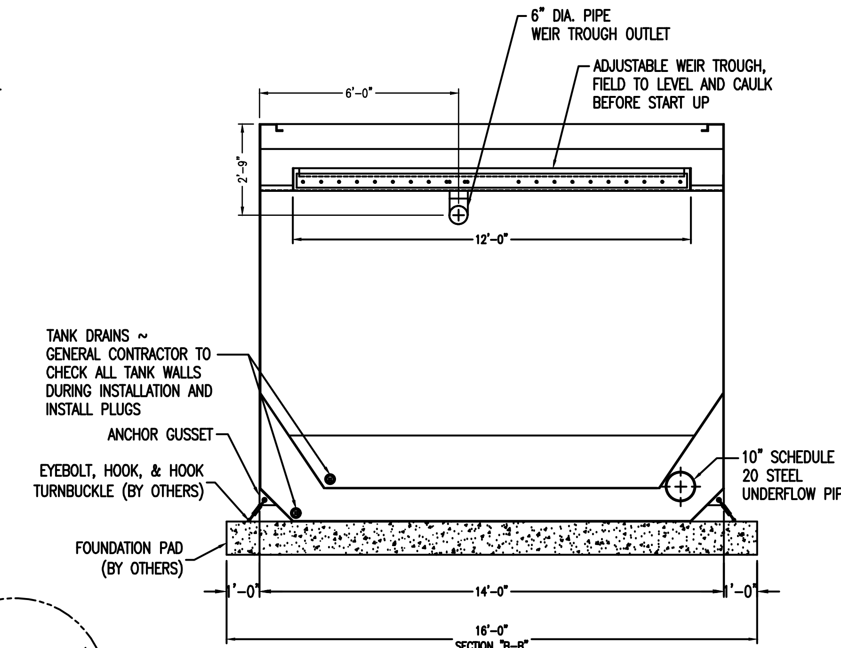




NOTE: CONTROL PANEL SHALL BE MOUNTED REMOTELY.

PLAN VIEW

NOTE: BLOWERS PROVIDED BY D. W. MARTINE AND ASSOCIATES



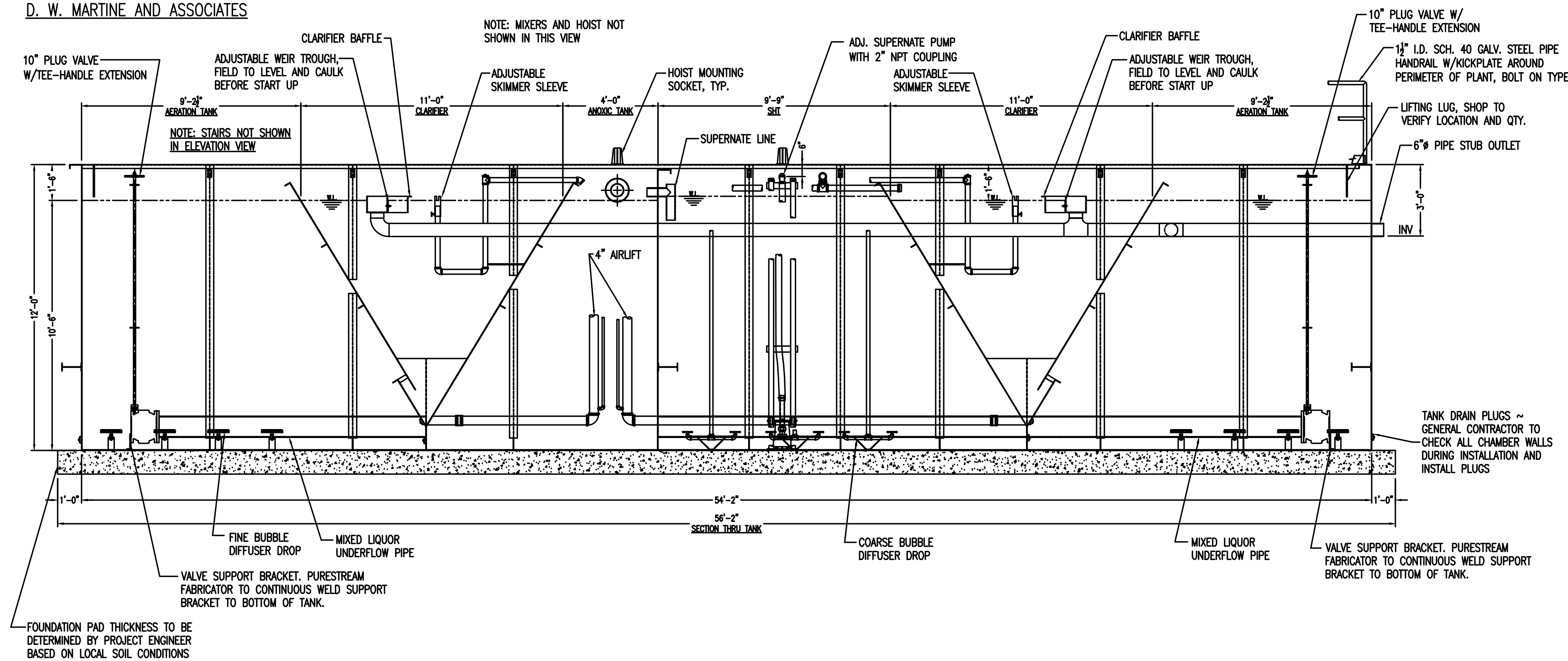
PROTECTION AGAINST CORROSION

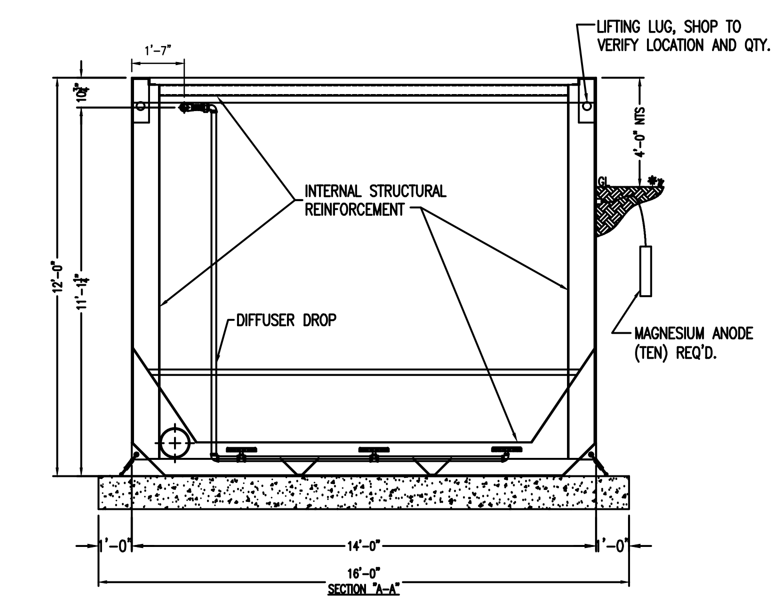
AFTER COMPLETE WELDING AND FABRICATION OF THE TANK, THE FOLLOWING WILL OCCUR:

SURFACE PREPARATION:
ALL SURFACES SHALL RECEIVE A SSPC-10 NEAR WHITE METAL FINISH OBTAINING A 1.5 TO 3.0 MIL SURFACE PROFILE.

PAINT:
INTERIOR AND EXTERIOR APPLICATION THICKNESS SHALL BE 8 TO 10 MILS D.F.T. OF TNEMEC 46H-413 COAL TAR EPOXY OR EQUAL.

COLOR: BLACK FINISH: SATIN





DESIGN DATA					
MODEL NUMBER	DESIGN FLOW G.P.D.	ANOXIC TANK VOLUME GALLON	CLARIFIER VOLUME GALLON	AERATION TANK VOLUME GALLON	SLUDGE HOLDING VOLUME GALLON
PES-45	45,000	7,434	12,144 total	26,295 total	13,757

NOTE:
THIS TANK STRUCTURE IS REINFORCED TO WITHSTAND NORMAL PRESSURES FROM THE SOIL AND FROM THE INTERIOR HYDROSTATIC LOAD ON ABOVE GRADE INSTALLATIONS. IF THERE IS A GROUND WATER PROBLEM, NOTIFY YOUR ENGINEER AND PURESTREAM IMMEDIATELY. PURESTREAM WILL NOT BE RESPONSIBLE FOR DAMAGE TO THE TANK STRUCTURE OR EQUIPMENT DUE TO GROUND WATER.

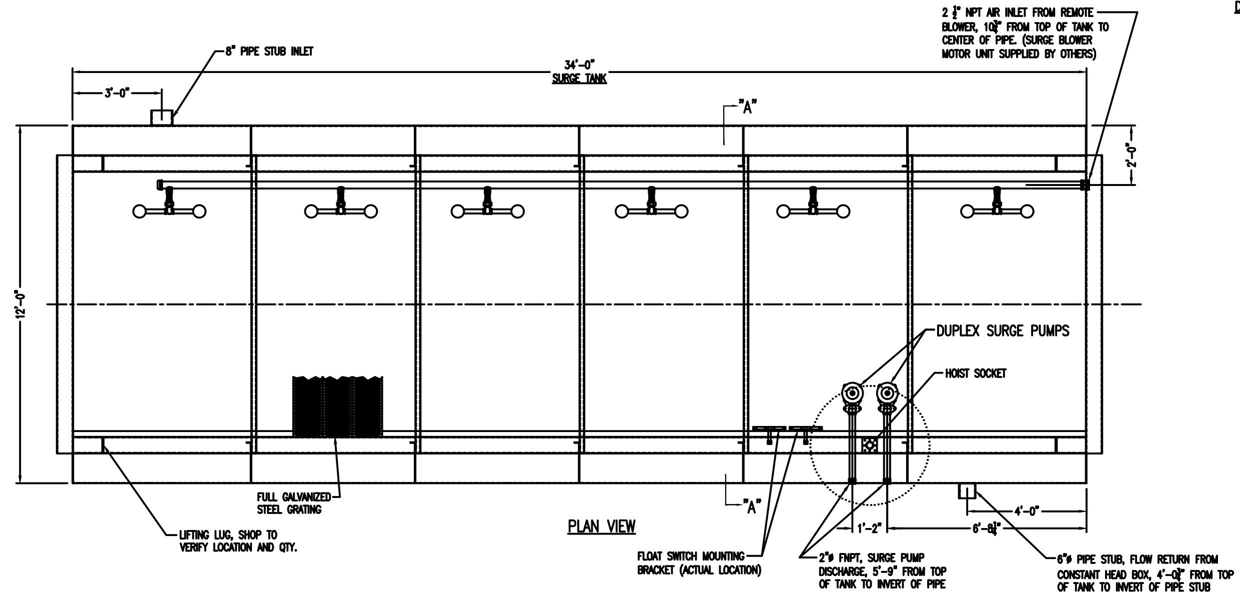
REVISIONS
R1, REVISED AS REQUESTED, PAT, 1-17-22
R2, REVISED AS REQUESTED, PAT, 1-27-22
R3, REVISED AS REQUESTED, PAT, 4-6-22
R4, REVISED AS REQUESTED, PAT, 4-8-22
R5, ADDED S.H.T. PUMP, PAT, 4-26-22

JOB NO: Q1902
JOB NAME: SUMMIT CLUB (WESTCHESTER)
LOCATION: NY
DRAWN BY: PAT DATE: 12-15-21

PURESTREAM/ES

DESCRIPTION: BIOLOGICALLY ENGINEERED SINGLE SLUDGE TREATMENT PREFABRICATED STEEL SEWAGE TREATMENT SYSTEM

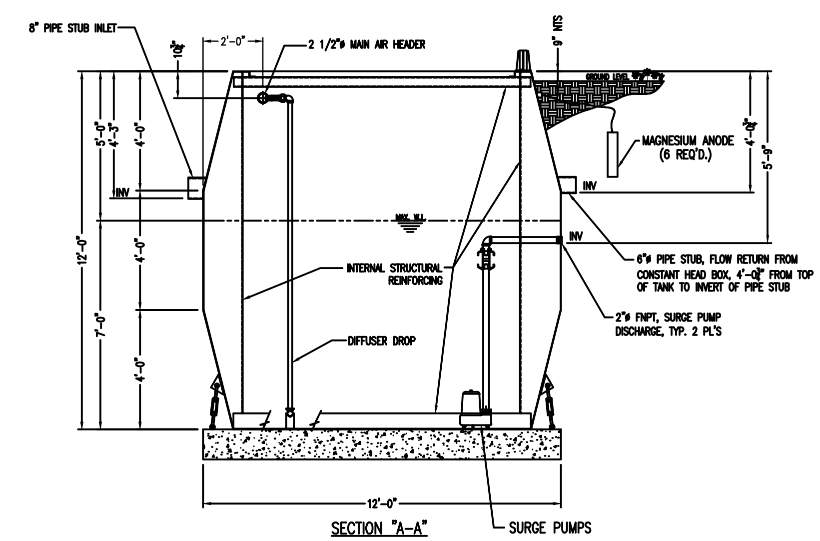
SCALE: NONE (24) DRG. SIZE: D PART& DRG.NO. Q1902S1-R5



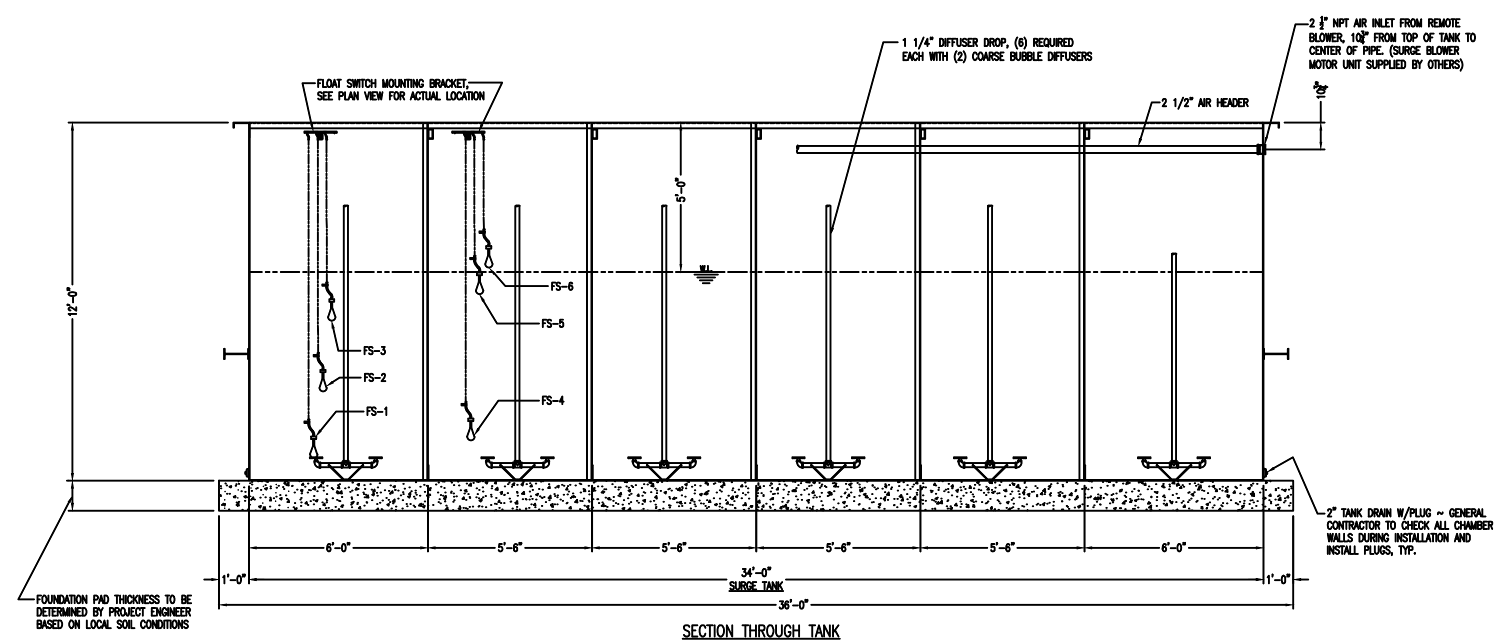
PLAN VIEW

NOTE: CONTROL PANEL SHALL BE MOUNTED REMOTELY.

NOTE: BLOWERS PROVIDED BY D. W. MARTINE AND ASSOCIATES



SECTION "A-A"



SECTION THROUGH TANK

FLOAT SWITCH LEGEND	
LS-1	SURGE TANK LOW LEVEL ALARM
LS-2	SURGE LAG PUMP OFF
LS-3	SURGE LEAD PUMP ON
LS-4	SURGE LEAD PUMP OFF
LS-5	SURGE LAG PUMP ON
LS-6	SURGE TANK HIGH WATER ALARM

NOTES:
1. PLANT TO BE SHIPPED BLOWER MOTOR UNIT(S), PUMPS CONTROL PANEL, GRATING, ANODES, HANDRAIL LOOSE FOR FIELD INSTALLATION BY OTHERS.
2. FLOAT SWITCH ELEVATION SHALL BE DETERMINED BY OTHERS.
3. BLOWER MOTOR UNITS SHALL BE PROVIDED BY D. W. MARTINE AND ASSOCIATES.

PROTECTION AGAINST CORROSION

AFTER COMPLETE WELDING AND FABRICATION OF THE TANK, THE FOLLOWING WILL OCCUR:

SURFACE PREPARATION:
ALL SURFACES SHALL RECEIVE A SSPC-10 NEAR WHITE METAL FINISH OBTAINING A 1.5 TO 3.0 MIL SURFACE PROFILE.

PAINT:
INTERIOR AND EXTERIOR APPLICATION THICKNESS SHALL BE 8 TO 10 MILS D.F.T. OF TNEMEC 46H-413 COAL TAR EPOXY OR EQUAL.

COLOR: BLACK FINISH: SATIN

NOTE:
THIS TANK STRUCTURE IS REINFORCED TO WITHSTAND NORMAL PRESSURES FROM THE SOIL AND FROM THE INTERIOR HYDROSTATIC LOAD ON ABOVE GRADE INSTALLATIONS. IF THERE IS A GROUND WATER PROBLEM, NOTIFY YOUR ENGINEER AND PURESTREAM IMMEDIATELY. PURESTREAM WILL NOT BE RESPONSIBLE FOR DAMAGE TO THE TANK STRUCTURE OR EQUIPMENT DUE TO GROUND WATER.

SURGE TANK VOLUME GALLON
15,051

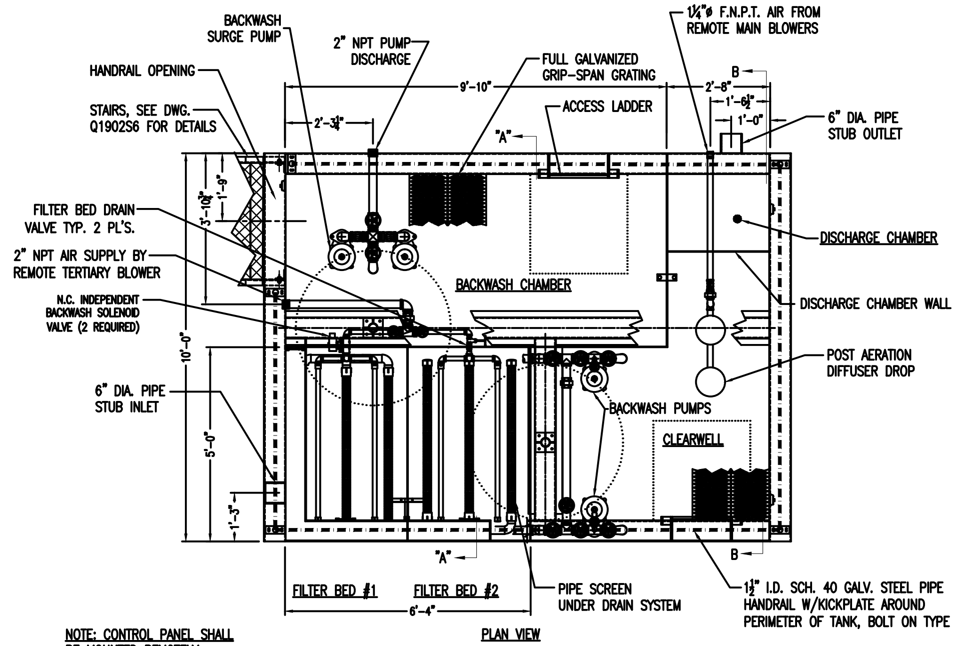
REVISIONS	REVISIONS
R6, REVISED AS REQUESTED, PAT, 4-21-22	R1, REVISED AS REQUESTED, PAT, 1-17-22
	R2, REVISED AS REQUESTED, PAT, 1-27-22
	R3, REVISED AS REQUESTED, PAT, 4-6-22
	R4, REVISED AS REQUESTED, PAT, 4-8-22
	R5, REVISED AS DISCUSSED, PAT, 4-11-22

JOB NO: Q1902
JOB NAME: SUMMIT CLUB (WESTCHESTER)
LOCATION: NY
DRAWN BY: PAT DATE: 12-15-21

PURESTREAM/ES

DESCRIPTION: SURGE TANK

SCALE: 32 | DRG. SIZE: D | PART& DRG.NO. Q1902S2-R6



NOTE: CONTROL PANEL SHALL BE MOUNTED REMOTELY.

NOTE: BLOWERS PROVIDED BY D. W. MARTINE AND ASSOCIATES

NOTE: CONTROL PANEL SHALL BE MOUNTED REMOTELY.

NOTE: BLOWERS PROVIDED BY D. W. MARTINE AND ASSOCIATES

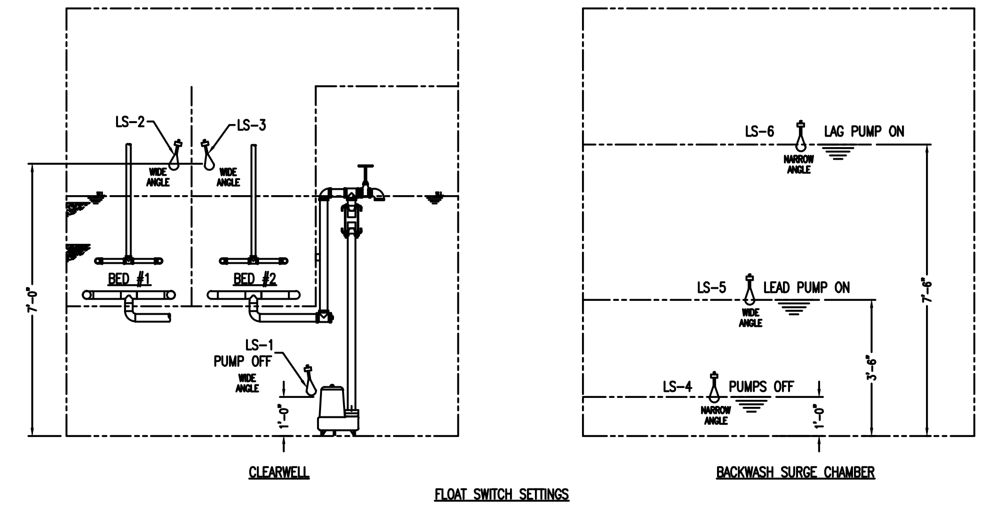
PROTECTION AGAINST CORROSION

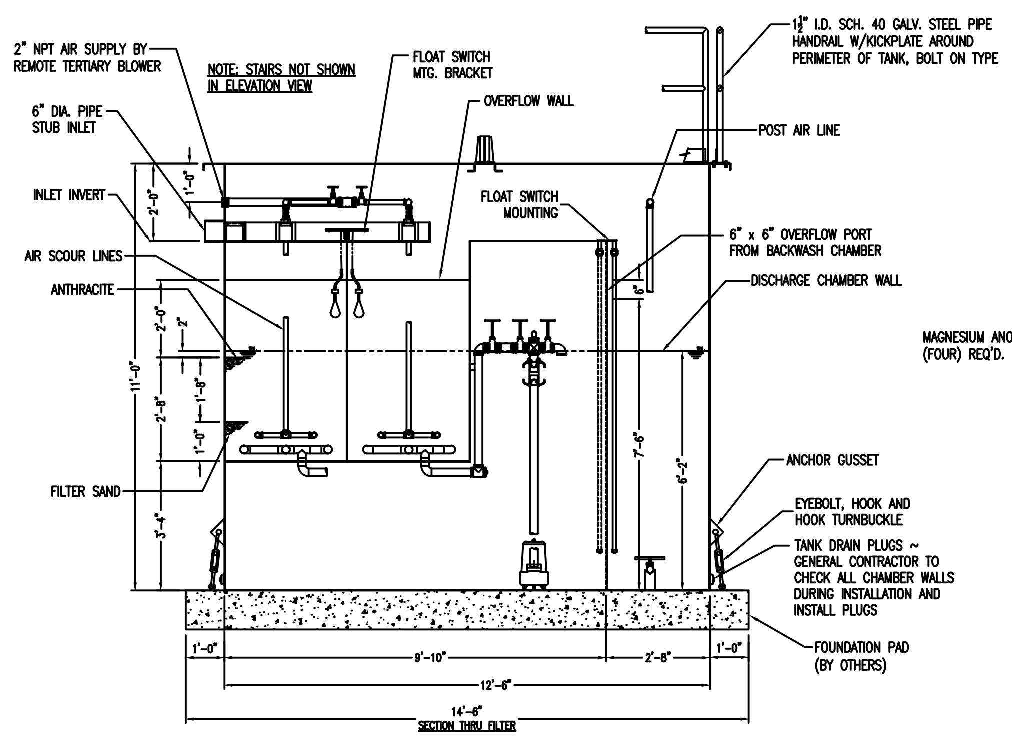
AFTER COMPLETE WELDING AND FABRICATION OF THE TANK, THE FOLLOWING WILL OCCUR:

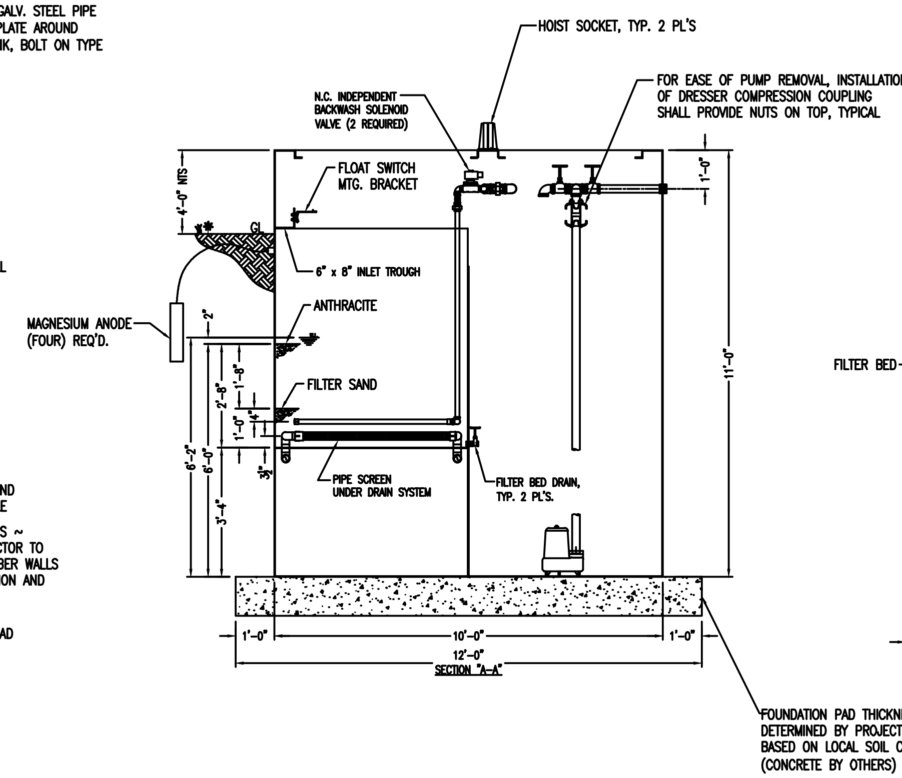
SURFACE PREPARATION:
ALL SURFACES SHALL RECEIVE A SSPC-10 NEAR WHITE METAL FINISH OBTAINING A 1.5 TO 3.0 MIL SURFACE PROFILE.

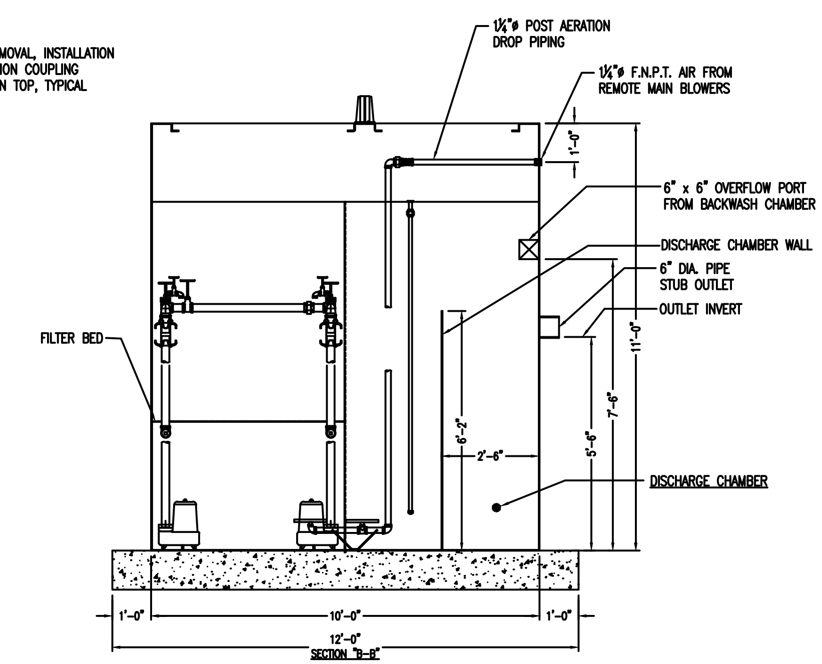
PAINT:
INTERIOR AND EXTERIOR APPLICATION THICKNESS SHALL BE 8 TO 10 MILS D.F.T. OF TNEMEC 46H-413 COAL TAR EPOXY OR EQUAL.

COLOR: BLACK FINISH: SATIN









DESIGN DATA

MODEL NO.	DESIGN FLOW G.P.D.	CLEARWELL VOL. GAL.	BACKWASH CHAMBER VOL. GAL.	FILTER BED TOTAL SQ. FT.
PST-31.5	45,000	2,520	2,520	31.5

NOTE:
THIS TANK STRUCTURE IS REINFORCED TO WITHSTAND NORMAL PRESSURES FROM THE SOIL AND FROM THE INTERIOR HYDROSTATIC LOAD ON ABOVE GRADE INSTALLATIONS. IF THERE IS A GROUND WATER PROBLEM, NOTIFY YOUR ENGINEER AND PURESTREAM IMMEDIATELY. PURESTREAM WILL NOT BE RESPONSIBLE FOR DAMAGE TO THE TANK STRUCTURE OR EQUIPMENT DUE TO GROUND WATER.

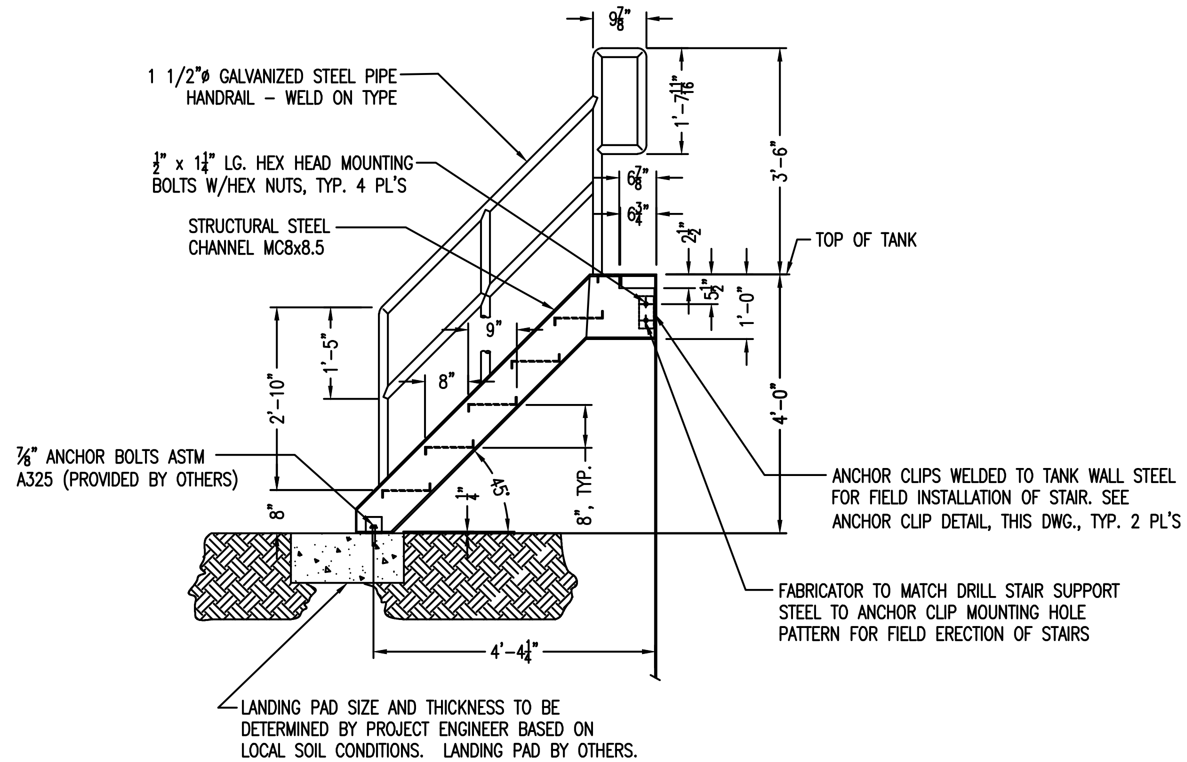
REVISIONS
R1, REVISED AS REQUESTED, PAT, 1-17-22
R2, REVISED AS REQUESTED, PAT, 1-27-22
R3, REVISED AS REQUESTED, PAT, 4-6-22

JOB NO: Q1902
JOB NAME: SUMMIT CLUB (WESTCHESTER)
LOCATION: NY
DRAWN BY: PAT DATE: 12-15-21

PURESTREAM INC.

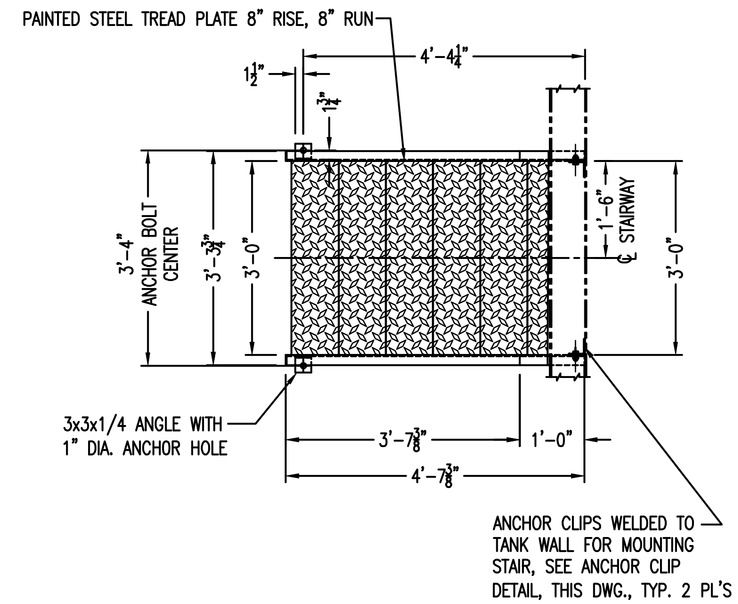
DESCRIPTION: PREFABRICATED SEWAGE TREATMENT TERTIARY FILTER

SCALE: 24 | DRG. SIZE: D | PART& DRG.NO. Q1902S5-R3



ELEVATION VIEW

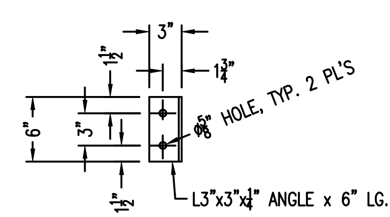
(TWO) STAIR ASSEMBLIES REQ'D.



HANDRAIL NOT SHOWN IN THIS VIEW

PLAN VIEW

(TWO) STAIR ASSEMBLIES REQ'D.



STAIR MOUNTING ANGLE CLIP DETIAL

2X SCALE

(TWO REQ'D.)

(TWO) STAIR ASSEMBLIES REQ'D.

NOTES:
LADDER SHALL BE HOT DIPPED GALVANIZED.
SEE PLANS FOR LOCATION OF STAIRS

FABRICATOR TO PROVIDE LOOSE FASTENERS PER STAIR ASSEMBLY

(4) ½" x 1¼" LG. HEX HEAD MOUNTING BOLTS W/HEX NUTS

REVISIONS		
R1, 4'-0" HIGH, PAT, 4-6-22	JOB NO: Q1902	purestream inc.
	JOB NAME: SUMMIT CLUB	DESCRIPTION 45' ACCESS LADDER, 4'-0" HEIGHT TREAD PLATE
	LOCATION: NY	
	DRAWN BY: PAT DATE: 1-18-22	SCALE: 19.2 DRG. SIZE C PART& DRG.NO. Q1902S6-R1

CARLIN • SIMPSON & ASSOCIATES
Consulting Geotechnical and Environmental Engineers

61 Main Street, Sayreville, New Jersey 08872
Tel. (732) 432-5757
Fax. (732) 432-5717

Principal:
Robert B. Simpson, P.E.

Associates:
Robert H. Barnes, P.E.
Meredith R. Anke, P.E.
Kurt W. Anke
Eric J. Shaw

13 February 2013
Revised 16 October 2013

Brynwood Partners, LLC
c/o Corigin Holdings
505 Fifth Avenue, 22nd Floor
New York, NY 10017

Attn: Ms. Megan Maciejowski

Re: Report on Subsurface Soil and Foundation Investigation
Brynwood Club Development
Bedford Road
Town of North Castle, NY (12-175)

Dear Ms. Maciejowski:

In accordance with our proposals dated 20 November 2012 and 9 September 2013 and your subsequent authorization, we have completed a Subsurface Soil and Foundation Investigation for the referenced site. The purpose of this study is to preliminarily determine the nature and engineering properties of the subsurface soil and bedrock as well as the groundwater conditions for the planned development, to recommend a practical foundation scheme, to determine the allowable bearing capacity of the site soils, and to determine the subsurface soil and groundwater conditions and soil permeability in the new stormwater management areas.

We understand that the planned construction will consist of 21 new structures, roadways, parking areas, retaining walls, tennis courts, underground utilities, and a stormwater management system. To guide us in our study, you have provided us with a site plan that indicates the existing site conditions and the location of the planned new development.

Our scope of work for this project included the following:

1. Reviewed the proposed layout, the existing site conditions, the expected soil conditions, and planned this study.

2. Retained General Borings, Inc. to advance 11 test borings at the subject site.

3. Retained Traficante Contracting Inc. to excavate 18 test pits at the subject site.

4. Inspected ten (10) supplemental test pits that were excavated at the site by Brynwood Club personnel.

5. Laid out the boring and test pit locations in the field, provided full time inspection of the explorations, obtained soil samples, and prepared detailed logs and a Boring and Test Pit Location Plan.

6. Performed three (3) field percolation tests and one (1) borehole permeability test.

7. Performed soil identification tests on selected soil samples in our laboratory.

8. Analyzed the field and laboratory test data and prepared this report containing the results of this study.

SITE DESCRIPTION

The project site is located on the Brynwood Club property on Bedford Road in North Castle, Westchester County, New York. The subject property is currently occupied by a golf club with a clubhouse building, tennis courts, and a few smaller out-structures. The proposed development area is also occupied by an asphalt paved parking lot and driveways as well as grass lawn areas and wooded areas. There are numerous existing underground utilities located throughout the property.

Within the proposed development area, the existing site grades vary from approximately elevation +610.0 at the southwest corner of the subject site and the westernmost portion of the site, to elevation +640.0 on the east side of the existing clubhouse building, to elevation +674.5 in the existing tennis court area in the northeastern portion of the property.

SUBSURFACE CONDITIONS

To determine the subsurface soil, bedrock, and groundwater conditions, we advanced 11 test borings and 28 test pits at the site. The borings and test pits were performed at the locations shown on the enclosed Boring and Test Pit Location Plan. Detailed logs have been prepared and are included in this report. Our field engineer visually identified all soil samples and selected soil samples were tested in our laboratory. The results of these tests are also included in this report.

Soil

The soil descriptions shown on the boring and test pit logs are based on the Burmister Classification System. In this system, the soil is divided into three components: Sand (S), Silt ($) and Gravel (G). The major component is indicated in all capital letters, the

lesser in lower case letters. The following modifiers indicate the quantity of each lesser component:

Modifier	**Quantity**
trace (t)	0 -10%
little (l)	10% - 20%
some (s)	20% - 35%
and (a)	35% - 50%

The subsurface soil conditions observed in the borings and test pits can be summarized as follows:

Stratum 1
Topsoil

The surface layer at most of the boring and test pit locations consists of brown topsoil that typically ranges from about 0’3” to 1’6” in thickness.

Stratum 2
Existing Fill

Beneath the topsoil and at the surface in three (3) of the borings (B-6, B-8, and B-9) and ten (10) of the test pits (TP-2, TP-9, TP-10, TP-12, TP-14, TP-16, TP-19, TP-21, TP-26, and TP-28) is existing fill that consists of loose to medium dense brown coarse to fine SAND, little (to and) Silt, trace (to some) coarse to fine Gravel. Cobbles, boulders, topsoil, roots, and debris were also present within the fill at some of the test locations. The existing fill was encountered to depths ranging from 1’0” to more than 9’0” beneath the existing ground surface. Test pits TP-9 and TP-28 were terminated in the fill at final depths of 6’9” and 9’0” beneath the ground surface, respectively.

Stratum 3
Sandy Silt or Silty Sand

Underlying the topsoil and existing fill is virgin soil that is comprised of medium dense to dense brown, light brown, or gray brown SILT some (to and), coarse to fine Sand, trace (to little) coarse to fine Gravel or coarse to fine SAND, little (to and) Silt, trace (to and) coarse to fine Gravel, with occasional cobbles and boulders. The Sandy Silt or Silty Sand stratum continued to depths ranging from 2’0” to 12’0” below the existing ground surface. Boring B-8 and test pits TP-8, TP-10, TP-12, TP-19, TP-20, TP-22, and TP-26 were terminated in this stratum at final depths ranging from 5’0” to 12’0” beneath the ground surface.

Stratum 4
Sand or Sandy Gravel

Below the Sandy Silt or Silty Sand at several test locations is completely weathered Gneiss bedrock that generally consists of dense to very dense brown or gray brown coarse to fine SAND, little (to some) Silt, trace (to some) coarse to fine Gravel or coarse to fine GRAVEL and, coarse to fine Sand, trace Silt. Where encountered in the borings and test pits, the completely weathered bedrock was present at depths ranging from 2’0” to 7’0” beneath the ground surface and continued to depths ranging from 4’7” to 15’2” below the existing ground surface.

Stratum 5 Gneiss Bedrock	Gneiss bedrock was encountered at 27 of the 39 test locations. Where encountered in the borings and test pits, gneiss bedrock was observed at depths ranging from 1'8" to 15'2" beneath the existing ground surface. In general, the quality of the bedrock will improve with depth. At boring B-10, the bedrock was cored between the depths of 2'0" and 7'0". The core recovery was 86% and the Rock Quality Designation (RQD) of the recovered core was 53%. This indicates that the quality of the upper five (5) feet of the Gneiss bedrock is fair. The Gneiss bedrock is moderately weathered and in a blocky and seamy condition.

Groundwater

Observations for groundwater were made during sampling and upon completion of the drilling operations at each boring location. In auger drilling operations, water is not introduced into the boreholes, and the groundwater position can often be determined by observing water flowing into or out of the boreholes. Furthermore, visual observation of the soil samples retrieved during the auger drilling and in the test pits can often be used in evaluating the groundwater conditions.

Groundwater was encountered in test pit TP-8 at a depth of 4'1" (+609.9), in test pit TP-13 at a depth of 4'10" (+631.2), in boring B-8 at a depth of 3'3" (+608.3), in test pit TP-22 at a depth of 4'6" (+470.5), and in test pit TP-28 at a depth of 8'0" (+491.0) beneath the ground surface. Groundwater was not encountered in any of the other borings or test pits that were performed at the subject site during this investigation.

Variations in the location of the long-term water table may occur as a result of changes in precipitation, evaporation, surface water runoff, and other factors not immediately apparent at the time of this exploration. Based on the site conditions, trapped groundwater may be encountered in the silty site soils and/or along the soil/rock interface during wet periods. Proper groundwater control measures will be required in the event that trapped water is encountered in the site excavations.

Bedrock

Bedrock was encountered in 27 of the 39 explorations that were performed at the site during this investigation. Completely weathered bedrock was encountered at ten (10) test locations at depths ranging from 2'0" to 7'0" below the existing ground surface. Harder bedrock was encountered in the remaining locations and below the completely weathered rock at depths ranging from 1'8" to 15'2" beneath the ground surface. These depths correspond to bedrock elevations ranging between approximately elevation +471.0 and elevation +669.8.

Based on the boring and test pit data and the site plans provided to this office, bedrock was encountered above the planned finished floor elevation in portions of the site. The observed depth to bedrock at each boring and test pit location is summarized in Table 1 in the following section of this report.

The bedrock encountered at the site consists of weathered Gneiss. Based on our experience, the in-situ bedrock will range from highly weathered, fractured rock to massive, intact rock. Penetration into the bedrock with excavation equipment will depend of the degree of weathering and fracturing in the rock. We anticipate that the ”rippability” of the bedrock will be variable and very limited. Based on our observations, harder rock will be encountered and blasting and/or the use of hydraulic hammers will be required to excavate the harder, intact bedrock. Rock removal is discussed further in a separate section of this report.

EVALUATION

At the time of this report, the proposed layout, the proposed finished floor elevations, and the site grading were preliminary. Therefore, the following evaluation is preliminary in nature and has been generalized for the expected development. The recommendations below are intended for planning purposes only and are not intended for final design and construction. Additional subsurface investigation will be required for the proposed buildings and retaining walls. Preliminarily, we estimate that an additional 12 to 15 explorations will be required for this project. Once the site plans have been further developed, a copy shall be forwarded to our office so that we can review it along with the recommendations in this report. At that time, we will provide specific recommendations for additional subsurface investigation. After the supplemental investigation has been completed, additional geotechnical recommendations will be provided for the project site. As a result, the recommendations within this report are subject to change.

Based on the preliminary site plans, we understand that the planned construction will consist of 21 new structures that will include seven (7) golf residences, seven (7) club villas, five (5) golf cottages, one (1) fairway residences building, and one (1) clubhouse building. The proposed construction will also include new asphalt paved roadways and parking areas, retaining walls, tennis courts, underground utilities, and a stormwater management system.

The grading plan provided to this office indicates that the proposed finished floor elevations vary across the site. In addition, the fairway residences, golf cottages, and golf residences will have basements. Based on the existing and proposed grades, cuts ranging up to approximately 14’0” and fills ranging up to approximately 10’0” are expected to achieve the proposed floor slab subgrade elevations. In the proposed pavement areas, cuts ranging up to approximately 6’0” and fills ranging up to approximately 8’0” are expected to achieve the proposed pavement subgrade elevations.

The boring and test pit data indicates that there is existing fill (Stratum 2) present in portions of the site to depths ranging from 1’0” to more than 9’0” below the existing ground surface. The existing fill generally consists of loose to medium dense Sand with varying amounts of Silt and Gravel and occasional cobbles, boulders, topsoil, roots, and debris. Underlying the existing fill is medium dense to dense Sandy Silt or Silty Sand (Stratum 3). The Sandy Silt or Silty Sand is underlain by dense to very dense completely weathered Gneiss bedrock (Stratum 4) in areas followed by more competent Gneiss bedrock (Stratum 5), which was encountered at depths ranging from 2’0” to 15’2” beneath the existing ground surface. The existing fill and bedrock observations are summarized in Table 1 below.

Table 1 - Summary of Boring and Test Pit Data

Boring or Test Pit No.	Approximate Ground Surface Elevation	Depth to Bottom of Existing Fill (Elevation)	Depth to Weathered Bedrock (Elevation)	Depth to Bedrock or Auger Refusal (Elevation)
B-1	+661.0	NE	5'0" (+656.0)	8'0" (+653.0)
B-2	+628.0	NE	NE	7'0" (+621.0)
B-3	+620.0	NE	2'0" (+618.0)	4'9" (+615.3)
B-4	+628.0	NE	2'0" (+626.0)	10'6" (+617.5)
B-5	+623.0	NE	2'0" (+621.0)	8'6" (+614.5)
B-6	+617.0	1'0" (+616.0)	NE	5'6" (+611.5)
B-7	+628.0	NE	5'0" (+623.0)	15'2" (+612.8)
B-8	+609.0	5'6" (+603.5)	NE	NE to 12'0"
B-9	+674.0	7'0" (+667.0)	7'0" (+667.0)	7'6" (+666.5)
B-10	+638.8	NE	NE	2'0" (+636.8)
B-11	+640.0	NE	4'0" (+636.0)	5'6" (+634.5)
TP-1	+662.0	NE	NE	2'0" (+660.0)
TP-2	+672.0	1'10" (+670.2)	NE	4'4" (+667.7)
TP-3	+672.0	NE	NE	2'2" (+669.8)
TP-4	+672.0	NE	NE	3'6" (+668.5)
TP-5	+670.0	NE	3'8" (+666.3)	4'9" (+665.3)
TP-6	+672.0	NE	2'10" (+669.2)	4'7" (+667.4)
TP-7	+620.0	NE	NE	2'8" (+617.3)
TP-8	+614.0	NE	NE	NE to 5'0"
TP-9	+628.0	>6'9" (<+621.3)	NE	NE to 6'9"
TP-10	+625.0	3'0" (+622.0)	NE	NE to 8'0"
TP-11	+642.0	NE	3'9" (+638.3)	6'0" (+636.0)
TP-12	+635.0	5'0" (+630.0)	NE	NE to 6'6"
TP-13	+636.0	NE	NE	7'5" (+628.6)
TP-14	+625.0	5'0" (+620.0)	NE	5'0" (+620.0)
TP-15	+668.0	NE	NE	1'8" (+666.3)
TP-16	+651.0	1'10" (+649.2)	NE	4'10" (+646.2)
TP-17	+655.0	NE	NE	NE to 1'0"
TP-18	+670.0	NE	NE	NE to 7'0"
TP-19	+427.0	2'5" (+424.6)	NE	NE to 7'0"
TP-20	+415.0	NE	NE	NE to 8'0"
TP-21	+478.0	1'4" (+476.7)	NE	7'0" (+471.0)
TP-22	+475.0	NE	NE	NE to 7'6"
TP-23	+496.0	NE	NE	3'10" (+492.2)
TP-24	+564.0	NE	NE	6'8" (+557.3)
TP-25	+633.0	NE	NE	3'4" (+629.7)
TP-26	+669.0	5'6" (+663.5)	NE	NE to 8'0"

Boring or Test Pit No.	Approximate Ground Surface Elevation	Depth to Bottom of Existing Fill (Elevation)	Depth to Weathered Bedrock (Elevation)	Depth to Bedrock or Auger Refusal (Elevation)
TP-27	+561.0	NE	NE	4'4" (+556.7)
TP-28	+499.0	>9'0" (<+490.0)	NE	NE to 9'0"

Notes: NE – Not Encountered
B-8: Groundwater at +608.3
TP-8: Groundwater at +609.9
TP-9: Terminated in the Existing Fill
TP-13: Groundwater at +631.2
TP-22: Groundwater at +470.5
TP-28: Groundwater at +491.0
TP-28: Terminated in the Existing Fill

Removal of Existing Structures from New Building and Pavement Areas

Building Areas

The site plan indicates that existing structures are present in some of the proposed building areas. The existing structures will be removed as part of the proposed development. All debris resulting from the demolition of these items must be completely removed from the new building areas, extending at least ten (10) feet beyond the new building limits, where practical. This shall include the complete removal of all foundations, walls, slabs, utilities, sidewalks, pavement, and miscellaneous debris. Where the removal of existing items or associated materials extends below the planned building, the resulting excavations shall be backfilled with new compacted fill as described below.

Existing utilities, where they are encountered within the planned building areas, should be either abandoned or rerouted around the new structures. Once the utility has been rerouted or abandoned, the section of pipe and any associated structure within the building areas should be completely removed. The removal of the pipe and structure must also include any loose fill around the pipe or structure. After the pipe, associated structure, and associated loose backfill have been removed, the resulting excavation shall be backfilled with new controlled fill as described below.

New compacted fill shall consist of either suitable on-site soil or imported sand and gravel. Imported sand and gravel fill shall contain less than 20% by weight passing a No. 200 sieve. The fill shall be placed in layers not exceeding one (1) foot in loose thickness. In the proposed building area, new fill shall be compacted to at least 95% of its Maximum Modified Dry Density (ASTM D1557). Each layer shall be compacted, tested, and approved prior to placing subsequent layers.

Pavement Areas

In the proposed pavement areas, any existing structures and debris resulting from the demolition of the structures must be completely removed from the new pavement areas, extending at least five (5) feet beyond the new paving limits, where practical. The

excavations resulting from the removal of existing items shall be backfilled using controlled compacted fill. New fill shall consist of either suitable on-site soil or imported sand and gravel placed in one (1) foot loose layers and compacted to at least 92% of its Maximum Modified Dry Density (ASTM D1557).

Implications of Existing Fill

The boring and test pit data indicates that existing fill is present in portions of the site. Where encountered in the borings and test pits, the fill extended to depths ranging from 1’0” to more than 9’0” beneath the existing ground surface. These depths correspond to elevations ranging from approximately +424.6 to elevation +670.2. The depth of the existing fill is expected to be variable and may be deeper in unexplored areas of the site and around the existing site buildings.

The existing fill is not an acceptable bearing material for the new building foundations or floor slabs. The consistency and density of the fill material are not predictable. Certain areas may contain clean dense soils while other areas may contain loose material, topsoil, and/or debris. The existing fill creates the possibility of intolerable differential settlements under loading.

To eliminate the potential for damaging differential settlements, we recommend that the existing fill be completely removed from the new building areas. Based on the existing grades and the proposed finished floor elevations, we expect that some of the existing fill will be removed during the planned building excavations. However, existing fill is expected to be encountered below the planned subgrade elevation in portions of the site. Undercutting of the subgrade will be required in these areas to remove the existing fill or otherwise unsuitable materials from the building areas. The over-excavated areas shall then be replaced with new structural fill, as necessary, to achieve the planned subgrade elevations.

To further evaluate the existing fill conditions in and around the planned building areas, we recommend that a series of supplemental test pits be performed at the time of construction. The test pits should be conducted under the full time observation of a Carlin-Simpson & Associates representative. These test pits will allow us to confirm the consistency, thickness, and horizontal limits of the existing fill material.

Provided that the existing fill and any other unsuitable materials encountered during construction are removed, it is our opinion that the new structural fill and virgin soils can adequately support the new building foundations and floor slabs.

Rock Removal - Blasting Issues

As discussed above, bedrock was encountered at 27 of the 39 test locations during this study. The bedrock was encountered at depths ranging from 1’8” to 15’2” beneath the ground surface. These depths correspond to bedrock elevations ranging between approximately elevation +611.5 and elevation +669.8. Based on the site plans provided to this office, bedrock was encountered above the planned finished floor elevation in portions of the site. Bedrock may also be encountered at higher elevations in the unexplored areas of the site.

The bedrock encountered in the borings and test pits consists of weathered Gneiss. Based on our experience, the in-situ bedrock will range from highly weathered, fractured rock to massive, intact rock. To excavate the rock, the upper 1’0” to 5’0” of rock may be “rippable” by using large construction equipment. The use of hydraulic hammers and/or blasting will be required in order to achieve deeper excavations. Zones of weathered rock may exist deeper than 5’0” but conditions are expected to be highly variable. Hard rock will be encountered during construction.

In order to develop the site, rock removal will be required in areas to achieve the proposed grades. Rock removal may also be required for the new pavement and utilities in portions of the site. Rock blasting will likely be required to achieve the proposed grades in areas. Nearby buildings and existing underground utilities could be affected by the blasting.

The Blasting Contractor should avoid over-blasting the rock. Over-blasting will disturb the deeper intact rock that will be used as bearing material for the proposed foundations and floor slab.

The blasting operation will be monitored by a seismologist using a seismograph. The Peak Particle Velocity emanating from any blast will be restricted to 2.0 in/sec. Each blast will be monitored to insure that this criteria is not exceeded.

The U.S. Bureau of Mines [Nicholas et al (1971)] has established that a threshold of 4.0 in/sec will likely crack plaster and thus they recommend that the safe vibrational criterion be 2.0 in/sec. This criterion has been used successfully in the industry. Each blast will be monitored independently to insure that this criterion is not exceeded. The monitoring results shall be provided to the Blasting Contractor as soon as possible so that the blasting program can be modified if necessary.

We recommend that a minimum of four (4) monitoring points be established, to the north, east, south and west of the planned blast area. The seismograph sensors should be placed near the closest structure and at any structures identified during the pre-blast survey that are considered to be susceptible to vibration damage.

Prior to the start of any construction, a Blasting Management Plan shall be prepared by the Blasting Contractor for this project. This plan shall be in accordance with State regulations and the Explosive Materials Code, NFPA No. 495, National Fire Prevention Association. Additionally, all blasting should adhere to the provisions of 29 CFR Ch. XVII Section 1910.109 for explosives and blasting agents and to all local requirements.

Prior to any blasting work being done, a licensed professional engineer shall be retained to perform a detailed pre-blast survey of existing structures located within 500 feet of the planned blast area. The pre-blast survey shall be conducted in accordance with the requirements of local authorities. A copy of all reports prepared by the licensed engineer shall be submitted to the Town Engineer and the Owner’s representative in a timely manner.

Prior to the beginning of blasting, a notice will be sent to all residential and commercial property owners within a 500 foot radius of the blast area. This notification will

be given at least 48 hours before blasting takes place. A contact person will be established and named in this notice to respond to all concerns raised by nearby residents during the blasting phase of the project. The contact person will respond to any inquiries within 24 hours.

Preparation of New Building Areas and Removal of Existing Fill

In order to prepare the building areas for construction, all surface materials such as topsoil, asphalt, and surface vegetation shall be removed from the planned building areas, extending at least ten (10) feet beyond the new construction limits, where feasible.

The boring data indicates that existing fill is present within portions the proposed building areas. Fill material may also be present in other unexplored portions of the site. Where encountered in the test borings, the existing fill extended to depths ranging from about 1'0" to 7'0" below the existing ground surface. As shown in Table 1 above, the approximate bottom of the fill material ranges from elevation +603.5 to elevation +670.2. The existing fill is expected to vary in thickness across the site and may extend deeper in the unexplored areas and around the existing site structures.

After the surface materials are removed, the existing fill shall be excavated from the new building areas. The removal of the existing fill from the new building areas shall extend through the existing fill, down to the virgin soil or weathered bedrock. At the bottom of the excavation, the removal of the unsuitable material shall extend horizontally beyond the building lines a minimum distance of three (3) feet plus a distance equal to the depth of the excavation below the planned finished floor elevation. For example, if the removal of the existing fill extends vertically five (5) feet below the planned finished floor elevation, the excavation must extend horizontally a minimum of eight (8) feet (3 feet plus 5 feet) beyond the new building line at that location.

The removal of the existing fill from the planned building areas shall be performed under the full time observation of Carlin-Simpson & Associates. The on-site representative from Carlin-Simpson & Associates shall direct the Contractor during this operation to ensure that all of the unsuitable material has been removed from the proposed building areas.

During the removal of the unsuitable material from the building areas, the Contractor should segregate the potentially re-usable existing fill material from the non-reusable fill (i.e. debris and topsoil). The on-site representative from Carlin-Simpson & Associate shall evaluate the suitability of the excavated materials for use as structural fill during the excavation and prior to its re-use. Potentially usable fill should be stockpiled and covered with tarps or plastic sheeting for protection from excess moisture. Any fill material that is wet must be dried prior to its re-use.

After the surface materials and existing fill have been removed and prior to the placement of new structural fill, the exposed subgrade must be graded level and proofrolled by several passes of a vibratory drum roller. The proofrolling operation is necessary to densify the underlying soils. Carlin-Simpson & Associates shall be retained to observe the proofrolling of the subgrade. If any soft or otherwise unsuitable soils are noted, the

unsuitable material shall be removed and replaced with new structural fill. Carlin-Simpson & Associates shall be responsible for determining what material, if any, is to be removed and will direct the contractor during this operation.

New structural fill required to achieve final grades shall consist of either suitable on-site soil or imported sand and gravel. Imported fill shall contain less than 20% by weight passing a No. 200 sieve. The structural fill shall be placed in layers not exceeding one (1) foot in loose thickness and each layer shall be compacted to at least 95% of its Maximum Modified Dry Density (ASTM D1557). Each layer must be compacted, tested, and approved prior to placing subsequent layers. The suitability of the excavated soil for reuse as structural fill is discussed in a following section of this report.

After the installation of structural fill has been completed to the required subgrade elevations, the virgin soil and new structural fill may be used to support the proposed building foundations and floor slabs.

New Building Foundations

According to the boring data, the foundation bearing materials will consist of medium dense to dense virgin soil, weathered bedrock, and new structural fill. Foundations for the proposed structures may be designed as a shallow spread footing bearing on the virgin soil, weathered bedrock, or new structural fill utilizing a net allowable bearing pressure of 4,000 psf (2.0 TSF).

Exterior footings shall bear at a depth of at least 42 inches below finished outside grade for protection from frost. Interior column footings may bear on the virgin soil, weathered bedrock, or new structural fill just below the floor slab provided the building is heated during winter. Column footings shall have a minimum dimension of 30 inches. The wall footings shall have a minimum width of 18 inches.

Prior to the placement of formwork, reinforcement steel, and concrete, the bearing subgrade soil shall be cleaned of all loose soil and compacted with several passes of a small vibratory drum trench compactor (i.e. Wacker Model RT560), a heavy vibratory plate tamper (i.e. Wacker BPU 3545A or equivalent), or "jumping jack" style tamper (i.e. Wacker Model BS 600). This must be performed under the inspection of a representative from Carlin-Simpson & Associates. If instability is observed during the compaction of the bearing subgrade, the soft soil shall be removed and replaced with new compacted fill.

Where rock is encountered in the foundation excavations, "Special Construction Procedures" must be employed. When continuous wall footings or closely spaced column footings (20 feet or less) bear on dissimilar material (i.e. rock and soil) the potential for differential movement exists. A footing bearing in rock will not move, whereas a footing bearing on soil will settle slightly due to the compressive nature of all soils when subjected to new loads. The area between movement and non-movement will develop a (shear) stress point. Cracks in foundations and walls will be the result from such movement. Therefore, continuous wall footings must bear either entirely on rock or entirely on soil for any individual building. Alternatively, for larger structures, transition zones can be constructed to create a gradual transition from a soil to a rock bearing subgrade.

Adjacent column footings greater than 20 feet apart may bear on dissimilar material (i.e. soil and rock). Any individual column footing must bear entirely on the same type bearing material (i.e. all soil or all rock).

Where rock and soil both exist at the bearing elevation within a foundation excavation, the footings must either be lowered to bear entirely on rock, or a minimum of 18 inches of rock must be removed from below planned footing bottom. The over-excavated 18 inches must then be filled with a granular material having a maximum particle size of ½-inch and containing at least 15% but not more than 30% material by weight passing a No. 200 sieve. The fill shall be placed in six (6) inch layers and each layer shall be compacted to at least 95% of its Maximum Modified Dry Density (ASTM D1557). This procedure will create a “cushion” atop the rock and reduce the potential for differential movement. For soft, rippable rock, this procedure will not be required.

If during the excavation for continuous foundations, the transition from soil to rock is gradual (i.e. from medium dense soil to dense weathered rock to very dense rock) over a distance of 20 feet or more, the “Special Construction Procedures” may not be required. This would have to be evaluated in the field on a case-by-case basis by the representative from Carlin-Simpson & Associates at the time of construction.

Where the transition from rock to soil is abrupt within the excavation for continuous wall foundations, transition zones can be constructed by over-excavating the rock in steps and increasing the “soil cushion” thickness over a distance of 24 feet or more. To construct the transition zone, the bedrock is over-excavated in a series of steps, each step being six (6) inches in depth and at least eight (8) feet in length. The first step is six (6) inches deep, the second step is 12 inches deep, and the final step is 18 inches deep. The over-excavation is then backfilled with the soil cushion material described above.

Floor Slab

After the footings and foundation walls are installed, fill will be required to backfill the excavations and to raise grades in the building areas to the slab subgrade elevations. New fill for the floor slab shall consist of either suitable on-site soil or imported sand and gravel containing less than 20% material by weight passing a No. 200 sieve. The fill shall be placed in layers not exceeding one (1) foot in loose thickness and each layer shall be compacted to at least 92% of its Maximum Modified Dry Density (ASTM D1557). Fill layers shall be compacted, tested, and approved before placing subsequent layers.

The floor may be designed as a slab on grade, bearing on virgin soil, weathered bedrock, bedrock, or new structural fill. We recommend a Modulus of Subgrade Reaction (k) of 200 pounds per cubic inch (pci) be used for design. A six (6) inch layer of 3/4-inch crushed stone is recommended beneath the concrete slab for additional support and drainage. In the event that the floor slab is constructed directly on Gneiss bedrock, a minimum of 12 inches of crushed stone or DGA should be provided beneath the floor slab for drainage and to act as a cushion on the rock. Sump pits and pumps are recommended where basements are planned.

Settlement

Settlement of individual footings, designed in accordance with recommendations presented in this report, is expected to be within tolerable limits for the proposed structure. For footings placed on natural soils or new compacted fill approved by Carlin-Simpson & Associates and constructed in accordance with the requirements outlined in this report, maximum total settlement is expected to be on the order of 1/2-inch or less. Maximum differential settlement between adjacent columns or load bearing walls is expected to be half the total settlement.

The above settlement values are based on our engineering experience with similar soil conditions and the anticipated structural loading, and are to guide the Structural Engineer with his design. To minimize difficulties during the foundation installation phase, it is critical that Carlin-Simpson & Associates be retained to observe the foundation bearing surfaces and to confirm the recommended bearing pressures and that the existing fill and unsuitable materials have been removed from beneath the new foundations.

Foundation Walls

In the event that foundation walls are required, the soil adjacent to the building walls will exert a horizontal pressure against the walls. This pressure is based on the soil density and Coefficient of Earth Pressure at Rest (k_o), which is applicable to non-yielding building walls. We estimate that the backfill material will have an in-place (moist) density of about 130 pcf and a k_o of 0.5. Based on these properties, the soil will produce an Equivalent Fluid Pressure of 65 pcf against the building walls.

For sliding, the coefficient of friction between concrete and the virgin site soils or new structural fill is 0.45. For clean sound rock, a friction coefficient of 0.55 can be used. Where passive lateral earth pressure is to be included in the design of the wall, a design value of 195 psf/ft may be used. This is based on a Coefficient of Passive Earth Pressure (k_p) of 3.0, an in-place soil backfill density of 130 pcf, and a factor of safety of 2.0.

Where foundation walls are required, we recommend that a footing drain be placed around the exterior of the new structure to prevent water from accumulating against the foundation wall. This drain may consist of a minimum four (4) inch diameter, rigid wall perforated PVC pipe surrounded by at least 12 inches of 3/4-inch clean crushed stone. The stone shall be wrapped in a geotextile fabric, Mirafi 140N or equivalent. The foundation drainpipe should be extended to daylight or to the stormwater collection system. The outside face of the foundation wall, where it extends below grade, must be damp proofed or waterproofed.

The foundation walls should be backfilled with suitable structural fill placed in layers up to one (1) foot in loose thickness. The new fill should be compacted with a vibratory drum trench compactor (i.e. Wacker Model RT560), a heavy vibratory plate tamper (i.e. Wacker BPU 3545A or equivalent) or “jumping jack” style tamper (i.e. Wacker Model BS 600) to at least 92% of its Maximum Modified Dry Density (ASTM D1557). Heavy equipment should not be operated near the wall as damage to the wall could occur.

Outside the structure, the backfill placed adjacent to the foundation walls and above the footing drain shall consist of either clean crushed stone or an imported sand and gravel mixture containing less than 10% by weight passing a No. 200 sieve and placed in layers not exceeding one (1) foot in thickness. This clean sand and gravel or crushed stone backfill shall extend a minimum of one (1) foot horizontally from the back face of the foundation walls, and shall extend vertically up the wall face to two (2) feet below the finished ground surface elevation.

Beyond this point, the foundation walls should be backfilled with suitable soil placed in layers up to one (1) foot in thickness. The new fill should be compacted with a vibratory drum trench compactor (i.e. Wacker Model RT560), a heavy vibratory plate tamper (i.e. Wacker BPU 3545A or equivalent), or "jumping jack" style tamper (i.e. Wacker Model BS 600) to at least 92% of its Maximum Modified Dry Density (ASTM D1557). Heavy equipment should not be operated near the walls as damage to the walls could occur. Material excavated from the cut areas on site will be suitable for reuse as compacted fill, provided that it remains relatively dry enough to be adequately compacted to the required density and does not contain any debris or organic material (i.e. topsoil and roots).

Seismic Design Considerations

From site-specific test boring data, the Site Class was determined from Table 1615.1.1 of the New York State Building Code. The site-specific data used to determine the Site Class typically includes soil test borings to determine Standard Penetration resistances (N-values). Based on the average N-values in the upper 100 feet of soil profile, the site can be classified as Site Class C – Very Dense Soil and Soft Rock Profile.

New structures should be designed to resist stress produced by lateral forces computed in accordance with Section 1615 of the New York State Building Code. The values in Table 2 shall be used for this project. Based on the information obtained from the borings, it is our opinion that the potential for liquefaction of the native soils at the site due to earthquake activity is relatively low.

Table 2 – Seismic Design Parameter Values

Mapped Spectral Response Acceleration for Short Periods, [Fig 1615 (1)]	S_S=0.347g
Mapped Spectral Response Acceleration at 1-Second Period, [Fig 1615 (2)]	S_{S1}=0.070g
Site Coefficient [Table 1615.1.2 (1)]	F_a=1.20
Site Coefficient [Table 1615.1.2 (2)]	F_v=1.70
Max Considered Earthquake Spectral Response for Short Periods [Eq 16-16]	S_{MS}=0.416g
Max Considered Earthquake Spectral Respond at 1-Second Period [Eq 16-17]	S_{M1}=0.119g
Design Spectral Response Acceleration for Short Periods [Eq 16-18]	S_{DS}=0.278g
Design Spectral Response Acceleration for 1-Second Period [Eq 16-19]	S_{D1}=0.079g

Site Retaining Walls

In order to develop the site, retaining walls will be required in areas. The site retaining walls may be designed as either cast-in-place steel reinforced concrete walls or geogrid reinforced modular block (MSE) walls. The preliminary site plans show five (5)

retaining walls. The maximum exposed height of these walls ranges from approximately seven (7) feet to 12 feet but the top and bottom wall elevations were not finalized at the time of this report.

The following recommendations are preliminary in nature based on the boring and test pit data from other areas of the project site during this investigation. The recommendations below are intended for planning purposes only and are not intended for final design and construction. A supplemental subsurface investigation is required for the proposed retaining walls so that additional design recommendations can be provided.

In the event that existing fill materials are present within the proposed wall areas, these materials must be completely removed from the limits of new wall construction. The removal of the topsoil or other unsuitable fill materials shall extend horizontally a minimum distance of five (5) feet beyond the front face of the new wall or extend horizontally a minimum distance equivalent to the vertical depth of the required excavation below the proposed wall base or foundation bearing elevation, whichever is greater. This is required to ensure that all unsuitable material has been removed from beneath the wall base or foundation zone of influence, which shall be defined by an imaginary plane projecting downward and away from the front edge of the wall base or foundation on a one horizontal to one vertical (1H:1V) projection.

The foundations for the new retaining wall may be placed on the virgin soil, weathered bedrock, or on new compacted fill approved by Carlin-Simpson & Associates. New compacted fill shall consist of either suitable on-site soil or imported sand and gravel. Imported fill shall contain less than 20% by weight passing the No. 200 sieve. The fill shall be placed in one (1) foot thick loose layers and compacted to at least 95% of its Maximum Modified Dry Density. Preliminarily, the footings or base of the wall can be designed using a net design bearing pressure of 4,000 psf (2.0 TSF).

For MSE walls, the wall base or foundation must be adequately embedded for internal and global stability. The embedment depth will be determined by the Wall Design Engineer. For reinforced concrete walls, the footing or base of the wall shall bear at least 42 inches below finished grade of the outside face of the wall for protection from frost. The wall foundation or base may bear at shallower depths when installed directly on the bedrock since rock is not susceptible to frost. Where both soil and rock are encountered within the wall foundation or base excavation, the “Special Construction Procedures” discussed above for the building foundations must be utilized.

Drains must be provided behind the retaining walls to prevent the buildup of hydrostatic pressure against the walls. The drain should consist of a 4-inch diameter perforated PVC pipe, surrounded with 3/4-inch clean crushed stone and wrapped in a geotextile fabric, Mirafi 140N or equivalent. The drain should be installed behind the base or foundation of the retaining wall to collect the water behind the wall and be connected into the site stormwater collection system or extended to daylight beyond the wall area.

Backfill placed directly behind the retaining walls shall consist of either suitable on-site soil or imported sand and gravel containing less than 20% by weight passing a No. 200 sieve. Each layer shall be compacted using a hand guided mechanical tamper to 92% of its

Maximum Modified Dry Density (ASTM D1557). Excessive compaction adjacent to the retaining walls must be avoided. Layers shall be tested and approved before placing subsequent layers. Large compaction equipment must not be used within ten (10) feet of the new walls to prevent potential damage to the walls.

The soil adjacent to the site retaining walls will exert a horizontal pressure against the walls. This pressure is based on the soil density and the Coefficient of Active Earth Pressure (k_a). We estimate that the backfill material will have an in-place (moist) density of about 130 pcf and an angle of internal friction (ϕ) of 30^o. For design, soil cohesion is assumed to be zero for the foundation soil, retained soil, and reinforced backfill. The active earth pressure coefficient (k_a) is 0.33 provided the grade behind the wall is level. Based on these properties, the retained soil will produce an Equivalent Fluid Pressure of 42.9 pcf against the retaining walls. If a sloping grade exists behind the new walls, the k_a and the Equivalent Fluid Pressure must be adjusted accordingly. In addition, any surcharge loads from structures, vehicles, or other retaining walls (i.e. tiered walls) must be considered in the wall design.

For sliding, the friction coefficient between mass concrete and the virgin site soils or new compacted fill is 0.45. For clean sound rock, a friction coefficient of 0.55 can be used. Where passive lateral earth pressure is to be included in the design of the wall, a maximum design value of 195 psf/ft may be used. This is based on a Coefficient of Passive Earth Pressure (k_p) of 3.0, an in-place soil backfill density of 130 pcf, and a factor of safety of 2.0.

The Wall Design Engineer shall prepare a complete wall design (i.e. drawings, specifications, and calculations), which shall be designed and sealed by a Professional Engineer registered in the State of New York and submitted to Carlin-Simpson & Associates for review and approval. MSE retaining walls shall be designed in accordance with the recommendations of the NCMA Design Manual for Segmental Retaining Walls (Current Edition).

The MSE wall design shall consider the internal stability of the reinforced soil mass and shall be in completed accordance with acceptable engineering practice. In addition, external stability, including sliding, overturning, and bearing, as well as global slope stability shall be evaluated in accordance with acceptable engineering practice.

The MSE Wall Designer Engineer shall be responsible for determining the required geogrid reinforcement lengths and elevations based on his stability analysis (including global stability) and the properties of the geogrid reinforcement used in the design. We anticipate that in the critical areas of the wall, global stability will be the controlling design criteria for the design of the geogrid reinforcement.

Stormwater Management Areas

We understand that the planned development will include one or more stormwater management areas. The preliminary grading plan shows a proposed infiltration basin with a forebay in the western portion of the project site. The plan also indicates that the basin will have a bottom elevation at +610.0. We also understand that there is an alternate stormwater

management area in the southwestern portion of the site, near the proposed fairway residences building. In addition, stormwater management areas will likely be required throughout the golf course property. However, at the time this report was prepared, the proposed stormwater management system had not been designed and the location, grades, and invert elevations of the system had not been finalized.

During this study, four (4) borings, one (1) test pit, one (1) borehole permeability test, and four (4) percolation tests were performed within or near the planned stormwater management areas. An addition ten (10) test pits (TP-19 through TP-28) were excavated at potential stormwater management areas throughout the golf course property. The tests were performed at the locations shown on the attached Boring and Test Pit Location Plan. The proposed test depths were provided by the project Site Engineer. The test depths were modified, however, based on the depth to bedrock encountered at the test locations.

The soil conditions encountered within the proposed infiltration basin area consist of a surface layer of topsoil (Stratum 1), approximately 0’6” to 0’9” in thickness, followed by existing fill (Stratum 2) in boring B-6. Below the topsoil and fill is virgin soil that consists of layers of Sandy Silt, Silty Sand, Sandy Gravel, Gravelly Sand, or Silty Gravelly Sand (Strata 3 and 4) followed by Gneiss bedrock (Stratum 5). Bedrock was encountered in the proposed infiltration basin area at depths ranging from 2’8” to 8’6” beneath the ground surface. These depths correspond to bedrock elevations ranging between elevation +611.5 and elevation +617.3, which is above the proposed bottom elevation of the infiltration basin.

In the alternate stormwater management area, the topsoil was underlain by approximately 5’6” of existing fill (Stratum 2) followed by layers of Sandy Silt and Silty Sand (Stratum 3). Groundwater was encountered in this portion of the site at depths ranging from 0’6” to 3’3” below the ground surface, which corresponds to groundwater levels ranging from approximately elevation +608.3 to elevation +613.2.

The subsurface soil and groundwater conditions encountered in the potential stormwater management areas throughout the golf course property vary across the site. The boring and test pit observations are summarized in Table 1 above.

In December 2012 and January 2013, permeability tests were performed within the proposed stormwater management areas. One (1) borehole permeability test (BP-4) and four (4) percolation tests (P-1 through P-4) were performed. The infiltration rates at the test locations are summarized in Table 3 below.

Table 3 – Field Permeability Test Results

Permeability Test No.	Permeability Test Depth (Elevation)	Permeability Rate	Soil Description
BP-4	7’0” (+621.0)	2.4 in/hour	Brown coarse to fine SAND, little Silt, some (+) coarse to fine Gravel
P-1	3’6” (+616.5)	>20 in/hour	Brown coarse to fine GRAVEL and, coarse to fine Sand, trace Silt
P-2	1’8” (+610.3)	NR	*Groundwater encountered 0’6” below the ground surface*

Permeability Test No.	Permeability Test Depth (Elevation)	Permeability Rate	Soil Description
P-3	2’8” (+613.3)	>20 in/hour	Brown coarse to fine SAND, some Silt, and (-) coarse to fine Gravel
P-4	2’0” (+613.0)	NR	*Groundwater encountered 1’10” below the ground surface*

NR – Not Recorded

Based on the field tests, the virgin soil in the areas of tests P-1 and P-3 has a permeability rate that exceeds 20 inches per hour. However, these tests were performed at elevations of +616.5 and +613.3, which are approximately 6’6” and 3’3” higher than the planned bottom of the proposed infiltration basin. Bedrock was encountered at depths of 4’9” (+615.3) and 5’6” (+611.5) below the surface at these test locations. In the event the virgin soil in the areas of tests P-1 and P-3 can be utilized for the stormwater management system, a permeability rate of 10 inches per hour should be used for preliminary design. This design permeability rate includes a factor of safety of 2.0.

Field permeability tests could not be performed at test locations P-2 and P-4 during this study since groundwater was encountered at depths of 0’6” (+611.5) and 1’10” (+613.2) below the ground surface, respectively. Should stormwater management areas be planned in other portions of the site, they must be evaluated on a case-by-case basis.

The stormwater management system should be designed in accordance with the applicable New York State Department of Conservation (NYSDEC) regulations and the New York State Stormwater Management Design Manual (August 2010). The testing requirements are outlined in Appendix D of the manual. The testing that was performed during this preliminary study was for initial feasibility testing for the stormwater management areas. Therefore, additional testing within the proposed subsurface system areas will be required to confirm the soil conditions and infiltration rates at the bottom of the system and to finalize the design of the system.

Pavement

We understand that the proposed construction will also include new asphalt paved driveways and parking areas. Based on the preliminary grading plan provided to this office, cuts ranging up to approximately 6’0” and fills ranging up to approximately 8’0” are anticipated to achieve the proposed pavement subgrade elevations. To prepare the new pavement areas, the existing surface materials (i.e. topsoil, vegetation, asphalt, etc.) must be removed from the planned pavement areas.

After all surface materials have been removed; the exposed subgrade that is either at or below the planned subgrade elevation shall be proofrolled with a large vibratory drum roller (i.e. Dynapac 250 or equivalent) to densify the underlying soils. The on-site representative from Carlin-Simpson & Associates shall witness the proofrolling operation. If any excessive movement is noted during the proofrolling, the soft or unsuitable soil shall be removed and replaced with new compacted fill.

Areas where existing fill is encountered shall be compacted in place. Carlin-Simpson & Associates must evaluate these areas for the presence of soft or unsuitable material within the existing fill matrix. Portions of this fill may have to be removed and replaced with new compacted fill. Carlin-Simpson & Associates will determine this during construction.

Where new fill is required to achieve final grades, it shall consist of either suitable on-site soil or imported sand and gravel. Imported sand and gravel shall contain less than 20% by weight passing a No. 200 sieve. New fill shall be placed in layers not exceeding one (1) foot in loose thickness and each layer shall be compacted to at least 92% of its Maximum Modified Dry Density (ASTM D1557). After the planned subgrade has been proofrolled and new compacted fill has been placed as required, the new pavement subbase may be placed on the existing site soils and new compacted fill.

When new fill is placed on a sloped subgrade, the fill layers must be benched a minimum of three (3) feet into the existing embankment. Fill layers shall be placed in horizontal layers, beginning at the base of the slope. End dumping over the top of a slope is not permitted.

The new pavement subbase may be placed on engineer-approved densified existing fill, virgin soil, or new compacted fill. A minimum of six (6) inches of dense graded aggregate (DGA) is recommended for the subbase layer for drainage and additional pavement support. We recommend that the following pavement sections be used for the parking lots and driveways. These pavement sections are subject to local government approval.

<u>Parking Lots (Light Duty)</u>

1 ½”	Asphalt Wearing Surface Course	NYSDOT, Type 6F
2”	Asphalt Base Course	NYSDOT, Type 1
6”	Stone Subbase (DGA)	NYSDOT, Type 4
	Approved Compacted Subgrade (Minimum CBR = 10)	

<u>Driveways (Medium Duty)</u>

1 ½”	Asphalt Wearing Surface Course	NYSDOT, Type 6F
2 ½”	Asphalt Base Course	NYSDOT, Type 1
8”	Stone Subbase (DGA)	NYSDOT, Type 4
	Approved Compacted Subgrade (Minimum CBR = 10)	

Based on the boring and test pit data, we anticipate that the existing site soils and new compacted fill will provide a CBR value that is equal to or greater than 10, which can adequately support the above pavement sections.

<u>Utilities</u>

New utilities may bear in the virgin soil, existing fill, new compacted fill, weathered rock, or rock. The bottom of all trenches should be excavated clean so a hard bottom is provided for pipe support. If any soft areas or unsuitable existing fill conditions are

encountered during the construction operation, these materials must be removed and replaced with new compacted fill.

In the event that the trench bottom becomes soft due to the inflow of surface or trapped water, the soft soil shall be removed and the excavation filled with a minimum of six (6) inches of 3/4-inch clean crushed stone to provide a firm base for support of the pipe. Sump pits and pumps should be adequate to keep the excavations dry.

After the utility is installed, the trench must be backfilled with compacted fill. The fill shall consist of suitable on-site soil or imported sand and gravel containing less than 20% by weight passing a No. 200 sieve. Large rock fragments must not be placed directly against the pipe. Controlled compacted fill shall be placed in one (1) foot loose layers and each layer shall be compacted to at least 92% of its Maximum Modified Dry Density (ASTM D1557). The backfill must be free of topsoil, debris and large boulders or rock fragments.

Temporary Construction Excavations

Temporary construction excavations shall be conducted in accordance with the most recent OSHA guidelines or applicable federal, state, or local codes. Based on the results of the borings and test pits, we believe the site soils and rock would have the following classifications as defined by OSHA guidelines.

Soil/Rock Type	Possible Classification
On Site Fill	Type "C"
Virgin Sandy Soils	Type "B" or "C"
Weathered or Intact Bedrock	Type "A" or Stable Rock

Further evaluation of the site soil deposits will be required in the field by a qualified person at the time of the excavation to determine the proper OSHA classification and allowable slope configuration. Temporary support (i.e. sheeting and shoring) should be used for any excavation that cannot be sloped or benched in accordance with the applicable regulations.

Suitability of the In-Situ Soils for Use as Compacted Fill

The suitability of each soil stratum for use as compacted fill is discussed below.

Stratum 1
Topsoil
Topsoil is not suitable for use as compacted fill. During construction, it may be stockpiled on site for later use in the landscaped areas or removed from the site.

Stratum 2
Existing Fill
The existing fill that was encountered at the site generally consists of brown coarse to fine Sand, little (to and) Silt, trace (to some) coarse to fine Gravel with occasional cobbles, boulders, topsoil, roots, and debris. Some of the existing fill may be suitable for use as compacted fill at the site

provided that it remains relatively dry for optimum compaction and that any debris (i.e. concrete, wood, etc.) and organic material (i.e. topsoil, roots, etc.) have been removed prior to its reuse.

<u>Strata 3 & 4</u>
Sandy Silt, Silty Sand, Sand, or Sandy Gravel

The virgin site soils that may be excavated during construction consist of layers of Sandy Silt, Silty Sand, Sand or Sandy Gravel with occasional cobbles and boulders. This material is generally suitable for use as compacted fill, provided that it remains relatively dry for optimum compaction. Large cobbles and boulders shall not be used as new structural fill in the proposed building areas or in utility trenches.

<u>Stratum 5</u>
Gneiss Bedrock

Excavated rock may also be used as fill material for the building and paved areas provided that the material conforms to the required gradation, is well-graded, and has been approved prior to use by Carlin-Simpson & Associates. All rock fill must be well blended with smaller rock fragments and/or soil. Open voids within the rock fill matrix must be avoided. Small boulders up to 24 inches in diameter may be placed in parking lot fills deeper than ten (10) feet below the finished pavement. Boulders must not be clustered and must be sufficiently surrounded with soil fill. We recommend that the boulders and excavated rock be processed by a crusher to provide suitable fill material for the building and pavement areas.

Rock fill shall be placed in 12-inch loose layers and compacted with multiple passes of a large vibratory roller to a firm and non-yielding state as determined by the on-site representative from Carlin-Simpson & Associates. Rock fill should not be used where it will interfere with the installation of foundations or utilities. Also, it shall not be used as backfill directly against concrete walls or utilities. Use of rock fill within the planned building and pavement areas shall be limited to the gradations limitations provided in Table 4 below.

<u>Table 4 - Gradation Limitations for Rock Fill</u>

Area	Location	Maximum Particle Size
Building Area	Within 4 feet of Finished Floor	3 inches
	More than 4 feet below Finished Floor	12 inches
Pavement Area	Within 4 feet of Finished Grade	6 inches
	More than 4 feet below Finished Grade	18 inches
	More than 10 feet below Finished Grade	24 inches

Proper moisture conditioning of the soil will be required. In the event that the on-site material is too wet at the time of placement and cannot be adequately compacted, the soil should be aerated and allowed to dry or the material removed and a drier cleaner fill material used. In the event that the on-site material is too dry at the time of placement and cannot be adequately compacted, water may be needed to increase the soil moisture content for proper compaction.

The in-situ soils which exist throughout the site may become soft and weave if exposed to excessive moisture and construction traffic. The instability will occur quickly when exposed to these elements and it will be difficult to stabilize the subgrade. We recommend that adequate site drainage be implemented early in the construction schedule and if the subgrade becomes wet, the Contractor should limit construction activity until the soil has dried.

GENERAL

The findings, conclusions and recommendations presented in this report represent our professional opinions concerning subsurface conditions at the site. The opinions presented are relative to the dates of our site work and should not be relied on to represent conditions at later dates or at locations not explored. The opinions included herein are based on information provided to us, the data obtained at specific locations during the study and our past experience. If additional information becomes available that might impact our geotechnical opinions, it will be necessary for Carlin-Simpson & Associates to review the information, reassess the potential concerns, and re-evaluate our conclusions and recommendations. Additional subsurface exploration may be required.

Regardless of the thoroughness of a geotechnical exploration, there is the possibility that conditions between borings and test pits will differ from those encountered at specific boring or test pit locations, that conditions are not as anticipated by the designers and/or the contractors, or that either natural events or the construction process have altered the subsurface conditions. These variations are an inherent risk associated with subsurface conditions in this region and the approximate methods used to obtain the data. These variations may not be apparent until construction.

The professional opinions presented in this geotechnical report are not final. Field observations and foundation installation monitoring by the geotechnical engineer, as well as soil density testing and other quality assurance functions associated with site earthwork and foundation construction, are an extension of this report. Therefore, Carlin-Simpson & Associates should be retained by the Owner to observe all earthwork and foundation construction, to document that the conditions anticipated in this study actually exist, and to finalize or amend our conclusions and recommendations Carlin-Simpson & Associates is not responsible or liable for the conclusions and recommendations presented in this report if Carlin-Simpson & Associates does not perform these observation and testing services.

Therefore, in order to preserve continuity in this project, the Owner must retain the services of Carlin-Simpson & Associates to provide full time geotechnical related monitoring and testing during construction. At a minimum, this shall include the observation and testing of the following: 1) the removal of existing fill and unsuitable soil, where required; 2) the proofrolling of the subgrade soil prior to the placement of new compacted fill; 3) the placement and compaction of controlled fill; 4) the excavation for the building foundations; 5) the preparation of the subgrade for the floor slabs and pavement areas; and 6) the construction of the proposed retaining walls.

This report has been prepared in accordance with generally accepted geotechnical engineering practice. No other warranty is expressed or implied. The evaluations and

recommendations presented in this report are based on the available project information, as well as on the results of the exploration. Carlin-Simpson & Associates should be given the opportunity to review the final drawings and site plans for this project to determine if changes to the recommendations outlined in this report are needed. Should the nature of the project change, these recommendations should be re-evaluated.

This report is provided for the exclusive use of Brynwood Partners, LLC and the project specific design team and may not be used or relied upon in connection with other projects or by other third parties. Carlin-Simpson & Associates disclaims liability for any such third party use or reliance without express written permission. Use of this report or the findings, conclusions or recommendations by others will be at the sole risk of the user. Carlin-Simpson & Associates is not responsible or liable for the interpretation by others of the data in this report, nor their conclusions, recommendations or opinions.

If the conditions encountered during construction vary significantly from those stated in this report, this office should be notified immediately so that additional recommendations can be made.

Thank you for allowing us to assist you with this project. Should you have any questions or comments, please contact this office.

Very truly yours,

CARLIN-SIMPSON & ASSOCIATES

MEREDITH R. ANKE, P.E.
Project Engineer

Robert Simpson

ROBERT B. SIMPSON, P.E.

File No. 12-175

CARLIN - SIMPSON & ASSOCIATES Sayreville, NJ	TEST BORING LOG	BORING NUMBER B-1

Project:	Proposed Renovations, Byrnwood Club Development, North Castle, NY	SHEET NO.:	1 of 1
Client:	JBM Realty	JOB NUMBER:	12-175
Drilling Contractor:	General Borings, Inc.	ELEVATION:	+661.0

GROUNDWATER					CASING	SAMPLE	CORE	TUBE	DATUM:	
DATE	TIME	DEPTH	CASING	TYPE	HSA	SS			START DATE:	18 Dec 12
No water encountered				DIA.	3 1/4"	1 3/8"			FINISH DATE:	18 Dec 12
				WGHT		140#			DRILLER:	T. McGovern
				FALL		30"			INSPECTOR:	JB

Depth (ft.)	Casing Blows per Foot	Sample No.	Blows on Sample Spoon per 6"	Sym	IDENTIFICATION	REMARKS
			7		**Clay Tennis Court** 0'6"	
1		S-1	9		Br $ a (+), cf S, l (-) mf G	Rec = 17"
			12			moist
2			14			
			19		same	
3		S-2	23		**Brown SILT and (+), coarse to fine**	Rec = 15"
			50/3"		**Sand, little (-) medium to fine Gravel**	moist
4						possible weathered rock in tip
5					5'0"	
			29		Br cf S, l (+) $ (completely weathered gneiss)	
6		S-3	75/4"			Rec = 6"
					Brown coarse to fine SAND, little (+)	moist
7					**Silt (completely weathered Gneiss)**	
		S-4	70/3"			Rec = 3"
8					8'0"	moist
					End of Boring @ 8'0"	Auger refusal @ 8'0"
9						
10						
11						
12						
13						
14						
15						
16						
17						
18						
19						
20						
21						
22						

CARLIN - SIMPSON & ASSOCIATES Sayreville, NJ	TEST BORING LOG	BORING NUMBER B-2

Project:	**Proposed Renovations, Byrnwood Club Development, North Castle, NY**	**SHEET NO.:**	1 of 1
Client:	**JBM Realty**	**JOB NUMBER:**	12-175
Drilling Contractor:	**General Borings, Inc.**	**ELEVATION:**	+628.0

GROUNDWATER					CASING	SAMPLE	CORE	TUBE		
DATE	**TIME**	**DEPTH**	**CASING**	**TYPE**	HSA	SS			**DATUM:**	
No water encountered				**DIA.**	3 1/4"	1 3/8"			**START DATE:**	18 Dec 12
				WGHT		140#			**FINISH DATE:**	18 Dec 12
				FALL		30"			**DRILLER:**	T. McGovern
									INSPECTOR:	JB

Depth (ft.)	Casing Blows per Foot	Sample No.	Blows on Sample Spoon per 6"	Sym	IDENTIFICATION	REMARKS
			2		**Topsoil** 0'6"	
1		**S-1**	3		Br $ a (+), cf S, t mf G	Rec = 15"
			2			moist
2			2			
			3		same	
3		**S-2**	9			Rec = 16"
			11		**Brown SILT and (+), coarse to fine**	moist
4			15		**Sand, trace medium to fine Gravel**	
5						
			10		same	
6		**S-3**	12			Rec = 17"
			16			moist
7			50/3"		7'0"	weathered rock in tip
					End of Boring @ 7'0"	Auger refusal @ 7'0"
8						
9						
10						
11						
12						
13						
14						
15						
16						
17						
18						
19						
20						
21						
22						

CARLIN - SIMPSON & ASSOCIATES Sayreville, NJ	TEST BORING LOG	BORING NUMBER B-3

Project:	**Proposed Renovations, Byrnwood Club Development, North Castle, NY**	**SHEET NO.:**	1 of 1
Client:	**JBM Realty**	**JOB NUMBER:**	12-175
Drilling Contractor:	**General Borings, Inc.**	**ELEVATION:**	+620.0

GROUNDWATER					CASING	SAMPLE	CORE	TUBE	DATUM:	
DATE	TIME	DEPTH	CASING	TYPE	HSA	SS			START DATE:	18 Dec 12
No water encountered				DIA.	3 1/4"	1 3/8"			FINISH DATE:	18 Dec 12
				WGHT		140#			DRILLER:	T. McGovern
				FALL		30"			INSPECTOR:	JB

Depth (ft.)	Casing Blows per Foot	Sample No.	Blows on Sample Spoon per 6"	Sym	IDENTIFICATION	REMARKS
			3		**Topsoil** 0'6"	
1		**S-1**	6		Br $ a (-), cf S, t mf G	Rec = 17"
			6		**Brown SILT and (-), coarse to fine**	moist
2			14		**Sand, trace medium to fine Gravel** 2'0"	
		S-2	25/5"		Lt br cf G a, cf S, t $ (completely weathered gneiss)	Rec = 5"
3					**Light brown coarse to fine GRAVEL**	moist
					and, coarse to fine Sand, trace	
4					**Silt (completely weathered Gneiss)**	
			23		Br cf G s, cf S, t $ (completely weathered gneiss)	
5		**S-3**	75/3"		4'9"	Rec = 6"
					End of Boring @ 4'9"	moist
6						Auger refusal @ 4'9"
7						
8						
9						
10						
11						
12						
13						
14						
15						
16						
17						
18						
19						
20						
21						
22						

CARLIN - SIMPSON & ASSOCIATES Sayreville, NJ	TEST BORING LOG	BORING NUMBER B-4

Project:	Proposed Renovations, Byrnwood Club Development, North Castle, NY	SHEET NO.:	1 of 1
Client:	JBM Realty	JOB NUMBER:	12-175
Drilling Contractor:	General Borings, Inc.	ELEVATION:	+628.0

GROUNDWATER					CASING	SAMPLE	CORE	TUBE	DATUM:	
DATE	TIME	DEPTH	CASING	TYPE	HSA	SS			START DATE:	18 Dec 12
No water encountered				DIA.	3 1/4"	1 3/8"			FINISH DATE:	18 Dec 12
				WGHT		140#			DRILLER:	T. McGovern
				FALL		30"			INSPECTOR:	JB

Depth (ft.)	Casing Blows per Foot	Sample No.	Blows on Sample Spoon per 6"	Sym	IDENTIFICATION	REMARKS
			2		**Topsoil** 0'6"	
1		**S-1**	1		Br cf S, a $, t f G	Rec = 14"
			2		**Brown coarse to fine SAND, and**	moist
2			2		**Silt, trace fine Gravel** 2'0"	
			10		Gr cf S t $, a cf G (completely weathered gneiss)	
3		**S-2**	20			Rec = 13"
			45			moist
4			35			weathered rock 3'-4'
5						
			9		Br cf S, l $, s (+) cf G (completely weathered gneiss)	
6		**S-3**	11			Rec = 17"
			13		**Brown coarse to fine SAND, little**	moist
7			10		**Silt, some (+) coarse to fine Gravel**	
			18		same **(completely weathered Gneiss)**	
8		**S-4**	26			Rec = 14"
			30			moist
9			43			
10						
		S-5	75/6"		same 10'6"	Refusal on spoon @ 10'6"
11					**End of Boring @ 10'6"**	
12						
13						
14						
15						
16						
17						
18						
19						
20						
21						
22						

CARLIN - SIMPSON & ASSOCIATES Sayreville, NJ	TEST BORING LOG	BORING NUMBER B-5

Project:	Proposed Renovations, Byrnwood Club Development, North Castle, NY	SHEET NO.:	1 of 1
Client:	JBM Realty	JOB NUMBER:	12-175
Drilling Contractor:	General Borings, Inc.	ELEVATION:	+623.0

GROUNDWATER					CASING	SAMPLE	CORE	TUBE	DATUM:	
DATE	TIME	DEPTH	CASING	TYPE	HSA	SS			START DATE:	18 Dec 12
No water encountered				DIA.	3 1/4"	1 3/8"			FINISH DATE:	18 Dec 12
				WGHT		140#			DRILLER:	T. McGovern
				FALL		30"			INSPECTOR:	JB

Depth (ft.)	Casing Blows per Foot	Sample No.	Blows on Sample Spoon per 6"	Sym	IDENTIFICATION	REMARKS
			2		Br cf S, s (+) $, t f G	
1		S-1	2		**Brown coarse to fine SAND,**	Rec = 17"
			3		**some (+) Silt, trace fine Gravel**	moist
2			13		2'0"	
			22		Br cf S, l $, s cf G	
3		S-2	10			Rec = 17"
			16		**Brown coarse to fine SAND, little**	moist
4			26		**Silt, some coarse to fine Gravel**	weathered rock in tip
					(completely weathered Gneiss)	
5						
			23		same, weathered gneiss	
6		S-3	62			Rec = 18"
			55			moist
7			81			weathered rock
8						
					8'6"	Auger refusal @ 8'6"
9					**End of Boring @ 8'6"**	
10						
11						
12						
13						
14						
15						
16						
17						
18						
19						
20						
21						
22						

CARLIN - SIMPSON & ASSOCIATES Sayreville, NJ	TEST BORING LOG	BORING NUMBER B-6

Project:	**Proposed Renovations, Byrnwood Club Development, North Castle, NY**	**SHEET NO.:**	1 of 1
Client:	**JBM Realty**	**JOB NUMBER:**	12-175
Drilling Contractor:	**General Borings, Inc.**	**ELEVATION:**	+617.0

GROUNDWATER					CASING	SAMPLE	CORE	TUBE	DATUM:	
DATE	TIME	DEPTH	CASING	TYPE	HSA	SS			START DATE:	19 Dec 12
No water encountered				DIA.	3 1/4"	1 3/8"			FINISH DATE:	19 Dec 12
				WGHT		140#			DRILLER:	T. McGovern
				FALL		30"			INSPECTOR:	KWA

Depth (ft.)	Casing Blows per Foot	Sample No.	Blows on Sample Spoon per 6"	Sym	IDENTIFICATION		REMARKS
			2		**Topsoil**	0'6"	
1		**S-1**	6		FILL (Br cf S, l $)	1'0"	Rec = 10"
			5		**FILL (Brown coarse to fine SAND, little Silt)**		moist
2			10				
			12		Br cf S, s $, a (-) cf G		
3		**S-2**	11				Rec = 11"
			11		same		moist
4			52		**Brown coarse to fine SAND, some Silt, and (-) coarse to fine Gravel**		
5							
		S-3	75/2"			5'6"	No recovery
6					**End of Boring @ 5'6"**		Auger refusal @ 5'6"
7							
8							
9							
10							
11							
12							
13							
14							
15							
16							
17							
18							
19							
20							
21							
22							

CARLIN - SIMPSON & ASSOCIATES Sayreville, NJ	TEST BORING LOG	BORING NUMBER B-7

Project:	Proposed Renovations, Byrnwood Club Development, North Castle, NY	SHEET NO.: 1 of 1
Client:	JBM Realty	JOB NUMBER: 12-175
Drilling Contractor:	General Borings, Inc.	ELEVATION: +628.0

GROUNDWATER					CASING	SAMPLE	CORE	TUBE	
DATE	TIME	DEPTH	CASING	TYPE	HSA	SS			DATUM:
No water encountered				DIA.	3 1/4"	1 3/8"			START DATE: 19 Dec 12
				WGHT		140#			FINISH DATE: 19 Dec 12
				FALL		30"			DRILLER: T. McGovern
									INSPECTOR: KWA

Depth (ft.)	Casing Blows per Foot	Sample No.	Blows on Sample Spoon per 6"	Sym	IDENTIFICATION	REMARKS
			2		**Topsoil** 0'6"	
1		S-1	4		Br cf S, l $,l f G	Rec = 18"
			4			moist
2			5			
			13		same	
3		S-2	28		**Brown coarse to fine SAND,**	Rec = 17"
			21		**little Silt, little fine Gravel**	moist
4			22			
5					5'0"	
			12		Br cf S, l $, t f G (completely weathered gniess)	
6		S-3	14			Rec = 15"
			19			moist
7			28		**Brown coarse to fine SAND, little**	very dense augering 7'-10'
					Silt, trace fine Gravel (completely	
8					**weathered Geniss)**	
9						
10						
			75		same	
11		S-4	50/3"			Rec = 6"
						moist
12						very dense augering 10'-15'
13						
14						
15						
		S-4	50/2"		same 15'2"	No recovery
16					**End of Boring @ 15'2"**	Spoon bouncing @ 15'2"
17						
18						
19						
20						
21						
22						

CARLIN - SIMPSON & ASSOCIATES Sayreville, NJ	TEST BORING LOG	BORING NUMBER B-8

Project:	Proposed Renovations, Byrnwood Club Development, North Castle, NY	SHEET NO.:	1 of 1
Client:	JBM Realty	JOB NUMBER:	12-175
Drilling Contractor:	General Borings, Inc.	ELEVATION:	+609.0

GROUNDWATER					CASING	SAMPLE	CORE	TUBE		
DATE	TIME	DEPTH	CASING	TYPE	HSA	SS			DATUM:	
19 Dec 12	1130	3'3"	None	DIA.	3 1/4"	1 3/8"			START DATE:	19 Dec 12
				WGHT		140#			FINISH DATE:	19 Dec 12
				FALL		30"			DRILLER:	T. McGovern
									INSPECTOR:	KWA

Depth (ft.)	Casing Blows per Foot	Sample No.	Blows on Sample Spoon per 6"	Sym	IDENTIFICATION	REMARKS
			2		**Brown Topsoil** 0'6"	
1		S-1	4		FILL (Br cf S, a $, t cf G)	Rec = 4"
			8			moist
2			7			
			10		FILL (same)	
3		S-2	11			No recovery
			11		**FILL (Brown coarse to fine SAND,**	moist
4			13		**and Silt, trace coarse to fine Gravel)**	
5						
			13		FILL (same) 5'6"	
6		S-3	8		Mtld gr, or br Cy $ s, cf S, w/t roots	Rec = 18"
			7		**Mottled gray, orange brown Clayey**	moist
7			8		**SILT some, coarse to fine Sand, with** 7'0"	
			8		**roots**	
8		S-4	8		Gr br cf S, s (+) $, l cf G	Rec = 15"
			7			wet
9			8		**Gray brown coarse to fine SAND,**	
					some (+) Silt, little coarse to fine	
10					**Gravel**	
			15		same, l cf G	
11		S-5	25			Rec = 16"
			26			wet
12			35		12'0"	
					End of Boring @ 12'0"	
13						
14						
15						
16						
17						
18						
19						
20						
21						
22						

CARLIN - SIMPSON & ASSOCIATES Sayreville, NJ	TEST BORING LOG	BORING NUMBER B-9

Project:	Proposed Renovations, Byrnwood Club Development, North Castle, NY	**SHEET NO.:**	1 of 1
Client:	JBM Realty	**JOB NUMBER:**	12-175
Drilling Contractor:	General Borings, Inc.	**ELEVATION:**	+674.0

GROUNDWATER					CASING	SAMPLE	CORE	TUBE	DATUM:	
DATE	TIME	DEPTH	CASING	TYPE	HSA	SS			START DATE:	19 Dec 12
No water encountered				DIA.	3 1/4"	1 3/8"			FINISH DATE:	19 Dec 12
				WGHT		140#			DRILLER:	T. McGovern
				FALL		30"			INSPECTOR:	KWA

Depth (ft.)	Casing Blows per Foot	Sample No.	Blows on Sample Spoon per 6"	Sym	IDENTIFICATION	REMARKS
			8		**Clay Tennis Court** 0'6"	
1		S-1	8		FILL (Br cf S, s $, s (+) cf G)	Rec = 17"
			8			moist
2			17			
			17		FILL (same)	
3		S-2	12			Rec = 15"
			7		**FILL (Brown coarse to fine Sand,**	moist
4			13		**some Silt, some (+) coarse to fine**	
					Gravel)	
5						
			10		FILL (Br cf S, s $, l cf G)	
6		S-3	4			Rec = 15"
			5			moist
7			11		7'0"	
		S-4	50/3"		**Highly to moderately weathered** 7'6"	Rec = 3"
8					**Gneiss**	moist
					Eknd of Boring @ 7'6"	Auger refusal @ 7'0"
9						
10						
11						
12						
13						
14						
15						
16						
17						
18						
19						
20						
21						
22						

CARLIN - SIMPSON & ASSOCIATES Sayreville, NJ	TEST BORING LOG	BORING NUMBER B-10
Project: Proposed Renovations, Byrnwood Club Development, North Castle, NY		SHEET NO.: 1 of 1
Client: JBM Realty		JOB NUMBER: 12-175
Drilling Contractor: General Borings, Inc.		ELEVATION: +638.8

GROUNDWATER					CASING	SAMPLE	CORE	TUBE	DATUM:
DATE	TIME	DEPTH	CASING	TYPE	HSA	SS			START DATE: 19 Dec 12
No water encountered				DIA.	3 1/4"	1 3/8"			FINISH DATE: 19 Dec 12
				WGHT		140#			DRILLER: T. McGovern
				FALL		30"			INSPECTOR: JB

Depth (ft.)	Casing Blows per Foot	Sample No.	Blows on Sample Spoon per 6"	Sym	IDENTIFICATION	REMARKS
			2		**Topsoil** 0'1"	
1		S-1	3		Br cf $ s, cf S, l cf G	Rec = 15"
			6		**Brown coarse to fine SILT some, coarse to**	moist
2			50/3"		**fine Sand, little coarse to fine Gravel** 2'0"	Auger refusal @ 2'0"
3						
		Run #1			**Gray, white Gneiss**	Run #1
4						2'0"-7'0"
						Run = 60"
5					5'0"	Rec = 52" = 86%
					Soil seam	RQD = 53%
6					5'8"	
					Gray, white Gneiss	
7					7'0"	
					End of Boring @ 7'0"	
8						
9						
10						
11						
12						
13						
14						
15						
16						
17						
18						
19						
20						
21						
22						

CARLIN - SIMPSON & ASSOCIATES Sayreville, NJ	TEST BORING LOG	BORING NUMBER B-11

Project:	**Proposed Renovations, Byrnwood Club Development, North Castle, NY**	**SHEET NO.:**	1 of 1
Client:	**JBM Realty**	**JOB NUMBER:**	12-175
Drilling Contractor:	**General Borings, Inc.**	**ELEVATION:**	+640.0

GROUNDWATER					**CASING**	**SAMPLE**	**CORE**	**TUBE**		
DATE	**TIME**	**DEPTH**	**CASING**	**TYPE**	**HSA**	**SS**			**DATUM:**	
No water encountered				**DIA.**	**3 1/4"**	**1 3/8"**			**START DATE:**	19 Dec 12
				WGHT		**140#**			**FINISH DATE:**	19 Dec 12
				FALL		**30"**			**DRILLER:**	T. McGovern
									INSPECTOR:	KWA

Depth (ft.)	Casing Blows per Foot	Sample No.	Blows on Sample Spoon per 6"	Sym	IDENTIFICATION	REMARKS
			2		**Topsoil**	
1		S-1	3		0'9"	Rec = 20"
			3		Br cf S, l (+) $	moist
2			7			
			5		same, dk br	
3		S-2	6		**Brown coarse to fine SAND,**	Rec = 17"
			8		**little (+) Silt**	moist
4			23		4'0"	
5					**Completely to highly weathered Gneiss**	
6					5'6"	Auger refusal @ 5'6"
					End of Boring @ 5'6"	
7						
8						
9						
10						
11						
12						
13						
14						
15						
16						
17						
18						
19						
20						
21						
22						

Byrnwood Club Development
Bedford Road
Town of New Castle, NY
(12-175)

3 January 2013

TEST PIT LOGS

TP-1	Elevation +662		
0-0'9"	Brown Topsoil		
0'9"-2'0"	Brown coarse to fine SAND, and Silt, trace (+) medium to fine Gravel	medium dense	moist
2'0"	Gneiss bedrock No water encountered		

TP-2	Elevation +672		
0-1'10"	FILL (Brown coarse to fine SAND, some silt, little (-) coarse to fine Gravel, with topsoil)	medium dense	moist
1'10"-4'4"	Light brown coarse to fine SAND, some (+) Silt	medium dense	moist
4'4"	Gneiss bedrock No water encountered		

TP-3	Elevation +672		
0-0'9"	Dark brown Topsoil with surface debris		
0'9"-2'2"	Brown coarse to fine SAND, some Silt	medium dense	moist
2'2"	Gneiss bedrock No water encountered		

Byrnwood Club Development
Bedford Road
Town of New Castle, NY
(12-175)

3 January 2013

TEST PIT LOGS

TP-4	Elevation +672		
0-0’6”	Brown Topsoil		
0’6”-3’6”	Brown coarse to fine SAND, and (-) Silt, some coarse to fine Gravel	medium dense	moist
3’6”	Gneiss bedrock No water encountered		

TP-5	Elevation +670		
0-0’7”	Brown Topsoil		
0’7”-3’8”	Light brown coarse to fine SAND, some (+) Silt	medium dense	moist
3’8”-4’9”	Brown coarse to fine SAND, some Silt (completely weathered gneiss)	dense	moist
4’9”	Gneiss bedrock No water encountered		

Byrnwood Club Development
Bedford Road
Town of New Castle, NY
(12-175)

3 January 2013

TEST PIT LOGS

TP-6	Elevation +672		
0-0’10”	Brown Topsoil		
0’10”-2’10”	Light brown coarse to fine SAND, some (-) Silt, little coarse to fine Gravel	medium dense	moist
2’10”-4’7”	Brown coarse to fine SAND, some Silt, little coarse to fine Gravel (completely weathered gneiss)	dense	moist
4’7”	Gneiss bedrock No water encountered		

TP-7	Elevation +620		
0-0’9”	Brown Topsoil		
0’9”-2’8”	Brown coarse to fine SAND, some Silt, trace coarse to fine Gravel	medium dense	moist
2’8”	Probable Gneiss bedrock		
	Test pit abandoned No water encountered		

TP-8	Elevation +614		
0-0’8”	Dark brown Topsoil		
0’8”-5’0”	Mottled orange brown, gray coarse to fine SAND, and (-) Silt	medium dense	moist
	Groundwater encountered @ 4’1”	slow inflow	

Byrnwood Club Development
Bedford Road
Town of New Castle, NY
(12-175)

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TEST PIT LOGS

TP-9	Elevation +628		
0-0'4"	Topsoil		
0'4"-6'9"	FILL (Brown coarse to fine SAND, some (+) Silt, some (+) coarse to fine Gravel, with cobbles and boulders)	medium dense	moist
6'9"	FILL (Gray coarse to fine SAND, trace (+) Silt)	medium dense	moist
	Possible cover over for utility Test pit was abandoned		
	No water encountered		

TP-10	Elevation +625		
0-0'4"	Topsoil		
0'4"-3'0"	FILL (Boulders with topsoil)	loose	moist
3'0"-8'0"	Brown coarse to fine SAND, some (+) Silt	medium dense	moist
	No water encountered		

Byrnwood Club Development
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Town of New Castle, NY
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3 January 2013

TEST PIT LOGS

TP-11	Elevation +642		
0-0’6”	Brown Topsoil		
0’6”-3’9”	Brown coarse to fine SAND, some Silt, little coarse to fine Gravel, with occasional cobbles and boulders	medium dense	moist
3’9”-6’0”	Brown coarse to fine SAND, little (+) Silt, some coarse to fine Gravel (completely weathered gneiss)	dense	moist
6’0”	Weathered Gneiss bedrock No water encountered		

TP-12	Elevation +635		
0-0’6”	Brown Topsoil		
0’6”-5’0”	FILL (Brown coarse to fine SAND, some (+) Silt, little (-) coarse to fine Gravel, with trace of debris)	loose	moist
5’0”-6’6”	Orange brown, gray coarse to fine SAND and Silt	dense	moist
	Refusal on boulder No water encountered		

Byrnwood Club Development
Bedford Road
Town of New Castle, NY
(12-175)

4 January 2013

TEST PIT LOGS

TP-13	Elevation +636		
0-0'9"	Brown Topsoil with roots		
0'9"-6'3"	Brown coarse to fine SAND, and Silt, little coarse to fine Gravel	medium dense	moist
6'3"-7'5"	Brown coarse to fine SAND, some (+) Silt, little (-) coarse to fine Gravel	dense	moist
7'5"	Gneiss bedrock		
	Groundwater encountered @ 4'10"	slow inflow	

TP-14	Elevation +625		
0-0'3"	Brown Topsoil		
0'3"-3'4"	FILL (Gray brown coarse to fine SAND, some Silt, little coarse to fine Gravel, with cobbles and boulders)	loose	moist
3'4"-5'0"	FILL (Brown coarse to fine SAND, little Silt)	medium dense	moist
5'0"	Gneiss bedrock No water encountered		

Byrnwood Club Development
Bedford Road
Town of New Castle, NY
(12-175)

4 January 2013

TEST PIT LOGS

TP-15	Elevation +668		
0-0'3"	Brown Topsoil		
0'3"-1'8"	Brown coarse to fine SAND, some (+) Silt, some (-) coarse to fine Gravel, with occasional cobbles and boulders	medium dense	moist
1'8"	Gneiss bedrock No water encountered		

TP-16	Elevation +651		
0-0'8"	Dark brown Topsoil		
0'8"-1'10"	FILL (Brown coarse to fine SAND, some (+) Silt, trace medium to fine Gravel, with cobbles)	medium dense	moist
1'10"-4'10"	Brown coarse to fine SAND, some (+) Silt, trace medium to fine Gravel	medium dense	moist
4'10"	Gneiss bedrock No water encountered		

Byrnwood Club Development
Bedford Road
Town of New Castle, NY
(12-175)

4 January 2013

TEST PIT LOGS

TP-17	Elevation +655		
0-0’3”	Topsoil		
0’3”-1’0”	Brown coarse to fine SAND, some (+) Silt, little coarse to fine Gravel	medium dense	moist
	Encountered irrigation pipes Test pit abandoned No water encountered		

TP-18	Elevation +670		
0-0’10”	Brown Topsoil		
0’10”-7’0”	Brown SILT and, coarse to fine Sand, little (-) medium to fine Gravel	medium dense	moist
	No water encountered		

Brynwood Club Development
Bedford Road
Town of North Castle, NY
(12-175)

13 September 2013

TEST PIT LOGS

TP-19

0-2’5”	FILL (Brown coarse to fine SAND, some Silt, some coarse to fine Gravel, with topsoil, cobbles, boulders)	loose	moist
2’5”-7’0”	Brown coarse to fine SAND, some Silt, little coarse to fine Gravel	medium dense	moist
	No water encountered		

TP-20

0-0’6”	Brown Topsoil		
0’6”-4’3”	Brown, orange brown coarse to fine SAND, some Silt, little coarse to fine Gravel	medium dense	moist
4’3”-8’0”	Orange brown coarse to fine SAND, little (-) Silt, some coarse to fine Gravel, with occasional cobbles	medium dense	moist
	No water encountered		

Brynwood Club Development
Bedford Road
Town of North Castle, NY
(12-175)

13 September 2013

TEST PIT LOGS

TP-21

0-0'6"	Dark brown Topsoil		
0'6"-1'4"	FILL (Brown coarse to fine SAND, some (-) Silt, trace medium to fine Gravel, with few roots)	medium dense	moist
1'4"-7'0"	Brown coarse to fine SAND, little Silt, trace (+) coarse to fine Gravel, with occasional cobbles	medium dense	moist
7'0"	Possible weathered bedrock		
	No water encountered		

TP-22

0-1'6"	Dark brown Topsoil, with roots		
1'6"-2'8"	Mottled gray brown, orange brown Clayey SILT, little medium to fine Sand	medium dense	moist
2'8"-3'6"	Brown coarse to fine SAND, some (+) Silt, little medium to fine Gravel	medium dense	moist
3'6"-6'0"	Brown coarse to fine SAND, little (+) Silt, come coarse to fine Gravel	medium dense	wet
6'0"-7'6"	Gray brown SILT little, coarse to fine Sand, trace medium to fine Gravel	medium dense	wet
	Groundwater encountered @ 4'6"	slow inflow	

Brynwood Club Development
Bedford Road
Town of North Castle, NY
(12-175)

13 September 2013

TEST PIT LOGS

TP-23

0-0’7”	Brown Topsoil		
0’7”-3’10”	Brown coarse to fine SAND, and (-) Silt, little (-) coarse to fine Gravel	dense	moist
3’10”	Weathered bedrock		
	No water encountered		

TP-24

0-0’8”	Brown Topsoil		
0’8”-6’8”	Brown coarse to fine SAND, some (+) Silt, little (-) coarse to fine Gravel, with occasional cobbles	medium dense	moist
6’8”	Possible weathered bedrock or boulder		
	No water encountered		

TP-25

0-0’4”	Brown Topsoil		
0’4”-3’4”	Brown coarse to fine SAND, and Silt, trace medium to fine Gravel	medium dense	moist
3’4”	Possible bedrock or boulder		
	No water encountered		

Brynwood Club Development
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(12-175)

13 September 2013

TEST PIT LOGS

TP-26

0-0'6"	Brown Topsoil		
0'6"-2'8"	FILL (Brown coarse to fine SAND, some (-) Silt, little coarse to fine Gravel, with cobbles and boulders)	medium dense	moist
2'8"-4'0"	FILL (Brown Topsoil, with trace roots)		
4'0"-5'6"	FILL (Dark gray brown Clayey SILT, and, coarse to fine Sand, with trace roots, trace debris)	medium stiff	moist
5'6"-8'0"	Brown coarse to fine SAND, and (-) Silt, trace coarse to fine Gravel	medium dense	moist
	No water encountered		

TP-27

0-0'9"	Brown Topsoil, with roots		
0'9"-4'4"	Light brown coarse to fine SAND, little Silt, trace coarse to fine Gravel	medium dense	dry
4'4"	Probable weathered bedrock		
	No water encountered		

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13 September 2013

TEST PIT LOGS

TP-28

0-0’4”	Brown Topsoil		
0’4”-8‘6”	FILL (Brown coarse to fine SAND, little Silt, little coarse to fine Gravel, with organics, debris)	loose	moist
8’6”-9’0”	FILL (Gray coarse to fine SAND, some Silt, little coarse to fine Gravel, with organics)	medium dense	wet
	Groundwater encountered @ 8’0”		

Byrnwood Club Development
Bedford Road
Town of New Castle, NY
(12-175)

18 -19 December 2012

Borehole Permeability Test (B-4)

Ground Surface Elevation: +628.0
Top of Casing Elevation: +631.5
Bottom of Test Hole Elevation: +621.0
Test Hole Depth from Ground Surface Elevation: 7'0" (84")

Pre-Soak:

Start Date: 18 Dec 2012 Time: 1545 Water Level*: 4'4"
End Date: 19 Dec 2012 Time: 0900 Water Level*: 7'1"

33" drop H_2O in 1035 minutes (17 hr. 15 min.) = 0.03 inches per minute

Test:

Start Date: 19 Dec 2012 Time: 1000 Water Level*: 4'3"
End Date: 19 Dec 2012 Time: 1515 Water Level*: 5'3.5"

12.5" drop H_2O in 315 minutes (5 hr. 15 min.) = 0.04 inches per minute

Time	Water Level*	Interval Water Level Drop (Inches)	Cumulative Water Level Drop (Inches)
1000	4'3"	0	0
1100	4'6"	3	3
1200	4'8"	2	5
1300	4'10"	2	7
1400	5'1"	3	10
1515	5'3.5"	2.5	12.5

Water Level* - Depth below top of casing (elevation +631.5)

Byrnwood Club Development
Bedford Road
Town of New Castle, NY
(12-175)

3 January 2013

<u>Percolation Test P-1</u>
(Elevation +620)

Test hole depth 42" from ground surface elevation

<u>Pre-Soak</u>

0-10 min, 22" drop of H2O (pipe drained)
22" drop H2O in 10 minutes = 2.20 inches per minute

<u>Test Run #1</u>

5 min, 15" drop H2O (re-filled pipe)

<u>Test Run #2</u>

5 min, 14" drop H2O (re-filled pipe)

<u>Test Run #3</u>

5 min, 12" drop H2O (re-filled pipe)

<u>Final Test Reading</u>

Start @ 1245, 14" from top of pipe
Finish @ 1300, 36" drop from top of pipe (pipe drained)
22" drop H2O in 15 minutes = 1.46 inches per minute

<u>Percolation Hole P-2</u>
(Elevation + 612)

Test hole depth 20" from ground elevation
Groundwater @ 0'6" below surface
Percolation test unable to be performed

Byrnwood Club Development
Bedford Road
Town of New Castle, NY
(12-175)

3 January 2013

<u>Percolation Test P-3</u>
(Elevation + 616)

Test hole depth 32" from ground surface elevation

<u>Pre-Soak</u>

0-24 min, 17" drop of H2O (pipe drained)
17" drop H2O in 24 minutes = 0.71 inches per minute

<u>Test Run #1</u>

5 min, 5" drop H2O (re-filled pipe)

<u>Test Run #2</u>

5 min, 5" drop H2O (re-filled pipe)

<u>Test Run #3</u>

5 min, 4" drop H2O (re-filled pipe)

<u>Final Test Reading</u>

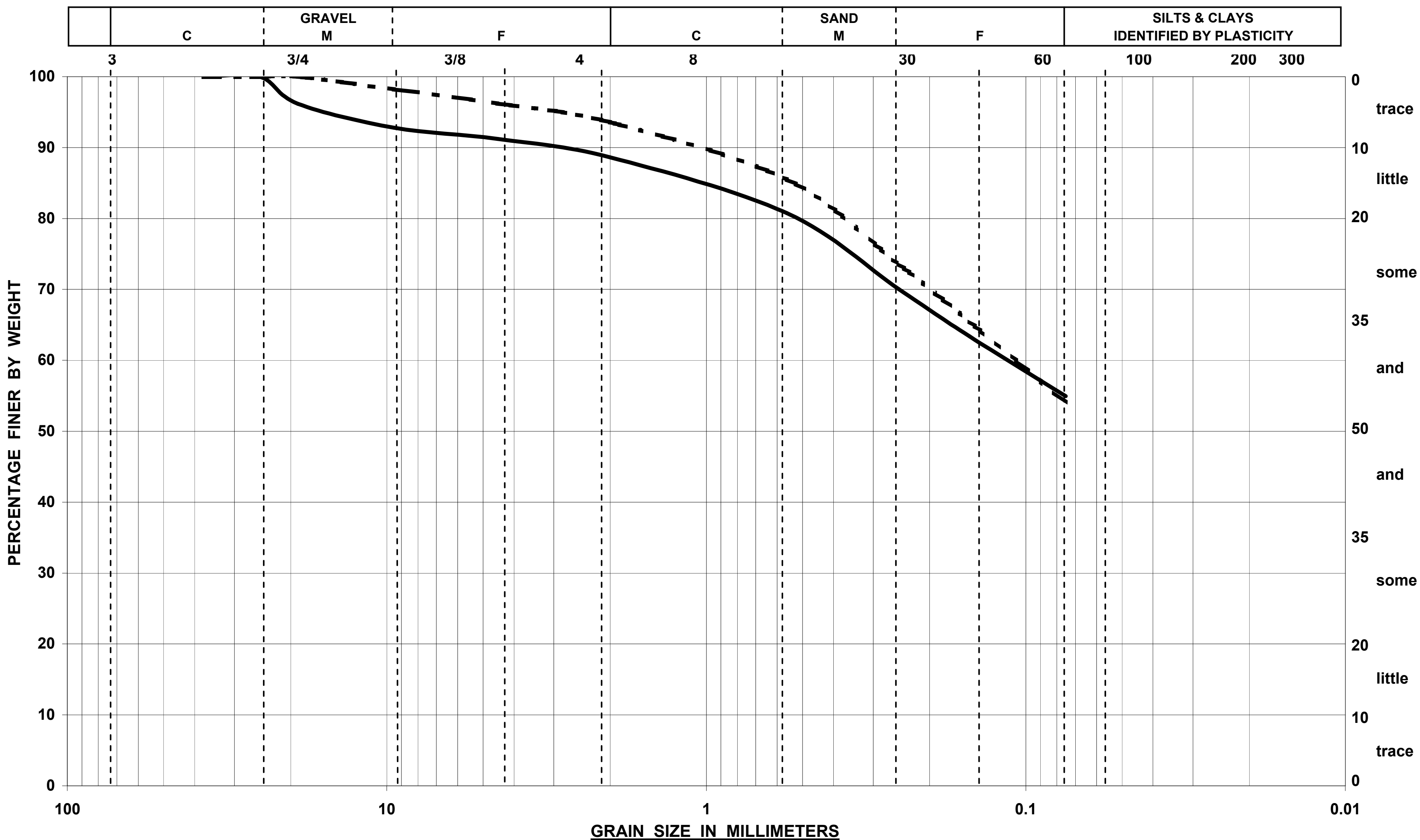
Start @ 1535, 15" from top of pipe
Finish @ 1605, 28" drop from top of pipe
13" drop H2O in 30 minutes = 0.43 inches per minute

<u>Percolation Hole P-4</u>
(Elevation + 615)

Test hole depth 24" from ground elevation
Groundwater @ 1'10" below surface
Percolation test unable to be performed

CARLIN-SIMPSON & ASSOCIATES
SAYREVILLE, NJ 08872

SIEVE ANALYSIS

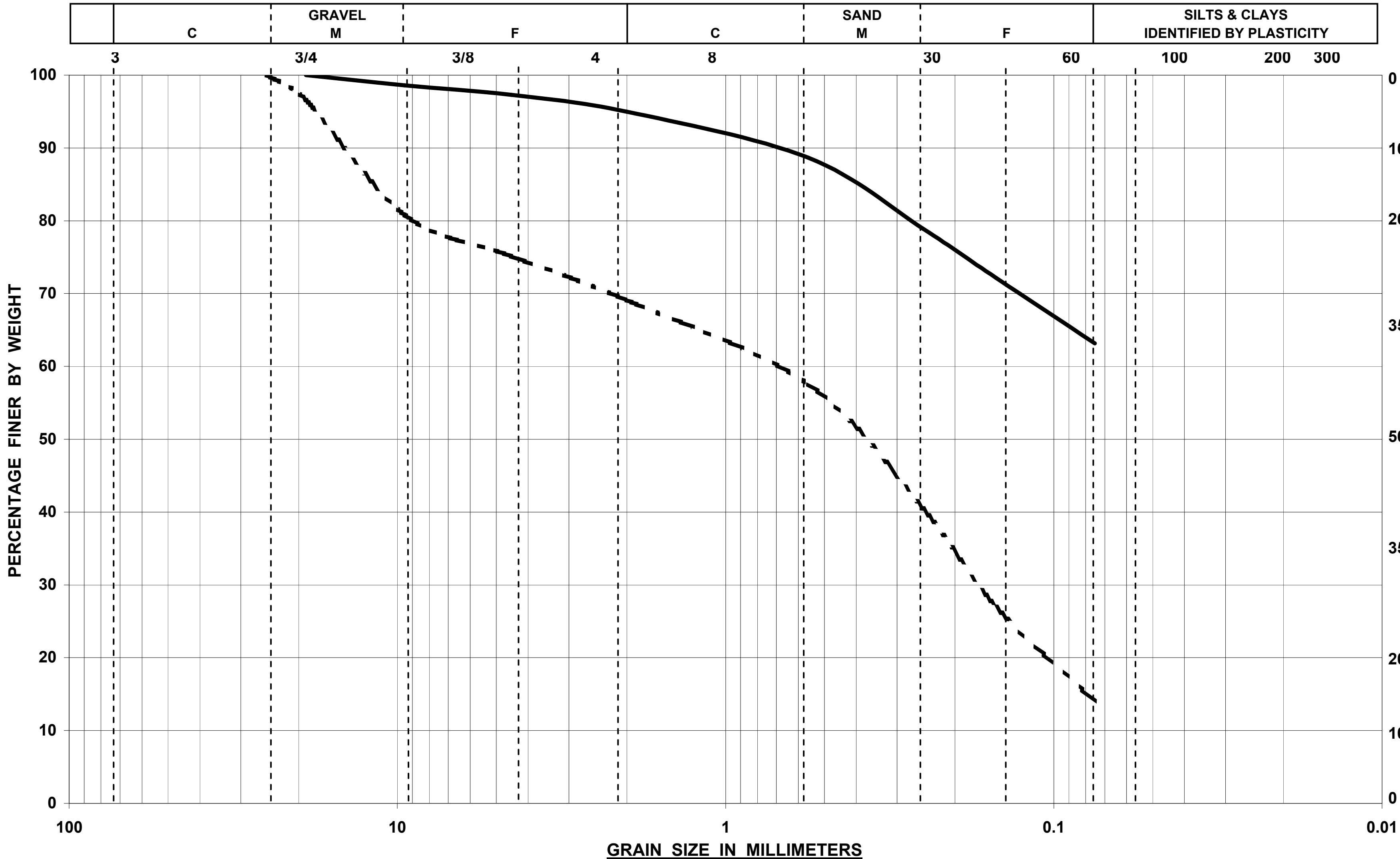


SYMBOL	BORING	SAMPLE	DEPTH	DESCRIPTION	NAT MC
———	B-1	S-1	0' 0" - 2' 0"	Brown SILT and (+), coarse to fine Sand, little (-) medium to fine Gravel	14.0%
— -	B-2	S-2	2' 0" - 4' 0"	Brown SILT and (+), coarse to fine Sand, trace medium to fine Gravel	14.2%

PROJECT Brynwood Club, Bedford Road, North Castle, NY **BY** MW **DATE** 7-Jan-13 **JOB NO** 12-175

CARLIN-SIMPSON & ASSOCIATES
SAYREVILLE, NJ 08872

SIEVE ANALYSIS

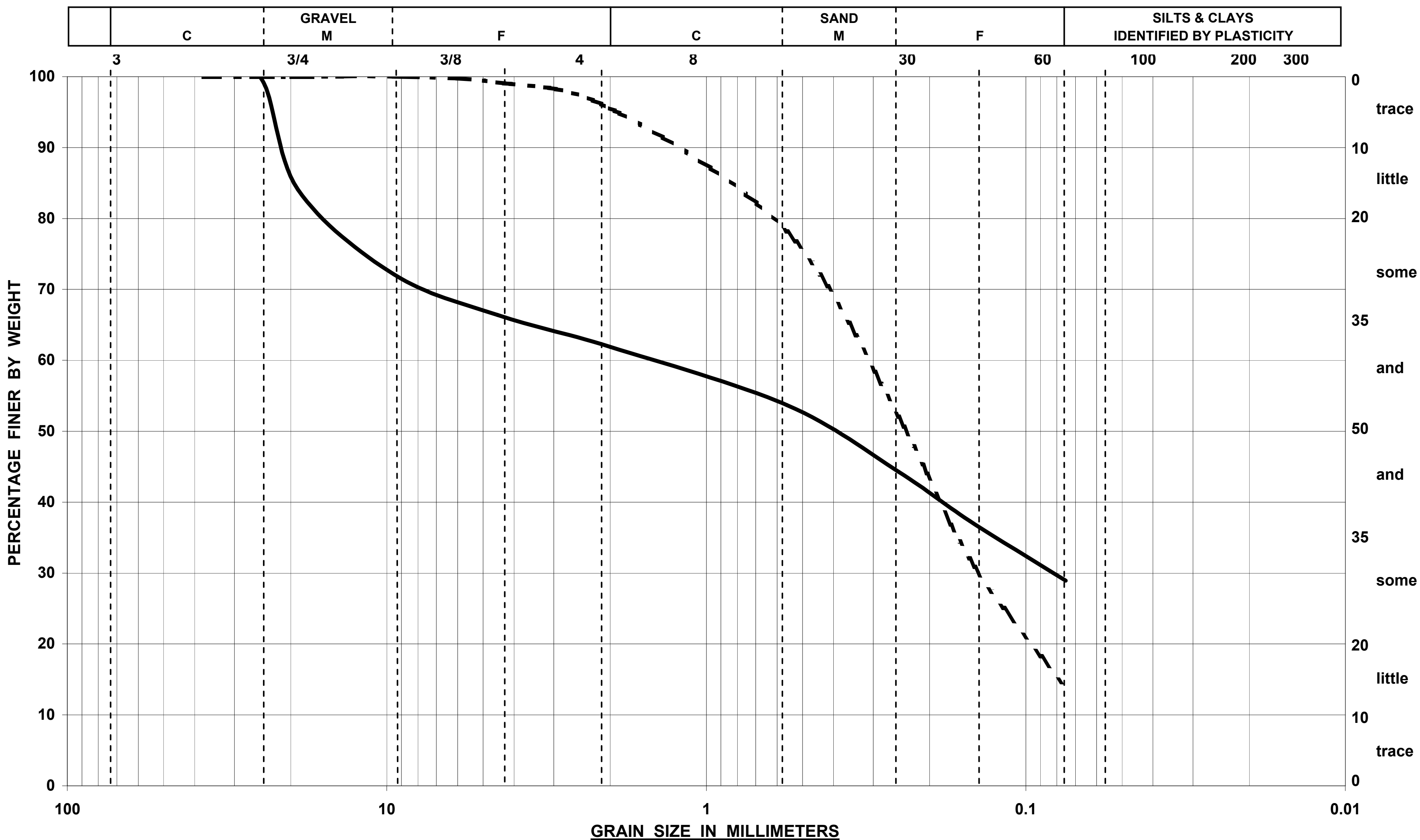


SYMBOL	BORING	SAMPLE	DEPTH	DESCRIPTION	NAT MC
———	B-3	S-1	0' 0" - 2' 0"	Brown SILT and (-), coarse to fine Sand, trace medium to fine Gravel	24.2%
— -	B-4	S-3	5' 0" - 7' 0"	Brown coarse to fine SAND, little Silt, some (+) medium to fine Gravel	12.1%

PROJECT Brynwood Club, Bedford Road, North Castle, NY **BY** MW **DATE** 7-Jan-13 **JOB NO** 12-175

CARLIN-SIMPSON & ASSOCIATES
SAYREVILLE, NJ 08872

SIEVE ANALYSIS

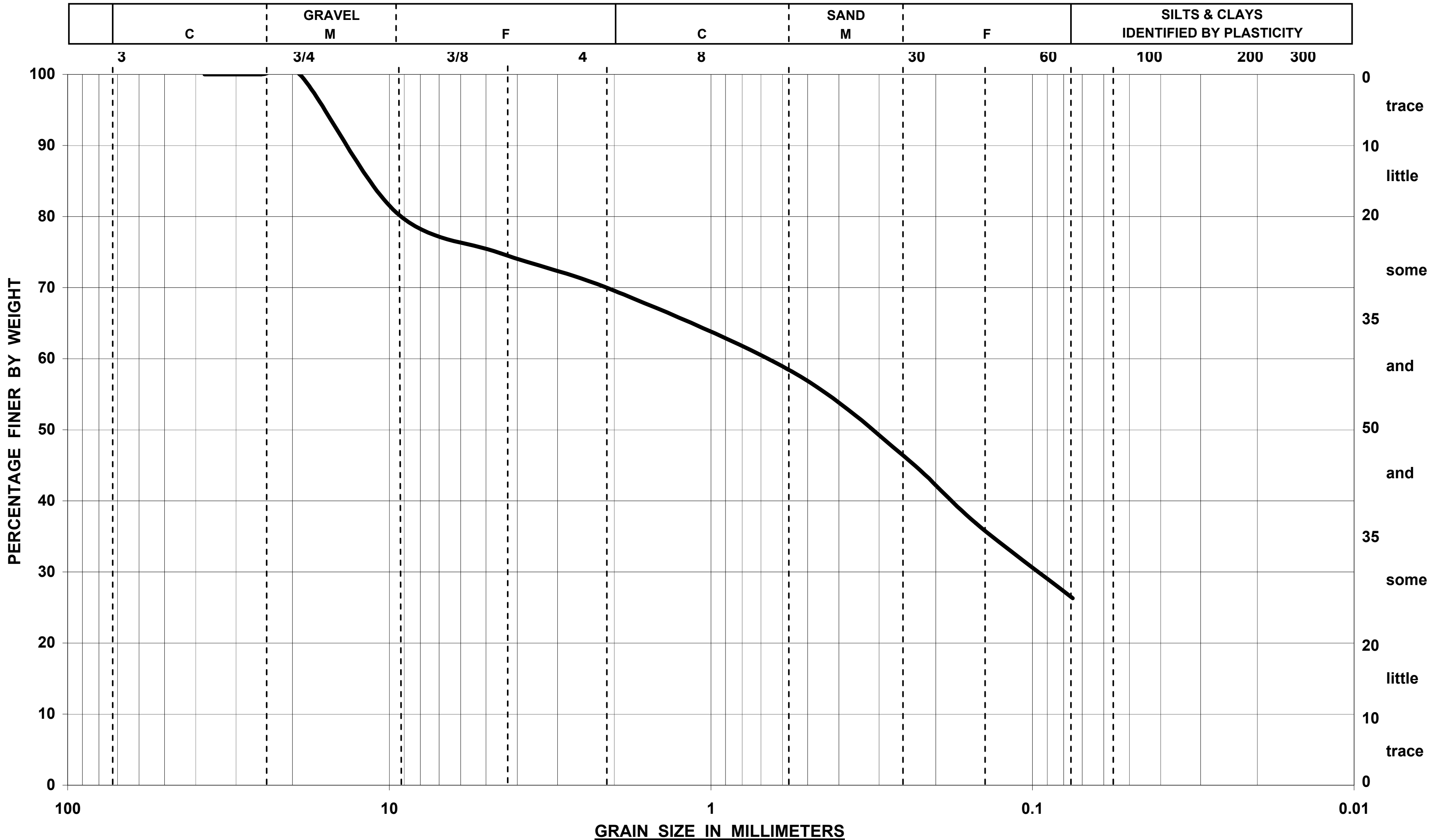


SYMBOL	BORING	SAMPLE	DEPTH	DESCRIPTION	NAT MC
———	B-6	S-2	2' 0" - 4' 0"	Brown coarse to fine Sand, some Silt, and (-) coarse to fine Gravel	9.9%
— -	B-7	S-3	5' 0" - 7' 0"	Brown coarse to fine SAND, little Silt, trace fine Gravel	8.7%

PROJECT Brynwood Club, Bedford Road, North Castle, NY **BY** MW **DATE** 10-Jan-13 **JOB NO** 12-175

CARLIN-SIMPSON & ASSOCIATES
SAYREVILLE, NJ 08872

SIEVE ANALYSIS

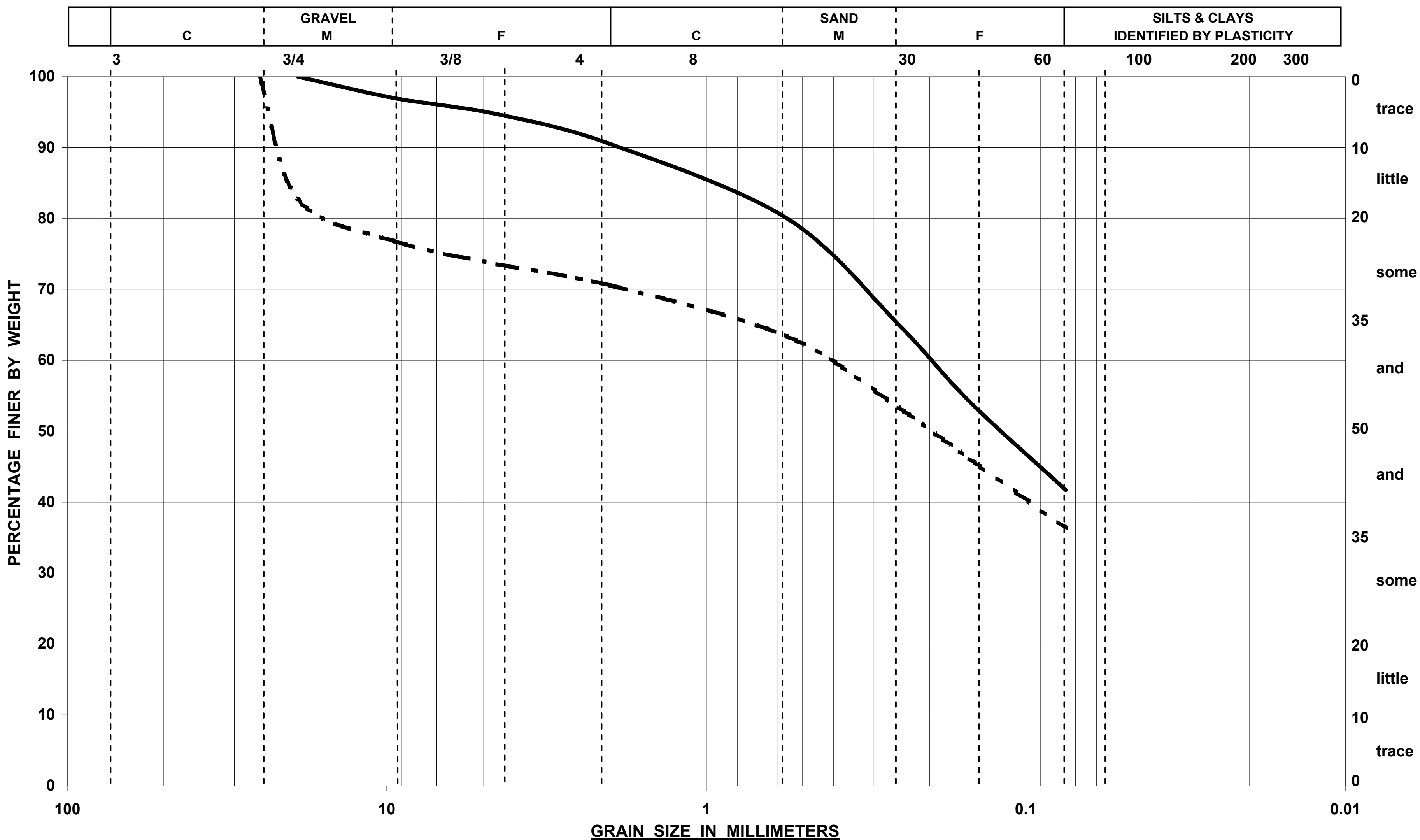


SYMBOL	BORING	SAMPLE	DEPTH	DESCRIPTION	NAT MC
———	B-9	S-2	2' 0" - 4' 0"	FILL (brown coarse to fine Sand, some Silt, some (+) medium to fine Gravel	15.0%

PROJECT Brynwood Club, Bedford Road, North Castle, NY BY MW DATE 7-Jan-13 JOB NO 12-175

CARLIN-SIMPSON & ASSOCIATES
SAYREVILLE, NJ 08872

SIEVE ANALYSIS

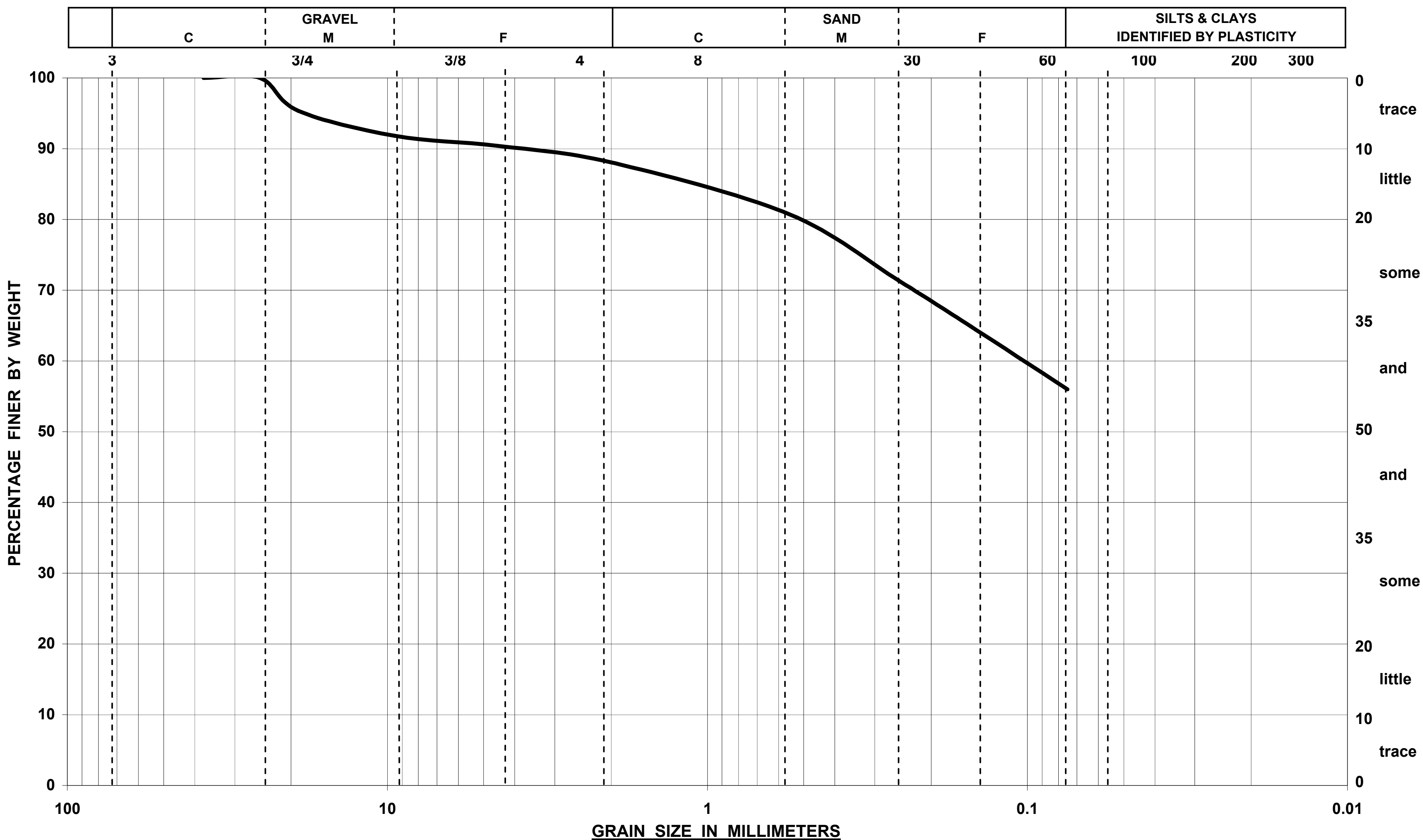


SYMBOL	Test Pit	SAMPLE	DEPTH	DESCRIPTION	NAT MC
———	TP-1	S-1		Brown coarse to fine SAND, and Silt, trace (+) medium to fine Gravel	18.2%
— -	TP-4	S-1		Brown coarse to fine Sand, and (-) Silt, some coarse to fine Gravel	14.0%

PROJECT Brynwood Club, Bedford Road, North Castle, NY **BY** MW **DATE** 7-Jan-13 **JOB NO** 12-175

CARLIN-SIMPSON & ASSOCIATES
SAYREVILLE, NJ 08872

SIEVE ANALYSIS



SYMBOL	Test Pit	SAMPLE	DEPTH	DESCRIPTION	NAT MC
——	TP-18	S-1	0' 10" - 7' 0"	Brown SILT and, coarse to fine Sand, little (-) medium to fine Gravel	18.0%

PROJECT Brynwood Club, Bedford Road, North Castle, NY BY MW DATE 7-Jan-13 JOB NO 12-175

GENERAL NOTES:

1. GENERAL LAYOUT WAS OBTAINED FROM A DRAWING PREPARED BY JOHN MEYER CONSULTING, PC ENTITLED "TEST PIT PLAN, BRYNWOOD CLUB, BEDFORD ROAD (NY 22), TOWN OF NORTH CASTLE NEW YORK," DRAWING TP-1, DATED DECEMBER 17, 2012.
2. BORING, TEST PIT, PERMEABILITY TEST, AND PERCOLATION TEST LOCATIONS WERE LAID OUT IN THE FIELD BY CARLIN-SIMPSON & ASSOCIATES (CSA).
3. BORINGS (B-1 THROUGH B-11) WERE PERFORMED BY GENERAL BORINGS INC. ON 18 & 19 DECEMBER 2012 UNDER THE FULL TIME INSPECTION OF CSA.
4. THE BOREHOLE PERMEABILITY TEST (BP-4) WAS PERFORMED BY CSA ON 18 & 19 DECEMBER 2012.
5. PERCOLATION TESTS (P-1, P-2, AND P-3) WERE PERFORMED BY CSA ON 3 JANUARY 2013.
6. TEST PITS (TP-1 THROUGH TP-18) WERE PERFORMED BY TRAFICANTE CONTRACTING, INC ON 3 & 4 JANUARY 2013 UNDER THE FULL TIME INSPECTION OF CSA.
7. TEST PITS (TP-19 THROUGH TP-28) WERE PERFORMED BY BRYNWOOD CLUB PERSONNEL IN SEPTEMBER 2013 UNDER THE FULL TIME INSPECTION OF CSA.
8. LOCATIONS ARE APPROXIMATE.

LEGEND:

- BORING LOCATION (DEC. 2012)
- TEST PIT LOCATION (JAN. 2013)
- TEST PIT LOCATION (SEPT. 2013)
- PERCOLATION TEST LOCATION (JAN. 2013)
- BOREHOLE PERMEABILITY TEST LOCATION (DEC. 2012)

ROBERT B. SIMPSON, P.E.
PROFESSIONAL ENGINEER

LICENSE NO. | SIGNATURE

BORING & TEST PIT LOCATION PLAN

BRYNWOOD CLUB DEVELOPMENT
NORTH CASTLE, NEW YORK

DRAWN	SCALE	
MRA	1" = 120'	CARLIN-SIMPSON AND ASSOCIATES 61 Main Street Sayreville, NJ 08872
CHECKED	DATE	
RBS	16 OCT 13	
PROJECT NO.	DWG. NO.	
12-175	FIG -1	Consulting Geotechnical and Environmental Engineers
APPROVED		

R&M ENGINEERING

Christopher W. Robinson, PE President
Wayne A. Muller, PE Vice President

Matthew P. Scheiner, PE Partner
Matthew K. Aylward, PE Partner
Gino Tedesco, Associate

April 26, 2022

Town of North Castle Planning Board
17 Bedford Road
Armonk, NY 10504

Attention: Mr. Christopher Carthy, Chairman
and Members of the Planning Board

RE: The Summit Club at Armonk
Sewage Treatment Plant Replacement
SCTM: 101.2-1-28.1 & 28.2
R&M No. 2021-201

Dear Chairman Carthy and Members of the Planning Board:

Enclosed herewith for your review and comment, please find the Engineering Design Report describing the proposed replacement and expansion of the existing sewage treatment plant (STP) for the anticipated development of The Summit Club at Armonk, formerly known as Brynwood Golf and Country Club.

In addition to the Engineering Design Report, the Short Environmental Assessment Form prepared for the STP has been included in the submission package. Both referenced documents have been concurrently submitted to the NYS Department of Environmental Conservation (NYS DEC) for the State Pollutant Discharge Elimination System (SPDES) review process required to obtain the proposed STP's discharge permit. Preparation and submission of the technical plans and specifications to the Planning Board and Westchester County Department of Health will be subsequent to NYS DEC conceptual approval of the report.

If you have any questions regarding the above or require any additional information, please do not hesitate to contact us.

Sincerely,
R&M Engineering

Matthew P. Scheiner, P.E.
Partner

MPS/snm
Encl.
cc: Jeffrey Mendell – Summit Club Partners, LLC (via email)
Paul Sysak, RLA, ASLA – JMC Site Development Consultants (via email)
David Lombardi, P.E. – JMC (via email)

R&M ENGINEERING

50 Elm Street
Huntington, NY 11743
Phone: 631.271.0576
Fax: 631.271.0592

LETTER OF TRANSMITTAL

TO: Town of North Castle Planning Board
17 Bedford Road
Armonk, NY 10504
Attn: Christopher Carthy, Chairman

CC:

DATE: April 28, 2022
R&M No: 2021-201
REF: The Summit Club at Armonk

VIA: ☐ FedEx ☐ Mail ☐ Messenger ☐ Pick-up ☒ Other

Quantity	Description	Sheet No.	Revision
1	Cover Letter	1 of 1	-
1	Engineering Report	1-149	-
1	Short EAF	4 pages	-

THESE ARE TRANSMITTED as checked below:

☒ For approval
☐ For your use
☐ As requested
☐ For review and comment
☐ For bids due ______________, 20 ___

☐ Approved as submitted
☐ Approved as noted
☐ Returned for corrections
☐ Other: ____

☐ Resubmit _____ copies for approval
☐ Submit _____ copies for distribution
☐ Return _____ corrected prints
☐ Prints returned after loan to us

REMARKS:

Short Environmental Assessment Form
Part 1 - Project Information

Instructions for Completing

Part 1 – Project Information. The applicant or project sponsor is responsible for the completion of Part 1. Responses become part of the application for approval or funding, are subject to public review, and may be subject to further verification. Complete Part 1 based on information currently available. If additional research or investigation would be needed to fully respond to any item, please answer as thoroughly as possible based on current information.

Complete all items in Part 1. You may also provide any additional information which you believe will be needed by or useful to the lead agency; attach additional pages as necessary to supplement any item.

Part 1 – Project and Sponsor Information			
R&M Engineering, Matthew P. Scheiner, PE			
Name of Action or Project: The Summit Club at Armonk STP Replacement			
Project Location (describe, and attach a location map): 568 & 570 Bedford Road, Armonk NY			
Brief Description of Proposed Action: Replacement of the existing STP for the redevelopment of existing golf course to include 72 Townhouse Units, clubhouse, and new amenities complex.			
Name of Applicant or Sponsor: R&M Engineering, Matthew P. Scheiner, PE	Telephone: (631) 271-0576 E-Mail: mscheiner@rmengineering.com		
Address: 50 Elm Street			
City/PO: Huntington	State: NY	Zip Code: 11743	

	NO	YES
1. Does the proposed action only involve the legislative adoption of a plan, local law, ordinance, administrative rule, or regulation? If Yes, attach a narrative description of the intent of the proposed action and the environmental resources that may be affected in the municipality and proceed to Part 2. If no, continue to question 2.	☑	☐
2. Does the proposed action require a permit, approval or funding from any other government Agency? If Yes, list agency(s) name and permit or approval:	☑	☐

3. a. Total acreage of the site of the proposed action? ± 156 acres
b. Total acreage to be physically disturbed? ± 3 acres
c. Total acreage (project site and any contiguous properties) owned or controlled by the applicant or project sponsor? ± 156 acres

4. Check all land uses that occur on, are adjoining or near the proposed action:

☐ Urban ☐ Rural (non-agriculture) ☐ Industrial ☑ Commercial ☑ Residential (suburban)
☐ Forest ☐ Agriculture ☐ Aquatic ☑ Other(Specify): Institutional, open space, golf course.
☐ Parkland

	NO	YES	N/A
5. Is the proposed action,			
a. A permitted use under the zoning regulations?	☐	☑	☐
b. Consistent with the adopted comprehensive plan?	☐	☑	☐

	NO	YES
6. Is the proposed action consistent with the predominant character of the existing built or natural landscape?	☐	☑
7. Is the site of the proposed action located in, or does it adjoin, a state listed Critical Environmental Area? If Yes, identify: ____________	☑	☐
8. a. Will the proposed action result in a substantial increase in traffic above present levels?	☑	☐
b. Are public transportation services available at or near the site of the proposed action?	☑	☐
c. Are any pedestrian accommodations or bicycle routes available on or near the site of the proposed action?	☑	☐
9. Does the proposed action meet or exceed the state energy code requirements? If the proposed action will exceed requirements, describe design features and technologies: ____________	☐	☑
10. Will the proposed action connect to an existing public/private water supply? If No, describe method for providing potable water: ____________ A new on-site water system will be provided and sized accordingly to accommodate the proposed residential golf club and amenity facilities.	☑	☐
11. Will the proposed action connect to existing wastewater utilities? If No, describe method for providing wastewater treatment: ____________ A replacement on-site STP will be provided to serve the golf course and residential/amenities facilities.	☑	☐
12. a. Does the project site contain, or is it substantially contiguous to, a building, archaeological site, or district which is listed on the National or State Register of Historic Places, or that has been determined by the Commissioner of the NYS Office of Parks, Recreation and Historic Preservation to be eligible for listing on the State Register of Historic Places? An Archeology Survey was prepared for the existing EIS with No Significant Findings.	☑	☐
b. Is the project site, or any portion of it, located in or adjacent to an area designated as sensitive for archaeological sites on the NY State Historic Preservation Office (SHPO) archaeological site inventory?	☐	☑
13. a. Does any portion of the site of the proposed action, or lands adjoining the proposed action, contain wetlands or other waterbodies regulated by a federal, state or local agency?	☐	☑
b. Would the proposed action physically alter, or encroach into, any existing wetland or waterbody?	☑	☐
If Yes, identify the wetland or waterbody and extent of alterations in square feet or acres: ____________ The site includes 6.56 acres of freshwater wetlands and 26.01 ac of freshwater wetland buffers. The project requires disturbance of 0 acres of the wetlands/wetland buffer. Unnamed federal waters are also located on the parcel.		

14. Identify the typical habitat types that occur on, or are likely to be found on the project site. Check all that apply: ☐ Shoreline ☐ Forest ☐ Agricultural/grasslands ☑ Early mid-successional ☑ Wetland ☐ Urban ☑ Suburban		
15. Does the site of the proposed action contain any species of animal, or associated habitats, listed by the State or Federal government as threatened or endangered?	NO ☑	YES ☐
16. Is the project site located in the 100-year flood plan?	NO ☐	YES ☑
17. Will the proposed action create storm water discharge, either from point or non-point sources? If Yes,	NO ☐	YES ☑
a. Will storm water discharges flow to adjacent properties?	☐	☑
b. Will storm water discharges be directed to established conveyance systems (runoff and storm drains)? If Yes, briefly describe: Stormwater runoff will be conveyed into existing stormwater insfrastructure or continue to flow overland on the golf course.	☐	☑
18. Does the proposed action include construction or other activities that would result in the impoundment of water or other liquids (e.g., retention pond, waste lagoon, dam)? If Yes, explain the purpose and size of the impoundment: Proposed stormwater management facilities.	NO ☐	YES ☑
19. Has the site of the proposed action or an adjoining property been the location of an active or closed solid waste management facility? If Yes, describe:	NO ☑	YES ☐
20. Has the site of the proposed action or an adjoining property been the subject of remediation (ongoing or completed) for hazardous waste? If Yes, describe:	NO ☑	YES ☐

I CERTIFY THAT THE INFORMATION PROVIDED ABOVE IS TRUE AND ACCURATE TO THE BEST OF MY KNOWLEDGE

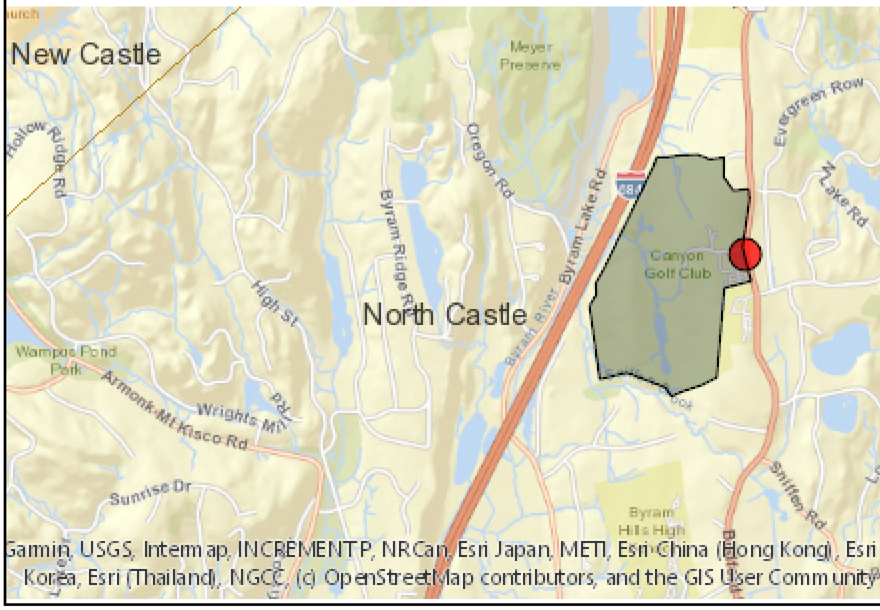
Applicant/sponsor/name: R&M Engineering, Matthew P. Scheiner, PE Date: 4/29/22

Signature: [signature] Title: Partner

PRINT FORM

EAF Mapper Summary Report

Tuesday, April 26, 2022 4:16 PM



Disclaimer: The EAF Mapper is a screening tool intended to assist project sponsors and reviewing agencies in preparing an environmental assessment form (EAF). Not all questions asked in the EAF are answered by the EAF Mapper. Additional information on any EAF question can be obtained by consulting the EAF Workbooks. Although the EAF Mapper provides the most up-to-date digital data available to DEC, you may also need to contact local or other data sources in order to obtain data not provided by the Mapper. Digital data is not a substitute for agency determinations.

Part 1 / Question 7 [Critical Environmental Area]	No
Part 1 / Question 12a [National or State Register of Historic Places or State Eligible Sites]	No
Part 1 / Question 12b [Archeological Sites]	Yes
Part 1 / Question 13a [Wetlands or Other Regulated Waterbodies]	Yes - Digital mapping information on local and federal wetlands and waterbodies is known to be incomplete. Refer to EAF Workbook.
Part 1 / Question 15 [Threatened or Endangered Animal]	No
Part 1 / Question 16 [100 Year Flood Plain]	Yes
Part 1 / Question 20 [Remediation Site]	No

R&M ENGINEERING

ENGINEERING REPORT

For

THE SUMMIT CLUB AT ARMONK

Sewage Treatment Plant Replacement

Armonk
Town of North Castle
Westchester County, NY 10504

R&M Job No.: 2021-201

Prepared for

Summit Club Partners, LLC
568 Bedford Road (NY-22)
Armonk, NY 10504

Signature of Engineer

Matthew P. Scheiner, P.E.
Printed Name

Partner, R&M Engineering
Title

April 26, 2022
Date

FOREWORD

This Engineering report has been prepared in compliance with the requirements of the *New York State Design Standards for Intermediate Sized Wastewater Treatment Systems* (issued by New York State Department of Environmental Conservative (NYSDEC)), requirements of Chapter 873, Article VIII of the Westchester County Sanitary Code and in general follows the guidelines of the *Recommended Standards For Wastewater Facilities* (Ten State Standards).

This Engineering Report has been prepared to address the complete replacement of the existing Sewage Treatment Plant (STP) to serve the proposed redevelopment of the property to update the existing golf course with a new clubhouse, amenities complex, and residential community comprised of 72 townhomes. The parcel for The Summit Club at Armonk project is located east of Interstate 684 and approximately 720 feet north of Blair Road in Armonk, Town of North Castle, New York.

TABLE OF CONTENTS

(All Drawings are located at the end of this document.)

SECTION I

GENERAL INFORMATION

Project Name:	The Summit Club at Armonk STP Replacement
Applicant:	Summit Club Partners, LLC c/o Mr. Jeffrey Mendell 568 Bedford Road Armonk, New York 10504
Project Description:	The applicant proposes to redevelop the existing golf course to also include 72 townhouse units, clubhouse, and a new amenities complex including a pool, spas, restaurant, and bar and lounge. The existing sewage treatment plant (STP) will be replaced, with the STP relocated and capacity upsized to meet the treatment and disposal needs of the golf course and proposed community as well as additional future expansion of the residential space.
Project Location:	The total site area where The Summit Club at Armonk development is proposed is 156.29 acres at 568 & 570 Bedford Road in Armonk, NY. The parcel for the Summit Club redevelopment is located east of Interstate 684 and approximately 720 feet north of Blair Road in Armonk, Town of North Castle, New York.
Consulting Engineer:	Robinson & Muller Engineers, P.C. 50 Elm Street Huntington, N.Y. 11743 Phone: (631) 271 – 0576, Fax: (631) 271 - 0592 E-Mail: MScheiner@rmengineering.com

SECTION II

INTRODUCTION

General

This Engineering Report has been prepared for The Summit Club at Armonk project, the development of a housing community of 72 townhomes and golf and country club. There are also future plans for expansion of the residential complex with additional townhomes and private guest cottages. A projected flow of 45,000 gpd shall be used as the basis of design when accounting for contributions to the existing STP from the proposed and potential future development. The project site is the Summit Club golf course in Armonk, Town of North Castle, New York.

The total project site area for the Summit Club development is 156.29 acres. The existing STP is situated on the site between the ninth hole green and fairway bunker within the existing framed building. This building will be used in the redevelopment as an equipment storage building. As such, a replacement STP is proposed within the hillside between the existing driveway to the existing STP building and the south side of the existing driving range.

Project Site

The overall existing site where the STP will be located varies in elevation from approximately 640 feet above mean sea level (AMSL) in the northeast portion of the property to 400 feet AMSL in the western portions of the property. The STP will be in the southeast portion of the property where the ground surface is proposed to be approximately 534-574 feet AMSL. Based on the subsurface soil and foundation investigation report by Carlin-Simpson & Associates in Appendix A, groundwater was only encountered in one of ten borings taken and four of eleven test pits excavated, reflecting variation in the location of long-term water table at the project site. Based on the information available from the investigation, it is assumed that the flow direction in the project site area is generally to the west.

The subject parcel for the STP and residential complex is a part of lot 101.02-1-28.2 (568 Bedford Road) and the golf course is on parcel 101.02-1-28.1 (570 Bedford Road). There are fourteen (14) currently private wells onsite, which are at least 50 feet away from the STP outfall line. The STP shall be serviced by a dedicated 1” water service line that runs from the proposed potable water treatment building adjacent to the existing STP building.

SECTION III

PROPOSED TREATMENT PLANT CAPACITY

SANITARY SEWAGE FLOW

The average daily design flow for sewage is the average of the daily volumes of sewage to be received at the STP for a continuous twelve (12) month period. For the community and golf club, the flow is determined by the criteria from Table B3 – Typical Per-Unit Hydraulic Loading Rates from the Department of Environmental Conservation (NYS DEC) "Design Standards for Wastewater Treatment Works, Intermediate Sized Sewage Facilities" (2014 Edition) as follows:

1.	Townhomes	162 Bedrooms	@ 110 gpd/Bedroom	=	17,820 gpd
2.	Bar & Grill	35 Seats	@ 16 gpd/Seat*	=	560 gpd
3.	Restaurant	252 Seats	@ 28 gpd/Seat*	=	7,056 gpd
4.	Golf Tournament	144 Golfers	@ 16 gpd/Golfer*	=	2,304 gpd
5.	Country Club	20 Employees	@ 12 gpd/Employee*	=	240 gpd
6.	Golf Course (GC)	15 Employees	@ 12 gpd/Employee*	=	180 gpd
7.	Seasonal GC Staff	12 Bedrooms	@ 60 gpd/Bedroom*	=	720 gpd
8.	Pool	257 Swimmers	@ 8 gpd/Swimmer*	=	2,053 gpd
9.	Spas	24 Swimmers	@ 8 gpd/Swimmer*	=	192 gpd
10.	Excess Pool Deck	170 Swimmers	@ 8 gpd/Swimmer*	=	1,363 gpd
11.	STP Equipment Washdown/Lab	—	55 gpd	=	55 gpd
	Proposed Total Flow			=	**32,543 gpd**
	Future Total Flow (Including Add'tl Guest Cottages + Townhomes)			=	**8,360 gpd**
	Total Average Daily Design Flow			=	**40,903 gpd**
	SAY			=	**45,000 gpd**

*These identified per-unit hydraulic loading rates in the above table have been reduced by 20% because they follow the guidelines set in the NYS DEC design standards for establishments with water-saving plumbing fixtures.

In the table above, items 1-9 result in a proposed flow of 32,543 gpd and the breakdown also includes planned future flows with a maximum contribution of 12,457 gpd. Therefore, a maximum average daily design flow of 45,000 gpd will be used to size the STP for the purposes of this report.

The State Pollutant Discharge Elimination System (SPDES) Permit No. 0069299 for the existing STP established an effluent limitation for flow of 0.016 MGD (16,000 gpd), while the actual flows are minimal and taken care of with temporary facilities while the golf course is closed for renovations. Since this report will evaluate and involve the complete replacement of the existing STP, the flow through the STP is proposed to increase to 45,000 gpd. With the existing discharge permit being expired and the increase in flow, a new SPDES Permit will be obtained from the NYS DEC as required.

In accordance with "Figure 1" of the Ten State Standards, the peak hourly flow for a population of approximately 600 (45,000 gpd ÷ 75 gpd per person) is 3.93 times the average daily flow rate. Peak hourly flow is therefore calculated to be 45,000 gpd x 3.93 = 176,850 gpd (122.81 gpm, say 123 gpm).

SECTION IV

INFLUENT SEWAGE CHARACTERISTICS

The standard influent untreated sewage design characteristics provided in the New York State Department of Environmental Conservation (NYS DEC) "Design Standards for Wastewater Treatment Works, Intermediate Sized Sewage Facilities" (2014 Edition) are as follows:

BOD_5:	155-286 mg/L
TSS:	155-330 mg/L
TP:	6-12 mg/L
Ammonia:	4-13 mg/L
FOG:	70-105 mg/L

Based on the above influent sewage characteristics and influent flow of 45,000 gallons per day, the influent loads that the expanded STP shall be capable of treating have been calculated as follows:

lbs. of pollutants = mg / L pollutant x 8.34 lb. / gal. x flow (Q) in gals. / day x 10^{-6}

BOD_5:	240 mg/L x 8.34 lb. /gal. x 45,000 gpd x 10^{-6}	=	90.07	lb. BOD_5 / day
TSS:	240 mg/L x 8.34 lb. /gal. x 45,000 gpd x 10^{-6}	=	90.07	lb. SS / day
TKN:	40 mg/L x 8.34 lb. /gal. x 45,000 gpd x 10^{-6}	=	15.01	lb. TKN/day
TP:	8 mg/L x 8.34 lb. /gal. x 45,000 gpd x 10^{-6}	=	3.00	lb. TP/day

SECTION V

EFFLUENT REQUIREMENTS

The treated effluent from the proposed Summit Club community and golf club will discharge to surface water, an onsite tributary to Byram River classified by NYS DEC as a Class D stream. Class D streams do not typically support any uses for drinking water, public swimming, fishing or fish propagation due to inconsistencies in flow and effluent dilution ratio. Therefore, the receiving tributary is classified as an "intermittent stream," which has typical effluent limits as specified in Table B-4B of the NYS DEC standards.

Consequently, we expect that the State Pollutant Discharge Elimination System (SPDES) permit to align with these limits. The 30-day arithmetic average flow limit listed on the permit will be the design flow of 45,000 GPD, and the preliminary effluent limits for the parcel provided by the NYS DEC Division of Water Quality specific to the project are outlined below:

BOD_5:	5.0 mg/L Daily Max.
TSS:	10.0 mg/L Daily Max.
Settleable Solids:	0.1 mg/L Daily Max.
Ammonia (Summer):	0.9 mg/L Daily Max.
Ammonia (Winter):	1.8 mg/L Daily Max.
Phosphorus:	1.0 mg/L Monthly Average
Fecal Coliform:	400 No./100 mL (7-day geometric mean)
Fecal Coliform:	200 No./100 mL (30-day geometric mean)

The daily maximum limit for the Summer is applicable between June 1st through October 31st each calendar year, while the limit for Winter applies November 1st through May 31st. Based on the selected Purestream Biologically Engineered Single Sludge Treatment (BESST) process for the STP replacement, the following effluent quality is anticipated:

BOD_5:	< 5.0 mg/L
TSS:	< 10.0 mg/L
Ammonia:	< 0.9 mg/L
Phosphorus:	< 1.0 mg/L
Fecal Coliform:	< 200 No./100 mL (30-day geometric mean)

The effluent quality is expected to meet or exceed the effluent requirements.

SECTION VI

TREATMENT OPTIONS

Based on density restrictions, formal sewage treatment must be provided for the proposed project. Generally, two options are available:

- Off-Site Treatment and
- On-Site Treatment.

Off-Site Treatment

Off-site treatment requires that there be an existing STP which:

- is sufficiently close to the project site to allow for economical transfer of sanitary sewage flow from the project site to the host STP site;
- has sufficient uncommitted excess capacity for the expected proposed and future sanitary sewage flow (if any); and
- is capable of treating the sewage to the required effluent quality.

After reviewing the site and the surrounding area, no STP sites were found that could potentially serve as an optimal alternative to replacing the existing STP and have the capacity to receive sewage from the Summit Club golf course and residential complex, and therefore we have concluded that it is not feasible to use an off-site treatment option.

On-Site Treatment

Some onsite treatment plants use extended aeration process or Rotating Biological Contactors (RBCs) followed by a deep bed denitrification filter(s). Other STPs use Sequencing Batch Reactors (SBR), Membrane Bio-Reactors (MBR), and the Biologically Engineered Single Sludge Treatment (BESST) process.

The BESST process was selected for the project based upon its record of process stability and ability to consistently achieve the NYS DEC & Westchester County sanitary sewage design goals for treatment of sanitary sewage.

Sanitary sewage will be transported to the STP from the residences and amenities complex via an 8” PVC gravity collection and conveyance system designed by JMC, PLLC.

Description of Selected BESST Treatment Process:

The BESST process is a continuous flow modified extended aeration process. Sewage enters first into the anoxic chamber where it mixes with Return Activated Sludge (RAS) from the clarifier. The nitrogen removal process is completed here as nitrite (NO_2-N) and nitrate (NO_3-N) produced in the aeration zone are converted to nitrogen gas (N_2). Some of the influent BOD_5 is consumed in this denitrification process. The dissolved oxygen (DO) level is maintained below 0.2 mg/l, and submerged mixers keep mixed liquor suspended solids (MLSS) in suspension.

The mixed liquor is transferred by gravity from the anoxic chamber to the far end of the aeration chamber through a submerged transfer pipe. BOD_5 removal and nitrification take place here as the mixed liquor is aerated by fine bubble air diffusers. The aerated mixed liquor then flows into the bottom of the clarifier by means of a baffle.

In the clarifier, solids settle to the bottom as the supernatant flows over the effluent weir and is gravity discharged to the effluent recharge system. Waste Activated Sludge (WAS) sludge is returned to the sludge holding tanks.

SECTION VII
TREATMENT FACILITY DESIGN

Drawing No. 1 – STP Site Plan shows the proposed location of the STP and effluent piping connecting into the existing outfall line that discharges to surface water. Drawing No. 2 - Hydraulic Profile illustrates the proposed hydraulic flow profile of sewage and sludge flows through the STP through the existing sewer manhole that will be used as the connection point into the outfall line.

The proposed sewage treatment and disposal facilities will consist of an equalization tank, a 45,000 gpd BESST process train including a sludge holding tank, an influent screening device and constant head box on a precast concrete access slab, a proposed flow metering effluent manhole, approximately 300 feet of 6” PVC piping to reach the existing outfall piping, and a proposed 20-ft by 35-ft masonry STP building containing a tertiary filter and two (2) UV treatment units. Each step of the process and the required support systems are described below.

All side walls, end walls, bottom, and partitions of the BESST process and equalization tanks shall be of structural grade ASTM-A36 steel plate and all internal piping will be constructed of type 316 stainless steel. There shall be full grating over each of the BESST tanks, including the tertiary filter within the building, and two (2) stairs for Operator access to the BESST process tank and tertiary filter that extend above grade. The perimeter of the process tank and filter will be equipped with galvanized steel safety handrails and kickplate at top of tank elevation.

Influent Equalization Tank

The 8” diameter PVC gravity sewer line has a proposed invert into the equalization tank set at 4.25 feet below the top of tank elevation. The existing flow equalization tank will be equipped with two (2) Goulds Model 3887 non-clog submersible pumps to convey sanitary sewage out of the tank to the anoxic tank internal to the BESST process train. Each pump will have the capacity to handle at a minimum the peak influent flow of 45 gpm at 13.26 ft. TDH. Pump performance curves can be found in Appendix B.

The equalization volume in the tank will be provided between the lead pump “off” elevation to the lag pump “on” elevation, consisting of a proportion of the daily average flow, sludge holding tank volume, and tertiary filter volume.

Equalization Volume Required	=	20% of Daily Average Flow + 25% Sludge Holding Tank Volume + 5% Daily Flow Filter Volume
	=	45,000 x 0.20 + 13,757 x 0.25 + 45,000 x 0.05
Total Required Equalization Volume	=	14,689.25 gallons (1,963.80 cu. ft.)

The minimum vertical difference between "Lag Pump On" float level elevation and the "Lead Off" float level elevation shall be 5.0 ft. This will provide a total equalization storage volume of 15,051 gallons, which is well above the minimum calculated above.

The applicable criteria of Chapter 60 "Screening, Grit Removal and Flow Equalization" of the Ten State Standards including general criteria and the special considerations and standards for flow equalization structures. The 34'-0" x 12'-0" x 7'-0" SWD equalization tank has full grating over the tank with removable panels for operator access. Operation of the pumps will be controlled by use of a pressure transducer, and all pressure transducer and tank elevations are shown below:

Float	**Height**
Top of Equalization Tank	585.75
Approximate Grade El.	585.50
Influent Line El.	581.50
High Water Level Alarm	581.25
Lag Pump On	580.75
Lag Pump Off	578.75
Lead Pump On	577.75
Lead Pump Off	575.75
Low Water Level Alarm	575.25
Bottom of Equalization Tank	573.75

Table – Equalization Pump Float Levels

Influent Screening Device

The two (2) explosion proof submersible raw sewage pumps specified in the previous section will pump the sewage from the equalization tank to a covered fine bar screen via two (2) 3" diameter force mains. The bar screen shall be mounted on the precast concrete access slab that is located between the proposed equalization and BESST process tank. See Drawing No. 1 – STP Site Plan for proposed location of the access slab. The screen will have the capacity to process the flow from both equalization pumps in the event that they run simultaneously. The screened solids will be disposed of manually. The selected screening device is a model MB 260T by Or-Tec, Inc. with a 2 mm screen opening. The screened influent will pass through a constant head box prior to being conveyed to the anoxic tank via gravity.

<u>Anoxic Compartment</u>

See Appendix C – Manufacturer's Process Calculations for Anoxic Compartment calculations.

The equalized sewage will enter the anoxic compartment where it will mix with the return activated sludge (RAS) which is returned from the bottom of the clarifier by means of air lift pumps. This anoxic compartment will act as a selector conditioning zone for the microorganisms which will consume the pollutants in the sewage. Some of the influent BOD_5 will be consumed by the denitrifying bacteria as they complete the nitrogen removal process (Denitrification) and convert nitrate (NO_3) to nitrogen gas (N_2). Two (2) electric submersible mixers on slide rail assemblies with manual hoists will be provided within the anoxic compartment to prevent settling. The mixed liquor will flow into the far end of the bottom of the aeration compartment through a submerged transfer pipe.

The BESST anoxic zone will be 14'-0" wide by 4'-0" long (plan view at the water level), and have a 10'-6" effective depth (12'-0" total sidewall depth). The total volume of the anoxic zone shared between the two trains shall be 993.85 cu.ft. (7,434.0 gallons) . With a design flow of 45,000 GPD, the detention time will be 3.96 hours.

<u>Aeration Compartment</u>

See Appendix C – Manufacturer's Process Calculations for Aeration Compartment calculations.

The mixed liquor will be aerated by a fine bubble air diffusion system to provide process oxygen and prevent solids settlement. The remaining BOD_5 will be removed and the nitrification process which begins as ammonia (NH_3) is converted to nitrite (NO_2) and nitrate (NO_3). The mixed liquor will then flow into the bottom of each clarifier by means of a baffle design integral to the clarifier. Return sludge will be removed from the bottom of each clarifier and pumped to the anoxic zone by means of air lift pumps. Oxygen levels in each aeration compartment will be controlled by utilizing a portable hand-held D.O. monitoring probe and adjusting the manual VFD's on each blower.

The air requirement for the aeration tanks is determined by the manufacturer based on the oxygen and air consumption rates, including a safety factor of 5 scfm. The calculation is outlined below:

Air Flow Rate Required:

$$Oxygen = \; Q((S_O - S_R)/0.68) - 1.42P_X + \; 4.57Q(N_O - N)$$

$$Oxygen = \; 170.33((0.24 - 0.0037)/0.68) - 1.42(14.004) + \; 4.57(170.33)(0.04 - 0.001)$$

$$Oxygen = \; 69.655 \; kg \; O_2/day$$

$$Air = O_2(\frac{c_S}{c_S - 2})(\frac{o_K}{0.024a})$$

$$Air = 69.655(\frac{8.1224}{8.1224 - 2}))(\frac{1.30}{0.024 * 30})$$

$$Air = 166.85 \; Nm^3/h$$

$$Air = \left(166.85 \frac{Nm^3}{h} * 35.31 \frac{m^3}{ft^3} * \frac{1 \; min}{60 \; hr}\right) = 98.19 \; cfm + 5 \; cfm =$$

$$Air = 103.19 \; cfm$$

Therefore, for each aeration tank the required amount of air is 51.60 cfm, and the air provided for the aeration tanks will come from the main process blower. See Appendix C for a breakdown of the manufacturer's BESST calculations as well as a list of inputs for the above calculations.

Each proposed aeration compartment will be 14'-0" wide by 9'-2 ½" long (plan view at the water level), and have a 10'-6" effective depth (12'-0" total sidewall depth). The aeration volume in each treatment train will be 1,757.69 cu.ft. (13,147.5 gallons), for a total volume of 3,515.37 cu.ft. (26,295 gallons). With the design flow of 45,000 GPD, the detention time will be 14.02 hours. The combined detention time for the anoxic zones and the aeration zones will be 17.98 hrs.

Clarifier

See Appendix C – Manufacturer's Process Calculations for Clarifier calculations.

The clarifier has a triangular cross-section. Mixed liquor will enter the clarifier through the baffle at the bottom of the clarifier and flow upward. As the mixed liquor rises, heavier solids settle out, and in effect, form a blanket which filters out colloids and very fine particles. A distinct interface forms between the supernatant and the sludge blanket. An air lift pump will be used to remove the activated sludge from the bottom of the clarifier and either discharge it to the anoxic chamber or waste it to the sludge storage tanks. Nitrified return activated sludge (RAS) will be recycled to the anoxic chamber to maintain the biomass concentration required for the treatment process. The RAS rate is proposed to be 4 times the design flow rate for the STP (45,000 GPD x 4 / 1440 min/day / 2 process trains = 62.50 gpm per process train).

Since there are two (2) sludge airlifts rated at 13 scfm each and two (2) skimmer airlifts rated at 5 scfm, the required amount of air for the airlift lines is 36 scfm. The airlift calculations from the manufacturer and performance curves are shown in Appendix C.

Periodically, waste activated sludge (WAS) will be pumped to the sludge storage tanks to control the solids retention time (SRT) of the biomass. FOG and skimmings will be transferred through the airlift system back to the sludge holding tanks. The design SRT is 29.2 days. An air lift skimmer will be used to remove floatables such as light plastics, fats and oils from the surface of the clarifier. Clarifier supernatant flows over a weir into a trough and flows by gravity to the tertiary filter.

Each clarifier will measure 14'-0" wide by 11'-0" long (plan view at the water level), and have a 10'-6" effective depth (12'-0" total sidewall depth). Each clarifier has a volume of 811.76 cu.ft. (6,072 gallons), for a total of 1,623.53 cu.ft. (12,144 gallons). Detention time in the clarifiers at average flow of 45,000 gpd will be 6.48 hrs. The combined detention time for the anoxic zones, the aeration zones, and the clarifiers will be 24.46 hrs. Surface loading rate will be 146.10 GPD/sq.ft. (45,000 gpd/(2 units X 154 sq.ft. per unit) and weir loading rate will be 1,607.14 GPD/Ft. (45,000 GPD/(2 Units X 14'-0" L)). These values are within the limitations set forth by the Ten States Standards.

Blowers

1. Process Air / Airlift Blowers
   A total of two (2) blowers, each with a minimum capacity of 148 scfm, will be provided for the aeration tanks and sludge airlifts, which is greater than the required capacity of 138.19 cfm (103.19 cfm + 36.0 cfm = 138.19 cfm) for both tanks, See Appendix C – Manufacturer's Process Calculations for the aeration and airlift calculations. One (1) blower will act as the duty blower, and the standby blower will as function as a common spare for the aeration/airlift, the equalization tank, sludge holding tank, and tertiary filter. The blower selected for this duty is the Kaeser Model BB69C with a 10.0 HP motor. See Appendix D for blower performance data. Each blower will be supplied with a manual VFD control system with an electrical bypass. High and low pressure switches will be provided with manual valves to accommodate usage of the standby blower.

2. Equalization Tank / Sludge Holding Tank Air Blowers
   Two (2) blowers, each with a minimum capacity of 74 scfm, will be dedicated for the equalization and sludge holding tanks. This minimum capacity is greater than the required capacities of the equalization tanks and sludge holding tank of 18.81 cfm and 55.22 cfm, respectively. The blower selected is the Kaeser Model BB52C, with a 5.0 HP motor, see Appendix D for blower performance data. Each blower will be supplied with a manual VFD control system with an electrical bypass. High and low pressure switches will be provided with manual valves to accommodate usage of the standby blower.

3. Tertiary Filter Air Blower
   One (1) duty blower, with a minimum capacity of 160 scfm, will be provided for the tertiary filter, which is greater than the required capacity of 126.40 cfm, based on an air supply rate of 4 cfm/sq. ft. of filter beds. The total square footprint of the proposed filter beds is 31.6 square feet. The blower selected is the Kaeser Model BB69C, with a 10.0 HP motor, See Appendix D for blower performance data. High and low pressure switches will be provided with manual valves to accommodate usage of the standby blower.

The blowers will be provided with sound enclosures and will be housed in the proposed STP control building.

Tertiary Filtration and Disinfection

To meet the stringent effluent BOD_5 and TSS limits for the STP outlined in Section V, a dual-media, dual-bed auto backwash tertiary filter and ultraviolet disinfection will be provided following the BESST extended aeration process. The tertiary filter unit to be provided as a pre-designed unit is the PURESTREAM PST-31.5 that includes filter beds, a clear well chamber, and backwash capabilities to treat secondary effluent to meet the design limits.

Drawings of the tertiary filter unit are included in Drawing No. 3 – Manufacturer's STP Layout. All side walls, bottom, and partitions of the filter will be of structural grade ¼" steel plate, the internal air scour lines will be Schedule 40 perforated PVC pipe, and the backwash surge and backwash pump piping is Schedule 40 PVC pipe with iron pipe fittings.

Disinfection of the effluent from the tertiary filter will be achieved using two (2) Enaqua Model M4 ultraviolet disinfection system units that will also be located in the proposed STP control building. The proposed in-line units will be installed in a flow-through configuration and fed by gravity from the filter. Isolation valves will be provided on the incoming lines to control flow in the event of maintenance, replacement, or repair work on one unit. See Appendix E regarding additional information on the UV disinfection system specified.

Effluent Flow Metering

A flow meter will be provided at a common location in the proposed 5' diameter sampling manhole and effluent flow meter chamber. The instrumentation will provide a visual readout of instantaneous flow using a flow totalizer and a flow recorder and will be located in a dry location adjacent to the control equipment in the proposed STP control building.

Effluent Recharge

The treated effluent from the STP is discharged to Byram River from an existing outfall to the tributary located in the northwest region of the subject parcel. The replacement STP will be connected into the existing buried 6" diameter SDR-35 PVC outfall line at an existing manhole west of the existing STP building. The effluent recharge piping and structures shall remain intact downstream of the referenced manhole, and no sufficient evidence exists to warrant a modification of the existing outfall location.

Sludge Holding Tank

The sludge holding tank will be used to hold wasted sludge prior to disposal and will be provided as a part of the main treatment process tank. Sludge holding tank sizing is based on an equivalent sewage flow of 75 gpd per capita and 3 cubic feet of sludge per capita per month. For the equivalent population of 600 people (45,000 gpd ÷ 75 gpd/capita) and 3 cubic feet of sludge per capita per month, the required tank volume is 1,800 cu.ft. (600 people X 3 cu.ft./capita), or 13,464.0 gallons. The sludge holding zone will measure 14'-0" wide by 9'-9" long (plan view at the water level) with a 10'-6" SWD (12'-0" total sidewall depth), providing a total volume of 1,839.17 cu. ft. (13,757 gallons). This will provide 39.17 cu. ft. (293.00 gal) greater than the 1,800 cu. ft needed of sludge storage, or approximately 30.65 days of storage capacity.

Air will be supplied to the sludge holding tank at a minimum rate of 30 cfm per 1000 cu. ft. of tank volume via non-clog coarse bubble diffusers to keep the contents aerobic to avoid septic odors and contents of the sludge holding tanks in the completely mixed condition. Consequently, the total air supply rate will be as follows:

CFM = 1,839.17 cu.ft. x 30 cfm/1000 cu. ft.
= **55.17 cfm**

Sludge and scum removal will be via scavenger truck to an approved off-site treatment facility, while the sludge supernatant will be returned by gravity flow to the anoxic zone of the treatment process. Each pump provided will be the Goulds Model 3887 submersible sewage pump, which will provide a minimum capacity of 76 gpm at 14.12 ft. TDH to elevate the sludge supernatant back to the equalization tank so decanted liquid can be rescreened prior to entering the treatment tanks. The sludge decant pump will be controlled by a dedicated control panel, which will contain a start timer, a stop timer, and a float override. Pump performance curves can be found in Appendix B.

Chemical Dosing

Dosing of alum to the aeration compartments of the BESST system is required to comply with the Total Phosphorus effluent limit dictated by the SPDES permit. A suitably sized chemical metering pump and storage tank with containment will be provided.

STP Control Building

The proposed STP control building will contain the tertiary filter, two (2) UV units, five (5) blowers, and spare mechanical equipment, electrical panels and controls.

A laboratory area will be provided within the building for the Operator, which shall include an emergency eyewash and safety shower installed as per 10 State Standards requirements. The structure will provide the necessary protection of the process controls and blowers from the elements (cold weather, rain, frost) and a dry, heated environment with proper ventilation for operating personnel for operation and maintenance functions, process testing, and record-keeping. Sufficient lighting shall be provided for safe working conditions.

The laboratory area of the STP control building will provide space to store instruments and test kits for process monitoring. The instruments and test kits to be provided will include:

* Portable dissolved oxygen meter
* pH meter
* Temperature meter or thermometer
* 1-liter graduated cylinders for settleability tests
* Hach DR900 colorimeter for Ammonia, Nitrite and Nitrate Measurement

Sufficient storage within the STP control building has been allotted for tools, spare parts, and lubricants as well as drawer space for the operator to store maintenance logs and treatment plant records. Spare parts and lubricants will be provided as part of the facility construction. Required logs and records will be discussed in detail in the facility Operation and Maintenance Manual to be prepared by the Engineer of Record during the construction period.

A new asphalt driveway will be paved on the west side of the STP control building to allow for Operator and visitor parking as well as a turnaround point for sludge pump trucks.

Standby Power

A standby gas generator will provide power to all the STP equipment during utility power outages. The generator will be pad mounted outside the STP control building in a louvered enclosure and will be provided with residential grade silencer.

Miscellaneous Facility Design Features

Separation Distances - Table B-1 “Recommended Minimum Aerial Separation Distance from Treatment Facility” of the NYS DEC standards for Intermediate Sized Wastewater Treatment Systems requires a 200-ft. minimum radial distance to existing downwind dwellings from STP treatment processes enclosed in a building. Table B-1 also requires a 150-ft. minimum separation distance from the treatment units to neighboring property lines with residential use. The above requirements are met for the replacement STP process as shown in the proposed site plan in Figure 1.

Table B-2 “Minimum Horizontal Separation Distances” presents the 50-ft. distance requirement for sewer piping from drilled wells. The existing private wells on the parcel are all located greater than 50 feet from the proposed gravity sewer piping for the replacement STP.

Water Supply - There shall be a 1” diameter water service for the STP that taps into the water supply distribution system from the proposed water treatment plant approximately 55 ft south of the existing STP building. A reduced pressure backflow preventer will be provided on the water supply into the treatment plant to protect the community water supply from possible contamination.

Ventilation - Ventilation will be provided to maintain a dry, comfortable condition inside the control building. Six (6) air changes per hour will be provided.

Testing - The design documents will contain provisions for structure, piping and equipment testing in accordance with the NYS DEC Standards and the requirements outlined in 10 State Standards. This will include structure water tightness testing, piping pressure testing, and operational testing of equipment (including pumps, controls, and alarms).

Certifications - Manufacturers certifications of successful equipment testing and Engineer of Record certification of installation and testing will be provided in accordance with the provisions of Sections F and G of the NYS DEC Standards.

Sampling Locations - Wastewater samples are to be taken at the plant influent (equalization tank) and the plant effluent (flow meter chamber). The sample locations are identified in the SPDES process flow diagram presented in Appendix F – Sampling Locations.

APPENDIX A

SOIL BORING RESULTS

BY CARLIN-SIMPSON & ASSOCIATES

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13 February 2013
Revised 16 October 2013

Brynwood Partners, LLC
c/o Corigin Holdings
505 Fifth Avenue, 22nd Floor
New York, NY 10017

Attn: Ms. Megan Maciejowski

Re: Report on Subsurface Soil and Foundation Investigation
Brynwood Club Development
Bedford Road
Town of North Castle, NY (12-175)

Dear Ms. Maciejowski:

In accordance with our proposals dated 20 November 2012 and 9 September 2013 and your subsequent authorization, we have completed a Subsurface Soil and Foundation Investigation for the referenced site. The purpose of this study is to preliminarily determine the nature and engineering properties of the subsurface soil and bedrock as well as the groundwater conditions for the planned development, to recommend a practical foundation scheme, to determine the allowable bearing capacity of the site soils, and to determine the subsurface soil and groundwater conditions and soil permeability in the new stormwater management areas.

We understand that the planned construction will consist of 21 new structures, roadways, parking areas, retaining walls, tennis courts, underground utilities, and a stormwater management system. To guide us in our study, you have provided us with a site plan that indicates the existing site conditions and the location of the planned new development.

Our scope of work for this project included the following:

1. Reviewed the proposed layout, the existing site conditions, the expected soil conditions, and planned this study.

2. Retained General Borings, Inc. to advance 11 test borings at the subject site.

3. Retained Traficante Contracting Inc. to excavate 18 test pits at the subject site.

4. Inspected ten (10) supplemental test pits that were excavated at the site by Brynwood Club personnel.

5. Laid out the boring and test pit locations in the field, provided full time inspection of the explorations, obtained soil samples, and prepared detailed logs and a Boring and Test Pit Location Plan.

6. Performed three (3) field percolation tests and one (1) borehole permeability test.

7. Performed soil identification tests on selected soil samples in our laboratory.

8. Analyzed the field and laboratory test data and prepared this report containing the results of this study.

SITE DESCRIPTION

The project site is located on the Brynwood Club property on Bedford Road in North Castle, Westchester County, New York. The subject property is currently occupied by a golf club with a clubhouse building, tennis courts, and a few smaller out-structures. The proposed development area is also occupied by an asphalt paved parking lot and driveways as well as grass lawn areas and wooded areas. There are numerous existing underground utilities located throughout the property.

Within the proposed development area, the existing site grades vary from approximately elevation +610.0 at the southwest corner of the subject site and the westernmost portion of the site, to elevation +640.0 on the east side of the existing clubhouse building, to elevation +674.5 in the existing tennis court area in the northeastern portion of the property.

SUBSURFACE CONDITIONS

To determine the subsurface soil, bedrock, and groundwater conditions, we advanced 11 test borings and 28 test pits at the site. The borings and test pits were performed at the locations shown on the enclosed Boring and Test Pit Location Plan. Detailed logs have been prepared and are included in this report. Our field engineer visually identified all soil samples and selected soil samples were tested in our laboratory. The results of these tests are also included in this report.

Soil

The soil descriptions shown on the boring and test pit logs are based on the Burmister Classification System. In this system, the soil is divided into three components: Sand (S), Silt ($) and Gravel (G). The major component is indicated in all capital letters, the

lesser in lower case letters. The following modifiers indicate the quantity of each lesser component:

Modifier	**Quantity**
trace (t)	0 -10%
little (l)	10% - 20%
some (s)	20% - 35%
and (a)	35% - 50%

The subsurface soil conditions observed in the borings and test pits can be summarized as follows:

Stratum 1
Topsoil

The surface layer at most of the boring and test pit locations consists of brown topsoil that typically ranges from about 0’3” to 1’6” in thickness.

Stratum 2
Existing Fill

Beneath the topsoil and at the surface in three (3) of the borings (B-6, B-8, and B-9) and ten (10) of the test pits (TP-2, TP-9, TP-10, TP-12, TP-14, TP-16, TP-19, TP-21, TP-26, and TP-28) is existing fill that consists of loose to medium dense brown coarse to fine SAND, little (to and) Silt, trace (to some) coarse to fine Gravel. Cobbles, boulders, topsoil, roots, and debris were also present within the fill at some of the test locations. The existing fill was encountered to depths ranging from 1’0” to more than 9’0” beneath the existing ground surface. Test pits TP-9 and TP-28 were terminated in the fill at final depths of 6’9” and 9’0” beneath the ground surface, respectively.

Stratum 3
Sandy Silt or Silty Sand

Underlying the topsoil and existing fill is virgin soil that is comprised of medium dense to dense brown, light brown, or gray brown SILT some (to and), coarse to fine Sand, trace (to little) coarse to fine Gravel or coarse to fine SAND, little (to and) Silt, trace (to and) coarse to fine Gravel, with occasional cobbles and boulders. The Sandy Silt or Silty Sand stratum continued to depths ranging from 2’0” to 12’0” below the existing ground surface. Boring B-8 and test pits TP-8, TP-10, TP-12, TP-19, TP-20, TP-22, and TP-26 were terminated in this stratum at final depths ranging from 5’0” to 12’0” beneath the ground surface.

Stratum 4
Sand or Sandy Gravel

Below the Sandy Silt or Silty Sand at several test locations is completely weathered Gneiss bedrock that generally consists of dense to very dense brown or gray brown coarse to fine SAND, little (to some) Silt, trace (to some) coarse to fine Gravel or coarse to fine GRAVEL and, coarse to fine Sand, trace Silt. Where encountered in the borings and test pits, the completely weathered bedrock was present at depths ranging from 2’0” to 7’0” beneath the ground surface and continued to depths ranging from 4’7” to 15’2” below the existing ground surface.

Stratum 5 Gneiss Bedrock	Gneiss bedrock was encountered at 27 of the 39 test locations. Where encountered in the borings and test pits, gneiss bedrock was observed at depths ranging from 1'8" to 15'2" beneath the existing ground surface. In general, the quality of the bedrock will improve with depth. At boring B-10, the bedrock was cored between the depths of 2'0" and 7'0". The core recovery was 86% and the Rock Quality Designation (RQD) of the recovered core was 53%. This indicates that the quality of the upper five (5) feet of the Gneiss bedrock is fair. The Gneiss bedrock is moderately weathered and in a blocky and seamy condition.

Groundwater

Observations for groundwater were made during sampling and upon completion of the drilling operations at each boring location. In auger drilling operations, water is not introduced into the boreholes, and the groundwater position can often be determined by observing water flowing into or out of the boreholes. Furthermore, visual observation of the soil samples retrieved during the auger drilling and in the test pits can often be used in evaluating the groundwater conditions.

Groundwater was encountered in test pit TP-8 at a depth of 4'1" (+609.9), in test pit TP-13 at a depth of 4'10" (+631.2), in boring B-8 at a depth of 3'3" (+608.3), in test pit TP-22 at a depth of 4'6" (+470.5), and in test pit TP-28 at a depth of 8'0" (+491.0) beneath the ground surface. Groundwater was not encountered in any of the other borings or test pits that were performed at the subject site during this investigation.

Variations in the location of the long-term water table may occur as a result of changes in precipitation, evaporation, surface water runoff, and other factors not immediately apparent at the time of this exploration. Based on the site conditions, trapped groundwater may be encountered in the silty site soils and/or along the soil/rock interface during wet periods. Proper groundwater control measures will be required in the event that trapped water is encountered in the site excavations.

Bedrock

Bedrock was encountered in 27 of the 39 explorations that were performed at the site during this investigation. Completely weathered bedrock was encountered at ten (10) test locations at depths ranging from 2'0" to 7'0" below the existing ground surface. Harder bedrock was encountered in the remaining locations and below the completely weathered rock at depths ranging from 1'8" to 15'2" beneath the ground surface. These depths correspond to bedrock elevations ranging between approximately elevation +471.0 and elevation +669.8.

Based on the boring and test pit data and the site plans provided to this office, bedrock was encountered above the planned finished floor elevation in portions of the site. The observed depth to bedrock at each boring and test pit location is summarized in Table 1 in the following section of this report.

The bedrock encountered at the site consists of weathered Gneiss. Based on our experience, the in-situ bedrock will range from highly weathered, fractured rock to massive, intact rock. Penetration into the bedrock with excavation equipment will depend of the degree of weathering and fracturing in the rock. We anticipate that the ”rippability” of the bedrock will be variable and very limited. Based on our observations, harder rock will be encountered and blasting and/or the use of hydraulic hammers will be required to excavate the harder, intact bedrock. Rock removal is discussed further in a separate section of this report.

EVALUATION

At the time of this report, the proposed layout, the proposed finished floor elevations, and the site grading were preliminary. Therefore, the following evaluation is preliminary in nature and has been generalized for the expected development. The recommendations below are intended for planning purposes only and are not intended for final design and construction. Additional subsurface investigation will be required for the proposed buildings and retaining walls. Preliminarily, we estimate that an additional 12 to 15 explorations will be required for this project. Once the site plans have been further developed, a copy shall be forwarded to our office so that we can review it along with the recommendations in this report. At that time, we will provide specific recommendations for additional subsurface investigation. After the supplemental investigation has been completed, additional geotechnical recommendations will be provided for the project site. As a result, the recommendations within this report are subject to change.

Based on the preliminary site plans, we understand that the planned construction will consist of 21 new structures that will include seven (7) golf residences, seven (7) club villas, five (5) golf cottages, one (1) fairway residences building, and one (1) clubhouse building. The proposed construction will also include new asphalt paved roadways and parking areas, retaining walls, tennis courts, underground utilities, and a stormwater management system.

The grading plan provided to this office indicates that the proposed finished floor elevations vary across the site. In addition, the fairway residences, golf cottages, and golf residences will have basements. Based on the existing and proposed grades, cuts ranging up to approximately 14’0” and fills ranging up to approximately 10’0” are expected to achieve the proposed floor slab subgrade elevations. In the proposed pavement areas, cuts ranging up to approximately 6’0” and fills ranging up to approximately 8’0” are expected to achieve the proposed pavement subgrade elevations.

The boring and test pit data indicates that there is existing fill (Stratum 2) present in portions of the site to depths ranging from 1’0” to more than 9’0” below the existing ground surface. The existing fill generally consists of loose to medium dense Sand with varying amounts of Silt and Gravel and occasional cobbles, boulders, topsoil, roots, and debris. Underlying the existing fill is medium dense to dense Sandy Silt or Silty Sand (Stratum 3). The Sandy Silt or Silty Sand is underlain by dense to very dense completely weathered Gneiss bedrock (Stratum 4) in areas followed by more competent Gneiss bedrock (Stratum 5), which was encountered at depths ranging from 2’0” to 15’2” beneath the existing ground surface. The existing fill and bedrock observations are summarized in Table 1 below.

Table 1 - Summary of Boring and Test Pit Data

Boring or Test Pit No.	Approximate Ground Surface Elevation	Depth to Bottom of Existing Fill (Elevation)	Depth to Weathered Bedrock (Elevation)	Depth to Bedrock or Auger Refusal (Elevation)
B-1	+661.0	NE	5’0” (+656.0)	8’0” (+653.0)
B-2	+628.0	NE	NE	7’0” (+621.0)
B-3	+620.0	NE	2’0” (+618.0)	4’9” (+615.3)
B-4	+628.0	NE	2’0” (+626.0)	10’6” (+617.5)
B-5	+623.0	NE	2’0” (+621.0)	8’6” (+614.5)
B-6	+617.0	1’0” (+616.0)	NE	5’6” (+611.5)
B-7	+628.0	NE	5’0” (+623.0)	15’2” (+612.8)
B-8	+609.0	5’6” (+603.5)	NE	NE to 12’0”
B-9	+674.0	7’0” (+667.0)	7’0” (+667.0)	7’6” (+666.5)
B-10	+638.8	NE	NE	2’0” (+636.8)
B-11	+640.0	NE	4’0” (+636.0)	5’6” (+634.5)
TP-1	+662.0	NE	NE	2’0” (+660.0)
TP-2	+672.0	1’10” (+670.2)	NE	4’4” (+667.7)
TP-3	+672.0	NE	NE	2’2” (+669.8)
TP-4	+672.0	NE	NE	3’6” (+668.5)
TP-5	+670.0	NE	3’8” (+666.3)	4’9” (+665.3)
TP-6	+672.0	NE	2’10” (+669.2)	4’7” (+667.4)
TP-7	+620.0	NE	NE	2’8” (+617.3)
TP-8	+614.0	NE	NE	NE to 5’0”
TP-9	+628.0	>6’9” (<+621.3)	NE	NE to 6’9”
TP-10	+625.0	3’0” (+622.0)	NE	NE to 8’0”
TP-11	+642.0	NE	3’9” (+638.3)	6’0” (+636.0)
TP-12	+635.0	5’0” (+630.0)	NE	NE to 6’6”
TP-13	+636.0	NE	NE	7’5” (+628.6)
TP-14	+625.0	5’0” (+620.0)	NE	5’0” (+620.0)
TP-15	+668.0	NE	NE	1’8” (+666.3)
TP-16	+651.0	1’10” (+649.2)	NE	4’10” (+646.2)
TP-17	+655.0	NE	NE	NE to 1’0”
TP-18	+670.0	NE	NE	NE to 7’0”
TP-19	+427.0	2’5” (+424.6)	NE	NE to 7’0”
TP-20	+415.0	NE	NE	NE to 8’0”
TP-21	+478.0	1’4” (+476.7)	NE	7’0” (+471.0)
TP-22	+475.0	NE	NE	NE to 7’6”
TP-23	+496.0	NE	NE	3’10” (+492.2)
TP-24	+564.0	NE	NE	6’8” (+557.3)
TP-25	+633.0	NE	NE	3’4” (+629.7)
TP-26	+669.0	5’6” (+663.5)	NE	NE to 8’0”

Boring or Test Pit No.	Approximate Ground Surface Elevation	Depth to Bottom of Existing Fill (Elevation)	Depth to Weathered Bedrock (Elevation)	Depth to Bedrock or Auger Refusal (Elevation)
TP-27	+561.0	NE	NE	4’4” (+556.7)
TP-28	+499.0	>9’0” (<+490.0)	NE	NE to 9’0”

Notes: NE – Not Encountered
B-8: Groundwater at +608.3
TP-8: Groundwater at +609.9
TP-9: Terminated in the Existing Fill
TP-13: Groundwater at +631.2
TP-22: Groundwater at +470.5
TP-28: Groundwater at +491.0
TP-28: Terminated in the Existing Fill

<u>Removal of Existing Structures from New Building and Pavement Areas</u>

Building Areas

The site plan indicates that existing structures are present in some of the proposed building areas. The existing structures will be removed as part of the proposed development. All debris resulting from the demolition of these items must be completely removed from the new building areas, extending at least ten (10) feet beyond the new building limits, where practical. This shall include the complete removal of all foundations, walls, slabs, utilities, sidewalks, pavement, and miscellaneous debris. Where the removal of existing items or associated materials extends below the planned building, the resulting excavations shall be backfilled with new compacted fill as described below.

Existing utilities, where they are encountered within the planned building areas, should be either abandoned or rerouted around the new structures. Once the utility has been rerouted or abandoned, the section of pipe and any associated structure within the building areas should be completely removed. The removal of the pipe and structure must also include any loose fill around the pipe or structure. After the pipe, associated structure, and associated loose backfill have been removed, the resulting excavation shall be backfilled with new controlled fill as described below.

New compacted fill shall consist of either suitable on-site soil or imported sand and gravel. Imported sand and gravel fill shall contain less than 20% by weight passing a No. 200 sieve. The fill shall be placed in layers not exceeding one (1) foot in loose thickness. In the proposed building area, new fill shall be compacted to at least 95% of its Maximum Modified Dry Density (ASTM D1557). Each layer shall be compacted, tested, and approved prior to placing subsequent layers.

Pavement Areas

In the proposed pavement areas, any existing structures and debris resulting from the demolition of the structures must be completely removed from the new pavement areas, extending at least five (5) feet beyond the new paving limits, where practical. The

excavations resulting from the removal of existing items shall be backfilled using controlled compacted fill. New fill shall consist of either suitable on-site soil or imported sand and gravel placed in one (1) foot loose layers and compacted to at least 92% of its Maximum Modified Dry Density (ASTM D1557).

Implications of Existing Fill

The boring and test pit data indicates that existing fill is present in portions of the site. Where encountered in the borings and test pits, the fill extended to depths ranging from 1’0” to more than 9’0” beneath the existing ground surface. These depths correspond to elevations ranging from approximately +424.6 to elevation +670.2. The depth of the existing fill is expected to be variable and may be deeper in unexplored areas of the site and around the existing site buildings.

The existing fill is not an acceptable bearing material for the new building foundations or floor slabs. The consistency and density of the fill material are not predictable. Certain areas may contain clean dense soils while other areas may contain loose material, topsoil, and/or debris. The existing fill creates the possibility of intolerable differential settlements under loading.

To eliminate the potential for damaging differential settlements, we recommend that the existing fill be completely removed from the new building areas. Based on the existing grades and the proposed finished floor elevations, we expect that some of the existing fill will be removed during the planned building excavations. However, existing fill is expected to be encountered below the planned subgrade elevation in portions of the site. Undercutting of the subgrade will be required in these areas to remove the existing fill or otherwise unsuitable materials from the building areas. The over-excavated areas shall then be replaced with new structural fill, as necessary, to achieve the planned subgrade elevations.

To further evaluate the existing fill conditions in and around the planned building areas, we recommend that a series of supplemental test pits be performed at the time of construction. The test pits should be conducted under the full time observation of a Carlin-Simpson & Associates representative. These test pits will allow us to confirm the consistency, thickness, and horizontal limits of the existing fill material.

Provided that the existing fill and any other unsuitable materials encountered during construction are removed, it is our opinion that the new structural fill and virgin soils can adequately support the new building foundations and floor slabs.

Rock Removal - Blasting Issues

As discussed above, bedrock was encountered at 27 of the 39 test locations during this study. The bedrock was encountered at depths ranging from 1’8” to 15’2” beneath the ground surface. These depths correspond to bedrock elevations ranging between approximately elevation +611.5 and elevation +669.8. Based on the site plans provided to this office, bedrock was encountered above the planned finished floor elevation in portions of the site. Bedrock may also be encountered at higher elevations in the unexplored areas of the site.

The bedrock encountered in the borings and test pits consists of weathered Gneiss. Based on our experience, the in-situ bedrock will range from highly weathered, fractured rock to massive, intact rock. To excavate the rock, the upper 1’0” to 5’0” of rock may be “rippable” by using large construction equipment. The use of hydraulic hammers and/or blasting will be required in order to achieve deeper excavations. Zones of weathered rock may exist deeper than 5’0” but conditions are expected to be highly variable. Hard rock will be encountered during construction.

In order to develop the site, rock removal will be required in areas to achieve the proposed grades. Rock removal may also be required for the new pavement and utilities in portions of the site. Rock blasting will likely be required to achieve the proposed grades in areas. Nearby buildings and existing underground utilities could be affected by the blasting.

The Blasting Contractor should avoid over-blasting the rock. Over-blasting will disturb the deeper intact rock that will be used as bearing material for the proposed foundations and floor slab.

The blasting operation will be monitored by a seismologist using a seismograph. The Peak Particle Velocity emanating from any blast will be restricted to 2.0 in/sec. Each blast will be monitored to insure that this criteria is not exceeded.

The U.S. Bureau of Mines [Nicholas et al (1971)] has established that a threshold of 4.0 in/sec will likely crack plaster and thus they recommend that the safe vibrational criterion be 2.0 in/sec. This criterion has been used successfully in the industry. Each blast will be monitored independently to insure that this criterion is not exceeded. The monitoring results shall be provided to the Blasting Contractor as soon as possible so that the blasting program can be modified if necessary.

We recommend that a minimum of four (4) monitoring points be established, to the north, east, south and west of the planned blast area. The seismograph sensors should be placed near the closest structure and at any structures identified during the pre-blast survey that are considered to be susceptible to vibration damage.

Prior to the start of any construction, a Blasting Management Plan shall be prepared by the Blasting Contractor for this project. This plan shall be in accordance with State regulations and the Explosive Materials Code, NFPA No. 495, National Fire Prevention Association. Additionally, all blasting should adhere to the provisions of 29 CFR Ch. XVII Section 1910.109 for explosives and blasting agents and to all local requirements.

Prior to any blasting work being done, a licensed professional engineer shall be retained to perform a detailed pre-blast survey of existing structures located within 500 feet of the planned blast area. The pre-blast survey shall be conducted in accordance with the requirements of local authorities. A copy of all reports prepared by the licensed engineer shall be submitted to the Town Engineer and the Owner’s representative in a timely manner.

Prior to the beginning of blasting, a notice will be sent to all residential and commercial property owners within a 500 foot radius of the blast area. This notification will

be given at least 48 hours before blasting takes place. A contact person will be established and named in this notice to respond to all concerns raised by nearby residents during the blasting phase of the project. The contact person will respond to any inquiries within 24 hours.

Preparation of New Building Areas and Removal of Existing Fill

In order to prepare the building areas for construction, all surface materials such as topsoil, asphalt, and surface vegetation shall be removed from the planned building areas, extending at least ten (10) feet beyond the new construction limits, where feasible.

The boring data indicates that existing fill is present within portions the proposed building areas. Fill material may also be present in other unexplored portions of the site. Where encountered in the test borings, the existing fill extended to depths ranging from about 1’0” to 7’0” below the existing ground surface. As shown in Table 1 above, the approximate bottom of the fill material ranges from elevation +603.5 to elevation +670.2. The existing fill is expected to vary in thickness across the site and may extend deeper in the unexplored areas and around the existing site structures.

After the surface materials are removed, the existing fill shall be excavated from the new building areas. The removal of the existing fill from the new building areas shall extend through the existing fill, down to the virgin soil or weathered bedrock. At the bottom of the excavation, the removal of the unsuitable material shall extend horizontally beyond the building lines a minimum distance of three (3) feet plus a distance equal to the depth of the excavation below the planned finished floor elevation. For example, if the removal of the existing fill extends vertically five (5) feet below the planned finished floor elevation, the excavation must extend horizontally a minimum of eight (8) feet (3 feet plus 5 feet) beyond the new building line at that location.

The removal of the existing fill from the planned building areas shall be performed under the full time observation of Carlin-Simpson & Associates. The on-site representative from Carlin-Simpson & Associates shall direct the Contractor during this operation to ensure that all of the unsuitable material has been removed from the proposed building areas.

During the removal of the unsuitable material from the building areas, the Contractor should segregate the potentially re-usable existing fill material from the non-reusable fill (i.e. debris and topsoil). The on-site representative from Carlin-Simpson & Associate shall evaluate the suitability of the excavated materials for use as structural fill during the excavation and prior to its re-use. Potentially usable fill should be stockpiled and covered with tarps or plastic sheeting for protection from excess moisture. Any fill material that is wet must be dried prior to its re-use.

After the surface materials and existing fill have been removed and prior to the placement of new structural fill, the exposed subgrade must be graded level and proofrolled by several passes of a vibratory drum roller. The proofrolling operation is necessary to densify the underlying soils. Carlin-Simpson & Associates shall be retained to observe the proofrolling of the subgrade. If any soft or otherwise unsuitable soils are noted, the

unsuitable material shall be removed and replaced with new structural fill. Carlin-Simpson & Associates shall be responsible for determining what material, if any, is to be removed and will direct the contractor during this operation.

New structural fill required to achieve final grades shall consist of either suitable on-site soil or imported sand and gravel. Imported fill shall contain less than 20% by weight passing a No. 200 sieve. The structural fill shall be placed in layers not exceeding one (1) foot in loose thickness and each layer shall be compacted to at least 95% of its Maximum Modified Dry Density (ASTM D1557). Each layer must be compacted, tested, and approved prior to placing subsequent layers. The suitability of the excavated soil for reuse as structural fill is discussed in a following section of this report.

After the installation of structural fill has been completed to the required subgrade elevations, the virgin soil and new structural fill may be used to support the proposed building foundations and floor slabs.

New Building Foundations

According to the boring data, the foundation bearing materials will consist of medium dense to dense virgin soil, weathered bedrock, and new structural fill. Foundations for the proposed structures may be designed as a shallow spread footing bearing on the virgin soil, weathered bedrock, or new structural fill utilizing a net allowable bearing pressure of 4,000 psf (2.0 TSF).

Exterior footings shall bear at a depth of at least 42 inches below finished outside grade for protection from frost. Interior column footings may bear on the virgin soil, weathered bedrock, or new structural fill just below the floor slab provided the building is heated during winter. Column footings shall have a minimum dimension of 30 inches. The wall footings shall have a minimum width of 18 inches.

Prior to the placement of formwork, reinforcement steel, and concrete, the bearing subgrade soil shall be cleaned of all loose soil and compacted with several passes of a small vibratory drum trench compactor (i.e. Wacker Model RT560), a heavy vibratory plate tamper (i.e. Wacker BPU 3545A or equivalent), or "jumping jack" style tamper (i.e. Wacker Model BS 600). This must be performed under the inspection of a representative from Carlin-Simpson & Associates. If instability is observed during the compaction of the bearing subgrade, the soft soil shall be removed and replaced with new compacted fill.

Where rock is encountered in the foundation excavations, "Special Construction Procedures" must be employed. When continuous wall footings or closely spaced column footings (20 feet or less) bear on dissimilar material (i.e. rock and soil) the potential for differential movement exists. A footing bearing in rock will not move, whereas a footing bearing on soil will settle slightly due to the compressive nature of all soils when subjected to new loads. The area between movement and non-movement will develop a (shear) stress point. Cracks in foundations and walls will be the result from such movement. Therefore, continuous wall footings must bear either entirely on rock or entirely on soil for any individual building. Alternatively, for larger structures, transition zones can be constructed to create a gradual transition from a soil to a rock bearing subgrade.

Adjacent column footings greater than 20 feet apart may bear on dissimilar material (i.e. soil and rock). Any individual column footing must bear entirely on the same type bearing material (i.e. all soil or all rock).

Where rock and soil both exist at the bearing elevation within a foundation excavation, the footings must either be lowered to bear entirely on rock, or a minimum of 18 inches of rock must be removed from below planned footing bottom. The over-excavated 18 inches must then be filled with a granular material having a maximum particle size of ½-inch and containing at least 15% but not more than 30% material by weight passing a No. 200 sieve. The fill shall be placed in six (6) inch layers and each layer shall be compacted to at least 95% of its Maximum Modified Dry Density (ASTM D1557). This procedure will create a "cushion" atop the rock and reduce the potential for differential movement. For soft, rippable rock, this procedure will not be required.

If during the excavation for continuous foundations, the transition from soil to rock is gradual (i.e. from medium dense soil to dense weathered rock to very dense rock) over a distance of 20 feet or more, the "Special Construction Procedures" may not be required. This would have to be evaluated in the field on a case-by-case basis by the representative from Carlin-Simpson & Associates at the time of construction.

Where the transition from rock to soil is abrupt within the excavation for continuous wall foundations, transition zones can be constructed by over-excavating the rock in steps and increasing the "soil cushion" thickness over a distance of 24 feet or more. To construct the transition zone, the bedrock is over-excavated in a series of steps, each step being six (6) inches in depth and at least eight (8) feet in length. The first step is six (6) inches deep, the second step is 12 inches deep, and the final step is 18 inches deep. The over-excavation is then backfilled with the soil cushion material described above.

Floor Slab

After the footings and foundation walls are installed, fill will be required to backfill the excavations and to raise grades in the building areas to the slab subgrade elevations. New fill for the floor slab shall consist of either suitable on-site soil or imported sand and gravel containing less than 20% material by weight passing a No. 200 sieve. The fill shall be placed in layers not exceeding one (1) foot in loose thickness and each layer shall be compacted to at least 92% of its Maximum Modified Dry Density (ASTM D1557). Fill layers shall be compacted, tested, and approved before placing subsequent layers.

The floor may be designed as a slab on grade, bearing on virgin soil, weathered bedrock, bedrock, or new structural fill. We recommend a Modulus of Subgrade Reaction (k) of 200 pounds per cubic inch (pci) be used for design. A six (6) inch layer of 3/4-inch crushed stone is recommended beneath the concrete slab for additional support and drainage. In the event that the floor slab is constructed directly on Gneiss bedrock, a minimum of 12 inches of crushed stone or DGA should be provided beneath the floor slab for drainage and to act as a cushion on the rock. Sump pits and pumps are recommended where basements are planned.

Settlement

Settlement of individual footings, designed in accordance with recommendations presented in this report, is expected to be within tolerable limits for the proposed structure. For footings placed on natural soils or new compacted fill approved by Carlin-Simpson & Associates and constructed in accordance with the requirements outlined in this report, maximum total settlement is expected to be on the order of 1/2-inch or less. Maximum differential settlement between adjacent columns or load bearing walls is expected to be half the total settlement.

The above settlement values are based on our engineering experience with similar soil conditions and the anticipated structural loading, and are to guide the Structural Engineer with his design. To minimize difficulties during the foundation installation phase, it is critical that Carlin-Simpson & Associates be retained to observe the foundation bearing surfaces and to confirm the recommended bearing pressures and that the existing fill and unsuitable materials have been removed from beneath the new foundations.

Foundation Walls

In the event that foundation walls are required, the soil adjacent to the building walls will exert a horizontal pressure against the walls. This pressure is based on the soil density and Coefficient of Earth Pressure at Rest (k_o), which is applicable to non-yielding building walls. We estimate that the backfill material will have an in-place (moist) density of about 130 pcf and a k_o of 0.5. Based on these properties, the soil will produce an Equivalent Fluid Pressure of 65 pcf against the building walls.

For sliding, the coefficient of friction between concrete and the virgin site soils or new structural fill is 0.45. For clean sound rock, a friction coefficient of 0.55 can be used. Where passive lateral earth pressure is to be included in the design of the wall, a design value of 195 psf/ft may be used. This is based on a Coefficient of Passive Earth Pressure (k_p) of 3.0, an in-place soil backfill density of 130 pcf, and a factor of safety of 2.0.

Where foundation walls are required, we recommend that a footing drain be placed around the exterior of the new structure to prevent water from accumulating against the foundation wall. This drain may consist of a minimum four (4) inch diameter, rigid wall perforated PVC pipe surrounded by at least 12 inches of 3/4-inch clean crushed stone. The stone shall be wrapped in a geotextile fabric, Mirafi 140N or equivalent. The foundation drainpipe should be extended to daylight or to the stormwater collection system. The outside face of the foundation wall, where it extends below grade, must be damp proofed or waterproofed.

The foundation walls should be backfilled with suitable structural fill placed in layers up to one (1) foot in loose thickness. The new fill should be compacted with a vibratory drum trench compactor (i.e. Wacker Model RT560), a heavy vibratory plate tamper (i.e. Wacker BPU 3545A or equivalent) or “jumping jack” style tamper (i.e. Wacker Model BS 600) to at least 92% of its Maximum Modified Dry Density (ASTM D1557). Heavy equipment should not be operated near the wall as damage to the wall could occur.

Outside the structure, the backfill placed adjacent to the foundation walls and above the footing drain shall consist of either clean crushed stone or an imported sand and gravel mixture containing less than 10% by weight passing a No. 200 sieve and placed in layers not exceeding one (1) foot in thickness. This clean sand and gravel or crushed stone backfill shall extend a minimum of one (1) foot horizontally from the back face of the foundation walls, and shall extend vertically up the wall face to two (2) feet below the finished ground surface elevation.

Beyond this point, the foundation walls should be backfilled with suitable soil placed in layers up to one (1) foot in thickness. The new fill should be compacted with a vibratory drum trench compactor (i.e. Wacker Model RT560), a heavy vibratory plate tamper (i.e. Wacker BPU 3545A or equivalent), or "jumping jack" style tamper (i.e. Wacker Model BS 600) to at least 92% of its Maximum Modified Dry Density (ASTM D1557). Heavy equipment should not be operated near the walls as damage to the walls could occur. Material excavated from the cut areas on site will be suitable for reuse as compacted fill, provided that it remains relatively dry enough to be adequately compacted to the required density and does not contain any debris or organic material (i.e. topsoil and roots).

Seismic Design Considerations

From site-specific test boring data, the Site Class was determined from Table 1615.1.1 of the New York State Building Code. The site-specific data used to determine the Site Class typically includes soil test borings to determine Standard Penetration resistances (N-values). Based on the average N-values in the upper 100 feet of soil profile, the site can be classified as Site Class C – Very Dense Soil and Soft Rock Profile.

New structures should be designed to resist stress produced by lateral forces computed in accordance with Section 1615 of the New York State Building Code. The values in Table 2 shall be used for this project. Based on the information obtained from the borings, it is our opinion that the potential for liquefaction of the native soils at the site due to earthquake activity is relatively low.

Table 2 – Seismic Design Parameter Values

Mapped Spectral Response Acceleration for Short Periods, [Fig 1615 (1)]	S_S=0.347g
Mapped Spectral Response Acceleration at 1-Second Period, [Fig 1615 (2)]	S_{S1}=0.070g
Site Coefficient [Table 1615.1.2 (1)]	F_a=1.20
Site Coefficient [Table 1615.1.2 (2)]	F_v=1.70
Max Considered Earthquake Spectral Response for Short Periods [Eq 16-16]	S_{MS}=0.416g
Max Considered Earthquake Spectral Respond at 1-Second Period [Eq 16-17]	S_{M1}=0.119g
Design Spectral Response Acceleration for Short Periods [Eq 16-18]	S_{DS}=0.278g
Design Spectral Response Acceleration for 1-Second Period [Eq 16-19]	S_{D1}=0.079g

Site Retaining Walls

In order to develop the site, retaining walls will be required in areas. The site retaining walls may be designed as either cast-in-place steel reinforced concrete walls or geogrid reinforced modular block (MSE) walls. The preliminary site plans show five (5)

retaining walls. The maximum exposed height of these walls ranges from approximately seven (7) feet to 12 feet but the top and bottom wall elevations were not finalized at the time of this report.

The following recommendations are preliminary in nature based on the boring and test pit data from other areas of the project site during this investigation. The recommendations below are intended for planning purposes only and are not intended for final design and construction. A supplemental subsurface investigation is required for the proposed retaining walls so that additional design recommendations can be provided.

In the event that existing fill materials are present within the proposed wall areas, these materials must be completely removed from the limits of new wall construction. The removal of the topsoil or other unsuitable fill materials shall extend horizontally a minimum distance of five (5) feet beyond the front face of the new wall or extend horizontally a minimum distance equivalent to the vertical depth of the required excavation below the proposed wall base or foundation bearing elevation, whichever is greater. This is required to ensure that all unsuitable material has been removed from beneath the wall base or foundation zone of influence, which shall be defined by an imaginary plane projecting downward and away from the front edge of the wall base or foundation on a one horizontal to one vertical (1H:1V) projection.

The foundations for the new retaining wall may be placed on the virgin soil, weathered bedrock, or on new compacted fill approved by Carlin-Simpson & Associates. New compacted fill shall consist of either suitable on-site soil or imported sand and gravel. Imported fill shall contain less than 20% by weight passing the No. 200 sieve. The fill shall be placed in one (1) foot thick loose layers and compacted to at least 95% of its Maximum Modified Dry Density. Preliminarily, the footings or base of the wall can be designed using a net design bearing pressure of 4,000 psf (2.0 TSF).

For MSE walls, the wall base or foundation must be adequately embedded for internal and global stability. The embedment depth will be determined by the Wall Design Engineer. For reinforced concrete walls, the footing or base of the wall shall bear at least 42 inches below finished grade of the outside face of the wall for protection from frost. The wall foundation or base may bear at shallower depths when installed directly on the bedrock since rock is not susceptible to frost. Where both soil and rock are encountered within the wall foundation or base excavation, the “Special Construction Procedures” discussed above for the building foundations must be utilized.

Drains must be provided behind the retaining walls to prevent the buildup of hydrostatic pressure against the walls. The drain should consist of a 4-inch diameter perforated PVC pipe, surrounded with 3/4-inch clean crushed stone and wrapped in a geotextile fabric, Mirafi 140N or equivalent. The drain should be installed behind the base or foundation of the retaining wall to collect the water behind the wall and be connected into the site stormwater collection system or extended to daylight beyond the wall area.

Backfill placed directly behind the retaining walls shall consist of either suitable on-site soil or imported sand and gravel containing less than 20% by weight passing a No. 200 sieve. Each layer shall be compacted using a hand guided mechanical tamper to 92% of its

Maximum Modified Dry Density (ASTM D1557). Excessive compaction adjacent to the retaining walls must be avoided. Layers shall be tested and approved before placing subsequent layers. Large compaction equipment must not be used within ten (10) feet of the new walls to prevent potential damage to the walls.

The soil adjacent to the site retaining walls will exert a horizontal pressure against the walls. This pressure is based on the soil density and the Coefficient of Active Earth Pressure (k_a). We estimate that the backfill material will have an in-place (moist) density of about 130 pcf and an angle of internal friction (ϕ) of 30°. For design, soil cohesion is assumed to be zero for the foundation soil, retained soil, and reinforced backfill. The active earth pressure coefficient (k_a) is 0.33 provided the grade behind the wall is level. Based on these properties, the retained soil will produce an Equivalent Fluid Pressure of 42.9 pcf against the retaining walls. If a sloping grade exists behind the new walls, the k_a and the Equivalent Fluid Pressure must be adjusted accordingly. In addition, any surcharge loads from structures, vehicles, or other retaining walls (i.e. tiered walls) must be considered in the wall design.

For sliding, the friction coefficient between mass concrete and the virgin site soils or new compacted fill is 0.45. For clean sound rock, a friction coefficient of 0.55 can be used. Where passive lateral earth pressure is to be included in the design of the wall, a maximum design value of 195 psf/ft may be used. This is based on a Coefficient of Passive Earth Pressure (k_p) of 3.0, an in-place soil backfill density of 130 pcf, and a factor of safety of 2.0.

The Wall Design Engineer shall prepare a complete wall design (i.e. drawings, specifications, and calculations), which shall be designed and sealed by a Professional Engineer registered in the State of New York and submitted to Carlin-Simpson & Associates for review and approval. MSE retaining walls shall be designed in accordance with the recommendations of the NCMA Design Manual for Segmental Retaining Walls (Current Edition).

The MSE wall design shall consider the internal stability of the reinforced soil mass and shall be in completed accordance with acceptable engineering practice. In addition, external stability, including sliding, overturning, and bearing, as well as global slope stability shall be evaluated in accordance with acceptable engineering practice.

The MSE Wall Designer Engineer shall be responsible for determining the required geogrid reinforcement lengths and elevations based on his stability analysis (including global stability) and the properties of the geogrid reinforcement used in the design. We anticipate that in the critical areas of the wall, global stability will be the controlling design criteria for the design of the geogrid reinforcement.

Stormwater Management Areas

We understand that the planned development will include one or more stormwater management areas. The preliminary grading plan shows a proposed infiltration basin with a forebay in the western portion of the project site. The plan also indicates that the basin will have a bottom elevation at +610.0. We also understand that there is an alternate stormwater

management area in the southwestern portion of the site, near the proposed fairway residences building. In addition, stormwater management areas will likely be required throughout the golf course property. However, at the time this report was prepared, the proposed stormwater management system had not been designed and the location, grades, and invert elevations of the system had not been finalized.

During this study, four (4) borings, one (1) test pit, one (1) borehole permeability test, and four (4) percolation tests were performed within or near the planned stormwater management areas. An addition ten (10) test pits (TP-19 through TP-28) were excavated at potential stormwater management areas throughout the golf course property. The tests were performed at the locations shown on the attached Boring and Test Pit Location Plan. The proposed test depths were provided by the project Site Engineer. The test depths were modified, however, based on the depth to bedrock encountered at the test locations.

The soil conditions encountered within the proposed infiltration basin area consist of a surface layer of topsoil (Stratum 1), approximately 0’6” to 0’9” in thickness, followed by existing fill (Stratum 2) in boring B-6. Below the topsoil and fill is virgin soil that consists of layers of Sandy Silt, Silty Sand, Sandy Gravel, Gravelly Sand, or Silty Gravelly Sand (Strata 3 and 4) followed by Gneiss bedrock (Stratum 5). Bedrock was encountered in the proposed infiltration basin area at depths ranging from 2’8” to 8’6” beneath the ground surface. These depths correspond to bedrock elevations ranging between elevation +611.5 and elevation +617.3, which is above the proposed bottom elevation of the infiltration basin.

In the alternate stormwater management area, the topsoil was underlain by approximately 5’6” of existing fill (Stratum 2) followed by layers of Sandy Silt and Silty Sand (Stratum 3). Groundwater was encountered in this portion of the site at depths ranging from 0’6” to 3’3” below the ground surface, which corresponds to groundwater levels ranging from approximately elevation +608.3 to elevation +613.2.

The subsurface soil and groundwater conditions encountered in the potential stormwater management areas throughout the golf course property vary across the site. The boring and test pit observations are summarized in Table 1 above.

In December 2012 and January 2013, permeability tests were performed within the proposed stormwater management areas. One (1) borehole permeability test (BP-4) and four (4) percolation tests (P-1 through P-4) were performed. The infiltration rates at the test locations are summarized in Table 3 below.

Table 3 – Field Permeability Test Results

Permeability Test No.	Permeability Test Depth (Elevation)	Permeability Rate	Soil Description
BP-4	7’0” (+621.0)	2.4 in/hour	Brown coarse to fine SAND, little Silt, some (+) coarse to fine Gravel
P-1	3’6” (+616.5)	>20 in/hour	Brown coarse to fine GRAVEL and, coarse to fine Sand, trace Silt
P-2	1’8” (+610.3)	NR	*Groundwater encountered 0’6” below the ground surface*

Permeability Test No.	Permeability Test Depth (Elevation)	Permeability Rate	Soil Description
P-3	2’8” (+613.3)	>20 in/hour	Brown coarse to fine SAND, some Silt, and (-) coarse to fine Gravel
P-4	2’0” (+613.0)	NR	*Groundwater encountered 1’10” below the ground surface*

NR – Not Recorded

Based on the field tests, the virgin soil in the areas of tests P-1 and P-3 has a permeability rate that exceeds 20 inches per hour. However, these tests were performed at elevations of +616.5 and +613.3, which are approximately 6’6” and 3’3” higher than the planned bottom of the proposed infiltration basin. Bedrock was encountered at depths of 4’9” (+615.3) and 5’6” (+611.5) below the surface at these test locations. In the event the virgin soil in the areas of tests P-1 and P-3 can be utilized for the stormwater management system, a permeability rate of 10 inches per hour should be used for preliminary design. This design permeability rate includes a factor of safety of 2.0.

Field permeability tests could not be performed at test locations P-2 and P-4 during this study since groundwater was encountered at depths of 0’6” (+611.5) and 1’10” (+613.2) below the ground surface, respectively. Should stormwater management areas be planned in other portions of the site, they must be evaluated on a case-by-case basis.

The stormwater management system should be designed in accordance with the applicable New York State Department of Conservation (NYSDEC) regulations and the New York State Stormwater Management Design Manual (August 2010). The testing requirements are outlined in Appendix D of the manual. The testing that was performed during this preliminary study was for initial feasibility testing for the stormwater management areas. Therefore, additional testing within the proposed subsurface system areas will be required to confirm the soil conditions and infiltration rates at the bottom of the system and to finalize the design of the system.

Pavement

We understand that the proposed construction will also include new asphalt paved driveways and parking areas. Based on the preliminary grading plan provided to this office, cuts ranging up to approximately 6’0” and fills ranging up to approximately 8’0” are anticipated to achieve the proposed pavement subgrade elevations. To prepare the new pavement areas, the existing surface materials (i.e. topsoil, vegetation, asphalt, etc.) must be removed from the planned pavement areas.

After all surface materials have been removed; the exposed subgrade that is either at or below the planned subgrade elevation shall be proofrolled with a large vibratory drum roller (i.e. Dynapac 250 or equivalent) to densify the underlying soils. The on-site representative from Carlin-Simpson & Associates shall witness the proofrolling operation. If any excessive movement is noted during the proofrolling, the soft or unsuitable soil shall be removed and replaced with new compacted fill.

Areas where existing fill is encountered shall be compacted in place. Carlin-Simpson & Associates must evaluate these areas for the presence of soft or unsuitable material within the existing fill matrix. Portions of this fill may have to be removed and replaced with new compacted fill. Carlin-Simpson & Associates will determine this during construction.

Where new fill is required to achieve final grades, it shall consist of either suitable on-site soil or imported sand and gravel. Imported sand and gravel shall contain less than 20% by weight passing a No. 200 sieve. New fill shall be placed in layers not exceeding one (1) foot in loose thickness and each layer shall be compacted to at least 92% of its Maximum Modified Dry Density (ASTM D1557). After the planned subgrade has been proofrolled and new compacted fill has been placed as required, the new pavement subbase may be placed on the existing site soils and new compacted fill.

When new fill is placed on a sloped subgrade, the fill layers must be benched a minimum of three (3) feet into the existing embankment. Fill layers shall be placed in horizontal layers, beginning at the base of the slope. End dumping over the top of a slope is not permitted.

The new pavement subbase may be placed on engineer-approved densified existing fill, virgin soil, or new compacted fill. A minimum of six (6) inches of dense graded aggregate (DGA) is recommended for the subbase layer for drainage and additional pavement support. We recommend that the following pavement sections be used for the parking lots and driveways. These pavement sections are subject to local government approval.

Parking Lots (Light Duty)

1 ½”	Asphalt Wearing Surface Course	NYSDOT, Type 6F
2”	Asphalt Base Course	NYSDOT, Type 1
6”	Stone Subbase (DGA)	NYSDOT, Type 4
	Approved Compacted Subgrade (Minimum CBR = 10)	

Driveways (Medium Duty)

1 ½”	Asphalt Wearing Surface Course	NYSDOT, Type 6F
2 ½”	Asphalt Base Course	NYSDOT, Type 1
8”	Stone Subbase (DGA)	NYSDOT, Type 4
	Approved Compacted Subgrade (Minimum CBR = 10)	

Based on the boring and test pit data, we anticipate that the existing site soils and new compacted fill will provide a CBR value that is equal to or greater than 10, which can adequately support the above pavement sections.

Utilities

New utilities may bear in the virgin soil, existing fill, new compacted fill, weathered rock, or rock. The bottom of all trenches should be excavated clean so a hard bottom is provided for pipe support. If any soft areas or unsuitable existing fill conditions are

encountered during the construction operation, these materials must be removed and replaced with new compacted fill.

In the event that the trench bottom becomes soft due to the inflow of surface or trapped water, the soft soil shall be removed and the excavation filled with a minimum of six (6) inches of 3/4-inch clean crushed stone to provide a firm base for support of the pipe. Sump pits and pumps should be adequate to keep the excavations dry.

After the utility is installed, the trench must be backfilled with compacted fill. The fill shall consist of suitable on-site soil or imported sand and gravel containing less than 20% by weight passing a No. 200 sieve. Large rock fragments must not be placed directly against the pipe. Controlled compacted fill shall be placed in one (1) foot loose layers and each layer shall be compacted to at least 92% of its Maximum Modified Dry Density (ASTM D1557). The backfill must be free of topsoil, debris and large boulders or rock fragments.

Temporary Construction Excavations

Temporary construction excavations shall be conducted in accordance with the most recent OSHA guidelines or applicable federal, state, or local codes. Based on the results of the borings and test pits, we believe the site soils and rock would have the following classifications as defined by OSHA guidelines.

Soil/Rock Type	Possible Classification
On Site Fill	Type "C"
Virgin Sandy Soils	Type "B" or "C"
Weathered or Intact Bedrock	Type "A" or Stable Rock

Further evaluation of the site soil deposits will be required in the field by a qualified person at the time of the excavation to determine the proper OSHA classification and allowable slope configuration. Temporary support (i.e. sheeting and shoring) should be used for any excavation that cannot be sloped or benched in accordance with the applicable regulations.

Suitability of the In-Situ Soils for Use as Compacted Fill

The suitability of each soil stratum for use as compacted fill is discussed below.

Stratum 1
Topsoil
Topsoil is not suitable for use as compacted fill. During construction, it may be stockpiled on site for later use in the landscaped areas or removed from the site.

Stratum 2
Existing Fill
The existing fill that was encountered at the site generally consists of brown coarse to fine Sand, little (to and) Silt, trace (to some) coarse to fine Gravel with occasional cobbles, boulders, topsoil, roots, and debris. Some of the existing fill may be suitable for use as compacted fill at the site

provided that it remains relatively dry for optimum compaction and that any debris (i.e. concrete, wood, etc.) and organic material (i.e. topsoil, roots, etc.) have been removed prior to its reuse.

Strata 3 & 4
Sandy Silt, Silty Sand, Sand, or Sandy Gravel

The virgin site soils that may be excavated during construction consist of layers of Sandy Silt, Silty Sand, Sand or Sandy Gravel with occasional cobbles and boulders. This material is generally suitable for use as compacted fill, provided that it remains relatively dry for optimum compaction. Large cobbles and boulders shall not be used as new structural fill in the proposed building areas or in utility trenches.

Stratum 5
Gneiss Bedrock

Excavated rock may also be used as fill material for the building and paved areas provided that the material conforms to the required gradation, is well-graded, and has been approved prior to use by Carlin-Simpson & Associates. All rock fill must be well blended with smaller rock fragments and/or soil. Open voids within the rock fill matrix must be avoided. Small boulders up to 24 inches in diameter may be placed in parking lot fills deeper than ten (10) feet below the finished pavement. Boulders must not be clustered and must be sufficiently surrounded with soil fill. We recommend that the boulders and excavated rock be processed by a crusher to provide suitable fill material for the building and pavement areas.

Rock fill shall be placed in 12-inch loose layers and compacted with multiple passes of a large vibratory roller to a firm and non-yielding state as determined by the on-site representative from Carlin-Simpson & Associates. Rock fill should not be used where it will interfere with the installation of foundations or utilities. Also, it shall not be used as backfill directly against concrete walls or utilities. Use of rock fill within the planned building and pavement areas shall be limited to the gradations limitations provided in Table 4 below.

Table 4 - Gradation Limitations for Rock Fill

Area	Location	Maximum Particle Size
Building Area	Within 4 feet of Finished Floor	3 inches
	More than 4 feet below Finished Floor	12 inches
Pavement Area	Within 4 feet of Finished Grade	6 inches
	More than 4 feet below Finished Grade	18 inches
	More than 10 feet below Finished Grade	24 inches

Proper moisture conditioning of the soil will be required. In the event that the on-site material is too wet at the time of placement and cannot be adequately compacted, the soil should be aerated and allowed to dry or the material removed and a drier cleaner fill material used. In the event that the on-site material is too dry at the time of placement and cannot be adequately compacted, water may be needed to increase the soil moisture content for proper compaction.

The in-situ soils which exist throughout the site may become soft and weave if exposed to excessive moisture and construction traffic. The instability will occur quickly when exposed to these elements and it will be difficult to stabilize the subgrade. We recommend that adequate site drainage be implemented early in the construction schedule and if the subgrade becomes wet, the Contractor should limit construction activity until the soil has dried.

GENERAL

The findings, conclusions and recommendations presented in this report represent our professional opinions concerning subsurface conditions at the site. The opinions presented are relative to the dates of our site work and should not be relied on to represent conditions at later dates or at locations not explored. The opinions included herein are based on information provided to us, the data obtained at specific locations during the study and our past experience. If additional information becomes available that might impact our geotechnical opinions, it will be necessary for Carlin-Simpson & Associates to review the information, reassess the potential concerns, and re-evaluate our conclusions and recommendations. Additional subsurface exploration may be required.

Regardless of the thoroughness of a geotechnical exploration, there is the possibility that conditions between borings and test pits will differ from those encountered at specific boring or test pit locations, that conditions are not as anticipated by the designers and/or the contractors, or that either natural events or the construction process have altered the subsurface conditions. These variations are an inherent risk associated with subsurface conditions in this region and the approximate methods used to obtain the data. These variations may not be apparent until construction.

The professional opinions presented in this geotechnical report are not final. Field observations and foundation installation monitoring by the geotechnical engineer, as well as soil density testing and other quality assurance functions associated with site earthwork and foundation construction, are an extension of this report. Therefore, Carlin-Simpson & Associates should be retained by the Owner to observe all earthwork and foundation construction, to document that the conditions anticipated in this study actually exist, and to finalize or amend our conclusions and recommendations Carlin-Simpson & Associates is not responsible or liable for the conclusions and recommendations presented in this report if Carlin-Simpson & Associates does not perform these observation and testing services.

Therefore, in order to preserve continuity in this project, the Owner must retain the services of Carlin-Simpson & Associates to provide full time geotechnical related monitoring and testing during construction. At a minimum, this shall include the observation and testing of the following: 1) the removal of existing fill and unsuitable soil, where required; 2) the proofrolling of the subgrade soil prior to the placement of new compacted fill; 3) the placement and compaction of controlled fill; 4) the excavation for the building foundations; 5) the preparation of the subgrade for the floor slabs and pavement areas; and 6) the construction of the proposed retaining walls.

This report has been prepared in accordance with generally accepted geotechnical engineering practice. No other warranty is expressed or implied. The evaluations and

recommendations presented in this report are based on the available project information, as well as on the results of the exploration. Carlin-Simpson & Associates should be given the opportunity to review the final drawings and site plans for this project to determine if changes to the recommendations outlined in this report are needed. Should the nature of the project change, these recommendations should be re-evaluated.

This report is provided for the exclusive use of Brynwood Partners, LLC and the project specific design team and may not be used or relied upon in connection with other projects or by other third parties. Carlin-Simpson & Associates disclaims liability for any such third party use or reliance without express written permission. Use of this report or the findings, conclusions or recommendations by others will be at the sole risk of the user. Carlin-Simpson & Associates is not responsible or liable for the interpretation by others of the data in this report, nor their conclusions, recommendations or opinions.

If the conditions encountered during construction vary significantly from those stated in this report, this office should be notified immediately so that additional recommendations can be made.

Thank you for allowing us to assist you with this project. Should you have any questions or comments, please contact this office.

Very truly yours,

CARLIN-SIMPSON & ASSOCIATES

M. Anke

MEREDITH R. ANKE, P.E.
Project Engineer

Robert Simpson

ROBERT B. SIMPSON, P.E.

STATE OF NEW YORK
ROBERT B. SIMPSON
081840-1
LICENSED PROFESSIONAL ENGINEER

File No. 12-175

CARLIN - SIMPSON & ASSOCIATES Sayreville, NJ	TEST BORING LOG	BORING NUMBER B-1
Project: Proposed Renovations, Byrnwood Club Development, North Castle, NY		**SHEET NO.:** 1 of 1
Client: JBM Realty		**JOB NUMBER:** 12-175
Drilling Contractor: General Borings, Inc.		**ELEVATION:** +661.0

GROUNDWATER					CASING	SAMPLE	CORE	TUBE	DATUM:	
DATE	TIME	DEPTH	CASING	TYPE	HSA	SS			START DATE:	18 Dec 12
No water encountered				DIA.	3 1/4"	1 3/8"			FINISH DATE:	18 Dec 12
				WGHT		140#			DRILLER:	T. McGovern
				FALL		30"			INSPECTOR:	JB

Depth (ft.)	Casing Blows per Foot	Sample No.	Blows on Sample Spoon per 6"	Sym	IDENTIFICATION	REMARKS
			7		**Clay Tennis Court** 0'6"	
1		S-1	9		Br $ a (+), cf S, l (-) mf G	Rec = 17"
			12			moist
2			14			
			19		same	
3		S-2	23		**Brown SILT and (+), coarse to fine**	Rec = 15"
			50/3"		**Sand, little (-) medium to fine Gravel**	moist
4						possible weathered rock in tip
5					5'0"	
			29		Br cf S, l (+) $ (completely weathered gneiss)	
6		S-3	75/4"			Rec = 6"
					Brown coarse to fine SAND, little (+)	moist
7					**Silt (completely weathered Gneiss)**	
		S-4	70/3"			Rec = 3"
8					8'0"	moist
					End of Boring @ 8'0"	Auger refusal @ 8'0"
9						
10						
11						
12						
13						
14						
15						
16						
17						
18						
19						
20						
21						
22						

CARLIN - SIMPSON & ASSOCIATES Sayreville, NJ	TEST BORING LOG	BORING NUMBER B-2

Project:	Proposed Renovations, Byrnwood Club Development, North Castle, NY	SHEET NO.:	1 of 1
Client:	JBM Realty	JOB NUMBER:	12-175
Drilling Contractor:	General Borings, Inc.	ELEVATION:	+628.0

GROUNDWATER					CASING	SAMPLE	CORE	TUBE		
DATE	TIME	DEPTH	CASING	TYPE	HSA	SS			DATUM:	
No water encountered				DIA.	3 1/4"	1 3/8"			START DATE:	18 Dec 12
				WGHT		140#			FINISH DATE:	18 Dec 12
				FALL		30"			DRILLER:	T. McGovern
									INSPECTOR:	JB

Depth (ft.)	Casing Blows per Foot	Sample No.	Blows on Sample Spoon per 6"	Sym	IDENTIFICATION	REMARKS
			2		**Topsoil** 0'6"	
1		**S-1**	3		Br $ a (+), cf S, t mf G	Rec = 15"
			2			moist
2			2			
			3		same	
3		**S-2**	9			Rec = 16"
			11		**Brown SILT and (+), coarse to fine**	moist
4			15		**Sand, trace medium to fine Gravel**	
5						
			10		same	
6		**S-3**	12			Rec = 17"
			16			moist
7			50/3"		7'0"	weathered rock in tip
					End of Boring @ 7'0"	Auger refusal @ 7'0"
8						
9						
10						
11						
12						
13						
14						
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16						
17						
18						
19						
20						
21						
22						

CARLIN - SIMPSON & ASSOCIATES Sayreville, NJ	TEST BORING LOG	BORING NUMBER B-3

Project:	**Proposed Renovations, Byrnwood Club Development, North Castle, NY**	**SHEET NO.:** 1 of 1
Client:	**JBM Realty**	**JOB NUMBER:** 12-175
Drilling Contractor:	**General Borings, Inc.**	**ELEVATION:** +620.0

GROUNDWATER					CASING	SAMPLE	CORE	TUBE	
DATE	TIME	DEPTH	CASING	TYPE	HSA	SS			**DATUM:**
No water encountered				DIA.	3 1/4"	1 3/8"			**START DATE:** 18 Dec 12
				WGHT		140#			**FINISH DATE:** 18 Dec 12
				FALL		30"			**DRILLER:** T. McGovern
									INSPECTOR: JB

Depth (ft.)	Casing Blows per Foot	Sample No.	Blows on Sample Spoon per 6"	Sym	IDENTIFICATION	REMARKS
			3		**Topsoil** 0'6"	
1		**S-1**	6		Br $ a (-), cf S, t mf G	Rec = 17"
			6		**Brown SILT and (-), coarse to fine**	moist
2			14		**Sand, trace medium to fine Gravel** 2'0"	
		S-2	25/5"		Lt br cf G a, cf S, t $ (completely weathered gneiss)	Rec = 5"
3					**Light brown coarse to fine GRAVEL**	moist
					and, coarse to fine Sand, trace	
4					**Silt (completely weathered Gneiss)**	
			23		Br cf G s, cf S, t $ (completely weathered gneiss)	
5		**S-3**	75/3"		4'9"	Rec = 6"
					End of Boring @ 4'9"	moist
6						Auger refusal @ 4'9"
7						
8						
9						
10						
11						
12						
13						
14						
15						
16						
17						
18						
19						
20						
21						
22						

CARLIN - SIMPSON & ASSOCIATES Sayreville, NJ	TEST BORING LOG	BORING NUMBER B-4

Project:	Proposed Renovations, Byrnwood Club Development, North Castle, NY	SHEET NO.: 1 of 1
Client:	JBM Realty	JOB NUMBER: 12-175
Drilling Contractor:	General Borings, Inc.	ELEVATION: +628.0

GROUNDWATER					CASING	SAMPLE	CORE	TUBE	DATUM:	
DATE	TIME	DEPTH	CASING	TYPE	HSA	SS			START DATE:	18 Dec 12
No water encountered				DIA.	3 1/4"	1 3/8"			FINISH DATE:	18 Dec 12
				WGHT		140#			DRILLER:	T. McGovern
				FALL		30"			INSPECTOR:	JB

Depth (ft.)	Casing Blows per Foot	Sample No.	Blows on Sample Spoon per 6"	Sym	IDENTIFICATION	REMARKS
			2		**Topsoil** 0'6"	
1		S-1	1		Br cf S, a $, t f G	Rec = 14"
			2		**Brown coarse to fine SAND, and**	moist
2			2		**Silt, trace fine Gravel** 2'0"	
			10		Gr cf S t $, a cf G (completely weathered gneiss)	
3		S-2	20			Rec = 13"
			45			moist
4			35			weathered rock 3'-4'
5						
			9		Br cf S, l $, s (+) cf G (completely weathered gneiss)	
6		S-3	11			Rec = 17"
			13		**Brown coarse to fine SAND, little**	moist
7			10		**Silt, some (+) coarse to fine Gravel**	
			18		same **(completely weathered Gneiss)**	
8		S-4	26			Rec = 14"
			30			moist
9			43			
10						
		S-5	75/6"		same 10'6"	Refusal on spoon @ 10'6"
11					**End of Boring @ 10'6"**	
12						
13						
14						
15						
16						
17						
18						
19						
20						
21						
22						

CARLIN - SIMPSON & ASSOCIATES Sayreville, NJ	TEST BORING LOG	BORING NUMBER B-5

Project:	Proposed Renovations, Byrnwood Club Development, North Castle, NY	SHEET NO.:	1 of 1
Client:	JBM Realty	JOB NUMBER:	12-175
Drilling Contractor:	General Borings, Inc.	ELEVATION:	+623.0

GROUNDWATER					CASING	SAMPLE	CORE	TUBE	DATUM:	
DATE	TIME	DEPTH	CASING	TYPE	HSA	SS			START DATE:	18 Dec 12
No water encountered				DIA.	3 1/4"	1 3/8"			FINISH DATE:	18 Dec 12
				WGHT		140#			DRILLER:	T. McGovern
				FALL		30"			INSPECTOR:	JB

Depth (ft.)	Casing Blows per Foot	Sample No.	Blows on Sample Spoon per 6"	Sym	IDENTIFICATION	REMARKS
			2		Br cf S, s (+) $, t f G	
1		S-1	2		**Brown coarse to fine SAND,**	Rec = 17"
			3		**some (+) Silt, trace fine Gravel**	moist
2			13		2'0"	
			22		Br cf S, l $, s cf G	
3		S-2	10			Rec = 17"
			16		**Brown coarse to fine SAND, little**	moist
4			26		**Silt, some coarse to fine Gravel**	weathered rock in tip
					(completely weathered Gneiss)	
5						
			23		same, weathered gneiss	
6		S-3	62			Rec = 18"
			55			moist
7			81			weathered rock
8						
					8'6"	Auger refusal @ 8'6"
9					**End of Boring @ 8'6"**	
10						
11						
12						
13						
14						
15						
16						
17						
18						
19						
20						
21						
22						

CARLIN - SIMPSON & ASSOCIATES Sayreville, NJ	TEST BORING LOG	BORING NUMBER B-6
Project: Proposed Renovations, Byrnwood Club Development, North Castle, NY		SHEET NO.: 1 of 1
Client: JBM Realty		JOB NUMBER: 12-175
Drilling Contractor: General Borings, Inc.		ELEVATION: +617.0

GROUNDWATER					CASING	SAMPLE	CORE	TUBE	DATUM:
DATE	TIME	DEPTH	CASING	TYPE	HSA	SS			START DATE: 19 Dec 12
No water encountered				DIA.	3 1/4"	1 3/8"			FINISH DATE: 19 Dec 12
				WGHT		140#			DRILLER: T. McGovern
				FALL		30"			INSPECTOR: KWA

Depth (ft.)	Casing Blows per Foot	Sample No.	Blows on Sample Spoon per 6"	Sym	IDENTIFICATION	REMARKS
			2		**Topsoil** 0'6"	
1		S-1	6		FILL (Br cf S, l $) 1'0"	Rec = 10"
			5		**FILL (Brown coarse to fine SAND, little Silt)**	moist
2			10			
			12		Br cf S, s $, a (-) cf G	
3		S-2	11			Rec = 11"
			11		same	moist
4			52		**Brown coarse to fine SAND, some Silt, and (-) coarse to fine Gravel**	
5						
		S-3	75/2"		5'6"	No recovery
6					**End of Boring @ 5'6"**	Auger refusal @ 5'6"
7						
8						
9						
10						
11						
12						
13						
14						
15						
16						
17						
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20						
21						
22						

CARLIN - SIMPSON & ASSOCIATES Sayreville, NJ	TEST BORING LOG	BORING NUMBER B-7

Project:	Proposed Renovations, Byrnwood Club Development, North Castle, NY	SHEET NO.:	1 of 1
Client:	JBM Realty	JOB NUMBER:	12-175
Drilling Contractor:	General Borings, Inc.	ELEVATION:	+628.0

GROUNDWATER					CASING	SAMPLE	CORE	TUBE	DATUM:	
DATE	TIME	DEPTH	CASING	TYPE	HSA	SS			START DATE:	19 Dec 12
No water encountered				DIA.	3 1/4"	1 3/8"			FINISH DATE:	19 Dec 12
				WGHT		140#			DRILLER:	T. McGovern
				FALL		30"			INSPECTOR:	KWA

Depth (ft.)	Casing Blows per Foot	Sample No.	Blows on Sample Spoon per 6"	Sym	IDENTIFICATION	REMARKS
			2		**Topsoil** 0'6"	
1		S-1	4		Br cf S, l $,l f G	Rec = 18"
			4			moist
2			5			
			13		same	
3		S-2	28		**Brown coarse to fine SAND,**	Rec = 17"
			21		**little Silt, little fine Gravel**	moist
4			22			
5					5'0"	
			12		Br cf S, l $, t f G (completely weathered gniess)	
6		S-3	14			Rec = 15"
			19			moist
7			28		**Brown coarse to fine SAND, little**	very dense augering 7'-10'
					Silt, trace fine Gravel (completely	
8					**weathered Geniss)**	
9						
10						
			75		same	
11		S-4	50/3"			Rec = 6"
						moist
12						very dense augering 10'-15'
13						
14						
15						
		S-4	50/2"		same 15'2"	No recovery
16					**End of Boring @ 15'2"**	Spoon bouncing @ 15'2"
17						
18						
19						
20						
21						
22						

CARLIN - SIMPSON & ASSOCIATES Sayreville, NJ	TEST BORING LOG	BORING NUMBER B-8

Project:	Proposed Renovations, Byrnwood Club Development, North Castle, NY	SHEET NO.:	1 of 1
Client:	JBM Realty	JOB NUMBER:	12-175
Drilling Contractor:	General Borings, Inc.	ELEVATION:	+609.0

GROUNDWATER					CASING	SAMPLE	CORE	TUBE	DATUM:	
DATE	TIME	DEPTH	CASING	TYPE	HSA	SS			START DATE:	19 Dec 12
19 Dec 12	1130	3'3"	None	DIA.	3 1/4"	1 3/8"			FINISH DATE:	19 Dec 12
				WGHT		140#			DRILLER:	T. McGovern
				FALL		30"			INSPECTOR:	KWA

Depth (ft.)	Casing Blows per Foot	Sample No.	Blows on Sample Spoon per 6"	Sym	IDENTIFICATION	REMARKS
			2		**Brown Topsoil** 0'6"	
1		S-1	4		FILL (Br cf S, a $, t cf G)	Rec = 4"
			8			moist
2			7			
			10		FILL (same)	
3		S-2	11			No recovery
			11		**FILL (Brown coarse to fine SAND,**	moist
4			13		**and Silt, trace coarse to fine Gravel)**	
5						
			13		FILL (same) 5'6"	
6		S-3	8		Mtld gr, or br Cy $ s, cf S, w/t roots	Rec = 18"
			7		**Mottled gray, orange brown Clayey**	moist
7			8		**SILT some, coarse to fine Sand, with** 7'0"	
			8		**roots**	
8		S-4	8		Gr br cf S, s (+) $, l cf G	Rec = 15"
			7			wet
9			8		**Gray brown coarse to fine SAND,**	
					some (+) Silt, little coarse to fine	
10					**Gravel**	
			15		same, l cf G	
11		S-5	25			Rec = 16"
			26			wet
12			35		12'0"	
					End of Boring @ 12'0"	
13						
14						
15						
16						
17						
18						
19						
20						
21						
22						

CARLIN - SIMPSON & ASSOCIATES Sayreville, NJ	TEST BORING LOG	BORING NUMBER B-9

Project:	**Proposed Renovations, Byrnwood Club Development, North Castle, NY**	**SHEET NO.:**	1 of 1
Client:	**JBM Realty**	**JOB NUMBER:**	12-175
Drilling Contractor:	**General Borings, Inc.**	**ELEVATION:**	+674.0

GROUNDWATER					CASING	SAMPLE	CORE	TUBE	DATUM:	
DATE	TIME	DEPTH	CASING	TYPE	HSA	SS			START DATE:	19 Dec 12
No water encountered				DIA.	3 1/4"	1 3/8"			FINISH DATE:	19 Dec 12
				WGHT		140#			DRILLER:	T. McGovern
				FALL		30"			INSPECTOR:	KWA

Depth (ft.)	Casing Blows per Foot	Sample No.	Blows on Sample Spoon per 6"	Sym	IDENTIFICATION	REMARKS
			8		**Clay Tennis Court** 0'6"	
1		**S-1**	8		FILL (Br cf S, s $, s (+) cf G)	Rec = 17"
			8			moist
2			17			
			17		FILL (same)	
3		**S-2**	12			Rec = 15"
			7		**FILL (Brown coarse to fine Sand,**	moist
4			13		**some Silt, some (+) coarse to fine**	
					Gravel)	
5						
			10		FILL (Br cf S, s $, l cf G)	
6		**S-3**	4			Rec = 15"
			5			moist
7			11		7'0"	
		S-4	50/3"		**Highly to moderately weathered** 7'6"	Rec = 3"
8					**Gneiss**	moist
					Eknd of Boring @ 7'6"	Auger refusal @ 7'0"
9						
10						
11						
12						
13						
14						
15						
16						
17						
18						
19						
20						
21						
22						

CARLIN - SIMPSON & ASSOCIATES Sayreville, NJ	TEST BORING LOG	BORING NUMBER B-10

Project:	Proposed Renovations, Byrnwood Club Development, North Castle, NY	SHEET NO.:	1 of 1
Client:	JBM Realty	JOB NUMBER:	12-175
Drilling Contractor:	General Borings, Inc.	ELEVATION:	+638.8

GROUNDWATER					CASING	SAMPLE	CORE	TUBE	DATUM:	
DATE	TIME	DEPTH	CASING	TYPE	HSA	SS			START DATE:	19 Dec 12
No water encountered				DIA.	3 1/4"	1 3/8"			FINISH DATE:	19 Dec 12
				WGHT		140#			DRILLER:	T. McGovern
				FALL		30"			INSPECTOR:	JB

Depth (ft.)	Casing Blows per Foot	Sample No.	Blows on Sample Spoon per 6"	Sym	IDENTIFICATION	REMARKS
			2		**Topsoil** 0'1"	
1		S-1	3		Br cf $ s, cf S, l cf G	Rec = 15"
			6		**Brown coarse to fine SILT some, coarse to**	moist
2			50/3"		**fine Sand, little coarse to fine Gravel** 2'0"	Auger refusal @ 2'0"
3						
		Run #1			**Gray, white Gneiss**	Run #1
4						2'0"-7'0"
						Run = 60"
5					5'0"	Rec = 52" = 86%
					Soil seam	RQD = 53%
6					5'8"	
					Gray, white Gneiss	
7					7'0"	
					End of Boring @ 7'0"	
8						
9						
10						
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12						
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21						
22						

CARLIN - SIMPSON & ASSOCIATES Sayreville, NJ	TEST BORING LOG	BORING NUMBER B-11

Project:	**Proposed Renovations, Byrnwood Club Development, North Castle, NY**	**SHEET NO.:**	1 of 1
Client:	**JBM Realty**	**JOB NUMBER:**	12-175
Drilling Contractor:	**General Borings, Inc.**	**ELEVATION:**	+640.0

GROUNDWATER					CASING	SAMPLE	CORE	TUBE		
DATE	**TIME**	**DEPTH**	**CASING**	**TYPE**	**HSA**	**SS**			**DATUM:**	
No water encountered				**DIA.**	**3 1/4"**	**1 3/8"**			**START DATE:**	19 Dec 12
				WGHT		**140#**			**FINISH DATE:**	19 Dec 12
				FALL		**30"**			**DRILLER:**	T. McGovern
									INSPECTOR:	KWA

Depth (ft.)	Casing Blows per Foot	Sample No.	Blows on Sample Spoon per 6"	Sym	IDENTIFICATION	REMARKS
			2		**Topsoil**	
1		**S-1**	3		0'9"	Rec = 20"
			3		Br cf S, l (+) $	moist
2			7			
			5		same, dk br	
3		**S-2**	6		**Brown coarse to fine SAND,**	Rec = 17"
			8		**little (+) Silt**	moist
4			23		4'0"	
5					**Completely to highly weathered**	
					Gneiss	
6					5'6"	Auger refusal @ 5'6"
					End of Boring @ 5'6"	
7						
8						
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22						

Byrnwood Club Development
Bedford Road
Town of New Castle, NY
(12-175)

3 January 2013

TEST PIT LOGS

TP-1	Elevation +662		
0-0’9”	Brown Topsoil		
0’9”-2’0”	Brown coarse to fine SAND, and Silt, trace (+) medium to fine Gravel	medium dense	moist
2’0”	Gneiss bedrock No water encountered		

TP-2	Elevation +672		
0-1’10”	FILL (Brown coarse to fine SAND, some silt, little (-) coarse to fine Gravel, with topsoil)	medium dense	moist
1’10”-4’4”	Light brown coarse to fine SAND, some (+) Silt	medium dense	moist
4’4”	Gneiss bedrock No water encountered		

TP-3	Elevation +672		
0-0’9”	Dark brown Topsoil with surface debris		
0’9”-2’2”	Brown coarse to fine SAND, some Silt	medium dense	moist
2’2”	Gneiss bedrock No water encountered		

Byrnwood Club Development
Bedford Road
Town of New Castle, NY
(12-175)

3 January 2013

TEST PIT LOGS

TP-4	Elevation +672		
0-0'6"	Brown Topsoil		
0'6"-3'6"	Brown coarse to fine SAND, and (-) Silt, some coarse to fine Gravel	medium dense	moist
3'6"	Gneiss bedrock No water encountered		

TP-5	Elevation +670		
0-0'7"	Brown Topsoil		
0'7"-3'8"	Light brown coarse to fine SAND, some (+) Silt	medium dense	moist
3'8"-4'9"	Brown coarse to fine SAND, some Silt (completely weathered gneiss)	dense	moist
4'9"	Gneiss bedrock No water encountered		

Byrnwood Club Development
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TEST PIT LOGS

TP-6	Elevation +672		
0-0'10"	Brown Topsoil		
0'10"-2'10"	Light brown coarse to fine SAND, some (-) Silt, little coarse to fine Gravel	medium dense	moist
2'10"-4'7"	Brown coarse to fine SAND, some Silt, little coarse to fine Gravel (completely weathered gneiss)	dense	moist
4'7"	Gneiss bedrock No water encountered		

TP-7	Elevation +620		
0-0'9"	Brown Topsoil		
0'9"-2'8"	Brown coarse to fine SAND, some Silt, trace coarse to fine Gravel	medium dense	moist
2'8"	Probable Gneiss bedrock		
	Test pit abandoned No water encountered		

TP-8	Elevation +614		
0-0'8"	Dark brown Topsoil		
0'8"-5'0"	Mottled orange brown, gray coarse to fine SAND, and (-) Silt	medium dense	moist
	Groundwater encountered @ 4'1"	slow inflow	

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TEST PIT LOGS

TP-9	Elevation +628		
0-0'4"	Topsoil		
0'4"-6'9"	FILL (Brown coarse to fine SAND, some (+) Silt, some (+) coarse to fine Gravel, with cobbles and boulders)	medium dense	moist
6'9"	FILL (Gray coarse to fine SAND, trace (+) Silt)	medium dense	moist
	Possible cover over for utility Test pit was abandoned		
	No water encountered		

TP-10	Elevation +625		
0-0'4"	Topsoil		
0'4"-3'0"	FILL (Boulders with topsoil)	loose	moist
3'0"-8'0"	Brown coarse to fine SAND, some (+) Silt	medium dense	moist
	No water encountered		

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TEST PIT LOGS

TP-11	Elevation +642		
0-0'6"	Brown Topsoil		
0'6"-3'9"	Brown coarse to fine SAND, some Silt, little coarse to fine Gravel, with occasional cobbles and boulders	medium dense	moist
3'9"-6'0"	Brown coarse to fine SAND, little (+) Silt, some coarse to fine Gravel (completely weathered gneiss)	dense	moist
6'0"	Weathered Gneiss bedrock No water encountered		

TP-12	Elevation +635		
0-0'6"	Brown Topsoil		
0'6"-5'0"	FILL (Brown coarse to fine SAND, some (+) Silt, little (-) coarse to fine Gravel, with trace of debris)	loose	moist
5'0"-6'6"	Orange brown, gray coarse to fine SAND and Silt	dense	moist
	Refusal on boulder No water encountered		

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4 January 2013

TEST PIT LOGS

TP-13	Elevation +636		
0-0’9”	Brown Topsoil with roots		
0’9”-6’3”	Brown coarse to fine SAND, and Silt, little coarse to fine Gravel	medium dense	moist
6’3”-7’5”	Brown coarse to fine SAND, some (+) Silt, little (-) coarse to fine Gravel	dense	moist
7’5”	Gneiss bedrock		
	Groundwater encountered @ 4’10”	slow inflow	

TP-14	Elevation +625		
0-0’3”	Brown Topsoil		
0’3”-3’4”	FILL (Gray brown coarse to fine SAND, some Silt, little coarse to fine Gravel, with cobbles and boulders)	loose	moist
3’4”-5’0”	FILL (Brown coarse to fine SAND, little Silt)	medium dense	moist
5’0”	Gneiss bedrock No water encountered		

Byrnwood Club Development
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4 January 2013

TEST PIT LOGS

TP-15	Elevation +668		
0-0'3"	Brown Topsoil		
0'3"-1'8"	Brown coarse to fine SAND, some (+) Silt, some (-) coarse to fine Gravel, with occasional cobbles and boulders	medium dense	moist
1'8"	Gneiss bedrock No water encountered		

TP-16	Elevation +651		
0-0'8"	Dark brown Topsoil		
0'8"-1'10"	FILL (Brown coarse to fine SAND, some (+) Silt, trace medium to fine Gravel, with cobbles)	medium dense	moist
1'10"-4'10"	Brown coarse to fine SAND, some (+) Silt, trace medium to fine Gravel	medium dense	moist
4'10"	Gneiss bedrock No water encountered		

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4 January 2013

TEST PIT LOGS

TP-17	Elevation +655		
0-0'3"	Topsoil		
0'3"-1'0"	Brown coarse to fine SAND, some (+) Silt, little coarse to fine Gravel	medium dense	moist
	Encountered irrigation pipes Test pit abandoned No water encountered		

TP-18	Elevation +670		
0-0'10"	Brown Topsoil		
0'10"-7'0"	Brown SILT and, coarse to fine Sand, little (-) medium to fine Gravel	medium dense	moist
	No water encountered		

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TEST PIT LOGS

TP-19

0-2’5”	FILL (Brown coarse to fine SAND, some Silt, some coarse to fine Gravel, with topsoil, cobbles, boulders)	loose	moist
2’5”-7’0”	Brown coarse to fine SAND, some Silt, little coarse to fine Gravel	medium dense	moist
	No water encountered		

TP-20

0-0’6”	Brown Topsoil		
0’6”-4’3”	Brown, orange brown coarse to fine SAND, some Silt, little coarse to fine Gravel	medium dense	moist
4’3”-8’0”	Orange brown coarse to fine SAND, little (-) Silt, some coarse to fine Gravel, with occasional cobbles	medium dense	moist
	No water encountered		

Brynwood Club Development
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TEST PIT LOGS

TP-21

0-0'6"	Dark brown Topsoil		
0'6"-1'4"	FILL (Brown coarse to fine SAND, some (-) Silt, trace medium to fine Gravel, with few roots)	medium dense	moist
1'4"-7'0"	Brown coarse to fine SAND, little Silt, trace (+) coarse to fine Gravel, with occasional cobbles	medium dense	moist
7'0"	Possible weathered bedrock		
	No water encountered		

TP-22

0-1'6"	Dark brown Topsoil, with roots		
1'6"-2'8"	Mottled gray brown, orange brown Clayey SILT, little medium to fine Sand	medium dense	moist
2'8"-3'6"	Brown coarse to fine SAND, some (+) Silt, little medium to fine Gravel	medium dense	moist
3'6"-6'0"	Brown coarse to fine SAND, little (+) Silt, come coarse to fine Gravel	medium dense	wet
6'0"-7'6"	Gray brown SILT little, coarse to fine Sand, trace medium to fine Gravel	medium dense	wet
	Groundwater encountered @ 4'6"	slow inflow	

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TEST PIT LOGS

TP-23

0-0’7”	Brown Topsoil		
0’7”-3’10”	Brown coarse to fine SAND, and (-) Silt, little (-) coarse to fine Gravel	dense	moist
3’10”	Weathered bedrock		
	No water encountered		

TP-24

0-0’8”	Brown Topsoil		
0’8”-6’8”	Brown coarse to fine SAND, some (+) Silt, little (-) coarse to fine Gravel, with occasional cobbles	medium dense	moist
6’8”	Possible weathered bedrock or boulder		
	No water encountered		

TP-25

0-0’4”	Brown Topsoil		
0’4”-3’4”	Brown coarse to fine SAND, and Silt, trace medium to fine Gravel	medium dense	moist
3’4”	Possible bedrock or boulder		
	No water encountered		

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TEST PIT LOGS

TP-26

0-0'6"	Brown Topsoil		
0'6"-2'8"	FILL (Brown coarse to fine SAND, some (-) Silt, little coarse to fine Gravel, with cobbles and boulders)	medium dense	moist
2'8"-4'0"	FILL (Brown Topsoil, with trace roots)		
4'0"-5'6"	FILL (Dark gray brown Clayey SILT, and, coarse to fine Sand, with trace roots, trace debris)	medium stiff	moist
5'6"-8'0"	Brown coarse to fine SAND, and (-) Silt, trace coarse to fine Gravel	medium dense	moist
	No water encountered		

TP-27

0-0'9"	Brown Topsoil, with roots		
0'9"-4'4"	Light brown coarse to fine SAND, little Silt, trace coarse to fine Gravel	medium dense	dry
4'4"	Probable weathered bedrock		
	No water encountered		

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TEST PIT LOGS

TP-28

0-0’4”	Brown Topsoil		
0’4”-8‘6”	FILL (Brown coarse to fine SAND, little Silt, little coarse to fine Gravel, with organics, debris)	loose	moist
8’6”-9’0”	FILL (Gray coarse to fine SAND, some Silt, little coarse to fine Gravel, with organics)	medium dense	wet
	Groundwater encountered @ 8’0”		

Byrnwood Club Development
Bedford Road
Town of New Castle, NY
(12-175)

18 -19 December 2012

Borehole Permeability Test (B-4)

Ground Surface Elevation: +628.0
Top of Casing Elevation: +631.5
Bottom of Test Hole Elevation: +621.0
Test Hole Depth from Ground Surface Elevation: 7'0" (84")

Pre-Soak:

Start Date: 18 Dec 2012 Time: 1545 Water Level*: 4'4"
End Date: 19 Dec 2012 Time: 0900 Water Level*: 7'1"

33" drop H_2O in 1035 minutes (17 hr. 15 min.) = 0.03 inches per minute

Test:

Start Date: 19 Dec 2012 Time: 1000 Water Level*: 4'3"
End Date: 19 Dec 2012 Time: 1515 Water Level*: 5'3.5"

12.5" drop H_2O in 315 minutes (5 hr. 15 min.) = 0.04 inches per minute

Time	Water Level*	Interval Water Level Drop (Inches)	Cumulative Water Level Drop (Inches)
1000	4'3"	0	0
1100	4'6"	3	3
1200	4'8"	2	5
1300	4'10"	2	7
1400	5'1"	3	10
1515	5'3.5"	2.5	12.5

Water Level* - Depth below top of casing (elevation +631.5)

Byrnwood Club Development
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Town of New Castle, NY
(12-175)

3 January 2013

Percolation Test P-1
(Elevation +620)

Test hole depth 42" from ground surface elevation

Pre-Soak

0-10 min, 22" drop of H2O (pipe drained)
22" drop H2O in 10 minutes = 2.20 inches per minute

Test Run #1

5 min, 15" drop H2O (re-filled pipe)

Test Run #2

5 min, 14" drop H2O (re-filled pipe)

Test Run #3

5 min, 12" drop H2O (re-filled pipe)

Final Test Reading

Start @ 1245, 14" from top of pipe
Finish @ 1300, 36" drop from top of pipe (pipe drained)
22" drop H2O in 15 minutes = 1.46 inches per minute

Percolation Hole P-2
(Elevation + 612)

Test hole depth 20" from ground elevation
Groundwater @ 0'6" below surface
Percolation test unable to be performed

Byrnwood Club Development
Bedford Road
Town of New Castle, NY
(12-175)

3 January 2013

Percolation Test P-3
(Elevation + 616)

Test hole depth 32" from ground surface elevation

Pre-Soak

0-24 min, 17" drop of H2O (pipe drained)
17" drop H2O in 24 minutes = 0.71 inches per minute

Test Run #1

5 min, 5" drop H2O (re-filled pipe)

Test Run #2

5 min, 5" drop H2O (re-filled pipe)

Test Run #3

5 min, 4" drop H2O (re-filled pipe)

Final Test Reading

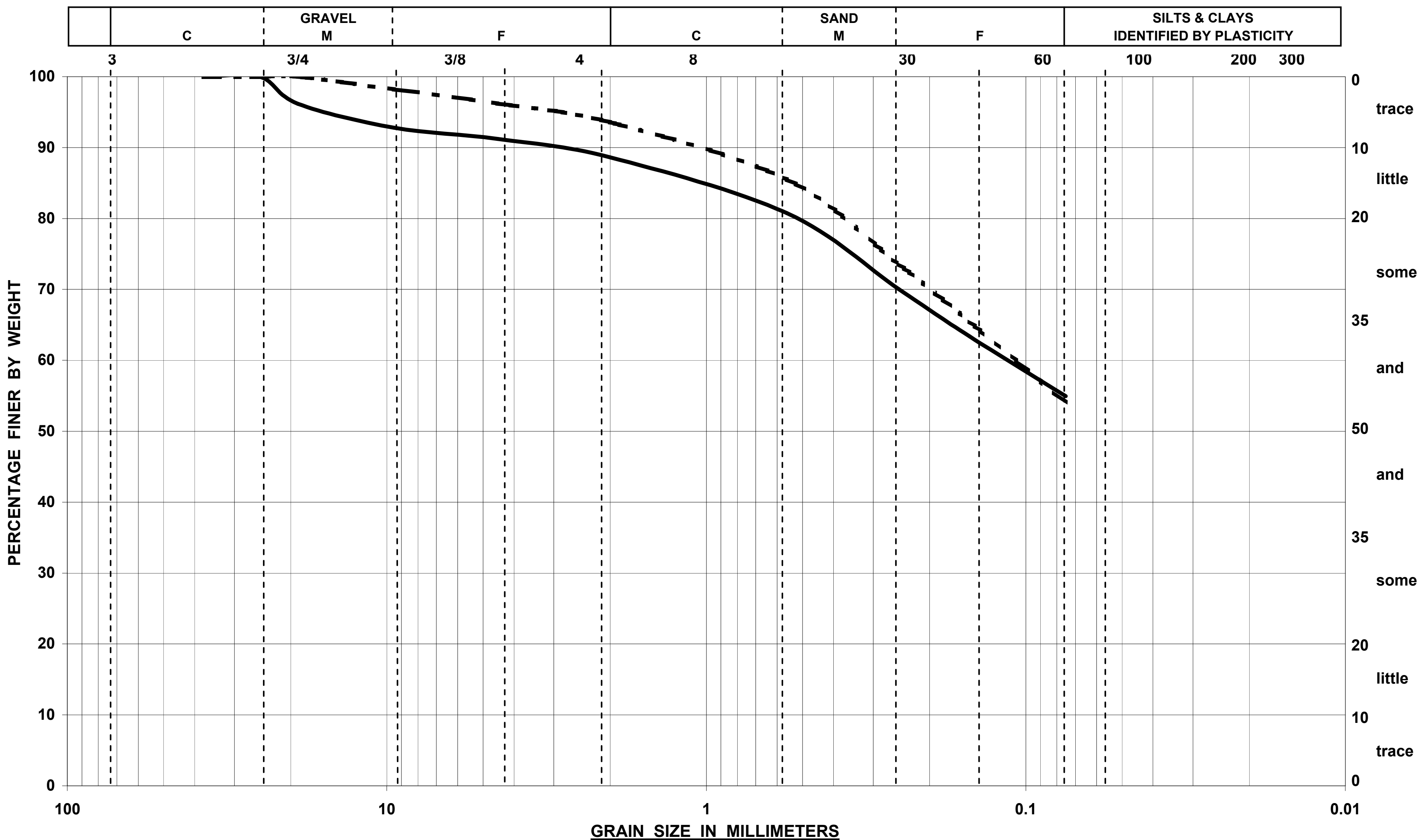
Start @ 1535, 15" from top of pipe
Finish @ 1605, 28" drop from top of pipe
13" drop H2O in 30 minutes = 0.43 inches per minute

Percolation Hole P-4
(Elevation + 615)

Test hole depth 24" from ground elevation
Groundwater @ 1'10" below surface
Percolation test unable to be performed

CARLIN-SIMPSON & ASSOCIATES
SAYREVILLE, NJ 08872

SIEVE ANALYSIS

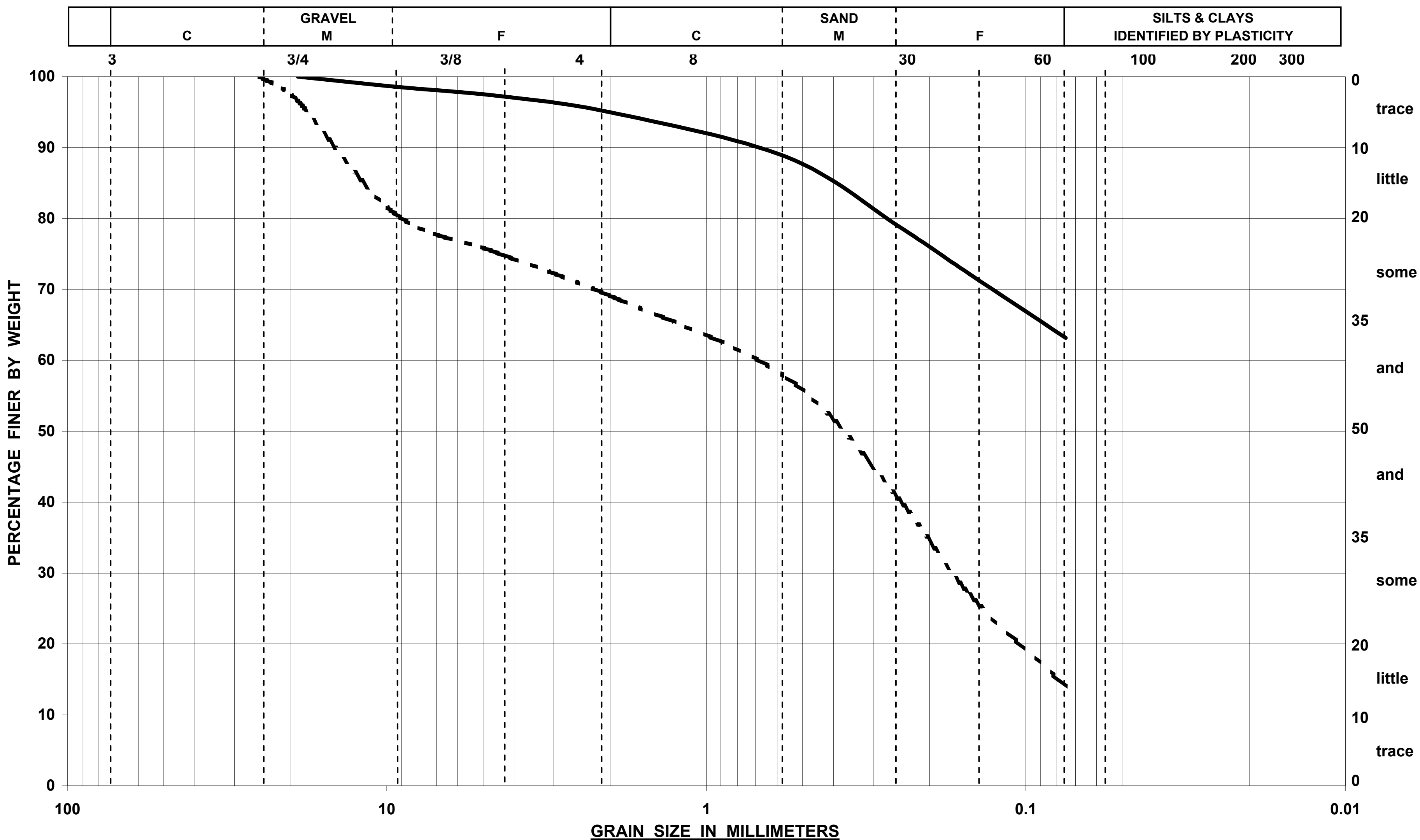


SYMBOL	BORING	SAMPLE	DEPTH	DESCRIPTION	NAT MC
———	B-1	S-1	0' 0" - 2' 0"	Brown SILT and (+), coarse to fine Sand, little (-) medium to fine Gravel	14.0%
— -	B-2	S-2	2' 0" - 4' 0"	Brown SILT and (+), coarse to fine Sand, trace medium to fine Gravel	14.2%

PROJECT Brynwood Club, Bedford Road, North Castle, NY **BY** MW **DATE** 7-Jan-13 **JOB NO** 12-175

CARLIN-SIMPSON & ASSOCIATES
SAYREVILLE, NJ 08872

SIEVE ANALYSIS



SYMBOL	BORING	SAMPLE	DEPTH	DESCRIPTION	NAT MC
———	B-3	S-1	0' 0" - 2' 0"	Brown SILT and (-), coarse to fine Sand, trace medium to fine Gravel	24.2%
— -	B-4	S-3	5' 0" - 7' 0"	Brown coarse to fine SAND, little Silt, some (+) medium to fine Gravel	12.1%

PROJECT Brynwood Club, Bedford Road, North Castle, NY **BY** MW **DATE** 7-Jan-13 **JOB NO** 12-175

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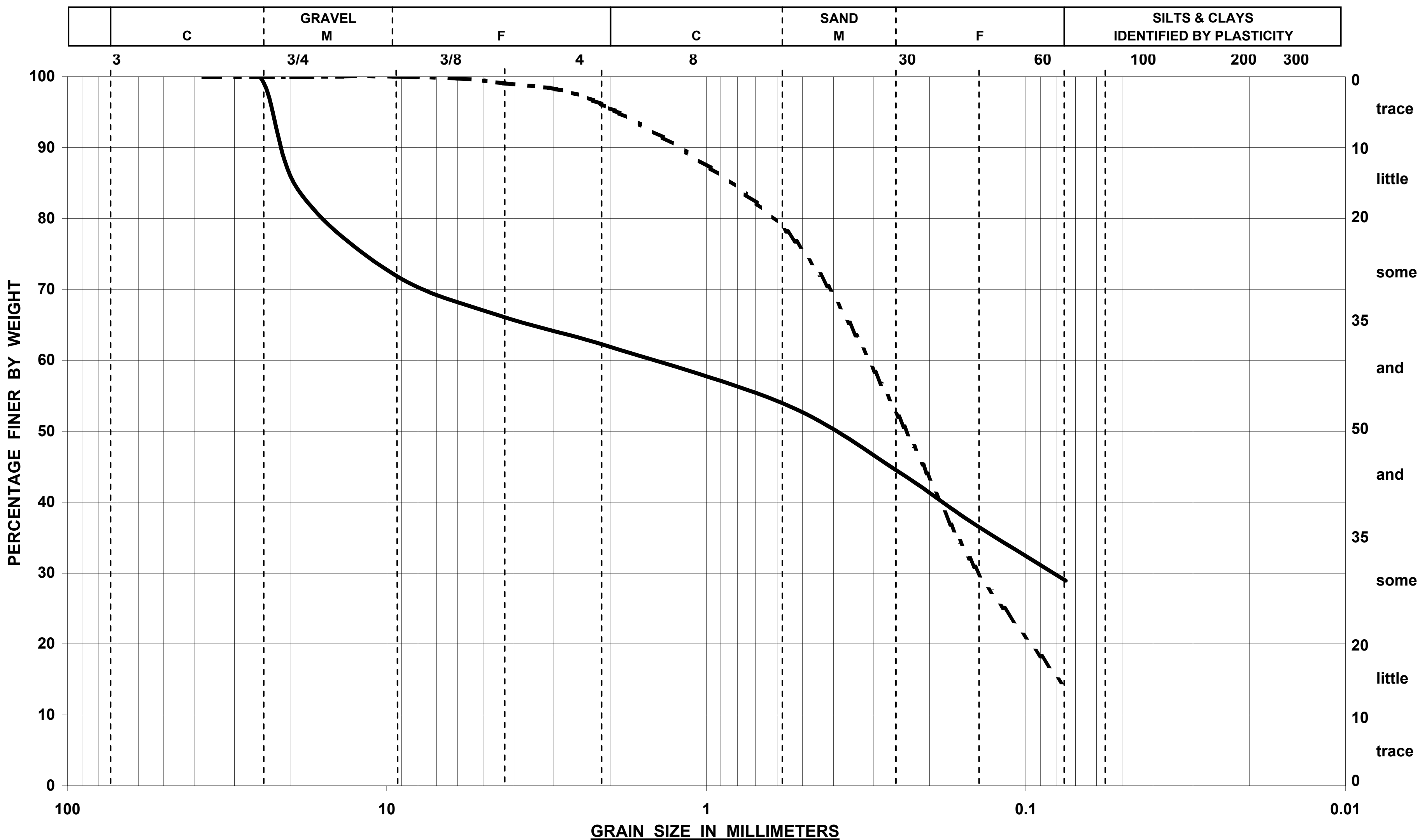
SIEVE ANALYSIS



SYMBOL	BORING	SAMPLE	DEPTH	DESCRIPTION	NAT MC
———	B-6	S-2	2' 0" - 4' 0"	Brown coarse to fine Sand, some Silt, and (-) coarse to fine Gravel	9.9%
— -	B-7	S-3	5' 0" - 7' 0"	Brown coarse to fine SAND, little Silt, trace fine Gravel	8.7%

PROJECT Brynwood Club, Bedford Road, North Castle, NY **BY** MW **DATE** 10-Jan-13 **JOB NO** 12-175

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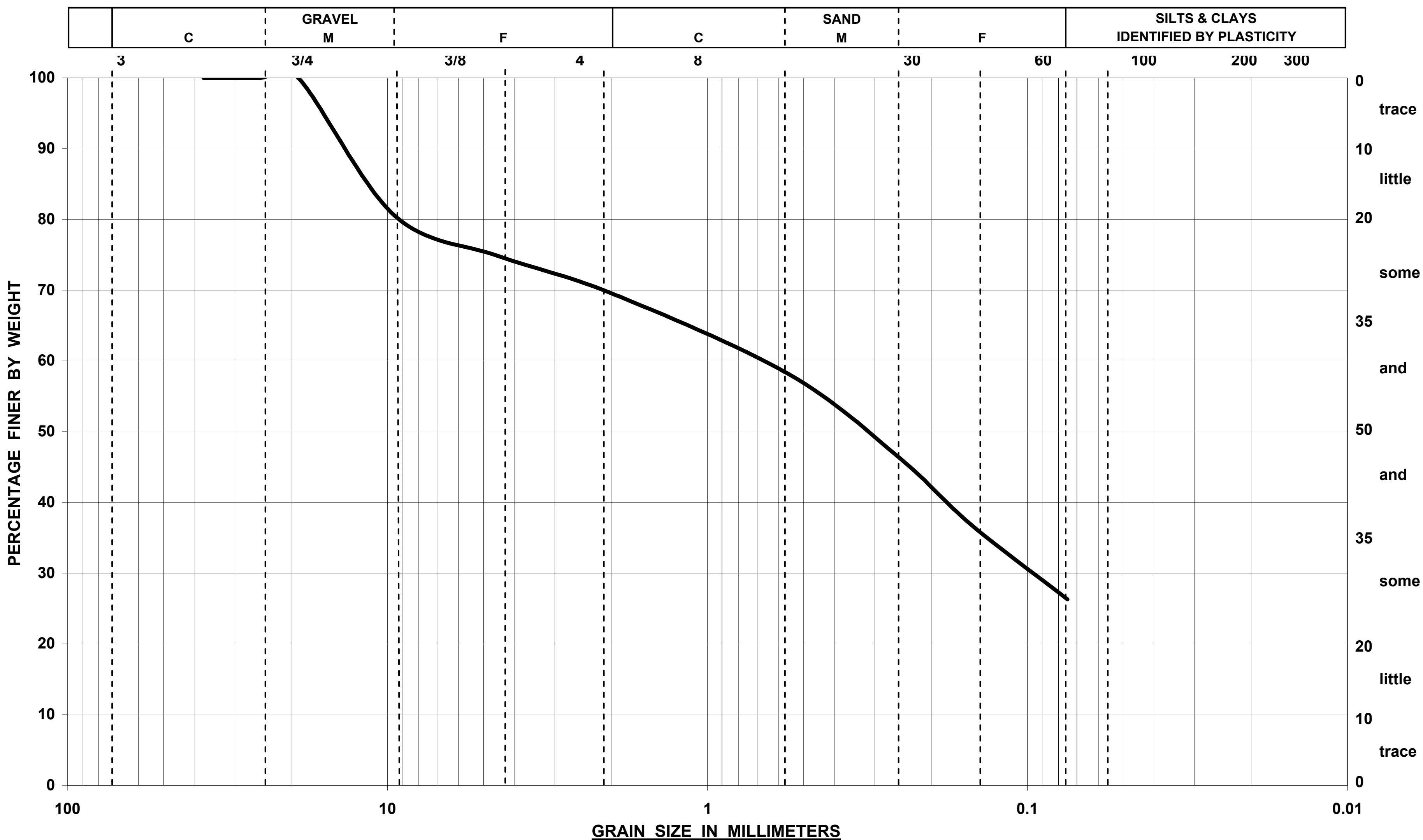
SAYREVILLE, NJ 08872

SIEVE ANALYSIS



SYMBOL	BORING	SAMPLE	DEPTH	DESCRIPTION	NAT MC
——	B-9	S-2	2' 0" - 4' 0"	FILL (brown coarse to fine Sand, some Silt, some (+) medium to fine Gravel	15.0%

PROJECT Brynwood Club, Bedford Road, North Castle, NY BY MW DATE 7-Jan-13 JOB NO 12-175

CARLIN-SIMPSON & ASSOCIATES
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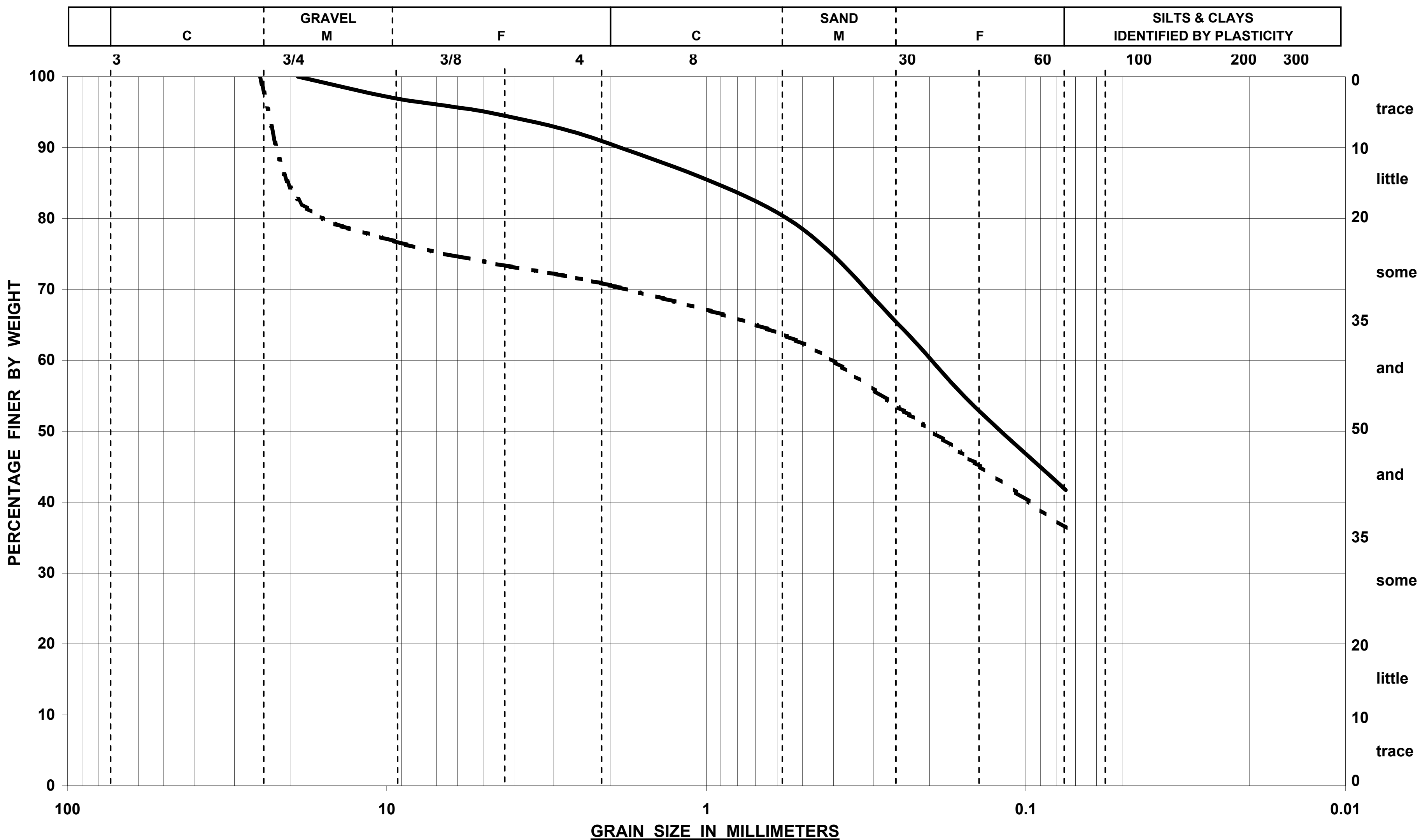
SIEVE ANALYSIS



SYMBOL	Test Pit	SAMPLE	DEPTH	DESCRIPTION	NAT MC
——— (solid)	TP-1	S-1		Brown coarse to fine SAND, and Silt, trace (+) medium to fine Gravel	18.2%
— - (dashed)	TP-4	S-1		Brown coarse to fine Sand, and (-) Silt, some coarse to fine Gravel	14.0%

PROJECT Brynwood Club, Bedford Road, North Castle, NY **BY** MW **DATE** 7-Jan-13 **JOB NO** 12-175

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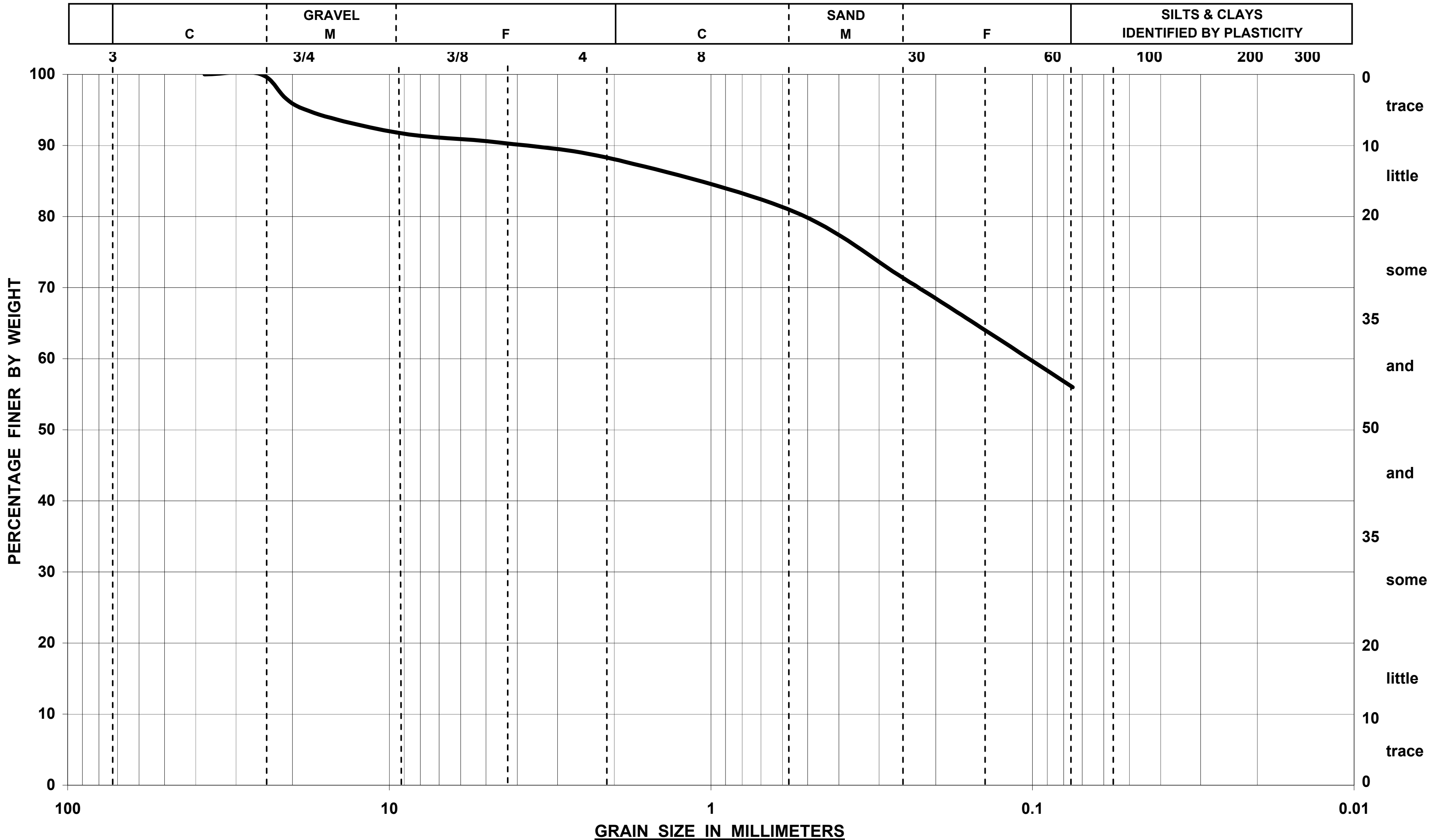
SIEVE ANALYSIS



SYMBOL	Test Pit	SAMPLE	DEPTH	DESCRIPTION	NAT MC
———	TP-18	S-1	0' 10" - 7' 0"	Brown SILT and, coarse to fine Sand, little (-) medium to fine Gravel	18.0%

PROJECT Brynwood Club, Bedford Road, North Castle, NY **BY** MW **DATE** 7-Jan-13 **JOB NO** 12-175

GENERAL NOTES:

1. GENERAL LAYOUT WAS OBTAINED FROM A DRAWING PREPARED BY JOHN MEYER CONSULTING, PC ENTITLED "TEST PIT PLAN, BRYNWOOD CLUB, BEDFORD ROAD (NY 22), TOWN OF NORTH CASTLE NEW YORK," DRAWING TP-1, DATED DECEMBER 17, 2012.
2. BORING, TEST PIT, PERMEABILITY TEST, AND PERCOLATION TEST LOCATIONS WERE LAID OUT IN THE FIELD BY CARLIN-SIMPSON & ASSOCIATES (CSA).
3. BORINGS (B-1 THROUGH B-11) WERE PERFORMED BY GENERAL BORINGS INC. ON 18 & 19 DECEMBER 2012 UNDER THE FULL TIME INSPECTION OF CSA.
4. THE BOREHOLE PERMEABILITY TEST (BP-4) WAS PERFORMED BY CSA ON 18 & 19 DECEMBER 2012.
5. PERCOLATION TESTS (P-1, P-2, AND P-3) WERE PERFORMED BY CSA ON 3 JANUARY 2013.
6. TEST PITS (TP-1 THROUGH TP-18) WERE PERFORMED BY TRAFICANTE CONTRACTING, INC ON 3 & 4 JANUARY 2013 UNDER THE FULL TIME INSPECTION OF CSA.
7. TEST PITS (TP-19 THROUGH TP-28) WERE PERFORMED BY BRYNWOOD CLUB PERSONNEL IN SEPTEMBER 2013 UNDER THE FULL TIME INSPECTION OF CSA.
8. LOCATIONS ARE APPROXIMATE.

LEGEND:

- BORING LOCATION (DEC. 2012)
- TEST PIT LOCATION (JAN. 2013)
- TEST PIT LOCATION (SEPT. 2013)
- PERCOLATION TEST LOCATION (JAN. 2013)
- BOREHOLE PERMEABILITY TEST LOCATION (DEC. 2012)

ROBERT B. SIMPSON, P.E.
PROFESSIONAL ENGINEER

LICENSE NO. SIGNATURE

BORING & TEST PIT LOCATION PLAN

BRYNWOOD CLUB DEVELOPMENT
NORTH CASTLE, NEW YORK

DRAWN	SCALE
MRA	1" = 120'
CHECKED	DATE
RBS	16 OCT 13
PROJECT NO.	DWG NO.
12-175	FIG -1
APPROVED	

CARLIN-SIMPSON AND ASSOCIATES
61 Main Street
Sayreville, NJ 08872

Consulting Geotechnical and Environmental Engineers

APPENDIX B

PUMP PERFORMANCE CURVES

EQUALIZATION TANK

1. SELECT SYSTEM HEAD POINTS				FLOW IN GPM:	20.00	35.00	45.00	65.00	85.00
2A. FORCE MAIN DATA :									
	PIPE TYPE :	SCH. 40 SS							
	C FACTOR :	120							
	NOMINAL DIA. (in.) :	3							
	INSIDE DIA. (in.) :	3							
	INSIDE DIA. (ft.) :	0.25							
	ID AREA (sq. ft.) :	0.049							
	LENGTH (ft.)	15							
'E HYDRAULIC VALUES									
FLOW RATE (gpm)	(cfs)	VELOCITY (fps)	VEL. HEAD (ft.)						
20	0.0446	0.91	0.01		0.01				
35	0.0780	1.59	0.04			0.04			
45	0.1003	2.04	0.06				0.06		
65	0.1448	2.95	0.14					0.14	
85	0.1894	3.86	0.23						0.23
2. TOTAL VELOCITY HEAD LOSS (STEP 2A + STEP 2B).......					0.01	0.04	0.06	0.14	0.23
3. PIPE LOSS									
A. 3" DIAMETER SCH. 40 SS HEAD LOSS									
@ GPM	HAZEN & WILLIAMS (ft.)								
20	0.03				0.03				
35	0.08					0.08			
45	0.12						0.12		
65	0.24							0.24	
85	0.39								0.39
3. SUM OF ALL PIPE LOSS (ft.)					0.03	0.08	0.12	0.24	0.39

4. MINOR LOSSES

A. 3" DIAMETER SCH. 40 SS HEAD LOSS

QUANTITY	TYPE OF LOSS	k FACTOR	k total
1	inlet	0.50	0.50
1	outlet	1.00	1.00
5	90 - elbow	0.51	2.55
0	45 - elbow	0.27	0.00
0	22.5 - elbow		0.00
0	tee (thru)	0.34	0.00
0	tee (branch)	1.02	0.00
0	gate valve	0.14	0.00
0	plug valve	1.00	0.00
0	butterfly valve		0.00
0	check valve	1.70	0.00
0	special control valve		0.00
0	wye fitting		0.00
1	reducer	0.33	0.33
		K TOTAL	4.38

@ GPM	VELOCITY HEAD (ft.)	K TOTAL	LOSS (ft.)					
20	0.01	4.38	0.06	0.06				
35	0.04	4.38	0.17		0.17			
45	0.06	4.38	0.28			0.28		
65	0.14	4.38	0.59				0.59	
85	0.23	4.38	1.01					1.01
4. SUM OF ALL MINOR LOSSES (ft.)				0.06	0.17	0.28	0.59	1.01
5. SUM OF ALL LOSSES (STEP 2 + STEP 3+ STEP 4)				0.10	0.29	0.47	0.97	1.64

6. STATIC HEAD

a. MAX. STATIC	12.79	12.79	12.79	12.79	12.79
b. MIN. STATIC	6.79	6.79	6.79	6.79	6.79

7. TOTAL DYNAMIC HEAD (TDH)

a. TDH max. .(STEP 5 + STEP 6a)	12.88	13.07	13.26	13.75	14.42
b. TDH max. .(STEP 5 + STEP 6b)	6.88	7.07	7.26	7.75	8.42

8. SYSTEM HEAD CURVES

C VALUE = 14 120

FLOW (GPM)	TDH max. (FT.)	TDH min. (FT.)
0	12.79	6.79
20	12.88	6.88
35	13.07	7.07
45	13.26	7.26
65	13.75	7.75
85	14.42	8.42

TECHNICAL BROCHURE
B3887BF R2

WS_BF Series
Model 3887BF

SUBMERSIBLE SEWAGE PUMP

BUILT IN THE USA
ENGINEERED, ASSEMBLED & TESTED

GOULDS WATER TECHNOLOGY
a xylem brand

FEATURES

Impeller: Cast iron, semi-open, non-clog, dynamically balanced with pump out vanes for mechanical seal protection.

Casing: Cast iron flanged volute type for maximum efficiency. Designed for easy installation on A10-20 slide rail or base elbow rail systems.

Mechanical Seal: SILICON CARBIDE VS. SILICON CARBIDE sealing faces for superior abrasive resistance, stainless steel metal parts, BUNA-N elastomers.

Shaft: Corrosion-resistant, 300 series stainless steel. Threaded design. Locknut on all models to guard against component damage on accidental reverse rotation.

Fasteners: 300 series stainless steel.

Capable of running dry without damage to components.

Designed for continuous operation when fully submerged.

EXTENDED WARRANTY AVAILABLE FOR RESIDENTIAL APPLICATIONS.

AGENCY LISTINGS

Tested to UL 778 and CSA 22.2 108 Standards
By Canadian Standards Association
File #LR38549

APPLICATIONS

Specifically designed for the following uses:

- Homes
- Water transfer
- Sewage systems
- Light industrial
- Dewatering/Effluent
- Commercial applications

Anywhere waste or drainage must be disposed of quickly, quietly and efficiently.

SPECIFICATIONS

Pump

- Solids handling capabilities: 2" maximum
- Capacities: up to 185 GPM
- Total heads: up to 38 feet TDH
- Discharge size: 2" NPT threaded companion flange as standard. 3" option available but must be ordered separately. (Order no. A1-3)
- Temperature: 104°F (40°C) continuous
  140°F (60°C) intermittent.

MOTORS

- Fully submerged in high grade turbine oil for lubrication and efficient heat transfer. All ratings are within the working limits of the motor.
- Class B insulation

Single phase (60 Hz):

- Capacitor start motors for maximum starting torque.
- Built-in overload with automatic reset.
- SJTOW or STOW severe duty oil and water resistant power cords.
- ⅓ – 1 HP models have NEMA three prong grounding plugs.

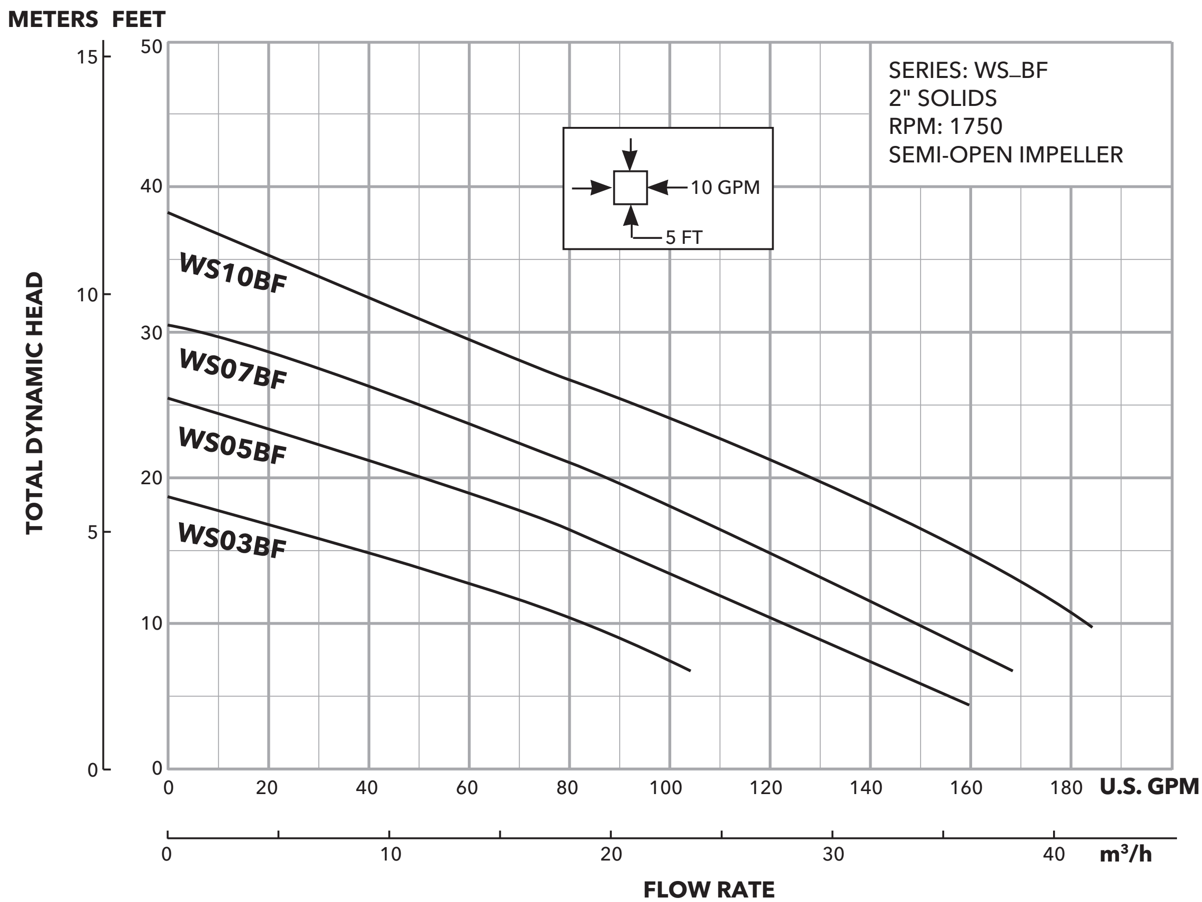
Three phase (60 Hz):

- Class 10 overload protection must be provided in separately ordered starter unit.
- STOW power cords all have bare lead cord ends.

- **Bearings:** Upper and lower heavy duty ball bearing construction.
- **Designed for Continuous Operation:** Pump ratings are within the motor manufacturer's recommended working limits, can be operated continuously without damage when fully submerged.
- **Power Cable:** Severe duty rated, oil and water resistant. Epoxy seal on motor end provides secondary moisture barrier in case of outer jacket damage and to prevent oil wicking. Standard cord is 20'. Optional lengths are available.
- **Motor Cover O-ring:** Assures positive sealing against contaminants and oil leakage.

MOTOR AND MODEL INFORMATION

Order Number	HP	Phase	Volts	RPM	Impeller Diameter (in.)	Maximum Amps	Locked Rotor Amps	KVA Code	Full Load Efficiency	Resistance		Weight (lbs.)
										Start	Line-Line	
WS0311BF	0.33	1	115	1750	4.69	10.7	30.0	M	54	11.9	1.7	63
WS0318BF			208			6.8	19.5	K	51	9.1	4.2	
WS0312BF			230			4.9	14.1	L	53	14.5	8.0	
WS0511BF	0.5		115		5.00	14.5	31.1	J	55	9.3	1.4	65
WS0518BF			208			8.0	19.5	K	51	9.1	4.2	
WS0512BF			230			7.3	16.5	J	54	11.7	5.6	
WS0538BF		3	200			3.8	12.3	K	75	–	6.7	
WS0532BF			230			3.3	9.7	K	75	–	9.9	
WS0534BF			460			1.7	4.9	K	75	–	39.4	
WS0537BF			575			1.4	4.3	K	68	–	47.8	
WS0718BF	0.75	1	208		5.38	11.0	39.0	K	65	2.6	1.4	85
WS0712BF			230			9.4	24.8	J	57	4.8	2.3	
WS0738BF		3	200			4.1	21.2	H	74	–	4.3	
WS0732BF			230			3.6	17.3	J	76	–	5.6	
WS0734BF			460			1.8	8.9	J	76	–	22.4	
WS0737BF			575			1.5	7.3	J	71	–	29.2	
WS1018BF	1	1	208		5.75	14.0	39.0	K	65	2.6	1.4	
WS1012BF			230			12.3	30.5	H	60	4.3	1.8	
WS1038BF		3	200			6.0	21.2	H	74	–	4.3	
WS1032BF			230			5.8	17.3	J	76	–	5.6	
WS1034BF			460			2.9	8.9	J	76	–	22.4	
WS1037BF			575			2.4	7.3	J	71	–	29.2	



PERFORMANCE RATINGS (gallons per minute)

Order No.		WS03BF	WS05BF	WS07BF	WS10BF
	HP ▶	⅓	½	¾	1
	RPM ▶	1750	1750	1750	1750
Total Head Feet of Water	10 ▶	80	122	145	183
	15	36	90	116	152
	20	–	50	86	123
	25	–	–	48	95
	30	–	–	–	58
	35	–	–	–	20

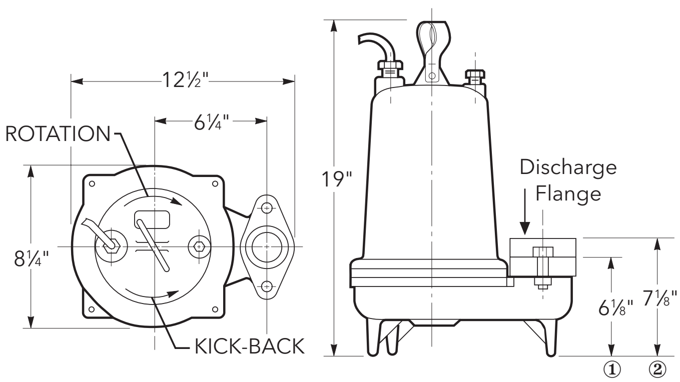
COMPONENTS

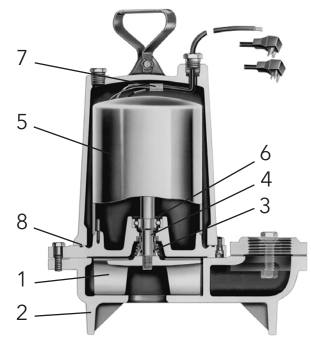
Item No.	Description
1	Impeller
2	Casing
3	Mechanical Seal
4	Motor Shaft
5	Motor
6	Ball Bearings
7	Power Cable
8	Casing O-Ring

* For available repair parts, see repair parts book.

DIMENSIONS

(All dimensions are in inches. Do not use for construction purposes.)





Discharge Flange:

① 2" NPT standard

② 3" NPT optional (order an A1-3)

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SLUDGE DECANT PUMP

1. SELECT SYSTEM HEAD POINTS	FLOW IN GPM:	55.00	70.00	76.00	95.00	115.00

2A. FORCE MAIN DATA :

PIPE TYPE :	SCH 80 PVC
C FACTOR :	120
NOMINAL DIA. (in.) :	3
INSIDE DIA. (in.) :	3.042
INSIDE DIA. (ft.) :	0.25
ID AREA (sq. ft.) :	0.050
LENGTH (ft.)	25

'E HYDRAULIC VALUES

FLOW RATE (gpm)	(cfs)	VELOCITY (fps)	VEL. HEAD (ft.)	55.00	70.00	76.00	95.00	115.00
55	0.1225	2.43	0.09	0.09				
70	0.1560	3.09	0.15		0.15			
76	0.1693	3.36	0.17			0.17		
95	0.2117	4.20	0.27				0.27	
115	0.2562	5.08	0.40					0.40
2. TOTAL VELOCITY HEAD LOSS (STEP 2A + STEP 2B).......				0.09	0.15	0.17	0.27	0.40

3. PIPE LOSS

A 3'' DIAMETER SCH 80 PVC HEADLOSS

@ GPM	HAZEN & WILLIAMS (ft.)	55.00	70.00	76.00	95.00	115.00
55	0.27	0.27				
70	0.43		0.43			
76	0.50			0.50		
95	0.76				0.76	
115	1.08					1.08
3. SUM OF ALL PIPE LOSS (ft.)		0.27	0.43	0.50	0.76	1.08

4. MINOR LOSSES

A 3" DIAMETER SCH 80 PVC HEADLOSS

QUANTITY	TYPE OF LOSS	k FACTOR	k total
1	inlet	0.50	0.50
1	outlet	1.00	1.00
3	90 - elbow	0.51	1.53
	45 - elbow	0.27	0.00
0	22.5 - elbow		0.00
0	tee (thru)	0.34	0.00
0	tee (branch)	1.02	0.00
0	gate valve	0.14	0.00
0	plug valve	1.00	0.00
0	butterfly valve		0.00
0	check valve	1.70	0.00
0	special control valve		0.00
0	wye fitting		0.00
0	reducer	0.33	0.00
		K TOTAL	3.03

@ GPM	VELOCITY HEAD (ft.)	K TOTAL	LOSS (ft.)					
55	0.09	3.03	0.28	0.28				
70	0.15	3.03	0.45		0.45			
76	0.17	3.03	0.53			0.53		
95	0.27	3.03	0.83				0.83	
115	0.40	3.03	1.21					1.21
4. SUM OF ALL MINOR LOSSES (ft.).				0.28	0.45	0.53	0.83	1.21
5. SUM OF ALL LOSSES (STEP 2 + STEP 3+ STEP 4).				0.64	1.03	1.20	1.86	2.69

6. STATIC HEAD

a. MAX. STATIC.	12.92	12.92	12.92	12.92	12.92
b. MIN. STATIC.	10.50	10.50	10.50	10.50	10.50

7. TOTAL DYNAMIC HEAD (TDH)

a. TDH max. .(STEP 5 + STEP 6a)	13.56	13.95	14.12	14.78	15.61
b. TDH max. .(STEP 5 + STEP 6b)	11.14	11.53	11.70	12.36	13.19

8. SYSTEM HEAD CURVES

C VALUE = 14 120

FLOW (GPM)	TDH max. (FT.)	TDH min. (FT.)
0	12.92	10.50
55	13.56	11.14
70	13.95	11.53
76	14.12	11.70
95	14.78	12.36
115	15.61	13.19

TECHNICAL BROCHURE
B3887BF R2

WS_BF Series

Model 3887BF

BUILT IN THE USA
ENGINEERED, ASSEMBLED & TESTED

SUBMERSIBLE SEWAGE PUMP

GOULDS WATER TECHNOLOGY
a xylem brand

FEATURES

Impeller: Cast iron, semi-open, non-clog, dynamically balanced with pump out vanes for mechanical seal protection.

Casing: Cast iron flanged volute type for maximum efficiency. Designed for easy installation on A10-20 slide rail or base elbow rail systems.

Mechanical Seal: SILICON CARBIDE VS. SILICON CARBIDE sealing faces for superior abrasive resistance, stainless steel metal parts, BUNA-N elastomers.

Shaft: Corrosion-resistant, 300 series stainless steel. Threaded design. Locknut on all models to guard against component damage on accidental reverse rotation.

Fasteners: 300 series stainless steel.

Capable of running dry without damage to components.

Designed for continuous operation when fully submerged.

EXTENDED WARRANTY AVAILABLE FOR RESIDENTIAL APPLICATIONS.

AGENCY LISTINGS

C US

Tested to UL 778 and CSA 22.2 108 Standards
By Canadian Standards Association
File #LR38549

APPLICATIONS

Specifically designed for the following uses:

- Homes
- Water transfer
- Sewage systems
- Light industrial
- Dewatering/Effluent
- Commercial applications

Anywhere waste or drainage must be disposed of quickly, quietly and efficiently.

SPECIFICATIONS

Pump

- Solids handling capabilities: 2" maximum
- Capacities: up to 185 GPM
- Total heads: up to 38 feet TDH
- Discharge size: 2" NPT threaded companion flange as standard. 3" option available but must be ordered separately. (Order no. A1-3)
- Temperature: 104°F (40°C) continuous
  140°F (60°C) intermittent.

MOTORS

- Fully submerged in high grade turbine oil for lubrication and efficient heat transfer. All ratings are within the working limits of the motor.
- Class B insulation

Single phase (60 Hz):

- Capacitor start motors for maximum starting torque.
- Built-in overload with automatic reset.
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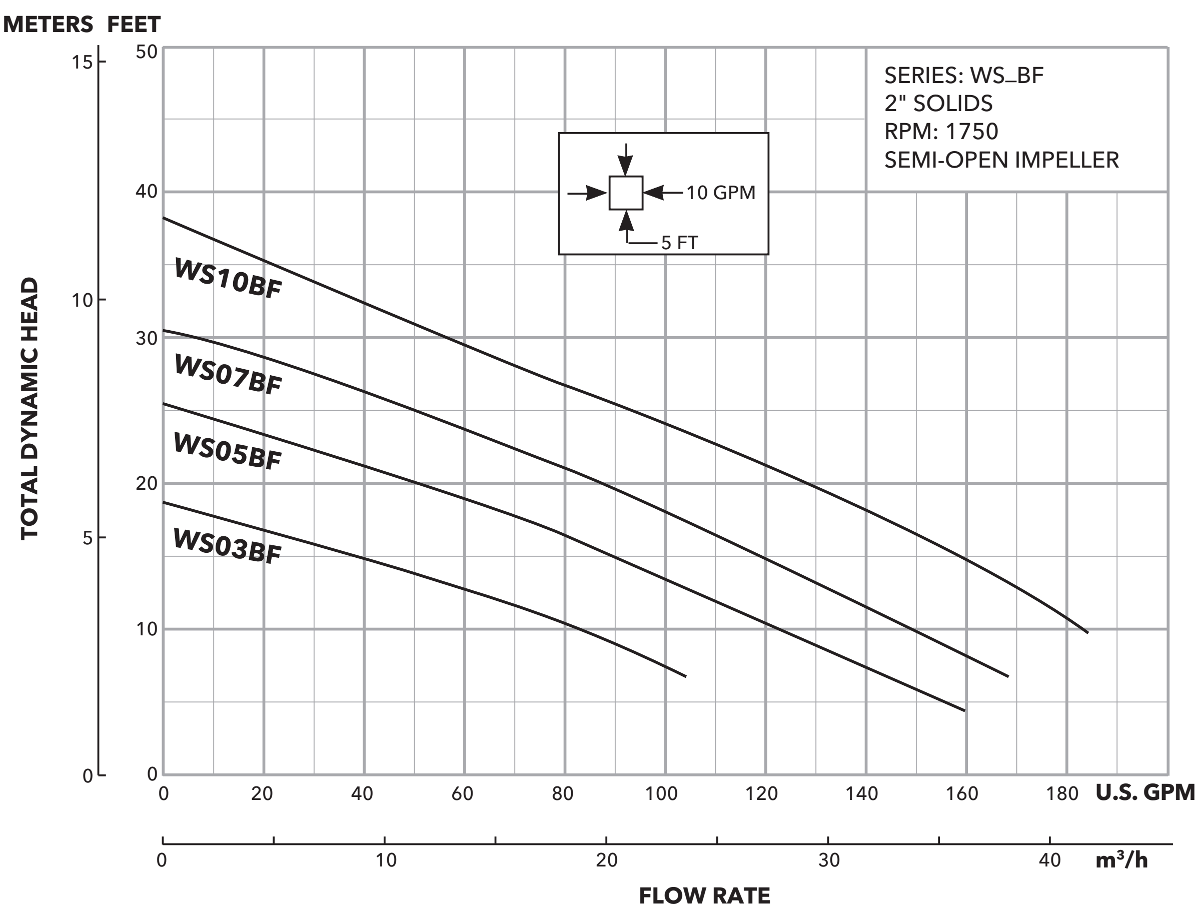

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	15	36	90	116	152
	20	–	50	86	123
	25	–	–	48	95
	30	–	–	–	58
	35	–	–	–	20

COMPONENTS

Item No.	Description
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3	Mechanical Seal
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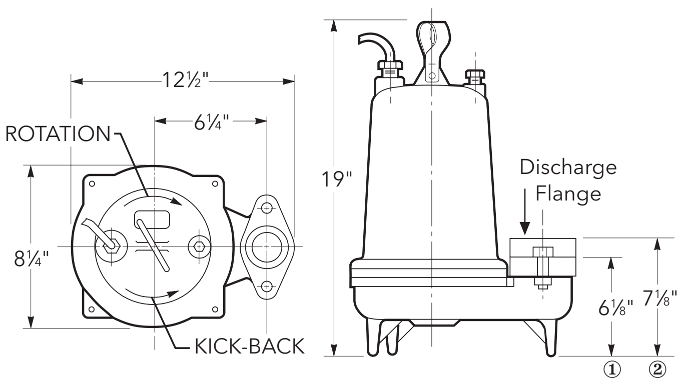

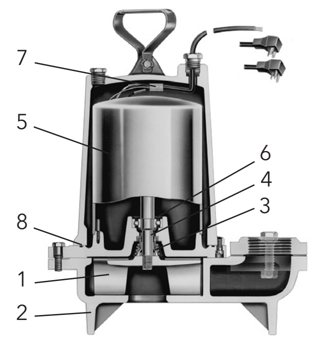

Discharge Flange:

① 2" NPT standard

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<u>APPENDIX C</u>

MANUFACTURER'S PROCESS CALCULATIONS

PES Project #	BJB-022522-SC(Rev5)	Date:	4/7/22
Job Name:	Summit Club		
QTY & Flow			

BESST DESIGN CALCULATIONS

1) $\mathbf{B_x}$ Actual Sludge Load [kg BOD_5 / kg VSS / d]

$\mathbf{B_x}$ = $B \times 1.02^{(tmin-20)}$
$\mathbf{B_x}$ = $0.120 \times 1.02^{(10 - 20)}$
$\mathbf{B_x}$ = 0.0984 kg BOD_5 / kg VSS / d

2) **A** Sludge Age [days]

A = $(1 / (YB_x)) \times (1-0.5((YB_x) / k_{ac})) + (Sqrt(1 + ((YB_x) / 2k_{ac})^2))$
A = (1/ (0.60 x 0.0984)) x (1- 0.5 x((0.60 x 0.0984) / 0.090))+ (Sqrt (1 + (0.60 x 0.0984) / (2x 0.090 $)^2$))
A = 29.1936 days

3) $\mathbf{k_d}$ Actual Rate of Decay [d^{-1}]

$\mathbf{k_d}$ = $k_{ac} / (1 + Ak_{ac})$
$\mathbf{k_d}$ = 0.090 / (1+(29.1936) (0.090))
$\mathbf{k_d}$ = 0.0248 d^{-1}

4) **X** Sludge Concentration [kg ss / m^3]

X = $1000 \times V_x / Kl$
X = 1000 x 0.600) / 100
X = 6.0000 kg ss / m^3

PES Project #	BJB-022522-SC(Rev5)	Date:	4/7/22
Job Name:	Summit Club		
QTY & Flow	0		

BESST DESIGN CALCULATIONS, Cont'd.

5) $\mathbf{X_v}$ Volatile Suspended Solids Concentration [kg VSS / m^3]

$\mathbf{X_v}$ = (X)(p)
$\mathbf{X_v}$ = 6.0000 x 0.65
$\mathbf{X_v}$ = 3.9000 kg VSS / m^3

6) **v** Actual Hydraulic Loading [m / h]

v = Lesser of v_l or v_c, where v_l = 1
$\mathbf{v_c}$ = $(N_x / X) \times e^{0.03(tmin-20)}$
$\mathbf{v_c}$ = (6.0000 / 6.0000) ($e^{0.03 *(10 - 20)}$)
$\mathbf{v_c}$ = 0.7408 m / h

7) $\mathbf{V_B}$ Aeration Volume [m^3]

$\mathbf{S_R}$ = S_T - (0.966(p)(NL))
$\mathbf{V_B}$ = $(Q(S_O - S_R)) / X_v B_x$
$\mathbf{V_B}$ = ((170.326)(0.2400 - 0.0037)) / (3.900)(0.0984)
$\mathbf{V_B}$ = 104.82 m^3

8) $\mathbf{S_S}$ Clarifier Surface Area [m^2]

$\mathbf{S_S}$ = $((Q_Q)(Q) / 24v$
$\mathbf{S_S}$ = ((3)(170.326)/(24 * 0.7408)
$\mathbf{S_S}$ = 28.739 m^2

9) $\mathbf{V_S}$ Clarifier Volume [m^3]

$\mathbf{V_S}$ = S_S / SV
$\mathbf{V_S}$ = 28.739 / 0.63
$\mathbf{V_S}$ = 45.618 m^3

PES Project #	BJB-022522-SC(Rev5)	Date:	4/7/22
Job Name:	Summit Club		
QTY & Flow	0		

BESST DESIGN CALCULATIONS, Cont'd.

10) $\mathbf{P_X}$ Net Mass of Volatile Suspended Solids Produced [kg VSS / d]

$\mathbf{P_X}$ = $(Y / (1 + Ak_d))(Q)(S_O - S_R)$

$\mathbf{P_X}$ = (0.60 / (1 + (29.1936) (0.0248)) (170.33)(0.2400 - 0.0037)

$\mathbf{P_X}$ = 14.004 kg VSS / d

11) $\mathbf{P_t}$ Sludge Production [kg ss / d]

$\mathbf{P_t}$ = P_X / p

$\mathbf{P_t}$ = 14.004 / 0.6500

$\mathbf{P_t}$ = 21.544 kg ss / d

12) $\mathbf{V_N}$ Nitrification Volume [m^3]

$\mathbf{V_N}$ = $(Q(N_O - N)) / (p_N m_U X_V)$

$\mathbf{V_N}$ = (170.326 (0.0400 - 0.0010)) / ((0.0450)(0.6085)(3.9000))

$\mathbf{V_N}$ = 62.149 m^3

13) $\mathbf{V_D}$ Denitrification Volume [m^3]

$\mathbf{V_D}$ = $(QN_O Y) / (0.75 m_Z X_V)$

$\mathbf{V_D}$ = (170.33 ((0.0400)(0.60))) / (0.75 (0.0750)(3.9000))

$\mathbf{V_D}$ = 18.634 m^3

14) $\mathbf{V_A}$ Volume of Aeration [m^3]

$\mathbf{V_A}$ = Larger of V_{AB} or V_N

$\mathbf{V_{AB}}$ = $V_B - V_D((1 + Ak_d) / (2.77(Am_Z)))$

$\mathbf{V_{AB}}$ = 104.82 - 18.634 ((1 + (29.1936)(0.0248)) /
(2.77 (29.1936)(0.0750))

$\mathbf{V_{AB}}$ = 99.526

$\mathbf{V_A}$ = 99.526 m^3

PES Project #	BJB-022522-SC(Rev5)	Date:	4/7/22
Job Name:	Summit Club		
QTY & Flow	0		

BESST DESIGN CALCULATIONS, Cont'd.

15) $\mathbf{V_T}$ Total Volume of Reactor [m^3]

$\mathbf{V_T}$ = $V_A + V_D + V_S$
$\mathbf{V_T}$ = 99.526 + 18.634 + 45.618
$\mathbf{V_T}$ = 163.78 m^3

16) $\mathbf{O_2}$ Oxygen Consumption [kg O_2 / d]

$\mathbf{O_2}$ = $Q((S_O - S_R) / 0.68) - 1.42P_X + 4.57Q(N_O - N)$
$\mathbf{O_2}$ = 170.33 ((0.2400 - 0.0037) / 0.68) - 1.42 (14.004)
+ 4.57 (170.33) (0.0400 - 0.0010)
$\mathbf{O_2}$ = 69.655 kg O_2 / d

17) **Nm** Air Consumption [Nm^3 / h]

Nm = $O_2(c_S / (c_S - 2))(o_k / (0.024a))$
Nm = 69.655 (8.1224 / (8.1224 - 2))
(1.3000 / (0.024 (30)))
Nm = 166.85 Nm^3 / h

BESST PROGRAM AND FORMULA LISTING

The following variable and formula lists represent the program listing for the computer model used to design and size the BESST system. Not all of the formulas are listed due to copyright and patent protection. Formulas that are NOT shown are mainly sub-formulas of those listed. For formula verification see Metcalf & Eddy: Wastewater Engineering; and K.R. Imhoff: Taschenbuch def Stadtenwasterung. 28. Auflage, Oldenbou Munchen - Wien 1993.

INPUT VALUES

1.)	**B**	**Sludge Load (kg BOD / kg VSS)**	**0.03 to 0.20**
2.)	N_X	**Flux Flow (kg ds / m^2 / h)** function of temperature (use @ 20 degrees Celsius)	**6.00**
3.)	V_L	**Limit Hydraulic Loading (m / h)**	**0.99 to 1.1**
4.)	V_X	**Sludge Volume (mL / L)**	**4.0 to 0.7**
5.)	**KI**	**Sludge Index (mL / g)**	**70 to 120**
6.)	**p**	**Volatile Suspended Solids (%)**	**0.62 to 0.68**
7.)	**Y**	**Maximum Yield Coefficient (kg VSS / kg BOD)**	**0.53 to 0.6**
8.)	k_{ac}	**Decay Rate (d)** constant	**0.09**
9.)	**Q**	**Flow Rate (m^3 / d)**	
10.)	Q_Q	**Flow Variation**	**1.5 to 3**
11.)	S_O	**Influent BOD (kg / m^3)**	
12.)	S_T	**Effluent BOD (kg / m^3)**	
13.)	N_O	**Influent Ammonia (kg / m^3)**	
14.)	**N**	**Effluent Ammonia (kg / m^3)** typically	**0.005**

INPUT VALUES

15.)	**N_3**	**Effluent Nitrates N-NO_3 (kg / m^3)**	typically	**0.001 to 0.015**
16.)	**NL_O**	**Influent TSS (kg / m^3)**		
17.)	**NL**	**Effluent TSS (kg / m^3**		
18.)	**min**	**Minimum Water Temperature (^oC)**		
19.)	**max**	**Maximum Water Temperature (^oC)**		
20.)	**a**	**Oxygen Transfer Coefficient (g / Nm^3)**		**15 to 50**
21.)	**SV**	**Ratio, Separation Surface to Separation Volume**		
22.)	**m_i**	**Specific Growth Rate of Nitrificants**	constant	**1.37**
23.)	**pH**	**pH**		**6.0 to 8.0**
24.)	**m_{id}**	**Specific Growth Rate of Denitrificants**	constant	**0.1 to 0.3**
25.)	**O_k**	**Peak Load of Aeration**	constant	**1.3**

Nitrification and Denitrification

Nitrogen is removed by the nitrification and denitrification processes. Nitrification is autotropic and all Purestream *ES*, LLC integrated bioreactors are designed for complete nitrification of ammonia to NO_3 (pleas see Metcalf & Eddy, Third Edition, Chapter 11-6).

Denitrification, however, is heterotropic and requires a carbon source. Conventional plants' "separate sludge denitrification" requires that carbon is added, typically in the form of methanol. This adds to operating costs, and if used in excess, to increased BOD_5 content. BESST technology's "single-sludge denitrification" approach uses an endogenous carbon source to maintain dentrifiers. Influent is combined with nitrified mixe liquor in the anoxic compartment providing the carbon source needed for denitrification. Relatively high mixe liquor recycle rates are employed and sufficient denitrification retention times provided.

Total nitrogen reduction (**N_T**) is a subject of not only providing sufficient anoxic volume for denitrification and keeping temperature above a certain minimum, but also a function of Recycled Activated Sludge (RAS) flow rate. The efficiency of **N_T** reduction is expressed as follows:

$$\eta = (1 - 1/(1 + n)) \times 100$$

Where n = RAS flow multiple of average flow Q.

The following are typical efficiencies and RAS flow multiples used / required:

	n	η (%)
Domestic	2	66
	3	75
	4	80
Slaughterhouse Wastewater	14	93
Hog Manure	29	97

Phosphorous Reduction

BESST technology delivers not only high efficiency reduction of organic matter, but also increased efficiency of phosphorous removal. Two processes, biological and chemical precipitation are employed with advantage

The mechanics of biological phosphorous removal, known as "Luxury Uptake", are due to exposure of activated sludge to alternating oxic and anoxic conditions. Under these conditions, the cells store more energy in the form of phosphorous than needed for their survival. If strictly oxic conditions are maintained during subsequent clarification, phosphorous will be retained by the cells and will eventually be removed with the excess sludge. Unlike most other methods of clarification, these conditions are maintained by the BESST process, and biological phosphorous reduction to less than 3 mg/L are readily achievable.

The basic reaction involved in the precipitation of phosphorous with iron is as follows:

$$Fe^{+3} + H_n(PO_4)^{n-3} \rightarrow FePO_4 + nH^+$$

In the case of iron, 1 mole will precipitate 1 mole of phosphate. The advantage of the process is its low chemical consumption, close to stoichiometric, and consequently, the reduction of ballast sludge production. Followed by microfiltration, reductions to 0.5 mg/L are possible.

If yet further reduction of phosphorous is required, ferric sulfate precipitation after the bioreactor followed by microfiltration must be used.

February 28, 2022
Project: Summit Club 45,000 gpd

SLUDGE AIRLIFT CALCULATIONS AND DATA

A. Maximum flow at six times average daily flow

$\frac{45{,}000 \times 6}{1440}$ = 188 GPM total

B. Two (2) 4” airlifts provided, each rated at 94 GPM

C. See performance curve attached for 4” airlift

At Lift (H_L) = 1’
Flow = 94 GPM
Submergence (H_S) = 9’

% Subm. = $\frac{9}{10}$ x 100 = 90%
Required Air = 12 CFM per airlift

At Lift (H_L) = 2’
Flow = 94 GPM
Submergence (H_S) = 9’

% Subm. = $\frac{9}{11}$ x 100 = 81.8%
Required Air = 18 CFM per airlift

At actual lift (H_L) = 1.5’, use 15 CFM per sludge airlift

D. Minimum flow at four times average daily flow

$\frac{45{,}000 \times 4}{1440}$ = 125 GPM total

E. Two (2) 4” airlifts provided, each rated at 63 GPM

F. See performance curve attached for 4” airlift

At Lift (H_L) = 1’
Flow = 63 GPM
Submergence (H_S) = 9’

% Subm. = $\frac{9}{10}$ x 100 = 90%
Required Air = 10 CFM per airlift

At Lift (H_L) = 2’
Flow = 63 GPM
Submergence (H_S) = 9’

% Subm. = $\frac{9}{11}$ x 100 = 81.8%
Required Air = 16 CFM per airlift

At actual lift (H_L) = 1.5’, use 13 CFM per sludge airlift

February 28, 2022
Project: Summit Club 45,000 gpd

SKIMMER AIRLIFT CALCULATIONS AND DATA

A. Maximum flow at two times average daily flow

$$\frac{45{,}000 \times 2}{1440} = 63 \text{ GPM total}$$

B. Two (2) 2.5” airlifts provided, each rated at 32 GPM

C. See performance curve attached for 2.5” airlift

At Lift (H_L) = 1’
Flow = 32 GPM
Submergence (H_S) = 5’

% Subm. = $\frac{5}{6} \times 100 = 83.3\%$
Required Air = 3 CFM per airlift

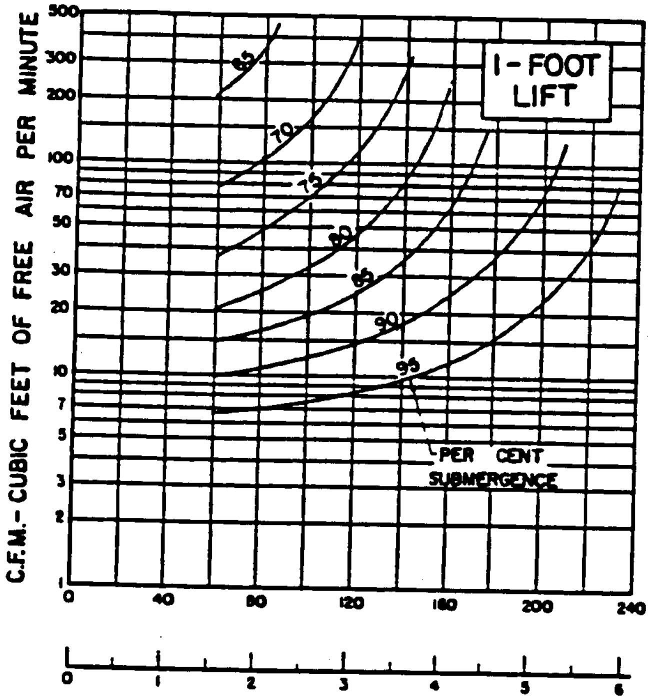
At Lift (H_L) = 2’
Flow = 32 GPM
Submergence (H_S) = 5’

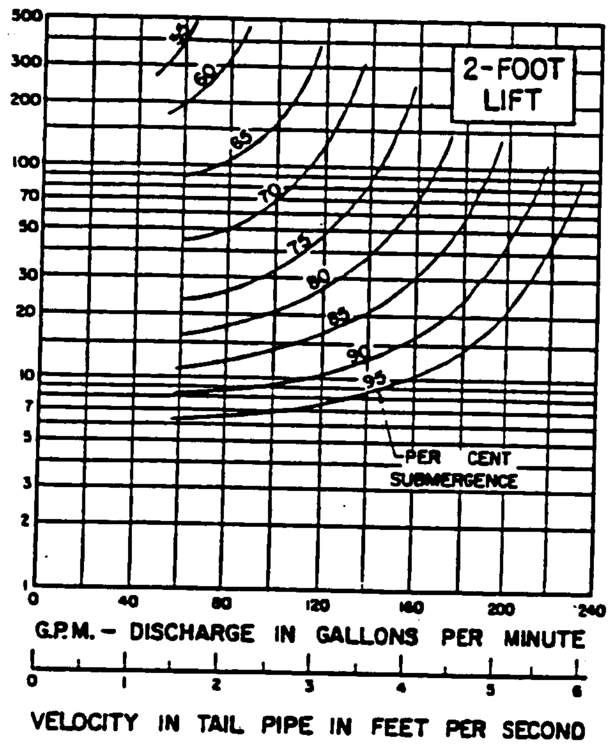
% Subm. = $\frac{5}{7} \times 100 = 71.4\%$
Required Air = 7 CFM

At actual lift (H_L) = 1.5’, use 5 CFM per sludge airlift

WasteWater Treatment Systems

TYPICAL PERFORMANCE CURVES FOR A 4-INCH AIR LIFT





NOTES:

1. THE AIR LIFT PERFORMANCE CURVES ON THIS CHART ARE TYPICAL FOR PUMPING CLEAR WATER AND ARE INTENDED TO BE USED FOR ESTIMATING.
2. THE PER CENT SUBMERGENCE = $\frac{H_S}{H_S + H_L} \times 100$.
3. IT IS SUGGESTED THAT THE CURVES BE NOT EXTENDED BEYOND THE LIMITS SHOWN BECAUSE THE APPROXIMATE MAXIMUM DISCHARGE FOR EACH CONDITION IS INDICATED.
4. FOR LIFTS BETWEEN THOSE INDICATED ON THIS CHART USE A STRAIGHT ARITHMETIC PROPORTION WHEN INTERPOLATING VALUES.

EXAMPLE 1:

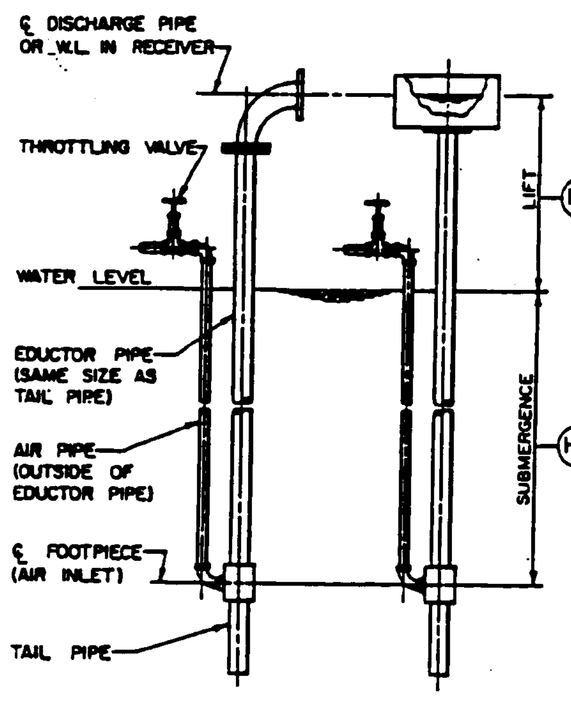
GIVEN: LIFT, H_L = 5'; SUBM., H_S = 13'.
DESIRED DISCH. = 100 G.P.M.

FIND: PER CENT SUBMERGENCE = $\frac{13}{13+5} \times 100 = 72$
AIR REQ'D. = 24 C.F.M. (FREE AIR)
VELOCITY IN 4" TAIL PIPE = 2.6 F.P.S.

EXAMPLE 2:

GIVEN: LIFT, H_L = 5.5'; SUBM., H_S = 12.5'.
DESIRED VEL. IN 4" TAIL PIPE = 3.0 F.P.S.

FIND: DISCH. FROM 4" AIR LIFT = 117 G.P.M.
PER CENT SUBM. = $\frac{12.5}{12.5+5.5} \times 100 = 69.3$.
AIR REQ'D.
= (AIR @ H=5') $- \frac{5.5-5.0}{7.0-5.0}$ (DIFF. AIR @ H=5' & 7').
= 40 − 0.25(40 − 30)
= 38 C.F.M. (FREE AIR).



TYPICAL AIR LIFTS FOR WHICH CURVES ARE APPLICABLE

purestream inc.
WASTEWATER TREATMENT EQUIPMENT
P.O. Box 68 Florence, KY 41022-0068 Phone (859) 371-9898 Fax (859) 371-3577

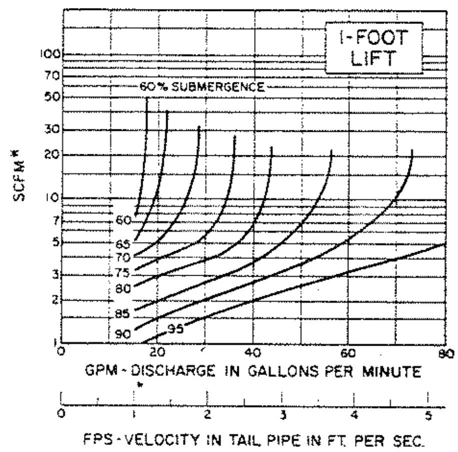
engineering data sheet

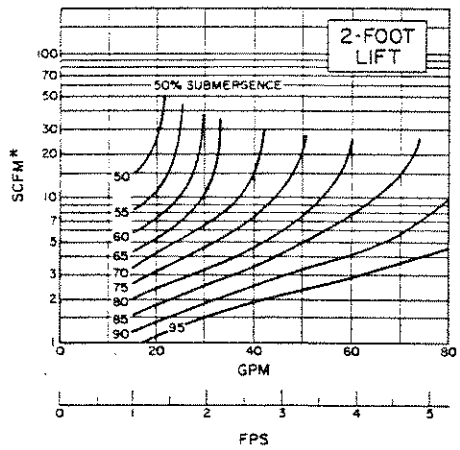
Chicago PUMP section 8630.4

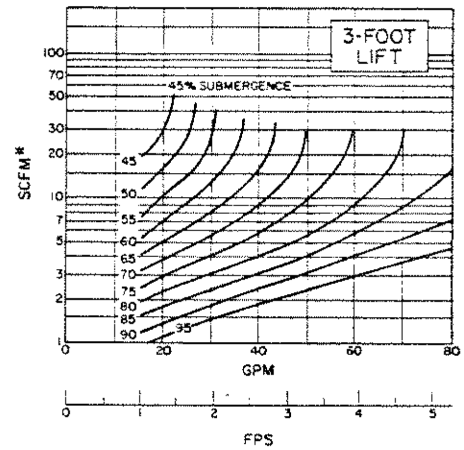
AIR LIFT PUMP

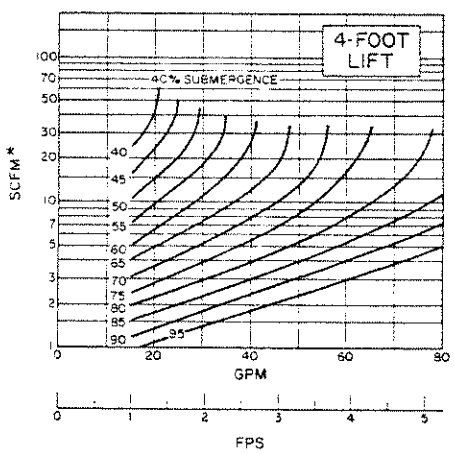
2½" SIZE

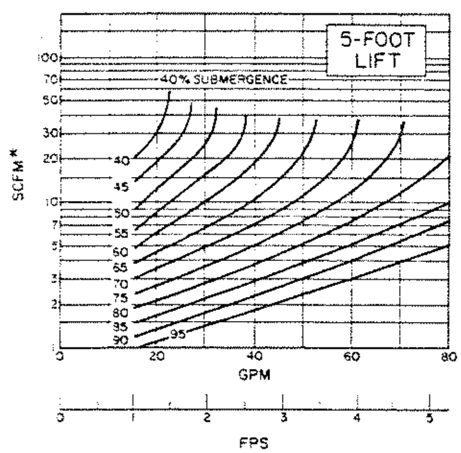
TYPICAL PERFORMANCE CURVES

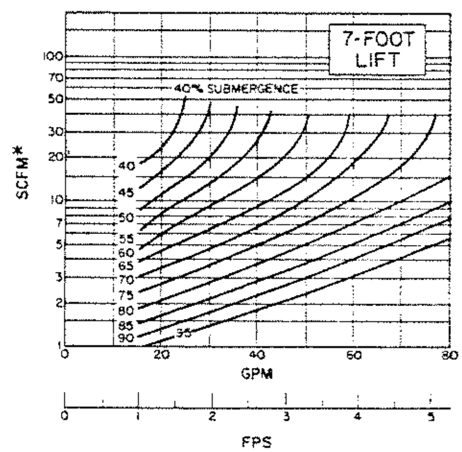


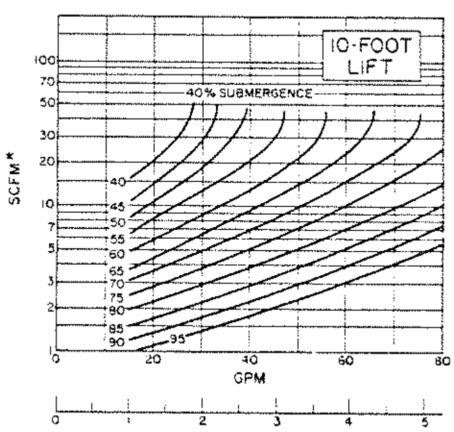












NOTES:

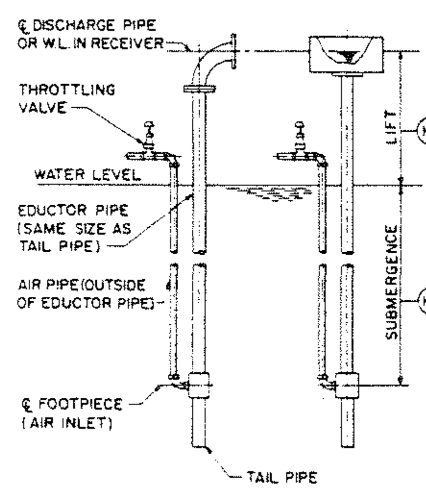
1. THE AIR LIFT PERFORMANCE CURVES ON THIS CHART ARE TYPICAL FOR PUMPING CLEAR WATER AND ARE INTENDED TO BE USED FOR ESTIMATING.
2. THE PER CENT SUBMERGENCE = $\frac{H_S}{H_S + H_L} \times 100$
3. IT IS SUGGESTED THAT THE CURVES NOT BE EXTENDED BEYOND THE LIMITS SHOWN BECAUSE THE APPROXIMATE MAXIMUM DISCHARGE FOR EACH CONDITION IS INDICATED.
4. FOR LIFTS BETWEEN THOSE INDICATED ON THIS CHART USE A STRAIGHT ARITHMETIC PROPORTION WHEN INTERPOLATING VALUES.

EXAMPLE:

GIVEN: LIFT, $H_L = 3'$, SUBM, $H_S = 12'$
DESIRED DISCH. = 40 GPM

FIND: PER CENT SUBMERGENCE = $\frac{12'}{12' + 3'} \times 100 = 80\%$
AIR REQ'D = 4 SCFM
VELOCITY IN 2½" TAIL PIPE = 2.6 FPS

* STANDARD CUBIC FEET OF AIR PER MINUTE AT 14.7 PSIA AND 70° F.



APPENDIX D

BLOWER PERFORMANCE DATA

PROCESS BLOWER

OMEGA PLUS ROTARY BLOWERS
- RECOMMENDATIONS BLOWERS -

Customer: Summit Club-Process/Airlift **Prepared By:** David W. Martine

INPUT DATA:

Operating mode:	Gauge pressure		Flow medium :	Humid Air	
Kind of package:	Com-paK Plus	on frequency control	Specific heat constant κ :	1.40	
Inlet temperature:	90 °F		Specific weight at standard conditions :	0.0760	lb/ ft³
Inlet pressure:	14.7 psia		Pressure difference :	6.0	psig
Inlet flow:	**160 icfm**				
			Discharge pressure :	20.7	psia
			Air humidity:	80	[%]

Technical data:

Package: **BB 69C**
Blower: OMEGA 22P
Motor power: 10.0 hp
Operating voltage: 208V/60Hz

Blower speed(60Hz): 5125 rpm
Connection ANSI:2
% of maximum speed: 86
Blower: OMEGA 22P

Performance data:	**min. frequency**	**Design point**	**max. frequency**	
Frequency:	18.0	55.4	60.0	Hz
Speed:	1540	4730	5130	rpm
Inlet air flow Q1*:	32	160	176	icfm
Inlet air flow Q1 (standard): Standard conditions 14.7psia, 68°F and 0 % RH	30	148	163	scfm
Discharge temperature*:	216	167	165	°F
Blower shaft power*:	2.1	6.0	6.6	bhp
Motor shaft power :			7.2	bhp

		without sound enclosure	with sound enclosure
Sound pressure level**:	**at fmax**	82dB(A)	69dB(A)
Sound pressure level**:	**at 60 Hz**	82dB(A)	69dB(A)
Sound power level**:	**at 60 Hz**	96dB(A)	85dB(A)
Dimension [inches] (W x L x H)		26x 26 x 38	31x 38 x 47
Estimated Weight		ca. 386 lbs	ca. 672 lbs

IGBT Frequency controlled **208V ± 5 % 60 Hz**

The stated control range can vary depending on manufacturer and type of the frequency converter.
Standard motor with impulse peak resistance in accordance with IEC 60034-1 for operation with a IGBT frequency converter.

*** Performance data to DIN ISO 1217, PART 1, ANNEX C**
**** Measured to DIN EN ISO 2151, figures ± 3 dB(A), with sound isolated pipework.**

Motor shaft power includes belt losses in addition to dirty filter losses of 0.6 psig (40 mbar)

Customer: Summit Club-Process/Airlift **Prepared By:** David W. Martine

Kind of package: Com-paK Plus on frequency control Operating mode:Gauge pressure

Inlet temperature: 90 °F
Inlet pressure: 14.7 psia
Input inlet flow: 160 icfm

Valve set pressure: 10.4 psig

Package: BB 69C
Blower: OMEGA 22P
Motor power: 10.0 hp
Operating voltage: 208V/60Hz

Blower speed(60Hz): 5125 rpm
Connection ANSI 2
% of maximum speed: 86
Fan voltage 208V/3Ph/60Hz

NOTE: ACCESSORIES SHOWN ARE INTENDED FOR AIR USE ONLY.

Accessories:

		yes	no
Unloaded start up valve:	AFM5	☐	☒
Check plate:	2 1/2"	☒	☐
Instrument/ sensor:			
Temperature gauge with switch point:		☒	☐
Pressure gauge:		☒	☐
Filter differential pressure switch:		☐	☒
oil level sensor		☐	☒
speed monitor		☐	☒
Auxiliary heating:		☐	☒
Omega P-GRD:		☐	☒

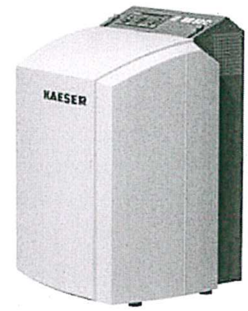
	yes	no
Sound enclosure:	☒	☐
Suction from ambient:	☒	☐
Suction from pipe:	☐	☒
Optional for package with sound enclosure		
Sound enclosure for outdor installation:	☐	☒
Frequency converter (FC):		
Frequency converter (FC) by customer:	☒	☐
Kaeser FC type OFC:	☐	☒

Standard equipment with s. encl.: 1x 2" Blowoff valve, pressure gauge, filter with maintenance indicator

Standard equipment without s. encl.: 1x 2" Blowoff valve, filter with maintenance indicator

Comments for project:

BB52C



Package	Blower	Horsepower
BB52C	Omega 21P	3,5,7.5,10

Electrical Data Drive Motor

						wye-delta starting (2-wire per phase)			direct online (1-wire per phase)		
Hp	Voltage (3ph/60Hz)	FLA +/- 10%	Nominal Eff	Insulation Class	Enclosure Type	Jumper Connection	Disconnect Fuse	Wire Size (75°C or higher)	Jumper Connection	Disconnect Fuse	Wire Size (75°C or higher)
3	208	9.1	86.5	F	TEFC	YY -> ΔΔ	10 AMP	14 AWG	ΔΔ	10 AMP	14 AWG
	230	8.2				YY -> ΔΔ	10 AMP	14 AWG	ΔΔ	10 AMP	14 AWG
	460	4.1				Y -> Δ	6 AMP	14 AWG	Δ	6 AMP	14 AWG
5	208	13.5	88.5	F	TEFC	YY -> ΔΔ	20 AMP	14 AWG	ΔΔ	20 AMP	12 AWG
	230	12.2				YY -> ΔΔ	15 AMP	14 AWG	ΔΔ	20 AMP	14 AWG
	460	6.1				Y -> Δ	10 AMP	14 AWG	Δ	10 AMP	14 AWG
7.5	208	18.4	89.9	F	TEFC	YY -> ΔΔ	25 AMP	14 AWG	ΔΔ	30 AMP	10 AWG
	230	17.6				YY -> ΔΔ	25 AMP	14 AWG	ΔΔ	30 AMP	10 AWG
	460	8.8				Y -> Δ	10 AMP	14 AWG	Δ	15 AMP	14 AWG
10	208	25	90.8	F	TEFC	YY -> ΔΔ	35 AMP	14 AWG	ΔΔ	40 AMP	8 AWG
	230	23				YY -> ΔΔ	30 AMP	14 AWG	ΔΔ	35 AMP	8 AWG
	460	11.5				Y -> Δ	20 AMP	14 AWG	Δ	20 AMP	12 AWG

Notes:
1. Disconnect fuses should be of dual element time delay design.
2. Breaker should be suitable for a heavy duty starting load and of inverse time delay design that complies to regulations outlined in NEC 430.52
3. Fuse and wire sizes determined in accordance to NEC 240.6, 430.52 and tables 250.122, 430.248, 430.250, 430.252.

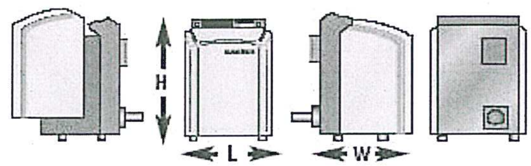
Enclosure Fan Data

Power	Voltage (60Hz)	Phase (60Hz)	Current Draw	Jumper Connection	Quantity	Enclosure Type	Fan Type	Flow
110W	115	1	3.42	Capacitor	1	TEFC	Radial	280 CFM
80W	230	1	0.60	Capacitor	1	TEFC	Radial	280 CFM
80W	208	3	0.61	Δ	1	TEFC	Radial	280 CFM
120W	230	3	0.68	Δ	1	TEFC	Radial	280 CFM
120W	460	3	0.37	Y	1	TEFC	Radial	280 CFM
120W	575	3	0.28	Y	1	TEFC	Radial	280 CFM

Notes:
1.) Nominal power in Watts.
2.) Current in A (+/- 10%).
3.) Default fan selection is 230/460V. If other voltage is required, it must be noted at time of order.
4.) Fan requires separate power supply.
5.) Fan should run at the same time as main motor. If fan is able to run for 15 minutes after machine is turned off, it will improve thermal conditions inside enclosure.

BB52C

Oil System Data	
Drive End Capacity	0.15 quarts
Gear End Capacity	0.13 quarts
Oil Type (Synthetic)	SB 220



Package Connections

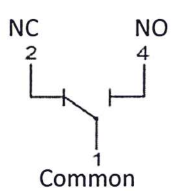
Hp	Cable Entry Drive Motor	Cable Entry Fan Motor	Length (in.) L	Width (in.) W	Height (in.) H	Floor (sq ft)	Weight (lb)	Connection Size (in.)	Type
3	3 x 1" NPT	2 × M16	31 1/2	28 3/8	44	6 1/5	382	2	Tube
5							424	2	Tube
7.5							463	2	Tube
10							474	2	Tube

Safety Devices

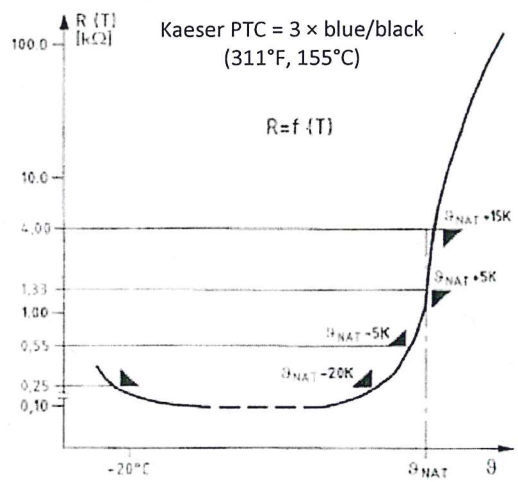
Discharge Temperature Gauge with Switch	Motor Winding PTC's

Range: 120 - 400°F (50 - 200°C)

Switching point: adjustable
Switching: 1 = common, 2 = NC, 4 = NO
Contacts: 5A / 24VDC non-inductive



Blower discharge temperature switch should be wired into control system to shut down blower operation when switch point is achieved.

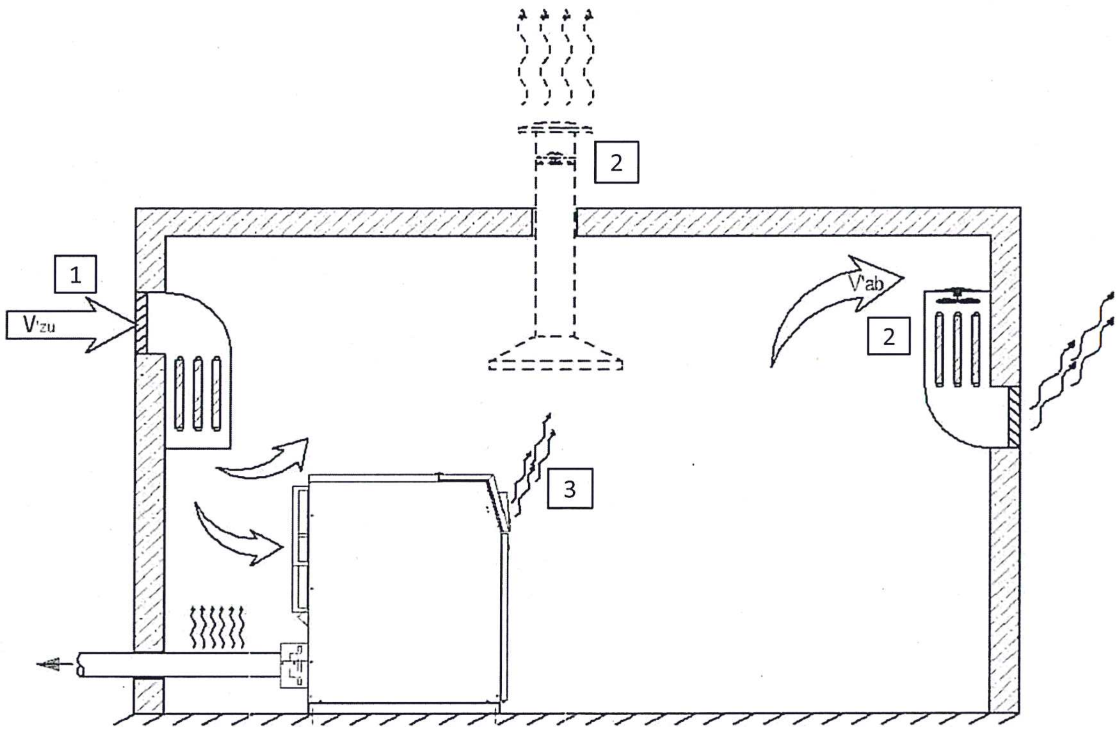


Motor winding PTC's require use of a control module. Kaeser part number 7.2710.2 can be purchased and integrated into control scheme for this purpose.

BB52C

Ventilation of Blower Room		
Air Inlet Opening	1	1.0 sq. ft
Cooling Fan Capacity (forced ventilation)	2	500 CFM
Max Heat Rejection	3	4,700 BTU / HR

Ventilation values based on 190 CFM @ 15 PSIG ΔP, 20Hp and ambient inlet. Max. room temp. = 104ºF and cooling air temp = 95ºF. Discharge piping length = 5 ft.



It is recommended to extract the exhaust air from the upper third of the room as this is where the heat collects. The room ventilation openings should be arranged that the current of cooling air flowing through the room passes over the blower inlet and exhaust ports and, if possible, should leave no stagnant air in the room. (A thermal short circuit must be avoided, i.e. discharged cooling air must not find its way to the cooling air inlet.)
The blower must not be positioned so near to a wall that the inflow of cooling air is obstructed.

Pipework should be insulated against heat emission.

If the blower station is located in the middle of a large hall its exhaust air can be extracted by means of a duct positioned above the exhaust port (illustrated in broken lines).

EQUALIZATION TANK &

SLUDGE HOLDING TANK BLOWER

OMEGA PLUS ROTARY BLOWERS
- RECOMMENDATIONS BLOWERS -

Customer: Summit Club-EQ_Sludge Holding **Prepared By:** David W. Martine

INPUT DATA:

Operating mode: Gauge pressure

Flow medium : Humid Air

Kind of package: Com-paK Plus on frequency control

Specific heat constant κ : 1.40

Inlet temperature: 90 °F

Specific weight at standard conditions : 0.0760 lb/ ft³

Inlet pressure: 14.7 psia

Pressure difference : 6.0 psig

Inlet flow: 80 icfm

Discharge pressure : 20.7 psia

Air humidity: 80 [%]

Technical data:

Package: BB 52C

Blower: OMEGA 21P

Motor power: 5.0 hp

Operating voltage: 208V/60Hz

Blower speed (60Hz): 3490 rpm

Connection ANSI: 2"

% of maximum speed: 56

Blower: OMEGA 21P

Performance data:	**min. frequency**	**Design point**	**max. frequency**	
Frequency:	22.0	58.4	60.0	Hz
Speed:	1280	3400	3490	rpm
Inlet air flow Q1*:	14	80	85	icfm
Inlet air flow Q1 (standard): Standard conditions 14.7psia, 68°F and 0 % RH	13	74	79	scfm
Discharge temperature*:	253	172	172	°F
Blower shaft power*:	1.5	3.5	3.5	bhp
Motor shaft power :			3.9	bhp

		without sound enclosure	with sound enclosure
Sound pressure level**:	**at fmax**	82dB(A)	72dB(A)
Sound pressure level**:	**at 60 Hz**	82dB(A)	72dB(A)
Sound power level**:	**at 60 Hz**	97dB(A)	87dB(A)
Dimension [inches] (W x L x H)		31x 31 x 37	31x 31 x 44
Estimated Weight		ca. 260 lbs	ca. 414 lbs

IGBT Frequency controlled **208V ± 5 % 60 Hz**

**The stated control range can vary depending on manufacturer and type of the frequency converter.
Standard motor with impulse peak resistance in accordance with IEC 60034-1 for operation with a IGBT frequency converter.**

*** Performance data to DIN ISO 1217, PART 1, ANNEX C**
**** Measured to DIN EN ISO 2151, figures ± 3 dB(A), with sound isolated pipework.**

Motor shaft power includes belt losses in addition to dirty filter losses of 0.6 psig (40 mbar)

Customer: Summit Club-EQ_Sludge Holding **Prepared By:** David W. Martine

Kind of package: Com-paK Plus on frequency control Operating mode: Gauge pressure

Inlet temperature: 90 °F
Inlet pressure: 14.7 psia
Input inlet flow: 80 icfm

Valve set pressure: **9.6** **psig**

Package: **BB 52C**
Blower: OMEGA 21P
Motor power: 5.0 hp
Operating voltage: 208V/60Hz

Blower speed(60Hz): 3490 rpm
Connection ANSI 2"
% of maximum speed: 56
Fan voltage 208V/3Ph/60Hz

NOTE: ACCESSORIES SHOWN ARE INTENDED FOR AIR USE ONLY.

Accessories:

		yes	no
Unloaded start up valve:	AFM4	☐	X
Check plate:	G2"	X	☐

Instrument/ sensor:

	yes	no
Temperature gauge with switch point:	X	☐
Pressure gauge:	X	☐
Filter differential pressure switch:	☐	X
oil level sensor	☐	X
speed monitor	☐	X
Auxiliary heating:	☐	X
Omega P-GRD:	☐	X

	yes	no
Sound enclosure:	X	☐
Suction from ambient:	X	☐
Suction from pipe:	☐	X

Optional for package with sound enclosure

	yes	no
Sound enclosure for outdor installation:	☐	X

Frequency converter (FC):

	yes	no
Frequency converter (FC) by customer:	X	☐
Kaeser FC type OFC:	☐	X

Standard equipment with s. encl.: 1x 1 1/4" Blowoff valve, pressure gauge, filter with maintenance indicator

Standard equipment without s. encl.: 1x 1 1/4" Blowoff valve, filter with maintenance indicator

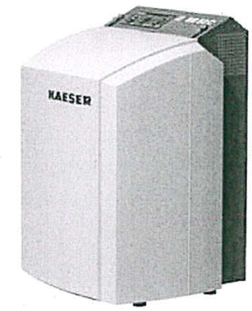
Comments for project:

KAESER OMEGA BLOWERS

Kaeser Com-paK Installation Data Sheet

BB52C

Package	Blower	Horsepower
BB52C	Omega 21P	3,5,7.5,10



Electrical Data Drive Motor

						wye-delta starting (2-wire per phase)			direct online (1-wire per phase)		
Hp	Voltage (3ph/60Hz)	FLA +/- 10%	Nominal Eff	Insulation Class	Enclosure Type	Jumper Connection	Disconnect Fuse	Wire Size (75°C or higher)	Jumper Connection	Disconnect Fuse	Wire Size (75°C or higher)
3	208	9.1	86.5	F	TEFC	YY -> ΔΔ	10 AMP	14 AWG	ΔΔ	10 AMP	14 AWG
	230	8.2				YY -> ΔΔ	10 AMP	14 AWG	ΔΔ	10 AMP	14 AWG
	460	4.1				Y -> Δ	6 AMP	14 AWG	Δ	6 AMP	14 AWG
5	208	13.5	88.5	F	TEFC	YY -> ΔΔ	20 AMP	14 AWG	ΔΔ	20 AMP	12 AWG
	230	12.2				YY -> ΔΔ	15 AMP	14 AWG	ΔΔ	20 AMP	14 AWG
	460	6.1				Y -> Δ	10 AMP	14 AWG	Δ	10 AMP	14 AWG
7.5	208	18.4	89.9	F	TEFC	YY -> ΔΔ	25 AMP	14 AWG	ΔΔ	30 AMP	10 AWG
	230	17.6				YY -> ΔΔ	25 AMP	14 AWG	ΔΔ	30 AMP	10 AWG
	460	8.8				Y -> Δ	10 AMP	14 AWG	Δ	15 AMP	14 AWG
10	208	25	90.8	F	TEFC	YY -> ΔΔ	35 AMP	14 AWG	ΔΔ	40 AMP	8 AWG
	230	23				YY -> ΔΔ	30 AMP	14 AWG	ΔΔ	35 AMP	8 AWG
	460	11.5				Y -> Δ	20 AMP	14 AWG	Δ	20 AMP	12 AWG

Notes:
1. Disconnect fuses should be of dual element time delay design.
2. Breaker should be suitable for a heavy duty starting load and of inverse time delay design that complies to regulations outlined in NEC 430.52
3. Fuse and wire sizes determined in accordance to NEC 240.6, 430.52 and tables 250.122, 430.248, 430.250, 430.252.

Enclosure Fan Data

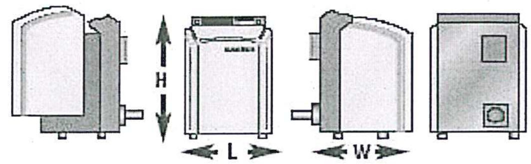
Power	Voltage (60Hz)	Phase (60Hz)	Current Draw	Jumper Connection	Quantity	Enclosure Type	Fan Type	Flow
110W	115	1	3.42	Capacitor	1	TEFC	Radial	280 CFM
80W	230	1	0.60	Capacitor	1	TEFC	Radial	280 CFM
80W	208	3	0.61	Δ	1	TEFC	Radial	280 CFM
120W	230	3	0.68	Δ	1	TEFC	Radial	280 CFM
120W	460	3	0.37	Y	1	TEFC	Radial	280 CFM
120W	575	3	0.28	Y	1	TEFC	Radial	280 CFM

Notes:
1.) Nominal power in Watts.
2.) Current in A (+/- 10%).
3.) Default fan selection is 230/460V. If other voltage is required, it must be noted at time of order.
4.) Fan requires separate power supply.
5.) Fan should run at the same time as main motor. If fan is able to run for 15 minutes after machine is turned off, it will improve thermal conditions inside enclosure.

Kaeser Com-paK Installation Data Sheet

BB52C

Oil System Data	
Drive End Capacity	0.15 quarts
Gear End Capacity	0.13 quarts
Oil Type (Synthetic)	SB 220



Package Connections

Hp	Cable Entry		Length (in.) L	Width (in.) W	Height (in.) H	Floor (sq ft)	Weight (lb)	Connection Size (in.)	Type
	Drive Motor	Fan Motor							
3	3 x 1" NPT	2 × M16	31 1/2	28 3/8	44	6 1/5	382	2	Tube
5							424	2	Tube
7.5							463	2	Tube
10							474	2	Tube

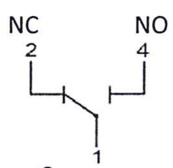
Safety Devices

Discharge Temperature Gauge with Switch	Motor Winding PTC's

Discharge Temperature Gauge with Switch

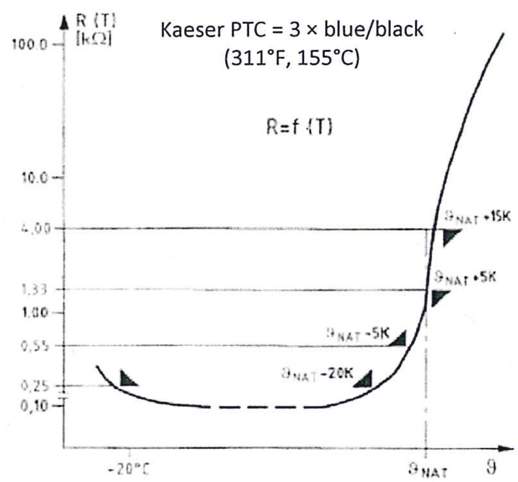
Range: 120 - 400°F (50 - 200°C)

Switching point: adjustable
Switching: 1 = common, 2 = NC, 4 = NO
Contacts: 5A / 24VDC non-inductive



Blower discharge temperature switch should be wired into control system to shut down blower operation when switch point is achieved.

Motor Winding PTC's

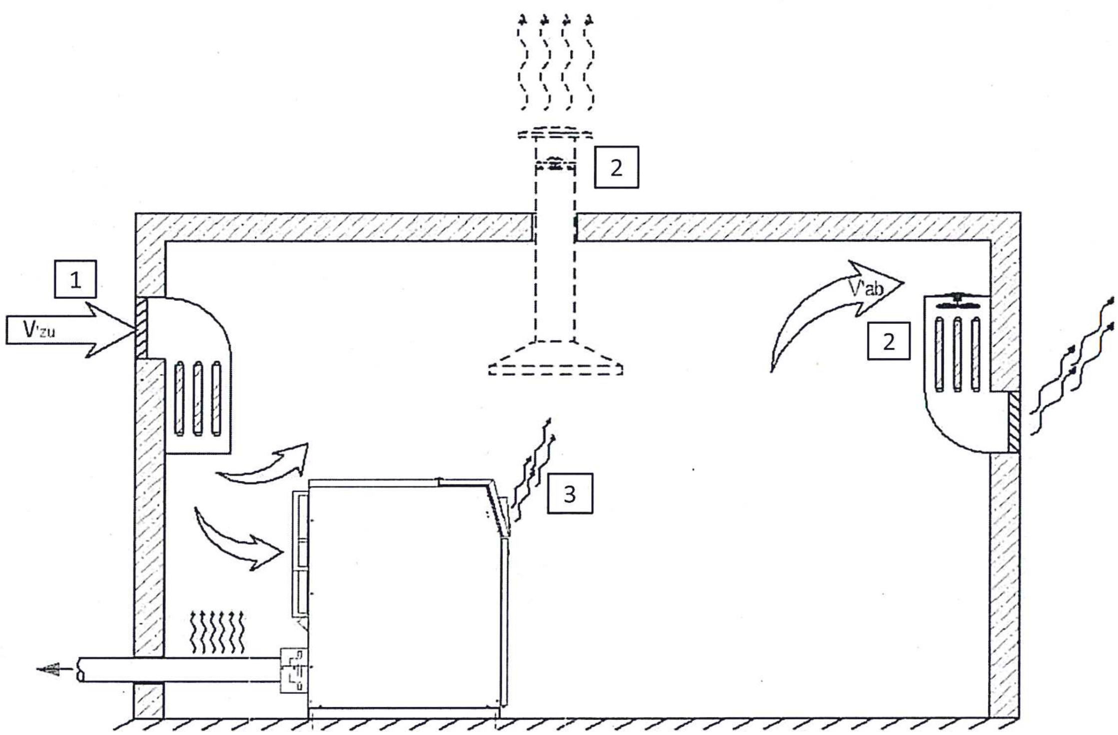


Motor winding PTC's require use of a control module. Kaeser part number 7.2710.2 can be purchased and integrated into control scheme for this purpose.

BB52C

Ventilation of Blower Room		
Air Inlet Opening	1	1.0 sq. ft
Cooling Fan Capacity (forced ventilation)	2	500 CFM
Max Heat Rejection	3	4,700 BTU / HR

Ventilation values based on 190 CFM @ 15 PSIG ΔP, 20Hp and ambient inlet. Max. room temp. = 104ºF and cooling air temp = 95ºF. Discharge piping length = 5 ft.



It is recommended to extract the exhaust air from the upper third of the room as this is where the heat collects. The room ventilation openings should be arranged that the current of cooling air flowing through the room passes over the blower inlet and exhaust ports and, if possible, should leave no stagnant air in the room. (A thermal short circuit must be avoided, i.e. discharged cooling air must not find its way to the cooling air inlet.)
The blower must not be positioned so near to a wall that the inflow of cooling air is obstructed.

Pipework should be insulated against heat emission.

If the blower station is located in the middle of a large hall its exhaust air can be extracted by means of a duct positioned above the exhaust port (illustrated in broken lines).

TERTIARY FILTER BLOWER

KAESER OMEGA BLOWERS

OMEGA PLUS ROTARY BLOWERS - PACKAGE RECOMMENDATIONS -

Customer: Summit Club-Tertiary Filter **Prepared By:** David W. Martine

INPUT DATA:

Operating mode:	Gauge pressure		Flow medium:	Humid Air	
Kind of package:	Com-paK Plus		Specific heat constant κ	1.40	
Inlet temperature :	90	°F	Specific weight at standard conditions :	0.076	lb/ ft³
Inlet pressure :	14.7	psi	Pressure difference :	7.0	psig
Air humidity:	80	[%]	Discharge pressure :	21.7	psi

Technical data:

NOTE: ACCESSORIES SHOWN ARE INTENDED FOR AIR USE ONLY.

Package:	**BB 69C**	Blower speed:	5125 rpm
Blower: OMEGA	22P	Connection ANSI:	2 1/2"
Motor power:	10.0 hp	% of maximum speed:	85
Operating voltage:	208V/60Hz	Volumetric efficiency:	0.84

Performance data:

Blower: OMEGA 22P	max. load	design point
Pressure difference Δp:	8.8 psig	7.0 psig
Inlet flow Q1*:	169 icfm	173 icfm
Inlet air flow Q1 (standard) : Standard conditions 14.7 psia, 68°F and 0 % RH		160 scfm
Discharge temperature*:	205 °F	180 °F
Motor shaft power :	9.9 bhp	8.2 bhp
Blower shaft power*:		7.5 bhp

	without sound enclosure	with sound enclosure
Sound pressure level** :	82 dB(A)	69 dB(A)
Sound power level** :	96 dB(A)	85 dB(A)
Dimension [inches] (W x L x H)	26x 26 x 38	31x 38 x 47
Estimated Weight	ca. 386 lbs	ca. 672 lbs

*** Performance data to DIN ISO 1217, part 1, annex C**

****Measured to DIN EN ISO 2151, figures ± 3 dB(A), with sound isolated pipework**

Motor shaft power includes belt losses in addition to dirty filter losses of 0.6 psig (40 mbar).

OMEGA PLUS ROTARY BLOWERS - PACKAGE RECOMMENDATIONS -

Customer: Summit Club-Tertiary Filter **Prepared By:** David W. Martine

Kind of package: Com-paK Plus
Operating mode: Gauge pressure

Inlet temperature : 90 °F
Inlet pressure : 14.7 psi
Input inlet flow: 160 icfm
Valve set pressure: 10.4 psig

Package: BB 69C
Blower: OMEGA 22P
Motor power: 10.0 hp
Operating voltage: 208V/60Hz

Blower speed: 5125 rpm
Connection ANSI: 2 1/2"
% of maximum speed: 85
Fan voltage: 208V/3Ph/60Hz

NOTE: ACCESSORIES SHOWN ARE INTENDED FOR AIR USE ONLY.

Accessories:

	yes	no
Unloaded start up valve: AFM5	☐	☒
Check plate: 2 1/2"	☒	☐
Instruments/ sensor:		
Temperature gauge with switch point:	☒	☐
Pressure gauge:	☒	☐
Filter differential pressure switch:	☐	☒
oil level sensor:	☐	☒
speed monitor:	☐	☒

	yes	no
Sound enclosure:	☒	☐
Inlet silencer-suction from ambient:	☒	☐
Inlet silencer-suction from pipe:	☐	☒
Optional for package with sound enclosure		
Sound enclosure for outdor installation:	☐	☒
Auxiliary heating:	☐	☒
Omega P-GRD:	☐	☒

Standard equipment with s. encl.: 1x 2" Blowoff valve, pressure gauge, filter with maintenance indicator

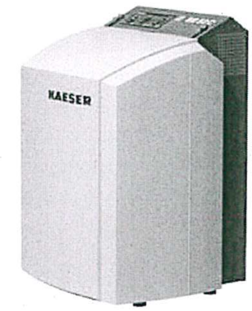
Standard equipment without s. encl.: 1x 2" Blowoff valve, filter with maintenance indicator

Comments for project:

KAESER OMEGA BLOWERS

Kaeser Com-paK Installation Data Sheet

BB52C



Package	Blower	Horsepower
BB52C	Omega 21P	3,5,7.5,10

Electrical Data Drive Motor

						wye-delta starting (2-wire per phase)			direct online (1-wire per phase)		
Hp	Voltage (3ph/60Hz)	FLA +/- 10%	Nominal Eff	Insulation Class	Enclosure Type	Jumper Connection	Disconnect Fuse	Wire Size (75°C or higher)	Jumper Connection	Disconnect Fuse	Wire Size (75°C or higher)
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	460	4.1				Y -> Δ	6 AMP	14 AWG	Δ	6 AMP	14 AWG
5	208	13.5	88.5	F	TEFC	YY -> ΔΔ	20 AMP	14 AWG	ΔΔ	20 AMP	12 AWG
	230	12.2				YY -> ΔΔ	15 AMP	14 AWG	ΔΔ	20 AMP	14 AWG
	460	6.1				Y -> Δ	10 AMP	14 AWG	Δ	10 AMP	14 AWG
7.5	208	18.4	89.9	F	TEFC	YY -> ΔΔ	25 AMP	14 AWG	ΔΔ	30 AMP	10 AWG
	230	17.6				YY -> ΔΔ	25 AMP	14 AWG	ΔΔ	30 AMP	10 AWG
	460	8.8				Y -> Δ	10 AMP	14 AWG	Δ	15 AMP	14 AWG
10	208	25	90.8	F	TEFC	YY -> ΔΔ	35 AMP	14 AWG	ΔΔ	40 AMP	8 AWG
	230	23				YY -> ΔΔ	30 AMP	14 AWG	ΔΔ	35 AMP	8 AWG
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Notes:
1. Disconnect fuses should be of dual element time delay design.
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3. Fuse and wire sizes determined in accordance to NEC 240.6, 430.52 and tables 250.122, 430.248, 430.250, 430.252.

Enclosure Fan Data

Power	Voltage (60Hz)	Phase (60Hz)	Current Draw	Jumper Connection	Quantity	Enclosure Type	Fan Type	Flow
110W	115	1	3.42	Capacitor	1	TEFC	Radial	280 CFM
80W	230	1	0.60	Capacitor	1	TEFC	Radial	280 CFM
80W	208	3	0.61	Δ	1	TEFC	Radial	280 CFM
120W	230	3	0.68	Δ	1	TEFC	Radial	280 CFM
120W	460	3	0.37	Y	1	TEFC	Radial	280 CFM
120W	575	3	0.28	Y	1	TEFC	Radial	280 CFM

Notes:
1.) Nominal power in Watts.
2.) Current in A (+/- 10%).
3.) Default fan selection is 230/460V. If other voltage is required, it must be noted at time of order.
4.) Fan requires separate power supply.
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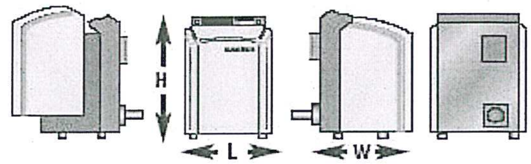
Kaeser Com-paK Installation Data Sheet

BB52C

Oil System Data	
Drive End Capacity	0.15 quarts
Gear End Capacity	0.13 quarts
Oil Type (Synthetic)	SB 220



Package Connections

Hp	Cable Entry		Length (in.) L	Width (in.) W	Height (in.) H	Floor (sq ft)	Weight (lb)	Connection Size (in.)	Type
	Drive Motor	Fan Motor							
3	3 x 1" NPT	2 × M16	31 1/2	28 3/8	44	6 1/5	382	2	Tube
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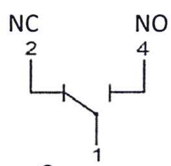
Safety Devices

Discharge Temperature Gauge with Switch	Motor Winding PTC's

Discharge Temperature Gauge with Switch

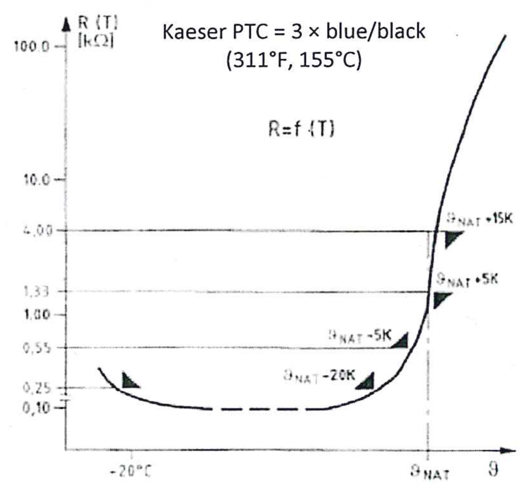
Range: 120 - 400°F (50 - 200°C)

Switching point: adjustable
Switching: 1 = common, 2 = NC, 4 = NO
Contacts: 5A / 24VDC non-inductive



Blower discharge temperature switch should be wired into control system to shut down blower operation when switch point is achieved.

Motor Winding PTC's

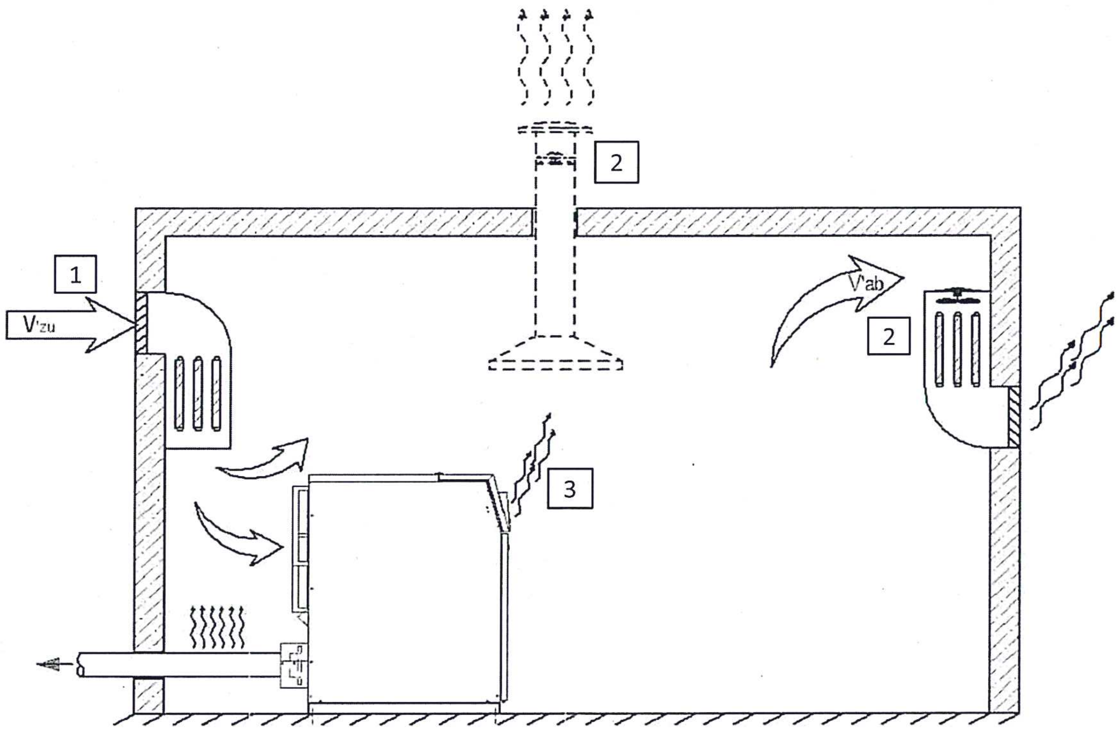


Motor winding PTC's require use of a control module. Kaeser part number 7.2710.2 can be purchased and integrated into control scheme for this purpose.

BB52C

Ventilation of Blower Room		
Air Inlet Opening	1	1.0 sq. ft
Cooling Fan Capacity (forced ventilation)	2	500 CFM
Max Heat Rejection	3	4,700 BTU / HR

Ventilation values based on 190 CFM @ 15 PSIG ΔP, 20Hp and ambient inlet. Max. room temp. = 104°F and cooling air temp = 95°F. Discharge piping length = 5 ft.



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The blower must not be positioned so near to a wall that the inflow of cooling air is obstructed.

Pipework should be insulated against heat emission.

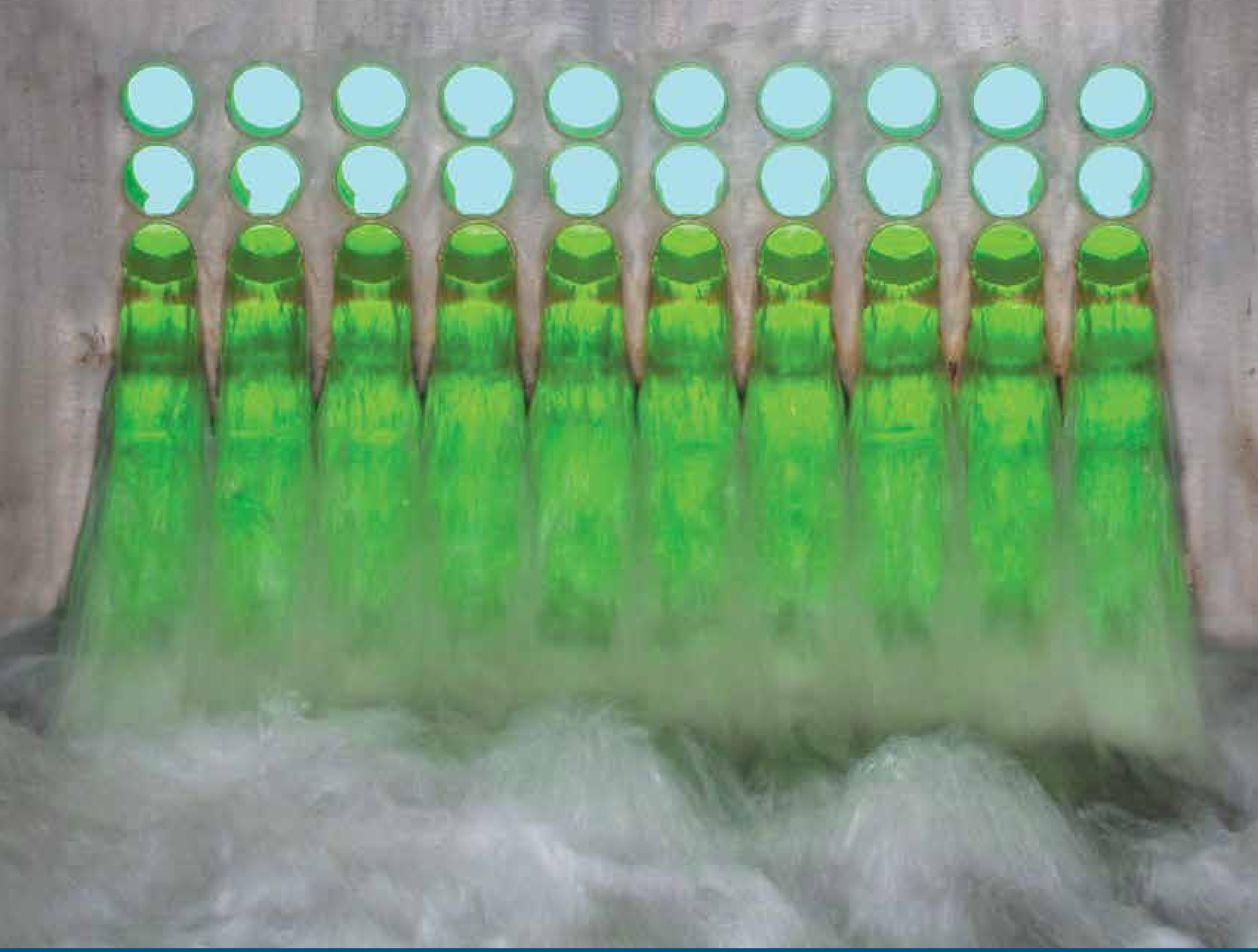
If the blower station is located in the middle of a large hall its exhaust air can be extracted by means of a duct positioned above the exhaust port (illustrated in broken lines).

APPENDIX E

DISINFECTION EQUIPMENT CUTS

Non-contact UV disinfection systems

Dry · Simple · Intelligent · Energy Efficient



ENAQUA™
A GRUNDFOS COMPANY

Designed and manufactured in USA

The right choice

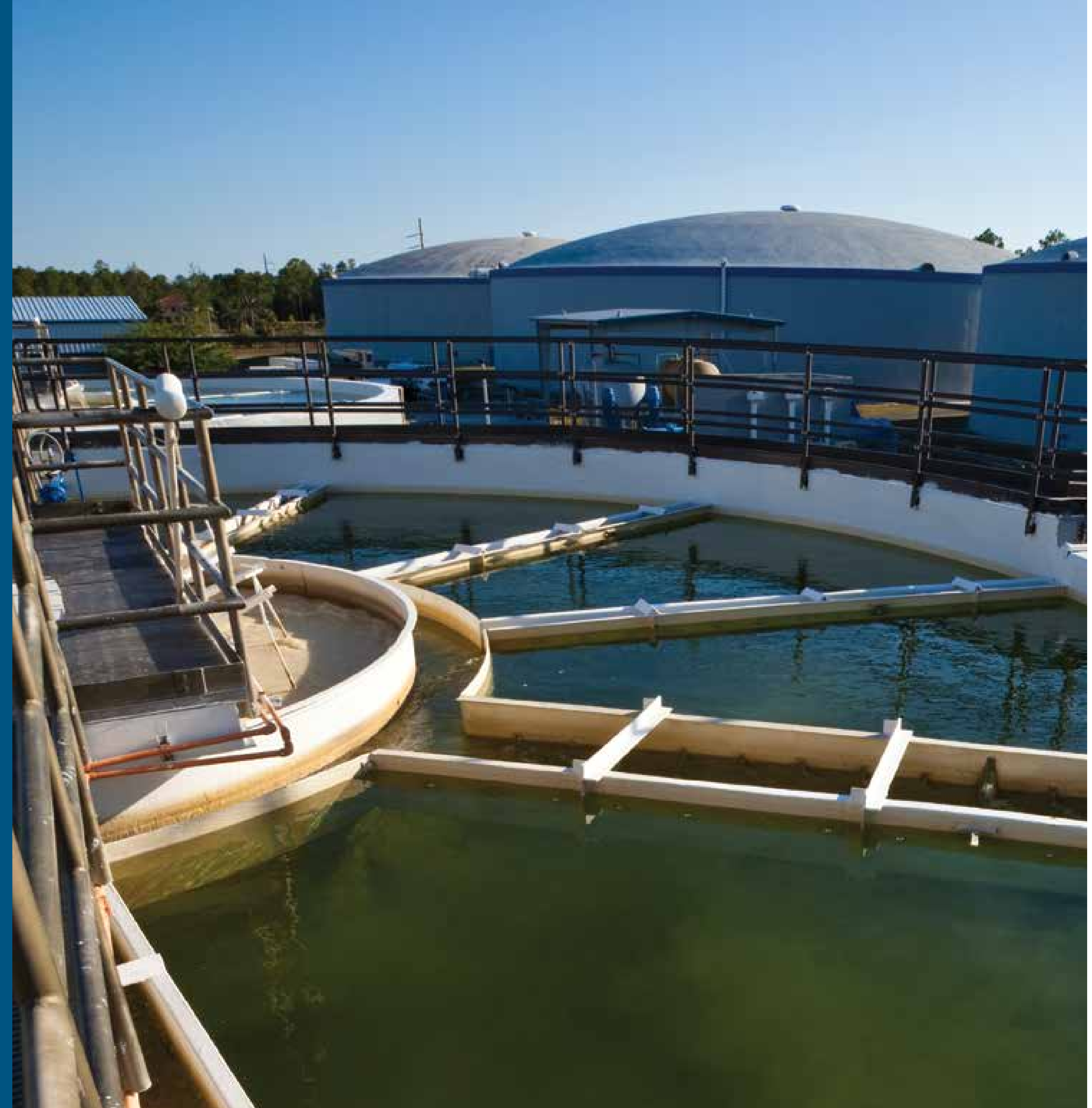
UV is the most cost effective and environmental friendly disinfection solution for wastewater.

About UV Disinfection

Ultraviolet light irradiation is a proven disinfection process using short wave length 254nm Ultraviolet (UV) energy to inactivate harmful microorganisms. UV radiation disrupts the DNA of pathogenic organisms such as bacteria, viruses and molds, leaving them unable to reproduce. UV has been used to disinfect various types of effluent from low-quality combined sewer overflow (CSO) to high-quality tertiary effluent since early 1900's.

UV – The preferred disinfection method in municipal wastewater

To comply federal Clean Water Act, and other regulations for indicator organisms, municipal wastewater must be disinfected before discharging or reusing. There are multiple options for chemical disinfection, but only one non-chemical disinfection technology. UV is the preferred disinfection method for municipal wastewater discharge or water reuse applications various chemical disinfection technologies. Currently more than 20% of wastewater treatment plants in the United States use UV as their preferred disinfection technology and this percentage has been increasing year over year.



Enaqua – a history of innovation

1985	1990	1992	1993	1997	1999	2003	2007	2009	2012	2013	2015	2017
Enaqua founded									**Acquisition by Grundfos**			
First Non-Contact UV System Water Technology Consulting	Patented Non-Contact Opaque Fluid UV System	Chemical Recovery RO Systems Brackish Water RO Systems	Municipal UV Waste-water System	Distribution of Membrane Products	Large Municipal UV Waste-water Systems	Seawater De-salination RO Systems	UV Web-based Control System	UV / UF / RO Municipal Waste-water Systems	Ensure Dosing System(EDS)* SMART Lamps*	$11 Million UV/ UF/ RO Chemical Recovery System	Validation test NWRI Title 22 and T1	Approval for CA Title 22 recycled water

*Patent pending

Advantages & benefits

Compared to conventional chlorination

	Ultraviolet light	Sodium hypochlorite	Chlorine gas
Disinfection effectiveness	High	High*	High*
Disinfection by products	No	Yes	Yes
Safety risks	Low	High	High
De-chlorination required	No	Yes	Yes
Contact channel	Small	Large	Large
pH dependency, Corrosion	No	Yes	Yes
O&M Cost	Low	High	Medium
Capital Investment	Medium	Low	High

**Cryptosporidium and Giardia are resistant against chlorination*

Third party validated technology, approved for CA Title 22 Recycled Water.

Enaqua is the first non-contact UV system supplier to have applied and received Third Party Validation, as a result of continuous efforts improving the Non-Contact UV disinfection technology. The validation testing and reports were conducted in 2015 by Carollo Engineers in accordance with the following protocols:

1. UV - Disinfection Guidelines for Drinking Water and Water Reuse (National Water Research Institute [NWRI]), August 2012
   • 53% to 80.0 % UVT range validated*

2. Uniform Protocol for Wastewater UV Validation Applications (International Ultraviolet Association [IUVA], 2011) – 36.0% to 81.0% UVT validated range*
   • MS2 Bacteriophage
   • T1 Coliphage

**Please contact Enaqua for validation range, parameters, and other technical details.*

UV made simple – features at a glance

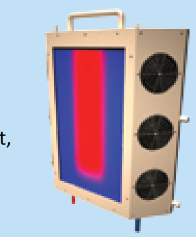
All of Enaqua's Non-Contact UV disinfection systems are built out of standard modules with high customization flexibility. The UV reactors are offered for both In-pipe or In-Channel configurations with variable plug & play inlets and outlets (page 10).

The systems are very easy to install as they are prefabricated and self-contained.

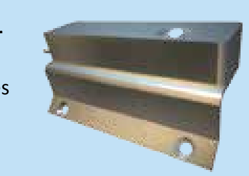
2 **Ensure Dosing System (EDS)**
Intelligent monitoring, control and FAIL SAFE ensures compliance at all times (page 8)

3 **Electrical panel**
Simple, compact and operator friendly HMI

4 **Flow & Level pacing**
Optimize energy consumption & life of consumables



5 **Heat Exchange System**
Controls reactor temperature for optimal UVC output using Effluent, plant W3 water, Potable, or Closed Loop system



6 **UV Intensity Monitor**
UV Sensor placed outside of AFP™ tubes – Dry without fouling

7 **Individually fused and switched lamp racks**
No cranes required, simple maintenance (page 7)

Single lamp ballast
Non-prorated Warranty up to 24 on/off cycles per day

8 **Controlled Water Level Downstream**
No level control mechanism required – simple hydraulic design

1 **SMART Lamps**
Cost efficient non-amalgam SMART lamp (page 9)

AFP™ Tubes
Fouling resistant virtually self-maintaining (page 6)

Always dry – AFP™ Non-Contact UV Technology

Enaqua – The Pioneer in cost effective Non-Contact UV design

Enaqua's innovative non-contact UV technology means no more repairing and replacing submerged components. Effluent flows through Enaqua's AFP tubes leaving the UV lamps, electronics and other components- accessible, and easy to maintain in the dry body of the UV reactor.

AFP™ tubes – The secret behind the performance

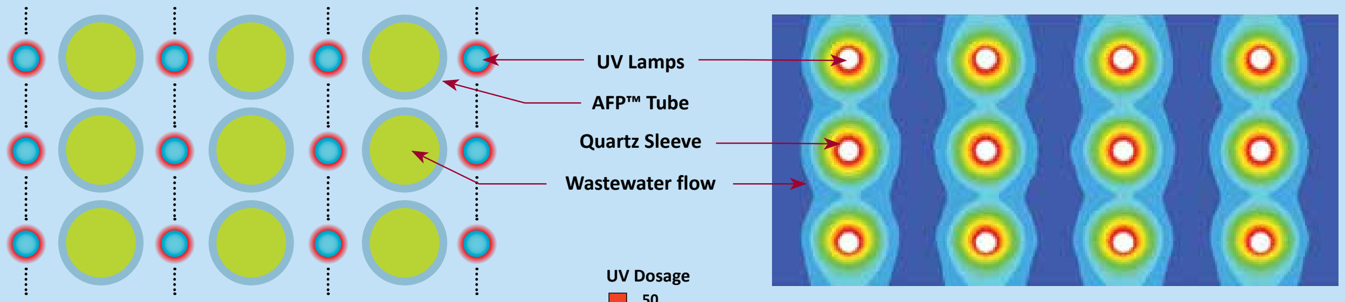
AFP stands for "Activated Fluoropolymer" which Enaqua specifically developed for Non-Contact UV applications:

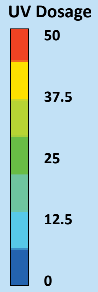
- High transmissivity of UVC
- AFP Tubes have no micro-structure-hence very resistant to scaling and fouling
- Durable, flexible, and fracture resistant material
- Long term UVC stability and Chemical resistance
- Multiple plants with over 20+ years of continuous operation

Technologies in comparison

ENAQUA AFP™
Non-Contact Technology

Quartz Sleeve UV
traditional Contact Technology



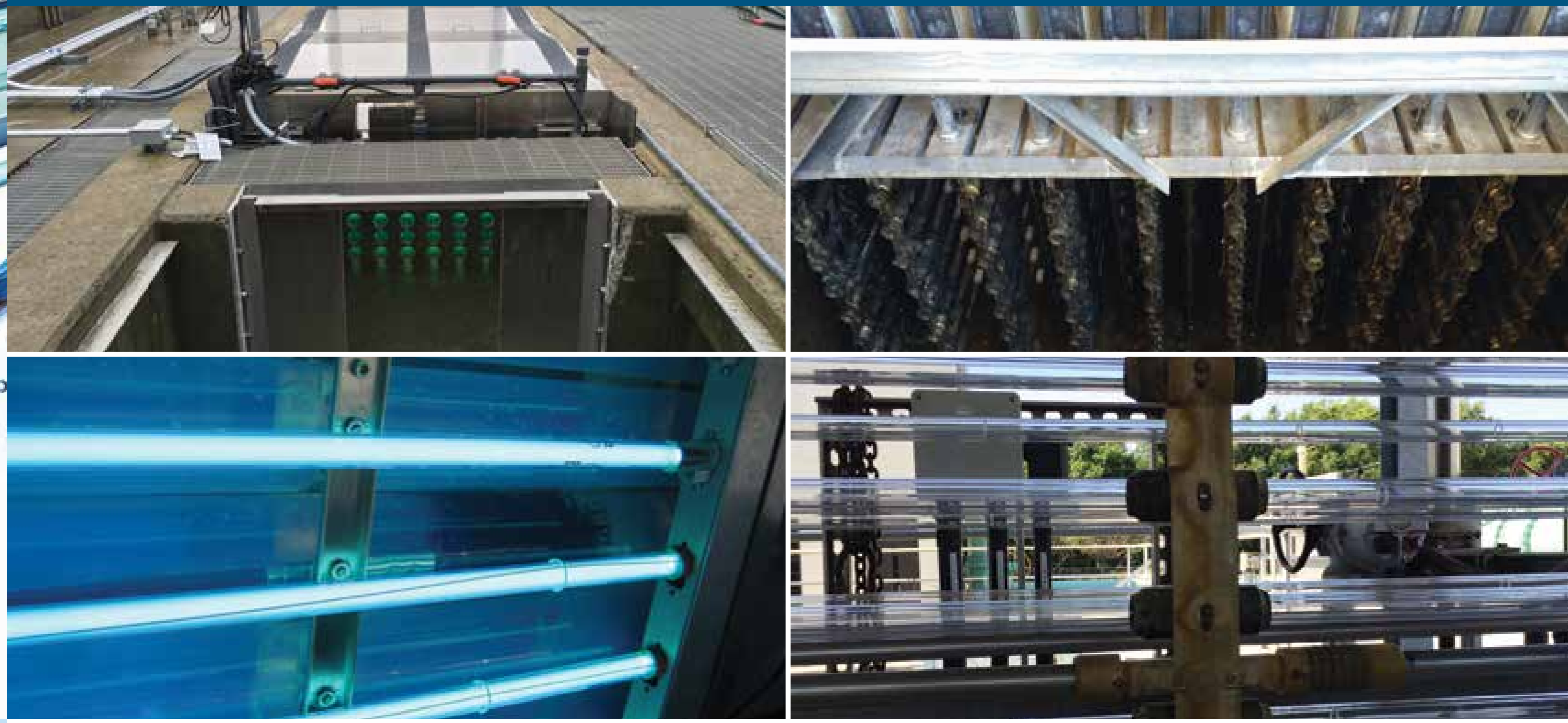


ENAQUA AFP™	Quartz Sleeve UV
Low cost high output lamps	High cost amalgam lamps
No quartz sleeves	Fragile quartz sleeves with risk of mercury and glass contamination
Fouling and Scaling Resistant AFP tube	Fouling-prone quartz sleeves
Turbulent flow provides self-cleaning of AFP™ tube	Cleaning system required
No AFP tube replacement needed under normal operating conditions	Quartz sleeves need to be replaced over time
Simple pipe hydraulics makes UV disinfection easy to predict	Channel hydraulics makes UV disinfection less predictable
Level Control Devices typically not required	Level control devices increase footprint

Simple – maintenance made clean, fast and easy

Enaqua's Non-Contact UV technology system maintenance is simple:

Enaqua's Non-Contact UV	Traditional Contact UV

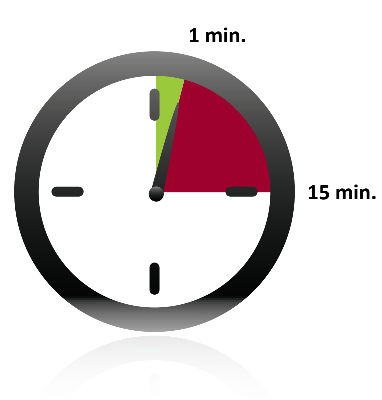


No more:

- High cost amalgam lamps
- Dirty and fouled quartz sleeves
- Problems with quartz cleaning devices
- Need to interrupt or remove any hydraulic seals
- Heavy duty cranes required for system maintenance
- Minimize Civil and Structural construction costs
- Time consuming lamp replacements
- Algae growth on the lamp racks
- Quartz sleeves to break and replace*
- SCADA programming

**No AFP™ tube replacement under normal conditions (20+ year history)*

Typical lamp replacement time



1 minute – Enaqua's Non-Contact UV

15 minutes – Traditional Contact UV

Intelligence – you don't want to miss...

Where Energy Efficiency matters

The Ensure Dosing System (EDS) is the most comprehensive monitoring and control system in the industry.

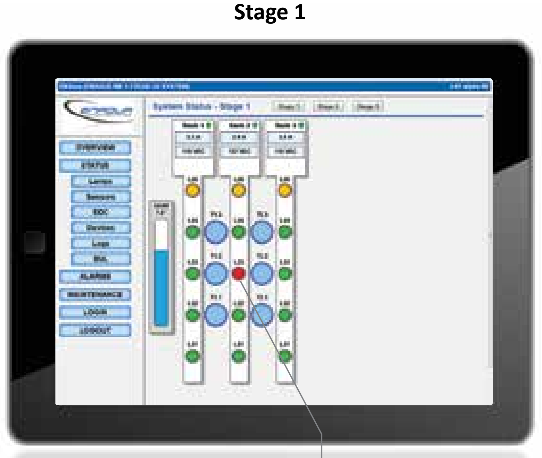
SCADA built in – Full system control and performance monitoring wherever and whenever you want:

- No special hardware and software requirements
- Simple connection via web browser
- Multiple Levels of Access
- Remote monitoring and control via Internet
- Stand-alone WiFi control e.g. with iPad®
- SCADA integration with ModBUS TCP/IP
- Remote troubleshooting
- Email and text notification

Fail Safe – Intuitive protection

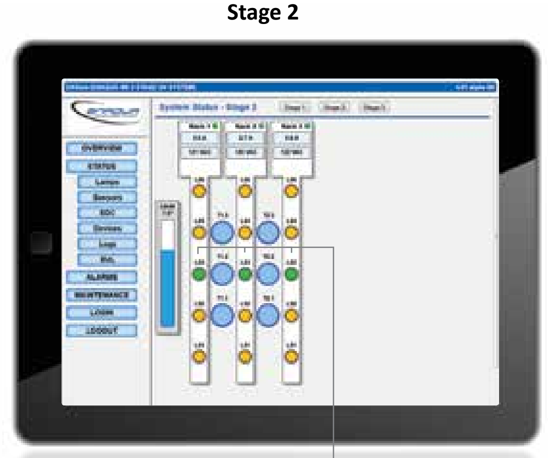
Enaqua's FAIL SAFE intelligence ensures compliance at all times. In case a lamp in one stage fails, the system will command selected lamps in a redundant stage to power-on to compensate for any UV dosage reduction (see application example).

Stage 1



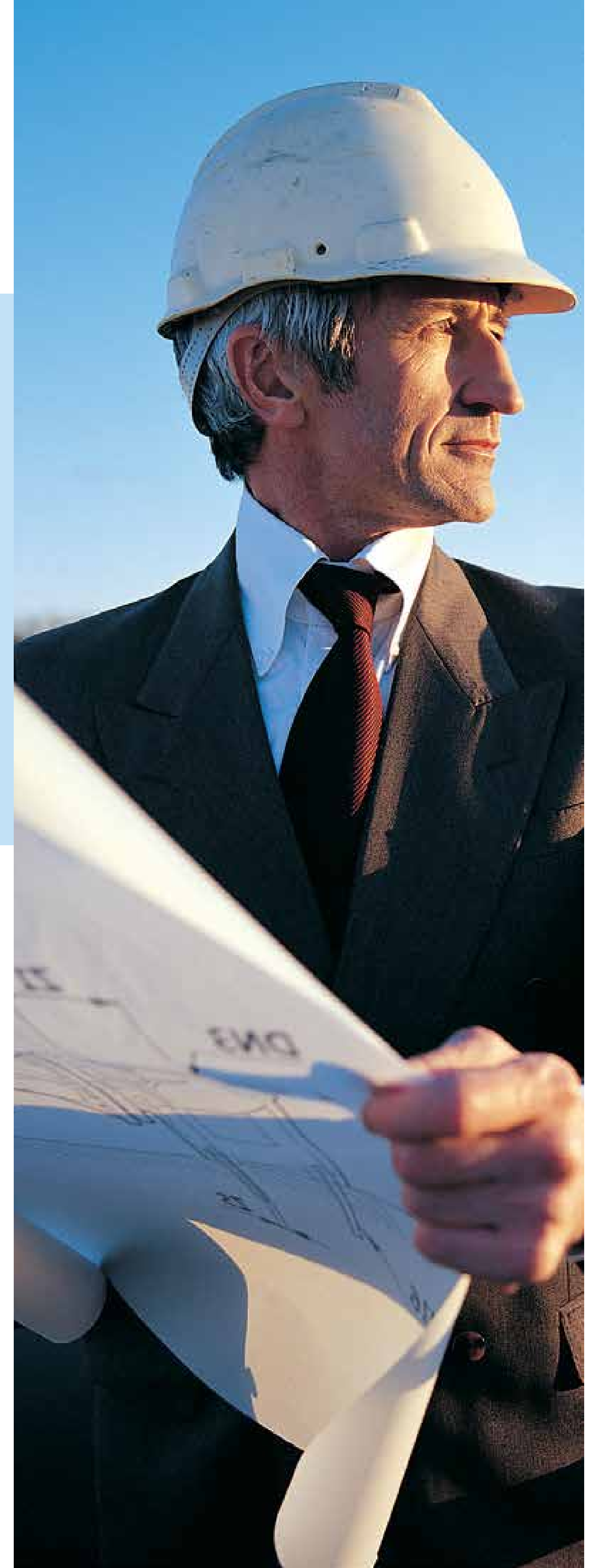
Lamp fault in stage 1: Alarm Alerts

Stage 2



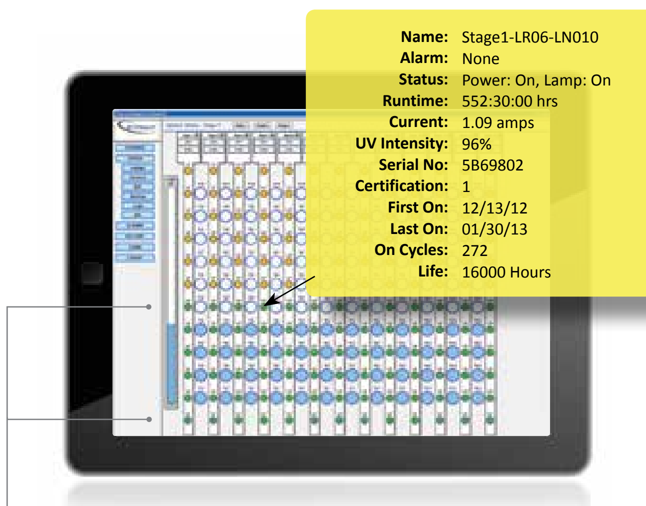
Automatically energizes ONLY selective lamps in Stage 2 to ensure disinfection while optimizing use of energy and consumables

Ipad® is a registered trademark of Apple



SMART Lamps – Advanced lamp control

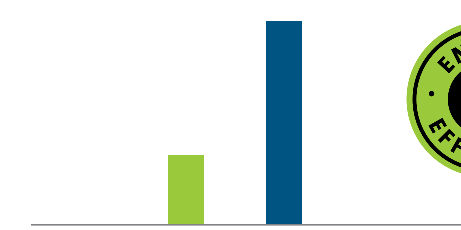
Enaqua's Low Pressure High Output (LPHO) lamps are equipped with a unique Smart Lamp Technology, a microchip integrated with the lamp connector identifies each UV lamp with a unique ID, monitors and logs lamp status, run time, lamp cycles, etc.



Flow & Level Pacing – Best energy efficiency

Enaqua's Flow & Level Pacing system automatically turns on only lamps which are required. This improves lamp and ballast life and reduces power consumption compared to systems that use "dimming".

Annual Energy Cost Comparison



$13,346
Enaqua EDS

$34,528
Traditional Dimming Systems

Actual comparison of bid guaranteed UV energy costs for Wastewater Plant, Peak 28MGD, Average 6MGD, $0.10/kWh.

Features and functions

For specific selection and sizing please contact Enaqua

		M3	M4	M5	C-Series	D-Series	E-Series
Maximum F low and Pressure							
Flow Range*1	MGD	0.03 - 0.12	0.04 - 0.17	0.2 - 0.5	0.5 - 10	0.5 - 21	0.5 - 27
	gpm	20 - 80	30 - 120	140 - 350	350 - 6944	350 - 14600	380 - 18500
	m3/h	5 - 18	6.8 - 27	32 - 80	80 - 1600	80 - 3300	80 - 4200
Max. Operating Pressure	psi	40*2	40*2	40*2	20	15	10
	bar	2.8	2.8	2.8	1.4	1.0	0.7
Mechanical data							
Max. Number of AFP™ Tubes	pcs	2	2	6	180	160	140
Max. UV Lamps per Stage	pcs	8			228	204	180
Inlet and Outlet Configuration	inch	Flange 2	Flange 4, 6	Flange 8, 10	In-Channel or Flange Options		
Wetted Materials		AFP™, 304SS Option: 316SS, PVC, CPVC		AFP™, 304SS Option: 316SS			
Multistage Design		–	–	Option	Option	Option	
Electrical data							
Operating Voltage at 50/60 Hz	V, 1PH	120, 220			220		
	V, 3PH	–		220, 380, 415, 480*3			
Ballast Type		Auto Ranging 110-277 VAC 50/60 Hz with 5 Year Warranty					
Controls							
LCD Status Display		✓	✓	✓	Option	Option	Option
Hand-Off-Automatic Switch		✓*4	✓*4	✓	✓	✓	✓
Control Light: Alarm/Running		–	–	✓	Option	Option	Option
Individual Lamp Rack Fuse and Switch		✓	✓	✓	✓	✓	✓
UV Status LEDs in Lamp Racks		–	✓	✓	✓	✓	✓
Ensure Dosing System (EDS)		Option	Option	Option	✓	✓	✓
SMART Lamps		✓	✓	✓	✓	✓	✓
Flow & Level Pacing		–	–	–	Option	Option	Option
Fail Safe		Option	Option	Option	Option	Option	Option
UV Sensor		Option	Option	Option	✓	✓	✓
Heat Exchange System (Lamp Temperature Control)		Ambient Air Exchange			Air to Air. Air to Liquid using Effluent, plant W3 water, Potable, or Closed Loop system		

*1 Design consideration 65% UVT, ~30 mJ/cm², Contact Enaqua for more details
*2 Max pressure for High Pressure Option: 80 psi (5.5 bar)
*3 Three-phase voltage requires neutral wire
*4 On/Off switch only

M Series UV reactors

– compact uv reactors ideal for small treatment plants for surface discharge, reuse, and industrial applications.

M3 Series
Flow rates up to 80 gpm (18.2 m³/ h)

M4 Series
Flow rates up to 120 gpm (27.25 m³/ h)

M5 Series
Flow rates up to 360 gpm (81.8 m³/ h)

C1, C2, C3 & D1, D2, D3 UV series reactors

– medium size uv reactors for surface discharge, reuse, and industrial applications.

C1 & D1 Series
In pipe UV reactors , single or double banks- for Flow rates up to 2.0 MGD (315.4 m³/ h).

C2 & D2 Series
In pipe UV reactors, single or double banks- for Flow rates up to 4.2 MGD (662.5 m³/ h).

C3 & D3 Series
In pipe UV reactors, single or double banks- for Flow rates up to 6.0 MGD (946.4 m³/ h).

4 – 11 Series UV reactors

– large uv reactors offered "in-pipe" or " in-channel" configurations.

C Series "In pipe" or "In Channel"
Multi Bank UV reactors for Flow rates up to 24.0 + MGD . Applications– UV disinfection for surface discharge, Reuse, industrial appli-cation, Etc.

C Series "In Pipe " Reactor

C Series "In Channel" Reactor

D Series "In pipe" or "In Channel"
Multi Bank UV reactors for Flow rates up to 36 + MGD . Applications– UV disinfec-tion for surface discharge, CSO, Industrial Applications, Etc.

D Series "In Pipe " Reactor

D Series "In Channel" Reactor

E Series "In Channel"
Multi Bank UV reactors for Flow rates up to 100 + MGD . Applications– UV disinfection for surface discharge, CSO, Etc.

Designed and manufactured in USA

Enaqua – UV made simple
Non-contact UV disinfection

- The **Engineer's Choice** for State-of-the-Art Technology
- The **City Manager's Choice** for Low Capital Cost
- The **Superintendent's Choice** for Low O&M Cost
- The **Operator's Choice** for Simple Operation
- The **Contractor's Choice** for Simple Installation
- The **Finance Director's Choice** for Lowest 20 Years Capital and Operations Cost Potential

ENAQUA
1350 Specialty Drive, Ste. D/F
Vista, CA 92081 USA
Tel: +1.760.599.2644
Fax: +1.760.599.2642
www.enaqua.com

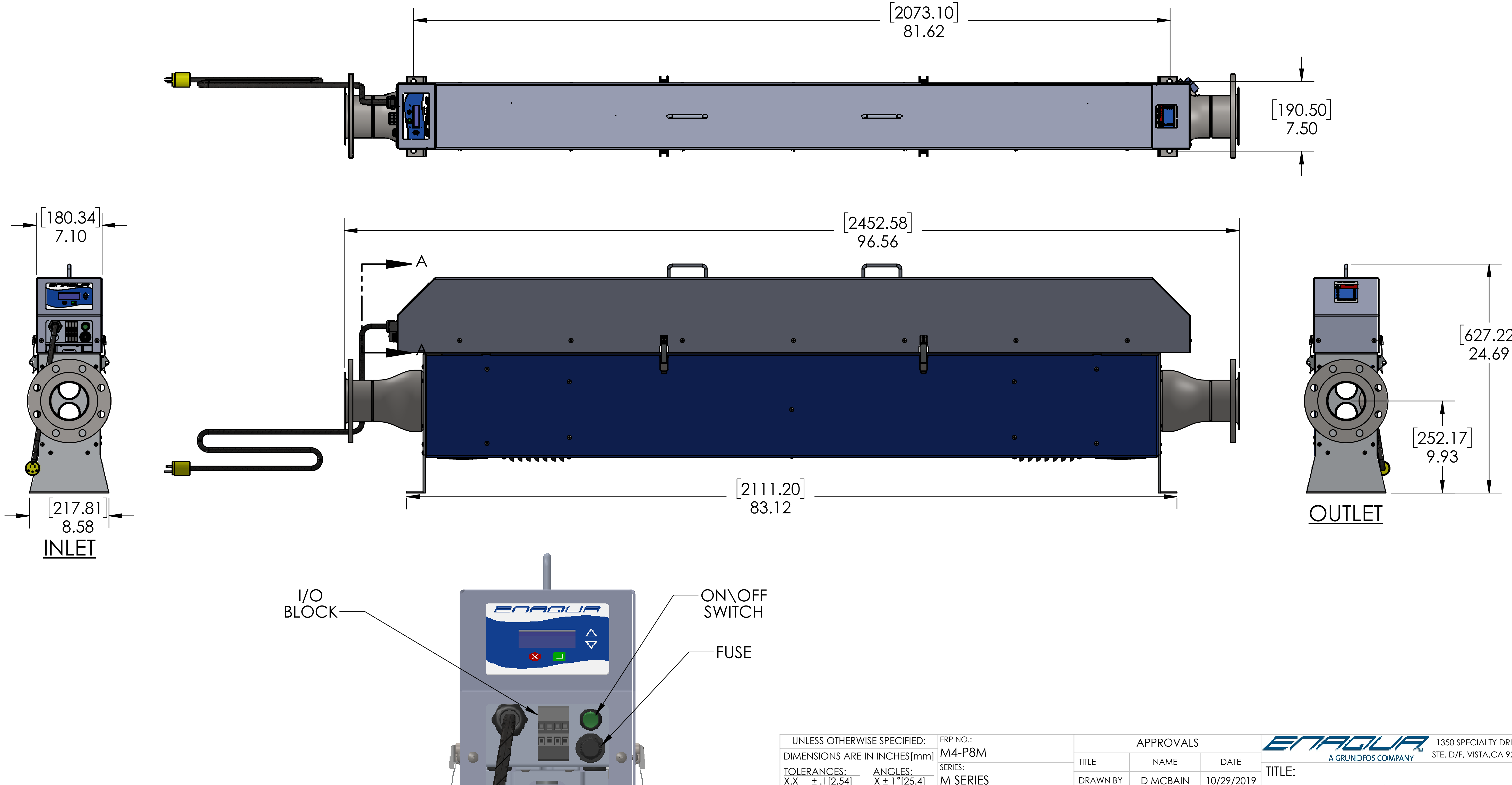
ENAQUA INFO
info@enaqua.com

ENAQUA SERVICE
service@enaqua.com

ENAQUA SALES
sales@enaqua.com

A GRUNDFOS COMPANY

REVISIONS				
ECM	REV.	DESCRIPTION	DATE	APPROVED
	A	INITIAL RELEASE	10/29/2019	DSM
	B	UPDATED MODEL	10/29/2019	DSM



SECTION A-A
SCALE 1 : 4

NOTES (UNLESS OTHERWISE SPECIFIED):

1. REMOVE ALL SHARP EDGES AND BURRS.
2. DRAWING IS IN ACCORDANCE WITH ASME Y14.5-2009.
3. ALL DIMENSIONS ARE IN INCHES AND/OR [MILLIMETERS].

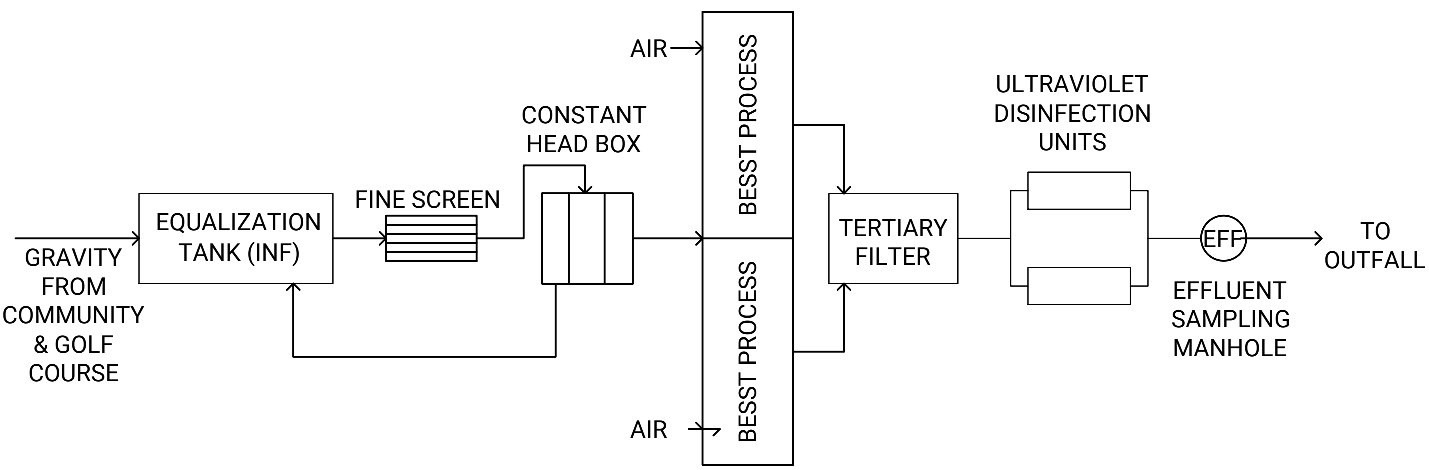
UNLESS OTHERWISE SPECIFIED:	ERP NO.: M4-P8M	APPROVALS			ENAQUA A GRUNDFOS COMPANY 1350 SPECIALTY DRIVE, STE. D/F, VISTA,CA 92081
DIMENSIONS ARE IN INCHES[mm]	SERIES: M SERIES	TITLE	NAME	DATE	TITLE: M4:P8M
TOLERANCES: X.X ± .1[2.54] X.XX ± .03[.76] X.XXX ± .010[.25] FRACTIONS: X/X ± 1/16[1.59]; ANGLES: X ± 1°[25.4] .X ± .5°[12.7] .XX ± .25°[6.4]	MATERIAL:	DRAWN BY	D MCBAIN	10/29/2019	
		DWG. Q.A.			
		BUYER CKD.			
PROPRIETARY AND CONFIDENTIAL THE INFORMATION CONTAINED IN THIS DRAWING IS THE SOLE PROPERTY OF ENAQUA. ANY REPRODUCTION IN PART OR AS A WHOLE WITHOUT THE WRITTEN PERMISSION OF ENAQUA IS PROHIBITED.	FINISH:	MFG. APPR.			SIZE B; DWG. NO. M4-P8M; REV B
		ENG. APPR.			
	DO NOT SCALE DRAWING	WEIGHT (LBS.): 123.95			SCALE: 3:32; SHEET 1 OF 1

APPENDIX F

SAMPLING LOCATIONS

PROCESS CONTROL MONITORING LOCATIONS

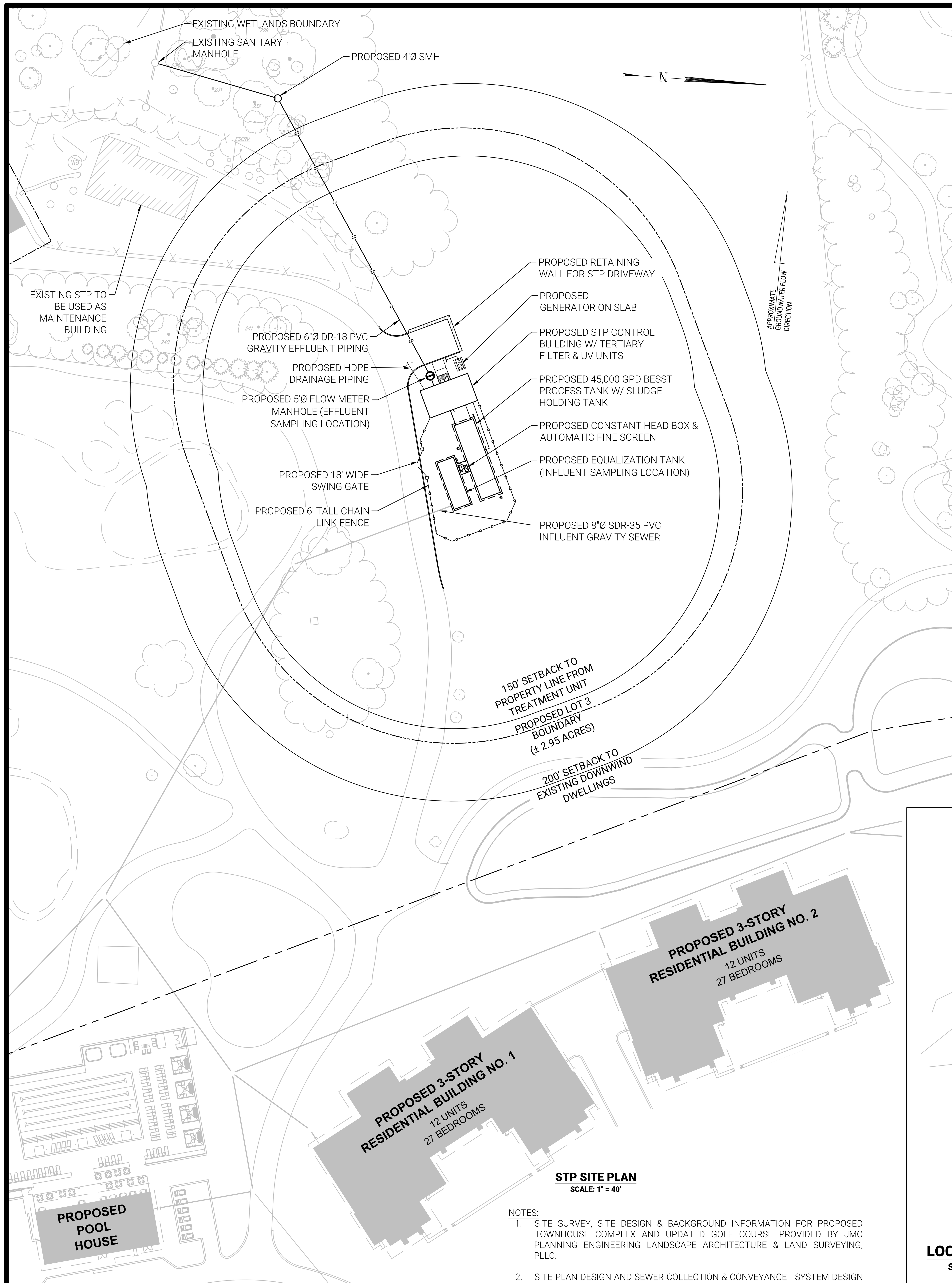
Permittee shall take samples and measurements to meet the monitoring requirements at the locations indicated below.



PROCESS CONTROL MONITORING LOCATION DESCRIPTION
Influent (INF): Sample taken in influent pump station
Effluent (EFF): Sample taken in effluent sampling manhole

DRAWING No. 1

STP SITE PLAN



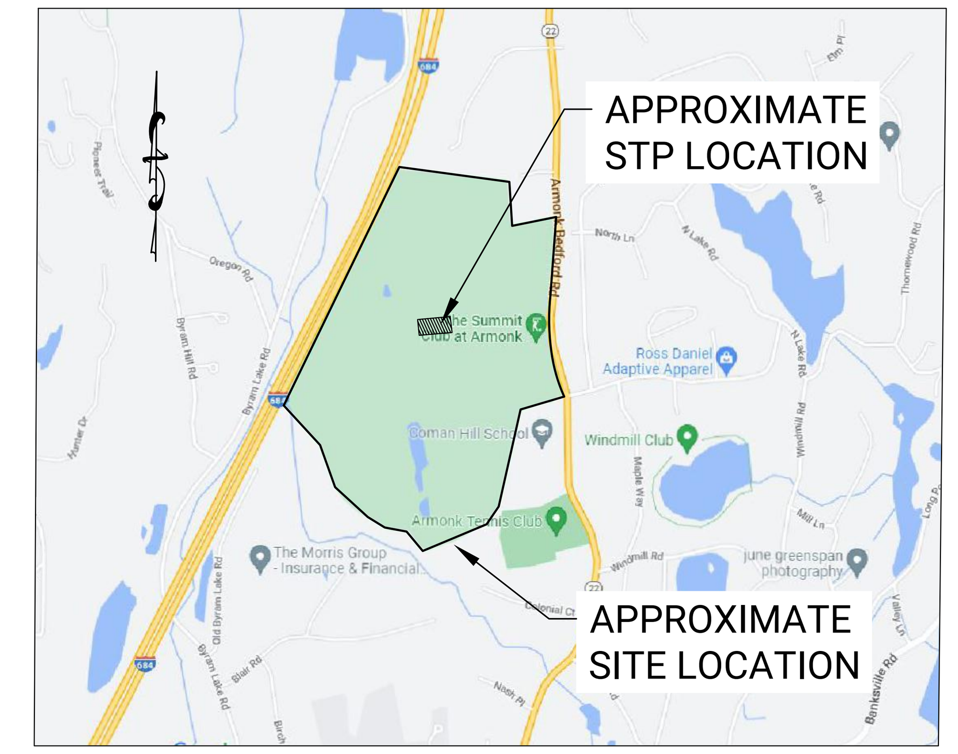
STP SITE PLAN
SCALE: 1" = 40'

NOTES:
1. SITE SURVEY, SITE DESIGN & BACKGROUND INFORMATION FOR PROPOSED TOWNHOUSE COMPLEX AND UPDATED GOLF COURSE PROVIDED BY JMC PLANNING ENGINEERING LANDSCAPE ARCHITECTURE & LAND SURVEYING, PLLC.
2. SITE PLAN DESIGN AND SEWER COLLECTION & CONVEYANCE SYSTEM DESIGN BY JMC PLLC.

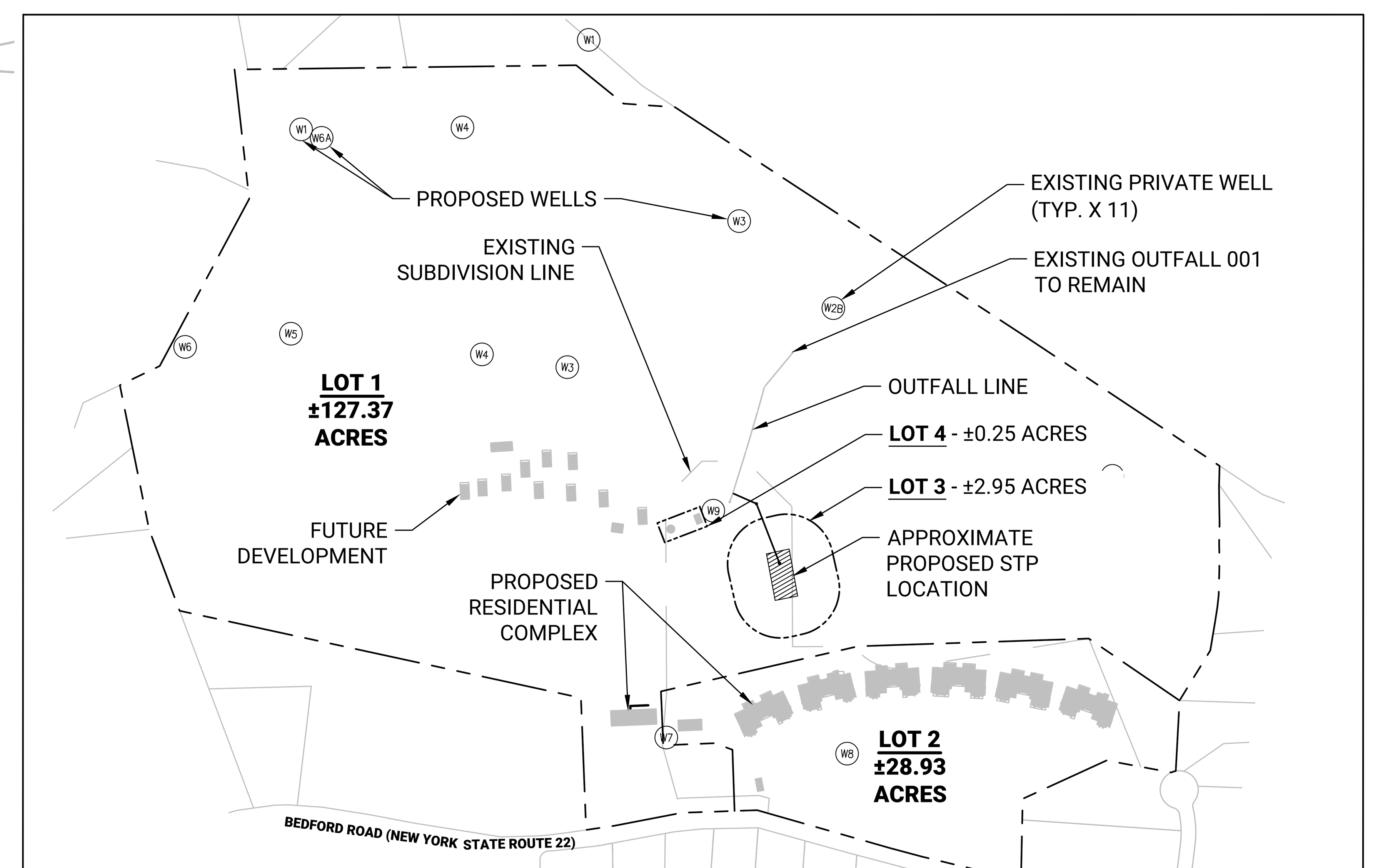
DESIGN SANITARY FLOW:

USE	AREA (s.f.)	EMPLOYEES	SEATS/ STATIONS	GOLFERS	BEDROOMS	SWIMMERS	USAGE RATE (gpd/units)**	USAGE (gpd)
Townhomes	-	-	-	-	162	-	110.0	17,820
Bar/Lounge	-	-	35	-	-	-	16.0	560
Restaurant	-	-	252	-	-	-	28.00	7,056
Golf Tournament	-	-	-	144	-	-	16.0	2,304
Country Club	-	20	-	-	-	-	12.0	240
Golf Course	-	15	-	-	-	-	12.0	180
Seasonal GC Staff	-	-	-	-	12	-	60.00	720
Pool	3,850	-	-	-	-	257	8.00	2,053
Spas	240	-	-	-	-	24	8	192
Excess Pool Deck	8,517	-	-	-	-	170	8	1,363
WWTP	-	-	-	-	-	-	55	55
Proposed Total Flow	-	-	-	-	-	-	-	32,543
Future Townhomes	-	-	-	-	36	-	110	3,960
Future Guest Cottages	-	-	-	-	40	-	110	4,400
Future Total Flow	-	-	-	-	-	-	-	8,360
Total Design Flow	12,607	35	287	144	174	451	-	40,903
SAY	-	-	-	-	-	-	-	45,000

**NOTES:
1. THE PROJECTED FLOW RATES ARE BASED ON THE TYPICAL PER-UNIT HYDRAULIC LOADING RATES FROM TABLE B-3 IN "NEW YORK STATE DESIGN STANDARDS FOR INTERMEDIATE SIZED WASTEWATER TREATMENT SYSTEMS," 2014.
2. HYDRAULIC LOADING RATES ARE DECREASED BY 20 PERCENT IN INSTALLATIONS SERVING PREMISES EQUIPPED WITH WATER-SAVING PLUMBING FIXTURES AS DICTATED BY SECTION B.6.B IN THE NYS DEC DESIGN STANDARDS.



KEY MAP
SCALE: 1"=1500'



LOCATION MAP
SCALE: 1"=400'

WCDH APPROVAL STAMP

No.	REVISION DESCRIPTION	DATE	BY

OWNER:
SUMMIT CLUB PARTNERS, LLC
568 BEDFORD ROAD (NY-22)
ARMONK, NY 10504

APPLICANT:
SUMMIT CLUB PARTNERS, LLC
568 BEDFORD ROAD (NY-22)
ARMONK, NY 10504

STP SITE PLAN

THE SUMMIT CLUB AT ARMONK SEWAGE TREATMENT PLANT

SITUATED IN
ARMONK
TOWN OF NORTH CASTLE, WESTCHESTER COUNTY, NEW YORK

WCTM: DISTRICT 003, SECTION 101.02, BLOCK 1, LOT 28.1 & 28.2

STATE OF NEW YORK · MATTHEW P. SCHEINER · 087181 · LICENSED PROFESSIONAL ENGINEER

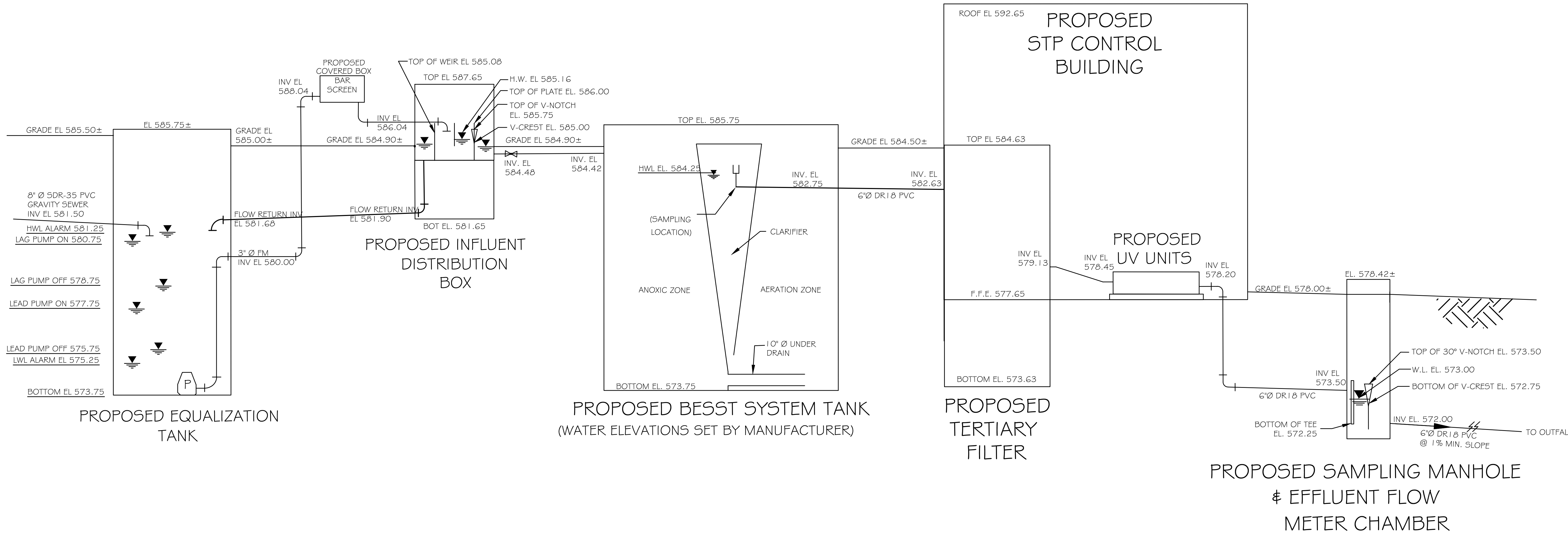
Matthew P. Scheiner, P.E.
NY State License No. 087181

R&M ENGINEERING
Robinson & Muller Engineers, P.C.
50 Elm Street
Huntington, NY 11743
Office: (631) 271-0576
Fax: (631) 271-0592
www.rmengineering.com

DWN. BY: SNM	CHK'D. BY: MPS	SCALE: AS NOTED	SHEET:
DATE: APRIL 2022	DATE: APRIL 2022	JOB No.: 2021-201	1

DRAWING No. 2

HYDRAULIC PROFILE



HYDRAULIC PROFILE

SCALE: N.T.S.

SUMMIT CLUB SEWAGE TREATMENT PLANT REPLACEMENT
TOWN OF NORTH CASTLE, WESTCHESTER COUNTY, NEW YORK

STP HYDRAULIC PROFILE

R&M ENGINEERING

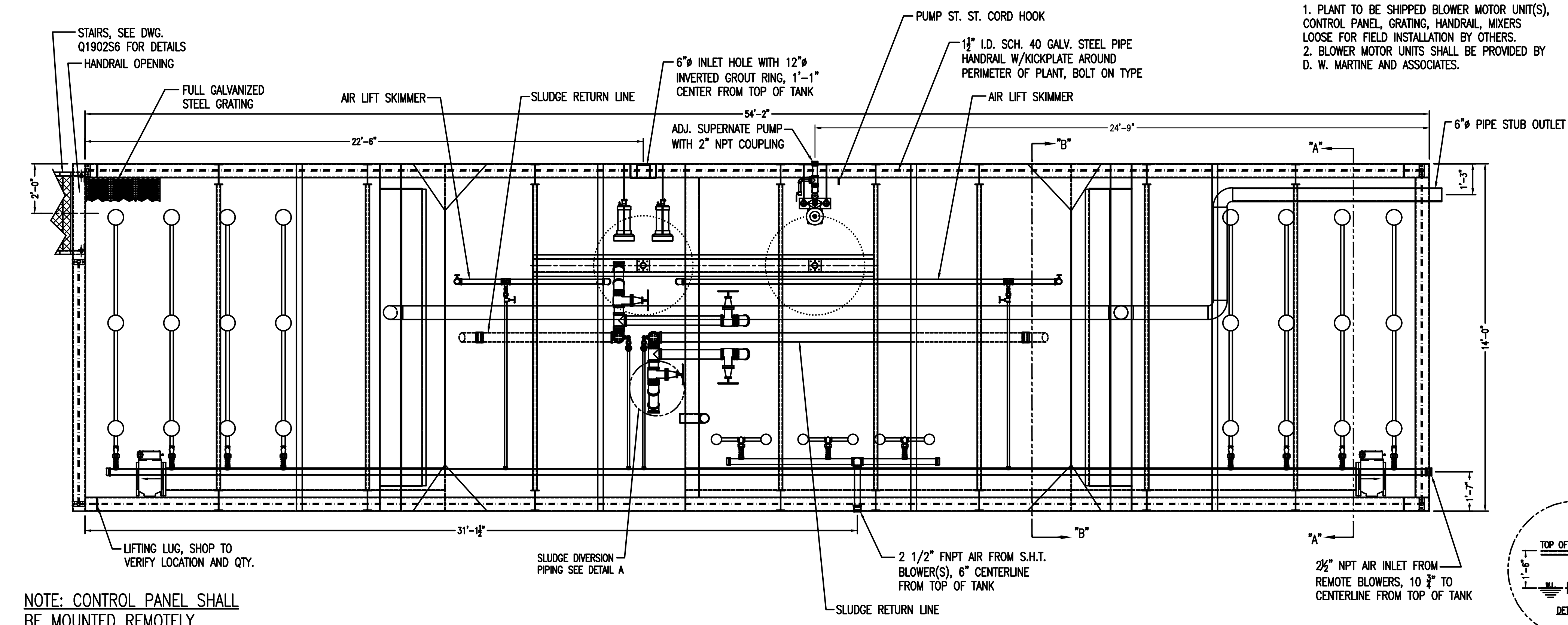
Robinson & Muller Engineers, P.C.
50 Elm Street
Huntington, NY 11743
Office: (631) 271-0576
Fax: (631) 271-0592
www.rmengineering.com

DATE:	APRIL 2022
SCALE:	NOT TO SCALE
JOB No.:	2021-201
SHEET:	2

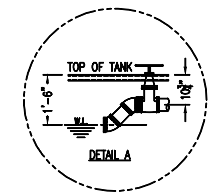
DRAWING No. 3

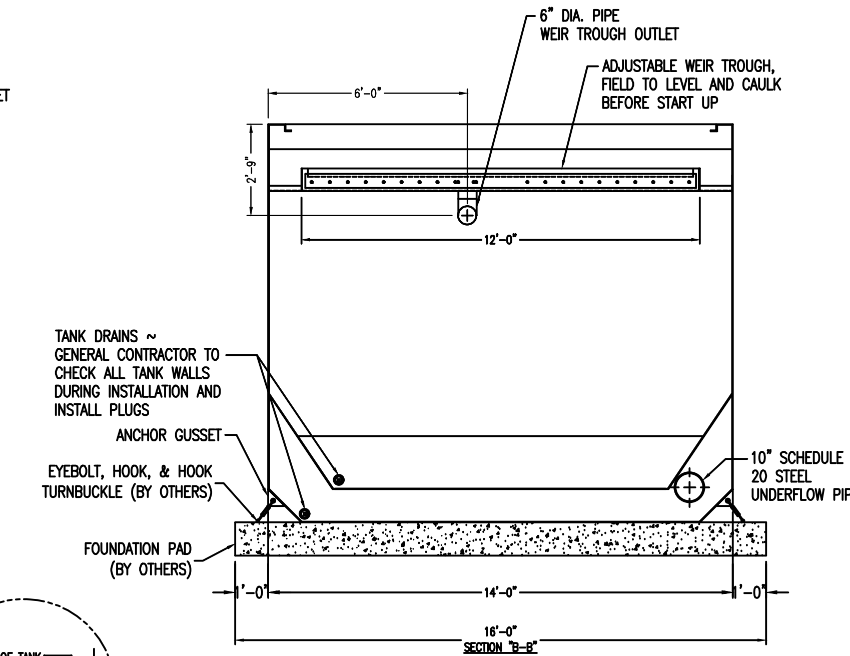
MANUFACTURER’S STP LAYOUT

NOTES:
1. PLANT TO BE SHIPPED BLOWER MOTOR UNIT(S), CONTROL PANEL, GRATING, HANDRAIL, MIXERS LOOSE FOR FIELD INSTALLATION BY OTHERS.
2. BLOWER MOTOR UNITS SHALL BE PROVIDED BY D. W. MARTINE AND ASSOCIATES.



PLAN VIEW





NOTE: CONTROL PANEL SHALL BE MOUNTED REMOTELY.

NOTE: BLOWERS PROVIDED BY D. W. MARTINE AND ASSOCIATES

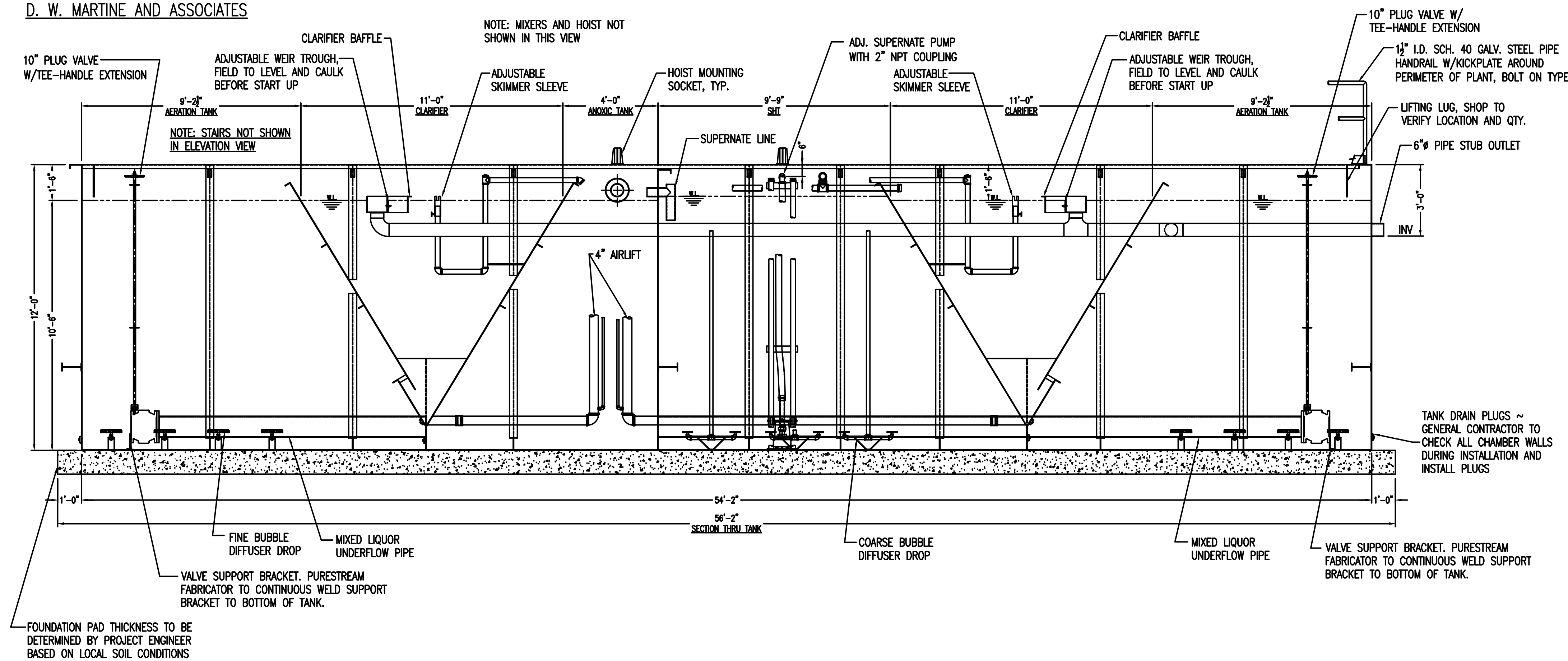
PROTECTION AGAINST CORROSION

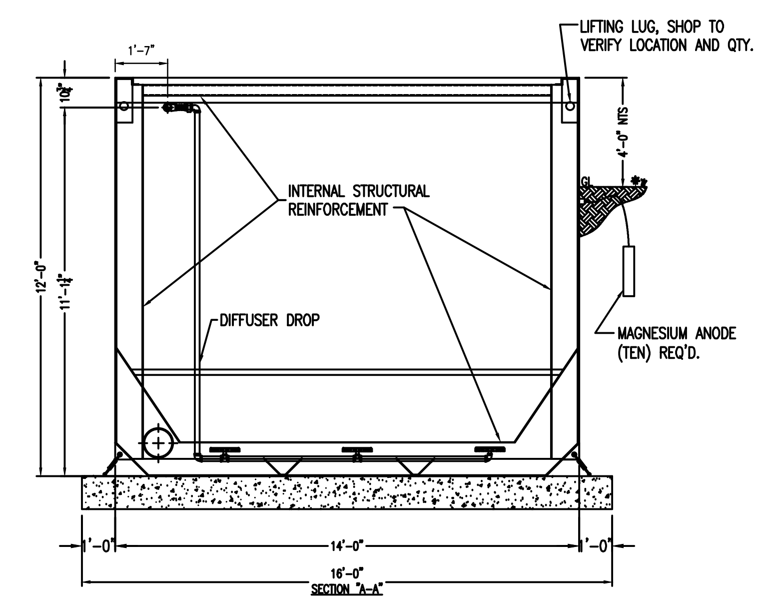
AFTER COMPLETE WELDING AND FABRICATION OF THE TANK, THE FOLLOWING WILL OCCUR:

SURFACE PREPARATION:
ALL SURFACES SHALL RECEIVE A SSPC-10 NEAR WHITE METAL FINISH OBTAINING A 1.5 TO 3.0 MIL SURFACE PROFILE.

PAINT:
INTERIOR AND EXTERIOR APPLICATION THICKNESS SHALL BE 8 TO 10 MILS D.F.T. OF TNEMEC 46H-413 COAL TAR EPOXY OR EQUAL.

COLOR: BLACK FINISH: SATIN





DESIGN DATA					
MODEL NUMBER	DESIGN FLOW G.P.D.	ANOXIC TANK VOLUME GALLON	CLARIFIER VOLUME GALLON	AERATION TANK VOLUME GALLON	SLUDGE HOLDING VOLUME GALLON
PES-45	45,000	7,434	12,144 total	26,295 total	13,757

NOTE:
THIS TANK STRUCTURE IS REINFORCED TO WITHSTAND NORMAL PRESSURES FROM THE SOIL AND FROM THE INTERIOR HYDROSTATIC LOAD ON ABOVE GRADE INSTALLATIONS. IF THERE IS A GROUND WATER PROBLEM, NOTIFY YOUR ENGINEER AND PURESTREAM IMMEDIATELY. PURESTREAM WILL NOT BE RESPONSIBLE FOR DAMAGE TO THE TANK STRUCTURE OR EQUIPMENT DUE TO GROUND WATER.

REVISIONS
R1, REVISED AS REQUESTED, PAT, 1-17-22
R2, REVISED AS REQUESTED, PAT, 1-27-22
R3, REVISED AS REQUESTED, PAT, 4-6-22
R4, REVISED AS REQUESTED, PAT, 4-8-22
R5, ADDED S.H.T. PUMP, PAT, 4-26-22

JOB NO: Q1902
JOB NAME: SUMMIT CLUB (WESTCHESTER)
LOCATION: NY
DRAWN BY: PAT
DATE: 12-15-21

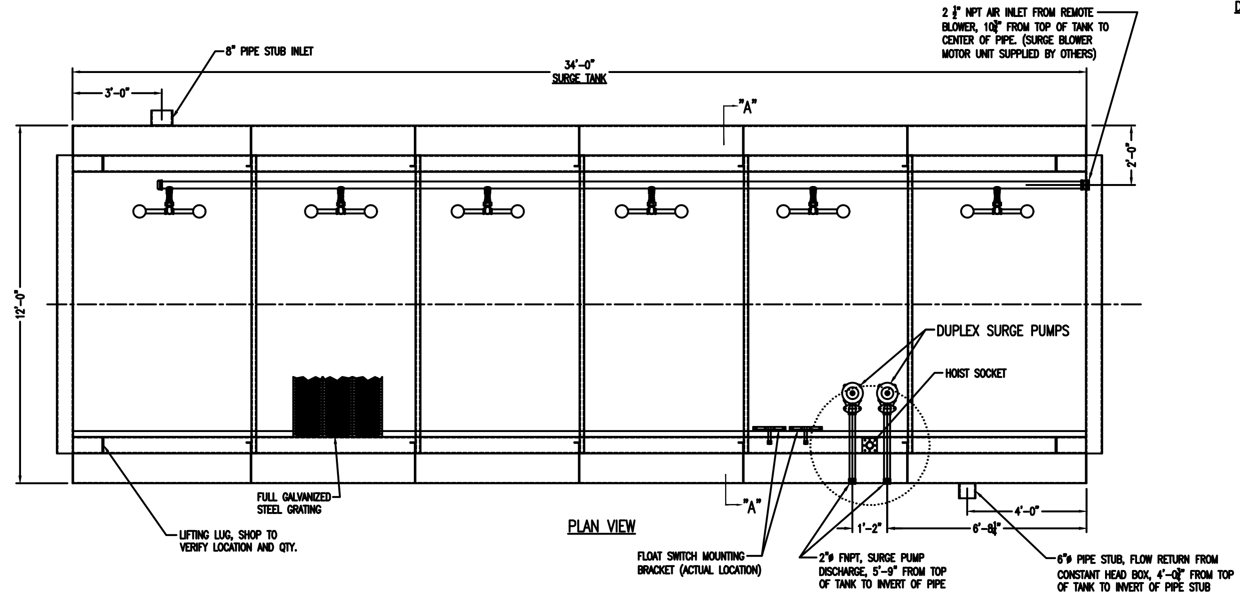
PURESTREAM/ES

DESCRIPTION: BIOLOGICALLY ENGINEERED SINGLE SLUDGE TREATMENT PREFABRICATED STEEL SEWAGE TREATMENT SYSTEM

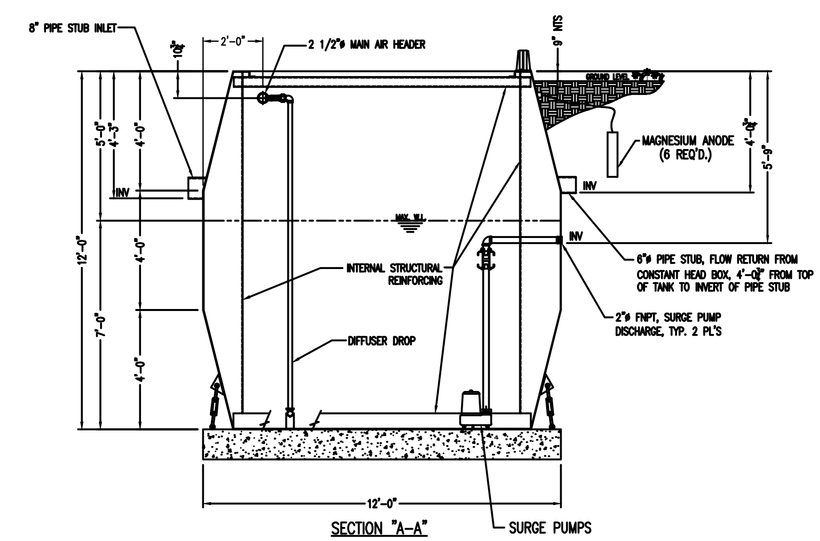
SCALE: NONE (24)
DRG. SIZE: D
PART& DRG.NO. Q1902S1-R5

NOTE: CONTROL PANEL SHALL BE MOUNTED REMOTELY.

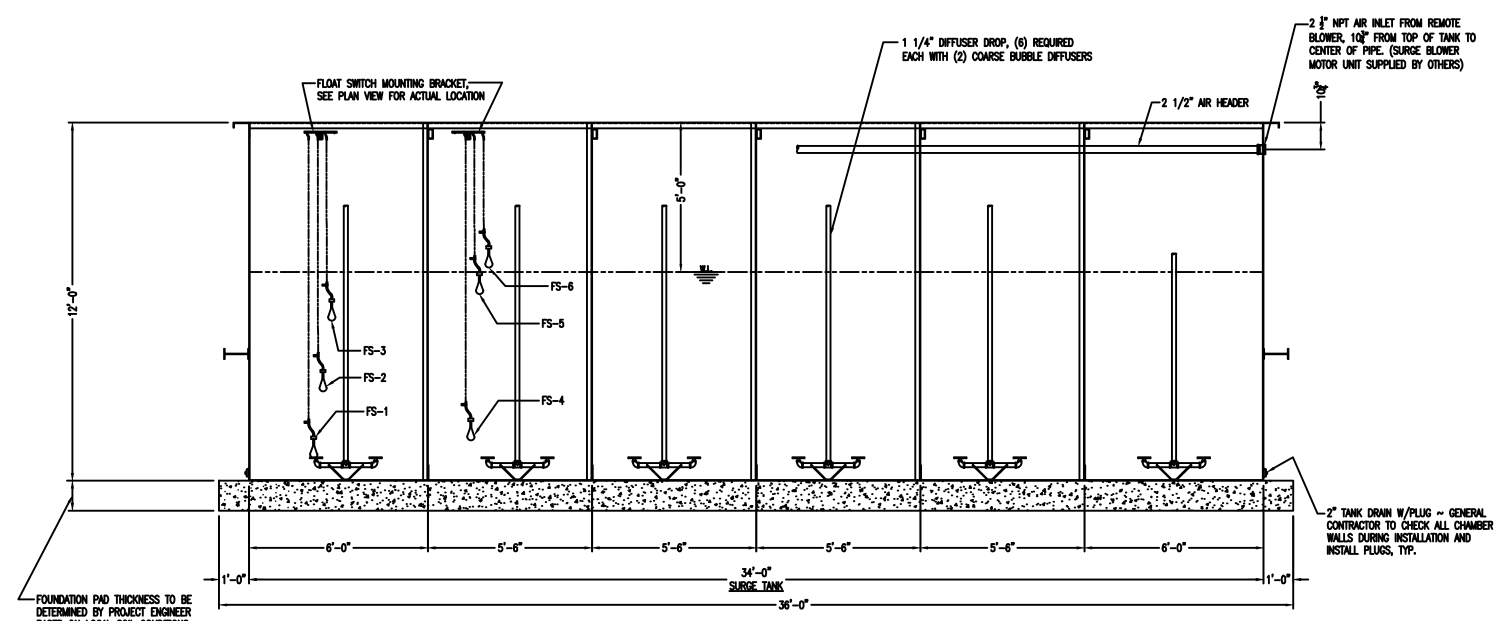
NOTE: BLOWERS PROVIDED BY D. W. MARTINE AND ASSOCIATES



PLAN VIEW



SECTION "A-A"



SECTION THROUGH TANK

FLOAT SWITCH LEGEND	
LS-1	SURGE TANK LOW LEVEL ALARM
LS-2	SURGE LAG PUMP OFF
LS-3	SURGE LEAD PUMP ON
LS-4	SURGE LEAD PUMP OFF
LS-5	SURGE LAG PUMP ON
LS-6	SURGE TANK HIGH WATER ALARM

NOTES:
1. PLANT TO BE SHIPPED BLOWER MOTOR UNIT(S), PUMPS CONTROL PANEL, GRATING, ANODES, HANDRAIL LOOSE FOR FIELD INSTALLATION BY OTHERS.
2. FLOAT SWITCH ELEVATION SHALL BE DETERMINED BY OTHERS.
3. BLOWER MOTOR UNITS SHALL BE PROVIDED BY D. W. MARTINE AND ASSOCIATES.

PROTECTION AGAINST CORROSION

AFTER COMPLETE WELDING AND FABRICATION OF THE TANK, THE FOLLOWING WILL OCCUR:

SURFACE PREPARATION:
ALL SURFACES SHALL RECEIVE A SSPC-10 NEAR WHITE METAL FINISH OBTAINING A 1.5 TO 3.0 MIL SURFACE PROFILE.

PAINT:
INTERIOR AND EXTERIOR APPLICATION THICKNESS SHALL BE 8 TO 10 MILS D.F.T. OF TNEMEC 46H-413 COAL TAR EPOXY OR EQUAL.

COLOR: BLACK FINISH: SATIN

NOTE:
THIS TANK STRUCTURE IS REINFORCED TO WITHSTAND NORMAL PRESSURES FROM THE SOIL AND FROM THE INTERIOR HYDROSTATIC LOAD ON ABOVE GRADE INSTALLATIONS. IF THERE IS A GROUND WATER PROBLEM, NOTIFY YOUR ENGINEER AND PURESTREAM IMMEDIATELY. PURESTREAM WILL NOT BE RESPONSIBLE FOR DAMAGE TO THE TANK STRUCTURE OR EQUIPMENT DUE TO GROUND WATER.

SURGE TANK VOLUME GALLON
15,051

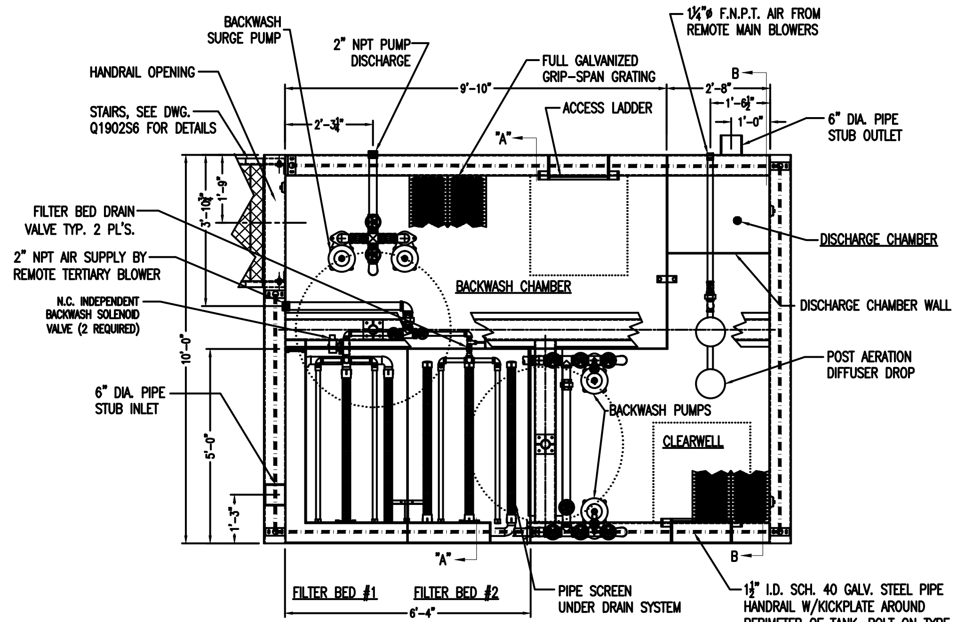
REVISIONS	REVISIONS
R6, REVISED AS REQUESTED, PAT, 4-21-22	R1, REVISED AS REQUESTED, PAT, 1-17-22
	R2, REVISED AS REQUESTED, PAT, 1-27-22
	R3, REVISED AS REQUESTED, PAT, 4-6-22
	R4, REVISED AS REQUESTED, PAT, 4-8-22
	R5, REVISED AS DISCUSSED, PAT, 4-11-22

JOB NO: Q1902
JOB NAME: SUMMIT CLUB (WESTCHESTER)
LOCATION: NY
DRAWN BY: PAT DATE: 12-15-21

PURESTREAM/ES

DESCRIPTION: SURGE TANK

SCALE: 32 | DRG. SIZE: D | PART& DRG.No. Q1902S2-R6



PLAN VIEW

NOTE: CONTROL PANEL SHALL BE MOUNTED REMOTELY.

NOTE: BLOWERS PROVIDED BY D. W. MARTINE AND ASSOCIATES

NOTE: CONTROL PANEL SHALL BE MOUNTED REMOTELY.

NOTE: BLOWERS PROVIDED BY D. W. MARTINE AND ASSOCIATES

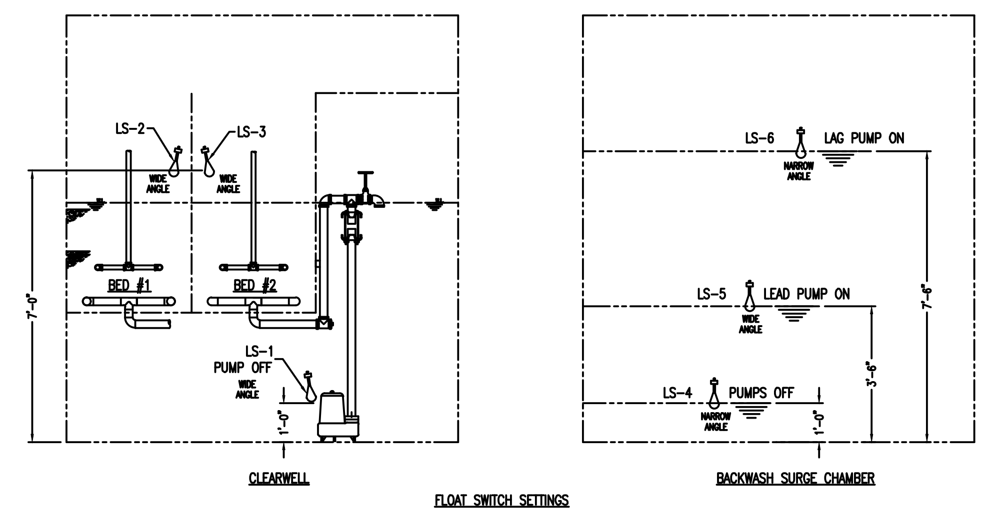
PROTECTION AGAINST CORROSION

AFTER COMPLETE WELDING AND FABRICATION OF THE TANK, THE FOLLOWING WILL OCCUR:

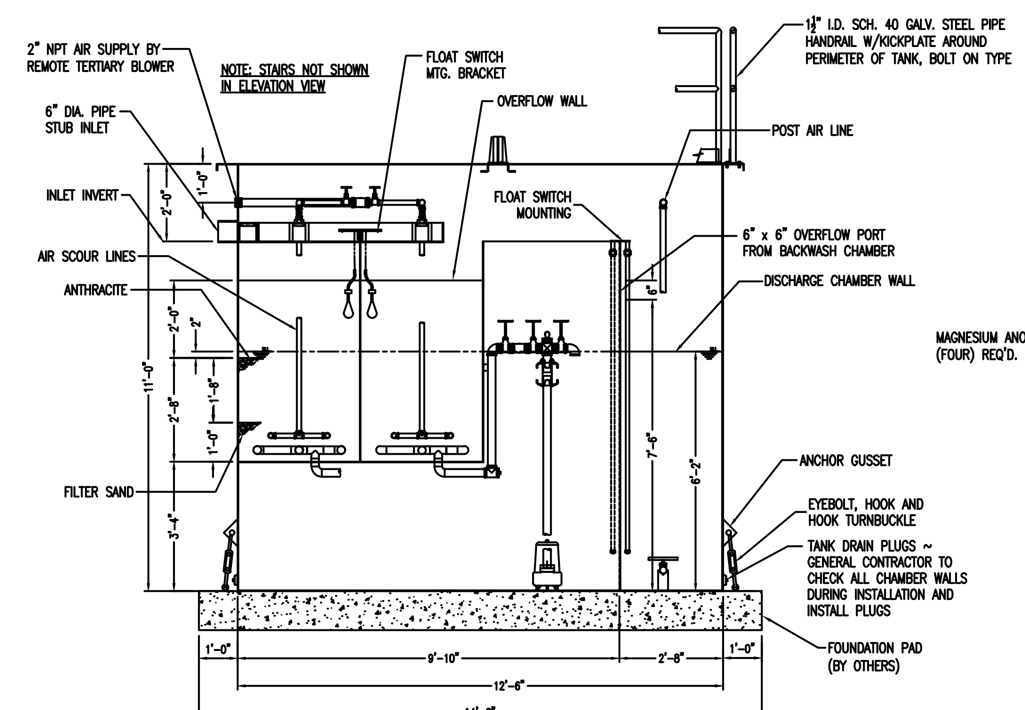
SURFACE PREPARATION:
ALL SURFACES SHALL RECEIVE A SSPC-10 NEAR WHITE METAL FINISH OBTAINING A 1.5 TO 3.0 MIL SURFACE PROFILE.

PAINT:
INTERIOR AND EXTERIOR APPLICATION THICKNESS SHALL BE 8 TO 10 MILS D.F.T. OF TNEMEC 46H-413 COAL TAR EPOXY OR EQUAL.

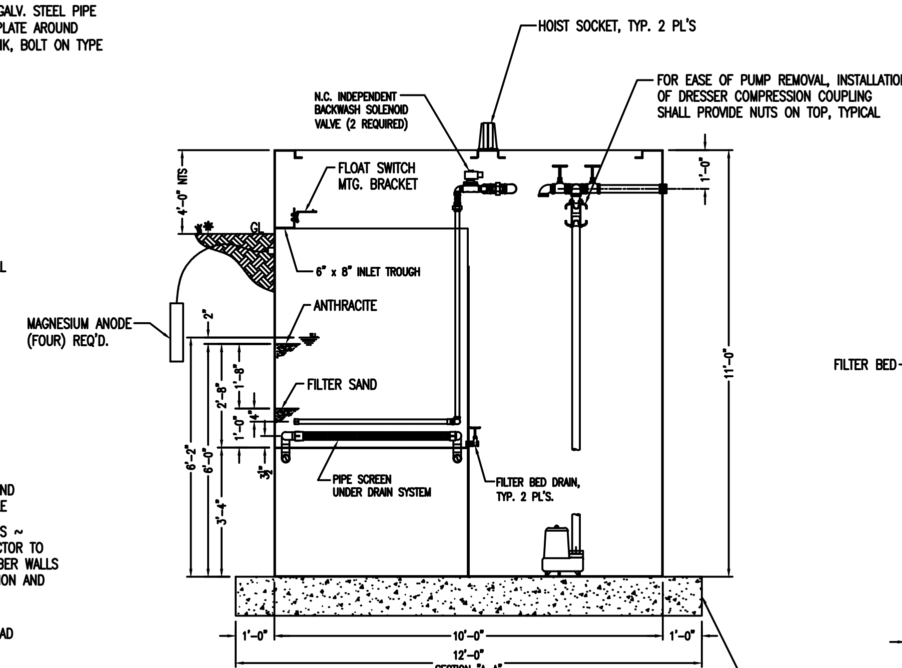
COLOR: BLACK FINISH: SATIN



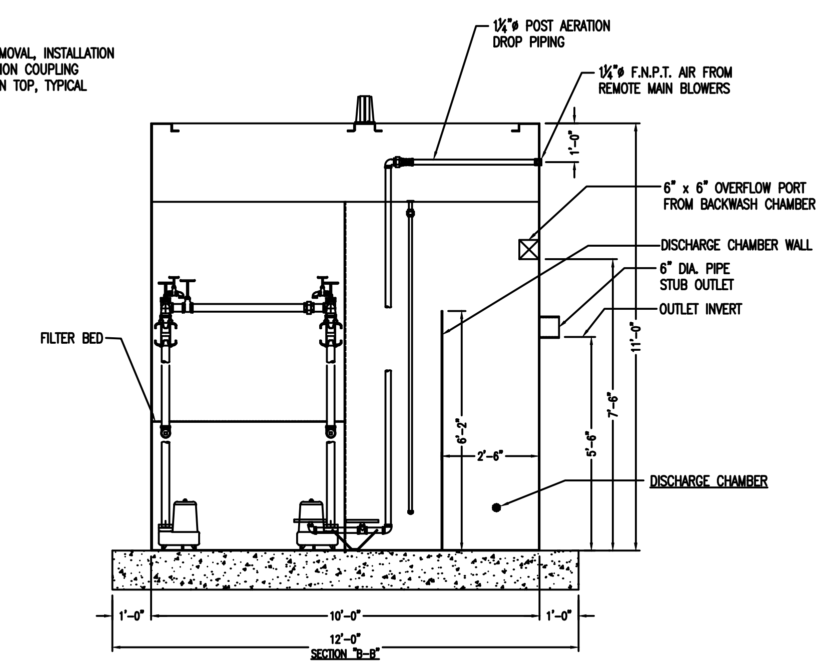
FLOAT SWITCH SETTINGS



SECTION THRU FILTER



SECTION "A-A"



SECTION "B-B"

FOUNDATION PAD THICKNESS TO BE DETERMINED BY PROJECT ENGINEER BASED ON LOCAL SOIL CONDITIONS. (CONCRETE BY OTHERS)

DESIGN DATA

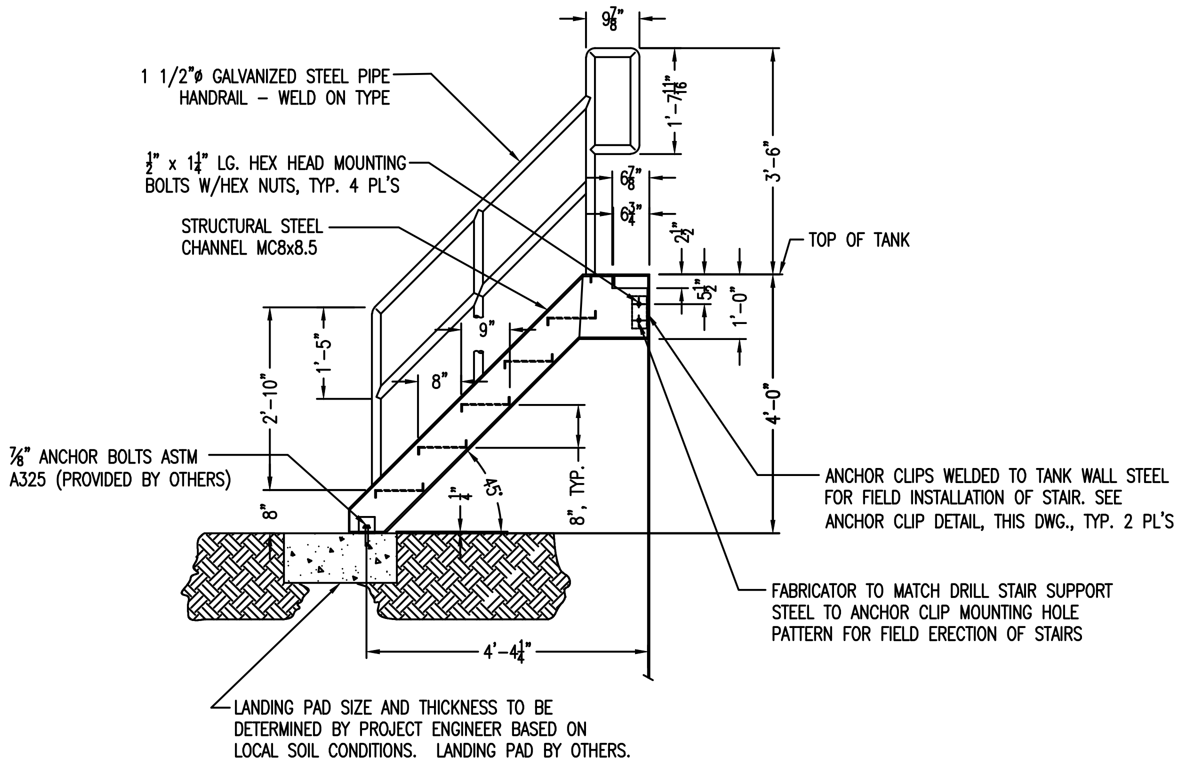
MODEL NO.	DESIGN FLOW G.P.D.	CLEARWELL VOL. GAL.	BACKWASH CHAMBER VOL. GAL.	FILTER BED TOTAL SQ. FT.
PST-31.5	45,000	2,520	2,520	31.5

NOTE:
THIS TANK STRUCTURE IS REINFORCED TO WITHSTAND NORMAL PRESSURES FROM THE SOIL AND FROM THE INTERIOR HYDROSTATIC LOAD ON ABOVE GRADE INSTALLATIONS. IF THERE IS A GROUND WATER PROBLEM, NOTIFY YOUR ENGINEER AND PURESTREAM IMMEDIATELY. PURESTREAM WILL NOT BE RESPONSIBLE FOR DAMAGE TO THE TANK STRUCTURE OR EQUIPMENT DUE TO GROUND WATER.

REVISIONS
R1, REVISED AS REQUESTED, PAT, 1-17-22
R2, REVISED AS REQUESTED, PAT, 1-27-22
R3, REVISED AS REQUESTED, PAT, 4-6-22

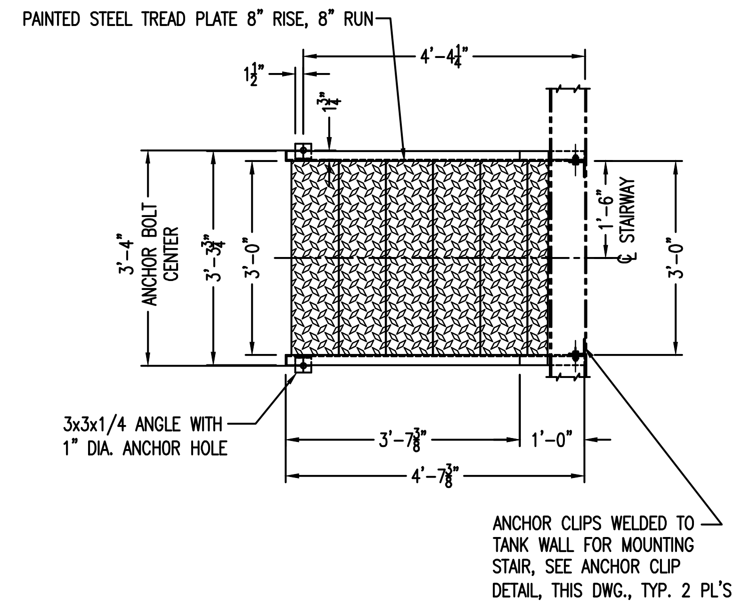
JOB NO: Q1902
JOB NAME: SUMMIT CLUB (WESTCHESTER)
LOCATION: NY
DRAWN BY: PAT DATE: 12-15-21

PURESTREAM INC.
DESCRIPTION: PREFABRICATED SEWAGE TREATMENT TERTIARY FILTER
SCALE: 24 DRG. SIZE: D PART& DRG.NO. Q1902S5-R3



ELEVATION VIEW

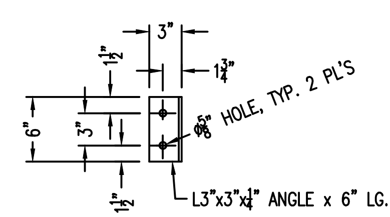
(TWO) STAIR ASSEMBLIES REQ'D.



HANDRAIL NOT SHOWN IN THIS VIEW

PLAN VIEW

(TWO) STAIR ASSEMBLIES REQ'D.



STAIR MOUNTING ANGLE CLIP DETIAL

2X SCALE

(TWO REQ'D.)

(TWO) STAIR ASSEMBLIES REQ'D.

NOTES:
LADDER SHALL BE HOT DIPPED GALVANIZED.
SEE PLANS FOR LOCATION OF STAIRS

FABRICATOR TO PROVIDE LOOSE FASTENERS PER STAIR ASSEMBLY

(4) ½" x 1¼" LG. HEX HEAD MOUNTING BOLTS W/HEX NUTS

REVISIONS		
R1, 4'-0" HIGH, PAT, 4-6-22	JOB NO: Q1902	PURESTREAM INC.
	JOB NAME: SUMMIT CLUB	DESCRIPTION 45' ACCESS LADDER, 4'-0" HEIGHT TREAD PLATE
	LOCATION: NY	
	DRAWN BY: PAT DATE: 1-18-22	SCALE: 19.2 DRG. SIZE C PART& DRG.NO. Q1902S6-R1