



MAMARONECK BEACH AND YACHT CLUB
555 SOUTH BARRY AVENUE
VILLAGE OF MAMARONECK, NEW YORK

DRAFT SUPPLEMENTAL ENVIRONMENTAL IMPACT STATEMENT
PROPOSED SANITARY SEWER SYSTEM UPGRADE



Photograph obtained from Mamaroneck Beach and Yacht Club website.

VOLUME 2 - APPENDICES

TRC Engineers, Inc.
April 13, 2016

XI. APPENDICES

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APPENDIX A

**DRAFT SUPPLEMENTAL ENVIRONMENTAL IMPACT STATEMENT (DSEIS) SCOPING
OUTLINE AS ADOPTED FEBRUARY 12, 2014**

VILLAGE OF



MAMARONECK

OFFICE OF THE
PLANNING DEPARTMENT

*Village Hall
Mamaroneck, N.Y. 10543*

TELEPHONE
914-777-7731

FAX
914-777-7792

*Address Reply to:
Planning Department
169 Mt. Pleasant Avenue
Mamaroneck, N.Y. 10543*

TO: ALL INVOLVED & INTERESTED AGENCIES

FROM: MAMARONECK VILLAGE PLANNING BOARD

PROJECT TITLE: Mamaroneck Beach & Yacht Club
555 South Barry Avenue
Village of Mamaroneck
County of Westchester
Section 4, Block 77, Lot 31
MR District

MAILING DATE: February 20, 2014

Re: Mamaroneck Beach & Yacht Club - Notice of Approval of a Resolution Adopting the Final Scope for the Draft Supplemental Environmental Impact Statement for the Sewer System Construction for property located at 555 South Barry Avenue.

Greetings:

On February 12, 2014, the Planning Board of the Village of Mamaroneck, acting as Lead Agency under the New York State Environmental Quality Review Act, approved the attached Resolution adopting the Final Scope for the Draft Supplemental Environmental Impact Statement (DSEIS) for a proposal to construct a new sewage pump station and sanitary force main ("Sanitary Sewer System Improvements") to serve the Mamaroneck Beach & Yacht Club ("Project Sponsor") property located at 555 South Barry Avenue. Pursuant to section 617.8 (f) of the SEQRA Regulations, the Resolution and Final Scope for the DSEIS are attached.

Thank you,

Robert James Galvin, AICP
Village Planner

RESOLUTION
VILLAGE OF MAMARONECK PLANNING BOARD
(Adopted February 12, 2014)

**RE: Mamaroneck Beach & Yacht Club
555 South Barry Avenue**

Resolution Adopting Final Scope for Draft Supplemental Environmental Impact Statement

After due discussion and deliberation, on motion by Mr. Sjunneemark, seconded by Mr. Wexler, and carried, the following resolution was adopted:

RESOLVED, that the Planning Board adopts the attached Final Scope dated February 12, 2014 for the ~~Mamaroneck Beach & Yacht Club Draft Supplemental Environmental Impact Statement for the~~ Proposed Site Sanitary Sewer System Upgrade.

VOTE: AYES: Ianniello, Wexler, Sjunneemark

NAYS: None

RECUSED: Sterk

ABSENT: Mendes

PLANNING BOARD
Village of Mamaroneck



Michael Ianniello, Chairman

Date: February 12, 2014

FINAL SCOPE

MAMARONECK BEACH AND YACHT CLUB
555 SOUTH BARRY AVENUE
MAMARONECK, NEW YORK

DRAFT SUPPLEMENTAL
ENVIRONMENTAL IMPACT STATEMENT (DSEIS)
February 12, 2014

This Final Scope outlines the issues to be covered in the Draft Supplemental Environmental Impact Statement (DSEIS) for the Proposed Site Sanitary Sewer System Upgrade for the Mamaroneck Beach and Yacht Club ("Proposed Action"). The outline reflects the recommendations of The SEQRA Handbook published by the New York State Department of Environmental Conservation, knowledge of issues in the area and review of information available in existing studies related to the subject site and surrounding area.

Name of Project: Mamaroneck Beach and Yacht Club
Site Sanitary Sewer System Upgrade

Project Location: 555 South Barry Avenue
Mamaroneck, New York

Applicant/Project Sponsor: Mamaroneck Beach and Yacht Club
555 South Barry Avenue
Mamaroneck, NY 10543
Contact: Lisa Rosenshein
(914) 698-3600

SEQRA Classification: Unlisted Action

Lead Agency: Village of Mamaroneck
Village Planning Board
Mamaroneck, New York

Lead Agency Contact: Mr. Michael Ianniello
Village Hall at the Regatta
123 Mamaroneck Avenue
Mamaroneck, New York 10543
Telephone-(914) 777-7703

Scoping Distribution: See Attached List.

Scope Adoption by Lead Agency: February 12, 2014

DESCRIPTION OF PROPOSED ACTION

The Proposed Action proposes a revision to the 2013 Amended Site Plan that had previously been submitted to the Village of Mamaroneck Planning Board on January 29, 2013 for Site Plan review and approval. Due to the age and condition of the existing sanitary pump station and force main, the Applicant proposes replacement of the referenced infrastructure. The proposed pump station and force main will be designed and constructed to current industry standards in accordance with permitting and approval requirements of all regulatory agencies having jurisdiction over the Proposed Action.

The location of the new pump station is proposed between the Great Lawn residence (2013 Site Plan) and the existing Manager's residence. From the new pump station, the force main is proposed in generally the same location as the existing force main, where it crosses under Otter Creek, traverses residential property at 519 Alda Road and connects to existing Village sanitary manhole #66449. The Proposed Action includes revising the onsite gravity sewer main and providing new sanitary service connections to existing buildings where appropriate. The work also includes minor modifications to proposed water service that may be impacted due to the realignment of the sanitary sewer system.

POTENTIAL SIGNIFICANT ADVERSE IMPACTS

Potential significant adverse impacts relate to sanitary sewer, natural resources, visual and aesthetic impacts, construction impacts, soils and topography.

GENERAL GUIDELINES

The primary goals of scoping are to focus the DSEIS on potentially significant adverse impacts and to eliminate consideration of those impacts that are irrelevant or insignificant. The DSEIS will address all components of the Proposed Action, including but not limited to the information needed to evaluate the various permits and approvals required to implement the Proposed Action.

The DSEIS will cover all items in this Final Scope and will conform to the format outlined in this document. Each impact issue (e.g., soils, etc.) will be identified and presented in a separate subsection which includes: (1) a discussion of existing conditions; (2) potential significant impacts associated with the Proposed Action; and (3) measures designed to mitigate the identified impacts, if any. The Existing Condition will be defined as the physical conditions as they currently exist on the Applicant's property, based on a current survey. The Potential Impacts of the Proposed Action will be compared to the "Existing Condition," the approved 2010 Site Plan and the proposed Amended 2013 Site Plan.

ENVIRONMENTAL IMPACT STATEMENT CONTENT

I. INTRODUCTION MATERIAL

A. Cover Sheet

The DSEIS will be preceded by a cover sheet that identifies the following:

1. Title of the document: Draft Supplemental Environmental Impact Statement.
2. Title of the Proposed Action.
3. Location: Street address; Village of Mamaroneck, Westchester County, New York, as well as the tax map designation of all properties that are part of the subject site.
4. Name, address and phone number of the lead agency, and name of contact person:

Lead Agency: Village Planning Board
Village of Mamaroneck

Contact Person: Mr. Michael Ianniello, Chairman
Mamaroneck Village Planning Board
Village Hall at the Regatta
123 Mamaroneck Avenue
Mamaroneck, New York 10543
Telephone (914) 777-7703

5. The name and address of the Project Sponsor (aka "the Applicant"), and the name and telephone number of a contact person representing the Applicant.
6. The name and address of the primary preparer(s) of the DSEIS, and the name and telephone number of a contact person representing the preparer(s).
7. Date of acceptance of the DSEIS:
8. Deadline by which comments on the DSEIS are due: [Note: Specific calendar date to be inserted later].

B. List of Consultants Involved With the Project

The names, addresses and project responsibilities of all consultants involved with the project will be listed.

C. Table of Contents

All headings which appear in the text will be presented in the Table of Contents, along with appropriate page numbers. In addition, the Table of Contents will include a list of figures, a list of tables, a list of appendices, and a list of additional DSEIS volumes, if any.

D. List of Involved and Interested Agencies and Permits and Approvals Required

II. EXECUTIVE SUMMARY

The DSEIS will include an executive summary. The executive summary will include information found elsewhere in the main body of the DSEIS and will be organized as follows:

- A. Brief description of the Proposed Action
- B. Summary of the anticipated impacts and proposed mitigation measures for each impact issue discussed in the DSEIS
- C. Summary description of the project alternatives in the DSEIS
- D. List of Involved and Interested Agencies and required approvals and/or permits, including any required legal instruments (i.e. easements)

III. DESCRIPTION OF THE PROPOSED ACTION

- A. Project Overview
- B. Regional, Village and Site Location
- C. Description of the proposed site development

A description of the proposed site sanitary sewer system including the gravity sewer, force main and pump station will be provided. This description will include components of the sewer system improvements designed to facilitate monitoring to prevent system failures and to mitigate the environmental impacts if repairs are required, including redundancies in the pump station to protect against system failure. Also any additional miscellaneous changes resulting from the sewer system revisions will be described. A description of the future ownership of the sewer system and all components, including the pump station, will be provided. A description of the ownership of the lands (including underwater lands) upon which the sewer line will be constructed, and the Applicant's property rights or entitlement to make use of such lands, shall be included. Impacts of the new sewer line on those publicly and privately owned lands shall be discussed. In addition, a description will be provided of the need for and status of the required easement to traverse the residential property at 519 Alda Road to connect to the existing Village sanitary manhole. A copy of all recorded easements or other legal instruments involving third parties required for the sewer line shall be attached as an Appendix to the DSEIS.

IV. PURPOSE AND NEED FOR THE PROPOSED ACTION

- A. Project Background and History
- B. Need for the Proposed Action
- C. Objectives of the Project Sponsor
- D. Public Benefits of the Proposed Action

V. ENVIRONMENTAL ANALYSIS

The DSEIS will include a discussion of the Existing Conditions, Potential Impacts of the Proposed Action and Proposed Mitigation measures. The Existing Condition will be defined as the physical conditions as they currently exist on the MBYC property. The Potential Impacts of the Proposed Action will be compared to the "Existing Condition," the approved 2010 Site Plan and the proposed 2013 Amended site Plan. The following categories will be included in the analysis:

A. Visual Character

1. Existing Conditions

The visual character of the site as it pertains to the location of the proposed sanitary pump station will be described including its relationship to the adjacent community and uses.

2. Potential Impacts

The visual impacts of the proposed pump station will be examined, utilizing photographic analyses and photo renderings to illustrate physical relationship to surrounding uses, streets and facilities. Potential impacts to public views will be analyzed including Otter Creek.

3. Proposed Mitigation

Mitigation measures that mitigate impacts (e.g. screening) on surrounding uses would be described.

B. Natural Features

1. Existing Conditions

Soils, Topography and Slopes

Existing soils, topography and slopes in the vicinity of the proposed work will be described. Existing retaining walls will be described.

Vegetation and Wildlife

Vegetative communities in the vicinity of the proposed work will be described. Wildlife likely to inhabit the vicinity of the proposed work, based on field investigations and review of existing data sources, will be described. Wildlife likely to inhabit the tidal area adjacent to the proposed work will be described. A list of any rare, endangered, threatened or special concern species or significant habitats found or expected to be found on this site will be provided. The New York State Department of Environmental Conservation will be contacted to determine any known occurrences of rare, endangered, threatened or special concern species or significant habitats on or in the vicinity of the site.

Wetlands & Streams

All Federal, State and locally regulated wetlands in the vicinity of the proposed work will be field delineated according to the definitions appropriate

to each jurisdiction. Existing wetland vegetation, soils and hydrology will be described. The existing functions and values provided by the wetlands will be qualitatively assessed.

The Otter Creek Critical Environmental area will be described.

2. Potential Impacts

Soils, Topography and Slopes

Proposed soil disturbance including cut and fill, trenching and potential sedimentation impacts would be discussed. Perform limited subsurface soil investigation to determine depth of rock. Impacts, if any, of soil disturbance and removal and addition of impervious surfaces would be discussed.

Wetlands & Streams

All wetlands areas should be mapped and identified by category, and the adjacent area boundary shown. All disturbances other than subsurface portion of the directional bore should be shown outside the wetland areas or justification provided for the disturbance. Any potential impacts to wetlands or wetland buffers from the Proposed Action, including approximate acreage or square footage affected, will be described. Any potential changes in wetland functions as a result of the proposed action will be described. Any permits required for the proposed activities will be described.

Vegetation and Wildlife

Potential impacts to vegetation and wildlife resulting from the Proposed Action will be described, including any potential impacts to the Otter Creek Critical Environmental Area. For Otter Creek an assessment of whether stream restoration is needed will be provided. Any potential restoration would be coordinated with the County.

3. Mitigation Measures

Soils, Topography and Slopes

Measures designed to mitigate potential adverse impacts to soils and topography will be discussed including a general sedimentation and erosion control plan prepared in accordance with the *New York State Standards and Specifications for Erosion and Sediment Control*, Fourth Printing, dated August 2005. Construction phasing as it pertains to the Proposed Action will be described. Requirements of all appropriate agencies will be described.

Vegetation and Wildlife

A conceptual landscape plan will be provided. Protection of significant vegetation and/or individual trees, if any, during construction and after completion of the Proposed Action will be provided.

Wetlands

Impacts to wetlands and wetland buffers will be minimized to the maximum extent practicable. A conceptual wetlands mitigation plan to restore or replace

potentially impacted wetlands, if impacted, will be provided. A discussion on how wetlands will be protected during construction and after completion of the Proposed Action will be provided.

Any impacts to Otter Creek will be minimized to the maximum extent practicable and mitigation measures to be taken will be described.

C. Sanitary Sewer System

1. Existing Conditions

A map and narrative describing the existing sanitary sewer system and the sanitary sewer systems shown on the 2010 Approved Site Plan and the 2013 Amended Site Plan will be provided. The plans will include locations and sizes of the sanitary sewers. The plans will establish the point of comparison for the proposed condition.

2. Potential Impacts

A map and narrative describing the revised sanitary sewers, the new force main and proposed pump station will be provided. Size and locations will be indicated. The proposed connection point to the Mamaroneck Sanitary Sewer District system will be shown and described. Schematic details of the pump station will be provided. Alternative locations of the pump station will be discussed, taking into consideration flood elevations on the site (as per the current LOMR for the property and FEMA ABFE map) and proximity to Otter Creek. A description will be provided of the capacity of the revised sewer system to handle the maximum usage under the 2010 Approved Site Plan and the 2013 Amended Site Plan will be provided (including the potential operation of all facilities and building occupancy, taking into account possible simultaneous multiple functions and events). Specifically, proposed average daily sanitary sewer flow (gpd) calculations shall be provided based on proposed land use. An appropriate peak factor (typically 4 in New York State) shall be applied to the proposed sanitary sewer calculations. The proposed sanitary sewer design (i.e. flow calculations, force main sizing and alignment and pump station shall be designed in accordance with Westchester County Department of Health (WCDOH) standards and coordinated with the Village Engineer. Potential impacts to other utilities (e.g. water pipe crossings) affected by the realignment of the sanitary sewer system will be discussed. Potential impacts related to the Otter Creek crossing, construction and noise will be discussed.

3. Proposed Mitigation

Protective measures to minimize impact to Otter Creek and adjacent wetlands will be discussed. Input and coordination with the Village Engineer and Westchester County DOH will be sought and incorporated into the design to minimize/avoid

impact to the municipal sewer system. Any information required by the DOH, an involved agency, to approve the proposed new sanitary sewer system, shall be provided.

D. Noise (Qualitative Analysis)

- I. Existing Conditions: An assessment of the existing noise conditions shall be summarized in the text.
2. Potential Impacts: Construction noise for the Proposed Action and compliance with Village ordinances will be discussed. Post-development noise levels associated with the pump station shall be estimated at sensitive locations to assess project impacts. The post-development noise levels shall be based upon measurements of additional noise produced by the sanitary pump station and construction related generators.

The combined noise levels shall be compared to published accepted noise sources and applicable industry standards for acceptable levels, specifically those identified in the New York State Department of Environmental Conservation policy statement, Assessing and Mitigating Noise Impacts.

3. Mitigation: Mitigation measures to reduce noise levels, both during construction and post-development, shall be analyzed.

E. Construction

The phase/sequence in which the sanitary sewer system will be constructed will be discussed, including conformance with all Village regulations. The proposed methods of construction to install the sanitary force main to minimize impact to Otter Creek will be discussed, including how the integrity of the sewer system improvements will be monitored both during and after construction.

VI. ALTERNATIVES

For each alternative listed, the Applicant will analyze the potential impacts (adverse as well as beneficial) for each category listed above.

- A. No Action
- B. Alternate force main alignment along South Barry Avenue. This alternative should include two options: an alignment under Otter Creek at South Barry Avenue, and an alignment attached to the Barry Avenue Bridge.
- C. Alternate force main alignment along Taylors Lane.
- D. For Alternatives B and C, or any other alternative requiring the construction of a pump station, alternative locations for that pump station should be analyzed, taking into consideration flood elevations on the site and proximity to Otter Creek.
- E. Private on-site wastewater treatment facility.

VII. ADVERSE ENVIRONMENTAL EFFECTS THAT CANNOT BE AVOIDED IF THE PROJECT IS IMPLEMENTED

VIII. IRREVERSIBLE AND IRRETRIEVABLE COMMITMENT OF RESOURCES

IX. Use and Conservation of Energy

X. Growth-Inducing, Cumulative and Secondary Impacts

XI. APPENDICES including but not limited to the following items:

- Sanitary Sewer Design Report
- Geotechnical Investigation Report (limited to area of proposed stream crossing work)
- Copy of recorded easement or other legal instruments involving third parties required for the sewer line.

Distribution List: Final Supplemental Environmental Impact Statement (SEIS) Scope

**Re: Mamaroneck Beach and Yacht Club
Sanitary Sewer Improvements**

**Harbor and Coastal Zone Management Commission
Cindy Goldstein, Chair
1066 Sea Haven Drive
Mamaroneck, New York 105463**

**Board of Architectural Review
Dennis Cucinella, Chair
207 No. Barry Avenue
Mamaroneck, New York 10543**

**Mayor and Board of Trustees
Village of Mamaroneck
123 Mamaroneck Avenue
Mamaroneck, New York 10543**

**Richard Slingerland, Village Manager
Village of Mamaroneck
123 Mamaroneck Avenue
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**Bill Gerety, Building Inspector
Village of Mamaroneck
123 Mamaroneck Avenue
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**Anthony Carr, Village Engineer
123 Mamaroneck Avenue
Mamaroneck, New York 10543**

**Susan Favate, Planning Consultant
Buckhurst Fish & Jacquemart, Inc.
115 Fifth Avenue
New York, New York 10003**

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Mamaroneck, New York 10543**

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White Plains, New York 10603

Agostino Fusco, Clerk-Treasurer
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Joseph Russo, Harbor Master
Village of Mamaroneck
123 Mamaroneck Avenue
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Robert Pecchia, Fire Chief
Village of Mamaroneck
123 Mamaroneck Avenue
Mamaroneck, New York 10543

Mamaroneck Public Library
136 Prospect Avenue
Mamaroneck, New York 10543

Westchester County Department of Health
145 Huguenot Street, 8th Floor
New Rochelle, New York 10801
Contact: Peter DeLucia, Assistant Commissioner, Bureau of Public Health Protection

Westchester County Department of Planning
148 Martine Avenue, Room 432
White Plains, New York 10601
Contact: Edward Burroughs, Commissioner

Westchester County Department of Environmental Facilities
270 North Avenue 6th Floor
New Rochelle, New York 10801
Contact: Thomas Lauro, Commissioner

Westchester County Department of Public Works
148 Martine Avenue
White Plains, New York 10601
Contact: Jay Pisco, Commissioner

**Westchester County Department of Planning and Soil Conservation
148 Martine Avenue, Room 432
White Plains, New York 10601
Contact: David Kvinge, Director of Environmental Planning**

**Town of Mamaroneck
Town Clerk
740 W. Boston Post Road
Mamaroneck, New York 10543**

**Joseph Carvin, Supervisor
Town of Rye
10 Pearl Street
Port Chester, New York 10573**

**New York State Department of State
Office of Communities and Waterfronts
99 Washington Avenue, Suite 1010
Albany, New York 12231-0001
Contact: George Stafford, Director**

**New York State Department of Environmental Conservation
Region 3 Office
21 South Putt Corners Road
New Paltz, New York 12561-1696
Contact: Margaret Duke**

**New York State Office of General Services
41st Floor, Corning Tower Empire State Plaza
Albany, New York 12242
Contact: RoAnn Destito, Commissioner**

**United States Army Corps of Engineers, North Atlantic Division
302 General Lee Avenue
Brooklyn, New York 11252
Contact: Donald Degidio, Colonel**

**Victor M. Tafur, Esq.
490 Bleeker Avenue
Mamaroneck, New York 10543**

**Shore Acres Property Owners Association (SAPOA)
c/o Daniel S. Natchez
916 East Boston Post Road
Mamaroneck, New York 10543-4109**

**Mamaroneck Beach & Yacht Club
555 South Barry Avenue
Mamaroneck, New York 10543**

**Mamaroneck Beach & Yacht Club
c/o Paul Noto Esq.
650 Halstead Avenue
Mamaroneck, New York 10543**

**NYSDES Headquarters
625 Broadway
Albany, New York 12233-0001
Attn: Rebecca Crist**

APPENDIX B

TECHNICAL REPORTS

APPENDIX B1

DRAFT ENGINEERS REPORT FOR ONSITE SANITARY SEWER AND PUMP STATION



DRAFT ENGINEERS REPORT
ONSITE SANITARY SEWERS AND PUMP STATION

MAMARONECK BEACH AND YACHT CLUB

555 South Barry Avenue
Mamaroneck, NY 10543
Tax Map Parcel: Section 4, Block 77, Lot 31

Applicant/Project Sponsor:

Mamaroneck Beach and Yacht Club

555 South Barry Avenue
Mamaroneck, NY 10543
Contact: Ms. Lisa Rosenshein
Tel: (914) 698-3600

Prepared by:

TRC Engineers, Inc.

7 Skyline Drive
Hawthorne, New York 10532
Tel: (914) 592-4040
TRC Project No.: 200001

Municipal Sewer System Owner:

Village of Mamaroneck
Village Hall at the Regatta
123 Mamaroneck Avenue
Mamaroneck, NY 10543

Authorization to submit to the Westchester County Department of
Health for Approval of Plans for a Wastewater Disposal System

Name: _____
Title: _____
Signature: _____
Date: _____

| Revision History | | |
|------------------|------|------------------|
| Rev. | Date | Description |
| 0 | | DSEIS Submission |

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4. Existing Sewer System
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Table No. 2 - Unit Flow Rates
Table No. 3 – On Season Sewage Flow Rate
Table No. 4 – Off Season Sewage Flow Rate
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Appendices

- A. Figures/Exhibits
 - 1) Site Location Map
- B. Pump Station Calculations
 - On Season
 - Off Season
- C. Manufacturer Catalog Sheets

References:

- Mamaroneck Village Code
- New York State Design Standards for Intermediate-Sized Wastewater Treatment Systems dated March 5, 2014
- Recommended Standards for Wastewater Facilities 2004 Edition

1. **Introduction**

The Mamaroneck Beach & Yacht Club (MBYC) Project is located at the southern end of South Barry Avenue in the Village of Mamaroneck, Westchester County, New York (Figure No. 1 - Site Location Map). The Project Sponsor/Applicant is proposing to upgrade the present club and will include demolition or reconstruction of several existing features including cabanas, pool, pedestrian paths and parking lots.

The Project will include alterations of the existing clubhouse and cabanas along with the construction of new amenities such as seasonal residences, recreation building, pedestrian paths, vehicle access roads and parking. Many of the existing features, including the existing gravel parking area adjacent to Otter Creek, existing buildings and tennis courts will remain in their present condition. The completed project is currently contemplated to be constructed in five (5) phases as further described below.

- Phase I – Yacht Club/Dockmaster Building;
- Phase II - Recreation Building, associated pool improvements, related utility and storm water improvements;
- Phase III - Great Lawn Seasonal Residence Building, adjacent paved parking, great lawn parking, related utility, sanitary and storm water improvements;
- Phase IV- Clubhouse and related utilities;
- Phase V – Beach Seasonal Residence Building, associated roadway, parking, utility and storm water improvements.

2. **Project Description**

The Project consists of the installation of a new 8" private sanitary sewer collection system and a sanitary sewer pump station to replace the existing systems within the Mamaroneck Beach and Yacht Club site. In accordance with the WCDOH rules and regulations an application will be filed for Approval of Plans for a Wastewater Disposal System for Sanitary Sewer Extension and Pump Station with a flow rate greater than 2,500 gallons per day.

3. **Floodplain**

The proposed pump station will be located in an area that has been defined as Flood Zone AE14 with BFEs of 14.0 (NAVD). Thus, the design of the pumping station was based upon the required protection within flood zone AE14.

The top elevation of the top slab of the proposed pump station has been designed to an elevation of 16.0 which is two (2) feet above the 100 year floodplain elevation to comply with the requirements of the Village Code and Design Standards, as follows:

- Chapter 186 Article I Flood Damage Prevention §186-5.B (3) (c) Utilities of the Village Code which states "New and replacement sanitary sewage systems shall be designed to minimize or eliminate infiltration of flood waters."
- New York State Design Standards for Intermediate-Sized Wastewater Treatment Systems dated March 5, 2014, Chapter B.5 recommends that lift stations and pump houses be watertight up to two (2) feet above the 100-year flood elevation.

4. Existing Sewer System

The project site is located in the Village of Mamaroneck and the Westchester County Mamaroneck Sewer Districts. Sewage from the site is collected in an onsite sewer system which drains to an existing onsite private submersible sewage pump station. The existing pump station is located in the lawn area south of the tennis courts and contains two (2) submersible pumps. Based on the available manufacturer's literature, provided by the owner, the two (2) pumps working together have an estimated pumping capacity of approximately 100 gallons per minute (gpm).

The existing pump station discharges through an existing 6-inch force main which traverses the site in a westerly direction. The existing force main crosses under Otter Creek where it discharges to the existing municipal gravity sewer system (Village manhole #66449) located in Alda Road.

The municipal sewer system to which the site discharges serves the residential neighborhood located immediately north of the site. The sewer system drains to a collector sewer located in South Barry Avenue, which drains to a County operated pump station located immediately south of Guion Creek. Sewage is pumped from the County pump station to a gravity sewer which drains to the Mamaroneck Wastewater Treatment Plant (WWTP). Department of Environmental Facilities (DEF) personnel have indicated that the pump station is presently operating at 1.38 MGD and has a design capacity of 2.88 MGD.

5. Sewage Flow Rate

Section B.6.b of the New York State Department of Environmental Conservation (NYSDEC) Design Standards for Intermediate-Sized Wastewater Treatment Systems (Design Standards) dated March 5, 2014 indicates that the design sewage flow rate is typically based on the flow rates determined using one (1) of the following three (3) methods:

1. Using the typical per unit hydraulic loading rates provided in Table B-3 of the NYSDEC Design Standards multiplied by the number of units;
2. Obtaining metered wastewater flow rates from existing or similar facilities; or
3. Obtaining metered daily water usage records from existing or similar facilities.

The unit flow rate was determined by calculating the average annual water usage rate and dividing by the total number of club members, resident staff members and non-resident staff members for a period of one (1) year from which an existing unit flow rate of 27 gallons per person per day was established. The determination of the unit flow rate based on metered water usage records is consistent with Method 3 of the Design Standards.

This unit flow rate is the average annual water usage rate or the average unit flow rate based on the entire year and does not consider the variations in the unit flow rates that will occur between on-season and off-season conditions. The design of the proposed pump station considers both of these conditions since it will operate on a year round basis. Based on the data utilized to determine the average annual unit flow rate, the unit flow rates for both the on-season and off-season conditions were determined. The calculated values, in gallons per person (gpd) per person for all conditions are presented in Table 2 below.

| Table 2 | |
|-------------------------------|----------------------|
| Unit Flow Rates | |
| Flow Condition | Unit Flow Rate (gpd) |
| Average Annual Unit Flow Rate | 27 |
| On-Season Unit Flow Rate | 42 |
| Off-Season Unit Flow Rate | 77 |

Further, the typical unit hydraulic flow rate of 110 gallons per bedroom per day for apartments from Table B-3 of the Design Standards was utilized for the proposed seasonal residences. These unit flow rates were applied to the total number of resident staff members, nonresident members and number of seasonal residences to determine the flow rates to the proposed pump station for both on and off season conditions.

The total number of members to be utilized in the analysis is as described in Table 18 of the Environmental Narrative dated February 2013 which indicates a new total population for the 2013 amended site plan of 900 persons. The total on-season population includes 31 resident staff members, 828 nonresident members and 41 persons in the seasonal residences. The total off-season population includes 30 resident staff members and

between 27 and 37 nonresident staff members for a total of 57 to 67 persons. For the off season analysis, the higher population value of 67 person was utilized.

Table 3 and Table 4 set forth the calculations for the average daily flow and peak hourly flow rate for the on and off season flow conditions to the proposed pump station. The Design Peak Hour Factor is based on the Harmon Peaking Factor as defined in the Recommended Standards for Wastewater Facilities, 2004 Edition and the formula below:

$$PF = \frac{18 + P^{1/2}}{4 + P^{1/2}}, \text{ where } P \text{ equals design contributing population in thousands}$$

| Table 3 | | | | | | |
|-----------------------------|--------------|-----------------|------------|----------------------|-----------------|-----------------|
| On-Season Sewage Flow Rate | | | | | | |
| Type of Use | No. of Units | No. of Bedrooms | Population | Unit Flow Rate (gpd) | Flow Rate (gpd) | Flow Rate (gpm) |
| Non Resident Members | | | 828 | 42 | 34,379 | 23.9 |
| Resident Staff Members | | | 31 | 42 | 1,724 | 1.2 |
| New Seasonal Residences | 18 | 1 | 41 | 110 | 1,980 | 1.4 |
| Totals | 18 | | 900 | | 38,083 | 26.4 |
| Peaking Factor | | | | | 3.8 | |
| Peak Hourly Flow Rate | | | | | 145,820 | 101.3 |
| Table 4 | | | | | | |
| Off-Season Sewage Flow Rate | | | | | | |
| Type of Use | | | Population | Unit Flow Rate (gpd) | Flow Rate (gpd) | Flow Rate (gpm) |
| Non Resident Members | | | 37 | 77 | 2,865 | 2.0 |
| Resident Staff Members | | | 30 | 77 | 2,323 | 1.6 |
| Totals | | | 67 | | 5,188 | 3.6 |
| Peaking Factor | | | | | 4.3 | |
| Peak Hourly Flow Rate | | | | | 22,244 | 15.4 |

6. Wastewater Collection System

A. Proposed Sanitary Sewer

The proposed sanitary sewer system extension will entail the installation of 8" PVC pipe and precast concrete manholes. The proposed sanitary sewer system has been designed and will be constructed in accordance with the requirements of the "Recommended Standards for Wastewater Facilities, Chapter 30 - Design of Sewers", Latest Edition and the Westchester County Department of Health approved plans.

B. Materials

- 1) Pipe material, as designated on the design drawings, shall be as follows:

- SDR-35, Type PSM polyvinyl chloride (PVC) sewer pipe and fittings in accordance with ASTM D-3034, "Standard Specification for Type PSM Poly (Vinyl Chloride) (PVC) Sewer Pipe and Fittings", latest revision.
 - Polyvinyl Chloride (PVC) Pressure Pipe (4-inch through 12-inch) Pressure class DR18 with CI pipe outside diameter conform to AWWA C900, latest revision; Joints shall employ an elastomeric seal (gasket) manufactured in conformance with ASTM F477.
 - Ductile iron gravity and pressure pipe shall conform to ASTM A746 - 09 Standard Specification for Ductile Iron Gravity Sewer Pipe and AWWA C111 and C151 (ANSI A21.51) standard. All pipe shall be new and shall have the AWWA or ASTM designation, pressure class and size of pipe stamped on the outside of each joint. Pipe shall be Special Thickness Class 52.
- 2) Precast Concrete Manholes
- Pre-cast concrete manholes shall be utilized with 4'-0" inside diameter and shall employ a flexible manhole pipe connection in accordance with "Resilient Connectors between Reinforced Concrete Manholes, Structures and Pipes", ASTM C 923.
 - Pre-cast concrete manholes shall be manufactured in accordance with ASTM C 478.
 - Manhole covers will be specified as watertight to minimize inflow and infiltration from flood waters.
 - Manhole vents will be provided as necessary.

C. Horizontal and Vertical Separation

Sewers shall be laid at least ten (10) feet horizontally from any existing or proposed water main. Sewers crossing water mains shall be laid to provide a minimum vertical distance of eighteen (18) inches between the outside of the water main and the outside of the sewer.

D. Low-Pressure Air Exfiltration Testing for Pipes

- 1) The air test shall conform to the test procedure described in ASTM F 1417 for plastic pipe. The test length shall not exceed one (1) interval of pipe between two (2) manholes.
- 2) After the pipe has been backfilled and cleaned, pneumatic plugs shall be placed in the line at each manhole and inflated to 25 psi. Low-pressure air shall be introduced into this sealed line until the internal air pressure reaches 4 psi greater than the average back pressure of any ground water that may be over the pipe. At least two (2) minutes shall be allowed for the air pressure to stabilize.
- 3) After the stabilization period (3.5 psi minimum pressure in the pipe), the portion of line being tested shall be acceptable if the time required in minutes for the pressure to decrease from 3.5 to 3.0 psi (greater than the average back

pressure of any ground water that may be over the pipe) is not less than five (5) minutes for an eight (8) inch diameter pipe.

E. Vacuum Testing of Manholes

- 1) ASTM C1244 Test Method for Concrete Sewer Manholes by the Negative Air Pressure (Vacuum) Test Prior to Backfill. This test method is only applicable to precast concrete manholes.
- 2) All lifting holes and exterior joints shall be filled and pointed with an approved non-shrinking mortar.
- 3) Manholes are to be tested prior to the placement of the pavement section.
- 4) All pipes and other openings into the manhole shall be suitably plugged in such a manner as to prevent displacement of the plugs while the vacuum is drawn.
- 5) Installation and operation of vacuum equipment and indicating devices shall be in accordance with equipment specifications and instructions provided by the manufacturer.
- 6) The test head may be placed in the cone section of the manhole. The rim-cone joint is not usually tested.
- 7) A vacuum of 10 inches of mercury shall be drawn. The time for the vacuum to drop to 9 inches of mercury shall be recorded.
- 8) Manhole shall pass if time required meets or exceeds values indicated in the following table.

| Table No. 5 - Manhole Vacuum Test Requirements | | | |
|--|------------------|--------|--------|
| | Manhole Diameter | | |
| Manhole Depth | 48" | 60 | 72 |
| 8 | 20 sec | 26 sec | 33 sec |
| 10 | 25 sec | 33 sec | 41 sec |
| 12 | 30 sec | 39 sec | 49 sec |
| 14 | 35 sec | 46 sec | 57 sec |
| 16 | 40 sec | 52 sec | 57 sec |
| 18 | 45 sec | 59 sec | 67 sec |

- 9) If the manhole fails the test, necessary repairs shall be made and the vacuum test repeated until the manhole passes the test. As an alternate method of acceptance, and only with the approval of the Engineer, the failed manhole may be tested in accordance with the standard infiltration/exfiltration test and rated accordingly.
- 10) If the manhole joint mastic or gasket is displaced during the vacuum test, the manhole shall be disassembled and the seal replaced.

7. Pump Station and Force Main Design

A. Submersible Pumps

Furnish and install two (2) Flygt NP 3085 SH3 Adaptive 256 submersible explosion proof non-clog wastewater pumps. Each pump shall be equipped with a 4.0 Hp submersible electric motor connected for operation on 208 volts, three (3) phase, 60 hertz with a minimum 50 feet of submersible cable (subcab) suitable for submersible pump applications.

B. Pump Station Calculations

Calculations for the Pump Station for both Peak Season and Off Season flow conditions are contained in Appendix B. The pumps station calculations have been summarized in Table No. 6 below.

| Table No. 6 - Pump Station Data | | | | |
|------------------------------------|------------|------|-------------|------|
| Description | Off Season | | Peak Season | |
| Design Average Inflow (I) = | 4 | gpm | 26 | gpm |
| Design Peak Hourly Inflow (I) = | 15 | gpm | 101 | gpm |
| Pump Flow Rate, Pump A, Qdp = | 113 | gpm | 115 | gpm |
| Force Main Velocity, Pump A = | 2.9 | fps | 2.9 | fps |
| Static Head (Maximum) | 33.0 | ft. | 32.0 | ft. |
| Friction Loss, Hf = | 16.2 | ft. | 16.8 | ft. |
| TDH (Maximum) = | 49.3 | ft. | 48.8 | ft. |
| Design Average Cycle Time (Tavg) = | 27.5 | Min. | 13.4 | Min. |

C. Precast Concrete

The proposed wet well and valve vault shall be constructed of reinforced precast concrete in accordance with the following minimum requirements.

- 1) Precast Reinforced Concrete Manhole Sections shall conform to the requirements of "Precast Reinforced Concrete Manhole Sections", ASTM C478 and AASHTO M199, latest revisions.
- 2) Reinforcing bars shall conform to the requirements of ASTM A767/A767M-09 Standard Specification for Zinc-Coated (Galvanized) Steel Bars for Concrete Reinforcement.
- 3) Joints between riser sections shall be rubber gasket joint sealer in accordance with the Specifications for Joints for Circular Concrete Sewer and Culvert Pipe Using Flexible Watertight Gaskets," AASHTO Designation M198 (ASTM C 990).
- 4) Gravity pipe to manholes connections shall include resilient connectors for connections between precast structures and pipes conforming to ASTM C923, "Resilient Connectors between Reinforced Concrete Manholes Structures, Pipes and Laterals".
- 5) Force main wall penetrations shall be sealed with Link-Seal® Model "S-316" Modular Seal or approved equal.
- 6) Precast concrete structures shall be designed for H20 traffic loading, where appropriate.

- 7) The minimum compressive strength of the concrete used for all precast structures shall be 4,000 psi. Where steps are required in structures, steps shall be installed during the casting of the structures, aligned as specified herein and on the Drawings.
- 8) Joints in the structures shall be tongue and groove joints, formed in such a manner so that a rubber seal can be applied.
- 9) Flat top slabs and base slabs shall be manufactured with two layers of steel reinforcement, one located near the bottom surface and one located near the top surface.

D. Level Control System

Liquid level measurement and control for the Pump Station will be controlled by a level transducer with settings at Low Level Alarm, Pump Off, Lead Pump On, Lag Pump On and High Level Alarm.

The Pump Controller will be set up with two (2) operational modes, one for the peak season and one for the off season which would allow for a change the level set points with a push of a button without going into the basin. The level transducer (see attached) will provide a wide range of available set points and (2) floats for back up.

One pumps will be furnished with a Flygt Mix-Flush valve. With the MultiSmart, a setting will be created for the off-season, so that the pump with the flush valve would start every five (5) minutes regardless of the level in the basin and run for a half minute to a minute to stir the basin.

E. Force Main Design

1) Design Parameters

- a. The proposed force main diameter will be 4 inches;
- b. The proposed force main will have a minimum cleansing velocity of 2 feet per second at the design pumping rate;
- c. The proposed force main shall be installed with a 4'-0" depth of cover;
- d. Friction loss calculations through the force main are based on the Hazen-Williams formula. A "C" value of 120 has been utilized in the design calculations.
- e. The proposed force main will enter a receiving manhole located 15 feet from the Village sewer manhole. This will provide a smooth flow transition to the existing gravity sewer system;
- f. The interior surface of the receiving manhole shall receive a coat of a crystalline waterproof coating.

2) Force Main Materials

- a. Polyethylene pipe shall be made from HDPE material having a material designation code of PE3608 or higher. The material shall meet the requirements of ASTM D 3350 and shall have a minimum cell classification of PE345464C. In addition, the material shall be listed as meeting NSF-61. The pipe and fittings shall meet the requirements of AWWA C906. HDPE pipe shall be rated for use at a pressure class of 125 psi. The outside diameter of the pipe shall be based upon the dips sizing system. Butt fusion: the pipe shall be joined by the butt fusion procedure outlined in ASTM F 2620 or PPI TR-33. All fusion joints shall be made in compliance with the pipe or fitting manufacturer's recommendations. Fusion joints shall be made by qualified fusion technicians per PPI TN-42.
- b. Polyvinyl Chloride (PVC) Pressure Pipe (4-inch through 12-inch) Pressure class DR18 with CI pipe outside diameter conform to AWWA C900, latest revision; Joints shall employ an elastomeric seal (gasket) manufactured in conformance with ASTM F477.
- c. Ductile iron pipe shall conform in all aspects to the requirements of AWWA Specifications C150 and C151, latest revisions. Pipe shall conform to the standard dimensions of push on joint pipe, Special Class 52. Rubber gasket joints for ductile iron pipe and fittings shall conform to AWWA Specification C111, latest edition.
- d. Fittings shall be ductile iron compact fittings (3 inch through 24 inch) rated for 350-psi in accordance with AWWA specification C153, latest revision. Fittings shall be furnished with push on joints in accordance with AWWA Specification C111, latest revision.
- e. Valves shall be mechanical joint, iron body, resilient seated gate valves in accordance with AWWA C509, latest edition. Valves shall have non rising stems, nut operated to open left. Valve boxes shall be cast iron, extension sleeve type, suitable for the depth of cover required by the drawings. Valve boxes shall be not less than 5 inches in inside diameter and shall be provided with suitable cast iron bases and lids marked "SEWER". All parts of valve boxes, bases, and covers shall be shop coated by dipping in an asphalt varnish.

3) Testing

- a. Hydrostatic leakage testing for polyethylene pipe shall comply with ASTM F 2164-02 Standard Practice for Field Leak Testing of Polyethylene (PE) Pressure Piping Systems Using Hydrostatic Pressure. Pneumatic (compressed air) leakage testing of HDPE pressure piping is not permitted.

- b. A hydrostatic pressure and leakage test for ductile iron pipe shall be conducted in accordance with AWWA specification C600, latest revision.
- c. The minimum hydrostatic test pressure shall be 50 psi.

F. Telemetry

The Pump Station Control Panel will be monitored by an alarm dialer system mounted adjacent to the Control Panel and wired to monitor any alarm signal generated by the Control Panel. In the event that an alarm signal is received from the control panel, the auto-dialer initiates the auto-dial sequence of owner supplied contact(s) telephone numbers. In the event that the phone number dialed does not answer, the auto-dialer shall default to the next priority telephone number. This process shall continue until the auto-dialer call is answered and the alarm has been acknowledged.

G. Control Panel Description

The control panel shall be provided with the following minimum features:

- Custom Three Phase Duplex Intrinsically Safe Control Panel
 - Alternating Pump Down Operation
- Three Phase Incoming Power
- 208/230/460:120 Vac, Transformer
 - For 120 Vac Control/Alarm Circuits
- NEMA Type 4X Rated Enclosure
 - Type 304 Stainless Steel Wall Mount
 - Pad-Lockable Handle
 - Deadfront w/ Inner Swing-Out Door
- Alarms (Activated By High Level Float)
 - Red Alarm Beacon
 - Alarm Horn
- Heavy Duty Oil Tight Indicator Lights (22mm LED Full Voltage Type)
 - 2 Green Pump Run Indicators (Inner Door Mount)
 - 2 Amber Seal Failure Indicators (Inner Door Mount)
 - 2 Red Thermal Cutout Indicators (Inner Door Mount)
- Heavy Duty Oil Tight Switches (22mm)
 - 2 Pump Hand-Off-Automatic Switches (Inner Door Mount)
 - Lead/Lag Selector Switch (Inner Door Mount)
 - Alarm Test Push Button Switch (Inner Door Mount)
 - Alarm Silence Push Button Switch (Enclosure Side Mount)
- 2 IEC Rated Contactors
 - 18 Amp
- 2 IEC Rated Motor Protective Switches (Short Circuit & Overload Protection)
 - Range, 13.0-18.0 Fla

- Non-Powered Auxiliary Contacts
 - Dry Contacts For High Level & Common Pump Fail (Seal Fail & Thermal Cutout)
- UL Listed (UL File 698a) For Control Panel Relating To Hazardous Locations with Intrinsically Safe Circuit Extensions
- Float control liquid level measurement and control set at Low Level Alarm, Pump Off, Lead Pump On, Lag Pump On and High Level Alarm.
- Elapsed time meter for each pump.

8. Ownership & Maintenance

Upon completion of construction and receipt of a Competed Works Approval (CWA), the onsite private sanitary sewer system will be owned and maintained by the Property Owner. An Operations and Maintenance Manual (O&M Manual) will be prepared for the proposed pump station and force main and will contain ownership information, contractor and sub-contractor names and addresses, consultant names and addresses, approving agency names and addresses, applicable permits and approvals, copies of applicable easements and/or legal agreements, approved drawings, engineers design report, technical specifications, submittals log, approved submittals, as-built drawing(s), WC DOH completed works approval (CWA), and manufacturer operation and maintenance manuals for the proposed pumps and pump controller.

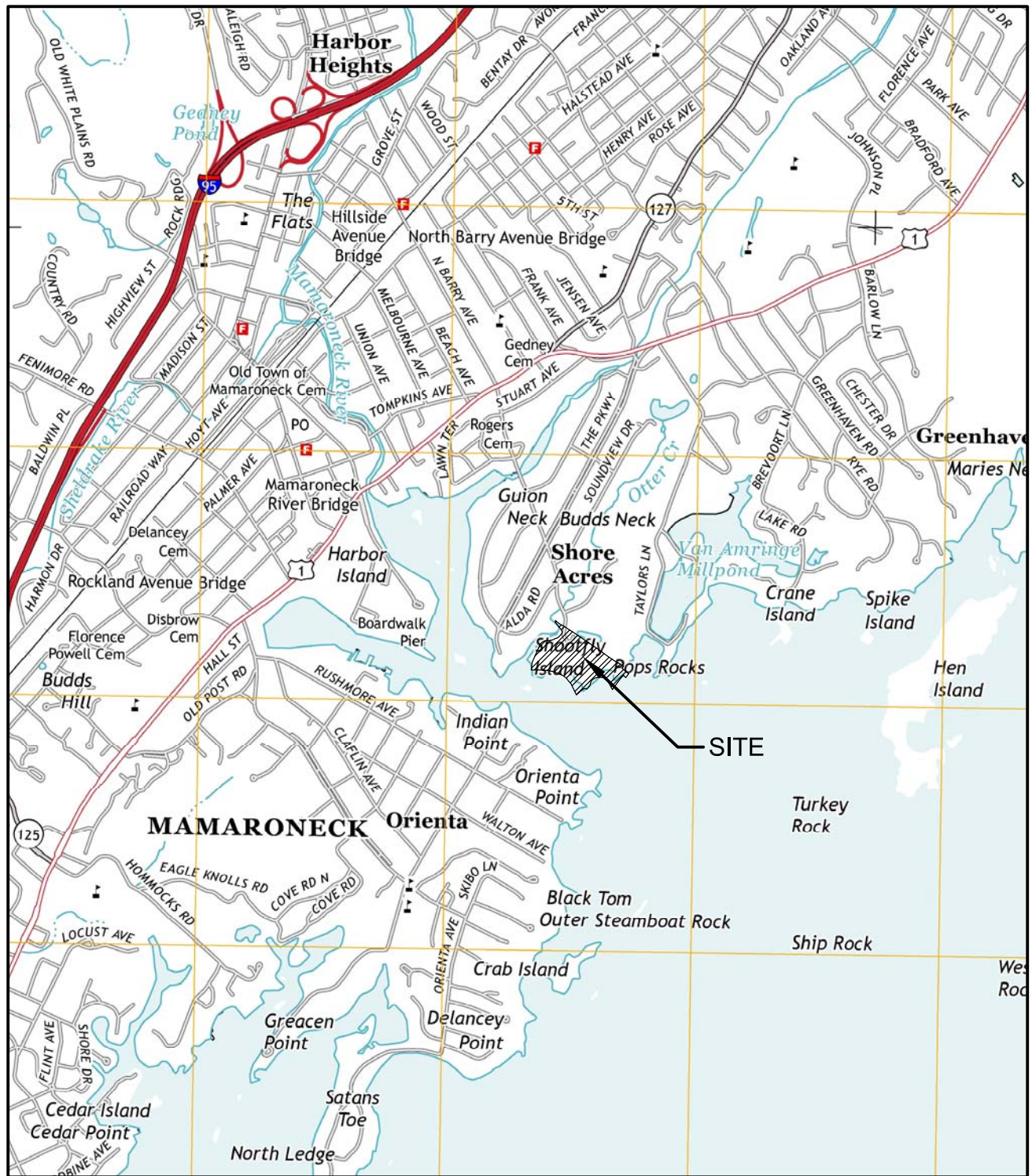
The O&M Manual will outline routine force main test procedures. Testing would be scheduled during the off-season so as not to impact club operations.

- Pressure and leakage test of the proposed force main will be conducted once every five (5) years along with the required test procedure and pressure.
- A dye test will be conducted once every five (5) years to determine visual evidence of leaks in conjunction with the pressure and leakage test.
- The test procedures will be performed under the supervision of a Consulting Engineer retained by the Club and/or the Village Engineer and Building Inspector.
- Any deficiencies which may be noted or observed during the test procedure will be repaired to the satisfaction of the Village Engineer.

Under New York State Education Law Article 145 (Engineering), Section 7209 (2), it is a violation of this law for any person, unless acting under the direction of a Licensed Professional Engineer, to alter this document.

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APPENDIX A
FIGURES/EXHIBITS



Source: USGS NY_Mamaroneck_20130322_TM_geo.pdf



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Project No. 200001
Scale 1"=2000'

Site Location Map
Mamaroneck Beach and Yacht Club
Village of Mamaroneck, NY

APPENDIX B
PUMP STATION CALCULATIONS

TRC Engineers, Inc.

Project: Mamaroneck Beach and Yacht Club
South Barry Avenue Alternative
Village of Mamaroneck, NY

Project No.: 200001

Comp. By: RPP

Subject: Lift Station Equivalent Pipe Length

Chckd. By: TDH

| Equivalent Pipe Length - Wet Well & Valve Vault | | | | | |
|--|------------|-----------|----------|-------------|--------|
| | Coef., "C" | Pipe Size | Quantity | Eqv. Length | Length |
| Flanged Base Elbow | 100 | 4 | 1 | 6 | 6 |
| Flanged Elbow | 100 | 4 | 1 | 6 | 6 |
| Flanged Swing Check Valve | 100 | 4 | 1 | 40 | 40 |
| Flanged Plug Valve | 100 | 4 | 1 | 3 | 3 |
| Flanged Tee Branch, Tee | 100 | 4 | 1 | 14 | 14 |
| Flanged NRS Gate Valve | 100 | 4 | 1 | 3 | 3 |
| Flanged Tee Branch, Tee | 100 | 4 | 1 | 14 | 14 |
| Equivalent Pipe Length = | | | | | 86 |
| Force Main Equivalent Pipe Length - Valve Vault to SMH | | | | | |
| | Coef., "C" | Pipe Size | Quantity | Eqv. Length | Length |
| 45 Bend - Hor. | 100 | 4 | 6 | 4 | 24 |
| 45 Bend - Vert. | 100 | 4 | 2 | 4 | 8 |
| 11.25 Bend - Hor. | 100 | 4 | 3 | 2 | 6 |
| Equivalent Pipe Length = | | | | | 38 |
| Total Equivalent Pipe Length | | | | | |
| Pump Station Piping (ft.) = | | | | | 86 |
| Force Main Piping (ft.) = | | | | | 38 |
| Sub-total Equivalent Pipe Length = | | | | | 124 |
| Coef., "C" = | | | | | 120 |
| Coef., "C" Adjustment = | | | | | 0.714 |
| Sub-total Equivalent Pipe Length = | | | | | 174 |
| Straight Pipe Lift Station | | | | | 15 |
| Straight Pipe Force Main | | | | | 1300 |
| Total Equivalent Pipe Length = | | | | | 1489 |
| Eqv. length values taken from Crane Pumps & Systems Engineering Information Manual | | | | | |

TRC Engineers, Inc.

Project: Mamaroneck Beach and Yacht Club
South Barry Avenue Alternative
Village of Mamaroneck, NY

Subject: Duplex Submersible Lift Station
On Season Flow Conditions

Project No.: 200001

Comp. By: RPP

Chkd. By: TDH

| PUMP STATION DATA | |
|-------------------------|-------|
| Station Grade Elev. | 16.00 |
| Wet Well Floor Elev. | -4.00 |
| Invert In | 0.53 |
| Discharge Pipe Size | 4 |
| Village MH 66476 Invert | 30.53 |

| FORCE MAIN DATA | |
|------------------------------|----------|
| Equivalent Length (ft.) | 1489 |
| Size (in.) | 4 |
| Pipe Class | DIP CL52 |
| Invert Elev. At Discharge MH | 30.53 |
| Peak Elev. In Force Main | 30.53 |
| Coef., "C" | 120 |

| SYSTEM HEAD DATA | | | | | |
|--------------------|-------------------------------|-------------|-------------------------------------|--------------------------|--------------------|
| System Head Loss | | | Manufacturers Pump Head Curve | Total Dynamic Head (TDH) | |
| Pump Rate (gpm) | Friction Loss per 1000 ft. | Hf (ft.) | | Lead Pump (feet) | Lag Pump (feet) |
| 80.0 | 5.8 | 8.57 | 56.0 | 40.60 | 39.85 |
| 90.0 | 7.2 | 10.65 | 53.7 | 42.68 | 41.93 |
| 100.0 | 8.7 | 12.95 | 51.5 | 44.98 | 44.23 |
| 110.0 | 10.4 | 15.45 | 49.8 | 47.48 | 46.73 |
| 120.0 | 12.2 | 18.15 | 48.0 | 50.18 | 49.43 |
| 130.0 | 14.1 | 21.05 | 46.3 | 53.08 | 52.33 |
| 140.0 | 16.2 | 24.15 | 44.1 | 56.18 | 55.43 |

| HEAD CALCULATION | |
|-------------------------------|----------|
| Pump Flow Rate, Pump A, Qdp = | 115 gpm |
| Force Main Velocity, Pump A = | 2.94 fps |
| Static Head (Maximum) | 32.0 ft. |
| Friction / 1000 Ft. = | 11.3 |
| Friction Loss, Hf = | 16.8 ft. |
| TDH (Maximum) = | 48.8 ft. |

| WET WELL VOLUME | |
|--|--------------------|
| Wet Well Dimension | 5.33 Square |
| Vol./ Ft. of Depth | 212 gallons / foot |
| Lead Pump On Depth 18 | 1.50 Feet |
| Vww, Volume of Wet Well (Lead Pump) | 319 gallons |
| Lag Pump On Depth 9 | 0.75 Feet |
| Vww, Volume of Wet Well (Lead plus Lag Pump) | 478 gallons |

TRC Engineers, Inc.

Project: Mamaroneck Beach and Yacht Club
 South Barry Avenue Alternative
 Village of Mamaroneck, NY

Subject: Duplex Submersible Lift Station
 On Season Flow Conditions

Project No.: 200001

Comp. By: RPP

Chkd. By: TDH

| PUMP CYCLE TIME | | |
|------------------------------------|---|---------------------------|
| Average Cycle Time (Tavg) | $\frac{V_{ww}}{Q(dp) - Q(l)}$ | $+$ $\frac{V_{ww}}{Q(l)}$ |
| Design Average Inflow (I) = | 33 gpm | |
| Design Average Cycle Time (Tavg) = | 13 minutes 10 < Tavg < 30 | |
| Design Fill Time (Lead Pump) = | Wet Well Volume ÷ Design Average Inflow | |
| Design Fill Time (Lead Pump) = | 10 < 30 Minutes | |

| STATION ELEVATION DATA | | |
|-------------------------|------|-----------|
| Description | | Elevation |
| Wet Well Floor Elev. | | -4.00 |
| Minimum Submerged Depth | 12.0 | 1.00 |
| Lead Pump Off Elev. | | -3.00 |
| Lead Pump On Elev. | | -1.50 |
| Lag Pump On Elev. | | -0.75 |
| Alarm On Elev. | 6.0 | -0.25 |
| Invert In | 9.4 | 0.53 |

| PUMP DATA | | | |
|------------------------------|-------|--------------------------|--------|
| Duplex Submersible Pumps | | PUMP A | PUMP B |
| Pump Manufacturer | | FLYGT | |
| Pump Model No. | | NP 3085 SH3 Adaptive 256 | |
| Electrical Data | HP | 4.0 | 4.0 |
| | Volts | 208 | 208 |
| | Phase | 3 | 3 |
| | RPM | 3430 | 3430 |
| Discharge Pipe Size (inches) | | 4 | 4 |

| DISPLACED AIR VOLUME | | |
|--|-----|------------|
| V _{ww} , Volume of Wet Well (Lead Pump) = | 319 | gallons |
| V _{ww} , Volume of Wet Well (Lead Pump) = | 43 | Cubic Feet |
| Design Average Cycle Time (Tavg) = | 13 | Minutes |
| Displaced Air Volume = | 3.2 | CFM |

TRC Engineers, Inc.

Project: Mamaroneck Beach and Yacht Club
 South Barry Avenue Alternative
 Village of Mamaroneck, NY

Subject: Duplex Submersible Lift Station
 On Season Flow Conditions

Project No.: 200001

Comp. By: RPP

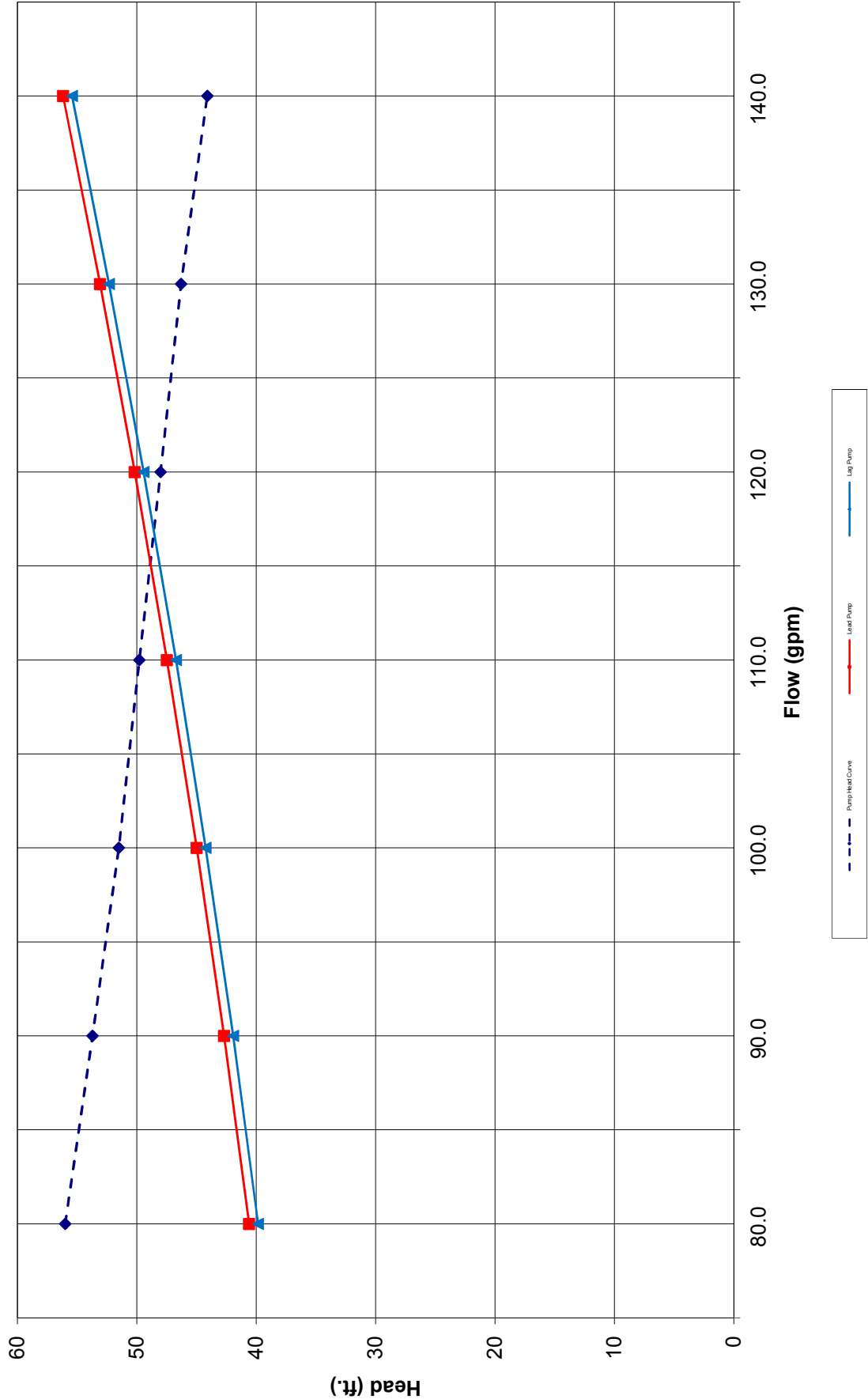
Chkd. By: TDH

| WET WELL STORAGE | | |
|-----------------------------|----------------|-----------|
| Description | | Elevation |
| Lead Pump Off Elev. = | | -3.00 |
| Invert In = | | 0.53 |
| Wet Well Storage Depth = | Feet | 3.53 |
| Vol./ Ft. of Depth = | Gallons / foot | 212 |
| Wet Well Storage Volume = | Gallons | 750 |
| Design Average Inflow (I) = | gpm | 33 |
| Wet Well Storage Time = | minutes | 22 |

| FORCE MAIN VOLUME | | |
|--|------|---------------|
| 4-Inch pipe volume = | 0.65 | Gallons/foot |
| Force Main Length = | 1300 | Length |
| Total Force Main Volume = | 849 | Gallons |
| Design Average Pumped Volume per Cycle = | 319 | Gallons/cycle |
| No. of Pump Cycles to Purge Force Main = | 2.7 | No. Cycles |
| Design Average Cycle Time (Tavg) = | 13 | Minutes |
| Average Force Main Residence Time = | 36 | Minutes |

| VENTILATION RATE | |
|-------------------------------|-------|
| Station Grade = | 16.00 |
| Invert Elevation = | -4.00 |
| Top Slab Thickness = | 1.00 |
| Wet Well Depth = | 19.0 |
| Wet Well Diameter = | 5.3 |
| Wet Well Volume (Cu. Ft.) = | 424 |
| No. of Air Changes per Hour = | 30 |
| Min. Air Change Rate (cfm) = | 212 |

System Head Curve On Season Conditions
Sanitary Lift Station



TRC Engineers, Inc.

Project: Mamaroneck Beach and Yacht Club
 South Barry Avenue Alternative
 Village of Mamaroneck, NY

Subject: Duplex Submersible Lift Station
 Off Season Flow Conditions

Project No.: 200001

Comp. By: RPP

Chkd. By: TDH

| PUMP STATION DATA | |
|-------------------------|-------|
| Station Grade Elev. | 16.00 |
| Wet Well Floor Elev. | -4.00 |
| Invert In | 0.53 |
| Discharge Pipe Size | 4 |
| Village MH 66476 Invert | 30.53 |

| FORCE MAIN DATA | |
|------------------------------|----------|
| Equivalent Pipe Length (ft.) | 1489 |
| Size (in.) | 4 |
| Pipe Class | DIP CL52 |
| Invert Elev. At Discharge MH | 30.53 |
| Peak Elev. In Force Main | 30.53 |
| Coef., "C" | 120 |

| SYSTEM HEAD DATA | | | | | |
|--------------------|-------------------------------|-------------|-------------------------------------|--------------------------|--------------------|
| System Head Loss | | | Manufacturers Pump Head Curve | Total Dynamic Head (TDH) | |
| Pump Rate (gpm) | Friction Loss per 1000 ft. | Hf (ft.) | | Lead Pump (feet) | Lag Pump (feet) |
| 80.0 | 5.8 | 8.57 | 56.0 | 41.60 | 41.10 |
| 90.0 | 7.2 | 10.65 | 53.7 | 43.68 | 43.18 |
| 100.0 | 8.7 | 12.95 | 51.5 | 45.98 | 45.48 |
| 110.0 | 10.4 | 15.45 | 49.8 | 48.48 | 47.98 |
| 120.0 | 12.2 | 18.15 | 48.0 | 51.18 | 50.68 |
| 130.0 | 14.1 | 21.05 | 46.3 | 54.08 | 53.58 |
| 140.0 | 16.2 | 24.15 | 44.1 | 57.18 | 56.68 |

| HEAD CALCULATION | |
|-------------------------------|------------------|
| Pump Flow Rate, Pump A, Qdp = | 113 gpm |
| Force Main Velocity, Pump A = | 2.89 fps > 2 fps |
| Static Head (Maximum) | 33.0 ft. |
| Friction / 1000 Ft. = | 10.9 |
| Friction Loss, Hf = | 16.24 ft. |
| TDH (Maximum) = | 49.3 ft. |

| WET WELL VOLUME | |
|--|--------------------|
| Wet Well Dimension | 5.33 Square |
| Vol./ Ft. of Depth | 212 gallons / foot |
| Lead Pump On Depth 6 | 0.50 Feet |
| Vww, Volume of Wet Well (Lead Pump) | 106 gallons |
| Lag Pump On Depth 6 | 0.50 Feet |
| Vww, Volume of Wet Well (Lead plus Lag Pump) | 212 gallons |

Project: Mamaroneck Beach and Yacht Club
South Barry Avenue Alternative
Village of Mamaroneck, NY

Subject: Duplex Submersible Lift Station
Off Season Flow Conditions

Project No.: 200001

Comp. By: RPP

Chkd. By: TDH

| CYCLE TIME | | |
|------------------------------------|---|-------------------------|
| Design Average Cycle Time (Tavg) = | $\frac{V_{ww}}{Q(dp) - Q(I)}$ | + $\frac{V_{ww}}{Q(I)}$ |
| Design Average Inflow (I) = | 4 gpm | |
| Design Average Cycle Time (Tavg) = | 28 minutes | 10 < Tavg < 30 |
| Design Fill Time (Lead Pump) = | Wet Well Volume ÷ Design Average Inflow | |
| Design Fill Time (Lead Pump) = | 27 < 30 Minutes | |

| STATION ELEVATION DATA | | |
|-------------------------|------|-----------|
| Description | | Elevation |
| Wet Well Floor Elev. | | -4.00 |
| Minimum Submerged Depth | 12.0 | 1.00 |
| Lead Pump Off Elev. | | -3.00 |
| Lead Pump On Elev. | | -2.50 |
| Lag Pump On Elev. | | -2.00 |
| Alarm On Elev. | 6.0 | -1.50 |
| Invert In | 24.4 | 0.53 |

| PUMP DATA | | | |
|------------------------------|-------|--------------------------|--------|
| Duplex Submersible Pumps | | PUMP A | PUMP B |
| Pump Manufacturer | | FLYGT | |
| Pump Model No. | | NP 3085 SH3 Adaptive 256 | |
| Electrical Data | HP | 4.0 | 4.0 |
| | Volts | 208 | 208 |
| | Phase | 3 | 3 |
| | RPM | 3430 | 3430 |
| Discharge Pipe Size (inches) | | 4 | 4 |

| DISPLACED AIR VOLUME | | |
|--|-----|------------|
| V _{ww} , Volume of Wet Well (Lead Pump) = | 106 | gallons |
| V _{ww} , Volume of Wet Well (Lead Pump) = | 14 | Cubic Feet |
| Design Average Cycle Time (Tavg) = | 28 | Minutes |
| Displaced Air Volume = | 0.5 | CFM |

TRC Engineers, Inc.

Project: Mamaroneck Beach and Yacht Club
 South Barry Avenue Alternative
 Village of Mamaroneck, NY

Subject: Duplex Submersible Lift Station
 Off Season Flow Conditions

Project No.: 200001

Comp. By: RPP

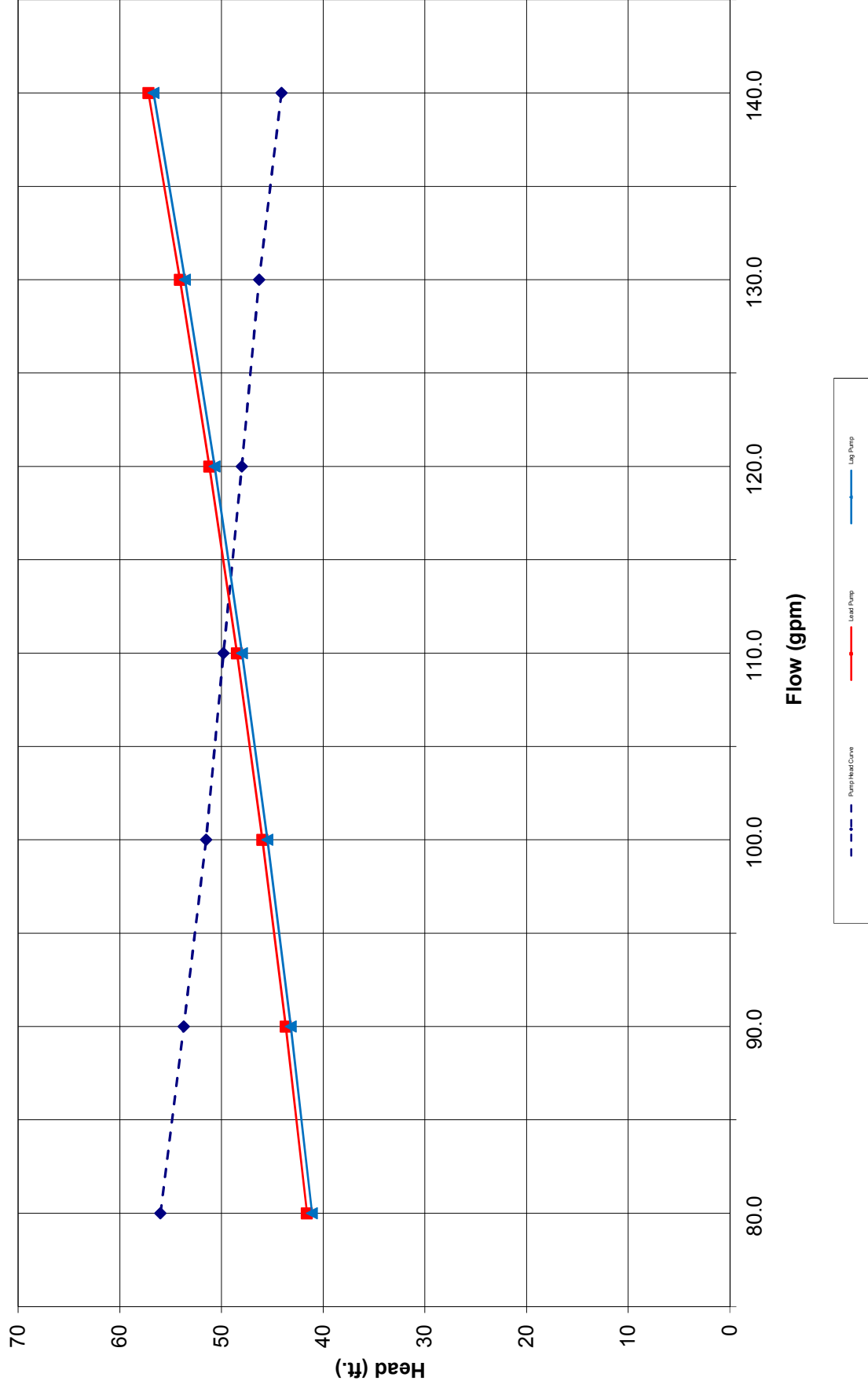
Chkd. By: TDH

| WET WELL STORAGE | |
|-------------------------------------|-----------|
| Description | Elevation |
| Lead Pump Off Elev. = | -3.00 |
| Invert In = | 0.53 |
| Wet Well Storage Depth = Feet | 3.53 |
| Vol./ Ft. of Depth = Gallons / foot | 212 |
| Wet Well Storage Volume = Gallons | 750 |
| Design Average Inflow (I) = gpm | 4 |
| Wet Well Storage Time = minutes | 188 |

| FORCE MAIN VOLUME | | |
|--|------|---------------|
| 4-Inch pipe volume = | 0.65 | Gallons/foot |
| Force Main Length = | 1300 | Length |
| Total Force Main Volume = | 849 | Gallons |
| Design Average Pumped Volume per Cycle = | 106 | Gallons/cycle |
| No. of Pump Cycles to Purge Force Main = | 8.0 | No. Cycles |
| Design Average Cycle Time (Tavg) = | 28 | Minutes |
| Average Force Main Residence Time = | 220 | Minutes |

| VENTILATION RATE | |
|-------------------------------|-------|
| Station Grade = | 16.00 |
| Invert Elevation = | -4.00 |
| Top Slab Thickness = | 1.00 |
| Wet Well Depth = | 19.0 |
| Wet Well Diameter = | 5.3 |
| Wet Well Volume (Cu. Ft.) = | 424 |
| No. of Air Changes per Hour = | 30 |
| Min. Air Change Rate (cfm) = | 212 |

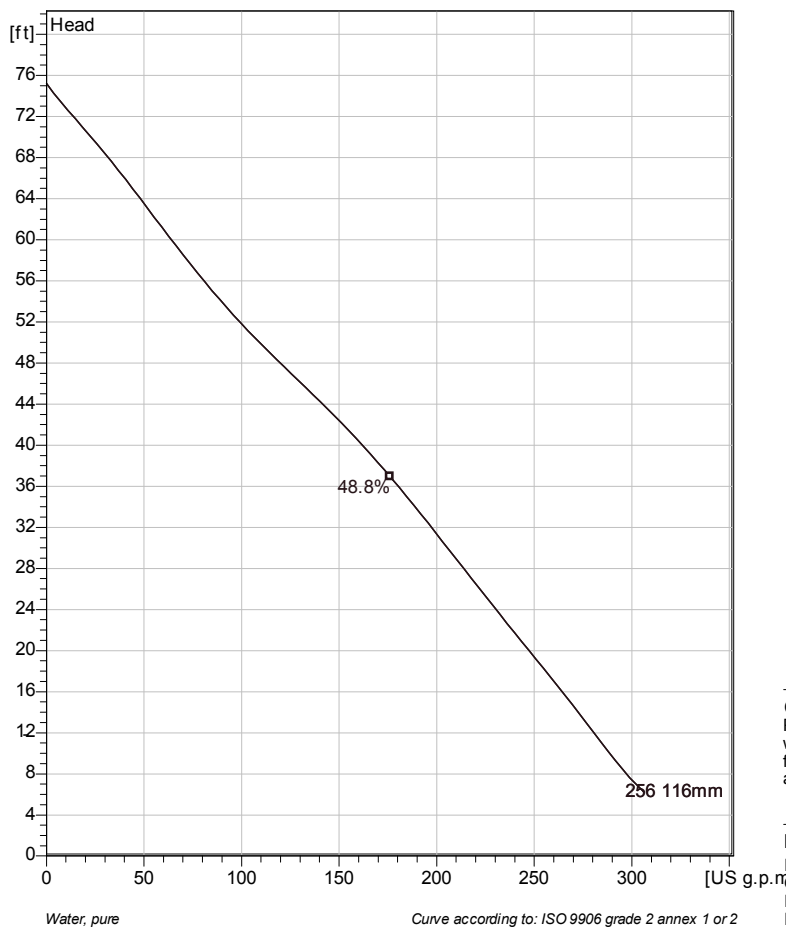
System Head Curve Off Season Conditions
Sanitary Lift Station



APPENDIX C
MANUFACTURER CATALOG SHEETS

NP 3085 SH 3~ Adaptive 256

Technical specification



Note: Picture might not correspond to the current configuration.

General

Patented self-cleaning semi-open channel impeller, ideal for pumping in waste water applications. Possible to be upgraded with Guide-pin® for even better clogging resistance. Modular based design with high adaptation grade.

Impeller

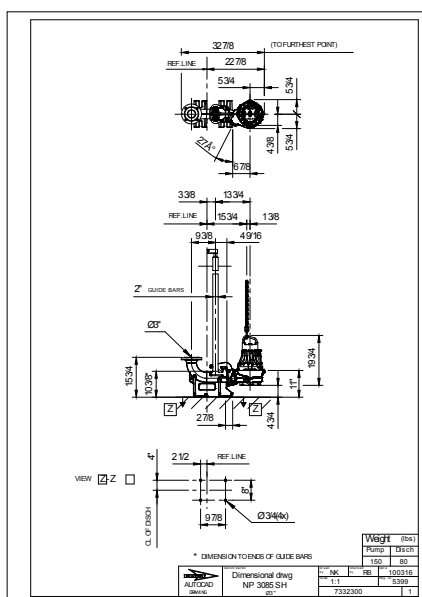
| | |
|-------------------|----------------|
| Impeller material | Grey cast iron |
| Outlet width | 3 1/8 inch |
| Inlet diameter | 80 mm |
| Impeller diameter | 116 mm |
| Number of blades | 2 |

Motor

| | |
|------------------|---------------------------|
| Motor # | N3085.190 15-09-2AL-W 4hp |
| Stator variant | 38 |
| Frequency | 60 Hz |
| Rated voltage | 460 V |
| Number of poles | 2 |
| Phases | 3~ |
| Rated power | 4 hp |
| Rated current | 5 A |
| Starting current | 30 A |
| Rated speed | 3430 rpm |
| Power factor | |
| 1/1 Load | 0.92 |
| 3/4 Load | 0.89 |
| 1/2 Load | 0.83 |
| Efficiency | |
| 1/1 Load | 81.0 % |
| 3/4 Load | 82.0 % |
| 1/2 Load | 81.0 % |

Configuration

Installation: P - Semi permanent, Wet



| | | | | |
|---------|------------|------------|------------|-------------|
| Project | Project ID | Created by | Created on | Last update |
| | | | 2014-02-24 | |

NP 3085 SH 3~ Adaptive 256

Performance curve



Pump

Outlet width 3 1/8 inch
Inlet diameter 80 mm
Impeller diameter 4⁹/₁₆"
Number of blades 2

Motor

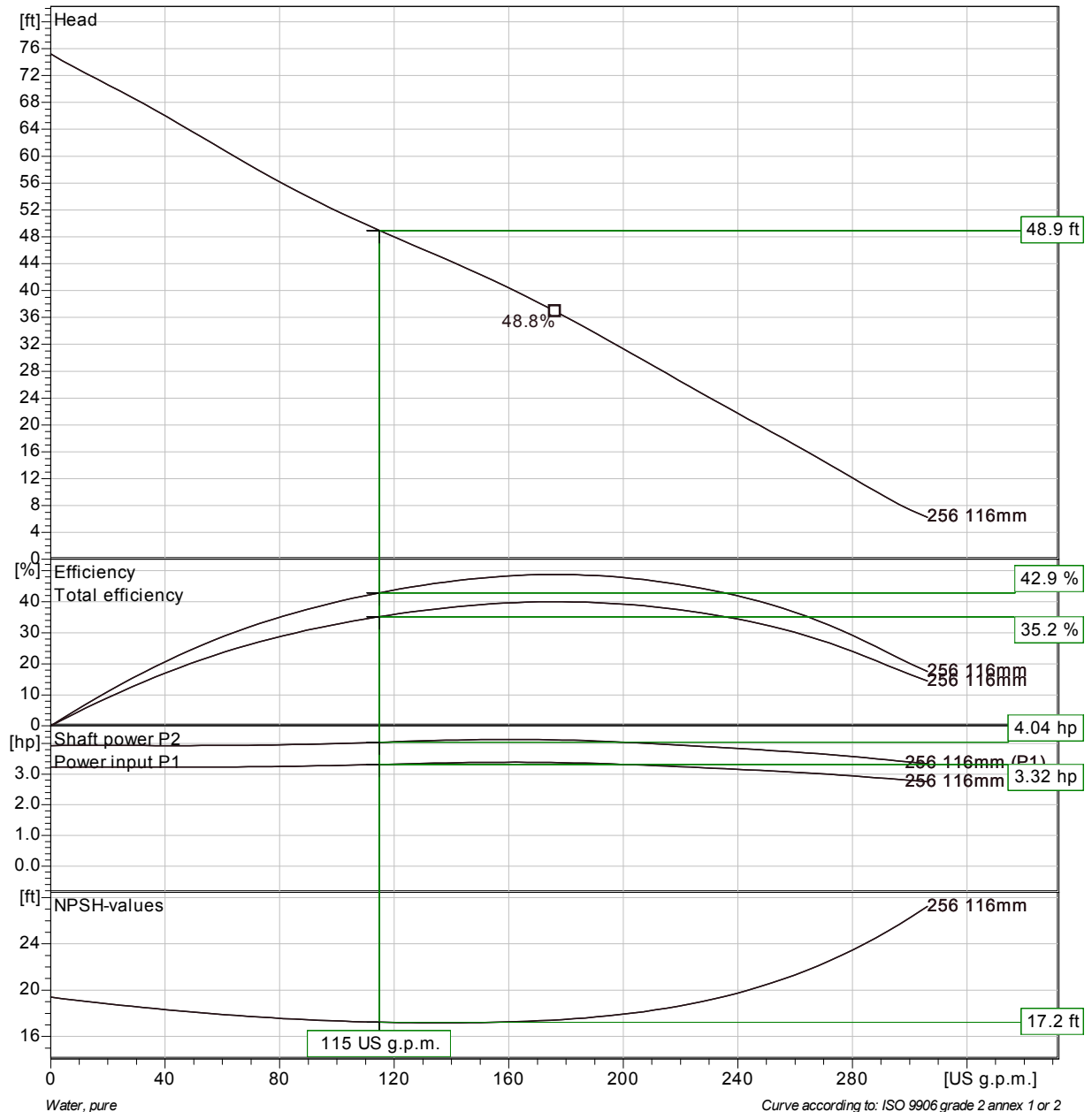
Motor # N3085.190 15-09-2AL-W 4hp
Stator variant 38
Frequency 60 Hz
Rated voltage 460 V
Number of poles 2
Phases 3~
Rated power 4 hp
Rated current 5 A
Starting current 30 A
Rated speed 3430 rpm

Power factor

1/1 Load 0.92
3/4 Load 0.89
1/2 Load 0.83

Efficiency

1/1 Load 81.0 %
3/4 Load 82.0 %
1/2 Load 81.0 %



| | | | | |
|---------|------------|------------|------------|-------------|
| Project | Project ID | Created by | Created on | Last update |
| | | | 2014-02-24 | |

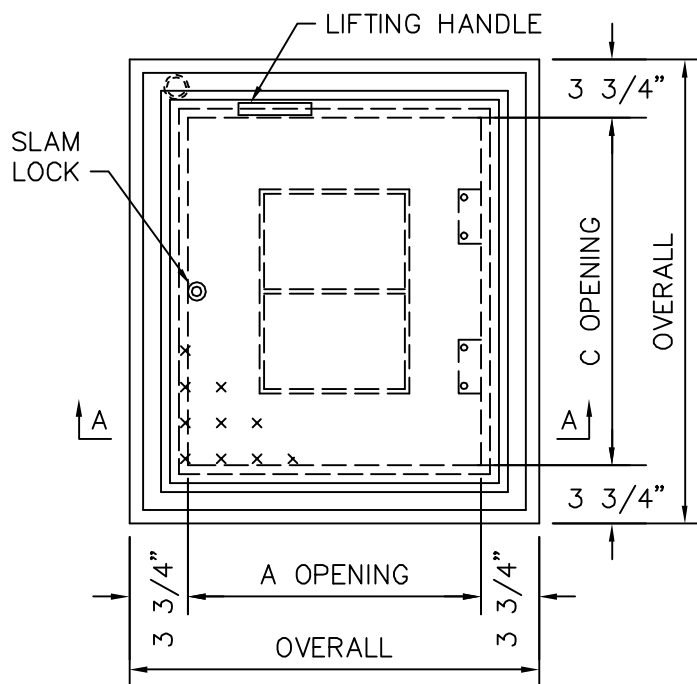
SERIES W1S ACCESS DOOR

STANDARD FEATURES:

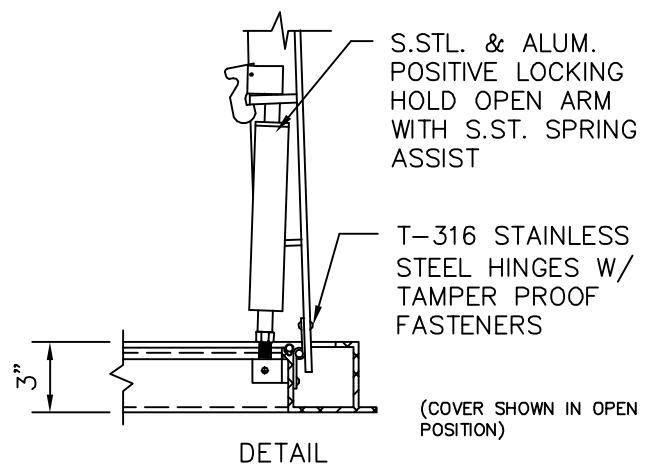
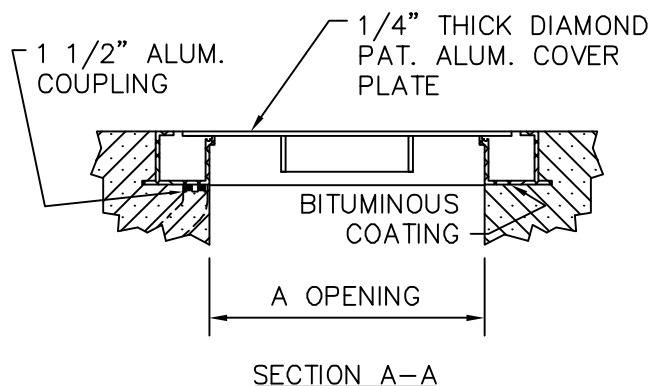
- AUTO-LOCK T-316 STAINLESS STEEL HOLD OPEN ARM WITH RELEASE HANDLE
- T-316 STAINLESS STEEL HINGES AND ATTACHING HARDWARE
- T-316 STAINLESS STEEL SLAM LOCK W/REMOVABLE KEY
- STAINLESS STEEL COMPRESSION SPRING ASSIST
- BUILT-IN NEOPRENE GASKET TO LIMIT THE TRANSMISSION OF ODORS
- NON-OZONE DEPLETING BITUMINOUS COATING
- SINGLE LEAF CONSTRUCTION
- 300 LBS. PER SQ. FT. LOAD RATING
- EXTRUDED ALUMINUM CHANNEL FRAME
- RECESSED LIFTING HANDLE
- LIFETIME GUARANTEE



www.HallidayProducts.com
Phone 800-298-1027
Fax 407-298-4534
Sales@HallidayProducts.com



| QTY. | MODEL NO. | DIMENSIONS | | UNIT WT. (LBS.) |
|------|-----------|------------|-----|-----------------|
| | | A | C | |
| | W1S2424 | 24" | 24" | 46 |
| | W1S2430 | 24" | 30" | 51 |
| | W1S2436 | 24" | 36" | 61 |
| | W1S2442 | 24" | 42" | 77 |
| | W1S2448 | 24" | 48" | 85 |
| | W1S3030 | 30" | 30" | 62 |
| | W1S3036 | 30" | 36" | 69 |
| | W1S3042 | 30" | 42" | 77 |
| | W1S3048 | 30" | 48" | 85 |
| | W1S3054 | 30" | 54" | 99 |
| | W1S3060 | 30" | 60" | 102 |
| | W1S3636 | 36" | 36" | 78 |
| | W1S3642 | 36" | 42" | 89 |
| | W1S3648 | 36" | 48" | 97 |
| | W1S3654 | 36" | 54" | 107 |
| | W1S3660 | 36" | 60" | 116 |
| | W1S3666 | 36" | 66" | 126 |
| | W1S3672 | 36" | 72" | 135 |
| | W1S4242 | 42" | 42" | 108 |
| | | | | |
| | | | | |



9G-EF (Mercury Free) Direct Acting Float Switch (B100)

The 9G-EF is the most reliable non-mercury float switch. It is Teflon®-coated, non-differential float of Type 304 SS, measures 5.5" (13.97 cm) in diameter and is appropriate for a variety of applications, including sewage wet wells, storm water basins, water reservoirs, sludge tanks, irrigation canals and process sumps. The float operates reliably in even the most difficult environments. The 9G-EF can be used singly to sense an alarm level, but typically two or more switches are used in conjunction with our controllers to provide a float-based control system. The 9G-EF can be used as the redundant control sensor in larger automation installations.

Typical Specifications

Float switch body shall be constructed of Teflon®-coated, 20 gauge, 304 stainless steel housing measuring not less than 5 1/2" (13.97 cm) in diameter. A long life, high reliability, potted SPST magnetic reed switch rated for not less than 100 VA at up to 250 Volts shall be mounted inside the float and connected to a multi-stranded, 2 conductor plus ground, 16 gauge, CPE jacketed cable. The cord shall have fine strand conductors (not more than 34 gauge) made especially for heavy flexing service. The cable connection point shall be potted in epoxy providing a strong bond to the float and reed switch forming a water/moisture tight connection. A flexible Neoprene sleeve, not less than 1/8" (0.457 cm) thick, shall be provided over the CPE jacketed cable extending not less than 5" (12.7 cm) from the top of the mounting bracket extending down through the cable mounting bracket hinge point to the top of the float switch body, providing cable stress point relief and extended operational life.

A 304 stainless steel flanged cable mounting clamp assembly shall be supplied allowing pipe or cable mounting as specified below. The float cable-mounting bracket shall be flared on both sides providing hinge point stress relief to both sides of the cable.

The float switch assembly shall provide a minimum of two pounds of buoyancy in solutions with a specific gravity of 1.0 (water) and shall have an operating temperature rating of -31 to 194 degrees F (-35 to +90 degrees C).

The float switches shall be Model 9G-EF floats as manufactured by Siemens Water Technologies, Control Systems Products.

Features

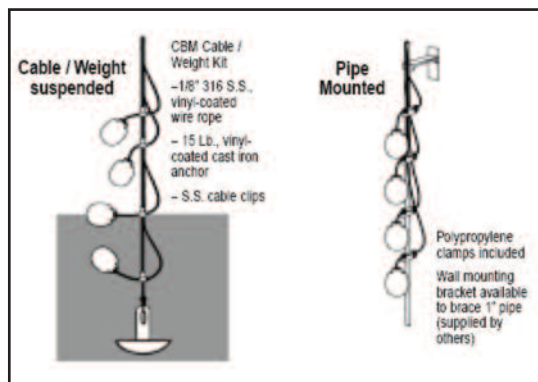
- Mercury Free – Magnetic Reed Switch
- Long life and reliable operation
- Non-oxidizing contacts allow low DC voltage signals for use with intrinsic safety devices
- Non-stick surface
- High buoyancy
- Pipe or suspension mounting
- 3 year factory warranty



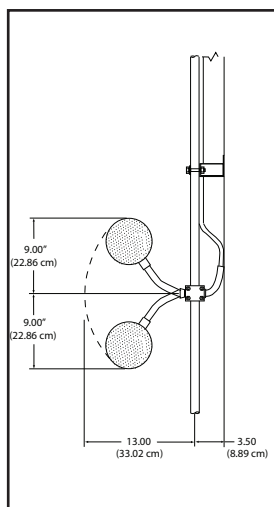
9G-EF (Mercury Free) Direct Acting Float Switch (B100)

| Description | Part Number |
|---|-------------|
| 9G-EF (Mercury Free) NOTP Float Switch | |
| Teflon coated 304 SS Float Switch w/1 N.O. Contact & 30' (9.144 m) Cable | W2T295692 |
| Teflon coated 304 SS Float Switch w/1 N.O. Contact & 60' (18.288 m) Cable | W2T294202 |
| 9G-EF (Mercury Free) NCTP Float Switch | |
| Teflon coated 304 SS Float Switch w/1 N.C. Contact & 30' (9.144 m) Cable | W2T296235 |
| Teflon coated 304 SS Float Switch w/1 N.C. Contact & 60' (18.288 m) Cable | W2T294168 |
| Mounting Hardware & Accessories | |
| 9G Float Cable Clamp Assembly | W3T4758 |
| 9G Float 1" (2.54 cm) Pipe Clamp Assembly | W2T294057 |
| 304 SS cable suspension kit, 21' (6.4 m) | W3T4901 |
| 304 SS cable suspension kit, 31' (9.448 m) | W3T4902 |
| 304 SS cable suspension kit, 41' (12.496m) | W3T4903 |
| 304 SS cable suspension kit, 61' (18.592 m) | W3T4904 |
| 304 SS cable suspension kit, 81' (24.688 m) | W3T4905 |
| 304 SS cable suspension kit, 101' (30.784 m) | W3T4906 |
| 5 Float Suspension Mount, 2 piece bracket w/strain reliefs | W2T277359 |
| 9G CL3 1" (2.54 cm) stainless steel pipe mount clamps (transducer or float mount) | W3T4748 |
| 15# (6.8 kg) Anchor | W2T280921 |
| Float Cable/Anchor kit 30' (w/15lb (6.8 kg) anchor, 30' (9.144 m) SS cable, wall bracket, 5 cable clamp) | W2T295021 |
| Float Cable/Anchor kit 60' (w/15lb (6.8 kg) anchor, 60' (18.288 m) SS cable, wall bracket, 5 cable clamp) | W2T295022 |
| IS6 Six Circuit Intrinsically Safe (Switch Circuit) Barrier: 12-24V DC powered | W2T294110 |
| 9G JCTF fiberglass junction box (supports up to XXXX floats) | W3T4742 |

Typical Mounting



Pipe Mounting Dimensions



Complete Control Capabilities

Siemens Water Technologies offers a single, high-quality source for everything from simple level sensors to telemetry systems involving complex system control engineering and software. Based in Vadnais Heights, Minnesota, Control Systems is part of the Siemens Water Technologies leading global provider of industrial, municipal and residential water and wastewater treatment systems, products and services. As a major manufacturer/integrator with an extensive selection of specialized product lines in the areas of SCADA and telemetry, power equipment integration, automation and measurement, Control Systems is uniquely positioned to provide cost effective, comprehensive solutions for water, wastewater and process control and telemetry applications.

Siemens
Water Technologies
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Vadnais Heights, MN 55110
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CS-9GEFdr-DS-0710
Subject to change without prior notice.

The information provided in this literature contains merely general descriptions or characteristics of performance which in actual case of use do not always apply as described or which may change as a result of further development of the products. An obligation to provide the respective characteristics shall only exist if expressly agreed in the terms of the contract.

Model 575

Submersible Level Transmitter



Description

The Model 575 has a removable, nonclogging snub nose end to protect the sensing elements. The Model 575 is used in general water/wastewater applications.

The unit is specially designed to provide the convenience of direct submergence in many types of liquid, especially wastewater, for quick, accurate and reliable level measurement. The simple design and rugged construction of these solid state instruments provide long lasting service with virtually no maintenance.

The 575 Series Transmitters indicate the level of liquid by continuously measuring hydrostatic pressure via its

sensing element, an ion implanted silicon semiconductor chip with integral Wheatstone Bridge circuit. Once the sensor measures the pressure, the data is transmitted by a 4 to 20 mA output signal. This design provides for excellent linearity and repeatability, low hysteresis and long-term stability.

The transmitter is easy to install. Simply lower the transmitter into a tank. All the electronics are mounted in a submersible 316 stainless steel housing. A special cable support bracket is also available. This gives extra stability to the transmitter when used with longer lengths of cable or when used in an agitated liquid.*

The transmitter is available calibrated for any span needed, from 0 to 3 psi or 0 to 0.2 bar (0 to 7 feet or 0 to 2.1 meters of water) to 0 to 300 psi or 0 to 20 bar (0 to 690 feet or 0 to 211 meters of water).

To complete your liquid level measurement and control system, use the AMETEK Model DMC Digital Meter/Controller with the 575 Series Transmitters.

* A conduit adapter is also available.

Features

- CSA approved for intrinsically safe operation
- Solid state semiconductor sensor for accuracy and reliability
- Rugged 316 stainless steel housing with excellent environmental protection
- Easy to install and use
- 2 wire 4 to 20 mA output
- Vented to the atmosphere through the surface end of the cable
- Reverse polarity and surge protected
- Lightning protectors available
- EMI protection available

Model 575S Submersible Level Transmitters

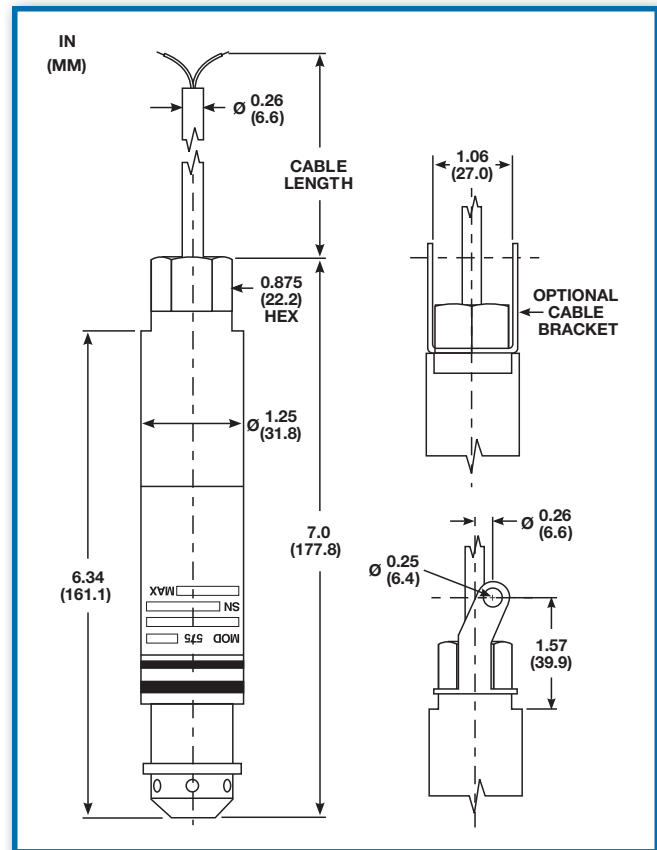
Applications

- Tanks
- Water/wastewater treatment
- Ponds
- Lift stations
- Water wells
- Slurry/sludge
- Pump control
- Level control

Specifications

- **Feet of Water:** 0/14, 0/35, 0/69, 0/138, 0/230, 0/345, 0/460, 0/690
- **Meters of Water:** 0/4, 0/10, 0/21, 0/42, 0/70, 0/105, 0/140, 0/210
- **Bar:** 0/0.4, 0/1, 0/2, 0/4, 0/7, 0/10, 0/14, 0/20
- **PSI:** 0/6, 0/15, 0/30, 0/60, 0/100, 0/150, 0/200, 0/300
- **Output:** 4 to 20 mA, 2 wire, current limited to 30 mA DC
- **Power Supply:** 12 to 40 VDC with reverse polarity surge protection; Limited to 28 VDC for CSA I.S.
- **Loop Resistance:** 1400 ohms maximum at 40 volts
- **Temperature Range**:**
Ambient Operating: CSA intrinsically safe T3C = -25° to 180°F (-32° to 82°C)
Storage: -40° to 180°F (-40° to 82°C)
**If submerged in a liquid that has frozen, damage will result. Limit high temperature to 140°F (60°C) for intrinsically safe operation.
- **Overrange Effect:** ±0.15% full scale at 200% of maximum range
- **Overrange Limit:** 200% of maximum range
- **Accuracy:** ±0.25% full scale, BFS (including linearity, hysteresis and repeatability); ±0.50% full scale (6 psi range only)
- **Zero Offset:** ±0.50% full scale set at 77°F (25°C)
- **Span:** ±0.50% full scale set at 77°F (25°C)
- **Temperature Effects: (15 psi and above)**
- **Compensated:** 23° to 130°F (-5°C to 55°C); Maximum ±1% URL output change for ±25°C temperature change within compensated range when calibrated at 25°C. Consult factory for lower or alternate pressure ranges.
- **Power Supply Effect:** ±0.005% full scale per volt
- **Construction:**
Diaphragm: 316L stainless steel

Dimensions



Housing Type: 316 stainless steel

Nut/Washer Type: 316 stainless steel

Cable Grommet: Viton standard.

Please contact factory for other options.

Housing O Ring: Viton standard.

Please contact factory for other options.

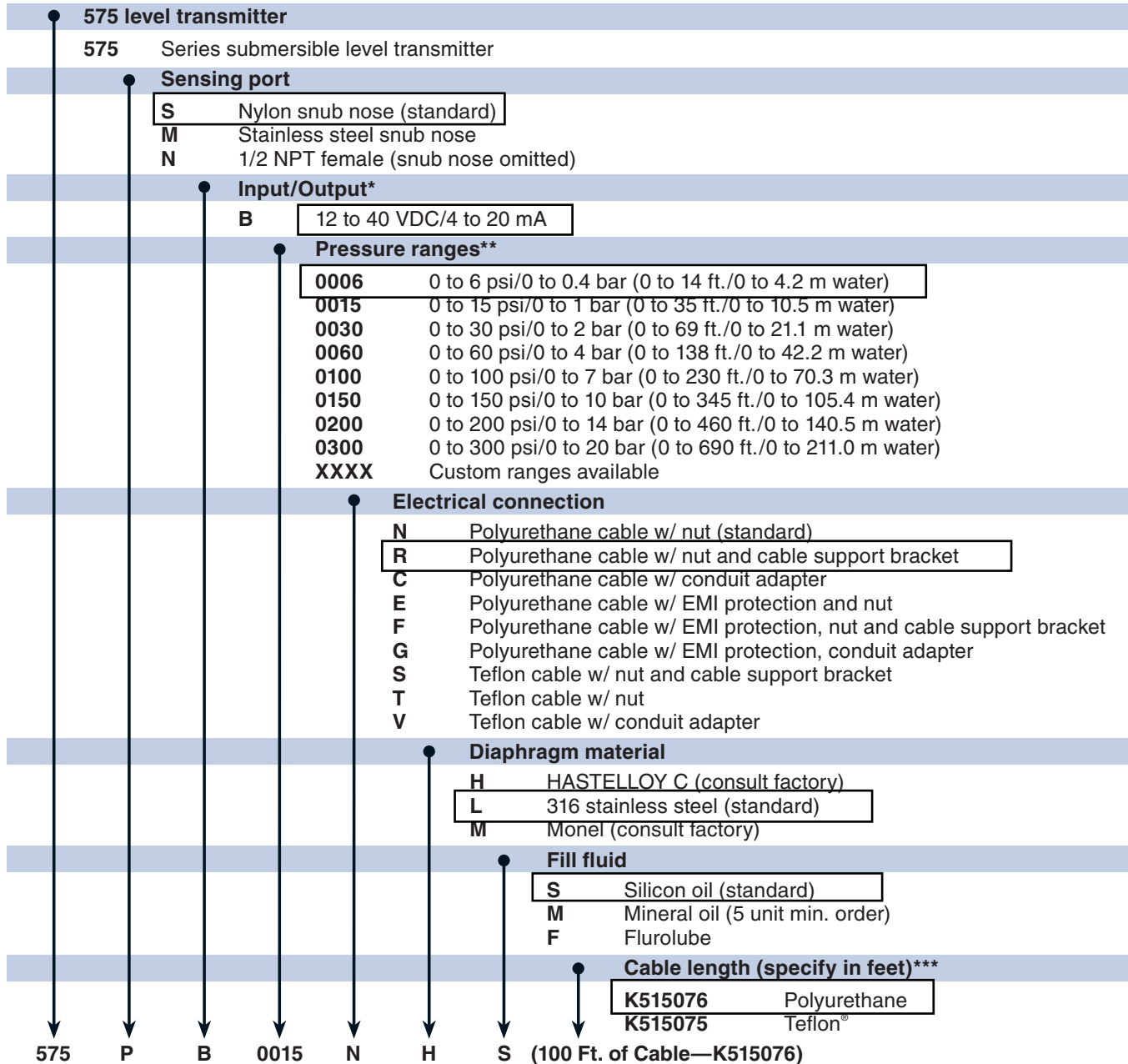
Cable Jacket: Polyurethane

- **Media Compatibility:** Reference materials of construction
- **Electrical Connection:** Attached 20 gauge polyurethane shielded cable. Unspliced lengths available up to 5000 ft. (1662 m)
- **Weight:** 1.0 lb. (454 g)
- **Approvals:** Meets CSA requirements for intrinsically safe operation in hazardous locations as designated by Class I, Div 1, Groups A, B, C & D and Class II, Groups E, F & G. Temperature Code T3C (when used with approved barrier).
- **Snub Nose:** Nylon 6/6, removable (1/2 inch NPT)
- **Option:** SJB-100 junction box with desiccant; DMC Meter Controller and Housing

Tel: 215-355-6900

www.ametekpmt.com

Model Numbering:



* Please contact the factory for availability of different input/output options.

** Calibrated ranges can be specified after the model code; the specific range should be between the upper and lower ranges in the category selected.

*** Note: Unspliced lengths available up to 5000 ft. (1662m). Please contact factory for other options.

PRODUCT BULLETIN FOR

THE PURAFIL VENT SCRUBBERS

PURAFIL



THE PURAFIL VENT SCRUBBERS (PVS) are ideal for removal of odorous gases in commercial rooftop applications with a 99.5+% gas removal efficiency. These inexpensive passive vent scrubbers are perfect for small vent applications and come standard with Purafil media designed to remove a broad spectrum of odorous gases from kitchen and bathroom exhaust as well as other general odors. Purafil offers two different models (PV40 and PV150) with a variety of options to meet your unique clean air challenges.



PURAFIL VENT SCRUBBER
MODEL PV40

SYSTEM ADVANTAGES:

CONSTRUCTION: Purafil Vent Scrubbers are made from aluminum and feature a blue epoxy powder coated finish with additional colors available upon request.

EASY MEDIA REPLACEMENT: Purafil Vent Scrubbers utilize a media container that can be easily removed by releasing the security latches without any additional tools.

LOW MAINTENANCE: Other than routine checks for nuisance odors, there is no maintenance required.

LOCAL SERVICE: Purafil's network of local representatives offer convenient and timely service. These factory-trained representatives work in conjunction with Purafil's in-house laboratory to provide media life analysis and comprehensive technical service.

PATENTED MEDIA ADVANTAGES:

Purafil® SP Blend media is provided with the Purafil Vent Scrubbers unless otherwise specified. Benefits of this media include:



- Landfill disposable in accordance with local, state and federal guidelines.
- UL Classified
- Medias are pre-mixed at Purafil's factory
- Substitutes for a two-pass media system
- New and spent media are non-toxic
- Removes broader spectrum of odorous gases

PV40 PURAFIL VENT SCRUBBER

STANDARD FEATURES: The PV40 connects to a vent pipe in a vertical connection, allowing for ventilation in the open position. This unit can be easily disassembled for media replacement by releasing the lockable metal latches and removing the media canister.

- Aluminum with blue epoxy powder coat finish
- Available in 4" or 6" flanged connection, with or without rain shield
- Stainless steel tamper proof lockable hook and security latches
- Recyclable disposable canister with .25 cubic feet of Purafil® SP Blend Media

OPTIONAL FEATURES:

- Metric Flange
- Rain shield and mounting kit available for 4" or 6" units
- Spare disposable media replacement canister
- Customer's choice of Purafil media



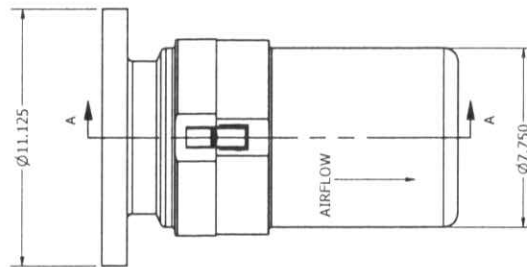
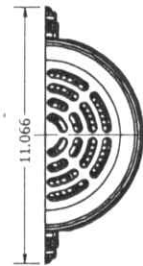
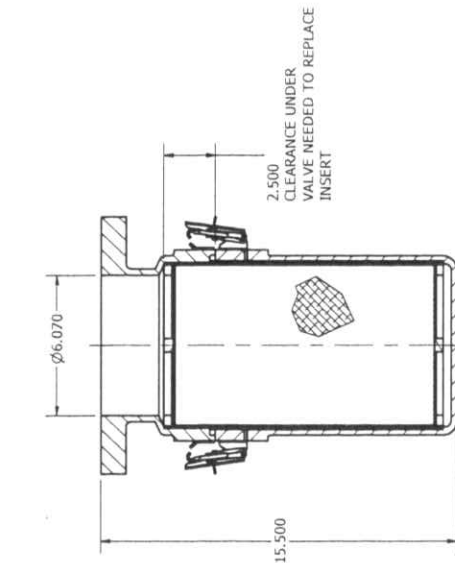
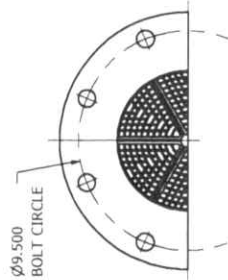
CUTAWAY VIEW
OF THE PURAFIL
VENT SCRUBBER
PV40

COLORS MAY VARY



OPTIONAL
RAIN SHIELD
FOR THE
PURAFIL VENT
SCRUBBER
PV40

1. DIMENSIONS ARE IN INCHES.
2. METRIC EQUIVALENTS IN BRACKETS [] ARE IN MILLIMETERS.
3. JINTS ARE SEALED WITH RTV SILICON RUBBER.
4. MAXIMUM MEDIA CAPACITY OF 0.30 CU FT.
5. FINISH - POWDER PAINT
6. TOLERANCE - ± 0.25 , UNLESS OTHERWISE LISTED



FIRST IN CLEAN AIRSM

JOB/UNIT IDENTIFICATION:

MODEL
NUMBER
PV40-106(R06)

PURAFIL, INC. REP.:

MAX RECOMMENDED AIRFLOW:

40 cfm @ 3.3 lwq.

[68 m³/hr @ 825 Pa.]

ELECTRICAL:

| VOLTAGE | PHASE | HZ | HP | TYPE |
|---------|-------|-----|-----|------|
| N/A | N/A | N/A | N/A | N/A |

PURAFIL® AIR PURIFICATION MEDIA(S) IN DIRECTION OF AIRFLOW:

| MEDIA TYPE | TOTAL MEDIA WEIGHT |
|-------------|--------------------|
| Print | 100% |
| TV | 100% |
| Radio | 100% |
| Internet | 100% |
| Out of Home | 100% |
| Direct Mail | 100% |
| Other | 100% |

ODORMIX SP 12 LBS [4.5 KG]

ORCARB ULTRA 12 LBS [4.5 KG]

UNIT SELECTION

PV40-106 - INVERTED

~~PV40-R06-R4IN-SHIFT-D~~

| | |
|--|--|
| <input checked="" type="checkbox"/> FOR APPROVAL | <input type="checkbox"/> FOR INFORMATION |
| <input type="checkbox"/> FOR CONSTRUCTION | <input type="checkbox"/> AS BUILT |
| <input type="checkbox"/> FOR QUOTE | |

| | |
|----------------|-----------|
| DATE: 3/8/2011 | REV DATE: |
|----------------|-----------|

| | |
|-----------|-----------|
| OPERATING | APPR. BY: |
|-----------|-----------|

DRAWING NUMBER:

PV40-I06/R06

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PRODUCT SPECIFICATION FOR

ODORMIX™ SP MEDIA




ODORMIX SP MEDIA demonstrate a higher working capacity for broad spectrum oxidation of contaminants in actual field conditions, where multiple gas challenges are present. The Purafil SP Series has been specially engineered to contain more permanganate (the active ingredient) for increased removal capacity, allowing the media to remain more available for removal of target gases. Purafil's Odormix™ SP (patent-pending) Media offers broad spectrum removal of odorous gases related to sewerage treatment operations.



ODORMIX SP MEDIA

MEDIA SPECIFICATION

Purafil's Odormix™ SP Media shall consist of an equal mix (by volume) of Purafil's Odoroxidant™ SP Media and Odorkol™ Media.

Odoroxidant™ SP Media shall be manufactured of generally spherical, porous pellets formed from a combination of powdered activated alumina and other binders, suitably impregnated with sodium permanganate to provide optimum adsorption, absorption and oxidation of a wide variety of gaseous contaminants. The sodium permanganate shall be applied during pellet formation, such that the impregnant is uniformly distributed throughout the pellet volume and is totally available for reaction. The Odorkol™ Media shall be a premium grade, activated carbon with a high surface area available for adsorption.

DISPOSAL REQUIREMENTS

Spent Odormix™ SP Media should be disposed of according to local, state and federal guidelines.

ADVANTAGES

- Landfill disposable
- UL Classified
- Medias are pre-mixed at Purafil's factory
- Substitutes for a two-pass media system
- New and spent media is non-toxic

PHYSICAL PROPERTIES

ODORMIX™ SP MEDIA BULK DENSITY: 40 lbs/ft³ (0.64 g/cc) ±5%.

Odoroxidant™ SP Media shall have the following physical properties:

- **MOISTURE CONTENT:** 35% Maximum
- **CRUSH STRENGTH:** 35% - 70%
- **ABRASION:** 4.5% Maximum
- **BULK DENSITY:** 50 lbs/ft³ (0.8 g/cc) ±5%
- **NOMINAL PELLET DIAMETER:** 1/16" - 1/8" (1.5 mm - 3.2 mm)
- **SODIUM PERMANGANATE CONTENT:** 12% Min.

Odorkol™ Media shall have the following physical properties:

- **MOISTURE CONTENT:** 2%
- **CTC:** 60% Minimum
- **BASE MATERIAL:** Activated Carbon
- **BULK DENSITY:** 30 lbs/ft³ (0.48 g/cc) ±5%
- **PELLET DIAMETER:** 4mm

APPLICATIONS

Purafil's Odormix™ SP Media is designed for broad spectrum removal of odorous gases, including mercaptans, hydrocarbons, hydrogen sulfide and sulfur dioxide. Odormix™ SP Media is recommended when space within Purafil's multi-stage scrubber is limited; in this application, Odormix™ SP substitutes for two media passes. Odormix™ SP is also recommended as a polishing media.

APPLICATION GUIDELINES

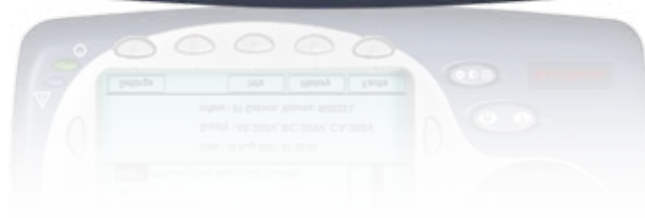
Odormix™ SP Media shall perform effectively under the following conditions and guidelines:

- **TEMPERATURE:** -4°F to 125°F (-20°C to 51°C)
- **HUMIDITY:** 10 - 95% RH
- **AIRFLOW:** Odormix™ SP Media shall be effective in Purafil systems, including the Drum Scrubber with airflows from 100 to 1,000 CFM (170 to 1699 m³/hr), Tub Scrubber with airflows from 500 to 6,000 CFM (850 to 10,194 m³/hr) and Deep Bed Scrubber with airflows from 600 to 8,000 CFM (1,020 to 13,592 m³/hr). Odormix™ SP Media shall also be effective in Vessel Scrubbers with airflows from 8,000 to 20,000 cfm (13,592 to 33,980 m³/hr) and in passive Mole Manhole Scrubbers.

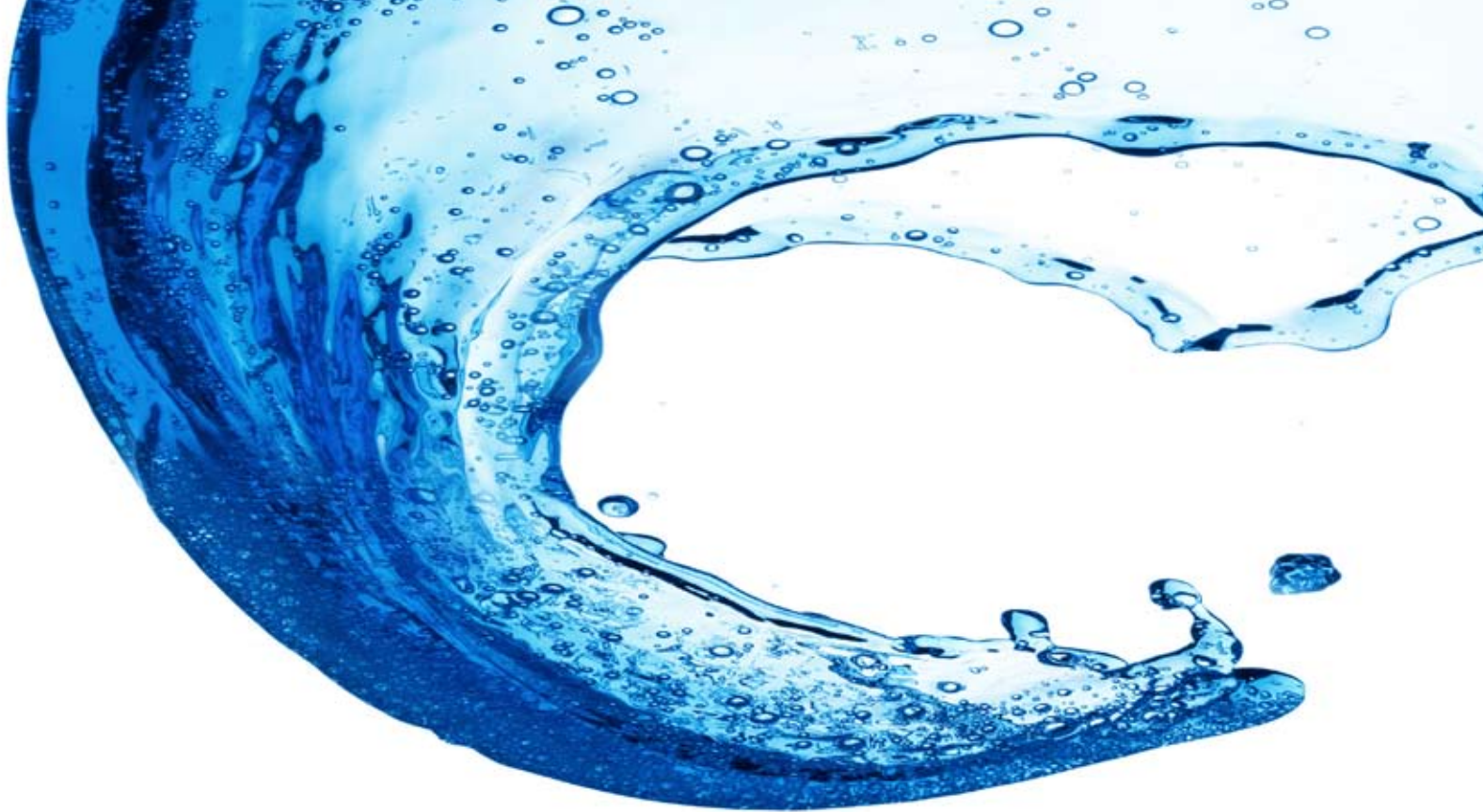


MultiSmart Pump Station Manager.

The new face of technology.



multitrode
WATER • WASTEWATER • PUMP STATION • TECHNOLOGY



What is a pump station manager?

It's the next generation of technology for water & wastewater pump stations – combining the best of PLCs, RTUs and pump controllers into a comprehensive and intuitive package.


The pump station manager also integrates up to 15 control panel components, reducing control panel cost and enabling energy cost/CO₂ reduction.

Why choose MultiSmart?

MultiSmart was designed to make Utilities better managers of their assets.

Benefits include:

- Lower cost of control panel (over \$10,000 is often achievable).
- Reduces operational costs by up to 70%.
- Reduces energy costs & CO₂ footprint by up to 15%.
- Wealth of asset management data.



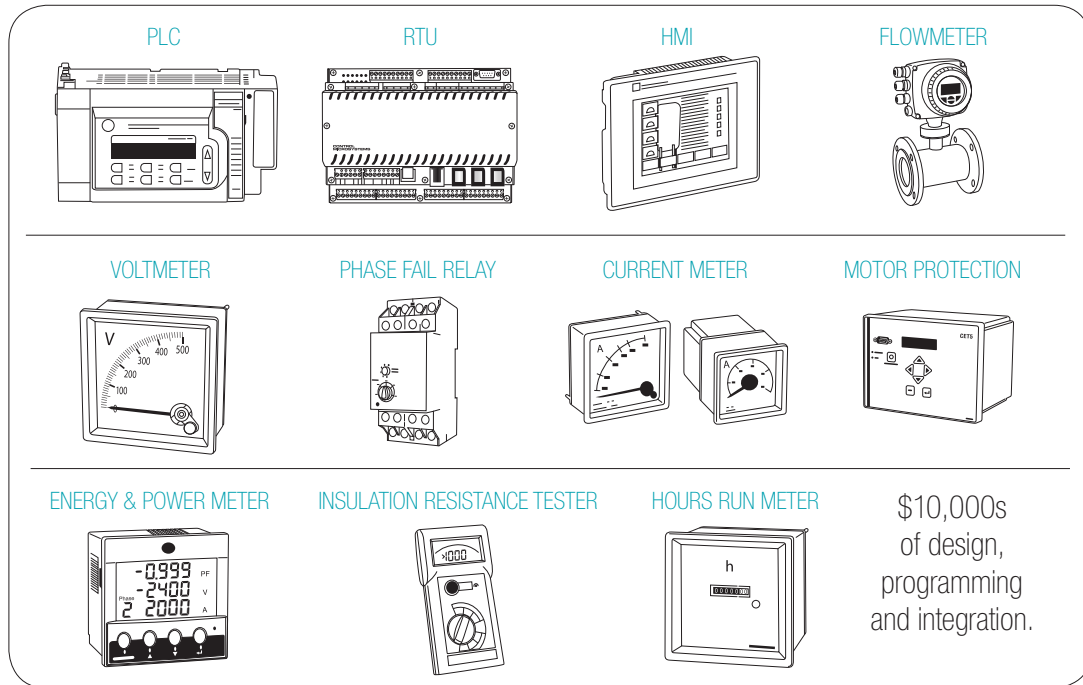
Someone has finally put all the versatility previously only available with a custom programmed PLC, into a user configurable platform. From simple to complex, this unit handles it all. The wealth of pump station operational information available to the end user is virtually limitless.

J.C. Van Harn, President, GrandTech Inc., Byron Centre, Michigan.

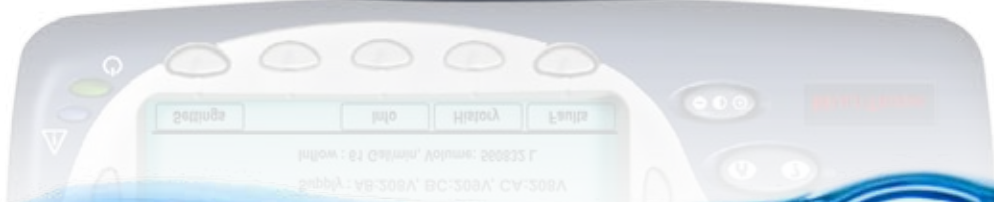
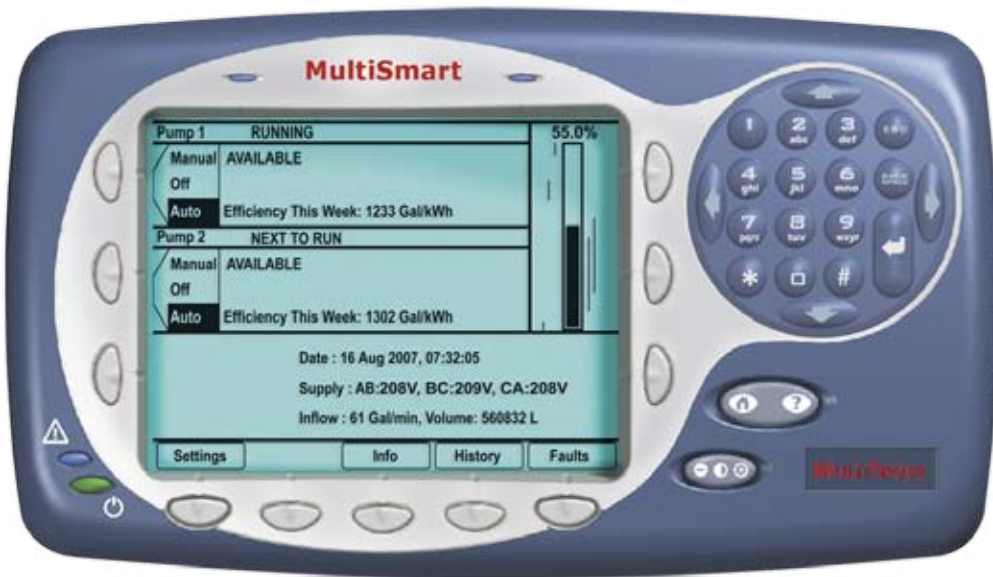
MultiSmart at a glance.

- “Setup wizard” for commissioning of a new station
- Save/Copy configuration using compact flash card
- Advanced pump control functionality for up to 6 pumps
- Flow without a flow meter
- Data logger for 50,000 events (10,000,000 direct to CF card)
- History page with detailed fault & event data
- 3-phase supply voltage monitoring and protection
- Flexible RTU with Modbus & DNP3 protocol for SCADA & local connectivity
- Energy, power & pump efficiency monitoring
- Expandable I/O

Why invest in PLCs, RTUs, pump controllers and \$1000s of programming...



when MultiSmart does it all.





Easy to use.

If you're in operations you know how important it is to get the right information when you're on site. Instead of a few flashing lights – which don't tell you anything – MultiSmart gives you comprehensive information on past and current problems.

Correct use of the MultiSmart encourages better decision making, better use of staff and leads to reduced operational costs.

| Fault Name | Status |
|---|----------------|
| Thermal Fault on Pump 1 | Reset Required |
| Seal Fault on Pump 2 | Present |
| Fault Triggered @ 06/06/2005 00:39:59 Fault Cleared @ 06/06/2005 00:40:48 Reset required to deactivate fault. Press 'Reset Fault' to deactivate. Devices Affected : Pump 1 | |
| <div>Reset Fault</div> | |
| Back | History |

Fault screen

| Flow Statistics | | Select |
|-------------------------|----------------------|--------|
| Rate | Value | |
| Station Inflow Rate | 45 gals/min | |
| Pump 1 Outflow Rate | 912 gals/min | |
| Pump 2 Outflow Rate | 930 gals/min | |
| Volume Pumped Today | 96328 gals | |
| Volume Pumped Yesterday | 131399 gals | |
| Volume Pumped This Week | 406743 gals | |
| Volume Pumped Last Week | 646697 gals | |
| Total Volume Pumped | 63052326 gals | |
| Number of Overflows | 1 | |
| Last Overflow Time | 16:13:05 34 Mar 2006 | |
| Total Overflow Volume | 5407 gals | |
| Back | Pg Up | Pg Dn |
| Set | Reset | |

Flow screen

| Power and Efficiency | | | Page |
|----------------------|--------|--------|------|
| | Pump 1 | Pump 2 | |
| Power (kW) | 11.3 | 0 | |
| Power Factor (%) | 96% | 0 | |
| Efficiency (L/kW): | | | |
| Today | 8839 | 4108 | |
| Yesterday | 6540 | 6045 | |
| This Week | 6635 | 6197 | |
| Last Week | 6600 | 6133 | |
| This Month | 6590 | 6064 | |
| Last Month | 6821 | 6085 | |
| Benchmark | 7021 | 6029 | |
| Energy (kWh): | | | |
| Back | Set | Reset | |

Power and pump efficiency screen

| Station Settings - P1 of 3 | |
|---|---|
| Set Points Level and alarm setpoints, enable/disable alarms, delays & level simulation | I/O, Faults & Level Link faults to inputs, configure faults, primary and backup level source |
| Setup Wizard Commission a station - Fill/Empty mode, number of pumps, wells, level device | Station Optimization Odor reduction, well clean-out, blocked pump detection, max run time, max station starts, max pumps to run, profiles, etc. |
| Alternation & Grouping Alternation, fixed sequence and multiple groups of pumps | Commission/Decom Take pumps in and out of service |
| Main | Advanced |
| | More |

Easy setup – Settings Menu 1

The MultiSmart is easy to use, expands to accomplish practically any sequence of operation that is required and offers a degree of reliability and functionality that cannot be cost effectively reproduced with a traditional programmable logic controller.

Gregory Shofer, Project Manager, Stantec, Ann Arbor, Michigan.

Easy to configure.

As soon as you start using the MultiSmart user interface you'll appreciate how easy it is to commission a new station – or to change the way an existing station operates to make it more efficient and cost effective.

The MultiSmart has hundreds of functions designed specifically to meet the needs of water & wastewater pump stations. From something as simple as changing setpoints or how a fault condition affects a pump, through to complex alternation schemes for large pump stations, you'll see how the MultiSmart puts the operational staff back in charge.

The beauty of the MultiSmart is that the defaults have been carefully thought out so that when a station is commissioned almost everything is working how you would like it. But nothing is fixed – so any parameter can be changed. Making it quick to set up but always adaptable.

And for challenging applications where a new feature is required – there's an IEC61131-3 compliant PLC extension to MultiSmart – so that any system integrator can extend the functionality further, giving you the flexibility of a PLC without the headaches.

MultiSmart has hundreds of features. (Here are just a few).

Max run time for a pump (switch to next pump and raise an alarm).

Odour reduction via max off time (ensures wells do not become septic).

Run the **most efficient** pump (instead of alternation).

Clean the well out every Monday morning (to just above the snore point of the pump).

Multiple setpoint profiles – allows remote switching or on date/time for spill management, energy reduction.

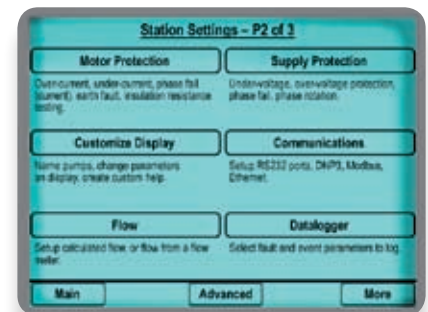
Generator profile – change setpoints and limit max pumps to run when generator operating.

'Locked level' – raise an alarm when the level has not changed enough in a given time period (suspect level device).

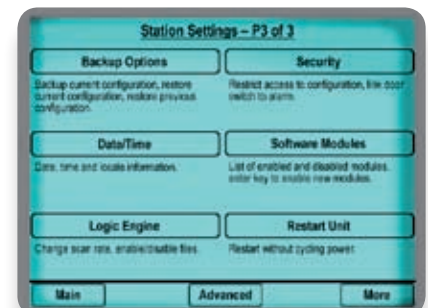
Each **fault configurable** as display only, hold out pump until fault clears, hold out pump until operator intervention, retry pump a set number of times after fault condition clears then finally lock out.

Optional **VFD module** to control one or more pumps, with easy setup.

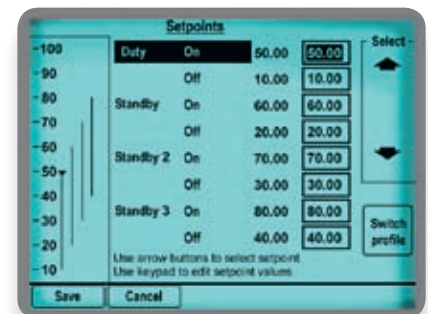
multitrode
WATER • WASTEWATER • PUMP STATION • TECHNOLOGY



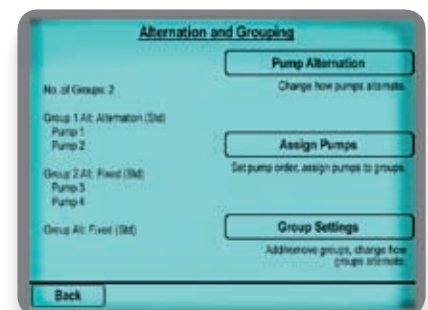
Easy setup – Settings Menu 2



Easy setup – Settings Menu 3



Changing Setpoints – intuitive



Complex pumping arrangements – made easy



Saving Costs – Capital and Operational.

Components that can usually be removed from a MultiSmart panel.

PLC/RTU or Pump Controller & RTU

HMI (display)

Flow meter

Voltmeter & selector switch

Phase fail relay

Current meter x3

Motor protection relay x2

Insulation resistance automatic tester

Energy & power meter x2

miniCAS (or other pump) relay x2

Saving costs in a Control Panel.

The MultiSmart pump station manager includes a number of the components in a control panel, bringing some major benefits:

- Lower cost of the control panel – typically \$5,500 lower material and labor cost, but in many cases much higher.
- Smaller panel – less impact on the community.
- Lower deployment and commissioning cost – one UK water utility calculated up to \$7,000 saving in staff on site due to smaller panel.
- Predictive maintenance indicators.
- Fault-finding data to get to the root cause of problems.
- Remote control – reset of faults and pump auto/manual/off from the SCADA.
- Better asset management data to a SCADA system.


Why Predictive Maintenance guarantees the best results.

Predictive Maintenance, also known as Condition Based Monitoring, is the ideal maintenance strategy because it identifies when assets need to be replaced – allowing the utility to plan cost-effective maintenance. However, most utilities are using Run to Fail or Preventive Maintenance Indicators as their maintenance strategy. This is because Predictive Maintenance has historically been considered too expensive to adopt. Critically, both Run to Fail and Preventive Maintenance have inherent flaws.

What's wrong with Run to Fail?

Run to Fail often seems like a low cost solution, but it has two major problems:

- a) When a pump fails, what is the guarantee that the other pump is operational?
Adopting a proactive approach to maintenance is far likelier to be viewed favorably by an EPA than adopting a 'hope for the best' approach.
- b) Without any visibility of the state of the assets prior to failure there is no guarantee that you are not running them into the ground. For example, one large utility found that a high proportion of its pumps failed after 7-8 years. The cause, identified by MultiTrode equipment, was that the 3-phase supply was too low, causing high running currents and reducing the life of the insulation on the motor windings. But at 5 years, the utility might have been feeling very confident that its low cost approach was working well.



Over the past six months, we have tested and installed six MultiSmart pump station managers and have been very pleased with the performance and ease of installation. The MultiSmart is reliable, easy to use and offers additional monitoring capabilities compared to other pump controllers we have used. Our field staff have all seen the benefits over float controls and in the future we will be looking to convert all our stations.

Frank McShane, Manager of Operations, East Gippsland Water Authority.

What's wrong with Preventive Maintenance?

Preventive Maintenance, or regular planned maintenance based on time in the field or equipment usage, is not a bad strategy. It's just not the best strategy. Preventive Maintenance clearly identifies that assets need maintenance but the frequency can only ever be a guess and often the maintenance is too frequent on some assets and not frequent enough on others.

How does Predictive Maintenance work?

To ensure that the hydraulic and electrical state of the pump and motor can be clearly monitored, the MultiSmart pump station manager measures the following:

| Parameter | Benefit |
|---|--|
| Flow rates per pump, total volume per pump | Identifies impellor wear problems. |
| Energy used per pump | Identifies energy cost for each pump. |
| Pump efficiency in gals/KWHr or litres/KWHr | Allows 'Run most efficient' algorithm to automatically save energy. Provides a measure of the cost of inefficiency to allow an ROI on service or replacement. |
| Insulation resistance per pump | Breakdown of motor windings causes 50-80% of motor failures. Pulling a pump and revarnishing is much lower cost than rewinding and can be done at a convenient time. |
| Supply voltage (all 3-phases) | Under-voltage leads to the windings running too hot, reducing the life of the motor significantly - and frequent trips by operations staff to reset "Pump Trip". Accurate monitoring allows a utility to rectify the underlying problem. |
| Current monitoring (all 3-phases) | Small imbalances in supply lead to larger current imbalances, causing uneven wear in bearings and windings running too hot. |
| Detailed fault analysis for each pump | Provides clear indication of which aspects of the electrical or hydraulic system need attention. |

MultiSmart delivers a wealth of Asset Management Data.

SCADA systems for pump stations frequently only have a few points of data per site — pump running, pump fault, level, level alarm, mains fail and flow (if a flow meter is available on site). This doesn't provide a platform for asset management. Asset managers, capital works managers and utility directors need real data to plan for the future.

MultiSmart provides 400-500 tags (data points) per site.

This wealth of data includes Predictive Maintenance information, volumes through the station, energy usage, peak power requirements and detailed fault information — allowing the utility to find out where their real costs lie.

MultiSmart also simplifies remote control — turning pumps on and off, resetting faults and changing setpoints.



Pre-designed SCADA

Any modern SCADA can connect to MultiSmart, but some vendors have already done the hard work, with screens and reports developed for the rich MultiSmart data as well as an "Add MultiSmart site" function.

Outpost2 from MultiTrove, visit multitrode.com/outpost2-scada-software to learn more.

VTS from Trihedral, visit trihedral.com

And PumpView is a secure on-line monitoring and control system, hosted by MultiTrove. Visit multitrode.com/pumpview

Which SCADA does MultiSmart connect to?

MultiSmart has a sophisticated RTU with Modbus & DNP3. The MultiSmart DNP3 implementation has been independently audited and proven to comply with the standard. MultiSmart has capacity for multiple masters and slaves to be configured allowing connection to any other modern SCADA platforms.

MultiSmart also supports connection over serial radio, ethernet radio, cellular data, cellular voice and phone lines.



Citect

RSView
from Rockwell
Automation

ClearSCADA



iFix and Cimplicity
from GE FANUC

Genesis 32
from Iconics

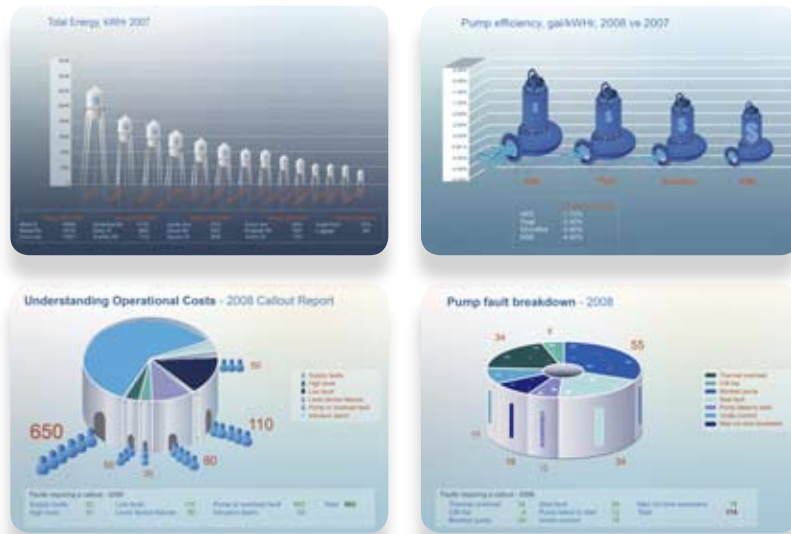
and any other modern SCADA platform.

MultiSmart reduces your energy costs and CO₂ footprint.

With energy costs rising and water & wastewater utilities concerned about their social responsibility, reducing energy use is a high priority.

MultiSmart measures the energy used for each pump, calculates the flow (or uses the data from a flowmeter if available) and derives the efficiency (gals/kWhr or litres/KWhr) of each pump in your network.

MultiSmart also includes an algorithm for automatically running the most efficient pump. The data on the energy cost per pump allows you to do an ROI calculation on servicing or replacing an inefficient pump.



Examples of reports and graphics created using data from MultiSmart

Pays for itself.

One UK water utility using MultiSmart found that one of their pumps in a 3-pump station was very inefficient and as a result the replacement cost of the impellor would be paid for within 95 days.

Improves pump efficiency.

Many water & wastewater utilities are unaware of how much pump efficiency can degrade, even in clean water.

A drop of 10% in efficiency in the first 10 years of service in a clean water pump is not uncommon. And a drop of over 20% in wastewater pumps is often found. MultiSmart helps address these problems.

The City of Tavares has been using the Multismart products for just under a year. I can't imagine how we did it before; we can now monitor and control every station with speed and with the accuracy of information we require. We have also found the flow calculations invaluable for I&I studies during rain events. Our experience with the product and tech support to date has been excellent. We highly recommend Multitrode and its products. The City of Tavares have standardized on MultiTrode products and stand by them.

Brad Hayes, Utilities Director & Jerry Blair, Supervisor, City of Tavares, FL.



MultiSmart gives you total control.

There are many remote sites within a water & wastewater network that don't contain any pumps – e.g. valve monitoring and control, flow meters, pressure and reservoirs. To help you get the most out of every aspect of your Utility, MultiSmart is also available in an RTU-only version and as a product called the Reservoir Monitor.

RTU-only.

The MultiSmart can be purchased and used just as an RTU. The physical appearance is exactly the same – a unit which includes a host processor & communications board, a DSP board for processing IO at high speed and IO cards, and a display. Unlike a standard RTU, which has contact closure digital inputs (DINs), the MultiSmart RTU can be configured as either contact closures or high speed counters.

To help cut costs and complexity it can be configured to measure:

- Conductive level sensors.
- Seal sensors.
- PTC thermistors.
- Flygt FLS and CLS sensors.

The MultiSmart RTU I/O also measures 3-phase voltage (direct phase up to 600v) and 3-phase currents (direct from 5A CTs).

Because of the high speed DSP processor, the voltage and current measurements can be used to accurately calculate:

- Power, KW.
- Power factor.
- Apparent power, KVA.
- Energy, KWHr.
- Apparent energy, KVAH.

The MultiSmart RTU also includes standard 4-20mA AINs, 4-20mA AOUTs and DOUTs along with the configurable DINs.

Reservoir Monitor.

The MultiSmart Reservoir Monitor was designed for reservoirs filled from remote pump stations. It includes functionality for communicating directly to the remote pump station as well as the SCADA system. The user interface works in exactly the same way, with the same menu structure, as the MultiSmart Pump Station Manager. So no extra training is required.



Specifications.

Processor, Comms, I/O, Display, Power Supply, Environmental.

Processor Unit

| | |
|-----------------|---|
| TYPE | Intel PXA255 |
| SPEED | 200MHz |
| FLASH MEMORY | 32MByte |
| RAM | 64MByte |
| REAL TIME CLOCK | Yes |
| SERIAL PORTS | RS232 x 3, 115kBit/s |
| ETHERNET PORT | 10Mbit/s |
| COMPACT FLASH | For firmware upgrades, configuration save/load, datalogging |

RTU/communications

| | |
|-------------|--|
| PROTOCOLS | DNP3 level 2, Modbus (RTU, ASCII, TCP) |
| MEDIA | TCP, UDP, RS232, 3G/GPRS/CDMA (1XRTT), PSTN/GSM/CDMA, |
| DATALOGGING | Change of state for digital, deadbanding for analog. Date/time and quality stamped |

PLC specification

| | |
|---|---|
| PROGRAMMING CAPABILITY | IEC61131-3 (configured via IsaGRAF workbench) |
| REFERENCE TO EXISTING FUNCTIONAL BLOCKS | Via tag database |

Configuration & Firmware upgrade

| | |
|--------|--|
| LOCAL | Compact Flash card or Ethernet from PC |
| REMOTE | Via DNP3 file transfer, or via FTP |

I/O modules

| | |
|--------------------------------|---|
| MULTISMART CARD: IO-3PC | General I/O and Pump Control |
| DIN X 20 | DINx 20 configurable as contact closure, counter, MultiTrobe probe input, seal, thermistor or FLS. Of these inputs: <ul style="list-style-type: none"> • 3 of the DINs have additional CLS capability • 2 of the DINs have additional high speed digital input capability (1 kHz) • 1 of the DINs has additional failsafe probe capability |
| DOUT x 7 | DOUTx 4 isolated voltage free contacts DOUTx 3 common voltage free contacts All rated 240Vrms, 5A |
| AIN x 2 | 2x 4-20mA inputs, 10bits, 0.2% resolution |
| AOUT x 1 | 1x 4-20mA outputs, 10bits, 0.2% resolution |
| VIN x 3 | 3-phase mains voltage inputs, 0.5% resolution. Up to 630V phase to phase |
| MULTISMART CARD: IO-3MP | Energy/Power Monitoring & Motor Protection board |
| IIN x 9 | 3 sets x 3-phase current inputs, derived from CTs, 0.5% resolution |
| IRT 1000v x 3 | 1000v dc to measure 0-20Mohm impedance on motor windings |
| DOUT x 5 | 5x isolated voltage free contacts, rated 240Vrms, 5A |
| AOUT X 3 | 3x 4-20mA output, 10bits, 0.2% resolution |
| ETHERNET IO MODULES: | General Analog and Digital I/O (connected via Modbus TCP to MultiSmart) |
| MSM-AD-8A / Adam 6017 | 8x AIN, 16-bit, differential; 2x DO open collector to 30V (not UL listed) |
| MSM-AD-18D / Adam 6050 | 12x DI, dry contact, 6x DO open collector to 30V (not UL listed) |
| ACROMAG 961EN-4006 | 6x AIN, 16-bit, differential, UL listed |
| ACROMAG 983EN-4012 | 12x DI or DO (any mix); DO open-drain to 35V DC max; DI active-low, buffered inputs, with a common connection, UL listed |

Note: Any Modbus or DNP3 I/O module can be connected to MultiSmart – the above parts have been integrated into the user interface.

Specifications.

Continued

User interface

320x240 backlit LCD screen with soft-keys

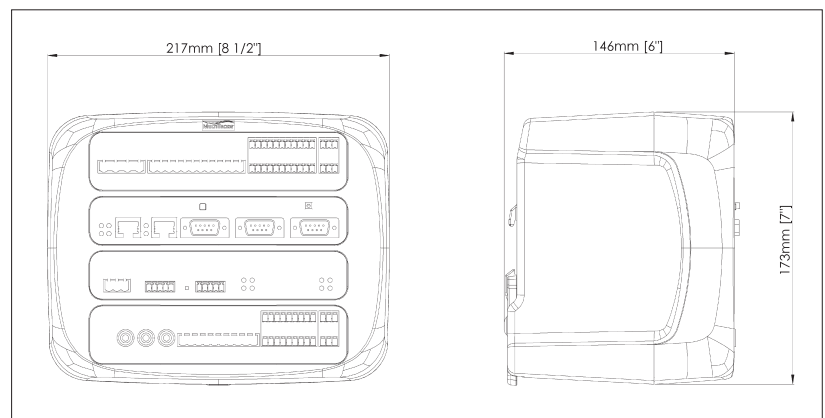
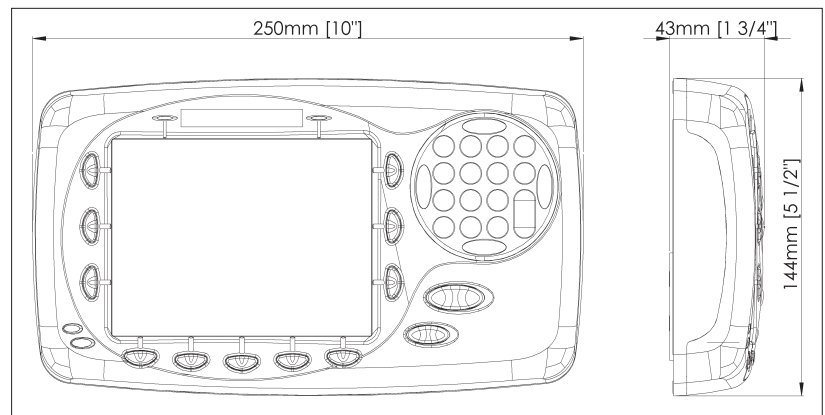
Power supply & environmental

| | |
|-------------------------------|--|
| DC SUPPLY | 11v-28v (DC supply voltage is monitored to 5% accuracy) |
| POWER | 15W max. 11W max. (without IO-3MP board) |
| AMBIENT TEMPERATURE | -10°C to +60°C |
| STORAGE TEMPERATURE | -40°C to +80°C |
| HUMIDITY | 5% to 95% non-condensing |
| Mains supply & battery backup | Option |

Physical Product

| | |
|-----------------------|---|
| CONTROLLER DIMENSIONS | H 173 x W 217 x D 159 (mm) H 6 ³ / ₄ x W 8 ¹ / ₂ x D 6 ¹ / ₄ (in) IP Rating IP20 |
| FACEPLATE DIMENSIONS | H 144 x W 250 x D 42 (mm) H 5 ⁵ / ₈ x W 9 ⁷ / ₈ x D 1 ⁵ / ₈ (in) IP/Nema IP55 / Nema 12 |

*Please note: I/O and software modules supplied depend on the configuration purchased.
All specifications subject to change without notice.*



Functionality.

Subset provided below. For complete functionality, review the product manual or specification document, available at multitrode.com

Supply Protection.

Under-voltage fault, Over-voltage fault, Phase imbalance fault, Phase rotation fault.

Motor Protection.

Over-current, Under-current, Ground/earth fault, Phase imbalance (current), I²T.

Flow.

Calculated flow for emptying wells (e.g. wastewater) of known volume: Inflow, Individual Pump flow rates & volumes, Station Volumes.

Flow from a flow meter: Metered Flow & Volume – if only one value is available the other can be derived, inflow also available via volume of well. Flow alarms.

Energy, Power and Pump Efficiency.

Power kW, power factor, Apparent power KVA (derived from 3-phase voltage and 3-phase current).

Energy KWHr, Apparent energy KVAH.

Pump efficiency – litres/KWHr, litres/KVAH or gal/KWHr, gal/KVAH.

Datalogger.

Configured by setup wizard, but any event/fault can be added/deleted. Analog & accumulators logged on deadband.

50,000 events logged to internal memory – can be copied to Compact Flash.

10,000,000 events can be logged to external 2GB C.F. card.

Pump Control.

Level from 4-20mA device, conductive probe, ball floats, remote level, logic-derived value.

1-6 pumps, 7-9 pumps available dependant on number of s/w modules enabled in the unit.

1 or 2 wells, hydraulically connected or independent.

Alternation – fixed, lead/lag, N-1, by pump efficiency, by hours run, by starts.

Alternation Groups – pumps can be placed in groups and alternated by above scheme, with groups set to fixed or alternation.

Setpoints – adjustable in %, m, ft, or user-defined values.

Multiple Setpoint profiles – switchable via user-interface, DIN, logic, SCADA or internal date/time clocks. Setpoint profiles include parameters: max pumps to run, max run time, max off time.

Alarm Setpoints – 4 alarms: high, high-high, low, low-low; available to be enabled/disabled and adjusted if enabled.

Level Simulation – via user interface for station testing.

Max pumps to run (e.g. for duty/standby-duty/assist).

Max run time fault (switch to next pump to run).

Odour reduction via Max off time (stops wells becoming septic).

Well washer control.

Blocked pump detection.

Pulse start (pump or group).

Pulse stop (pump or group).

Remote auto/off/manual.

Remote fault reset.

Fault Module.

All faults configurable as display only, auto-reset (allow pump to start after fault condition clears), manual reset (wait for operator intervention via user interface or SCADA), auto-reset configurable number of times, then go to manual reset.

Pump fault inputs from variety of sources: Thermal PTC thermistor, seal, FLS, CLS, voltage-free digital input.

General faults also available to configure.



MultiTrobe Inc - USA

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APPENDIX B2

**DRAFT STORMWATER POLLUTION PREVENTION PLAN AMENDMENT
(SPDES PERMIT NO. NYR10T581)**



**DRAFT STORMWATER POLLUTION PREVENTION PLAN
AMENDMENT
(SPDES PERMIT NO. NYR10T581)**

MAMARONECK BEACH AND YACHT CLUB

555 South Barry Avenue
Mamaroneck, NY 10543
Tax Map Parcel: Section 4, Block 77, Lot 31

Applicant/Project Sponsor:

Mamaroneck Beach and Yacht Club

555 South Barry Avenue
Mamaroneck, NY 10543
Contact: Ms. Lisa Rosenshein
Tel: (914) 698-3600

Prepared by:

TRC Engineers, Inc.

7 Skyline Drive
Hawthorne, New York 10532
Tel: (914) 592-4040
TRC Project No.: 200001

Municipality:

Village Engineer
Village of Mamaroneck
Village Hall at the Regatta
123 Mamaroneck Avenue
Mamaroneck, NY 10543

| Revision History | | |
|------------------|------|------------------|
| Rev. | Date | Description |
| 0 | | DSEIS Submission |

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Section 1 - Scope of Report

1.1 Scope

This SWPPP Amendment has been prepared in accordance with the requirements of the New York State Department of Environmental Conservation (NYSDEC) State Pollution Discharge Elimination System (SPDES) for Discharges from Construction Activity, General Permit No. GP-0-15-002 (General Permit) and shall become an Amendment to the Storm Water Pollution Prevention Plan.

In accordance with the provisions of the General Permit, this SWPPP Amendment addresses the changes in permit coverage and the construction of the pump station, force main and sanitary sewers. The SWPPP Amendment will be prepared and submitted to the Village of Mamaroneck Engineer for review and acceptance prior to the start of construction and addresses the net increase in impervious surface area needed to construct the proposed pump station; the method by which stormwater will be managed; and the required soil erosion and sediment control measures that will be utilized during the construction of the proposed force main.

Section 2 – SWPPP Modifications/Amendments

2.1 SPDES Permit

The SWPPP for this project was determined to satisfy the plan submittal requirements of the State Pollution Discharge Elimination System (SPDES) for Discharges from Construction Activity, General Permit No. GP-02-01 (General Permit). The SPDES Permit No. for this project is NYR10T581.

2.2 General Permit Coverage

Since the submission and acceptance of the SWPPP, the NYSDEC has issued two (2) renewals to the SPDES General Permit as further described below.

A. General Permit GP-0-08-001

Effective May 1, 2008, the New York State Department of Environmental Conservation (NYSDEC) State Pollution Discharge Elimination System (SPDES) for Discharges from Construction Activity, General Permit No. GP-02-01 (General Permit) was replaced by the New York State Department of Environmental Conservation (NYSDEC) State Pollution Discharge Elimination System (SPDES) for Discharges from Construction Activity, General Permit No. GP-0-08-001 (General Permit).

In accordance with Part II.D.1 of the General Permit No. GP-0-08-001, “Upon renewal of SPDES General Permit for Stormwater Discharges from Construction Activity (Permit No. GP-02-01), *an owner or operator of a construction activity*

with coverage under GP-02-01, as of the effective date of GP-0-08-001, shall be permitted to discharge in accordance with GP-0-08-001 unless otherwise notified by the Department.”

B. General Permit GP-0-10-001

Effective January 29, 2010, the New York State Department of Environmental Conservation (NYSDEC) State Pollution Discharge Elimination System (SPDES) for Discharges from Construction Activity, General Permit No. GP-0-08-001 (General Permit) was replaced by the New York State Department of Environmental Conservation (NYSDEC) State Pollution Discharge Elimination System (SPDES) for Discharges from Construction Activity, General Permit No. GP-0-10-001 (General Permit).

In accordance with Part II.D.1 of the General Permit No. GP-0-10-001 “Upon renewal of SPDES General Permit for Stormwater Discharges from Construction Activity (Permit No. GP-0-08-001), *an owner or operator of construction activity* with coverage under GP-0-08-001, as of the effective date of GP-0-10-001, shall be authorized to *discharge* in accordance with GP-0-10-001 unless otherwise notified by the Department.”

C. General Permit GP-0-15-002

Effective January 29, 2015, the New York State Department of Environmental Conservation (NYSDEC) State Pollution Discharge Elimination System (SPDES) for Discharges from Construction Activity, General Permit No. GP-0-10-001 (General Permit) was replaced by the New York State Department of Environmental Conservation (NYSDEC) State Pollution Discharge Elimination System (SPDES) for Discharges from Construction Activity, General Permit No. GP-0-15-002 (General Permit). The General Permit will expire on January 28, 2020.

In accordance with Part II.D.1 of the General Permit No. GP-0-15-002 “Upon renewal of SPDES General Permit for Stormwater Discharges from Construction Activity (Permit No. GP-0-10-001), an owner or operator of a construction activity with coverage under GP-0-10-001, as of the effective date of GP-0-15-002, shall be authorized to discharge in accordance with GP-0-15-002, unless otherwise notified by the Department.” and “An owner or operator may continue to implement the technical/design components of the post-construction stormwater management controls provided that such design was done in conformance with the technical standards in place at the time of initial project authorization. However, they must comply with the other, non-design provisions of GP-0-15-002.”

2.3 Reporting

- A. Inspections - In accordance with Part IV.C.2.a “For construction sites where soil disturbance activities are on-going, the qualified inspector shall conduct a site inspection at least once every seven (7) calendar days.”
- B. Record Retention - The owner or operator shall retain a copy of the NOI, NOI Acknowledgment Letter, SWPPP and any inspection reports that were prepared in conjunction with this permit for a period of at least five (5) years from the date that the site achieves final stabilization.

2.4 Certification Forms

An updated version of the Contractor/Sub-Contractor SPDES Permit Certification (GP-0-15-002) is contained in Appendix B and should be substituted for the Certification Form contained in the SWPPP.

2.5 Water Quality

Construction of the proposed pump station will result in a net increase in impervious surface coverage of approximately 500 square feet (0.011 acres). Storm water quality from the pump station pad will be managed through the use of an infiltration trench. The infiltration trench will be sized to accommodate the required water quality volume as described in Chapter 4 of the DEC Design Manual. The required water quality volume is determined by the following equation.

$$WQ_v = \frac{(P)(R_v)(A)}{12}$$

Where:

- WQ_v = water quality volume (in acre-feet)
- P = 90% Rainfall Event Number (see Figure 4.1, DEC Design Manual)
- R_v = 0.05 + 0.009 (I), where I is the percent of impervious cover
- A = site area in acres (onsite)

The value of the 90% Rainfall Event (P) for the portion of Westchester County where the Project is located is 1.5 inches. Based on the net increase in impervious surface coverage, the required water quality volume for the pump station pad will be 57 cubic feet. One (1) infiltration trench will be constructed parallel to each of the long sides of the pump station pad. Each infiltration trench will have a length of 30 feet, a width of 1'-3", and a depth of 2'-0". The volume provided in each infiltration trench will be 30 cubic feet with a total volume provide of 60 cubic feet.

2.6 Soil Erosion and Sediment Control

During construction, the potential for soil erosion and sedimentation shall be designed and installed in accordance with New York State Standards and Specifications for Erosion

and Sediment Control dated August 2005 which has replaced the New York Guidelines for Urban Erosion and Sediment Control, Fourth Printing, dated April 1997.

The SWPPP Amendment will address the methods required to manage the potential for soil erosion and sedimentation through the use of temporary soil erosion and sediment control devices designed and installed in accordance with New York State Standards and Specifications for Erosion and Sediment Control dated August 2005. These temporary soil erosion and sediment control measures would include, but not limited to storm drain inlet protection; street sweeping; dust control; and soil stockpiling.

Soil Stockpiling: The stockpile has been located away from sensitive vegetation or specimen trees and on a dry level area and shall comply with the following:

- All stockpiles shall be protected using a perimeter dike of silt fence or straw bale sediment barriers to prevent sediment runoff. This applies to all stockpiles remaining in place for more than two weeks.
- Stockpile side slopes shall not exceed 2 horizontal to 1 vertical (2:1).
- Temporary seeding or covering of stockpiles shall be completed within two weeks of formation.

Dust Control: Dust control would be accomplished through the use of vegetative cover, mulch, spray adhesive, sprinkling or barriers. Water would be applied by sprinkler or water truck as necessary during grading operations to minimize sediment transport and maintain acceptable air quality conditions. Repetitive treatments will be done as needed until grades are paved or stabilized with vegetation.

Inlet Protection (Catch Basin Filters): Temporary catch basin filters will be utilized to prevent the deposition of sediment into the storm sewer system prior to the stabilization of exposed areas with vegetation or pavement.

- Filters will be placed around each catch basin inlet prior to paving or stabilization with vegetation.
- Sediment shall be removed from the filters when sediment has accumulated to 50 percent of the filter's original height.

Excavation Dewatering: Sump pits would be constructed to where water will collect in utility trenches during water may collect during the excavation phase of construction. The sump pit shall be constructed of a perforated vertical standpipe placed in the center of the pit to collect filtered water. The vertical standpipe shall be wrapped in a filter cloth (Mirafi 100X, Poly Filter GB, or a filter cloth with an equivalent sieve size between 40 and 80). It is recommended that $\frac{1}{4}$ to $\frac{1}{2}$ inch hardware cloth be wrapped around and secured to the standpipe prior to attaching the filter cloth.

The vertical standpipe assembly shall be placed on a 12 inch layer of 2 inch aggregate. After installing the standpipe, the pit shall be backfilled with 2 inch aggregate. The

standpipe shall project 12 to 18 inches above grade. The number of sump pits and locations shall be determined by the contractor.

Water is then pumped from the center of the standpipe to a suitable designed sediment trap, sediment basin, or stabilized area, such as a filter strip. If a sediment trap or portable sediment tank is used, the tank or trap shall have a minimum volume of the 16 times the pump discharge rate.

Street Sweeping: Street Sweeping is considered a good housekeeping technique. Dry street sweeping would be required during all trench excavations within paved roads and parking areas to remove sediments and other contaminants directly from the paved surfaces. Street sweeping will occur daily and before forecasted storm events. All materials collected during street sweeping will be disposed of at an off-site location.

Section 3 - Summary and Conclusions

Based on the information presented in this SWPPP Amendment, the implementation of the proposed Storm Water Pollution Prevention Plan for the Project will meet the conditions of the NYSDEC State Pollution Discharge Elimination System (SPDES) for Discharges from Construction Activity General Permit.

Respectfully submitted,

TRC Engineers, Inc.

Ralph P. Peragine, P.E.
New York PE 064262

Under New York State Education Law Article 145 (Engineering), Section 7209 (2), it is a violation of this law for any person, unless acting under the direction of a Licensed Professional Engineer, to alter this document.

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APPENDIX A

CONTRACTOR/SUB-CONTRACTOR SPDES PERMIT CERTIFICATION

Project Name: Mamaroneck Beach and Yacht Club

Address: 555 South Barry Avenue

Mamaroneck, NY 10543

Pursuant to requirements of the NYSDEC SPDES General Permit for Construction Activities, GP-0-15-002, the Contractor and Subcontractor are required to certify that they understand the permit conditions and their responsibilities. Any Contractor or Sub-Contractor performing an activity that involves soil disturbance shall provide a signed copy of this certification to the Engineer prior to performing any Contract work.

"I hereby certify under penalty of law that I understand and agree to comply with the terms and conditions of the SWPPP and agree to implement any corrective actions identified by the qualified inspector during a site inspection. I also understand that the owner or operator must comply with the terms and conditions of the most current version of the New York State Pollutant Discharge Elimination System ("SPDES") general permit for stormwater discharges from construction activities and that it is unlawful for any person to cause or contribute to a violation of water quality standards. Furthermore, I am aware that there are significant penalties for submitting false information that I do not believe to be true, including the possibility of fine and imprisonment for knowing violations"

Company Name: _____

Address: _____

Tel.: _____

Fax: _____

Description of Specific SWPPP Elements Company is Responsible For:

Signature

Date

Printed Name

Title

Name and Title of Trained Individual(s) Responsible for SWPPP Implementation:

APPENDIX B

**NYSDEC STATE POLLUTION DISCHARGE ELIMINATION SYSTEM (SPDES) FOR DISCHARGES
FROM CONSTRUCTION ACTIVITY, GENERAL PERMIT NO. GP-0-15-002**

APPENDIX B3

SUBSURFACE GEOTECHNICAL DATA



Consulting, Municipal & Environmental Engineers
Planners ■ Surveyors ■ Landscape Architects

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Suite 202
Chestnut Ridge, NY 10977-6218
Tel: 845.352.0411 ■ Fax: 845.352.2611

October 26, 2010

Rosenshein Associates
555 South Barry Avenue
Mamaroneck, New York 10543

Attn.: Aggie Rigos

Re: Geotechnical Engineering Report
Proposed Improvements – Phase II
Mamaroneck Beach and Yacht Club
Mamaroneck, New York
MC Project No. 07000808A-G152A

This report is submitted as per our agreement for Geotechnical Engineering Services and supplements our Phase I Report dated August 26, 2010. It includes our findings, conclusions and recommendations related to the design and construction of foundations and slabs-on-grade for the proposed buildings.

We understand that the project includes the phased construction of improvements to the Club facility. Phase II includes the construction of a multi-level residential structure at the western end of the site and a club activity related structure near the tennis court complex.

EXPLORATIONS

Eight (8) test borings and three (3) percolation tests were completed by Soiltesting Inc. of Oxford, Connecticut between September 27 and 29, 2010. The boring location plan, a record sheet for each boring and the percolation test results are attached to this report. The percolation test results are provided for the use of others. Further, this report has been prepared based on the information provided on the record sheets. The borings were advanced using hollow stem auger method. Soil samples were recovered using a split spoon drive sampler driven with a 140-pound hammer free falling thirty (30) inches. Rock was core sampled in five (5) of the test borings using a core barrel with a diamond bit.

Borings B-1 to 3 were performed at the western end of the site hereafter referred to as the "West Site". Borings B-4 to 7 are in the area to be developed for Club activities just south of the tennis courts hereafter called the "South Site". The area considered by the Phase I Report is the eastern end of the site that includes the marina and referred to as the "East Site" in this report.



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Mamaroneck Beach and Yacht Club
Mamaroneck, New York
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Based on our interpretation of the information on the boring sheets and the scope of the project, it was deemed unnecessary to perform laboratory soil tests to assist with the identification of the soil and evaluation of engineering properties.

SUBSURFACE CONDITIONS

West Site (Boring B-1 to 3)

Conditions beneath the West Site are variable where six (6) feet of sand and gravel soil fill with organics covers nine (9) feet of very soft organic clayey silt with organics (peat) at the Boring B-1 location. Decomposed a highly weathered rock continues the profile to the maximum depth explored, twenty-three (23) feet. The soil fill decreases in thickness to about three (3) feet and the organic clayey silt disappears in an easterly direction across the site. The rock is identified as highly weathered and fractured schist/gneiss in poor to very poor structural condition in terms of the Rock Quality Designation (RQD) system of classification.

Water levels, as observed in the boreholes, existed at about three (3) feet at the time the borings were completed.

South Site (Boring B-4 to 7)

Soil fill also exists beneath this site with sand with gravel being mixed with organics and construction debris which in turn covers clayey silt and organics to depths that range from three (3) feet six (6) inches to eight (8) feet. Dense rock fragments continue the profile to hard rock at depths that range from three (3) foot six (6) inches to eleven (11) feet. Highly weathered and fractured rock then exists to the maximum depth of exploration, fifteen (15) feet.

Water levels, as observed in some of the boreholes, existed at a depth of four (4) feet at the time the borings were completed.

East Site (Boring B-11)

Boring B-11 was performed in the eastern reach of the site in the area considered for Phase I of the project. It shows that the rock is shallow, two (2) feet six (6) inches below grade, and of very poor structural quality.

Rock outcropping has been reported between Borings B-2 and B-3 and near Boring B-11. Therefore, rock excavations may be required.



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ANALYSIS AND DESIGN CONSIDERATIONS

The following were considered in developing the geotechnical conclusions and design recommendations:

1. The site features and proposed improvements are as shown on a Boring Location Plan by Gregg Cameron DeAngelis, AIA, Architects.
2. Two (2) buildings are proposed. One (1) is proposed for the West Site as a multi-storied residential structure. The first level will be on-grade as a parking and garage level. The second structure, to be located at the South Site, will be smaller, of similar construction, however, the ground level will be used for storage.
3. No basement levels are planned for the building footprints.
4. Differential settlement of the building components within a grid dimension of twenty (20) feet should not exceed one-half (0.5) inch.
5. The design and construction shall be completed in accordance with the Building Code of New York State (Code).

COMMENTS AND CONCLUSIONS

The existing soil fill and soft organic clayey silt at the West Site are not suitable to support the foundations and slabs. The undisturbed soil and rock beneath the soil fill are suitable support for spread footing type foundations. The soil fill and soft clayey silt deepen rapidly across the western end of the "West Site". Replacement of this deep unsuitable condition with quality fill is not realistic considering a difficult excavation that needs to be dewatered and that the disposal of excavated material may present environmental issues. It may be prudent to further investigate the depth and boundaries of this deep unsuitable condition to realize shallow workable excavations. The proposed building design and location could be altered to economize the project. Where the building footprint cannot be moved east to better subsurface conditions, deep foundations would be considered in lieu of the costly and difficult excavation and backfilling scenario. The entire footprint would, however, have to be on deep foundation elements for a compatible structural system not subject to differential movement and cracking damage. This behavior is typical for structures that bear on foundations that transition from shallow spread footings to pile support.



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RECOMMENDATIONS

The following recommendations are offered:

Building Foundations

South and East Sites and Eastern Side of West Site:

1. Remove topsoil and soil fill from the entire building footprint.
2. Dewater the excavation and backfill with compacted Select Fill.
3. Use spread footing foundations bearing on undisturbed soil, entirely on rock or a minimum of twelve (12) inches of compacted Select Fill that replaces the soil fill at least three (3) feet below the final exterior grades (as frost heave protection) and two (2) feet below interior heated area slabs for bearing stability.
4. Where compacted Select Fill is placed beneath footings it should be limited to a depth of five (5) feet and should extend outboard of the footing a distance equal to the depth below the footing.
5. Use a design bearing capacity of four thousand (4,000) and eight thousand (8,000) pounds per square foot (psf) for footing dimensions of at least eighteen (18) inches for soil and rock respectively.
6. Footings should not transition from soil to rock bearing. Either footing levels should be adjusted so they bear totally on rock or the rock undercut at least one (1) foot and compacted Select Fill placed as a cushion.

Western Side of West Site:

We recommend further exploration in this area, as discussed above in the "Comments and Conclusion" section, to identify the boundary of the existing organic material. Once the boundary is known a decision should be made either to change location of building or support part of the building on piles and part on shallow foundations. In such case a construction joint should be provided by the Structural Engineer between the two parts of the building.

For pile supported building use the following recommendations:

1. Use pile foundations for support of the superstructure and ground floor level.



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2. Tabulated below are design recommendations for several typical pile sections. The capacities refer to the soil/pile interaction, not the structural capacity of the section performing as a column.

| Pile Type | Design Capacity (tons) | Installed Capacity * (tons) |
|---|------------------------|-----------------------------|
| <u>Driven Pile Alternatives</u> | | |
| Timber (ASTM D25, Table 2) | 17 | 20 |
| Concrete Cast-In-Place Concrete Filled Pipe: 10" diameter | 35 | 40 |
| <u>Drilled-In Pile Alternatives</u> | | |
| Concreted Pipe with 4 foot rock socket: 10" diameter | 55 | 60 |

** These values consider downdrag on the pile due to settlement of surrounding miscellaneous fill.*

- The driven piles should penetrate to the very dense soil and/or fractured rock but not less than eight (8) feet for lateral stability.
- The piles should be driven to the installed capacity using a dynamic pile formula, as the Engineering News Formula. Caution is advance as to not damage the piles after they encounter the rock.
- A minimum pile-driving hammer energy of 7,500 and 15,000 foot-pounds is suggested for the timber and cast-in-place pipe and piles, respectively.
- Two (2) piles should be driven as test piles at locations spread across the site. Two (2) test piles should be dynamic load tested in accordance with the ASTM D4945 Standard prior to installing production piles. The testing should be performed and, based on the results of the tests, the driving criteria developed under the direction of a licensed Professional Engineer specializing in this type work.
- One (1) drilled-in pile should be load-tested in accordance with the ASTM D1143 Standard prior to installing the production piles.
- Since drilled-in piles socketed into rock develop most of their capacity as side wall residence of the socket the load test could be a tension test as per ASTM D3689 as a cost saving procedure.



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9. Small diameter drilled-in piles known as micro-piles designed, tested and installed by and as directed by a licensed Professional Engineer specializing in this type of application, should be considered. These piles could develop capacities in the range of twenty (2) to sixty (60) tons.

Slabs

1. The slab-on-grade subgrades should be a minimum thickness of nine (9) inches of compacted Select Fill over the in-place materials.
2. Use a Modulus of Subgrade Reaction (k) of 200 pounds per square inch per inch (pci) for slab designs.
3. The slab should be a structural element for pile supported structures.

Earthquake (Seismic) Considerations

Use Site Class D as per the Code. The existing soil profile is deemed not susceptible to liquefaction.

Groundwater Management

The soil fill removal excavation should be dewatered to allow satisfactory placement and compaction of the Select Fill. Dewatering specifications shall be of the performance type requiring that the contractor lower water table to a minimum of two (2) feet below the excavation depth.

Select Fill

Select fill should be a well-graded sand and gravel, free of debris and organic material, with a maximum particle size of three (3) inches, between ten (10) and seventy (70) percent by weight passing the Standard No. 40 sieve size and less than twelve (12) percent passing the No. 200 sieve.

Compaction

Compaction of the select fill beneath footings and slabs should achieve a density of at least ninety-five (95) percent of the maximum density for the material as determined in the laboratory when tested in accordance with the most recent ASTM D1557 Standard.



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Quality Control

The following construction tasks should be inspected by a Geotechnical Engineer using appropriate laboratory and field-testing support:

- Removal of topsoil and in-place soil fill;
- Confirmation of foundation bearing levels;
- Compaction of in-place soil prior to backfilling with Select Fill;
- Supply and compaction of Select Fill;
- Testing and Installation of Piles.

The Geotechnical Engineer should also review the removal excavation dewatering program to include design. If micro-piles are specified the Geotechnical Engineer should review the design as well as testing and installation.

LIMITATIONS

1. The conclusions and recommendations submitted in this report are based in part upon the data obtained from subsurface explorations provided by Soiltesting, Inc. The nature and extent of variations between and apart from these explorations may not become evident until construction begins. If variations then appear evident, it will be necessary to reevaluate the recommendations of this report.
2. The generalized soil profile described in the text is intended to convey trends in subsurface conditions. The boundaries between strata are approximate and idealized and have been developed by interpretations of widely spaced explorations and samples; actual soil transitions are probably more erratic.
3. Water level readings have been made in the drill holes at times and under conditions stated on the boring logs. These data have been reviewed and interpretations have been made in the text of this report. However, it must be noted that fluctuations in the level of the groundwater may occur due to variations in rainfall, temperature, and other factors occurring since the time measurements were made. More precise determinations of groundwater levels would require the installation of groundwater observation wells and water level readings taken over an extended period of time. Ground water levels are expected to fluctuate with seasonal and climatic changes.



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4. In the event that any changes in the nature, design or location of the proposed building and/or site improvements are planned, the conclusions and recommendations contained in this report shall not be considered valid unless the changes are reviewed and conclusions of this report modified or verified in writing by Maser Consulting P.A. (Maser). Further, it is recommended that Maser be provided the opportunity for a general review of the final design and specifications in order that the geotechnical related recommendations may be properly interpreted and implemented in the design and specifications.
5. This report has been prepared for the exclusive use of Rosenshein Associates for specific application to construction at the Mamaroneck Beach and Yacht Club site in Mamaroneck, New York. Further, it has been prepared in accordance with generally accepted soil and foundation engineering practices. No other warranty, expressed or implied, is made.
6. This report is for design purposes only and is not sufficient to prepare construction cost estimates or bids.

We trust these recommendations will allow you to complete the design and construction of the new buildings.

Very truly yours,

MASER CONSULTING P.A.


Thomas H. Otto, P.E.
Department Manager, Geotechnical Services



Moustafa A. Gouda, P.E., D. GE, F.ASCE
Principal, Director
Geotechnical/Environmental Services

THO:ca
Attachments: Boring Location Plan
Boring Record Sheets

Mamaroneck Beach & Yacht Club Phase I Plan



Topographical Survey of the Mamaroneck Beach & Yacht Club
in the Village of Mamaroneck, Town of Rye, Westchester Co., N.Y.
May 23, 2000
Sept. 13, 2000 (Revised)
Scale 1" = 40'



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MAMARONECK, NY 10604
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445 Hudson Avenue
Mamaroneck, NY 10604
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CIVIL & TRAFFIC
TIC RAYMOND ELLER ASSOC
1000 Park Avenue
New York, NY 10028
212-337-4000

M/E/P ENGINEER
WERNER E. TETEN, P.E.
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Mamaroneck, NY 10604
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LANDSCAPE ARCHITECT
J.C. LOTTO, LANDSCAPE ARCHITECT
807 Quaker Ridge Road
Mamaroneck, NY 10604
914-777-2727

REVISION
DATE
NO.

REVISED BORING
LOCATION PLAN

| | | | | |
|--|---|---------------|------------------------------|---------------------|
| SOILTESTING, INC. 140 OXFORD RD. OXFORD, CT 06478 CT (203) 888-4531 NY (914) 946-4850 | CLIENT: Rosenshein Associates | | SHEET <u>1</u> OF <u>1</u> | |
| | PROJECT NO. G98-8702-10 | | HOLE NO. B - 1 | |
| | PROJECT NAME Mamaroneck Beach & Yacht Club | | BORING LOCATIONS per Plan | |
| FOREMAN - DRILLER MD/djd | LOCATION 555 South Barry Avenue Mamaroneck, NY | | | |
| INSPECTOR | TYPE | CASING HSA | SAMPLER SS | CORE BAR NWD4 |
| GROUND WATER OBSERVATIONS AT <u>30"</u> FT AFTER <u>0</u> HOURS | SIZE I.D. | 4 1/4" | 1 3/8" | 2 1/2" |
| AT <u> </u> FT AFTER <u> </u> HOURS | HAMMER WT. | 140# | | BIT |
| | HAMMER FALL | 30" | | dia |
| | | | | OFFSET |
| | | | | DATE START 9/28/10 |
| | | | | DATE FINISH 9/28/10 |
| | | | | SURFACE ELEV. |
| | | | | GROUND WATER ELEV. |

| DEPTH | CASING BLOWS PER FOOT | SAMPLE | | | | | BLOWS PER 6 IN ON SAMPLER (FORCE ON TUBE) 0 - 6 - 12 12- 18 | | | CORE TIME PER FT (MIN) | DENSITY OR CONSIST | STRATA CHANGE DEPTH | FIELD IDENTIFICATION OF SOIL REMARKS INCL. COLOR, LOSS OF WASH WATER, SEAMS IN ROCK, ETC. |
|-------|-----------------------|--------|------|-----|------|-------------|--|-------|--|------------------------|--------------------|---------------------|---|
| | | NO | Type | PEN | REC. | DEPTH @ BOT | | | | | MOIST | ELEV | |
| 5 | | 1 | ss | 24" | 16" | 2'0" | 10 | 8 | | | moist | 6" | TOPSOIL |
| | | 2 | ss | 24" | 16" | 4'0" | 11 | 8 | | | compact | | blk F-C SAND & F GRAVEL, tr silt |
| | | | | | | | 21 | 18 | | | moist | | olv brn F SAND & SILT, lit M-C sand, F gravel, organics (fill) |
| | | 3 | ss | 24" | 12" | 6'0" | 15 | 10 | | | dense | 4'0" | blk F SAND & ORGANIC SILT, lit F-C sand, & F gravel (fill) |
| 10 | | | | | | | 2 | 2 | | | wet | | gry/brn F-C SAND & F GRAVEL (poss fill) |
| | | 4 | ss | 24" | 24" | 8'0" | 48 | 12 | | | dense | 6'0" | |
| | | | | | | | 2 | 1 | | | wet | | gry ORGANIC CLAYEY SILT |
| | | 5 | ss | 24" | 24" | 10'0" | 1 | 2 | | | v loose | | |
| 15 | | | | | | | 1 | 1 | | | wet | | SAME; sm organics (PEAT) |
| | | 6 | ss | 24" | 21" | 12'0" | 1 | 1 | | | v loose | | |
| | | | | | | | 1 | 1 | | | wet | | gry ORGANIC CLAYEY SILT |
| | | | | | | | 2 | | | | loose | | |
| 20 | | | | | | | | | | | | | |
| | | 7 | ss | 19" | 13" | 16'7" | 4 | 7 | | | wet | 15'0" | |
| | | | | | | | 9 | 50/1" | | | compact | 16'0" | brn F SAND & SILT |
| | | | | | | | | | | | | 16'6" | partially weathered BEDROCK |
| 25 | | | | | | | | | | | | 17'0" | AUGER REFUSAL |
| | | 1 | cr | 60" | 52" | 23'0" | RQD = 37% | | | 1.50 | | | BEDROCK (schist) |
| | | | | | | | | | | 1.50 | | | (Fractured gneiss with iron staining on joints. |
| | | | | | | | | | | 1.00 | | | Few partially weathered schist seams) |
| 30 | | | | | | | | | | 1.50 | | | |
| | | | | | | | | | | 1.50 | | | |
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NOTE: Subsoil conditions revealed by this investigation represent conditions at specific locations and may not represent conditions at other locations or times.

| | | | |
|---|-------------------|--------------------------------|-----------------------|
| GROUND SURFACE TO _____ FT. | USED _____ CASING | THEN _____ CASING TO _____ FT. | HOLE NO. B - 1 |
| A = AUGER UP = UNDISTURBED PISTON T = THINWALL V = VANE TEST | | | |
| WOR = WEIGHT OF RODS | | WOH = WEIGHT OF HAMMER & RODS | C = COARSE |
| SS = SPLIT TUBE SAMPLER | | H.S.A. = HOLLOW STEM AUGER | M = MEDIUM |
| PROPORTIONS USED: TRACE = 0 - 10% LITTLE = 10 - 20% SOME = 20 - 35% AND = 35 - 50% | | | F = FINE |

| | | | | |
|--|---|---|--|--|
| SOILTESTING, INC. 140 OXFORD RD. OXFORD, CT 06478 CT (203) 888-4531 NY (914) 946-4850 | CLIENT: Rosenshein Associates | | SHEET <u>1</u> OF <u>1</u> HOLE NO. B -2 | |
| | PROJECT NO. G98-8702-10 | | BORING LOCATIONS per Plan | |
| | PROJECT NAME Mamaroneck Beach & Yacht Club | | | |
| FOREMAN - DRILLER MD/djd | LOCATION 555 South Barry Avenue Mamaroneck, NY | | OFFSET DATE START 9/27/10 DATE FINISH 9/27/10 SURFACE ELEV. GROUND WATER ELEV. | |
| INSPECTOR | TYPE SIZE I.D. HAMMER WT. HAMMER FALL | CASING HSA 4 1/4" SAMPLER SS 1 3/8" CORE BAR 140# 30" | | |
| GROUND WATER OBSERVATIONS AT <u>none</u> FT AFTER <u>0</u> HOURS AT <u> </u> FT AFTER <u> </u> HOURS | | | | |

| DEPTH | CASING BLOWS PER FOOT | SAMPLE | | | | | BLOWS PER 6 IN ON SAMPLER (FORCE ON TUBE) 0 - 6 6 - 12 12 - 18 | | | CORE TIME PER FT (MIN) | DENSITY OR CONSIST | STRATA CHANGE DEPTH | FIELD IDENTIFICATION OF SOIL REMARKS INCL. COLOR, LOSS OF WASH WATER, SEAMS IN ROCK, ETC. |
|-------|-----------------------|--------|------|-----|------|-------------|---|-------|--|------------------------|--------------------|---------------------|---|
| | | NO | Type | PEN | REC. | DEPTH @ BOT | | | | | | ELEV | |
| 5 | | 1 | ss | 24" | 8" | 2'0" | 15 | 21 | | | dry | 4" | TOPSOIL |
| | | | | | | | 21 | 12 | | | dense | 2'6" | brn FM SAND, sm silt, organics, lit F gravel (poss fill) |
| | | 2 | ss | 9" | 10" | 2'9" | 13 | 50/5" | | | dry | | BOULDER |
| | | 3 | ss | 14" | 12" | 5'2" | 11 | 32 | | | dry | 5'0" | |
| | | | | | | | 50/2" | | | | dense | 6'0" | fractured BEDROCK or BOULDER AUGER REFUSAL |
| | | | | | | | | | | | | | E.O.B. 6'0" |
| 10 | | | | | | | | | | | | | |
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NOTE: Subsoil conditions revealed by this investigation represent conditions at specific locations and may not represent conditions at other locations or times.

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| GROUND SURFACE TO <u> </u> FT. USED <u> </u> CASING THEN <u> </u> CASING TO <u> </u> FT. | | HOLE NO. B -2 |
| A = AUGER UP = UNDISTURBED PISTON T = THINWALL V = VANE TEST WOR = WEIGHT OF RODS WOH = WEIGHT OF HAMMER & RODS C = COARSE SS = SPLIT TUBE SAMPLER H.S.A. = HOLLOW STEM AUGER M = MEDIUM PROPORTIONS USED: TRACE = 0 - 10% LITTLE = 10 - 20% SOME = 20 - 35% AND = 35 - 50% F = FINE | | |

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|--|---|--------|---------|------------------------------|---------------------|
| SOILTESTING, INC. 140 OXFORD RD. OXFORD, CT 06478 CT (203) 888-4531 NY (914) 946-4850 | CLIENT: Rosenshein Associates | | | SHEET <u>1</u> OF <u>1</u> | |
| | PROJECT NO. G98-8702-10 | | | HOLE NO. B -3 | |
| | PROJECT NAME Mamaroneck Beach & Yacht Club | | | BORING LOCATIONS per Plan | |
| FOREMAN - DRILLER MD/djd | LOCATION 555 South Barry Avenue Mamaroneck, NY | | | | |
| INSPECTOR | TYPE | CASING | SAMPLER | CORE BAR | OFFSET |
| | | HSA | SS | NWD4 | |
| GROUND WATER OBSERVATIONS | SIZE I.D. | 4 1/4" | 1 3/8" | 2 1/8" | DATE START 9/27/10 |
| AT 3'0" FT AFTER 0 HOURS | HAMMER WT. | | 140# | BIT | DATE FINISH 9/28/10 |
| AT _ FT AFTER _ HOURS | HAMMER FALL | | 30" | dia | SURFACE ELEV. |
| | | | | | GROUND WATER ELEV. |

| DEPTH | CASING BLOWS PER FOOT | SAMPLE | | | | | BLOWS PER 6 IN ON SAMPLER (FORCE ON TUBE) 0 - 6 6 - 12 12- 18 | | | CORE TIME PER FT (MIN) | DENSITY OR CONSIST | STRATA CHANGE DEPTH | FIELD IDENTIFICATION OF SOIL REMARKS INCL. COLOR, LOSS OF WASH WATER, SEAMS IN ROCK, ETC. |
|-------|--------------------------------|--------|------|-----|-----|----------------|--|----|--|------------------------------------|--------------------------|---------------------------|---|
| | | NO | Type | PEN | REC | DEPTH @ BOT | | | | | MOIST | ELEV | |
| 5 | | 1 | ss | 24" | 14" | 2'0" | 2 | 5 | | | moist-dry | 10" | TOPSOIL |
| | | | | | | | 7 | 10 | | | compact | | It brn FMC SAND, sm F gravel, tr silt (fill) |
| | | 2 | ss | 17" | 4" | 3'5" | 7 | 14 | | | moist-wet | 3'0" | SAME; tr organics, plastics (fill) |
| | | | | | | | 75/5" | | | | dense | | partially decomposed BEDROCK |
| | | 3 | ss | 1" | 1" | 4'1" | 50/4" | | | | dry | | SAME |
| 10 | | 4 | ss | 0" | 0" | 5'6" | 50/0" | | | | dense | 5'6" | AUGER REFUSAL |
| | | 1 | cr | 60" | 25" | 9'6" | RQD = 7% | | | 1.50 | | | fractured BEDROCK or BOULDERS |
| | | | | | | | | | | 1.50 | | | |
| | | | | | | | | | | 1.00 | | | |
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NOTE: Subsoil conditions revealed by this investigation represent conditions at specific locations and may not represent conditions at other locations or times.

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|--|--|-------------------|--------------------------------|----------------------|
| GROUND SURFACE TO _____ FT. | | USED _____ CASING | THEN _____ CASING TO _____ FT. | HOLE NO. B -3 |
| A = AUGER UP = UNDISTURBED PISTON T = THINWALL V = VANE TEST WOR = WEIGHT OF RODS WOH = WEIGHT OF HAMMER & RODS C = COARSE SS = SPLIT TUBE SAMPLER H.S.A. = HOLLOW STEM AUGER M = MEDIUM PROPORTIONS USED: TRACE = 0 - 10% LITTLE = 10 - 20% SOME = 20 - 35% AND = 35 - 50% F = FINE | | | | |

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|--|--|---|--|--|--|------------------------------|---------|----------|---------------------|
| SOILTESTING, INC. 140 OXFORD RD. OXFORD, CT 06478 CT (203) 888-4531 NY (914) 946-4850 | | CLIENT: Rosenshein Associates | | | | SHEET <u>1</u> OF <u>1</u> | | | |
| | | PROJECT NO. G98-8702-10 | | | | HOLE NO. B - 4 | | | |
| FOREMAN - DRILLER MD/djd | | PROJECT NAME Mamaroneck Beach & Yacht Club | | | | BORING LOCATIONS per Plan | | | |
| | | LOCATION 555 South Barry Avenue Mamaroneck, NY | | | | | | | |
| INSPECTOR | | TYPE | | | | CASING | SAMPLER | CORE BAR | OFFSET |
| | | SIZE I.D. | | | | HSA | SS | NWD4 | DATE START 9/28/10 |
| GROUND WATER OBSERVATIONS AT <u>none</u> FT AFTER <u>0</u> HOURS AT <u> </u> FT AFTER <u> </u> HOURS | | HAMMER WT. | | | | 4 1/4" | 1 3/8" | 2 1/8" | DATE FINISH 9/28/10 |
| | | HAMMER FALL | | | | 140# | BIT | | SURFACE ELEV. |
| | | | | | | 30" | dia | | GROUND WATER ELEV. |

| DEPTH | CASING BLOWS PER FOOT | SAMPLE | | | | | BLOWS PER 6 IN ON SAMPLER (FORCE ON TUBE) 0 - 6 6 - 12 12 - 18 | | | CORE TIME PER FT (MIN) | DENSITY OR CONSIST MOIST | STRATA CHANGE DEPTH ELEV | FIELD IDENTIFICATION OF SOIL REMARKS INCL. COLOR, LOSS OF WASH WATER, SEAMS IN ROCK, ETC. |
|-------|--------------------------------|--------|------|-----|------|----------------|---|-------|------|------------------------------------|---|---|---|
| | | NO | Type | PEN | REC. | DEPTH @ BOT | | | | | | | |
| 5 | | 1 | ss | 24" | 14" | 2'0" | 4 | 9 | | dry compact | 6" | TOPSOIL | |
| | | | | | | 14 | 30 | | 2'0" | | brn FM SAND, sm silt, lit C sand, F gravel, tr cobble, brick (fill) | | |
| | | 2 | ss | 10" | 6" | 2'10" | 20 | 50/4" | | | 3'6" | brn SILT & F SAND, sm M-C sand, F gravel, tr small boulders | |
| | | | | | | | | | | | AUGER REFUSAL | | |
| | | 1 | cr | 60" | 23" | 8'6" | RQD = 8% | | | | 1.00 | fractured BEDROCK or BOULDERS | |
| | | | | | | | | | 1.50 | | | | |
| | | | | | | | | | 1.50 | | | | |
| | | | | | | | | | 1.00 | | | | |
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NOTE: Subsoil conditions revealed by this investigation represent conditions at specific locations and may not represent conditions at other locations or times.

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|---|--|-------------------------------|---------------------------|-----------------------------|-----------------------|
| GROUND SURFACE TO <u> </u> FT. | | USED <u> </u> | CASING THEN <u> </u> | CASING TO <u> </u> FT. | HOLE NO. B - 4 |
| A = AUGER UP = UNDISTURBED PISTON T = THINWALL V = VANE TEST | | | | | |
| WOR = WEIGHT OF RODS | | WOH = WEIGHT OF HAMMER & RODS | | C = COARSE | |
| SS = SPLIT TUBE SAMPLER | | H.S.A. = HOLLOW STEM AUGER | | M = MEDIUM | |
| PROPORTIONS USED: TRACE = 0 - 10% LITTLE = 10 - 20% SOME = 20 - 35% AND = 35 - 50% | | | | F = FINE | |

| | | | | |
|--|---|---------------|------------------------------|---------------------|
| SOILTESTING, INC. 140 OXFORD RD. OXFORD, CT 06478 CT (203) 888-4531 NY (914) 946-4850 | CLIENT: Rosenshein Associates | | SHEET <u>1</u> OF <u>1</u> | |
| | PROJECT NO. G98-8702-10 | | HOLE NO. B - 5 | |
| | PROJECT NAME Mamaroneck Beach & Yacht Club | | BORING LOCATIONS per Plan | |
| FOREMAN - DRILLER MD/djd | LOCATION 555 South Barry Avenue Mamaroneck, NY | | | |
| INSPECTOR | TYPE | CASING HSA | SAMPLER SS | CORE BAR NWD4 |
| GROUND WATER OBSERVATIONS AT 4'0" FT AFTER 0 HOURS AT ___ FT AFTER ___ HOURS | SIZE I.D. | 4 1/4" | 1 3/8" | 2 1/4" |
| | HAMMER WT. | | 140# | BIT |
| | HAMMER FALL | | 30" | dia |
| | | | | OFFSET |
| | | | | DATE START 9/28/10 |
| | | | | DATE FINISH 9/28/10 |
| | | | | SURFACE ELEV. |
| | | | | GROUND WATER ELEV. |

| DEPTH | CASING BLOWS PER FOOT | SAMPLE | | | | | BLOWS PER 6 IN ON SAMPLER (FORCE ON TUBE) 0 - 6 6 - 12 12 - 18 | | | CORE TIME PER FT (MIN) | DENSITY OR CONSIST | STRATA CHANGE DEPTH | FIELD IDENTIFICATION OF SOIL REMARKS INCL. COLOR, LOSS OF WASH WATER, SEAMS IN ROCK, ETC. |
|-------|--------------------------------|--------|------|-----|-----|----------------|---|----|--|------------------------------------|--------------------------|---------------------------|---|
| | | NO | Type | PEN | REC | DEPTH @ BOT | | | | | MOIST | ELEV | |
| 5 | | 1 | ss | 24" | 17" | 2'0" | 2 | 6 | | | moist | 6" | TOPSOIL |
| | | 2 | ss | 24" | 13" | 4'0" | 5 | 4 | | | compact | | drk brn SILT, sm FM sand, lit C sand, F gravel, tr roots |
| | | 3 | ss | 24" | 14" | 6'0" | 4 | 4 | | | loose | 4'0" | dkbrn/brn SILT & CLAY, lit FM sand, tr C sand, F gravel, brick (fill) |
| | | 4 | ss | 14" | 14" | 7'2" | 5 | 11 | | | wet | 7'0" | brn F SAND & CLAYEY SILT, sm organics (peat), lit C sand & F gravel |
| | | | | | | | 8 | 10 | | | wet | | drk brn FM SAND, sm silt, C sand, lit F gravel |
| 10 | | | | | | | 50/2" | | | | dense | | partially decomposed BEDROCK |
| | | 1 | cr | 60" | 50" | 15'0" | RQD = 15% | | | 1.50 | | 10'0" | AUGER REFUSAL |
| | | | | | | | | | | 1.50 | | | BEDROCK (schist) |
| | | | | | | | | | | 1.00 | | | (Fractured gneiss with iron staining on joints. |
| | | | | | | | | | | 1.00 | | | Few partially weathered schist seams) |
| 15 | | | | | | | | | | 1.00 | | | |
| 20 | | | | | | | | | | | | | |
| 25 | | | | | | | | | | | | | |
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NOTE: Subsoil conditions revealed by this investigation represent conditions at specific locations and may not represent conditions at other locations or times.

| | | | |
|--|-------------------|--------------------------------|-----------------------|
| GROUND SURFACE TO _____ FT. | USED _____ CASING | THEN _____ CASING TO _____ FT. | HOLE NO. B - 5 |
| A = AUGER UP = UNDISTURBED PISTON T = THINWALL V = VANE TEST WOR = WEIGHT OF RODS WOH = WEIGHT OF HAMMER & RODS C = COARSE SS = SPLIT TUBE SAMPLER H.S.A. = HOLLOW STEM AUGER M = MEDIUM PROPORTIONS USED: TRACE = 0 - 10% LITTLE = 10 - 20% SOME = 20 - 35% AND = 35 - 50% F = FINE | | | |

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|--|---|--|------------------------------|----------|
| SOILTESTING, INC. 140 OXFORD RD. OXFORD, CT 06478 CT (203) 888-4531 NY (914) 946-4850 | CLIENT: Rosenshein Associates | | SHEET <u>1</u> OF <u>1</u> | |
| | PROJECT NO. G98-8702-10 | | HOLE NO. B -6 | |
| | PROJECT NAME Mamaroneck Beach & Yacht Club | | | |
| FOREMAN - DRILLER MD/djd | LOCATION 555 South Barry Avenue Mamaroneck, NY | | BORING LOCATIONS per Plan | |
| INSPECTOR | TYPE SIZE I.D. HAMMER WT. HAMMER FALL | CASING HSA | SAMPLER SS | CORE BAR |
| GROUND WATER OBSERVATIONS AT <u>none</u> FT AFTER <u>0</u> HOURS AT <u> </u> FT AFTER <u> </u> HOURS | | OFFSET | | |
| | | DATE START 9/28/10 | | |
| | | DATE FINISH 9/28/10 | | |
| | | SURFACE ELEV. | | |
| GROUND WATER ELEV. | | | | |

| DEPTH | CASING BLOWS PER FOOT | SAMPLE | | | | | BLOWS PER 6 IN ON SAMPLER (FORCE ON TUBE) 0 - 6 6 - 12 12- 18 | | | CORE TIME PER FT (MIN) | DENSITY OR CONSIST | STRATA CHANGE DEPTH | FIELD IDENTIFICATION OF SOIL REMARKS INCL. COLOR, LOSS OF WASH WATER, SEAMS IN ROCK, ETC. |
|-------|--------------------------------|--------|------|-----|------|----------------|--|---|--|------------------------------------|--------------------------|--|---|
| | | NO | Type | PEN | REC. | DEPTH @ BOT | | | | | MOIST | ELEV | |
| | | | | | | | | | | | | | |
| 5 | | 1 | ss | 24" | 17" | 2'0" | 2 | 4 | | | moist | 11" | TOPSOIL |
| | | | | | | 6 | 6 | | | loose | | brn/drk brn SILT, sm FM sand, lit F gravel, tr asphalt,brick brn FM SAND & SILT, sm C sand, F gravel, lit organics, tr brick drk brn FM SAND & SILT, sm organics, C sand, lit F gravel, tr brick, cobble (fill) | |
| | | 2 | ss | 24" | 14" | 4'0" | 8 | 9 | | | moist | | |
| | | | | | | 6 | 4 | | | compact | | | |
| | | 3 | ss | 24" | 10" | 6'0" | 2 | 4 | | | wet-moist | | |
| | | | | | | 7 | 3 | | | compact | 6'0" | | |
| 10 | | 4 | ss | 11" | 10" | 7'5" | 2 | 4 | | | wet-dry | | drk gry/brn ORGANIC SILT & FM SAND, sm C |
| | | | | | | 50/5" | | | | | dense | 7'5" | sand, lit F gravel, tr wood |
| | | 5 | ss | 1" | 1" | 8'1" | 50/1" | | | | dry | | partially weathered BEDROCK |
| | | 6 | ss | 0" | 0" | 50/0" | 50/0" | | | | dense | | SAME |
| | | | | | | | | | | | | 11'0" | AUGER REFUSAL |
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NOTE: Subsoil conditions revealed by this investigation represent conditions at specific locations and may not represent conditions at other locations or times.

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| GROUND SURFACE TO _____ FT. USED _____ CASING THEN _____ CASING TO _____ FT. | | HOLE NO. B -6 |
| A = AUGER UP = UNDISTURBED PISTON T = THINWALL V = VANE TEST WOR = WEIGHT OF RODS WOH = WEIGHT OF HAMMER & RODS C = COARSE SS = SPLIT TUBE SAMPLER H.S.A. = HOLLOW STEM AUGER M = MEDIUM PROPORTIONS USED: TRACE = 0 - 10% LITTLE = 10 - 20% SOME = 20 - 35% AND = 35 - 50% F = FINE | | |

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|--|---|---------|------------------------------|---------------------|
| SOILTESTING, INC. 140 OXFORD RD. OXFORD, CT 06478 CT (203) 888-4531 NY (914) 946-4850 | CLIENT: Rosenshein Associates | | SHEET <u>1</u> OF <u>1</u> | |
| | PROJECT NO. G98-8702-10 | | HOLE NO. B - 7 | |
| | PROJECT NAME Mamaroneck Beach & Yacht Club | | BORING LOCATIONS per Plan | |
| FOREMAN - DRILLER MD/djd | LOCATION 555 South Barry Avenue Mamaroneck, NY | | | |
| INSPECTOR | CASING | SAMPLER | CORE BAR | OFFSET |
| | TYPE | HSA | SS | DATE START 9/28/10 |
| GROUND WATER OBSERVATIONS | SIZE I.D. | 4 1/4" | 1 3/8" | DATE FINISH 9/28/10 |
| AT 4'0" FT AFTER 0 HOURS | HAMMER WT. | 140# | | SURFACE ELEV. |
| AT ___ FT AFTER ___ HOURS | HAMMER FALL | 30" | | GROUND WATER ELEV. |

| DEPTH | CASING BLOWS PER FOOT | SAMPLE | | | | | BLOWS PER 6 IN ON SAMPLER (FORCE ON TUBE) 0 - 6 6 - 12 12 - 18 | | | CORE TIME PER FT (MIN) | DENSITY OR CONSIST | STRATA CHANGE DEPTH | FIELD IDENTIFICATION OF SOIL REMARKS INCL. COLOR, LOSS OF WASH WATER, SEAMS IN ROCK, ETC. |
|-------|-----------------------|--------|------|-----|-----|-------------|---|-------|--|------------------------|--------------------|---------------------|---|
| | | NO | Type | PEN | REC | DEPTH @ BOT | | | | | | | |
| 5 | | 1 | ss | 24" | 9" | 2'0" | 2 | 2 | | | moist | 12" | TOPSOIL |
| | | | | | | | 5 | 7 | | | loose | | brn SILT, lit FM sand, organics (poss fill) |
| | | 2 | ss | 24" | 0" | 4'0" | 3 | 4 | | | moist | | |
| | | | | | | | 3 | 5 | | | loose | | |
| | | 3 | ss | 24" | 6" | 6'0" | 3 | 2 | | | v moist | | |
| 10 | | | | | | | 3 | 4 | | | loose | 6'0" | |
| | | 4 | ss | 24" | 17" | 8'0" | 6 | 5 | | | wet | | lt brn SILT, sm F sand, organics |
| | | | | | | | 8 | 11 | | | compact | 8'0" | |
| | | 5 | ss | 21" | 15" | 9'9" | 11 | 16 | | | wet | | brn F-M SAND, sm silt & C sand |
| | | | | | | | 35 | 50/3" | | | v dense | 9'9" | AUGER REFUSAL |
| 15 | | | | | | | | | | | | | poss BEDROCK E.O.B. 9'9" |
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NOTE: Subsoil conditions revealed by this investigation represent conditions at specific locations and may not represent conditions at other locations or times.

GROUND SURFACE TO _____ FT. USED _____ CASING THEN _____ CASING TO _____ FT. **HOLE NO. B - 7**

A = AUGER UP = UNDISTURBED PISTON T = THINWALL V = VANE TEST
 WOR = WEIGHT OF RODS WOH = WEIGHT OF HAMMER & RODS C = COARSE
 SS = SPLIT TUBE SAMPLER H.S.A. = HOLLOW STEM AUGER M = MEDIUM
 PROPORTIONS USED: TRACE = 0 - 10% LITTLE = 10 - 20% SOME = 20 - 35% AND = 35 - 50% F = FINE

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|--|---|---------------|---------------|------------------------------|---------------------|
| SOILTESTING, INC. 140 OXFORD RD. OXFORD, CT 06478 CT (203) 888-4531 NY (914) 946-4850 | CLIENT: Rosenshein Associates | | | SHEET <u>1</u> OF <u>1</u> | |
| | PROJECT NO. G98-8702-10 | | | HOLE NO. B -11 | |
| | PROJECT NAME Mamaroneck Beach & Yacht Club | | | BORING LOCATIONS per Plan | |
| FOREMAN - DRILLER MD/djd | LOCATION 555 South Barry Avenue Mamaroneck, NY | | | | |
| INSPECTOR | TYPE | CASING HSA | SAMPLER SS | CORE BAR NWD4 | OFFSET |
| GROUND WATER OBSERVATIONS AT <u>none</u> FT AFTER <u>0</u> HOURS AT <u> </u> FT AFTER <u> </u> HOURS | SIZE I.D. | 4 1/4" | 1 3/8" | 2 1/2" | DATE START 9/27/10 |
| | HAMMER WT. | | 140# | BIT | DATE FINISH 9/28/10 |
| | HAMMER FALL | | 30" | dia | SURFACE ELEV. |
| | | | | | GROUND WATER ELEV. |

| DEPTH | CASING BLOWS PER FOOT | SAMPLE | | | | | BLOWS PER 6 IN ON SAMPLER (FORCE ON TUBE) 0 - 6 6 - 12 12- 18 | | | CORE TIME PER FT (MIN) | DENSITY OR CONSIST | STRATA CHANGE DEPTH | FIELD IDENTIFICATION OF SOIL REMARKS INCL. COLOR, LOSS OF WASH WATER, SEAMS IN ROCK, ETC. |
|-------|--------------------------------|--------|------|-----|-----|----------------|--|-------|--|------------------------------------|--------------------------|---------------------------|--|
| | | NO | Type | PEN | REC | DEPTH @ BOT | | | | | | | |
| 5 | | 1 | ss | 23" | 18" | 1'11" | 7 | 5 | | | dry compact | 1'9" | gry/brn SILTY CLAY, sm F sand, lit M-C sand, F gravel (poss fill) partially decomposed BEDROCK or BOULDER AUGER REFUSAL fractured BEDROCK or BOULDERS |
| | | | | | | | 7 | 25/5" | | | | 2'6" | |
| | | 1 | cr | 60" | 23" | 7'6" | RQD = 9% | | | 2.00 | | | |
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NOTE: Subsoil conditions revealed by this investigation represent conditions at specific locations and may not represent conditions at other locations or times.

| | | | |
|---|-------------------|--------------------------------|-----------------------|
| GROUND SURFACE TO _____ FT. | USED _____ CASING | THEN _____ CASING TO _____ FT. | HOLE NO. B -11 |
| A = AUGER UP = UNDISTURBED PISTON T = THINWALL V = VANE TEST WOR = WEIGHT OF RODS WOH = WEIGHT OF HAMMER & RODS C = COARSE SS = SPLIT TUBE SAMPLER H.S.A. = HOLLOW STEM AUGER M = MEDIUM PROPORTIONS USED: TRACE = 0 - 10% LITTLE = 10 - 20% SOME = 20 - 35% AND = 35 - 50% F = FINE | | | |

APPENDIX B4

SOILS MAP AND DESCRIPTIONS

Soil Map—Westchester County, New York



Map Scale: 1:7,240 if printed on A portrait (8.5" x 11") sheet.



Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 18N WGS84




**Natural Resources
Conservation Service**

Web Soil Survey
National Cooperative Soil Survey

4/29/2014
Page 1 of 3

MAP LEGEND

Area of Interest (AOI)

 Area of Interest (AOI)

Soils

 Soil Map Unit Polygons

 Soil Map Unit Lines

 Soil Map Unit Points

Special Point Features



Blowout



Borrow Pit



Clay Spot



Closed Depression



Gravel Pit



Gravelly Spot



Landfill



Lava Flow



Marsh or swamp



Mine or Quarry



Miscellaneous Water



Perennial Water



Rock Outcrop



Saline Spot



Sandy Spot



Severely Eroded Spot



Sinkhole



Slide or Slip



Sodic Spot



Spoil Area



Stony Spot



Very Stony Spot



Wet Spot



Other



Special Line Features

Water Features



Streams and Canals

Transportation



Rails



Interstate Highways



US Routes



Major Roads



Local Roads

Background



Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:12,000.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service

Web Soil Survey URL: <http://websoilsurvey.nrcs.usda.gov>

Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Westchester County, New York

Survey Area Data: Version 9, Dec 15, 2013

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Mar 26, 2011—Apr 16, 2012

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Map Unit Legend

| Westchester County, New York (NY119) | | | |
|--------------------------------------|--|--------------|----------------|
| Map Unit Symbol | Map Unit Name | Acres in AOI | Percent of AOI |
| CrC | Charlton-Chatfield complex, rolling, very rocky | 53.7 | 21.0% |
| Ip | Ipswich mucky peat | 33.3 | 13.0% |
| Ub | Udorthents, smoothed | 0.9 | 0.4% |
| Uc | Udorthents, wet substratum | 18.4 | 7.2% |
| Uf | Urban land | 0.3 | 0.1% |
| UhB | Urban land-Charlton complex, 2 to 8 percent slopes | 15.5 | 6.1% |
| UIC | Urban land-Charlton-Chatfield complex, rolling, very rocky | 79.6 | 31.1% |
| UID | Urban land-Charlton-Chatfield complex, hilly, very rocky | 6.8 | 2.7% |
| W | Water | 47.2 | 18.5% |
| Totals for Area of Interest | | 255.7 | 100.0% |

Westchester County, New York

UIC—Urban land-Charlton-Chatfield complex, rolling, very rocky

Map Unit Setting

Elevation: 100 to 1,000 feet

Mean annual precipitation: 46 to 50 inches

Mean annual air temperature: 46 to 52 degrees F

Frost-free period: 115 to 215 days

Map Unit Composition

Urban land: 40 percent

Charlton and similar soils: 20 percent

Chatfield and similar soils: 15 percent

Minor components: 25 percent

Description of Charlton

Setting

Landform: Till plains, ridges, hills

Landform position (two-dimensional): Shoulder

Landform position (three-dimensional): Crest

Down-slope shape: Convex

Across-slope shape: Convex

Parent material: Acid loamy till derived mainly from schist, gneiss, or granite

Properties and qualities

Slope: 2 to 15 percent

Depth to restrictive feature: More than 80 inches

Drainage class: Well drained

Capacity of the most limiting layer to transmit water

(Ksat): Moderately high to high (0.57 to 5.95 in/hr)

Depth to water table: More than 80 inches

Frequency of flooding: None

Frequency of ponding: None

Available water capacity: Moderate (about 7.5 inches)

Typical profile

0 to 8 inches: Loam

8 to 24 inches: Sandy loam

24 to 60 inches: Sandy loam

Description of Chatfield

Setting

Landform: Ridges, hills

Landform position (two-dimensional): Shoulder

Landform position (three-dimensional): Crest

Down-slope shape: Convex

Across-slope shape: Convex

Parent material: Loamy till derived mainly from granite, gneiss, or schist

Properties and qualities

Slope: 2 to 15 percent

Depth to restrictive feature: 20 to 40 inches to lithic bedrock

Drainage class: Well drained

Capacity of the most limiting layer to transmit water (Ksat): Low to high (0.01 to 5.95 in/hr)

Depth to water table: More than 80 inches

Frequency of flooding: None

Frequency of ponding: None

Calcium carbonate, maximum content: 1 percent

Available water capacity: Low (about 3.2 inches)

Typical profile

0 to 7 inches: Loam

7 to 24 inches: Flaggy silt loam

24 to 28 inches: Unweathered bedrock

Minor Components

Leicester

Percent of map unit: 5 percent

Landform: Depressions

Rock outcrop

Percent of map unit: 5 percent

Sutton

Percent of map unit: 5 percent

Udorthents

Percent of map unit: 5 percent

Hollis

Percent of map unit: 2 percent

Sun

Percent of map unit: 2 percent

Landform: Depressions

Palms

Percent of map unit: 1 percent

Landform: Swamps, marshes

Data Source Information

Soil Survey Area: Westchester County, New York

Survey Area Data: Version 9, Dec 15, 2013

Westchester County, New York

CrC—Charlton-Chatfield complex, rolling, very rocky

Map Unit Setting

Elevation: 100 to 1,000 feet

Mean annual precipitation: 46 to 50 inches

Mean annual air temperature: 46 to 52 degrees F

Frost-free period: 115 to 215 days

Map Unit Composition

Charlton and similar soils: 50 percent

Chatfield and similar soils: 30 percent

Minor components: 20 percent

Description of Charlton

Setting

Landform: Till plains, ridges, hills

Landform position (two-dimensional): Shoulder

Landform position (three-dimensional): Crest

Down-slope shape: Convex

Across-slope shape: Convex

Parent material: Acid loamy till derived mainly from schist, gneiss, or granite

Properties and qualities

Slope: 2 to 15 percent

Depth to restrictive feature: More than 80 inches

Drainage class: Well drained

Capacity of the most limiting layer to transmit water

(Ksat): Moderately high to high (0.57 to 5.95 in/hr)

Depth to water table: More than 80 inches

Frequency of flooding: None

Frequency of ponding: None

Available water capacity: Moderate (about 7.5 inches)

Interpretive groups

Farmland classification: Not prime farmland

Land capability (nonirrigated): 6s

Hydrologic Soil Group: B

Typical profile

0 to 8 inches: Loam

8 to 24 inches: Sandy loam

24 to 60 inches: Sandy loam

Description of Chatfield

Setting

Landform: Ridges, hills

Landform position (two-dimensional): Shoulder

Landform position (three-dimensional): Crest

Down-slope shape: Convex

Across-slope shape: Convex

Parent material: Loamy till derived mainly from granite, gneiss, or schist

Properties and qualities

Slope: 2 to 15 percent

Depth to restrictive feature: 20 to 40 inches to lithic bedrock

Drainage class: Well drained

Capacity of the most limiting layer to transmit water (Ksat): Low to high (0.01 to 5.95 in/hr)

Depth to water table: More than 80 inches

Frequency of flooding: None

Frequency of ponding: None

Calcium carbonate, maximum content: 1 percent

Available water capacity: Low (about 3.2 inches)

Interpretive groups

Farmland classification: Not prime farmland

Land capability (nonirrigated): 6s

Hydrologic Soil Group: B

Typical profile

0 to 7 inches: Loam

7 to 24 inches: Flaggy silt loam

24 to 28 inches: Unweathered bedrock

Minor Components

Hollis

Percent of map unit: 5 percent

Rock outcrop

Percent of map unit: 5 percent

Sutton

Percent of map unit: 4 percent

Sun

Percent of map unit: 2 percent

Landform: Depressions

Leicester

Percent of map unit: 2 percent

Palms

Percent of map unit: 1 percent

Landform: Swamps, marshes

Carlisle

Percent of map unit: 1 percent

Landform: Swamps, marshes

Data Source Information

Soil Survey Area: Westchester County, New York
Survey Area Data: Version 9, Dec 15, 2013

Westchester County, New York

Ip—Ipswich mucky peat

Map Unit Setting

Mean annual precipitation: 46 to 50 inches

Mean annual air temperature: 46 to 52 degrees F

Frost-free period: 115 to 215 days

Map Unit Composition

Ipswich and similar soils: 85 percent

Minor components: 15 percent

Description of Ipswich

Setting

Landform: Tidal marshes

Landform position (two-dimensional): Toeslope

Landform position (three-dimensional): Talf

Down-slope shape: Concave

Across-slope shape: Concave

Parent material: Organic material in tidal marshes

Properties and qualities

Slope: 0 to 1 percent

Depth to restrictive feature: More than 80 inches

Drainage class: Very poorly drained

Capacity of the most limiting layer to transmit water

(Ksat): Moderately high to very high (0.57 to 19.98 in/hr)

Depth to water table: About 0 inches

Frequency of flooding: Frequent

Frequency of ponding: Frequent

Available water capacity: Very high (about 16.2 inches)

Interpretive groups

Farmland classification: Not prime farmland

Land capability (nonirrigated): 8w

Hydrologic Soil Group: A/D

Typical profile

0 to 8 inches: Mucky peat

8 to 20 inches: Muck

20 to 60 inches: Mucky peat

Minor Components

Fluvaquents

Percent of map unit: 10 percent

Landform: Flood plains

Udifuvents

Percent of map unit: 3 percent

Udorthents, wet substratum

Percent of map unit: 2 percent

Data Source Information

Soil Survey Area: Westchester County, New York

Survey Area Data: Version 9, Dec 15, 2013

APPENDIX C

RECORDED EASEMENTS AND OTHER LEGAL INSTRUMENTS

(No Applicable Easements or Other Legal Instruments)

APPENDIX D

CORRESPONDENCE TO & FROM INVOLVED AND INTERESTED AGENCIES

New York State Department of Environmental Conservation

Division of Environmental Permits, Region 3

21 South Putt Corners Road, New Paltz, New York 12561-1620

Phone: (845) 256-3054 FAX: (845) 255-4659

Website: www.dec.ny.gov



February 6, 2014

Michael Ianniello, Chairman
Village Planning Board
123 Mamaroneck Avenue
Mamaroneck, NY 10543

Re: Mamaroneck Beach & Yacht Club – Club expansion and sewer main modification
Village of Mamaroneck, Westchester County
Supplemental SEQR response and Determination of Jurisdiction

Dear Chairman Ianniello:

The Department of Environmental Conservation (DEC) has reviewed the documents provided by the Village regarding the proposal by Mamaroneck Beach & Yacht Club for expansion of the Club by the introduction of new seasonal residences and additions or modifications to other recreational buildings. This project underwent State Environmental Quality Review (SEQR) in 2007 which included Draft and Final Environmental Impact Statements (EIS) by the Village.

There were several subsequent amended sites plans submitted to the Village. Issues with the existing sanitary sewer main were discovered in August 2013. The current amended site plan now includes replacement of the sewer main and construction of a new pumping station and sewer force main. The Village, as SEQR Lead Agency, has determined that preparation of a Supplemental EIS is required to consider the potential impacts of the sewer system improvements.

The DEC reviewed the following documents:

Received from the Village May 1, 2013

Mamaroneck Beach and Yacht Club, Environmental Narrative, revised October 2010

Downloaded from the Village website January 9, 2014

January 8, 2014 Planning Board Agenda with Attachments including the amended site plans revised November 25, 2013

Received from the Village January 13, 2014

Village of Mamaroneck Planning Board Resolution and Positive Declaration Re:
Mamaroneck Beach and Yacht Club

Village of Mamaroneck Planning Board Draft Supplemental Environmental Impact
Statement (DSEIS) draft Scope of Issues To Be Addressed, dated December 11, 2013

DEC jurisdiction over this project, with reference to the Environmental Conservation Law (ECL), is as follows:

Article 25 of the ECL, Tidal Wetlands

The Mamaroneck Beach & Yacht Club, Otter Creek, and the location of the proposed sewer main

replacement at 519 Alda Road contain DEC-regulated tidal wetlands and associated adjacent area, disturbance to which generally requires a permit. The tidal wetland locations are mapped, as shown on the attached map with reference to the categories of the wetland areas.

The adjacent area of tidal wetlands is defined in the tidal wetland regulations 6 NYCRR Part 661. Per Section 661.4(b), the adjacent area will extend to the most landward limit of the following:

- 300 feet from the landward edge of the wetland boundary or
- to the seaward edge of the closest lawfully and presently existing (i.e., as of August 20, 1977), functional and substantial fabricated structure
- to the elevation contour of 10 feet above mean sea level, except when such contour crosses the seaward face of a bluff or cliff;

As there do not appear to be any bluffs or cliffs on the site, the adjacent area will be limited by the 300-foot distance, the presence of structures, and the 10-foot contour. Please see the second attached map which indicates what will be the limit for the adjacent area along that section of shoreline for the Mamaroneck Beach & Yacht Club site and the property at 519 Alda Road. This determination was based on staff review of the site and aerial photos associated with the official 1974 Tidal Wetland Maps.

Based on this determination, it appears that the following actions are subject to regulation:

- The proposed replacement sewer main will be located in the tidal wetland and adjacent area.
- Although the location of the 10-foot contour is not clear on the plans, it appears that portions of the pump station or associated grading maybe in the adjacent area.
- All modifications of existing retaining walls are regulated, including the installation of the new stormwater lines per Section 661.5(b)(25).
- Any new discharge of stormwater is also a regulated activity per Section 661.5(b)(44).
- Any grading, new filling, material stockpiling, etc in the “existing gravel parking” adjacent to Otter Creek would be a regulated activity requiring a permit.

It appears that most other aspects of the plan are outside the tidal wetland or adjacent area. A final determination on jurisdiction and compatibility of regulated activities with the preservation of tidal wetlands cannot be made until a plan with the location of all tidal wetland and adjacent area boundaries is provided. DEC requires that contours be expressed in National Vertical Datum 1988 (NAVD88) for the purposes of establishing the adjacent area. Tidal wetland boundaries must be based on the official maps and confirmed by DEC staff.

The DEC offers the following comments on the Draft Scoping Document:

Section III

This section should include a description of the NYS Office of General Services property and the private land at 519 Alda Road which are part of the project work area. Any easement or right-of-way granting Mamaroneck Beach & Yacht Club access should be documented. If no grants are in existence, then the applicant should discuss the process for obtaining access. Proof of legal access or permission from all other property owners will be a requirement of the DEC tidal wetland permit.

Re: Mamaroneck Beach & Yacht Club – Club expansion and sewer main modification
Village of Mamaroneck, Westchester County
Supplemental SEQR response and Determination of Jurisdiction

Section V.B.1 & 2

The November 25, 2013 plans indicate that the applicant will be pursuing directional boring for installation of the sewer main under Otter Creek. The plans note the presence of tidal wetlands with categories of “SM”, Coastal Shoals, Bars and Flats, and “LZ”, Littoral Zone. However this area also contains “IM”, Intertidal Marsh, one of the highest quality wetlands. All wetland areas should be mapped and identified by category, and the adjacent area boundary shown. All disturbances other than subsurface portion of the directional bore should be shown outside the wetland areas or justification provided for the disturbance.

Both the directional boring and the alternative plan for a force main along South Barry Avenue must minimize impact to both the tidal wetlands and the adjacent area.

Section V.B.3 – Natural Features, Mitigation Measures

Please note that the correct title of the referenced DEC publication is “New York Standards and Specifications for Erosion and Sediment Controls (August, 2005)”.

State Pollutant Discharge Elimination System (SPDES) - Stormwater

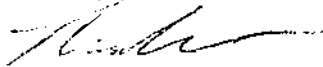
As this project will disturb more than one acre, it will require a SPDES permit for the discharge of stormwater from construction activities. Review and approval of the Stormwater Pollution Prevention Plan (SWPPP) is the responsibility of the Village as a Municipal Separate Storm Sewer System (MS4) community.

Cultural/Historic Resources

These sites are in an area of archeological sensitivity as define by NY State Historic Preservation Office (SHPO). A determination of impact by SHPO will be a requirement of DEC approvals pursuant to Uniform Procedures.

If you have any questions, please contact me at (845) 256-3014 or the above address.

Sincerely yours



Rebecca Crist
Environmental Analyst

Enc: Map of Mamaroneck Beach & Yacht Club with DEC tidal wetlands categories
Map of Mamaroneck Beach & Yacht Club with DEC determination on extent of adjacent area

Ecc: Lisa Rosenshein, Mamaroneck Beach & Yacht Club w/ enc
NYS DOS Coastal Resources w/ enc
Bethany Wieczorek, Thomas Pohl, and John Carstens, NYS OGS Land Management w/ enc

Mamaroneck Beach & Yacht Club

V. Mamaroneck, Westchester County



Adjacent area limit is
10-foot contour or
300-foot distance

519
Alda
Road

Adjacent area limit is
the 10-foot contour

Adjacent area limit is the seawall -
functional and substantial fabricated
structure existing as of August 20, 1977

0 100 200 400
Feet

Map by Rebecca Crist - ext 3014
NYS DEC - Division of Environmental Permits
For Reference Only



Mamaroneck Beach & Yacht Club

V. Mamaroneck, Westchester County



Legend

- Coastal Shoals, Bars & Mud Flats
- Littoral Zone
- Intertidal Marsh
- Fresh Marsh
- High Marsh

0 100 200 400
Feet

Map by Rebecca Crist - ext 3014
NYS DEC - Division of Environmental Permits
For Reference Only





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September 23, 2013

William Gerety, Building Inspector
Village of Mamaroneck
169 Mt. Pleasant Avenue
Mamaroneck, NY 10543

RE: Mamaroneck Beach and Yacht Club
Village of Mamaroneck, NY

Dear Mr. Gerety:

In response to the "Order to Remedy Violation" and "Failed Inspection" dated 8/12/2013 issued by the Village of Mamaroneck Building Inspector to the Mamaroneck Beach & Yacht Club (MBYC) relating to the condition of the existing pump station and force main, several test were performed on the existing force main including a dye test, pressure test and a video inspection (copies attached). Based on the results of the tests conducted, the existing force main was determined to be in a serviceable and operating condition and as of the date of the tests conducted does not to have any apparent leaks.

Very truly yours,

TRC Engineers, Inc.

Ralph P. Peragine, P.E.
Senior Project Manager

Encs.





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Report Date: September 19, 2013

**MAMARONECK BEACH & YACHT CLUB
555 SOUTH BARRY AVENUE
MAMARONECK, NY**

REPORT OF TEST AND INSPECTION
EXISTING SANITARY FORCE MAIN TV INSPECTION

Date Performed: Tuesday, September 10, 2013
Time Performed: Morning thru early afternoon
Weather: Partly Cloudy, temperature in the 80's

Purpose:

An "Order to Remedy Violation" and "Failed Inspection" dated 8/12/2013 was issued by the Village of Mamaroneck Building Inspector to the Mamaroneck Beach & Yacht Club (MBYC) relating to the condition of the existing pump station and force main. The existing 6-inch force main extends from the pump station (centrally located at the MBYC site) across the site, under Otter Creek, through residential lot at 515 Alda Road and ending at a receiving manhole located in Alda Road for an approximate length of 800 feet. The video inspection was conducted to determine the condition of the existing sanitary force main.

Test Performed by:

- ACS Underground Solutions – TV Inspection Service
- Greenwich Drains - Jet cleaned the force main
- Frank Nask - Sewer Contractor
- Ken Abbott - Licensed Plumbing Contractor

Procedure:

The existing force main was accessed through the pump station and was jet cleaned and vacuumed in preparation for the TV inspection by Greenwich Drains. The force main video inspection was performed by ACS Underground Solutions. ACS utilized a manual camera for the video inspection of the force main. Due to the limitations of the manual camera, the video inspection was limited to a distance of approximately 150 feet into the force main from both the pump station end of the force main and the receiving manhole end of the force main in Alda Road. The use of the manual camera was limited due to the ability to push the camera cable through the pipe due to friction and pipe curvature/alignment. As a result, the section of the force main under Otter Creek could not be observed.

Results:

- A preliminary review conducted during the inspection revealed no breaks, intrusions or obstructions within the portions of the force main which was observed.
- A copy of the video and inspection report will be submitted upon its receipt from ACS Underground Solutions.



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Report Date: September 19, 2013

**MAMARONECK BEACH & YACHT CLUB
555 SOUTH BARRY AVENUE
MAMARONECK, NY**

REPORT OF TEST AND INSPECTION
EXISTING SANITARY FORCE MAIN PRESSURE TEST

Date Performed: Tuesday, September 10, 2013
Time Performed: 2:15 PM to 3:00 PM
Weather: Partly Cloudy, temperature in the 80's

Purpose:

An "Order to Remedy Violation" and "Failed Inspection" dated 8/12/2013 was issued by the Village of Mamaroneck Building Inspector to the Mamaroneck Beach & Yacht Club (MBYC) relating to the condition of the existing pump station and force main. The existing 6-inch force main extends from the pump station (centrally located at the MBYC site) across the site, under Otter Creek, through residential lot at 515 Alda Road and ending at a receiving manhole located in Alda Road. The pressure test was conducted to determine if a leak from the existing sanitary force main could be detected.

Performed by:

- Sewer Contractor - Frank Nask
- Licensed Plumbing Contractor - Ken Abbott

Observed by:

- Bill Gerety - Village Building Inspector
- Thomas Holmes - TRC Engineers, Inc. (Owner representative)

Procedure:

A hydrostatic test of the existing force main was conducted as follows: The force main and air vent were plugged at the Alda Road receiving manhole with standard inflatable sewer plugs (rated at a maximum pressure of 15 psi); a pressure gauge was installed in the force main at the pump station; the force main was pumped full with water until the pressure gauge indicated a stable reading of 14 psi. The pump was shut down and the pressure gauge was observed for a period of 45 minutes. At the end of the test period, a pressure reading of 14 psi was observed indicating a zero pressure drop in the force main.

Results:

- Force Main: 800± linear feet 6-inch ductile iron and transite pipe.
- Test period: 2:15 PM to 3:00 PM
- Test Time: 45 minutes
- Initial test pressure: 14 psi
- Ending test pressure: 14 psi
- Pressure Drop: 0 psi (no leakage)



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Report Date: September 19, 2013

**MAMARONECK BEACH & YACHT CLUB
555 SOUTH BARRY AVENUE
MAMARONECK, NY**

**REPORT OF TEST AND INSPECTION
EXISTING SANITARY FORCE MAIN DYE TEST**

Date Performed: Monday, September 9, 2013
Time Performed: 11 PM to 12 noon
Weather: Partly Cloudy, temperature in the 80's.

Purpose:

An "Order to Remedy Violation" and "Failed Inspection" dated 8/12/2013 was issued by the Village of Mamaroneck Building Inspector to the Mamaroneck Beach & Yacht Club (MBYC) relating to the condition of the existing pump station and force main. The existing 6-inch force main extends from the pump station (centrally located at the MBYC site) across the site, under Otter Creek, through residential lot at 515 Alda Road and ending at a receiving manhole located in Alda Road. The dye test was conducted to determine if a leak from the existing sanitary force main could be visually detected.

Performed by:

- Sewer Contractor - Frank Nask
- Licensed Plumbing Contractor - Ken Abbott

Observed by:

- Bill Gerety - Village Building Inspector
- Anthony Carr - Village Engineer
- Bill Ciraco - Village Fire Inspector
- Thomas Holmes - TRC Engineers, Inc. (Owner representative)
- Maintenance Supervisor - MBYC

Procedure:

Personnel were stationed at the pump station, adjacent to Otter Creek and at the force main receiving manhole in Alda Road. Green sewer dye was poured into the MBYC pump station; the pumps were manually operated through several pump cycles until dye was observed in the force main receiving manhole.

Results:

- No dye was observed in Otter Creek.
- No dye was observed at the ground surface along the alignment of the existing force main.



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September 23, 2013

SANITARY FORCE MAIN REMEDIATION

TO: Anthony Carr
Village of Mamaroneck Engineer

C: Village Building Inspector
Village Fire Inspector

RE: Mamaroneck Beach and Yacht Club
555 South Barry Avenue
Mamaroneck, NY

The Mamaroneck Beach and Yacht Club (MBYC) was notified on Monday, August 12, 2013 that Officials of the Village of Mamaroneck discovered a sewage leak emanating from a force main located in Otter Creek adjacent to the Club. The leak was confirmed by a dye test performed by Village personnel. The Club immediately employed professional staff to investigate and remediate the sewage leak. In the meantime, the force main and pump station were taken offline and a third party contractor was employed to pump out the wet well and dispose the sewage off site. The force main leak was located and plugged on Tuesday, August 13, 2013. Repair was performed and completed by several contractors hired by the Club on Wednesday, August 14, 2013.

Subsequent investigation of the existing force main was performed by the MBYC in coordination with Village of Mamaroneck Officials. Investigation included a dye test, pressure test and TV inspection. Test results were submitted to the Village. Results of the investigation indicated that there are no apparent leaks in the existing force main.

As discussed with the Building Inspector and the Village Engineer, the Applicant acknowledges their intention to provide a more permanent rehabilitation to or replacement of the existing sanitary force main and pump station. Due to the environmental sensitivity of Otter Creek and its adjacent tidal wetlands, a method of rehabilitation or replacement must assure minimal impact to the Creek and its adjacent wetlands. The method of rehabilitation/replacement to be selected must employ trenchless excavation within the critical environmental area. With this in mind, several pipe rehabilitation/replacement options being considered include the following.

Methods of Trenchless Excavation to be Considered for Force Main Remediation:

- **Sliplining** is used to repair leaks or restore structural stability to an existing pipeline. Sliplining is completed by installing a smaller, "carrier pipe" into a larger "host pipe", grouting the annular space between the two pipes, and sealing the ends. The most common material used to slipline an existing pipe is high density polyethylene (HDPE). Sliplining can be used to stop infiltration and restore structural integrity to an existing pipe.

Restoration by sliplining will require further TV inspection and cleaning of the entire force main to determine potential limiting factors. Installation of the new pipe to be pulled/pushed through the existing pipe could be restricted by vertical and horizontal bends. There are known bends at the west side of the creek, where the emergency repair was made, and it is likely that additional bends exist along the east bank of the creek. Sliplining would be limited in these areas, thereby requiring excavation within the tidal wetlands to install the new pipe beyond the bends.

- **Pipe bursting** is a trenchless method of replacing buried pipelines (such as sewer) without the need for a traditional construction trench. "Launching and receiving pits" replace the trench needed by conventional pipe-laying. This method includes bursting the existing pipe and replacing it with a new pipe, generally the same size or larger.

Restoration by pipe bursting, similar to sliplining, is also limited by pipe bends. Pipe bursting would typically be used to thread a larger pipe within the existing pipe. The existing force main is 6 inches in diameter. The new force main would only be 4 inches in diameter. For the reasons stated, pipe bursting would not be appropriate for this proposed use.

- A **Cured-In-Place Pipe (CIPP)** is a trenchless rehabilitation methods used to repair existing pipelines. CIPP is a jointless, seamless, pipe-within-a-pipe with the capability to rehabilitate pipes. As one of the most widely used rehabilitation methods CIPP has application in water and sewer.

Restoration by CIPP will require further TV inspection and cleaning of the entire force main. It is likely that the new epoxy liner could be successfully blown through the existing pipe and could likely negotiate the bends. This can only be determined after completing TV inspection. In order to complete the TV inspection, it would be necessary to create access points in the existing pipe in several locations, so that the distances for the camera to travel and the bends it must negotiate, would be feasible. Since other options are available (e.g. directional boring), additional TV inspection is not recommended at the present time.

- **Directional Boring**, commonly called horizontal directional drilling or HDD, is a steerable trenchless method of installing underground pipes in a shallow arc along a prescribed bore path by using a surface-launched drilling rig, with minimal impact on the surrounding area. Directional boring is used when trenching or excavating is not practical.

It is suitable for a variety of soil conditions and jobs including road, landscape and river crossings.

Installation of a new sanitary force main could be performed within the environmentally sensitive area using this form of trenchless excavation without disturbing the Otter Creek and with minimal disturbance to the adjacent tidal wetlands. A boring pit would be established on the MBYC site and directional drilling would be performed under the creek extending to the Alda Road manhole. A receiving pit would be established near the manhole and connection to the manhole would be performed. Limited soil investigation must be explored to determine the potential presence of bedrock or boulders. Although directional boring can be performed successfully in bedrock it is not recommended where boulders or cobbles are plentiful. The relative absence of existing utilities along the proposed alignment is also advantageous to directional boring.

Alternate Sanitary Force Main Route

Consideration of an alternate route for the force main over Otter Creek was considered. The route would be aligned along the Club's entrance drive, along the South Barry Avenue right-of-way to discharge into an existing manhole in either Alda Road or South Barry Avenue. The alternate route would require hanging the force main under the bridge. TRC does not recommend this route for the following reasons:

- The force main would be exposed to potential freezing
- The force main would be exposed to potential flood damage
- The force main would be subject to potential vandalism
- If the bridge would be compromised, so would the force main
- The force main would be located over Otter Creek and any potential leakage would discharge directly to the Creek.

Therefore, TRC's opinion is that placing the force main under Otter Creek would be more environmentally protective than hanging it from the Otter Creek bridge.

RECOMMENDATION

All of the described methods of trenchless excavation remain viable options for replacement of the existing force main. Based on the results of the investigation thus far, TRC Engineers recommends installing a new force main utilizing Directional Boring under Otter Creek and its adjacent tidal wetlands to avoid disturbance of this Critical Environmental Area.

Based on the increase in sewage to be generated resulting from the proposed Site Plan, TRC recommends replacing the existing sanitary pump station. The new pump station and force main will assure a permanent solution to potential unwanted sewage discharges.

Design of all new sanitary sewer elements will be performed in accordance with the applicable standards including the Recommended Standards for Wastewater Facilities (10



State Standards). Approvals from all appropriate agencies will be sought including the Village of Mamaroneck, Westchester County Department of Health, NYSDEC, NYSDOS and USACE. The MBYC understands that it will not start construction prior to receiving the permits and approvals for the rehabilitation/replacement of the force main and new sewage pump station.

TRC Engineers, Inc.



Ralph Peragine, P.E.
Senior Project Manager



Thomas Holmes
Project Manager

C: MBYC Team members

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Nicola Colabella
Anthony Vaccaro
Plumbing & Heating
15 Elmwood Avenue
W. Harrison, NY 10604
(914) 682-7047

September 23, 2013
Fire Inspector
Village of Mamaroneck
169 Mt. Pleasant Avenue
Mamaroneck, New York 10543

RE: Mamaroneck Beach & Yacht Club
Visual Inspection

Per the request of MBYC, I visually inspected the existing sanitary waste lines contained within all of existing structures, such as the Clubhouse, Snack Bar and Boathouse on September 23, 2013. I did not witness any issues which would effect the correct operation of the Club's sanitary waste discharge system.

It is my opinion based upon what I could reasonably visually observe, that the sanitary waste system is operating in a satisfactory manner and appears to be in compliance with applicable plumbing codes.



Nicola Colabella &
Anthony Vaccaro
Plumbing & Heating
Lic # 573



Mamaroneck Beach & Yacht Club
555 South Barry Avenue
Mamaroneck, NY

Pump Station I&I Repairs



Pump Station I&I Repairs



Pump Station I&I Repairs



APPENDIX E

WESTCHESTER COUNTY SANITARY CODE
SECTION 873 ARTICLE VIII: SEWERAGE, SEWAGE AND REFUSE

(Added 6-22-1989, eff. 6-22-1989)

Sec. 873.714. Water supplies; new houses and buildings, disinfection.

1. Before occupancy of a house or building constructed after the effective date of this Code, the public water system thereof shall be effectively flushed with water from the water source provided to service the premises, after which a sample of water shall be collected from the water distribution system of such house or building, shall be submitted to a laboratory acceptable to the State Department of Health for bacterial analysis and the results of such tests shall be on file and available on the premises.
2. In the event that the laboratory analysis indicates that the microbiological quality does not meet the standards for microbiological quality for water for domestic use as set forth in the State Sanitary Code, the public water system shall be effectively disinfected and microbiological sampling and analysis repeated until the microbiological quality meets the standards.

(Added 6-22-1989, eff. 6-22-1989)

Sec. 873.715. Water supplies; separability.

If any provision of this article is held invalid, such invalidity shall not affect other provisions which shall be given effect without the invalid provision.

(Added 6-22-1989, eff. 6-22-1989)

ARTICLE VIII. SEWERAGE, SEWAGE AND REFUSE*

***Editor's note:** An amendment adopted July 19, 2001, amended Art. VIII of the Sanitary Code in its entirety, in effect repealing and reenacting said article to read as herein set out. The former Art. VIII, §§ 873.701--873.811, pertained to similar subject matter and was derived from §§ 1--12 of Art. VII, effective Sept. 1, 1959.

Sec. 873.720. Purpose.

The purpose of this article is two-fold.

- A. The first purpose is to ensure that the health and safety of the drinking water and other natural resources of the County of Westchester is preserved and that potential threats to such natural resources are monitored and reduced through the implementation of a system whereby providers of separate sewage disposal system services will be licensed by the Commissioner of Health and subject to reporting requirements which will enable the Department of Health to record and monitor all available data relating to separate sewage disposal systems located within Westchester County, and to establish database and public education systems pursuant thereto; and

- B. The second purpose is to ensure that the sewage and other wastewater generated from habitable buildings and properties in Westchester County is processed in the most environmentally appropriate manner possible by requiring all separate sewage disposal systems constructed or installed in Westchester County conform to the standards established in the New York State Public Health Law, by the Board of Health and/or the Commissioner of Health, and/or to require, where possible, the connection of such buildings or properties to public sewer systems.

(Added 7-19-2001, eff. 7-19-2001)

Sec. 873.721. Definitions.

Whenever used in this article, the following terms shall have the meaning set forth below:

- A. *Construction* shall mean installation or replacement of sewage disposal system components, including soil, gravel, pipes, tankage, pits, junction boxes, and all associated appurtenances and/or distribution systems.
- B. *Septic system contractor* shall mean an individual who engages in the performance of any one (1) or more of the following services, or who offers to provide the following services for a fee, in Westchester County, with respect to separate sewage disposal systems: construction; installation; repair and/or rehabilitation; and servicing, except for evacuation of septage.
- C. *Licensed septic system contractor* and/or *licensee* means a septic system contractor who possesses a valid license issued by the Westchester County Commissioner of Health pursuant to the provisions outlined in section 873.722 herein.
- D. *Individual* means any person, firm, company, association, corporation, partnership, co-partnership, joint-stock company, trust, governmental entity, or any other legal business entity and/or the employees thereof.
- E. *Harmful or deleterious substance* shall mean one (1) or a combination of the following:
 - (1) Roof, cellar, foundation, footing, area, storm, surface or ground water.
 - (2) Discharge of domestic sewage in excess of one hundred fifty (150) gallons per day per capita or at a rate exceeding three hundred (300) gallons per capita per day within any one-hour period.
 - (3) Liquid, gaseous, solid or other trade or industrial waste for which a written approval has not been obtained from the official agency having by law responsible charge of the receiving sanitary sewer or sewer treatment works to which such sewer is tributary, when having one (1) or more of the following characteristics at point of discharge:
 - a. Volume exceeding the limits acceptable to the above

official agency.

- b. Solids in excess of one thousand (1,000) parts per million.
- c. Viscosity in excess of 1 10/100.
- d. Temperature lower than thirty-two (32) degrees Fahrenheit or above one hundred fifty (150) degrees Fahrenheit.
- e. Color in excess of five hundred (500) parts per million.
- f. Biochemical oxygen demand in excess of four hundred (400) parts per million.
- g. Chlorine demand in excess of twenty-five (25) parts per million measured after thirty (30) minutes holding at sixty-eight (68) F.
- h. Suspended solids in excess of three hundred (300) parts per million.
- i. Settleable solids measured by Imhoff cone in one (1) hour in excess of ten (10) milliliters per liter of discharge.
- j. Hydrogen ion concentration below four and one-half (4.5) or in excess of nine and one-half (9.5).
- k. Unshredded garbage, refuse, decayed wood, sawdust, shavings, bark, sand, lime, cinders, ashes, offal, oil, tar, dye stuffs, grit, abrasives, metal filings, trimmings or other offensive material exclusive of domestic waterborne sewage.
- l. Chemicals or chemical compounds which are toxic, inflammable or explosive by themselves or upon acidification, alkalization, oxidation or reduction, or are strong reducing agents, inflammable or explosive gases, liquids or solids.
- m. Viable pathogenic bacteria, other than normally discharged in raw domestic sewage.
- n. Radioactive material which is not readily soluble in water and in an amount such that the radioactivity shall not exceed one (1) microcurie of Strontium-90 or Polonium-210; or one hundred (100) microcurie of Iodine-131 or Potassium-32, or any other radioactive material having a half-life of more than thirty (30) days; or ten (10) microcuries of other radioactive material; for each one million (1,000,000) gallons of sewage in the receiving sewer. This limit shall not apply to any radioactive material which has been diluted and homogeneously mixed with stable isotopes of the same element in the same chemical form to the extent that the dose rate does not exceed three hundred (300) millirems per week.

F. *Offensive material* shall mean any sewage, fecal matter, manure, offal,

garbage, dead animals, meat wastes, blood, tankage, brine, urine or any putrescible organic matter or the contents of privies, cesspools, septic tanks or chemical toilets, either in liquid or solid state, or any other substance or liquid dangerous or prejudicial to health.

- G. *Privy* shall mean any facility or structure provided for the temporary storage or disposal of human excreta without water carriage.
- H. *Sanitary landfill* shall mean the controlled process of disposing of refuse or offensive material by depositing, compacting in layers and completely covering all such refuse and material.
- I. *Separate sewage disposal system* shall mean the whole or any part of a system or facilities or means for the treatment or modification or ultimate disposal of water-borne sewage or domestic wastes or trade wastes or offensive material, regardless of location with respect to any building or structure or premises thereby served. Such system shall include but shall not be limited to facilities for the treatment or modification or required control of harmful or deleterious substance before discharge to a sewage disposal system (individually and/or collectively referred to herein as "SSDS").

(Added 7-19-2001, eff. 7-19-2001)

Sec. 873.722. Licensing requirements for septic system contractors.

Notwithstanding any other provision of this chapter to the contrary:

- A. Beginning on April 1, 2002, each and every person who provides or offers to provide services as a septic system contractor in Westchester County shall have obtained a license from the Commissioner in accordance with the requirements of this section. No person may provide or offer to provide services as a septic system contractor after April 1, 2002, without first having obtained such a license, except as may be authorized by the commissioner pursuant to section 873.722 C.(12), below.
- B. Application requirements.
 - (1) Any individual who seeks to operate as a septic system contractor in Westchester County shall submit an application to the commissioner on a form to be provided by the commissioner, along with the initial non-refundable application fee in the amount set forth below.
 - (2) Any individual who seeks to operate as a septic system contractor in Westchester County shall also be required to participate in a licensing instruction program developed and implemented by the department, or its duly authorized designee, which program shall include both course work in the areas of septic system construction, installation and operation and standard examinations relating to the matters covered by such course work.
 - (3) As part of the licensing instruction program, the department shall hold courses and examinations periodically, at such time and in such locations as the commissioner shall specify. Any person who

has completed the application form and submitted the required application fee and licensing instruction program fee, shall be eligible to participate in the next regularly scheduled license instruction program. Pursuant to such licensing instruction program, the department shall conduct such examinations, which may take the form of written, oral and/or practical examinations, as it deems necessary to test the applicants' knowledge of SSDS construction, installation, repair, and rehabilitation.

C. Licensing.

- (1) Upon the successful completion of the licensing instruction program, including successful completion of the examination to the satisfaction of the commissioner, and the payment of the biennial licensing fee, the commissioner shall issue a license certificate to the individual, which license shall indicate that the holder thereof is entitled to engage in the work or occupation of a licensed septic system contractor. All licenses shall expire two years from the date of issuance.
- (2) The licensee shall carry the license certificate on his person at all times while engaging in or performing the work for which the license has been issued in Westchester County. Such license shall be shown to any properly interested person, including customers, upon request. The licensee shall also conspicuously post a sign, at the primary public street entrance to the work site, which sign shall contain the licensee's Department of Health license number in a form to be specified by the commissioner.
- (3) Licenses issued by the department pursuant to this section shall be utilized only by the person named on such license and shall be non-transferable. The license of one individual shall not be deemed to satisfy the separate licensing requirements applicable to employees, contractors and/or subcontractors of such individual where such employees, contractors and/or subcontractors are performing services which require a license pursuant to this section.
- (4) All such construction; installation; repair and/or rehabilitation; and servicing of SSDS in Westchester County, except for the evacuation of septage, shall be subject to the direct supervision of the licensee. For purposes of this subsection, "direct supervision" shall mean that the licensed individual shall be responsible for all activities on site, and shall, during the course of providing such services, be physically present at the work site.
- (5) Exceptions to licensing requirements. The provisions of this section shall not apply to individuals who are employees of any federal or state agencies, when such individuals are acting within the scope of that employment.
- (6) Fees. The non-refundable fees which shall be paid to the department in connection with the application and licensing procedures outlined herein shall be:

- a. Original application fee: \$200.00 per applicant.
 - b. License instruction program fee (including the cost of examination): \$100.00 per applicant for initial exam; \$25.00 for re-issuance of examinations and/or for renewal examinations.
 - c. Biennial license/renewal fee: \$200.00 per licensee.
- (7) The commissioner may require the participation of licensed septic system contractors at department-sponsored informational seminars at any time during any licensing term in order to ensure that all licensed septic system contractors are informed of developing issues, technologies, and laws which may impact the performance of services by the licensed septic system contractor in Westchester County.
- (8) A licensed septic system contractor shall comply, at its own expense, with the provisions of all applicable federal, state and municipal laws, rules, regulations or requirements including, but not limited to, all federal, state and municipal laws, rules, regulations or requirements applicable to the licensee as an employer of labor or otherwise. All licensees shall be required to comply with all rules, regulations and licensing requirements pertaining to its professional status and that of its employees, partners, associates, subcontractors and others employed to render the services hereunder.
- (9) Renewal. No person shall perform the services of a licensed septic system contractor after the expiration of the license issued by the department. The licensed septic system contractor may seek renewal of its license by submitting a renewal application, on the form provided by the department, to the department not less than 30 days in advance of the expiration date of the licensed septic system contractor's existing license. Prior to the approval of the renewal license, the licensed septic system contractor shall be required to submit a completed application and pay the biennial renewal fee of \$200.00, as referenced above, prior to the department's issuance of the renewal license, and may be required to successfully complete a renewal examination. The commissioner may, in his discretion, require any licensee who fails to submit the renewal application within the time frames specified above to submit an application and fees, in accordance with this section, as though the licensee had not previously been licensed by the commissioner.
- (10) The commissioner may refuse to issue or renew a license in the event that an individual fails to satisfactorily complete the licensing instruction program, examination, or renewal examination, or fails to comply with the licensing standards outlined herein.
- (11) Upon the issuance of a license by the commissioner, the names and contact information for each licensed septic system contractor shall be placed on a public registry to be maintained by the

commissioner and made available for consumer review and reference.

- (12) The commissioner, in his discretion, may issue a temporary license to a prospective licensed septic system contractor in the case of an emergency where, in the opinion of the commissioner, the condition of a SSDS poses a threat to public health and safety, provided however, that the duration of such temporary license shall not exceed six months. The commissioner may, in his discretion, refuse to issue a temporary license or suspend any existing temporary license where the commissioner deems the qualifications or work practices of the holder of the temporary license to be unsatisfactory, or where the threat to public health and safety has been eliminated to the satisfaction of the commissioner. The issuance of such a temporary license may be utilized by its holder only with respect to the emergency identified and which formed the basis for issuance of the temporary license, and shall not entitle the holder thereof to provide services as a licensed septic system contractor in Westchester County generally. The holder of such a temporary license shall be required to pay pro rata fees, in accordance with the fees established in subsection C.(6), above, on a month-to-month basis for the term of such temporary license.

(Added 7-19-2001, eff. 7-19-2001)

Sec. 873.723. Standards applicable to licensed septic system contractors.

- A. All licensed septic system contractors shall comply with all provisions set forth in this Article VIII to the extent that such provisions relate to licensed septic system contractors or SSDS, and to any other provision of this chapter which relates to license holders.
- B. All licensed septic system contractors shall comply with all standards of workmanship as may be established in the training programs to be provided by the department, or its designee, pursuant to such licensing program, or generally in the industry.
- C. No person shall knowingly engage in any fraud or material deception of the commissioner, the department, or any Westchester County consumer with respect to the qualifications or licensing status of the individual, its employees, or independent contractors, or the services which are offered or provided to any such consumer, in connection with the services regulated hereunder.
- D. No person shall knowingly cooperate with any individual engaged in any fraud or material deception of the commissioner, the department, or any Westchester County consumer with respect to the qualifications or licensing status of the individual, its employees, or independent contractors, or the professional services which are offered or provided by such individual to any such consumer, in connection with the services regulated hereunder.

(Added 7-19-2001, eff. 7-19-2001)

Sec. 873.724. Reporting requirements for licensed septic system contractors.

Notwithstanding any other provision of this chapter to the contrary:

- A. Each and every licensed septic system contractor shall be required to complete a septic system data form in the form provided by the commissioner upon the completion of any on-site services performed with respect to any SSDS in Westchester County, which form shall specify the service provided to the property owner and any other information which the commissioner, in his discretion, may deem appropriate. Each and every licensed septic system contractor shall be required to issue a copy of the septic system data form to both the commissioner and to the owner of the facility which is served by such SSDS within ten business days of the service date. Such septic system data forms shall include language which informs the property owner that all licensed septic system contractors shall be required to maintain their Westchester County license; shall be required to display such license and license number to the property owner upon request; and shall specify the contact information for the department.
- B. In the event that any service provided by the licensed septic system contractor indicates that the SSDS presents a significant threat to public health, safety and/or the environment, the licensed septic system contractor shall state the existence and nature of such emergency clearly on the face of such septic system data form, and shall issue a copy of the septic system data form to both the commissioner and to the owner of the facility which is served by the SSDS within three business days of the service date.
- C. To the extent that the condition of any given SSDS is such that the licensed septic system contractor cannot bring the SSDS into compliance with all applicable federal, state and municipal laws, rules, regulations or requirements, the licensed septic system contractor shall advise the consumer of such condition in advance of providing any services to the consumer with respect to such SSDS, and shall note on the face of any septic system data form prepared with respect to such SSDS both the existence of such condition and the subsequent efforts, if any, made by the licensed septic system contractor to bring the SSDS into conformance with such laws, rules and regulations, and the consumer's assent to same.
- D. Licensed septic system contractors shall be required to maintain a copy of each and every septic system data form for a period of not less than six years from the date of service.
- E. The commissioner shall maintain a database of the records for each SSDS, which records are to be provided by all licensed septic system contractors, and shall include, but not be limited to, the following information, where applicable:
 - (1) Residence address;
 - (2) Number of bedrooms;

- (3) Number of bathrooms;
- (4) Square footage of residence/commercial structure;
- (5) Type of sewage disposal system;
- (6) Grade/slope of disposal area;
- (7) Percolation rate at disposal area;
- (8) Distance from well, if applicable;
- (9) Well yield (gallons per minute), if applicable;
- (10) Depth of well (feet), and physical characteristics of well, if applicable;
- (11) Date of system installation;
- (12) Name of system installer;
- (13) A listing of current and previous owners; and
- (14) Maintenance history.

- F. The information contained in such database shall be made available for inspection by members of the public at reasonable times during the regular business hours of the department.

(Added 7-19-2001, eff. 7-19-2001)

Sec. 873.725. Penalties and enforcement.

Except as expressly stated in this Article VIII, any person who is deemed to have violated section 873.723 hereof, shall be subject to enforcement proceedings in accordance with the provisions of sections 209--215; 217--221; and 304--309 of this chapter. Each day of a continuing violation shall constitute a separate and distinct violation hereunder. This provision is not, however, intended to impose any liability or affirmative obligation upon the owner of any real property which is served by an SSDS regarding any such services which may be provided on such property by any unlicensed individual where that individual represented to such owner that he or she was a licensed septic system contractor.

(Added 7-19-2001, eff. 7-19-2001)

Sec. 873.726. Permit required for separate sewage systems.

- A. No person shall undertake to construct any new building or structure requiring a separate sewage disposal system or to construct such system to serve any existing building or structure without first having obtained the written approval for such system issued pursuant to the Public Health Law or by the commissioner.
- B. No such system for the subsurface disposal of sewage shall hereafter be approved on any building site not having in existence on the date of approval the required usable area. Such area thereafter shall be so isolated and protected as to effectively prevent removal, displacement, compaction or other adverse physical change in the characteristics of the soil or in the drainage of the area

designated for such usage.

- C. Such separate sewage disposal system shall be constructed, installed, repaired and/or rehabilitated in accordance with the standards, rules or regulations duly promulgated by the commissioner and with the terms or conditions of the permit issued therefor or approved amendments thereto.
- D. Whenever inspection indicates the construction to be otherwise than in accordance with the Public Health Law or this Code or the conditions of any permit or written approval issued pursuant thereto or the standards applicable to said construction, all work shall cease upon written notice served upon any person connected with or working in or about the said system or any part thereof, or by registered mail to the last recorded address of the person named in such permit or approval. Thereafter no further work shall be done other than to remedy such violation and to proceed with work in compliance with the aforementioned requirements, provided the inspector determines that the work may properly proceed. Otherwise, the written approval shall terminate and no further work shall be undertaken until a new written approval shall have been obtained.

Whenever considered necessary by the inspector, any covered work shall be promptly uncovered for inspection at any time before issuance of the certificate of completion. Any approval shall be subject to modification or change as may be directed in writing by a representative of the commissioner due to conditions found during construction, provided that such inspector may at his discretion require all or part of the construction to cease until approval of the necessary modification or change has been obtained in the same manner as the original approval.

- E. No new separate sewage disposal system shall be placed in operation nor shall any new building requiring such system be occupied until a certificate shall have been issued indicating that such disposal system has been constructed in compliance with the terms of the approval issued and the requirements of this code. Such certificate of completion may be issued by the commissioner or by any building or plumbing inspector of a local municipality within the Health District duly authorized by the commissioner so to do. Such certificate of completion may be issued upon receipt of written certification by a professional engineer, registered architect or land surveyor, licensed to practice in the State of New York, stating that the system has been installed under his supervision as shown on plans submitted with such certification in accordance with the terms of the approval and the requirements of this code.
- F. In the event of the failure of any separate sewage disposal system installed under the approval of the commissioner or otherwise, the owner of the building or structure served thereby shall forthwith cause an investigation to be made of the reason for such failure and shall place the system in a proper and sanitary operating condition by any legal means within such period of time as may be determined by the commissioner to be reasonable to perform such work. During such investigation any portion of the system may be left open for inspection provided it is protected so as to effectively prevent direct contact with the sewage contents. The findings of the commissioner shall be presumptive evidence of the cause of failure. In the event the owner is not subject to legal process, the occupant of the premises shall be responsible for the maintenance of the separate sewage disposal system in a satisfactory and sanitary condition during such occupancy.

- G. The issuance of any approval or certification pursuant to the provisions of this code shall not be construed as a guaranty by the commissioner or the Westchester County Department of Health or any employee or agent that the system has been properly constructed or will function satisfactorily, nor shall it in any way restrict the actions or powers of the commissioner in the enforcement of any law or regulation.

(Added 7-19-2001, eff. 7-19-2001)

Sec. 873.727. Sewer connection required.

The owner of any habitable building or property used for human occupancy, employment, recreation or other purpose abutting upon any street, alley or right-of-way in which there is located a public sanitary sewer may be required to install at the expense of such owner suitable toilet facilities therein and to connect such facilities directly with the public sanitary sewer, in accordance with any local regulations of the municipality owning such sewer, within 90 days after date of an order in writing issued by the commissioner to do so, provided that such sewer is within 100 feet of any property line of such premises and is otherwise accessible. Where a public sanitary sewer is available no new arrangement shall be made other than an individual connection to serve each building site.

(Added 7-19-2001, eff. 7-19-2001)

Cross references: Department of Environmental Facilities, Chs. 128 and 237; Environmental Coordinating Agency, Ch. 342; environmental facilities sewer ordinance, Ch. 824; sanitary sewer districts, Ch. 964.

Sec. 873.728. Sewer connections in sewerred areas.

Within the corporate limits of any city or village or within a town sewer district, no new habitable building shall be occupied unless served by a connection to the public sanitary sewer system, provided that a temporary system for the separate disposal of sewage or other wastes may be installed to serve an individual and isolated premises in accordance with the requirements of this code when the prior written consent of the municipal council or board or its duly authorized representative having jurisdiction over such sewer district is filed with the application. Such temporary facilities shall be approved only when a method of ultimately providing for a connection to a public sanitary sewer is indicated by the municipal governing council or board. This regulation shall not apply to a building site of 40,000 square feet or more in area which contains the usable area otherwise required.

(Added 7-19-2001, eff. 7-19-2001)

Sec. 873.729. Building served by separate sewers.

Where a public sanitary sewer is not available and accessible, every habitable building hereafter constructed shall be properly plumbed and the building sewer shall be connected to a separate sewage disposal system complying with the provisions of this code, and no other means for the disposal of water-borne sewage shall be employed. When a public sanitary sewer shall become available to the property so served, a direct connection shall be made to such public sanitary sewer and any separate sewerage

facilities shall be abandoned and every tank or pit in such system shall be opened, emptied of any sewage and completely filled in with inert material.

(Added 7-19-2001, eff. 7-19-2001)

Sec. 873.730. Protection of public sewers.

No person shall discharge or cause the discharge of any harmful or deleterious substance to any sanitary sewer or separate sewage disposal system so as to endanger the use of or the materials of construction of such sewer or system or so as to result in the stoppage or other failure of the sewerage system or subsequent sewage treatment, unless a permit for such discharge has been secured from the official agency having by law responsible charge of such sewerage system or sewage treatment works and such discharge conforms to the terms of such permit.

No unauthorized person shall break, damage, destroy, uncover, interfere with or commit any act which shall harm any structure, device, equipment or treatment process which is a part of a public sanitary sewerage system or sewage treatment works.

(Added 7-19-2001, eff. 7-19-2001)

Sec. 873.731. Exposure of sewage.

No person shall construct, or maintain any privy, cesspool, sewage disposal system, pipe or drain so as to expose or discharge the sewage contents or other deleterious liquid or matter therefrom to the atmosphere or on the surface of the ground or into any storm sewer or drain nor so as to endanger any source of supply of drinking water nor so as to discharge into any water course or body of water unless approval for such discharge shall have been issued therefor in accordance with the provisions of this code or the Public Health Law.

Complete daily records shall be kept of the operation of any sewage or waste treatment or chlorination as required under the provisions of any written approval for discharge issued therefor in accordance with the provisions of this code or the Public Health Law.

(Added 7-19-2001, eff. 7-19-2001)

Sec. 873.732. Temporary facilities on construction.

Any builder, contractor or other person employing men on the construction of any highway, building or structure shall provide or cause to be provided a temporary privy or privies or other satisfactory toilet facilities at a convenient place upon the premises, or readily accessible thereto and the same shall be properly enclosed and the contents thereof shall be completely covered with clean inert material or otherwise effectively treated or removed immediately by the end of each shift or working day.

(Added 7-19-2001, eff. 7-19-2001)

Sec. 873.733. Disposal of offensive material.

- A. *Storage.* No person shall permit, deposit, store or hold any offensive material on any premises or place or in any building or structure unless such material is so

treated, screened, covered or placed as not to create a nuisance detrimental to health. All containers for the storage of such material shall completely confine the material, shall be rodent and insect proof and shall be kept in an inoffensive and sanitary condition at all times.

- B. *Privies.* No person shall hereafter construct, or provide any privy unless it is constructed and maintained so that all human excreta is received in a water-tight vault or receptacle wherein the contents are continuously subjected to an effective disinfectant. The commissioner may require the use of any existing privy to be discontinued, the contents removed, and the pit filled with inert material, whenever the use of such privy is no longer necessary or whenever such privy is located, constructed or maintained otherwise than in conformity to the provisions of the State or County Sanitary Code, or creates a nuisance. All privies shall be properly enclosed and screened, ventilated, lighted, kept in repair and shall be maintained at all times in a clean and sanitary condition. No privy shall be located or maintained within ten feet of any property line, within 25 feet of any public street or way or within 25 feet of any door or window of any building used for human occupancy. No such facilities shall be constructed under or within any building or structure intended or used for human occupancy.
- C. *Protection of facilities.* No person shall dispose of any substance into any plumbing line, sewer, privy or separate sewage disposal system other than that which said facility is designed or is intended to receive.
- D. *Burial or discharge.* No person shall dispose of any offensive material by burial unless it shall be buried at least 250 feet from any source of water supply or so disposed of at such other place that no water supply will be polluted and where nuisance will not be created, subject to regulations for the protection of public water supplies adopted pursuant to the provisions of the Public Health Law.
- E. *Garbage fed to hogs.* No garbage shall be fed to hogs unless said garbage has first been heated to at least 212 degrees Fahrenheit continuously for 30 minutes in apparatus and by methods approved by the commissioner.

(Added 7-19-2001, eff. 7-19-2001)

Sec. 873.734. Removal and transportation of offensive material.

No person shall remove or transport or permit the removal or transportation of any offensive material except in such manner and in or by such conveyance as will prevent the creation of a nuisance or the loss or discharge of such material in any public place. All such material shall be so handled, covered or treated that it cannot escape or be accessible to rodents, flies or other insects or create a nuisance. All vehicles and implements used in connection therewith shall be kept in an inoffensive and sanitary condition and when not in use shall be so stored or kept as not to create a nuisance.

(Added 7-19-2001, eff. 7-19-2001)

Sec. 873.735. Permit required for collection.

No person, except a municipality, shall engage in the business of removing, collecting or transporting offensive material without first having obtained a permit therefor from the commissioner.

(Added 7-19-2001, eff. 7-19-2001)

Sec. 873.736. Approval of disposal area.

- (a) The operation or maintenance of a dump for the disposal of refuse or offensive material is hereby declared to constitute a public health nuisance. No offensive material or combustible refuse shall be disposed of other than through the use of a sanitary landfill established, operated and maintained in accordance with standards established by the Commissioner of Health, or by use of an incinerator constructed, operated and maintained so as to comply with other requirements of the Sanitary Code or of the Public Health Law.
- (b) Any person, including a municipal corporation, who uses or permits the use of any land or water as a public place of disposal of offensive material or combustible refuse by means of a sanitary landfill shall obtain a permit therefor from the commissioner.
- (c) At any disposal area all material of any type whatsoever shall be deposited, controlled, treated, covered or handled in such a manner as not to create offensive odors, a breeding place for insects, vermin or rodents, the dissemination or dust or fires or the exposure of any person to toxic, poisonous or hazardous substances.

(Added 7-19-2001, eff. 7-19-2001)

ARTICLE IX. SANITATION OF HABITABLE BUILDINGS

Sec. 873.821. Definitions.

- 1. "Dwelling unit" shall mean a room or group of rooms with facilities for regular preparation of meals and occupied or intended to be occupied by one household consisting of one (1) family as a home where its members live and sleep.
- 2. "Habitable building" shall mean any structure intended to be occupied in whole or in part by one (1) or more human beings.
- 3. Exception. Except where specifically defined elsewhere in this code, the definitions and standards contained in the Recommended Standard Plumbing Code promulgated by the State Department of Health and in the State Building Construction Code Applicable to One- and Two-Family Dwellings and the State Building Construction Code Applicable to Multiple Dwellings and any subsequent amendments thereto or revisions thereof shall apply.

(§ 1, Art. VIII, eff. 9-1-1959)

Sec. 873.831. General provisions.

- 1. *Scope.* Every existing habitable public or private building which is in whole or in part leased by the owner or his agent or which is permitted to be used by patrons or by the general public and every habitable building hereafter constructed shall comply with the following minimum requirements.
- 2. *Structure.* Every habitable building shall be constructed of durable material

APPENDIX F

FEDERAL EMERGENCY MANAGEMENT AGENCY (FEMA)

- FEMA Letter of Map Revision Determination Document
- FEMA Advisory Base Flood Elevation Map
- FEMA FIRM Number 39119C0353F, Panel 353 of 426
- Figure 1 - FEMA Flood Zone Delineation (Effective 9/28/2007)
- Figure 2 – Approved FEMA Flood Zone Delineation (LOMR 2/20/2013)
- Figure 3 – Preliminary FEMA Flood Zone Delineation (12/8/2014)



Federal Emergency Management Agency

Washington, D.C. 20472

LETTER OF MAP REVISION DETERMINATION DOCUMENT

| COMMUNITY AND REVISION INFORMATION | | PROJECT DESCRIPTION | BASIS OF REQUEST |
|---|---|---|--|
| COMMUNITY | Village of Mamaroneck Westchester County New York | NO PROJECT | COASTAL ANALYSIS NEW TOPOGRAPHIC DATA |
| | COMMUNITY NO.: 360916 | | |
| IDENTIFIER | Mamaroneck Beach and Yacht Club | APPROXIMATE LATITUDE AND LONGITUDE: 40.942, -73.722 SOURCE: Precision Mapping Streets DATUM: NAD 83 | |
| ANNOTATED MAPPING ENCLOSURES | | ANNOTATED STUDY ENCLOSURES | |
| TYPE: FIRM* NO.: 36119C0353F DATE: September 28, 2007 | | NO REVISION TO THE FLOOD INSURANCE STUDY REPORT | |

Enclosures reflect changes to flooding sources affected by this revision.

* FIRM - Flood Insurance Rate Map

FLOODING SOURCE AND REVISED REACH

Long Island Sound - An area bounded by Otter Creek on the west and Long Island Sound on the east and south side and from approximately 400 feet south to approximately 1,430 feet southeast of the intersection of Alda Road and South Barry Avenue

SUMMARY OF REVISIONS

| Flooding Source | Effective Flooding | Revised Flooding | Increases | Decreases |
|-------------------|--------------------|------------------|-----------|-----------|
| Long Island Sound | Zone AE | Zone AE | YES | YES |
| | BFEs * | BFEs | YES | YES |
| | Zone VE | Zone AE | YES | YES |
| | Zone VE | Zone VE | YES | YES |

* BFEs - Base Flood Elevations

DETERMINATION

This document provides the determination from the Department of Homeland Security's Federal Emergency Management Agency (FEMA) regarding a request for a Letter of Map Revision (LOMR) for the area described above. Using the information submitted, we have determined that a revision to the flood hazards depicted in the Flood Insurance Study (FIS) report and/or National Flood Insurance Program (NFIP) map is warranted. This document revises the effective NFIP map, as indicated in the attached documentation. Please use the enclosed annotated map panel revised by this LOMR for floodplain management purposes and for all flood insurance policies and renewals in your community.

This determination is based on the flood data presently available. The enclosed documents provide additional information regarding this determination. If you have any questions about this document, please contact the FEMA Map Information eXchange (FMIX) toll free at 1-877-336-2627 (1-877-FEMA MAP) or by letter addressed to the Engineering Library, 847 South Pickett Street, Alexandria, VA 22304-4605. Additional Information about the NFIP is available on our Web site at <http://www.fema.gov/business/nfip>.

Todd A. Steiner, Program Specialist
Engineering Management Branch
Federal Insurance and Mitigation Administration



Federal Emergency Management Agency
Washington, D.C. 20472

**LETTER OF MAP REVISION
DETERMINATION DOCUMENT (CONTINUED)**

OTHER FLOODING SOURCES AFFECTED BY THIS REVISION

FLOODING SOURCE AND REVISED REACH

Long Island Sound - An area bounded by Otter Creek on the west and Long Island Sound on the east and south side and from approximately 400 feet south to approximately 1,430 feet southeast of the intersection of Alda Road and South Barry Avenue

SUMMARY OF REVISIONS

| Flooding Source | Effective Flooding | Revised Flooding | Increases | Decreases |
|------------------------|---------------------------|-------------------------|------------------|------------------|
| Long Island Sound | Zone AE | Zone X (unshaded) | YES | NONE |
| | Zone VE | Zone X (unshaded) | YES | NONE |

* BFEs - Base Flood Elevations

This determination is based on the flood data presently available. The enclosed documents provide additional information regarding this determination. If you have any questions about this document, please contact the FEMA Map Assistance Center toll free at 1-877-336-2627 (1-877-FEMA MAP) or by letter addressed to the Engineering Library, 847 South Pickett Street, Alexandria, VA 22304-4605. Additional Information about the NFIP is available on our Web site at <http://www.fema.gov/business/nfip>.

Todd A. Steiner, Program Specialist
Engineering Management Branch
Federal Insurance and Mitigation Administration



Federal Emergency Management Agency

Washington, D.C. 20472

LETTER OF MAP REVISION DETERMINATION DOCUMENT (CONTINUED)

COMMUNITY INFORMATION

APPLICABLE NFIP REGULATIONS/COMMUNITY OBLIGATION

We have made this determination pursuant to Section 206 of the Flood Disaster Protection Act of 1973 (P.L. 93-234) and in accordance with the National Flood Insurance Act of 1968, as amended (Title XIII of the Housing and Urban Development Act of 1968, P.L. 90-448), 42 U.S.C. 4001-4128, and 44 CFR Part 65. Pursuant to Section 1361 of the National Flood Insurance Act of 1968, as amended, communities participating in the NFIP are required to adopt and enforce floodplain management regulations that meet or exceed NFIP criteria. These criteria, including adoption of the FIS report and FIRM, and the modifications made by this LOMR, are the minimum requirements for continued NFIP participation and do not supersede more stringent State/Commonwealth or local requirements to which the regulations apply.

COMMUNITY REMINDERS

We based this determination on the 1-percent-annual-chance stillwater elevations computed in the FIS for your community. A comprehensive restudy of your community's flood hazards could establish greater flood hazards in this area.

Your community must regulate all proposed floodplain development and ensure that any permits required by Federal or State/Commonwealth law have been obtained. State/Commonwealth or community officials, based on knowledge of local conditions and in the interest of safety, may set higher standards for construction or may limit development in floodplain areas. If your State/Commonwealth or community has adopted more restrictive or comprehensive floodplain management criteria, those criteria take precedence over the minimum NFIP requirements.

Because the FIS report establishing the BFEs for your community has been completed, certain additional requirements must be met under Section 1361 of the National Flood Insurance Act of 1968, as amended, within 6 months from the date of this letter. Prior to the effective date of this revision your community is required, as a condition of continued eligibility in the NFIP, to adopt or show evidence of adoption of floodplain management regulations that meet the standards of Paragraph **60.3(e)** of the enclosed NFIP regulations (44 CFR 59, etc.). These standards are the minimum requirements and do not supersede any State or local requirements of a more stringent nature.

It must be emphasized that all the standards specified in Paragraph **60.3(e)** of the NFIP regulations must be enacted in a legally enforceable document. This includes adoption of the current effective FIS report and FIRM to which the regulations apply and other modifications made by this map revision. Some of the standards should already have been enacted by your community in order to establish initial eligibility in the NFIP. Your community can meet any additional requirements by taking one of the following actions:

1. Amending existing regulations to incorporate any additional requirements of Paragraph **60.3(e)**
2. Adopting all the standards of Paragraph **60.3(e)** into one new, comprehensive set of regulations
3. Showing evidence that regulations have previously been adopted that meet or exceed the minimum requirements of Paragraph **60.3(e)**

This determination is based on the flood data presently available. The enclosed documents provide additional information regarding this determination. If you have any questions about this document, please contact the FEMA Map Information eXchange (FMIX) toll free at 1-877-336-2627 (1-877-FEMA MAP) or by letter addressed to the Engineering Library, 847 South Pickett Street, Alexandria, VA 22304-4605. Additional Information about the NFIP is available on our Web site at <http://www.fema.gov/business/nfip>.

A handwritten signature in black ink, appearing to read "Todd A. Steiner".

Todd A. Steiner, Program Specialist
Engineering Management Branch
Federal Insurance and Mitigation Administration



Federal Emergency Management Agency

Washington, D.C. 20472

LETTER OF MAP REVISION DETERMINATION DOCUMENT (CONTINUED)

Communities that fail to enact the necessary floodplain management regulations will be suspended from participation in the NFIP and subject to the prohibitions contained in Section 202(a) of the Flood Disaster Protection Act of 1973 (Public Law 93-234) as amended.

We will not print and distribute this LOMR to primary users, such as local insurance agents or mortgage lenders; instead, the community will serve as a repository for the new data. We encourage you to disseminate the information in this LOMR by preparing a news release for publication in your community's newspaper that describes the revision and explains how your community will provide the data and help interpret the NFIP maps. In that way, interested persons, such as property owners, insurance agents, and mortgage lenders, can benefit from the information.

We have designated a Consultation Coordination Officer (CCO) to assist your community. The CCO will be the primary liaison between your community and FEMA. For information regarding your CCO, please contact:

Mr. Timothy P. Crowley
Director, Mitigation Division
Federal Emergency Management Agency, Region II
26 Federal Plaza, 13th floor
New York, NY 10278-0002

STATUS OF THE COMMUNITY NFIP MAPS

We will not physically revise and republish the FIRM for your community to reflect the modifications made by this LOMR at this time. When changes to the previously cited FIRM panel warrant physical revision and republication in the future, we will incorporate the modifications made by this LOMR at that time.

This determination is based on the flood data presently available. The enclosed documents provide additional information regarding this determination. If you have any questions about this document, please contact the FEMA Map Information eXchange (FMIX) toll free at 1-877-336-2627 (1-877-FEMA MAP) or by letter addressed to the Engineering Library, 847 South Pickett Street, Alexandria, VA 22304-4605. Additional Information about the NFIP is available on our Web site at <http://www.fema.gov/business/nfip>.

A handwritten signature in black ink, appearing to read "Todd A. Steiner".

Todd A. Steiner, Program Specialist
Engineering Management Branch
Federal Insurance and Mitigation Administration



Federal Emergency Management Agency

Washington, D.C. 20472

LETTER OF MAP REVISION DETERMINATION DOCUMENT (CONTINUED)

PUBLIC NOTIFICATION OF REVISION

PUBLIC NOTIFICATION

A notice of changes will be published in the *Federal Register*. This information also will be published in your local newspaper on or about the dates listed below and through FEMA's Flood Hazard Mapping Web site at https://www.floodmaps.fema.gov/fhm/Scripts/bfe_main.asp.

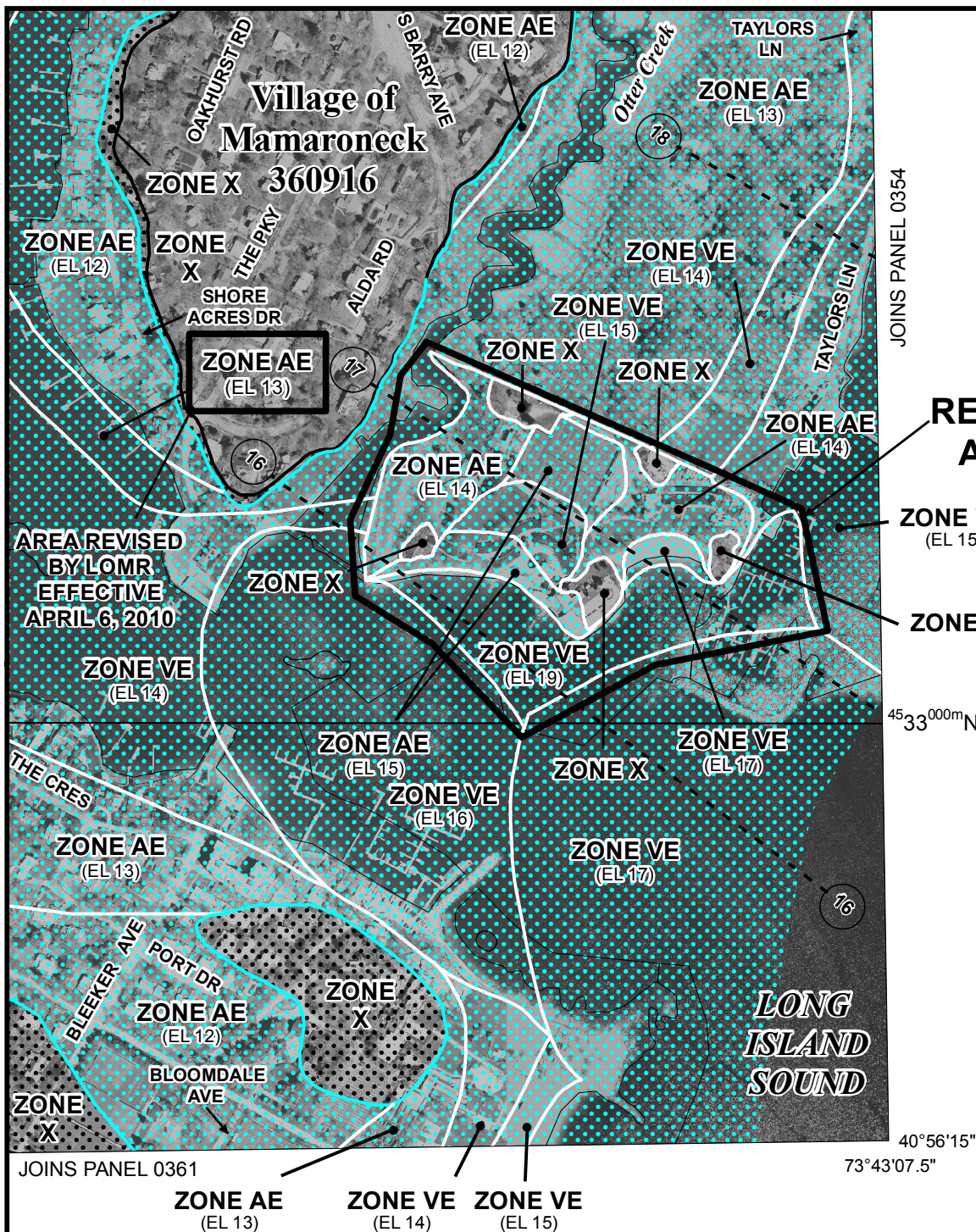
LOCAL NEWSPAPER Name: *The Journal News*
Dates: 8/27/2012 and 9/3/2012

Within 90 days of the second publication in the local newspaper, a citizen may request that we reconsider this determination. Any requests for reconsideration must be based on scientific or technical data. This revision will become effective 6 months from the date of this letter and after we have resolved any appeals that we have received during the 90-day appeal period. Until this LOMR is effective, the revised flood hazard determination information presented in this LOMR may be changed.




This determination is based on the flood data presently available. The enclosed documents provide additional information regarding this determination. If you have any questions about this document, please contact the FEMA Map Information eXchange (FMIX) toll free at 1-877-336-2627 (1-877-FEMA MAP) or by letter addressed to the Engineering Library, 847 South Pickett Street, Alexandria, VA 22304-4605. Additional Information about the NFIP is available on our Web site at <http://www.fema.gov/business/nfip>.

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Federal Insurance and Mitigation Administration

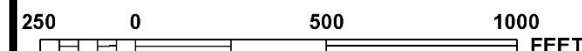


MAP LEGEND

-  1% annual chance (100-Year) Floodplain
-  1% annual chance (100-Year) Floodway
-  0.2% annual chance (500-Year) Floodplain



MAP SCALE 1" = 500'



NFIP

PANEL 0353F

FIRM

FLOOD INSURANCE RATE MAP

for WESTCHESTER COUNTY, NEW YORK
(ALL JURISDICTIONS)

| CONTAINS: | NUMBER |
|---------------------|--------|
| COMMUNITY | |
| HARRISON, TOWN OF | 360912 |
| MAMARONECK, TOWN OF | 360917 |
| MAMARONECK, VILLAGE | 360916 |
| OF | |

REVISED TO
REFLECT LOMR
EFFECTIVE: February 20, 2010

PANEL 353 OF 426

MAP SUFFIX: F

(SEE MAP INDEX FOR FIRM PANEL LAYOUT)

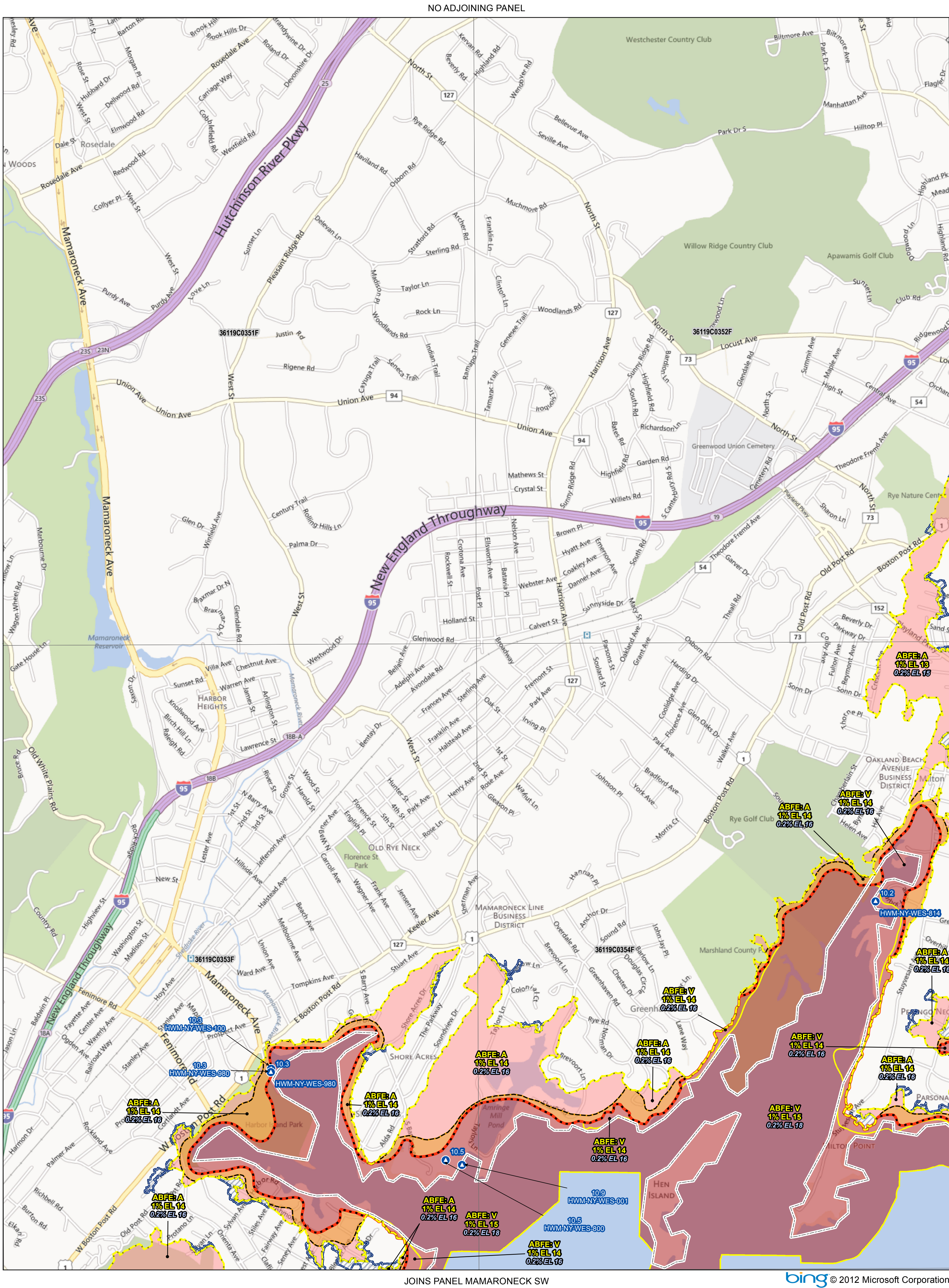
Notice to User: The Map Number shown below should be used when placing map orders; the Community Number shown above should be used on insurance applications for the subject community.

MAP NUMBER
36119C0353F

EFFECTIVE DATE
SEPTEMBER 28, 2007



Federal Emergency Management Agency



ADVISORY BASE FLOOD ELEVATIONS

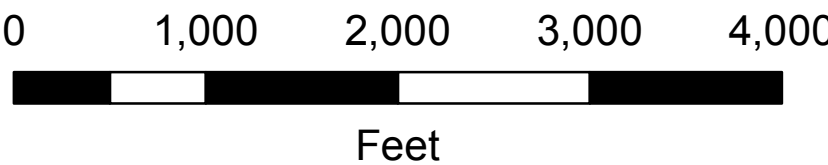
This map shows Advisory Base Flood Elevations (ABFEs) developed by FEMA. Use the QR code to the right, or navigate to <http://www.region2coastal.com/> for more information on how they were determined.

These ABFEs can serve as a guide to understanding current coastal flood hazard risk and the elevations that communities should build to in order to protect themselves from future flood events. As part of the long term recovery effort, the ABFEs are a tool for Federal, State, and local officials, building officials, builders and architects, insurance professionals, and property owners to make informed decisions during rebuilding and to mitigate losses from future flood events, safeguard lives, and protect the private and public investment in rebuilding.

The elevations shown on this map are considered best available data until issuance of updated Flood Insurance Rate Maps.

OBSERVED SANDY SURGE ELEVATIONS^{1,6}

Approximately 10-11 ft on this Panel



NOTES

¹ Measured in feet relative to the North American Vertical Datum of 1988 (NAVD88).

² Each whole-foot 1% annual chance Advisory Base Flood Elevation shown applies to all properties located in the mapped zone, with zone boundaries outlined in yellow.

³ Each whole-foot 0.2% annual chance Advisory Base Flood Elevation shown applies to all properties located in the mapped zone, with zone boundaries outlined in yellow.

⁴ Depicts the extent of the "Coastal A Zone" or area of moderate wave action where wave heights are between 1.5 and 3 feet. The FEMA Coastal Construction Manual, American Society of Civil Engineers, and the 2012 International Residential Building Code recommend Zone VE construction practices in this area.

⁵ Depicts the approximate extent of the Coastal Barrier Resources System (CBRS). Most new Federal expenditures and financial assistance (including flood insurance) are prohibited within the CBRS, with some exceptions. For the best available CBRS boundary data, visit: <http://www.fws.gov/cbra/Maps/Mapper.html>

Data Sources:

⁶ Sandy Surge Elevations: U.S. Geological Survey Rapid Deployment Gauges and High Water Marks (Provisional data retrieved on 11/27/2012). Current data can be found at: <http://water.usgs.gov/floods/events/2012/sandy/>; Base Map: Bing Maps Road; Stillwater Elevations: Preliminary Coastal FEMA Flood Insurance Study Update for New York City and New Jersey, 2012; Storm Track: NOAA National Weather Service

MAPS FOR ADVISORY PURPOSES ONLY - NOT FOR INSURANCE RATING PURPOSES

For insurance rating purposes refer to the effective Flood Insurance Rate Map (FIRM), available from your local floodplain administrator or the FEMA Map Service Center (<http://msc.fema.gov>)

USAGE

LEGEND

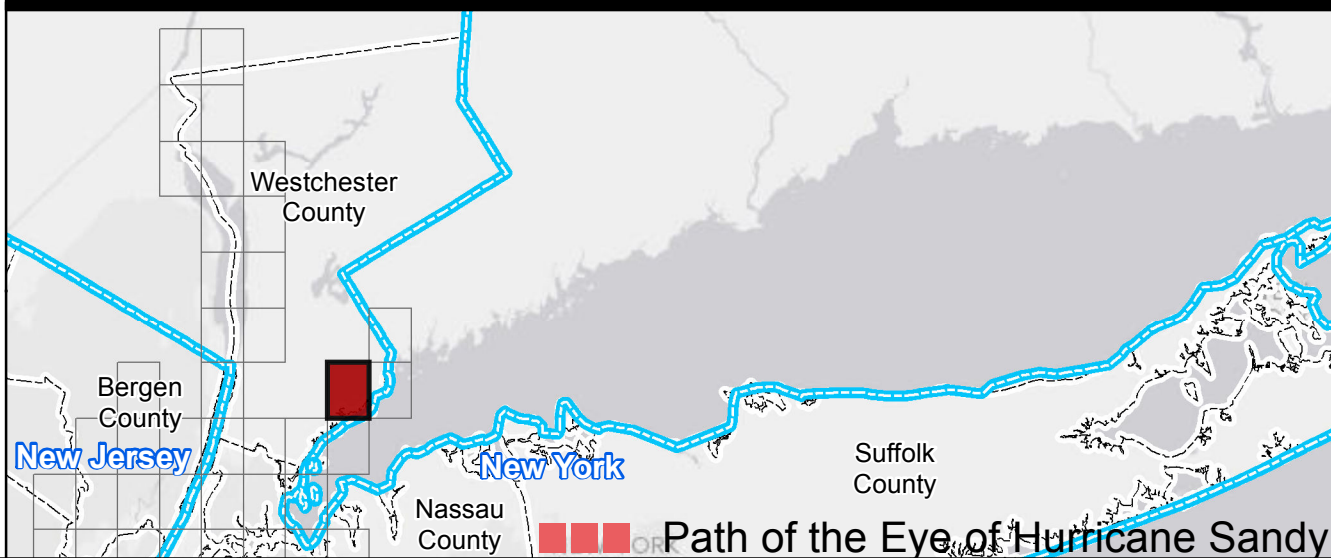
Flood Advisory Related Data

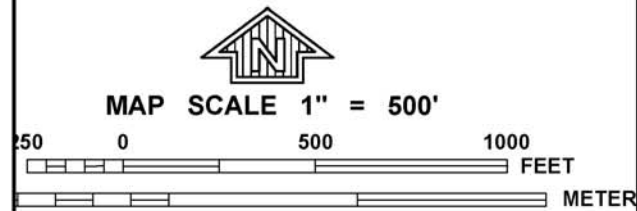
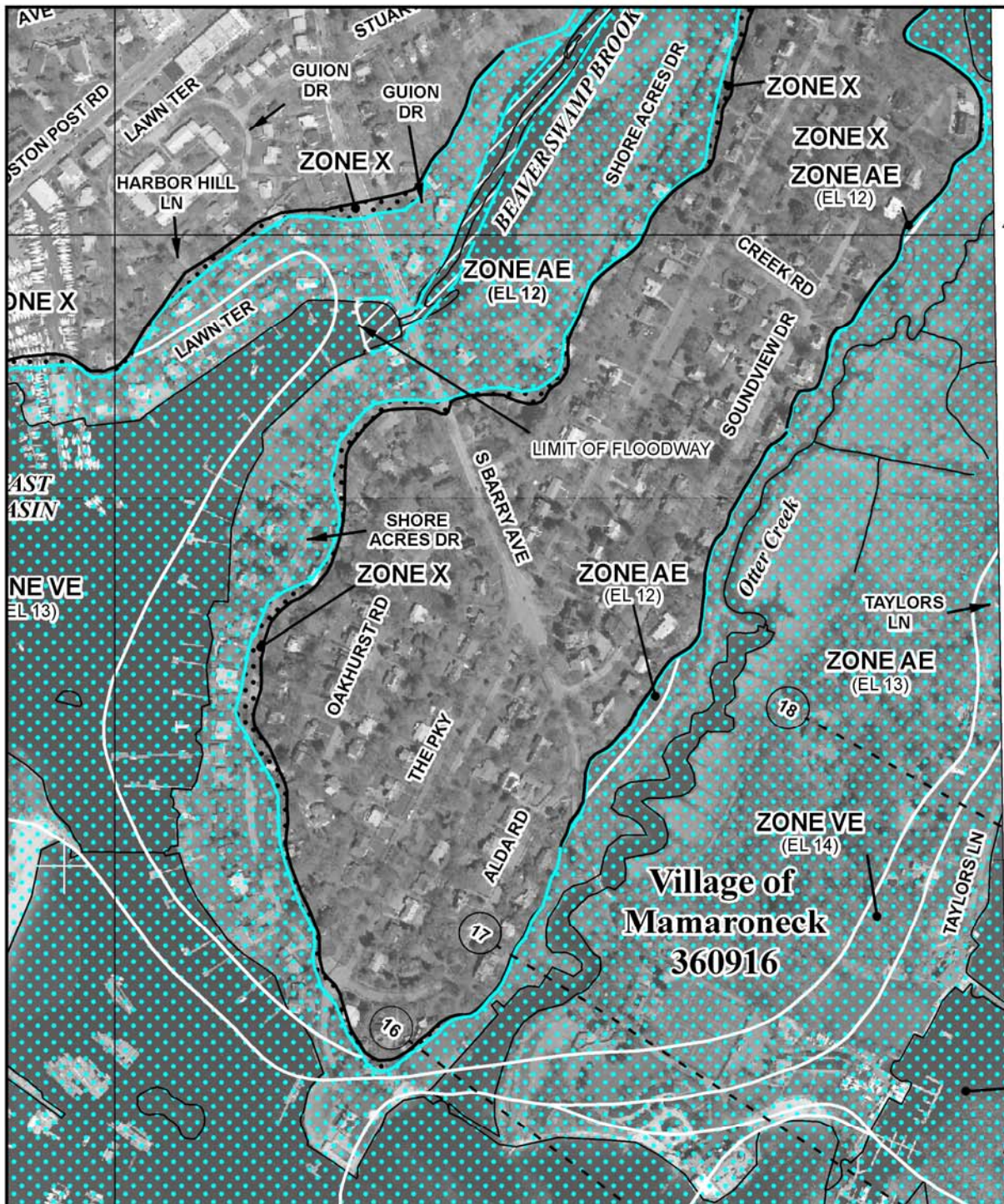
- Advisory Base Flood Elevation Zone (ABFE)²
- 1% EL
- 0.2% EL
- Advisory Flood Hazard Zone V
- Area of Moderate Wave Action⁴
- Advisory Flood Hazard Zone A
- Advisory Limit of the 1% Annual Chance Flood Hazard Area²
- Advisory Limit of the 0.2% Annual Chance Flood Hazard Area³
- Advisory Shaded Zone X
- Effective FIRM Panel Boundary
- Hurricane Sandy Related Data
- Provisional Hurricane Sandy Surge Elevation⁶

Geographic Boundaries

CBRA⁵ County State

OVERVIEW MAP





NFIP

PANEL 0353F

FIRM

FLOOD INSURANCE RATE MAP

for WESTCHESTER COUNTY, NEW YORK
(ALL JURISDICTIONS)

CONTAINS:

| COMMUNITY | NUMBER |
|------------------------|--------|
| HARRISON, TOWN OF | 360912 |
| MAMARONECK, TOWN OF | 360917 |
| MAMARONECK, VILLAGE OF | 360916 |

PANEL 353 OF 426

MAP SUFFIX: F

(SEE MAP INDEX FOR FIRM PANEL LAYOUT)

Notice to User: The Map Number shown below should be used when placing map orders; the Community Number shown above should be used on insurance applications for the subject community.

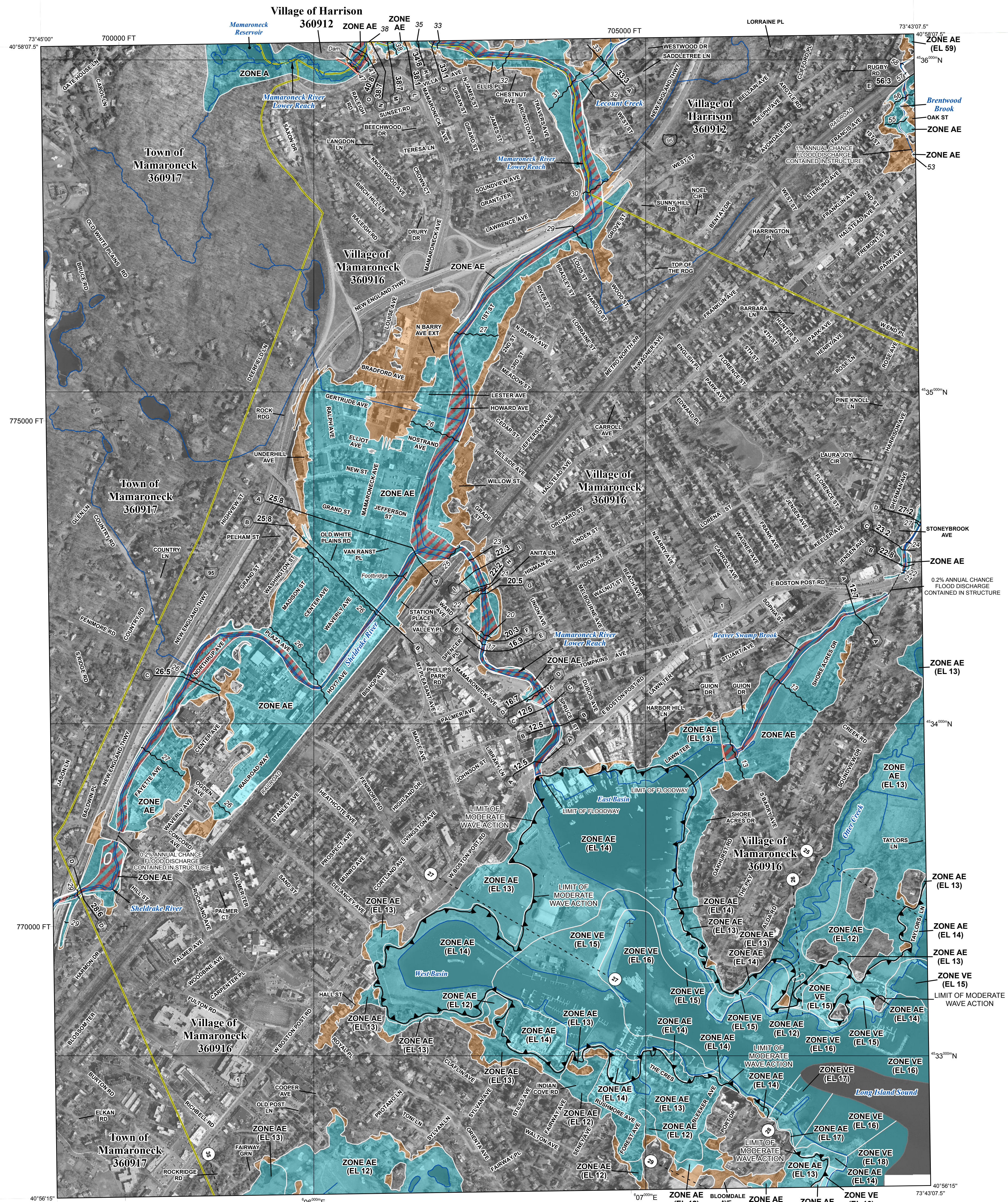


MAP NUMBER
36119C0353F

EFFECTIVE DATE
SEPTEMBER 28, 2007

Federal Emergency Management Agency

This is an official copy of a portion of the above referenced flood map. It was extracted using F-MIT On-Line. This map does not reflect changes or amendments which may have been made subsequent to the date on the title block. For the latest product information about National Flood Insurance Program flood maps check the FEMA Flood Map Store at www.msc.fema.gov



FLOOD HAZARD INFORMATION

SEE FIS REPORT FOR DETAILED LEGEND AND INDEX MAP FOR FIRM PANEL LAYOUT

THE INFORMATION DEPICTED ON THIS MAP AND SUPPORTING DOCUMENTATION ARE ALSO AVAILABLE IN DIGITAL FORMAT AT [HTTP://MSC.FEMA.GOV](http://msc.fema.gov)

Without Base Flood Elevation (BFE)
Zone A, V, A99

With BFE or Depth Zone AE, AO, AH, VE, AR

Regulatory Floodway

0.2% Annual Chance Flood Hazard, Areas of 1% Annual Chance Flood with average depth less than one foot or with drainage areas of less than one square mile Zone X

Future Conditions 1% Annual Chance Flood Hazard Zone X

Area with Reduced Flood Risk due to Levee See Notes Zone X

Area of Minimal Flood Hazard Zone X

Area of Undetermined Flood Hazard Zone D

Channel, Culvert, or Storm Sewer

Levee, Dike, or Floodwall

18.2

17.5

Cross Sections with 1% Annual Chance Water Surface Elevation (BFE)

Coastal Transect

Coastal Transect Baseline

Profile Baseline

Hydrographic Feature

Base Flood Elevation Line (BFE)

Limit of Study

Jurisdiction Boundary

Limit of Moderate Wave Action (LIMWA)

NOTES TO USERS

For information and questions about this map, available products associated with this FIRM including historic versions of this FIRM, how to order products or the National Flood Insurance Program in general, please call the FEMA Map Information eXchange at 1-877-FEMA-MAP (1-877-336-2627) or visit the FEMA Map Service Center website at <http://msc.fema.gov>. Available products may include previously issued Letters of Map Change, a Flood Insurance Study Report, and/or digital versions of this map. Many of these products can be ordered or obtained directly from the website. Users may determine the current map date for each FIRM panel by visiting the FEMA Map Service Center website or by calling the FEMA Map Information eXchange.

Communities annexing land on adjacent FIRM panels must obtain a current copy of the adjacent panel as well as the current FIRM index. These may be ordered directly from the Map Service Center at the number listed above.

For community and countywide map dates refer to the Flood Insurance Study report for this jurisdiction. To determine if flood insurance is available in this community, contact your Insurance agent or call the National Flood Insurance Program at 1-800-638-6620.

Base map information shown on this FIRM was provided in digital format by New York State Cyber and Critical Infrastructure. This information was derived from digital orthophotography at a 0.5 foot ground resolution from imagery flown in April 2013.

LIMIT OF MODERATE WAVE ACTION: Zone AE has been divided by a Limit of Moderate Wave Action (LIMWA). The LIMWA represents the approximate landward limit of the 1.5-foot breaking wave. The effects of wave hazards between the VE Zone and the LIMWA (or between the shoreline and the LIMWA for areas where VE Zones are not identified) will be similar to, but less severe than those in the VE Zone.

Limit of Moderate Wave Action (LIMWA)

SCALE

Map Projection:
Universal Transverse Mercator Zone 18N; North American Datum 1983;
GRS_1980 Spheroid; North American Vertical Datum of 1988

1 inch = 500 feet 1:6,000

0 500 1,000 2,000 Feet

0 125 250 500 Meters

PANEL LOCATOR

FEMA

National Flood Insurance Program

Westchester County, New York

NATIONAL FLOOD INSURANCE PROGRAM FLOOD INSURANCE RATE MAP

WESTCHESTER COUNTY, NEW YORK
All Jurisdictions

PANEL 353 OF 426

Panel Contains:

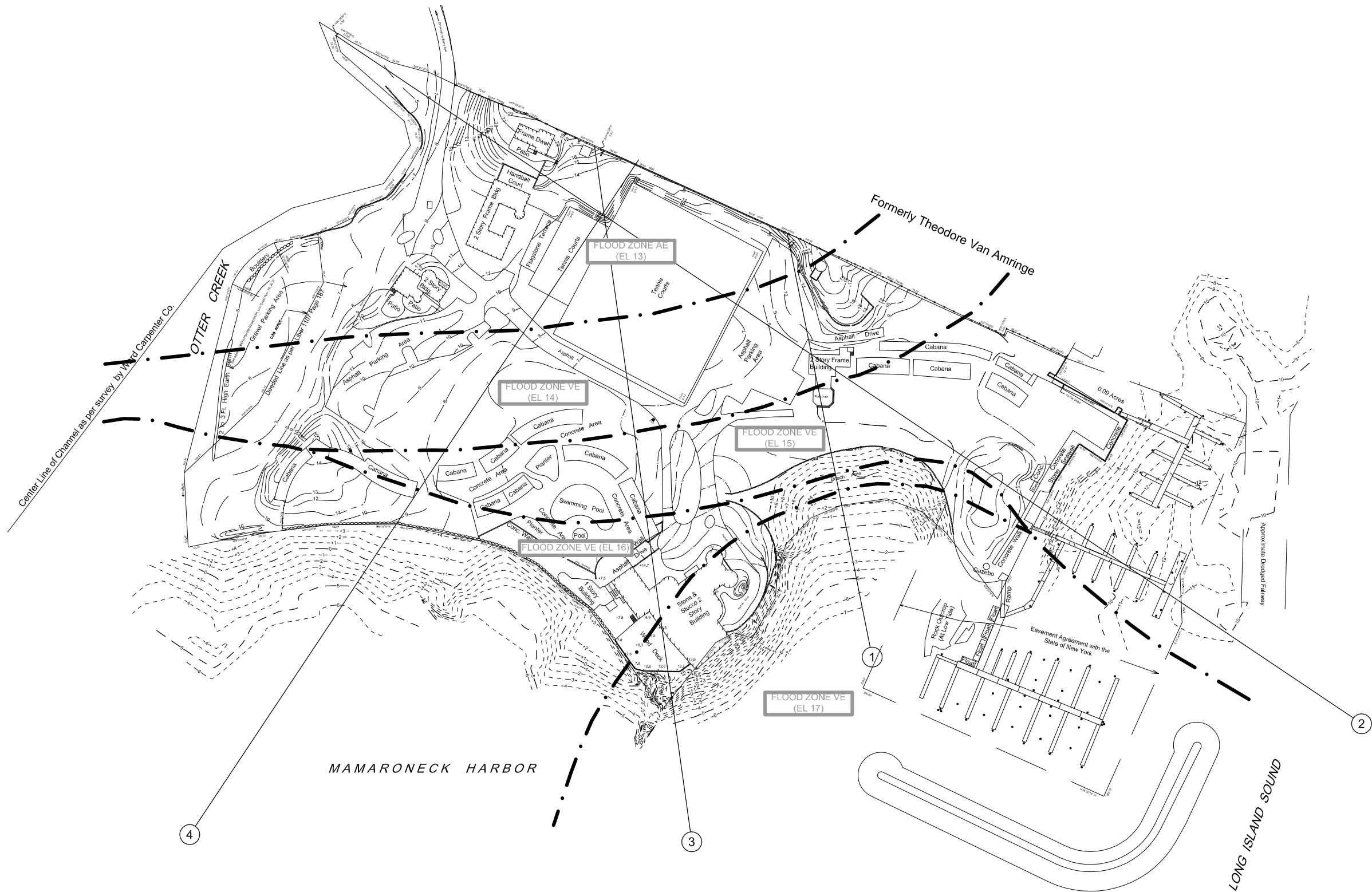
| COMMUNITY | NUMBER | PANEL | SUFFIX |
|------------------------|--------|-------|--------|
| HARRISON, TOWN OF | 360912 | 0353 | G |
| MAMARONECK, TOWN OF | 360917 | 0353 | G |
| OF MAMARONECK, VILLAGE | 360916 | 0353 | G |

PRELIMINARY
DECEMBER 8, 2014

VERSION NUMBER
2.2.2.1

MAP NUMBER
36119C0353G

MAP REVISED



Source: Ocean & Coastal Consultants Engineering, P.C. A New York State Registered Company

GENERAL NOTES

- ALL TOPOGRAPHIC ELEVATIONS SHOWN REFER TO NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVD 88). ALL CONTOURS ABOVE ELEVATION ZERO (0) ARE SHOWN WITH A PLUS (+).
- BASE MAP USED BY OCEAN AND COASTAL CONSULTANTS, INC. IS ADOPTED FROM A DRAWING PREPARED BY RICHARD A. SPINELLI LAND SURVEYOR OF MAMARONECK, N.Y., DATED MAY 25, 2000, REVISED NOVEMBER 17, 2010.
- AFOREMENTIONED BASE MAP OVERLAYED INTO COORDINATE SYSTEM BASED ON NEW YORK STATE EAST - NAD 83.
- LOCATION OF BREAKWATER WAS DETERMINED FROM AERIAL PHOTOGRAPH BY AERO GRAPHICS CORP. BOHEMIA, NY, DATED MARCH 27, 2000.
- DATA WATERWARD WAS COLLECTED BY OCEAN AND COASTAL CONSULTANTS, INC. ON JULY 28, 2000; AUGUST 4, 2000 AND SUPPLEMENTED WITH DATA FROM JUNE 7, 2011.
- FLOOD ZONE DATA OBTAINED FROM FEMA FLOOD INSURANCE RATE MAP 36119C353F, DATED SEPTEMBER 28, 2007. BASE FLOOD ELEVATIONS REFER TO NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVD 88).

LEGEND

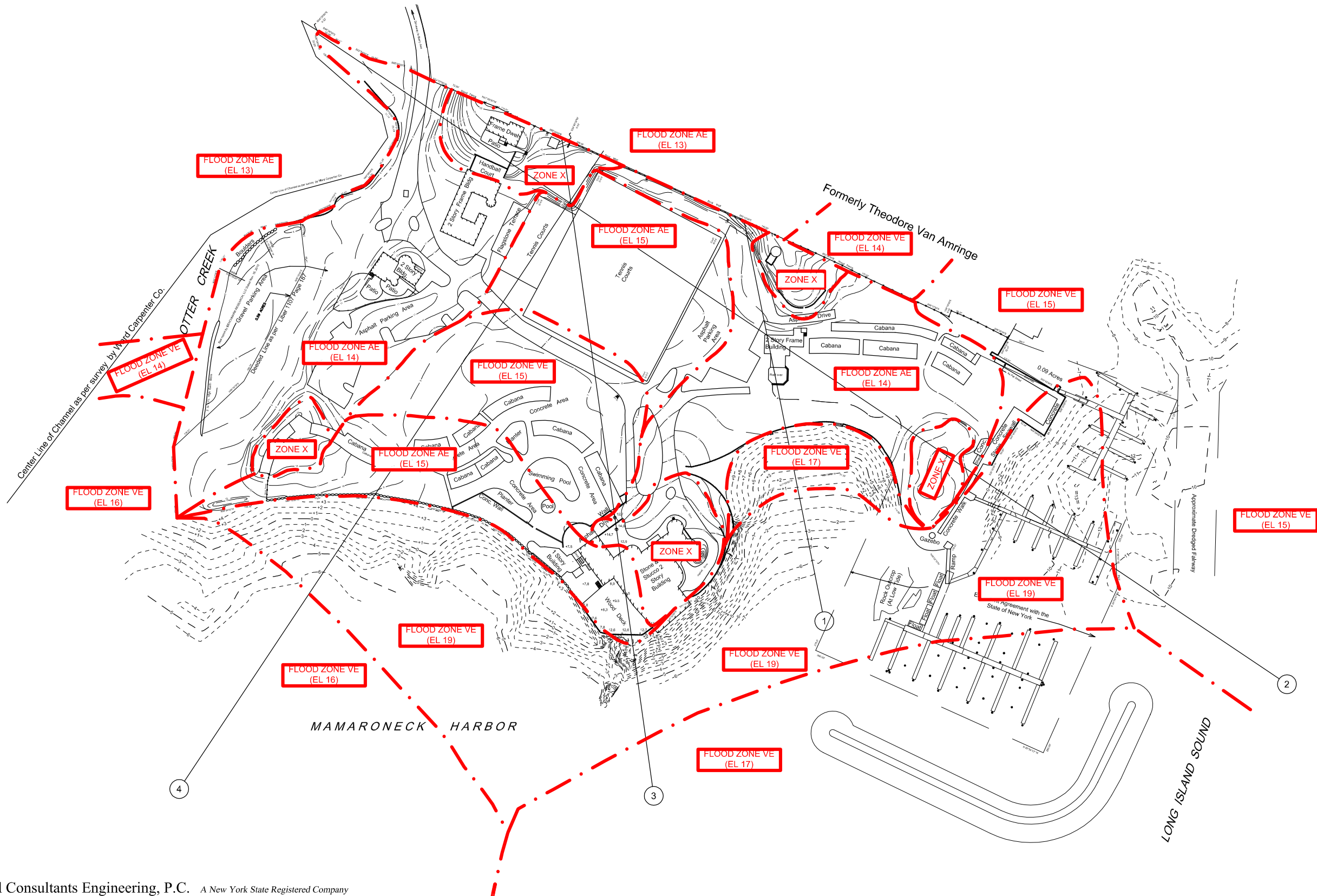
- ① — LONG ISLAND SOUND TRANSECT TO DETERMINE FLOOD ZONE DESIGNATION

Scale: 1"=150'-0"

Figure 01 - FEMA Flood Zone Delineation
Effective September 28, 2007

MAMARONECK BEACH & YACHT CLUB
Clubhouse Alterations and New Seasonal Residences
Village of Mamaroneck, New York

© TRC Engineers, Inc.



Source: Ocean & Coastal Consultants Engineering, P.C. A New York State Registered Company

GENERAL NOTES

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- FLOOD ZONE DATA OBTAINED FROM FEMA FLOOD INSURANCE RATE MAP 36119C353F, DATED SEPTEMBER 28, 2007. BASE FLOOD ELEVATIONS REFER TO NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVD 88).

LEGEND

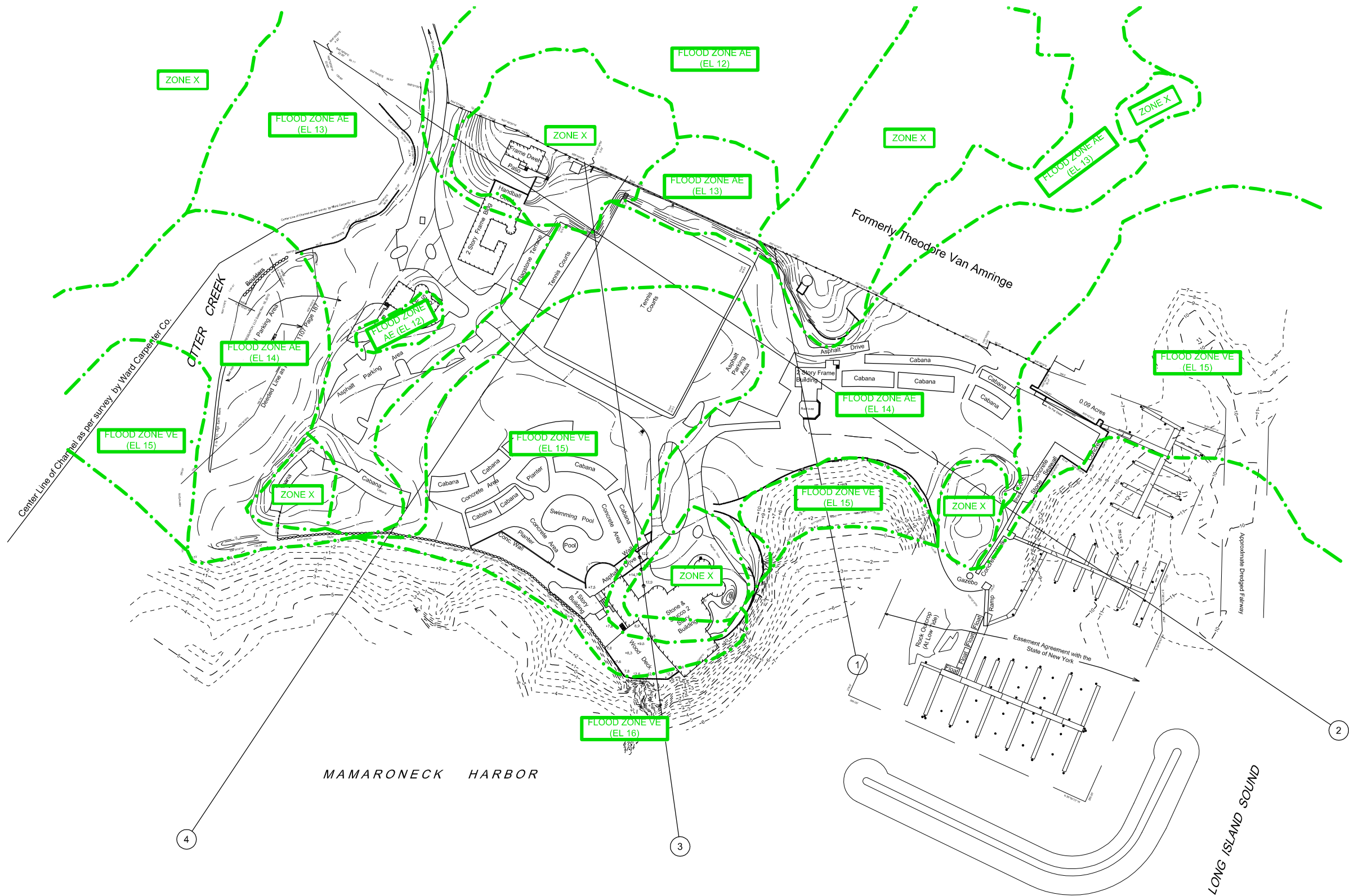
- ① — LONG ISLAND SOUND TRANSECT TO DETERMINE FLOOD ZONE DESIGNATION
- +8.3 SPOT GRADE
- ⊕ 8.3 INTERPOLATED SPOT GRADE

Scale: 1"=150'-0"

Figure 02 - Approved FEMA Flood Zone
Delineation LOMR February 20, 2013

MAMARONECK BEACH & YACHT CLUB
Clubhouse Alterations and New Seasonal Residences
Village of Mamaroneck, New York

© TRC Engineers, Inc.



Source: Ocean & Coastal Consultants Engineering, P.C. A New York State Registered Company

GENERAL NOTES

- ALL TOPOGRAPHIC ELEVATIONS SHOWN REFER TO NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVD 88). ALL CONTOURS ABOVE ELEVATION ZERO (0) ARE SHOWN WITH A PLUS (+).
- BASE MAP USED BY OCEAN AND COASTAL CONSULTANTS, INC. IS ADOPTED FROM A DRAWING PREPARED BY RICHARD A. SPINELLI LAND SURVEYOR OF MAMARONECK, N.Y., DATED MAY 25, 2000, REVISED NOVEMBER 17, 2010.
- AFOREMENTIONED BASE MAP OVERLAYED INTO COORDINATE SYSTEM BASED ON NEW YORK STATE EAST - NAD 83.
- LOCATION OF BREAKWATER WAS DETERMINED FROM AERIAL PHOTOGRAPH BY AERO GRAPHICS CORP. BOHEMIA, NY, DATED MARCH 27, 2000.
- DATA WATERWARD WAS COLLECTED BY OCEAN AND COASTAL CONSULTANTS, INC. ON JULY 28, 2000; AUGUST 4, 2000 AND SUPPLEMENTED WITH DATA FROM JUNE 7, 2011.
- FLOOD ZONE DATA OBTAINED FROM PRELIMINARY FEMA FLOOD INSURANCE RATE MAP 36119C0353G, DATED DECEMBER 2014. BASE FLOOD ELEVATIONS REFER TO NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVD 88).

LEGEND

- ① — LONG ISLAND SOUND TRANSECT TO DETERMINE FLOOD ZONE DESIGNATION
- +8.3 SPOT GRADE
- ⊕ 8.3 INTERPOLATED SPOT GRADE

Scale: 1"=150'-0"

Figure 03 - Preliminary FEMA Flood Zone Delineation December 8, 2014

MAMARONECK BEACH & YACHT CLUB
Clubhouse Alterations and New Seasonal Residences
Village of Mamaroneck, New York

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