TOWN OF CARMEL
ENVIRONMENTAL CONSERVATION BOARD

60 McAlpin Avenue
Mahopac, New York 10541
Tel. (845) 628-1500 - Ext. 190
www.ci.carmel.ny.us

ENVIRONMENTAL CONSERVATION BOARD AGENDA

AUGUST 2, 2018 – 7:30 P.M.

SUBMISSION OF AN APPLICATION OR LETTER OF PERMISSION

APPLICANT	ADDRESS	TAX MAP #	COMMENTS
1. NYCDEP	Kirk Lake Dam - Off of Hill Street	64.19-1-17	Geotechnical Borings (2)
2. Inzano, Anna	188 Bullet Hole Road	63.-1-16.2	Install Driveway

MISCELLANEOUS

3. Minutes – 06/21/18 & 7/19/18

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Mahopac, New York 10541
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APPLICATION FOR WETLAND PERMIT OR LETTER OF PERMISSION

Name of Applicant: Paul Costa, P.E., Portfolio Manager, NYCDEP

Address of Applicant: 96-05 Horace Harding Expressway, 4th Floor Corona, NY 11368 **Email:** pcosta@dep.nyc.gov

Telephone# 718-595-5470 **Name and Address of Owner if different from Applicant:**

New York City Department of Environmental Protection

Property Address: Kirk Lake Dam, North of 6N, Mahopac, NY **Tax Map #** ~~075-006~~ 64.19-1-17

Agency Submitting Application if Applicable: NYCDEP

Location of Wetland: Not applicable - No wetlands in project area

Size of Work Section & Specific Location: Kirk Lake Dam

Will Project Utilize State Owned Lands? If Yes, Specify: No

Type and extent of work (feet of new channel, yards of material to be removed, draining, dredging, filling, etc). A brief description of the regulated activity (attach supporting details).

Subsurface investigation: two geotechnical borings (25-30 ft below ground surface) from top of earthen dam

Proposed Start Date: _____ **Anticipated Completion Date:** _____ **Fee Paid $** _____

****

CERTIFICATION

I hereby affirm under penalty of perjury that information provided on this form is true to the best of my knowledge and belief, false statements made herein are punishable as a Class A misdemeanor pursuant to Section 210.45 of the Penal Law. As a condition to the issuance of a permit, the applicant accepts full legal responsibility for all damage, direct or indirect, or whatever nature, and by whomever suffered, arising out of the project described here-in and agrees to indemnify and save harmless the Town of Carmel from suits, actions, damages and costs of every name and description resulting from the said project.

Paul Costa
SIGNATURE

6/25/18
DATE

Short Environmental Assessment Form
Part 1 - Project Information

Instructions for Completing

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

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

Part 1 - Project and Sponsor Information

New York City Department of Environmental Protection

Name of Action or Project:
Subsurface Investigation at Kirk Lake Dam

Project Location (describe, and attach a location map):
Kirk Lake, Carmel, Putnam County, New York

Brief Description of Proposed Action:
The New York City Department of Environmental Protection (DEP) wishes to advance a subsurface investigation at its Kirk Lake Dam. The information obtained from these borings will provide data to further characterize the foundation rock masses and more fully define the foundation material parameters for the dam and address the New York State Department of Environmental Conservation (NYSDEC) comment on the stability analysis performed previously an included in the Engineering Assessment submitted by DEP. Borings are located on the dam in an area of maintained lawn and bare soil and will be advanced to 25 to 30 feet below the ground surface. The locations will be accessed using existing roads and therefore tree cutting and clearing is not required. The area will be returned to existing conditions stored at the conclusion of the work.

Name of Applicant or Sponsor:	Telephone: 718-595-5470
New York City Department of Environmental Protection	E-Mail: pcosta@dep.nyc.gov

Address:
96-05 Horace Harding Expressway, 4th Floor

City/PO:	State:	Zip Code:
Corona	NY	11368

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

3.a. Total acreage of the site of the proposed action? .076 acres
b. Total acreage to be physically disturbed? .0007 acres
c. Total acreage (project site and any contiguous properties) owned or controlled by the applicant or project sponsor? 0 acres

4. Check all land uses that occur on, adjoining and near the proposed action.

☐ Urban ☑ Rural (non-agriculture) ☐ Industrial ☐ Commercial ☑ Residential (suburban)
☑ Forest ☐ Agriculture ☑ Aquatic ☐ Other (specify): _____
☐ Parkland

	NO	YES	N/A
5. Is the proposed action, a. A permitted use under the zoning regulations?	☐	☐	☑
b. Consistent with the adopted comprehensive plan?	☐	☐	☑
6. Is the proposed action consistent with the predominant character of the existing built or natural landscape?	☐	☑	
7. Is the site of the proposed action located in, or does it adjoin, a state listed Critical Environmental Area? If Yes, identify: _____	☑	☐	
8. a. Will the proposed action result in a substantial increase in traffic above present levels?	☑	☐	
b. Are public transportation service(s) available at or near the site of the proposed action?	☑	☐	
c. Are any pedestrian accommodations or bicycle routes available on or near site of the proposed action?	☑	☐	
9. Does the proposed action meet or exceed the state energy code requirements? If the proposed action will exceed requirements, describe design features and technologies: project will not require energy use - except for fuel to power the drill rig.	☐	☑	
10. Will the proposed action connect to an existing public/private water supply? If No, describe method for providing potable water: This project will not require a connection to a potable water supply.	☑	☐	
11. Will the proposed action connect to existing wastewater utilities? If No, describe method for providing wastewater treatment: This project will not require wastewater treatment.	☑	☐	
12. a. Does the site contain a structure that is listed on either the State or National Register of Historic Places?	☑	☐	
b. Is the proposed action located in an archeological sensitive area? auto-fill item; project is in dam embankment	☐	☑	
13. . a. Does any portion of the site of the proposed action, or lands adjoining the proposed action, contain wetlands or other waterbodies regulated by a federal, state or local agency?	☐	☑	
b. Would the proposed action physically alter, or encroach into, any existing wetland or waterbody? If Yes, identify the wetland or waterbody and extent of alterations in square feet or acres: _____	☑	☐	

14. Identify the typical habitat types that occur on, or are likely to be found on the project site. Check all that apply:
☑ Shoreline ☑ Forest ☐ Agricultural/grasslands ☐ Early mid-successional
☑ Wetland ☐ Urban ☐ Suburban

	NO	YES
15. Does the site of the proposed action contain any species of animal, or associated habitats, listed by the State or Federal government as threatened or endangered?	☑	☐
16. Is the project site located in the 100 year flood plain?	☐	☑
17. Will the proposed action create storm water discharge, either from point or non-point sources? If Yes,	NO	YES
a. Will storm water discharges flow to adjacent properties? ☐ NO ☐ YES	☑	☐
b. Will storm water discharges be directed to established conveyance systems (runoff and storm drains)? If Yes, briefly describe: ☐ NO ☐ YES		

	NO	YES
18. Does the proposed action include construction or other activities that result in the impoundment of water or other liquids (e.g. retention pond, waste lagoon, dam)? If Yes, explain purpose and size: _____	☑	☐
19. Has the site of the proposed action or an adjoining property been the location of an active or closed solid waste management facility? If Yes, describe: _____	☑	☐
20. Has the site of the proposed action or an adjoining property been the subject of remediation (ongoing or completed) for hazardous waste? If Yes, describe: _____	☑	☐

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

Applicant/sponsor name: Paul Costa, P.E.; NYCDEP Date: 6/25/18

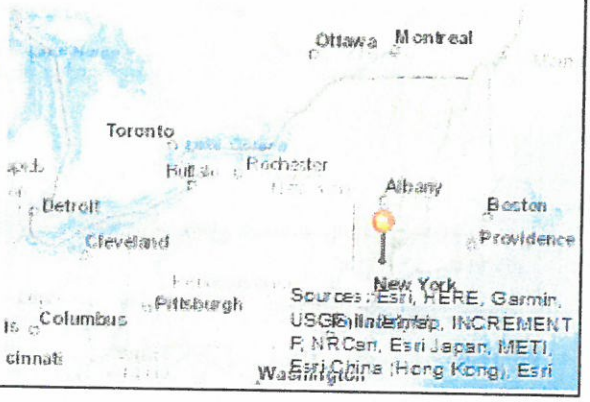
Signature: Paul Costa

PRINT FORM

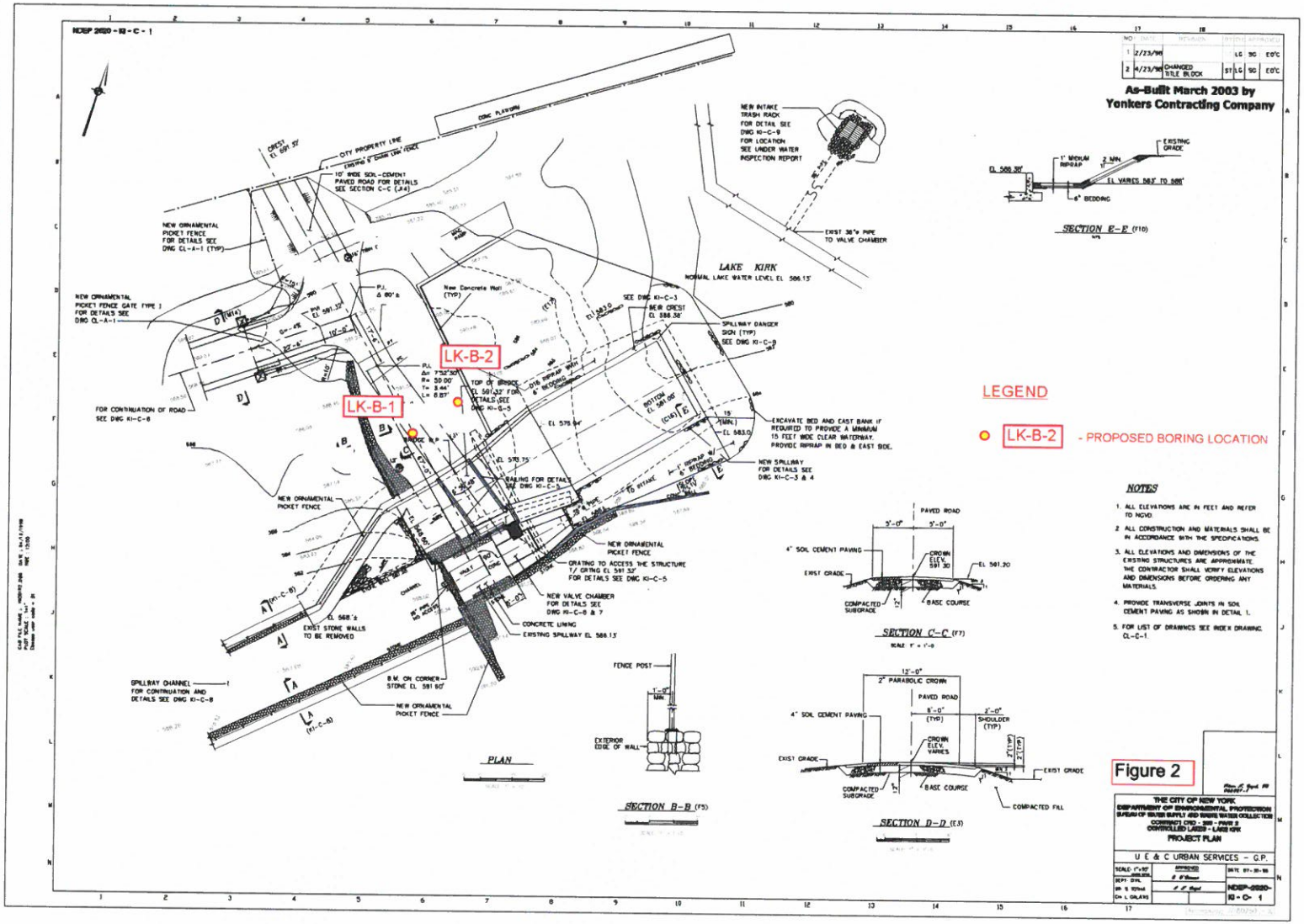
EAF Mapper Summary Report

Tuesday, June 12, 2018 5:05 PM

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



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


LK-B-2
LK-B-1
LEGEND
LK-B-2 - PROPOSED BORING LOCATION
As-Built March 2003 by
Yonkers Contracting Company
LAKE KIRK
NORMAL LAKE WATER LEVEL EL 586.13'
PLAN
SECTION B-B (F5)
SECTION C-C (F7)
SECTION D-D (F.5)
SECTION E-E (F10)
NOTES
1. ALL ELEVATIONS ARE IN FEET AND REFER TO NGVD.
2. ALL CONSTRUCTION AND MATERIALS SHALL BE IN ACCORDANCE WITH THE SPECIFICATIONS.
3. ALL ELEVATIONS AND DIMENSIONS OF THE EXISTING STRUCTURES ARE APPROXIMATE. THE CONTRACTOR SHALL VERIFY ELEVATIONS AND DIMENSIONS BEFORE ORDERING ANY MATERIALS.
4. PROVIDE TRANSVERSE JOINTS IN SOIL CEMENT PAVING AS SHOWN IN DETAIL 1.
5. FOR LIST OF DRAWINGS SEE INDEX DRAWING CL-C-1.
Figure 2
THE CITY OF NEW YORK
DEPARTMENT OF ENVIRONMENTAL PROTECTION
BUREAU OF WATER SUPPLY AND SEWER WATER COLLECTION
CONTRACT CWD - 235 - PART 2
CONTROLLED LAKES - LAKE KIRK
PROJECT PLAN
U E & C URBAN SERVICES - G.P.
NDEP-2020-
KI - C - 1

DRILLING PROGRAM PLAN

ENGINEERING ASSESSMENT FOR CLASS B DAMS, EAST OF HUDSON: LOWER CHIA LIN DAM, TOWN OF EAST FISHKILL, DUTCHESS COUNTY, NY
KIRK LAKE DAM, TOWN OF CARMEL, PUTNAM COUNTY, NY

Prepared for

City of New York
Department of Environmental Protection
Bureau of Engineering Design and Construction

Prepared by:

AECOM Imagine it. Delivered.

1255 Broad Street, Suite 201
Clifton, New Jersey 07013

AECOM Project No : 60304574
June 12, 2018

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1.1 GENERAL

This Drilling Program Plan (DPP) describes a planned subsurface investigation to be conducted by AECOM at the Lower Chia Lin dam and Kirk Lake dam. The purpose of the investigation is to obtain subsurface information through geotechnical test borings. Piezometers will be installed in the boreholes to monitor water levels. This introductory section provides a brief description of the project.

In accordance with the NYCDEP Drilling and Boring Environmental Health and Safety Checklist, field activities will generally conform to U.S. Army Corps of Engineers Regulation ER 1110-1-1807, "Drilling in Earth Embankment Dams and Levees." A copy of ER 1110-1-1807 is attached for reference as Appendix A.

This DPP is fully compliant with the requirements of ER 1110-1-1807. The approved DPP will be available on site at all time for reference during field operations. All field personnel will read the DPP and be familiar with its content before starting field activities.

1.2 BACKGROUND

AECOM has previously performed hazard evaluations and prepared Engineering Assessment reports for four (4) Class B dams (Kirk Lake, Lake Gleneida, Lower Chia Lin, and Muscoot Reservoir) located within the East of Hudson watershed under TO # 9. These reports were submitted to NYSDEC in August 2016.

In order to address NYSDEC comments on the Engineering Assessments, test borings are proposed to collect subsurface information and to measure water levels at the Kirk Lake dam and Lower Chia Lin dam. These data are necessary to evaluate dam stability in accordance with NYSDEC comments.

Lower Chia Lin Dam

No records of original embankment construction or test borings are available. Similarly, the phreatic surface across the embankment is undefined, and it is uncertain whether the embankment includes a central core wall to control seepage. Test borings will be drilled and piezometers installed to fill this data gap.

Based on new boring information, AECOM will update previous stability analyses using the new boring information and piezometer data. Because previous stability analyses were based on assumed soil parameters and water levels, the new data will provide a more realistic assessment of embankment stability.

Kirk Lake Dam

No records of test borings are available. Similarly, the phreatic surface across the embankment is undefined. Test borings will be drilled and piezometers installed to fill this data gap. A primary goal is to measure water levels in close proximity to the spillway to provide a measure of uplift pressures on the spillway slab. Because previous analyses were based on assumed water levels, the new data will allow a more realistic assessment of spillway stability.

NYCDEP indicated that historic drawings in their files show that Kirk Lake dam was originally a timber structure. Accordingly, it is anticipated that test borings may encounter old timbers buried within the embankment.

2.1 GENERAL

This work plan (DPP) provides a description of the soil test boring investigation to be performed at the Lower Chia Lin and Kirk Lake dams. Specifically, this document includes a description of the tasks to be performed by AECOM under the soil test boring investigation as well as those by a drilling subcontractor retained by AECOM. In summary, the work to be performed includes the drilling of exploratory soil test borings, geotechnical sampling of underlying soils, geotechnical laboratory testing of representative soil samples, and installation of vibrating wire piezometers.

2.2 PERMITS AND APPROVALS

Prior to beginning the field investigations, all required permits and approvals will be obtained. This includes preparing a site specific Health and Safety Plan (HASP) and completing the NYCDEP Drilling and Boring Environmental Health and Safety Checklist. No work will commence without the written approval of the HASP, Checklist, and DPP by NYCDEP.

The Drilling and Boring Checklist is a comprehensive tool intended to achieve compliance with regulations and permits, and to minimize the risk of injury and damage to subsurface structures and the environment. Part of the Checklist procedure is for all parties involved with this portion of the project (i.e., the NYCDEP, the Engineer, and the Drilling Contractor) to attend a meeting(s) where each item on the Checklist is addressed and responsibility for each item is agreed to. (The checklist meeting was held on June 7, 2018 at NYCDEP offices.)

NYCDEP has informed the Towns of Carmel and East Fishkill in writing of planned drilling activities. In response, the Town of Carmel requested that a Wetland Permit Application be submitted in accordance with their local wetland ordinance. This application will be submitted and approved prior to the start of field work on Kirk Lake dam. As of the date of this DPP, no response had been received from the Town of East Fishkill. NYCDEP will follow up with the Town to determine whether any local permits are required.

The drilling subcontractor will contact the mandated New York One Call utility location service to identify the presence of any existing underground utilities prior to commencement of any intrusive drilling. Documentation for One Call utility location services will be provided to NYCDEP prior to start of field activities. A copy of this documentation will also be maintained on site at all times.

2.3 HEALTH & SAFETY PLAN (HASP)

The AECOM HASP will present the health and safety requirements and guidelines for AECOM's services associated with the site investigation to be performed at the project sites. The HASP will be prepared in compliance with applicable sections of OSHA Regulations 29 CFR Part 1910 and 29 CFR Part 1926. The HASP will also include specific requirements included in DEP's BEDC EHA Standards and SOPs, DEP BEDC Emergency and Spill/Release Incident Reporting Protocols, and SOP 315 Incident, Near Miss and Release Reporting and Investigation. The HASP will be available at all times during field activities at the site. All AECOM and drilling subcontractor's employees involved in field activities will be required to read the HASP and comply with its provisions. To this end, an AECOM Site Safety Representative (SSR) will verify and ensure compliance.

Although no water borings are planned, as a precaution, the driller will provide a safety life ring since the work is in proximity to water.

2.4 SUBSURFACE INVESTIGATION

The proposed subsurface investigation program will consist of two (2) geotechnical soil test borings at Kirk Lake dam and four (4) geotechnical test borings at Lower Chia Lin dam. Laboratory testing will be performed on selected soil samples to be obtained from the test borings. In addition, vibrating wire piezometers will be installed in all boreholes to monitor water levels within the dam embankments. As an option, automated readout devices will be installed at each dam if authorized by NYCDEP.

Plans showing the proposed locations of the test borings Lower Chia Lin dam and Kirk Lake dam are included as Figures 1 and 2, respectively.

2.4.1 Field Staff

The test borings and required geotechnical sampling will be performed by a drilling subcontractor retained by AECOM (Craig Geotechnical Drilling). The drilling contractor's field personnel will have a minimum of 5-years relevant experience. The drill rig operator will also be familiar with this DPP, the Drilling & Borings Checklist, and ACOE ER 1110-1-1807.

AECOM will manage the subsurface investigation program, including coordination with NYCDEP. All work performed by the drilling subcontractor will be under the continuous supervision and inspection of an AECOM licensed geotechnical engineer (P.E.) or geologist (P.G.) having a minimum of 5-years relevant experience. The AECOM field representative will fully enforce the provisions and requirements of this DPP and the Drilling & Borings Checklist, as well as the requirements of the ACOE ER 1110-1-1807.

No exceptions will be permitted without prior approval of NYCDEP. The AECOM field representative will review the Drilling and Borings Checklist with the drilling personnel prior to commencing work. This review will be repeated if the driller's personnel change. Work will not commence unless all required equipment and materials are on site.

The AECOM field representative will serve as the Site Safety Representative (SSR). For this role, the field representative must complete the mandatory 4-hour training provided by NYCDEP. An alternate SSR will also be trained.

The AECOM field representative will prepare daily reports and submit these to NYCDEP at the end of each working day. A sample daily field report is included in Appendix B.

2.4.2 Communication

Cell phones are planned for primary communication. Cell service availability will be checked and verified prior to the start of drilling and at the start of each work day. If unavailable, a search will be made for the nearest location(s) having good cell service.

An Emergency Contact list is attached as Appendix C.

NYCDEP will be promptly notified of all incidents, including but not limited to, turbid discharge downgradient, artesian conditions, etc.

Near miss incidents will be also be reported to NYCDEP (Chris Morris, 914.844.0257).

No communication will be made with the public. All inquiries by the public will be referred to Chris Morris, 914.844.0257.

2.4.3 Test Borings

Drilling operations and procedures will conform to this DPP, the Drilling & Boring Checklist, and ACOE ER 1110-1-1807. The soil test borings will be performed using a truck-mounted or a track-mounted drill rig at the approximate locations shown in Figures 1 and 2. The borings will be advanced to an estimated depth of approximately 25 to 40 feet below the existing ground surface. The actual boring termination depth will be determined in the field. The intent is to drill completely through the embankment fill and into the foundation soil. Borings will be terminated at a depth approximately two times

the embankment height or when competent foundation material is encountered, for example, dense glacial till or bedrock. Coring into bedrock is not planned.

The drill rig will be equipped with emergency stops at a minimum of four locations. These are intended to be hit by anyone if an emergency arises. Prior to the start of work, the driller will show all field personnel the location of these stops and demonstrate how they work. This demonstration will be repeated whenever new personnel are on site.

All test borings will have a minimum of 3-1/2 inch diameter and shall be advanced using casing to stabilize the borehole. Use of hollow stem augers or other open drilling methods are not permitted.

As outlined in ER 1110-1-1807, drilling through embankment dams may pose significant risk to these structures. These risks may include:

- Hydraulic fracturing due to excessive pressures from drilling fluids;
- Erosion of soil in the borehole or along the walls of cracks;
- Contamination of filter and drainage features;
- Heave and sample disturbance caused by unbalanced water pressures in the borehole

Drilling equipment and procedures will be selected to minimize the risks outlined above. Specifically, the following equipment and procedures will be used:

- Drilling tools will be sized to minimize likelihood of the return flow clogging and creating pressure spikes.
- To the extent practicable, fluid discharges from the bit will be upward to minimize risk of pressure spikes and soil erosion in the borehole.
- Drill tools will be lowered and raised slowly to avoid pressure changes in the drill hole.
- The drilling feed rate will be slow to avoid crowding the bit, minimizing risk of hydraulic fracturing.A positive head will be maintained in the casing at all times to prevent "running sand" conditions and loss of soil.
- Drilling fluids will be monitored continuously to identify potential loss of fluids. In addition, the sides of the embankment and the reservoir will be monitored for evidence of fluid discharge.

All cuttings, drilling fluids, and spoils will be collected in a mud pan. If necessary, the ground surface area immediately surrounding the borehole and mud pan will be appropriately covered (e.g., plywood, tarps) to prevent adverse impacts to the surrounding ground surface.

A drip pan will be placed under the drill rig to collect any drippings of oil, hydraulic fluid, etc. The drip pan will be underlain by continuous plastic sheeting extending the

full width and length of the drill rig. A "curb" will be created along the perimeter of the plastic sheeting using lumber or similar means to contain potential spillage and prevent discharge to surrounding areas.

Straw wattles will be placed between the drill rig and the water. The intent is to protect the water from potential drill rig leaks and spilled drilling fluids. (Note that the wattles are not intended as storm water controls. Rather, they are only intended to contain accidental spillage.)

The drill rig will be equipped with bio-degradable hydraulic fluid.

All containerized fuel, oil, hydraulic fluid, etc. will be provided with secondary containment. These materials will be removed from the dam site at the end of each work day. Current MSDS sheets for all chemicals brought on site will be kept on site at all times by the driller.

The driller will provide documentation that the drill rig is equipped with bio-degradable hydraulic fluid and that the drill rig was checked for leaks/drips of other fluids immediately prior to arriving on site. In the event that leaks occur, the drill rig will be removed from the dam site and the leaks repaired prior to resuming work. The driller will also provide a list of all chemicals that may be brought to the site.

All work areas will be kept neat, organized, and tidy. Good housekeeping practices will be employed at all times.

2.4.3.1 Source of Water

Water for drilling operations will be taken from the reservoir. A 10% bleach solution will be used to clean equipment that comes in contact with the reservoir or reservoir discharge water.

All rinse water will be collected and placed in drums for disposal.

2.4.3.2 Artesian Conditions

The potential for occurrence of artesian conditions at the two dam sites is unknown. A primary concern with artesian conditions is uncontrolled release of water onto the embankment, potentially saturating the soil and/or causing erosion.

The driller will be prepared to deal with artesian conditions, if encountered. At minimum, the driller will have suitable and sufficient material on hand at all times to control and permanently plug artesian flow, including but not limited to:

- Drilling mud materials;
- Bentonite pellets and grout materials;

- Sufficient casing to extend the casing pipe above ground level. (This will also allow measurement of the artesian head);
- Stuffing box and packers to stop artesian flow.

Drilling mud, if used to control artesian head, will be biodegradable.

The driller has proposed using a stuffing packer in lieu of a pneumatic packer to control artesian flow. AECOM concurs that this is acceptable.

NYCDEP will be notified immediately if artesian conditions are encountered. The immediate goal would be to stop uncontrolled release of artesian water either by installing the stuffing packer or extending the casing pipe. Once the water flow is controlled, procedures for grouting the hole will be discussed and approved by AECOM and NYCDEP before proceeding.

2.4.3.3 Soil Sampling

Soil samples will be obtained in all borings in accordance with American Society for Testing and Materials (ASTM) Standard Specification D1586 Standard Penetration Test (SPT). The SPT consists of driving a 2 in O.D. split spoon for a depth of 24 inches with repeated blows of a 140 lb. hammer free falling 30 inches. The standard penetration or N-value is defined as the number of blows required to drive the sampler for a 12 inch interval after an initial 6 inches of penetration. A positive head will be maintained in the borehole at all times to prevent heave and disturbance of soil being sampled.

Standard Penetration Tests and associated split-spoon samples in all borings will be obtained continuously to boring termination. The soil samples obtained from the borings will be visually classified by the AECOM engineer/geologist by using the Unified Soil Classification System (USCS). The recovered split-spoon samples will be placed in jars, labeled with the project name and number, boring number, sample number, sample depth, SPT blow counts and the amount of recovery. The personnel will be responsible for preparing detailed field logs of the materials encountered, ensuring that the storage and labeling of the field samples are performed properly, and making field adjustments to the subsurface exploration program based on site conditions.

A sample boring log is attached in Appendix B.

2.4.3.4 Core Wall Investigation

Borings will typically be located as pairs, straddling the dam centerline. At each pair of boring locations, AECOM will investigate the possible presence of a dam core wall by probing near the centerline of the dam crest with the drill rig (e.g., driving a split spoon sampler or similar probe to a depth of 3 to 4 feet). All probe holes will be backfilled with grout. If probing reveals a possible core wall, a shallow test pit may be hand-excavated to

expose and document the top of the core wall, as approved by NYCDEP. Test pits, if any, will be backfilled with excavated soil compacted using a hand tamper. Existing sod will be carefully removed from the test pit location and replaced at completion.

2.4.3.5 Piezometer Installation

AECOM will furnish and install one vibrating wire piezometer in each of the test borings (6 total). Piezometer sensors will be positioned within the saturated zone of the embankment fill, providing data to estimate the phreatic surface. The actual depth of the piezometers will be determined in the field, but they will typically be positioned approximately midway between the depth where water is first encountered and the base of the embankment fill. At NYCDEP's option, solar powered data loggers with wireless capabilities will be provided for long term monitoring with alarm levels.

AECOM recommends that piezometers be grouted in place. This is simpler than installing a sand pack and is consistent with current practice. Installation procedures were also discussed with the driller, who confirmed that use of a sand pack is not common. Because the piezometer sensors measure pressure, negligible intake volume is required when compared to a conventional standpipe piezometer. Therefore, a sand pack around the sensor is not necessary. However, the driller also confirmed that they could install a sand pack around the sensor, if preferred by NYCDEP.

Piezometer installation notes are attached as Appendix D. These include the proposed grout mix design. . Grout will be placed using tremie methods. Displaced drill water will be collected and drummed for disposal. Likewise, wash water used for cleaning grout pipes and equipment will also be collected and drummed. The grout mix shall be approved by NYCDEP prior to installation of the piezometers.

Instrumentation cables will be routed in shallow trenches to a single readout location to facilitate potential installation of data loggers. An 8-foot 4x4 pressure treated post will be installed at the readout location. At DEP's option, a data logger will be installed and mounted on the post.

2.4.3.6 Handling and Drumming of Cuttings and Drill Fluids

Drill cuttings and fluids will be contained and shall not be allowed to discharge to the water. Every effort will be made to prevent turbidity from entering the water. All excess drill cuttings, soil samples, grout, slurries, and waste shall be drummed and removed from each of the sites at the end of the subsurface investigation.

The drilling contractor will place all drill cuttings and drill/grout water generated at each test boring into new or re-conditioned DOT-approved 55-gallon drums. The waste streams (i.e., water and soil) shall be drummed separately. The driller will collect one composite sample of drummed drill cuttings and waste liquid at each dam site for

laboratory waste characterization analysis. The samples will be collected in laboratory supplied bottleware and sent under proper preservative and chain-of-custody to an analytical laboratory (e.g., TestAmerica Laboratories, Inc.) for analysis of volatile organic compounds (VOCs), semi-VOCs, pH, RCRA Metals, pesticides and herbicides by the Toxicity characteristic leaching procedure (TCLP) method, and for total polychlorinated biphenyls (PCBs).

The driller will subcontract Clean Harbors Environmental Services Inc. (CHES) or other firm approved by AECOM/NYCDEP to handle the shipment and off-site treatment/disposal of all drummed waste. The driller will prepare CHES waste profile forms, based on the waste characterization analytical results, and provide to NYCDEP to execute as the generator. Upon acceptance of the waste profiles, CHES will schedule the drums to be picked up from the site and shipped to the disposal facilities. An AECOM representative will be on-site during drum loading and obtain a copy of shipping forms. AECOM assumes that all waste will be profiled as non-RCRA Hazardous and not require shipment under hazardous waste manifests.

The 55-gallon drums will be temporarily staged on site at a location selected by NYCDEP. Drums will be neatly staged on a plastic liner and covered with a watertight tarp. Temporary plastic fencing will be installed around the drums.

2.5 GEOTECHNICAL LABORATORY TESTING

After completion of the field portion of the investigation, geotechnical laboratory testing on selected soil samples will be performed by AECOM's drilling subcontractor.

2.5.1 Geotechnical Testing

Upon completion of the test borings, the recovered soil samples will be retained by the driller for temporary storage. After reviewing the boring information, AECOM will prepare a laboratory assignment for selected representative soil samples to obtain the necessary parameters for engineering evaluation. The testing will be performed primarily to confirm the visual soil classification made in the field and to assist in engineering evaluations. The laboratory testing will include:

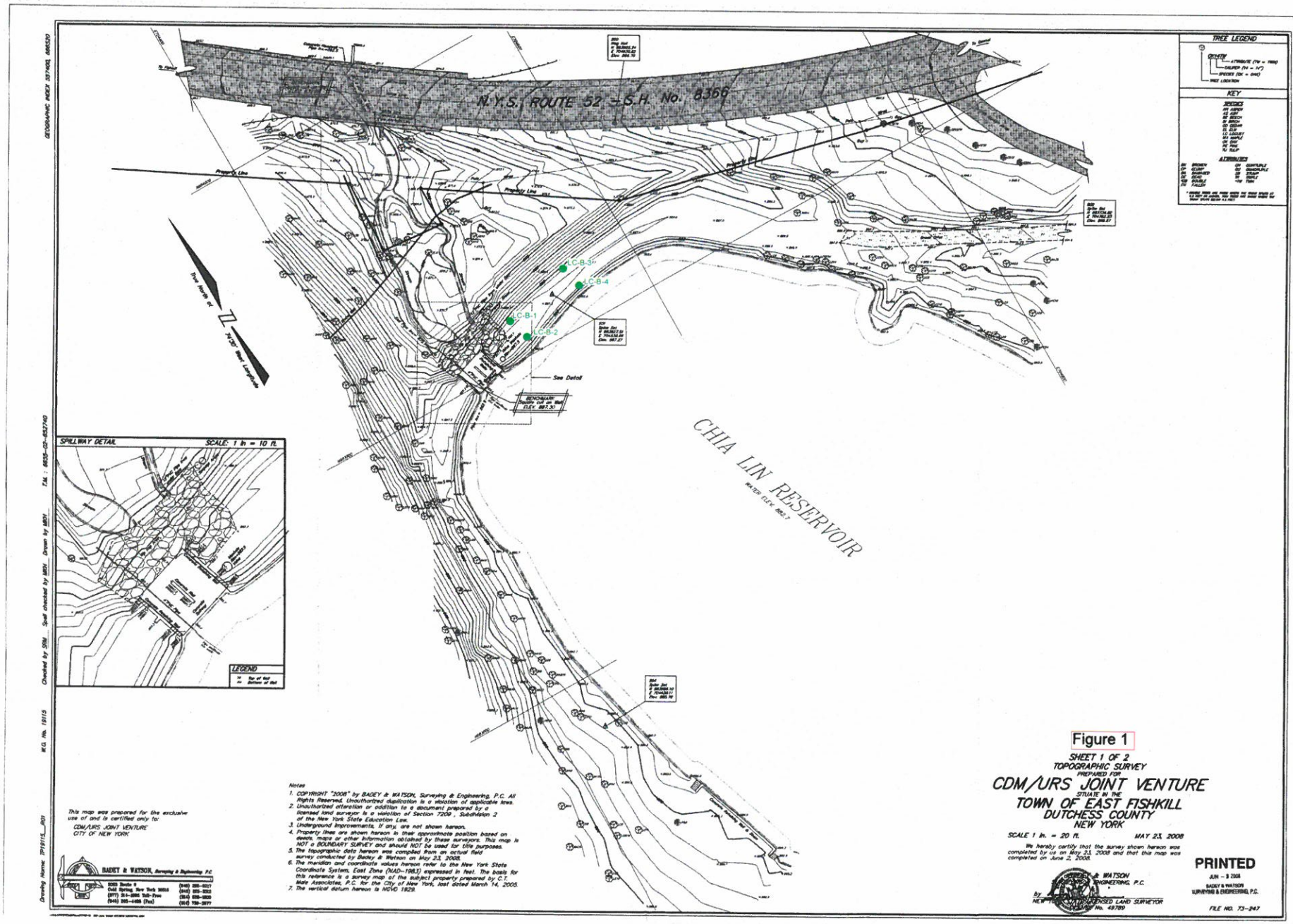
- Water Content Determination (ASTM D2216)
- Hydraulic Conductivity, (ASTM D 5084)
- Combined Sieve and Hydrometer Analysis (ASTM D422)
- Atterberg Liquid Limit, Plastic Limit, and Plasticity Index (ASTM D4318)

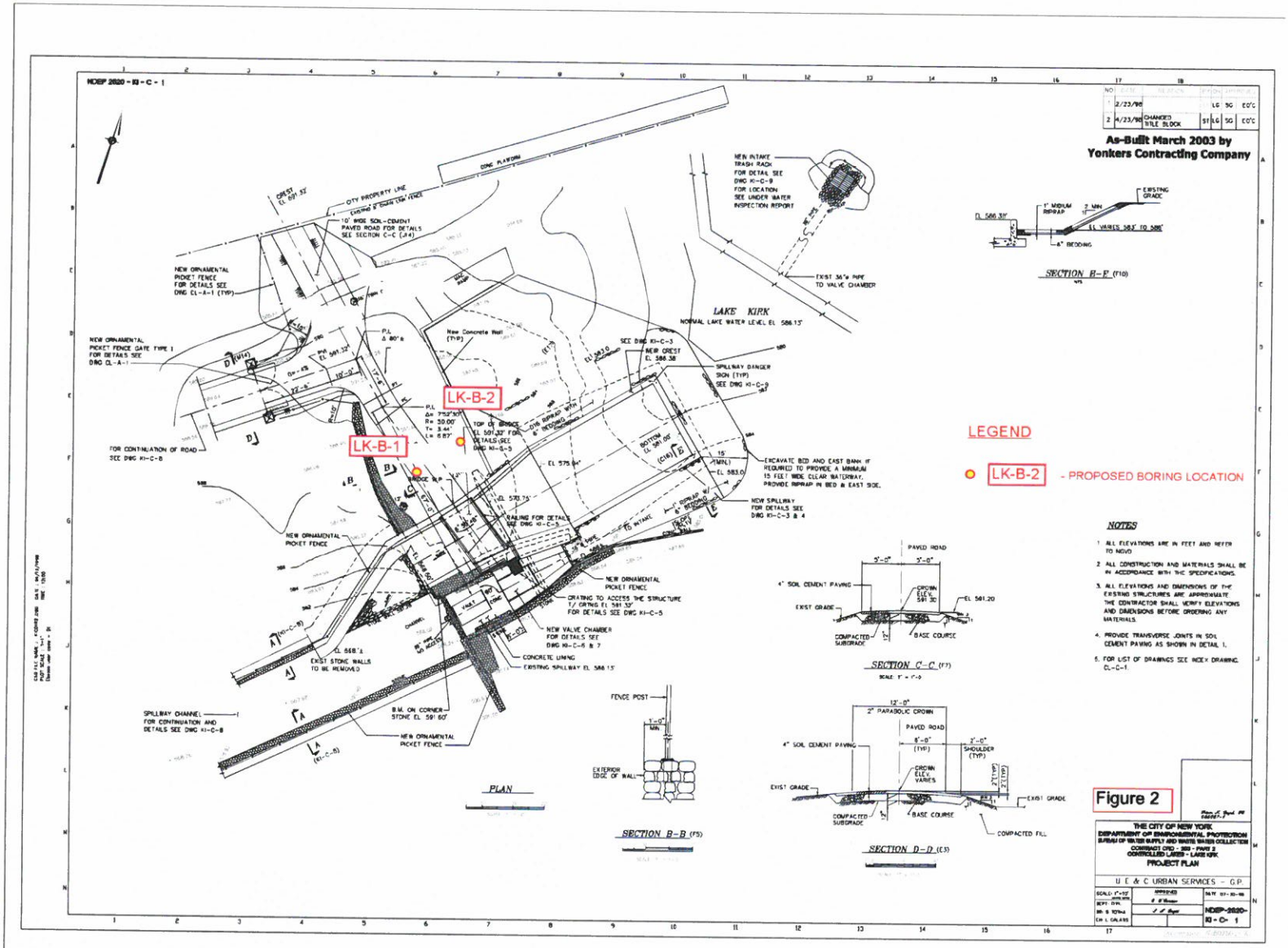
Laboratory testing assignments (type of tests and number of tests) will be determined based on the subsurface conditions encountered and the samples obtained.

2.6 SAMPLE DISPOSITION

All soil samples will be temporarily retained and stored by the driller. At completion of geotechnical laboratory testing, all remaining soil samples will be returned to the appropriate dam site and placed into a 55-gallon waste drums for disposal. Once this task is complete, the drums will be scheduled for removal from the dam sites.

FIGURES


N.Y.S. ROUTE 52 = S.H. No. 8366
CHIA LIN RESERVOIR
WATER ELEV. 882.7
LC-B-1
LC-B-2
LC-B-3
LC-B-4
See Detail
BENCHMARK
ELEV. 887.51
SPILLWAY DETAIL
SCALE: 1 in = 10 ft.
LEGEND
TREE LEGEND
KEY
Figure 1
SHEET 1 OF 2
TOPOGRAPHIC SURVEY
PREPARED FOR
CDM/URS JOINT VENTURE
SITUATE IN THE
TOWN OF EAST FISHKILL
DUTCHESS COUNTY
NEW YORK
SCALE 1 in. = 20 ft.
MAY 23, 2008
We hereby certify that the survey shown hereon was completed by us on May 23, 2008 and that this map was completed on June 2, 2008.
PRINTED
JUN - 9 2008
BADEY & WATSON SURVEYING & ENGINEERING, P.C.
FILE NO. 73-247
This map was prepared for the exclusive use of and is certified only to:
CDM/URS JOINT VENTURE
CITY OF NEW YORK
BADEY & WATSON, Surveying & Engineering P.C.
Notes
1. COPYRIGHT "2008" by BADEY & WATSON, Surveying & Engineering, P.C. All Rights Reserved. Unauthorized duplication is a violation of applicable laws.
2. Unauthorized alteration or addition to a document prepared by a licensed land surveyor is a violation of Section 7209 , Subdivision 2 of the New York State Education Law.
3. Underground improvements, if any, are not shown hereon.
4. Property lines are shown hereon in their approximate position based on deeds, maps or other information obtained by these surveyors. This map is NOT a BOUNDARY SURVEY and should NOT be used for title purposes.
5. The topographic data hereon was compiled from an actual field survey conducted by Badey & Watson on May 23, 2008.
6. The meridian and coordinate values hereon refer to the New York State Coordinate System, East Zone (NAD-1983) expressed in feet. The basis for this reference is a survey map of the subject property prepared by C.T. Male Associates, P.C. for the City of New York, last dated March 14, 2005.
7. The vertical datum hereon is NGVD 1929.


LK-B-1
LK-B-2
LAKE KIRK
NORMAL LAKE WATER LEVEL EL 586.13'
LEGEND
LK-B-2 - PROPOSED BORING LOCATION
As-Built March 2003 by
Yonkers Contracting Company
NOTES
1. ALL ELEVATIONS ARE IN FEET AND REFER TO NGVD
2. ALL CONSTRUCTION AND MATERIALS SHALL BE IN ACCORDANCE WITH THE SPECIFICATIONS.
3. ALL ELEVATIONS AND DIMENSIONS OF THE EXISTING STRUCTURES ARE APPROXIMATE THE CONTRACTOR SHALL VERIFY ELEVATIONS AND DIMENSIONS BEFORE ORDERING ANY MATERIALS.
4. PROVIDE TRANSVERSE JOINTS IN SOIL CEMENT PAVING AS SHOWN IN DETAIL 1.
5. FOR LIST OF DRAWINGS SEE INDEX DRAWING CL-C-1.
PLAN
SECTION B-B (F5)
SECTION C-C (F7)
SECTION D-D (E3)
SECTION H-F (T10)
Figure 2
THE CITY OF NEW YORK
DEPARTMENT OF ENVIRONMENTAL PROTECTION
CONTRACT CRD - 359 - PART 2
CONTROLLED LAKES - LAKE KIRK
PROJECT PLAN
U E & C URBAN SERVICES - G.P.
NDEP-2020-KI-C-1

APPENDIX A

ACOE ER 1110-1-1807

DEPARTMENT OF THE ARMY
U.S. Army Corps of Engineers
Washington, DC 20314-1000

ER 1110-1-1807

CECW-CE

Regulation
No. 1110-1-1807

31 December 2014

Engineering and Design
DRILLING IN EARTH EMBANKMENT DAMS AND LEVEES

1. Purpose. This regulation establishes policy and requirements and provides guidance for drilling in dam and levee earth embankments and/or their earth and rock foundations. The primary purpose of this regulation is to prevent damage to embankments and their foundations from hydraulic fracturing, erosion, filter/drain contamination, heave, or other mechanisms during drilling operations, sampling, in-situ testing, grouting, instrumentation installation, borehole completion, and borehole abandonment.

2. Applicability. This regulation applies to all major subordinate commands (MSC), district commands, laboratories, and field operating activities having Civil Works and/or Military Program responsibilities. It applies to in-house and contracted drilling efforts for earth embankments or foundations associated with all dams and levees that have a federal interest.

3. Distribution. This regulation is approved for public release; distribution is unlimited.

4. References. References are listed in Appendix A.

5. Background. Drilling into, in close proximity to, or through embankment dams and levees and their foundations may pose significant risk to the structures. Water, compressed air, and various drilling fluids have been used as circulating media while drilling through earth embankments and their foundations. Although these methods have been successful in accomplishing the intended purposes, there have been incidents of damage to embankments and foundations. While using air (including air with foam), there have been reports of loss of circulation with pneumatic fracturing of the embankment as evidenced by connections to other borings and blowouts on embankment slopes. While using water and drilling mud as the circulating medium, there have been similar reports of erosion and/or hydraulic fracturing of the embankment or foundation materials. Conversely, there have been cases where heave, borehole collapse and significant disturbance have occurred while drilling in granular materials below the groundwater level. This typically has been the result of not using a proper drilling fluid to balance the water pressures in the soil or using high energy systems that induce heave in order to evacuate the cuttings. There is a delicate balance between too much induced fluid pressure that will cause hydraulic fracture and not enough fluid pressure that will result in borehole instability, heave, or significant sample disturbance. Other potential damaging effects include: creating preferential seepage paths due to improper backfilling, inadequate protection of embankment from drilling fluids during foundation rock coring, erosion and widening of cracks, and inadvertently clogging filters or drains with drilling fluid or grout. All drilling and associated activities that use fluid or other circulation or stabilization media need to be evaluated for the potential to hydraulically

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This regulation supersedes ER 1110-1-1807, dated 1 March 2006

fracture the embankment or foundation. These activities include but are not limited to the use of drilling fluids, backfilling borings after completion, backfill grouting of instrumentation, backfill grouting of casings, water testing for permeability, piezometer rehabilitation, etc. The risk will vary with the selected methods and the site conditions. Every drilling operation must be well thought out and must have benefits of successful completion that confidently outweigh the risk of potential negative impacts. The following paragraphs describe the general concerns associated with each type of potential damage.

a. Hydraulic Fracturing. Excessive pressures from water, air, drilling fluid, or grout can fracture embankment and foundation materials. Hydraulic fracturing problems have occurred while drilling in embankments as evidenced by reports of loss of fluid circulation, blowouts into nearby borings, seepage of drilling fluids on the face of the embankment, and other similar situations. Hydraulic fracture can occur in both cohesive materials and cohesionless materials, and bedrock. It has been found that in soils, hydraulic fracturing can occur when the borehole pressure exceeds the lowest total confining stress (minimum principal stress σ_3) plus some additional strength. The additional strength can be approximated by the undrained strength of the soil. The minor principal confining stress (σ_3) in a normally consolidated soil with a level ground condition is typically the horizontal stress, which can be reasonably estimated. However, the minor principal confining stress in and under an embankment is difficult to determine and can vary significantly from idealized geostatic conditions. Effects from the side slope geometry, piezometric surface, abutment configuration, foundation rock geometry, embedded structures, compaction stress, and settlement history all are significant and can influence in-situ stress conditions. Typical drilling methods that use circulation fluids can quickly create induced fluid pressures that exceed the minimum confining stress. This often occurs when the return path for the fluid clogs and the induced pressures quickly increase. The use of non-pressurized stabilizing fluids is preferable, yet in some subsurface conditions, hydraulic fracture can occur under gravity pressure. Low stress zones may exist within and under embankments. It is possible for the confining stress in these locations to be much less than the gravity pressure exerted by a drilling fluid or grout. Certain embankment locations and conditions have a higher potential for hydraulic fracturing due to geometric configurations that create zones of low confining stress. Sherard 1973 and 1986 are good references that provide a comprehensive evaluation of the issues along with numerous case histories. Locations and conditions where hydraulic fracturing by drilling media is more likely to occur and have the higher potential of damaging the structure include the following:

(1) Near and over steep abutments that create low confining or tensile stress conditions.

(2) Adjacent to rock overhangs on abutments.

(3) Adjacent to buried structures or abrupt foundation geometry change that creates a differential settlement condition and a zone of lower soil stress transfer.

(4) Adjacent to conduits where narrow zones of soil backfill were placed between the structure and rock face.

(5) Dam cores that can experience more settlement than the adjacent shells.

(6) Dams in very narrow valleys. Arching keeps full confining stresses from developing.

(7) Near abutments where abrupt changes in geometry occur.

(8) In areas where the embankment is subject to differential settlement due to large differences in thickness of adjacent compressible foundation or embankment soils.

b. Erosion. The introduction of drilling fluids into cracks, either existing or formed by hydraulic fracture, can potentially cause erosion along the crack walls. This will enlarge the crack and could lead to an increased potential for internal erosion. Existing subsurface cracks are common in many dams and are often the result of differential settlement. The locations most at risk for existing cracks are typically the same areas that have low confining stress and have the highest risk for hydraulic fracture to occur.

c. Contamination of Filter/Drainage Features. In addition to hydraulic fracturing, the use of drilling fluids can pose a contamination risk for internal drainage features if the drill fluid or sealing grout migrates into and clogs the drain materials. Avoid drilling near drains or seepage blankets that may become contaminated by fluids. If drain penetration is justified, special provisions must be taken to prevent contamination. Special provisions may also be required for protecting the drainage features while backfilling the hole (such as placement of filter material through the zone of the drain or filter and installing lower and upper seals).

d. Heave and Sample Disturbance. Drilling programs that include performing in-situ tests or undisturbed sampling may require the use of drilling fluid to offset the confining stress relieved by the drilling of the hole. There have been cases where the failure to prevent stress relief or heave of granular soils below the water table have led to invalid in-situ test results and subsequently invalid interpretation of the subsurface conditions. This has occurred for both tests performed in drill holes and test performed in casings installed by methods that did not control heave or disturbance. Reclamation DSO 98-17 (1999) contains methods to deal with heaving sands while drilling and performing Standard Penetration Tests. If high quality undisturbed samples of fine grained soils are required for shear strength testing, then drilling mud may be required to prevent the soil from failing in undrained triaxial extension. See Ladd and DeGroot (2004) for a discussion on clay sample disturbance due to drilling.

6. Policy. This regulation provides guidance for investigation, maintenance, and remediation drilling in and near embankment dams and levees and/or their earth and rock foundations. including investigation planning, site preparation, borehole advancement, subsurface testing, instrumentation installation, piezometer and well rehabilitation, grouting, and borehole completion. It identifies drilling program plan requirements, restrictions on drilling fluids, drilling procedures to minimize risk of damage, borehole completion requirements, and prescribes personnel requirements, and the review and approval processes. It is the responsibility of the District Dam or Levee Safety Officer (DSO or LSO) to assure compliance with the restrictions and procedures outlined in this regulation.

a. Drilling Program Plan. An approved Drilling Program Plan (DPP) is required prior to any drilling, sampling, grouting, or any other invasive in-situ testing or exploration. This includes drilling activities related to investigation, maintenance, and remediation. When planning an investigation or remediation program, the data needs must be weighed against the potential risks of damage created by the drilling process. In general, all drilling and investigation should be targeted to obtain information related to a specific failure mode identified from a Potential Failure Mode Analysis (PFMA). For dams, the justification for drilling must include an approved

recommendation from a risk assessment performed in support of the Dam Safety risk management process described in ER 1110-2-1156 Safety of Dams - Policy and Procedures. If the structure has not had a PFMA, a thorough evaluation similar to the PFMA process must be performed and presented in the DPP to show that the drilling is justified. It is paramount that all existing subsurface information is thoroughly evaluated and understood by the exploration team prior to developing a plan for additional drilling. In order to understand and communicate subsurface conditions and estimate drilling risks, the existing subsurface information must be assimilated into essential plan and section drawings showing the proposed drill holes, target sample areas and/or proposed instrumentation. For critical or complicated drilling programs the Geotechnical and Geology Community of Practice leads can be contacted to obtain recommendations for subject matter experts to assist in developing the DPP. Specific requirements for the DPP are included in Appendix B.

b. Restrictions on the Use of Drilling Fluids. All drilling programs in dams and levees should be designed to minimize the need for any drilling fluid such as air, gas, water, mud, polymers, slurries or any other drilling fluid that could pressurize the borehole soils. If the drilling objective can be performed using dry methods such as augers or sonic drilling they should be employed in lieu of methods that require fluids. If drilling fluids must be used due to the drilling objective or the subsurface conditions, the DPP must contain an analysis of the potential to cause damage and a plan that covers the measures that will be used to minimize the risk. The use of pressurized air or foam should only be considered when drilling in materials that will not transmit pressures to the soil core or other critical features or when the air pressure is reliably isolated from the borehole soils. Drilling in an open graded rockfill shell may be an example of when using air may be appropriate. All DPPs that propose the use of stabilizing or circulating fluids or other media will require additional review and approval as described in paragraph 6f.

c. Drilling Procedures. As there are many existing and potentially new methods for drilling and sampling that may be implemented on dams and levees, this regulation will not provide specific procedures. Most procedures are documented in applicable standards and reference documents. There are however, some general procedures that should be followed when using drilling fluids to limit the risk of damage.

(1) Tools should be sized and designed to minimize the likelihood of the return flow clogging. Methods that require the cuttings to flow through a small annulus between the tools or casing and the borehole wall should not be used.

(2) If possible, fluid discharges from the bit should be upward. A downward discharge increases the chance of clogging which could lead to a pressure spike. A lateral discharge into the sidewalls could lead to excessive disturbance or erosion.

(3) Lower and raise drill tools slowly to avoid pressure changes in the drill hole; this is especially important when using tools with restricted annulus space below the groundwater table as the pressure changes are more severe and can lead to suction and surging problems.

(4) Drilling feed rate must be slow enough to avoid crowding the bit and, thus, minimize the chance of inducing fracturing. The bit must be of a design such that pressure buildup is minimized.

(5) Drilling media properties, pressure, and return should be continuously monitored. A floating needle pressure valve is required to record maximum pressure spikes that can occur instantaneously and are often unnoticed.

(6) In some conditions, casing can be advanced ahead of the drilling bit to reduce the risk of hydraulic fracturing by confining the drilling fluids within the casing.

(7) When core drilling rock, the embankment or foundation soil above top of rock must be protected and isolated from the circulating drilling fluid. Fractures in the bedrock must be considered as potential flow paths in contact with the overlying soil.

(8) In situations where the presence of significant artesian pressure is suspected, which are common at the toe of dams, it may be necessary to use weighted drilling muds or raise the drill rig or install surface casing for pressure control along with the use of drilling mud. In some cases there may be a high risk of initiating internal erosion by drilling borings or excavating test pits in these areas. Emergency materials to stop progressive erosion in an excavation, a trench, or a borehole must be on site and readily available. For this situation, it is recommended to stockpile fine (C33 concrete sand) and coarse processed aggregates to filter and plug the excavation. Specific details such as height of the drill pad and amount of surface casing must be developed on a case-by-case basis dependent upon specific site conditions.

d. Borehole Completion. All boreholes and other penetrations (including direct push sampling, Cone Penetration Test soundings, Standard Penetration Testing, Becker Penetration Testing,) in and around embankment dams and levees must be sealed after completion. Completing a borehole by backfilling with drill cuttings is not acceptable. All boreholes and similar penetrations in the impervious portions of an embankment dam or levee and their foundations must be backfilled by tremie placed cement-bentonite grout or bentonite pellets/chips. The DPP must address the possibility of confined and separate ground water aquifers and demonstrate safe completion which avoids cross-contamination and leakage. The grout must be designed to obtain strength equal to or greater than the soil. Note that some instrumentation installations may require additional considerations for the grout strength. Gravity grouting techniques should be used for backfilling boreholes. For borings that penetrate zones with low confining stress it is possible to induce hydraulic fracturing from the gravity pressure. When grouting borings in these locations or if significant grout losses are observed, the grout backfilling should be done in stages allowing the grout to set between stages. For pervious portions of the dam or levee, the borehole must be backfilled by tremie placement of granular materials that are sized to provide drainage without being susceptible to migration through the pervious embankment or foundation materials or segregation during placement. Lutenegger, et.al. (1995) is a good source for borehole backfill guidelines. Special procedures and materials may be required for installation of instrumentation in boreholes.

e. Drilling Personnel. Drill rig operators must have a minimum of 5 years experience drilling with the equipment and procedures described in the drilling program. The drill rig operator must also be familiar with these guidelines. All drilling activities on USACE dams or levees must be conducted in the presence of a geotechnical engineer that is a licensed professional engineer or a licensed professional geologist who will be responsible for maintaining the integrity of the structure.

f. Approval Requirements. Drilling Program Plans must be reviewed and approved by the District Dam Safety Officer (Dams) or Levee Safety Officer (Levees). If any drilling fluid or other stabilizing or circulating media is proposed, a technical review performed by the Geotechnical and Materials Community of Practice (G&M CoP) Standing Committee on Drilling and Instrumentation is required. The plan will then require approval from the District DSO/LSO pending satisfactory resolution of the technical review comments. The Standing Committee on Drilling and Instrumentation will be chaired by the G&M CoP Lead, co-chaired and managed by the Risk Management Center, and staffed with G&M CoP experts.

g. Reporting. All incidents of damage or potential damage related to drilling and associated activities for dams must be reported following procedures outlined in Chapter 13 Reporting Evidence of Distress in Civil Works Structures of ER 1110-2-1156 Safety of Dams- Policy and Procedures. Damage in levees must be reported to the Levee Safety Officers and Levee Safety Program Managers in the District, MSC, and Headquarters.

h. Exemptions. Drilling required for immediate emergency measures where delays required to develop the DPP and obtain approvals would result in unacceptable risk of damage or failure, may be exempted from the requirements to prepare a DPP by the District DSO/LSO. Emergency drilling should be appropriately expedited but should follow the general guidelines presented in this regulation. No other exemptions or deviations from these requirements may be made.

7. Environmental Operating Principles. The user of this ER, as a member of a Project Delivery Team, is responsible for seeking opportunities to incorporate the Environmental Operating Principles (EOPs) wherever possible. A listing of the EOPs is available at: http://www.usace.army.mil/Missions/Environmental/EnvironmentalOperatingPrinciples.aspx.

FOR THE COMMANDER:

WILLIAM H. GRAHAM
COL, EN
Chief of Staff

2 Appendices
Appendix A - References and Resources
Appendix B - Drilling Program Plan

APPENDIX A

References and Resources

Drilling Procedures

EM 1110-1-1804 Geotechnical Investigations (including Appendix F EM 1110-1-1906 Soil Sampling).

EM 1110-2-1908 Instrumentation of Embankment Dams and Levees.

EM 1110-2-1914 Design, Construction and Maintenance of Relief Wells.

EM 1110-2-2300 General Design and Construction Considerations for Earth and Rock-Fill Dams.

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ASTM D1587-08 Standard Practice for Thin-Walled Tube Sampling of Soils for Geotechnical Purposes, 2012.

ASTM D2113-08, Standard Practice for Rock Core Drilling and Sampling of Rock for Site Investigation, 2008.

ASTM D5781/D5781M-13, Standard Guide for Use of Dual-Wall Reverse-Circulation Drilling for Geoenvironmental Exploration and the Installation of Subsurface Water-Quality Monitoring Devices, 2013.

ASTM D5782-95, Standard Guide for Use of Direct Air-Rotary Drilling for Geoenvironmental Exploration and the Installation of Subsurface Water-Quality Monitoring Devices, 2012.

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Xia, H. and Moore, I.D., "Estimation of Maximum Mud Pressure in Purely Cohesive Material during Directional Drilling, Geomechanics and Geoengineering: An International Journal, Vol. 1, No.1, 3-11. 2006.

Yanagisawa, E. and Panah, A.K., "Two dimensional study of hydraulic fracturing criteria in cohesive soils", Soils and Foundations, Japanese Society of Soil Mechanics and Foundation Engineering, Vol. 34, No. 1, 1-9, Mar. 1994.

Sample Disturbance

Ladd, C. C., and D.J DeGroot, 2004 (revised). "Recommended Practice for soft ground site characterization, Arthur Casagrande lecture, Proc. 12th Pan-American Conf. on Soil Mech. and Geot. Engineering.

Filter Design

Filter for Embankment Dams – Best Practices for Design and Construction, Federal Emergency Management Agency, http://www.fema.gov/library/viewRecord.do?fromSearch=fromsearch&id=4943, December 2011.

Dam Safety Guidance

ER 1110-2-1156 Safety of Dams- Policy and Procedures.

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APPENDIX B

Drilling Program Plan

An approved drilling program plan (DPP) is required for any exploration or remedial drilling (including grouting) work to occur in or near an embankment dam or levee or their foundations. When drilling is justified, an exploration team must be formed to determine and document the drilling program components required to adequately and safely address the project needs. The exploration team must thoroughly discuss the drilling program to ensure that the program minimizes risk and meets the project goals. The drilling program must be prepared by experienced geotechnical engineers and/or engineering geologists familiar with subsurface exploration techniques and methods, with advice from drilling specialists. The Lead engineer on the exploration team must be a registered professional engineer. This section describes the basic information that must be developed and included in the drilling program.

a. Objective and Justification. The objective of the drilling program must be clearly summarized including the purpose of the drilling and how the borings, samples, testing, instrumentation, etc. will be used. The need for the drilling must be thoroughly justified. Drilling should be minimized by first utilizing non-destructive methods including parametric analysis, the use of published correlations, and non-destructive geophysical testing. The justification must include documentation that shows the purpose is based obtaining information related to potential failure modes identified in an approved risk assessment in support of the dam or levee safety program. If an approved PFMA or risk assessment has not been performed, the exploration team must perform a thorough evaluation similar to the PFMA process and present a valid justification demonstrating that the drilling is required to obtain information related to a credible potential failure mode.

b. Exploration Team. List members of the exploration team used in developing the DPP. Include name, organization, title, registration, and years of experience.

c. Existing Information Review. In order to understand subsurface conditions, justify additional drilling, and estimate drilling risks, all relevant existing information must be assimilated and reviewed by the exploration team and then concisely summarized in the DPP. Information review typically includes, but is not limited to:

(1) Geologic mapping, boring logs, driller's notes, and reports portraying information from previous investigations and construction.

(2) Geotechnical files and reports including Site Characterization Reports.

(3) Foundation Completion Reports.

(4) Embankment Construction Reports.

(5) Periodic Inspection or Periodic Assessment Reports.

(6) As-built drawings.

(7) Archived records.

(8) Other construction reports.

(9) Construction photos for both original embankment construction and any subsequent construction.

(10) Instrumentation plans, data, and reports.

(11) Project records available in district and project offices.

d. Essential Geologic and Engineering Drawings. The DPP must include a set of drawings depicting the current understanding of subsurface conditions, as they relate to the proposed work. This detailed set of foundation and embankment drawings typically requires a plan showing all previous and proposed subsurface investigation locations, profile drawings, and sections of the embankment in the areas proposed for exploration. The sections must be drawn to scale with no vertical exaggeration and must show the proposed borings along with all available factual information and appropriate geologic or engineering interpretations. The drawings should be updated regularly during the drilling operations to show conditions encountered and adjust geologic interpretations to help guide the program. The information on the plan, profile and sections must be detailed and include a summary of all data significant to the analytical and exploration needs such as:

(1) Embankment zones, including added berms, blankets, filters, and drains.

(2) Details of subsurface material classification.

(3) Geologic contacts and continuity interpretations supported by all nearby drilling and sampling details.

(4) Depth of the top of rock and all other zones of importance.

(5) Piezometer locations showing screened influence zones and recorded piezometric levels tied to the reservoir water level.

(6) Other instrumentation such as inclinometers, movement monuments, etc., shown in the context of the foundation geology contacts and interpretations.

(7) SPT blow counts or other test results defining engineering properties.

(8) Geophysical data, where useful (e.g. cross hole shear wave velocity profiles).

(9) Estimated extent of any zones of interest, including natural and made-made (grout holes).

(10) Seepage areas tied to geologic units, where possible.

(11) Location of all structures, including seepage control features, outlet works, etc.

(12) Location and types of any distress features (seepage, wet spots, sand boils, sinkholes, etc.).

Maintaining updated geologic sections and a plan during the drilling operations is important for making exploration changes and for responding to unusual or unexpected conditions or events. The process for accomplishing this must be outlined in the drilling program.

e. Drilling Scope and Methodology. The drilling program must include a summary of the scope and methods that will be used, including the following:

(1) Number and location of proposed borings.

(2) Utilities, surface and underground obstacles, and accessibility.

(3) Materials expected to be drilled, sampled, and tested.

(4) Depth, diameter, bearing, and inclination of borings.

(5) Required sample type (disturbed or undisturbed), size, location, and reason for sampling.

(6) Proposed laboratory testing.

(7) Drilling, sampling, and testing methods.

(8) Details of the proposed tools and drilling equipment.

(9) Instrumentation and borehole completion requirements (influence zone, seals, etc.). Drill rig operators: Name and years of experience.

(10) Field Supervision Personnel: Name, organization, title, registrations, years of experience.

(11) Personnel responsible for logging materials and assuring geologic drawings are updated regularly during the drilling program.

f. Risk Evaluation. Include an evaluation of the risk of hydraulic fracturing, erosion, contamination of drainage features, heave, or any other damage. This should include:

(1) A detailed description of any drilling fluid used including details on the circulation system, locations where fluid will contact soil, and circulation pressures that will be used.

(2) Monitoring needs during drilling, and a contingency plan if loss of drilling fluid or other complications are observed during drilling.

(3) Measures to minimize the risk of damage to the dam or foundation.

(4) Measures to prevent the possibility of cross-contamination and leakage from confined and separate ground water aquifers.

(5) Measures to prevent drill contact with structural features, such as conduits.

(6) Nearby instruments whose behavior will be monitored during the investigation and the expected response including threshold and limit values, and contingency plans for unexpected response.

(7) An emergency action plan including a list of emergency equipment and supplies to have onsite (phone/radio, filter materials, grout materials, etc.).

g. DSO/LSO Certification. Provide a certification page with the signature of the appropriate DSO/LSO. The certification must state: This Drilling Program Plan has been developed and reviewed by experienced professionals and is in compliance with all the requirements of ER 1110-1-1807. The proposed actions are justified and have been developed to minimize the likelihood of damage to the existing structure.

APPENDIX B

SAMPLE DAILY FIELD REPORT

SAMPLE BORING LOG

Field Report

Project:	Amawalk Dam	Report No.:	49
Project No.:	60304574	Day/Time:	Tuesday, January 6, 2015
Location:	Town of Somers	Weather/Temp:	Cloudy/Snow 15°F
Contractor:	Jersey Boring & Drilling Co., Inc	Client:	NYCDEP

	Equipment Rental _____ Tolls $_____ Parking $_____ Mileage _____ Project Preparation Time: 2 hrs	Arrive Job 07:00 Depart Job 12:30 Total Hours on Job 5.5 hrs Travel Time 4 hrs	**TOTAL CHARGEABLE HOURS**

Summary of technical and/or engineering services performed, including field test data. Locations, elevations and depth are estimated

- Traveled to site.
- Unlocked AECOM lock from dam gate.
- Chuck and Joey from Jersey Boring arrived at 07:00 am.
- Due to cold temperatures Jersey Boring was unable to start up the drill rig, tried to get it started but they were unsuccessful, no work drilling occurred today.
- ACM-MW-01 GWT is at 4.5 feet below ground surface, ACM-MW-02 GWT is at the surface (well is slightly pressurized), and ACM-MW-03 GWT is at 9.7 feet below ground surface. ACM-MW-01 is about 600 feet from the spillway, ACM-MW-02 is about 400 feet from the spillway, and ACM-MW-03 is about 100 feet away from the spillway.
- Due to anticipated cold temperatures and wind, tomorrow's field work has been cancelled by Jersey Boring.
- Cleaned up and secured work area at the end of the day.
- Locked up gate with AECOM lock along with DEP lock and notified Tom Boland via email that dam gate is locked up.
- No AECOM incidents. No Jersey Boring incidents. No environmental releases.
- Reservoir Level: 393.9'

Field Representative: Daniel Loveless

Position: Field Supervisor

Company: AECOM

AECOM	CLIENT: NYCDEP	LOG OF BORING NUMBER: ACM-MW-2
	PROJECT NAME: Amawalk Dam	ARCHITECT-ENGINEER: AECOM

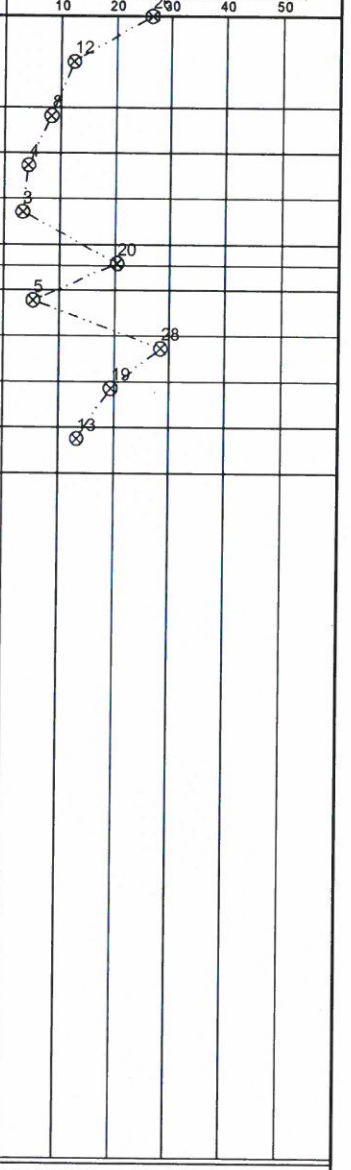
SITE LOCATION: Town of Somers, New York

DEPTH(FT) / ELEVATION(FT)	SAMPLE NO.	SAMPLE TYPE	SAMPLE DISTANCE RECOVERY	DESCRIPTION OF MATERIAL	UNIT DRY WT. LBS./FT.^{3}
				SURFACE ELEVATION	
	1	SS		No Recovery - Samples 1 and 2	
	2	SS		4.0	
5.0	3	SS		Brownish gray sand and gravel with some silt - clay seam in top 2.0 inches (SM) 6.0	
	4	SS		Gray sandy clay with some gravel and silt (CL) 8.0	
10.0	5	SS		Grayish brown clay with silt and some sand - little gravel - trace roots (CL) 10.0	
	6	SS		Grayish brown clay and silt with some sand and trace roots (CL) 10.9	
	7	SS		12.0 Gray coarse to medium silty sand with some gravel (CL) Brownish gray clay and silt with some sand and gravel (CL) 14.0	
15.0	8	SS		Gray coarse to medium silty sand with some gravel (SM) 16.0	
	9	SS		Gray gravelly sand with some silt (SP) 18.0	
20.0	10	SS		Gray gravelly sand with some silt (SP) 20.0	
				End of Boring Monitoring well installed at 19.0 feet 10.0 foot screen and 9.0 foot riser pipe installed #1 sand packed to top of screen Bentonite grout seal to top of borehole	

UNCONFINED COMPRESSIVE STRENGTH TONS/FT.^{2} (1 2 3 4 5)

PLASTIC LIMIT % — WATER CONTENT % — LIQUID LIMIT % (10 20 30 40 50)

STANDARD PENETRATION BLOWS/(FT) (10 20 30 40 50)



The stratification lines represent the approximate boundary lines between soil types: in situ, the transition may be gradual.

NORTHING	BORING STARTED 12/31/14	AECOM OFFICE	Green Bay, Wisconsin
EASTING	BORING COMPLETED 12/31/14	ENTERED BY CAH	SHEET NO. 1 OF 1
WL Surface	RIG/FOREMAN CME 55/CD	APP'D BY D. LOVELESS	AECOM JOB NO. 60304574

AECOM LOG 60304574.GPJ FS_DATATEMPLATE.GDT 2/6/15

APPENDIX C

EMERGENCY CONTACT LIST

Emergency Contact List (checklist items 17 & 18)

Lower Chia Lin Dam and Kirk Lake Dam Boring Investigation

05/10/2018

Agency	Telephone	Cell Phone	Health and Safety Issue
Police Department	911		Accident or injury requiring medical attention
Fire Department	911		Fire
Ambulance	911		Injury requiring medical attention
NYC Poison Control Center	212 764-7667		
Hospital: Kirk Lake Dam Northern Westchester Hospital Center 400 E. Man Street Mt Kisko, NY 10549	914 666-1200		Injury requiring medical attention
Hospital: Lower Chia Lin Dam St Luke's Cornwall Hospital Newburgh Campus 70 Dubois Street Newburgh, NY 12550	845 561-4400		Injury requiring medical attention
Craig Test Boring Project Manager: Ben Thies	609-625-4862		Any Health and Safety incident/environmental impact
Craig Test Boring Health & Safety Officer: Kevin Craig	609-625-4862		Any Health and Safety incident/environmental impact
AECOM Project Manager: Bhavin Gandhi	973 883-8389	732 447-8717	Any Health and Safety incident/environmental impact
AECOM Field Representative: Dan Loveless	732-564-3315	732-433-4328	Any Health and Safety incident/environmental impact
AECOM SHE Representative: Lijuan Sang	973 883 8615	513 365 5467	Any Health and Safety incident/environmental impact
AECOM SHE Manager: Stacy Wells	212-377-8583	917-324-2554	Any Health and Safety incident/environmental impact
NYCDEP BEDC Accountable Manager: Lizette Gomez	718-595-6217	917-962-3011	Any Health and Safety incident/environmental impact
NYCDEP EHS Regional Manager: Ann Ruzek	718 595 6255	347-881-6564	Any Health and Safety incident/environmental impact
BWS EHS: Pete Capozzella	914-749-5404		Any Health and Safety incident/environmental impact

APPENDIX D

PIEZOMETER INSTALLATION NOTES

AECOM

Lower Chia Lin Dam & KirK Lake Dam

06/21/18

Vibrating Wire Piezometer Notes:

1. Vibrating Wire (VW) piezometers will be provided by AECOM.
2. Data loggers shall be VW Quattro Logger manufactured by Slope Indicator Company, or approved equal. Furnish and install locking, weatherproof enclosure and all necessary cables and adaptors. (Optional, at NYCDEP's request.)
3. Install piezometers in accordance with the following procedures and the manufacturer's specifications and recommendations.
4. Piezometers shall be factory assembled with the standard polyethylene signal cable.
5. Calibration sheets shall be supplied by Slope Indicator Company prior to installation.
6. VW Piezometers shall be grouted in place. Place cement-bentonite grout using tremie methods.
7. Use the following grout mix (2.5 water:1 cement:0.3 bentonite, by weight):
    a. 94 lbs (1 bag) Portland Cement
    b. 30 gallons water
    c. 25 lbs bentonite
8. Mix cement with water first, then mix bentonite. Adjust amount of bentonite to produce a grout with the consistency of heavy cream. Test grout using Marsh funnel. (55 seconds +/-).
9. Use bentonite powder Baroid Aquagel Gold Seal or Quickgel.
10. Prepare vibrating wire piezometer for installation at least one hour in advance of installation:
    a. Check each piezometer well in advance of drilling the borehole. The pressure under dry conditions should be close to the zero pressure on the calibration sheets. If not, check with the manufacturer (the piezometer may be defective). Apply barometric correction.
    b. Coil the piezometer tip around and tape it to the lead wire so that the tip is facing up. Pull off the filter tip at the end of the piezometer and fill with water. Replace tip.
    c. Place piezometer in bucket of water to keep the tip saturated until the time of installation into the borehole. Take a reading on each piezometer in the bucket of water. The reading should be close to the height of water in the bucket, above the tip. Record the pressure and approximate depth of water. If there is a discrepancy, recheck the calibration sheets.
    d. Record the barometric pressure, without correction for elevation or sea level. Correct the pressure reading for barometric pressure to further check the calibration per manufacturer's recommendations.
    e. Determine the depth required for the piezometer, and measure the required distance from the tip along the signal cable and label the depth with tape. Double check length.
    f. Tape the piezometer tip to a sacrificial grout pipe that will extend to the bottom of hole. Use 1" galvanized steel pipe. Tape the lead cable to the grout pipe at maximum 5-foot intervals along the pipe. Lower grout pipe and piezometer(s) into the borehole. Check

the reading on the piezometer once it has been lowered into the hole. The reading should correspond to the height of water in the borehole.

11. Grout borehole using tremie methods. The sacrificial grout pipe shall abandoned in the borehole.
12. Take a reading on the piezometer immediately after grouting.
13. Run signal cables to the data logger and readout station. Bury cables in accordance with the manufacturer's recommendations. Bury cables 16" below ground surface.
14. Install an 8-foot 4x4 pressure treated post at readout station. Embed post 3 feet into the ground.
15. Attach data logger to the 8-foot 4x4 pressure treated post. Furnish and install locking, weatherproof enclosure for the data logger. Install enclosure and data logger at approximately arm-height above ground surface. (Optional, at NYCDEP's request.)

PUTNAM ENGINEERING, PLLC.
Engineers and Architects

July 26, 2018

Mr. Robert Laga, Chairman
Town of Carmel ECB
60 McAlpin Avenue
Mahopac, NY 10541

Re: Inzano
188 Bullet Hole Road
(T) Carmel
T.M.: 63.-1-16.2

Dear Chairman Laga and Members of the Board:

Mrs. Anna Inzano and her late husband, Mario, purchased this property in June 2017 from Serg Inc. This property had the driveway cleared and improvements installed (drainage swale and piping) by the original property owners, Jordano and Gervasi. This action is established by their request in 2015 to have their bond for site improvements returned to them.

Serg Inc. made site improvements and cleared portions of the land to install the driveway, as well as install the fill section for the subsurface sanitary treatment system. The extent of clearing is unknown.

What is known is that the original owners (Jordano and Gervasi) did not file for nor obtain a wetland permit for any of the work they performed within the wetland buffer. Serg Inc. did not file for nor obtain a wetland permit for any work that they may have performed in the buffer area prior to selling the property to the Inzano's.

At this point, plans have been prepared for the restoration of that portion of the wetland buffer that is located to the east of the proposed driveway. The driveway will be gravel so that no impervious surface is proposed to be within 100 feet of the wetland/water course. As the Board knows, the NYC DEP Rules and Regulations prohibit installing an impervious surface within 100 feet of a wetland/stream.

The house will be located outside the wetland buffer, and it is proposed to treat the roof runoff in a rain garden.

A Stormwater Pollution Prevention Plan is required by the NYC DEP, and a draft copy has been submitted to the Carmel ECB.

L83271

I ask to be placed on the next available agenda so that we can discuss our proposal and move forward with having a wetland permit issued.

Sincerely,

PUTNAM ENGINEERING, PLLC

Paul M. Lynch, P.E.
PML/dac

L83271

TOWN OF CARMEL
ENVIRONMENTAL CONSERVATION BOARD

60 McAlpin Avenue
Mahopac, New York 10541
Tel. (845) 628-1500 - Ext. 190
www.ci.carmel.ny.us

APPLICATION FOR WETLAND PERMIT OR LETTER OF PERMISSION

Name of Applicant: Mario +Anna Inzano
Address of Applicant: 15335 Shoshone trl Brooksville fl 34604 **Email:**

Telephone# **Name and Address of Owner if different from Applicant:**

Property Address: 188 Bullethole Rd **Tax Map #** 63.1-1-16.2
Agency Submitting Application if Applicable:
Location of Wetland: west side of property
Size of Work Section & Specific Location: see site plan
Will Project Utilize State Owned Lands? If Yes, Specify: NO

Type and extent of work (feet of new channel, yards of material to be removed, draining, dredging, filling, etc). A brief description of the regulated activity (attach supporting details). 250 ft driveway in buffer zone.

Proposed Start Date: 11/1/17 **Anticipated Completion Date:** 8/1/18 **Fee Paid $** 225.00

****

CERTIFICATION

I hereby affirm under penalty of perjury that information provided on this form is true to the best of my knowledge and belief, false statements made herein are punishable as a Class A misdemeanor pursuant to Section 210.45 of the Penal Law. As a condition to the issuance of a permit, the applicant accepts full legal responsibility for all damage, direct or indirect, or whatever nature, and by whomever suffered, arising out of the project described here-in and agrees to indemnify and save harmless the Town of Carmel from suits, actions, damages and costs of every name and description resulting from the said project.

Mario Inzano
SIGNATURE

10/16/17
DATE

Short Environmental Assessment Form
Part 1 - Project Information

Instructions for Completing

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

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

Part 1 - Project and Sponsor Information

Name of Action or Project:

Project Location (describe, and attach a location map):

188 Bullet Hole Road, Mahopac, NY 10541

Brief Description of Proposed Action:

Construction of driveway.

Name of Applicant or Sponsor:	Telephone: 914-403-1991
Mario Inzano	E-Mail: abc81403@yahoo.com

Address:

15335 Shoshone Trl

City/PO:	State:	Zip Code:
Brooksville	FL	34604

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

3.a. Total acreage of the site of the proposed action? 4.8 acres
b. Total acreage to be physically disturbed? 0.83 acres
c. Total acreage (project site and any contiguous properties) owned or controlled by the applicant or project sponsor? 4.8 acres

4. Check all land uses that occur on, adjoining and near the proposed action.

☐ Urban ☐ Rural (non-agriculture) ☐ Industrial ☐ Commercial ☑ Residential (suburban)
☐ Forest ☐ Agriculture ☐ Aquatic ☐ Other (specify): _____
☐ Parkland

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

	NO	YES
6. Is the proposed action consistent with the predominant character of the existing built or natural landscape?	☐	☑

	NO	YES
7. Is the site of the proposed action located in, or does it adjoin, a state listed Critical Environmental Area? If Yes, identify: _____	☑	☐

	NO	YES
8. a. Will the proposed action result in a substantial increase in traffic above present levels?	☑	☐
b. Are public transportation service(s) available at or near the site of the proposed action?	☑	☐
c. Are any pedestrian accommodations or bicycle routes available on or near site of the proposed action?	☑	☐

	NO	YES
9. Does the proposed action meet or exceed the state energy code requirements? If the proposed action will exceed requirements, describe design features and technologies:	☑	☐

	NO	YES
10. Will the proposed action connect to an existing public/private water supply? If No, describe method for providing potable water: _____	☐	☑

	NO	YES
11. Will the proposed action connect to existing wastewater utilities? If No, describe method for providing wastewater treatment: _____	☐	☑

	NO	YES
12. a. Does the site contain a structure that is listed on either the State or National Register of Historic Places?	☑	☐
b. Is the proposed action located in an archeological sensitive area?	☑	☐

	NO	YES
13. a. Does any portion of the site of the proposed action, or lands adjoining the proposed action, contain wetlands or other waterbodies regulated by a federal, state or local agency?	☐	☑
b. Would the proposed action physically alter, or encroach into, any existing wetland or waterbody?	☑	☐
If Yes, identify the wetland or waterbody and extent of alterations in square feet or acres: _____		

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

☐ Shoreline ☐ Forest ☐ Agricultural/grasslands ☐ Early mid-successional
☑ Wetland ☐ Urban ☑ Suburban

	NO	YES
15. Does the site of the proposed action contain any species of animal, or associated habitats, listed by the State or Federal government as threatened or endangered?	☐	☑

	NO	YES
16. Is the project site located in the 100 year flood plain?	☑	☐

	NO	YES
17. Will the proposed action create storm water discharge, either from point or non-point sources? If Yes, a. Will storm water discharges flow to adjacent properties? ☑ NO ☐ YES	☐	☑
b. Will storm water discharges be directed to established conveyance systems (runoff and storm drains)? If Yes, briefly describe: ☑ NO ☐ YES		

	NO	YES
18. Does the proposed action include construction or other activities that result in the impoundment of water or other liquids (e.g. retention pond, waste lagoon, dam)? If Yes, explain purpose and size: _____	☑	☐
19. Has the site of the proposed action or an adjoining property been the location of an active or closed solid waste management facility? If Yes, describe: _____	☑	☐
20. Has the site of the proposed action or an adjoining property been the subject of remediation (ongoing or completed) for hazardous waste? If Yes, describe: _____	☑	☐

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

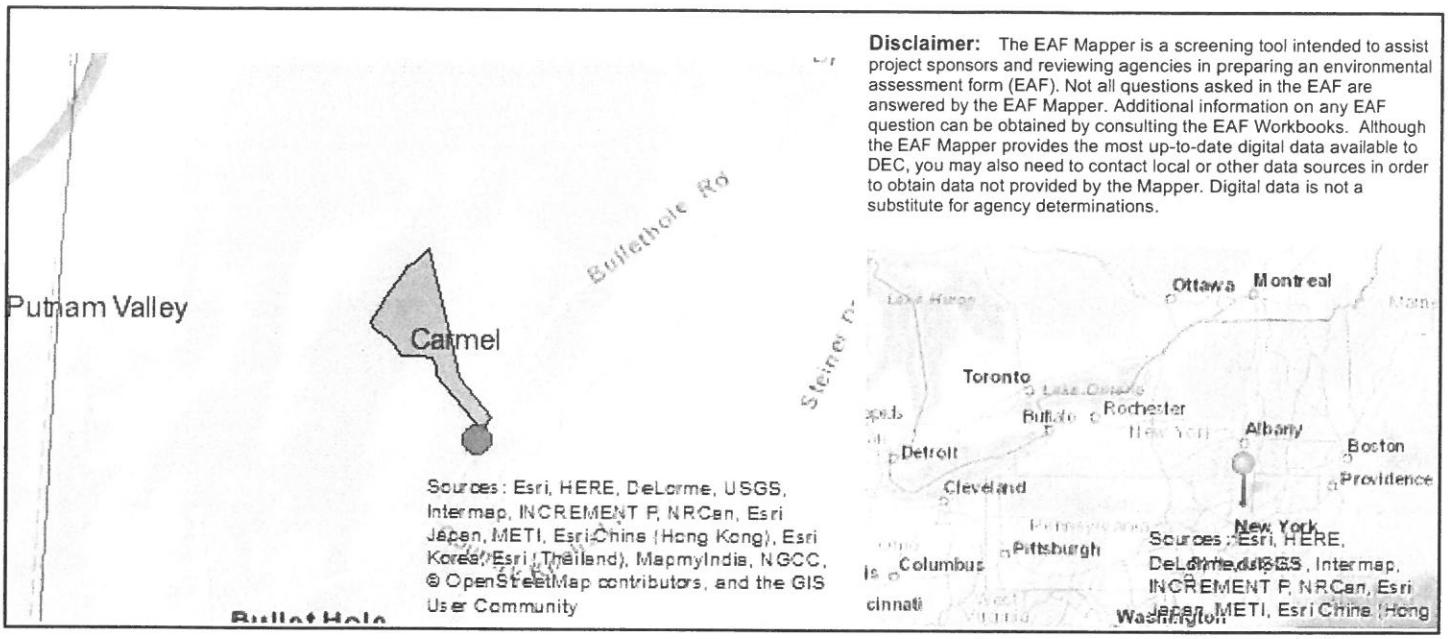
Applicant/sponsor name: Mario Intano Date: 10/5/17

Signature: Mario Intano

PRINT FORM

EAF Mapper Summary Report

Tuesday, October 17, 2017 11:39 AM



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

TOWN of CARMEL GENERAL EROSION CONTROL NOTES:

A. CONSTRUCTION EQUIPMENT SHALL NOT UNNECESSARILY CROSS LIVE STREAMS EXCEPT BY MEANS OF BRIDGES AND CULVERTS OR OTHER APPROVED METHODS.

B. WHENEVER FEASIBLE, NATURAL VEGETATION SHOULD BE RETAINED AND PROTECTED.

C. ONLY THE SMALLEST PRACTICAL AREA OF LAND SHOULD BE EXPOSED AT ANY ONE TIME DURING DEVELOPMENT.

D. WHEN LAND IS EXPOSED DURING DEVELOPMENT, THE EXPOSURE SHALL BE KEPT TO THE SHORTEST PRACTICAL PERIOD OF TIME.

E. THE PERMANENT FINAL VEGETATION AND STRUCTURES SHALL BE INSTALLED AS SOON AS PRACTICAL AND AS MAY BE DIRECTED BY THE ENGINEER.

AREA of DISTURBANCE:

AREA OF DISTURBANCE = 49,800 S.F. (1.14 AC.)

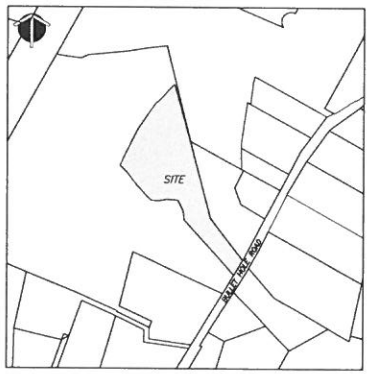
TOTAL FILL TO SITE = 700 C.Y.

IMPERVIOUS SURFACES:

EXISTING IMPERVIOUS SURFACES =	0 S.F.
PROPOSED IMPERVIOUS SURFACES =	1,953 S.F.
TOTAL IMPERVIOUS SURFACES =	1,953 S.F.

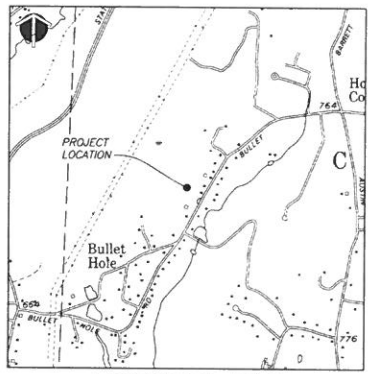
SOILS LEGEND

SOIL SYMBOL	SOIL GROUP	SOIL NAME
ChB	B	CHARLTON FINE SANDY LOAM, 3 TO 8 PERCENT SLOPES
CsD	B	CHATFIELD-CHARLTON COMPLEX, 15 TO 35 PERCENT SLOPES, VERY ROCKY
LcB	B	LEICESTER LOAM, 3 TO 8 PERCENT SLOPES, STONY



AREA MAP

SCALE: 1"=300'



LOCATION MAP

SCALE: 1"=1000'

TOWN of CARMEL GENERAL EROSION CONTROL NOTES:

A. CONSTRUCTION EQUIPMENT SHALL NOT UNNECESSARILY CROSS LIVE STREAMS EXCEPT BY MEANS OF BRIDGES AND CULVERTS OR OTHER APPROVED METHODS.

B. WHENEVER FEASIBLE, NATURAL VEGETATION SHOULD BE RETAINED AND PROTECTED.

C. ONLY THE SMALLEST PRACTICAL AREA OF LAND SHOULD BE EXPOSED AT ANY ONE TIME DURING DEVELOPMENT.

D. WHEN LAND IS EXPOSED DURING DEVELOPMENT, THE EXPOSURE SHALL BE KEPT TO THE SHORTEST PRACTICAL PERIOD OF TIME.

E. THE PERMANENT FINAL VEGETATION AND STRUCTURES SHALL BE INSTALLED AS SOON AS PRACTICAL AND AS MAY BE DIRECTED BY THE ENGINEER.

PLAN NOTES:

1. OWNER/APPLICANT: MRS. ANNA INZANO
   188 BULLET HOLE ROAD
   MAHOPAC, NY 10541
   PROJECT LOCATION: 188 BULLET HOLE ROAD
   TOWN OF CARMEL
   TAX MAP 63.-1-16.2
2. BOUNDARY AND TOPOGRAPHIC INFORMATION FROM PLAN ENTITLED "SURVEY OF PROPERTY SITUATE IN THE TOWN OF CARMEL", LAST REVISED FEB.1, 2018 AS PREPARED BY LINK LAND SURVEYORS, PC.
3. LOT AREA = 205,351 S.F. (4.7 ACRES)
4. VERTICAL DATUM: ASSUMED DATUM, 2 FOOT CONTOUR INTERVAL.
5. THERE ARE NO WATERCOURSES, WETLANDS OR FLOODPLAINS WITHIN 200 FEET, EXCEPT AS NOTED.
6. THE APPLICANT SHALL NOTIFY THE TOWN OF CARMEL ENGINEERING DEPARTMENT AT LEAST 5 DAYS PRIOR TO THE COMMENCEMENT OF ANY WORK ON THE SITE. CONTACT NUMBER IS 845-628-1500, EXTENSION 185.
7. FOR SSTS LAYOUT AND DETAILS, REFER TO SSTS DRAWINGS, DRAWINGS NO.-1 AND NO.-2 AS PREPARED BY PUTNAM ENGINEERING, DATED OCTOBER 12, 2017.

SITE PLAN

GRAPHIC SCALE

1 INCH = 30 FEET

PUTNAM ENGINEERING, PLLC
ENGINEERS - ARCHITECTS
4 OLD ROUTE 6, BREWSTER, NEW YORK 10509
(845) 279-6789 FAX (845) 279-6769

PURSUANT TO NEW YORK STATE EDUCATION LAW, ARTICLE 145, SECTION 7209 SUBDIVISION 2, "IT IS A VIOLATION OF THIS LAW FOR ANY PERSON, UNLESS HE IS ACTING UNDER THE DIRECTION OF A LICENSED PROFESSIONAL ENGINEER, TO ALTER AN ITEM IN ANY WAY. IF AN ITEM BEARING THE SEAL OF AN ENGINEER IS ALTERED, THE ALTERING ENGINEER SHALL AFFIX TO THE ITEM HIS SEAL AND THE NOTATION "ALTERED BY" FOLLOWED BY HIS SIGNATURE AND THE DATE OF SUCH ALTERATION, AND A SPECIFIC DESCRIPTION OF THE ALTERATION."

REVISIONS		
NO.	DATE	DESCRIPTION

PROJECT

PLAN PREPARED FOR:

MRS. ANNA INZANO

188 BULLET HOLE ROAD
TOWN OF CARMEL
PUTNAM COUNTY, NY

TAX MAP 63, BLOCK 1, LOT 16.2

DATE	18 JUL 18
PROJECT MANAGER	PML
DRAWN BY	BS
CHECKED BY	PML
SCALE	AS NOTED

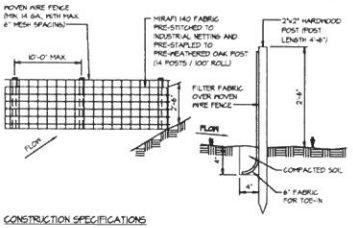
DRAWING

INTEGRATED PLOT PLAN

PROJECT NUMBER 6021

DRAWING NUMBER IPP-1

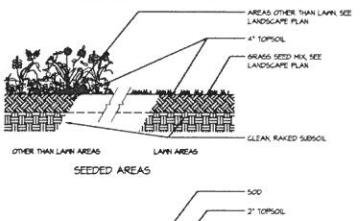
SHEET 1 OF 2



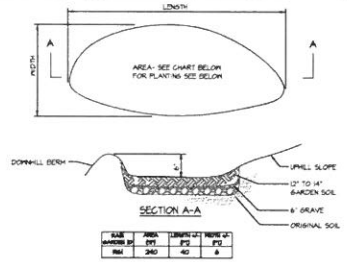
CONSTRUCTION SPECIFICATIONS

1. WOVEN WIRE FENCE TO BE FASTENED SECURELY TO FENCE POSTS WITH WIRE TIES OR STAPLES. POSTS SHALL BE 2"x2" HARDWOOD.
2. FILTER FABRIC TO BE EMBEDDED IN SOIL A MIN. OF 8 INCHES. FILTER CLOTH TO BE FASTENED SECURELY TO WOVEN WIRE FENCE WITH TIES SPACED EVERY 24" AT TOP AND MID SECTION.
3. INSPECTION SHALL BE FREQUENT AND REPAIR OR REPLACEMENT SHALL BE MADE PROMPTLY AS NEEDED.
4. SILT FENCE TO BE REMOVED AT END OF CONSTRUCTION BUT NOT BEFORE ALL DISTURBED AREAS ARE STABILIZED AND VEGETATED.
5. FOR SILT FENCE INSTALLATION ON PAVED AREAS, REMOVE PORTION OF ASPHALT NECESSARY TO TOE-IN THE FABRIC AND TO INSTALL THE POSTS. THE PAVEMENT SHALL BE RESTORED BEFORE FINAL SITE CLEANING.

1 SILT FENCE DETAILS
IPP-2 N.T.S.



2 SEEDING DETAILS
IPP-2 N.T.S.



RAIN GARDEN ID	AREA (SF)	LENGTH (+/-) FT	WIDTH (+/-) FT
RG1	240	40	6

NOTES:
1. THIS IS A GENERIC RAIN GARDEN DETAIL. THE LENGTH AND WIDTH OF THE GARDEN, AS WELL AS SHAPE MAY DIFFER. THE TOTAL SURFACE AREA SHALL BE AS LISTED ABOVE.
2. GARDEN SOIL SHALL BE 50%-70% SAND (LESS THAN 5% CLAY CONTENT) AND 50%-30% TOPSOIL (WITH AN AVERAGE OF 5% ORGANIC MATERIAL) AND FREE OF STONES, ROOTS AND WOOD DEBRIS AND ANIMAL WASTE.
3. GRAVEL SHALL BE CLEANED WASHED GRAVEL, APPROXIMATELY 1.5-2.0 INCHES DIAMETER ROCK.

3 RAIN GARDEN DETAILS
IPP-2 N.T.S.

SLOPE STABILIZATION NOTES:

1. TEMPORARY VEGETATIVE COVER:
   A. SCARIFY COMPACTED SOIL AREAS.
   B. SEED AS FOLLOWS:
      SPRING/SUMMER/EARLY FALL PLANTING: ANNUAL RYEGRASS AND CEREAL OATS AT 50 LBS/AC.
      LATE FALL/EARLY WINTER PLANTING: ARGOSTOCK WINTER RYE AT 100 LBS/AC.
   C. MULCH WITH NOT LESS THAN ONE (1) INCH AND NOT MORE THAN THREE (3) INCHES OF STRAW WITH AN APPLICATION RATE OF TWO TONS PER ACRE. PROVIDE 90 PERCENT COVERAGE TO PROTECTED SURFACE, ANCHOR AS NEEDED
   D. DURING WINTER CONSTRUCTION OR PERIODS OF WET WEATHER, TEMPORARY SLOPE STABILIZATION SHALL BE PROVIDED BY EITHER A ROLLED EROSION CONTROL PRODUCT OR A HEAVY MULCH LAYER SUITABLY ANCHORED. THE CONTRACTOR MUST RESEED THE AREA IN THE SPRING WITH THE APPROPRIATE SEEDING.
   E. DURING DRY WEATHER CONSTRUCTION, ALL SEEDED AREAS ARE TO BE ADEQUATELY WATERED TO ENSURE VEGETATED COVER.
2. PERMANENT VEGETATIVE COVER:
   A. GRADE TO FINISHED SLOPES.
   B. SCARIFY COMPACTED SOIL AREAS.
   C. TOPSOIL WITH NOT LESS THAN FOUR (4) INCHES OF SUITABLE "TOPSOIL MATERIAL (5% X 18) INCHES AT 5875 AREA)
   D. SEED AS FOLLOWS:
      MAINTAINED TURF GRASS: SEED / LBS/AC.
      KENTUCKY BLUE GRASS: 30
      CREEPING RED FESCUE: 20
      RED TOP OR RYE GRASS: 5
      WILDFLOWER AREAS: "NATIVE STEEP SLOPE MIX WITH ANNUAL RYEGRASS" SEED MIX ERNMX-181 AS MFR. BY ERNST CONSERVATION SEEDS, WITH AN APPLICATION RATE OF 60 LBS/ACRE.
   E. MULCH WITH NOT LESS THAN ONE (1) INCH AND NOT MORE THAN THREE (3) INCHES OF STRAW WITH AN APPLICATION RATE OF TWO TONS PER ACRE. PROVIDE 90 PERCENT COVERAGE TO PROTECTED SURFACE, ANCHOR AS NEEDED.
   F. FOR DISTURBED AREAS WITH SLOPES EXCEEDING WATER THAN IV : 3H, INSTEAD OF MULCHING,EROSION CONTROL BLANKET/MATTING SUCH AS NORTH AMERICAN GREEN S150 (OR APPROVED EQUAL) SHALL BE USED. THE DISTURBED AREA SHALL BE PREPARED AS RECOMMENDED BY THE EROSION CONTROL BLANKET/MATTING MANUFACTURER. PRIOR TO INSTALLATION, DISTURBED AREAS SHALL BE SEEDED AS DESCRIBED ABOVE.

SEQUENCE of CONSTRUCTION:

TOTAL AREA OF DISTURBANCE = 1.34 AC.

1. SURVEY AND STAKE OUT PROPOSED HOUSE, DRIVEWAY AND STORMWATER BMP LOCATIONS.
2. INSTALL STABILIZED CONSTRUCTION ENTRANCE.
3. MAINTAIN SILT FENCE IMMEDIATELY DOWNGRADE OF PROPOSED DISTURBANCE AND WHERE INDICATED ON PLAN. ALL SILT FENCE TO BE INSTALLED PARALLEL TO CONTOURS.
4. STRIP AND STOCKPILE TOPSOIL FROM THE CLEARED AREA AND STORE AT TOPSOIL STOCKPILES AS SHOWN ON THE PLAN.
5. COMPLETE ROUGH GRADING AT SITE. FILL T BE PLACED IN 8 INCH LIFTS AND COMPACTED TO 95 PERCENT DRY DENSITY BY MECHANICAL MEANS. FILL SHALL BE FREE FROM ROOTS, VEGETATION AND OVERSIZED STONES. BUILD RETAINING WALL AS GRADING PROGRESSES.
6. ONCE THE ABOVE DESCRIBED EARTHWORK IS COMPLETED, IT MUST BE TEMPORARILY STABILIZED WITHIN ONE (1) WEEK FOLLOWING CONSTRUCTION.
7. BUILD THE HOUSE. INSTALL ROOF DRAINS. CONNECT HOUSE TO ALL UTILITIES. TRENCHES TO BE BACKFILLED IMMEDIATELY UPON COMPLETION OF INSTALLATION OF PIPES AND CABLES. EXPOSED SOIL TO BE STABILIZED IMMEDIATELY AFTER BACKFILL.
8. CONSTRUCT SUBSURFACE SEWAGE TREATMENT SYSTEM
9. COMPLETE GRADING. SEED AND STABILIZE DISTURBED AREAS IMMEDIATELY AFTER GRADING. INSTALL THE RAIN GARDEN AND STABILIZE.
10. INSTALL CONNECTING PIPES AND FLOW SPLITTER.
11. INSTALL GRAVEL ON ENTIRE LENGTH OF DRIVEWAY. CLEAN ALL DRAINAGE STRUCTURES.
12. CLEAN SEDIMENT TRAPS AND TEMPORARY SWALES. CONVERT TO PERMANENT SWALES.
13. REMOVE ALL TEMPORARY EROSION CONTROL MEASURES TO INCLUDE SILT FENCE.
14. UPON CPLETION OF ABOVE ACTIVITIES AND SATISFACTORY ESTABLISHMENT OF VEGETATION ON DISTURBED AREAS, CONTRACTOR TO PERFORM FINAL CLEARING OF THE PROJECT SITE.

ON-SITE POLLUTION CONTROL MEASURES:

1. THERE SHALL BE A RECEPTACLE PLACED ON THE SITE TO TEMPORARILY STORE GARBAGE, DEBRIS OR CONSTRUCTION WASTE MATERIAL. THE CONTAINER SHALL NOT BE USED TO TRANSFER ANY GARBAGE FROM ANY OTHER OFF-SITE ACTIVITY
2. THE RECORD OWNER SHALL BE RESPONSIBLE FOR KEEPING THE SITE FREE OF LITTER AT ALL TIMES. DURING CONSTRUCTION ACTIVITIES THE OWNER MAY DESIGNATE A CONTRACTOR IN CHARGE AS A RESPONSIBLE PARTY.
3. THE SITE SHALL BE INSPECTED AT THE END OF EACH WORKDAY AND TRASH, DEBRIS AND GARBAGE SHALL BE PICKED UP AND PLACED IN ON-SITE DUMPSTERS OR OTHERWISE REMOVED FROM THE SITE.
4. A PORTABLE TOILET FACILITY SHALL BE PROVIDED FOR CONSTRUCTION WORKERS AND AN ADDITIONAL FACILITY FOR EVERY 10 ON-SITE WORKERS.
5. CONSTRUCTION VEHICLES SHALL BE SERVICED OFF-SITE AT A PROPER FACILITY. LEAKING OR ILL REPAIRED VEHICLES SHALL NOT BE LOCATED ON SITE. NO OIL CHANGES ARE PERMITTED ON SITE. FUELING OF VEHICLES ON SITE SHALL BE CAREFULLY PERFORMED WITH AN APPROVED DISPENSER NOZZLE HOSE AND PUMP. SPILLS SHALL PROMPTLY BE REPORTED TO THE NYSDEC AND TOWN. OIL ABSORBENT PADS AND ROLLS SHALL BE USED TO TEMPORARILY CONTAIN ANY SPILLS
6. CHEMICAL SOIL ADDITIVES OR HERBICIDES SHALL NOT BE USED ON SITE DURING CONSTRUCTION
7. THE CONTAINERS SHALL BE OF SUFFICIENT SIZE FOR THE CONSTRUCTION ACTIVITY. CONTAINERS SHALL BE EMPTIED BY AN APPROVED CARTER TO A PROPER FACILITY. WHEN FULL, CONTAINERS SHALL BE COVERED TO PREVENT INFILTRATION OF RAIN AND TO PREVENT WIND BORNE DEBRIS REMOVAL.
8. PAINTS, CHEMICALS OR OTHER TOXIC SUBSTANCES SHALL NOT BE PLACED IN TRASH CONTAINERS. PAINTS, CHEMICALS OR TOXIC SUBSTANCES SHALL BE REMOVED FROM SITE BY AN APPROVED LICENSED CARTER.
9. THERE SHALL BE NO OPEN FIRES OR BARREL FIRES PERMITTED.
10. DEBRIS OR TRASH PILES ARE NOT PERMITTED. DEBRIS SHALL BE PLACED IN CONTAINERS. TEMPORARY PILES OF BRUSH OR STUMPS SHALL BE PROTECTED BY SILT FENCE SIMILAR TO TOPSOIL STOCKPILES

EROSION CONTROL GENERAL NOTES:

1. THE SITE SHALL BE DISTURBED ONLY AS INDICATED ON THESE PLANS.
2. THE CONTRACTOR SHALL MAKE AVAILABLE ON-SITE, ALL EQUIPMENT, MATERIALS AND LABOR NECESSARY TO EFFECT EMERGENCY REPAIR.
3. THE CONTRACTOR SHALL PROVIDE A TELEPHONE NUMBER TO THE DIRECTOR OF CODE ENFORCEMENT FOR USE IN EMERGENCY SITUATIONS.
4. FOR EROSION AND SEDIMENT CONTROL DETAILS, REFER TO THIS DRAWING.
5. CONTRACTOR SHALL STOCKPILE SOIL ONLY IN DESIGNATED STOCKPILE AREAS. ALL OTHER MATERIALS SHALL BE EXCAVATED, MOVED, COMPACTED IN PLACE AND STABILIZED IN ACCORDANCE WITH SLOPE STABILIZATION NOTES AT TIME OF PLACEMENT.
6. CONTRACTOR SHALL FOLLOW OSHA REQUIREMENTS FOR CONSTRUCTION ACTIVITIES, INCLUDING ADEQUATE PROTECTIVE SYSTEM FOR TRENCHING AND EXCAVATIONS.
7. EMBANKMENT FILL MATERIAL SHALL BE FREE FROM ALL ROOTS, VEGETATION AND OVERSIZED FILL TO BE PLACED IN 8 INCH LIFTS AND COMPACTED TO 95 PERCENT PROCTOR BY MECHANICAL MEANS. FILL TO BE PLACED ON SUITABLE INORGANIC SUB GRADE.
8. ALL DISTURBED AREAS ARE CONSIDERED "STABILIZED" WHEN 80 PERCENT OF UNIFORM, PERENNIAL VEGETATIVE COVER IS ACHIEVED OR EQUIVALENT STABILIZATION MEASURES (SUCH AS MULCHES, EROSION CONTROL BLANKET, ETC.) HAVE BEEN PROPERLY EMPLOYED
9. THERE SHALL BE NO DISCHARGES OF AUTOMOTIVE PRODUCTS OR LUBRICANTS TO THE EXTERIOR OR STORMWATER SURFACES. ALL LUBRICANTS SHALL BE CONTAINED AND PROPERLY RECYCLED AT AN APPROVED FACILITY.

VEHICLE & EQUIPMENT FUELING and WET NOZZLE REPORT:

DESCRIPTION and PURPOSE

VEHICLE EQUIPMENT FUELING PROCEDURES AND PRACTICES ARE DESIGNED TO PREVENT FUEL SPILLS AND LEAKS, AND REDUCE OR ELIMINATE CONTAMINATION OF STORMWATER. THIS CAN BE ACCOMPLISHED BY FUELING IN DESIGNATED AREAS ONLY, IMPLEMENTING SPILL CONTROLS, AND TRAINING EMPLOYEES AND SUBCONTRACTORS IN PROPER FUELING PROCEDURES.

SUITABLE APPLICATIONS

THESE PROCEDURES ARE SUITABLE OR ALL CONSTRUCTION SITES WHERE VEHICLE AND EQUIPMENT FUELING TAKES PLACE.

LIMITATIONS

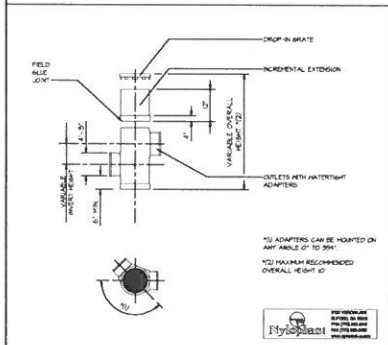
ONSITE VEHICLE AND EQUIPMENT FUELING SHOULD ONLY BE USED WHERE IT IS IMPRACTICAL TO SEND VEHICLES AND EQUIPMENT OFFSITE FOR FUELING.

IMPLEMENTATION

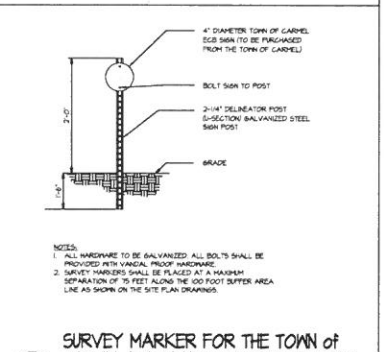
- DESIGNATE "TOPPING-OFF" OF FUEL TANKS.
- ABSORBENT SPILL CLEANUP MATERIALS AND SPILL KITS SHALL BE AVAILABLE IN FUELING AREAS AND ON FUELING TRUCKS, AND SHALL BE DISPOSED OF PROPERLY AFTER USE.
- DRIP PANS OR ABSORBENT PADS SHOULD BE USED DURING VEHICLE AND EQUIPMENT FUELING, UNLESS THE FUELING IS PERFORMED OVER AN IMPERMEABLE SURFACE IN A DEDICATED FUELING AREA.
- USE ABSORBENT MATERIALS ON SMALL SPILLS. DO NOT HOSE DOWN OR BURY THE SPILL. REMOVE THE ABSORBENT MATERIALS PROMPTLY AND DISPOSE OF PROPERLY.
- AVOID MOBILE FUELING OF MOBILE CONSTRUCTION EQUIPMENT AROUND THE SITE; RATHER, TRANSPORT THE EQUIPMENT TO DESIGNATED FUELING AREAS. WITH THE EXCEPTION OF TRACKED EQUIPMENT SUCH AS BULLDOZERS AND LARGE EXCAVATORS, MOST VEHICLES SHOULD BE ABLE TO TRAVEL TO A DESIGNATED AREA WITH LITTLE LOST TIME.
- EMPLOYEES AND SUBCONTRACTORS SHALL BE TRAINED IN PROPER FUELING AND CLEANUP PROCEDURES.
- WHEN FUELING MUST TAKE PLACE OUTSIDE, DESIGNATE AN AREA AWAY FROM DRAINAGE COURSES TO BE USED.
- DEDICATED FUELING AREAS SHOULD BE PROTECTED FROM STORMWATER RUNON AND RUNOFF, AND SHOULD BE LOCATED AT LEAST 50 FEET AWAY FROM DOWNSTREAM DRAINAGE FACILITIES AND WATERCOURSES. FUELING MUST BE PERFORMED ON LEVEL-GRADE AREAS.
- PROTECT FUELING AREAS WITH BERMS AND DIKES TO PREVENT RUNON, RUNOFF, AND TO CONTAIN SPILLS.
- NOZZLE USED IN VEHICLE AND EQUIPMENT FUELING SHOULD BE EQUIPPED WITH AN AUTOMATIC SHUTOFF TO CONTROL DRIPS. FUELING OPERATIONS SHOULD NOT BE LEFT UNATTENDED.
- FEDERAL, STATE AND LOCAL REQUIREMENTS SHOULD BE OBSERVED FOR ANY STATIONARY ABOVE GROUND STORAGE TANKS.

INSPECTION AND MAINTENANCE

- VEHICLES AND EQUIPMENT SHOULD BE INSPECTED EACH DAY OF USE FOR LEAKS. LEAKS SHOULD BE REPAIRED IMMEDIATELY OR PROBLEM VEHICLES OR EQUIPMENT SHOULD BE REMOVED FROM THE PROJECT SITE.
- KEEP AMPLE SUPPLIES OF SPILL CLEANUP MATERIALS ON-SITE.
- IMMEDIATELY CLEAN UP SPILLS AND PROPERLY DISPOSE OF CONTAMINATED SOIL AND CLEANUP MATERIALS

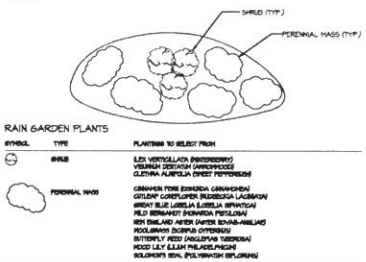


4 'NYLOPLAST' YARD DRAIN DETAIL
IPP-2 N.T.S.



NOTES:
1. ALL HARDWARE TO BE GALVANIZED. ALL BOLTS SHALL BE PROVIDED WITH VANDAL PROOF HARDWARE.
2. SURVEY MARKERS SHALL BE PLACED AT A MAXIMUM SEPARATION OF 75 FEET ALONG THE 100 FOOT BUFFER AREA LINE AS SHOWN ON THE SITE PLAN DRAWINGS.

5 SURVEY MARKER FOR THE TOWN of CARMEL FRESHWATER WETLAND BUFFER
IPP-2 N.T.S.



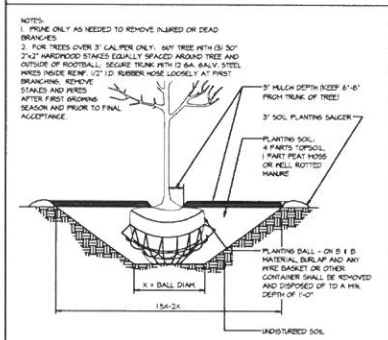
RAIN GARDEN PLANTS

SYMBOL	TYPE	PLANTING TO SELECT FROM
	SHRUB	LEX VERTICILLATA (WINTERBERRY) VIBURNUM DENTATUM (ARROWWOOD) CLETHRA ALNIFOLIA (SWEET PEPPERBUSH)
	PERENNIAL MASS	CALAMAGROSTIS CANADENSIS (BLUEJOINT GRASS) CAREX COMOSA (BRISTLY SEDGE) CAREX GRAYI (GRAY'S SEDGE) CAREX VULPINOIDEA (FOX SEDGE) CHELONE GLABRA (WHITE TURTLEHEAD) CHRYSOPSIS MARIANA (MARYLAND GOLDEN ASTER) ECHINACEA PURPUREA (PURPLE CONEFLOWER) EUPATORIUM PERFOLIATUM (BONESET) EUTHAMIA GRAMINIFOLIA (FLAT-TOP GOLDENROW) GLYCERIA STRIATA (FOWL MANNA GRASS) HELIANTHUS ANGUSTIFOLIUS (SWAMP SUNFLOWER) IRIS VERSICOLOR (BLUE FLAG IRIS) JUNCUS EFFUSUS (SOFT RUSH) LOBELIA CARDINALIS (CARDINAL FLOWER) LOBELIA SIPHILITICA (GREAT BLUE LOBELIA) MONARDA DIDYMA (OSWEGO TEA) PANICUM VIRGATUM (SWITCH GRASS) PENSTEMON DIGITALIS (FOXGLOVE BEARDTONGUE) PHLOX PANICULATA (GARDEN PHLOX) RUDBECKIA FULGIDA (ORANGE CONEFLOWER) SCHIZACHYRIUM SCOPARIUM (LITTLE BLUESTEM) SCIRPUS ATROVIRENS (DARK GREEN BULRUSH) SCIRPUS CYPERINUS (WOOL GRASS) SPOROBOLUS HETEROLEPIS (PRAIRIE DROPSEED) VERBENA HASTATA (BLUE VERVAIN)

RAIN GARDEN ID	AREA (SF)	NUMBER OF GARDENS	# OF SHRUBS PER GARDEN	TOTAL # OF SHRUBS	# OF PERENNIALS PER GARDEN	TOTAL # OF PERENNIALS
RG1	240	1	3	3	40	40

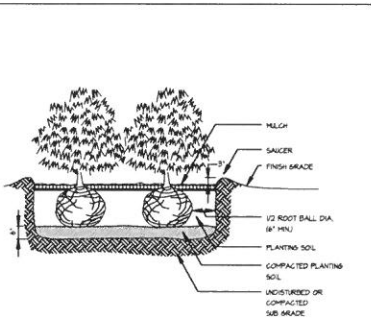
NOTES:
1. FOR RAIN GARDEN LOCATION, REFER TO DRAWING IPP-1. TO DIVERSIFY LANDSCAPE APPEARANCE AND TO PROVIDE PLANTS BEST SUITABLE FOR THE SUN EXPOSURE AT THE SITE, ONLY GENERAL PLANTING INSTRUCTIONS ARE PROVIDED. RAIN GARDEN SHALL HAVE NUMBER OF SHRUBS AND PERENNIAL AS LISTED ABOVE. THE LANDSCAPER WILL BE RESPONSIBLE FOR THE PLANT SELECTION.
2. PLANTS SHALL BE GOWANUS KROPH WITH A WELL ESTABLISHED ROOT SYSTEM.
3. SHREDDED HARDWOOD MULCH SHOULD BE APPLIED UP TO 3" TO KEEP SOIL IN PLACE.

6 RAIN GARDEN PLANTINGS
IPP-2 N.T.S.

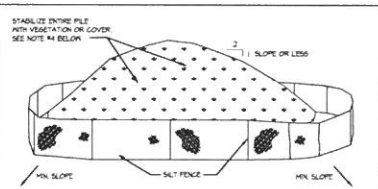


NOTES:
1. PRUNE ONLY AS NEEDED TO REMOVE INJURED OR DEAD BRANCHES.
2. FOR TREES OVER 3" CAL PER ONLY, BUY TREE WITH (3) 30" 2"x2" HARDWOOD STAKES EQUALLY SPACED AROUND TREE AND OUTSIDE OF ROOTBALL. SECURE TRUNK WITH (2 EA. 8-ALY. STEEL WIRES INSIDE REINF. 1/2" I.D. RUBBER HOSE LOOSELY AT FIRST BRANCHING. REMOVE STAKES AND WIRES AFTER FIRST GROWING SEASON AND PRIOR TO FINAL ACCEPTANCE.

7 TREE PLANTING DETAIL
IPP-2 N.T.S.



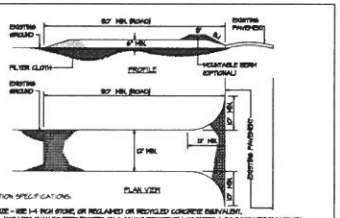
8 SHRUB PLANTING DETAIL
IPP-2 N.T.S.



INSTALLATION NOTES

1. AREA CHOSEN FOR STOCKPILING OPERATIONS SHALL BE DRY AND STABLE.
2. MAXIMUM SLOPE OF STOCKPILE SHALL BE 1:2.
3. UPON COMPLETION OF SOIL STOCKPILING, EACH PILE SHALL BE SURROUNDED WITH SILT FENCING.
4. SPRING/SUMMER/FALL SEEDING: SEED WITH PERENNIAL RYE GRASS @ 40 LBS/AC. STABILIZATION FROM NOVEMBER 1 THROUGH MARCH 31 SHALL BE BY A ROLLED EROSION CONTROL PRODUCT OR MAY BE HYDROSEEDED WITH WINTER RYE WITH A HEAVY MULCH LAYER. RESEED STOCKPILE IN SPRING AS NOTED ABOVE.
5. SEE SILT FENCE DETAIL FOR SILT FENCE INSTALLATION SPECIFICATIONS.

9 TOPSOIL STOCKPILE DETAIL
IPP-2 N.T.S.



CONSTRUCTION SPECIFICATIONS:

1. STONE SIZE - USE 1-4 INCH STONE, OR RECLAIMED OR RECYCLED CONCRETE EQUIVALENT.
2. LENGTH - NOT LESS THAN 50 FEET (EXCEPT ON A SINGLE RESIDENCE LOT WHERE A 30 FOOT MINIMUM LENGTH WOULD APPLY).
3. THICKNESS - NOT LESS THAN SIX (6) INCHES FOR LIGHT DUTY ROADS AND SINGLE FAMILY RESIDENCES, NOT LESS THAN TEN (10) INCHES FOR HEAVY DUTY ROADS.
4. WIDTH - TWELVE (12) FOOT MINIMUM, BUT NOT LESS THAN THE FULL WIDTH AT POINTS WHERE INGRESS OR EGRESS OCCURS. TWENTY-FOOT (24) FOOT IF SINGLE ENTRANCE TO SITE.
5. FILTER CLOTH - WILL BE PLACED OVER THE ENTIRE AREA PRIOR TO PLACING OF STONE. "MIRAFI" 600X, OR APPROVED EQUAL.
6. SURFACE WATER - ALL SURFACE WATER FLOWING OR DIVERTED TOWARD CONSTRUCTION ENTRANCES SHALL BE PIPED BENEATH THE ENTRANCE. IF PIPING IS IMPRACTICAL, A MOUNTABLE BERM WITH 5:1 SLOPES WILL BE PERMITTED.
7. MAINTENANCE - THE ENTRANCE SHALL BE MAINTAINED IN A CONDITION WHICH WILL PREVENT TRACKING OR FLOWING OF SEDIMENT ONTO PUBLIC RIGHTS-OF-WAY. ALL SEDIMENT SPILLED, DROPPED, WASHED OR TRACKED ONTO PUBLIC RIGHTS-OF-WAY MUST BE REMOVED IMMEDIATELY.
8. WASHING - WHEN WASHING IS REQUIRED, IT SHALL BE DONE ON AN AREA STABILIZED WITH STONE AND WHICH DRAINS INTO AN APPROVED SEDIMENT TRAPPING DEVICE.
9. PERIODIC INSPECTION AND NEEDED MAINTENANCE SHALL BE PROVIDED AFTER EACH RAIN.

10 STABILIZED CONSTRUCTION ENTRANCE DTL.
IPP-2 N.T.S.

PUTNAM ENGINEERING, PLLC
ENGINEERS - ARCHITECTS
4 OLD ROUTE 6, BREWSTER, NEW YORK 10509
(845) 279-6784 FAX (845) 279-6764

REVISIONS

NO.	DATE	DESCRIPTION

PROJECT

PLAN PREPARED FOR:
MRS. ANNA INZANO
188 BULLET HOLE ROAD
TOWN OF CARMEL
PUTNAM COUNTY, NY
TAX MAP 63, BLOCK 1, LOT 16.2

DATE	16 JUL 18
PROJECT MANAGER	PML
DRAWN BY	BG
CHECKED BY	PML
SCALE	AS NOTED

DRAWING: INTEGRATED PLOT PLAN DETAILS and NOTES

PROJECT NUMBER: 8321
DRAWING NUMBER: IPP-2
SHEET 2 OF 2

PUTNAM ENGINEERING, PLLC.
Engineers and Architects

STORMWATER MANAGEMENT REPORT

AND

STORMWATER POLLUTION PREVENTION PLAN

SUBDIVISION LOT 2
OF
JOHN JORDANO SUBDIVISION
BULLET HOLE ROAD

Town of Carmel, NY
Tax Map 63.-1-16.2

Owner/Applicant

ANNA INZANO

188 Bullet Hole Road
Mahopac, NY 10541

JULY 2018

P8327

4 Old Route 6, Brewster, New York 10509 • (845) 279-6789 • Fax (845) 279-6769

TABLE OF CONTENTS

I. BACKGROUND INFORMATION

A. HISTORY:

On 7/2/2004, Mr. John Jordano and his wife, Michelle Gervasi, filed a subdivision application through their engineer with the Town of Carmel Planning Board. The applicants owned a 26.85 acre parcel located off Bullet Hole Road in Mahopac, Town of Carmel. Jordano/Gervasi sought to break off a 4.71 acre parcel thus creating a 2-lot subdivision.

A request was made to the Town of Carmel for permission to perform deep hole testing with the Putnam County Health Department. Applicants need to receive approval by the Town of Carmel in order to do any testing with the PCHD. A sketch subdivision plan dated April 29, 2004 was used to indicate where the applicant's engineer wanted to test.

Mr. David Klotzle, Town of Carmel Wetland Inspector, performed a site inspection, and in a memo written to Peggy Moore (Planning Board Secretary, ECB Secretary, ZBA Secretary) dated July 26, 2004, stated:

"There are streams and associated wetlands on lot 2 of this subdivision. The proposed septic, driveway and house site are located just outside these areas so no permit is required at this point. However, any changes to the present (April 24, 2004) plan may require permits."

When a zoning variance is required in the Town of Carmel, the Planning Board has historically denied the application and referred the applicant to the ZBA. The board votes to deny, and then they stamp the drawing in order for the applicant to appear before the ZBA.

At the August 11, 2004 meeting for sketch plan review, Board Member Emma Kounine stated, "she did not think the Board should deny to the ECB or the ZBA." She said her concern is the driveway. She asked why it is reverse of the norm. She said she would like to know before sending the applicant for any other approvals.

From this point forward, there is never a mention of referring the project to the ECB or that the projects needs a wetland permit.

At the November 17, 2014 Planning Board Meeting, the application was denied, and the applicant was sent to the ZBA to obtain whatever variances were needed. Those variances were granted by the ZBA.

On May 4, 2005, the Planning Board granted sketch plan approval for the project. The only technical comments were from Mr. Karell who was the town engineer. He said there were a few comments left (from previous reviews) and that they were minor. The project was designated a minor subdivision, and a public hearing was set.

At the June 1, 2005 meeting, the Planning Board voted on a negative declaration for the SEQR determination. Resolution #05-26 was approved. The Board went on to approve the subdivision resolution #05-27 at the same meeting. The Negative Declaration Notice of Determination of Non-Significance contains notes 7 and 8, which are copied below:

7. The proposed development will result in the creation of new impervious surfaces. A storm water management plan utilizing Best Management Practices has been prepared in support of this action, which will maintain the current rate of runoff from the site. Therefore, no negative environmental impacts are anticipated as a result of the proposed storm water management system.

8. Limited construction or site modification associated with the subdivision will occur within the wetland setback located on the site. Any potential impacts will be mitigated through the storm water management plan and wetland mitigation. It can, therefore, be concluded that because no significant activities occur within the regulated area, no negative impacts are anticipated to wetland resources.

The above two bullets from the resolution reference a storm water management plan and wetland mitigation. No such plan or mitigation was found in the Planning Board file. Furthermore, there is no Environmental Conservation Board file for this action, as no application was ever made to that Board.

Anna and Mario Inzano purchased the property from Serg Inc., 35 Brett Road, Carmel, NY, on June 26, 2017. When they purchased the property, the driveway had been cut in and a drainage swale along with a 15" HDPE pipe installed. The septic fill pad had also been installed.

Jordano and Gervasi posted a $48,300 cash bond with the Town of Carmel in 2004 as part of the conditions of the subdivision approval. The bond was to cover the installation cost of installing drainage swales, pipe and paving the "common driveway" portion of lot #1. The driveway was to be widened to a 15 foot width.

On July 15, 2015, the Jordano/Gervasi's attorney wrote the Town of Carmel seeking to have the bond returned. The Town of Carmel Engineering Department performed a site inspection, and on July 29, 2015, agreed to a reduction of the bond citing completion of some portions of the work. It should be clear that whatever work was done was within the wetland buffer, and no wetland permit existed at that time thus violating town ordinance.

When the Inzano's purchased the property in June 2017, they were told all of the approvals were in place and proceeded to clear the balance of the lot. A notice of violation was issued by the Town of Carmel and the NYC DEP.

B. PROJECT DESCRIPTION:

This is lot #2 of a two-lot subdivision that was filed with the Putnam County Clerk's office and identified as F.M. #3015. The property is 26.85 acres and is located on the west side of Bullet Hole Road. There is a common driveway with lot #1 for the first 350 feet. Lot #2 has an access easement to use this portion of the driveway.

The driveway into lot #2 was cleared and rough-graded by the original property owners (Jordano/Gervasi), and drainage improvements installed, including a drainage swale and 15" HDPE culvert. This work was done within the 100 foot wetland buffer and done without having a wetland permit.

The property slopes upward from Bullet Hole Road. The house location is situated on a slope ranging between 10 and 12 percent. The subsurface sanitary treatment system (SSTS) is located 50 feet behind the house, which is the minimum separation distance allowed by the PCHD when the SSTS is upgradient of the dwelling and in direct line of flow.

Behind the SSTS, the land becomes much steeper and is in the 30 percentage range. There are local wetlands approximately 400 feet beyond the SSTS that have formed just east of a naturally occurring saddle. Runoff drainage from the wetlands flow east-southeast and joint a stream that is located along the eastern property line.

The stream along with locally flagged wetlands exist along the eastern side of the property, and portions of the original approved driveway are located within the 100 foot wetland buffer area. The NYCDEP has flagged the wetland resulting in a shift of the wetland, encroaching farther west (into the lot). The Town regulated wetland was shown on the filed map, yet no discussion of it was recorded in any Planning Board minutes, and no referral to the Carmel ECB was ever made by the Planning Board. The Town of Carmel's negative declaration for SEQR determination (2005) references a stormwater management plan and wetland mitigation. Neither of these documents could be found.

This report has been developed to address the stormwater management/treatment and erosion and sediment control aspects of constructing the proposed single family residence and driveway. This report will address the pre and post construction activities in order to mitigate potential stormwater quality impact to the stream and any downstream wetland areas.

The proposed development has resulted in 2.3 acres of disturbance on lot #2 with 0.42 acres located in the wetland buffer; 0.30 acres will be restored as wetland buffer by replanting the disturbed area with native tree saplings found on the property.

The proposed development will result in approximately 0.045 acres of impervious surface.

Construction of the project shall begin immediately after receiving approval from all involved agencies, which is anticipated to be this fall and completed by spring 2019.

C. PROPOSED FUTURE (DEVELOPMENT) CONDITIONS:

It is proposed to construct a single family residence with an individual subsurface sewage treatment (SSTS) and individual well. The driveway leading from the common drive to the house will be gravel.

Stormwater runoff from the site will be directed upgradient of the SSTS system and directed to the stream/drainage course located on the east side of the property.

The 1953 sf of impervious area of the house (footprint) and the walkway will drain to a proposed rain garden. Portions of the gravel driveway will be directed to and flow in a grass swale. The balance of the driveway will drain to/through the wetland buffer. The wetland buffer will function as a filter strip.

II. STORMWATER MANAGEMENT, TREATMENT AND CONVEYANCE

A. STORMWATER MANAGEMENT AND TREATMENT:
Stormwater runoff from the impervious surfaces will be treated by a rain garden (2) and its proposed infiltration. Detail design of the treatment is available in Appendix C.

B. STORMWATER CONVEYANCE SYSTEM:
Stormwater is conveyed by using combination of sheet flow, shallow concentrated flow, swales and pipes. SCS TR-20 Method as part of HydroCAD software is used to estimate runoff for this project.

III. EROSION AND SEDIMENT CONTROL

An Erosion and Sediment Control Plan is developed for this project to provide runoff control, soil stabilization and sediment control at the site both during and after the construction activities. Some proposed practices are for temporary use while others are meant to provide permanent protection to the site.

Each practice proposed for this project will aim to provide at least one of the three goals as stated above. Please refer to the construction drawings for location and details of proposed erosion and sediment control practices.

A. TEMPORARY MEASURES:

Stabilized Construction Entrance: Stabilized construction entrance is an aggregate pad with geotextile fabric underneath. The pad is located at access point to the site. Its' primary function is to prevent sediment tracing of vehicle onto the public right of way.

Silt Fence: Silt fence is a geotextile barrier, which is installed downhill of a small disturbed area for sediment control. The fence will intercept and reduce runoff velocity; sediment will settle behind the fence.

Temporary Swale: A temporary swale is an excavated drainage way for temporary interception of sediment laden runoff. Sediment laden runoff will be discharged into a sediment trapping practice.

Temporary Critical Area Planning: Disturbed area and bare ground surface are susceptible to erosion. Whenever soils are exposed and a permanent vegetative cover cannot be provided in time, the exposed area shall be protected by using temporary planning.

B. PERMANENT MEASURES:

Topsoil: This practice involves the spreading of topsoil materials on graded area for establishing vegetative coverage to stabilize the soil and reduce erosion.

Mulching: This is the application of course plant residue, chips or other suitable material over newly seeded soil surface or around newly planted plants.

Permanent Critical Area Planting: Establishment of permanent vegetative cover at project site over graded, disturbed or exposed bare soil area. Seed mix shall be chosen per intended use of the proposed planting area and per actual site soil condition. Project specific landscaping plan may call for planting of shrubs and trees for additional aesthetic value and erosion protection. Permanent seeding/planting is time specific; temporary planting shall be used until permanent planting can be performed.

Grass Waterway: Swales are stabilized by establishing suitable vegetative cover in the flow channel to provide erosion protection. Liners may be used in addition to the grass cover for additional channel stability.

Rock Outlet Protection: This practice is the use of a rock apron at the discharge end of pipes, culverts or channels to reduce the flow velocity and prevent erosion of downstream area.

IV. MAINTENANCE RESPONSIBILITIES OF STORMWATER AND EROSION AND SEDIMENT CONTROL FACILITIES

Temporary and permanent measures shall be maintained by project owner/developer or a designated representative (such as the general contractor) during the entire construction period. After the construction is completed, permanent measures shall be maintained by the current property owner or their successor.

Owner: Mrs. Anna Inzano

188 Bullet Hole Road

V. LIST OF PERMITS, APPROVALS AND EXPIRATION DATES

NYCDEP	--	Individual Residential Stormwater Permit	Pending
		Subsurface Sewage Treatment System	Approved
Putnam County Dept. of Health	–	Subsurface Sewage Treatment System	Approved
Town of Carmel ECB	–	Wetland Permit	Pending

VI. CONCLUSION

The proposed action is a small single family residential project on an existing 4.71 acre lot. Even though the lot is large, the only developable area is in close proximity to Town of Carmel wetland and other site restrictions have limited the stormwater BMPs that are suitable for this project. The proposed rain garden, grass swales and vegetating previously bare soil shall be adequate to mitigate the potential impact on stormwater quality to the furthest practical extent with minimum amount disturbance to the project parcel and still provide acceptable tolerance to other site restrictions.

VII. SEQUENCE OF CONSTRUCTION

A. GENERAL NOTES:

1. The site shall be disturbed only where necessary. Only the smallest practical area of land shall be exposed at any one time during development. When land is exposed, the exposure shall be kept to the shortest practical period of time by immediate stabilization per the stabilization notes, unless otherwise specified. All disturbed areas are considered "stabilized" when 80% OF uniform, perennial vegetative cover is achieved or equivalent stabilization measures (such as mulch, erosion, blanket, etc.) have been properly employed. No work shall continue before prior disturbance is stabilized.
2. Wherever feasible, natural vegetation shall be retained and protected.
3. The project owner/developer or designated representative shall arrange a pre-construction meeting inviting all involved review agencies of record prior to start of construction activities.
4. Temporary measures shall be maintained by project owner/developer or a designated representative (such as the general contractor) during the entire construction period. After the construction is completed, permanent measures shall be maintained by the property owner(s). Legally binding

documents shall be included with the sale of the property (properties) to ensure future owner(s) maintain the stormwater facilities.

Owner: Mrs. Anna Inzano
188 Bullet Hole Road
Mahopac, NY 10541

5. The project owner/developer or designated representative shall retain the service of qualified personnel (Licensed Professional Engineer, Certified Professional in Erosion & Sediment Control-CPESC or Soil Scientist) to perform site inspections during the construction period.
6. The contractor shall make available on site all equipment, materials and labor necessary to effect emergency repair and replacement of the erosion control measures.
7. Site inspections during construction period shall be performed at least every 7 calendar days and within 24 hours of a storm event of 0.5 inches or greater. During winter, if the soil disturbance is completely suspended and the site is properly stabilized, inspection frequency may reduce, but shall maintain a minimum of monthly inspections in all situations (even where there is a total winter shutdown). During periods of reduced inspection frequency, inspections must still be done after every storm event of 0.5 inches or greater. To be allowed to reduce inspection frequencies, the operator must complete stabilization activities (perimeter controls, traps, barriers, etc.) before proper installation is precluded by snow cover or frozen ground. If vegetation is desired, seeding, planting and/or sodding must be scheduled to avoid die-off from fall frosts and allow for proper germination.
8. The contractor is responsible for controlling dust by sprinkling exposed areas periodically with water.
9. The project owner/developer or designated representative shall keep inspection reports and logs at the site. A summary of inspection activities shall be posted at a publicly accessible area of the site on a monthly basis.

B. SEQUENCE OF CONSTRUCTION:

Total Area of Disturbance – 2.30 acres.

In order to effectively control erosion and sediment, contractor shall adhere to the location, materials and procedures shown on the IPP Plan.

1. Survey and stake out proposed house, driveway and stormwater BMP locations.
2. Install stabilized construction entrance.
3. Maintain silt fence immediately downgrade of areas of proposed disturbance and where indicated on plan. All silt fences to be installed parallel to contours.
4. Strip and stockpile topsoil from the cleared area and store at the topsoil stockpiles as shown on the plan.
5. Complete rough grading at site. Fill to be placed.

APPENDIX A
DRAINAGE AREA MAP

(Q:R8327)

APPENDIX B
HYDROCAD WORKSHEETS

(Q:R8327)

APPENDIX C
SUPPORTING INFORMATION

APPENDIX D
JORDANO/GERVASI SUBDIVISION INFORMATION