



– *BELL POND DAM* –

VISUAL INSPECTION REPORT



Dam Name: Bell Pond Dam

CTDEEP ID#: 15907

Owner: Town of Wethersfield

Town: Wethersfield, Connecticut

Consultant: GZA GeoEnvironmental, Inc.

Date of Inspection: September 27, 2016





Proactive by Design

GEOTECHNICAL
ENVIRONMENTAL
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WATER
CONSTRUCTION
MANAGEMENT

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April 11, 2017
GZA File No. 05.0045906.00

Mr. Derrick Gregor
Town Engineer, Town of Wethersfield
505 Silas Deane Highway
Wethersfield, Connecticut 06109

Re: Visual Inspection Report
Bell Pond Dam
CTDEEP # 15907

Dear Mr. Gregor:

In accordance with our proposal dated August 28, 2015 and our Notice to Proceed dated July 21, 2016 attached to the Town of Wethersfield Purchase Order Number: 20166877-000, GZA GeoEnvironmental, Inc. (GZA) has completed a visual inspection of the Bell Pond Dam located in Wethersfield, Connecticut. Our site visit was performed on September 27, 2016 by Matthew A. Taylor, P.E., David M. Barstow, P.E., and Anthony Trani of GZA GeoEnvironmental, Inc. (GZA) and Don Moisa of Town of Wethersfield.

The purpose of our efforts was to assess the current condition of the dam and to prepare an updated, formal Regulatory Inspection of the dam in accordance with the State of Connecticut Department of Energy and Environmental Protection (CTDEEP) Dam Safety Regulation 22a-409, pertaining to inspection frequency. Our services and report are subject to the Limitations found in **Appendix D**.

Bell Pond Dam is currently classified in the CTDEEP dam inventory as **Class BB (Moderate) Hazard Potential** dam. Based on our visual inspection, the dam has been judged to be in **POOR** condition, in GZA's opinion. Refer to Appendix A for the condition rating definitions as per the Connecticut Dam Safety regulations. At the time of the inspection, the weather was cloudy with a temperature of approximately 65° Fahrenheit.

A further discussion of our evaluation and recommended actions are presented in the attached Inspection Report, which includes: (a) CTDEEP Dam Inspection Form; (b) Limitations; (c) Photo Log and Photo Location Plan; and (d) Historic Drawings.

The primary deficiencies at the dam observed during our visual inspection include, but are not limited to, the following:



1. Poor condition of the auxiliary spillway including settlement and cracking of the auxiliary spillway concrete cap, missing stone masonry/voids, apparent displacement/movement of the downstream mass concrete repair.
2. Unknown conditions at the intake and outlet works structures and gate valve;
3. Deteriorated concrete at the former turbine housing structure.
4. Excessive vegetation, brush and tree growth on the auxiliary spillway and upstream slope of the dike that prevent visual observations of the dam; and
5. Possible need to increase the CT DEEP Hazard Classification of the dam based on downstream impacts resulting from a hypothetical dam breach scenario.

The "Poor" Condition rating for the dam has been concluded by GZA because significant dam rehabilitation is required to bring the dam into proper working order and in compliance with the dam safety regulations. GZA has recommended a more detailed evaluation, commonly referred to as a Phase II Evaluation, to complete the necessary engineering analysis and gather additional site specific information that is needed to develop and evaluate rehabilitation alternatives.

With respect to the dam's hazard classification, it appears that if there was an uncontrolled release from the (i.e. breach), water from the impoundment would flow into the Goff Brook downstream area, and potentially damage the residences at 44 and 36 Bell Pond Drive and Maple Street (Route 3). As such, in accordance with the CT DEEP Dam Safety Regulations, Bell Pond Dam appears to meet the criteria for classification as a **Class B (significant)** or possibly **Class C (high)** hazard potential dam. A detailed hydrologic and hydraulic analysis is required to determine the impact of a dam breach to determine the appropriate hazard class for the dam, in GZA's opinion.

It is critical to note that the condition of the dam depends on numerous and constantly changing internal and external conditions and is evolutionary in nature. It would be incorrect to assume that the present condition of the dam will continue to represent the condition of the dam at some point in the future. Only through continued care and inspection can unsafe conditions be detected.

GZA GeoEnvironmental, Inc. will submit one bound color copy of the final inspection report to the Inland Water Resources Division of CTDEEP. An electronic copy of the complete report in unlocked, searchable PDF format, using the latest CTDEEP prescribed format will also be sent to the CTDEEP.



We are happy to have been able to assist you with this inspection. Please contact the undersigned if you have any questions or comments regarding the content of this Inspection Report.

Sincerely,

GZA GeoEnvironmental, Inc.

A handwritten signature in blue ink, appearing to read "D. Barstow".

David M. Barstow, P.E.
Sr. Project Manager

A handwritten signature in blue ink, appearing to read "Peter H. Baril".

Peter H. Baril, P.E.
Consultant/Reviewer

A handwritten signature in blue ink, appearing to read "M. Taylor".

Matthew A. Taylor, P.E.
Principal-in-Charge

Enclosures:

CTDEEP Dam Inspection Report Form

Appendices

- A. Overall Dam Condition Selection Standards
- B. Hazard Classification of Dams
- C. Photo Location Plan and Photo Log with Site Sketch
- D. Limitations
- E. Historic Drawing



**Connecticut Department of
Energy & Environmental Protection**
Bureau of Water Protection & Land Reuse
Inland Water Resources Division



DAM SAFETY PROGRAM DAM INSPECTION REPORT FORM – FOR REGULATORY INSPECTION

Please complete this form in accordance with the instructions (DEEP-DAM-INST-002).

Part I: Summary of Dam Inspection

Dam Name:	Bell Pond Dam	Inspection Date(s):	9/27/2016
Alternate Dam Name(s):	Chester Mill Dam	CT Dam ID #:	15907
Location (Municipality):	Wethersfield	Temperature / Weather:	60-70°F /Cloudy
Registered?: Yes or No If yes, provide the 9 digit registration number found on the notification letter.	Yes – Number Unknown	Pool Level: See Instructions	1 to 2 inches above the primary spillway
Emergency Action Plan?: Yes or No If Yes, see instructions	No	Impoundment Use: use options listed in instructions	Recreational
Hydraulic and Hydrologic Analysis?: Yes or No If Yes, see instructions	Yes (1981)	Stability Analysis?: Yes or No If Yes, see instructions	No
Overall Condition: (refer to Appendix A located at the end of this form) Poor			

Persons present at the inspection <i>(select the tab button in the last cell to the right to create another row)</i>		
Name	Title/Position	Representing
Matthew Taylor, P.E.	Associate Principal	GZA GeoEnvironmental, Inc.
David Barstow, P.E.	Project Manager	GZA GeoEnvironmental, Inc.
Anthony Trani	Assistant Project Manager	GZA GeoEnvironmental, Inc.
Don Moisa	Operations Coordinator	Town of Wethersfield

Owners and Operators: If there is more than one owner or operator, copy the empty table below for each owner or operator and paste right below the previous table, then complete the information for each

*By providing this e-mail address you are agreeing to receive official correspondence from DEEP, at this electronic address, concerning the subject report. Please remember to check your security settings to be sure you can receive e-mails from ".ct.gov" addresses. Also, please notify DEEP if your e-mail address changes by email via deep.damsafety@ct.gov.

Indicate if Owner or Operator: Owner

Name: Town of Wethersfield (Contact: Jeff Bridges, Town Manager)

Mailing Address: 505 Silas Deane Highway

City/Town: Wethersfield

State: CT

Zip Code: 06109

Phone: (860) 721-2801

ext.: ---

Emergency Phone: ---

***E-mail: jeff.bridges@wethersfieldct.gov**

Part II: General Dam Information

General Description: The total length of Bell Pond Dam is 112 feet which includes the primary spillway and auxiliary spillway. The maximum height of the dam is 21 feet. The primary and auxiliary spillway are constructed with stone masonry with a 6-foot wide concrete cap at the top (curved, uncontrolled, broad crested weirs) and both appear to be founded on bedrock. The primary spillway is approximately 60-feet-long and has a splash apron at the base. There is also a 70+/- foot long, upstream earthen dike located to the left of the dam. The dike is up to about 4 feet high.

The auxiliary spillway is about 50-feet long and its crest is about six inches higher than the primary spillway. The auxiliary spillway has a downstream stone masonry retaining wall that is perpendicular to the dam, about 12-feet long, and located about 12 feet right from the auxiliary and primary spillway connection. An apparent repair consisting of mass concrete is located downstream of the auxiliary spillway crest, to right of the referenced retaining wall and extends across the entire downstream face of the auxiliary spillway. Refer to Site Sketch, Figure 3.

The intake/outlet works at the dam are not well understood based on the limited available information. Per the Sheet C-2 – Site Plan – prepared by Maguire Group, Inc., dated March 11, 2002, the dam has an intake structure located about 40 feet upstream of the left abutment of the primary spillway. The Intake Structure is connected via an unspecified conduit to a “Concrete Valve Chamber” located on the upstream slope of the earthen dike, approximately 7 feet upstream of the left abutment of the primary spillway. The structure houses a 15-inch CIP pipe with an undefined valve. (Note the Bell Pond Dam Topographic Survey – prepared by Town of Wethersfield, dated March 21, 2001 called out the 15-inch pipe as CMP). The 15-inch conduit then extends through the left abutment of the primary spillway via a former penstock that is called out as being 36-inch diameter steel pipe. (Note the 1981 USACE Phase I Report calls out the former penstock as being 24-inch diameter). The 36-inch pipe extends into the “former turbine housing” or “Alcove” downstream of the left abutment of the primary spillway.

The left upstream dike is an approximately 70-feet long earthen embankment. The dike connects the former turbine housing structure and existing topography at the abutment contact to the north. The auxiliary spillway meets the existing topography at the right abutment contact and there is no right embankment. The impoundment is used for recreation.

Water discharges over the spillway into Goff Brook which is lined with rip-rap immediately downstream of the dam. A 105-foot long cast-in-place concrete retaining wall is located on the left side of the downstream channel, beginning at the former turbine housing structure.

Hazard Classification:	BB	Dam Height (ft):	21
Dam Length (ft):	180+/-	Spillway Length (ft):	112 (includes auxiliary spillway)
Spillway Type:	Curved, Uncontrolled Broad Crested Weir	Normal Freeboard (ft):	4
Drainage Area (square miles):	5.63 (3,600-acres)	Impoundment Area (at principal spillway crest, in acres):	2.5

Watercourse(s): Spillway discharges to Goff Brook

OTHER INFORMATION: The information presented in the table above was obtained from a CTDEEP Dam Registration Form and from direct observation. Elevations included in this inspection report are in reference to the Compass Geodetic Services datum (CGS).

A series of six (6) dams are located on the upper watershed of Goff Brook. The dams are listed in descending order from upstream to downstream: 1860 Reservoir Dam (Hazard Class A), Murphy Pond Dam (Hazard Class A), Griswold Pond Dam (Hazard Class A), Mill Woods Park Pond Dam (Hazard Class A), Mill Woods Park Swimming

Pond Dam (Hazard Class A) and Bell Pond Dam (Hazard Class BB). The Town of Wethersfield is the owner/operator for each of these dams on Goff Brook.

Several documents were available at either the Connecticut Department of Energy and Environmental Protection (CTDEEP) or in the Town of Wethersfield files for Bell Pond Dam. Below is a review of pertinent files.

The earliest records of repairs to the dam was in the early 1970's. Within the 1981 US Army Corps of Engineers Phase I Inspection report, dated 1981 was a plan entitled "Restoration of Chester Mill Dam- dated July 8, 1971". It is not clear who the engineer was, however, the plan is stamped as "Approved by the State of Connecticut – Water Resources Commission – dated August 26, 1971. The repairs included: pouring concrete along the downstream toe of the primary spillway to fill voids/scoured area, replace missing stones and repoint as needed on the downstream face of the dam, remove and reset the upper 4 courses of masonry stones, install a 6-ft wide concrete cap on top of the primary and auxiliary spillway, add a perpendicular retaining wall on downstream side of the auxiliary spillway bank backfill between an existing perpendicular wall and the downstream face of the auxiliary spillway with mass concrete, and fill a 36-inch diameter penetration on the downstream face of the primary spillway, approximately 51 feet to the right of the left abutment. These improvements appeared to have been constructed.

July 10, 1981 Phase I Inspection Report –At the time, the impoundment was reported to be filled with sediment. In 1980, the upstream gate had been operated to lower the pond and a bituminous coating was applied seven to ten feet upstream of the primary spillway face in an attempt to reduce seepage through the stone masonry portion of the dam. Per the H&H calculations included, the spillway can pass 25% of the probable maximum flood (2,130 cfs) without overtopping the earthen embankment, which the Corps indicated was comparable to the 100-year flood. A dam failure analysis using the "Rule of Thumb" guidance from the Army Corps of Engineers indicates Bell Pond Dam was a low hazard dam. This rating is given because "loss of life would be unlikely and only minimal economic loss would be anticipated."

September 10, 1997 DEP/Inland Water Resources Division Dam Inspection Checklist – At the time of this inspection, the dam was reported to be in Fair condition. Woody debris including trees was reported on the left embankment. No animal burrows or erosion were observed. Small voids were reported in the masonry dam and some seepage was noted through the downstream face at several locations.

The auxiliary spillway had displaced masonry stones and a void was noted on its downstream face. The cap on the auxiliary spillway was reported to have settled and leakage and was observed to be flowing underneath the cap in this area. Sandbags were reported to be in-place upstream of the auxiliary spillway; they apparently had been in place for several years. In addition, the mass concrete repair located immediately downstream of the auxiliary spillway was reported to be undermined and had apparently pulled away from the downstream face of the auxiliary spillway structure.

Spalling was reported on the former turbine housing structure and many cracks were also observed with signs of apparent settlement/movement. The stone masonry near the metal, (diameter unspecified) penstock or outlet was reported to be poor condition and needed replacement. Per this inspection report, the Bell Pond Dam is upstream of Maple Street and moderate economic loss would likely occur if the dam were to fail. As such, the dam was assigned a Class BB hazard rating.

May 8, 2003 CTDEEP Permit - This permit was prepared for proposed repairs to Bell Pond Dam as described in application #DS-02-17 prepared by the Maguire Group Inc. and includes plans entitled "Millwoods Park, Modifications to Bell Pond Dam" dated April 22, 2003. Repairs were to include repair to failed portion of the auxiliary spillway, downstream retaining walls, replace the upstream valve on the 15-inch conduit with a new sluice gate, and installing riprap for scour protection. The application includes H&H calculation that showed the dam has a 3,000+ cubic feet per second (cfs) spillway capacity (primary and auxiliary combined) and the peak discharge flow rate during the 100-year flood was reported to be 532.5 cfs. Although the permit was granted, it does not appear that these repairs were performed.

References

"Connecticut River Basin, Wethersfield, Connecticut, Bell Pond Dam, CT 01659, Phase I Inspection Report, National Dam Inspection Program", by Purcell Associates, dated July 10, 1981

"DEP/Inland Water Resources Division Dam Inspection Checklist" State of Connecticut, Department of Environmental Protection, Inland Water Resources Division, September 10, 1997

Bell Pond Dam

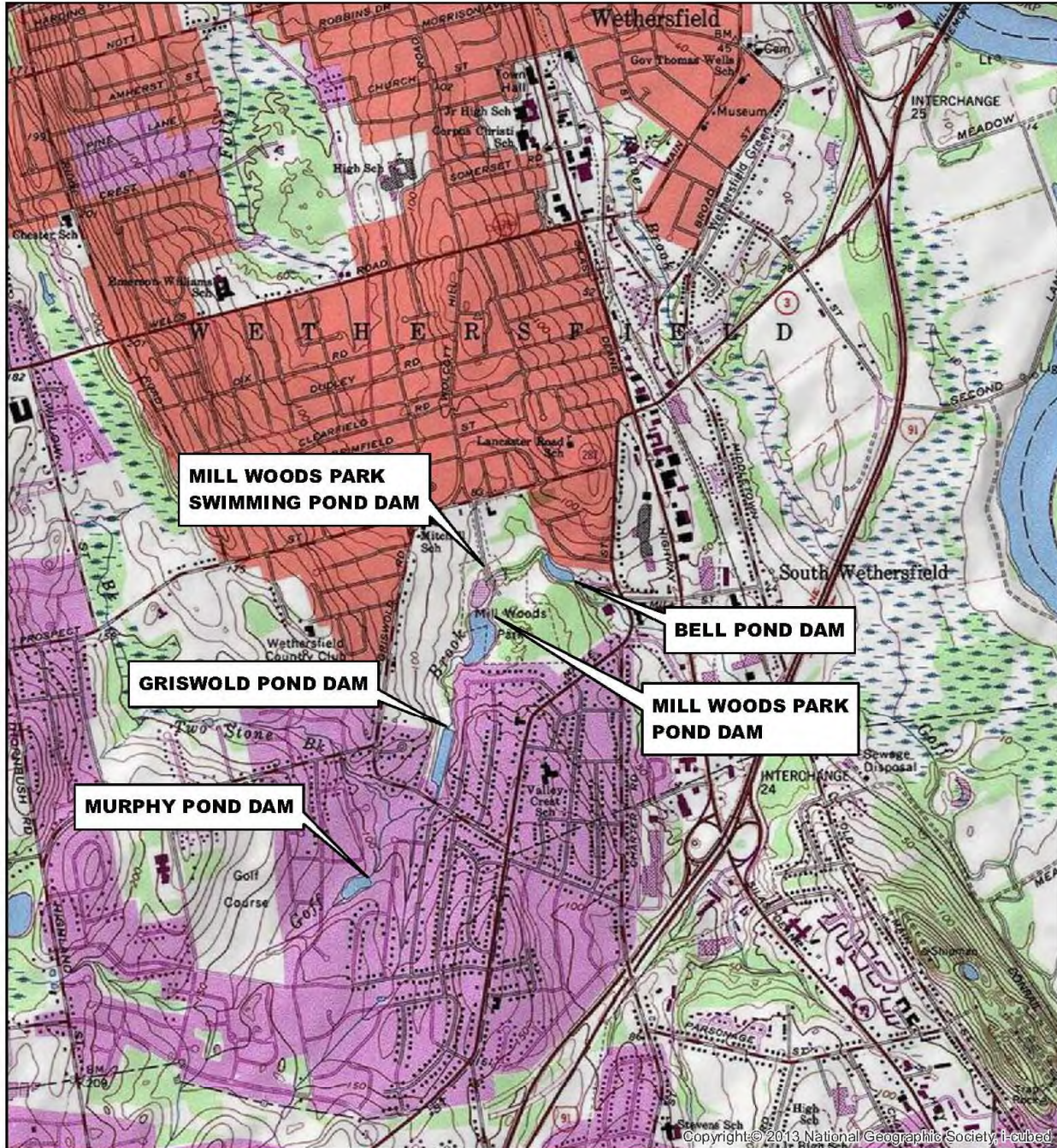
Dam ID# 15907




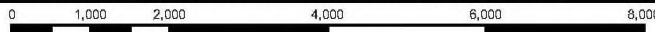
September 27, 2016

"CTDEEP Permit Application Transmittal Form", State of Connecticut, Department of Environmental Protection, September 12, 2002




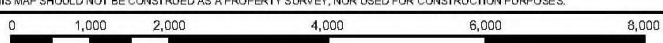
Rocque, Jr., Arthur, "Permit, Permit No.: DS-02-17, CT Dam Inv. No.: 15907, Town: Wethersfield", State of Connecticut, Department of Environmental Protection, May 8, 2003

Part III: Aerial Photo/Location Map



 <p>GZA GeoEnvironmental, Inc. Engineers and Scientists www.gza.com</p>  <p>USGS 7.5 MINUTE QUADRANGLE BASE MAP: HARTFORD SOUTH, CONNECTICUT 1997</p>	<p>BELL POND DAM LOCUS</p>			
	<p>WETHERSFIELD, CONNECTICUT</p>			
	<p>Source: TOPOI maps are USGS topographic maps. Copyright: © 2011 National Geographic Society, i-cubed and are provided by argisonline.com.</p>			
	<p>PROJ MGR: DMB</p>	<p>REVIEWED BY: MAT</p>		<p>PROJECT NO. 05.0045906.00</p>
	<p>DESIGNED BY: AJT</p>	<p>DRAWN BY: MJS</p>		<p>DATE: SEPTEMBER 2016</p>
<p>THIS MAP HAS BEEN COMPILED FROM OTHER MAPS AND/OR SOURCES OF INFORMATION. THIS MAP SHOULD NOT BE CONSTRUED AS A PROPERTY SURVEY, NOR USED FOR CONSTRUCTION PURPOSES.</p>			<p>FIGURE 1</p>	
 <p>Scale in Feet</p>				
<p>© 2016 - GZA GeoEnvironmental, Inc. J:_45,500-45,999\45906.h06 Town of Wethersfield\45906-00.dmb\GIS\mxd\LOCUS BELL PND.mxd, 12/5/2016, 1:09:27 PM, max.strubel</p>				



 <p>GZA GeoEnvironmental, Inc. Engineers and Scientists www.gza.com</p>  <p>USGS 7.5 MINUTE QUADRANGLE BASE MAP: HARTFORD SOUTH, CONNECTICUT 1997</p>	<p>BELL POND DAM AERIAL PHOTOGRAPH</p>		
	<p>WETHERSFIELD, CONNECTICUT</p>		
	<p>Source: Imagery provided by arcgisonline.com.</p>		
	<p>PROJ MGR: DMB DESIGNED BY: AJT</p>	<p>REVIEWED BY: MAT DRAWN BY: MJS</p>	
<p>THIS MAP HAS BEEN COMPILED FROM OTHER MAPS AND/OR SOURCES OF INFORMATION. THIS MAP SHOULD NOT BE CONSTRUED AS A PROPERTY SURVEY, NOR USED FOR CONSTRUCTION PURPOSES.</p>			<p>FIGURE 2</p>
 <p>Scale In Feet</p>			

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Part IV: Dam/Embankment/Dike Information

Number of Dam/Embankments/Dikes: (1) One

Dam/Embankment/Dike Name (see instructions): Dike

General Description: The dike consists of an approximately 70-foot long earthen embankment on the left side of the spillway. The crest of the dike is about 4-feet wide and is at about Elevation 62 feet (Datum: CGS) which is about 4 feet above the crest of the primary spillway. The upstream slope has a 2 horizontal to 1 vertical (2H:1V) slope with brush and oversteep areas due to wave action/erosion. The crest and downstream slope are part of the lawn for the 44 Bell Pond Drive residence to the east. The downstream slope of the dike is relatively flat and slopes down to towards the 44 Bell Pond Drive residence.

General Condition: Fair (U/S) to Good (Crest and D/S)

Concrete Condition: N/A

Stone Masonry: N/A

Settlement/Alignment/Movement: None observed

Seepage/Foundation Drainage: None observed

Riprap: None observed (although the 1981 Phase I report indicated the upstream slope used to be protected with 3 to 6 inch riprap)

Erosion/Burrows: Several animal burrows measuring 3-inches in diameter and up to 6-inches deep were observed on the upstream slope. Erosion was observed on the crest, upstream and downstream slope at the dike contact with the former turbine housing structure.

Vegetative Cover: The downstream (southern) portion of the upstream slope is covered with dense brush and vegetation. Additionally, several mature trees (up to 12-inch diameter), brush and oversteep areas with bare soils were observed on the upstream slope. The crest and the downstream slope are maintained grass (lawn). An 18- to 24-inch-diameter stump and roots system was observed at the right contact near the former turbine housing structure.

Other: Tree roots at the surface were observed on the crest of the dam.

Photos/Graphics/Sketches: See Parts XIII and XIV below.

Part V: Principal Spillway, Training Walls, Apron

Number of Principal Spillways: (1) One

Spillway Type (see instructions): Curved, Uncontrolled, Broad Crested Weir

General Description: The primary spillway is approximately curved, dry-laid, stone masonry dam with a 6-foot wide concrete cap at about El. 57.9 feet (Datum: CGS) and is approximately 6 inches lower than the auxiliary spillway. The dam has a concrete and masonry splash pad at the downstream toe of the spillway.

General Condition: Fair

Concrete Condition: Fair - Concrete cap

Stone Masonry: Fair

Settlement/Alignment/Movement: The splash pad is constructed of several large pieces of flat stone or cast-in-place concrete. The individual pieces of the splash pad appear misaligned (possible settlement) near the center of the spillway.

Cracks: None observed – spillway cap was submerged or covered with algae which obstructed the view.

Scouring/Undermining: None observed

Seepage/Foundation Drainage: None observed – water was flowing over the dam which obstructed the view.

Other: The upstream portion of the primary spillway was submerged and could not be observed.

Photos/Graphics/Sketches: See Parts XIII and XIV below.

Part VI: Auxiliary Spillway, Training Walls, Apron

Number of Auxiliary Spillways: (1) One

Auxiliary Spillway Type (see instructions): Uncontrolled, broad crested weir

General Description: The auxiliary spillway is approximately 50-feet long and is constructed with stone masonry with a 6-foot wide concrete cap. The auxiliary spillway is located on the right side of the primary spillway and ties into the existing topography at its right abutment.

General Condition: Poor

Concrete Condition: Poor

Stone Masonry: Poor – Missing face stone and gaps.

Settlement/Alignment/Movement: The concrete cap on the auxiliary spillway crest has settled where it ties into the right abutment. The settlement is approximately 3-inches over a 5-foot section. Several masonry stones below this cap were displaced or missing (upstream to downstream). Water was observed flowing over the auxiliary spillway in the area where the cap was missing.

Cracks: The concrete cap near the abutment contact was cracked where the cap had settled.

Scouring/Undermining: The concrete mass is undermined and water was observed seeping from below/around the concrete mass downstream of the dam.

Vegetative Cover: Grassy vegetation and two, 3- to 6-inch diameter, dead trees were observed growing along the upstream side of the concrete cap. Several 3- to 8-inch diameter trees and dense brush were observed growing at the contact between the training wall and the mass concrete. A 4- to 6-inch diameter tree and brush were observed to be growing from the stone masonry face at the training wall and auxiliary spillway contact. This vegetation significantly limited visual observation.

Riprap: Large boulders (noted as armor stone on a few of the available drawings) were noted on the right side of the downstream area/over the mass concrete.

Seepage/Foundation Drainage: The downstream face of the auxiliary spillway was observed to be wet from seepage near where the boulder rubble meets the auxiliary spillway. However, due to the flow over the spillway and vegetation, it was difficult to assess the origin of the flow.

Other: Silty sediment appears to extend up the top of the auxiliary spillway within the impoundment. The upstream portion of the auxiliary spillway concrete cap was submerged and could not be observed. Woody debris was observed in the depression where the cap had settled.

Photos/Graphics/Sketches: See Parts XIII and XIV below.

Part VII: Downstream Channel

Number of Downstream Channels: (1) One

Channel Name (see instructions), include Watercourse Name: Goff Brook

General Description: The downstream channel is a bedrock lined natural brook that flows to the south. A 105-foot long cast-in-place concrete retaining wall is located on the left side of the downstream channel which starts at the former turbine housing structure.

General Condition: Satisfactory

Scouring: None observed

Debris: None observed

Riprap: Up to 24-inch diameter riprap / river stone was observed in the downstream channel. The downstream channel of the auxiliary spillway consists of siltstone bedrock.

Other: The 2002 repair plans indicated concrete grout fill was proposed to be installed in undermined portions of the wall footing; however, it was not obvious if the wall was undermined or if the concrete grout fill had been placed.

Photos/Graphics/Sketches: See Parts XIII and XIV below.

Part VIII: Intake Structure(s)

Number of Intake Structures: (2) Two

Intake Structure Type (see instructions): Intake Structure and Concrete Valve Chamber

General Description: The intake structure is reportedly located within the impoundment, approximately 40 feet upstream of the left abutment of the primary spillway. The intake structure is connected to concrete valve chamber on the upstream slope of the dike, upstream of the left spillway abutment. The two structures are connected with a 15-inch CIP or CMP pipe that passes through a dam via a 36-inch steel or CMP sleeve/former penstock. A shutoff valve is reportedly on the 15inch pipe inside the concrete valve chamber. Neither of these structures were observed during the inspection.

General Condition: Unknown

Concrete Condition: Unknown

Stone Masonry: Unknown

Settlement/Alignment/Movement: Unknown

Cracks: Unknown

Other: N/A

Photos/Graphics/Sketches: See Parts XIII and XIV below.

Part IX: Outlet Structure(s)

Number of Outlet Structures: (1) One

Outlet Structure Type (see instructions): Former turbine housing or "Alcove" downstream of the left abutment of the primary spillway.

General Description: A 15-inch-diameter pipe that passes through the 36-inch sleeve/penstock, discharges to in to the former turbine housing structure. The former turbine appears to on the floor of the structure.

General Condition: Poor - The end pipe appeared to be uneven on the end indicating possible corrosion or rusting. Due to flowing water over the dam, the outlet structure could only be observed from the top of the dam, which limited our ability to assess its size or condition.

Concrete Condition: Poor – The concrete walls were observed to be cracked and spalled.

Stone Masonry: Poor - The stone masonry appeared to be missing stones. However, the flow over the primary spillway entered into the structure, thereby limited our visual observations.

Settlement/Alignment/Movement: None observed

Scouring/Undermining: None observed

Other: N/A

Photos/Graphics/Sketches: See Parts XIII and XIV below.

Part X: Miscellaneous Features

List miscellaneous features: Bell Pond Dam is located 160 feet west of the cul-de-sac at the end of Bell Pond Drive. The dam can also be accessed via Mill Woods Park. Bell Pond dam impounds southern flowing Goff Brook and forms Bell Pond.

Photos/Graphics/Sketches: See Parts XIII and XIV below.

Part XI: Downstream Hazard Classification Reassessment

Downstream Hazard Classification: *(provide recommendation for the hazard class based on the Dam Safety regulation. See Instructions and [Appendix B.](#))*

Bell Pond Dam is currently listed in the CT DEEP dam database as a Class BB (moderate hazard potential). There are several residences on Bell Pond Drive which are downstream of the dam along Goff Brook. The 44 Bell Pond Drive residence is about 35 feet downstream from the toe of the upstream dike and the 36 Bell Pond Drive residence is about 115 feet downstream of the primary spillway. Additionally, a bridge that carries Maple Street (Route 3) over the brook is about 800 feet downstream of the dam. If the Bell Pond Dam were to breach, water from the impoundment would flow down Goff Brook and potentially damage these residences and impact the bridge.

Based on an Average Daily Traffic (ADT) map available at www.CT.Gov, there is no traffic counts for the portion of Maple Street directly downstream of the dam. However, traffic counts on Maple Street (Route 3) north of the dam are 10,900 ADT and south of the dam are 8,200 ADT. Traffic counts on Mill Street (Mill Street intersects Maple Street north of where Goff Brook crosses Maple Street) is 6,000 ADT. Based on this information, we assume that the traffic count on the portion of Maple Street downstream of Bell Pond Dam is greater than 1500 ADT.

Because of the lack of a detailed hydrologic and hydraulic analyses for Bell Pond Dam, it is unclear how extensive the damage would be from an uncontrolled dam breach. However, based on the available data, it appears raising the hazard class from **Class BB (moderate)** to **Class B (significant)** or possibly **Class C (high)** hazard potential dam may be warranted if a detailed H&H analysis confirms major property damage or probable loss of life. A detailed hydrologic and hydraulic analysis is required to determine the impact of a dam breach to determine the appropriate hazard class for the dam.

Part XII: Recommendations *(See instructions for identifying recommendations)*

Recommendations: The following recommendations and remedial measures generally describe the recommended approach to address the current deficiencies at the dam. Prior to undertaking any maintenance, repairs or remedial measures, the applicability of dam safety and environmental permits should be considered.

1. Perform a Phase II level evaluation of the dam to determine the scope of necessary dam repair program. Engineering evaluations that should be performed as part of the Phase II study should include the following:
 - a. Perform supplemental topographic information to capture current conditions.
 - b. Perform a wetland delineation to identify resource impacts.
 - c. Perform a hydrologic and hydraulic (H&H) analysis to determine the appropriate spillway design flood, evaluate spillway adequacy, and evaluate overtopping potential. If overtopping is predicted, evaluate options to increase hydraulic capacity of the dam.
 - d. Perform subsurface investigations to obtain the necessary site specific data to support a stability analysis of the dam.
 - e. Perform a stability analyses for the dam
 - f. Perform a pipe inspection of the 15-inch pipe that passes through the dam.
 - g. Investigate the condition and operability of the intake structure and shut off gate valve. Use of divers or ROV's is anticipated.
 - h. Perform an alternatives analysis of repair options for the dam including dam removal. Repairs will likely include the following:
 - i. Repair/replacement of deficient stone masonry and concrete.
 - ii. Stabilization of the downstream mass concrete
 - iii. Rehabilitation of the intake/outlet works.
 - iv. Erosion protection on the upstream slope of the dike.
2. Utilize the H&H analysis data along with a limited topographic evaluation of the downstream areas and

dam breach modeling to determine the appropriate hazard class for the dam (i.e. Class B or C depending if loss of life is "probable" or "possible").

3. An Emergency Action Plan should be prepared to identify the potential inundation zone and emergency notification list in the event of a dam failure.
4. Repair the auxiliary spillway which includes removal of brush and trees, replacement of the missing stone masonry on the dam face, installation of a new concrete cap section, and stabilization of the mass concrete and area of boulder rubble.

Recurrent Maintenance Recommendations:

GZA recommends the following recurrent maintenance-level activities that can be undertaken by Owner and do not require engineering design or a dam safety permit.

5. Remove unwanted vegetation.
6. Remove debris from the spillway, auxiliary spillway and outlet works structures
7. Periodically monitor the dam (at least weekly and after storm events) to determine if conditions worsen over time. If conditions worsen, contact a qualified engineer to assess the situation.
8. Restore the area containing animal burrows and exterminate burrowing animals.

Part XIII: Photographs/Graphics (see instructions and Appendix C)

Refer to Appendix C for Photographic Log

Part XIV: Sketches

Refer to Appendix C and E for a Site Sketch

Part XV: Professional Engineer Certification

The following certification must be signed by a Professional Engineer

"I hereby certify that the information provided in this report has been examined by me and found to be true and correct in my professional judgment."



2/28/17

Signature of Professional Engineer

Date

Matthew A. Taylor

Associate Principal

26480

Printed Name of Professional Engineer

Title

CT P.E. Number


GZA GeoEnvironmental, Inc
Name of Firm

Affix P.E. Stamp Here



Part XVI: Owner Signature

The following statement must be signed by the Owner(s) of the subject Dam.

"The information provided in this report has been examined by me."	
	3/2/2017
Signature of Owner	Date
Jeff Bridges (Town of Wethersfield)	Town Manager
Name of Owner (print or type)	Title (if applicable)
Signature of Owner	Date
Name of Owner (print or type)	Title (if applicable)
Signature of Owner	Date
Name of Owner (print or type)	Title (if applicable)
Signature of Owner	Date
Name of Owner (print or type)	Title (if applicable)

Note: Mail the completed inspection report to:

DAM SAFETY PROGRAM
INLAND WATER RESOURCES DIVISION
CONNECTICUT DEPARTMENT OF ENERGY AND ENVIRONMENTAL PROTECTION
79 ELM STREET
HARTFORD, CT 06106

In addition, please send this completed report converted to Adobe portable document format (pdf) including a scan of the signature page via email to: DEEP.DamSafety@ct.gov

APPENDIX A

OVERALL DAM CONDITION SELECTION STANDARDS

Appendix A: Overall Dam Condition Selection Standards

Condition	Definition
Good	Through file research and after a thorough visual inspection it has been determined that the dam is well maintained and no existing dam safety deficiencies are recognized. Only continued routine maintenance is required.
Satisfactory	Through file research and after a thorough visual inspection it has been determined that no significant deficiencies are recognized. Only minor maintenance is required and only minor flaws are noted.
Fair	Through file research and after a thorough visual inspection it has been determined that there are no critical deficiencies with the dam that would require engineering analysis with the following exception: the engineer may recommend that a hydrologic and hydraulic analysis be conducted due to the lack of adequate freeboard and/or the lack of spillway capacity documentation. A condition exists at the dam that may require some sort of additional monitoring.
Poor	Through file research and after a thorough visual inspection it has been determined that deficiencies are recognized that require engineering analysis and/or remedial action.
Unsatisfactory	Through file research and after a thorough visual inspection it has been determined that a deficiency is recognized that requires immediate or emergency action. Administrative/Enforcement action may be required as determined by the Dam Safety Program. Reservoir level restrictions may be necessary until the problem is resolved.

APPENDIX B

HAZARD CLASSIFICATION OF DAMS

Appendix B - Hazard Classification of Dams

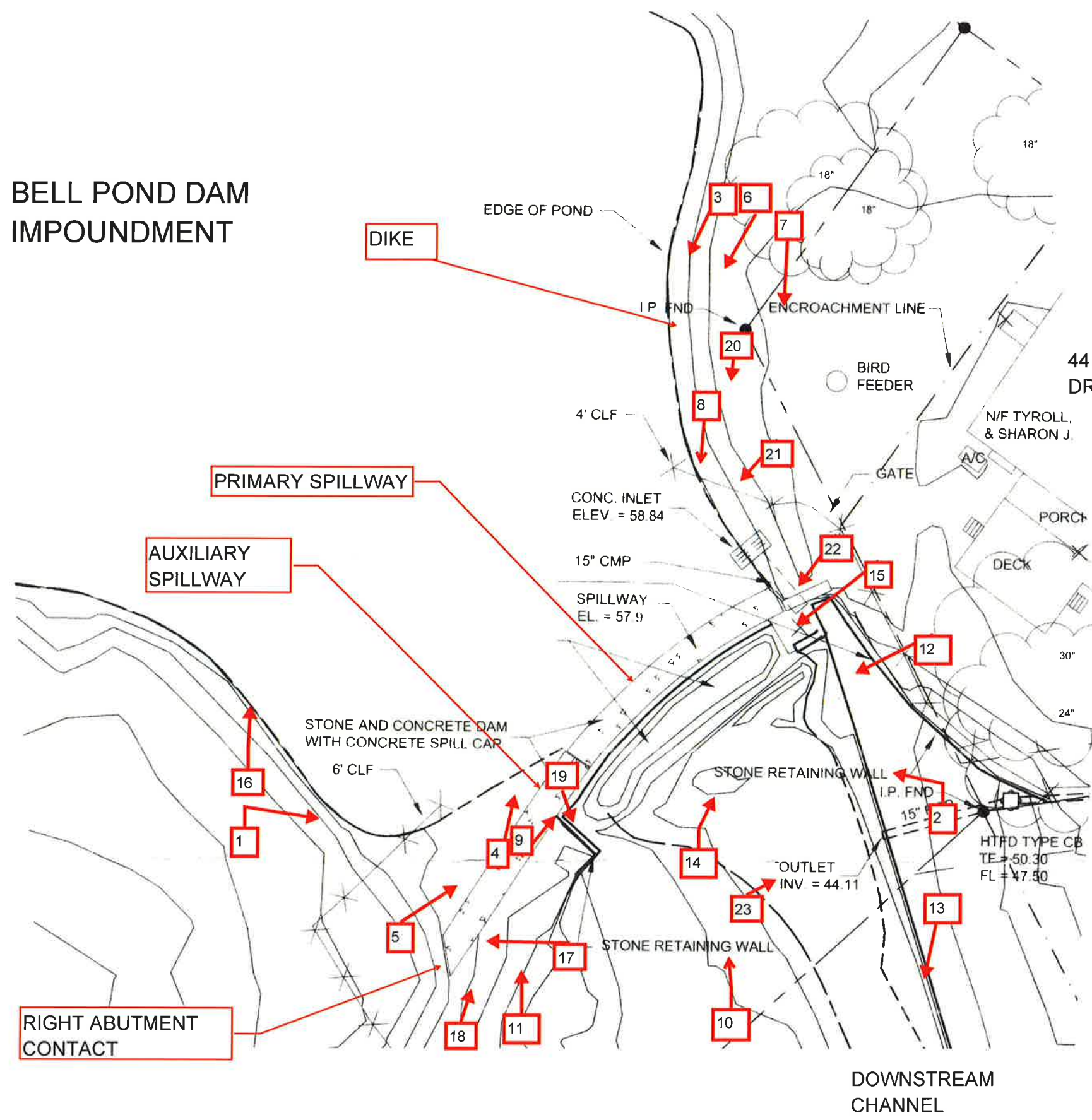
- I. A Class AA dam is a negligible hazard potential dam which, if it were to fail, would result in the following:**
- (i) no measurable damage to roadways;
 - (ii) no measurable damage to land and structures;
 - (iii) negligible economic loss.
- II. A Class A dam is a low hazard potential dam which, if it were to fail, would result in any of the following:**
- (i) damage to agricultural land;
 - (ii) damage to unimproved roadways (less than 100 ADT);
 - (iii) minimal economic loss.
- III. A Class BB dam is a moderate hazard potential dam which, if it were to fail, would result in any of the following:**
- (i) damage to normally unoccupied storage structures;
 - (ii) damage to low volume roadways (less than 500 ADT);
 - (iii) moderate economic loss.
- IV. A Class B dam is a significant hazard potential dam which, if it were to fail, would result in any of the following:**
- (i) possible loss of life;
 - (ii) minor damage to habitable structures, residences, hospitals, convalescent homes, schools, etc;
 - (iii) damage to or interruption of the use of service of utilities;
 - (iv) damage to primary roadways (less than 1500 ADT) and railroads;
 - (v) significant economic loss.
- V. A Class C dam is a high hazard potential dam which, if it were to fail, would result in any of the following:**
- (i) probable loss of life;
 - (ii) major damage to habitable structures, residences, hospitals, convalescent homes, schools, etc;
 - (iii) damage to main highways (greater than 1500 ADT);
 - (iv) great economic loss.

APPENDIX C

PHOTO LOCATION PLAN AND PHOTO LOG WITH SITE SKETCH

©2016 - GZA GeoEnvironmental, Inc. 024-\\gza\gmeant\joh... 05.00-05.99\0500-00.dwg (Bell Pond) October 04, 2016 - 8:30am Lawrence.copano

BELL POND DAM IMPOUNDMENT



LEGEND

3 → APPROXIMATE LOCATION / ORIENTATION OF PHOTOGRAPH WITH NUMBER IDENTIFICATION

NOTES:

1. BASEMAP DEVELOPED FROM A PLAN ENTITLED "BELL POND DAM TOPOGRAPHIC SURVEY." BY TOWN OF WETHERSFIELD ENGINEERING DIVISION. DATED MARCH 21, 2001 ORIGINAL SCALE 1" = 20", SHEET 1 OF 1 SHEETS. Datum: CGS (Compass Geodetic System)
2. DAM INSPECTION PERFORMED BY GZA PERSONNEL ON SEPTEMBER 27, 2016.



NO.	ISSUE/DESCRIPTION	BY	DATE
UNLESS SPECIFICALLY STATED BY WRITTEN AGREEMENT, THIS DRAWING IS THE SOLE PROPERTY OF GZA GEOENVIRONMENTAL, INC. (GZA). THE INFORMATION SHOWN ON THE DRAWING IS SOLELY FOR USE BY GZA'S CLIENT OR THE CLIENT'S DESIGNATED REPRESENTATIVE FOR THE SPECIFIC PROJECT AND LOCATION IDENTIFIED ON THE DRAWING. THE DRAWING SHALL NOT BE TRANSFERRED, REUSED, COPIED, OR ALTERED IN ANY MANNER FOR USE AT ANY OTHER LOCATION OR FOR ANY OTHER PURPOSE WITHOUT THE PRIOR WRITTEN CONSENT OF GZA. ANY TRANSFER, REUSE, OR MODIFICATION TO THE DRAWING BY THE CLIENT OR OTHERS, WITHOUT THE PRIOR WRITTEN EXPRESS CONSENT OF GZA, WILL BE AT THE USER'S SOLE RISK AND WITHOUT ANY RISK OR LIABILITY TO GZA.			

**BELL POND DAM
BELL POND DRIVE
WETHERSFIELD, CONNECTICUT**

PHOTO LOCATION PLAN

PREPARED BY: GZA GeoEnvironmental, Inc. Engineers and Scientists www.gza.com		PREPARED FOR: TOWN OF WETHERSFIELD ENGINEERING DIVISION WETHERSFIELD, CONNECTICUT	
PROJ MGR: DMB	REVIEWED BY: DMB	CHECKED BY: MAT	FIGURE 4 SHEET NO.
DESIGNED BY: LBC	DRAWN BY: LBC	SCALE: N.T.S.	
DATE: SEPTEMBER 2016	PROJECT NO: 05.0045906.00	REVISION NO.	



Client Name: Town of Wethersfield	Site Location: Bell Pond Dam, Wethersfield, CT	Project No.: 05.0045906.00
---	--	--------------------------------------

Photo No.: 01	Date: 9/27/16
Direction Photo Taken: Easterly	
Photographer: D. Barstow	
Description: Overview of dam from upstream.	



Photo No.: 02	Date: 9/27/16
Direction Photo Taken: Northwesterly	
Photographer: D. Barstow	
Description: Overview of dam from downstream.	





Client Name:
Town of Wethersfield

Site Location:
Bell Pond Dam, Wethersfield, CT

Project No.:
05.0045906.00

Photo No.: 03	Date: 9/27/16
Direction Photo Taken: Southerly	
Photographer: D. Barstow	
Description: Overview of upstream slope from left abutment. Note: mature trees and low brush on upstream slope of dike.	



Photo No.: 04	Date: 9/27/16
Direction Photo Taken: Northeasterly	
Photographer: D. Barstow	
Description: Overview of dike. Note mature trees and brush on embankment	





Client Name:
Town of Wethersfield

Site Location:
Bell Pond Dam, Wethersfield, CT

Project No.:
05.0045906.00

Photo No.:
05 **Date:**
9/27/16

Direction Photo Taken:
Northeasterly

Photographer:
D. Barstow

Description:
Overview of the auxiliary and primary spillway crests from right abutment.



Photo No.:
06 **Date:**
9/27/16

Direction Photo Taken:
Southerly

Photographer:
D. Barstow

Description:
Overview of dike crest from left abutment.





Client Name:
Town of Wethersfield

Site Location:
Bell Pond Dam, Wethersfield, CT

Project No.:
05.0045906.00

Photo No.:
07 **Date:**
9/27/16

Direction Photo Taken:
Southerly

Photographer:
D. Barstow

Description:

Overview of downstream face and crest of the dike from left abutment.



Photo No.:
08 **Date:**
9/27/16

Direction Photo Taken:
Southerly

Photographer:
D. Barstow

Description:

Overview of spillway from upstream on the dike. Note trees and brush on right side of dam where the auxiliary spillway is located.





Client Name:
Town of Wethersfield

Site Location:
Bell Pond Dam, Wethersfield, CT

Project No.:
05.0045906.00

Photo No.:
09 **Date:**
9/27/16

Direction Photo Taken:
Northeasterly

Photographer:
D. Barstow

Description:

Primary spillway and former turbine housing structure.



Former turbine housing structure

Photo No.:
10 **Date:**
9/27/16

Direction Photo Taken:
Northerly

Photographer:
D. Barstow

Description:

Overview of spillway from downstream. Note misaligned splash apron in the center of the photo.



Misalignment of splash apron



Client Name:
Town of Wethersfield

Site Location:
Bell Pond Dam, Wethersfield, CT

Project No.:
05.0045906.00

Photo No.: 11
Date: 9/27/16

Direction Photo Taken:
Northeasterly

Photographer:
D. Barstow

Description:

Overview of auxiliary spillway from downstream. Note missing masonry blocks below the cap and large mass concrete pad (right side) that was poured for a repair.



Photo No.: 12
Date: 9/27/16

Direction Photo Taken:
Westerly

Photographer:
D. Barstow

Description:

Overview of downstream channel. Note large riprap in downstream channel.





Client Name:
Town of Wethersfield

Site Location:
Bell Pond Dam, Wethersfield, CT

Project No.:
05.0045906.00

Photo No.: 13
Date: 9/27/16

Direction Photo Taken:
Southerly

Photographer:
D. Barstow

Description:
Overview of downstream channel.



Photo No.: 14
Date: 9/27/16

Direction Photo Taken:
Northeasterly

Photographer:
D. Barstow

Description:
Overview of area where the former turbine housing structure was located. Note: the discharge location and spalling on concrete walls.



penstock

Former turbine housing structure



Client Name:
Town of Wethersfield

Site Location:
Bell Pond Dam, Wethersfield, CT

Project No.:
05.0045906.00

Photo No.: 15
Date: 9/27/16

Direction Photo Taken:
Down and Southwesterly

Photographer:
D. Barstow

Description:
Looking down from spillway abutment at the former turbine housing structure. Note the pipe (penstock) on the right.

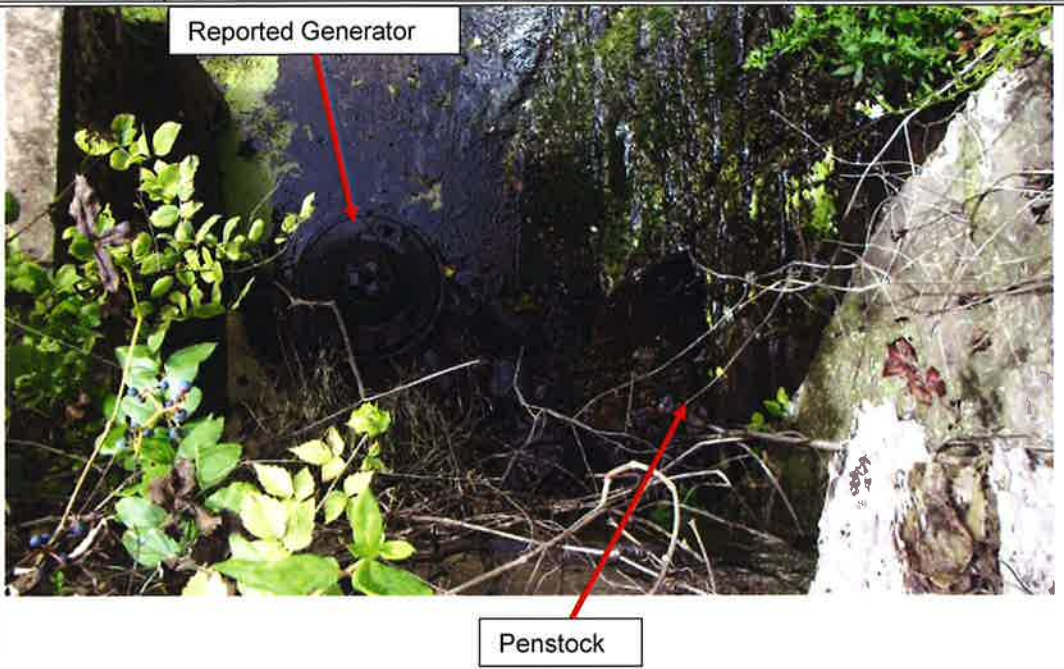


Photo No.: 16
Date: 9/27/16

Direction Photo Taken:
Northerly

Photographer:
D. Barstow

Description:
Overview of reservoir area.





Client Name:
Town of Wethersfield

Site Location:
Bell Pond Dam, Wethersfield, CT

Project No.:
05.0045906.00

Photo No.: 17
Date: 9/27/16

Direction Photo Taken:
Westerly

Photographer:
D. Barstow

Description:
Overview of water overtopping auxiliary dam. The capstone in this section has settled due to missing masonry stone. Woody debris has collected in this area.



Photo No.: 18
Date: 9/27/16

Direction Photo Taken:
Northeasterly

Photographer:
D. Barstow

Description:
Overview of auxiliary spillway showing settled capstone and woody debris.





Client Name:
Town of Wethersfield

Site Location:
Bell Pond Dam, Wethersfield, CT

Project No.:
05.0045906.00

Photo No.:
19 **Date:**
9/27/16

Direction Photo Taken:
Down and southwesterly

Photographer:
D. Barstow

Description:
Overview of downstream side of dam at the abutment of the perpendicular masonry wall and the auxiliary spillway. Note the tree growing out of the masonry wall which is perpendicular to the auxiliary spillway.



Photo No.:
20 **Date:**
9/27/16

Direction Photo Taken:
Southerly

Photographer:
D. Barstow

Description:
Tree roots observed in the crest of the dike.





Client Name:
Town of Wethersfield

Site Location:
Bell Pond Dam, Wethersfield, CT

Project No.:
05.0045906.00

Photo No.: 21
Date: 9/27/16

Direction Photo Taken:
Southwesterly

Photographer:
D. Barstow

Description:

One of a cluster of animal burrow holes located in the crest of the dike.



Photo No.: 22
Date: 9/27/16

Direction Photo Taken:
Southwesterly

Photographer:
D. Barstow

Surface erosion on the upstream side of the dike at the spillway contact.





Client Name:
Town of Wethersfield

Site Location:
Bell Pond Dam, Wethersfield, CT

Project No.:
05.0045906.00

Photo No.: 23
Date: 9/27/16

Direction Photo Taken:
Easterly

Photographer:
D. Barstow

Description:
Storm drain outlet pipe in retaining wall of downstream channel.



APPENDIX D

LIMITATIONS



USE OF REPORT

1. GeoEnvironmental, Inc. (GZA) prepared this report on behalf of, and for the exclusive use of the Town of Wethersfield (Client) for Bell Pond Dam and for the stated purpose(s) and location(s) identified in the Report. Use of this report, in whole or in part, at other locations, or for other purposes, may lead to inappropriate conclusions; and we do not accept any responsibility for the consequences of such use(s). Further, reliance by any party not identified in the agreement, for any use, without our prior written permission, shall be at that party's sole risk, and without any liability to GZA.

STANDARD OF CARE

2. Our findings and conclusions are based on the work conducted as part of the Scope of Services set forth in the Report and/or proposal, and reflect our professional judgment. These findings and conclusions must be considered not as scientific or engineering certainties, but rather as our professional opinions concerning the limited data gathered during the course of our work. Conditions other than described in this report may be found at the subject location(s).
3. Our services were performed using the degree of skill and care ordinarily exercised by qualified professionals performing the same type of services at the same time, under similar conditions, at the same or a similar property. No warranty, expressed or implied, is made.

SUBSURFACE CONDITIONS

4. If presented, the generalized soil profile(s) and description, along with the conclusions and recommendations provided in our Report, are based in part on widely-spaced subsurface explorations by GZA and/or others, with a limited number of soil and/or rock samples and groundwater /piezometers data and are intended only to convey trends in subsurface conditions. The boundaries between strata are approximate and idealized, and were based on our assessment of subsurface conditions. The composition of strata, and the transitions between strata, may be more variable and more complex than indicated. For more specific information on soil conditions at a specific location refer to the exploration logs. The nature and extent of variations between these explorations may not become evident until further exploration or construction. If variations or other latent conditions then appear evident, it will be necessary to reevaluate the conclusions and recommendations of this report.
5. Water level readings have been made in test holes (as described in the Report), monitoring wells and piezometers, at the specified times and under the stated conditions. These data have been reviewed and interpretations have been made in this Report. Fluctuations in the groundwater and piezometer levels, however, occur due to temporal or spatial variations in areal recharge rates, soil heterogeneities, reservoir and tailwater levels, the presence of subsurface utilities, and/or natural or artificially induced perturbations.

GENERAL

6. The observations described in this report were made under the conditions stated therein. The conclusions presented were based solely upon the services described therein, and not on scientific tasks or procedures beyond the scope of described services or the time and budgetary constraints imposed by the Client.
7. In preparing this report, GZA relied on certain information provided by the Client, state and local officials, and other parties referenced therein available to GZA at the time of the evaluation. GZA did not attempt to independently verify the accuracy or completeness of all information reviewed or received during the course of this evaluation.
8. Any GZA hydrologic analysis presented herein is for the rainfall volumes and distributions stated herein. For storm conditions other than those analyzed, the response of the site's spillway, impoundment, and drainage network has not been evaluated.



9. Observations were made of the site and of structures on the site as indicated within the report. Where access to portions of the structure or site, or to structures on the site was unavailable or limited, GZA renders no opinion as to the condition of that portion of the site or structure. In particular, it is noted that water levels in the impoundment and elsewhere and/or flow over the spillway may have limited GZA's ability to make observations of underwater portions of the structure. Excessive vegetation, when present, also inhibits observations.
10. In reviewing this Report, it should be realized that the reported condition of the dam is based on observations of field conditions during the course of this study along with data made available to GZA. It is important to note that the condition of a dam depends on numerous and constantly changing internal and external conditions, and is evolutionary in nature. It would be incorrect to assume that the present condition of the dam will continue to represent the condition of the dam at some point in the future. Only through continued inspection and care can there be any chance that unsafe conditions be detected.

COMPLIANCE WITH CODES AND REGULATIONS

11. We used reasonable care in identifying and interpreting applicable codes and regulations. These codes and regulations are subject to various, and possibly contradictory, interpretations. Compliance with codes and regulations by other parties is beyond our control.
12. This scope of work does not include an assessment of the need for fences, gates, no-trespassing signs, repairs to existing fences and railings and other items which may be needed to minimize trespass and provide greater security for the facility and safety to the public. An evaluation of the project for compliance with OSHA rules and regulations is also excluded.

COST ESTIMATES

13. Unless otherwise stated, our cost estimates are for comparative, or general planning purposes. These estimates may involve approximate quantity evaluations and may not be sufficiently accurate to develop construction bids, or to predict the actual cost of work addressed in this Report. Further, since we have no control over the labor and material costs required to plan and execute the anticipated work, our estimates were made using our experience and readily available information. Actual costs may vary over time and could be significantly more, or less, than stated in the Report.

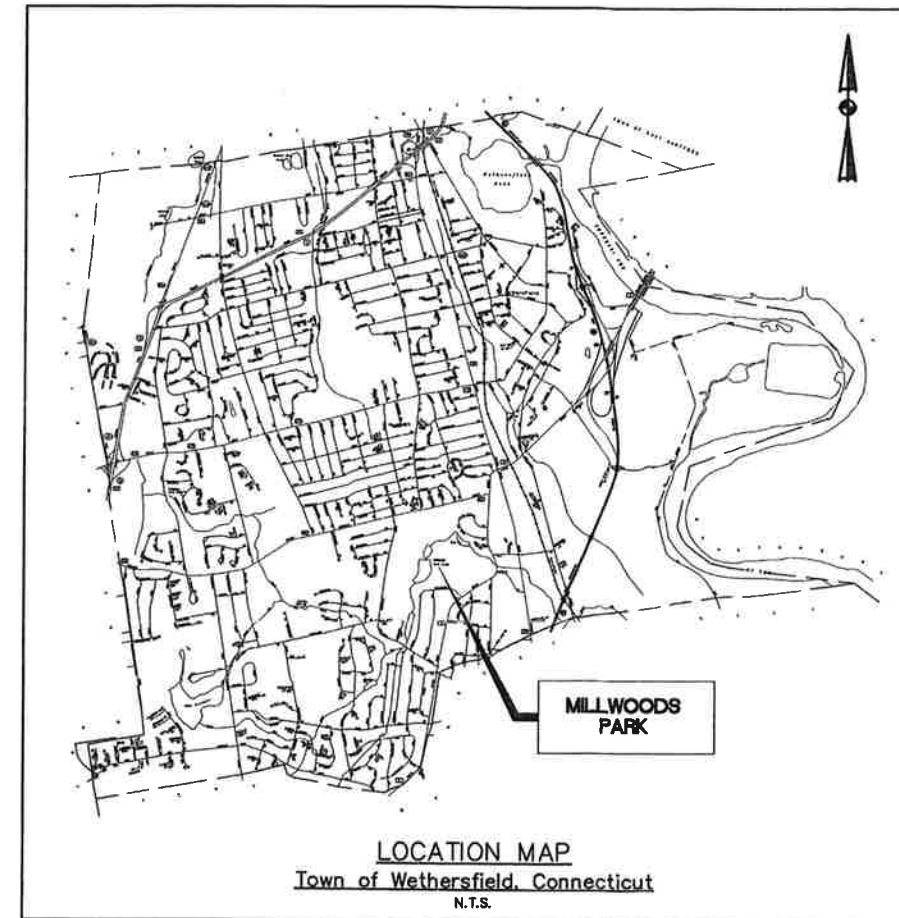
ADDITIONAL SERVICES

14. It is recommended that GZA be retained to provide services during any future: site observations, explorations, evaluations, design, implementation activities, construction and/or implementation of remedial measures recommended in this Report. This will allow us the opportunity to: i) observe conditions and compliance with our design concepts and opinions; ii) allow for changes in the event that conditions are other than anticipated; iii) provide modifications to our design; and iv) assess the consequences of changes in technologies and/or regulations.

APPENDIX E
HISTORIC DRAWINGS

GENERAL NOTES

- THE EXISTENCE OF UTILITIES & APPURTENANCES, INCLUDING RESERVOIR DRAIN PIPING AND VALVING, AS SHOWN ON THESE DRAWINGS ARE FOR REFERENCE ONLY; THE EXACT SIZE, TYPE, LOCATION AND ELEVATION SHALL BE THOROUGHLY INVESTIGATED BY THE CONTRACTOR PRIOR TO THE START OF CONSTRUCTION. ANY DISCREPANCIES SHALL BE BROUGHT TO THE ATTENTION OF THE ENGINEER IMMEDIATELY.
- ALL GRASSED AREAS OUTSIDE OF THE CONTRACT LIMIT LINES DISTURBED BY CONSTRUCTION SHALL BE REPLACED WITH TOPSOIL, FERTILIZED AND SEEDED, SODDED OR HYDRO-SEEDED AS SPECIFIED AT NO ADDITIONAL EXPENSE TO THE OWNER.
- STREET LINES AND PROPERTY LINES AS SHOWN ON THESE DRAWINGS ARE APPROX. ONLY.
- ALL AREAS OUTSIDE OF THE CONTRACT LIMIT LINES DISTURBED BY CONSTRUCTION SHALL BE RESTORED TO ORIGINAL CONDITIONS AT NO ADDITIONAL EXPENSE TO THE OWNER.
- THE CONTRACTOR SHALL CONFINE HIS OPERATIONS AND ACTIVITIES FOR CONSTRUCTION PURPOSES WITHIN THE LIMITS SET BY THE OWNER.
- UNDER NO CIRCUMSTANCES, SHALL THE CONTRACTOR BE ALLOWED TO START ANY KIND OF EXCAVATION WORK PRIOR TO HIS OBTAINING ALL THE NECESSARY INFORMATION REGARDING THE LOCATION OF UNDERGROUND UTILITIES AT THE SITE. IT SHALL BE THE CONTRACTOR'S RESPONSIBILITY TO CONTACT THE CUJPA (1-800-922-4455) AND/OR ALL UTILITIES TO HAVE ALL UTILITIES MARKED ON THE SITE PRIOR TO STARTING THE WORK. REFER TO THE SPECIAL CONDITIONS SECTION OF THE CONTRACT SPECIFICATIONS.
- ELEVATIONS SHOWN ON PLANS HAVE BEEN PLOTTED FROM INFORMATION PROVIDED BY THE TOWN AND LIMITED FIELD SURVEYS.
- DUST SHALL BE CONTROLLED BY USING WATER AS DIRECTED BY THE OWNER.
- ALL CONSTRUCTION SHALL BE IN ACCORDANCE WITH TOWN / STATE SPECIFICATIONS AND STANDARDS WHERE APPLICABLE.
- THE TOWN OF WETHERSFIELD ENGINEERING DEPARTMENT SHALL PROVIDE SURVEY CONTROL REQUIRED FOR CONSTRUCTION.
- ALL STRUCTURES, CHAMBERS, AND PIPES WHICH ARE PART OF THE COMPLETED WORK, SHALL BE THOROUGHLY CLEANED AND MADE OPERATIONAL BY THE CONTRACTOR PRIOR TO FINAL ACCEPTANCE BY THE OWNER, AT NO ADDITIONAL COST TO THE OWNER.
- THE DEP DAM SAFETY PERMIT APPROVALS, ALONG WITH THE CONTRACT PLANS AND SPECIFICATIONS, SHALL BE KEPT AT THE PROJECT SITE AND MADE AVAILABLE TO THE COMMISSIONER OF DEP AT ANY TIME DURING THE CONSTRUCTION OF THE PERMITTED ACTIVITIES.
- AN AREA FOR TEMPORARY OFFICE TRAILERS, STOCKPILE, AND STAGING SHALL BE LOCATED AT A LOCATION APPROVED BY THE OWNER.
- REFER TO THE CONTRACT DOCUMENTS FOR ENVIRONMENTAL COMPLIANCE REQUIREMENTS OF THIS CONTRACT.
- PORTIONS OF THE AREA WITHIN THE CONTRACT LIMIT LINES ARE LOCATED WITHIN OR IN CLOSE PROXIMITY TO DESIGNATED INLAND WETLANDS AND/OR WATERCOURSES. THE LIMITS OF THESE INLAND WETLANDS ARE SHOWN ON THE CONTRACT DRAWINGS. ALL WORK IN THESE AREAS SHALL BE CONDUCTED ACCORDING TO THE REQUIREMENTS SO NOTED ON THE CONTRACT DRAWINGS AND CALLED FOR IN THE SPECIFICATIONS, INCLUDING THE CONDITIONS AS OUTLINED IN THE PERMITS OBTAINED FOR THIS PROJECT (INCLUDED IN THE APPENDICES OF THE CONTRACT SPECIFICATIONS).
- SIGNIFICANT TREES (12"Ø+) AND OTHERS SO NOTED WITHIN THE CONTRACT LIMIT LINES SHALL BE PROTECTED. MINIMIZE THE NUMBER OF TREES REMOVED TO COMPLETE THE PROPOSED WORK. TREES TO BE REMOVED SHALL BE MARKED BY THE CONTRACTOR AND APPROVED BY THE OWNER.
- ALL ROADWAY AND ADJOINING AREAS AFFECTED BY THE PROPOSED WORK SHALL BE KEPT CLEAN AND FREE OF SEDIMENTATION BUILDUP. ROADWAY SWEEPING SHALL BE PERFORMED WHEN DIRECTED BY THE ENGINEER.
- THE CONTRACTOR IS RESPONSIBLE FOR ADHERING TO ALL OF THE CONDITIONS OF THE PERMIT APPROVALS (DEP DAM SAFETY AND LOCAL INLAND WETLANDS), INCLUDED IN THE APPENDICES OF THE CONTRACT DOCUMENTS, AT NO ADDITIONAL COST TO THE OWNER.
- NO CONSTRUCTION VEHICLES SHALL BE STORED, SERVICED, WASHED OR FLUSHED OUT IN A LOCATION WHERE LEAKS, SPILLAGE, WASTE MATERIALS, CLEANERS OR WATERS MAY BE INTRODUCED OR FLOW INTO WETLANDS OR WATERCOURSES, AT THE SOLE DISCRETION OF THE OWNER.
- NO MATERIALS STORAGE OR STOCKPILING OF CONSTRUCTION RELATED MATERIALS SHALL OCCUR IN ANY WETLANDS OR WATERCOURSES.
- CONTRACTOR SHALL PROVIDE AND MAINTAIN, ON-SITE, A SPILL CONTAINMENT AND CLEANUP SYSTEM CONSISTING OF CONTAINMENT BOOMS, ABSORBENT MATERIALS, AND STORAGE DRUM, FOR USE IN THE EVENT OF A FUEL SPILL DURING CONSTRUCTION. FUEL SPILLS SHALL BE REPORTED TO THE OWNER AND TO THE APPROPRIATE REGULATORY OFFICIALS AS DESCRIBED BY CT STATE STATUTES. COSTS FOR THIS EQUIPMENT SHALL BE INCLUDED IN THE PRICES BID UNDER "FOR ALL OTHER WORK". CONTRACTOR SHALL PROVIDE ONE (1) COMPLETE SYSTEM FOR EACH OF THE TWO (2) PROJECT SITES.
- ENTRANCE TO THE PROJECT AREA IS THROUGH MILL WOODS PARK (SEE "SITE LOCATION PLAN", THIS DRAWING). CONTRACTOR SHALL MAINTAIN EXISTING ACCESS WAY DURING CONSTRUCTION, AND SHALL REPAIR THE ACCESS WAY SURFACE DURING AND FOLLOWING CONSTRUCTION. CONTRACTOR SHALL BE SOLELY RESPONSIBLE FOR MAINTAINING THE ACCESS WAY IN A PASSABLE CONDITION AT ALL TIMES FOR BOTH HEAVY CONSTRUCTION AND LIGHT DUTY VEHICLES. PASSABILITY OF ACCESS WAY SHALL BE AT THE SOLE DISCRETION OF THE OWNER. PROVIDE AND INSTALL FILTER FABRIC FENCE ALONG FULL LENGTH OF ACCESS WAY, AND AS FURTHER DIRECTED IN THE FIELD BY THE OWNER.

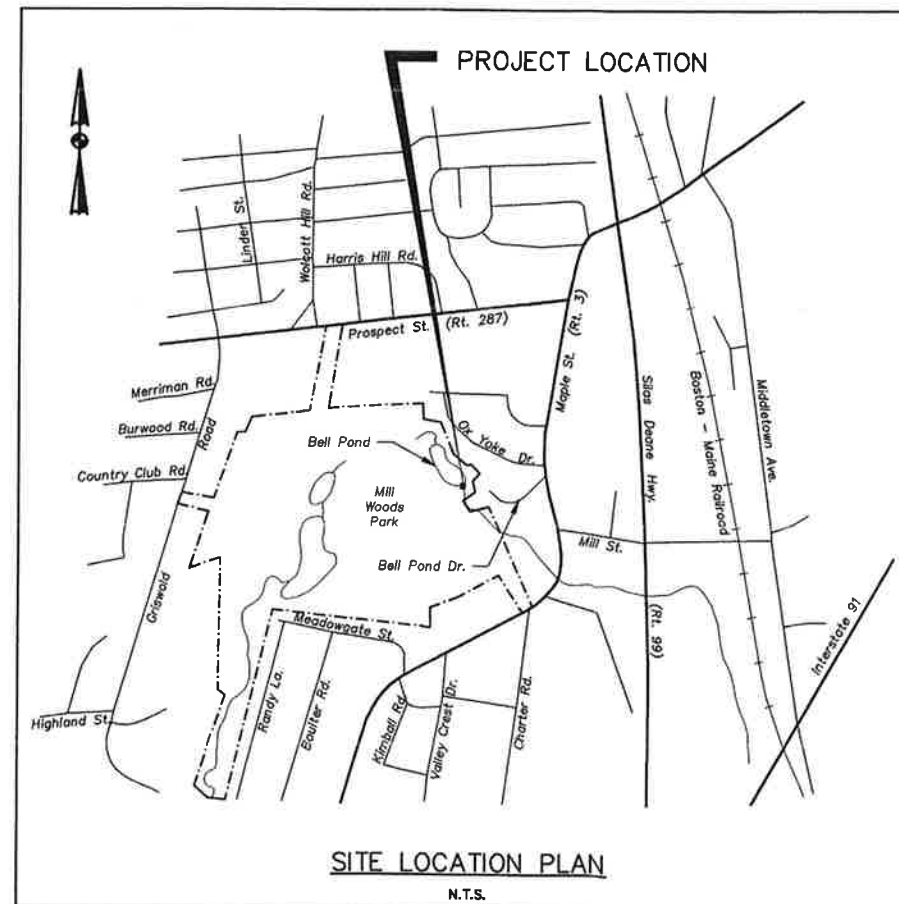


LIST OF DRAWINGS

DRAWING NUMBER	DRAWING TITLE	SHEET NUMBER
GENERAL		
G-1	TITLE SHEET	01
G-2	NOTES, REQUIREMENTS, LOCATION PLAN, LIST OF DRAWINGS, & LEGEND	02
CIVIL		
C-1	EXISTING CONDITIONS PLAN	03
C-2	SITE PLAN (20 SCALE)	04
C-3	PARTIAL SITE PLAN (5 SCALE)	05
C-4	DAM MODIFICATIONS - PLAN & ELEVATION	06
STRUCTURAL		
S-1	STRUCTURAL DETAILS (TO BE PROVIDED)	07

LEGEND

Existing	PROPOSED
Street Line	CHAIN LINK FENCE
Property Line	STAKED HAY BALES
Town Line	FILTER FABRIC FENCE
Water Course Boundary	GRADE TO DRAIN
Encroachment Line	RIP RAP
Edge of Road with Curb	CLEAR AND GRUB (NON-ASSOCIATED)
Edge of Road Without Curb	
Fence	
Tree Line	
Storm Sewer Line	
Topographic Contour	
MH Manhole	
CB Catch Basin	
Utility Pole	
Utility Pole w/ Light	
Wetland Boundary	



DESIGNED BY: A.M.C.
DRAWN BY: A.M.C.
CHK'D BY: R.G.T.

REV	MADE BY	CHK'D BY	DESCRIPTION

Maguire Group Inc.
Architects / Engineers / Planners
One Court Street
New Britain, Connecticut 06051



Town of Wethersfield, Connecticut
BELL POND DAM
**GENERAL NOTES, LEGEND,
LIST OF DRAWINGS AND
LOCATION PLAN**

DATE: March 11, 2002
SCALE: As Noted
MGI No: 16160
CONTRACT No: 1000

G
2

NOTES:

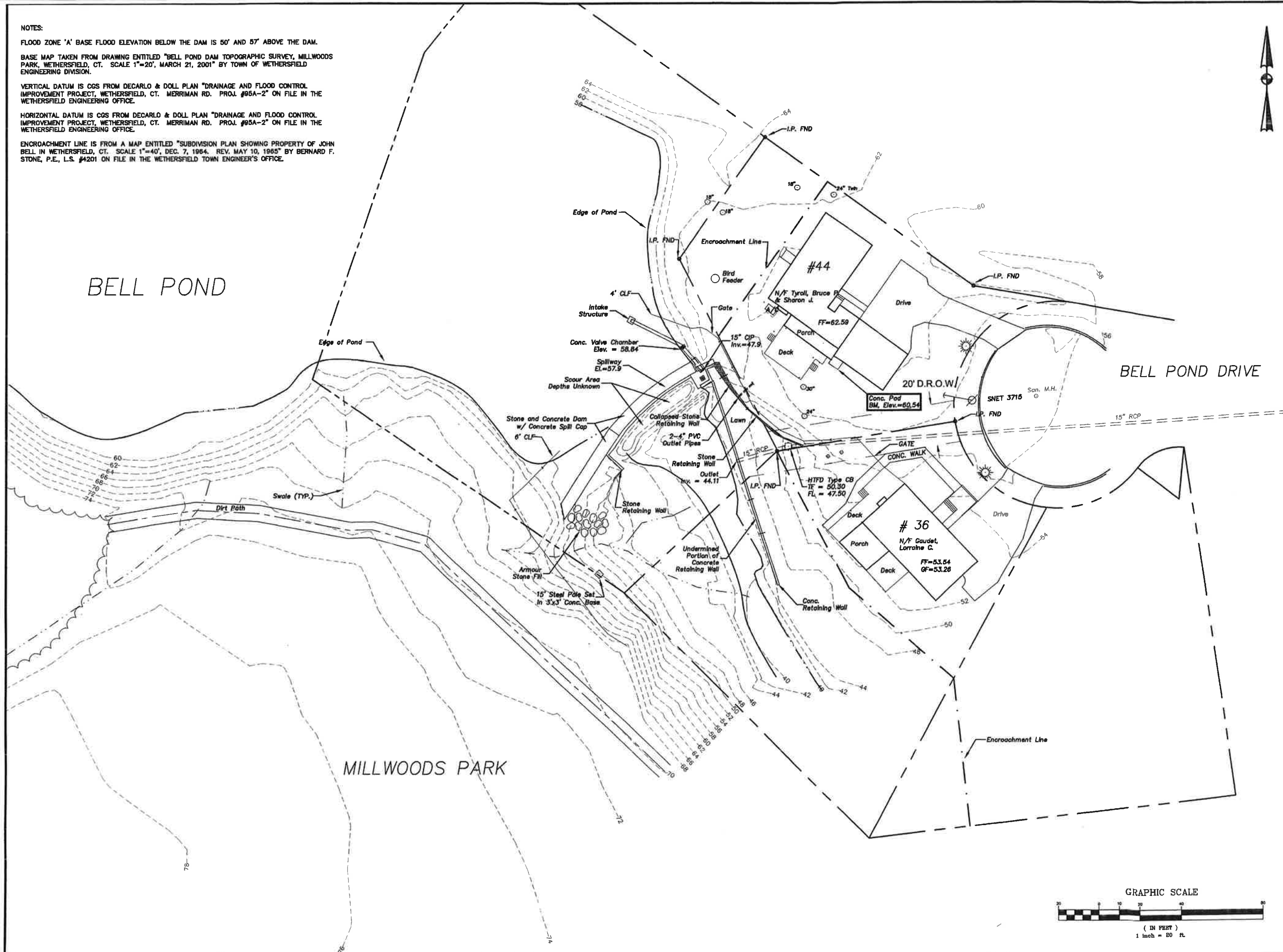
FLOOD ZONE 'A' BASE FLOOD ELEVATION BELOW THE DAM IS 50' AND 57' ABOVE THE DAM.

BASE MAP TAKEN FROM DRAWING ENTITLED "BELL POND DAM TOPOGRAPHIC SURVEY, MILLWOODS PARK, WETHERSFIELD, CT. SCALE 1"=20', MARCH 21, 2001" BY TOWN OF WETHERSFIELD ENGINEERING DIVISION.

VERTICAL DATUM IS CGS FROM DECARLO & DOLL PLAN "DRAINAGE AND FLOOD CONTROL IMPROVEMENT PROJECT, WETHERSFIELD, CT. MERRIMAN RD. PROJ. #95A-2" ON FILE IN THE WETHERSFIELD ENGINEERING OFFICE.

HORIZONTAL DATUM IS CGS FROM DECARLO & DOLL PLAN "DRAINAGE AND FLOOD CONTROL IMPROVEMENT PROJECT, WETHERSFIELD, CT. MERRIMAN RD. PROJ. #95A-2" ON FILE IN THE WETHERSFIELD ENGINEERING OFFICE.

ENCROACHMENT LINE IS FROM A MAP ENTITLED "SUBDIVISION PLAN SHOWING PROPERTY OF JOHN BELL IN WETHERSFIELD, CT. SCALE 1"=40', DEC. 7, 1984. REV. MAY 10, 1985" BY BERNARD F. STONE, P.E., L.S. #4201 ON FILE IN THE WETHERSFIELD TOWN ENGINEER'S OFFICE.



DESIGNED BY: A.M.C.
 DRAWN BY: A.M.C.
 CHK'D BY: R.G.T.

REV	MADE BY	CHK'D BY	DESCRIPTION

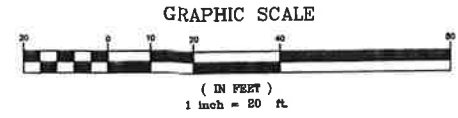
Maguire Group Inc.
 Architects / Engineers / Planners
 One Court Street
 New Britain, Connecticut 06051



Town of Wethersfield, Connecticut

BELL POND DAM
 EXISTING CONDITIONS PLAN

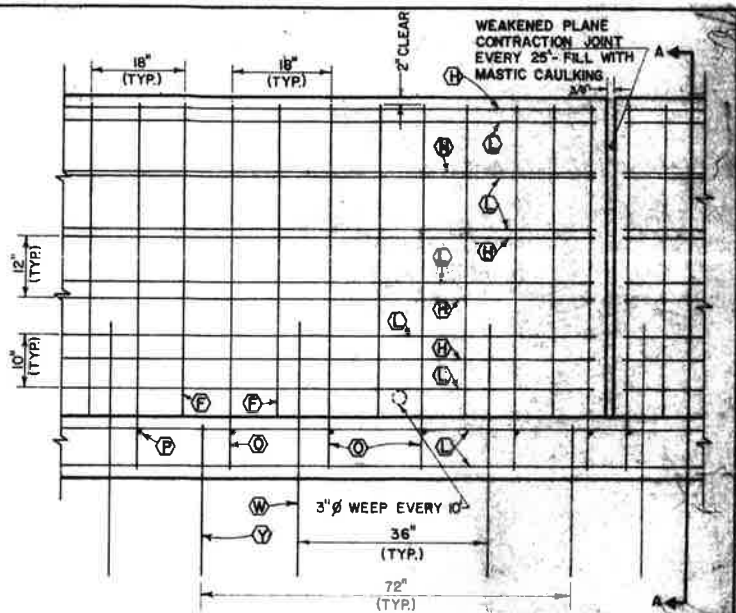
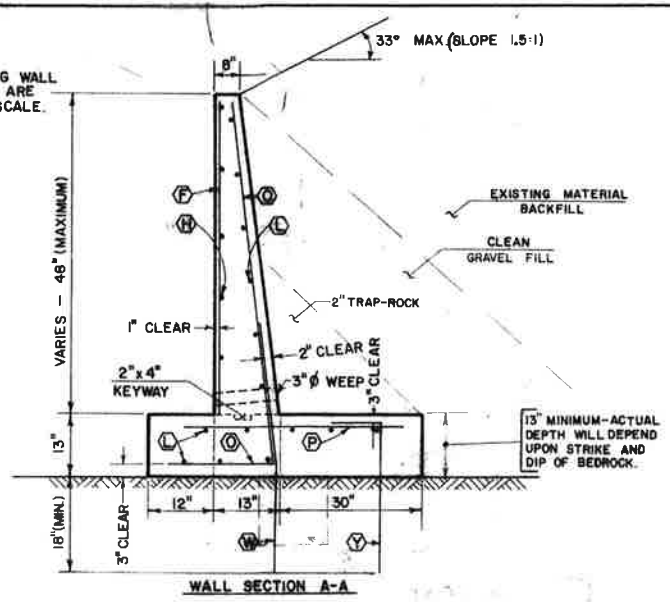
DATE: March 11, 2002
 SCALE: 1"=20'
 MGI No: 16160
 CONTRACT No: 1000



C
 1
 Sheet No. 3 of 7

BELL POND
ELEVATIONS RECORDED ON
JULY 7, 1980

NOTE: RETAINING WALL
DETAILS ARE
NOT TO SCALE.

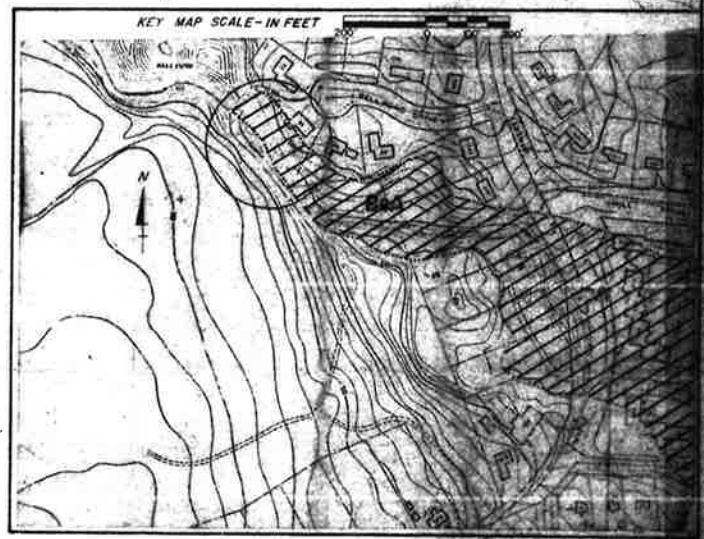
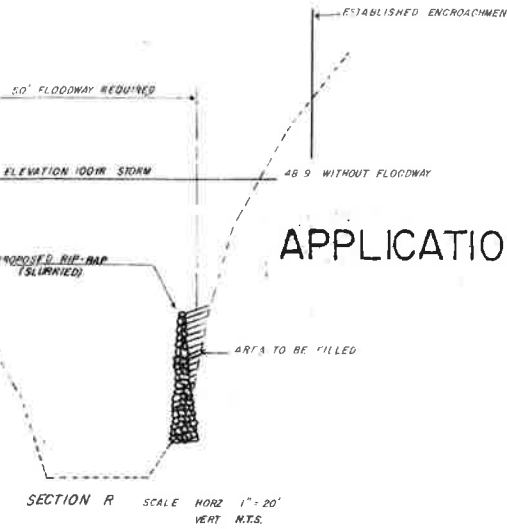
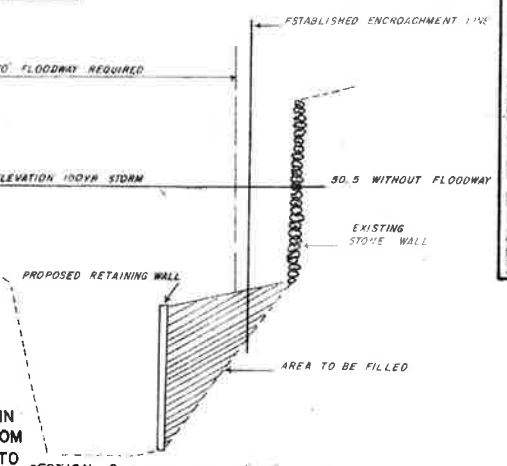


BAR	SIZE	LENGTH	SPACING
P	3	48"	18"
Q	3	76"	18"
F	3	46"	18"
L	4	*	10"
H	4	*	12"
W	5	48"	36"
Y	5	48"	72"

* CONTINUOUS

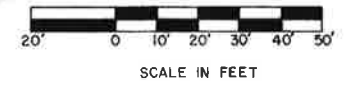


ORDINARY HIGH WATER IN
GOFF BROOK RANGES FROM
46.0' BELOW THE DAM TO
44.0' AT THE SOUTHERLY
PROJECT LIMIT.



- NOTES:
- All concrete to be 4000psi and cured during placement.
 - All reinforcing steel to be grade 60.
 - Bars designated as "L" & "H" are noted as continuous; lap splices shall overlap by a minimum of 18". Not more than one half of adjacent continuous bars may be spliced within a 76" section of wall.
 - Length shown for bars designated "Y" & "W" is maximum. Sections of wall with stem height less than 48" to hinge those bars not cut to 2" below finish top of wall. "L" & "H" bars in wall stem to be horizontally deleted from top to bottom as stem height decreases to maintain a minimum of 2" cover over the uppermost bars.
 - Area beneath the wall footing to be grubbed clean of all organic material.
 - Bars noted as "H" & "Y" are to be grouted into bedrock to a minimum depth of 18".
 - Entire exterior finish of retaining wall to be treated with anti-spill compound.
 - Elevations shown as 80.00 are proposed top of stem.

- REGULATED INLAND WETLAND AREA
- AREA TO BE FILLED 300 CY
- CROSS SECTION TAKEN FROM FLOOD INSURANCE STUDY TABLE 1



APPLICATION FOR FLOOD & EROSION BOARD

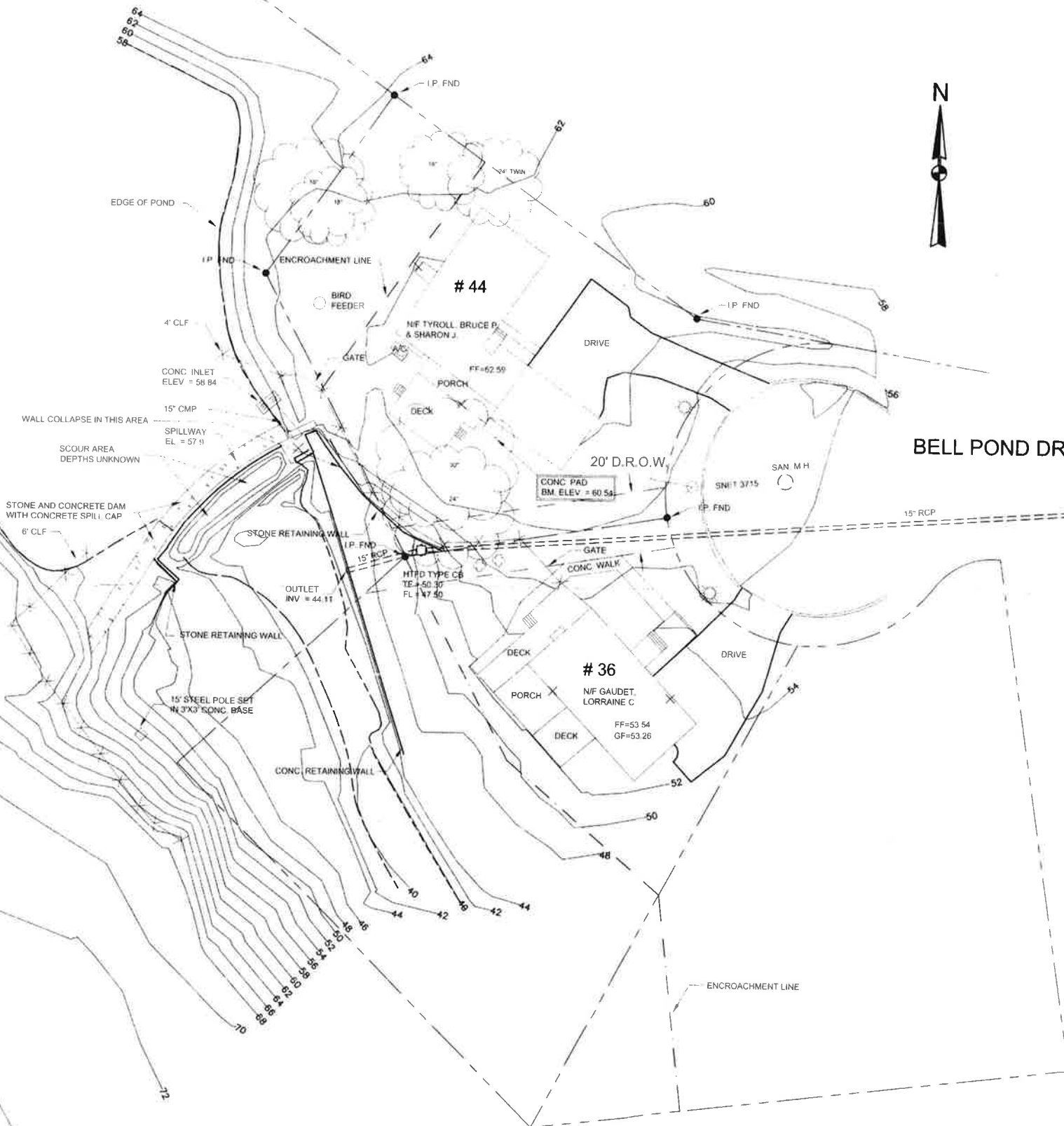
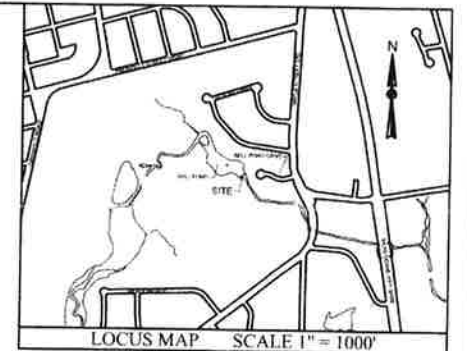
TOWN OF WETHERSFIELD
ENGINEERING DIVISION

PROPOSED RETAINING WALL	
BELL POND DAM	SCALE 1" = 20'
DATE OCT 1979	APPROVED BY
DRAWN BY W.J.L.	REVISION OCT 1980
DRAWING NUMBER	MAY 1978, RD 158

BELL POND

MILLWOODS PARK

BELL POND DRIVE



LEGEND

- BOUNDARY LINE
- EASEMENT LINE
- - - ENCROACHMENT LINE
- FENCE LINE
- CONTOUR LINE
- STORM SEWER LINE
- EDGE OF WATER
- TREE LINE
- TREE

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TOWN OF WETHERSFIELD		
BELL POND DAM TOPOGRAPHIC SURVEY		
ENGINEERING DIVISION	SCALE: 1" = 20'	DRAWN BY: CZ CHECKED BY: MJT
MILLWOODS PARK		
DATE: MARCH 21, 2001	FILE P:\PROJECTS\PARKS\MILLWOODS PARK\BELL POND DAM\TOPD.DWG	DWG No.