



Presentation For:

Warner's Pond Dam Rehabilitation

Concord, Massachusetts

PUBLIC MEETING

March 2, 2006

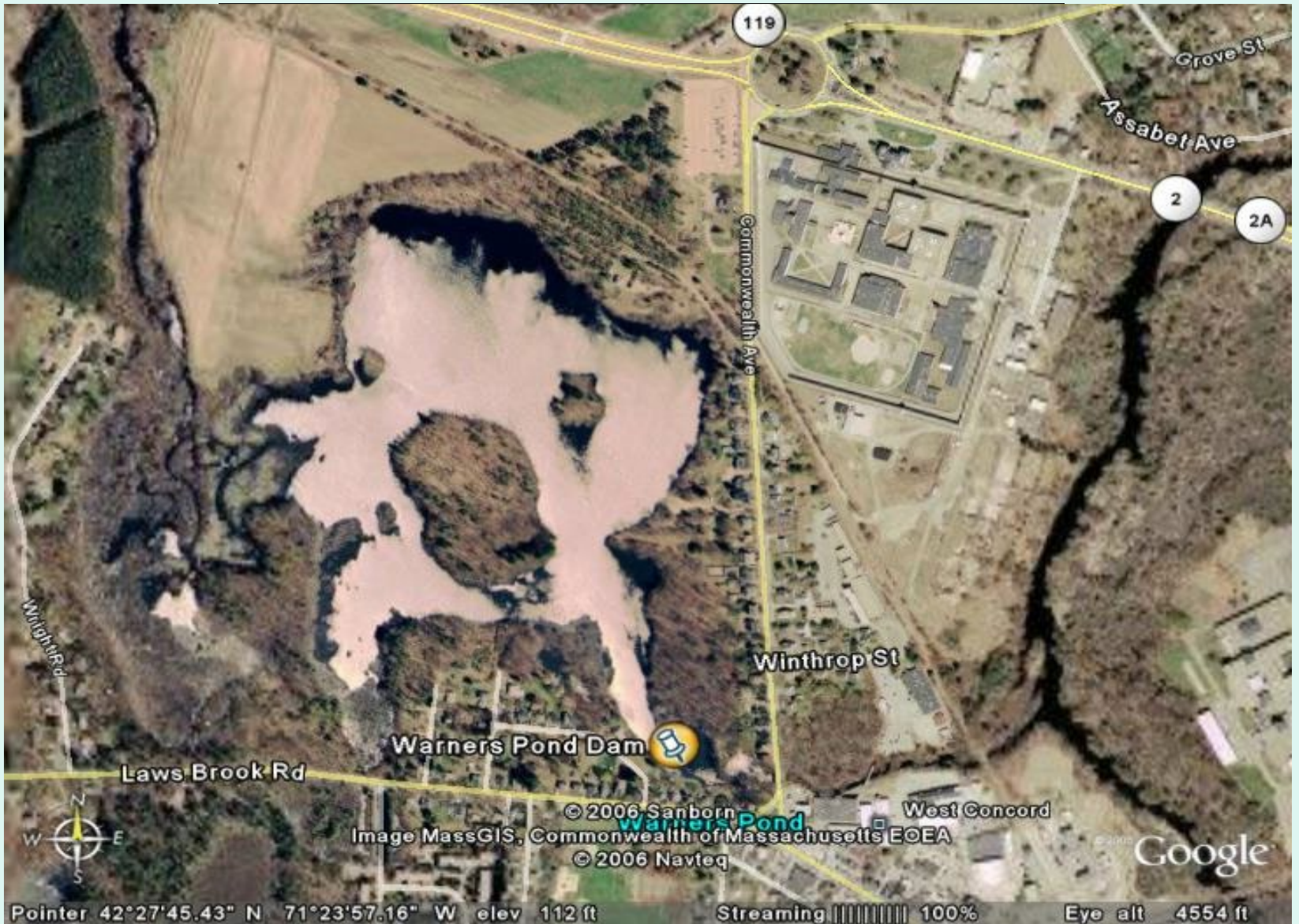


Project Team

- *Concord Public Works*
 - Bill Edgerton – Public Works Director
 - Jim Shuris; Town Engineer
 - Sean Divoll; Public Works Engineer; Town Contact
- *GZA GeoEnvironmental, Inc.*
 - Peter Baril-Principal-in-Charge
 - Chris Haker-Project Manager; Lead Designer
- *Dufresne-Henry*
 - Randall Christensen; Environmental Permitting
 - Nicole Sanford; Environmental Permitting
 - Victor Olson; Structural Design and Plans Preparation



Where's the Dam?



Project Goals

- *Assess condition of dam.*
- *Improve Dam Safety in accordance with state regulations.*
- *Protect pond and associated resources*
- *Improve site access.*
- *Construct improvements in a timely manner.*



Project Scope

- *Existing conditions assessment*
- *Engineering design*
- *Permitting*
- *Preparation of contract documents and specifications (Bidding)*
- *Complete construction of improvements*
- *Preparation of operation and maintenance plan*



Project Schedule

- *Kickoff Meeting*
 - *December 6, 2005*
- *Preliminary design*
 - *Through Mid Winter 2006*
 - *March 6, 2006 Public presentation (TONIGHT)*
- *Final design*
 - *Late Winter to Spring 2006*
 - *Late March or Early April, 2006 Public presentation*
- *Permitting*
 - *Late Winter to Spring/Early Summer 2006*
 - *Public comment during permit process*
- *Construction*
 - *Late Summer/Fall 2006*



Meeting Purpose

- *To update public on what has been accomplished since the Dec. 6, 2005 meeting.*
- *Present conceptual design plans and drawings.*
- *To obtain feedback from public.*



Since Dec. 6, 2005 Meeting

- *Complete base field investigations*
- *Completed dam inspection report*
 - *Evaluated deficiencies*
 - *Recommendations for improvements*
- *Evaluated environmental impacts of proposed improvements*
- *Prepared conceptual design plans*



November 2005 Dam Safety Inspection

- *Current Dam Deficiencies / Issues*
 - Failure of right (east) spillway training wall.
 - Severely eroded earth embankment with signs of previous overtopping.
 - Inoperable outlet controls.
 - Lack of emergency site access.
 - Heavy tree and brush growth on earth embankments.



Key Deficiencies / Issues

Failure of right (east) spillway training wall. Severely eroded earth embankment with signs of previous overtopping.



Key Deficiencies / Issues

Inoperable outlet controls



Key Deficiencies / Issues

Site access



Key Deficiencies / Issues

Heavy tree and brush growth on earth embankments

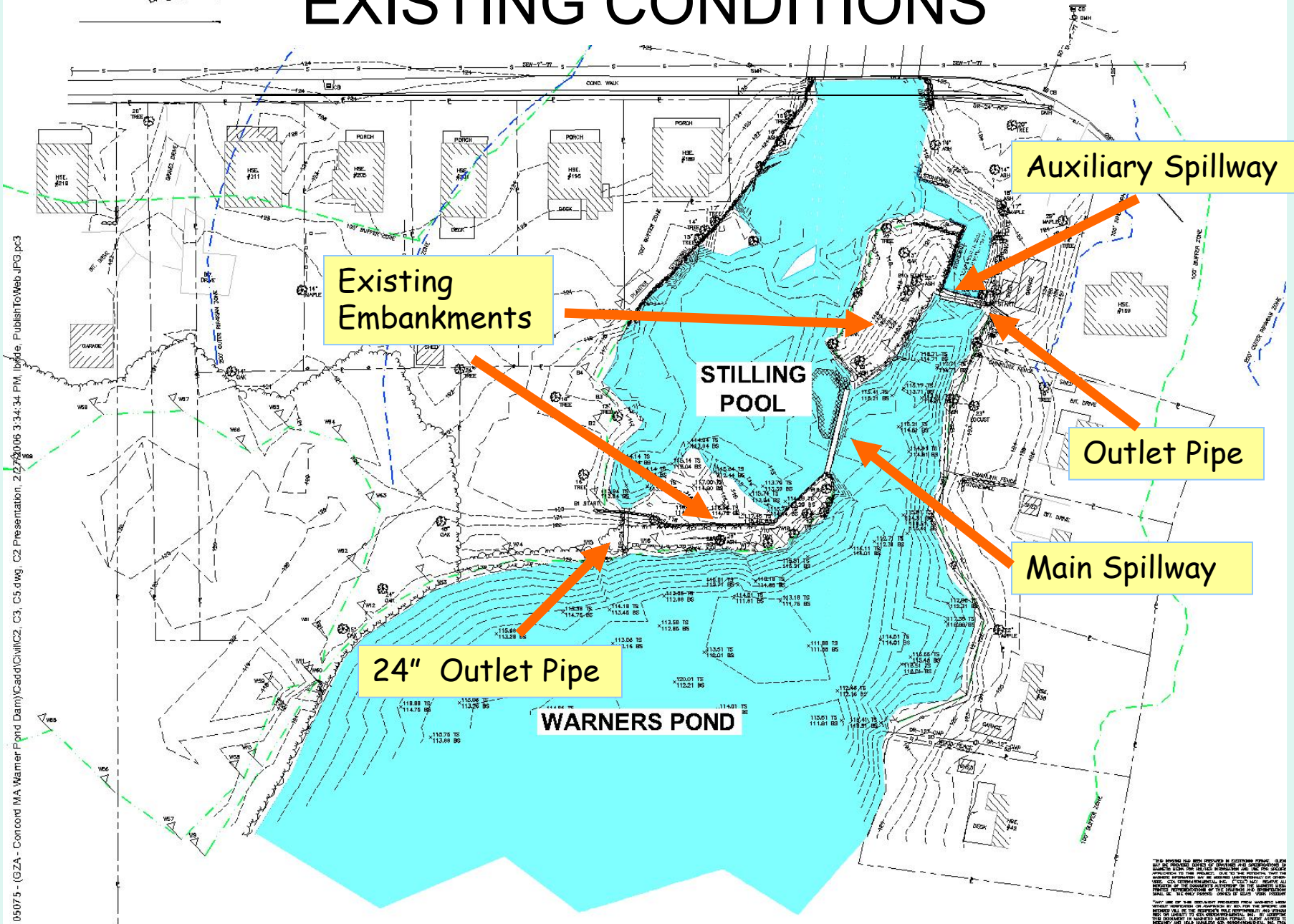


Hydrology & Hydraulic Analysis

- *Inadequate Spillway Capacity to Pass the 100 – Year Design Flood.*
- *Backwater from Assabet River submerges dam crest under 50- & 100-year floods.*
- *Additional spillway capacity may be needed to pass less intense, more frequent storms/floods.*
- *Low Point North of Dam*



EXISTING CONDITIONS



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Ways to Increase Spillway Capacity

- *Increase Spillway Length*
 - High Cost and downstream impacts
- *Raise Dam*
 - High Cost and upstream impacts
- *Overtopping Protection*
 - Cost Effective
 - Articulated Concrete Blocks
 - Rip Rap
 - Turf Reinforcement Mats
 - Low Point North of Dam

ARTICULATED CONCRETE BLOCKS



RIP RAP SLOPE



TURF REINFORCEMENT MATS



TURF REINFORCEMENT MATS



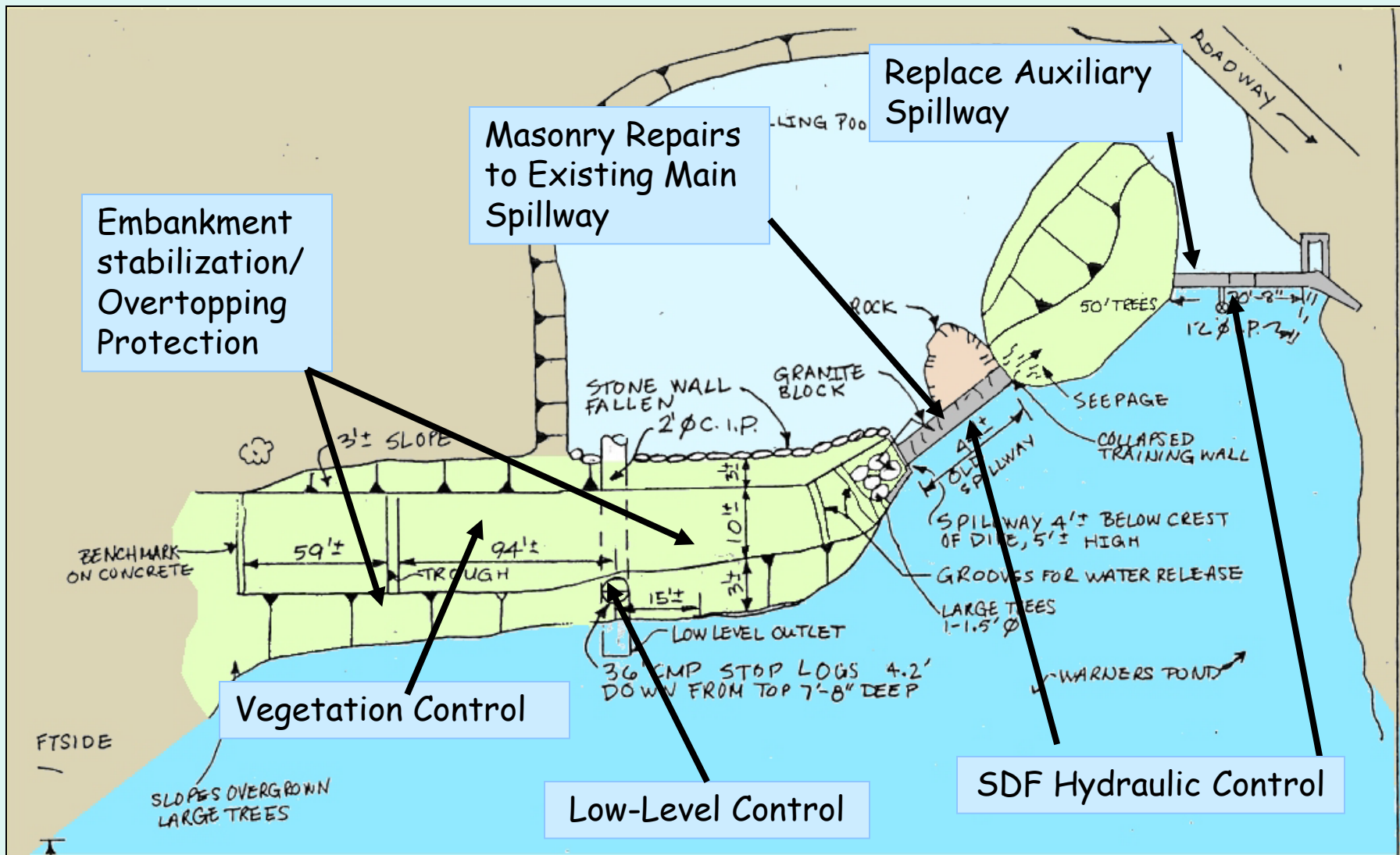
OVERTOPPING PROTECTION

Turf Reinforcement Mats selected for:

- *Aesthetics*
- *Cost*
- *Relatively low flow rates and velocities*

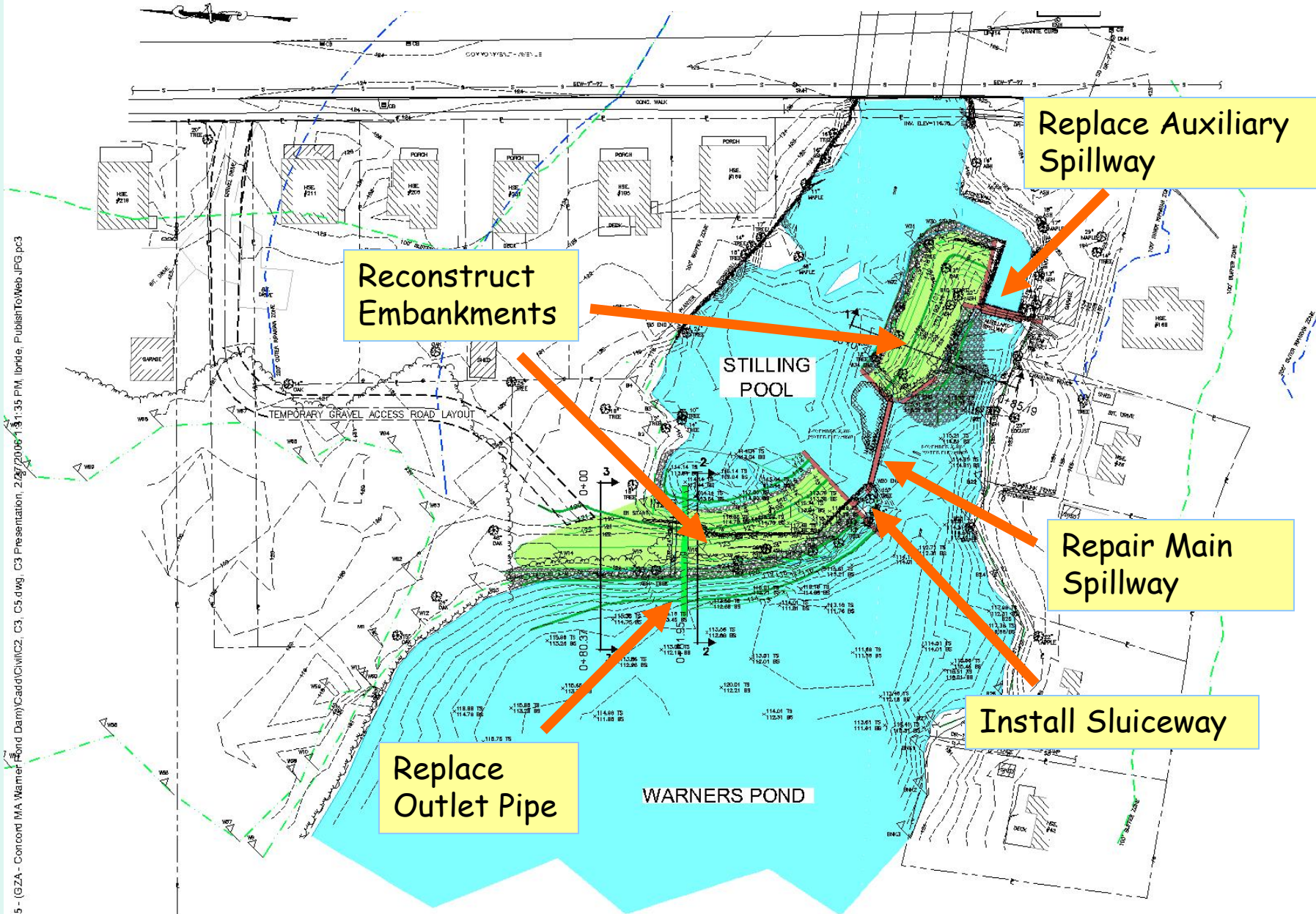


PROPOSED IMPROVEMENTS

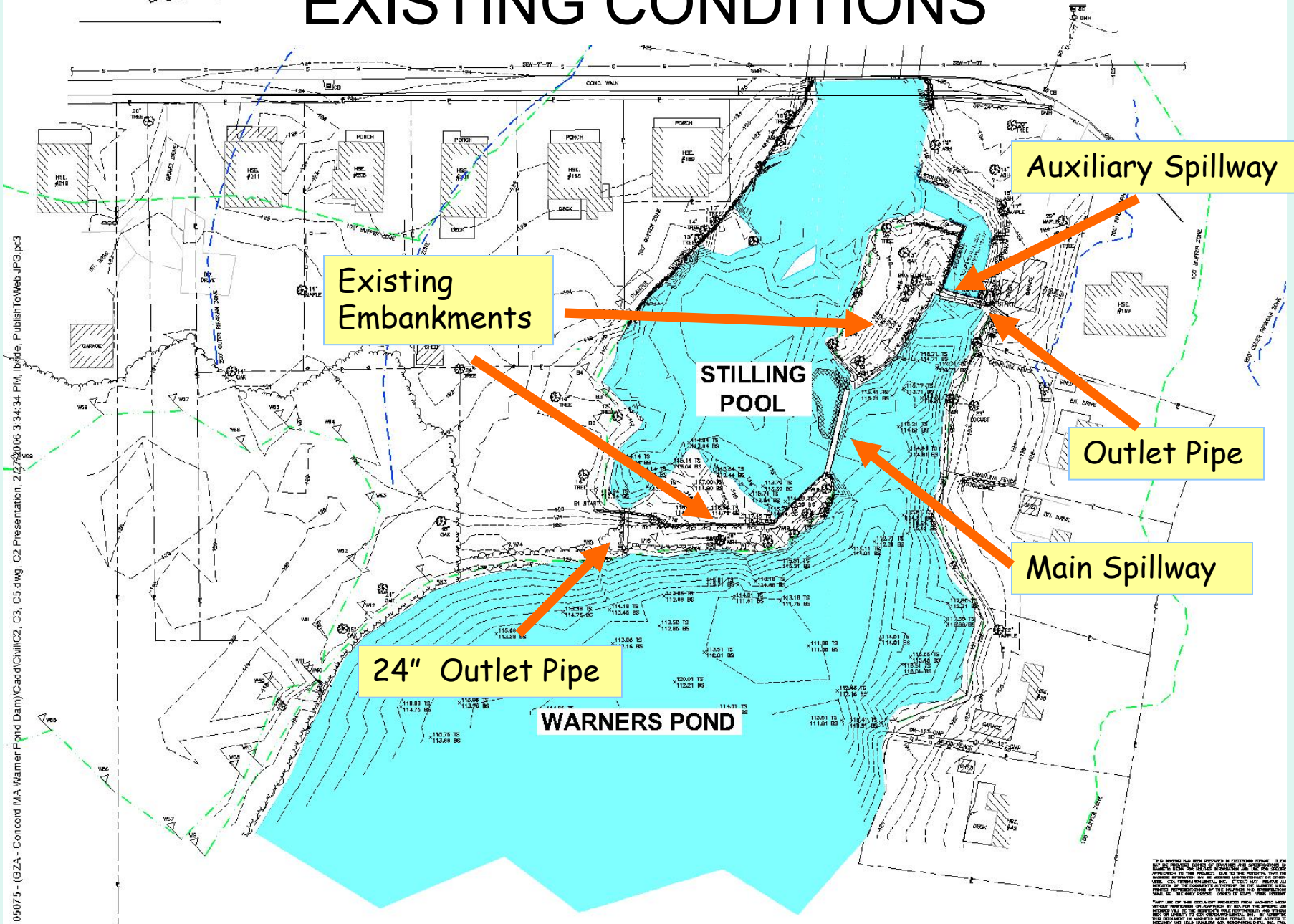


Sketch based on Haley & Aldrich's April 30, 1999 Dam Safety Inspection Report

PROPOSED IMPROVEMENTS



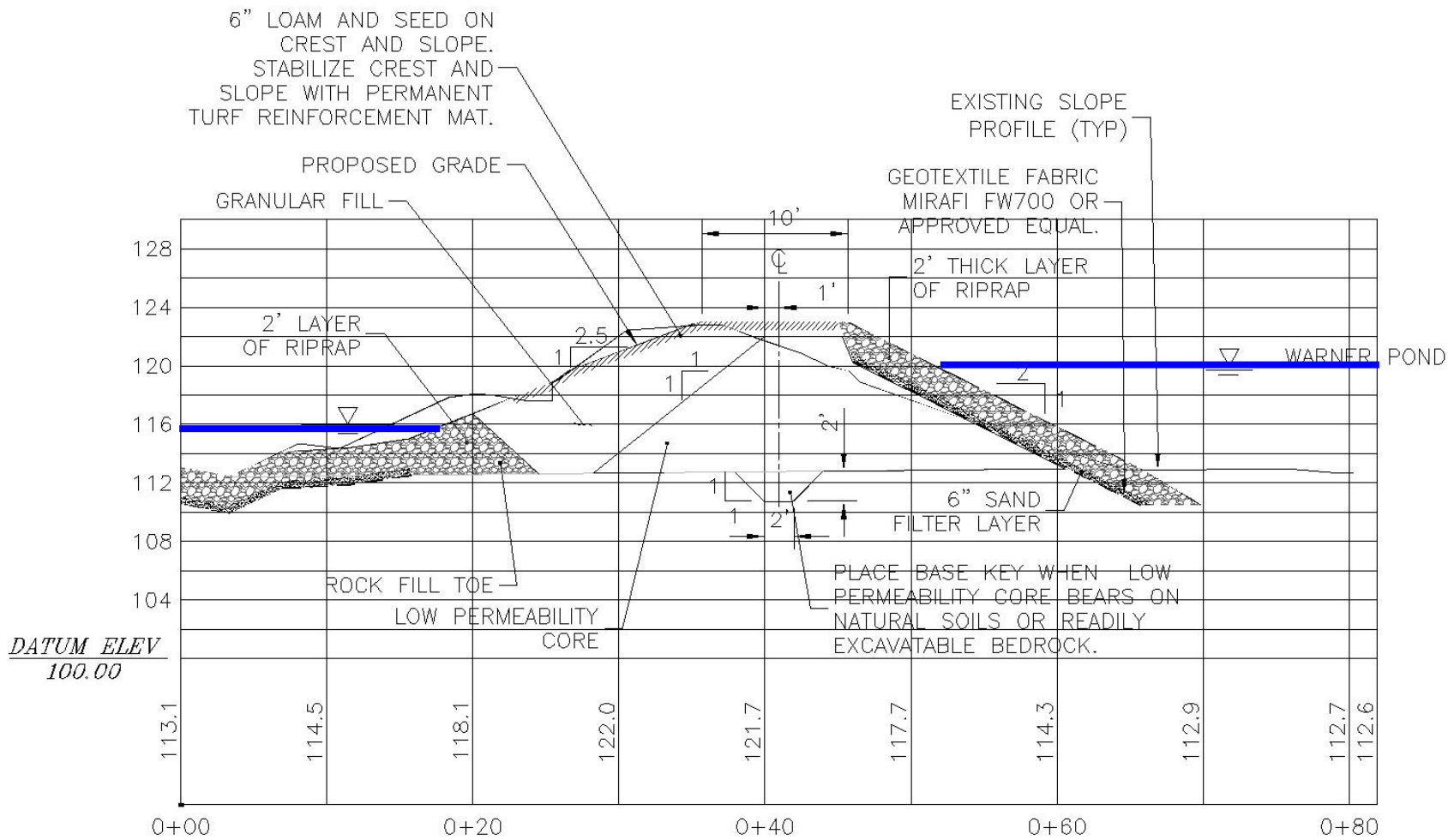
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TYPICAL EMBANKMENT CROSS SECTION



SECTION 2

SCALE: 1"=10'

PROJECT BENEFITS

- *Improve Dam Safety*
- *Preservation Of Pond Resources*
- *Functional Water Controls*
 - *Allows for seasonal draw downs*
 - *Allows for emergency draw down*
- *Improve Water Quality in Auxiliary Spillway Area*
- *Enhance view of Pond from Comm. Ave.*

ADDITIONAL COMMENTS



FISH LADDER

- *A review of available fisheries information was performed.*
- *A fish ladder at Warners Pond Dam would not likely be effective until other obstacles are removed or fitted with fish passage.*
- *If other obstacles are addressed, fish ladder may be retrofitted into auxiliary spillway at Warners Pond Dam.*
- *Additional study needed.*

HYDROPOWER FEASIBILITY

Theoretical Available Energy Production and Associated Savings

	Median Annual Flow (cfs)	Median August Flow (cfs)
	48.83	11.21
Operating Head (ft) =	2.97	
Power (KW)	10	2
Time Available to Produce Power in a Year (hours)	4,380	7,476
Energy Produced in a Year (KW-hr)	45,722	17,915
Annual Avoided Energy Cost (\$)	4,572	1,792
Estimated Cost to Design and Build (\$)	350,000	200,000
Payback Period (years)	77	112

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PLEASE PROVIDE COMMENTS/QUESTIONS TO:

SEAN DIVOLL, P.E.

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OPEN DISCUSSION

