TOWN OF NEWMARKET, NEW HAMPSHIRE

Wednesday, May 2, 2018, 7:00 PM
NEWMARKET TOWN HALL CHAMBERS

1. **Pledge of Allegiance**
2. **Public Forum**
3. **Public Hearing**
4. **Town Council to Consider Acceptauce of Minutes**
   a. April 11, 2018 Workshop Meeting Minutes
   b. April 18, 2018 Meeting Minutes
5. **Report of the Towu Administrator**
6. **Committee Reports**
7. **Old Business**
   a. **Resolutions/Ordinauces in the 2nd Reading**
   b. **Resolutions/Ordiuauces in the 3rd reading**
   c. Items Laid on the Table
8. **New Business/Correspoudeuce**
   a. **Towu Council to Consider Nominations, Appointments and Elections**
      i. ***Charlotte DiLorenzo***
         Housing Authority - Term Expires March 31, 2023
   b. **Resolutious/Ordinances in the 1st Reading**
      i. ***Resolution2017/2018-46***
         Authorizing the Town Administrator to Enter into an Agreement with GZA GeoEnvironmental, Inc. for Final Design and Engineering Services related to the Rehabilitation of the Macallen Dam
   c. Correspondence to the Town Council
   d. Closing Comments by Town Councilors
   e. Next Council Meeting

i. *May 16, 2018*

9. **Adjournment**

TOWN OF NEWMARKET, NEW HAMPSHIRE
TOWN COUNCIL WORKSHOP MEETING

APRIL 11, 2018 6:00 PM

TOWN HALL AUDITORIUM

PRESENT: Council Chairman Dale Pike, Council Vice Chairman Toni Weinstein, Councilor Gretchen Kast, Councilor Amy Burns, Councilor Casey Finch, Councilor Zachary Dumont

EXCUSED: Councilor Kyle Bowden

ALSO PRESENT: Town Administrator Steve Fournier; Rick Alpers, Shelley Walts, and Nicole Armaganian of Primex Insurance Company

PRIMEX GOAL SETTING SESSION

Introduction and Review of Agenda

Mr. Rick Alpers, Risk Management & Member Services Consultant at Primex, introduced Member Services Consultant Shelly Walts and new Risk Management Associate Nicole Armaganian, and started the meeting at 6:01 pm. He said they were pleased to be there and valued their partnership with Newmarket to help navigate their annual goal-setting session. He said if towns functioned well at the top and had annual goals, it would trickle down through the organization. He said they would discuss where they wanted Newmarket to go and he would play the role of facilitator.

Mr. Alpers said he would review the 2016 goals, take down the top three individual goals of each councilor and the Town Administrator as to what they wanted to see Newmarket accomplish over the next 12-18 months, and then take a 5-10 minute break while they looked at the goals and tried to find some common themes. He said they would then set 3 or 4 goals out of that and put some timelines and dates around them, with further detail in the objectives. He said he wanted them to focus on what the next 12-18 months looked like as a Council, with the Town Administrator, with the Department Heads, and what Newmarket looked like as a community.

Review of 2016 Goals

Mr. Alpers reviewed the previous goals set by the Town Council for 2017, and said the first goal was to build a process for a Unified Town-Wide CIP Plan with delivery by October 2017. Town Administrator Fournier said they were always working to improve it, but that it was much better than in 2016. Mr. Alpers said the second goal was to increase Parking in Downtown, exploring public or private solutions. Town Administrator Fournier said the Council was working with the Newmarket Business Association to try to address the issue, but that land was scarce for the Town. Chairman Pike stated that they had decided last year to resurface the Bay Road parking lot and lease some overnight parking there. Town Administrator Fournier said they also increased parking on Beech Street and changed the rules for the Library parking lot to overnight parking with permit. Chairman Pike noted that metered parking tickets were up, and said it was part of the plan was to discourage long-term parking in Downtown.

Mr. Alpers said that the third goal for 2017 was to continue relations with the School Board and the SAU staff to find further efficiencies and solidify the shared positions with Facilities and Finance. Town Administrator Fournier said the goal had been completed and was working well, and they were looking at sharing other positions as well. Chairman Pike said that the School Superintendent and the Town Administrator, as well as the School Board and the Town Council, worked very well together and were able to meet any challenges. Mr. Alpers said the fourth goal had been to meet with the Planning Board and work together to align the 2017 goals, based off summaries of consultants and Strafford Regional Planning Commission reports.

Mr. Alpers said they were now looking toward 2018/19, and asked the councilors to think about what they wanted to accomplish next year as a Council together, in the community, and where they wanted to go. He asked councilors to think about one exciting prospect on the horizon for Newmarket right now.

Prospects for Newmarket

Councilor Kast said that Newmarket's reputation had risen in the Seacoast as a great place to be and people were coming to visit. Councilor Burns said Newmarket had great trails and outdoor activities, with kayak rental at the waterfront and wonderful restaurants and shops. Town Administrator Fournier said Newmarket was finally addressing the Junior-Senior High School and the Elementary School which were being renovated. He said Downtown had been successful and Newmarket needed to develop gateways on North Main Street and south on Exeter Road to continue development out. Vice-Chair Weinstein said Newmarket was poised to embrace energy efficiency in the community and explore energy alternatives, and said there was a new Energy & Environment Advisory Committee.

Councilor Dumont stated that houses did not stay long on the market long and that people were willing to pay more and make a long-term commitment to the community. Vice-Chair Weinstein said they had an amazing Recreation Department in Newmarket which was exploring opportunities for all ages. Chairman Pike said Newmarket had brought down nitrogen concentrations by 90% in Great Bay, which was a tremendous asset to the community. Town Administrator Fournier said along with that utility issues had been addressed with a new Wastewater Treatment Facility, and said water was no longer an issue with the new Macintosh Well. He said they were updating utilities to be able to handle development, and they continued to invest in development.

Issues for Newmarket

Mr. Alpers asked what still needed a little work in Newmarket, and Vice-Chair Weinstein said parking was a real problem. Town Administrator Fournier said roads and facilities needed improvement, and there was also an issue that Newmarket was becoming unaffordable. He clarified that is was not because of taxes but was due to the value of the homes. Councilor Kast said Newmarket also had a lopsided ratio of owned versus rentals, and Town Administrator said the majority were rentals. Chairman Pike pointed out that Newmarket did not have a lot of industry to stay on top of that and help with the tax rate. Councilor Dumont felt there were walking issues with some sidewalks in disrepair, and Town Administrator Fournier said they would be addressed when the North Route 108 project was completed.

Councilor Kast stated that because of changes in the area, the Downtown in Newmarket had become a commuter path versus a destination. Town Administrator Fournier explained that in summer if the Spalding backed up traffic would be sent via Route 108 to Route 33. Chairman Pike said Newmarket had not seen a lot of commercial development, and said they were looking to move some of the properties taken over by the Town to tax-paying properties. Vice-Chair Weinstein felt that Newmarket's tax rate was something they always needed to keep in mind to align the needs of the Town with reality.

Town Administrator Fournier said Newmarket had a lot of open space but not a lot of parks, and nothing for the outer areas. Vice-Chair Weinstein said there was also no green space Downtown, and said walkability and ride-ability were important for connect-ability. Councilor Dumont also mentioned public transportation. Chairman Pike said that it was difficult to maintain ridership in the Town, and said he also felt that Route 108 was over-capacitated. He said there were some improvements to Route 108 north of town but none south.

Chairman Pike stated that they were nearing a decision on the Macallen Dam Advisory Committee and were optimistic they would reach a good conclusion. Town Administrator Fournier explained that the Town owned and maintained the dam in the middle of Downtown, and said some significant fixes and improvements were needed. Councilor Finch said the waterfront in general would need some repairs for erosion in Schanda Park. Chairman Pike said there was an idea to extend Schanda Park along the waterfront, and Town Administrator Fournier said they were trying to correct right-of-way issues and private-owned property issues to create a Riverwalk. Chairman Pike said that would enhanced if they were able to create a small park around the dam.

Top 2-3 Goals per Councilor and Town Administrator

Mr. Alpers said he would give the councilors and the Town Administrator 5-7 minutes to write down what they wanted to see accomplished over the next 12-18 months by the Council, the community, the Town Administrator, and the Department Heads.

Town Administrator Fournier stated that his first goal was to address Gateway Development, with the paving project on North Route 108 wrapping up soon. He said there would be a large parcel of empty land, and though the Town did not own the property, they had already invested a lot of money into infrastructure to allow development in that area. He said he would look at development on North Main

Street and south on Exeter Road, and said there were a lot of empty parcels that could be used. He said his second goal was a Facilities Rehabilitation Plan to improve older buildings in the Town and go energy efficient as well. His third goal was Infill Development by adding green spaces or to incentivize new buildings and move parking elsewhere.

Chairman Pike said his first goal was be to continue to work with the Planning Board to address future zoning changes on Route 152. He said they also needed an updated presentation on development-related projects. Town Administrator Fournier said they needed a Marketing Plan. Chairman Pike said his second goal was a Facilities Plan which would be sustainable. He said his third goal was to keep roads sustainable after completion and to estimate a cost for upkeep.

Vice-Chair Weinstein said her first goal was Economic Development, but that she had included other things in that such as North and South Route 108, parking, marketing properties the Town owned, and focusing on relationships with local businesses and the Newmarket Business Association. She said her second goal was to continue to work on a CIP/Facilities Plan, and said she would like to see a Facilities Plan that mirrored the Road Plan, on a schedule and with a way to balance costs. Town Administrator Fournier said the Town currently had approximately $3 million in Capital Reserve Funds. Vice-Chair Weinstein said her third goal was to consider all energy options for their community.

Councilor Kast said her first goal was seeing some creative solutions to CIP, deferred maintenance, and facilities as part of planning, and said energy savings was part of the innovation solutions. She said her second goal was parking, and she said she went back to the visionary exercise to see what the priorities were. She asked what other solutions were available besides more parking spaces, and said Durham had instituted a program called Park Once and Walk. She felt it was timely to get another vision plan as a benchmark, and Chairman Pike said the visioning was part of the Mills in 2015, and was held every 5 years. Councilor Kast said that instead her third goal was to start looking at ways, policy-wise or tax incentive-wise, to start promoting conversion of housing from rental to ownership.

Councilor Burns said her first goal was to develop the gateway which would help attract business and help the tax rate. She said her second goal was Being Green which included energy efficiency, climate change planning, and walkability. She said her third goal was the Facilities Planning, scheduled much like the Road Plan with finding patterns.

Councilor Finch said his first goal was for the Town to become paperless or electronic, which would free up space, be cost efficient, and environmentally friendly which was being green. Mr. Alpers asked for a scope, and Town Administrator Fournier said they were doing everything with a new financial software system, departments scanning bills, and Council agendas no longer on paper with a system online by May to become 100% digital. Councilor Finch said his second goal was energy optimization and his third goal was facilities, parking, and a waterfront plan working the dam project into something larger.

Councilor Dumont said his first goal was trying to incentivize non-restaurant types of businesses in Newmarket to fill areas opening up and develop a plan to help market the Town for businesses. He suggested businesses that could provide more services to the Town would be beneficial. He said his second goal was a Traffic Study to see how traffic entered Newmarket from South 108/Exeter Road,

especially with relation to the railroad crossing. He said he felt the area was too congested, and said it would be a benefit to work with the State and utilize the Town's own resources. He said his third goal was to examine the current housing supply in Newmarket to see if there was a way to incentivize single-family homes.

Mr. Alpers said they were talking tonight about a lot of quality-of-life issues for the community, which showed how far they had come since last year. Vice-Chair Weinstein said that communication had not been mentioned, and said though they were doing a good job as a community, they had lost newspaper coverage. Town Administrator Fournier stated that there were no longer competing newspapers, and felt they were trying to figure it out as much as Newmarket. Councilor Kast said there were a lot of volunteers and asked if there was a way to harness that energy. Mr. Alpers said that communication was the single greatest challenge for any institution, community, or school district, and said it was a way to further their reach. Chairman Pike felt it might be a good opportunity to take the website to another level.

There was a break in the Workshop Meeting from 7:22 pm to 7:34 pm.

TOP 2018 GOALS

Mr. Alpers said his team had come up with 3 goals for 2018/19. He said if they are accomplished, something else could be planned for completion in the next 18 months. He said the goals were there and he would assign who would accomplish them and add some dates for deliverables.

Goal #1 – A Facilities Plan that coordinates with CIP; energy efficiency tied in with any renovations of facilities.

Town Administrator Fournier stated that the Town shared a Facilities Director with the School, and that an examination of all facilities would be coming up shortly. He said the inventory would be done at the end of the month, and they would then set up a detailed plan and assign priorities. He said he would coordinate it with CIP which was due at the same time.

Mr. Alpers set a deliverable date of June 1, 2018 for Inventory completion by the Facilities Director, and September 1, 2018 for delivery of the Facilities Plan by the Facilities Director and the Town Administrator, in advance of the Budget.

Goal #2 – Economic Development/Marketing

Mr. Alpers stated that they should begin to look at what it would take to develop the Gateway. He said the Downtown was busy and vibrant and they needed to figure out how to continue to build on that momentum from either end. He said this also included a Marketing Plan with how to best get Newmarket from a pass-through community to a destination. Town Administrator Fournier said the Gateway was a new idea, and the Council needed to have the Joint Meeting with the Planning Board. Mr. Alpers asked when the Joint Meeting with the Planning Board might happen and Town Administrator Fournier suggested June 15, 2018.

Town Administrator Fournier said the Town had applied for a grant from a Master's Program at UNH for a marketing plan, but had not yet heard. Chairman Pike mentioned that they had an Economic Development Committee which was on hiatus, and Town Administrator Fournier said this would be more like hiring a marketing director to see what products they could offer. He said the utilities issues on North Main Street were being upgraded and Exeter Road was already done.

Discussion: Councilor Kast asked for clarification on the goal, and Town Administrator Fournier said they were trying to get people to stop, and development would slow them down. He said they were previously focused on Downtown and this would be a shift to focus on expanding to the north and south. He said they were looking to improve the tax base and quality of life by offering more services for residents, and improving the view of the community when people come to Newmarket. Vice-Chair Weinstein said she had spoken with people who were looking for space for small businesses in Newmarket which did not exist.

Town Administrator Fournier said he was seeing a lot of development in communities with either plazas or mixed-use buildings. Mr. Alpers mentioned the application to UNH for some kind of marketing plan, and Town Administrator Fournier said they now needed to move on their own. He said there was no money in the Budget currently and they would need to include it in the Budget for FY2020 at the earliest. Chairman Pike asked if there was any sense of the costs, and Town Administrator Fournier estimated between $10,000 and $30,000. Councilor Dumont asked how the marketing plan would work, and Town Administrator Fournier said the marketing firm would look at what was already available in Newmarket and meet with focus groups to do a complete rebranding.

Mr. Alpers said that as far as the Economic Development Plan, the Council would first meet with the Planning Board and then execute an RFP in FY2019 for marketing. Chairman Pike said the Planning Board had wanted Design Standards for understanding the look of developments and felt this should not be dropped. Town Administrator Fournier suggested that for economic growth, they should explore hiring an Economic Development Director in FY2020, even on a part-time basis, to focus on getting the marketing out.

Goal #3 – Quality of Life Issues: Waterfront Plan, creating green spaces, walkability, bike lanes.

Mr. Alpers stated that the last goal involved the quality of life issues such as a Waterfront Plan, creating more green spaces and parks, the walkability of the Town, and adding more bike lanes. He said the Council would be working with the Community Development Director, the Town Administrator, and the Economic Development Director for a finality of details. He felt that this goal was important and was also part of the first two goals. He said he was reluctant to put a date to this from a Council standpoint. He said while completing other projects in Town they needed to take these important quality of life issues into consideration when making decisions.

Councilor Finch felt it involved the usability of the Town in general. Vice-Chair Weinstein felt a goal with marketing should be to advertise the conservation trails in Newmarket. Town Administrator Fournier said a lot of people thought access to conservation land was not allowed, but the opposite was true and they are supposed to have access.

Final Comments

Mr. Alpers said that he hoped the Town Council found the goal-setting process helpful and beneficial. He said the report would be put together within 2 weeks and emailed to Town Administrator Fournier for review and any changes, after which it would be forwarded to the Town Administrator as a draft. He said the Council could then make changes and adopt the goals.

Mr. Alpers said he appreciated the Town Council and the Town Administrator allowing Primex to be part of this process tonight. He said if Boards at the top are working well together, it flowed to the rest of the organization. He said he observed that the Town Council and the Town Administrator worked very well together and felt Newmarket had a bright future ahead. He thanked everyone for their participation.

ADJOURNMENT

The Town Council Workshop Meeting was adjourned at 8:05 pm.

Respectfully submitted,

Patricia Denmark, Recording Secretary

DRAFT

TOWN OF NEWMARKET, NEW HAMPSHIRE
TOWN COUNCIL REGULAR MEETING

APRIL 18, 2018 7:00 PM

TOWN COUNCIL CHAMBERS

PRESENT: Council Chairman Dale Pike, Council Vice Chairman Toni Weinstein, Councilor Zachary Dumont, Councilor Gretchen Kast, Councilor Kyle Bowden, Councilor Amy Burns, Councilor Casey Finch

ALSO PRESENT: Police Chief Kyle True, Conservation Commission Member Drew Kiefaber, Conservation Commission Member Patrick Reynolds, Land Conservation Director Duane Hyde of the Southeast Land Trust (SELT), Planning Board Vice-Chair Valerie Shelton, Community Development Director Diane Hardy, Kyle Pimental of the Strafford Regional Planning Commission

AGENDA

Chairman Dale Pike welcomed everyone to the April 18, 2018 Newmarket Town Council Meeting and called the meeting to order at 7:00 pm, followed by the Pledge of Allegiance.

PUBLIC FORUM

Chairman Pike opened the Public Forum at 7:01 pm,

As no one from the public came forward, Chairman Pike closed the Public Forum at 7:01 pm.

PUBLIC HEARINGS

Chairman Pike opened the Public Hearings at 7:02 pm, and asked if anyone from the public wished to speak.

Ordinance #2017-2018-03 Amendments to Chapter 32 Zoning, Section 32-238 Impact Fees of the Municipal Code of the Town of Newmarket and Zoning Ordinance, Adopted 2/14/1996 as Amended through October 18, 2017

Resolution #2017/2018-45 Adoption of the Newmarket, NH Multi-Hazard Mitigation Plan Update

As no one from the public came forward to speak to either *Ordinance #2017-2018-03* or *Resolution #2017/2018-45*, Chairman Pike closed the Public Hearings at 7:02 pm.

TOWN COUNCIL TO CONSIDER ACCEPTANCE OF MINUTES

Acceptance of the minutes of the Regular Meeting of March 28, 2018

Vice-Chair Weinstein made a motion to approve the minutes of the Regular Meeting of March 28, 2018, which was seconded by Councilor Burns.

Councilor Finch corrected an error on line 259 to state that the Piscassic River-Loiselle Property kiosk sign "will be installed".

Police Chief Kyle True polled the Council and the minutes of the meeting of March 28, 2018 were approved as amended by a vote of 7-0.

Acceptance of the minutes of the Regular Meeting of April 4, 2018

Vice-Chair Weinstein made a motion to approve the minutes of the Regular Meeting of April 4, 2018, which as seconded by Councilor Burns.

Councilor Kast made a change on line 78 to correct "School Research Officer" to *School Resource Officer.*

Police Chief True polled the Council and the minutes of the meeting of the Regular Meeting of April 4, 2018 were approved as amended by a vote of 5-0, with 2 abstentions.

REPORT OF THE TOWN ADMINSTRATOR – Submitted as part of the Council Packet.

COMMITTEE REPORTS – None

OLD BUSINESS

ORDINANCES AND RESOLUTIONS IN THE 2ND READING

Chairman Pike asked that *Resolution #2017/2018-44* be taken out of order and the Council agreed.

Resolution #2017/2018-44 Purchase of Tucker Property for Conservation Purposes

Drew Kiefaber, member of the Conservation Commission, introduced Conservation Commission member Patrick Reynolds, Duane Hyde of the Southeast Land Trust (SELT), and Valerie Shelton who was representing the seller of the property. He said the property was formerly owned by Don Tucker, who before his death had spoken of a desire to have it conserved. He said the land became part of his estate and the property abutted other conserved lands. He said the Newmarket Conservation Commission,

working with the Southeast Land Trust (SELT), had been communicating with the owners of the property for a way to conserve it.

Mr. Kiefaber said the parcel actually consisted of two (2) pieces of property at the end of Neal Mill Road. He said one piece was a little over 15 acres, much of it wetland, which drained from the Southeast Land Trust to this property and eventually to the Piscassic River. Chairman Pike asked about the site of the Tucker Well and Mr. Kiefaber said it was located across the street and not abutting. He said the current proposal was that the Town and the Southeast Land Trust (SELT) would buy the property, assuming an appraised value of $150,000 to $170,000. He said if it was appraised above that amount the landowner would do a bargain sale at $170,000.

Mr. Kiefaber said the funding would come from two (2) sources: (1) Town of Newmarket Conservation Fund, contributing up to $105,000; and (2) Wetlands Reserve Easement Program (Federal). He said SELT would do the legwork of applying for and getting the easement, which would be put on the property by the current landowner. He said SELT would ultimately own the property and the Town of Newmarket would have an executory interest in the ownership. He said the proposal was structured that way because a land trust would provide better stewardship of that property for conservation than a municipality, and SELT also owned an abutting property which would drain through this property and provide continuation of water cleansing through conservation land.

Mr. Kiefaber said the other parcel was a thin strip of land about ¾ acre with frontage on the Piscassic River which would be included in this acquisition, fronting on a Class 6 road. He said this parcel also abutted another property with a conservation easement, which abutted the Town portion for the Tucker Well for which the Town owned the easement.

Discussion: Vice-Chair Weinstein asked the balance of the Conservation Fund, and Mr. Kiefaber said they currently had a balance of $294,000. Councilor Kast asked what would happen if the property cost came in less than $170,000. Mr. Kiefaber explained that the Wetlands Reserve Program had a set amount of money which was provided for an easement on a property, on a per-acre basis. As this was a finite amount, if the appraisal came in lower the Conservation Commission would be contributing less.

Land Conservation Director Duane Hyde, of the Southeast Land Trust (SELT), said there was an error in the Resolution, and said SELT was bringing in a little over $102,000, approximately $70,000 from the Wetlands Protection Easement Program, $9,000 applying to Great Bay Resource Protection Partnership for funding, and $25,000 in private funds, an approximate 50/50 split of the Town and SELT. Mr. Kiefaber said other expenses included long-term easement stewardship funds and closing costs. Councilor Kast asked about access and usage for Town residents, and Mr. Kiefaber said the land was open to the public for non-motorized access in general, and hunting would be permitted within other regulations.

Chairman Pike said he had been hiking the Newfields-Manchester Rail Trail and had come across a side trail which passed through meadows and wetlands, and said he was thrilled to see it being made larger. Councilor Kast asked if there would be development of trails on the property. Mr. Kiefaber said trails were not planned as the area was mostly wetlands, and the end of the Class 6 road became a double-wide trail through the Piscassic Greenway. Director Hyde stated that the Piscassic Greenway, owned by the Southeast Land Trust, currently consisted of approximately 450 acres with a well-signed trail network. Mr. Kiefaber said they would probably have to look at some sort of drainage or improvement at the end of Neal Mill Road to provide space for people to leave vehicles.

Councilor Kast asked about the relation of the easement with NRCS. Director Hyde said SELT secured a dedicated amount of money for projects that met certain criteria from NRCS, the Natural Resources Conservation Service, through its Wetlands Resource Easement Program. He said NRCS was a federal program under the Department of Agriculture related to areas noted in the Coastal Conservation Plan protecting rare turtle habitats, which this property had. He said the program would rank the projects and fund acquisition of Conservation Easements by the NRCS, with the easement held by the federal agency, and paying $70,000. He stated that SELT, along with the Town, would then acquire the property to round out the overall purchase price.

Councilor Kast asked if that agency would then be involved in some of the Conservation activity. Director Hyde said as part of the program, NRCS was involved in doing wetlands restoration to improve habitat on the property, and would usually undertake that in the first year of ownership. Mr. Kiefaber stated that almost all conservation properties required this sort of combination of funding sources. Councilor Kast asked about water quality, and Director Hyde stated that the Tucker Well had been permitted by the State of New Hampshire but that they did have requirements for source protection around wells.

Councilor Kast asked about the whole picture of the abutting conservation land, and Mr. Kiefaber said in general conservation organizations looked to try to establish larger pieces of property in conserved areas whenever possible. Director Hyde added that he had done the abutting piece with Don Tucker when he was alive, and said they had talked about the importance of the stream that passes through this property to the Piscassic River and to protecting the water quality of the river and the Tucker Well. He said these stream systems and abutting wetlands were also important corridors for wildlife movement and they would be protecting that as well.

Police Chief True polled the Council and *Resolution #2017/2018-44 Purchase of Tucker Property for Conservation Purposes* was approved by a vote of 7-0.

Ordinance # 2017-2018-03 Amendments to Chapter 32 Zoning, Section 32-238 Impact Fees of the Municipal Code of the Town of Newmarket and Zoning Ordinance, Adopted 2/14/1996 as Amended through October 18, 2017

Community Development Director Diane Hardy said she was there on behalf of the Planning Board to recommend for approval to the Town Council to make some amendments to the Town Zoning Ordinance under the Impact Fees section. She said the Town had an Impact Fees program since 2001, which provided the School and the Town with a means of funding public facilities necessitated by growth and

development in the community. She explained that there was a section in the Zoning Ordinance where the Planning Board could provide waivers under certain circumstances. She said there had been a lot of discussion about Accessory Dwelling Units (ADUs), and said a State Law was passed last year that said communities had to allow these types of dwellings within residential zones as a way of promoting affordable housing.

Community Development Director Hardy said ADUs in Newmarket were basically allowed in all zones that allowed residential/single-family housing. She said to apply for an accessory apartment you would go to the Zoning Board and seek a special exception. She said there were certain conditions that had to be met: the dwelling had to allow for 2-bedroom apartments, one unit had to be owner-occupied, parking had to be accommodated as well as sewer and water provided, there had to be an interior door between units which could not be locked, and the structure had to be compatible with the character of the neighborhood.

Community Development Director Hardy said the Town Attorney had reviewed the Zoning Ordinance, advised them to be in compliance with Federal as well as State laws, and had recommended some language that limited the number of bedrooms created to equal the number of bedrooms before. She said the Planning Board then drafted some language, held a work session and a Public Hearing, and had a recommendation to be brought forward to the Council for consideration. She said they were just adding another paragraph to the Zoning Ordinance stating that the ADUs be created from conversion of existing living areas, and that the number of bedrooms not be increased on the property.

Discussion: Vice-Chair Weinstein asked how the process worked. Community Development Director Hardy said the ADUs could be approved after duly notifying the public, and the Planning Board had the jurisdiction to waive Impact Fees. She felt the changes would help the Planning Board clarify some of the grey areas in the law and put them on a stronger legal ground. She said the Planning Board discussed ways of assuring compliance with the rules through the application process.

Police Chief True polled the Council and *Ordinance# 2017-2018-03 Amendments to Chapter 32 Zoning, Section 32-238 Impact Fees of the Municipal Code of the Town of Newmarket and Zoning Ordinance, Adopted 2/14/1996 as Amended through October 18, 2017* was approved by a vote of 7-0.

Resolution #2017/2018-42 Purchase of a Ford Taurus Unmarked Cruiser for the Police Department to include Costs Associated with Replacement of Emergency Lighting, and Equipment Set-up

Vice-Chair Weinstein made a motion to approve *Resolution #2017/2018-42 Purchase of a Ford Taurus Unmarked Cruiser for the Police Department to include Costs Associated with Replacement of Emergency Lighting, and Equipment Set-up*, which was seconded by Councilor Burns.

Police Chief True said the Police Department was looking to replace a 2005 Crown Victoria which had low mileage but had developed a number of maintenance issues, and the vehicle had to be put out of service last year. He said the estimated cost to keep the vehicle would be approximately $2,800 just to pass inspection. He said in this instance he recommended that the Town not pass the vehicle on to another department but to sell it at State Auction. He said they were looking to replace it with a brand new 2018 Ford Taurus, which would be an unmarked vehicle used by detectives.

Police Chief True said the State bid from Grappone Ford would be a vehicle cost of $25,000 with a total cost of $30,609 with set-up, and it would be purchased from the Police Department Detail Revolving Account, which was separate from Capital Reserves. He said he received 3 bids to outfit the vehicle and recommended the lowest bid from 2-Way Communication in Newington.

Discussion: Councilor Dumont asked what would happen to the equipment currently in the vehicle. Police Chief True said the radio was antiquated and unsupported by Motorola, and right now Rockingham County was benefitting from a 50% price drop.

Police Chief True polled the Council and *Resolution #2017/2018-42 Purchase of a Ford Taurus Unmarked Cruiser for the Police Department to include Costs Associated with Replacement of Emergency Lighting, and Equipment Set-up*, was approved by a vote of 7-0.

Resolution #2017/2018-43 Purchase of a Ford Interceptor SUV for the Police Department to include Costs Associated with Replacement and/or Transferal of Emergency Lighting, and Equipment Set-up

Vice-Chair Weinstein made a motion to approve *Resolution #2017/2018-43 Purchase ofa Ford Interceptor SUV for the Police Department to include Costs Associated with Replacement and/or Transferal of Emergency Lighting, and Equipment Set-up*, which was seconded by Councilor Bowden.

Police Chief True stated that this was a black-and-white line car to replace a 2014 SUV with approximately 103,000 miles. He said the current vehicle was beyond warranty and they had spent $4,900 beyond the warranty. He said items from the 2014 vehicle could be removed and put in the new vehicle, and said the lowest bid on outfitting the vehicle was again 2-Way Communications at $2,427. He said the State bid from Grappone Ford bid was $29,122 for a total of $32,049 with set-up. He said the vehicle would be purchased from the Police Department Capital Reserve Fund, which currently had $222,000 in the fund.

Discussion: Vice-Chair Weinstein said the Staff Report recommended keeping vehicles from between 4-10 years and this seemed on the low end. Police Chief True said the Department tried to purchase at least one vehicle per year, but in the 3rd year they would replace 2 vehicles, one line car and one unmarked vehicle. He said they kept the unmarked vehicles for 10 years minimum as they got less wear and tear, while the black-and-white line cars were constantly running. He said historically they tried to change out police line-car vehicles between 90,000 and 100,000 miles to make sure they are safe.

Police Chief True polled the council and *Resolution #2017/2018-43 Purchase of a Ford Interceptor SUV for the Police Department to include Costs Associated with Replacement and/or Transferal of Emergency Lighting, and Equipment Set-up* was approved by a vote of 7-0.

Resolution #2017/2018-45 Adoption of the Newmarket, NH Multi-Hazard Mitigation Plan Update 2018

Vice-Chair Weinstein made a motion to approve *Resolution #2017/2018-45 Adoption of the Newmarket, NH Multi-Hazard Mitigation Plan Update 2018*, which was seconded by Councilor Bowden.

Kyle Pimental, Principal Regional Planner at Strafford Regional Planning Commission, stated that the Town Administrator asked him to give background on the Hazard Mitigation Update. He said he would talk about

the Multi-Hazard Mitigation Plan, the Town process they had gone through, and some of the more significant changes made in the update since 2013 and go over the next steps moving forward.

Mr. Pimental gave some background stating that in 2000 Congress adopted the Disaster Mitigation Act, which basically authorized Federal funding for development of State and local Hazard Mitigation Plans. He said currently Congress required all local governments to have an approved plan to receive any sort of Federal funding, especially Federal Disaster Funding. He said there was a big difference between pre- and post-disaster funding. He explained that if a community did not have a Hazard Mitigation Plan and there was a natural disaster, they could still receive Federal funding post-disaster, but to do something pre-disaster they would not be eligible to receive Federal funding.

Mr. Pimental said that New Hampshire was one of the most compliant states in the country with 231 out of 234 communities compliant. He said the primary purpose of the plan was for communities to get together emergency personnel and look at different types of hazards that could impact the Town, determine their vulnerability, and start thinking of some long-term strategies to reduce their risks. He said the plans were meant to be revolving documents which should be reviewed by the Emergency Management Department before or after any event and had a life-cycle of 5 years before expiration. He stated that Newmarket's plan expired February 1, 2018, and said that going through Homeland Security took a lot of time and the funding was also delayed until late fall of last year.

Mr. Pimental said the process was that the Town received $7,500 from Homeland Security from a FEMA Grant, and as part of that the Town's contribution had to be $2,500 in an in-kind match. He said once funding was in place, the Town had the opportunity to pick their consultant and decided to work again with the Strafford Regional Planning Commission. He said he and the Emergency Management Department then organized a committee of 6 people to review materials and they met 4 times from December 6, 2017 to January 24, 2018. He said the job of the committee was to provide him with some local knowledge, some perspective on the Town's biggest concerns, and to go over what happened over the last 5 years.

Mr. Pimental reviewed significant changes saying that FEMA changed their guidelines every few year. He said Newmarket's Plan met all regulations and Homeland Security had already given conditional approval, so that everything FEMA wanted to see was already in the plan. He said the chapter on Community Profile was not in the Town's 2013 plan, new land use data had come out, and new housing data. He said they reviewed the Town's critical infrastructure and key resources and there were 5 different tables for emergency response facilities, non-emergency response facilities, critical infrastructure, vulnerable populations, and water resources which were all met.

Mr. Pimental said they had looked at the Town's Flood Insurance policies and compliance with the Flood Insurance Program, looked at various projects done (seawater rise, Stormwater, etc.), and assessed each hazard using a required vulnerability tool. He said two new hazards were added: (1) cyber-attacks and (2) coastal flooding. He said they looked at Federal declarations over the last 5 years and each hazard now had a new write-up including potential future impacts and losses.

Mr. Pimental said they also looked at what the Town had accomplished since their 2013 Plan, and said there were 12 actions of which the Town completed 7, rolled 2 over into the 2018 Plan, and 2 were removed. He said they looked at existing mitigation items like the Town's Flood Plan Ordinance, building codes, mutual aid, and assessed functioning, and looked at new mitigation actions and put this all together in an Implementation Plan. He said the plan was submitted on January 11, 2018 and Homeland Security had given conditional approval on March 23, 2018.

Mr. Pimental said New Hampshire was only the second state in the country to allow the State to review these plans, which was important in that it saved communities time in going through FEMA. He said New Hampshire now allowed the State Department of Homeland Security to review their plans and provide assistance. He said the next steps would be for the Council to adopt the plan and send it back to FEMA for final approval. He said the approval date of the final letter would be the start of the 5-year plan.

Discussion: Councilor Kast said since the Town's prior plan had expired and they were now in the period where they were not eligible for funding. Mr. Pimental said if the Town were to apply for any pre-disaster funding now they would be ineligible. He explained that the funding from FEMA was late and nothing could be done until the funding arrived. He said it also took time to go from Federal to State Homeland Security to the Planning Commission down to getting the community ready.

Community Development Director Hardy said the Town of Newmarket did not have any pre-disaster projects ready so that timing was really a moot issue. She said there was nothing on their Capital Improvement Program that qualified for pre-disaster funding, and they were still eligible for post-disaster Federal funding. Councilor Kast asked how the projects listed would move forward once the plan was adopted. Mr. Pimental said that each action identified on the Implementation Plan should have a responsible party as lead for moving that project forward, and said it was the Town's responsibility to look at the actions and decide which were most important, depending on resources.

Councilor Bowden asked about active shooter situations, and Mr. Pimental said they had that discussion and some communities were adding it into their disaster plans, howeverthe Town also had an Emergency Management Operations Plan that might be a better fit. Chairman Pike pointed out that there was not a single plan that covered everything the Town had to monitor.

Police ChiefTrue polled the Council and *Resolution #2017/2018-45 Adoption of the Newmarket, NH Multi-Hazard Mitigation Pion Update 2018* was approved by a vote of 7-0.

ORDINANCES AND RESOLUTIONS IN THE 3RD READING – None

ITEMS LAID ON THE TABLE – None

NEW BUSINESS /CORRESPONDENCE

TOWN COUNCIL TO CONSIDER NOMINATIONS, APPOINTMENTS AND ELECTIONS

Cemetery Trustee

Candidate: *David Erwin Smith - Term Expires March 2020*

Councilor Dumont made a motion to approve the nomination of *David Erwin Smith - Term Expires March 2020* as a *Cemetery Trustee*, which was seconded by Councilor Burns.

Police Chief True polled the Council and the nomination of *David Erwin Smith* as a *Cemetery Trustee* was approved by a vote of 7-0.

ORDINANCES AND RESOLUTIONS IN THE 1ST READING – None

CORRESPONDENCE – None

CLOSING COMMENTS

Vice-Chair Weinstein said the Roadside Cleanup would be held Sunday, April 29, 2018 from 1:00 pm–4:00 pm, and people interested in helping out could meet at the Elementary School at 12:45 pm or send her an email.

Vice-Chair Weinstein said there was also an event being organized by Patty Marsden of the Newmarket Community Church for the First Annual Newmarket Cares Day. She said the idea was to bring volunteers together and pair them with projects for the Town and private projects. She said it would be held May 11, 2018 from 11:30 am to 5:00 pm and coincide with a half-day of school. Anyone interested should contact the Community Church.

Councilor Finch reiterated that the Piscassic-Loiselle sign would be going up on Saturday morning.

Councilor Dumont said there were 2 public hearings last week on Wildcat Transit Route 5 Bus Service, as they were looking at getting rid of all weekend service and cutting off the Bennett Way section of their bus route. He said there were noticeable concerns from non-motor vehicle owning residents, and said he was working on some ways to save some weekend service as he was an employee of Wildcat Transit.

NEXT MEETING: The next Regular Town Council Meeting will be held on May 2, 2018 in the Town Council Chambers.

ADJOURNMENT

Chairman Pike adjourned the meeting at 8:39 pm.

Respectfully submitted,

Patricia Denmark, Recording Secretary

DRAFT

RECEIVED

APR 18 2018

TOWN OF NEW MARKET
ADMINISTRATOR'S OFFICE

APPLICATION FOR APPOINTMENT TO A BOARD, COMMISSION, OR COMMITTEE POSITION WITHIN THE TOWN OF NEWMARKET

Applicant's Name: Charlotte DiLorenzo

Address: 193 S Main St #6 Phone/Cell 603-988-4405

RSA 669:19 Newmarket Registered Voter: Yes No **# of Years as Resident:** 25
RSA 91:2 Are you an American Citizen? Yes No

Email address: cbdilorenzo@comcast.net

Full membership (3 year term) **position applying for** Newmarket Housing Authority Commissioner

State what the new **term expiration date is:** 3/31/2023

Alternate position (3 year term) position applying for _____

State what the new term expiration date is: _____

I feel the following experience and background qualifies me for this position:

I have been a housing commissioner for NHA for six years and would like to continue serving the residents of Great Hill Terrace and NHA's portable vouchers holders (Section 8) vouchers.

(need more room, please use the back)

Charlotte DiLorenzo 4/17/2018
Signature Date

You are welcome to submit a letter or resume with this form. Applicants are requested to attend the Council meeting to address the Town Council prior to the decisionmaking process. Applicants will be notified of the time and date of this meeting in advance. Thank you for your application and interest in the Town of Newmarket.

Town Hall
186 Main Street
Newmarket, NH 03857

Tel: (603) 659-3617
Fax: (603) 659-8508

Founded December 15, 1727
Chartered January 1, 1991

TOWN OF NEWMARKET, NEW HAMPSHIRE

STAFF REPORT

DATE: May2, 2018

TITLE: Charlotte DiLorenzo

PREPARED BY: Wendy Chase, Executive Assistant

TOWN ADMINISTRATOR'S COMMENTS - RECOMMENDATION:

BACKGROUND:

DISCUSSION:

FISCAL IMPACT:

RECOMMENDATION:

ATTACHMENTS:

Description	Upload Date	Type
Appointment Application	4/26/2018	Exhibit

Town Hall
186 Main Street
Newmarket, NH 03857

Tel: (603) 659-3617
Fax: (603) 659-8508

Founded December 15, 1727
Chartered January 1, 1991

TOWN OF NEWMARKET, NEW HAMPSHIRE

STAFF REPORT

DATE: May2, 2018

TITLE: Resolution 2017/2018-46

PREPARED BY: Diane Hardy, Director of Planning and Community Development

TOWN ADMINISTRATOR'S COMMENTS - RECOMMENDATION:

BACKGROUND:
The Town is required to address deficiencies related to the Macallen Dam, as the result of a Letter of Deficiency issued by the New Hampshire Department of Environmental Services. (See attached.) In July 2017, the Town hired GZA Geoenvironmental Inc. to evaluate conceptual design options and prepare related stability analyses to address the dam safety issues. These options are detailed in the attached final summary report which has been approved by the New Hampshire DES. The Macallen Dam Study Committee has examined these options and reported back to the Town Council with a recommended course of action related to rehabilitation of the dam at the December 6, 2017 Town Council meeting.

DISCUSSION:
There were three (3) specific options, (with various wall heights, alignments, and gate alternatives) that were evaluated by GZA and considered by the Macallen Dam Study Committee. These involved raising the abutment walls on either side of the dam to address the spillway capacity issues. As an additional work task, GZA evaluated modifications to the existing gate structure. At a meeting on November 2017, the Committee selected the Pneumatically-Operated Gate Option, as the "Preferred Alternative" which involves the replacement of the existing antiquated gate structure, installation of an automated crest gate system, repair of left and right training walls adjacent to the dam, a slight increase in the height of the right wall abutment, and the addition of earthen fill and safety fencing. See attached "Action Plan: Conceptual Design Modifications to the Macallen Dam'.

FISCAL IMPACT:

As part of GZA's work, estimates were provided for each alternative ranging in cost from $1,460,000 to $1,540,000. (See attached reports for cost analyses). This resolution before the Town Council will provide funding to continue final engineering and design related to the "Preferred Alternative". Construction costs for this alternative is estimated at $1,230,000. Proposal has been provided for the necessary final design and engineering. Note: GZA was selected through a competitive negotiation (RFQ/RFP) process in accordance with the Town's procurement requirements. Three firms were interviewed for engineering services for the Macallen Dam. GZA was the top-ranking consultant with the most cost-effective pricing.

Funding is available in the Macallen Dam Capital Reserve fund for this purpose. This will allow us to proceed with the next stage of engineering, so that the Town will be in a position to recommend bond financing for construction for a vote at the March 2019 Town Meeting.

RECOMMENDATION:

It is recommended that the Town Council approve this resolution to authorize the Town Administrator to enter into an agreement with GZA Geo Environmental Inc. in an amount not to exceed $202,600 for final design and permitting of the "Preferred Alternative" and to withdraw said amount from the previously established Macallen Dam Capital Reserve Fund.

ATTACHMENTS:

Description	Upload Date	Type
Resolution 2018-2019 -46	4/26/2018	Cover Memo
Action Plan	4/26/2018	Cover Memo
Letter of Deficiency	4/26/2018	Cover Memo
Summary Report Meeting	4/26/2018	Cover Memo
GZA's Proposal for Final Engineering and Design	4/26/2018	Cover Memo

CHARTERED JANUARY 1, 1991 **FOUNDED DECEMBER 15, 1727**

TOWN OF NEWMARKET, NEW HAMPSHIRE
By the Newmarket Town Council

Resolution 2018-2019-46
Authorizing the Town Administrator to Enter into an Agreement with GZA GeoEnvironmental, Inc. for Final Design and Engineering Services related to the Rehabilitation of the Macallen Dam

WHEREAS: The State of New Hampshire Department of Environmental Services (NH DES) has issued a Letter of Deficiency (LOD) for the Town-owned Macallen Dam located in downtown Newmarket on the Lamprey River and the Town of Newmarket is required to address the issues identified in the Letter of Deficiency; and

WHEREAS: The Town Council in August 20, 2014 formed the Macallen Dam Study Committee to examine options for addressing the Town's Letter of Deficiency and to report back to the Town Council with a recommended course of action related to the removal, preservation or other possibilities for the Macallen Dam; and

WHEREAS: The Town has issued a Request for Qualification (RFQ) and solicited Proposals for professional engineering services related to the Macallen Dam; and

WHEREAS: The Macallen Dam Study Committee interviewed three firms to provide engineering services for the Macallen Dam, and GZA was selected as the top ranking consultant in accordance with the Town's procurement requirements; and

WHEREAS: In July 2017, GZA GeoEnvironmental Inc. was hired by the Town of Newmarket to provide conceptual design options and stability analysis to address specific dam safety issues at the dam as detailed in the "Macallen Dam: Stability Analysis and Conceptual Design of Remedial Alternatives Summary Report", which has been reviewed and approved by the New Hampshire Department of Environmental Services; and

WHEREAS: The Macallen Dam Study Committee reviewed all options and at its meeting on November 2, 2017 selected the Pneumatically-Operated Gate Option as the "Preferred Alternative" as outlined in the "Action Plan: Conceptual Design Modifications to the Macallen Dam Memorandum"; and

WHEREAS: The "Preferred Alternative" involves demolition of the existing antiquated concrete gate structure and installation of an automated crest gate in the same location left of the existing spillway. It includes rehabilitation and repair of the left and right training walls and slight raising of the right abutment and the addition of earthen fill with a safety fence; and

WHEREAS: The estimated cost for the construction of the "Preferred Alternative" is $1,230,000 which will be refined and recommended to be considered for bond financing for a Town Meeting Vote in March 2019; and

WHEREAS: The committee recommends contracting with GZA GeoEnvironmental Inc. of Bedford NH to provide further engineering services related to Final Design and Permitting; and

WHEREAS: Work under this Agreement will not commence until after July 1, 2018, at which time the projected balance in the Macallen Dam Capital Reserve Fund will be $ 211,664,

WHEREAS: GZA has submitted a proposal to the Town, which involves the following components:

Base Line Scope		**$ 195,900**	(Final Design and Permitting)
Task 1	Project Coordination	$ 3,200	
Task 2	Project Kick-off/consultation	8,400	
Task 3	Field Investigations/Data collection	12,900	
Task 4	Final Design	127,700	
Task 5	Permitting [1]	34,900	
Task 6	Bidding Services	8,800	
Allowance for Fees	(*Estimated)*	**$ 6,700**	
NHDES Wetland Permit		$ 2,700	
NHDES Dam Permit		4,000	

1. Allowance for fees separate from and in addition to price listed for specific tasks.

Total Contract Amount **$ 202,600**

NOW, THEREFORE, BE IT RESOLVED BY THE NEWMARKET TOWN COUNCIL THAT:

The Town Council authorizes the Town Administrator to enter into an agreement with GZA GeoEnvironmental Inc.in an amount not to exceed **$202,600** for final design and permitting of the "Preferred Alternative" and to withdraw said amount from the previously established Macallen Dam Capital Reserve Fund.

First Reading: *May 2, 2018*

Second Reading:

Approval:

Approved: _____

Dale Pike, Chair Newmarket Town Council

A True Copy Attest:_____

Terri Littlefield, Town Clerk

GZA

Proactive by Design

GEOTECHNICAL
ENVIRONMENTAL
ECOLOGICAL
WATER
CONSTRUCTION MANAGEMENT

249 Vanderbilt Avenue
Norwood, MA 02062
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F: 781.278.5702
www.gza.com

March 26, 2018
File No. 01.0173346.00

Newmarket Town Hall
Town Council Chambers
186 Main Street
Newmarket, NH 03857

Re: Action Plan: Conceptual Design Modifications to Macallen Dam
Newmarket, New Hampshire

Dear Committee Members:

GZA GeoEnvironmental, Inc. (GZA) is pleased to present to the Macallen Dam Study Committee (Committee), the Town of Newmarket, New Hampshire and the New Hampshire Department of Environmental Services (NHDES) Dam Bureau the following Action Plan for the Macallen Dam. The Action Plan specifies the actions to be taken to address the identified deficiencies at Macallen Dam, located in Newmarket, New Hampshire, as outlined in the September 27, 2010 Letter of Deficiency (LOD) and presents a proposed timeframe for undertaking these actions. This plan has been developed in accordance with our proposal dated July 11, 2017, executed on July 20, 2017. This document is subject to the Limitations presented in **Appendix A**.

This Action Plan outlines the next steps to bring the Macallen Dam into compliance with New Hampshire Dam Safety Regulations and focuses on the preferred repair alternative developed by GZA in accordance with our proposal scope and approved by the Committee. Please refer to the November 22, 2017 Engineering Summary Report entitled "Macallen Dam: Stability Analysis and Conceptual Design of Remedial Alternatives" for additional background information for the dam and deficiencies and our development of conceptual designs, related stability analyses, and conceptual level budgetary cost estimates associated with the rehabilitation of the Macallen Dam.

Deficiencies and Remedial Measures

In accordance with RSA 482:12 and Env-Wr 302.02, the Macallen Dam was inspected by the NHDES Dam Bureau on November 5, 2009. Safety issues were identified at the dam in a Letter of Deficiency issued by the NHDES in September 2010, based on the 2009 inspection. The LOD advised the Town of the multiple items that constituted deficiencies that NDHES believes should be remedied. In addition, the Town had previously received an LOD in May 2008 requesting the Town evaluate and determine whether the spillway capacity of the dam is adequate to safely pass the peak flow during the design flood.

Significant work has been completed to evaluate the feasibility of restoring or removing Macallen Dam, as well as assessment of potential impacts of various restoration/removal scenarios. Over the ensuing years, the Town subsequently authorized multiple studies by multiple engineering consultant firms, ultimately culminating in GZA's November 22, 2017

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Engineering Summary Report, which summarized the pertinent issues identified in the letters of deficiency and previous studies performed at the dam. The Report also outlined analyses completed to further advance conceptual design and subsequent rehabilitation of the dam which are intended to fulfill the requirements of the LOD. The report presented a "Preferred Alternative" that was selected by the Committee as the recommended alternative to be developed further as part of a final design to rehabilitate the dam.

Preferred Alternative

GZA developed three (3) conceptual alternatives associated with raising the abutment walls to address the dam's spillway capacity requirements. As an additional task item, the Town requested that GZA evaluate modifications to the existing gate structure to increase spillway capacity, therefore, minimizing the height to which the abutments will be required to be raised. GZA presented the conceptual design alternatives to the Committee and NHDES during meetings held on October 11, 2017 and November 2, 2017. During the meeting held between GZA, the Committee, and NHDES on November 2, 2017, the Committee selected the Pneumatically-Operated Gate Option as the "Preferred Alternative" to be developed further for final design. This alternative includes demolition of the existing concrete gate structure and installation of an automated crest gate in that same location to the left of the existing spillway. This option also includes rehabilitation and repair of the left and righttraining walls, and slight raising of the right abutment. The conceptual design for raising the right abutment includes the addition of earthen fill with a safety fence. During final design, installation of some form of a structural wall could be considered with this alternative.

This preferred alternative was then presented to the Town Council during a public presentation held at the Town Council Chambers on December 6, 2017. The purpose of the meeting was to present the results of the abutment stability analysis, conceptual design, cost estimates, and recommended next steps for the Town in implementing the results of the study. Execution of the preferred alternative will increase the hydraulic capacity of Macallen Dam and address deficiencies identified by the NHDES in their 2008 and 2010 LODs at the Macallen Dam. The Engineering Summary Report provides additional justification for the proposed dam modifications and engineering analyses indicating the proposed alternative meets required factors of safety for the assessed component as outlined in New Hampshire Dam Safety Regulations. Construction of the proposed alternative will bring the dam into compliance with applicable regulations.

Next Steps

The NHDES Dam Bureau reviewed the Engineering Summary Report dated November 22, 2017 and attended the Public Presentation held on December 6, 2017. The NHDES Dam Bureau provided a letter dated February 13, 2018 indicating acceptance of the approach, design, and conceptual alternatives, including approval of the fail-safe crest gate system, presented in the Engineering Summary Report and findings presented at the Public Meeting (see Attachment 1). It should be noted that the approval letter from NHDES does not include approval of final hydraulics, resulting peak water surface elevation, and associated design elevation for the raised abutments. Final hydrologic and hydraulic analysis, review, and approval will be required during final engineering design. GZA does not anticipate this analysis to significantly change the results presented in our Summary Report upon which the "preferred alternative" was based, nor our conceptual-level estimate of the rehabilitation costs anticipated for its implementation.

Following approval of the preferred conceptual design alternative by NHDES, the Committee may begin the next steps to implement the repairs and address the deficiencies.

Below is an estimated outline and assumed timeline to implement the conceptual design.

- Winter 2018 - Public Hearing; Town Approval of Preferred Alternative; NHDES approval of concepts (Completed)
- Spring 2018 - Council Approval of Funds for Final Design and Permitting
- Summer 2018 - Start of Final Design and Permitting
- Fall 2018 - Submit Permits
- Fall 2018 - Start of Town's CIP and Budget Process
- March 2019 - Town Meeting Vote on Bond for Construction
- Spring 2019 - Final Design Complete; Permits Received
- Spring 2019 - Construction Bidding;
- Spring 2019 - Contract Award; Order Gate for Fabrication*
- Summer 2019 - Construction Begins
- Fall 2019 - End of Construction (Late October)
- Winter 2020 - Reporting and Project Closeout

**Note: Lead time for fabrication of pneumatic gates is typically 2-4 months and fabrication for hydraulic gates can be 6-9 months.*

Property Ownership and Future Coordination

There are specifics related to property ownership of the vacant parcel of land adjacent to the right abutment of the dam and Durham Book Exchange Building that were reviewed by the Town's legal counsel, and these specifics should be discussed with NHF&G and the Owner of the Durham Book Exchange. It is GZA's understanding that the property of land adjacent to the dam was owned separately by the Newmarket Community Development Corporation (NCDC), the New Hampshire Fish & Game (NHF&G) and the Town of Newmarket at different times over the past 50 years. The Town's legal counsel prepared a letter indicating that the NHF&G owns the fish ladder structure and the parcel of land subject to rights of access of various easement holders (see Attachment 2).

The letter states that Fish and Game granted a right of way and easement over the Parcel to the NCDC. This easement was for the purposes of "nonvehicular ingress and egress to the former Fish and Game Building" and for "maintaining, grading, landscaping, placing temporary furniture on and using said premises as a park-like facility." This easement is subject to Fish and Game's continuing right of access to its fish ladder and restricts NCDC from building any permanent structures or obstacles, such as fences, walls, or trees, that would obstruct such access. The Parcel cannot be used as a parking area. NCDC is obligated to maintain the Parcel. B&N Investors Limited Partnership ("B&N") currently owns the property adjacent to the Parcel where the Durham Book Exchange is located ("B&N Property"). B&N purchased the B&N Property from NCDC. In that conveyance, NCDC granted to B&N the same easement over the Parcel that it obtained from Fish and Game, subject to the same restrictions (no parking or blocking Fish and Game's access). However, NCDC retained its right to use the easement over the Parcel and the obligation to maintain the Parcel; B&N has the right but not the obligation to conduct maintenance activities such as landscaping for use of the Parcel as a park-like facility. NCDC also has an access easement to enable it to pass to and from the Parcel, the B&N Property, and the adjacent cement bridge. The Town owns the dam across the Lamprey River near the Parcel together with the cement abutments to the Dam and a ten-foot strip of land that appear to overlap both the Parcel and the B&N Property, as well as access rights across the Parcel and the B&N Property, to allow it to access the Dam for the purpose of repairs or additions required to keep the Dam anchored to the shore.

Following review of the property title information, the Town met with NHFG and NHDES to discuss property ownership and rights, as well as, any potential concerns NHFG may have regarding rehabilitation of the dam and adjacent property.

The NHF&G staff confirmed they will discuss the property rights issue with their land agents and NHF&G will also consult with Brett Towler of US Fish and Wildlife Service (USFWS) regarding potential impacts to fish passage at the dam resulting from the proposed project. The Town expects to hear from NHF&G regarding the proposed project in April 2018.

The Town will also need to coordinate with adjacent property owners, including the owner of the Durham Book Exchange and Bryant Rock Condominium Association (adjacent to the left abutment) regarding the dam modifications and any needed temporary construction easements. Additionally, the Town will need to coordinate with the New Hampshire Division of Historic Resources (NHDHR) regarding potential permitting impacts for the project.

Permitting

Based on our experience with other dam repair projects, and due to the potential impacts to surface waters and bank we anticipate the following permits will be required for the Macallen Dam Modifications Project:

- Dam Safety Permit (NHDES)
- Wetlands Permit Application (NHDES)
- Shoreland Permit Application (NHDES)
- USACE State Programmatic General Permit (USACE)
- NPDES Construction General Permit (EPA New England)
- FEMA Floodway No-Rise Certificate (FEMA / Local Floodplain Coordinator)
- Local Permits (Newmarket Conservation Commission)

The following assumptions are associated with the permitting effort for modifications to the Macallen Dam:

1. Project is anticipated to be classified as a Major Impact Project due to impacts to streambank likely exceeding 50 linear feet. As a result, Historical Review and a Stamped Survey will be required.
2. Lamprey River is a New Hampshire Designated River and is also considered a national "Wild and Scenic" river. As a result, presentation of the wetland application to the advisory committee and inclusion of comments will be required.
3. Rare Species Study and Phase 1B/2/3 Archaeological Studies are not anticipated as part of dam rehabilitation.
4. Wetland Mitigation Costs or Replication are not expected to be required as part of the dam rehabilitation because estimated impacts to wetlands are below state thresholds (10,000 sq ft). Final Design will be coordinated with permitting to mitigate wetland impacts to the maximum extent possible.

Budget Estimate

The estimated cost for engineering, permitting, and construction is based on our current understanding of the dam and the preferred conceptual design alternative.

Engineering Studies and Design:	$60,000 - $100,000
Permitting:	$50,000 - $70,000
Construction-Phase Engineering Services:	$100,000 - $140,000
Construction Cost	$1,230,000
Estimated Total:	$1,440,000 - $1,540,000

The estimate above represents our present judgement to the costs associated with the design, permitting, construction, and construction oversight. It should be recognized that unforeseen conditions, which become evident during the course of the work may require an alteration or increase in the effort required.

GZA appreciates the opportunity to provide engineering services to the Town of Newmarket. Please contact the undersigned if you have any questions or concerns.

Very truly yours,

GZA GEOENVIRONMENTAL, INC.

Todd E. Monson, P. E.(MA)
Project Manager

James P. Guarente, P.E.
Consultant/Reviewer

Chad W. Cox, P.E.(MA)
Principal-In-Charge

Attachments

Attachment 1 – *Conceptual Approval* Letter from NHDES Dam Bureau
Attachment 2 – *Status of Title* Letter from Donahue, Tucker & Ciandella, PLLC

The State of New Hampshire
DEPARTMENT OF ENVIRONMENTAL SERVICES

Robert R. Scott, Commissioner

Mr. Stephen R. Fournier
Town Administrator
Town of Newmarket
186 Main Street
Newmarket NH 03857

February 13, 2018

RE: Review of Stability Analysis and Conceptual Design of Remedial Alternatives
Macallen Dam
NH Dam D177001
Newmarket NH

Dear Mr. Fournier:

The New Hampshire Department of Environmental Services (NHDES) has reviewed the November 22, 2017 Macallen Dam: Stability Analysis and Conceptual Design Remedial Alternatives report provided by GZA GeoEnvironmental, Inc.

The report includes 3 conceptual alternatives which preserve the layout of the existing gate section and raise the left and right abutments to an elevation of 34.6 ft. All of these alternatives will provide the required 1-foot of freeboard for the previously approved inflow design flood (IDF) of 9,825 cfs with a maximum water surface elevation of 33.6 ft, and address stability and condition issues with the existing abutment walls and gate structure. These options do not change the projected maximum water surface elevation for the IDF. Finally, calculations indicate that the various proposals to increase the height of the abutments with walls and/or embankment material are all stable for the design elevation of 34.6 ft as well as a higher abutment elevation of 35.6 ft. As such, NHDES considers any of the 3 options as a viable alternative to meet discharge capacity criteria.

The report also includes 3 alternatives to replace the existing gate structure and further increase the discharge capacity of the dam. All of them would also include some increase in the existing abutment elevations, but not to the degree of those described in the previous paragraph. The first of these was to employ a fuse gate system that would self-activate when the water surface elevation reaches a prescribed elevation. Specifically, this would be a series of steel or reinforced concrete blocks that would tip over and wash downstream, thereby increasing the discharge capacity to ensure that the IDF passes the dam with at least 1-foot of freeboard. Though this modification would meet the discharge capacity criteria, it was not fully evaluated as it would not provide operational control of the impoundment level and would have to be recovered and reset if it were to activate.

The other two options for replacing the gate structure are bottom hinged crest gates operated either pneumatically or hydraulically. As with the fuse gate alternative, the existing abutment walls would also be raised to some degree and remediated as part of reconstruction. Both of these systems use the weight of the water impounded to lower the bottom hinged crest gates and will be designed so that they may automatically lower at a pre-determined impoundment elevation or when power is lost. In addition a remote control system, likely a valve that would bleed the compressed air or pressurized hydraulic fluid that controls the height of the crest gates, would be placed in a safe location away from the dam to provide a failsafe means to lower the crest gates regardless of power or the level of the impoundment. Because of this operational reliability, the additional discharge capacity provided by the operation of both of the crest gate systems may be used in determining the final design elevation of the abutments. According to the Review of Stability Analysis and Conceptual Design of Remedial Alternatives hydraulic modeling of your

engineering consultant, the crest gate alternatives would result in a maximum water surface elevation of 30.9 ft reducing the required height of the abutments to provide the required 1-foot of freeboard. These systems would also allow for routine operations to discharge more water during more frequent events or to lower the impoundment level for maintenance.

NHDES is approving both of the proposed conceptual alternatives of raising the abutment height or replacing the existing gate structure with a bottom hinged crest gate designed for failsafe operation as options for meeting the discharge capacity requirement of passing the IDF with at least 1-foot of freeboard and no manual operations.

If you have any questions, please contact James R. Weber, P.E. or me at 271-3406.

Sincerely,

Steve N. Doyon , PE Administrator
Dam Safety & Inspection Section

cc: Todd Munson, P.E. - GZA

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PLEASE RESPOND TO THE EXETER OFFFICE
Confidential Attorney-Client Communication

February 15, 2018

Steve Fournier, Town Administrator
Town of Newmarket, NH
Town Hall
186 Main Street, 1st Floor
Newmarket, NH 03857

Re: Lamprey River Retaining Wall off Main Street, Newmarket, NH
Status of Title

Dear Mr. Fournier:

You have asked me to determine ownership of a certain piece of land along the bank of the Lamprey River and a retaining wall next to the current Durham Book Exchange off of Main Street in downtown Newmarket, NH (the "Parcel"). This letter summarizes my findings based on a review of relevant instruments recorded in the Rockingham County Registry of Deeds.

The Parcel consists of the grassy area between the current Durham Book Exchange and the existing retaining wall along the Lamprey River. The Parcel has not been surveyed and the exact metes and bounds are not included in any recorded deed or plan.

The State of New Hampshire Department of Fish and Game ("Fish and Game") owns the Parcel subject to rights of access of various easement holders.

Fish and Game granted a right of way and easement over the Parcel to the Newmarket Community Development Corporation ("NCDC"). This easement was for the purposes of "non-vehicular ingress and egress to the former Fish and Game Building" and for "maintaining, grading, landscaping, placing temporary furniture on and using said premises as a park-like facility." This easement is subject to Fish and Game's continuing right of access to its fish ladder, and restricts NCDC from building any permanent structures or obstacles, such as fences, walls, or trees, that would obstruct such access. The Parcel cannot be used as a parking area. NCDC is obligated to maintain the Parcel.

B&N Investors Limited Partnership ("B&N") currently owns the property adjacent to the Parcel where the Durham Book Exchange is located ("B&N Property"). B&N purchased the B&N Property from NCDC. In that conveyance, NCDC granted to B&N the same easement over the Parcel that it obtained from Fish and Game, subject to the same restrictions (no parking or blocking Fish and Game's access). However, NCDC retained its right to use the easement over the Parcel and the obligation to maintain the Parcel; B&N has the right but not the obligation to conduct maintenance activities such as landscaping for use of the Parcel as a park-like facility. NCDC also has an access easement to enable it to pass to and from the Parcel, the B&N Property, and the adjacent cement bridge.

The Town of Newmarket ("Town") owns the dam across the Lamprey River near the Parcel (the "Dam") together with the cement abutments to the Dam and a ten-foot strip of land that appear to overlap both the Parcel and the B&N Property, as well as access rights across the Parcel and the B&N Property, to allow it to access the Dam for the purpose of repairs or additions required to keep the Dam anchored to the shore.

In conclusion, Fish and Game, the Town, NCDC, and B&N all have varying rights to this Parcel. To the extent that the retaining wall is connected to the Dam or the cement abutment, the Town can conduct the repair of the retaining wall. Otherwise, the Town must seek permission from Fish and Game or NCDC to repair the retaining wall. In repairing the wall, the Town must respect the rights of use and access of Fish and Game, NCDC, and B&N.

Please feel free to contact me should you have any questions.

Sincerely,

Amelia Sreter
(603) 778-0686
asreter@dtclawyers.com

GZA
Proactive by Design

GEOTECHNICAL
ENVIRONMENTAL
ECOLOGICAL
WATER
CONSTRUCTION MANAGEMENT

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F: 781.278.5702
www.gza.com

March 26, 2018
File No. 01.0173346.00

Newmarket Town Hall
Town Council Chambers
186 Main Street
Newmarket, NH 03857

Re: Action Plan: Conceptual Design Modifications to Macallen Dam
Newmarket, New Hampshire

Dear Committee Members:

GZA GeoEnvironmental, Inc. (GZA) is pleased to present to the Macallen Dam Study Committee (Committee), the Town of Newmarket, New Hampshire and the New Hampshire Department of Environmental Services (NHDES) Dam Bureau the following Action Plan for the Macallen Dam. The Action Plan specifies the actions to be taken to address the identified deficiencies at Macallen Dam, located in Newmarket, New Hampshire, as outlined in the September 27, 2010 Letter of Deficiency (LOD) and presents a proposed timeframe for undertaking these actions. This plan has been developed in accordance with our proposal dated July 11, 2017, executed on July 20, 2017. This document is subject to the Limitations presented in **Appendix A.**

This Action Plan outlines the next steps to bring the Macallen Dam into compliance with New Hampshire Dam Safety Regulations and focuses on the preferred repair alternative developed by GZA in accordance with our proposal scope and approved by the Committee. Please refer to the November 22, 2017 Engineering Summary Report entitled "Macallen Dam: Stability Analysis and Conceptual Design of Remedial Alternatives" for additional background information for the dam and deficiencies and our development of conceptual designs, related stability analyses, and conceptual level budgetary cost estimates associated with the rehabilitation of the Macallen Dam.

Deficiencies and Remedial Measures

In accordance with RSA 482:12 and Env-Wr 302.02, the Macallen Dam was inspected by the NHDES Dam Bureau on November 5, 2009. Safety issues were identified at the dam in a Letter of Deficiency issued by the NHDES in September 2010, based on the 2009 inspection. The LOD advised the Town of the multiple items that constituted deficiencies that NDHES believes should be remedied. In addition, the Town had previously received an LOD in May 2008 requesting the Town evaluate and determine whether the spillway capacity of the dam is adequate to safely pass the peak flow during the design flood.

Significant work has been completed to evaluate the feasibility of restoring or removing Macallen Dam, as well as assessment of potential impacts of various restoration/removal scenarios. Over the ensuing years, the Town subsequently authorized multiple studies by multiple engineering consultant firms, ultimately culminating in GZA's November 22, 2017

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Engineering Summary Report, which summarized the pertinent issues identified in the letters of deficiency and previous studies performed at the dam. The Report also outlined analyses completed to further advance conceptual design and subsequent rehabilitation of the dam which are intended to fulfill the requirements of the LOD. The report presented a "Preferred Alternative" that was selected by the Committee as the recommended alternative to be developed further as part of a final design to rehabilitate the dam.

Preferred Alternative

GZA developed three (3) conceptual alternatives associated with raising the abutment walls to address the dam's spillway capacity requirements. As an additional task item, the Town requested that GZA evaluate modifications to the existing gate structure to increase spillway capacity, therefore, minimizing the height to which the abutments will be required to be raised. GZA presented the conceptual design alternatives to the Committee and NHDES during meetings held on October 11, 2017 and November 2, 2017. During the meeting held between GZA, the Committee, and NHDES on November 2, 2017, the Committee selected the Pneumatically-Operated Gate option as the "Preferred Alternative" to be developed further for final design. This alternative includes demolition of the existing concrete gate structure and installation of an automated crest gate in that same location to the left of the existing spillway. This option also includes rehabilitation and repair of the left and right training walls, and slight raising of the right abutment. The conceptual design for raising the right abutment includes the addition of earthen fill with a safety fence. During final design, installation of some form of a structural wall could be considered with this alternative.

This preferred alternative was then presented to the Town Council during a public presentation held at the Town Council Chambers on December 6, 2017. The purpose of the meeting was to present the results of the abutment stability analysis, conceptual design, cost estimates, and recommended next steps for the Town in implementing the results of the study. Execution of the preferred alternative will increase the hydraulic capacity of Macallen Dam and address deficiencies identified by the NHDES in their 2008 and 2010 LODs at the Macallen Dam. The Engineering Summary Report provides additional justification for the proposed dam modifications and engineering analyses indicating the proposed alternative meets required factors of safety for the assessed component as outlined in New Hampshire Dam Safety Regulations. Construction of the proposed alternative will bring the dam into compliance with applicable regulations.

Next Steps

The NHDES Dam Bureau reviewed the Engineering Summary Report dated November 22, 2017 and attended the public Presentation held on December 6, 2017. The NHDES Dam Bureau provided a letter dated February 13, 2018 indicating acceptance of the approach, design, and conceptual alternatives, including approval of the fail-safe crest gate system, presented in the Engineering Summary Report and findings presented at the Public Meeting (see Attachment 1). It should be noted that the approval letter from NHDES does not include approval of final hydraulics, resulting peak water surface elevation, and associated design elevation for the raised abutments. Final hydrologic and hydraulic analysis, review, and approval will be required during final engineering design. GZA does not anticipate this analysis to significantly change the results presented in our Summary Report upon which the "preferred alternative" was based, nor our conceptual-level estimate of the rehabilitation costs anticipated for its implementation.

Following approval of the preferred conceptual design alternative by NHDES, the Committee may begin the next steps to implement the repairs and address the deficiencies.

Below is an estimated outline and assumed timeline to implement the conceptual design.

- Winter 2018 - Public Hearing; Town Approval of Preferred Alternative; NHDES approval of concepts (Completed)
- Spring 2018 - Council Approval of Funds for Final Design and Permitting
- Summer 2018 - Start of Final Design and Permitting
- Fall 2018 - Submit Permits
- Fall 2018 - Start of Town's CIP and Budget Process
- March 2019 - Town Meeting Vote on Bond for Construction
- Spring 2019 - Final Design Complete; Permits Received
- Spring 2019 - Construction Bidding;
- Spring 2019 - Contract Award; Order Gate for Fabrication*
- Summer 2019 - Construction Begins
- Fall 2019 - End of Construction (Late October)
- Winter 2020 - Reporting and Project Closeout

**Note: Lead time for fabrication of pneumatic gates is typically 2-4 months and fabrication for hydraulic gates can be 6-9 months.*

Property Ownership and Future Coordination

There are specifics related to property ownership of the vacant parcel of land adjacent to the right abutment of the dam and Durham Book Exchange Building that were reviewed by the Town's legal counsel, and these specifics should be discussed with NHF&G and the Owner of the Durham Book Exchange. It is GZA's understanding that the property of land adjacent to the dam was owned separately by the Newmarket Community Development Corporation (NCDC), the New Hampshire Fish & Game (NHF&G) and the Town of Newmarket at different times over the past 50 years. The Town's legal counsel prepared a letter indicating that the NHF&G owns the fish ladder structure and the parcel of land subject to rights of access of various easement holders (see Attachment 2).

The letter states that Fish and Game granted a right of way and easement over the Parcel to the NCDC. This easement was for the purposes of "nonvehicular ingress and egress to the former Fish and Game Building" and for "maintaining, grading, landscaping, placing temporary furniture on and using said premises as a park-like facility." This easement is subject to Fish and Game's continuing right of access to its fish ladder and restricts NCDC from building any permanent structures or obstacles, such as fences, walls, or trees, that would obstruct such access. The Parcel cannot be used as a parking area. NCDC is obligated to maintain the Parcel. B&N Investors Limited Partnership ("B&N") currently owns the property adjacent to the Parcel where the Durham Book Exchange is located ("B&N Property"). B&N purchased the B&N Property from NCDC. In that conveyance, NCDC granted to B&N the same easement over the Parcel that it obtained from Fish and Game, subject to the same restrictions (no parking or blocking Fish and Game's access). However, NCDC retained its right to use the easement over the Parcel and the obligation to maintain the Parcel; B&N has the right but not the obligation to conduct maintenance activities such as landscaping for use of the Parcel as a park-like facility. NCDC also has an access easement to enable it to pass to and from the Parcel, the B&N Property, and the adjacent cement bridge. The Town owns the dam across the Lamprey River near the Parcel together with the cement abutments to the Darn and a ten-foot strip of land that appear to overlap both the Parcel and the B&N Property, as well as access rights across the parcel and the B&N Property, to allow it to access the Dam for the purpose of repairs or additions required to keep the Dam anchored to the shore.

Following review of the property title information, the Town met with NHFG and NHDES to discuss property ownership and rights, as well as, any potential concerns NHFG may have regarding rehabilitation of the dam and adjacent property.

The NHF&G staff confirmed they will discuss the property rights issue with their land agents and NHF&G will also consult with Brett Towler of US Fish and Wildlife Service (USFWS) regarding potential impacts to fish passage at the dam resulting from the proposed project. The Town expects to hear from NHF&G regarding the proposed project in April 2018.

The Town will also need to coordinate with adjacent property owners, including the owner of the Durham Book Exchange and Bryant Rock Condominium Association (adjacent to the left abutment) regarding the dam modifications and any needed temporary construction easements. Additionally, the Town will need to coordinate with the New Hampshire Division of Historic Resources (NHDHR) regarding potential permitting impacts for the project.

Permitting

Based on our experience with other dam repair projects, and due to the potential impacts to surface waters and bank we anticipate the following permits will be required for the Macallen Dam Modifications Project:

- Dam Safety Permit (NHDES)
- Wetlands Permit Application (NHDES)
- Shoreland Permit Application (NHDES)
- USACE State Programmatic General Permit (USACE)
- NPDES Construction General Permit (EPA New England)
- FEMA Floodway No-Rise Certificate (FEMA / Local Floodplain Coordinator)
- Local Permits (Newmarket Conservation Commission)

The following assumptions are associated with the permitting effort for modifications to the Macallen Dam:

1. Project is anticipated to be classified as a Major Impact Project due to impacts to streambank likely exceeding 50 linear feet. As a result, Historical Review and a Stamped Survey will be required.
2. Lamprey River is a New Hampshire Designated River and is also considered a national "Wild and Scenic" river. As a result, presentation of the wetland application to the advisory committee and inclusion of comments will be required.
3. Rare Species Study and Phase 1B/2/3 Archaeological Studies are not anticipated as part of dam rehabilitation.
4. Wetland Mitigation Costs or Replication are not expected to be required as part of the dam rehabilitation because estimated impacts to wetlands are below state thresholds (10,000 sq ft). Final Design will be coordinated with permitting to mitigate wetland impacts to the maximum extent possible.

Budget Estimate

The estimated cost for engineering, permitting, and construction is based on our current understanding of the dam and the preferred conceptual design alternative.

Engineering Studies and Design:	$60,000 - $100,000
Permitting:	$50,000 - $70,000
Construction-Phase Engineering Services:	$100,000 - $140,000
Construction Cost	$1,230,000
Estimated Total:	$1,440,000 - $1,540,000

The estimate above represents our present judgement to the costs associated with the design, permitting, construction, and construction oversight. It should be recognized that unforeseen conditions, which become evident during the course of the work may require an alteration or increase in the effort required.

GZA appreciates the opportunity to provide engineering services to the Town of Newmarket. Please contact the undersigned if you have any questions or concerns.

Very truly yours,

GZA GEOENVIRONMENTAL, INC.

Todd E. Monson, P.E.(MA)
Project Manager

James P. Guarente, P.E.
Consultant/Reviewer

Chad W. Cox, P.E.(MA)
Principal-In-Charge

Attachments

Attachment 1–*Conceptual Approval* Letter from NHDES Dam Bureau
Attachment 2 –*Status of Title* Letter from Donahue, Tucker & Ciandella, PLLC

The State of New Hampshire
DEPARTMENT OF ENVIRONMENTAL SERVICES

Robert R. Scott, Commissioner

Mr. Stephen R. Fournier
Town Administrator
Town of Newmarket
186 Main Street
Newmarket NH 03857

February 13, 2018

RE: Review of Stability Analysis and Conceptual Design of Remedial Alternatives
Macallen Dam
NH Dam D177001
Newmarket NH

Dear Mr. Fournier:

The New Hampshire Department of Environmental Services (NHDES) has reviewed the November 22, 2017 Macallen Dam: Stability Analysis and Conceptual Design Remedial Alternatives report provided by GZA GeoEnvironmental, Inc.

The report includes 3 conceptual alternatives which preserve the layout of the existing gate section and raise the left and right abutments to an elevation of 34.6 ft. All of these alternatives will provide the required 1-foot of freeboard for the previously approved inflow design flood (IDF) of 9,825 cfs with a maximum water surface elevation of 33.6 ft, and address stability and condition issues with the existing abutment walls and gate structure. These options do not change the projected maximum water surface elevation for the IDF. Finally, calculations indicate that the various proposals to increase the height of the abutments with walls and/or embankment material are all stable for the design elevation of 34.6 ft as well as a higher abutment elevation of 35.6 ft. As such, NHDES considers any of the 3 options as a viable alternative to meet discharge capacity criteria.

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If you have any questions, please contact James R. Weber, P.E. or me at 271-3406.

Sincerely,

Steve N. Doyon, PE Administrator
Dam Safety & Inspection Section

cc: Todd Munson, P.E. - GZA

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PLEASE RESPOND TO THE EXETER OFFFICE
Confidential Attorney-Client Communication

February 15, 2018

Steve Fournier, Town Administrator
Town of Newmarket, NH
Town Hall
186 Main Street, 1st Floor
Newmarket, NH 03857

Re: Lamprey River Retaining Wall off Main Street, Newmarket, NH
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Please feel free to contact me should you have any questions.

Sincerely,

Amelia Sreter
(603) 778-0686
asreter@dtclawyers.com

The State of New Hampshire

DEPARTMENT OF ENVIRONMENTAL SERVICES

Thomas S. Burack, Commissioner

Mr. Ed Wojnowski
Town of Newmarket
186 Main Street
Newmarket, NH 03857

September 27, 2010
Letter of Deficiency
DSP#10-076

RE: Macallen Dam #177.01, Newmarket

NEW STATUTORY PENALTY PROVISIONS
PLEASE READ CAREFULLY

Dear Mr. Wojnowski:

The Department of Environmental Services, Dam Bureau (DES) is responsible for ensuring the safety of dams in New Hampshire through its dam safety program. One of the many tools that helps us to reach this goal is our dam inspection program.

In accordance with RSA 482:12 and Env-Wr 302.02, an inspection of the subject dam was conducted on November 5, 2009. Based upon the results of that inspection, as well as upon additional investigation or analysis that may have been conducted, DES is issuing this Letter of Deficiency (LOD) to advise you that the following items constitute deficiencies that DES believes can be remedied in accordance with the deadlines indicated:

Continue to monitor and repair:

1. Seepage from downstream left side stone training wall, located at base of gate structure apron;

2. Concrete cracks and spalling on:
   a. Upstream right side training wall vertical crack. See photo A;
   b. Downstream right side of gate structure housing. See photo B;
   c. Concrete piers on the upstream face of the of the gate structure housing. See photo C;

By March 1, 2011:

3. Submit an Operation, Maintenance and Response (OMR) plan to DES for review. See attached template;

4. Submit an updated Emergency Action Plan (EAP) in accordance with Env-Wr 500;

By September 1, 2011:

5. Fill, seed and mulch the right side earthen embankment in order to provide a level, hearty grass surface consistent across the complete surface. See photo D;

6. Remove deteriorated portions to a sound substrate, clean and structurally patch the following areas:
   a. Gate structure housing's downstream left side interface with the downstream retaining wall. See photo E;
   b. Left side upstream training wall, bricked portion. See photo F and G;

7. Investigate and report to DES the condition of the right side upstream training wall's base, assess for possible undermining and overall condition of the wall. This is the wall section below water line, below what was field evaluated on November 5-2010 by DES and Wright-Pierce engineers. See photos H, I and J;

8. Submit a permit application with appropriate plans and specifications to increase the discharge capacity of the dam to safely pass the design flow (2.5 Q100 or 1DF) with one foot of freeboard with no operations and to address any other structural deficiency found as part of your consultant's detailed evaluation; and

By September 1, 2012:

9. Complete the reconstruction and/or repair of the dam to meet the requirements of the permit issued in accordance with item #8.

Our intent in issuing this LOD is to make you aware of items that require your attention to ensure the continued safe operation of your dam. It is our hope that, through the return of the attached form and correction of the identified deficiencies, you will develop and maintain a commitment to keeping a safe and well-maintained dam.

Please note that effective January 1, 2009, significant changes to the penalty provisions of New Hampshire's dam safety statute (RSA 482) became effective. These changes require DES to commence proceedings to levy fines of up to $2,000 per violation per day against a dam owner who does not respond within 45 days of receipt of a written order, directive, or any notice of needed maintenance, repair, or reconstruction issued by DES. To avoid proceedings under this provision, you **must respond** to this LOD. We believe the easiest way to respond is to sign and return the attached "Intent to Complete Repairs" form, either agreeing to correct the identified deficiencies by the dates indicated OR by proposing amendments to the listed work items or dates, which you may do by writing directly on the form. DES will evaluate and respond to any reasonable requests for proposed amendments in a timely manner. We have enclosed a self addressed stamped envelope for you to return this form. You may also scan and e-mail the completed form to damsafety@des.nh.gov or fax it to (603) 271-6120. **If you fail to return this form within 45 days or fail to otherwise respond in writing within 45 days indicating your intent to remedy the identified deficiencies, you will not have the benefit of the compliance deadlines indicated on the form and DES will commence a proceeding under RSA 482:89 to seek administrative fines for the identified deficiencies.** Please note that responding as required does not preclude DES from pursuing other appropriate action for the identified deficiencies, in accordance with the DES Compliance Assurance Response Policy, available on-line at http://des.nh.gov/organization/commissioner/legal/carp/index.htm.

If you have any questions or comments regarding this LOD or would like to be present at future inspections, please contact Chuck Corliss at 271-4130 or write to me at the address for the Water Division listed on the bottom of the previous page.

Sincerely,

Steve N. Doyon

Steve N. Doyon, P.E., Administrator
Dam Safety and Inspection

Attachments: Dam Report, Photos, Plan View Drawing, OMR form, DB13
cc: DES Legal Unit
Certified# 7007 3020 0000 5329 1391

SND/CAC/was/h:/damfiles/17701/LOD/20100927 17701

GZA

Proactive by Design

GEOTECHNICAL
ENVIRONMENTAL
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WATER
CONSTRUCTION MANAGEMENT

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April 19, 2018
RFP File No. 01.P000818.18

Newmarket Town Hall
Town Council Chambers
186 Main Street
Newmarket, NH 03857

Re: Macallen Dam Rehabilitation - Final Design and Permitting
Formal Scope, Budget and Contract Agreement
Newmarket, New Hampshire

Pursuant to the Macallen Dam Study Committee's (Committee) notification to GZA GeoEnvironmental, Inc. (GZA) that the Town of Newmarket (Town) has selected GZA to execute final design and permitting for the rehabilitation of Macallen Dam, we are pleased to present this formal scope of work, budget and contract agreement for engineering services. The primary goal of the project is to perform final design and permitting for the rehabilitation of portions of the dam to address specific dam safety issues identified by the New Hampshire Department of Environmental Services Dam Bureau (NHDES). The work will be performed as a follow-up to GZA's conceptual design concepts and stability analyses detailed in the *Macallen Dam: Stability Analysis and Conceptual Design of Remedial Alternatives* Summary Report, which was finalized on November 22, 2017, and the preferred alternative as detailed in our *Action Plan: Conceptual Design Modifications to Macallen Dam* Memorandum, which was finalized on March 26, 2018.

Thekey objectives to bring the current conceptual-level preferred alternative to final design level with accompanying 100% Plans, Specifications and Bid Documentation include:

a) Confirm dam safety deficiencies as identified by previous studies and provide improved information based on existing site conditions, site survey, and supplemental subsurface investigations (as appropriate).

b) Assess preferred alternative related options for addressing dam safety deficiencies and evaluate potential advantages and disadvantages of options in terms of effectiveness, constructability, environmental impacts, and cost. Refine the preferred alternative in cooperation with the Town and project stakeholders.

c) Develop a restoration design for the adjacent parcel of land that is consistent with the Town's vision and goals.

d) Prepare preliminary and final plans and specifications for the rehabilitation of the dam abutments, training walls, gate structure and adjacent areas in accordance with standard engineering practice and per NHDES's Dam Safety Regulations (Env-Wr 300-400). Provide the Town with an engineer's cost estimate for construction.

e) Coordinate with permitting agencies and project stakeholders as part of public outreach. Prepare the necessary permit applications for the execution of the project.

f) Assist the Town with the bidding process and selection of the construction contractor.

GZA understands that additional assistance with resident engineering services and engineer-of-record services may be requested as an addendum to this contract.

An Equal Opportunity Employer M/F/V/H

PROJECT BACKGROUND AND UNDERSTANDING

The Town of Newmarket is seeking the services of GZA to perform various supplemental investigations and environmental permitting services leading to final rehabilitation design associated with the Macallen Dam (D177001), located in Newmarket, New Hampshire. GZA prepared abutment stability analyses, gate automation analysis, and conceptual designs of remedial alternatives for the Macallen Dam during 2017. The objective of GZA's prior work was to develop concepts to help bring the dam into compliance with NHDES Dam Bureau's Discharge Capacity requirements under Section Env-Wr 303.12 of the New Hampshire Code of Administrative Rules and to address dam safety deficiencies identified in a Letter of Deficiency (LOD) issued by the NHDES Dam Bureau on September 27, 2010.

In support of the conceptual design of proposed dam rehabilitation alternatives, GZA prepared and submitted a Summary Report titled *Macallen Dam: Stability Analysis and Conceptual Design of Remedial Alternatives Summary Report* to the NHDES Dam Bureau on November 22, 2017, which outlined conceptual design concepts and abutment stability analyses. The report includes three (3) conceptual alternatives which preserve the layout of the existing gate structure and spillway and raise the left and right abutments to provide the required 1-foot of freeboard for the previously approved inflow design flood (IDF) of 9,824 cfs with a maximum water surface elevation of 33.6 feet, and address stability and condition issues associated with the existing abutment and gate structure walls. Note that based on the results of an Incremental Damage Assessment (IDA) by others, NHDES has accepted the inflow design flood for the dam to be equal to the 100-year peak discharge, which has a peak flow of 9,824 cfs, based on hydraulics associated with the current (existing) conditions.

The report also includes alternatives to replace the existing gate structure which would increase (the currently deficient) discharge capacity of the dam, such that safe passage of IDF is achieved. The Lamprey River has a complex hydrologic and hydraulic function, such that during peak flows water from the Lamprey River watershed discharges to the Oyster River Watershed. As a result, modifications to the hydraulic capacity of the Macallen Dam impact how much water is discharged out of the Lamprey River Watershed, and thus impact the peak flow at the dam. Under existing conditions, the dam does not pass the IDF (100-year flow) which is currently 9,824. The report details the conceptual replacement of the existing gate structure in a manner that will increase hydraulic capacity of the dam, which results in a proposed IDF of approximately 11,100 cfs and a peak water surface elevation of approximately 30.9 feet. The gate modification alternatives would include some increase in the existing abutment elevations but not to the degree of the original three alternatives.

The Town received a letter from NHDES Dam bureau on February 13, 2018 approving the proposed conceptual alternatives of raising the abutment height or replacing the existing gate structure with a bottom hinged crest gate designed for failsafe operation as options for meeting the discharge capacity requirement of passing the IDF with at least 1-foot of freeboard and no manual operations. The Town is currently in the process of engaging project stakeholders, including New Hampshire Fish & Game (NHF&G), the Newmarket Community Development Council (NCDC), B&N Investors Limited Partnership (B&N), and Bryant Rock Condominium Association, to discuss the progress of conceptual design for the rehabilitation of Macallen Dam and the next steps as the project progresses into final design and permitting.

Subsequent to NHDES February 13th approval of the conceptual approach, GZA submitted a final memorandum titled *Action Plan: Conceptual Design Modifications to Macallen Dam* on March 26, 2018 which outlined the next steps to bring the Macallen Dam into compliance with New Hampshire Dam Safety Regulations and focuses on the preferred repair alternative developed by GZA and approved by the Committee to be developed further for final design. The preferred alternative includes demolition of the existing concrete gate structure and installation of a pneumatically-actuated automatic crest gate in the same location as the existing gate structure to the left of the spillway. This option also includes rehabilitation and repair of the left and right training walls and slight raising of the right abutment. The conceptual design for raising the right abutment includes the addition of earthen fill with a fence and restoration as a public park.

Concurrent with the Action Plan preparation and at the request of the Town, GZA began initial coordination with NHF&G via email and telephone communication to schedule a meeting to discuss the project. GZA then attended the meeting with the Town, NHF&G, and NHDES on March 19, 2018 to discuss the project.

Additionally, at the request of the Town, GZA prepared site figures and conceptual renderings of the proposed park restoration in support of a grant application to the *50th Anniversary National Trails and Wild and 5cenic Rivers Project* that was submitted on March 2, 2018.

PROJECT APPROACH

Our proposed conceptual design addresses the dam deficiencies, including inadequate spillway capacity and structural instability and deterioration associated with the training walls and gate structure. Based on our expertise with dam engineering design and construction, the key design issues for the proposed Macallen Dam rehabilitation include:

- Suitability of sub-surface conditions to support proposed rehabilitation of the abutment walls and installation of a new crest gate system;
- Project schedule impacts due to likely long lead time for gate fabrication;
- Constructability, especially dealing with water control and stream diversion during dam construction;
- Identifying hydraulic characteristics of new gate in relation to seasonal and emergency flooding operations;
- Automated operation of gate and failsafe gate operation and contingency for gate maintenance; and
- Location of and access to the new control shed, which will contain air compressor machinery and other related gate control systems (i.e., water level sensors).
- Public access and restoration of the adjacent parcel of land as a public park.

GZA's approach to the engineering investigations and design tasks for the Macallen Dam Project involves a phased, sequential approach such that the project objectives can be responsively met with the appropriate level of engineering effort and scope, in a manner mutually understood by, and acceptable to, the Town and GZA. Using this type of approach, GZA can effectively keep the Town apprised of the results of each major task, and effectively obtain input to address concerns (that we may not otherwise be aware of) during the course of the work. Our strategy is to work closely with the Town to develop a final design that will address the concerns identified during the previous dam inspections, incorporate current design practice, provide for environmental best management practices, provide for public access through development of a public park, and positively address the project scheduling and budgetary needs.

Our strategy also is one that acknowledges that permitting concerns will be critical for the success of this project. A successful permitting strategy requires efforts on two fronts: appropriate design and public involvement. The public and the various resource agencies should be consulted early and often, ideally before the formal permitting process. This will help build a sense of project partnership and ownership on the part of the stakeholders. It is GZA's experience that if stakeholders are provided with adequate information and allowed early input on a project, they can be transformed from adversaries to project advocates, without sacrificing dam safety engineering standards. This is typically very important on dam rehabilitation projects where water control will be a major issue.

GZA landscape architects will meet with the Town early on to gain an understanding of what type of program elements and spatial configurations are desirable for the public access park. The schematic design provided by for the *50th Anniversary National Trails and Wild and Scenic Rivers Project* may serve as a starting point to solicit further information

from the Town and its stakeholders about what uses the park shall serve, what plant material may be preferable, informational signage, park furniture and amenities, lighting, and water access.

The following scope of services has been prepared based on recent discussions and meetings with the Town, the Dam Study Committee, and NHDES during 2017 and 2018.

SCOPE OF WORK

Task 1. Preliminary Coordination and Grant Application Support – (Completed)

At the request of the Town, prior to initiating the new contract for final design and permitting, GZA performed additional services to facilitate project progress in accordance with the project schedule outlined in the Action Plan. These services included:

- Attendance at a Macallen Dam Study Committee Meeting on February 15, 2018 to discuss status of the project, approval of conceptual alternatives and next steps, and coordination and scheduling of future meetings.
- Coordination with project stakeholders, including telephone conversations and email communication with NHF&G, to request and schedule a meeting to discuss the progress of conceptual design for the rehabilitation of Macallen Dam and next steps as the project moves into final design.
- Attendance at a meeting with the Town, NHF&G, and NHDES on March 19, 2018 to discuss status of the project, access and property issues, and coordination and scheduling of future meetings.
- Support for the preparation of a grant application for the *50th Anniversary National Trails and Wild and Scenic Rivers Project*, including development of a conceptual site plan and renderings of conceptual improvements to the proposed Macallen Waterfront Park. *Note: GZA is only including 50% of the labor costs billed to date for work completed for preparation of the grant.*

Our summary cost table presented at the end of this proposal includes the amount expended to execute these services.

Task 2. Project Management and Meetings

Task 2.1 Kick-Off Meeting

Upon notice to proceed, GZA project team members will contact the Town to schedule a meeting to discuss various technical and project management issues including:

- Client's concerns, objectives, and preferences;
- Pertinent existing data needs;
- Present overview of proposed engineering approach and methods; and
- Overview of project schedule (i.e., key milestones, timing of deliverables, etc.).

In conjunction with the Kick-Off Meeting, the design team will re-visit the dam site to conduct a more thorough site reconnaissance to evaluate site access for evaluation and construction related activities. GZA will evaluate any changes observed and stating our opinion as to the current condition of the dam.

Task 2.2 Additional Meetings

In support of the tasks proposed under this scope of work, we have budgeted for five (5) joint coordination meetings with the Macallen Dam Study Committee and additional stakeholders (NHDES, NHF&G, abutters, etc.). Included within the budgeted five meetings, GZA can attend a meeting of a public presentation to the Newmarket Town Council, public, affected property owners, and stakeholders as requested by the Town. If requested by the Town, GZA can take the lead to present the results of project. If additional meetings are requested, GZA can amend the contract to support the needs of the Town.

GZA suggests that meetings with project stakeholders be held, and that GZA attend these meeting to provide support and direction to the Town. We envision these meetings would have three purposes, 1) inform stakeholders of the serious deficiencies at the dam; 2) inform stakeholders of the options for correcting the deficiencies; and 3) solicit feedback and input from stakeholders on the design of the rehabilitation project. At these meetings, the stakeholders will be presented with the alternatives which were studied and rejected by the Town and GZA and the Preferred Alternative. By involving stakeholders at this time, before formal permitting begins, it is hoped that stakeholder concerns and issues can be identified and resolved before the required permitting public meetings. Input provided by stakeholders will be included, where appropriate, in the design of the preferred alternative.

More than five (5) meetings may be required during the duration of the project. If additional meetings are requested, the cost for each meeting would be $1,100.00 and would include attendance at a meeting (assumed to be 2 hours), with travel, and two hours of preparation time.

Task 3. Field Investigations / Data Gathering

Task 3.1 Subsurface Explorations & Laboratory Testing

GZA proposes to design and execute a program of supplemental subsurface explorations test borings, soil sampling, and laboratory analysis. We are proposing these explorations primarily to collect data on the subsurface conditions at the abutments of the dam. We anticipate one test boring and up to two probes will be performed by a driller under contract to GZA during one day of drilling. The locations of the boring and probes will be selected to provide a representative picture of the subsurface soil, and foundation conditions behind the left abutment training wall. It is anticipated that the borings will be extended approximately 30 to 40 feet deep, or until bedrock is encountered, whichever is shallower.

The test boring will be performed with a truck mounted or all-terrain mounted vehicle (ATV) drill rig. Borings will be advanced by drive-and-wash methods with flush jointed casing. Standard penetration tests (SPT) will be performed continuously in the fill and every 5 feet thereafter. Samples will be taken for analyses. We anticipate up to 10 feet of NX rock coring at one boring location to confirm bedrock conditions. Borings will be observed and logged by a GZA field engineer. We have budgeted one day for the drilling observation under this task.

GZA has assumed the drilling program outlined above will be completed in approximately one (1) rig day. All drilling will be completed during normal working hours, between 7AM and 5PM. GZA will inform the Town as soon as possible if any unanticipated conditions are encountered that extend the drilling program beyond the budgeted 1 rig day. GZA assume that the Town will arrange for access to the exploration locations and coordinate approval from abutters as necessary.

GZA has assumed the preparation of any necessary permit applications will be completed by the drilling sub-contractor. Any permitting fees will be paid for directly by the Town and have not been included in our labor budget. A table detailing expected permit fees is included at the end of the cost proposal.

GZA plans to execute a geotechnical laboratory testing program to estimate material properties to be used in the geotechnical design. In particular, sieve analyses (ASTM D422) will be performed to facilitate soil classifications and to estimate permeability values. GZA has budgeted up to two (2) sieve tests for gradation.

Task 3.2 Test Pit Explorations

GZA proposes to execute a program of up to three (3) test pits behind training walls at the right and left abutments to make visual assessments of conditions behind the walls. GZA will visually observe and photo-document the condition of the walls. We anticipate test pit operations will be complete in one day. While on-site GZA will attempt to evaluate the condition of the stone masonry and back batter (if any) of the stone masonry training walls. This information will be used to assess existing stability of the training walls and to confirm assumptions used in our preliminary geotechnical assessments.

Test pits will be performed in one field day during the hours of 7AM to 5PM during at locations mutually agreed upon by GZA and the Committee. The test pits will be performed by a qualified excavation contractor who will be sub-contracted to GZA. We anticipate test pits will be up to a maximum of approximately 6 feet in depth, or shallower depending on conditions encountered. Soil excavated from the test pit will be backfilled in 1-foot thick lifts and tamped by the excavator bucket upon completion. Prior to the test pit excavations, GZA will coordinate with our subcontractor to notify New Hampshire 811 (Dig Safe). A GZA representative will be on-site to coordinate field activities, observe the test pits, document the observed conditions and prepare exploration logs.

GZA and its subcontractor will attempt to minimize impacts, however some disturbance of existing grass and vegetation should be expected at the test pit locations.

Task 3.3 Wetlands Delineation

This field work task will include the efforts of a GZA wetlands scientist to identify and delineate the federal and state wetland resource areas on and within 150 feet of the dam limits. The following work will be completed as part of this subtask:

- GZA will delineate wetland boundaries throughout the Site in accordance with the U.S. Army Corps of Engineers (USACE) Wetlands Delineation Manual, Technical Report Y-87-1, using the Routine Determination Method; in conjunction with the Regional Supplement to the Corps 1987 Wetland Delineation Manual: North Central and Northeast Region, Technical Report ERDC/EL TR-09-19; North American Digital Flora: National Wetland Plant List, Version 2.4.0 US Army Corps of Engineers, Engineer Research and Development Center, Cold Regions Research and Engineering Laboratory, Hanover, NH and BONAP, Chapel Hill, NC (2012) and Field Indicators for Identifying Hydric Soils in New England, Version 4, 2017;
- Surveyor's flagging will be used to mark the limits of inland bank and vegetated wetland in the work area, and the flags will be uniquely marked with an alpha-numeric identifier so that they can each be identified on the project plans. These flags will be surveyed as a part of the project survey effort;
- Classification of wetlands will be in accordance with *Classification of Wetlands and Deepwater Habitats of the United States*, U.S. Fish and Wildlife Service 1979, including identification of surface waters and classifications, as appropriate;
- Complete photographs, sketches and wetland classification datasheets to generally characterize each wetland, with a focus in the areas on the edges of the ROW where clearing activities will occur;
- Assess potential vernal pool habitat in accordance with *Identification and Documentation of Vernal Pools in New Hampshire*, second edition, 2004. Potential vernal pools will be identified within the project area. Confirmation of

vernal pools can only occur during the typical breeding season from May through June. Therefore, for purposes of agency discussions and permitting, potential vernal pools will need to be confirmed or assumptions that these areas contain vernal pools made to advance the project through permitting; and

- GZA will complete a wetland function-value assessment throughout the Site in accordance with the USACE Highway Methodology Workbook Supplement. The data from this assessment will be incorporated into permitting documents for the project.

Task 3.4 Topographic and Wetlands Survey

GZA will engage **Doucet Survey, Inc.**, a surveyor licensed in the State of New Hampshire, to perform a topographic survey of the site and immediate area. Spot elevations will be taken on important structures and appurtenances. The surveyor will create a base topographic map of the site with 1-foot contour intervals. The survey area is approximately 0.5 acres and will include the areas identified in Figure 1. Trees of greater than 4-inch diameter at breast level will be located on the plan and the general tree line will be delineated. The alignment of overhead utilities will be shown on the plan as well as the locations of indicators of subsurface utilities and assumed alignments.

The site plan will be prepared in AutoCAD format at a scale of 1-inch equals 20 feet. The site plan will be used as a base map by GZA in design development and will be suitable for use in future permitting and construction documents. The survey will augment LiDAR data and prior survey data already collected at the site. The base map will reference the horizontal datum based on New Hampshire State Plane Coordinates NAD83 and the vertical datum based on the North American Vertical Datum of 1988 (NAVD88).

GZA does not propose to research property lines as a part of the site survey, but approximate property lines based on assessor's maps will be overlain on the plan. The Action Plan includes a description of property ownership rights for the parcel and the fish ladder, as well as, a recommendation to engage project stakeholders throughout the design process. No bathymetry work is proposed as part of this scope of services. GZA plans to use existing bathymetric data, collected at 5-foot contour intervals by Gomez & Sullivan (GSE) as part of their 2016 Feasibility Study, to supplement topographic information collected as part of this task.

Task 4. Final Design

Task 4.1 Hydrologic and Hydraulic Analyses

GZA understands that significant effort has previously been performed by others in support of the hydrologic and hydraulic (H&H) analysis and NHDES has reviewed the work performed; therefore, no hydrologic analysis will be performed as part of this scope of work. The existing model approved by NHDES will be used.

GZA will refine the one-dimensional hydraulic model, developed in HEC-RAS format, that was approved by NHDES in 2016 for hydraulic analysis of the final design alternative. GZA's analysis will focus on refining dam / gate geometry at the Macallen Dam to evaluate impacts to peak flows and water surfaces elevations resulting from dam rehabilitation and modification of the gate structure. GZA will prepare a short summary of the hydraulic results in a memorandum to be submitted to NHDES for review and approval. We have assumed that one teleconference call to discuss the results will be sufficient.

Model results including peak inflow and discharge rates, free board or overtopping depth, percent of SDF passed will be presented in tabular form and model input parameters will be summarized within the permit documents.

Task 4.2 Structural Design and Updated Geotechnical Evaluations

Design of the proposed rehabilitated training walls, parapet walls (if any), and crest gate structure will be performed in accordance with the New Hampshire Dam Safety Regulations and standard engineering practice and our experience with similar structures. Our stability analysis for the proposed new gate structure will address loading under normal operating conditions, impact loading, ice loading at normal pool elevations, flood conditions at the SDF pool elevation and seismic loading conditions at the normal pool. GZA will perform an updated two-dimensional stability analysis (limit equilibrium analysis) using the "Gravity Method" at the left abutment training wall. The right abutment training wall will be evaluated using the "Gravity Method" as well as GeoStudio's Slope/W program, where appropriate. Potential impacts to the walls due to added loads from proposed fill and or parapet walls will be evaluated. The design will provide for appropriate Factors of Safety against sliding failure, overturning and bearing capacity failure for each loading condition as per the recommendations of the Corps of Engineers criteria and New Hampshire Dam Safety Regulations, as appropriate. Subsurface explorations, discussed above, will be used to verify parameters and stability analyses performed as part of the final design.

Please note that no analysis and design of the existing spillway (other than the gate structure) is included within this scope of work as NHDES has confirmed their understanding that the gate replacement is not considered alteration of the existing spillway.

Task 4.3 Plans and Specifications

The Dam Study Committee has voted and approved the Preferred Alternative and we assume the Town will officially accept the recommended Preferred Alternative. Upon approval by the Town of the Preferred Alternative, GZA will prepare plans, specifications and related documentation for use in obtaining permits and competitive bids from construction contractors for dam repair and modifications based on the previously agreed preferred alternative. The project design documents will provide for means of addressing the identified deficiencies, including spillway/gate capacity, abutment stability, outlet works configuration, slope protection on the upstream slope, tree clearing, training wall rehabilitation/re-pointing, etc. Presently, we anticipate the final design plans will include, at minimum, the following:

Civil/Site Drawings

- Cover Sheet;
- Existing Conditions Plan;
- Proposed Improvements Plan;
- Sediment and Erosion Control / Water Control Plan;
- Traffic Control Plan (possible);
- Sections/Details (two to four sheets); and
- Mitigation Plans and Sections (possible)

Gate Related Structural/Mechanical/Electrical Drawings

- General Notes
- Demolition Plan – Existing Gate Structure
- Crest Gate Details and Elevations

- Standard Details
- Control Shed Plan and Notes
- Control Shed Section, Details and Schedules
- Electrical/Instrumentation Controls

GZA will prepare drawings at 50-, 90- and 100-percent (final) stages. At interim stages, GZA will solicit the Town's input and address its comments. Final plan sets will be stamped by a Professional Engineer, licensed in the State of New Hampshire. In addition to the contract plans, GZA will prepare contract technical specifications and bidding documents, at the 50-, 90- and 100-percent stages, including:

- Invitation to Bid;
- Instructions to Bidders;
- Special Conditions;
- Bid Form;
- Agreement Forms, Performance, and Payment Bond Forms (if not provided by the Town);
- General Conditions (if not provided by the Town); and
- Supplementary Conditions Technical Specification Clauses.

GZA will prepare, to the greatest extent possible, method specifications and will provide for lump sum pricing of bid items. Note that the crest gate specification will likely rely heavily on performance standards. Specifications will be submitted to the Town in draft form for comment prior to finalization. We have assumed that all front-end ("boiler plate") documents will be provided to GZA in hard copy and electronic formats by the Town.

An estimated project schedule for construction will be prepared and submitted as part of the final design package. GZA's final design package will also discuss effective ways in which the project can be implemented, as well as providing our opinion as to prioritization for repairs. GZA has provided an optional scope of work to perform construction phase services in Task 8. This currently optional task is strongly recommended to be included in our design contract so that we can observe compliance with plans and specifications and so that we may make adjustments to the design to meet unanticipated conditions encountered during construction. Note that a requirement of the dam safety permit will be the requirement that the Town engage a qualified Construction Engineer to ensure compliance with approved plans and specifications.

Drawings will be provided in electronic format and can be produced in hard-copy as needed; however, production of hard copies would be billed at cost plus 10 percent.

Task 4.4 Engineer's Estimate of Construction

Once the design is complete, GZA will also prepare an engineer's estimate of construction costs for the Town's budgetary purposes. The engineer's estimate will contain estimates of lump sum costs and approximate quantities used to determine total cost of unit price bid items, if any.

Task 4.5 Landscape Architecture Design of Park Restoration

GZA's Landscape Architect will work with the Town to advance the schematic design of the public park to final construction plans and specifications. Separate from the dam design package, GZA will provide 50-, 90-, and 100-percent design drawings with estimates of probable costs at each stage of design development. It is anticipated that that the Town will have strong input into the design of the pubic park. GZA will present design development drawings at public meetings at the 50- and 90-percent stage for public input. GZA landscape architects understand the historic nature of the park's setting and will take cues from the surrounding town's vernacular to guide in the design of the park. The park will be designed using Americans with Disabilities Act design guidelines, and local, and state building codes.

Task 4.6 Develop Operations and Maintenance Program

To fulfill the requirement stipulated in the NHDES Regulations for reconstruction of an existing dam in (Env-Wr 402.06(b), and related sections), GZA will prepare an Operations and Maintenance (O&M) Manual as supporting documentation for the permit application and for use by the Town in monitoring, operating and maintaining the reconstructed dam. The O&M Manual will set out procedures for maintaining the dam including the crest gate system, monitoring the structures, and operating the outlet control(s) in normal and emergency conditions. In particular, the O&M Manual will provide guidance for operating water control structures in accordance with NHDES normal operating procedures. Along with providing four copies of the plan, GZA will visit the site once to provide on-site training and orientation to operations staff, once construction and gate start-up/testing are completed.

Task 5. Permitting

Based on the preferred alternative presented in the Conceptual Summary Report and Action Plan, the project is estimated to include over 50 linear feet of bank impact, with work within 100 feet of the highest observable tide line that alters surface water associated with the Lamprey River, which is designated as a Wild & Scenic River. In addition, the project is located within 100-feet of a designated prime wetland. At this level of impact, the project will be classified as a Major Impact project by the New Hampshire Department of Environmental Services Wetlands Bureau per Env-Wt 303.02 (b) and (f). In addition, as currently designed, the project will require an NHDES Dam Permit, U.S. Army Corps of Engineers State Programmatic General Permit, possible local permitting, and possible FEMA FloodWay No-Rise Certificate. The project will be subject to review by the following agencies for issuance of a wetlands permit:

- U.S. Army Corps of Engineers (USACE);
- U.S. Environmental Protection Agency (EPA);
- New Hampshire Department of Environmental Services (NHDES);
- New Hampshire Fish and Game Department (NHF&G);
- New Hampshire Division of Historic Resources (NHDHR);
- New Hampshire Natural Heritage Bureau (NHNHB);
- Lamprey River Advisory Committee, and
- The Town of Newmarket.

The Town of Newmarket has a Wetland Protection Overlay District which requires a Special (Conditional) Use Permit from the Planning Board for impacts within wetlands and Wetland buffers. Therefore, GZA has included costs for wetland permitting and local permitting (if not waived as a municipal project). Although the project is located on a designated

river, the Site is located in an urbanized exempt area, and thus it is our understanding that it does not require an NHDES Shoreland Permit.

GZA has prepared this proposal based on information currently available as well as our experience with similar permitting. The actual level of effort required to complete the natural resources permitting identified in this project is unknown, to a certain degree, because the extent of impact required for construction activity will be tabulated as part of preparing final dam plans and completing the permit process. Therefore, assumptions regarding the anticipated level of impact have been made above and are further detailed in the subtasks below.

Task 5.1 NHDES and USACE wetland Permitting

Based on overall project need and review of preliminary data, GZA anticipates that the project requires a standard Wetlands Permit and will be classified as a major impact project. GZA has made several assumptions that guide the approach to permitting this project as outlined below. GZA will prepare documentation and compile State wetland permitting documents for submittal as follows:

- GZA will quantify and classify the level of natural resource impact (wetland, wetland buffer, shoreland, vernal pool, exemplary natural community, and endangered species habitat);
- GZA will prepare a narrative report that addresses the need for the proposed impact and the steps that have been taken to avoid and minimize impacts in accordance with NHDES Administrative Rule Env-Wt 302.04 (a);
- GZA will complete the USACE Appendix B Checklist (as required by the NHDES wetland permit application) which requires review of several environmental factors including impaired streams, floodplain identification, wildlife habitat identified in the NH Wildlife Action Plan, and others that may be applicable to this project;
- GZA will submit a Request For Project Review submittal to the New Hampshire Division of Historical Resources (NHDHR) forthe project;
- GZA will initiate final review of the project Site by the New Hampshire Natural Heritage Bureau (NHNHB). Coordinate with NHNHB and/or the NHF&G – Nongame and Endangered Wildlife Program, and the United States EPA to address concerns over endangered, threatened or rare species that may be affected by the proposed project. NHNHB reviews are required to be completed within one year of submittal of the wetlands permit application;
- GZA will also coordinate and participate in meetings with other agencies (i.e., NHF&G and NHNHB) as needed to support the application review process. GZA will prepare a NHDES Wetlands Permit Application package that includes a Wetland Permit Application Form, United States Geologic Survey site locus map, tax maps, permitting plans, abutters list, and impact photographs. GZA will provide the wetland permit application to the NHDES. In addition, four copies of the application will be provided to the municipalities for internal use and public review;
- GZA will notify all abutters of this project via certified mail in accordance with NHDES Env Wt 501.01(c); and
- GZA will coordinate with USACE to participate in the pre-application meeting and project review.

For the purposes of this proposal, GZA has made several assumptions, as outlined below:

- The proposed project will permanently impact less than three acres of wetland and qualify for review under the Department of the Army General Permits for the State of New Hampshire, which will require the preparation of a Standard Wetland Permit Application;
- An Alteration of Terrain (AOT) Permit will not be required as less than 100,000 square feet of disturbance is anticipated;

- Wetland mitigation will not be required as less than 10,000 square feet of wetland impact, expected less 200 linear feet of permanent shoreline impact is anticipated, and the addition of riprap to protect existing infrastructure (per Env-Wt 302.03);
- This task assumes a wetland permit fee of approximately $2,700. The actual wetland permit fee will vary based on the final design and the square footage of proposed wetland impact; and
- Shoreland permitting is not anticipated to be required as the project is located on urbanized exempt lots as described in the current Town of Newmarket Shoreland Protection Overlay District and the NHDES Shoreland Permit Program Guidance.

Task 5.2 NHDES Dam Permit

GZA will prepare and submit an Application to Construct or Reconstruct a Dam Permit to NHDES. Requirements for the Dam Permit application will include technical plans and specifications (from Task 4) as well as a project narrative and other information in support of the application form. Note NHDES requires a general filing fee of $2,000 to facilitate permit review as well as an additional $2,000 fee due to its classification as a high hazard structure. Our proposal does not include this ($4,000) filing fee.

Task 5.3 Phase IA Archeological Assessment

Archeological assessment services will be provided by **Victoria Bunker, Inc (VBI).** GZA will retain VBI to complete the following work in support of this project:

- Complete a cultural resources literature review to identify previously identified archaeological sites within one mile of the Site;
- Conduct a Phase IA Archeological Resources Survey for the project Site to identify areas sensitive for archaeological sites (pre-contact and post-contact). VBI will also document visible stone walls and historical features or structures;
- Identify a proposed strategy for avoidance measures and/or need for further archeological investigation; and
- Submit a Request for Project Review to the Division of Historical Resources (DHR) and present the Phase IA investigation results and avoidance measures to the DHR.

For the purposes of this proposal, GZA has made several assumptions, as outlined below:

- The proposed project will not require a Phase IB or Phase II Archeological Assessment; and
- If required, GZA will obtain an estimate for the completion of a Phase IB and/or Phase II Archeological Assessment for review by the Town of Newmarket.

Task 5.4 Local Permitting

The proposed project occurs within the Town of Newmarket Wetland Protection Overlay District. A Special (Conditional) Use Permit is required for construction within wetlands and buffers. GZA will perform the following subtasks:

- Prepare a Town of Newmarket Special (Conditional) Use Permit Application to the Newmarket Planning Board which includes the Special Permit application form, a narrative report, summary of impacts, site photographs, abutters list, proposed plan including dimensions of proposed site features, and letter of authorization signed by the Town, and copy of the State wetland permit application; and

- This proposal assumes the Town will either waive fees for a municipal project or fees will not exceed $200 for notifications to abutters.
- Any necessary building permits will be the responsibly of the contractor.

Task 5.5 Permitting Meetings

GZA will plan to attend local and State meetings in support of the project.

- A GZA permitting specialist will attend up to two (2) planning meetings with the Town of Newmarket (i.e. Dam Committee) as plan development and permitting progresses;
- A GZA permitting specialist will attend up to two local meetings: one each with the Newmarket Conservation Commission and Newmarket Planning Board to complete the Special (Conditional) Use Permit submittal process; and
- A GZA permitting specialist will attend one meeting with the Lamprey River Local Advisory Committee to present the state wetland permit application.

Task 6. Bidding Assistance Services

Task 6.1 Bid Document Preparation

GZA will reproduce up to 10 sets of the Final Bidding Documents (plans, specifications, and contract) and provide them to the Town for distribution and one copy with .pdf versions of the documents. GZA will also prepare a list of potential contractors to notify them of the project. The mechanics of the advertising and bidding process will be established by the Town in accordance with any applicable municipal public procurement procedures.

Task 6.2 Pre-Bid Conference and Addendums

GZA coordinate with the Town to schedule and participate in an on-site pre-bid conference, preparation of meeting minutes (with attendance list), preparation of responses to Requests for Information from Contractors, and preparation of Bidding Document Addendums.

Task 6.3 Bid Tabulations

Once bids are received by the Town and a copy is given to GZA, we will review, tabulate and summarize the bids, and check the references for the apparent low bidder. We will provide the Town with a summary memorandum of the bid tabulations and a recommendation letter for project award.

Optional Task 7. FEMA Floodplain Analysis

The Macallen Dam is currently mapped within a Special Hazard Flood Area (SHFA), an area of land area covered by the floodwaters of the Lamprey River base flood (1% annual chance flood) on National Flood Insurance Program (NFIP) Flood Insurance Rate Maps (FIRMs) as developed by the Federal Emergency Management Agency (FEMA). The SFHA is the area where the NFIP's floodplain management regulations must be enforced and the area where the mandatory purchase of flood insurance applies. The Macallen Dam is currently mapped within a Zone AE as shown on the effective Map Number 33015C0235E, effective date of May 17, 2005, which details Rockingham County, NH. The Macallen Dam is also located within a Regulatory Floodway on the preliminary Map Number 33015C0235F, with preliminary date of April 9, 2014. A "Regulatory Floodway" means the channel of a river or other watercourse and the adjacent land areas that must be reserved in order to discharge the base flood without cumulatively increasing the water surface elevation more than a

designated height. Communities must regulate development in these floodways to ensure that there are no increases (+0.01 feet) in upstream flood elevations.

The Floodplain management regulations do not need to be enforced for preliminary maps. However, if the preliminary maps become accepted by the community, floodplain management regulations associated with work to be performed within a Regulatory Floodway must be enforced. As a result, any project in a floodway must be reviewed to determine if the project will increase flood heights, and typically projects resulting in increases of +0.01 feet and greater will not be allowed. An engineering analysis must be conducted before a permit can be issued. The community's permit file must have a record of the results of this analysis, which can be in the form of a No-rise Certification. This No-rise Certification must be supported by technical data and signed by a registered professional engineer. The supporting technical data should be based on the standard step-backwater computer model used to develop the 100-year floodway shown on the Flood Insurance Rate Map (FIRM).

GZA will need to request the Effective (currently preliminary) model used in the analysis to develop the SFHAs for the community. This model is different than the model used and accepted by NHDES. GZA will then modify the effective model to include proposed modifications to the dam, the gate structure, and the surrounding areas to evaluate and show that no increase in water surface elevations is expected resulting for the project. This evaluation will be documented within a No-Rise Certificate to be submitted to the floodplain coordinator for review and approval. FEMA charges a $300 fee, plus $93 per-case surcharge fee to cover the cost of providing the effective model. GZA suggests that an allowance of $500 be carried to cover costs for requesting the model.

Optional Task 8. Provision of Quote to Manage Construction

Task 8.1 Construction Inspection Services

As mentioned above, a requirement of the dam safety permit will be that the Town engage a qualified Construction Engineer to ensure compliance with approved plans and specifications. GZA strongly recommends that as the design engineer, we also be engaged to serve as the Construction Engineer. Under this subtask, GZA will provide a Resident (On-Site) Project Representative during the construction phase of the project. GZA's resident would observe and document the progress of construction, conditions encountered, contractor effort and personnel, and compliance of the work with the project plans and specifications. GZA's resident would act as the Town's liaison with the Contractor and would interface with both GZA's and the Town's project manager. GZA's resident engineer will photo document the progress of construction and will prepare daily logs documenting activities, conditions, and progress.

The average monthly budget rate provided for Construction Inspection Services assumes a single GZA field engineer on-site five days per week, 40 hours per week. We have also provided a budget rate for part time construction inspection services, which assumes a single GZA field engineer would be on-site for two days per week. The budget estimate includes travel and per diem for the resident. The time on site by the engineer is typically dictated by construction activities at the Site. GZA assumes that the construction can be completed in twelve (12) weeks.

Neither the professional activities of GZA or our subcontractors, nor the presence of GZA's employees and/or subcontractors will be construed by any party to imply that GZA has any responsibility for any contractor's methods of work performance, procedures, superintendence, sequencing of operations, or safety in, on or about the project site. The Client agrees to make evident in their agreement with contractors that neither the presence of GZA's field representative nor any observation or testing by GZA will excuse him for defects discovered in his work. With respect to site safety, GZA will be responsible solely for the on-site activities of its own employees and subcontractors, and this responsibility will not be construed to relieve Client and Client's own contractors from their obligations to maintain a safe project site. Client agrees that Client's own contractor is solely responsible for project site safety and warrants that: (1) this intent will be

made evident in the Client's agreement with his contractor; and (2) Client will require GZA to be named as an Additional Insured under his contractor's general liability insurance policy.

Task 8.2 Engineer of Record Services

Additionally, we recommend, in concert with the Construction Engineer duties, that GZA provide other Engineer-of-Record Services during construction. In general, these services will involve a GZA project manager and a GZA project engineer attending project meetings and reviewing contractor submittals, requests for information (RFI's) for conformance to the contract documents. An assumed level of effort (without major unexpected conditions) has been used to prepare the average monthly budget estimate. Included in the monthly estimate is GZA project management time and the efforts of the GZA principal-in-charge in overseeing the project as a whole. More specifically the scope anticipated for Engineer-of-Record Services includes:

Meeting Attendance

A GZA project manager or engineer will attend all required meetings at the site (and elsewhere as required) on behalf of the Town. These meeting will typically consist of the weekly project progress meeting where contractor progress will be discussed along with questions and upcoming schedule. GZA will prepare and electronically distribute meeting minutes from each meeting as applicable.

Review of Contractor Submittals

GZA will provide technical review of Contractor's shop drawings, test results of materials, review samples and other submissions related to the proposed dam construction as necessary for compliance with the Project Drawings and Specifications. Our scope assumes only a limited number of re-submittals. We will process and respond to correspondence from contractors. Correspondence received from the contractor(s) will be reviewed by our staff relative to the specifications and the project permits. GZA will provide a written response and will make a recommendation to the Town as to whether to accept, accept with modifications, or reject the submittal. All correspondence will be properly distributed to the project team and maintained in the project file. We have assumed approximately 8 hours per week of submittal review.

Respond to Requests for Clarifications and Changed Conditions

GZA will provide a project manager on a part-time basis (assuming an average of 4 hours per week) to provide liaison with the Town, the Contractor, and GZA's field personnel and to respond to requests for clarification or information or other questions from any project partner. Action items developed as a result of the questions will be discussed immediately with the Town to determine whether the action is necessary is within the project scope, and any associated cost implications. GZA will develop technical recommendations in a timely manner to address unanticipated conditions, when encountered. GZA will issue a written response to the Town with our opinion as to the appropriate resolution of questions or unexpected conditions.

Review of Monthly Pay Requisitions

GZA will review contractor-submitted pay requisitions and compare them against contractor progress at the site as observed by GZA and reported by the on-site Resident. GZA will prepare a written memo addressed to the Town for each pay requisition stating GZA opinion regarding the release of payment. We have assumed one pay requisition per month.

Certificate of Substantial Completion and Affidavit of Compliance

At the completion of the project, GZA will review the Contractor's "As-built" plans, in cooperation with the resident engineer. A "punchlist" will be prepared during a site meeting with the Contractor and Resident containing items for completion prior to project close-out. At the appropriate time, GZA will prepare a Certificate of Substantial Completion for the purposes assisting with authorization of final payment to the Contractor. Also, at the end of the construction phase, an Affidavit of Compliance, as per NHDES regulations, will be prepared by a GZA professional Engineer to be submitted as required as part of a completion report. We will prepare and submit other Certificates of Compliance for permitting, as required.

SCHEDULE

GZA is prepared to initiate the proposed Scope of Work within one week of the receipt of a signed contract (as indicated below under Conditions of Engagement). GZA has developed a proposed schedule for the work and has included the general timeline below. GZA will revise the schedule and update the Town as the project progressed. Please note that the provided schedule is based on receiving of Notice to Proceed by April 30, 2018.

- May 2018 - Council Approval of Funds for Final Design and Permitting
- Summer 2018 - Start of Final Design and Permitting
- Fall 2018 - Submit Permits
- Fall 2018 - Start of Town's CIP and Budget Process
- March 2019 - Town Meeting Vote on Bond for Construction
- Spring 2019 - Final Design Complete; Permits Received
- Spring 2019 - Construction Bidding;
- Spring 2019 - Contract Award; Order Gate for Fabrication*
- Summer 2019 - Construction Begins
- Fall 2019 - End of Construction (Late October)
- Winter 2020 - Reporting and Project Closeout

**Note: Lead time for fabrication of pneumatic gates is typically 2-4 months and fabrication for hydraulic gates can be 6-9 months.*

COST PROPOSAL

Billings for the base scope of services described above in Tasks 1 through 6, will be at a Total Lump Sum (fixed price) fee of $195,900.00 as outlined in the Table below. We have also provided a fixed price fee for each of the optional scope items within the table. This estimate is based on the anticipated scope of work outlined above which represents our best judgment at this time as to the efforts required to achieve the stated objectives. It must be recognized, however, that unforeseen conditions, beyond the scope stated herein, which become evident during the course of the studies, may alter or increase the scope of work required. You will be notified of any conditions requiring an increase in baseline scope and budget prior to GZA proceeding.

GZA SUMMARY OF COSTS
MACALLEN DAM REHABILITATION – FINAL DESIGN & PERMITTING
NEWMARKET, NEW HAMPSHIRE

TASK	DESCRIPTION	COST
1	Preliminary Coordination & Grant Application Support	$3,200
2	Project Kickoff/Initial Consultations	$8,400
3	Field Investigations/ Data Gathering	$12,900
4	Final Design	$127,700
5	Permitting	$34,900
6	Bidding Assistance Services	$8,800
	TOTAL COST– BASELINE SCOPE	**$195,900**

OPTIONAL TASK	DESCRIPTION	EST. BUDGET
7	Floodway Analysis & No-Rise Certificate	$5,000
8.1A	Construction Inspection Services (Full Time)(@ $7,230/week for 12 weeks)	$86,760
8.1B	Construction Inspection Services (Part Time)(@ $3,260/week for 12 weeks)	$39,120
8.2	Engineer-Of-Record Services	$32,270

SUMMARY OF ALLOWANCE FOR FEEs[1]

DESCRIPTION	EST. FEE
NHDES Wetland Permit Fee	$2,700
Dam Permit Fee	$4,000
Local Permitting Fees	$200
FEMA Floodway Analysis Data Request Fee	$500
Total	**$7,400**

1. Allowance for fees separate from and in addition to price listed for specific tasks above.

TERMS AND CONDITIONS

We have included the modified Terms and Conditions that were negotiated between GZA and the Town in July 2017 and were included in the *Macallen Dam: Stability Analysis and Conceptual Design of Abutment Walls* contract executed on July 20, 2017. This Proposal may be accepted by signing in the appropriate spaces below and returning one complete copy (including attachments) to us. Submittal of a signed contract acknowledges acceptance of our Proposal for Professional Services, Schedule of Fees, and previously negotiated Terms and Conditions for Professional Services (08/08 Edition/05-9011, Modified July 11, 2017).

We look forward to continuing our work with the Town and the Dam Study Committee on this interesting and challenging project. Should you have any questions, please contact us at your convenience.

Very truly yours,

GZA GEOENVIRONMENTAL, INC.

Todd E. Monson, P.E.
Project Manager

James P. Guarente, P.E.
Consultant/Reviewer

Chad W. Cox, P.E. MA
Principal-In-Charge

Attachments: Figure 1 – Survey Limits
Appendix A – Terms and Conditions (08/08 Edition /05-9010) - Modified July 11, 2017

This Proposal for Services is hereby accepted and executed by a duly authorized signatory, who by execution hereof, warrants that he/she has full authority to act for, in the name of, and on behalf of the Town of Newmarket, New Hampshire.

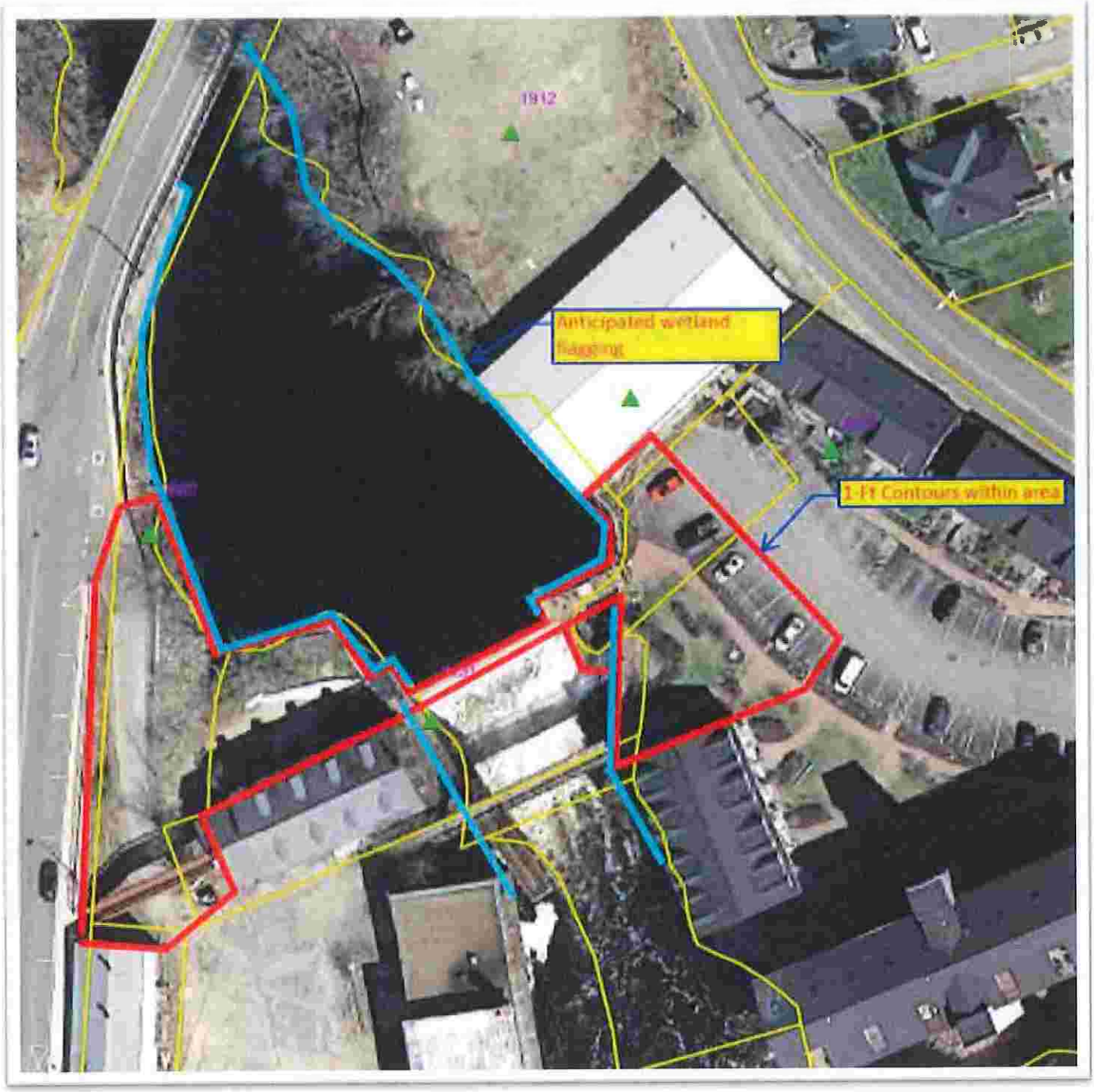
TOWN OF NEWMARKET, NEW HAMPSHIRE

By: _____ Title: _____
for the Town of Newmarket, New Hampshire

Typed Name: _____ Date: _____

FIGURE 1

SURVEY LIMITS



APPENDIX A

TERMS AND CONDITIONS

TERMS AND CONDITIONS FOR PROFESSIONAL SERVICES
Including Site Investigation, Remediation, Geotechnical, Construction, And Testing

© 2018 by GZA GeoEnvironmental, Inc.

Client ("You"): Town of Newmarket, New Hampshire

Proposal No: 01.P000818.18

Site: Macallen Dam, Newmarket, New Hampshire

These Terms and Conditions, together with GZA's Proposal, make up the Agreement between GZA and you, Client, named above.

BEFORE SIGNING THE PROPOSAL, BE SURE YOU READ AND UNDERSTAND THE PARAGRAPHS ENTITLED "INDEMNIFICATION" AND "LIMITATION OF REMEDIES" WHICH DEAL WITH THE ALLOCATION OF RISK BETWEEN YOU AND GZA.

1. **Services.** GZA will perform the services set forth in its Proposal and any amendments or change orders authorized by you. Any request or direction from you that would require extra work or additional time for performance or would result in an increase in GZA's costs will be the subject of a negotiated amendment or change order.

2. Standard of Care; Warranties.

a. GZA will perform the services with the degree of skill and care ordinarily exercised by qualified professionals performing the same type of services at the same time under similar conditions in the same or similar locality.

b. GZA warrants that its construction services will be of good quality, free of faults and defects and in conformance with the Proposal.

c. **EXCEPT AS SET FORTH IN SUBSECTIONS 2a AND 2b, ABOVE, NO WARRANTY, EXPRESS OR IMPLIED, INCLUDING WARRANTY OF MARKETABILITY OR FITNESS FOR A PARTICULAR PURPOSE, IS MADE OR INTENDED BY GZA'S PROPOSAL OR BY ANY OF GZA'S ORAL OR WRITTEN REPORTS.**

d. GZA assigns to you any manufacturers' warranties of equipment or materials purchased from others, to the extent they are assignable, and your sole recourse will be against the manufacturer. Full risk of loss of materials and equipment will pass to you upon delivery to the Site, and you will be responsible for insuring and otherwise protecting them against theft and damage.

3. Payment.

a. Except as otherwise stated in the Proposal, you will compensate GZA for the services at the rates set forth in the applicable Proposal, amendment or change order; reimburse its expenses, which will include a communication fee calculated as a percentage of labor invoiced; and pay any sales or similar taxes thereon.

b. Any retainer specified in GZA's Proposal shall be due prior to the start of services and will be applied to the final invoice for services.

c. GZA will submit invoices periodically, and payment will be due within 30 days from invoice date. Overdue payments will bear interest at 1½ percent per month when the payments are 60 days overdue or, if lower, the maximum lawful rate. GZA may terminate its services upon 10 days' written notice anytime your payment is overdue on this or any other project and you will pay for all services through termination.

4. Your Responsibilities.

a. Except as otherwise agreed, you will secure the approvals, permits, licenses and consents necessary for performance of the services. You will provide GZA with access to your records if available to assist in obtaining information regarding underground structures and utilities and will provide such documents as are known to you.

5. **Right of Entry; Site Restoration.** You grant GZA and its subcontractor(s) permission to enter the Site to perform the services. If you do not own the Site, you represent and warrant that the owner has granted permission for GZA to enter the Site and perform the services; you will provide reasonable verification on request; and you will indemnify GZA for any claims by the Site owner related to alleged trespass by GZA or its subcontractors. GZA will exercise reasonable care to limit damage to landscaping, paving, systems and structures at the Site that may occur and you agree to compensate GZA for any restoration it is asked to perform, unless otherwise indicated in the Proposal.

6. **Underground Utilities.** As required by law, GZA will provide proper notification to the applicable state utility "Call Before You Dig" program should there be the need for subsurface explorations to carry out proposal scope items. GZA will rely on information provided by appropriate governmental authorities and utilities with respect to the location of underground structures.

7. **Reliance.** The services, information, and other data furnished by you shall be at your expense, and GZA may rely upon all information and data that you furnish, including the accuracy and completeness thereof. You acknowledge that the quality of the services provided by GZA is directly related to the accuracy and completeness of the information and data that you furnish to GZA.

GZA's REPORTS ARE PREPARED FOR AND MADE AVAILABLE FOR YOUR SOLE USE. YOU ACKNOWLEDGE AND AGREE THAT USE OF OR RELIANCE UPON THE REPORT OR THE FINDINGS IN THE REPORT BY ANY OTHER PARTY, OR FOR ANY OTHER PROJECT OR PURPOSE, SHALL BE AT YOUR OR SUCH OTHER PARTY'S SOLE RISK AND WITHOUT ANY LIABILITY TO GZA.

8. **Lab Tests and Samples.** GZA is entitled to rely on the results of laboratory tests using generally accepted methodologies. GZA may dispose of samples in accordance with applicable laws 30 days after submitting test results to you unless you request in writing for them to be returned to you or to be held longer, in which case you will compensate GZA for storage and/or shipping beyond 30 days.

9. **GZA Professionals.** Section Deleted.

10. **Hazardous Materials; GZA "Not a Generator".** Before any hazardous or contaminated materials are removed from the Site, you will sign manifests naming you as the generator of the waste (or, if you are not the generator, you will arrange for the generator to sign). You will select the treatment or disposal facility to which any waste is taken. GZA will not be the generator or owner of, nor will it possess, take title to, or assume legal liability for any hazardous or contaminated materials at or removed from the Site. GZA will not have responsibility for or control of the Site or of operations or activities at the Site other than its own. GZA will not undertake, arrange for or control the handling, treatment, storage, removal, shipment, transportation or disposal of any hazardous or contaminated materials at or removed from the Site, other than any laboratory samples it collects or tests. You agree to defend, indemnify and hold GZA harmless for any costs or liability incurred by GZA in defense of or in payment for any legal actions in which it is alleged that GZA is the owner, generator, treater, storer or disposer of hazardous waste.

11. **Limits on GZA's Responsibility.** GZA will not be responsible for the acts or omissions of contractors or others at the Site, except for its own subcontractors and employees. GZA will not supervise, direct or assume control over or the authority to stop any contractor's work, nor shall GZA's professional activities nor the presence of GZA or its employees and subcontractors be construed to imply that GZA has authority over or responsibility for the means, methods, techniques, sequences or procedures of construction, for work site health or safety precautions or programs, or for any failure of contractors to comply with contracts, plans, specifications or laws. Any opinions by GZA of probable costs of labor, materials, equipment or services to be furnished by others are strictly estimates and are not a guarantee that actual costs will be consistent with the estimates.

12. **Changed Conditions.**

a. You recognize the uncertainties related to environmental and geotechnical services, which often require a phased or exploratory approach, with the need for additional services becoming apparent during the initial services. You also recognize that actual conditions encountered may vary significantly from those anticipated, that laws and regulations are subject to change, and that the requirements of regulatory authorities are often unpredictable.

b. If changed or unanticipated conditions or delays make additional services necessary or result in additional costs or time for performance, GZA will notify you and the parties will negotiate appropriate changes to the scope of services, compensation and schedule.

c. If no agreement can be reached, GZA will be entitled to terminate its services and to be equitably compensated for the services already performed. GZA will not be responsible for delays or failures to perform due to weather, labor disputes, intervention by or inability to get approvals from public authorities, acts or omissions on your part, or any other causes beyond GZA's reasonable control.

13. **Documents and Information.** All documents, data, calculations and work papers prepared or furnished by GZA are the property of the Town of Newmarket. Designs, reports, data and other work product delivered to you are for your use only, for the limited purposes disclosed to GZA. Any delayed use, use at another site, use on another project, or use by a third party will be at the user's sole risk, and without any liability to GZA.

14. **Electronic Media.** Any drawings, reports and data on any form of electronic media generated by GZA shall become the property of the Town of Newmarket upon delivery. Any transfer of these electronic files to others or reuse or modifications to such files by you will be at the user's sole risk and without any liability to GZA.

15. **Confidentiality; Subpoenas.** Section Deleted.

16. **Insurance.** Prior to the commencement of performance of the services, GZA will furnish you certificates of such insurance and will maintain workers compensation, commercial general liability, automobile liability, and professional liability/contractor's pollution liability insurance. The Certificate will present the following coverage limits:

Commercial General Liability $2,000,000
Workers Compensation/Employers Liability Statutory/$1,000,000
Automobile Liability $1,000,000
Contractors Pollution Liability $1,000,000
Professional Liability $1,000,000

Should the Town of Newmarket decide the insurance amounts/coverage is insufficient, it will notify GZA within 30 business days with a suggested deadline toward amounts/coverage. GZA will then respond within 30 days regarding the availability of and/or additional expense of the additional insurance.

17. **Indemnification.** You agree to hold harmless, indemnify, and defend GZA and its affiliates and subcontractors and their employees, officers, directors and agents (collectively referred to in this paragraph as "GZA") against all claims, suits, fines and penalties, including mandated cleanup costs and attorneys' fees and other costs of settlement and defense, which claims, suits, fines, penalties or costs arise out of or are related to this Agreement or the services, except to the extent they are caused by GZA's negligence or willful misconduct.

18. Limitation of Remedies.

a. To the fullest extent permitted by law and notwithstanding anything else in this Agreement to the contrary, the aggregate liability of GZA and its affiliates and subcontractors and their employees, officers, directors and agents (collectively referred to in this paragraph as "GZA") for all claims arising out of this Agreement or the services is limited to the limit of insurance coverage carried by GZA under this Agreement

b. GZA will not be liable for lost profits, loss of use of property, delays, or other special, indirect, incidental, consequential, punitive, exemplary, or multiple damages.

c. You will look solely to GZA for your remedy for any claim arising out of or relating to this Agreement, including any claim arising out of or relating to alleged negligence or errors or omissions of any GZA principal, officer, employee or agent.

19. Disputes.

a. All disputes between you and GZA shall be subject to non-binding mediation.

b. Either party may demand mediation by serving a written notice stating the essential nature of the dispute, the amount of time or money claimed, and requiring that the matter be mediated within forty-five (45) days of service of notice.

c. The mediation shall be conducted by a retired NH Superior or Supreme Court judge offering mediation services, subject to the rules set by the mediator, or by such other person as the parties may agree upon.

d. No action or suit may be commenced unless mediation has occurred but did not resolve the dispute, or unless a statute of limitation period would expire if suit were not filed prior to such forty-five (45) days after service of notice.

20. Miscellaneous.

a. New Hampshire law shall govern this Agreement.

b. The above terms and conditions regarding Limitation of Remedies and Indemnification shall survive the completion of the services under this Agreement and the termination of the contract for any cause.

c. Any amendment to these Terms and Conditions must be in writing and signed by both parties.

d. Having received these Terms and Conditions, your oral authorization to commence services, your actions, or your use of the Report or Work Product constitutes your acceptance of them.

e. This Agreement supersedes any contract terms, purchase orders or other documents issued by you.

f. Neither party may assign or transfer this Agreement or any rights or duties hereunder without the written consent of the other party.

g. Your failure or the failure of your successors or assigns to receive payment or reimbursement from any other party for any reason whatsoever shall not absolve you, your successors or assigns of any obligation to pay any sum to GZA under this agreement.

h. These Terms and Conditions shall govern over any inconsistent terms in GZA's Proposal.

i. The provisions of this Agreement are severable; if any provision is unenforceable it shall be appropriately limited and given effect to the extent it is enforceable.

j. The covenants and agreements contained in this Agreement shall apply to, inure to the benefit of and be binding upon the parties hereto and upon their respective successors and assigns.

GZA GeoEnvironmental, Inc.

Public Presentation
Macallen Dam: Stability Analysis and Conceptual Design of Remedial Alternatives

Proactive By Design.
Our Company Commitment

Newmarket Town Council

Wednesday, December 6

7:00 pm

AGENDA

1. Background and Project History
2. Alternatives Analysis
3. Gate Automation Analysis
4. Dam Appurtenances Repairs and Rehabilitation
5. Conceptual Alternatives and Renderings
6. Preferred Alternative
7. Moving Forward (Next Steps)

Project Partners: Dam Study Committee, Town of Newmarket, NHDES

TASKS AND SCHEDULE

Task No.	Activity Description	Aug-17				Sep-17				Oct-17				Nov-17					Dec-17			
		1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	5	1	2	3	4
1	Project Kick-Off Meeting/Initial Consultation																					
2	Engineering Analyses (Stability, Design, Hydraulics)																					
3	Submit Summary Report to Town and NHDES																					
4	Coordination with NHDES Dam Safety Bureau																					
5	Action Plan																					
6	Coordination Meetings and Public Presentation																					
7	Emergency Action Plan Update																					
8	Operations & Maintenancce Response Form Update																					
9	Gate Automation Analysis																					

BACKGROUND: LETTER OF DEFICIENCY (LOD)

- Fill, seed, mulch right side embankment
- Remove & Structurally patch concrete:
  - Left abutment gate structure / piers
  - Left side upstream training wall
- Investigate and repair right side training wall
- Submit permit, plans, and specifications for Rehabilitation of Dam
- Compete reconstruction/repair of Dam

Multiple LODs in past decade

BACKGROUND: PREVIOUS STUDIES

2010
- Town Passes Warrant Article for Removal Feasibility Study
- Overall Assessment Wright-Pierce

2011

2012
- Additional H&H, Breach Study, & Incremental Damage Assessment Wright-Pierce

2013
- Shift in Town policy to Repair Structure & Increase Spillway Capacity

2014
- Final Feasibility Study Completed Gomez & Sullivan

2015

2016
- Refined H&H Analysis Gomez & Sullivan
- NHDES Approved Design Flow

2017
- GZA hired to perform conceptual design and stability analysis for dam remedial alternatives

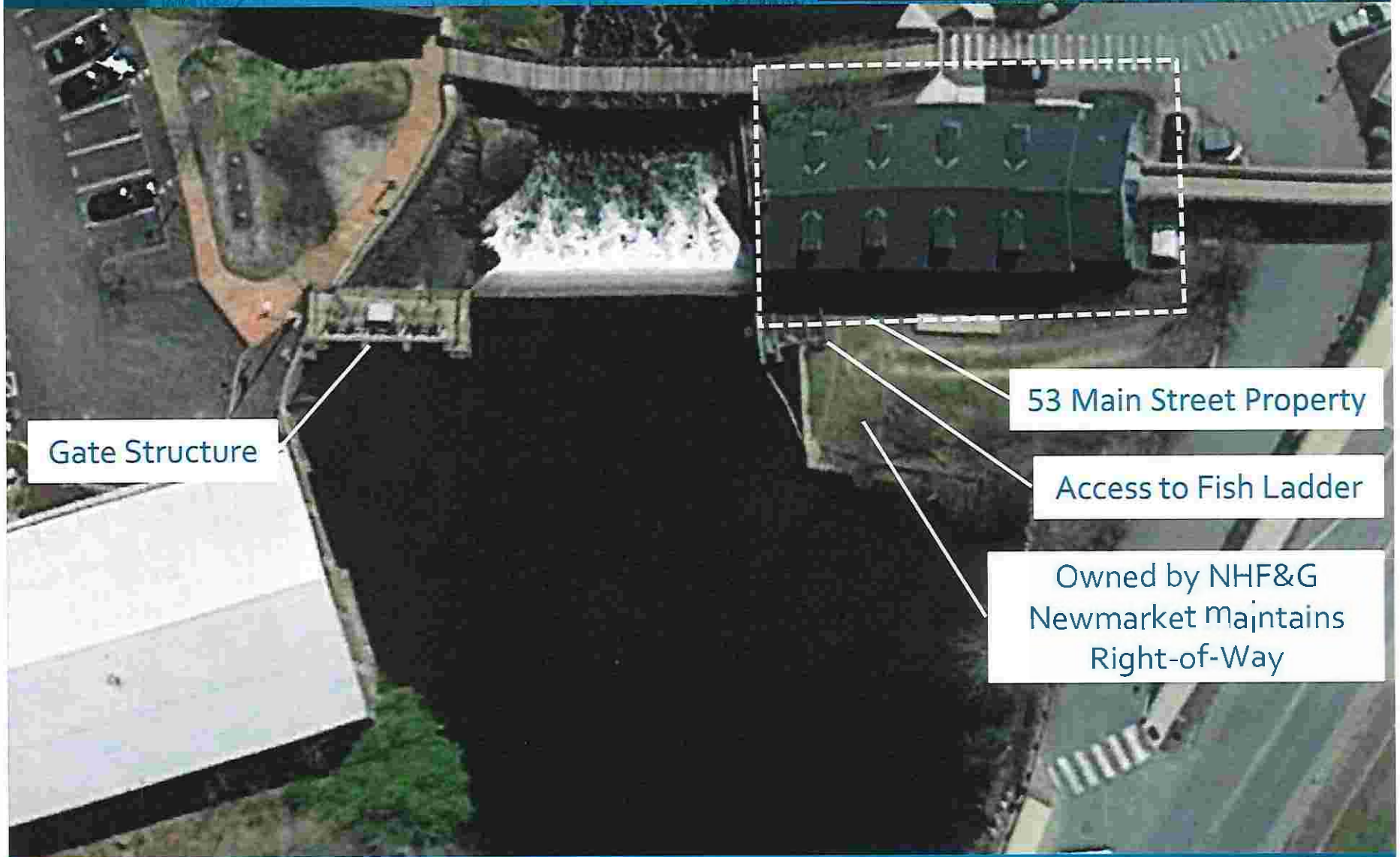
OBJECTIVE AND PURPOSE

Objective: Develop concepts which bring the dam into compliance with NHDES Dam Bureau's Discharge Capacity requirements.

Purpose: Design dam rehabilitation concepts that:

- Enhance the safety of the dam
- Maintain the upstream impoundment
- Improve compliance with NH dam safety regulations
- Minimize aesthetic impacts

PROPERTY / SITE ACCESS



CONCEPTUAL ALTERNATIVES

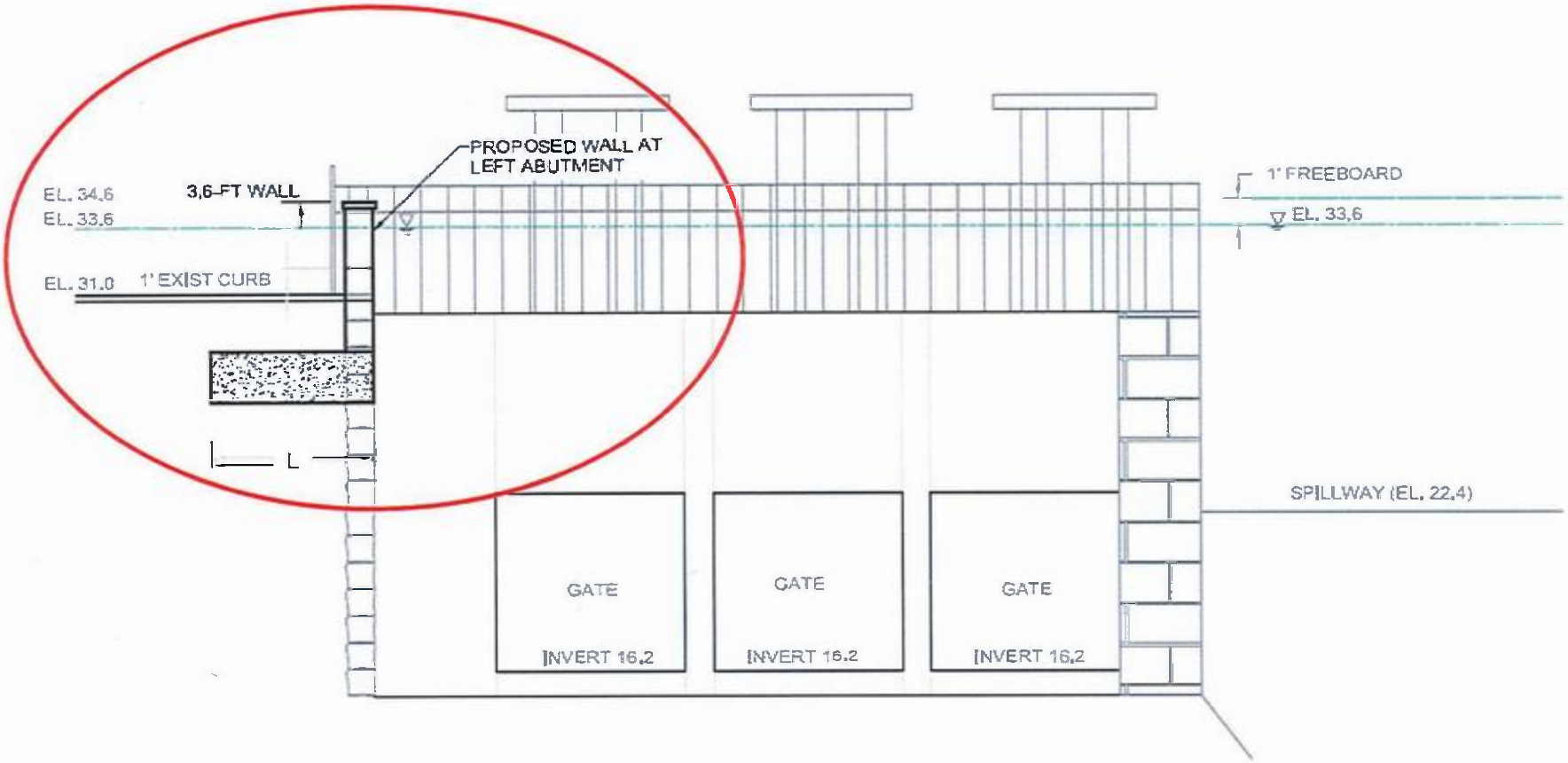
Raising Abutment Walls

- Option 1: 4' Left Abutment Wall; 6' Right Abutment Wall; No Fill
- Option 2: 4' Left Abutment Wall; 4' Right Abutment Wall; 2' Fill
- Option 3: 4' Left Abutment Wall; 2' Right Abutment Wall; 4' Fill

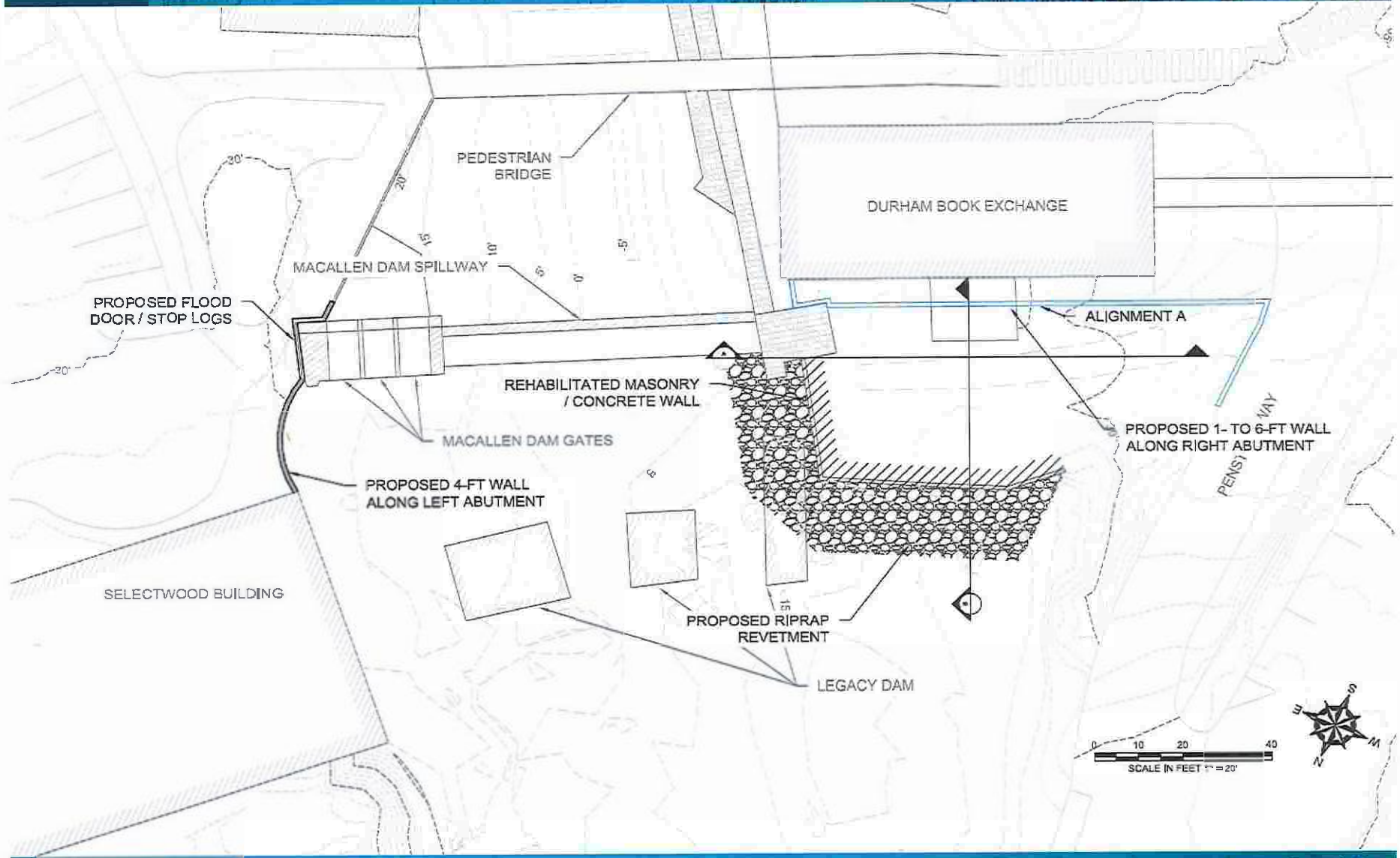
Wall Alignments (Right Abutment)

- Alignment A: Offset 6' from Warehouse
- Alignment B: Offset 25' from Warehouse
- Alignment C: Offset 35' from Warehouse (Along Masonry Wall)

LEFT ABUTMENT
ALL OPTIONS 1, 2, 3

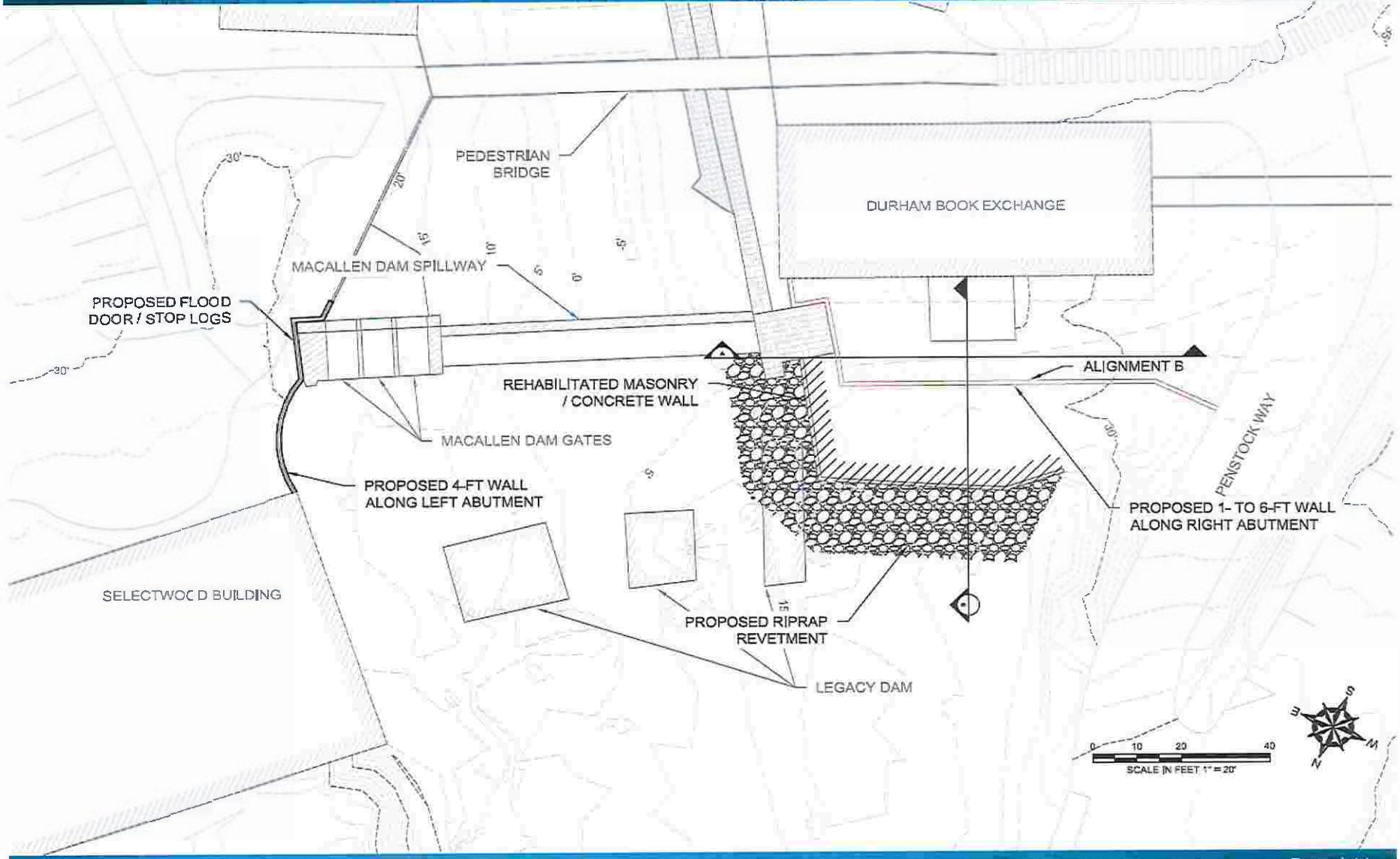


ALIGNMENT A

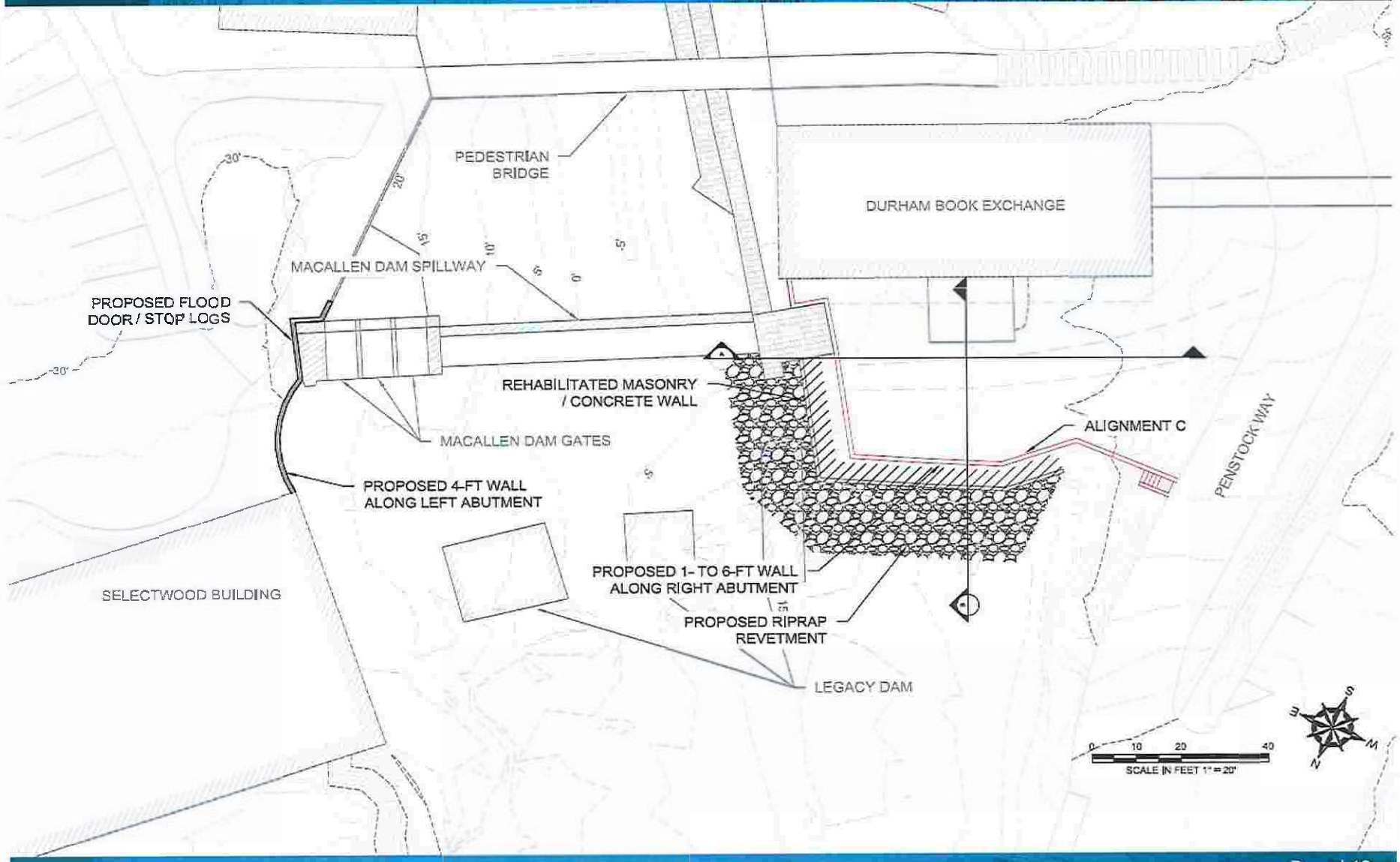

PEDESTRIAN BRIDGE
DURHAM BOOK EXCHANGE
MACALLEN DAM SPILLWAY
PROPOSED FLOOD DOOR / STOP LOGS
ALIGNMENT A
REHABILITATED MASONRY / CONCRETE WALL
MACALLEN DAM GATES
PROPOSED 1- TO 6-FT WALL ALONG RIGHT ABUTMENT
PROPOSED 4-FT WALL ALONG LEFT ABUTMENT
SELECTWOOD BUILDING
PROPOSED RIPRAP REVETMENT
LEGACY DAM
SCALE IN FEET 1" = 20'

ALIGNMENT B

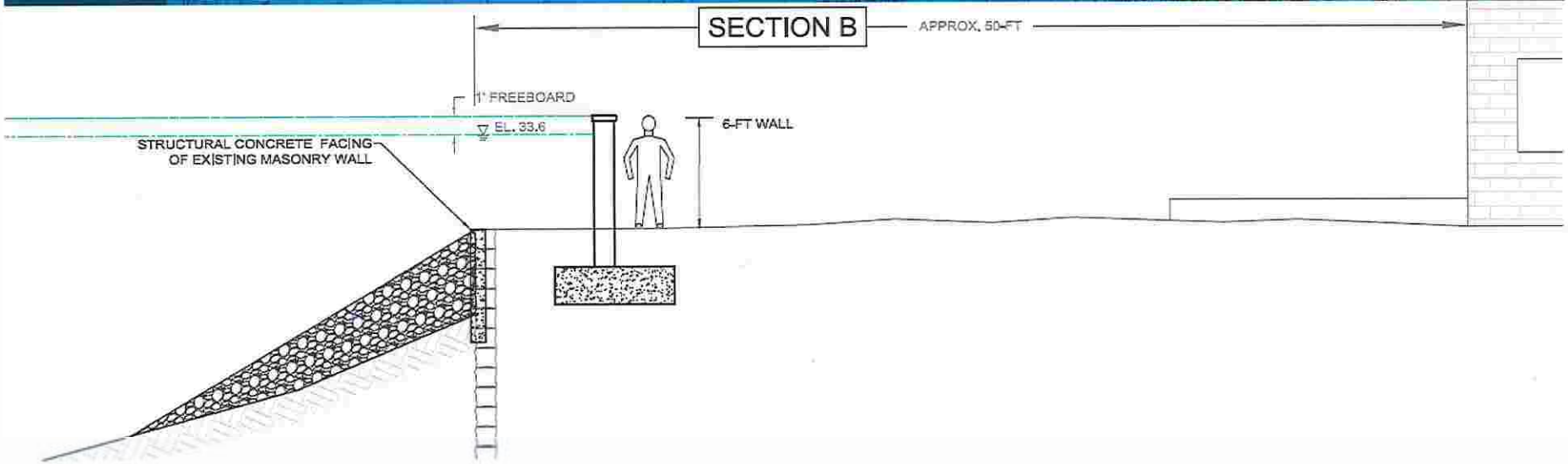
GEOTECHNICAL
ENVIRONMENTAL
ECOLOGICAL
WATER
CONSTRUCTION MANAGEMENT

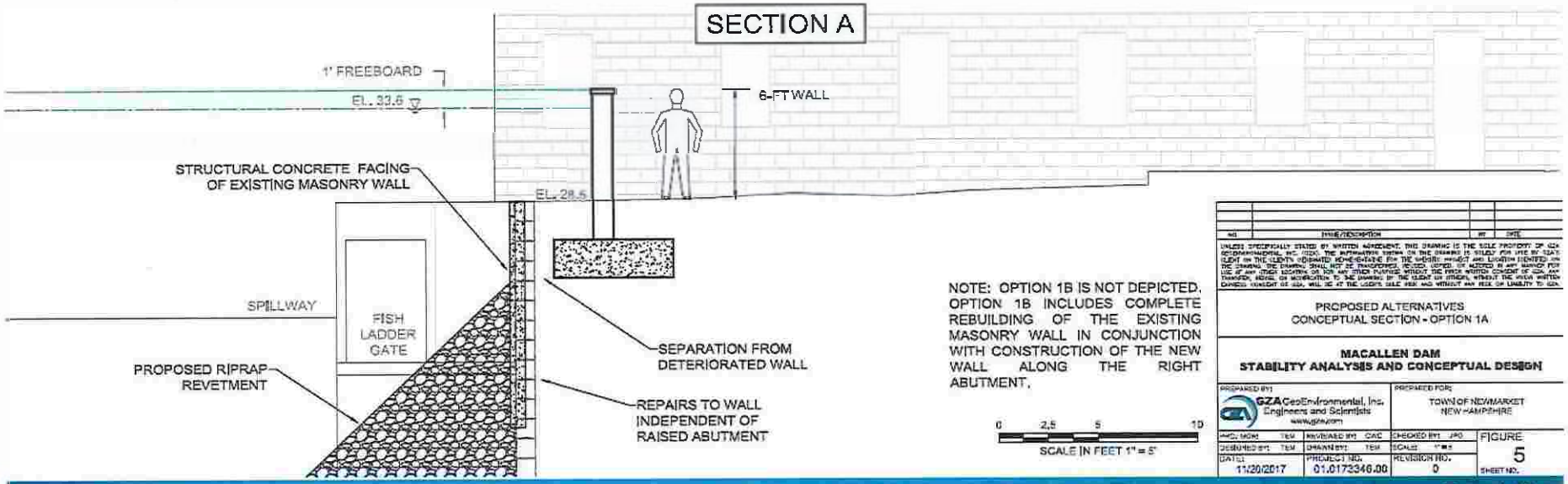

PEDESTRIAN BRIDGE
DURHAM BOOK EXCHANGE
MACALLEN DAM SPILLWAY
PROPOSED FLOOD DOOR / STOP LOGS
REHABILITATED MASONRY / CONCRETE WALL
ALIGNMENT B
MACALLEN DAM GATES
PENSTOCK WAY
PROPOSED 4-FT WALL ALONG LEFT ABUTMENT
PROPOSED 1- TO 6-FT WALL ALONG RIGHT ABUTMENT
SELECTWOOD BUILDING
PROPOSED RIPRAP REVETMENT
LEGACY DAM
0 10 20 40
SCALE IN FEET 1" = 20'

ALIGNMENT C


PEDESTRIAN BRIDGE
DURHAM BOOK EXCHANGE
MACALLEN DAM SPILLWAY
PROPOSED FLOOD DOOR / STOP LOGS
REHABILITATED MASONRY / CONCRETE WALL
MACALLEN DAM GATES
ALIGNMENT C
PENSTOCK WAY
PROPOSED 4-FT WALL ALONG LEFT ABUTMENT
SELECTWOOD BUILDING
PROPOSED 1- TO 6-FT WALL ALONG RIGHT ABUTMENT
PROPOSED RIPRAP REVETMENT
LEGACY DAM
SCALE IN FEET 1" = 20'

OPTION 1A:
6' WALL, NO FILL





NOTE: OPTION 1B IS NOT DEPICTED. OPTION 1B INCLUDES COMPLETE REBUILDING OF THE EXISTING MASONRY WALL IN CONJUNCTION WITH CONSTRUCTION OF THE NEW WALL ALONG THE RIGHT ABUTMENT.

0 2.5 5 10
SCALE IN FEET 1" = 5'

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PROPOSED ALTERNATIVES
CONCEPTUAL SECTION - OPTION 1A

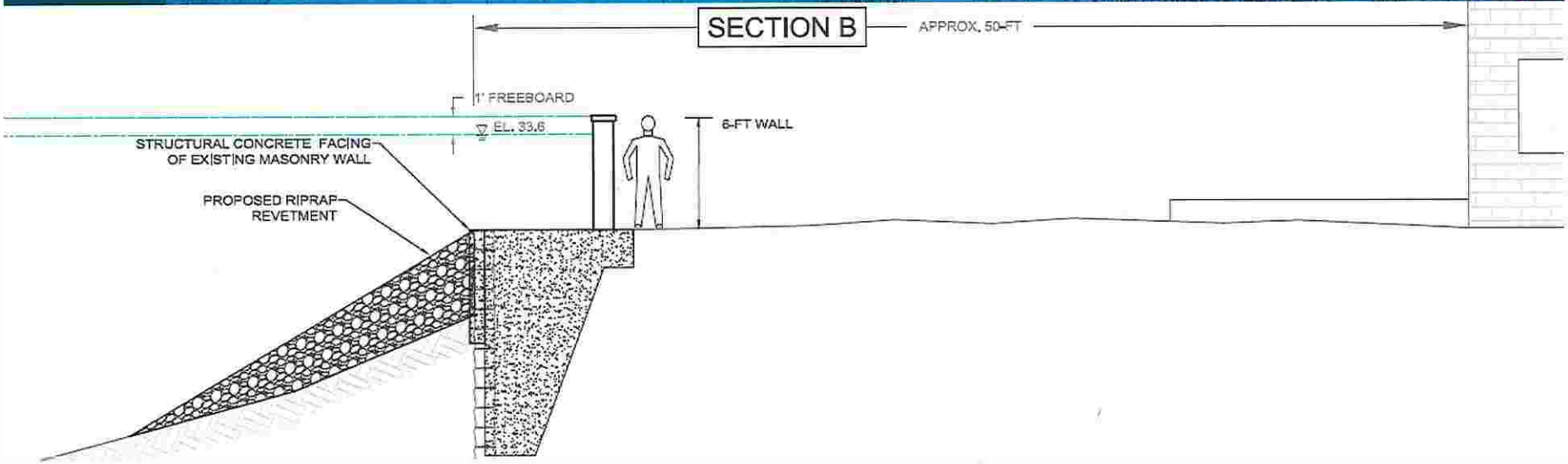
MACALLEN DAM
STABILITY ANALYSIS AND CONCEPTUAL DESIGN

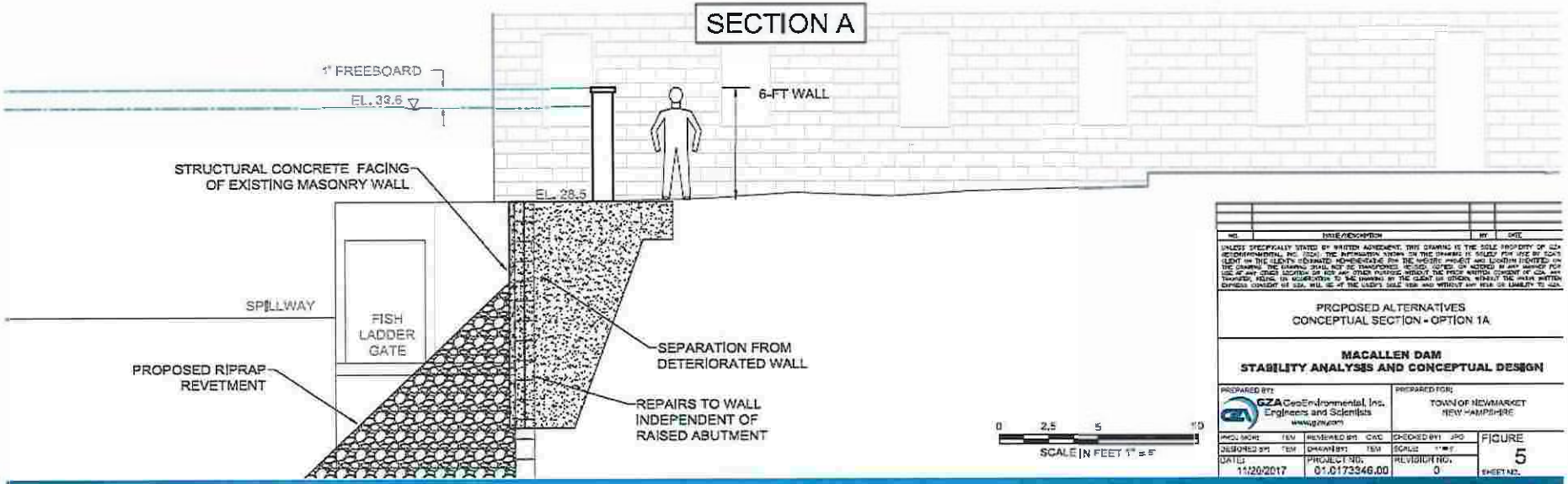
PREPARED BY: GZA GeoEnvironmental, Inc. Engineers and Scientists www.gza.com

PREPARED FOR: TOWN OF NEWMARKET NEW HAMPSHIRE

PROJ. MGR. TEM	REVIEWED BY: CAC	CHECKED BY: JPO	FIGURE		
DESIGNED BY: TEM	DRAWN BY: TEM	SCALE: 1"=5'	5		
DATE: 11/20/2017	PROJECT NO. 01.0173346.00	REVISION NO. 0	SHEET NO.		

OPTION 1B:
6' WALL - REPLACE, NO FILL





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PROPOSED ALTERNATIVES
CONCEPTUAL SECTION - OPTION 1A

MACALLEN DAM
STABILITY ANALYSES AND CONCEPTUAL DESIGN

PREPARED BY:
GZA GeoEnvironmental, Inc.
Engineers and Scientists
www.gza.com

PREPARED FOR:
TOWN OF NEWMARKET
NEW HAMPSHIRE

PROJ. MGR. TEM	REVIEWED BY: CWC	CHECKED BY: JPO	FIGURE		
DESIGNED BY: TEM	DRAWN BY: TEM	SCALE: 1"=5'	5		
DATE: 11/20/2017	PROJECT NO. 01.0173346.00	REVISION NO. 0	SHEET NO.		

OPTION 1, ALIGNMENT A:

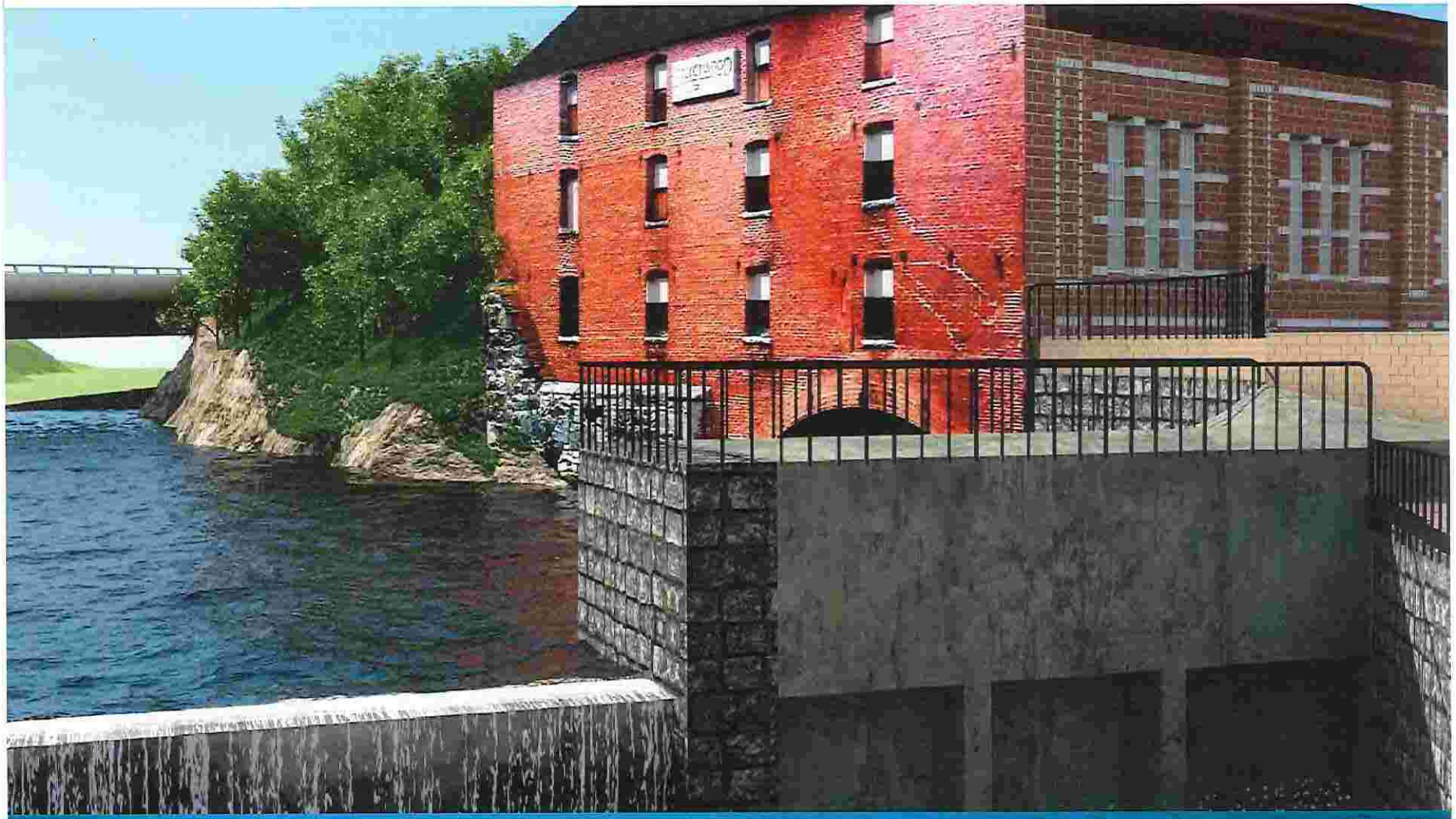
OPTION 1, ALIGNMENT B:

OPTION 1, ALIGNMENT C:

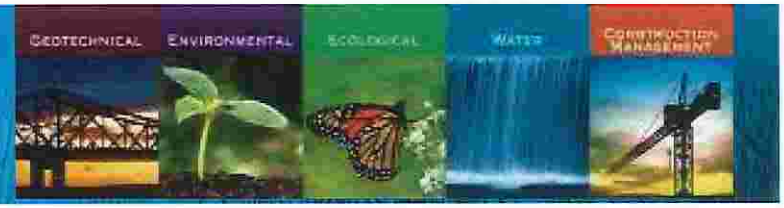
OPTION 1, ALIGNMENT C:

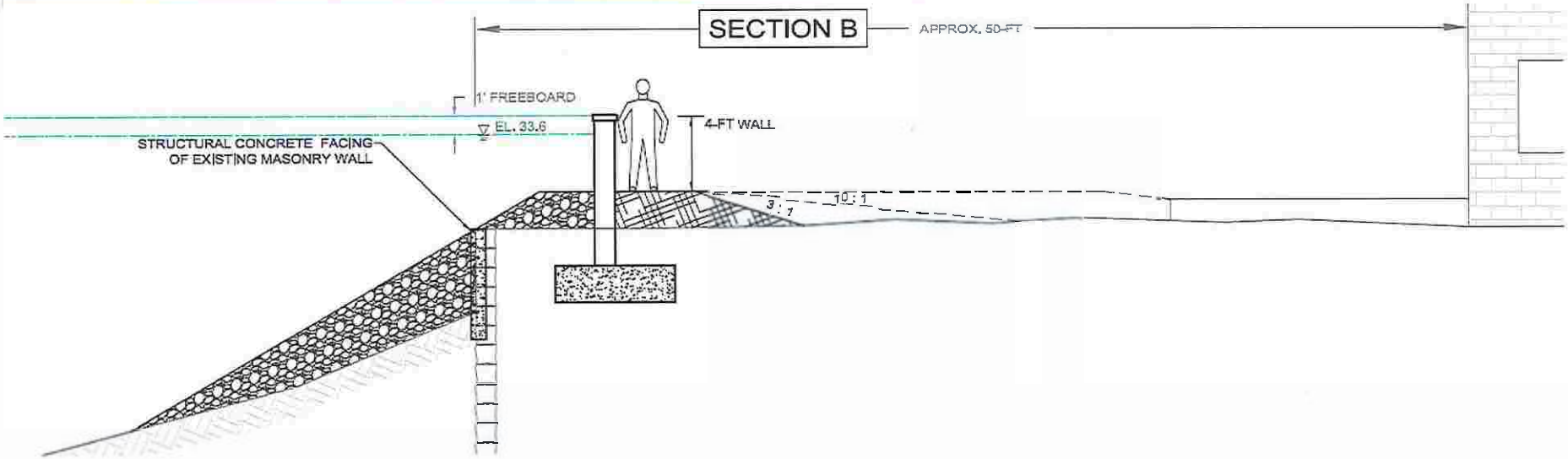
OPTION 1, ALIGNMENT C:

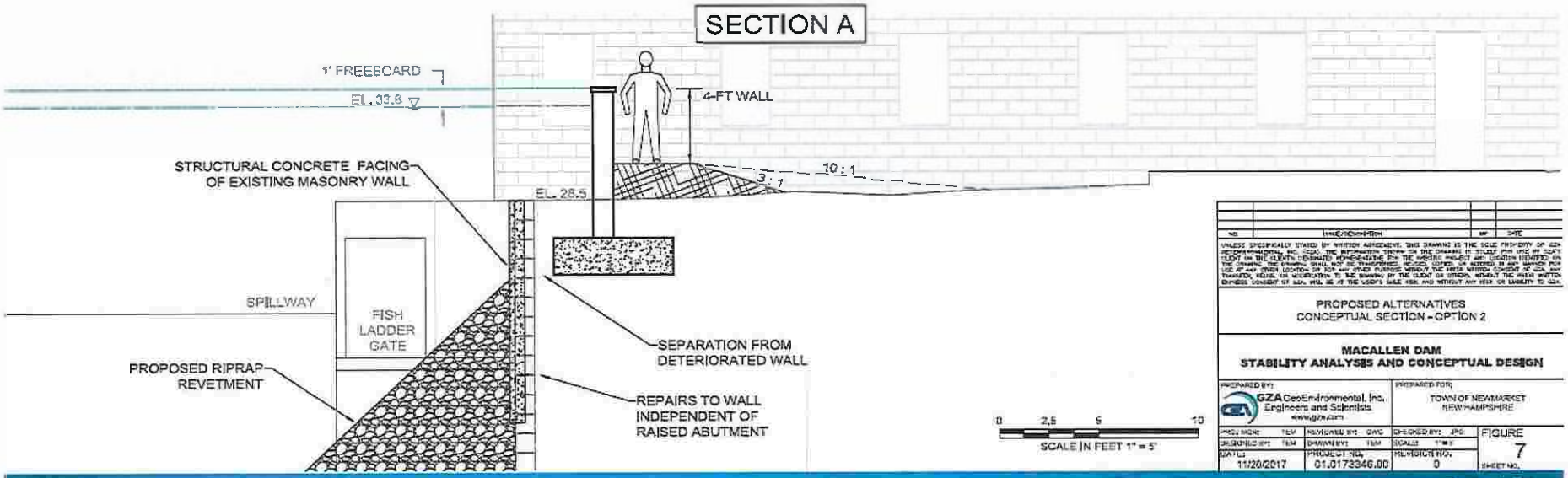
OPTION 1: LEFT ABUTMENT
OPTIONS 1, 2, & 3



OPTION 2:
4' WALL, 2' FILL







NO	DATE/DESCRIPTION	BY	DATE

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PROPOSED ALTERNATIVES
CONCEPTUAL SECTION - OPTION 2

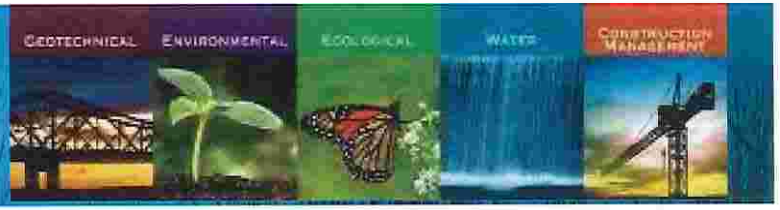
MACALLEN DAM
STABILITY ANALYSIS AND CONCEPTUAL DESIGN

PREPARED BY: GZA GeoEnvironmental, Inc. Engineers and Scientists www.gza.com

PREPARED FOR: TOWN OF NEWMARKET NEW HAMPSHIRE

PROJ. MGR: TEM	REVIEWED BY: CWC	CHECKED BY: JPG	FIGURE 7
DESIGNED BY: TEM	DRAWN BY: TEM	SCALE: 1"=5'	
DATE: 11/20/2017	PROJECT NO. 01.0173346.00	REVISION NO. 0	SHEET NO.

OPTION 2, ALIGNMENT C:



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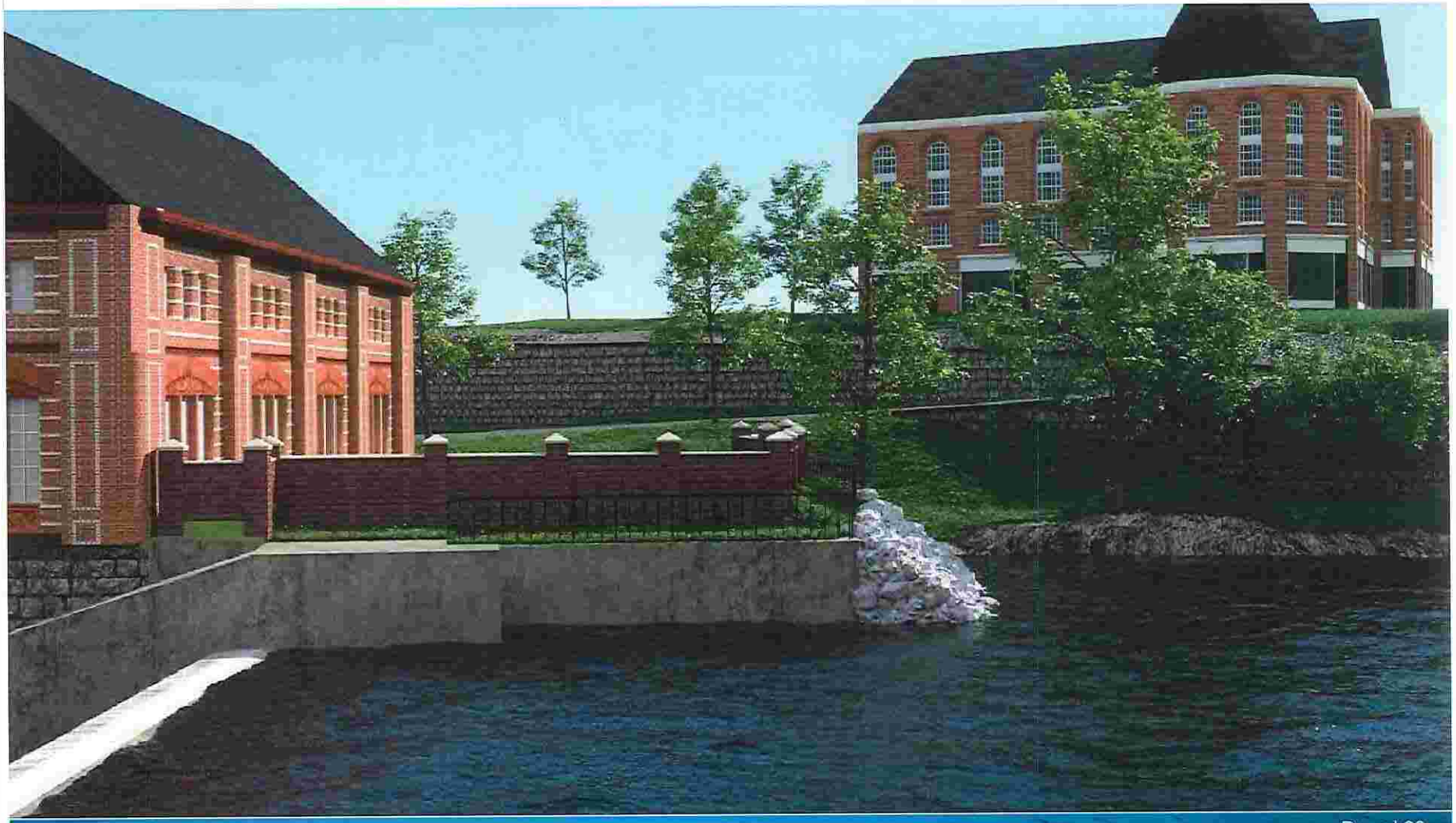
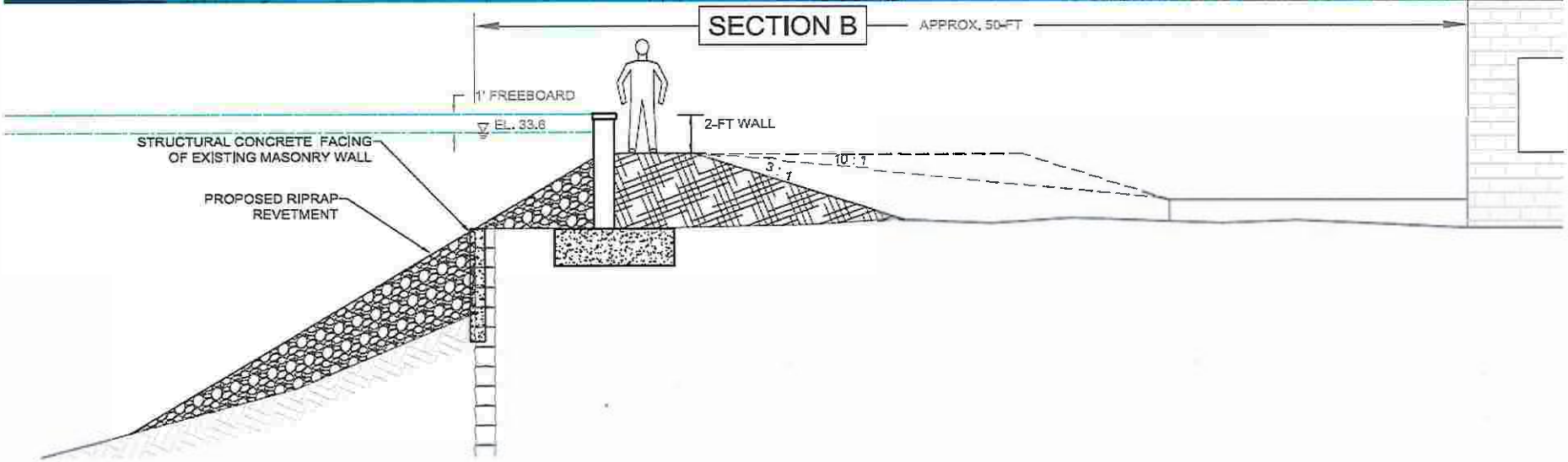
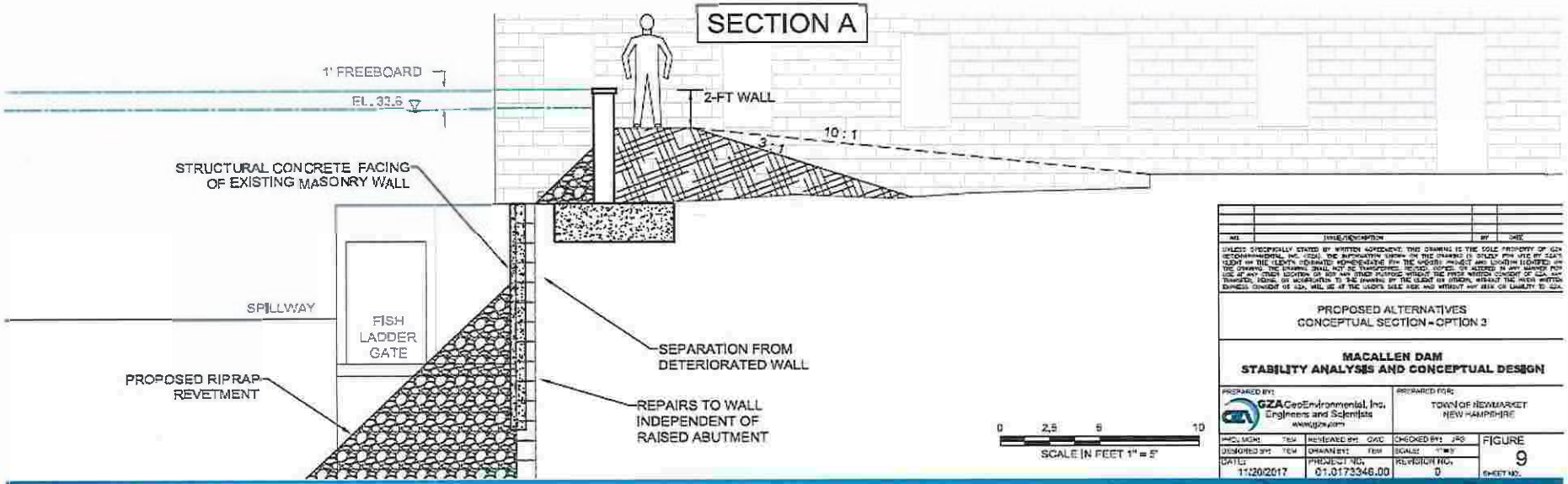


OPTION 2, ALIGNMENT C:

OPTION 3:
2' WALL, 4' FILL





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PROPOSED ALTERNATIVES
CONCEPTUAL SECTION - OPTION 3

MACALLEN DAM
STABILITY ANALYSES AND CONCEPTUAL DESIGN

PREPARED BY:
GZA GeoEnvironmental, Inc.
Engineers and Scientists
www.gza.com

PREPARED FOR:
TOWN OF NEWMARKET
NEW HAMPSHIRE

PROJ. MGR: TEM	REVIEWED BY: GVC	CHECKED BY: JPS	FIGURE 9
DESIGNED BY: TEM	DRAWN BY: TEM	SCALE: 1"=5'	
DATE: 11/20/2017	PROJECT NO. 01.0173346.00	REVISION NO. 0	SHEET NO.

OPTION 3, ALIGNMENT C:

OPTION 3, ALIGNMENT C:

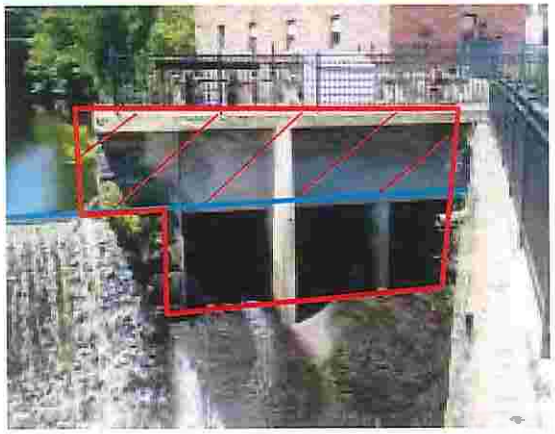
OPTION 3, ALIGNMENT C:

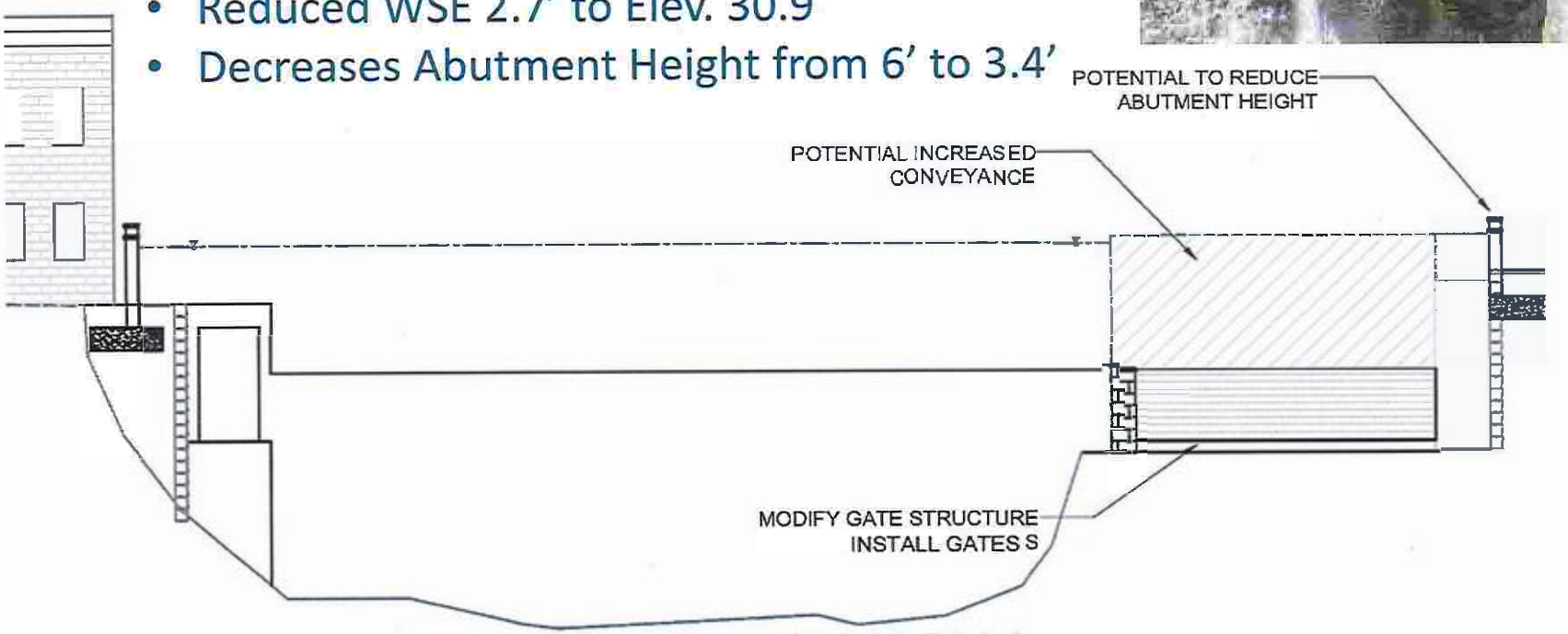
EXISTING GATE STRUCTURE CONDITIONS

- Three (3) Wooden Slide Gates
- Gate Approaching 100-year Lifespan
- Deteriorated Condition
  - Won't Seat Properly
  - Leakage
  - Hole in Wooden Gate

GATE AUTOMATION: INCREASE GATE CAPACITY

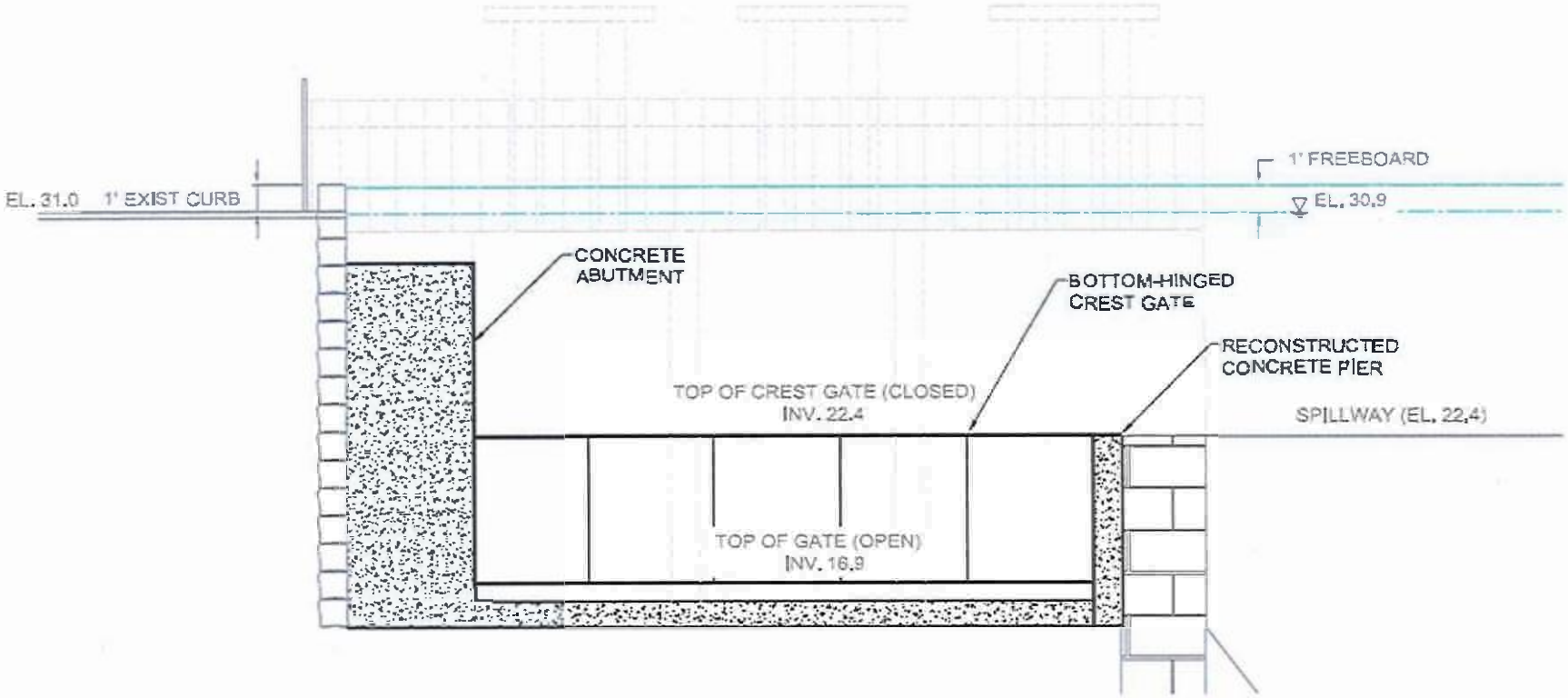
- 22' wide, 5.5' tall Crest Gate
- "Fail Safe" Operation / Automation
- Increase Capacity of Dam
  - Existing Conveyance Area = 147 ft^2
  - Proposed Conveyance Area = 381 ft^2
  - Reduced WSE 2.7' to Elev. 30.9
  - Decreases Abutment Height from 6' to 3.4'



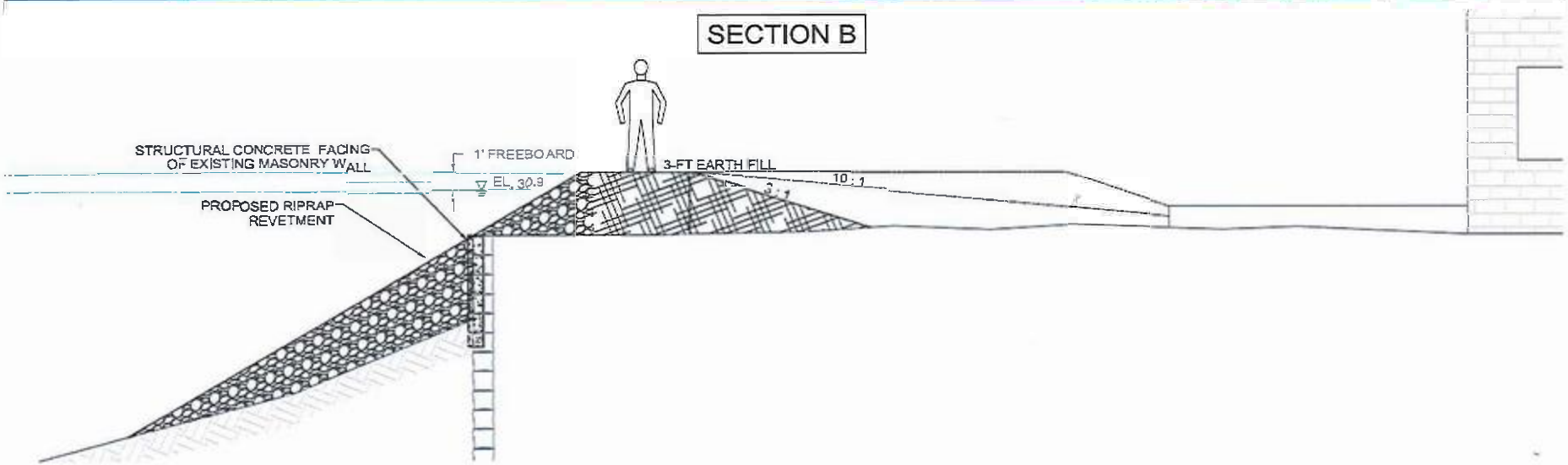


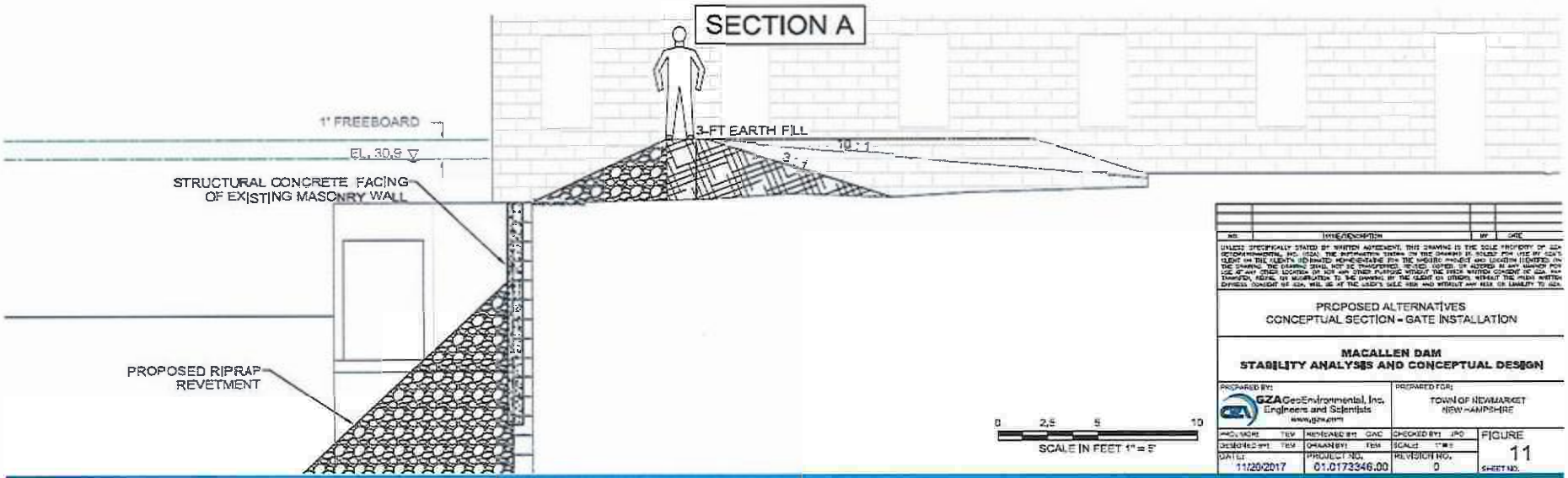
LOOKING UPSTREAM

CREST GATE INSTALLATION: GATE STRUCTURE



CREST GATE INSTALLATION: RIGHT ABUTMENT





NO.	DESCRIPTION	BY	DATE

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PROPOSED ALTERNATIVES
CONCEPTUAL SECTION - GATE INSTALLATION

MACALLEN DAM
STABILITY ANALYSES AND CONCEPTUAL DESIGN

PREPARED BY:
GZA GeoEnvironmental, Inc.
Engineers and Scientists
www.gza.com

PREPARED FOR:
TOWN OF NEWMARKET
NEW HAMPSHIRE

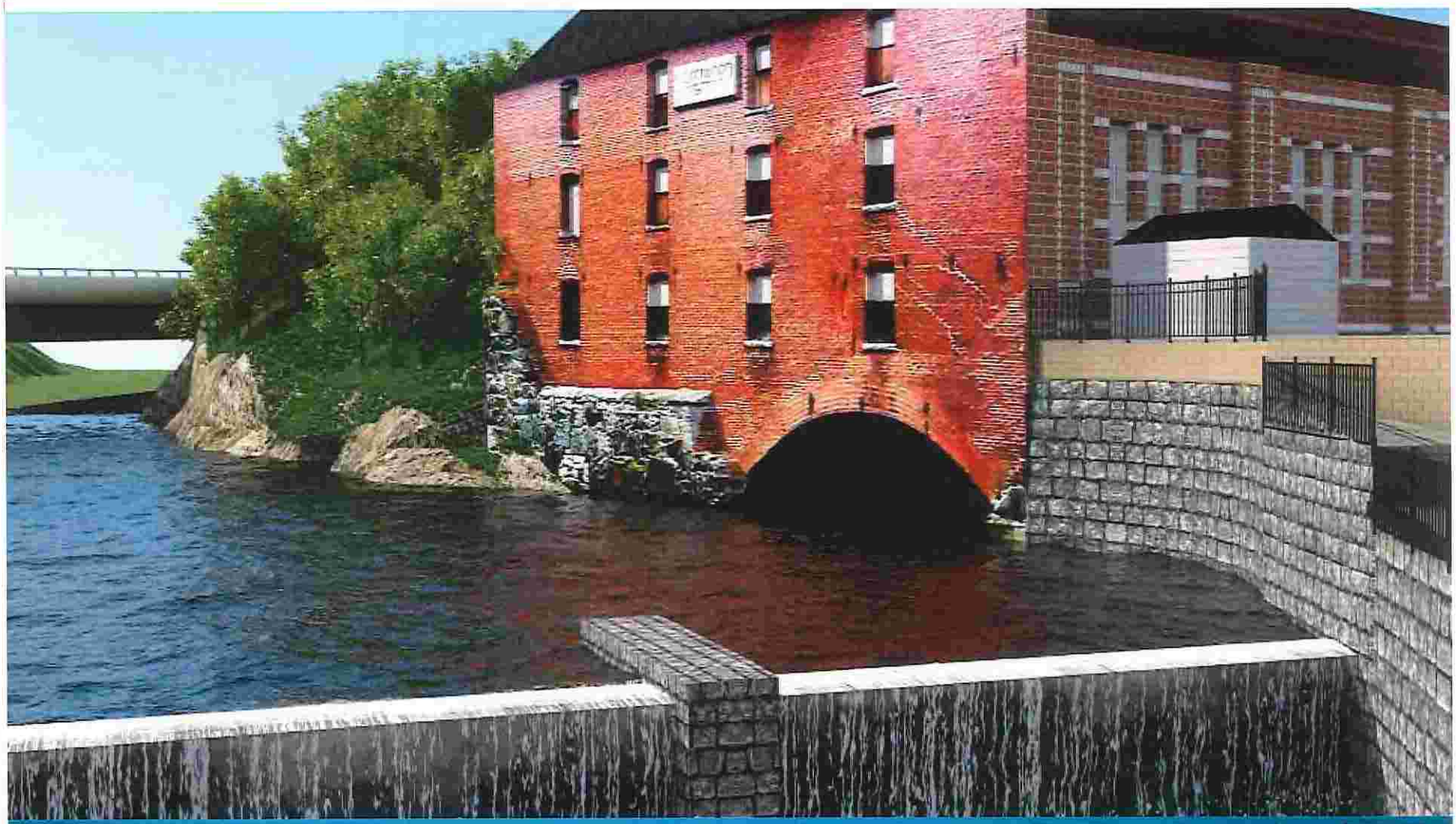
PROJ. MGR. TEV	REVIEWED BY: GAC	CHECKED BY: JPO	FIGURE 11
DESIGNED BY: TEV	DRAWN BY: TEV	SCALE: 1"=5'	
DATE: 11/20/2017	PROJECT NO. 01.0173346.00	REVISION NO. 0	SHEET NO.

CREST GATE INSTALLATION:

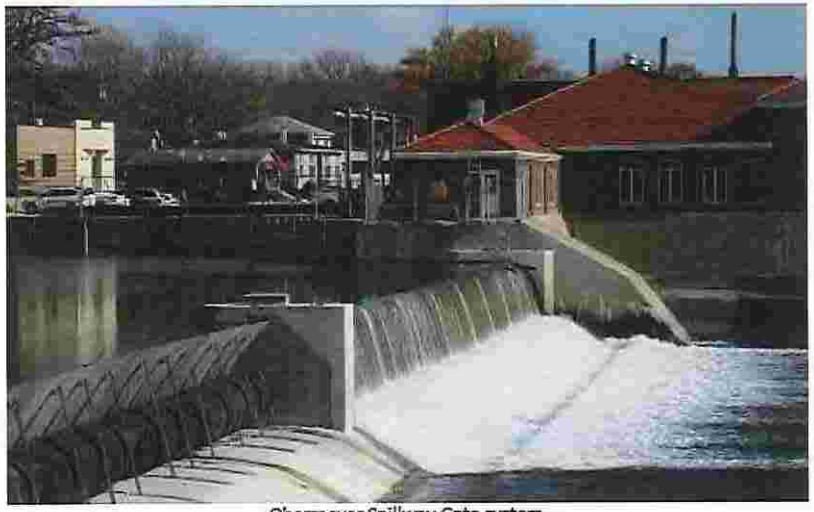
CREST GATE INSTALLATION:

CREST GATE INSTALLATION:

CREST GATE INSTALLATION:



CREST GATE ALTERNATIVES
PNUEMATIC GATE



Obermeyer Spillway Gate system.
Image Source: Obermeyer hydro, Inc. website.

- Bottom-hinged crest gate
- Air-Filled Rubber Bladder supports entire crest gate width
- Accurate automatic pond level control even under power failure conditions
- "Fail-Safe" operation
- Steel plates on upstream edge
- Success in cold climates
- Requires control house
- 30+ years Life Expectancy

CREST GATE ALTERNATIVES
PNUEMATIC GATE

Obermeyer Spillway Gate system. Jackson Falls Dam, Nashua, NH

Image Source: GZA Phase I Inspection

CREST GATE ALTERNATIVES
HYDRAULIC GATE

Hydraulically-Operated Crest Gate system. Otis Reservoir Dam, Otis, MA
Image Source: GZA Construction Observation

- Bottom-hinged crest gate
- Hydraulic piston controls steel crest gate
- Precise control of water levels
- "Fail-Safe" operation
- Steel plates on upstream edge
- Requires control house
- Success in cold climates
- Increased life expectancy
- Increased cost (+ $250,000)
- 60 – 100 year Life Expectancy

CREST GATE ALTERNATIVES
HYDRAULIC GATE

Hydraulically-Operated Crest Gate system.
Image Source: Steel Fab, Inc. Crest Gate Brochure

DAM REPAIRS

Photo A, Crack behind ladder

Photo F

Leakage at gate structure

Photo J

ESTIMATES OF PROBABLE COST

Option 1	$1.46M
Option 2	$1.43M
Option 3	$1.22M
Pneumatic Gate	$1.23M
Hydraulic Gate	$1.54M

- Cost for replacement of existing gates:
  $140K for gate + $120k for structure repairs
  (included in Options 1, 2, and 3)

ESTIMATES OF PROBABLE COST

ESTIMATES OF PROBABLE COST						
ITEM NO.	DESCRIPTION	OPTION 1	OPTION 2	OPTION 3	PNUEMATIC GATE	HYDRAULIC GATE
1	Mobilization/Demobilization	$66,000	$66,000	$66,000	$66,000	$66,000
2	Temporary Erosion and Sediment Control	$19,800	$19,800	$19,800	$19,800	$19,800
3	Right Side Temporary Dewatering and Water Control	$73,500	$73,500	$73,500	$73,500	$73,500
4	Left Abutment Parapet Wall	$158,800	$158,800	$158,800		
5	Right Abutment Parapet Wall	$356,200	$292,100	$114,400		
6	Right Abutment Earth Fill		$42,100	$56,400	$42,100	$42,100
7	Existing Right Abutment Wall Repairs	$162,800	$162,800	$162,800	$162,800	$162,800
9	New Steel Slide Gates	$138,600	$138,600	$138,600		
10	Gate Structure Repairs & Left Side Water Control	$123,600	$123,600	$123,600		
11	Left Side Water Control & Pumping	$22,000	$22,000	$22,000	$71,800	$71,800
12	Demolition of Existing Gate Structure				$104,200	$104,200
13	Obermeyer Crest Gate				$403,200	
14	Hydraulic Crest Gate					$645,900
15	Site Restoration	$39,600	$39,600	$39,600	$39,600	$39,600
	Estimated Construction Costs	$1,161,000	$1,139,000	$976,000	$983,000	$1,226,000
	25% contingency	$290,300	$284,800	$244,000	$245,800	$306,500
	Total:	**$1,460,000**	**$1,430,000**	**$1,220,000**	**$1,230,000**	**$1,540,000**

Engineering Studies and Design:	$60,000 - $100,000
Permitting:	$60,000 - $70,000
Construction-Phase Services:	$100,000 - $140,000
Estimated Total:	$220,000 - $310,000

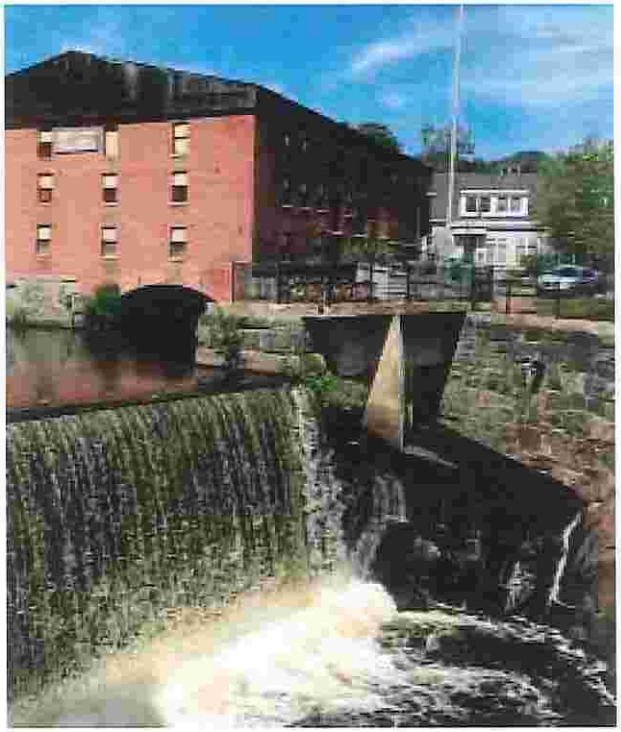
Note: Estimates rounded up to the $10k

MOVING FORWARD
NEXT STEPS

Fall 2017	NHDES approval of Concept Design (Summary Report)
Winter 2018	Public Hearing; Town Approval of Preferred Alternative
Spring 2018	Council Approval of Funds for Final Design/Permitting
Summer 2018	Begin Engineering, Final Design, & Permitting
Fall 2018	Start of Town's CIP and Budget Process
March 2019	Town Meeting Vote on Bond for Construction
Spring 2019	Construction Bidding Process; Order Gates*
Summer 2019	Permits Received
Summer 2019	Contract Award; Construction Begins
Fall 2019	Construction Ends (Late October*)
Winter 2020	Reporting and Project Closeout

PERMITTING AND REGULATORY COMPLIANCE

1. Dam Permit
2. Wetlands Permit
3. Shoreland Permit (250')
4. Corps State Programmatic General Permit
5. NPDES Construction General Permit
6. Local Permitting
7. FEMA Floodway No-Rise Certificate



PERMITTING AND REGULATORY COMPLIANCE

Permitting Item	Cost Estimate
1. Wetland Delineation/Characterization and Shoreland Field Documentation	$2,000
2. NH Licensed Land Survey	$3,000
3. Major Impact Wetland Permit (without fees)	$5,000
4. Wetland Permit Fee	$2,700
5. Phase IA Archeological Assessment	$5,000
6. Army Corps Permitting (includes pre-application meeting)	$3,000
7. Local Permitting (if not waived)	$3,000
8. Local Meetings (for wetland and designated river permitting)	$4,000
9. Shoreland Permit	$3,000
10. Shoreland Permit Fee	$750
11. Dam Permit	$10,000
12. Dam Permit Fee	$4,000
13. FEMA Floodway Analysis	$5,000
Subtotal	$50,450
Contingency (10%)	$5,050
Total	**$55,500**

Assumptions:

1. Project is anticipated to be classified as a Major Impact Project due to impacts to streambank likely exceeding 50 linear feet. As a result, Historical Review and a Stamped Survey will be required.

2. Lamprey River is a New Hampshire Designated River and is also considered "Wild and Scenic". As a result, presentation of the wetland application to the advisory committee and inclusion of comments will be required.

3. Rare Species Study and Phase 1B/2/3 Archaeological Studies are not anticipated as part of dam rehabilitation.

4. Wetland Mitigation Costs are not expected to be required as part of the dam rehabilitation. Final Design will be coordinated with permitting to mitigate wetland impacts to the maximum extent possible.

GEOTECHNICAL
ENVIRONMENTAL
ECOLOGICAL
WATER
CONSTRUCTION MANAGEMENT

Questions?