

Minnehaha Creek Watershed District

REQUEST FOR BOARD ACTION

MEETING DATE: August 11, 2016

TITLE: Authorization to Enter into a Construction Contract with Blackstone Contractors for Maintenance of the Gray's Bay Dam

RESOLUTION NUMBER: 16-065

PREPARED BY: Laura Domyancich

E-MAIL: ldomyancich@minnehahacreek.org

TELEPHONE: 952-641-4582

REVIEWED BY: Administrator Counsel Program Mgr. (Name): Tiffany Schaufler
 Board Committee Engineer Other

WORKSHOP ACTION:

<input type="checkbox"/> Advance to Board mtg. Consent Agenda.	<input type="checkbox"/> Advance to Board meeting for discussion prior to action.
<input type="checkbox"/> Refer to a future workshop (date):_____	<input type="checkbox"/> Refer to taskforce or committee (date):_____
<input type="checkbox"/> Return to staff for additional work.	<input type="checkbox"/> No further action requested.
<input checked="" type="checkbox"/> Other (specify): Not Reviewed at Workshop. Seeking approval at August 11, 2016 Board Meeting.	

PURPOSE or ACTION REQUESTED:

Authorization to enter into a contract with Blackstone Contractors for repair and maintenance of the Gray's Bay Dam in the amount of \$20,862 and establish a not-to-exceed budget of \$22,948.20

PROJECT/PROGRAM LOCATION:

Gray's Bay of Lake Minnetonka / Minnehaha Creek Headwaters

PROJECT TIMELINE:

May 2016: Infrastructure inspection of Gray's Bay Dam
August-September 2016: Repair of gear reduction mechanisms
November 2016: Repair of gate cables, side and bottom gate seals, and vertical dimension opening veneers

PROJECT/PROGRAM COST:

Fund name and number: Project Maintenance and Land Management, 2003
Current budget: \$546,429
Expenditures to date: \$101,179.43
Requested amount of funding: \$22,948.20

PAST BOARD ACTIONS:

- June 11, 2015: RES 15-051 Authorization to Contract with Wenck Associates to Update the Operations and Maintenance Manual and Develop a Capital Reinvestment Plan

SUMMARY:

Through the creation of the Infrastructure Maintenance Plan, and the associated development of standard O&M protocols, a regular rotation of District infrastructure inspection and repair was established. In initiating this rotation of infrastructure maintenance, Project Maintenance and Land Management (PMLM) staff identified the Gray's Bay Dam / Headwaters Control Structure as the top priority. Managing the level of Lake Minnetonka and flow in Minnehaha Creek is dependent on the consistent good function of the dam structure, and staff's confidence in the integrity of the equipment is vital to fulfilling the District's responsibility to perform the duties of the Headwaters Control Structure Operating Plan. Following, proactive maintenance of the Gray's Bay Dam/ Headwaters Control Structure was pursued.

District staff developed a scope under which Wenck Associates inspected the dam on May 12, 2016. Consequently, Wenck provided a technical memo (**Attachment 1**) recommending replacement of the radial arm gate seals and the steel cables, modification of the vertical dimension opening veneers, and maintenance of the gear reduction mechanisms. Aside from the replacement of the neoprene seals and stainless steel lifting cables in 1989, the dam equipment is entirely original from 1979.

Wenck Associates and District staff identified Blackstone Contractors as being highly qualified to perform this needed maintenance based on their familiarity with the structure and similar District infrastructure, the qualifications of their personnel, and the capabilities of their shop to machine the needed equipment. Blackstone Contractors was provided a Scope of Work Report (**Attachment 2**) detailing maintenance to be performed on the dam structure, and responded with a quote (**Attachment 3**) for the required tasks. Because the cost of this work falls under \$25,000 and District staff are familiar with the abilities of Blackstone Contractors to perform this work, only one quote was sought. Staff finds the quote of \$20,862 to be responsive and fair.

ATTACHMENTS:

- Attachment 1: Gray's Bay Dam Maintenance Technical Memo
- Attachment 2: Scope of Work Report – Gray's Bay Dam Maintenance
- Attachment 3: Quote Sheet for Gray's Bay Dam Maintenance – Blackstone Contractors

RESOLUTION

RESOLUTION NUMBER: 16-065

TITLE: **Authorization to Enter into a Construction Contract with Blackstone Contractors for Gray's Bay Dam Maintenance**

WHEREAS, the Minnehaha Creek Watershed District is implementing the Infrastructure Maintenance Plan, which plans and budgets for long-term inspection, maintenance, and replacement of District infrastructure as it ages; and

WHEREAS, District staff are aware of repair and replacement needs for the 37-year old Gray's Bay Dam structure; and

WHEREAS, following an inspection of the dam by District engineer Wenck Associates, specific mechanical parts of the dam structure were identified as needing repair or replacement; and

WHEREAS, the Gray's Bay Dam / Headwaters Control Structure was identified in the Infrastructure Maintenance Plan as a facility in need of maintenance; and

WHEREAS, Wenck Associates and District staff considered the expertise and equipment needed for the required maintenance and identified Blackstone Contractors as being highly qualified to manage the repairs; and

WHEREAS, Wenck Associates estimated the total cost of repairs, and District staff identified from this list of repairs those that were the highest priority. The total cost of the priority repairs was below \$25,000, which necessitated seeking one quote for the maintenance; and

WHEREAS, Blackstone Contractors was provided a Scope of Work Report based on a Technical Memo written by Wenck Associates and responded with a fair and responsive quote of \$20,862.

NOW, THEREFORE, BE IT RESOLVED that the District Administrator is authorized, on advice of counsel, to enter into a contract with Blackstone Contractors in the amount of \$20,862 for maintenance of the Gray's Bay Dam / Headwaters Control Structure; and

BE IT FURTHER RESOLVED that the Board establishes a project construction budget in the not-to-exceed amount of \$22,948.20 and authorizes the District Administrator, in his judgment and on the recommendation of the District engineer, to authorize change orders obligating the District up to that amount; and

BE IT FINALLY RESOLVED that the District Administrator is authorized to issue a supplemental work order to the District engineer for construction oversight, shop visits to guide repair work, and inspection of the repaired and replaced equipment in an amount not to exceed \$1,700.

Resolution Number 16-065 was moved by Manager _____, seconded by Manager _____.
Motion to adopt the resolution ___ ayes, ___ nays, ___ abstentions. Date: _____.

Secretary

Date: _____

Technical Memo



Responsive partner.
Exceptional outcomes.

To: Laura Domyancich, Project and Land Technician
Minnehaha Creek Watershed District

From: Mike Panzer, PE,PG
Wenck Associates, Inc.

Date: July 12, 2016

Subject: Grays Bay Dam Inspection, Maintenance and Recommendations

cc: Chris Meehan, Wenck Associates, Inc.

On May 12, 2016 an inspection and interview was performed with you at the Grays Bay Dam site and also the storage facility at 325 Blake Road in Hopkins. The purpose was to collect information concerning the operation and maintenance/repair needs associated with the dam and spillway. The maintenance/repair needs inspection focused on five general areas:

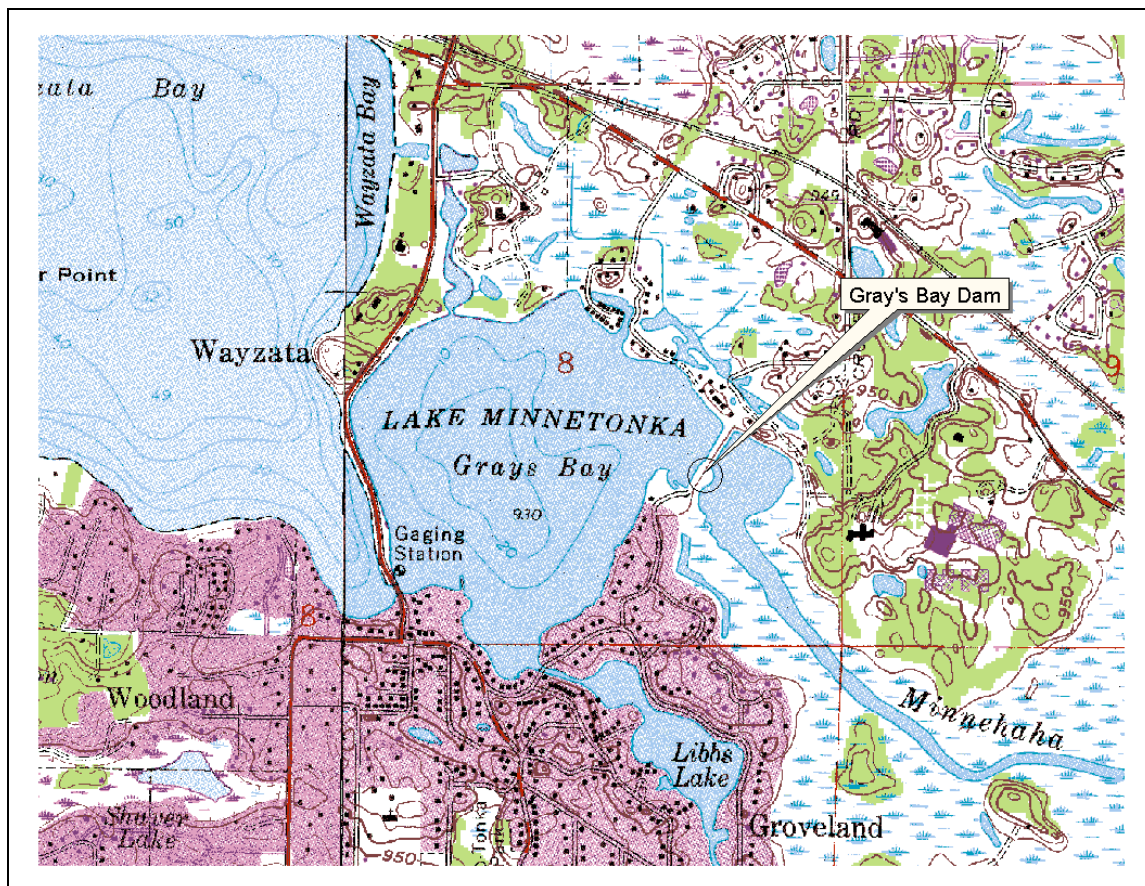
1. Leakage around and under the three stainless steel tainter gates, when gates are closed. *(There is leakage when the gates are open as well but not noticeable compared to the flow being released. The issues here are leakage for extended periods like throughout the winter and appearance when lake levels are low and the gates are shut.)*
2. Reliability and leakage of the three gear reduction mechanisms that allow manual raising and lowering of gates via a hand-wheel. *(These mechanisms are self-contained and have been in service 37 years. The seals are understandably bad and internal lubricants have leaked out and caused considerable staining of the concrete to which the mechanisms are attached. The main issue is how long these mechanisms can realistically be relied upon to function. If they lose function, there is no means to manually raise or lower the gates. Appearance is also an issue because petroleum based lubricants are obviously leaking out and staining the concrete.)*
3. Reliability of the cables that lift and lower the gates. *(There are six cables that transfer rotation from the gear reduction mechanisms and axle to lift the gates. Four of the six are original equipment from 1979. Two were replaced approximately 20 years ago after a malfunction.)*
4. Abrasion of neoprene seals and leakage around stop logs installed/removed each year. *(The aluminum stop logs have replaceable neoprene seals that are intended to stop leakage around the logs during the winter. Abrasion of seals was observed and MCWD staff have reported visible leakage.)*
5. Refurbish and install, or replace vertical opening dimension veneers. *(These veneers are installed in each bay and are intended to give the operator a reading of the vertical opening dimension under each stainless steel tainter gate. The operator can then visually set each gate to a predetermined opening dimension in order to adjust flow up or down. The existing veneers would either*

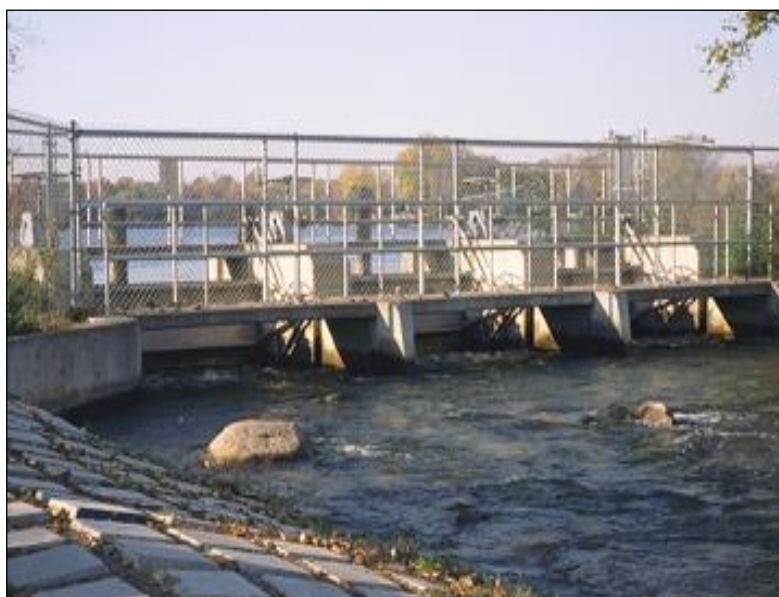
be removed, reburbished so they are more easily readable and reinstalled, or refabricated with highlighted markings.)

This memo addresses our observations at the dam site and includes recommended maintenance activities, schedules and estimated costs. These costs are based upon a unit price quotation from a responsible contractor that is familiar with the Grays Bay Dam, has experience with other stop log related structures built by MCWD, and has successfully built multiple MCWD projects.

Grays Bay Dam Outlet Control Structure

The Outlet Control Structure was designed by MCWD and built in 1979-1980. It controls the water discharging from Lake Minnetonka to Minnehaha Creek. The structure consists of three 10-foot wide discharge bays fitted with adjustable stainless steel radial tainter gates accompanied by a 202-foot fixed crest steel sheet pile weir that serves as an emergency spillway in the event extreme wet weather events are experienced, like those in 2014. In 2005, MCWD undertook a project to provide public access to the dam area by constructing a wooden deck and railing system over the structure where people can view the lake, fish and enjoy the area which is City of Minnetonka parkland.





Pre-2005 view of Grays Bay Dam with Grays Bay in background



Post-2005 appearance of the dam. Stop logs are installed

Stainless Steel Radial Tainter Gates and Seals

The adjustable gates were observed to be in good physical condition. Minor leaking of the rubber J-seals, or also known as bulb and tail seals that close gaps along the vertical concrete bay walls, was noticed in the central and easterly bays.



Westerly Gate Seal Leakage – May 12, 2016

The westerly gate exhibited more pronounced leakage. There was an estimated 2 feet of head difference between the upstream (lake) and downstream (wetland) at the time of the inspection. It was determined that replacement of all 6 of the gate-edge seals would be scheduled soon, probably at the end of the 2016 season when the lake level is low and the gates may be lifted and blocked in a fully open position. If the water is low enough the bottom or sweeper seal may be inspected and replaced if needed. It was not possible to determine sweeper seal leakage because of water levels. However no discernable leakage was observed when all gates were in a closed position. This is remarkable since these are the original seals from 1979.

Gate Adjustment Gear Reduction Boxes



Gear Reduction Box (one of three)

The gear reduction boxes raise and lower the gate gates via an axel and cable system. There is one for each of the three gates. A hand-turned wheel is used to turn a vertical shaft. The shaft motion is transferred to the axel to raise/lower the gate via stainless steel cable. These gear boxes are from original construction and have been exposed to the elements for 37 years. Visible leakage of lubricant and staining of the concrete is present at all three locations. It is recommended that all three gear reduction boxes be refurbished and that the refurbished mechanisms be protected from direct rainfall, snow and ice by a metal hood or enclosure.

Gate Lifting Cables



Stainless Steel Cable Lift

The cables were observed to be in satisfactory condition without visible fraying. However, water levels prevented observation of the cable attachments to the gates. The cables wind around a drum on the gate axel and are attached to the drums via a set screw. Since the gates will be lifted and blocked to replace seals, it is recommended that the cables be replaced at the same time.

Stop Log Seals



Stop Logs with Neoprene Seals

MCWD staff have reported leakage of water through the aluminum stop logs, when installed over the winter months. The stop logs are equipped with easily replaced neoprene seals. Although complete elimination of leakage is not a realistic goal. Most leakage could be addressed by replacement of the neoprene seals on some regular basis such as every 10 years.

Vertical Dimension Opening Veneers

Each of the three discharge bays has a veneer installed that the operator can observe and estimate the vertical opening under the gate being operated. Since the gate is radial, the vertical opening is variable and a function of the angle of rotation. When the gate is closed or nearly closed, it requires a greater number of rotations of the hand wheel to increase the vertical dimension of the gate opening 0.1 feet than it does when the gate setting is already open to some degree. The veneers should be marked to show each vertical opening increment of 0.1 feet and thus the markings on the veneer, showing radial movement

should be marked at a variable spacing. Currently the veneers are marked with equal spacings and are not recommended to be used.



Metal Veneer Bolted to Concrete in Each Bay

The metal veneers are secured to the concrete by metal bolts. After removal, the veneers could be flipped over and marked correctly and reinstalled with stainless steel bolts. Alternatively, new veneers could be fabricated with new highlighted markings.

Operational Priority

Operational priorities were established based upon maintaining the function of the outlet structure. In terms of what operation/maintenance activity is a priority:

<u>Priority</u>	<u>Activity</u>
1	Replace/Refurbish Gear Reduction Mechanisms (remove, clean, replace all seals, replace lubricant, repaint, reinstall with galvanized, aluminum or stainless steel cover)
2	Replace Gate Cables
3	Replace Gate Seals
4	Modify Vertical Dimension Opening Veneers
5	Replace Stop Log Seals

Costs

Costs were estimated based upon unit price amounts quoted from a responsible contractor familiar with the work and having successfully completed previous MCWD projects. The

amounts quoted assume all the work will be authorized concurrently and are valid until May 1, 2017. The total costs are far below the statutory requirement for bidding so it is not necessary to incur the additional costs to prepare bidding documents, go through the bidding process and manage extensive contract requirements.

The estimated costs are listed in the table below. It is recommended that all the work be authorized, at the same time, and completed before winterization of the structure in 2016, typically immediately following Thanksgiving.

Gear reduction mechanism work could start now, working on and completing one at a time, so that there are two gates available for operation throughout 2016. Stop log seal replacement and modification of veneers could also start now. Cable replacement and gate seal replacement will best be accomplished at the time winterization work is done.

Priority	Description	Unit Price	Quantity	Extension	Maintenance Cycle
1	Refurbish Gear Reduction Mechanisms (remove, clean, replace all seals, replace lubricant, repaint, reinstall with galvanized, aluminum or stainless steel cover) (does not include removal of staining)	\$2,230	3	\$6,690	20 years
2	Replace Gate Cables with Like Materials	\$1,028	3	\$3,084	10 years
3	Replace Gate Seals in Each Bay with Like Materials (includes sidewall seals only - bottom sweeper seals will be inspected when out of water)	\$1,765	3	\$5,295	10 years
4	Remove, Modify and Reinstall Vertical Dimension Opening Veneers	\$625	3	\$1,875	20 years
5	Replace Stop Log Seals	\$485	18	\$8,730	10 years
Total Estimated Contractor Cost				\$25,674	
		Hours	Billing Rate	Extension	
	Meeting to finalize work and schedule	4	125	\$500	
	Provide Contractor with Corrected Veneer Spacings (shop visit)	4	125	\$500	
	Inspect Gear Reduction Mechanisms before Reinstallation (shop visit)	2	125	\$250	
	Inspect Replaced Seals, Cables, Veneers (site visit)	3	125	\$375	
Total Estimated Engineering Cost				\$1,625	
Contingency for fabricating new veneers				\$1,500	



Scope of Work Report

Gray's Bay Dam Maintenance

1. **PURPOSE:** Implement maintenance of the Gray's Bay Dam (Headwaters Control Structure)
2. **GENERAL BACKGROUND:** The Gray's Bay Dam allows the Minnehaha Creek Watershed District (MCWD) to appropriately manage flow from Lake Minnetonka into Minnehaha Creek. The structure was designed by MCWD and built in 1979-1980. The structure consists of three 10-foot wide discharge bays fitted with adjustable stainless steel radial tainter gates accompanied by a 202-foot fixed crest steel sheet pile weir that serves as an emergency spillway in the event of extreme weather. The dam is covered by a wooden deck and railing system, and the dam can be accessed through aluminum grate openings in the top of the wooden deck.
3. **EQUIPMENT DESCRIPTION AND NEEDED REPAIRS (CONTRACT SERVICES):**

3.1 GATE ADJUSTMENT GEAR REDUCTION BOXES

Current Condition: Gear reduction boxes raise and lower the gates via an axel and cable system. There is one for each of the three gates. A hand-turned wheel is used to turn a vertical shaft. The shaft motion is transferred to the axel to raise and lower the gate via a stainless steel cable. These gear boxes are from original construction and have been exposed to the elements for 37 years. Visible leakage of the gear lubricant and staining of the concrete is present at all three locations.

Repairs (Contract Services): All three gear reduction boxes should be removed, lubricant replaced, and the boxes repainted. New galvanized aluminum or stainless steel hoods or enclosures should be fabricated, and the boxes reinstalled.

3.2 GATE LIFTING CABLES

Current Condition: Cables are in satisfactory condition without visible fraying, but the condition of the attachments to the gates is unknown.

Repairs (Contract Services): Replace cables and associated attachments with like materials.

3.3 STAINLESS STEEL RADIAL TAINTER GATES AND SEALS

Current Condition: The adjustable gates are in good condition, but minor leakage from the rubber J-seals (bulb and tail seals) that close gaps along the vertical concrete bay walls, was noted in the central and easterly bays. The westerly gate exhibited more pronounced leakage.

Repairs (Contract Services): Replacement of all of the gate-edge seals with like materials should occur at the end of the 2016 season when the lake level is low and the gates may be lifted and blocked in a fully open position, but before freezing temperatures occur. If the water is low enough, the bottom or sweeper seal should be inspected and replaced with like materials, if needed.

3.4 VERTICAL DIMENSION OPENING VENEERS

Current Condition: Each of the three discharge bays has a veneer installed, which allows the operator to observe and estimate the vertical opening under the gate being operated. Since the gate is radial, the vertical opening is variable and a function of the angle of rotation. The veneers currently display equally-spaced increments.

Repairs (Contract Services): The veneers should be removed and potentially re-used by marking corrected increments on the reverse side if a total of 3-feet of vertical opening markings can be shown. If the existing veneers cannot be re-used, new veneers should be fabricated with corrected increments to 3-feet. Veneers should be reinstalled with stainless steel bolts.

4. ASSUMPTIONS:

a) Repairs of the gear reduction mechanisms to be completed on one gate at a time so that at least two gates are operational throughout the maintenance period. Repairs to gear reduction mechanisms can be completed during the summer/early fall of 2016.

b) Modification of the gate veneers can be completed during the summer/early fall of 2016.

c) Repairs to all other components to be completed near the end of the open water season, but before freezing temperatures, when lake levels are low and dam gates can be fully lifted out of the water.

d) Repair of veneers, gear reduction mechanisms, and replaced seals, veneers, and cables to be inspected by Engineer before repair work is deemed complete.

e) Dam deck, when open for repairs, will be closed to public. Contractor must ensure that public does not enter deck area when repairs are occurring and deck is open. Ramp to deck must be blocked or barricaded by contractor. Dam deck will be closed and locked during non-work hours.

6. APPENDIX:

- APPENDIX A: Quote Sheet
- APPENDIX B: Original Construction Plans
- APPENDIX C: Technical Memo

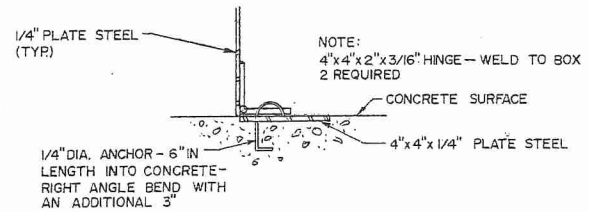
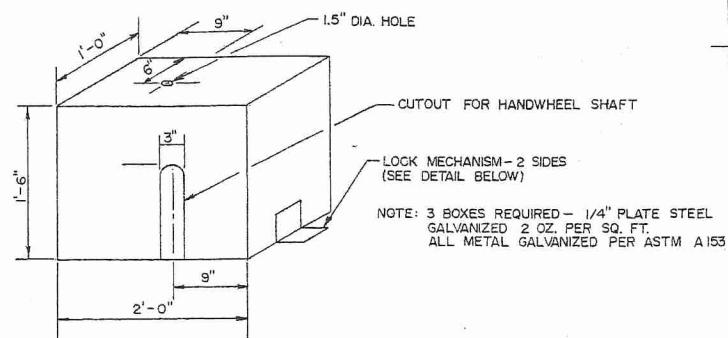
7. SUBMITTING QUOTE:

Please submit a completed Quote Sheet (Appendix A) to Laura Domyancich at ldomyancich@minnehahacreek.org.

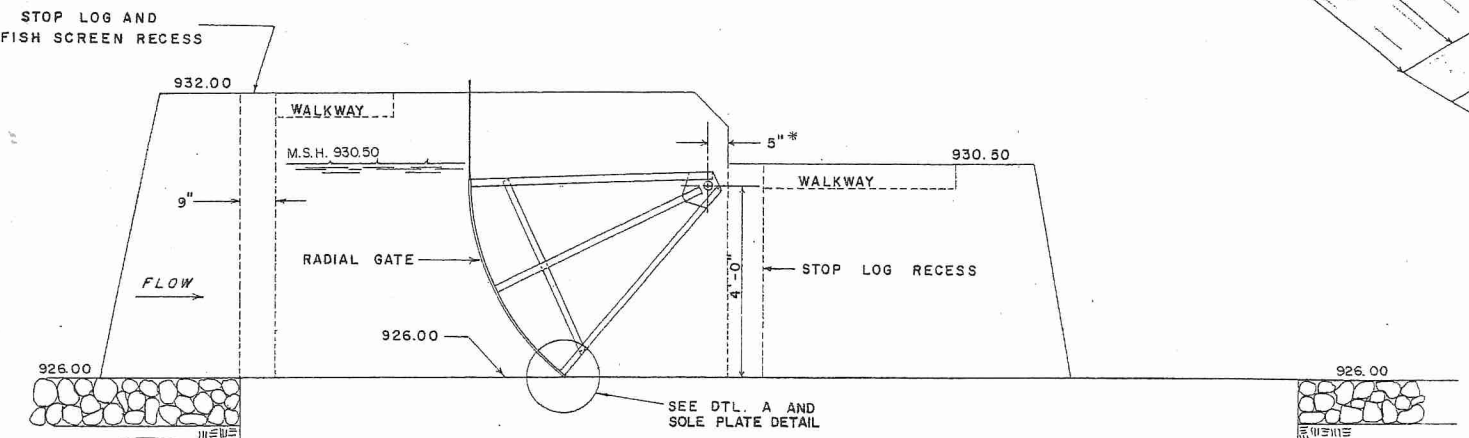
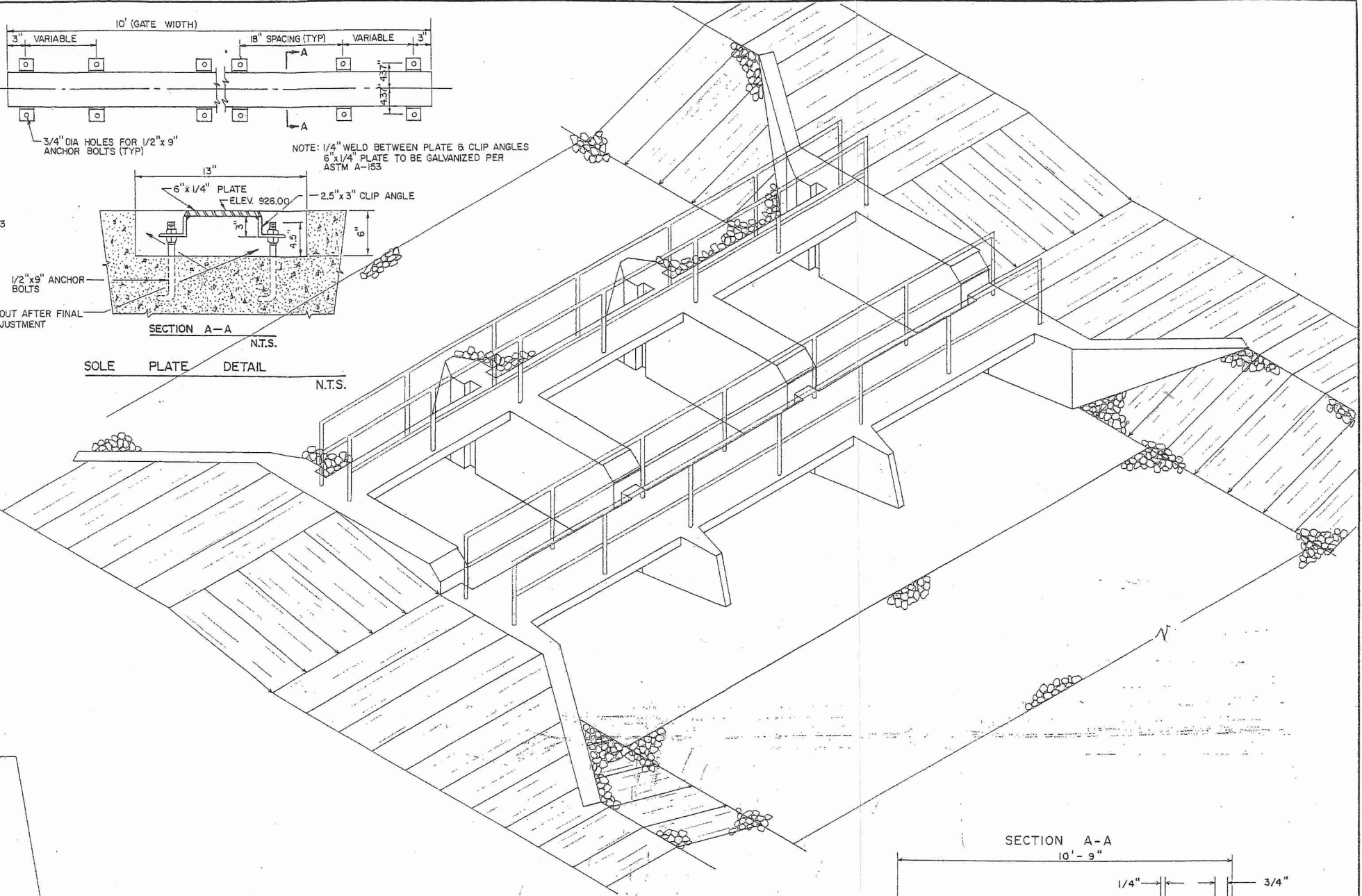
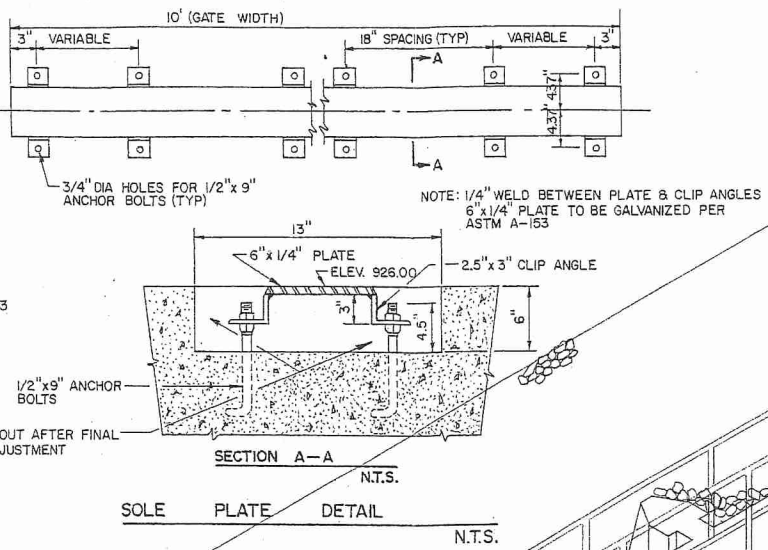
APPENDIX A: Quote Sheet

Gray's Bay Dam Maintenance

Item #	Item	Unit Price	Quantity	Extension
1	Refurbish gear reduction mechanisms		3	\$ -
2	Replace gate cables and associated attachments with like materials		6	\$ -
3	Replace side gate seals in each bay with like materials		6	\$ -
4	Replace bottom (sweeper) gate seal in each bay, if able to inspect and replacement is needed		3	\$ -
5	Remove, modify, and re-install vertical dimension opening veneers		3	\$ -
6	CONTINGENCY: Fabricate new vertical dimension opening veneers		3	\$ -

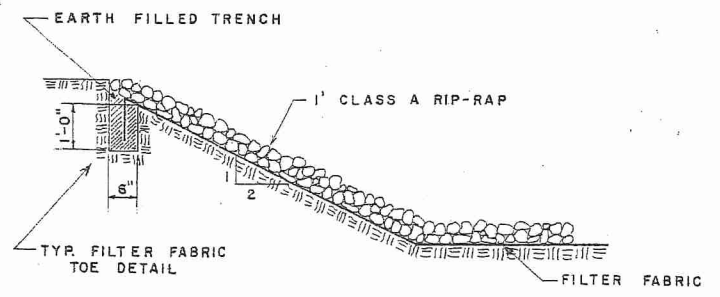
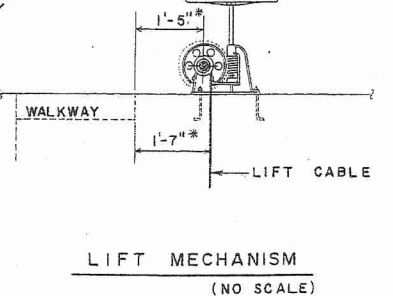
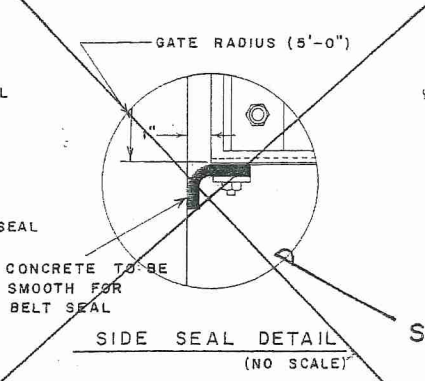
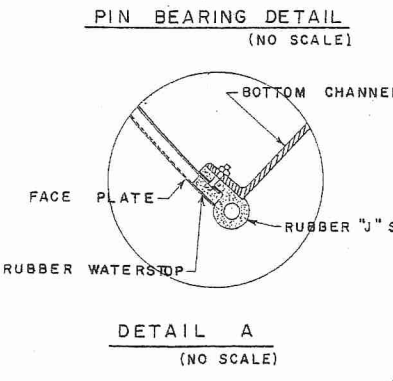
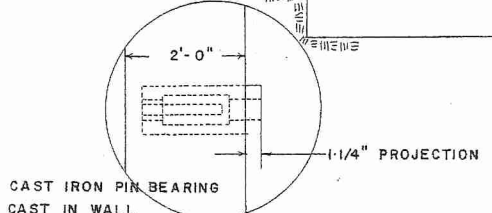
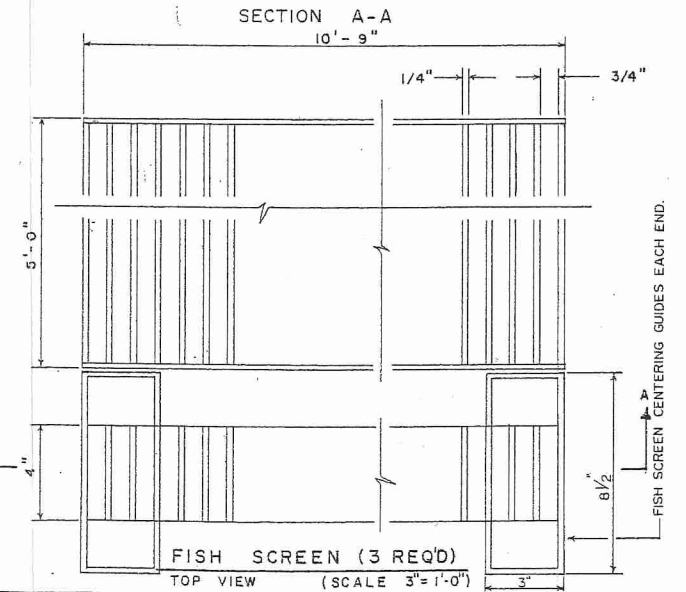


PROTECTIVE BOX FOR LIFT MECHANISM
N.T.S.
* THIS DIMENSION TO BE DETERMINED FROM SHOP DRAWINGS



RADIAL GATE
(SCALE 1/2" = 1'-0")

ISOMETRIC VIEW
(NO SCALE)
NOTE: RADIAL GATES & FISH SCREENS NOT SHOWN IN ISOMETRIC



NOTE: FILTER FABRIC JOINTS SHALL OVERLAP 2 FEET AND BE PINNED INTO THE EMBANKMENT W/ 6" U-SHAPED WIRE PINS OR SINGLE-SHAFT STEEL PINS W/ METAL-DISC HEAD, AT 6' INTERVALS.

I HEREBY CERTIFY THAT THIS PLAN, SPECIFICATION, OR REPORT WAS PREPARED BY ME OR UNDER MY DIRECT SUPERVISION AND THAT I AM A DULY REGISTERED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MINNESOTA.
[Signature]
DATE 6/27/79 REG. NO. 9581

Revisions	MINNEHABA CREEK WATERSHED DIST.	No.
	CONTROL STURTURE DETAILS	Dwg. 1-3
		Date 7/79
		E. A. HICKOK & ASSOCIATES
Drawn By _____ Designed By _____ Checked By _____		Hydrologists - Engineers Minneapolis, Minnesota

Technical Memo



Responsive partner.
Exceptional outcomes.

To: Laura Domyancich, Project and Land Technician
Minnehaha Creek Watershed District

From: Mike Panzer, PE,PG
Wenck Associates, Inc.

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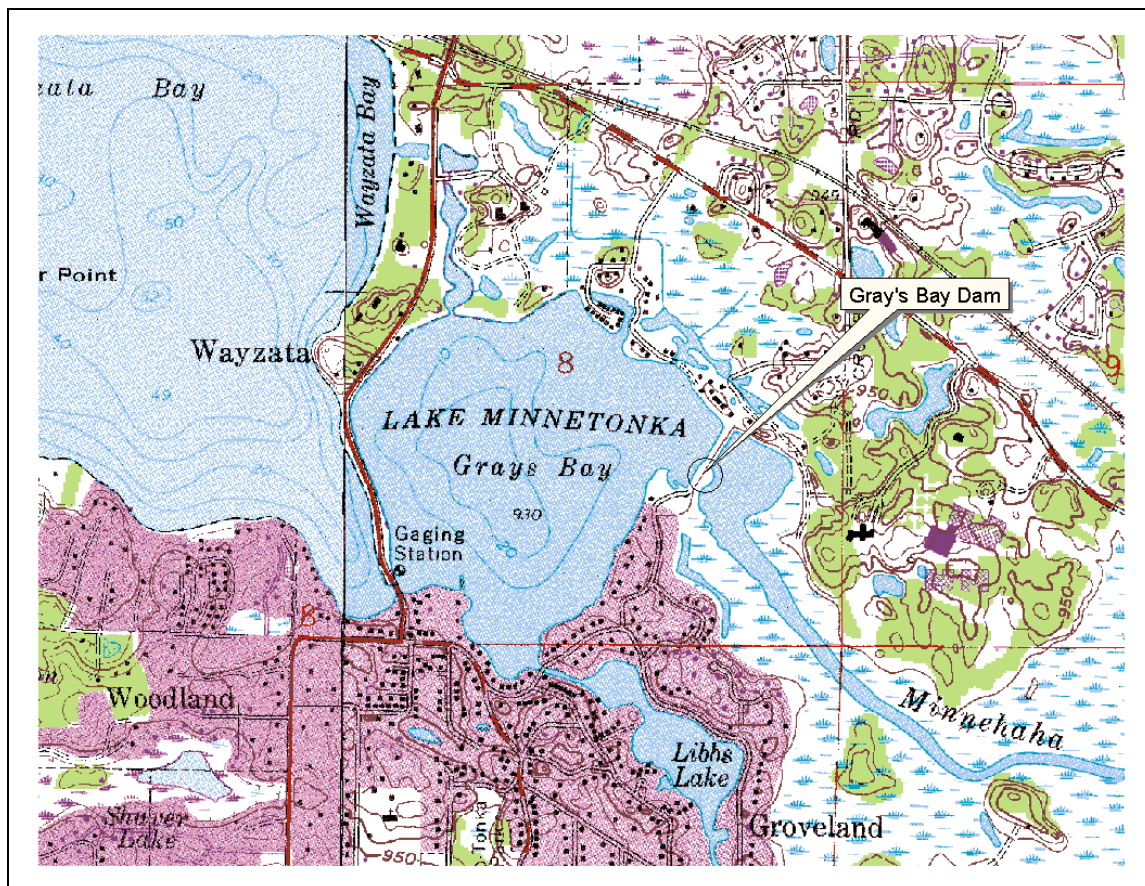
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Pre-2005 view of Grays Bay Dam with Grays Bay in background



Post-2005 appearance of the dam. Stop logs are installed

Stainless Steel Radial Tainter Gates and Seals

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Gear Reduction Box (one of three)

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MCWD staff have reported leakage of water through the aluminum stop logs, when installed over the winter months. The stop logs are equipped with easily replaced neoprene seals. Although complete elimination of leakage is not a realistic goal. Most leakage could be addressed by replacement of the neoprene seals on some regular basis such as every 10 years.

Vertical Dimension Opening Veneers

Each of the three discharge bays has a veneer installed that the operator can observe and estimate the vertical opening under the gate being operated. Since the gate is radial, the vertical opening is variable and a function of the angle of rotation. When the gate is closed or nearly closed, it requires a greater number of rotations of the hand wheel to increase the vertical dimension of the gate opening 0.1 feet than it does when the gate setting is already open to some degree. The veneers should be marked to show each vertical opening increment of 0.1 feet and thus the markings on the veneer, showing radial movement

should be marked at a variable spacing. Currently the veneers are marked with equal spacings and are not recommended to be used.



Metal Veneer Bolted to Concrete in Each Bay

The metal veneers are secured to the concrete by metal bolts. After removal, the veneers could be flipped over and marked correctly and reinstalled with stainless steel bolts. Alternatively, new veneers could be fabricated with new highlighted markings.

Operational Priority

Operational priorities were established based upon maintaining the function of the outlet structure. In terms of what operation/maintenance activity is a priority:

<u>Priority</u>	<u>Activity</u>
1	Replace/Refurbish Gear Reduction Mechanisms (remove, clean, replace all seals, replace lubricant, repaint, reinstall with galvanized, aluminum or stainless steel cover)
2	Replace Gate Cables
3	Replace Gate Seals
4	Modify Vertical Dimension Opening Veneers
5	Replace Stop Log Seals

Costs

Costs were estimated based upon unit price amounts quoted from a responsible contractor familiar with the work and having successfully completed previous MCWD projects. The

amounts quoted assume all the work will be authorized concurrently and are valid until May 1, 2017. The total costs are far below the statutory requirement for bidding so it is not necessary to incur the additional costs to prepare bidding documents, go through the bidding process and manage extensive contract requirements.

The estimated costs are listed in the table below. It is recommended that all the work be authorized, at the same time, and completed before winterization of the structure in 2016, typically immediately following Thanksgiving.

Gear reduction mechanism work could start now, working on and completing one at a time, so that there are two gates available for operation throughout 2016. Stop log seal replacement and modification of veneers could also start now. Cable replacement and gate seal replacement will best be accomplished at the time winterization work is done.

Priority	Description	Unit Price	Quantity	Extension	Maintenance Cycle
1	Refurbish Gear Reduction Mechanisms (remove, clean, replace all seals, replace lubricant, repaint, reinstall with galvanized, aluminum or stainless steel cover) (does not include removal of staining)	\$2,230	3	\$6,690	20 years
2	Replace Gate Cables with Like Materials	\$1,028	3	\$3,084	10 years
3	Replace Gate Seals in Each Bay with Like Materials (includes sidewall seals only - bottom sweeper seals will be inspected when out of water)	\$1,765	3	\$5,295	10 years
4	Remove, Modify and Reinstall Vertical Dimension Opening Veneers	\$625	3	\$1,875	20 years
5	Replace Stop Log Seals	\$485	18	\$8,730	10 years
Total Estimated Contractor Cost				\$25,674	
		Hours	Billing Rate	Extension	
	Meeting to finalize work and schedule	4	125	\$500	
	Provide Contractor with Corrected Veneer Spacings (shop visit)	4	125	\$500	
	Inspect Gear Reduction Mechanisms before Reinstallation (shop visit)	2	125	\$250	
	Inspect Replaced Seals, Cables, Veneers (site visit)	3	125	\$375	
Total Estimated Engineering Cost				\$1,625	
Contingency for fabricating new veneers				\$1,500	

Exhibit B: Quote Sheet

Gray's Bay Dam Maintenance

Item #	Item	Unit Price	Quantity	Extension
1	Refurbish gear reduction mechanisms	2230	3	\$ 6,690.00
2	Replace gate cables and associated attachments with like materials	514	6	\$ 3,084.00
3	Replace side gate seals in each bay with like materials	883	6	\$ 5,298.00
4	Replace bottom (sweeper) gate seal in each bay, if able to inspect and replacement is needed	975	3	\$ 2,925.00
5	Remove, modify, and re-install vertical dimension opening veneers	625	3	\$ 1,875.00
6	CONTINGENCY: Fabricate new vertical dimension opening veneers	330	3	\$ 990.00
				\$ 20,862.00