HUITT-ZOLLARS

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June 8, 2020

Mr. Paul Mueller
Lake McQueeney Water Control and Improvement District No. 1
c/o Allen Boone Humphries Robinson LLP
3200 Southwest Freeway, Suite 2600
Houston, Texas 77027

**Reference:** **Spill Gate Replacement at the Lake McQueeney Dam**

**Subject:** **Gate Replacement Recommendation**

Dear Mr. Mueller:

Huitt-Zollars, Inc. (Huitt-Zollars) has concluded our analysis of the spill gate replacement alternatives at the Lake McQueeney Dam. Please see the attachment for our findings and estimated project costs for the Obermeyer Gate Replacement and for the Bear-Trap Gate Replacement.

Based on information provided by the Guadalupe Blanco River Authority (GBRA) on the Dunlap Dam Gate Replacement, the construction cost for fully automated Hydraulic Powered Gates at the Lake McQueeney Dam would be $34,796,044. This cost does not include the associated soft costs which we would estimate to be around $4,300,000. This would put the project cost for the hydraulic gate replacement at $39,180,000. The project costs for the Obermeyer and Bear-Trap Gate Replacements are $38,067,325 and $32,076,473, respectively.

Based on the potential maintenance issues with the Obermeyer Gates and safety and personnel costs associated with the Bear Trap Gates and overall project costs, we recommend the spill gates in the Lake McQueeney Dam be replaced with Hydraulic Powered Spill Gates.

Please let me know if you need additional information on this matter.

Respectfully submitted,
**HUITT-ZOLLARS, INC.**

Gregory R. Wine, P.E., LEED AP
Senior Vice President


Huitt-Zollars Inc
Firm Registration No. F-761
June 8, 2020

Attachment

## 1.0 Obermeyer Crest Gate Replacement

### 1.1 General description and overall operation

The Obermeyer crest gate is a proprietary system that is supplied by Obermeyer Hydro, Inc., headquartered in Northern Colorado. This gate system consists of four bottom-hinged, steel gate panels per gate bay supported on the downstream side by pneumatically controlled rubber air bladders. Typical cross sections of the Obermeyer replacement gate, in open and closed positions, are shown on Figure 1-1 and Figure 1-2.

The concept involves the use of air pressure and inflatable bladders to raise or lower the overlying gates to various positions depending upon the desired release rate of flow. The replacement Obermeyer crest gates would span the same 85-foot width and impound 12-foot height of water similarly to the existing bear trap gate system on Lake McQueeney.

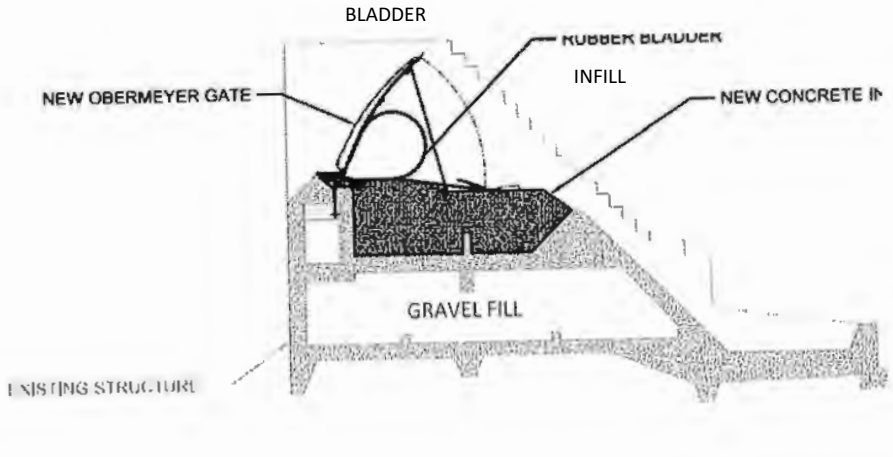


Figure 1-1: Obermeyer Gate Cross-Sections (Open)

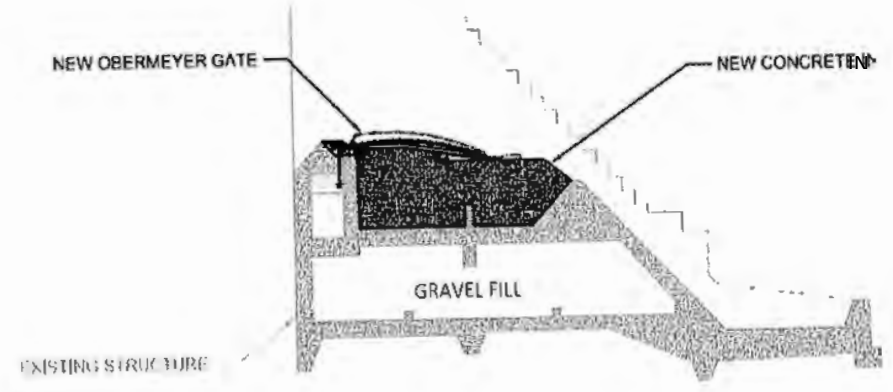


Figure 1-2: Obermeyer Gate Cross-Sections (Closed)

Figure 1-3: Typical Obermeyer Crest Gate Configuration (during installation)

The configuration of the air bladders on the downstream side of the crest gates is vulnerable to vandalism and the collection of debris that can damage the bladders and disrupt the proper operation of the dam. A protective steel plate would be configured to provide protection to the bladders as depicted on Figure 1-4. Obermeyer has installed these downstream plates on only 2% of its gate projects. The existing structure of the dam would need to be modified to provide a level surface on which the bladders would rest and the shield plates to slide on. Additionally, the splitter piers would need to extend down stream a bit to minimize the occurrence of debris getting between the shield plates and the bladders during flows over the Obermeyer gates. This was to address a concern voiced by the Guadalupe Blanco River Authority (GBRA) of boulders getting trapped behind the bladders and damaging them. Also, a recommendation to merge the four gate leaves into one at each gate bay so that if a bladder failed, the adjoining gate leaf would not displace thereby exposing the back side of the adjacent gat and allowing debris to get trapped between the bladders and steel shield.

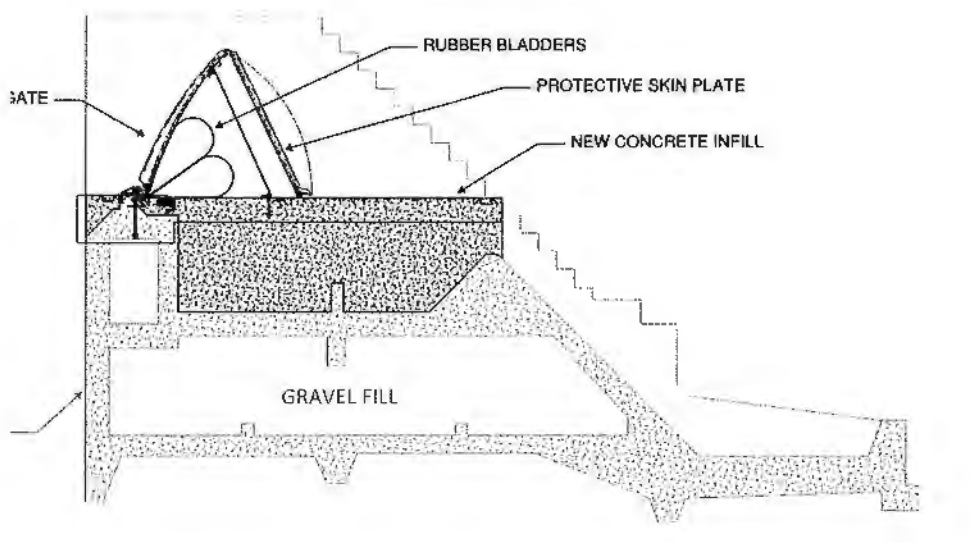


Figure 1-4: Obermeyer Gate with Protective Skin Plate Cross-Section

Although structural modifications will be needed to accommodate the new crest gate configuration, an advantage of the Obermeyer crest gate system is that the new crest gates can be sized to fit within the area occupied by the existing bear trap gates. The Obermeyer crest gate system will require modifications to the existing training walls, the existing bear trap gate concrete support structure, and the existing powerhouse, as mentioned above.

The existing training walls will require modification to provide a smooth surface for the Obermeyer gate side seal to bear on during operations. The smooth surface will be achieved by installing a seal plate on the vertical concrete face at each end of the gate. The existing training wall abutting the bear trap concrete structure has a vertical concrete face, which the current bear trap gates seal against. The existing concrete surface is not suitable for the new Obermeyer crest gate seals. A stainless-steel plate will be required due to a low friction value and longer service life.

A large cavity exists below the bear trap gate when the gate is in a down position. A portion of this cavity will have to be infilled with concrete to establish a base for the bladders as shown on Figure 1-1 and Figure 1-2 to install the Obermeyer crest gate system. This infill can be cast into a shape to help with the hydraulics of the structure. The final design will need to consider the additional loading of the concrete in-fill on the existing concrete structure and existing gravel fill within the large structural cavity. Finally, there may be necessary modifications to the powerhouse to house the compressors and associated pneumatic equipment.

Other items to be added to the existing structure to improve maintenance, inspection, operation, and repair conditions are:

1. Stop logs
2. A Gantry Crane and Hoist
3. An Access Bridge Walkway Platform

The probably project cost for the design and construction of the Obermeyer Crest Gate Replacement is estimated to be $ 38,067,325 which includes the stop logs, gantry crane and hoist and access bridge walkway platform. See Attachment A for separate cost estimates for the Obermeyer Crest Gate Replacement and for the stop logs, gantry crane and hoist and access bridge walkway platform.

## 2.0 MODERNIZED BEAR-TRAP GATES

### 2.1 General Description and Overall Configuration

The bear trap gate is known as a Huber-Lutz roof weir gate. The design has been around for at least 100 years. The existing Lake McQueeney bear trap gate is 85 feet wide and approximately 12 feet high. It consists of an L-shaped upstream leaf and a curved downstream leaf as shown on Figure 2-1. Operation of the gate is achieved from simple hydraulic principles, i.e., the application of water pressure. No pumps or electronics are required to operate the gate. The gate is lowered by filling the gate chamber with water to separate the two leaf parts, lifting the locking bars, and then draining the water from the inside of the gate chamber to allow the gate to settle into a lowered position.

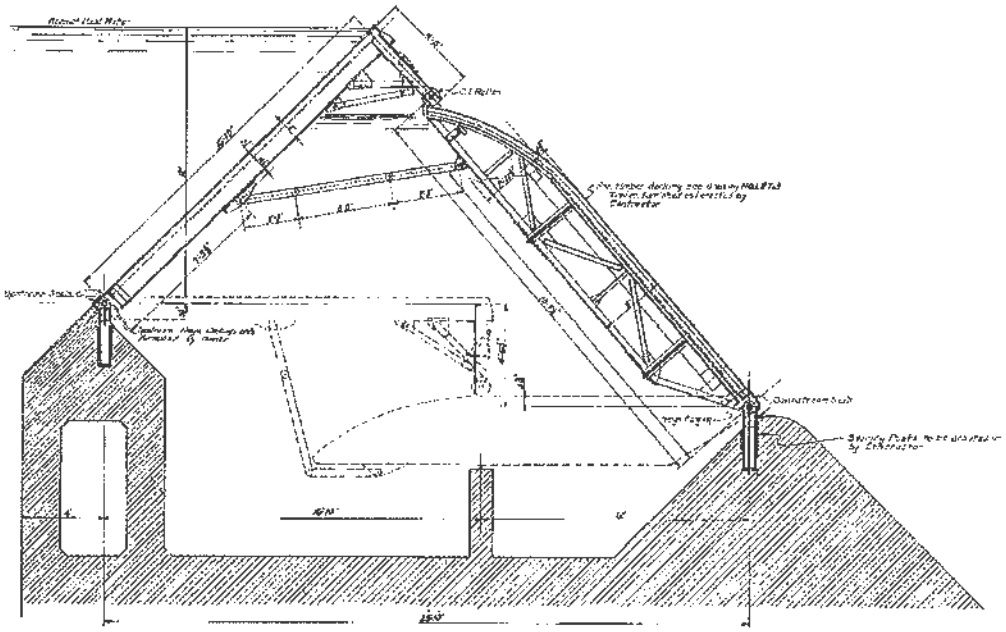

Figure 2-1: Bear Trap Gate Cross-Section

GBRA has had challenges in operating the existing bear trap gates over the past 90 years of service or more. The existing gates have performed reliably and required little maintenance until recent years. Interest within GBRA has increased due to the break downs of bear trap gates at other dam locations. A modernized bear trap gate system will consider lessons learned from operating bear trap gate systems across North America along with GBRA's site specific experience.

The modernized bear-trap gates could be fabricated to fit in the same place as the existing gates. There will be some modifications required to the existing structure. To address the operational concerns experienced with the existing Bear trap gates, specific improvements would be addressed in the design of the modernized bear trap gates, as follows:

1. The existing side seals would be upgraded to a modern gate seal.

2. The occurrence of gate separation is attributed to a lack of connectivity between the upstream and downstream gate leaves and is brought about by a vacuum created in the overtopping flow that "sucks" the water from the top portion of the downstream gate leaf, thereby causing it to drop. Methods to remedy this condition would be incorporated into the design of the modernized bear trap gates.

3. The existing wooden timbers would be replaced with a steel skin plates to reduce the maintenance associated with impact damage to the timbers and degradation. The downstream section of the bear trap would include buoyant chambers to provide for proper operation and floating of the gate system.

4. The force required to operate the locking bars will be reduced through the replacement of the bars and the provisions for modern protective coating systems.

5. A new lowered intake chamber would be created to allow operation of the gates with lower head conditions. Also, the trash gratings over the inlet ports would be reconfigured to minimize the accumulation of debris which interferes with the operation of the gates and require frequent cleaning by hand.

6. A significant limitation of bear trap gate system is the inability to automate the operations of the gates. This requires operators on site for the operation of the gates as well as requires personnel to manually set the locking bars in place.

7. As currently required, personnel will still have to remove debris in and around the gates which may block the operation of the gates. For protection during this removal operation, the stop logs will need to be installed.

As with the Obermeyer crest gates, other items that could be added to the existing bear trap structure to improve maintenance, inspection, operation, and repair conditions and to truly modernize the dam structure are:

1. A stoplog structure for unwatering
2. An Overhead Gantry crane system for moving stoplogs
3. A Bridge/Access platform
4. Crack repair

The probably project cost for the design and construction of the Bear Trap Gate Replacement is estimated to be $ 32,076,473. See Attachment B.

## 3.0 CONCLUSIONS

### 3.1 Gate replacement recommendation

While the Obermeyer Crest gates and the Modernized Bear-Trap gates are potential replacement options for the existing bear trap gates on the Lake McQueeney dam, both have drawbacks when compared to hydraulic powered gates. The cost of the Obermeyer Crest Gates is about the same as the estimate provided by GBRA for the replacement of the gates at the Lake Dunlap Dam with Hydraulic Powered Gates. However, there are issues with the Obermeyer Gates being a sole source proprietary system as well as issues with potential debris removal and vandalism. The Modernized Bear-Trap gates, while less expensive, cannot be operated remotely and have safety and personnel issues which are negative factors on their selection. Plus, the cost differential between it and the Hydraulic Powered Gates (project cost of around $39,180,000 as provided by GBRA) is small over the life of the project, and the operation costs in the form of required operation manpower would minimize that cost differential even more. Finally, the automation and, more specifically, the ability to control the operation of each gate bay independently in concert with the operation of the upstream US Army Corps of Engineers' Canyon Lake and Dam are important. When comparing the three gate replacement options, the replacement of the existing Bear-Trap Gates with Hydraulic Powered Gates is the recommended alternative for the Lake McQueeney Dam.

# Attachment A

Huitt-Zollars, Inc. FRIENDS OF LAKE MCQUEENEY Pre-Design Phase

5/22/2020

Probable Project Cost

Obermeyer Gate Replacements at Lake McQueeney Dam

**Summary of Project Cost Estimates**

| Item | Item Description | | Project Cost |
|---|---|---|---|
| A | Replacement of Gates, Armoring, Access Walkway, Hoist and Stoplogs | $ | 38,067,325 |
| B | Replacement of Gates | $ | 30,710,172 |
| C | Armoring, Access Walkway, Hoist and Stoplogs (See breakdown below) | $ | 7,357,153 |
| | Total | $ | 38,067,325 |
| C1 | Stoplogs and Hoist | $ | 1,446,453 |
| C2 | Walkway | $ | 2,594,518 |
| C3 | Armoring | $ | 3,316,183 |
| | Total | $ | 7,357,153 |

Huitt-Zollars, Inc | FRIENDS OF LAKE MCQUEENEY | Pre-Design Phase

5/22/2020

Probable Project Cost

A - Obermeyer Gate Replacements w/ Walkway, Stoplogs and Armoring at Lake McQueeney Dam

**CONSTRUCTION COST**

**DIRECT COSTS**

| Item # | Item | | AMOUNT |
|---|---|---|---|
| 1 | General Conditions | $ | 201,852 |
| 2 | Site Prep | $ | 125,000 |
| 3 | Remove existing beartrap gates 3 ea | $ | 150,000 |
| 4 | Soil Anchor Tiebacks | $ | 1,420,000 |
| 5 | Dewatering between sheetpile wall and Existing dam | $ | 20,500 |
| 6 | Cofferdams | $ | 1,845,000 |
| 7 | Earthwork | $ | 150,000 |
| 8 | Soil Stabilization | $ | 1,161,000 |
| 9 | Dam Armoring SOG | $ | 1,621,000 |
| 10 | Emergency Spillway Concrete | $ | 850,000 |
| 11 | Spillway Erosion Control | $ | 6,500 |
| 12 | Foundations and loadbearing elements | $ | 436,000 |
| 13 | Duct Banks, Air Supply, and Equipment Pads | $ | 170,000 |
| 14 | Concrete for In-fill and downstream splitter piers | $ | 1,620,000 |
| 15 | Mass Concrete footing for stoplog structure | $ | 1,806,500 |
| 16 | Excavation for mass concrete footing | $ | 600,000 |
| 17 | Concrete crack repair | $ | 30,000 |
| 18 | Concrete surface repair | $ | 60,000 |
| 19 | Flood Events (4 per year, 2 yrs) | $ | 200,000 |
| 20 | Lead Paint Abatement | $ | 30,000 |
| 21 | Gates and anchorages, embeds, rub plates, installation, shield plates | $ | 4,800,000 |
| 22 | Access Walkway and Metal Framing | $ | 876,435.00 |
| 23 | Foundations, Bridge and Stair Tower Piers | $ | 371,584.00 |
| 24 | Gantry Crane and Hoist | $ | 125,000.00 |
| 25 | Stoplogs | $ | 75,000.00 |
| | *Total Direct Costs* | $ | 18,751,371 |
| | **SUBCONCONTRACTORS' MARK-UPS** | | |
| 26 | Subcontractor-GC's | $ | 1,500,110 |
| 27 | Subcontractor-OH | $ | 1,125,082 |
| 28 | Subcontractor Fee | $ | 1,125,082 |
| 29 | Subcontractor Bond/Insurance | $ | 468,784 |
| | *Total Subcontractors' markup* | $ | 4,219,058 |
| | **RISK ASSESSMENT MARK-UPS** | | |
| 30 | Construction Contingency (10%) | $ | 2,297,043 |
| 31 | Escalation (8%) | $ | 1,837,634 |
| | *Total Risk Assessment Mark-ups* | $ | 4,134,677 |
| | **GENERAL REQUIREMENTS** | | |
| 32 | *Total General Requirements* | $ | 2,710,511 |
| | **CONTRACTOR'S FEE** | | |
| 33 | G&A | $ | 1,192,625 |
| 34 | Profit | $ | 2,385,249 |
| | *Total Contractor's Fee* | $ | 3,577,874 |
| | **INSURANCES AND BOND** | | |
| 35 | Builders All Risk Insurance | $ | 106,859 |
| 36 | General Libility Insurance | $ | 66,787 |
| 37 | P&P Bond | $ | 240,433 |
| | *Total Insurances and Bond* | $ | 414,079 |
| | **TOTAL CONSTRUCTION COST** | **$** | **33,807,571** |
| | **SOFT COSTS** | | |
| 38 | Engineering (Design, Bidding and Construction Administration) | $ | 2,535,568 |
| 39 | Construction Materials Testing | $ | 202,845 |
| 40 | Construction Management and Inspection | $ | 1,521,341 |
| | **TOTAL SOFT COSTS** | ***$*** | ***4,259,754*** |
| | **TOTAL PROBABLE PROJECT COST** | **$** | **38,067,325** |

Huitt-Zollars, Inc | FRIENDS OF LAKE MCQUEENEY | Pre-Design Phase

5/22/2020

Probable Project Cost

B - Obermeyer Gate Replacements at Lake McQueeney Dam

**CONSTRUCTION COST**

**DIRECT COSTS**

| Item # | Item | | AMOUNT |
|---|---|---|---|
| 1 | General Conditions | $ | 171,852 |
| 2 | Site Prep | $ | 100,000 |
| 3 | Remove existing beartrap gates 3 ea | $ | 150,000 |
| 4 | Soil Anchor Tiebacks | $ | 1,420,000 |
| 5 | Dewatering between sheetpile wall and Existing dam | $ | 20,500 |
| 6 | Cofferdams | $ | 1,845,000 |
| 7 | Earthwork | $ | 150,000 |
| 8 | Soil Stabilization | $ | 1,161,000 |
| 9 | Emergency Spillway Concrete | $ | 850,000 |
| 10 | Spillway Erosion Control | $ | 6,500 |
| 11 | Foundations and loadbearing elements | $ | 436,000 |
| 12 | Duct Banks, Air Supply and Equipment Pads | $ | 170,000 |
| 13 | Concrete for In-fill and downstream splitter piers | $ | 1,620,000 |
| 14 | Mass Concrete footing for Dam Stability | $ | 1,406,500 |
| 15 | Excavation for mass concrete footing | $ | 500,000 |
| 16 | Concrete crack repair | $ | 30,000 |
| 17 | Concrete surface repair | $ | 60,000 |
| 18 | Flood Events (4 per year, 2 yrs) | $ | 200,000 |
| 19 | Lead Paint Abatement | $ | 30,000 |
| 20 | Gates and anchorages, embeds, rub plates, installation, shield plates | $ | 4,800,000 |
| | *Total Direct Costs* | $ | 15,127,352 |
| | **SUBCONCONTRACTORS' MARK-UPS** | | |
| 21 | Subcontractor-GC's | $ | 1,210,188 |
| 22 | Subcontractor-OH | $ | 907,641 |
| 23 | Subcontractor Fee | $ | 907,641 |
| 24 | Subcontractor Bond/Insurance | $ | 378,184 |
| 25 | *Total Subcontractors' markup* | $ | 3,403,654 |
| | **RISK ASSESSMENT MARK-UPS** | | |
| 26 | Construction Contingency (10%) | $ | 1,853,101 |
| 27 | Escalation (8%) | $ | 1,482,480 |
| | *Total Risk Assessment Mark-ups* | $ | 3,335,581 |
| | **GENERAL REQUIREMENTS** | | |
| 28 | *Total General Requirements* | $ | 2,186,659 |
| | **CONTRACTOR'S FEE** | | |
| 29 | G&A | $ | 962,130 |
| 30 | Profit | $ | 1,924,260 |
| | *Total Contractor's Fee* | $ | 2,886,390 |
| | **INSURANCES AND BOND** | | |
| 31 | Builders All Risk Insurance | $ | 86,207 |
| 32 | General Libility Insurance | $ | 53,879 |
| 33 | P&P Bond | $ | 193,965 |
| | *Total Insurances and Bond* | $ | 334,051 |
| | **TOTAL CONSTRUCTION COST** | **$** | **27,273,687** |
| | **SOFT COSTS** | | |
| 34 | Engineering (Design, Bidding and Construction Administration) | $ | 2,045,527 |
| 35 | Construction Materials Testing | $ | 163,642 |
| 36 | Construction Management and Inspection | $ | 1,227,316 |
| | **TOTAL SOFT COSTS** | ***$*** | ***3,436,485*** |
| | **TOTAL PROBABLE PROJECT COST** | **$** | **30,710,172** |

Huitt-Zollars, Inc | FRIENDS OF LAKE MCQUEENEY | Pre-Design Phase

5/22/2020

Probable Project Cost

C - Access Walkway, Gantry Crane and Hoist and Stoplogs at Lake McQueeney Dam

**CONSTRUCTION COST**

**DIRECT COSTS**

| Item # | Item | | AMOUNT |
|---|---|---|---|
| 1 | General Conditions | $ | 30,000 |
| 2 | Site Prep | $ | 25,000 |
| 3 | Dam Armoring SOG | $ | 1,621,000 |
| 4 | Mass Concrete footing for stoplog structure | $ | 400,000 |
| 5 | Excavation for mass concrete footing | $ | 100,000 |
| 6 | Access Walkway and Metal Framing | $ | 876,435.00 |
| 7 | Foundations, Bridge and Stair Tower Piers | $ | 371,584.00 |
| 8 | Gantry Crane and Hoist | $ | 125,000.00 |
| 9 | Stoplogs | $ | 75,000.00 |
| | *Total Direct Costs* | $ | 3,624,019 |
| | **SUBCONCONTRACTORS' MARK-UPS** | | |
| 10 | Subcontractor-GC's | $ | 289,922 |
| 11 | Subcontractor-OH | $ | 217,441 |
| 12 | Subcontractor Fee | $ | 217,441 |
| 13 | Subcontractor Bond/Insurance | $ | 90,600 |
| | *Total Subcontractors' markup* | $ | 815,404 |
| | **RISK ASSESSMENT MARK-UPS** | | |
| 15 | Construction Contingency (10%) | $ | 443,942 |
| 16 | Escalation (8%) | $ | 355,154 |
| | *Total Risk Assessment Mark-ups* | $ | 799,096 |
| | **GENERAL REQUIREMENTS** | | |
| 17 | *Total General Requirements* | $ | 523,852 |
| | **CONTRACTOR'S FEE** | | |
| 18 | G&A | $ | 230,495 |
| 19 | Profit | $ | 460,990 |
| | *Total Contractor's Fee* | $ | 691,485 |
| | **INSURANCES AND BOND** | | |
| 20 | Builders All Risk Insurance | $ | 20,652 |
| 21 | General Libility Insurance | $ | 12,908 |
| 22 | P&P Bond | $ | 46,468 |
| | *Total Insurances and Bond* | $ | 80,028 |
| | **TOTAL CONSTRUCTION COST** | **$** | **6,533,884** |
| | **SOFT COSTS** | | |
| 23 | Engineering (Design, Bidding and Construction Administration) | $ | 490,041 |
| 24 | Construction Materials Testing | $ | 39,203 |
| 25 | Construction Management and Inspection | $ | 294,025 |
| | **TOTAL SOFT COSTS** | ***$*** | ***823,269*** |
| | **TOTAL PROBABLE PROJECT COST** | **$** | **7,357,153** |

Huitt-Zollars, Inc | FRIENDS OF LAKE MCQUEENEY | Pre-Design Phase

5/22/2020

Probable Project Cost

C1 - Gantry Crane and Hoist and Stoplogs at Lake McQueeney Dam

**CONSTRUCTION COST**

**DIRECT COSTS**

| Item # | Item | | AMOUNT |
|---|---|---|---|
| 1 | General Conditions | $ | 7,500 |
| 2 | Site Prep | $ | 5,000 |
| 3 | Mass Concrete footing for stoplog structure | $ | 400,000 |
| 4 | Excavation for mass concrete footing | $ | 100,000 |
| 5 | Gantry Crane and Hoist | $ | 125,000 |
| 6 | Stoplogs | $ | 75,000 |
| | *Total Direct Costs* | $ | 712,500 |
| | **SUBCONCONTRACTORS' MARK-UPS** | | |
| 7 | Subcontractor-GC's | $ | 57,000 |
| 8 | Subcontractor-OH | $ | 42,750 |
| 9 | Subcontractor Fee | $ | 42,750 |
| 10 | Subcontractor Bond/Insurance | $ | 17,813 |
| | *Total Subcontractors' markup* | $ | 160,313 |
| | **RISK ASSESSMENT MARK-UPS** | | |
| 11 | Construction Contingency (10%) | $ | 87,281 |
| 12 | Escalation (8%) | $ | 69,825 |
| | *Total Risk Assessment Mark-ups* | $ | 157,106 |
| | **GENERAL REQUIREMENTS** | | |
| 13 | *Total General Requirements* | $ | 102,992 |
| | **CONTRACTOR'S FEE** | | |
| 14 | G&A | $ | 45,316 |
| 15 | Profit | $ | 90,633 |
| | *Total Contractor's Fee* | $ | 135,949 |
| | **INSURANCES AND BOND** | | |
| 16 | Builders All Risk Insurance | $ | 4,060 |
| 17 | General Libility Insurance | $ | 2,538 |
| 18 | P&P Bond | $ | 9,136 |
| | *Total Insurances and Bond* | $ | 15,734 |
| | **TOTAL CONSTRUCTION COST** | **$** | **1,284,594** |
| | **SOFT COSTS** | | |
| 19 | Engineering (Design, Bidding and Construction Administration) | $ | 96,345 |
| 20 | Construction Materials Testing | $ | 7,708 |
| 21 | Construction Management and Inspection | $ | 57,807 |
| | **TOTAL SOFT COSTS** | ***$*** | ***161,859*** |
| | **TOTAL PROBABLE PROJECT COST** | **$** | **1,446,453** |

Huitt-Zollars, Inc | FRIENDS OF LAKE MCQUEENEY | Pre-Design Phase

5/22/2020

Probable Project Cost

C2 - Access Walkway at Lake McQueeney Dam

**CONSTRUCTION COST**

**DIRECT COSTS**

| Item # | Item | | AMOUNT |
|---|---|---|---|
| 1 | General Conditions | $ | 15,000 |
| 2 | Site Prep | $ | 15,000 |
| 3 | Access Walkway and Metal Framing | $ | 876,435 |
| 4 | Foundations, Bridge and Stair Tower Piers | $ | 371,584 |
| | *Total Direct Costs* | $ | 1,278,019 |
| | **SUBCONCONTRACTORS' MARK-UPS** | | |
| 5 | Subcontractor-GC's | $ | 102,242 |
| 6 | Subcontractor-OH | $ | 76,681 |
| 7 | Subcontractor Fee | $ | 76,681 |
| 8 | Subcontractor Bond/Insurance | $ | 31,950 |
| | *Total Subcontractors' markup* | $ | 287,554 |
| | **RISK ASSESSMENT MARK-UPS** | | |
| 9 | Construction Contingency (10%) | $ | 156,557 |
| 10 | Escalation (8%) | $ | 125,246 |
| | *Total Risk Assessment Mark-ups* | $ | 281,803 |
| | **GENERAL REQUIREMENTS** | | |
| 11 | *Total General Requirements* | $ | 184,738 |
| | **CONTRACTOR'S FEE** | | |
| 12 | G&A | $ | 81,285 |
| 13 | Profit | $ | 162,569 |
| | *Total Contractor's Fee* | $ | 243,854 |
| | **INSURANCES AND BOND** | | |
| 14 | Builders All Risk Insurance | $ | 7,283 |
| 15 | General Libility Insurance | $ | 4,552 |
| 16 | P&P Bond | $ | 16,387 |
| | *Total Insurances and Bond* | $ | 28,222 |
| | **TOTAL CONSTRUCTION COST** | **$** | **2,304,190** |
| | **SOFT COSTS** | | |
| 17 | Engineering (Design, Bidding and Construction Administration) | $ | 172,814 |
| 18 | Construction Materials Testing | $ | 13,825 |
| 19 | Construction Management and Inspection | $ | 103,689 |
| | **TOTAL SOFT COSTS** | ***$*** | ***290,328*** |
| | **TOTAL PROBABLE PROJECT COST** | **$** | **2,594,518** |

Huitt-Zollars, Inc | FRIENDS OF LAKE MCQUEENEY | Pre-Design Phase

5/22/2020

Probable Project Cost

C3 - Armoring at Lake McQueeney Dam

**CONSTRUCTION COST**

**DIRECT COSTS**

| Item # | Item | | AMOUNT |
|---|---|---|---|
| 1 | General Conditions | $ | 7,500 |
| 2 | Site Prep | $ | 5,000 |
| 3 | Dam Armoring SOG | $ | 1,621,000 |
| | *Total Direct Costs* | $ | 1,633,500 |
| | **SUBCONCONTRACTORS' MARK-UPS** | | |
| 10 | Subcontractor-GC's | $ | 130,680 |
| 11 | Subcontractor-OH | $ | 98,010 |
| 12 | Subcontractor Fee | $ | 98,010 |
| 13 | Subcontractor Bond/Insurance | $ | 40,838 |
| | *Total Subcontractors' markup* | $ | 367,538 |
| | **RISK ASSESSMENT MARK-UPS** | | |
| 15 | Construction Contingency (10%) | $ | 200,104 |
| 16 | Escalation (8%) | $ | 160,083 |
| | *Total Risk Assessment Mark-ups* | $ | 360,187 |
| | **GENERAL REQUIREMENTS** | | |
| 17 | *Total General Requirements* | $ | 236,122 |
| | **CONTRACTOR'S FEE** | | |
| 18 | G&A | $ | 103,894 |
| 19 | Profit | $ | 207,788 |
| | *Total Contractor's Fee* | $ | 311,682 |
| | **INSURANCES AND BOND** | | |
| 20 | Builders All Risk Insurance | $ | 9,309 |
| 21 | General Libility Insurance | $ | 5,818 |
| 22 | P&P Bond | $ | 20,945 |
| | *Total Insurances and Bond* | $ | 36,072 |
| | **TOTAL CONSTRUCTION COST** | **$** | **2,945,100** |
| | **SOFT COSTS** | | |
| 23 | Engineering (Design, Bidding and Construction Administration) | $ | 220,883 |
| 24 | Construction Materials Testing | $ | 17,671 |
| 25 | Construction Management and Inspection | $ | 132,530 |
| | **TOTAL SOFT COSTS** | ***$*** | ***371,083*** |
| | **TOTAL PROBABLE PROJECT COST** | **$** | **3,316,183** |

# Attachment B

Huitt-Zollars, Inc | FRIENDS OF LAKE MCQUEENEY | Pre-Design Phase

5/8/2020

Probable Project Cost

Bear Trap Gate Replacements at Lake McQueeney Dam

**CONSTRUCTION COST**

**DIRECT COSTS**

| Item # | Item | | AMOUNT |
|---|---|---|---|
| 1 | General Conditions | $ | 201,852 |
| 2 | Site Prep | $ | 125,000 |
| 3 | Remove existing beartrap gates 3 ea | $ | 150,000 |
| 4 | Soil Anchor Tiebacks | $ | 1,420,000 |
| 5 | Dewatering between sheetpile wall and Existing dam | $ | 20,500 |
| 6 | Cofferdams | $ | 1,845,000 |
| 7 | Earthwork | $ | 150,000 |
| 8 | Soil Stabilization | $ | 1,161,000 |
| 9 | Dam Armoring SOG | $ | 900,000 |
| 10 | Emergency Spillway Concrete | $ | 850,000 |
| 11 | Spillway Erosion Control | $ | 6,500 |
| 12 | Foundations and loadbearing elements | $ | 436,000 |
| 13 | Lower intake ports | $ | 500,000 |
| 14 | Concrete for In-fill and downstream splitter piers | $ | 500,000 |
| 15 | Mass Concrete footing for stoplog structure | $ | 1,806,500 |
| 16 | Excavation for mass concrete footing | $ | 600,000 |
| 17 | Concrete crack repair | $ | 50,000 |
| 18 | Concrete surface repair | $ | 100,000 |
| 19 | Flood Events (4 per year, 2 yrs) | $ | 200,000 |
| 20 | Lead Paint Abatement | $ | 30,000 |
| 21 | Gates and anchorages, embeds, rub plates, installation, shield plates | $ | 3,300,000 |
| 22 | Access Walkway and Metal Framing | $ | 876,435.00 |
| 23 | Foundations, Bridge and Stair Tower Piers | $ | 371,584.00 |
| 24 | Gantry Crane and Hoist | $ | 125,000.00 |
| 25 | Stoplogs | $ | 75,000.00 |
| | *Total Direct Costs* | $ | 15,800,371 |

**SUBCONCONTRACTORS' MARK-UPS**

| | | | |
|---|---|---|---|
| 26 | Subcontractor-GC's | $ | 1,264,030 |
| 27 | Subcontractor-OH | $ | 948,022 |
| 28 | Subcontractor Fee | $ | 948,022 |
| 29 | Subcontractor Bond/Insurance | $ | 395,009 |
| | *Total Subcontractors' markup* | $ | 3,555,083 |

**RISK ASSESSMENT MARK-UPS**

| | | | |
|---|---|---|---|
| 30 | Construction Contingency (10%) | $ | 1,935,545 |
| 31 | Escalation (8%) | $ | 1,548,436 |
| | *Total Risk Assessment Mark-ups* | $ | 3,483,982 |

**GENERAL REQUIREMENTS**

| | | | |
|---|---|---|---|
| 32 | *Total General Requirements* | $ | 2,283,944 |

**CONTRACTOR'S FEE**

| | | | |
|---|---|---|---|
| 33 | G&A | $ | 1,004,935 |
| 34 | Profit | $ | 2,009,870 |
| | *Total Contractor's Fee* | $ | 3,014,806 |

**INSURANCES AND BOND**

| | | | |
|---|---|---|---|
| 35 | Builders All Risk Insurance | $ | 90,042 |
| 36 | General Libility Insurance | $ | 56,276 |
| 37 | P&P Bond | $ | 202,595 |
| | *Total Insurances and Bond* | $ | 348,914 |

| | | | |
|---|---|---|---|
| | **TOTAL CONSTRUCTION COST** | **$** | **28,487,099** |

**SOFT COSTS**

| | | | |
|---|---|---|---|
| 38 | Engineering (Design, Bidding and Construction Administration) | $ | 2,136,532 |
| 39 | Construction Materials Testing | $ | 170,923 |
| 40 | Construction Management and Inspection | $ | 1,281,919 |
| | **TOTAL SOFT COSTS** | ***$*** | ***3,589,374*** |

| | | | |
|---|---|---|---|
| | **TOTAL PROBABLE PROJECT COST** | **$** | **32,076,473** |