

**FEASIBILITY STUDY  
FOR  
REHABILITATION OF  
LARIMER & WELD IRRIGATION COMPANY  
CANAL DIVERSION  
ON THE CACHE LA POUDE RIVER**

**FEASIBILITY STUDY APPROVAL**  
Pursuant to Colorado Revised Statutes 37-60-121 & 122, and  
in accordance with policies adopted by the Board, the  
CWCB staff has determined this Feasibility Study meets all  
applicable requirements for approval.

Owned By:

Signed

9/9/16  
Date

Larimer & Weld Irrigation Company  
P.O. Box 2016  
106 Elm Street  
Eaton, CO 80615

Prepared By:

Anderson Consulting Engineers  
And  
Larimer & Weld Irrigation Company

Sponsored by the  
Larimer & Weld Irrigation Company  
in conjunction with the  
Colorado Water Conservation Board

July 10, 2016

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**Larimer & Weld Officers:**

Lynn Fagerberg, President

Gary Booth, Vice President

Kim Nelson, Secretary-Treasurer

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Anderson Consulting Engineers, Inc.

Mayo Sommermeyer, Esq.  
Larimer & Weld Irrigation Company, legal counsel

**Feasibility Study  
for the Rehabilitation of  
Larimer & Weld Irrigation Company  
Canal Diversion  
on the Cache La Poudre River**

**PROJECT OVERVIEW**

This project will result in the complete replacement of the aging and crumbling structures facilitating the offtake of water to the Poudre Valley Canal from the Cache La Poudre River. This particular application is to apply to Phase I, which consists of the gate facilities and supporting elements. This project will be done in three Phases. Phase I will involve the gates, Phase II will be the trashrack and the forebay, Phase III will involve the entire structure and gates on the River itself.

A very important element of having this facility in good repair is that it is an essential element to the Dry Creek Flood Control project, which was done by the City of Fort Collins. The existence and proper operation of the gates is essential to being able to turn off river flow and make the ditch capacity available for flood water in the event that we have a sufficient storm to justify that action. Therefore, when we talk about alternatives to this project, there really are none that are reasonable or acceptable. Fort Collins Master Agreement dated August 29, 2006, available upon request.

In order to put this in perspective, it is estimated that Phase II will have a cost of approximately \$700,000.00, and Phase III will have a cost of approximately \$1.5M. It is anticipated that we will make a request for funds as needed along these lines in each year following the completion of Phase I. The entire project must be done in annual phases to permit construction in the non-irrigation season during low river flows.

**PROJECT SPONSOR**

The **Larimer & Weld Irrigation Company** is a Colorado Mutual Ditch Company and a Non-profit Corporation. Articles of Incorporation and Bylaws for the company are included in Appendix C.

The company's facilities, built about the turn of the century, are located in Larimer and Weld Counties in Colorado. Their business office is located in Eaton, Colorado and their maintenance office is located in Fort Collins, Colorado. The system stretches from the Cache La Poudre River diversion located in north Fort Collins to near Galeton, Colorado in Weld County. The company has direct flow water rights from their diversion in the Cache La Poudre River and also is the carrier for reservoir water owned by their stockholders and the stockholders in several other ditch and reservoir companies. The companies which own stock in the Larimer & Weld and convey water through their system include the Windsor Reservoir & Canal Company, the Larimer & Weld Reservoir Company, and also those stockholders that own CBT water.

Their facilities consist of approximately 40 miles of supply ditch including many control structures, checks, and headgates. Appendix A included herein is a map of the system.

The stockholders in the Company own water through their stock in the Larimer and Weld Irrigation Company, the Larimer and Weld Reservoir Company, the Windsor Reservoir and Canal Company, and also CBT water. The water for these companies is delivered through the Larimer Weld System.

The Company was incorporated in March 1879. Due to the early date of conception, little information has been retained concerning the early development of the Company. The Company has been in operation continuously since its inception and has not changed from its original purpose.

## **PROJECT SERVICE AREA**

The approximate service area boundaries are shown on the map in Appendix A. The service area of the Larimer & Weld Irrigation Company includes approximately 61,000 acres of irrigated land. Crops grown in the service area include corn, beets, pinto beans, wheat, barley, oats, alfalfa, grass hay, and some vegetable crops.

The predominant soils in the service area are the Olney-Kim-Otero, Otero-Thedalund-Nelsen, and Nunn-Dacono-Altvan associations as listed in the Soil Survey of Larimer County and Weld County, Colorado, United States Department of Agriculture, September 1980. These soils are deep, level to moderately sloping, well drained sandy loams and loams formed in a mixed alluvium and eolian deposits. Following is a more complete description of the soils as taken from the soil survey.

### **Olney series:**

The Olney series consists of deep, well drained soils that formed in alluvium. Olney soils are on plains. Slopes are 0 to 5 percent. Olney soils are similar to the Fort Collins and Vona soils and are near the Kim, Nelson, Otero, and Thedalund soils. Fort Collins soils are less than 35 percent fine and coarser sand in the B horizon. Vona soils are less than 18 percent clay in the B horizon. Nelson and Thedalund soils have sandstone between 20 and 40 inches.

Crops yields per acre in this series are typically: 3.5 to 5.5 tons of hay; 20 to 24 tons of beets; 2400 to 2700 pounds of dry pinto beans; and, 80 to 180 bushels of corn.

### **Kim series:**

The Kim series consists of deep, well drained soils that formed in mixed eolian deposits and parent sediment from a wide variety of bedrock. Kim soils are on plains and alluvial fans. Slopes are 0 to 9 percent. Kim soils are similar to the Colby, Otero, Shingle, and Thedalund soils and are near the Fort Collins and Olney soils. Colby soils are more silty in all horizons. Otero soils are less than 18 percent clay in the C horizon. Shingle and Thedalund soils have shale between 10

and 40 inches. Fort Collins and Olney soils have a B horizon. Typically these soils have free carbonates at the surface content of coarse fragments ranges to as much as 10 percent.

Crops yields per acre in this series are: 3 to 4 tons of hay; 20 tons of beets; and, 80 to 140 bushels of corn.

#### **Otero series:**

The Otero series consists of deep, well drained soils that formed in alluvium and eolian deposits. Otero soils are on plains and terraces. Slopes are 0 to 9 percent. Otero soils are similar to the Kim, Nelson, Tassel, and Thedalund soils and are near the Olney and Vona soils. Kim soils are more than 18 percent clay in the C horizon. Nelson, Tassel, and Thedalund soils have sandstone and shale between 10 and 40 inches. Olney and Vona soils have a B horizon. Typically these soils have free carbonates at the surface. Content of coarse fragments ranges from 0 to 10 percent.

Crops yields per acre in this series are: 3 to 5. 5 tons of hay; 18 to 23 tons of beets; and, 80 to 170 bushels of corn.

#### **Nunn series:**

The Nunn series consists of deep, well drained soils that formed in mixed alluvium and eolian deposits. Nunn soils are on terraces, alluvial fans, and smooth plains. Slopes are 0 to 3 percent. Nunn soils are similar to the Altvan and Dacono soils and are near the Colombo, Fort Collins, Haverson, and Weld soils. Altvan and Dacono soils have a sand and gravel C horizon at a depth of 20 to 40 inches. Colombo and Haverson soils lack a B horizon. Fort Collins soils are less than 35 percent clay in the B horizon. Weld soils have an abrupt textural boundary between the A and B horizons.

Crops yields per acre in this series are typically: 3. 5 to 5. 5 tons of hay; 20 to 24 tons of beets; 2400 to 2700 pounds of dry pinto beans; and, 80 to 180 bushels of corn.

### **LAND OWNERSHIP**

The land in the project service is primarily private farms, ranches, and some individual home sites. All of the agricultural land serviced by the Company is privately owned.

### **WATER RIGHTS**

A consideration of water rights, and records of water diversion, provide the primary bases for determination of design discharges. The Larimer & Weld system holds some of the earlier rights on the Cache la Poudre River, A review of diversion records for the past ten years has shown that the canal regularly diverts direct river flows to the maximum decreed flow rate. Direct flow decrees associated with the Larimer & Weld diversion are as follows:

<b>Order No.</b>	<b>Decreed Rate</b>	<b>Decree Date</b>	<b>Cumulative</b>
10	3.00	1884	3.00
16	1.47	1884	4.47
21	16.67	1884	21.14
45	75.00	1884	96.14
73	54.33	1884	150.47
88	571.00	1884	721.47

Total water delivered through the Larimer & Weld system averages approximately 90,000 acre feet per year.

### **NEED FOR THE PROJECT**

The need for this project was largely covered in Project Overview at the beginning of this application. Additionally, the obvious condition of the structures speaks for itself. There are some significant safety advantages which will be realized. Particularly in Phase II when a bridge is put across the trashrack to enable the safe removal of debris. The dam structure will be substantially changed, particularly lowering it, which will increase river flows and add a degree of health to the River overall. This, of course, is an advantage to the River and the system, and not just particularly to LWIC.

# ENGINEER'S COST ESTIMATE

## ENGINEER'S ESTIMATE (PRELIMINARY - 90%)

Project: LWIC Headgate Structure Rehabilitation Project

Date: June 30, 2016

Item Number	Spec #	Description	Estimated Quantity	Unit	Unit Price (\$)	Bid Price (\$)
<b>BID WORK:</b>						
<b>Miscellaneous:</b>						
1	CDOT 626	Mobilization, Bonds and Insurance	1	LS	\$30,000.00	\$30,000
2	TBD	Utility Locates	1	LS	\$800.00	\$800
3	CDOT 625	Construction Survey	1	LS	\$3,000.00	\$3,000
4	CDOT 201	Clearing and Grubbing	1	LS	\$2,000.00	\$2,000
5	TBD	Dewatering	1	LS	\$15,000.00	\$15,000
6	TBD	Materials Testing	1	LS	\$1,440.00	\$1,440
7	CDOT 213	Erosion Control	1	LS	\$2,500.00	\$2,500
8	CDOT 209	Dust Control	1	LS	\$450.00	\$450
9	CDOT 212	Seeding (Native)	2.00	AC	\$1,250.00	\$2,500
10	CDOT 620	Sanitary Facilities	1	EA	\$500.00	\$500
11	CDOT 607	Wire Fence	1	LS	\$1,350.00	\$1,350
<b>Subtotal:</b>						<b>\$59,540</b>
<b>Demolition:</b>						
12	CDOT 202	Removal of Structure	1	LS	\$30,000.00	\$30,000
13	CDOT 202	Remove and Relocate Structure (Precast Bldg.)	1	LS	\$10,000.00	\$10,000
<b>Subtotal:</b>						<b>\$40,000</b>
<b>Earthwork:</b>						
14	CDOT 203	Embankment Material (C.I.P.) (Import Fill)	1,050	CY	\$10.00	\$10,500
15	CDOT 206	Structure Excavation	382	CY	\$15.00	\$5,730
16	CDOT 206	Structure Backfill (Class 1)	263	CY	\$25.00	\$6,575
17	CDOT 506	Riprap (Class 12/12" d50)	70	CY	\$85.00	\$5,950
18	TBD	Aggregate Base Course (Class 5 or 6)	25	TON	\$36.00	\$900
<b>Subtotal:</b>						<b>\$29,655</b>
<b>Structures:</b>						
19	CDOT 508	Timber Roofing w/ Metal Sheathing	216	SF	\$9.00	\$1,944
20	CDOT 509	Pedestrian Steel Handrail	14	LF	\$30.00	\$420
21	CDOT 509	Traffic Steel Rubrail	99	LF	\$37.50	\$3,713
22	CDOT 515	Concrete Sealer (SikaTop Seal 107)	187	SY	\$18.00	\$3,366
23	CDOT 601	Concrete Class D	190	CY	\$400.00	\$76,000
24	CDOT 601	Concrete Masonry Wall	400	SF	\$22.00	\$8,800
25	CDOT 602	Reinforcing Steel	28,372	LB	\$0.55	\$15,605
26	CDOT 900	Steel Door	1	EA	\$600.00	\$600
27	CDOT 900	Windows	2	EA	\$300.00	\$600
28	TBD	Reposition Concrete 2'x2'x6" Block Wall	1	LS	\$5,200.00	\$5,200
<b>Subtotal:</b>						<b>\$116,247</b>
<b>Electrical and Controls:</b>						
29	TBD	Temporary Electrical Service	1	LS	\$1,250.00	\$1,250
30	TBD	Electrical and Controls Demolition and Building Equipment Decommissioning for Storage	1	LS	\$3,600.00	\$3,600
31	TBD	Electrical Service and Utility Wiring for New Building	1	LS	\$7,450.00	\$7,450
32	TBD	External Conduit, Pullboxes and Wire Installation	1	LS	\$13,900.00	\$13,900
<b>Subtotal:</b>						<b>\$26,200</b>

**TOTAL BID PRICE:**

**\$271,642.10**



**ENGINEER'S ESTIMATE**  
(PRELIMINARY - 90%)

Project: LWIC Headgate Structure Rehabilitation Project  
Date: June 30, 2016

Item Number	Spec #	Description	Estimated Quantity	Unit	Unit Price (\$)	Bid Price (\$)
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**VENDOR WORK:**

**Water Control Gates and Operators (Parker Construction and Machine of Fort Collins):**

1	TBD	6'W x 4'H Stainless Steel Roller Gates	6	EA	\$31,900.00	\$191,400.00
2	TBD	Extra Gate Leaf for Above	1	EA	\$10,375.00	\$10,375.00
3	TBD	Upstream Skirt	1	LS	\$15,200.00	\$15,200.00
4	TBD	Anchor Bolt Assembly	1	LS	\$3,700.00	\$3,700.00
5	TBD	Cylinder Encasement	6	EA	\$2,700.00	\$16,200
6	TBD	Hydraulic Lines	1	LS	\$13,250.00	\$13,250
7	TBD	Gate Position Indicators	6	EA	\$1,725.00	\$10,350
8	TBD	Battery Back Up Unit	1	LS	\$3,750.00	\$3,750
9	TBD	Hydraulic Power Unit (Expandable)	1	LS	\$33,800.00	\$33,800
10	TBD	Hydraulic Oil	1	LS	\$2,147.00	\$2,147

**Subtotal: \$300,172**

**Controls and Automation (PCM, Robben Electric, Programming Consultant TBD)**

11	TBD	Hydraulic Controls Interface	1	LS	\$25,000.00	\$25,000
12	TBD	Closed Loop Automation (Non-SCADA)	1	LS	\$17,000.00	\$17,000
13	TBD	Automation Integration	1	LS	\$7,500.00	\$7,500
14	TBD	River Level Sensor Station (Closed Loop)	1	LS	\$8,800.00	\$8,800
15	TBD	High Ditch Sensor Station	1	LS	\$2,700.00	\$2,700
16	TBD	Existing System Removal and Reinstallation	1	LS	\$7,200.00	\$7,200
17	TBD	Accumulators (10 Gallon) (Upgrade)	2	EA	\$5,000.00	\$10,000
18	TBD	3HP Pump and 24V Pump (Upgrade)	1	LS	\$700.00	\$700
19	TBD	SCADA Equipment (Sensors, Wiring, PLC)	1	LS	\$12,300.00	\$12,300
20	TBD	SCADA Interface Programming	1	LS	\$12,000.00	\$12,000
21	TBD	Sutron (Upgraded Unit)	2	EA	\$1,300.00	\$2,600
22	TBD	Cylinder Position Sensor Encasement	6	EA	\$700.00	\$4,200
23	TBD	As-Built Schematics of Control System	1	LS	\$2,500.00	\$2,500

**Subtotal: \$112,500**

**TOTAL GATE, OPERATORS AND CONTROLS PRICE:**

**\$412,672**

**TOTAL PROJECT ESTIMATE:**

**\$684,314**

## IMPLEMENTATION SCHEDULE

The following schedule is proposed for implementation of the project.

Task	Target Completion Date
Feasibility Study	July 10, 2016
Loan from CWCB	September 30, 2016
Anderson Engineering	
Design	October 5, 2016
Start Construction	November 1, 2016
Complete Construction	March 30, 2017

## **FUND REQUIREMENT SCHEDULE**

The expected fund requirement schedule for the project, with an estimated project total cost of approximately \$750,000.00, is shown in the Engineer's Cost Estimates herein above.

## **FINANCIAL PLAN**

The Larimer & Weld Irrigation Company proposes to apply for a \$675,000.00 loan from the Colorado Water Conservation Board (CWCB) for 30 years at approximately 1.7% interest. The remainder of the project cost, the 1% loan origination fee, and payments into the 10% reserve would be paid by available and ongoing generated cash.

Revenue for operations and payment of loans is derived from assessments on 1,419 shares of outstanding stock and income from running charges and frack water rentals. Assessments are presented to stockholders and approved at the annual stockholders meeting held in January of each year. The 2016 assessment is \$350.00 per share. Assessments have been \$350.00 since 2011 and this loan will not require an adjustment.

The financial condition of the Company is solid at the present time. The Company has no debt, other than the approximately \$2,000,000.00 in CWCB loans.

## **CREDIT WORTHINESS**

The Company currently has only two outstanding loans from CWCB, which total approximately \$2M. The Company has a long term relationship with the Farmers Bank in Ault and has the ability to borrow money as required to conduct their normal business if needed.

## **COLLATERAL**

The Larimer & Weld Irrigation Company can offer the following collateral for the CWCB loan.

1. The revenue from assessments as allowed by the Company Bylaws and Articles of Incorporation.
2. A certificate of deposit account in the amount of one annual payment to be held by the State Treasurer.
3. The project itself, and other Company facilities.

## **SOCIAL, ECONOMIC, AND PHYSICAL IMPACTS**

The project will have no significant social impacts as none of the facilities are utilized for recreation. No additional recreation or other activities are created by the project. However, this updated gate project offers improved operation and enhanced protection for the Dry Creek Flood Project.

The project will have no significant physical impacts except in the immediate vicinity of the construction. These impacts will be minor in nature and will affect only small areas of less than one acre.

## **PERMITTING**

The Company and the Engineer believe no Environmental Assessment (EA) or Environmental Impact Statement (EIS) will be required. All work is associated with agricultural projects and all work is confined to the existing ditch. The Corps of Engineers has approved this project as being exempt from 404 permitting.

**THE DOW LAW FIRM, LLC**  
ATTORNEYS AND COUNSELORS AT LAW

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OF COUNSEL

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\* ALSO ADMITTED TO PRACTICE LAW IN NEBRASKA

**MEMORANDUM**

*Via Email: jonathan.hernandez@state.co.us*

To: Jonathan Hernandez

From: Mayo Sommermeyer

Re: LWIC/ CWCB—Poudre River Dam & Offtake Project

Date: August 17, 2016

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Dear Mr. Hernandez:

Further to your memo to us of August 4 seeking additional information, we respectfully supply the following. I have tried to follow your itemized list per your August 4 memo for clarity and ease of incorporating this information into previous submissions.

**1) Provide a background on the existing structure. When was it built? What repairs or improvements have occurred over the years?**

The structure off the River was probably originally built in the 1870s. However, we have no records going back that far. The Company was significantly expanded in the early 1920s, and the canal structure as it now generally appears was built in 1921. Over the years, it has had numerous repairs, mostly in the nature of patching. Motors and gates have been replaced as necessary, and they now need to be replaced again. There was significant damage to some of the gates as a result of the 2013 flood, including the motors being fully submerged and having to be rebuilt and retrofitted. The electric motors are particularly susceptible to damage and failure in the event of a flood. The project anticipates replacing the mechanism hydraulically, eliminating the risk of electrical failure. Approximately 60% of the total water delivered by our system goes through these gates. This amounts to about 54,000-60,000 acre feet per year. These gates handle River water, CBT water, and trade water with other companies.

**2) Please expand on the Dry Creek Flood Control Project and the role this structure on the Poudre River plays in that plan. Does Fort Collins offer any funds covering improvements made because of the flood control project?**

The Dry Creek Flood Control Project is intended to provide for flood waters entering the Larimer and Weld Canal during a 100-year flood on Dry Creek. A SCADA system has been installed by the City of Fort Collins to track the water and flood flows in Dry Creek and close the headgates from the Poudre River as needed to create additional capacity in the canal. This project also assists the LWIC by reducing the liability of canal breaching from storm flows entering the canal. The City of Fort Collins provides for all SCADA controls/equipment, programming and maintenance of the system.

It should be kept in mind that the Dry Creek Flood Control Project was an alternative to the City of Fort Collins having to create substantial structures, bridges, and other ways to route flood water through the northern part of Fort Collins, which is highly populated and developed. This would include at least one large trailer park near the big ditch and College Avenue. If the gate system failed to close in the event of a flood, it would be disastrous to the ditch, as well as cause flooding that would otherwise be handled by the system. It cannot be emphasized to much how critical this gate operation is to the protection afforded by the Dry Creek Flood Control Project.

**3a) An alternative that must be considered is the No Action alternative. Please expand what happens if the nothing is done. A few years of operation before water rights are impacted or will it be felt immediately?**

If nothing is done, the LWIC has increased risk in breaching the canal and the liability associated with the breach on adjacent property owners. Flood waters that exceed the banks of the river will be captured by the canal. In addition, the LWIC facilities largely depend on accurate operation of the headgates at this location. These gates and the structure are deteriorating with exposed rebar, rusted gates, and scour on the downstream portion of the canal. Replacement of this headgate structure is necessary to maintain the deliveries to the water users for the next 50 years.

The safety and necessity of these gates operating flawlessly is primarily covered in question 2 above.

**3b) Another alternative to the selected project is to do all three phases at once, rather than over three years. Please provide a description as to why that alternative was not selected.**

The principal reason for completing the project in phases is to make sure that each phase can be completed within the irrigation off season. The intent is to provide a buffer so that potential delays due to weather or unforeseen problems with construction do not affect getting the structure operational when storage water becomes available the following year. The complexity of the first and third phases, in particular, contributed to the phasing plan. The construction of all three phases would not likely be completed within the late fall/winter months and be functional for the irrigation season.

**4a) Please describe the design considerations that went into sizing of the headgates. What is the maximum flow rate required by: Company's decrees, carriage flows for other companies, and Dry Creek Flood Control Project? What will be the maximum flow rate of the new gates?**

The intent of the design was to maintain the existing flow capacity, regardless of decreed flow rates. The existing flow capacity through the gates with maximum impoundment behind the dam, is approximately 925 cfs. A number of different gate configurations involving fewer larger gates and combinations of large and small gates were evaluated with this goal in mind. The LWIC Board elected to maintain the current number and configuration to keep the gates interchangeable for operation and maintenance purposes. There is no flow rate required by the Dry Creek Flood Control Project; it is simply the capacity of the canal at the location of Dry Creek.

**4b) Please describe any design considerations that went into gate type selection and controls (electric vs hydraulic).**

LWIC has experienced problems in the past during large floods with failure of the electrically operated gates. The failures have taken a couple of forms. The first type is a general power outage which results in the gates having to be mechanically operated. Mechanical operation may not always be feasible when the diversion structure is inundated and is painfully slow with Rotork type operators. The second type is infiltration of water while the electric operators are submerged during a flood. In this case the affected operators are out of service until the units are disassembled and serviced. After the September 2013 flood, four of the six operators had to be shipped to the manufacturer to be rebuilt.

Hydraulic operators were chosen because the electric components (pumps) can be elevated and isolated within the control house to protect them from flooding. The hydraulic cylinders that operate the gates are unaffected by inundation. Each gate may also be operated from within the elevated control house by means of a 12-volt back up pump system or a high volume hand pump.

**4c) Please describe any design improvements the new structure will have (such as wider bridge access for equipment).**

Including the already mentioned access improvements which will facilitate maintenance of the headgate structure, the following improvements are included in the new design:

1. Enlarged and elevated control building. Enlarged building allows for sensitive controls and operational equipment to be kept inside out of the elements and safe from vandalism. Elevating the building and the equipment inside helps protect against flooding.
2. High strength concrete, epoxy coated rebar and special coating will protect the structure from icing conditions during wintertime diversions.
3. Gate leaves and rollers will be manufactured from materials that are highly resistant to corrosion.
4. Hydraulic gate operators, normally powered by a 240VAC pump, will have both 12V and manual backup pump systems.

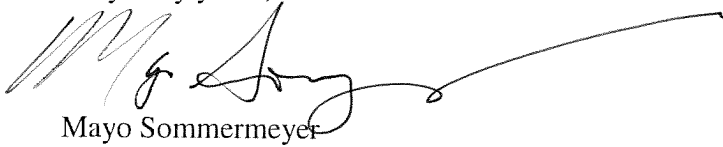
**4d) Will anything from existing structure be reused or will this be a completely new structure? If it was possible to reuse some items, but decided against it, please provide Company's rational.**

The only items that we anticipate being able to reuse will be salvaging of the electric motors and operators. These electric screw jack operators do work very well in certain circumstances, and the motors are in good shape. We believe these will be salvaged and stored in our yard pending sale to other companies that may have need of them.

As always, thank you very much for your highly professional help as we move ahead with this.

Thank you.

Very truly yours,

A handwritten signature in black ink, appearing to read 'Mayo Sommermeyer', with a long, sweeping horizontal line extending to the right.

Mayo Sommermeyer

MS/sjm

cc: Lynn Fagerberg  
Kim Nelson  
Brad Anderson  
Jeff Smith

**ENGINEER'S ESTIMATE**  
(PRELIMINARY - 90%)

**Project:** LWIC Headgate Structure Rehabilitation Project  
**Date:** June 30, 2016

Item Number	Spec #	Description	Estimated Quantity	Unit	Unit Price (\$)	Bid Price (\$)
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**BID WORK:**

**Miscellaneous:**

1	CDOT 626	Mobilization, Bonds and Insurance	1	LS	\$30,000.00	\$30,000
2	TBD	Utility Locates	1	LS	\$800.00	\$800
3	CDOT 625	Construction Survey	1	LS	\$3,000.00	\$3,000
4	CDOT 201	Clearing and Grubbing	1	LS	\$2,000.00	\$2,000
5	TBD	Dewatering	1	LS	\$15,000.00	\$15,000
6	TBD	Materials Testing	1	LS	\$1,440.00	\$1,440
7	CDOT 213	Erosion Control	1	LS	\$2,500.00	\$2,500
8	CDOT 209	Dust Control	1	LS	\$450.00	\$450
9	CDOT 212	Seeding (Native)	2.00	AC	\$1,250.00	\$2,500
10	CDOT 620	Sanitary Facilities	1	EA	\$500.00	\$500
11	CDOT 607	Wire Fence	1	LS	\$1,350.00	\$1,350

**Subtotal: \$59,540**

**Demolition:**

12	CDOT 202	Removal of Structure	1	LS	\$30,000.00	\$30,000
13	CDOT 202	Remove and Relocate Structure (Precast Bldg.)	1	LS	\$10,000.00	\$10,000

**Subtotal: \$40,000**

**Earthwork:**

14	CDOT 203	Embankment Material (C.I.P.) (Import Fill)	1,050	CY	\$10.00	\$10,500
15	CDOT 206	Structure Excavation	382	CY	\$15.00	\$5,730
16	CDOT 206	Structure Backfill (Class 1)	263	CY	\$25.00	\$6,575
17	CDOT 506	Riprap (Class 12/12" d50)	70	CY	\$85.00	\$5,950
18	TBD	Aggregate Base Course (Class 5 or 6)	25	TON	\$36.00	\$900

**Subtotal: \$29,655**

**Structures:**

19	CDOT 508	Timber Roofing w/ Metal Sheathing	216	SF	\$9.00	\$1,944
20	CDOT 509	Pedestrian Steel Handrail	14	LF	\$30.00	\$420
21	CDOT 509	Traffic Steel Rubrail	99	LF	\$37.50	\$3,713
22	CDOT 515	Concrete Sealer (SikaTop Seal 107)	187	SY	\$18.00	\$3,366
23	CDOT 601	Concrete Class D	190	CY	\$400.00	\$76,000
24	CDOT 601	Concrete Masonry Wall	400	SF	\$22.00	\$8,800
25	CDOT 602	Reinforcing Steel	28,372	LB	\$0.55	\$15,605
26	CDOT 900	Steel Door	1	EA	\$600.00	\$600
27	CDOT 900	Windows	2	EA	\$300.00	\$600
28	TBD	Reposition Concrete 2'x2'x6' Block Wall	1	LS	\$5,200.00	\$5,200

**Subtotal: \$116,247**

**Electrical and Controls:**

29	TBD	Temporary Electrical Service	1	LS	\$1,250.00	\$1,250
30	TBD	Electrical and Controls Demolition and Building Equipment Decommissioning for Storage	1	LS	\$3,600.00	\$3,600
31	TBD	Electrical Service and Utility Wiring for New Building	1	LS	\$7,450.00	\$7,450
32	TBD	External Conduit, Pullboxes and Wire Installation	1	LS	\$13,900.00	\$13,900

**Subtotal: \$26,200**

**TOTAL BID PRICE:**

**\$271,642.10**



**ENGINEER'S ESTIMATE**  
(PRELIMINARY - 90%)

**Project:** LWIC Headgate Structure Rehabilitation Project  
**Date:** June 30, 2016

Item Number	Spec #	Description	Estimated Quantity	Unit	Unit Price (\$)	Bid Price (\$)
-------------	--------	-------------	--------------------	------	-----------------	----------------

**VENDOR WORK:**

**Water Control Gates and Operators (Parker Construction and Machine of Fort Collins):**

1	TBD	6'W x 4'H Stainless Steel Roller Gates	6	EA	\$31,900.00	\$191,400.00
2	TBD	Extra Gate Leaf for Above	1	EA	\$10,375.00	\$10,375.00
3	TBD	Upstream Skirt	1	LS	\$15,200.00	\$15,200.00
4	TBD	Anchor Bolt Assembly	1	LS	\$3,700.00	\$3,700.00
5	TBD	Cylinder Encasement	6	EA	\$2,700.00	\$16,200
6	TBD	Hydraulic Lines	1	LS	\$13,250.00	\$13,250
7	TBD	Gate Position Indicators	6	EA	\$1,725.00	\$10,350
8	TBD	Battery Back Up Unit	1	LS	\$3,750.00	\$3,750
9	TBD	Hydraulic Power Unit (Expandable)	1	LS	\$33,800.00	\$33,800
10	TBD	Hydraulic Oil	1	LS	\$2,147.00	\$2,147

**Subtotal: \$300,172**

**Controls and Automation (PCM, Robben Electric, Programming Consultant TBD)**

11	TBD	Hydraulic Controls Interface	1	LS	\$25,000.00	\$25,000
12	TBD	Closed Loop Automation (Non-SCADA)	1	LS	\$17,000.00	\$17,000
13	TBD	Automation Integration	1	LS	\$7,500.00	\$7,500
14	TBD	River Level Sensor Station (Closed Loop)	1	LS	\$8,800.00	\$8,800
15	TBD	High Ditch Sensor Station	1	LS	\$2,700.00	\$2,700
16	TBD	Existing System Removal and Reinstallation	1	LS	\$7,200.00	\$7,200
17	TBD	Accumulators (10 Gallon) (Upgrade)	2	EA	\$5,000.00	\$10,000
18	TBD	3HP Pump and 24V Pump (Upgrade)	1	LS	\$700.00	\$700
19	TBD	SCADA Equipment (Sensors, Wiring, PLC)	1	LS	\$12,300.00	\$12,300
20	TBD	SCADA Interface Programming	1	LS	\$12,000.00	\$12,000
21	TBD	Sutron (Upgraded Unit)	2	EA	\$1,300.00	\$2,600
22	TBD	Cylinder Position Sensor Encasement	6	EA	\$700.00	\$4,200
23	TBD	As-Built Schematics of Control System	1	LS	\$2,500.00	\$2,500

**Subtotal: \$112,500**

**TOTAL GATE, OPERATORS AND CONTROLS PRICE:**

**\$412,672**

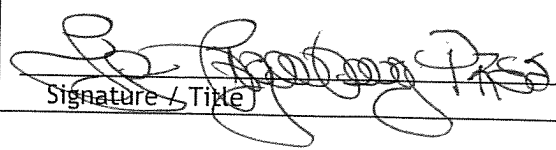
**TOTAL PROJECT ESTIMATE:**

**\$684,314**

**COLORADO**Colorado Water  
Conservation Board

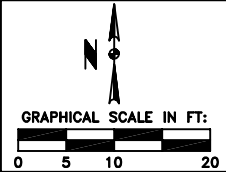
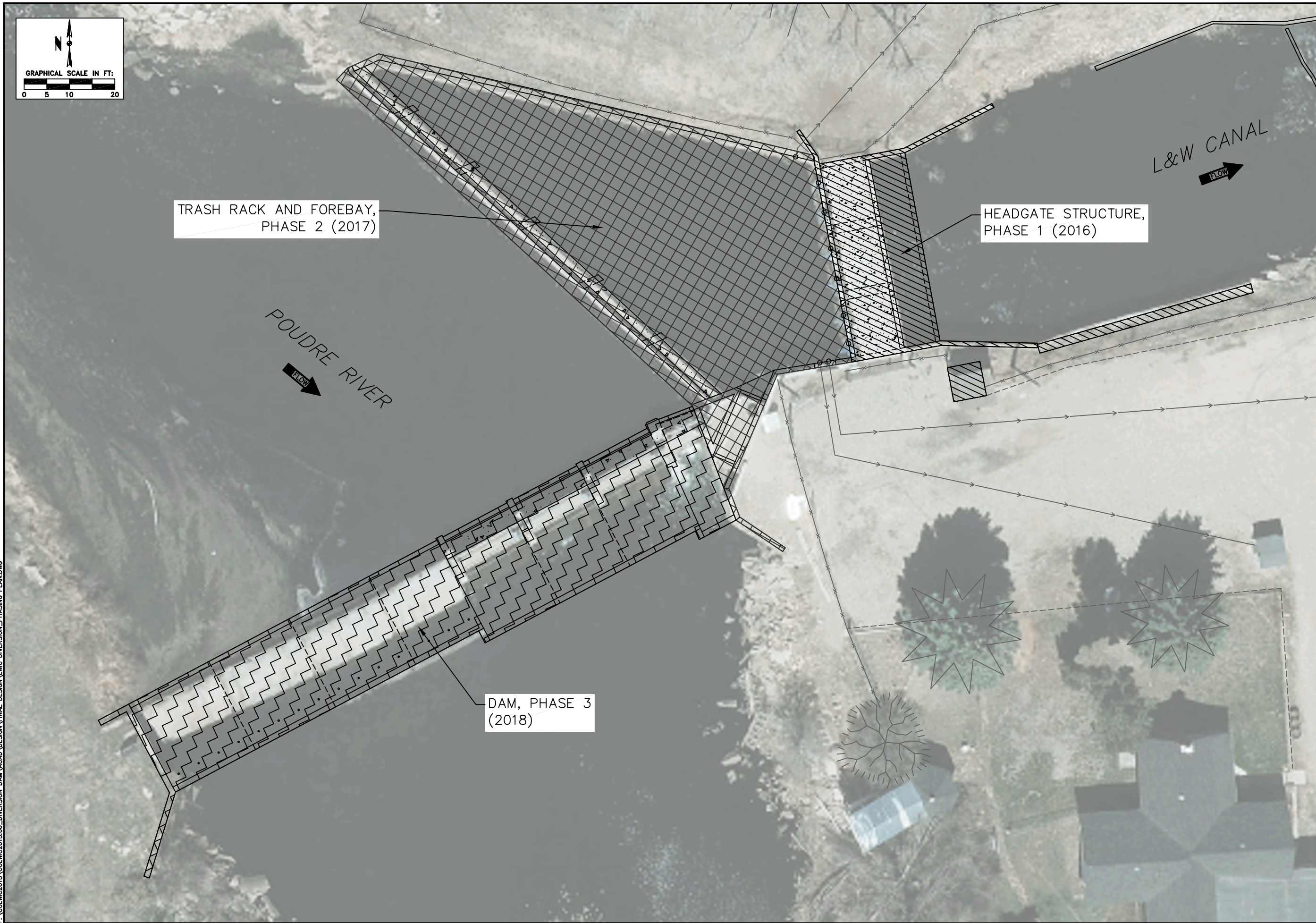
Department of Natural Resources

**Water Project Loan Program**

<b>Application Type</b>	
Prequalification (Attach 3 years of financial statements) <input type="checkbox"/> <b>X</b> Loan Approval (Attach Loan Feasibility Study)	
<b>Agency/Company Information</b>	
Company / Borrower Name: Larimer & Weld Irrigation Company	
Authorized Agent & Title: Lynn Fagerberg, President	
Address: 106 Elm Street, Eaton, CO 80615	
Phone: (970) 454-3377	Email: information@eatonditch.com
Organization Type: <input checked="" type="checkbox"/> Ditch Co, <input type="checkbox"/> District, <input type="checkbox"/> Municipality other: _____	Incorporated? <input checked="" type="checkbox"/> YES NO
County: Larimer & Weld	Number of Shares/Taps: 1419
Water District: Division 1, District 3	Avg. Water Diverted/Yr _____ acre-feet
Number of Shareholders/Customers Served: 361	Current Assessment per Share \$350.00 (Ditch Co)
Federal ID Number: 84-0248330	Average monthly water bill \$ N/A (Municipality)
<b>Contact Information</b>	
Project Representative: Jeff Smith	
Phone: (970) 222-0252	Email: jsmith@eatonditch.com
Engineer: Brad Anderson, P.E.	
Phone: (970) 226-0120	Email: brad.anderson@acewater.com
Attorney: Mayo Sommermeyer	
Phone: (970) 420-9775	Email: mayosomm@gmail.com
<b>Project Information</b>	
Project Name: Poudre River Dam and Offtake Project	
Brief Description of Project: (Attach separate sheets if needed)	
Phase 1—Replace headgate structure, six gates, and control house	
General Location: (Attach Map of Area)	
Estimated Engineering Costs: \$50,000.00	Estimated Construction Costs: \$684,000.00
Other Costs (Describe Above): \$56,000.00 Contingency \$50,000.00, Loan Origination Fee \$6,750.00	Estimated Total Project Costs: \$750,000.00
Requested Loan Amount: \$675,000.00 (Limit 90% of Total Project Costs)	Requested Loan Term (10, 20, or 30 years): 30 Years
Project Start Date(s) Design: 90% Completed Construction: October, 2016	
<b>Signature</b>	
Signature / Title:  Date: 7-8-16	Return to: Finance Section Attn: Anna Mauss 1313 Sherman St #718 Denver, CO 80203 Ph. 303/866.3449 e-mail: anna.mauss@state.co.us



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ANDERSON CONSULTING ENGINEERS, INC.  
Civil • Water Resources • Environmental  
375 East Horsetooth Road, Building 5, Fort Collins, CO 80525  
Phone (970) 225-0120 / Fax (970) 225-0121  
www.andersoneng.com



## PHASING PLAN

## LWIC POUDRE RIVER DIVERSION STRUCTURE REHABILITATION

DRAWN BY:	SRP
DESIGNED BY:	SRP
CHECKED BY:	BAA
PROJECT NUMBER: COLWIC2013.06	
DATE: 6/21/16	
FIGURE: FIGURE 1	



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CONSTRUCTION DRAWINGS FOR THE  
LWIC HEADGATE STRUCTURE REHABILITATION PROJECT  
FORT COLLINS, CO  
JUNE 24, 2016

PRELIMINARY  
90%



SHEET INDEX		
SHEET NO.	INDEX NO.	SHEET TITLE
GENERAL		
01	G1	COVER SHEET
02	C1	SITE PLAN
03	C2	PROJECT INFORMATION
04	C3	GEOTECHNICAL BORING LOCATIONS AND LOG OF B-1
05	C4	GEOTECHNICAL BORING LOGS (BORINGS B-1 & B-2)
06	C5	GEOTECHNICAL BORING LOGS (BORING B-4)
07	C6	GEOTECHNICAL BORING LOGS (BORING B-5)
08	C7	ACCESS PLAN
STRUCTURAL		
09	S1	STRUCTURAL DEMOLITION PLAN
10	S2	STRUCTURAL NOTES
11	S3	STRUCTURAL PLAN
12	S4	ABUTMENT AND WING WALL FOOTING PLAN
13	S5	SECTIONS AND ELEVATIONS
14	S6	CONTROL BUILDING PLAN, NOTES AND ELEVATIONS
15	S7	CONTROL BUILDING ELEVATIONS AND NOTES
16	S8	STRUCTURAL DETAILS 1
17	S9	STRUCTURAL DETAILS 2
18	S10	STRUCTURAL DETAILS 3
19	S11	RAILING PLAN
20	S12	GENERAL DETAILS
ELECTRICAL		
21	E1	ELECTRICAL AND CONTROLS DEMOLITION PLAN
22	E2	ELECTRICAL AND CONTROLS DEMOLITION DETAILS
23	E3	ELECTRICAL PLAN
24	E4	CONTROL BUILDING ELECTRICAL DETAILS
25	E5	ELECTRICAL DETAILS

P:\COL\WC2013\COL\WC2013.06\_DIVERSION DAM\ACAD\DESIGN\FINAL DESIGN\LWIC DIVERSION COVER SHEET.DWG

REVISIONS:-----

**OWNER:**  
LARIMER AND WELD  
IRRIGATION COMPANY  
106 ELM AVENUE  
EATON, CO 80615

**DESIGN ENGINEER:**  
ANDERSON CONSULTING ENGINEERS, INC.  
375 EAST HORSETOOTH ROAD, BUILDING 5  
FORT COLLINS, CO 80525  
PHONE (970) 226-0120



**STRUCTURAL ENGINEER:**  
RELIABLE ENGINEERING, LLC  
5324 E. 130TH WAY  
THORNTON, CO 80241  
PHONE (970) 252-4536



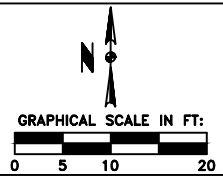
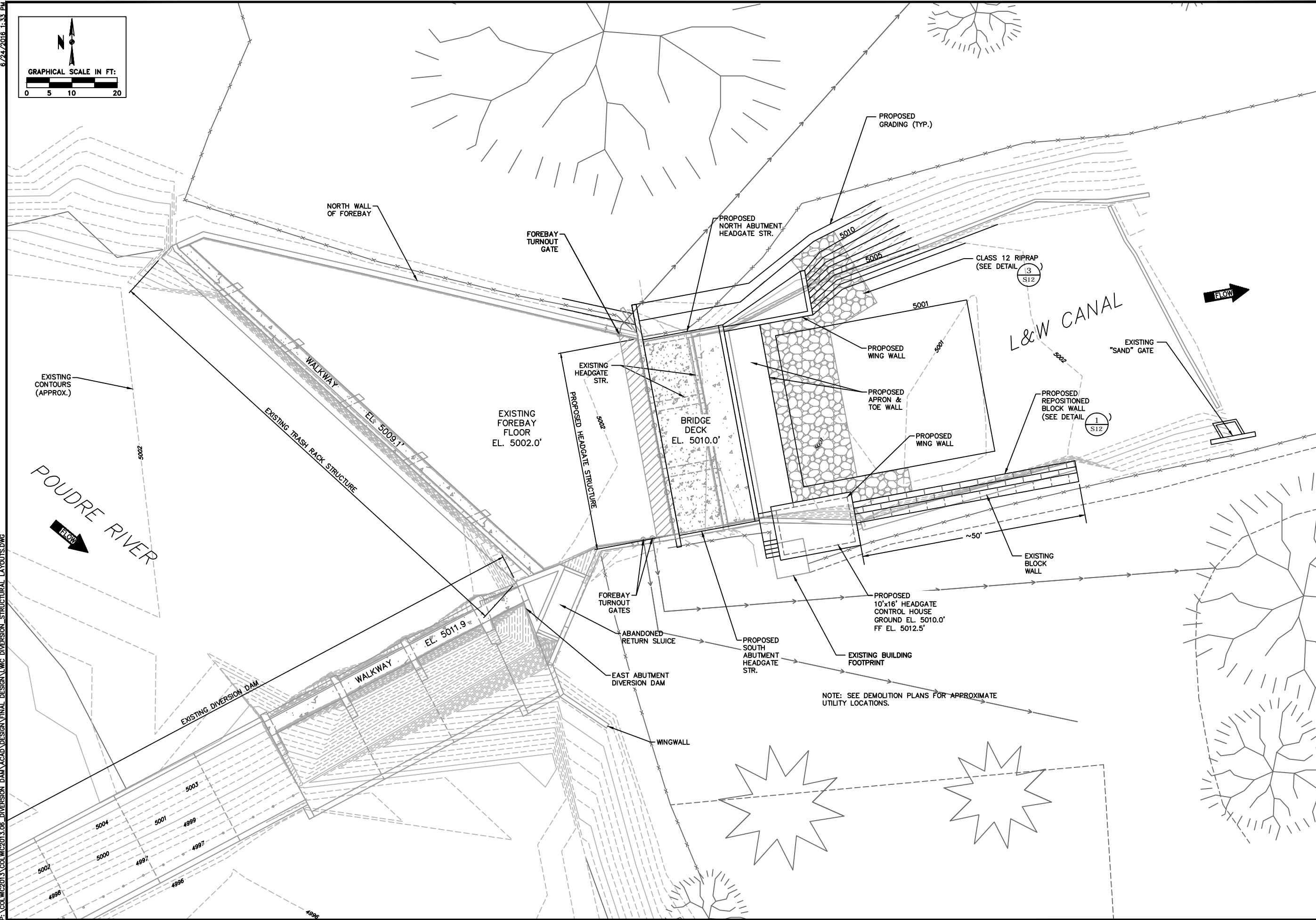
PRELIMINARY

SHEET: 01 INDEX: G1



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Anderson Consulting Engineers, Inc.  
Civil Water Resources Environmental  
375 East Horsetooth Road, Building 5, Fort Collins, CO 80525  
Phone: (970) 226-4121  
www.anderson-engineers.com



SITE PLAN

LWIC HEADGATE  
STRUCTURE  
REHABILITATION PROJECT

PRELIMINARY

DRAWN BY:	SRP
DESIGNED BY:	SRP
CHECKED BY:	BAA
PROJECT NUMBER: COLWIC2013.06	
DATE: 06/03/16	
SHEET: 02	INDEX: C1

GENERAL NOTES	
1.	ALL CONSTRUCTION SHALL CONFORM TO THESE PLANS, THE SPECIFICATIONS WHICH ARE INCLUDED WITH THE CONTRACT DOCUMENTS.
2.	ALL MATERIALS AND WORKMANSHIP SHALL BE SUBJECT TO INSPECTION BY THE OWNER/ENGINEER. THE OWNER/ENGINEER RESERVE THE RIGHT TO ACCEPT OR REJECT ANY SUCH MATERIALS AND WORKMANSHIP THAT DOES NOT CONFORM TO THE STANDARDS AND SPECIFICATIONS SET FORTH HEREIN. SUBSTITUTIONS SHALL REQUIRE THE ENGINEER'S WRITTEN APPROVAL.
3.	IT SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR TO VERIFY THE EXISTENCE AND LOCATION OF ALL UNDERGROUND UTILITIES WITHIN THE WORK AREA AND COORDINATE CONSTRUCTION SCHEDULES WITH THESE UTILITY OWNERS. THE CONTRACTOR SHALL BE RESPONSIBLE FOR PROTECTING UTILITIES DURING CONSTRUCTION.
4.	THE CONTRACTOR SHALL PROVIDE ALL CONSTRUCTION STAKING FOR THIS PROJECT. ALL SURVEYING MUST BE PERFORMED UNDER THE SUPERVISION OF A COLORADO LICENSED SURVEYOR.
5.	THE CONTRACTOR SHALL RESTORE ALL DISTURBED AREAS TO THEIR ORIGINAL CONDITION OR BETTER AS DESIGNATED BY THE OWNER.
6.	REINFORCEMENT BAR LAP LENGTHS NOT SHOWN ON THE DRAWINGS SHALL BE PER ACI STANDARDS.
7.	THE CONTRACTOR SHALL NOTIFY THE OWNER IMMEDIATELY OF ANY FIELD CONDITION NOT CONSISTENT WITH THE CONTRACT DOCUMENTS.
8.	THE CONTRACTOR SHALL PROVIDE A TRAFFIC CONTROL PLAN TO THE OWNER FOR REVIEW PRIOR TO MOBILIZATION AND SHALL OBTAIN ANY NECESSARY PERMITS AND TRAFFIC PLAN APPROVALS FROM THE APPROPRIATE AUTHORITIES.
9.	THE CONTRACTOR SHALL PROTECT ALL EXISTING STRUCTURES AND LANDSCAPING EXCEPT AS SHOWN ON THESE DRAWINGS, FROM DAMAGE BY EQUIPMENT OR CONSTRUCTION OPERATIONS. ALL STRUCTURES AND LANDSCAPING DAMAGED BY THE CONTRACTOR SHALL BE REMOVED AND REPLACED AT THE CONTRACTORS EXPENSE.
10.	THE CONTRACTOR SHALL PROVIDE EROSION CONTROL DURING CONSTRUCTION. THE CONTRACTOR SHALL PROVIDE A FINAL EROSION CONTROL PLAN TO THE APPROPRIATE GOVERNING AUTHORITY FOR REVIEW PRIOR TO MOBILIZATION. THE CONTRACTOR SHALL ALSO PREPARE AND MAINTAIN A STATE OF COLORADO APPROVED STORMWATER MANAGEMENT PLAN (SWMP).
11.	THE CONTRACTOR SHALL MAINTAIN A SAFE WORK AREA IN ACCORDANCE WITH ALL LOCAL, STATE AND FEDERAL REGULATIONS, AND SHALL PROVIDE ACCESS TO THE SITE FOR ALL EMERGENCY VEHICLES.
12.	THE ACCESS ROADS ADJACENT TO THE CONSTRUCTION AREA SHALL BE CLEANED OF DEBRIS GENERATED BY THE PROJECT BY THE CONTRACTOR AT THE EARLIEST OPPORTUNITY, OR IMMEDIATELY WHEN DEEMED NECESSARY BY THE OWNER FOR THE SAFETY OF TRAFFIC OR PEDESTRIANS, BUT IN NO CASE SHALL THE ROADS BE LEFT UNCLEANED AFTER THE COMPLETION OF THE DAY'S WORK. IT SHALL BE THE CONTRACTOR'S RESPONSIBILITY TO PROVIDE THE NECESSARY EQUIPMENT AND MATERIALS TO SATISFACTORILY CLEAN THE ADJACENT ROADWAYS AT NO ADDITIONAL COST TO THE PROJECT.
13.	THE PROJECT IS LOCATED IN A MAJOR DRAINAGE AREA, WHICH IS SUBJECT TO FLOODING DURING RAINFALL EVENTS. THE CONTRACTOR SHALL MAINTAIN A CONTINGENCY PLAN FOR THE POTENTIAL OF FLOODING. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE MAINTENANCE, MITIGATION, OR REPLACEMENT OF ALL EROSION PROTECTION AND DEWATERING FACILITIES THAT ARE DAMAGED OR WASHED AWAY BY FLOODING.
14.	CONTRACTOR IS RESPONSIBLE FOR ALL GEOTECHNICAL AND MATERIALS TESTING, INCLUDING CONCRETE STRENGTH TESTING REQUIRED BY THE PLANS AND SPECIFICATIONS. TESTING REPORTS SHALL BE SUBMITTED TO THE ENGINEER FOR REVIEW.
15.	CONTRACTOR MUST BE PREPARED TO DEAL WITH NUISANCE WATER (STORM WATER AND GROUND WATER) AND SHALL PROVIDE COFFERDAMS DIVERSION CULVERTS PUMPS AND OTHER EQUIPMENT NECESSARY TO DEWATER THE SITE FOR CONSTRUCTION. DEWATERING OPERATIONS SHALL BE CONTINUOUS UNTIL ALL STRUCTURES ARE COMPLETE. DEWATERING PRACTICES SHALL CONFORM TO PROJECT SPECIFICATIONS AND LOCAL, STATE AND FEDERAL REQUIREMENTS.

SURVEY NOTES:

- SURVEY COMPLETED BY:  
HAMMER LAND SURVEYING, INC.  
3050 67TH AVENUE, SUITE 200  
GREELEY, CO 80634  
PH: 970.535.9318
- BASIS OF BEARING: CONSIDERING THE LINE BETWEEN V 401 AND NGS MONUMENT F 4 LYING ON THE CAMPUS OF COLORADO STATE UNIVERSITY JUST EAST OF THE FORESTRY BUILDING AS BEARING SOUTH 07°21'32" WEST, 12123.74 FEET, WITH ALL OTHER BEARINGS CONTAINED HEREIN RELATIVE THERETO.
- HORIZONTAL AND VERTICAL DATUM IS TAKEN FROM NGS SURVEY MARK V 401, BEING AN ELEVATION OF 4977.81 FEET NAVD 88 DATUM. MONUMENT IS LYING IN THE NORTHWEST QUADRANT OF THE INTERSECTION OF COLLEGE AVENUE AND BRISTLECONE DRIVE. THE MARK IS A PUNCH HOLE, TOP CENTER OF A 6.7 M LONG STAINLESS STEEL ROD, ENCLOSED IN A 5 INCH PVC PIPE WITH LOGO LID CEMENTED INTO SIDEWALK. AT THE SOUTHEAST CORNER OF THE GREASE MONKEY PROPERTY. IT IS 72.2 FEET SOUTHEAST FROM THE SOUTHEAST CORNER OF GREASE MONKEY BUILDING, 42.3 FEET NORTH FROM THE CENTERLINE OF BRISTLECONE DRIVE, 38.4 FEET WEST FROM THE SOUTHERN NOSE OF A TRAFFIC ISLAND TO A SHOPPING CENTER.
- THESE DRAWINGS ARE AT MODIFIED STATE PLANE.
- ALL PROPERTY PINS, INTERSECTION MONUMENTS, AND SECTION CORNERS DISTURBED DURING CONSTRUCTION MUST BE REFERENCED AND REPLACED UNDER THE SUPERVISION OF A LICENSED SURVEYOR.
- THE SIZE, TYPE AND LOCATION OF ALL KNOWN UNDERGROUND UTILITIES ARE APPROXIMATE WHEN SHOWN ON THESE DRAWINGS. IT SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR TO VERIFY THE EXISTENCE OF ALL UNDERGROUND UTILITIES IN THE AREA OF THE WORK BEFORE COMMENCING NEW CONSTRUCTION. THE CONTRACTOR SHALL BE RESPONSIBLE FOR LOCATING ALL UNDERGROUND UTILITIES AND SHALL BE RESPONSIBLE FOR ALL UNKNOWN UNDERGROUND UTILITIES.
- ALL PROJECT CONTROL LISTED HEREON IS PROVIDED AS A COURTESY. IT IS THE RESPONSIBILITY OF THE RECIPIENT TO VERIFY THE ACCURACY OF THE COORDINATES AND ELEVATIONS SHOWN PRIOR TO USING THEM FOR ANY PURPOSES.

ABBREVIATIONS	
ACE	ANDERSON CONSULTING ENGINEERS, INC.
EL.	ELEVATION
INV.	INVERT
TYP.	TYPICAL
L.F.	LINEAR FEET
GB	GRADE BREAK
EOC	EDGE OF CONCRETE
EOA	EDGE OF ASPHALT
TOC	TOP OF CURB
TBW	TOP BACK OF WALK
FL	FLOW LINE
L.F.	LINEAR FEET
H	HIGH
W	WIDE
DIA.	DIAMETER
CL	CENTERLINE
N	NORTHING
E	EASTING
STA.	STATION
RCP	REINFORCED CONCRETE PIPE
RCBC	REINFORCED CONCRETE BOX CULVERT
HERCP	HORIZONTAL ELLIPTICAL RCP
DIP	DUCTILE IRON PIPE
FES	FLARED END SECTION
TRM	TURF REINFORCEMENT MAT
MH	MANHOLE
PI	POINT OF INFLECTION

MAPPING LEGEND	
	EXISTING CONTOUR (MINOR)
	EXISTING CONTOUR (MAJOR)
	PROPOSED CONTOUR
	EXISTING PROPERTY BOUNDARY
	EXISTING EASEMENT BOUNDARY
	EXISTING FENCE
	EXISTING STORM SEWER
	EXISTING SANITARY SEWER
	EXISTING WATER LINE
	EXISTING GAS LINE
	EXISTING IRRIGATION LINE
	EXISTING OVERHEAD ELECTRIC
	EXISTING OVERHEAD TELEPHONE
	UNDERGROUND ELECTRICAL POWER LINE
	UNDERGROUND TELEPHONE LINE
	UNDERGROUND FIBER OPTIC LINE
	FLOWLINE
	WATER WELL, FIRE HYDRANT, WATER VALVE
	WATER SHUTOFF, SERVICE AND METER
	WATER MARKER AND MANHOLE
	ELECTRIC METER, BOX AND VAULT
	POWER POLE, GUY WIRE, ELECTRIC PEDESTAL
	ELECTRIC MANHOLE, LIGHT POLE
	FIBER OPTIC VAULT AND MARKER
	TELEPHONE PEDESTAL, MARKER AND MANHOLE
	SANITARY MANHOLE, CLEAN OUT, CONTROL POINT
	SURVEY CONTROL BENCHMARK
	GEOTECHNICAL TEST HOLE
	DECIDUOUS / CONIFEROUS TREE
	BUSH / SHRUB
	PROPOSED TURF REINFORCEMENT MAT
	PROPOSED ROCK RIPRAP
	PROPOSED TRAILS



PROJECT INFORMATION

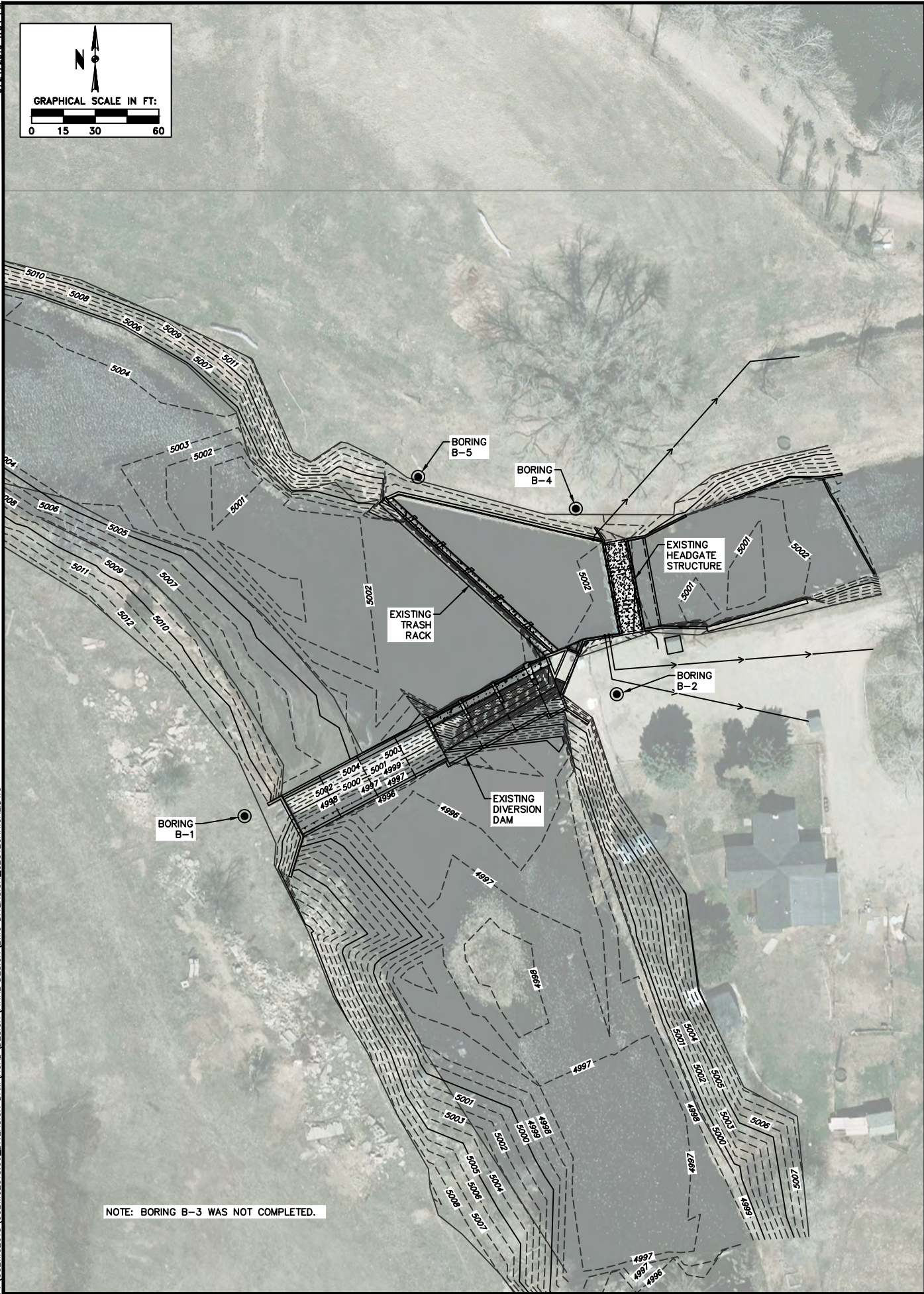
LWIC HEADGATE  
STRUCTURE  
REHABILITATION PROJECT

PRELIMINARY

DRAWN BY:	SRP
DESIGNED BY:	SRP
CHECKED BY:	BAA
PROJECT NUMBER: COLWIC2013.06	
DATE: 06/03/16	
SHEET: 03	INDEX: C2



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P:\COLWIC2013\COLWIC2013.06\_DIVERSION DAM\ACAD\DESIGN\FINAL DESIGN\LWIC DIVERSION GEOTECHNICAL.DWG



REVISIONS:-----

LARIMER AND WELD DIVERSION STRUCTURE IMPROVEMENTS												
FORT COLLINS, COLORADO												
PROJECT NO: 1152049		LOG OF BORING B-1 SHEET 1 OF 2					DATE: JUNE 2015					
RIG TYPE: CME55							WATER DEPTH					
FOREMAN: DG		START DATE		6/10/2015		WHILE DRILLING		5.5'				
AUGER TYPE: 4" CFA		FINISH DATE		6/10/2015		AFTER DRILLING		N/A				
SPT HAMMER: AUTOMATIC		SURFACE ELEV		N/A		24 HOUR		N/A				
SOIL DESCRIPTION		TYPE	D (FEET)	N (BLOW3/FT)	QU (PSF)	MC (%)	DD (PCF)	A-LIMITS		-200 (%)	SWELL	
								LL	PI		PRESSURE	% @ 500 PSF
COBBLES / GRAVEL / SAND medium dense silty sand seams with depth		CS	1									
			2									
			3									
			4									
			5	11	--	8.6	95.6					
SAND & GRAVEL (SP/GP) dense to very dense with cobbles		SS	6									
			7									
			8									
			9									
			10	47	--	8.8						
		SS	11									
			12									
			13									
			14									
			15	50/10"	--	15.9						
CLAYSTONE / SILTSTONE grey moderately hard to hard		CS	16									
			17									
			18									
			19									
			20	50/3.5"	9000+	8.3						
		SS	21									
			22									
			23									
			24									
			25	50/3"	--	13.1						

Continued on Sheet 2 of 2

Continued on Sheet 2 of 2

Earth Engineering Consultants, LLC

Anderson Consulting Engineers, Inc.  
Civil Water Resources Environmental  
375 East Horsetooth Road, Building 5, Fort Collins, CO 80525  
Phone (970) 226-4121  
www.aecinc.com



GEOTECHNICAL BORING  
LOCATIONS AND LOG OF B-1

LWIC HEADGATE  
STRUCTURE  
REHABILITATION PROJECT

PRELIMINARY

DRAWN BY:	SRP
DESIGNED BY:	SRP
CHECKED BY:	BAA
PROJECT NUMBER: COLWIC2013.06	
DATE: 06/03/16	
SHEET: 04	INDEX: C3



LARIMER AND WELD DIVERSION STRUCTURE IMPROVEMENTS											
FORT COLLINS, COLORADO											
PROJECT NO: 1152049		LOG OF BORING B-1					DATE: JUNE 2015				
RIG TYPE: CME55		SHEET 2 OF 2					WATER DEPTH				
FOREMAN: DG		START DATE		6/10/2015		WHILE DRILLING		5.5'			
AUGER TYPE: 4" CFA		FINISH DATE		6/10/2015		AFTER DRILLING		N/A			
SPT HAMMER: AUTOMATIC		SURFACE ELEV		N/A		24 HOUR		N/A			
SOIL DESCRIPTION		D	N	QU	MC	DD	A-LIMITS		-200	SWELL	
TYPE		(FEET)	(BLOWS/FT)	(PSF)	(%)	(PCF)	LL	PI	(%)	PRESSURE	% @ 500 PSF
Continued from Sheet 1 of 2		26									
		27									
CLAYSTONE / SILTSTONE		28									
grey		29									
moderately hard to hard		30									
		31									
		32									
		33									
		34									
		35									
		36									
		37									
		38									
		39									
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		42									
		43									
		44									
		45									
		46									
		47									
		48									
		49									
		50									
BOTTOM OF BORING DEPTH 30.0'											

Earth Engineering Consultants, LLC

LARIMER AND WELD DIVERSION STRUCTURE IMPROVEMENTS											
FORT COLLINS, COLORADO											
PROJECT NO: 1152049		LOG OF BORING B-2					DATE: JUNE 2015				
RIG TYPE: CME55		SHEET 1 OF 1					WATER DEPTH				
FOREMAN: DG		START DATE		6/10/2015		WHILE DRILLING			5'		
AUGER TYPE: 4" CFA		FINISH DATE		6/10/2015		AFTER DRILLING			N/A		
SPT HAMMER: AUTOMATIC		SURFACE ELEV		N/A		24 HOUR			N/A		
SOIL DESCRIPTION		D	N	QU	MC	DD	A-LIMITS		-200	SWELL	
TYPE		(FEET)	(BLOWS/FT)	(PSF)	(%)	(PCF)	LL	PI	(%)	PRESSURE % @ 500 PSF	
GRAVEL / BASE - 8"		--									
		1									
		--									
		2									
		--									
		3									
		--									
LEAN CLAY with SAND (CL) - FILL brown / rust soft to medium stiff		4									
		--									
		CS	5	4	2000	24.0	98.2	38	24	74.4	<500 psf None
		--									
		6									
		--									
		7									
SAND & GRAVEL (SP/GP) dense to very dense no recovery; auger cuttings		--									
		8									
		--									
		9									
		--									
		SS	10	50/2"	--	21.4					
		--									
		11									
		--									
		12									
		--									
		13									
		--									
		14									
CLAYSTONE / SILTSTONE brown / rust / grey highly weathered soft to moderately hard		--									
		SS	15	47	9000+	21.5					
		--									
		16									
		--									
		17									
		--									
		18									
		--									
		19									
CLAYSTONE / SILTSTONE / SANDSTONE grey moderately hard to hard no recovery; auger cuttings		--									
		CS	20	50/0.5"	--	12.8					
		--									
		21									
		--									
		22									
		--									
		23									
		--									
		24									
cemented lense no recovery; auger cuttings		--									
		CS	25	Bounce	--	11.4					
		--									
BOTTOM OF BORING DEPTH 25.0'		--									

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LARIMER AND WELD DIVERSION STRUCTURE IMPROVEMENTS													
FORT COLLINS, COLORADO													
PROJECT NO: 1152049		LOG OF BORING B-4				DATE: JUNE 2015							
RIG TYPE: CME55		SHEET 1 OF 2				WATER DEPTH							
FOREMAN: DG		START DATE		6/10/2015		WHILE DRILLING		5'					
AUGER TYPE: 4" CFA		FINISH DATE		6/10/2015		AFTER DRILLING		N/A					
SPT HAMMER: AUTOMATIC		SURFACE ELEV		N/A		24 HOUR		N/A					
SOIL DESCRIPTION		D (FEET)	N (BLOWS/FT)	QU (PSF)	MC (%)	DD (PCF)	A-LIMITS		-200 (%)	SWELL			
							LL	PI		PRESSURE	% @ 500 PSF		
SILTY/CLAYEY SAND & GRAVEL (SM-GM / SC-GC) - Fill dark brown with cobbles		1											
		2											
		3											
		4											
SAND & GRAVEL (SP/GP) medium dense with cobbles	CS	5	18	--	8.7								
		6											
		7											
		8											
		9											
		silty loose	SS	10	8	--	22.2						
				11									
				12									
				13									
		dense to very dense	SS	14									
15	50/6"			--	12.0								
16													
17													
18													
19													
CLAYSTONE / SILTSTONE grey moderately hard to hard	CS	20	50/4.5"	9000+	15.3	119.6							
		21											
		22											
		23											
		24											
		SS	25	50/4"	9000+	16.8							
		Continued on Sheet 2 of 2											

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LARIMER AND WELD DIVERSION STRUCTURE IMPROVEMENTS											
FORT COLLINS, COLORADO											
PROJECT NO: 1152049		LOG OF BORING B-4					DATE: JUNE 2015				
RIG TYPE: CME55		SHEET 2 OF 2					WATER DEPTH				
FOREMAN: DG		START DATE		6/10/2015			WHILE DRILLING		5'		
AUGER TYPE: 4" CFA		FINISH DATE		6/10/2015			AFTER DRILLING		N/A		
SPT HAMMER: AUTOMATIC		SURFACE ELEV		N/A			24 HOUR		N/A		
SOIL DESCRIPTION		D	N	QU	MC	DD	A-LIMITS		-200	SWELL	
TYPE		(FEET)	(BLOWS/FT)	(PSF)	(%)	(PCF)	LL	PI	(%)	PRESSURE	% @ 500 PSF
Continued from Sheet 1 of 2		26									
CLAYSTONE / SILTSTONE		27									
grey		28									
moderately hard to hard		29									
		30									% @ 1000 psf
CS		30	50/4"	9000	12.1	112.6	--	--	--	2300 psf	0.8%
BOTTOM OF BORING DEPTH 30.0'		31									
		32									
		33									
		34									
		35									
		36									
		37									
		38									
		39									
		40									
		41									
		42									
		43									
		44									
		45									
		46									
		47									
		48									
		49									
		50									

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LARIMER AND WELD DIVERSION STRUCTURE IMPROVEMENTS												
FORT COLLINS, COLORADO												
PROJECT NO: 1152049		LOG OF BORING B-5				DATE: JUNE 2015						
RIG TYPE: CME55		SHEET 1 OF 2				WATER DEPTH						
FOREMAN: DG		START DATE		6/10/2015		WHILE DRILLING		5'				
AUGER TYPE: 4" CFA		FINISH DATE		6/10/2015		AFTER DRILLING		N/A				
SPT HAMMER: AUTOMATIC		SURFACE ELEV		N/A		24 HOUR		N/A				
SOIL DESCRIPTION		D	N	QU	MC	DD	A-LIMITS		-200	SWELL		
		TYPE	(FEET)	(BLOWS/FT)	(PSF)	(%)	LL	PI	(%)	PRESSURE	% @ 500 PSF	
SAND & GRAVEL (SP/GP) dense with cobbles little recovery			1									
			2									
			3									
			4									
		CS	5	35								
			6									
			7									
			8									
			9									
		SS	10	33	--	15.3						
CLAYSTONE / SILTSTONE grey moderately hard to hard			11									
			12									
			13									
			14									
		SS	15	35	--	12.7						
			16									
			17									
			18									
			19									
		SS	20	50/9"	--	18.6						
Continued on Sheet 2 of 2			21									
			22									
			23									
			24									
		CS	25	50/4"	9000+	12.8	115.3					

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LARIMER AND WELD DIVERSION STRUCTURE IMPROVEMENTS												
FORT COLLINS, COLORADO												
PROJECT NO: 1152049		LOG OF BORING B-5				DATE: JUNE 2015						
RIG TYPE: CME55		SHEET 2 OF 2				WATER DEPTH						
FOREMAN: DG		START DATE		6/10/2015		WHILE DRILLING		5'				
AUGER TYPE: 4" CFA		FINISH DATE		6/10/2015		AFTER DRILLING		N/A				
SPT HAMMER: AUTOMATIC		SURFACE ELEV		N/A		24 HOUR		N/A				
SOIL DESCRIPTION		D	N	QU	MC	DD	A-LIMITS		-200	SWELL		
		TYPE	(FEET)	(BLOWS/FT)	(PSF)	(%)	LL	PI	(%)	PRESSURE	% @ 500 PSF	
Continued from Sheet 1 of 2			26									
CLAYSTONE / SILTSTONE grey moderately hard to hard			27									
			28									
			29									
			30									
		SS	30	50/4"	9000	10.7						
BOTTOM OF BORING DEPTH 30.5'			31									
			32									
			33									
			34									
			35									
			36									
			37									
			38									
			39									
			40									
			41									
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			50									

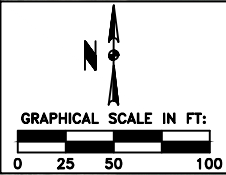
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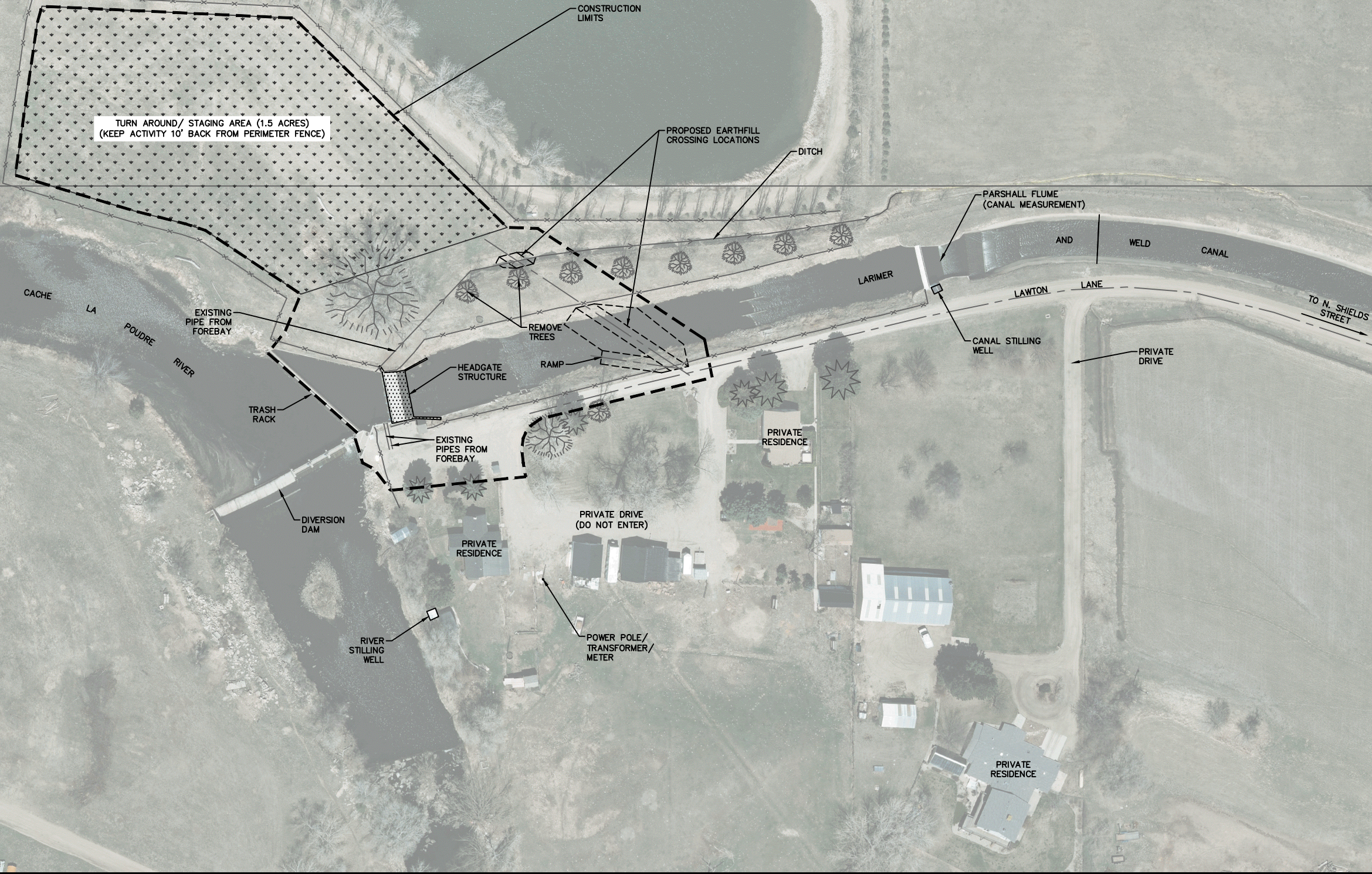


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NOTES:  
1. THIS SHEET IS AT STATE PLANE.



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ACCESS PLAN

LWIC HEADGATE  
STRUCTURE  
REHABILITATION PROJECT

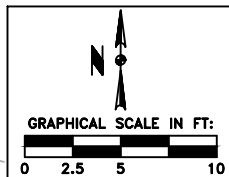
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DRAWN BY:	SRP
DESIGNED BY:	SRP
CHECKED BY:	BAA
PROJECT NUMBER: COLWIC2013.06	
DATE: 06/03/16	
SHEET: 08	INDEX: C7

REVISIONS:-----



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CUTLINE OF FOREBAY WALL. REMOVE MATERIAL AS NEEDED TO MAKE ROOM FOR NEW HEADWALL AND FORMS. SIMILAR OPPOSITE SIDE

REMOVE WINGWALL (~3.5 CY)

REMOVE BRIDGE ABUTMENT (~11 CY)

REMOVE NORTH WING WALL AND FOUNDATION (~21 CY)

REMOVE EXISTING PIPELINE AS NEEDED FOR CONSTRUCTION. TO BE FULLY REPLACED BY OWNER CONCURRENT WITH CONSTRUCTION

REMOVE EXISTING RIPRAP FROM THE FOOTPRINT OF THE PROPOSED STRUCTURE. STOCKPILE FOR REUSE (TYP.)

EXISTING TURNOUT. PRESERVE IN PLACE

CANAL GATE LWG 306

REMOVE ALL ELECTRIC MOTOR ACTUATORS AND THREADED STEMS. RETURN TO OWNER. GATES AND EMBEDDED ITEMS TO BE DISPOSED OF OR DEMOLISHED WITH HEADWALL. (TYP. @ 6)

CANAL GATE LWG305

REMOVE APRON AND TOE WALL (~31 CY)

REMOVE PIERS AND FLOOR (~60 CY)

L&W CANAL

CANAL GATE LWG304

CANAL GATE LWG303

CUTLINE OF FOREBAY FLOOR. REMOVE FLOOR TO A DISTANCE OF ~3' FROM HEADWALL. THICKNESS UNDETERMINED. (10 CY)

REMOVE HEADWALL (26 CY)

CANAL GATE LWG302

CANAL GATE LWG301

REMOVE SOUTH WING WALL AND FOUNDATION (~20 CY)

CONCRETE BLOCK WALL. DISMANTLE AS NEEDED TO ALLOW FOR CONSTRUCTION. TO BE REPOSITIONED AS NOTED ON SHEET C1.

REMOVE BRIDGE DECK AND PARAPET WALL (~41 CY)

REMOVE BRIDGE ABUTMENT (~11 CY)

REMOVE EXISTING PIPELINES AS NEEDED FOR CONSTRUCTION. TO BE FULLY REPLACED BY OWNER CONCURRENT WITH PROJECT. COORDINATE REMOVAL AND REPLACEMENT WITH UTILITY INSTALLATION

EXISTING TURNOUTS. PRESERVE IN PLACE

EXISTING CONTROL BUILDING. DO NOT DEMOLISH. CUT WELDS BETWEEN FOUNDATION AND WALLS. REMOVE TO LOCATION DESIGNATED BY THE OWNER. EQUIPMENT, BOXES AND CONDUITS TO BE DISCONNECTED REMOVED AND STORED PER ELECTRICAL AND CONTROLS DEMOLITION PLAN.

#### DEMOLITION NOTES:

1. SEE ELECTRICAL AND CONTROLS DEMOLITION PLAN FOR ADDITIONAL INFORMATION.
2. FENCE MATERIAL, POSTS AND GATES SHALL BE REMOVED AS NEEDED. FENCES AND GATES SHALL BE REPLACED IN KIND BY FINAL COMPLETION UNLESS OTHERWISE NOTED IN THESE PLANS.
3. CONCRETE RUBBLE TO BE DISPOSED OF OFF SITE AT A LOCATION DESIGNATED BY THE OWNER. NO MATERIAL WILL BE STOCKPILED OR DISPOSED OF ON SITE UNLESS APPROVED BY THE OWNER.
4. DEMOLISHED CONCRETE MAY BE CRUSHED AND USED FOR STRUCTURAL FILL OR TRADED FOR MATERIAL AT CONTRACTORS OPTION. USE AS STRUCTURAL FILL SHALL BE APPROVED BY THE ENGINEER.
5. CONTRACTOR SHALL BE RESPONSIBLE FOR OFF-SITE DISPOSAL OF ALL REMAINING DEBRIS AND TRASH NOT OTHERWISE ADDRESSED IN DEMOLITION PLANS.
6. STRUCTURES NOT DESIGNATED FOR REMOVAL AT THIS TIME SHALL BE PROTECTED IN PLACE.
7. CONTRACTOR SHALL CONSULT ENGINEER PRIOR TO REUSE OF RIPRAP MATERIAL.
8. REMOVAL QUANTITIES ARE ESTIMATED. CONCRETE REMOVAL SHALL BE BID AS LUMP SUM.

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## STRUCTURAL DEMOLITION PLAN

## LWIC HEADGATE STRUCTURE REHABILITATION PROJECT

PRELIMINARY

DRAWN BY:	SRP
DESIGNED BY:	SRP
CHECKED BY:	BAA
PROJECT NUMBER: COLWIC2013.06	
DATE: 06/03/16	
SHEET: 09	INDEX: S1

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STRUCTURAL NOTES

1. THESE DRAWINGS ARE PROVIDED TO ILLUSTRATE THE STRUCTURAL ENGINEERING OF THE MEMBERS ASSOCIATED WITH NEW CONSTRUCTION ONLY. IT IS NOT INTENDED TO BE FULLY DIRECTIVE NOR COVER ENGINEERING DETAILS OF SUCH MATERIALS, PRODUCTS OR EQUIPMENT SUPPLIED BY OTHERS. THE ENGINEER DOES NOT CONTROL JOB SITE ASSEMBLY OR PROCEDURES, GRADE AND QUALITY OF MATERIALS OR EQUIPMENT SUPPLIED BY OTHERS. IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO ADHERE TO WORKMANSHIP CONSISTENT WITH SAFE BUILDING PRACTICES AND COMPLIANCE WITH ALL ASSOCIATED BUILDING CODES AND ENSURE THAT ALL MATERIALS COMPLY WITH THIS DESIGN.
2. THESE NOTES SUPPLEMENT THE DRAWINGS AND TECHNICAL SPECIFICATIONS, WHICH SHALL BE REFERRED TO FOR ADDITIONAL REQUIREMENTS.
3. DESIGN CRITERIA: AASHTO STANDARD SPECIFICATION FOR HIGHWAY BRIDGES, LATEST ADDITION.
4. VEHICULAR LIVE LOADING: HS25.
5. WORK SHALL BE DONE IN ACCORDANCE TO THE ABOVE REFERENCED CODE BOOK AND CDOT STANDARDS AS DESCRIBED IN: COLORADO DEPARTMENT OF TRANSPORTATION, STANDARD SPECIFICATIONS FOR ROAD AND BRIDGE CONSTRUCTION, LATEST EDITION.
6. LOCATE EXISTING UNDERGROUND UTILITIES, AND NOTIFY OWNER OF EXISTING UTILITIES OR SUBGRADE CONDITIONS WHICH INTERFERE WITH WORK.
7. WHERE DISCREPANCIES OCCUR BETWEEN PLANS, DETAILS, GENERAL NOTES AND SPECIFICATIONS, THE MORE STRINGENT REQUIREMENTS SHALL GOVERN. DETAILS ON DRAWINGS TAKE PRECEDENCE OVER GENERAL NOTES AND TYPICAL DETAILS. DETAILS NOTED TYPICAL APPLY TO ALL SIMILAR CONDITIONS. WHERE NO SPECIFIC DETAILS ARE SHOWN, CONSTRUCTION SHALL CONFORM TO SIMILAR WORK ELSEWHERE ON THE PROJECT.
8. THE ENGINEER SHALL NOT BE RESPONSIBLE IN THE EVENT OF ANY DEVIATIONS, CHANGES OR ALTERATIONS TO THE RECOMMENDED DETAILS DESCRIBED IN THESE DRAWINGS UNLESS SUCH DEVIATIONS, CHANGES OR ALTERATIONS ARE ILLUSTRATED IN A REVISED DRAWING OR ARE APPROVED IN WRITING BY AN AUTHORIZED REPRESENTATIVE OF THE ENGINEER. DO NOT SCALE DRAWINGS.
9. ALL DIMENSIONS AND DETAILS SHOWN ON THESE LAYOUTS MUST BE CHECKED AND VERIFIED BY THE OWNER, ENGINEER AND /OR CONTRACTOR(S) BEFORE PROCEEDING WITH THE WORK OR MATERIAL ACQUISITION.
10. THE STRUCTURE IS DESIGNED TO FUNCTION AS A UNIT UPON COMPLETION. CONTRACTOR IS RESPONSIBLE FOR FURNISHING ALL TEMPORARY FALSEWORK, SHORING, AND LATERAL BRACING OF THE STRUCTURE AND RELATED FALSEWORK DURING CONSTRUCTION DEMOLITION, AND/OR ERECTION.
11. SUBMITTALS: CONSULT WITH ENGINEER AND REFER TO GENERAL NOTES OR BID DOCUMENTS FOR DETAILED REQUIREMENTS. IF THE CONTRACTOR REQUESTS A CHANGE FROM THE STRUCTURAL DRAWINGS, IT SHALL BE APPROVED BY THE ENGINEER PRIOR TO SUBMITTING SHOP DRAWINGS. VARIATION SHALL BE INDICATED ON THE SHOP DRAWINGS.
12. SUBSTITUTIONS. THE OWNER’S AND ENGINEER’S APPROVAL SHALL BE SECURED FOR ALL SUBSTITUTIONS.
13. NONCONFORMANCE. NOTIFY THE OWNER AND ENGINEER OF CONDITIONS NOT CONSTRUCTED PER THE CONTRACT DOCUMENTS PRIOR TO PROCEEDING WITH CORRECTIVE WORK. SUBMIT PROPOSED REPAIR TO THE OWNER AND ENGINEER FOR ACCEPTANCE.
14. CONCRETE. MINIMUM COMPRESSIVE STRENGTH FOR CONCRETE (F’C) = 4,500 PSI MIN (CDOT, CLASS D) @ 28 DAYS UNLESS OTHERWISE NOTED. MAXIMUM WATER CEMENT RATIO 0.42. MINIMUM CEMENT CONTENT 615 LBS./CY. MAXIMUM AGGREGATE SIZE ¾". ENTRAINED AIR CONTENT 5% TO 8%. ADMIXTURES: AIR ENTRAINING ADMIXTURE, WATER REDUCING ADMIXTURE. NOTE: CHAMFER ALL EXPOSED EDGES.
15. CONCRETE MIX DESIGN IS THE RESPONSIBILITY OF THE CONTRACTOR AND/OR RELATED SUPPLIERS. CONCRETE MIX DESIGNS SHALL BE PREPARED BY AN INDEPENDENT CONCRETE TESTING LABORATORY. MAXIMUM SLUMP SHALL NOT EXCEED 4 INCHES. ALL CONCRETE WORK AND REINFORCEMENT DETAILING SHALL BE IN ACCORDANCE WITH ACI BUILDING CODE 318 LATEST EDITION. USE STANDARD HOOKS FOR DOWELS UNLESS NOTED OTHERWISE.
16. REINFORCING: ALL REINFORCING SHALL BE DEFORMED BARS CONFORMING TO ASTM A615, GRADE 60. MAKE ALL REINFORCING BAR BENDS IN THE FABRICATOR’S SHOP UNLESS NOTED OR OTHERWISE APPROVED BY THE ENGINEER. NO WELDING OF REINFORCING PERMITTED UNLESS NOTED ON DRAWINGS, OR APPROVED BY ENGINEER. WHERE PERMITTED, PERFORM WELDING IN ACCORDANCE WITH AWS D 1.4. LATEST EDITION.
  - 16.1. ALL REINFORCING STEEL TO BE EPOXY COATED.
  - 16.2. PROVIDE 500 L.F. OF EPOXY COATED #5 REINFORCING TO BE BENT & PLACED AT THE DIRECTION OF THE ENGINEER.
17. REINFORCEMENT PROTECTION/COVER. CONCRETE PLACE AGAINST EARTH = 3". CONCRETE PLACED IN FORMS, EXPOSED TO WEATHER OR EARTH = 2 INCHES. REINFORCEMENT PLACING TOLERANCES PER ACI 117. PROVIDE ADDITIONAL BARS OR STIRRUPS REQUIRED TO SECURE REINFORCING IN PLACE DURING CONCRETE PLACEMENT.
18. PROVIDE ACCESSORIES NECESSARY TO PROPERLY SUPPORT REINFORCING AND WELDED WIRE FABRIC AT POSITIONS SHOWN ON PLANS. ALL REINFORCING DOWELS, BOLTS, AND EMBEDDED PLATES SHALL BE SET AND TIED IN PLACE BEFORE THE CONCRETE IS PLACED. "STABBING" INTO PREVIOUSLY PLACED CONCRETE IS NOT PERMITTED.
19. NO SPLICES OF REINFORCEMENT SHALL BE MADE EXCEPT AS DETAILED OR AUTHORIZED BY THE ENGINEER. LAP SPLICES, WHERE PERMITTED SHALL BE A MINIMUM OF 48 BAR DIAMETERS UNLESS NOTED OTHERWISE FOR #6 BARS AND SMALLER. MAKE BARS CONTINUOUS AROUND CORNERS OR FURNISH CORNER BARS TO ATTAIN THE PROPER LAP SPLICE.
20. ALL JOISTS, STRINGERS, HEADERS, LEDGERS OR OTHER MEMBERS MUST BE CENTERED ON THEIR SUPPORTS AS SHOWN UNLESS DESIGNED AND SPECIFICALLY NOTED OTHERWISE.
21. STRUCTURAL STEEL MATERIALS. ALL STRUCTURAL STEEL MATERIALS SHALL BE ASTM A572, GRADE 50, FY = 50 KSI. ROUND PIPE SHALL CONFORM TO ASTM A53, TYPE S, GRADE B.
22. CONTRACTOR SHALL CONNECT STRUCTURAL STEEL UTILIZING ESTABLISHED METHODS AS OUTLINED IN AISC "MANUAL OF STEEL CONSTRUCTION" AND WELDING IN ACCORDANCE WITH AWS STRUCTURAL CODE STRUCTURAL STEEL MATERIALS. ALL STRUCTURAL STEEL MATERIALS SHALL BE APPROVED BY THE ENGINEER.
23. STEEL COATINGS: STRUCTURAL STEEL SHALL RECEIVE A RUST INHIBITIVE PRIMER AND TWO FINISH COATS OF EXTERIOR SEMI-GLOSS ACRYLIC ENAMEL. COLOR TO BE SELECTED BY OWNER. COLD-GALVANIZING COMPOUND MAY BE USED WHERE APPROVED BY THE ENGINEER.
24. CONNECTION MATERIALS: ALL BOLTS, NUTS, WASHERS USED IN THE ASSEMBLY OF STEEL STRUCTURES SHALL BE APPROVED BY THE ENGINEER.
25. HIGH STRENGTH BOLTS: ASTM A325 OR ASTM F1852 TENSION CONTROL TYPE 1 HEAVY HEX, PLAIN UNLESS NOTED OTHERWISE.
26. WELDING ELECTRODES: ALL WELDING ELECTRODES AND FLUXES SHALL CONFORM TO THE REQUIREMENTS OF THE AMERICAN WELDING SOCIETY (AWS) STANDARD SPECIFICATIONS.
27. EXPANSION ANCHORS: WEDGE TYPE CONFORMING WITH FEDERAL SPECIFICATION A-A, 1923A, TYPE 4. HILTI QUICK BOLT KB3, HDG OR EQUAL. MINIMUM LENGTH = 6".
28. CONCRETE COATING (WATERPROOFING): SIKATOP SEAL 107 (POWER WASH CONCRETE SURFACE AND APPLY 2 COATS PER MANUFACTURER’S INSTRUCTIONS)
29. CONCRETE REPAIR MATERIALS: CONCRETE REPAIR MATERIALS SHALL BE FROM ONE MANUFACTURER AND SHALL BE COMPATIBLE PRODUCT SYSTEMS. SUBMIT SELECTED PRODUCTS FOR APPROVAL.

EPOXY ANCHORING – SIKADUR ANCHOR FIX 2, OR CURRENT EQUIVALENT PRODUCT.  
REPAIR MORTARS – SIKATOP III PLUS, 122 PLUS, 123 PLUS, SIKA REPAIR 223 OR CURRENT EQUIVALENT PRODUCT.  
BONDING AGENTS – SIKA ARMATEC 110 EPOCHEM, SIKADUR 32, HI-MOD OR CURRENT EQUIVALENT PRODUCT.

REVISIONS:-----

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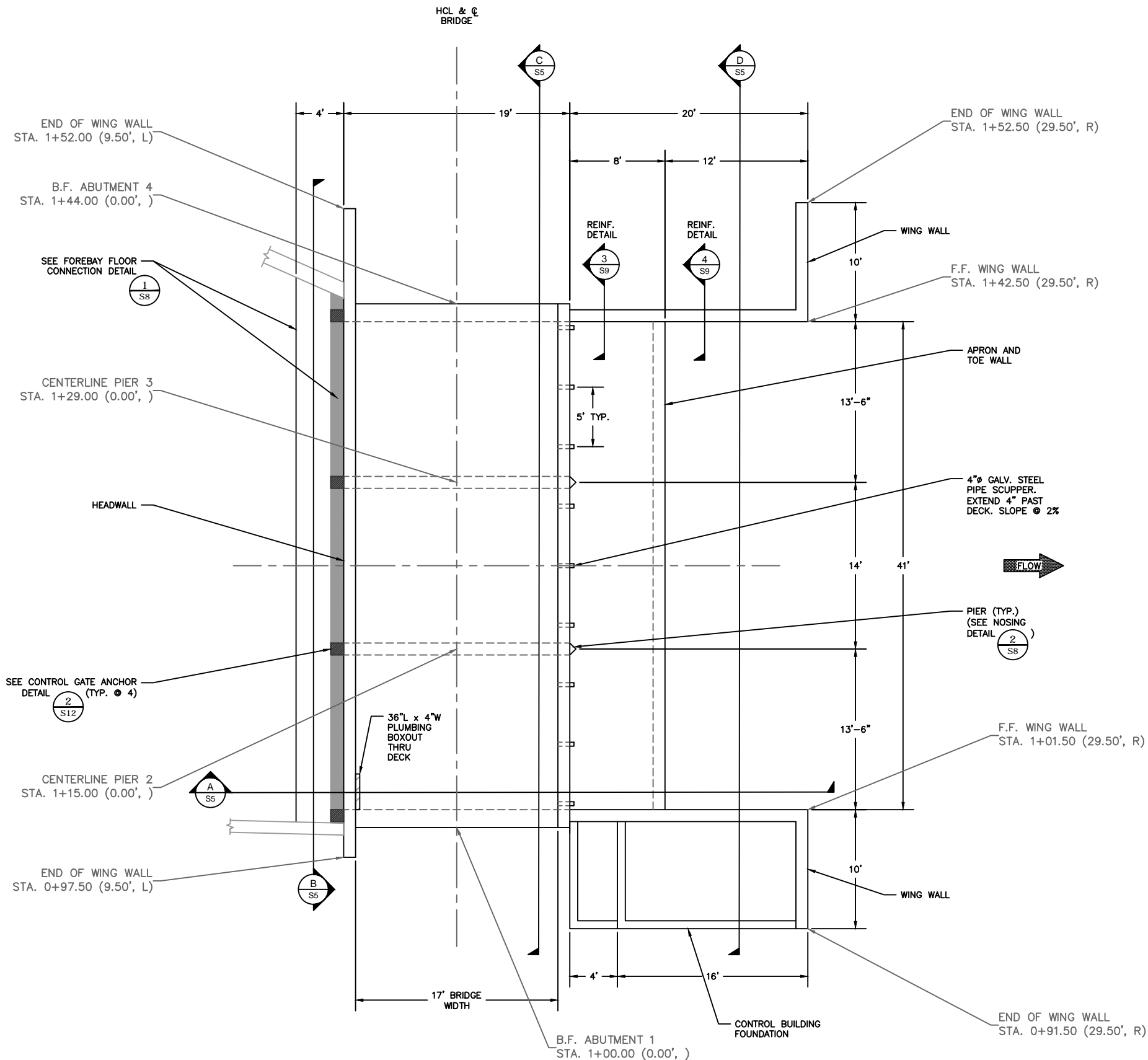


STRUCTURAL NOTES

LWIC HEADGATE  
STRUCTURE  
REHABILITATION PROJECT

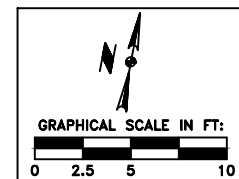
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DRAWN BY:	SRP
DESIGNED BY:	TPG
CHECKED BY:	TPG
PROJECT NUMBER: COLWIC2013.06	
DATE: 06/03/16	
SHEET: 10	INDEX: S2



PLAN

NOTE:  
WATER CONTROL GATES AND OPERATORS ARE TO BE PROVIDED AS A UNIT BY  
PARKER CONSTRUCTION AND MACHINE IN FORT COLLINS, CO. PROPOSED GATES  
AND OPERATORS ARE NOT SHOWN ON THESE STRUCTURAL PLANS FOR CLARITY.

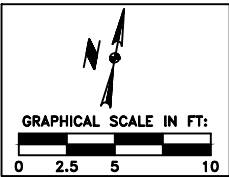


STRUCTURAL PLAN

LWIC HEADGATE  
STRUCTURE  
REHABILITATION PROJECT

PRELIMINARY

DRAWN BY:	SRP
DESIGNED BY:	TPG
CHECKED BY:	TPG
PROJECT NUMBER:	COLWIC2013.06
DATE:	06/03/16
SHEET:	11
INDEX:	S3

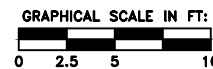
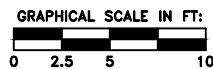
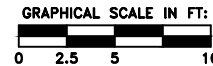
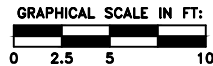


## ABUTMENT AND WING WALL FOOTING PLAN

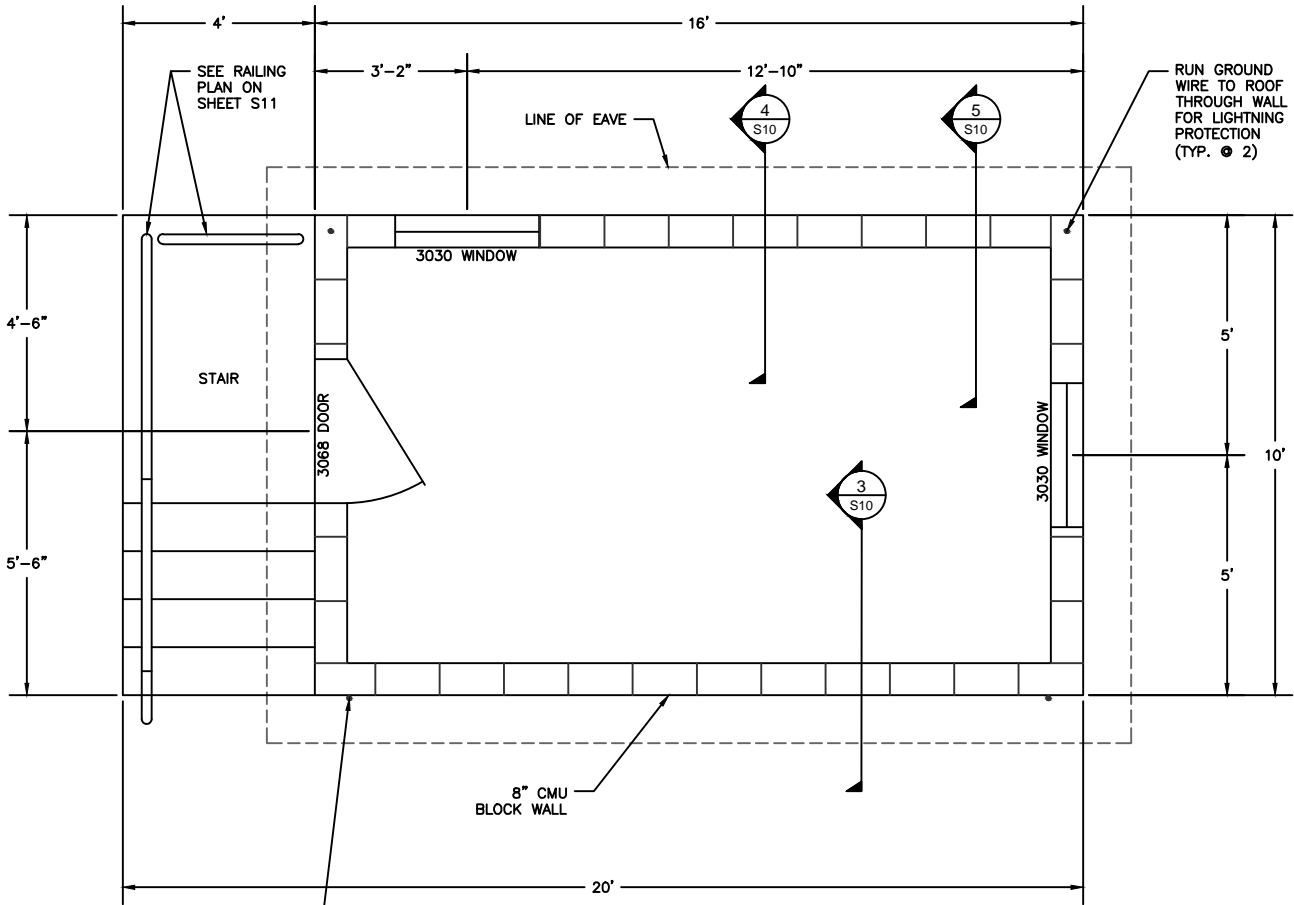
# LWIC HEADGATE STRUCTURE REHABILITATION PROJECT

PRELIMINARY

<b>DRAWN BY:</b>	<b>SRP</b>
<b>DESIGNED BY:</b>	<b>TPG</b>
<b>CHECKED BY:</b>	<b>TPG</b>
<b>PROJECT NUMBER:</b> <b>COLWIC2013.06</b>	
<b>DATE:</b> <b>06/03/16</b>	
<b>SHEET:</b> <b>12</b>	<b>INDEX:</b> <b>S4</b>



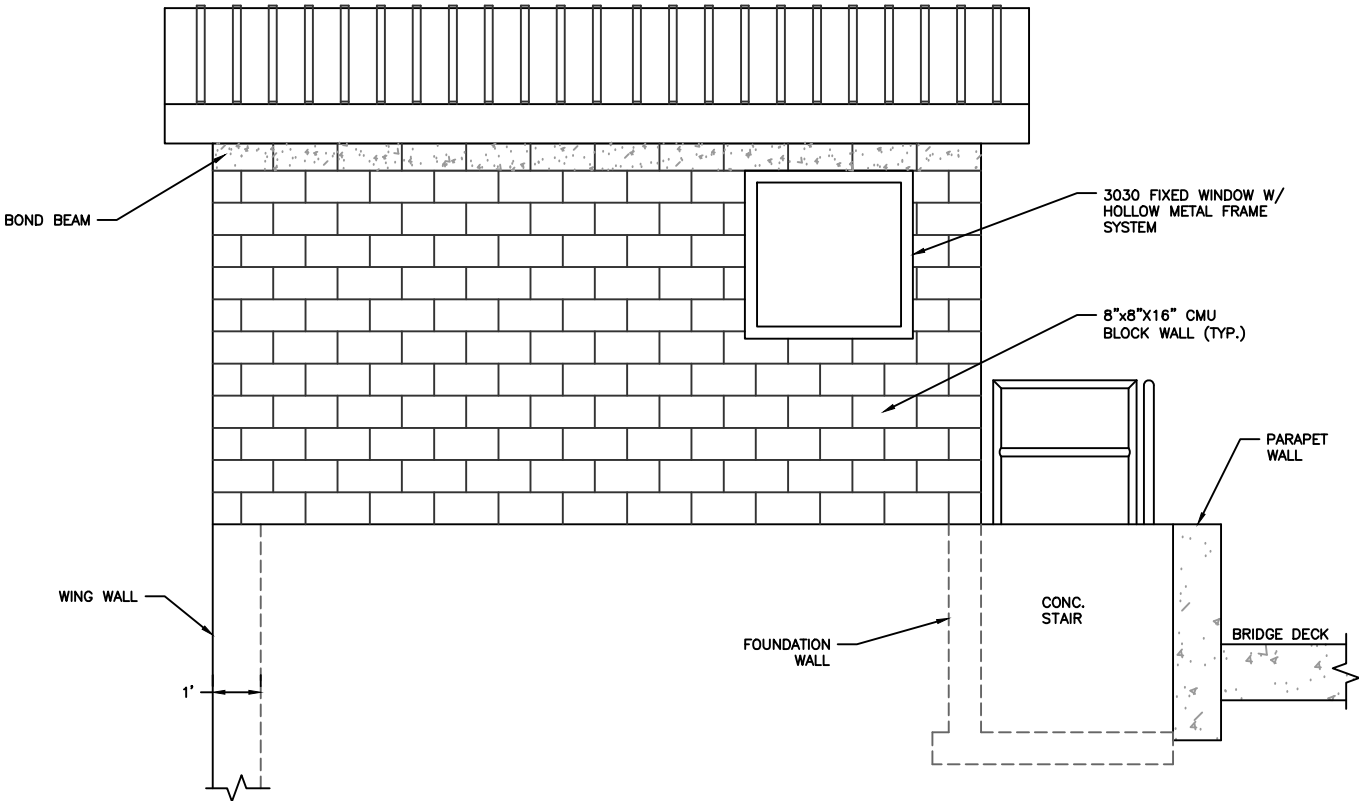
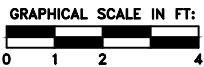




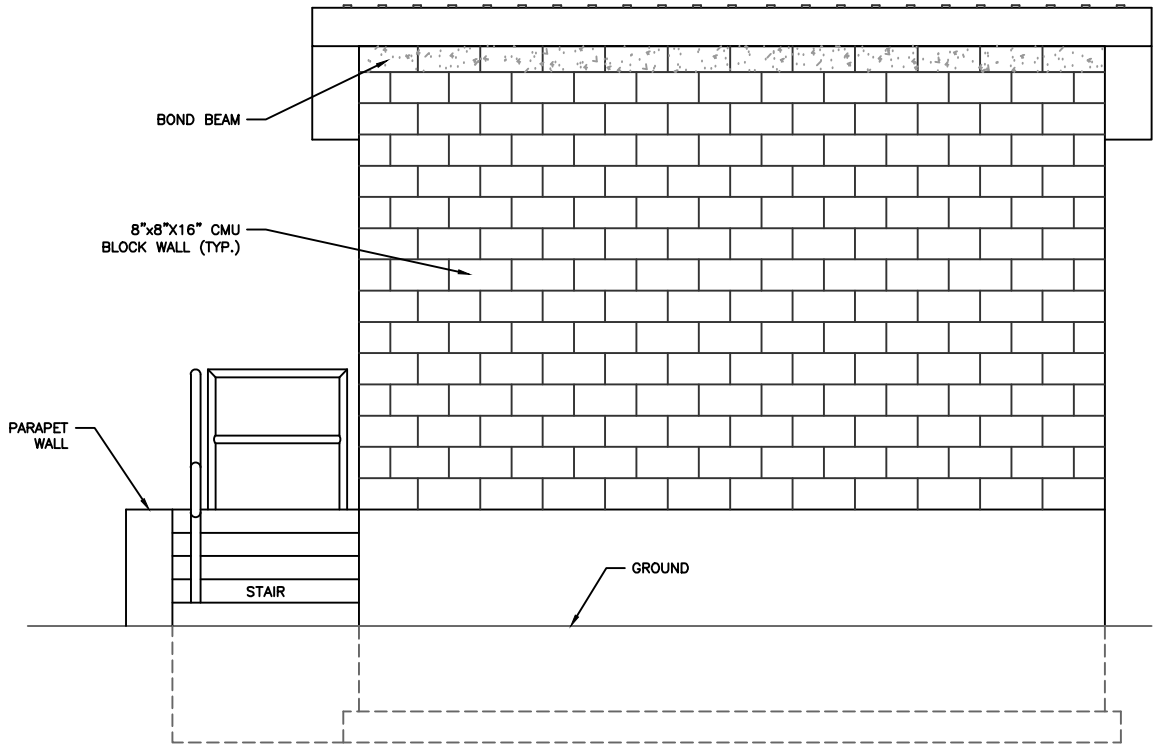
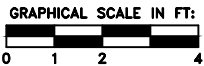
ELECTRICIAN SHALL BOND GROUND WIRE TO FOUNDATION REINFORCEMENT AT ALL FOUR CORNERS OF BUILDING. #2/0 COPPER OR AS DETERMINED BY ELECTRICIAN.

**BUILDING PLAN**

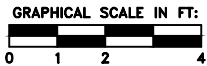
- NOTE:
1. SEE ELECTRICAL PLAN FOR EMBEDDED CONDUIT LOCATIONS
  2. CMU BLOCK WALLS SHALL BE PAINTED WHITE INTERIOR AND EXTERIOR.

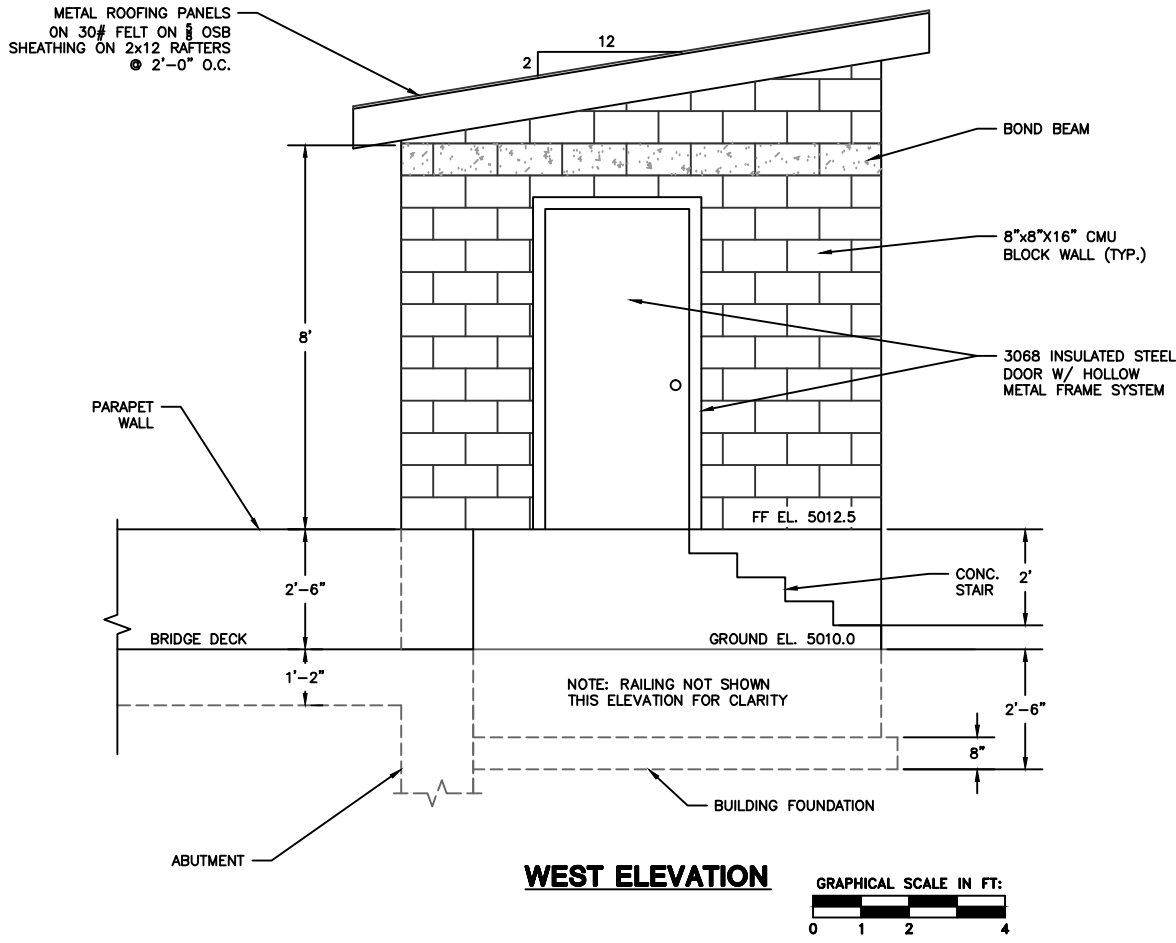
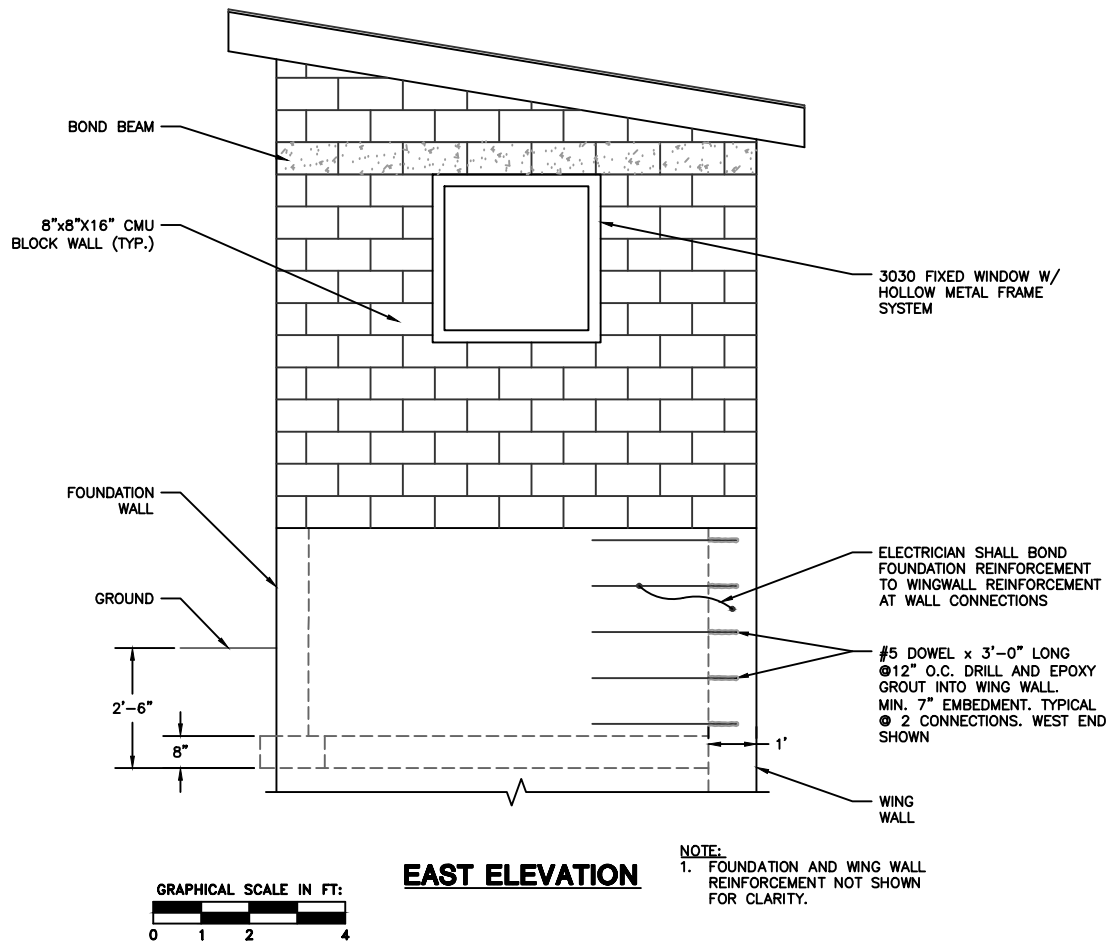


**NORTH ELEVATION**



**SOUTH ELEVATION**





**BUILDING STRUCTURAL NOTES**

- BUILDING GENERAL NOTES:**
1. ALL PHASES OF WORK TO CONFORM TO THE STANDARDS OF THE 2015 INTERNATIONAL BUILDING CODE.
  2. THE CONTRACTOR SHALL FIELD VERIFY ALL DIMENSIONS PRIOR TO STARTING WORK AND NOTIFY THE ENGINEER IMMEDIATELY OF ANY DISCREPANCIES OR INCONSISTENCIES PRIOR TO PROCEEDING.
- DESIGN CRITERIA:**
1. ROOF SNOW LOAD = 30 PSF.
  2. WIND LOAD: 110 MPH, EXPOSURE C.
- CONCRETE:**
1. ALL CONCRETE WORK SHALL CONFORM TO THE REQUIREMENTS OF ACI 318 "BUILDING CODE REQUIREMENTS FOR REINFORCED CONCRETE,"
  2. ALL CONCRETE SHALL HAVE A MINIMUM COMPRESSIVE STRENGTH AT 28 DAYS OF 4,000 PSI.
  3. CEMENT SHALL CONFORM TO ASTM C150, TYPE II; AGGREGATES TO ASTM C33.
  4. CONCRETE SHALL CONTAIN 5-8% AIR ENTRAINMENT.
- REINFORCING STEEL:**
1. FABRICATE AND PLACE REINFORCING BARS IN ACCORDANCE WITH CRSI "MANUAL OF STANDARD PRACTICE" AND CRSI "RECOMMENDED PRACTICE FOR PLACING REINFORCING BARS."
  2. REINFORCING STEEL TO COMPLY WITH ASTM A615, GRADE 60.
  3. LAP REINFORCING STEEL IN CONCRETE WHERE SPliced 48 BAR DIAMETERS, BUT NOT LESS THAN 2'-6".
  4. LAP WALL STEEL IN CAST CONCRETE AROUND CORNERS 48 BAR DIAMETERS, BUT NOT LESS THAN 2'-6".
  5. ALL REINFORCING STEEL TO BE EPOXY COATED.
- MASONRY:**
1. FABRICATE AND PLACE REINFORCING BARS IN ACCORDANCE WITH CRSI "MANUAL OF STANDARD PRACTICE" AND CRSI "RECOMMENDED PRACTICE FOR PLACING REINFORCING BARS."
  2. MATERIALS:
    - A. MASONRY UNITS SHALL CONFORM TO ASTM C90, GRADE N.
    - B. MORTAR SHALL CONFORM TO ASTM C270, TYPE S.
    - C. WALL SHALL BE HORIZONTALLY REINFORCED WITH 9-GAGE, LADDER TYPE DUR-O-WALL AT 16" O.C.
    - D. WALL SHALL BE VERTICALLY REINFORCED WITH (1) #5 AT CORNERS, EACH SIDE OF DOORWAY AND WINDOW OPENINGS AND NOT LESS THAN 4'-0" O.C.
    - E. MASONRY SHALL HAVE A MINIMUM NET AREA COMPRESSIVE STRENGTH,  $f_m$ , OF 1,500 PSI.
    - F. GROUT SHALL HAVE A MINIMUM 28-DAY COMPRESSIVE STRENGTH OF 3,000 PSI.
  3. PROVIDE CONTINUOUS BOND BEAM, REINFORCED WITH (2)#5s AT TOP COURSE AND BOND BEAM ABOVE DOORWAYS AND WINDOW, A MINIMUM OF 4 UNITS (5'-4") LONG.
- STRUCTURAL STEEL:**
1. FABRICATION AND ERECTION TO CONFORM TO THE AMERICAN INSTITUTE OF STEEL CONSTRUCTION, "SPECIFICATIONS FOR THE DESIGN, FABRICATION AND ERECTION OF STRUCTURAL STEEL BUILDINGS".
  2. QUALIFIED WELDERS ARE TO BE USED FOR ALL WELDING. ALL WELDING TO CONFORM TO THE LATEST EDITION OF THE AMERICAN WELDING SOCIETY STRUCTURAL WELDING CODE D1.1.
  3. MATERIALS:
    - A. STRUCTURAL STEEL SHAPES AND PLATES: ASTM A36.
    - B. WELDING ELECTRODES: ASTM A5.1 OR A5.5, E70 XX ELECTRODE.
- TIMBER:**
1. ALL DIMENSION LUMBER SHALL BE EITHER DOUGLAS FIR OR HEM FIR, NUMBER 2 OR BETTER.
- SOILS:**
1. ALL RECOMMENDATIONS OF EARTH ENGINEERING CONSULTANTS, LLC GEOTECHNICAL REPORT (JOB #1152049) SHALL BE FOLLOWED. ANY DISCREPANCIES IN SOILS CONDITIONS SHALL BE BROUGHT TO THE IMMEDIATE ATTENTION OF THE ENGINEER PRIOR TO PROCEEDING.
  2. ALLOWABLE BEARING PRESSURE = 3,000 PSF.



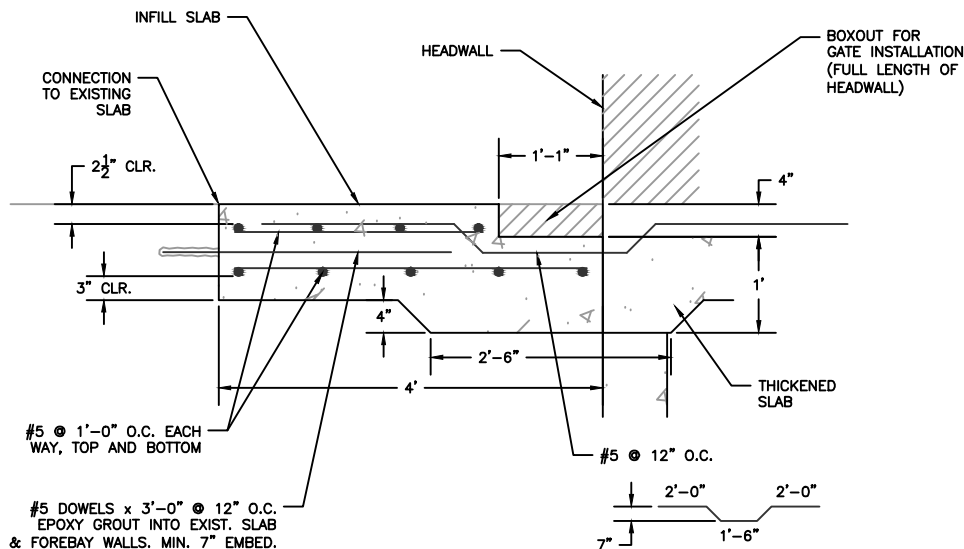
**CONTROL BUILDING  
ELEVATIONS AND NOTES**

**LWIC HEADGATE  
STRUCTURE  
REHABILITATION PROJECT**

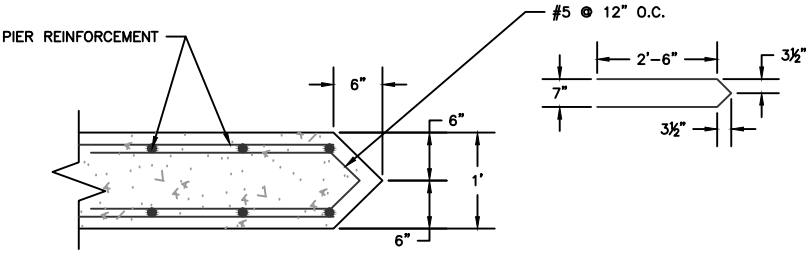
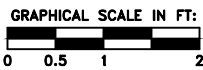
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PROJECT NUMBER: COLWIC2013.06	
DATE: 06/03/16	
SHEET: 15	INDEX: S7

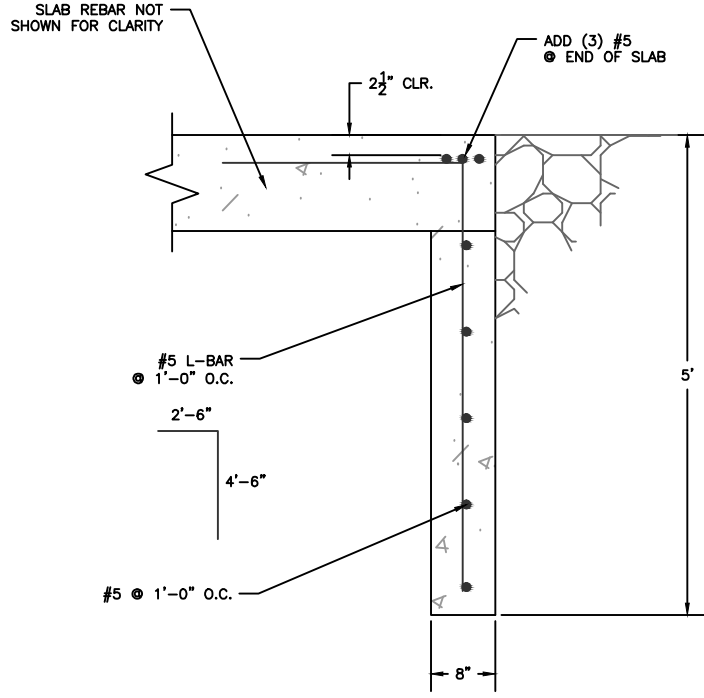
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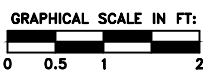
FOREBAY FLOOR CONNECTION DETAIL 1 S8



PIER NOSING DETAIL 2 S8



TOE WALL REINFORCEMENT DETAIL 3 S8



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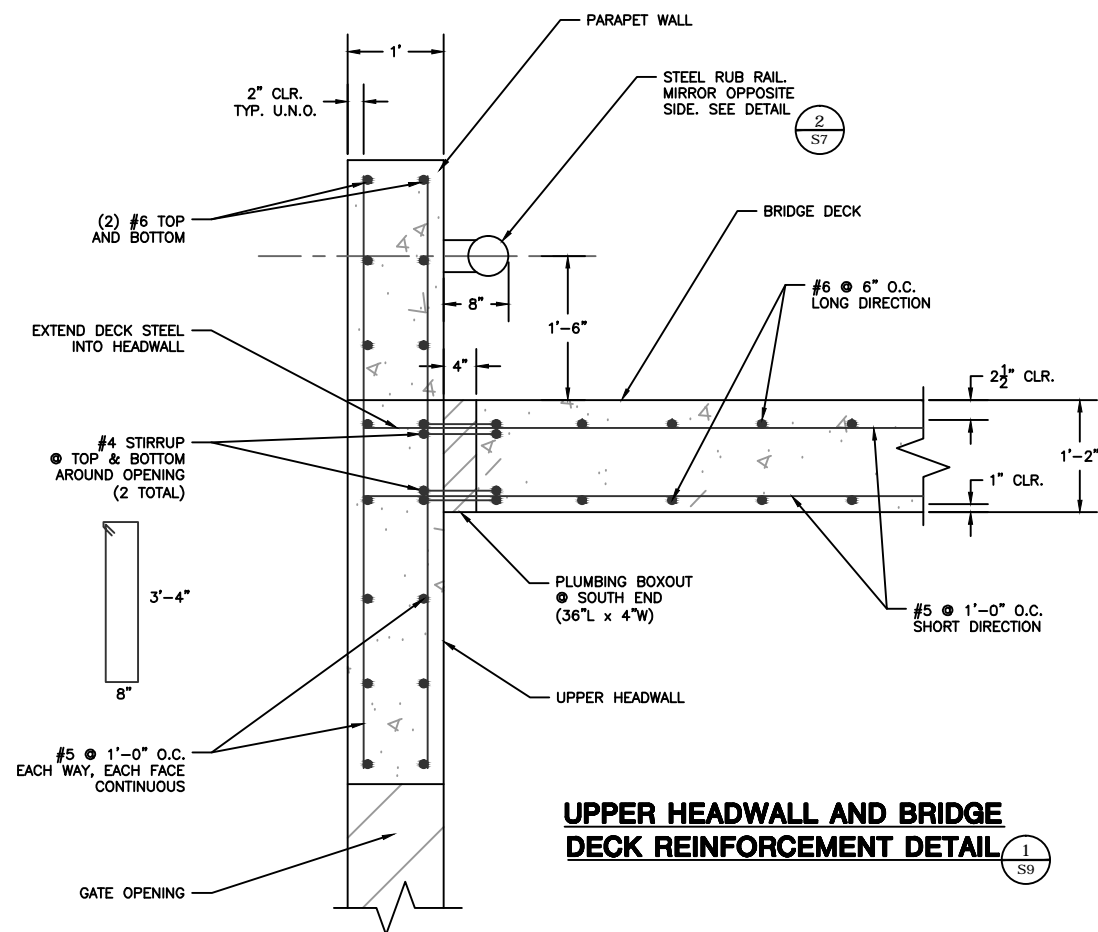
STRUCTURAL DETAILS 1

LWIC HEADGATE  
STRUCTURE  
REHABILITATION PROJECT

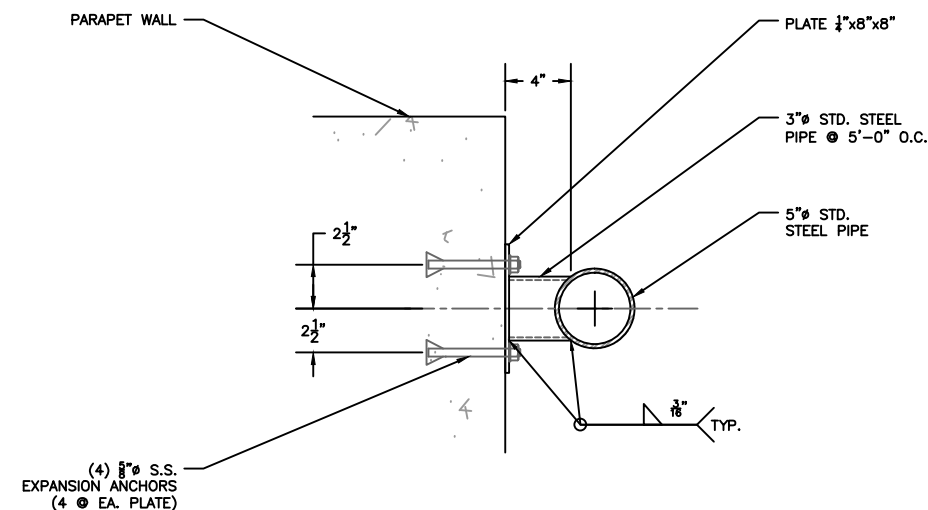
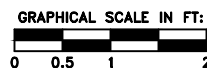
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DATE: 06/03/16	
SHEET: 16	INDEX: S8

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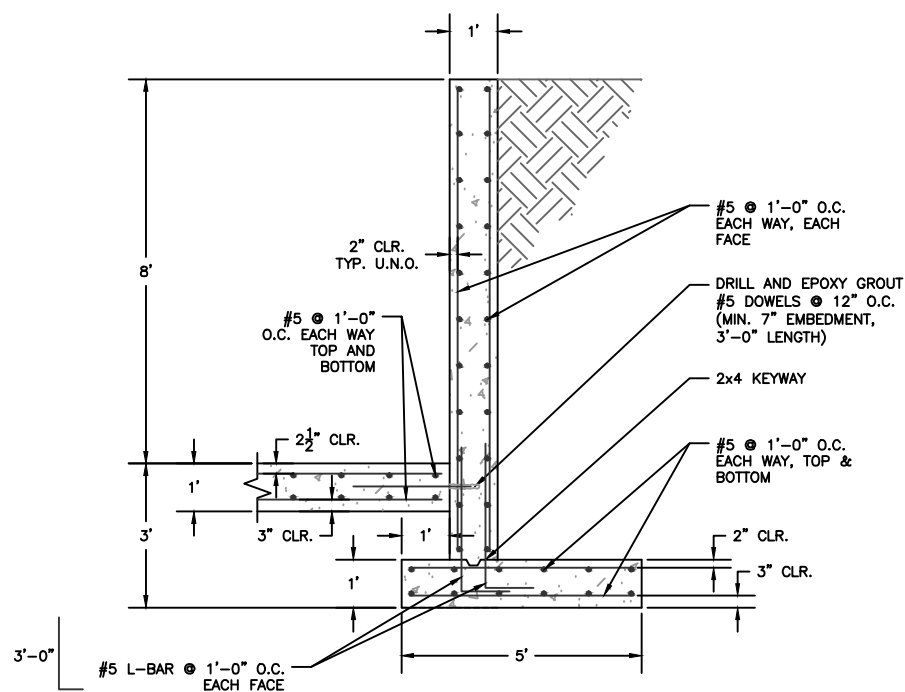
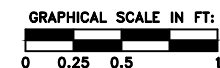


UPPER HEADWALL AND BRIDGE DECK REINFORCEMENT DETAIL (1/S9)

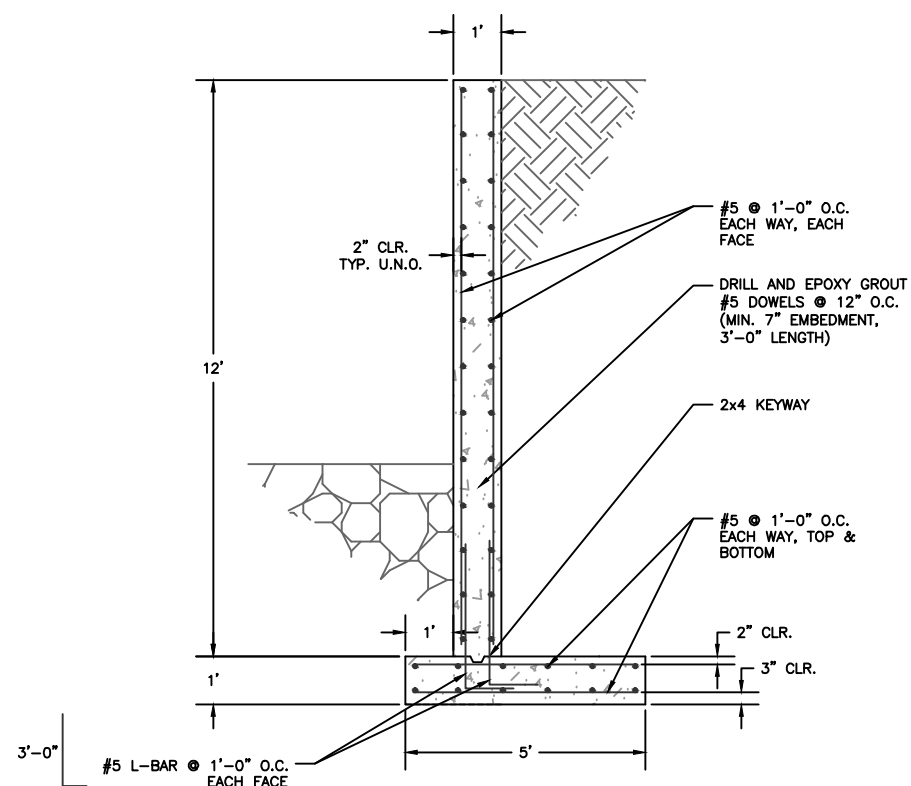
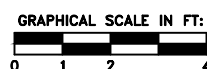


- NOTES:
1. EXTEND RUB RAIL TO END OF WALL INCLUDING 90° SWEEP RETURN.
  2. PROVIDE END CLOSURE ON ALL PIPE.

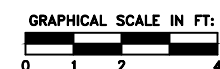
TYPICAL RUB RAIL DETAIL (2/S9)



WEST WINGWALL REINFORCEMENT DETAIL (3/S9)



EAST WINGWALL REINFORCEMENT DETAIL (4/S9)



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STRUCTURAL DETAILS 2

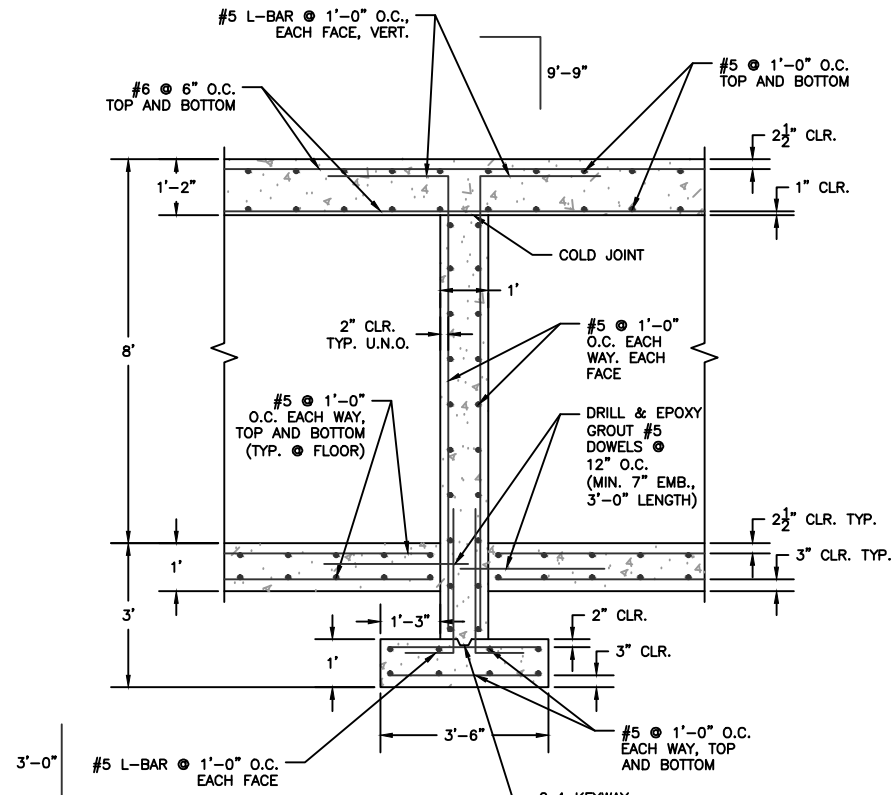
LWIC HEADGATE  
STRUCTURE  
REHABILITATION PROJECT

PRELIMINARY

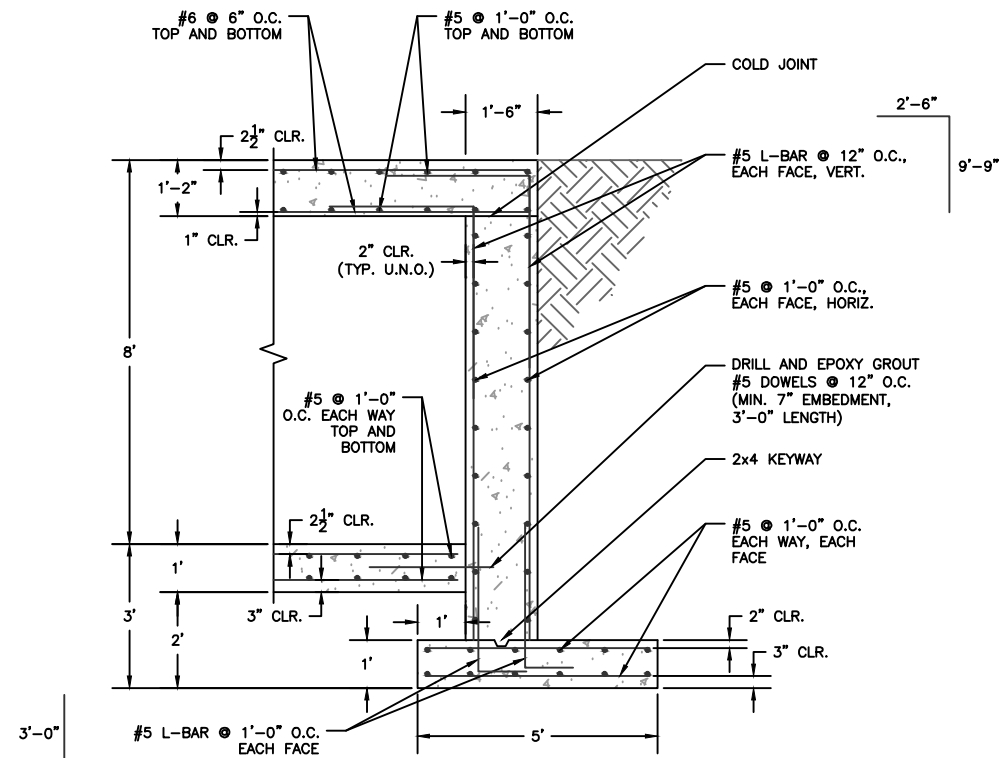
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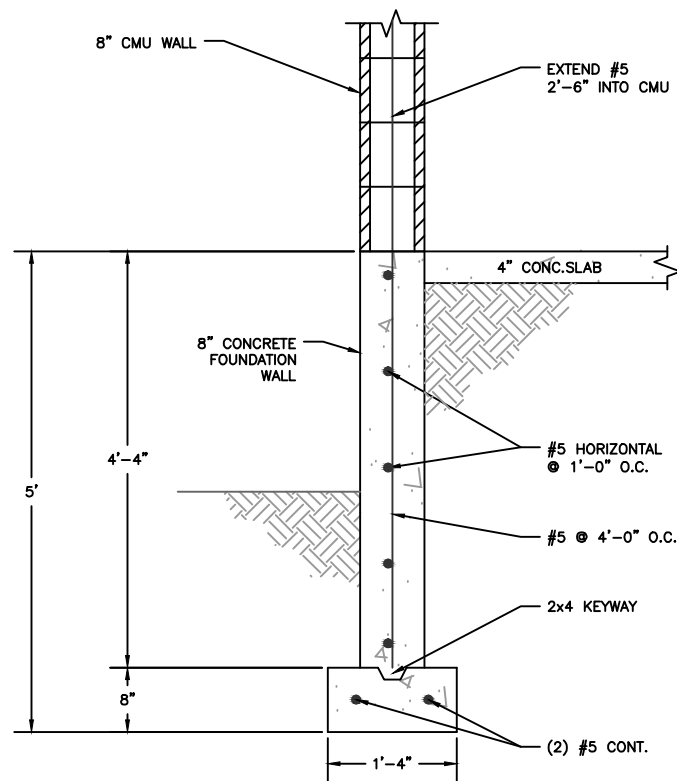
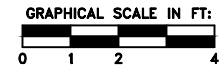
REVISIONS:-----



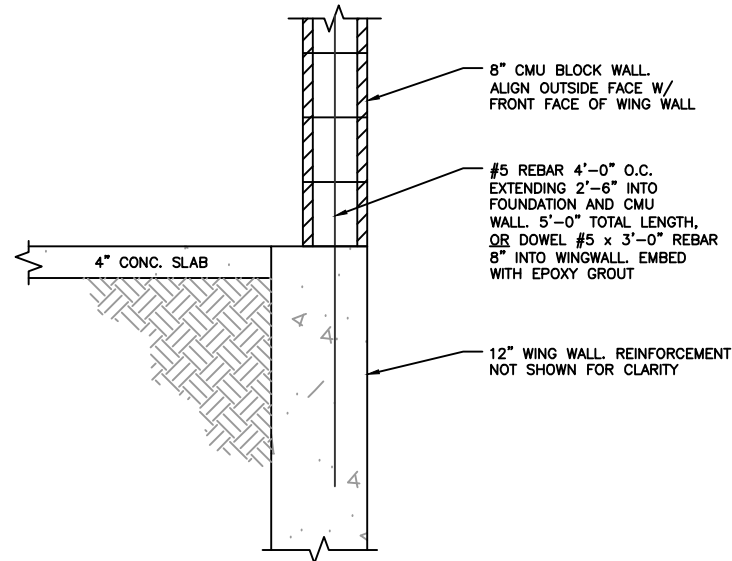
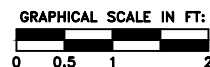
BRIDGE PIER REINFORCEMENT DETAIL (1) S10



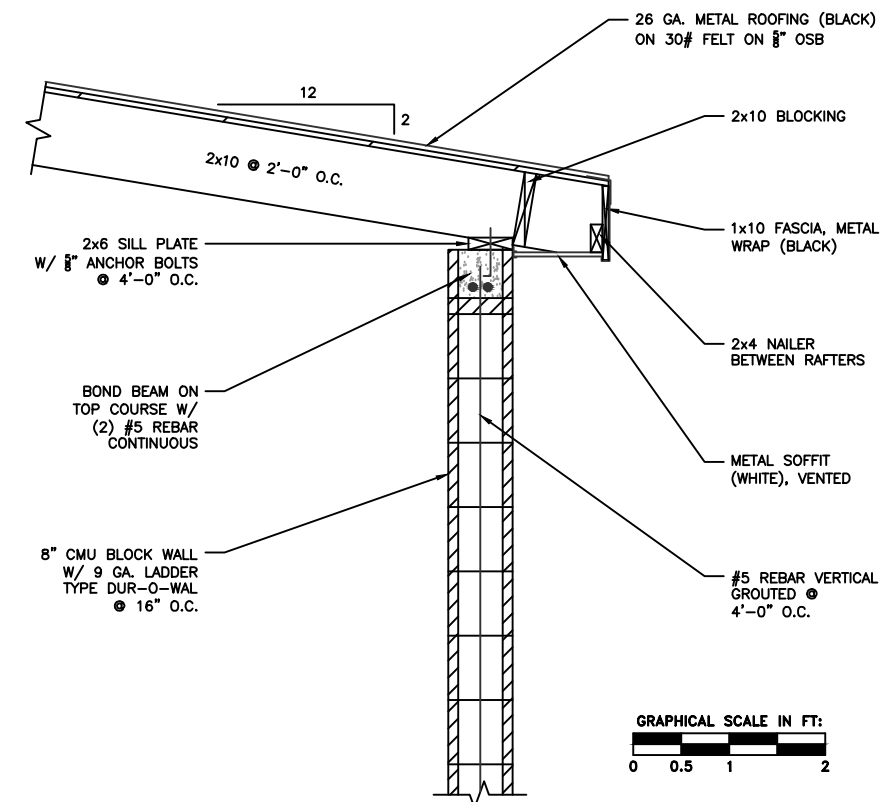
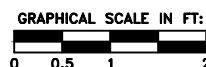
BRIDGE ABUTMENT REINFORCEMENT DETAIL (2) S10



TYPICAL BUILDING FOUNDATION (3) S10

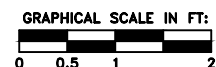


TYPICAL BUILDING TO WINGWALL CONNECTION (4) S10



NOTE:  
1. NORTH WALL SHOWN. SOUTH WALL SIMILAR ATTACHMENT.

TYPICAL SECTION THRU BUILDING (5) S10



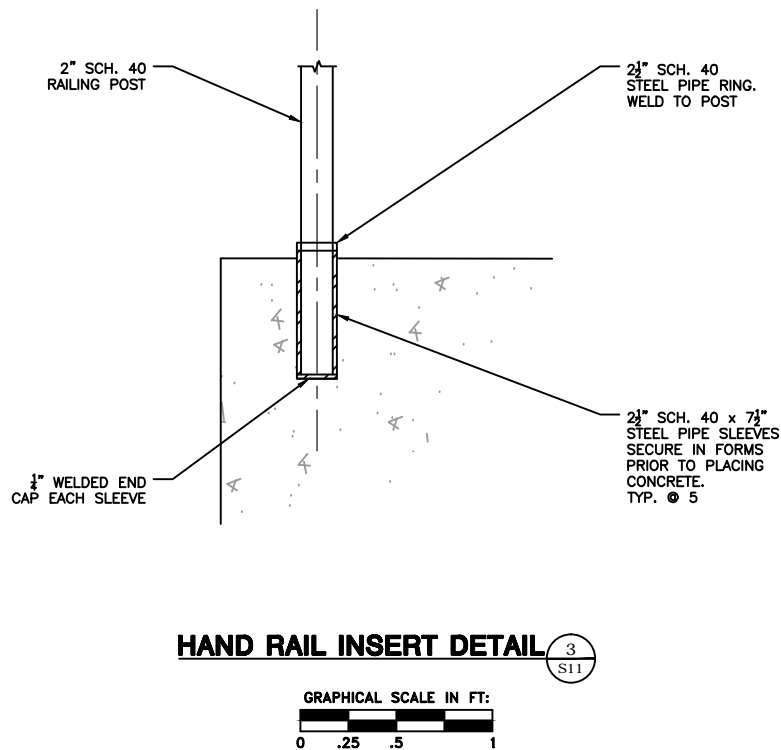
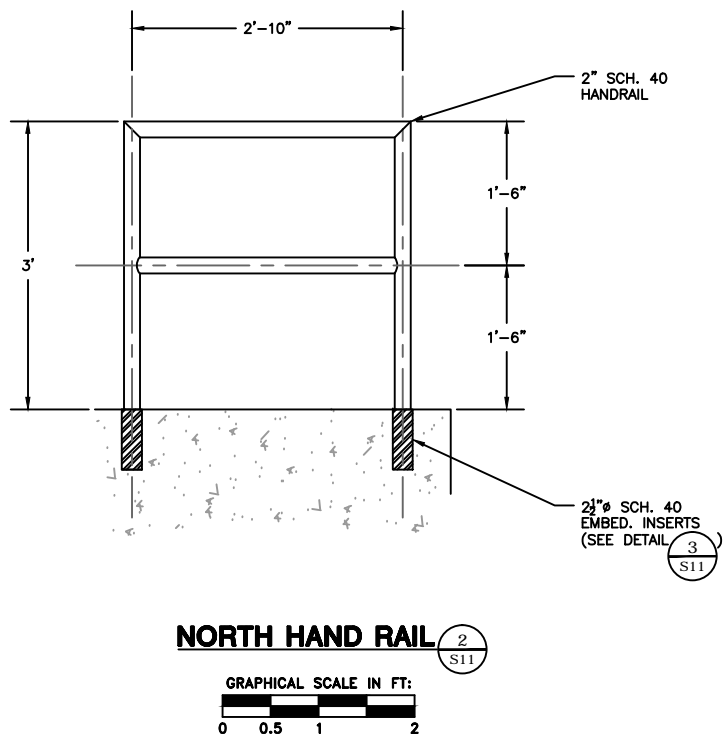
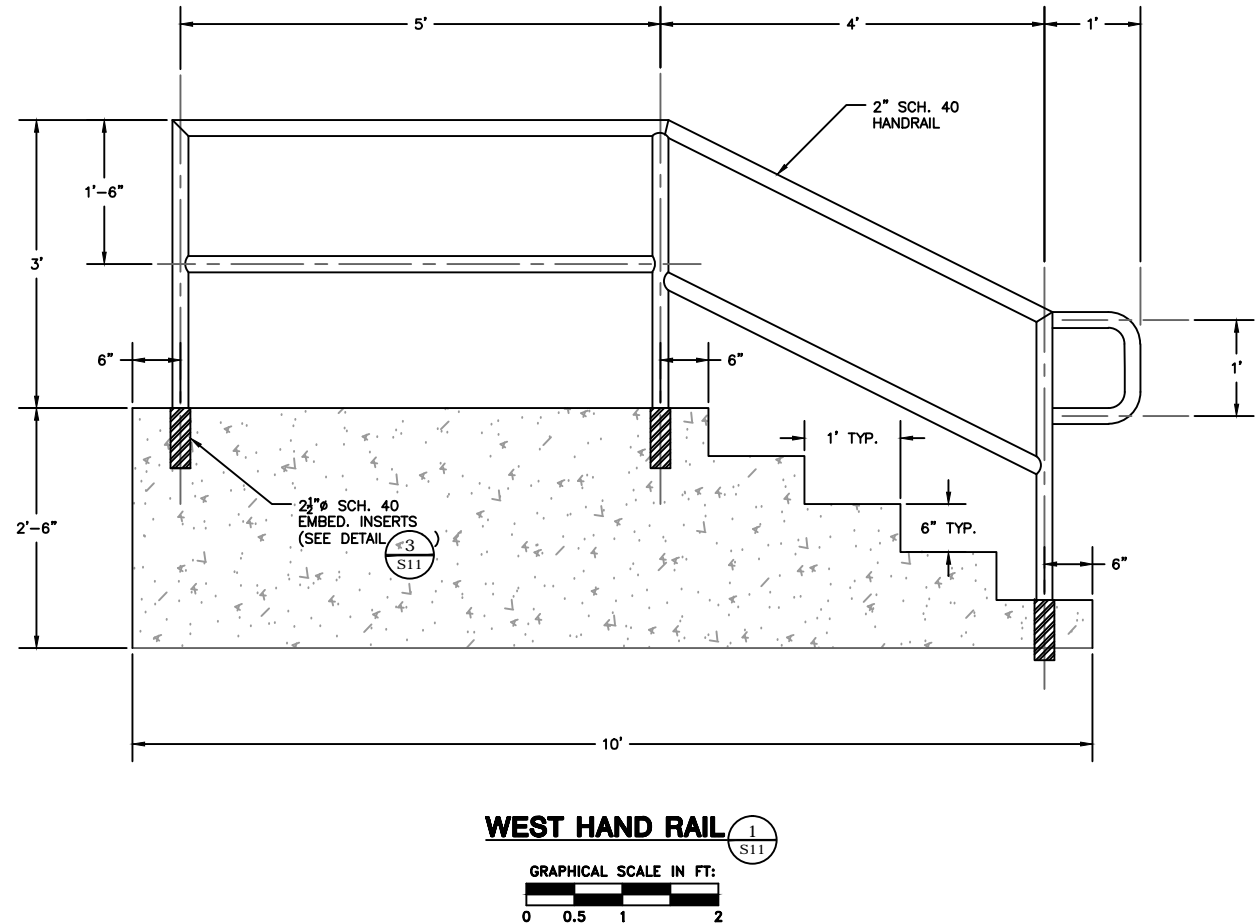
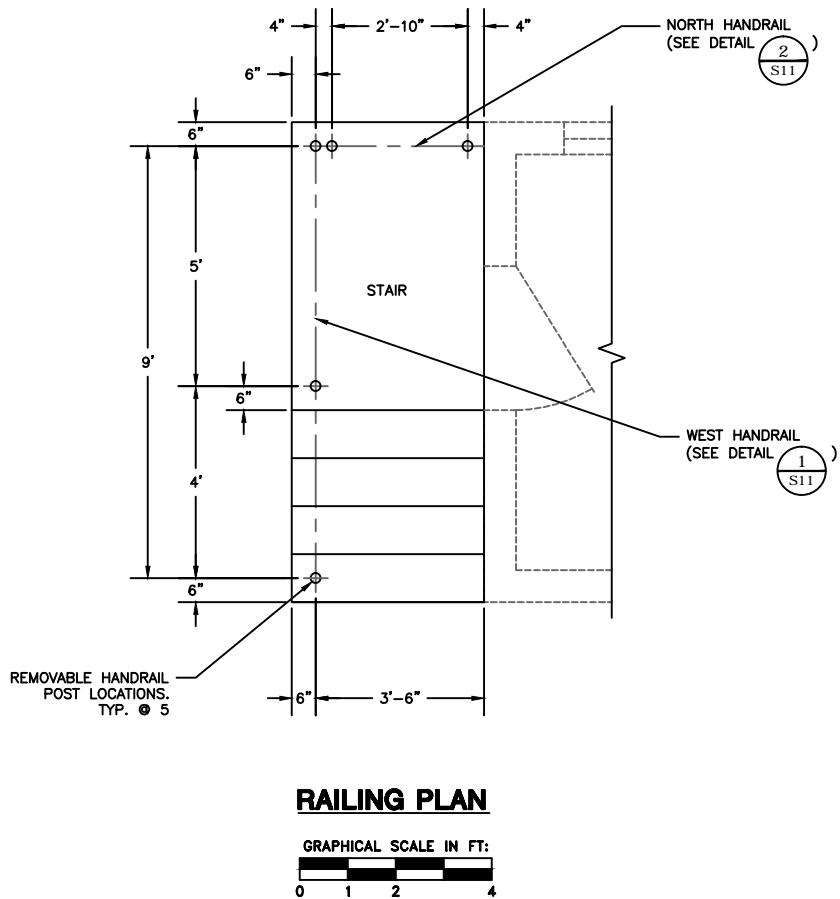
STRUCTURAL DETAILS 3

LWIC HEADGATE  
STRUCTURE  
REHABILITATION PROJECT

PRELIMINARY

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INDEX:	S10

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**HANDRAIL NOTES:**

1. HANDRAIL SHALL BE 2" O.D. PAINTED STEEL PIPE ATTACHED TO CONCRETE STAIR AS SHOWN.
2. MEASUREMENTS SHALL BE FIELD VERIFIED PRIOR TO FABRICATION.
3. PIPE RAILS SHALL RECEIVE A RUST-INHIBITIVE PRIMER AND TWO FINISH COATS OF EXTERIOR SEMI-GLOSS ACRYLIC ENAMEL. COLOR TO BE DETERMINED BY OWNER.
4. CONTRACTOR SHALL SUBMIT SHOP DRAWINGS OF PROPOSED HANDRAILS FOR ENGINEER'S APPROVAL.



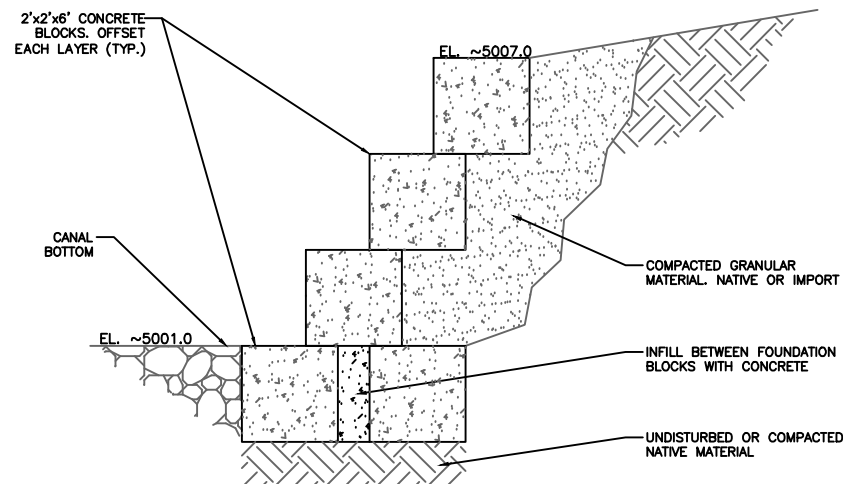
**RAILING PLAN**

**LWIC HEADGATE  
STRUCTURE  
REHABILITATION PROJECT**

**PRELIMINARY**

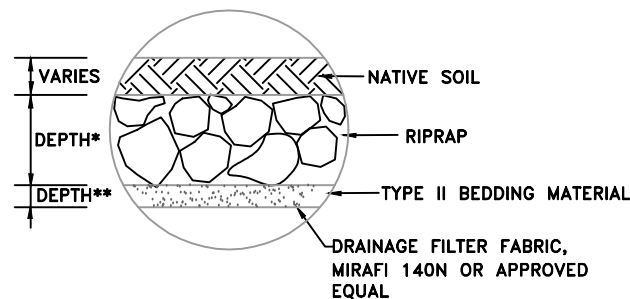
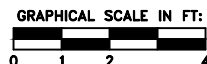
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DATE: 06/03/16	
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- NOTES:
1. WALL CONSTRUCTION SHALL USE BLOCKS SALVAGED FROM EXISTING WALL (~25 VISIBLE), SUPPLEMENT WITH NEW BLOCKS PER BID SCHEDULE (16).
  2. MECHANICALLY COMPACT GRANULAR MATERIAL WITH EACH LIFT.
  3. CONSULT WITH ENGINEER BEFORE DISCARDING DAMAGED BLOCKS.

**BLOCK WALL DETAIL** 1 S12



- \* DEPTH = 2X CLASS IN INCHES (E.G., CLASS 9 = 18 INCHES)
- \*\* DEPTH = 6 INCHES FOR CLASS 9 & 12 RIPRAP, 8 INCHES FOR CLASS 18 RIPRAP

NOTES:

1. ALL RIPRAP PLACED ON CHANNEL SLOPES SHALL BE INSTALLED TO FINAL GRADES, THEN BACKFILLED WITH NATIVE SOIL OR SAND/GRAVEL TO FILL THE ROCK INTERSTICES TO RIPRAP SURFACE.
2. ALL TOE RIPRAP PLACED BELOW CHANNEL BED SHALL BE INSTALLED 12 INCHES BELOW FINAL GRADE AND BURIED WITH NATIVE CHANNEL BED MATERIAL (SAND, GRAVEL, & COBBLE).
3. GENERAL PLACEMENT TECHNIQUES SHOULD RESULT IN LARGER ROCK AT THE SURFACE WITH ROCK SECURELY INTERLOCKED AT THE DESIGN THICKNESS AND GRADE. COMPACTION AND LEVELING SHOULD RESULT IN MINIMAL VOIDS AND PROJECTIONS ABOVE GRADE.
4. REFER TO SPECIFICATIONS FOR MATERIALS AND PLACEMENT REQUIREMENTS FOR RIPRAP AND GRANULAR BEDDING MATERIAL.

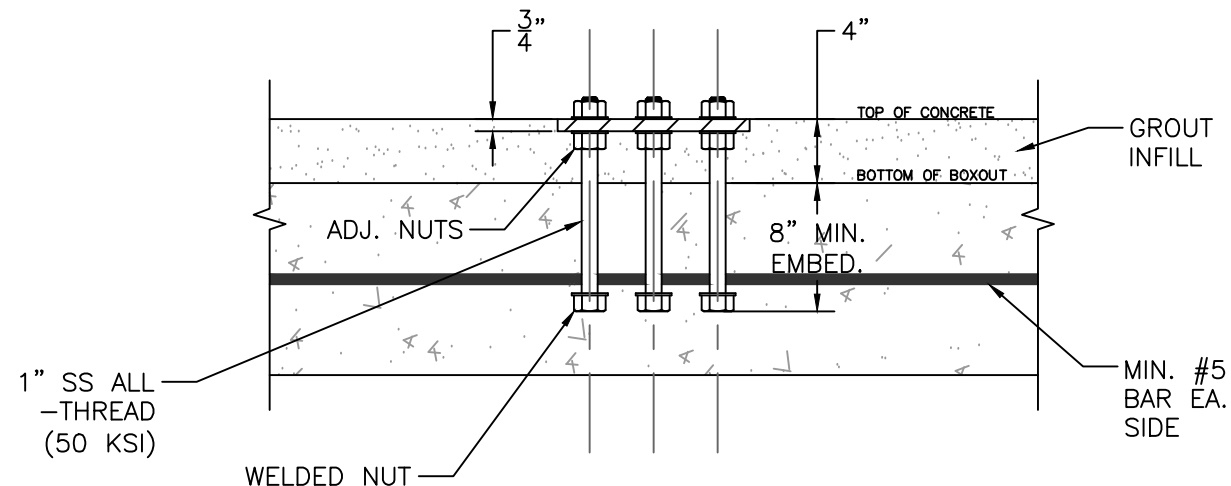
**RIPRAP DETAIL** 3 S12

GRADATION OF ROCK FOR CLASS 9 RIPRAP	
PERCENT SMALLER THAN GIVEN SIZE (BY WEIGHT)	INTERMEDIATE ROCK DIMENSION (POUNDS, INCHES)
70-100	160, 15
50-70	85, 12
35-50	35, 9
2-10	1, 3

GRADATION OF ROCK FOR CLASS 12 RIPRAP	
PERCENT SMALLER THAN GIVEN SIZE (BY WEIGHT)	INTERMEDIATE ROCK DIMENSION (POUNDS, INCHES)
70-100	440, 21
50-70	275, 18
35-50	85, 12
2-10	3, 4

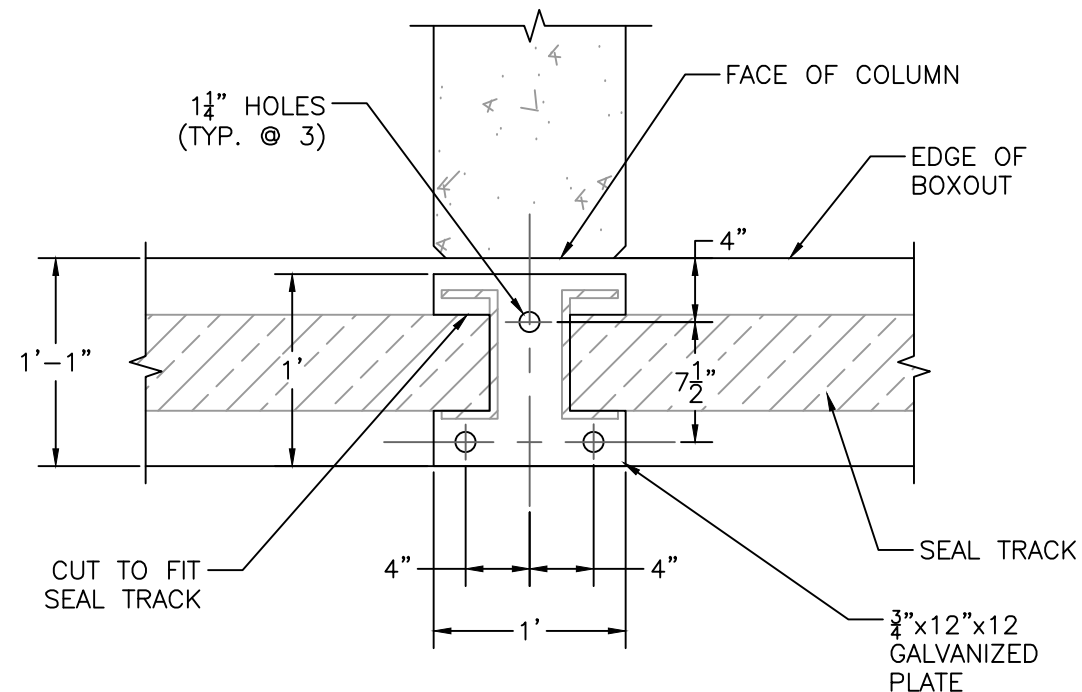
GRADATION OF ROCK FOR CLASS 18 RIPRAP	
PERCENT SMALLER THAN GIVEN SIZE (BY WEIGHT)	INTERMEDIATE ROCK DIMENSION (POUNDS, INCHES)
70-100	1275, 30
50-70	655, 24
35-50	275, 18
2-10	10, 6

GRADATION OF TYPE II BEDDING MATERIAL	
SIEVE SIZE	PERCENT PASSING (BY WEIGHT)
3"	90-100
3/4"	20-90
#4	0-20
#200	0-3



**SECTION**

NOTE:  
PLATE AND ANCHORS TO BE SUPPLIED BY GATE MANUFACTURER PRIOR TO PLACING FOREBAY FLOOR CONNECTION INFILL SLAB..



**PLAN**

**CONTROL GATE ANCHOR DETAIL** 2 S12

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Civil Water Resources Environmental  
375 East Horsetooth Road, Building 5, Fort Collins, CO 80525  
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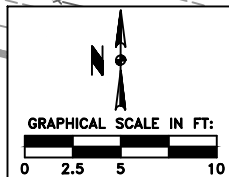
**GENERAL DETAILS**

**LWIC HEADGATE  
STRUCTURE  
REHABILITATION PROJECT**

**PRELIMINARY**

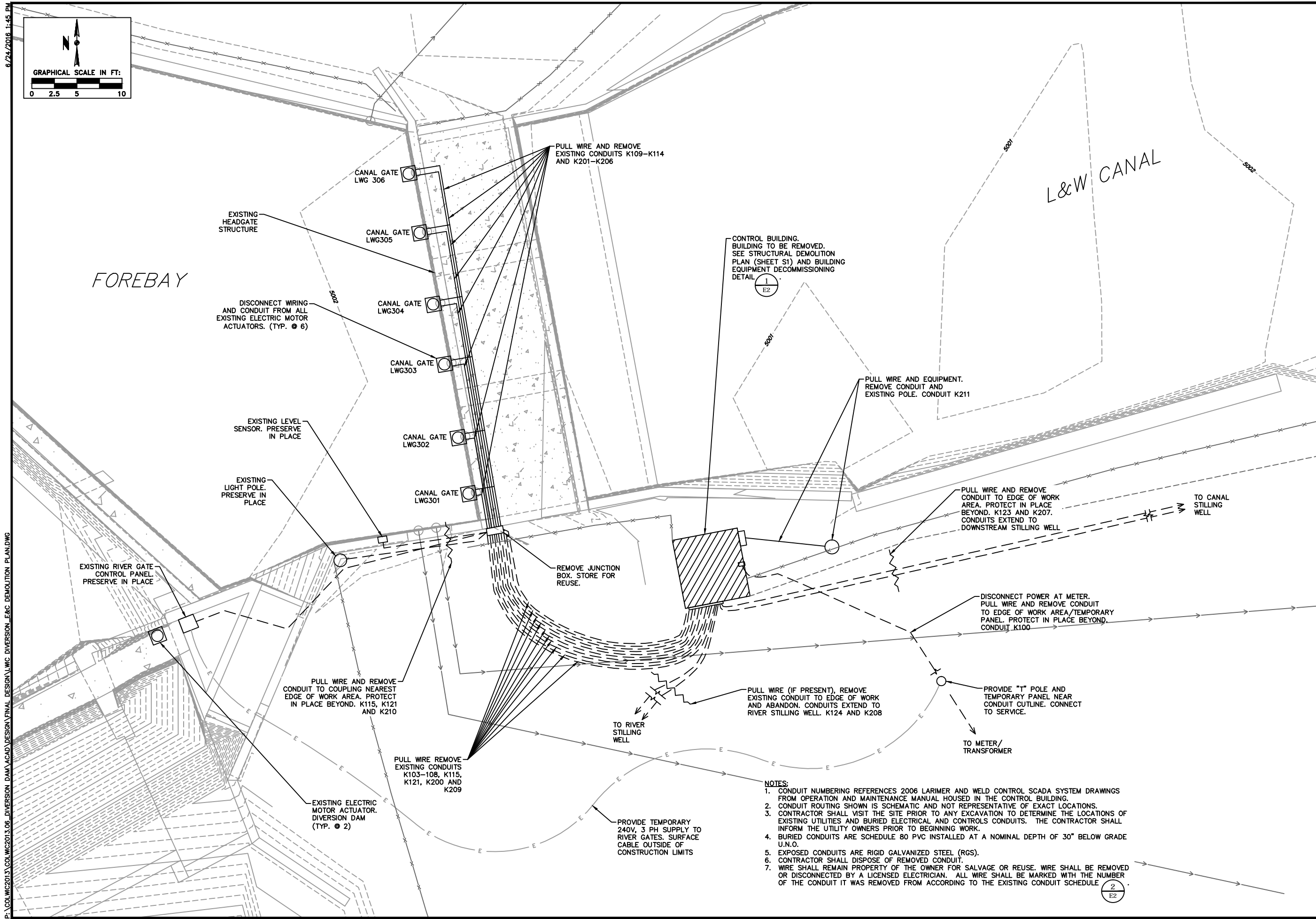
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REVISIONS: ----



- NOTES:
1. CONDUIT NUMBERING REFERENCES 2006 LARIMER AND WELD CONTROL SCADA SYSTEM DRAWINGS FROM OPERATION AND MAINTENANCE MANUAL HOUSED IN THE CONTROL BUILDING.
  2. CONDUIT ROUTING SHOWN IS SCHEMATIC AND NOT REPRESENTATIVE OF EXACT LOCATIONS.
  3. CONTRACTOR SHALL VISIT THE SITE PRIOR TO ANY EXCAVATION TO DETERMINE THE LOCATIONS OF EXISTING UTILITIES AND BURIED ELECTRICAL AND CONTROLS CONDUITS. THE CONTRACTOR SHALL INFORM THE UTILITY OWNERS PRIOR TO BEGINNING WORK.
  4. BURIED CONDUITS ARE SCHEDULE 80 PVC INSTALLED AT A NOMINAL DEPTH OF 30" BELOW GRADE U.N.O.
  5. EXPOSED CONDUITS ARE RIGID GALVANIZED STEEL (RGS).
  6. CONTRACTOR SHALL DISPOSE OF REMOVED CONDUIT.
  7. WIRE SHALL REMAIN PROPERTY OF THE OWNER FOR SALVAGE OR REUSE. WIRE SHALL BE REMOVED OR DISCONNECTED BY A LICENSED ELECTRICIAN. ALL WIRE SHALL BE MARKED WITH THE NUMBER OF THE CONDUIT IT WAS REMOVED FROM ACCORDING TO THE EXISTING CONDUIT SCHEDULE.

Anderson Consulting Engineers, Inc.  
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## ELECTRICAL AND CONTROLS DEMOLITION PLAN

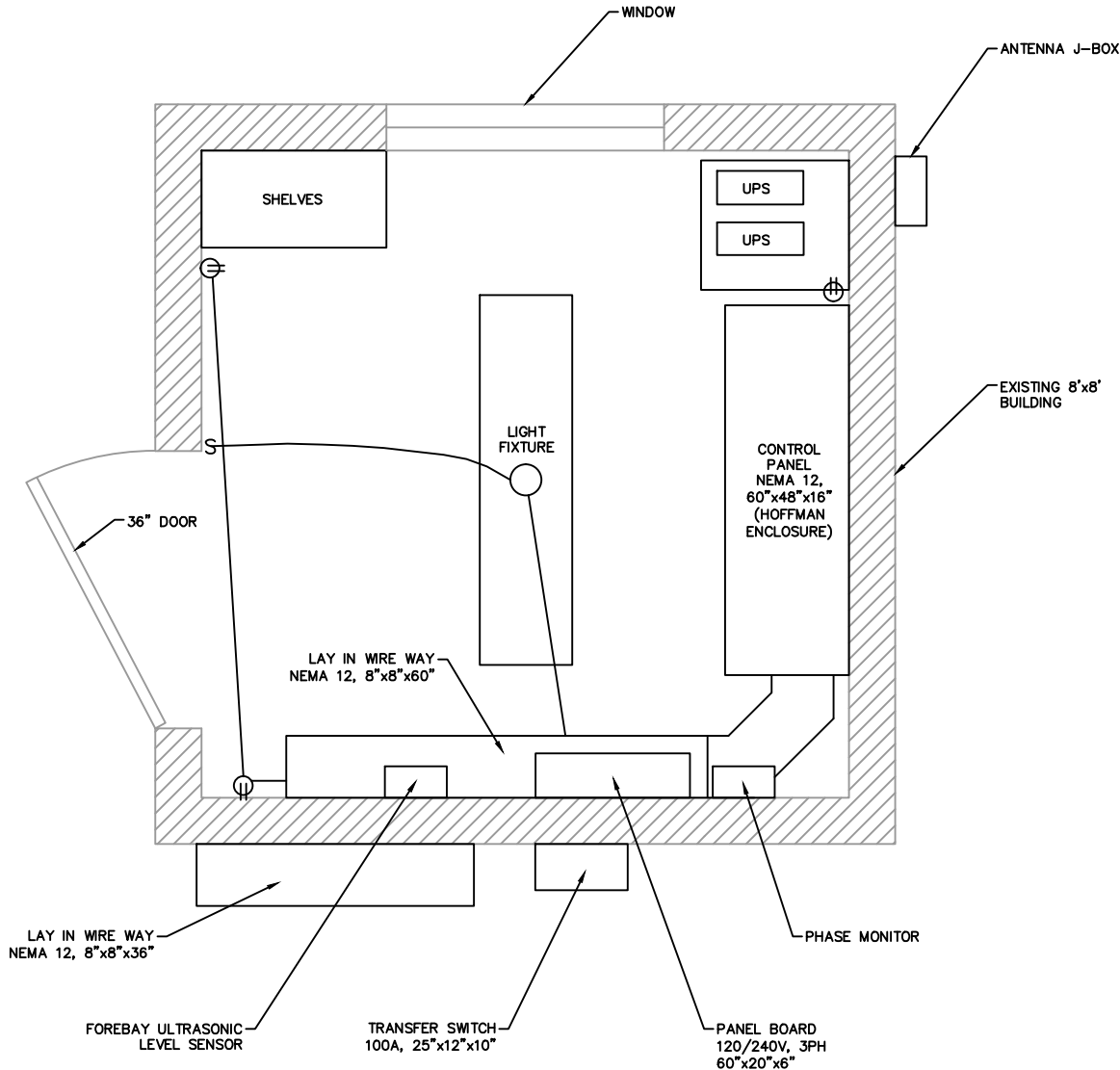
## LWIC HEADGATE STRUCTURE REHABILITATION PROJECT

PRELIMINARY

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DESIGNED BY:	SRP
CHECKED BY:	BAA
PROJECT NUMBER:	COLWIC2013.06
DATE:	06/03/16
SHEET:	21
INDEX:	E1



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DECOMMISSIONING NOTES:

1. ALL WIRE CUT OR DISCONNECTED FROM EQUIPMENT SHALL BE PROPERLY MARKED (COLOR CODED AND/OR NUMBERED) FOR REINSTALLATION. PROVIDE A COMMON MARKING ON BOTH SIDES OF THE CUT OR CONNECTION POINT.
2. AFTER BEING PROPERLY MARKED ALL WIRING SHALL BE REMOVED FROM CONDUIT AND WIRE WAYS BY AN ELECTRICIAN. WIRE TO REMAIN PROPERTY OF THE OWNER FOR SALVAGE OR REUSE.
3. CONDUITS SHALL BE DISCONNECTED FROM BOXES AND ENCLOSURES. DO NOT CUT.
4. THE FOLLOWING EQUIPMENT SHALL BE REMOVED FROM THE BUILDING AND STORED FOR REUSE: TRANSFER SWITCH, PANEL BOARD, CONTROL PANEL (HOFFMAN ENCLOSURE), UPS SYSTEM W/RACK, PHASE MONITOR, FOREBAY ULTRASONIC LEVEL SENSOR, INLET RECEPTACLE, ALL WIRE WAYS, EMERGENCY STROBE, LIGHTNING PROTECTION AIR TERMINALS AND SHELVEING.
5. UTILITY WIRING, CONDUITS, BOXES, OUTLETS, SWITCHES AND FIXTURES SHALL REMAIN WITH THE BUILDING.

BUILDING EQUIPMENT DECOMMISSIONING DETAIL

NOT TO SCALE

1  
E2

CONDUIT SCHEDULE

CONDUIT NUMBER	SIZE (in)	TYPE	REMARKS	CABLE	ROUTING
POWER CONDUITS					
K100	1 1/2	RGS/PVC	Bury 30" Deep	3-1/C-#2, 1-#2 GND	240 VOLT, THREE PHASE PWR TO TRANSF SW.
K101	1 1/2	RGS	Exposed	3-1/C-#10, 1-#2 GND	TRANSFER SWITCH TO PANEL BOARD LPA
K102	1	RGS	Exposed	3-1/C-#10, 1-#12 GND	TRANSF. SWITCH TO MALE INLET RECP TACLE
K103	1	RGS/PVC	Bury 30" Deep	3-#10, 1-#12 GND, 8-#14	POWER/CONTROL- BLDG TO JB1-GATE LWG301
K104	1	RGS/PVC	Bury 30" Deep	3-#10, 1-#12 GND, 8-#14	240V. 3Φ POWER- BLDG TO JB1-GATE LWG302
K105	1	RGS/PVC	Bury 30" Deep	3-#10, 1-#12 GND, 8-#14	240V. 3Φ POWER- BLDG TO JB1-GATE LWG303
K106	1	RGS/PVC	Bury 30" Deep	3-#10, 1-#12 GND, 8-#14	240V. 3Φ POWER- BLDG TO JB1-GATE LWG304
K107	1	RGS/PVC	Bury 30" Deep	3-#12, 1-#12 GND, 8-#14	240V. 3Φ POWER- BLDG TO JB1-GATE LWG305
K108	1	RGS/PVC	Bury 30" Deep	3-#12, 1-#12 GND, 8-#14	240V. 3Φ POWER- BLDG TO JB1-GATE LWG306
K109	3/4	RGS	Exposed	3-#10, 1-#12 GND, 8-#14	POWER/CONTROL TO GATE LWG301
K110	3/4	RGS	Exposed	3-#10, 1-#12 GND, 8-#14	POWER/CONTROL TO GATE LWG302
K111	3/4	RGS	Exposed	3-#10, 1-#12 GND, 8-#14	POWER/CONTROL TO GATE LWG303
K112	3/4	RGS	Exposed	3-#10, 1-#12 GND, 8-#14	POWER/CONTROL TO GATE LWG304
K113	3/4	RGS	Exposed	3-#12, 1-#12 GND, 8-#14	POWER/CONTROL TO GATE LWG305
K114	3/4	RGS	Exposed	3-#12, 1-#12 GND, 8-#14	POWER/CONTROL TO GATE LWG306
K115	1	RGS/PVC	Exsting	3-1/C-#10, 1-#12 GND	POWER TO RIVER GATES
PANELBOARD LPA CONDUITS					
K120	3/4	RGS	Exposed	2-1/C-#12, 1#12 GND	LPA-20 TO BUILDNG LGHTS
K121	3/4	RGS	Existing	2-1/C-#12, 1#12 GND	LPA-22 TO EXTERIOR LIGHT
K122	3/4	RGS	Exposed	2-1/C-#12, 1#12 GND	LPA-26 TO BUILDNG RECEPTACLES
K123	1	PVC	Exsting	2-1/C-#12, 1#12 GND	LPA-28 DS STILLNG WELL POWER
K124	1	PVC	Existing	2-1/C-#12, 1#12 GND	LPA-29 US STILLNG WELL POWER
K125	3/4	RGS	Exposed	2-1/C-#12, 1#12 GND	STROBE LIGHT TO CONTROL CABINET
INSTRUMENTATION AND CONTROL CONDUITS					
K200	1	GRS/PVC	Bury 30" Deep	6-2/C#18 STP	GATE POSITION 4-20mA- GATES LWG301-306
K201	1	RGS	Exposed	6-2/C#18 STP	GATE POSITION 4-20mA- GATE LWG301
K202	1	RGS	Exposed	6-2/C#18 STP	GATE POSITION 4-20mA- GATE LWG302
K203	1	RGS	Exposed	4-2/C#18 STP	GATE POSITION 4-20mA- GATE LWG303
K204	1	RGS	Exposed	3-2/C#18 STP	GATE POSITION 4-20mA- GATE LWG304
K205	1	RGS	Exposed	2-2/C#18 STP	GATE POSITION 4-20mA- GATE LWG305
K206	1	RGS	Exposed	1-2/C#18 STP	GATE POSITION 4-20mA- GATE LWG306
K207	1	RGS	Existing	1-2c#18 STP	DS STILLNG WELL LEVEL 4-20mA
K208	1	RGS	Existing	1-2c#18 STP	US STILLNG WELL LEVEL 4-20mA
K209	1	GRS/PVC	Bury 50" Deep	2-2/C#18 STP	INFLUENT GATE 4-20MA L301
K210	3/4	GRS	Exposed	2-2/C#18 STP	INFLUENT GATE FROM J-B1 TO L301
K211	1 1/2	GRS/PVC	Bury 50" Deep	ANTENNA CABLE	FROM PLC TO MAST ON EXISTING POLE

EXISTING CONDUIT SCHEDULE

NOT TO SCALE

2  
E2

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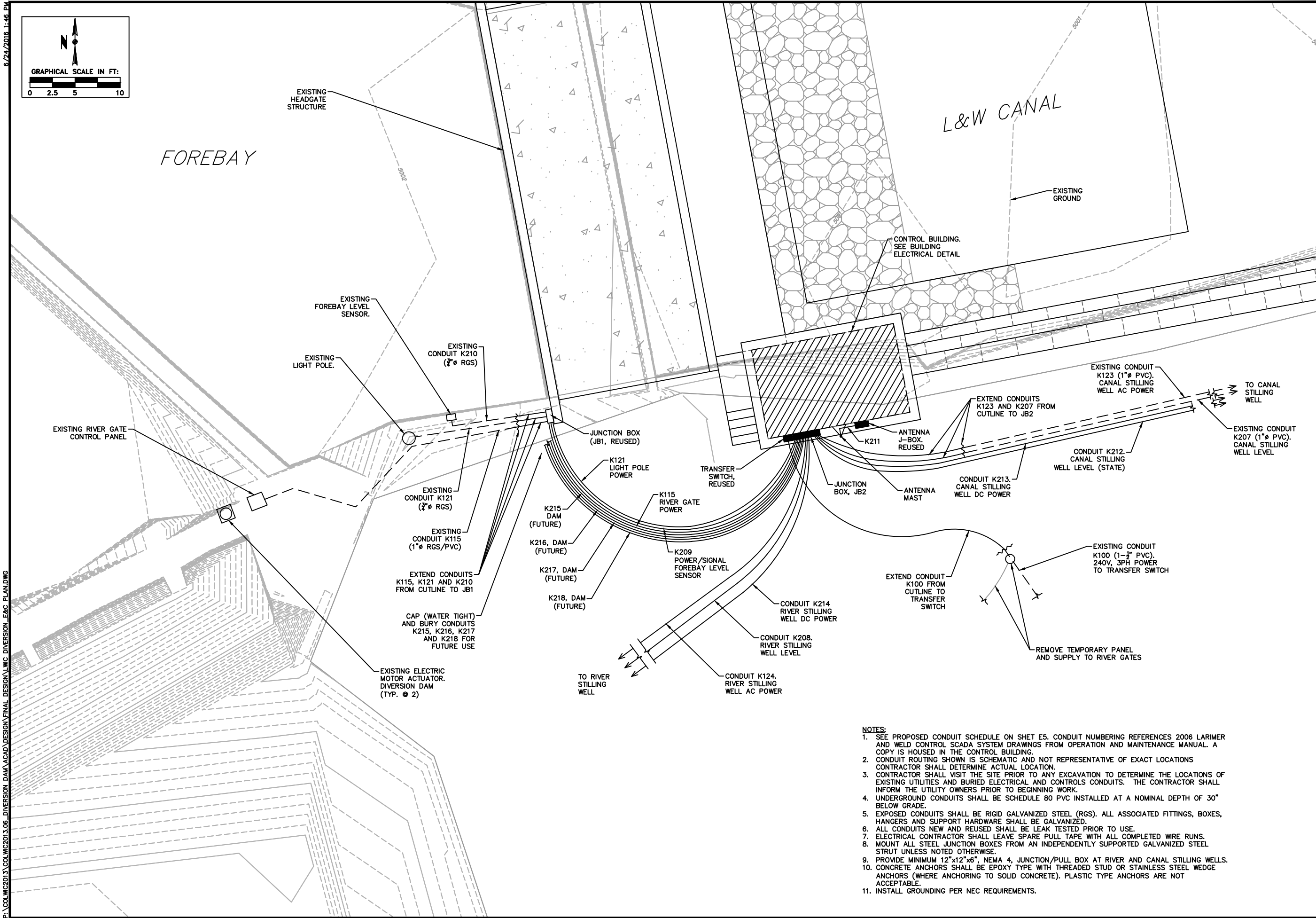
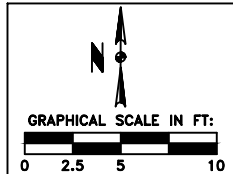
ELECTRICAL AND  
CONTROLS DEMOLITION  
DETAILS

LWIC HEADGATE  
STRUCTURE  
REHABILITATION PROJECT

PRELIMINARY

DRAWN BY:	SRP
DESIGNED BY:	SRP
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DATE:	06/03/16
SHEET:	22
INDEX:	E2

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- NOTES:
1. SEE PROPOSED CONDUIT SCHEDULE ON SHET E5. CONDUIT NUMBERING REFERENCES 2006 LARIMER AND WELD CONTROL SCADA SYSTEM DRAWINGS FROM OPERATION AND MAINTENANCE MANUAL. A COPY IS HOUSED IN THE CONTROL BUILDING.
  2. CONDUIT ROUTING SHOWN IS SCHEMATIC AND NOT REPRESENTATIVE OF EXACT LOCATIONS. CONTRACTOR SHALL DETERMINE ACTUAL LOCATION.
  3. CONTRACTOR SHALL VISIT THE SITE PRIOR TO ANY EXCAVATION TO DETERMINE THE LOCATIONS OF EXISTING UTILITIES AND BURIED ELECTRICAL AND CONTROLS CONDUITS. THE CONTRACTOR SHALL INFORM THE UTILITY OWNERS PRIOR TO BEGINNING WORK.
  4. UNDERGROUND CONDUITS SHALL BE SCHEDULE 80 PVC INSTALLED AT A NOMINAL DEPTH OF 30" BELOW GRADE.
  5. EXPOSED CONDUITS SHALL BE RIGID GALVANIZED STEEL (RGS). ALL ASSOCIATED FITTINGS, BOXES, HANGERS AND SUPPORT HARDWARE SHALL BE GALVANIZED.
  6. ALL CONDUITS NEW AND REUSED SHALL BE LEAK TESTED PRIOR TO USE.
  7. ELECTRICAL CONTRACTOR SHALL LEAVE SPARE PULL TAPE WITH ALL COMPLETED WIRE RUNS.
  8. MOUNT ALL STEEL JUNCTION BOXES FROM AN INDEPENDENTLY SUPPORTED GALVANIZED STEEL STRUT UNLESS NOTED OTHERWISE.
  9. PROVIDE MINIMUM 12"x12"x6", NEMA 4, JUNCTION/PULL BOX AT RIVER AND CANAL STILLING WELLS.
  10. CONCRETE ANCHORS SHALL BE EPOXY TYPE WITH THREADED STUD OR STAINLESS STEEL WEDGE ANCHORS (WHERE ANCHORING TO SOLID CONCRETE). PLASTIC TYPE ANCHORS ARE NOT ACCEPTABLE.
  11. INSTALL GROUNDING PER NEC REQUIREMENTS.

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ELECTRICAL PLAN

LWIC HEADGATE  
STRUCTURE  
REHABILITATION PROJECT

PRELIMINARY

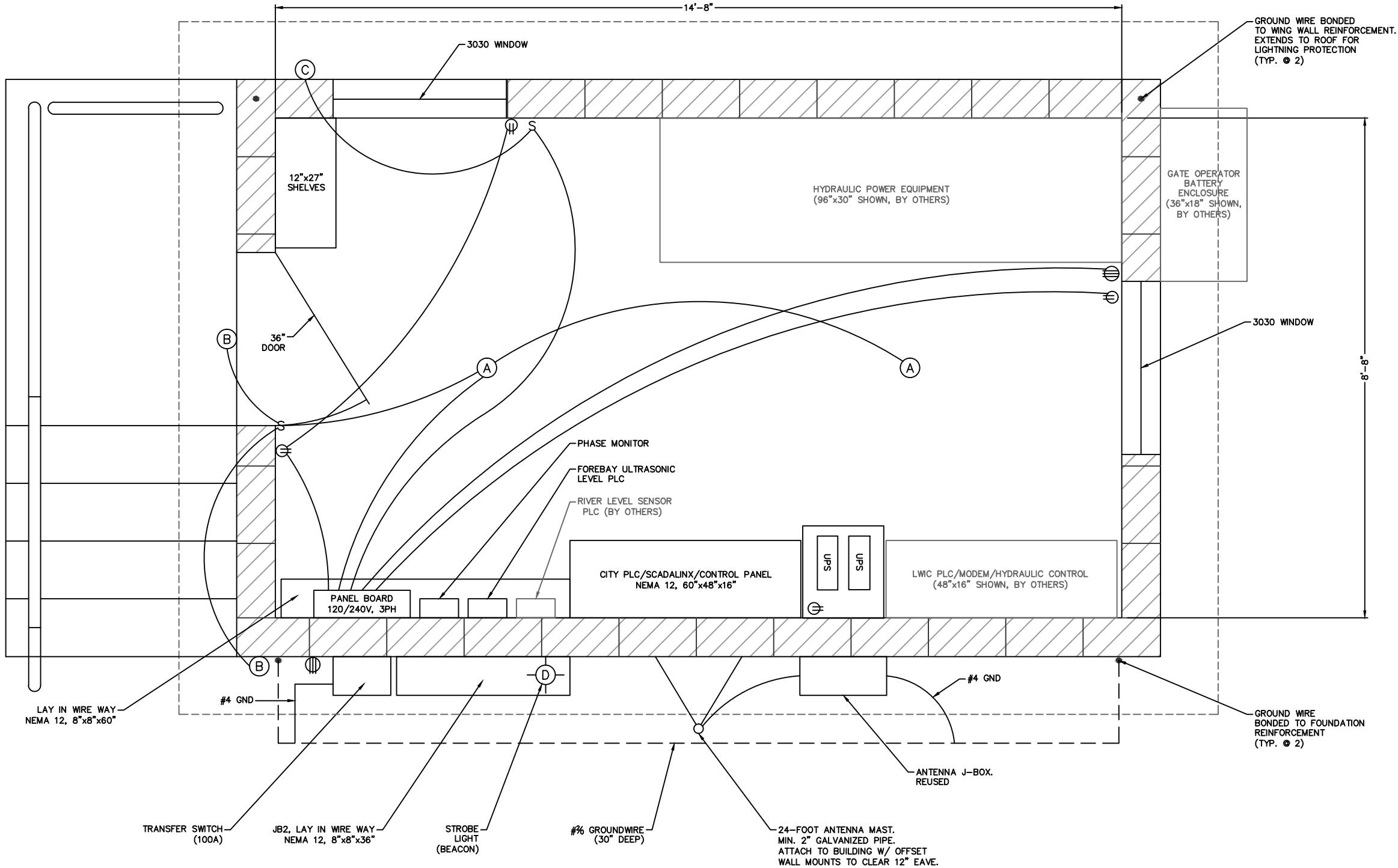
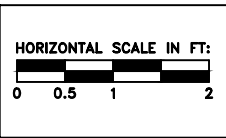
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DATE: 06/03/16	
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**CONTROL BUILDING ELECTRICAL PLAN**

- NOTES:
1. ALL ELECTRICAL EQUIPMENT AND CONNECTIONS SHALL BE MOUNTED 12" MINIMUM ABOVE FLOOR LEVEL.
  2. ALL ELECTRICAL ENCLOSURES SHALL BE RATED NEMA 12.
  3. INSTALL LIGHTNING PROTECTION AIR TERMINALS ON ROOF OF BUILDING.

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**CONTROL BUILDING  
ELECTRICAL DETAILS**

**LWIC HEADGATE  
STRUCTURE  
REHABILITATION PROJECT**

**PRELIMINARY**

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PROJECT NUMBER: COLWIC2013.06	
DATE: 06/03/16	
SHEET: 24	INDEX: E4

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ELECTRICAL EQUIPMENT		
ITEM	CATALOG NO.	DESCRIPTION
PANEL BOARD	CH PRL3A	USED, 60"H x 20"W x 5 $\frac{3}{4}$ "D
TRANSFER SWITCH	DT323URK-N	USED, 24 $\frac{5}{8}$ "H x 11 $\frac{5}{16}$ "W x 9 $\frac{7}{8}$ " D
HOFFMAN ENCLOSURE	A-604816LP	USED, 60"H x 48"W x 16"D
60" WIREWAY	F-88L60	NEW
36" WIREWAY	F-88L36	NEW

FIXTURE SCHEDULE	
TYPE	DESCRIPTION
A	4-FOOT LED UTILITY SHOP LIGHT, 4 LIGHT, 7000-8000 LUMENS
B	LED WALL PACK LIGHT, OUTDOOR RATED, 250-300W EQUIVALENT, BLACK OR GRAY
C	DUAL LED FLOOD LIGHT, OUTDOOR RATED, 500W EQUIVALENT (PER LIGHT), BLACK OR GRAY

PROPOSED CONDUIT SCHEDULE					
CONDUIT	SIZE	TYPE	REMARKS	CABLE	DECRPTION
NUMBER	(INCH)				
POWER CONDUITS					
K100	1 1/2	RGS/PVC	EXIST., 30" BURY	3-1/C #2, 1 #2 GND	240 V, 3PH POWER TO TRANSF. SW.
K115	1 1/4	RGS/PVC	EXIST., 30" BURY	3-1/C #10, 1 #12 GND	POWER TO DAM (RIVER) GATES
PANEL BOARD LPA CONDUITS					
K121	1 1/4	RGS/PVC	EXIST., 30" BURY	2-1/C #12, 1 #12 GND	LPA-22 POWER TO LIGHT POLE
K123	1	PVC	EXIST., 30" BURY	2-1/C #12, 1 #12 GND	LPA-28 POWER TO CANAL STILLING WELL
K124	1 1/4	PVC	NEW, 30" BURY	2-1/C #12, 1 #12 GND	LPA-29 POWER TO RIVER STILLING WELL
INSTRUMENTATION AND CONTROL CONDUITS					
K207	1	PVC	EXISTING	1-2/C #16 STP	LEVEL AT CANAL STILLING WELL
K208	1 1/4	PVC	NEW	8-1/C #12 (8 COLOR), 1-2/C #14 STP	LEVEL AT RIVER STILLING WELL
K209	1 1/4	RGS/PVC	EXISTING	2-2/C #18 STP	LEVEL AT FOREBAY TO L301 (PLC)
K210	1 1/4	RGS	EXISTING	2-2/C #18 STP	LEVEL AT FOREBAY SENSOR TO JB1
K211	1 1/2	RGS	NEW	ANTENNA CABLE	FROM PLC TO NEW ANTENNA MAST
K212	1 1/4	PVC	NEW	2-2/C #14 STP	LEVEL AT CANAL STILLING WELL (STATE)
K213	1 1/4	PVC	NEW	2-1/C #8 (2 COLORS)	24 VDC TO CANAL STILLING WELL
K214	1 1/4	PVC	NEW	2-1/C #8 (2 COLORS)	24 VDC TO RIVER STILLING WELL
K215	1 1/4	PVC	NEW	TBD BY OTHERS	DAM GATE (FUTURE)
K216	1 1/4	PVC	NEW	TBD BY OTHERS	DAM GATE (FUTURE)
K217	1 1/4	PVC	NEW	TBD BY OTHERS	DAM GATE (FUTURE)
K218	1 1/4	PVC	NEW	TBD BY OTHERS	DAM GATE (FUTURE)

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ELECTRICAL DETAILS

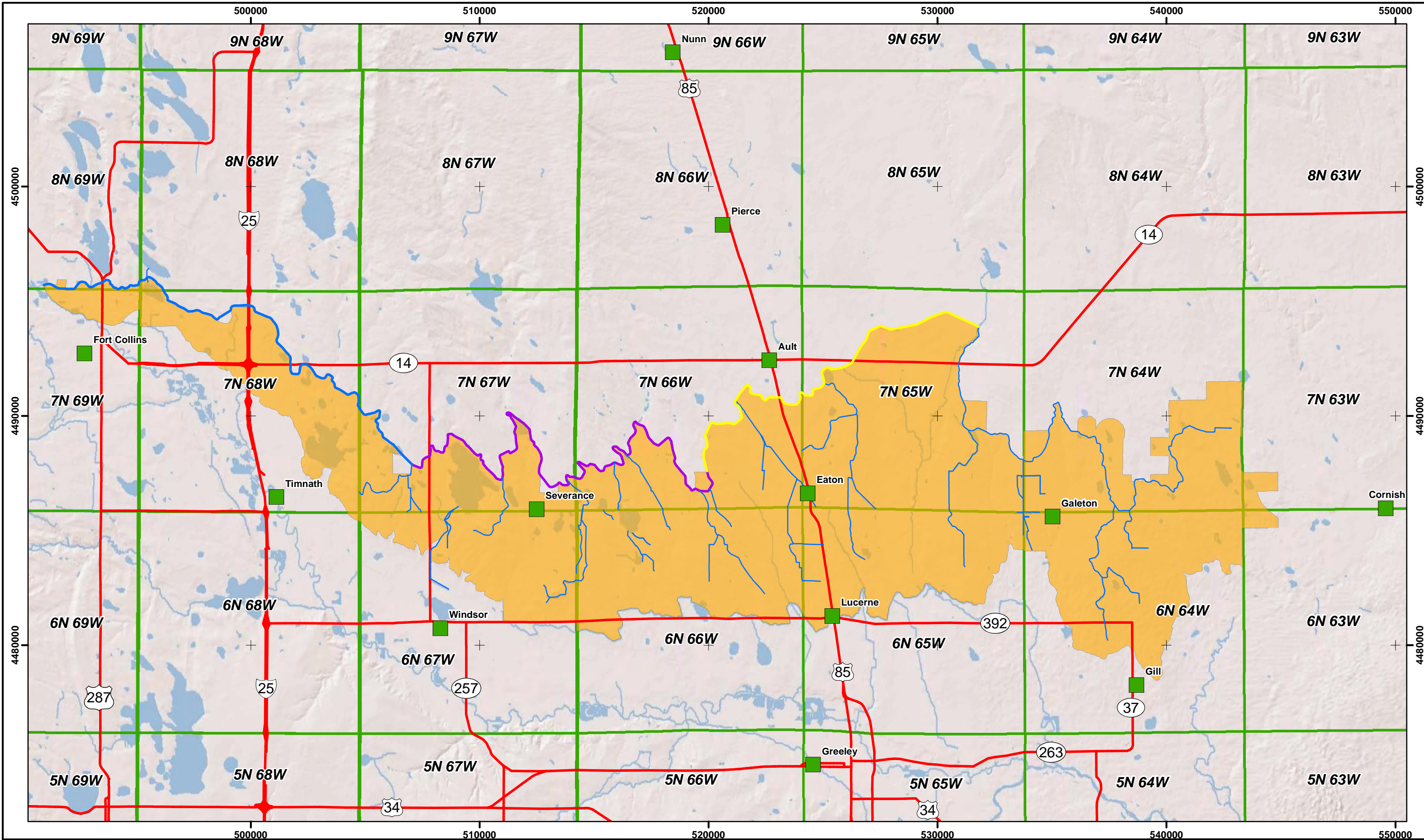
LWIC HEADGATE  
STRUCTURE  
REHABILITATION PROJECT

PRELIMINARY

DRAWN BY:	SRP
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PROJECT NUMBER: COLWIC2013.06	
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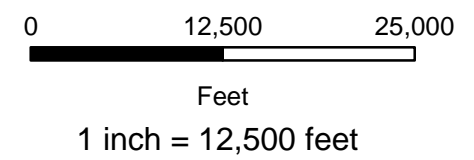




**Legend**

- Larimer and Weld Canal - Upper Division
- Larimer and Weld Canal - Middle Division
- Larimer and Weld Canal - Lower Division
- Ditches
- Major Roads
- Cities
- L & W Canal Service Area
- PLSS

*Note: All contents of this map are projected in UTM NAD83 13N. Grid around map border is also UTM.*



# LWIC System Map





































03/26/2005





03/26/2005





03/26/2005





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03/26/2005



Colorado Secretary of State  
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### Amended and Restated Articles of Incorporation

filed pursuant to §7-90-301, et seq. and §7-130-106 and §7-90-304.5 of the Colorado Revised Statutes (C.R.S.)

ID number: 19871001881

1. Entity name: THE LARIMER AND WELD IRRIGATION COMPANY  
(If changing the name of the corporation, indicate name BEFORE the name change)

2. New Entity name:  
(if applicable) \_\_\_\_\_

3. Use of Restricted Words (if any of these  
terms are contained in an entity name, true  
name of an entity, trade name or trademark  
stated in this document, mark the applicable  
box):

- ☐ "bank" or "trust" or any derivative thereof  
☐ "credit union" ☐ "savings and loan"  
☐ "insurance", "casualty", "mutual", or "surety"

4. If the corporation's period of duration  
as amended is less than perpetual, state  
the date on which the period of duration  
expires: \_\_\_\_\_  
(mm/dd/yyyy)

OR

If the corporation's period of duration as amended is perpetual, mark this box: ☒

5. The amended and restated constituent filed document is attached.

6. The amendment to the articles of incorporation was in the manner indicated below:  
(make the applicable selection)

- ☐ The amendment and restatement was adopted by the board of directors or incorporators without  
member action and member action was not required.
- ☒ The amendment and restatement was adopted by the members AND the number of votes cast for  
the amendment by each voting group entitled to vote separately on the amendment was sufficient  
for approval by that voting group.

(If the amended and restated articles of incorporation include amendments adopted on a different date or in a different manner, mark this  
box ☐ and include an attachment stating the date and manner of adoption.)

7. (Optional) Delayed effective date: \_\_\_\_\_  
(mm/dd/yyyy)

Notice:

Causing this document to be delivered to the secretary of state for filing shall constitute the affirmation or acknowledgment of each individual causing such delivery, under penalties of perjury, that the document is the individual's act and deed, or that the individual in good faith believes the document is the act and deed of the person on whose behalf the individual is causing the document to be delivered for filing, taken in conformity with the requirements of part 3 of article 90 of title 7, C.R.S., the constituent documents, and the organic statutes, and that the individual in good faith believes the facts stated in the document are true and the document complies with the requirements of that Part, the constituent documents, and the organic statutes.

This perjury notice applies to each individual who causes this document to be delivered to the secretary of state, whether or not such individual is named in the document as one who has caused it to be delivered.

8. Name(s) and address(es) of the individual(s) causing the document to be delivered for filing:

<u>Dow</u>	<u>Timothy</u>	<u>J</u>	
(Last)	(First)	(Middle)	(Suffix)
<u>Suite 7</u>			
(Street name and number or Post Office Box number)			
<u>323 S College Ave.</u>			
<u>Fort Collins</u>	<u>CO</u>	<u>80524</u>	
(City)	(State)	(Postal/Zip Code)	
<u></u>	<u>United States</u>		
(Province – if applicable)	(Country – if not US)		

(The document need not state the true name and address of more than one individual. However, if you wish to state the name and address of any additional individuals causing the document to be delivered for filing, mark this box ☐ and include an attachment stating the name and address of such individuals.)

**Disclaimer:**

This form, and any related instructions, are not intended to provide legal, business or tax advice, and are offered as a public service without representation or warranty. While this form is believed to satisfy minimum legal requirements as of its revision date, compliance with applicable law, as the same may be amended from time to time, remains the responsibility of the user of this form. Questions should be addressed to the user's attorney.

**AMENDED AND RESTATED  
ARTICLES OF INCORPORATION  
OF  
THE LARIMER AND WELD IRRIGATION COMPANY**

The undersigned natural persons of the age of eighteen years or more, pursuant to the Colorado Revised Nonprofit Corporation Act, adopt the following Amended and Restated Articles of Incorporation for such Corporation:

**ARTICLE I**

Name of Corporation

The name of the corporation is THE LARIMER AND WELD IRRIGATION COMPANY.

**ARTICLE II**

Period of Duration

The corporation shall have perpetual existence.

**ARTICLE III**

Purpose and Powers

3.1 Purposes. The corporation is organized as a non-profit mutual ditch company pursuant to Colorado Revised Statutes Section 7-42-101 et seq. The purpose of the corporation is to own and operate water rights, a reservoir and such other facilities as may be necessary to transport and carry and store the water of the corporation and its shareholders and engage in any lawful activity incident thereto.

3.2 Powers. The corporation shall have all of the rights, privileges and powers now or subsequently conferred on mutual ditch companies and nonprofit corporations by the laws of Colorado. The corporation shall have and may exercise all powers necessary or convenient to affect any of the purposes for which the corporation has organized.

**ARTICLE IV**

Membership and Capital Stock

4.1 Membership Qualifications. The corporation shall have one class of members and the qualifications and rights of the members shall be further set forth in the bylaws. Any person or entity owning capital stock in the corporation, as reflected in the corporation's records, shall be a member.

4.2 Capital Stock. The aggregate number of shares of capital stock that the corporation is authorized to issue is one thousand four hundred nineteen (1,419) shares of common stock with a one hundred dollar (\$100.00) par value. The capital stock, including both authorized but previously unissued shares as well as treasury shares, may be issued for consideration as shall be fixed from time to time by



the board of directors. The consideration for the issuance of the shares may be paid, in whole or in part, in money, or other property, tangible or intangible, or in labor or services actually performed for the corporation, according to the laws of the State of Colorado. In the absence of fraud in the transaction, the judgment of the board of directors shall be conclusive as to the value of consideration received. No certificate shall be issued for any share until such share is fully paid. Each holder of shares shall be entitled to a certificate signed by the President or any Vice-President and the Secretary of the corporation, certifying the number of shares owned by him or her. The certificate shall comply with the laws of the State of Colorado on the date of its issuance. Shares shall only be transferable only on the books of the corporation upon surrender of the certificate or certificates representing the shares, properly endorsed. The corporation may charge a reasonable fee and all costs incurred in any transfer. Only whole shares may be issued and transferred.

4.3 Rights of Membership. The rights and interests of members shall be determined in proportion to their business in the corporation. A member's business in the corporation shall be determined exclusively by his or her share ownership on a pro rata basis. Members shall have the right to receive services from the corporation substantially at cost, to receive a return of any excess of payments over losses and expenses, and to share in any assets upon dissolution.

4.4 Membership Voting. Each member is entitled to one vote per share owned on each matter submitted to a vote of members.

4.5 Election of Directors. The directors shall be elected by a majority vote of the members. Cumulative voting shall not be permitted in the election of directors or otherwise. Unless otherwise ordered by a court of competent jurisdiction, at all meetings of members representing one-tenth of the shares, represented in person or by proxy, shall constitute a quorum of that voting group.

## ARTICLE V

### Bylaws

The bylaws of the corporation shall be adopted by the board of directors. The board of directors may alter, amend or repeal the bylaws as provided therein.

## ARTICLE VI

### Restriction on Transfer of Membership

The board of directors may adopt provisions in the bylaws which will impose reasonable restrictions on the transfer of memberships or stock in the corporation.

## ARTICLE VII

### Registered Office and Agent

The address of the current registered office of the corporation and the name of the current registered agent at that address is Donn Engel, 106 Elm Avenue, Eaton, Colorado 80615.

## ARTICLE VIII

### Principal Office

The principal office of the corporation is presently located at 106 Elm Avenue, Eaton, Colorado 80615.

## ARTICLE IX

### Board of Directors

9.1 Directors. The corporation shall have three (3) to five (5) directors who shall serve as its board of directors. The names and addresses of the directors who are to serve until a successor or successors are elected and shall qualify are:

1. Perry Haythorn  
18170 WCR 74  
Eaton, CO 80615
2. Barry Anderson  
15681 WCR 74  
Eaton, CO 80615
3. Jim Ochsner  
7422 WCR 74  
Windsor, CO 80550
4. Ruben Hergert  
1720 60<sup>th</sup> Avenue, Apt. 219  
Greeley, CO 80634
5. Steve Cecil  
36626 WCR 59  
Eaton, CO 80615

9.2 Increase or Decrease of Directors. The board of directors of the corporation may be increased or decreased at any time by adoption of or amendment to the bylaws, but no decrease shall have the effect of shortening the term of any incumbent director. In the absence of any provision in the bylaws fixing the number of directors, the number shall be the same as provided in these Articles of Incorporation.

## ARTICLE X

### Indemnification of Directors

The corporation shall indemnify its directors to the full extent permitted by Colorado law.

## ARTICLE XI

### Limitation of Liability

11.1 Breach of Fiduciary Duty. The personal liability of a director to the corporation or its members for monetary damages for breach of fiduciary duty as a director is limited to the full extent provided by Colorado law.

11.2 Obligations of Corporation. The directors, officers, employees and members of the corporation shall not, as such, be liable on its obligations.

11.3 Wanton and Willful Acts. Directors shall not be liable for actions taken or omissions made in the performance of corporate duties except for wanton and willful acts or omissions.

11.4 Conflicts of Interest. To the full extent permitted by Colorado law, as now in effect and as amended from time to time, no contract or other transaction between the Corporation and one or more of its directors or officers, or any other corporation, partnership, association or other organization in which one or more of its directors or officers are directors or officers or have a financial interest, shall be either void or voidable solely for that reason or solely because the director or officer is present at or participates in a meeting of the board of directors or the committee thereof which authorizes, approves or ratifies such contract or transaction or solely because their votes are counted for such purpose. Common or interested directors may be counted in determining the presence of a quorum at a meeting of the board of directors or of a committee thereof which authorizes, approves or ratifies such contract or transaction.

## ARTICLE XII

### Income

12.1 Reserves. The corporation's income is intended to be used for the purpose of meeting losses and expenses. Excess income may be retained in reasonable amounts for purposes of expanding or maintaining facilities, retiring capital indebtedness, acquiring other assets or other reasonable capital projects as determined in the discretion of the Board of Directors. The corporation shall maintain records sufficient to reflect the equity of each member in the assets acquired with the funds. Any excess income not retained in reasonable reserves for future losses and expenses shall belong to members in proportion to their respective stock ownership.

12.2 Dividends. Shares of the corporation shall not carry the right to dividends.

## ARTICLE XIII

### Distribution of Assets on Dissolution

13.1 Distribution. Upon dissolution of the corporation, gains from the sale of appreciated assets and other assets of the corporation shall be distributed to all members in proportion to their respective stock ownership at the time of dissolution after the payment of applicable liabilities.

13.2 Member Rights. The bylaws of the corporation shall not provide for forfeiture of a member's rights and interest upon withdrawal or termination.

## ARTICLE XIV

### Legal Description of Facilities

The facilities of the corporation include an irrigating ditch commonly known as the "Eaton Ditch" which begins at a point on the North side of the Cache La Poudre River; where the water from said river flows into said Ditch being in the South Half of Section 34, Township 8 North, Range 69 West. Thence the course of said Ditch flows easterly along the border between said Section 34 and Section 3, Township 7 North, Range 69 West and then along the border of Section 35, Township 8 North, Range 69 West and Section 2, Township 7 North, Range 69 West and then through the South Halves of Sections 35 and Section 36, Township 8 North, Range 69 West and continues into the South Half of Section 31, Township 8 North, Range 68 West. From there the Ditch continues generally in a south-easterly direction through Sections 6, 5, 4, 3, 10, 11, 14 and 13 of Township 7 North, Range 68 West and then turns south parallel to the Larimer County and Weld County line between Section 13 of Township 7 North, Range 68 West and Section 18 of Township 7 North, Range 67 West. The Ditch then continues south into Section 24, Township 7 North, Range 68 West and then flows in a south-easterly direction into Section 19, 30 and 29 in Township 7 North, Range 67 West. From thence the Ditch flows into Section 28 and 21, Township 7 North, Range 67 West before turning in a southeasterly direction back into Section 28, then continuing on into Section 27 and Section 34, Township 7 North, Range 67 West. From which the Ditch continues meandering in a course generally easterly with both North and South bends at various points through the following Sections:

1. Sections 34, 27, 26, 23, 26, 25, 26, 35 and 36 of Township 7 North, Range 67 West;
2. Sections 31, 30, 29, 30, 29, 20, 29, 28, 33, 34, 27, 22, 23, 14, 23, 24 and 13 of Township 7 North, Range 66 West;
3. Sections 19, 17, 8, 9, 3 and 2 of Township 7 North, Range 65 West, and then

ending at a point in the Southeast quarter of Section 2, Township 7 North, Range 65 West of the 6<sup>th</sup> P.M. at the beginning of the Owl Creek Ditch.

In addition, the corporation maintains facilities for its workers located in the South half of Section 34, Township 8 North, Range 69 West; the Northwest Quarter of Section 29, Township 7 North, Range 67 West; and in the South Half of Section 34, Township 7 North, Range 66 West of the 6<sup>th</sup> P.M.

## ARTICLE XV

### Nonprofit Corporation

This corporation is organized as a nonprofit corporation under the Colorado Revised Nonprofit Corporation Act, as it may be amended from time to time. In addition, the corporation shall have all of the rights and powers of a ditch company granted by Article 42 of Title 7 of the Colorado Revised Statutes pursuant to C.R.S. §7-42-101(2). The terms of these Articles shall in all cases be interpreted in a manner consistent with such provisions. In the event the terms of these Articles conflict with the terms of C.R.S. §7-42-101 et seq. or the Colorado Revised Nonprofit Corporation Act then such statutory authorities shall



control. In the event of a conflict between the statutory authorities, the statutes shall be given precedent in the following order:

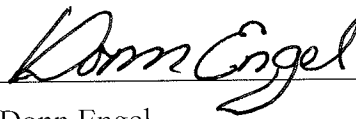
1. C.R.S. §7-42-101 et seq.,
2. Colorado Revised Nonprofit Corporation Act.

## ARTICLE XVI

### Amendments

The Corporation reserves the right to amend its Articles of Incorporation from time to time in accordance with the Colorado Revised Nonprofit Corporation Act.

The undersigned consents to the appointment as the registered agent of THE LARIMER AND WELD IRRIGATION COMPANY.

A handwritten signature in cursive script, reading "Donn Engel", is written over a horizontal line.

Donn Engel

The (a) name or names, and (b) mailing address or addresses, of any one or more of the individuals who cause this document to be delivered for filing, and to whom the Secretary of State may deliver notice if filing of this document is refused, are:

Timothy J. Dow, 323 S. College Avenue, Suite 7, Fort Collins,

Colorado 80524

**RESOLUTION OF THE SHAREHOLDERS AND DIRECTORS OF  
THE LARIMER AND WELD IRRIGATION COMPANY,  
A COLORADO MUTUAL DITCH COMPANY AND NONPROFIT  
CORPORATION**

On December 1, 2007, an annual meeting of the shareholders was held. A quorum was present and a majority of such shareholders present consented that the following action be taken.

A quorum of the directors was also present and a majority of the directors also consented that the following action be taken.

RESOLVED, that the Amended and Restated Articles of Incorporation in the form attached hereto shall be approved and adopted.

Dated this 1 day of December, 2007.

SECRETARY:

  
Donn Engel

**AMENDED AND RESTATED  
BYLAWS  
OF  
THE LARIMER AND WELD IRRIGATION COMPANY**

The board of directors of The Larimer and Weld Irrigation Company (the "Corporation") has adopted these bylaws of the Corporation (these "Bylaws") pursuant to Colorado Revised Statutes ("C.R.S.") Section 7-130-201. These Bylaws completely amend and restate such Bylaws in their entirety. Defined terms used but not defined herein shall have the meanings ascribed thereto in the Articles of Incorporation.

**ARTICLE 1**

**OFFICES**

The principal office of the corporation shall be located at 106 Elm Avenue, Eaton, Colorado 80615. The board of directors may change the principal place of business at any time. The corporation may also have offices at other places within or outside of Colorado as the board of directors may from time to time approve.

**ARTICLE 2**

**MEMBERS**

Section 1. **Qualification.** The Corporation shall have one class of Members who are assessable annually for a monetary payment to the Corporation for costs, expenses, investments and obligations of the Corporation. Memberships shall be reflected by the issuance of common stock.

Section 2. **Assessments.** Assessments shall be established in accordance with C.R.S. § 7-42-104. Failure to make the required payment or contribution cause the member's privileges or membership to be suspended, as determined by the board of directors in accordance with Colorado law including but not limited to C.R.S. § 7-126-302 and § 7-42-104, as may be amended or replaced from time to time. Furthermore, the Board of Directors may at its discretion cease delivery of water to any Member whose assessments are not paid in full at any time when assessments are past due by twenty or more days. In addition, if a shareholder is delinquent on three (3) annual assessments, an action may be maintained in the name of the Corporation to recover any assessment which shall remain due and unpaid for a period of sixty days after a written demand has been deposited in the post office properly addressed to the delinquent Member. Thereafter, if assessments remain unpaid the Member shall forfeit his or her stock pursuant to § 7-42-104. The proceeds of any sale of such stock over and above the amount due on the shares shall be paid to the delinquent Member.

Section 3. **New Members.** New Members may be admitted to the Corporation upon the purchase or acquisition of common stock in the corporation in a manner consistent with the terms of the Articles, these Bylaws and the laws of the State of Colorado.



Section 4.     **Certificate Representing Shares.** Each Member shall be entitled to a certificate signed by an officer of the Corporation, certifying the number and type of shares owned. Shares shall be transferable only on the books of the Corporation upon surrender of the certificate representing the shares, properly endorsed. The Corporation may charge a reasonable fee and all costs incurred in the transfer. Any shareholder who has lost, destroyed or mislaid his common stock certificate shall notify the Secretary in writing by hand delivery or certified US mail as soon as reasonably possible. If three or more years have elapsed since the receipt of the written notice by the Secretary, and such stockholder has paid all assessments due and owing, the shareholder shall complete a Verified Statement of Loss and Notice of Demand as provided to him by the Secretary upon request by the shareholder. Upon execution of the Verified Statement of Loss and Notice of Demand, the payment of all assessments due and owing, and the payment of a one time fee of \$500 per share plus \$100 per new certificate to be issued, the Corporation shall publish, at the additional expense of the shareholder, at least once a week for five successive weeks, the fifth publication being on the twenty-eighth day after the first publication, in a newspaper of general circulation in Weld County setting forth the Verified Statement of Loss and Notice of Demand in full and stating that the corporation will issue, on the date stated therein, following the last publication date by thirty days, a duplicate or replacement certificate unless a contrary claim is filed with the Corporation prior to such date. Assuming no claimants come forward, the Secretary shall issue one or more new or duplicate certificates representing an equal number of shares of common stock. All rights under the original certificates shall cease immediately thereafter.

If three or more years have not elapsed since the receipt of the written notice by the Secretary, provided however that such stockholder has paid all assessments due and owing, the shareholder shall complete the Verified Statement of Loss and Notice of Demand as provided by the Secretary to the shareholder upon request and post bond as provided in said Statement. Upon execution of the Verified Statement of Loss and Notice of Demand, the payment of all assessments due and owing, the payment of a one time fee of \$500 per transaction plus \$100 per new certificate to be issued, and the posting of a bond in an amount equal to twice the current fair market value of the underlying stock represented by the lost certificate such amount determined in the sole discretion of the Board of Directors, the Corporation shall publish, at the additional expense of the shareholder, at least once a week for five successive weeks, the fifth publication being on the twenty-eighth day after the first publication, in a newspaper of general circulation in Weld County setting forth the Verified Statement of Loss and Notice of Demand in full and stating that the Corporation will issue, on the date stated therein, following the last publication date by thirty days, a duplicate or replacement certificate unless a contrary claim is filed with the corporation prior to such date. Assuming no claimants come forward, the Secretary shall issue one or more new or duplicate certificates representing an equal number of shares of common stock. All rights under the original certificates shall cease immediately thereafter.

Section 5.     **Transfer of Stock.** No transfer of stock for uses on land not historically irrigated by water of the Corporation (hereinafter, "New Land(s)") or for uses not historically made (hereinafter, "New Uses") shall be permitted except by and upon orders and approval of

the Board of Directors. If a person acquiring stock (the "Transferee") expresses an intent to use the purchased shares for New Uses or upon New Lands, the secretary of the Corporation shall suspend the reissue of certificates pending review by the Board of Directors. The Transferee shall submit an application to the Board of Directors describing the New Uses and/or New Lands that is sufficiently detailed to permit the Board of Directors to determine whether the proposed uses will be detrimental to the operation of the Corporation's water delivery system, in violation of the Corporation's water rights, decrees, the Articles or these Bylaws, or otherwise injurious to the Members and the Corporation as a whole. The Board of Directors shall review any such application in a timely manner and, if the Board determines that the application cannot be granted as presented, it shall allow the Transferee an opportunity to revise its plan to address the Board's concerns. The Board of Directors shall then reconsider the revised plan using the same standards for review as if it were the original application. The Board of Directors is authorized to engage engineering and legal help to assist in its review of the application, and any fees thereby generated which would not have been incurred but for the application shall be borne by the Transferee.

Section 6. **Colorado Big Thompson Allotment Contracts.** In the event the corporation owns, acquires or has title to Colorado Big Thompson Water Project Allotment Contracts administered by the Northern Colorado Water Conservancy District, shareholders shall not be permitted to separately transfer, sell, distribute, give or otherwise convey any portion of said contracts independently from the transfer of their underlying shares in the Corporation.

### ARTICLE 3

#### CHANGES OF WATER RIGHTS

Section 1. **Application – Review – Standard.** Any Member (the "Applicant") desiring a change of water rights as defined in the Water Right Determination and Administration Act of 1969, C.R.S. §37-92-101 through 37-92-603, including, but not limited to, a change in point of diversion or place of use of any water that the Applicant is entitled to receive as a result of stock ownership must first make a written application to the Board of Directors. A change of water right shall include the use of water the Applicant is entitled to as a result of stock ownership as augmentation water in a plan for augmentation or exchange. The request should detail the requested change and include adequate terms and conditions to prevent injury to the Corporation and the Members. If, in the reasonable opinion of the Board of Directors, such change may be approved without injury to the Corporation and the Members, the Board of Directors shall then approve the change application subject to necessary terms and conditions. In evaluating whether the requested change of water rights can be made without injury to the Corporation and the Members, the Corporation may obtain an engineering and legal analysis of the requested change by the Applicant and the terms and conditions offered by the Applicant.

- (a) The Application shall include a deposit of Five Thousand Dollars (\$5,000.00) payable to the Company which shall be used by the Company to pay all costs and expenses incurred by the Company for any initial estimate of reasonable engineering, expert and attorney fees for the review as contemplated in Paragraph

Four (4). Any part of the Five Thousand Dollar (\$5,000.00) deposit remaining after determination of the initial estimate, if any, will be applied toward the deposit required in Paragraph Four (4).

Section 2. **Timely Review.** The Corporation shall evaluate the application for change of water rights within a reasonable amount of time.

Section 3. **Board Approval Required.** No application for approval of a change of water rights or plan for augmentation as described above may be made to the District Court for Water Division No. 1, State of Colorado ("Water Court") unless the same has been submitted to the Corporation and has either been approved or denied by the Board of Directors. If an application has been approved by the Board of Directors, the Applicant must include terms and conditions at least as stringent as those approved by the Board of Directors in an application to the District Court for Water Division No. 1., State of Colorado.

Section 4. **Applicant Pays Costs.** An Applicant for a change of water right must reimburse the Corporation for the Corporation's reasonable costs and fees, including a charge for time spent by the Board of Directors and Corporation employees in analyzing the application to the Board of Directors and in any litigation that follows. This specifically includes a challenge to the Board of Director's denial of an application. Said Applicant shall also be responsible for all legal, engineering and expert fees and costs for review and analysis of said Application that may be incurred by the company. Furthermore, the Applicant shall be responsible for the payment of all costs, fees and expenses incurred by the Company including but not limited to any engineering, expert and attorney fees for any filing in Water Court including opposition to any Application and any and all subsequent legal proceedings. Court expenses and fees shall include but not be limited to administrative hearings, referee hearings, water court proceedings, any appeals and any and all subsequent legal proceedings therefrom or thereafter. Prior to analyzing the proposed change, the Board of Directors shall obtain an estimate of the costs. The Board of Directors shall make said estimate of cost within thirty (30) days of submission of an application and the Applicant shall have thirty (30) days after receipt of the estimate from the Board of Directors to make the deposit. The Board of Directors shall not take final action on any Application until, and unless, the Applicant makes said deposit with the Corporation. If the estimate and deposit need to be adjusted by further payment or reimbursement, such adjustments and reimbursements shall be made upon the completion of the analysis. In no event shall the committee be required to finally approve or disapprove of the Application until all fees incurred by the Corporation are reimbursed. With regard to expenses and fees for proceedings after approval or denial of the initial application, the Applicant shall reimburse the Company within thirty (30) days of receipt from the Company of a statement detailing costs and fees incurred, including but not limited to Court expenses and fees, engineering and expert review fees and attorney fees.

Section 5. All waters diverted under any priority awarded to The Larimer & Weld Irrigation Company and all waters otherwise diverted by The Larimer & Weld Irrigation Company must enter through the headgate of the Larimer & Weld Canal on the Poudre River,

and the water to which any shareholder is entitled cannot bypass the river headgate and measuring structure of the Larimer & Weld Canal.

## ARTICLE 4

### MEETINGS OF MEMBERS

Section 1. **Annual Meeting.** The annual meeting of the Members of the corporation shall be held each year on such date as may be fixed by resolution of the board of directors. The annual meeting shall be held for the election of directors and the transaction of such other business as may properly come before it. At each annual meeting, the board of directors shall submit to the membership a report of the corporation's business activities during the preceding year and the general financial condition of the corporation.

Section 2. **Special Meetings.** Special meetings of the Members may be called by or at the direction of the President, Board of Directors or ten (10%) percent of the outstanding Members.

Section 3. **Notice of Meetings.** Notice of any meetings, annual or special, shall specify the date, time, place and purpose of the meeting and shall be delivered, either personally, by mail or delivery service, to all Members. Notice for meetings shall be sent not less than ten (10) and no more than sixty (60) days prior to the meeting. Provided, however, if authorized shares are to be increased then notice shall be given at least thirty (30) days prior to the meeting. A Member may waive notice pursuant to C.R.S. § 7-127-126, as may be amended or replaced from time to time. All Members in good standing as of the record date provided in this Section 3 shall be entitled to notice. The record date for giving notice shall be the business day preceding the day on which notice is given or, if the notice is waived, at the close of business on the business day preceding the day on which the meeting is held. Notice shall be deemed to be effective as provided in C.R.S. § 7-121-402, as may be amended or replaced from time to time.

Section 4. **Voting.** The record date for determining the Members entitled to vote at any meeting shall be the same date as the record date for the giving of notice with respect to such meeting. A Member entitled to vote may vote in person or by proxy executed in writing by the Member or the Member's duly authorized attorney-in-fact. Each Member shall be entitled to one vote for each share of common stock held by such member. All acts and resolutions of the Members shall be deemed adopted upon a favorable vote of a majority of the votes cast by Members qualified to vote. A Member entitled to vote may vote in person or by proxy executed in writing by the Member or the Member's duly authorized attorney-in-fact. Members holding ten (10%) percent of the votes entitled to be cast on the matter shall constitute a quorum unless otherwise required by the Colorado Nonprofit Corporation Act. Cumulative voting shall not be allowed. In the event that more than one person or entity owns a share of stock, the combined persons and/or entities shall be required to designate a single voting Member who shall be exclusively appointed to vote said share. Such voting Member shall also be appointed to receive all correspondence on behalf of the owners of said share including but not limited to assessment notices.



Section 5.     **Members List.** After fixing a record date for a notice of a meeting or for determining the Members entitled to take action by written ballot, the corporation shall prepare an alphabetical list of the names of all of its Members who are entitled to notice of, and to vote at, the meeting or to take such action by written ballot. The list shall show the address of each Member entitled to notice of, and to vote at, the meeting or to take such action by written ballot and the number of votes each Member is entitled to vote at the meeting or by written ballot. If prepared in connection with a meeting of the Members, the Members list shall be available for inspection by any member entitled to vote at the meeting, beginning the earlier of ten days before the meeting for which the list was prepared or two business days after notice of the meeting is given and continuing through the meeting, and any adjournment thereof, at the corporation's principal office or at a place identified in the notice of the meeting in the city where the meeting will be held. The corporation shall make the list available at the meeting, and any Member entitled to vote at the meeting or an agent or attorney of a member entitled to vote at the meeting is entitled to inspect the list at any time during the meeting or any adjournment. If prepared in connection with action to be taken by the Members by written ballot, the Members list shall be available for inspection by any Member entitled to cast a vote by such written ballot, beginning on the date that the first written ballot is delivered to the Members and continuing through the time when such written ballots must be received by the corporation in order to be counted, at the corporation's principal office.

Section 6.     **Action Without Meeting.** Any action which might be taken at a meeting of the Members may be taken without a meeting if a consent in writing, setting forth the action taken, is signed by all of the Members entitled to vote and C.R.S. § 7-127-107, as may be amended or replaced from time to time, are complied with. In addition, any action that may be taken at a meeting of the Members may be taken without a meeting if the corporation delivers a written ballot to every Member entitled to vote in accordance with C.R.S. § 7-127-109, as may be amended or replaced from time to time.

## **ARTICLE 5**

### **BOARD OF DIRECTORS**

Section 1.     **Directors.** The corporation shall have a board of directors consisting of three to five Members. Directors shall not be required to be residents of Colorado or Members of the corporation to serve. Directors shall serve a staggered term of three years or until their successors are elected and qualify. No more than two (2) Directors shall be replaced in any single year unless two vacancies shall occur through death, retirement or removal.

Section 2.     **Vacancies.** Vacancies on the board of directors may be filled for the unexpired term of the predecessor in office by a majority vote of the remaining directors at any meeting of the board of directors. A vacancy created by an increase in the number of directors may be filled for a term of office continuing only until the next election of directors.

Section 3. **Powers and Duties of the Directors.** The board of directors shall have control and general management of the affairs, property and business of the corporation and, subject to these bylaws, may adopt such rules and regulations for that purpose and for the conduct of its meetings as the board of directors may deem proper. The powers shall include but not be limited to the appointment and removal of the officers of the corporation specified in these bylaws.

Section 4. **Election of Directors.** The election of directors shall be at the annual meeting of the membership. Nominees receiving the greatest number of votes shall be elected. Cumulative voting shall not be allowed.

Section 5. **Chairperson of the Board.** From among its Members, the board of directors shall elect a chairperson of the board. The chairperson of the board shall preside at meetings of the board of directors.

Section 6. **Removal.** Any Director may be removed from office, either with or without cause, at any time by a vote of the shareholders. Another person may be elected to that place to serve for the remainder of that term. This election may be made at any special meeting of the shareholders called for this purpose, by vote of a majority of all of the shares outstanding and entitled to vote. Vacancies not filled by shareholders at such meeting may be filled by the Directors as provided above.

Section 7. **Loans.** The Board shall have the power to lend money for any of the purposes set forth in the Articles of Incorporation; to invest the funds of the Corporation from time to time; and to take and hold real and personal property as security for the payment of funds so loaned or invested and to lend money to or otherwise assist its employees.

## ARTICLE 6

### MEETINGS OF DIRECTORS

Section 1. **Annual Meeting.** The annual meeting of the board of directors shall be held immediately after and at the same place where the annual meeting of the Members has been held. The meeting will be held for the purpose of electing officers, appointing committees and for the transaction of any other business as may properly come before the board of directors. No notice shall be required for the annual meeting of the board of directors. A board member may attend a meeting by telephone or other electronic means.

Section 2. **Special and Monthly Meetings.** Special meetings of the board of directors may be called by or at the direction of the president or the chairperson of the board. Monthly meetings may be scheduled in a similar manner. A board member may attend a meeting by telephone or other electronic means.

Section 3. **Notice of Meetings.** Except for the annual meeting of the board of directors, notice of the time and place of any meeting of the board of directors shall be given, if

the date, time or place of meeting is different from that specified in Section 2, either written or orally, not later than ten (10) days prior to the meeting. Neither the business to be transacted at nor the purpose of any regular or special meeting need be specified in the notice or waiver of the meeting. A director's attendance at or participation in a meeting waives any required notice to that director.

Section 4. **Voting.** At all meetings of the board of directors, a majority of the board of directors shall constitute a quorum for the transaction of business. The act of the majority of the directors present when there is a quorum shall be the act of the directors.

Section 5. **Action Without Meeting.** Any action which might be taken at a meeting of the board of directors may be taken without a meeting if a consent in writing, setting forth the action taken is signed by all of the directors entitled to vote.

## ARTICLE 7

### OFFICERS AND DUTIES

Section 1. **Officers.** The officers of the corporation shall consist of a chairperson of the board, a president, one or more vice presidents, a secretary and a treasurer. Any two or more offices may be held by the same person, except the offices of president and secretary. Officers shall be elected or appointed by the board of directors at the annual meeting of the directors. A vacancy in any office may be filled by the board of directors at any regular or special meeting called for that purpose.

Section 2. **Chairperson of the Board.** The chairperson of the board shall preside at all meetings of the Members and the board of directors, and may have any other powers and duties as may be conferred by the board of directors.

Section 3. **President.** The president shall, subject to the direction and supervision of the board of directors, be the chief executive officer of the corporation and shall have general and active control of its affairs and business and general supervision of its officers, agents and employees. The president shall have the authority to sign all contracts and other instruments on behalf of the corporation, except as the authority may be restricted by resolutions of the board of directors adopted from time to time.

Section 4. **Vice Presidents.** Vice presidents shall have the duties that the board of directors or the president may delegate to them from time to time. In the absence of the president or his or her inability to act, the duties and powers of the office shall be performed and exercised by a vice president.

Section 5. **Secretary.** The secretary shall keep the minutes and act as secretary of all meetings of the Members and of the board of directors. The secretary shall be the custodian of the corporation records. The secretary shall perform all duties usually incident to the office of

the secretary, those duties specified in these bylaws, and other duties that may from time to time be assigned by the board of directors.

Section 6.     **Treasurer.** The treasurer shall have general supervision over the care and custody of the funds and securities of the corporation and shall deposit the same or cause the same to be deposited in the name of the corporation in the bank or banks, trust company or trust companies, that the board of directors may designate. The treasurer shall keep or cause to be kept full and accurate accounts of all receipts and disbursements of the corporation and whenever required by the board of directors, shall render or cause to be rendered financial statements of the corporation.

Section 7.     **Delegation of Authority.** In case of the absence of any officer of the corporation, or for any other reason that the board of directors deems sufficient, the board of directors may delegate the powers and duties of an officer to any other officer or to any director or employee of the Corporation.

Section 8.     **Other Officers.** The board of directors may appoint other officers as it may deem necessary for the proper management of the corporation.

Section 9.     **Removal.** Any officer may be removed by the board of directors with or without cause and without prejudice to contract rights, if any. Election or appointment of an officer to office shall not, of itself, create contract rights.

## **ARTICLE 8**

### **NEGOTIABLE INSTRUMENTS**

All checks, drafts, bills of exchange, notes or other obligations or orders for the payment of money shall be signed in the name of the corporation by the officers or persons that the board of directors of the corporation may from time to time designate by resolution.

## **ARTICLE 9**

### **AMENDMENTS**

The board of directors shall have the power to alter, amend or repeal the bylaws of the corporation consistent with C.R.S. Section 7-130-201 at any regular meeting of the board of directors or at any special meeting called for that purpose.

## **ARTICLE 10**

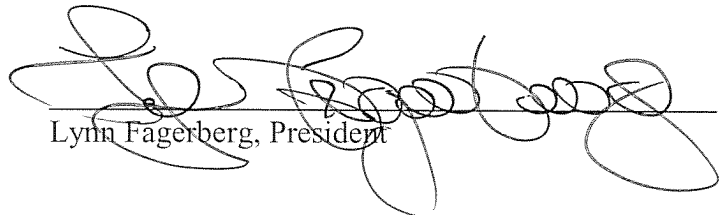
### **MUTUAL DITCH COMPANY**

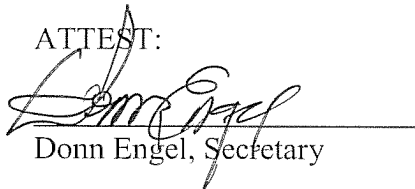


This corporation is organized as a nonprofit corporation under the Colorado Revised Nonprofit Corporation, as it may be amended from time to time. In addition, the corporation shall have all of the rights and powers of a ditch company granted by Article 42 of Title 7 of the Colorado Revised Statutes pursuant to C.R.S. § 7-42-101(2). In addition, the corporation shall operate as a mutual ditch company within the meaning of §501(c)(12) of the Internal Revenue Code. The terms of these Bylaws shall in all cases be interpreted in a manner consistent with such provisions. In the event the terms of these Bylaws conflict with the terms of I.R.C. §501(c)(12), C.R.S. §7-42-101 et seq. or the Colorado Revised Nonprofit Corporation Act then such statutory authorities shall control. In the event of a conflict between the statutory authorities, the statutes shall be given precedence in the following order:

1. C.R.S. §7-42-101 et seq.,
2. Colorado Revised Nonprofit Corporation Act,
3. Section 501(c)(12) of the Internal Revenue Code.

Adopted by the Board of Directors and dated effective this 7 day of February,  
2014.

  
Lynn Fagerberg, President

ATTEST:  
  
Donn Engel, Secretary