Boise Project Board of Control

MC-6 Hydroelectric Project

Application for:
WaterSMART: Water and Energy Efficiency Grants for FY2019
Funding Opportunity No. BOR-DO-19-F004
March 19, 2019

Submitted by:

Boise Project Board of Control
2465 Overland Road
Boise, Idaho 83705-3155

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TABLE OF CONTENTS

ATTACHMENTS

March 19, 2019
Boise Project Board of Control
Kuna, Idaho
Ada County
MC-6 Hydroelectric Project

EXECUTIVE SUMMARY

The Boise Project Board of Control (BPBC) submits this application for Funding Opportunity Announcement No.BOR-DO-19-F004 under Water Conservation and Hydropower Projects through the 2019 WaterSMART: Water and Energy Efficiency Grant Program from the Bureau of Reclamation (USBR). Through this application, BPBC is seeking $1,000,000 in federal funding assistance for Federal Funding Group II. The funding will be used to bypass 3,000 lineal feet of canal in the Indian Creek Canal with steel pipe and install a 2.1 MW hydroelectric facility. The facility will generate an average of 6,800,000 KWHr of electricity every year, which will increase water conservation/efficiency by reducing seepage losses and generate renewable hydroelectric energy, meeting two goals of the Funding Opportunity Announcement. The proposed project is to be completed in 18 months with an estimated start date of June 2019 and a completion date of December 2020. The Indian Creek Canal is a USBR federal facility operated and maintained by BPBC. BPBC has partnered with MC-6 Hydro LLC on the Project. MC-6 Hydro LLC will pay BPBC royalties for the first 30 years. After 30 years, MC-6 Hydro LLC will transfer ownership of the project to BPBC at no cost.

BACKGROUND DATA

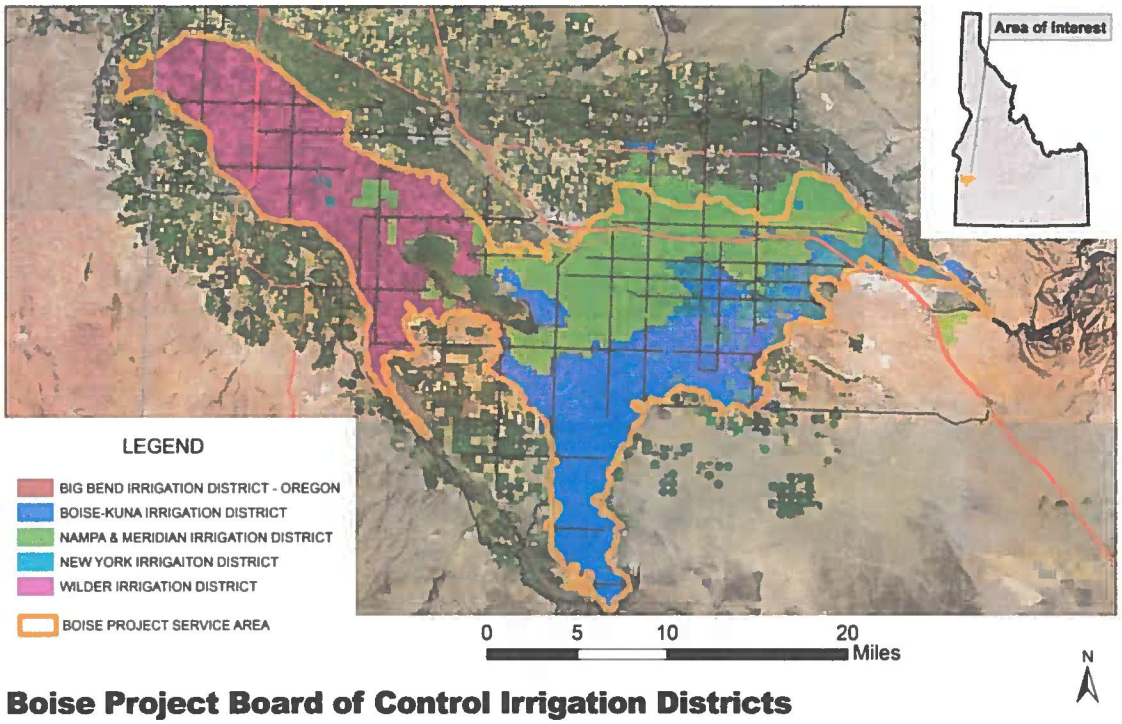


Figure 1 – Boise Project Board of Control Service Area

Boise Project Board of Control

The MC-6 Hydroelectric Project would be built and owned by MC-6 Hydro LLC with royalties paid to BPBC for 30 years. At the end of 30 years, ownership of the MC-6 Hydroelectric project would be transferred to BPBC at no cost. BPBC is an entity created on behalf of five (5) irrigation districts, all of which were established in the early 20th Century to serve irrigators with waters made possible by the development of the Arrowrock Division of the Boise Project by the United States Department of Interior, Bureau of Reclamation (USBR). The five districts consist of:

- Big Bend Irrigation District (Malheur County, OR)
- Boise-Kuna Irrigation District (Ada and Canyon Counties, ID)
- Nampa-Meridian Irrigation District (Ada and Canyon Counties, ID)
- New York Irrigation District (Ada County, ID)
- Wilder Irrigation District (Canyon County, ID)

BPBC delivers irrigation water to approximately 167,000 acres from both Boise River rights and reservoir storage rights in Anderson and Arrowrock Reservoirs held by the USBR in trust for the Districts. BPBC's delivery system comprises of over 1,400 miles of canals, laterals and sub-laterals, more than 10,000 individual structures including headgates and check structures, and is operated by a full-time staff of approximately 100 dedicated employees.

Approximately 30,000 users are served by BPBC. The major crops irrigated by the Indian Creek Canal consist of alfalfa hay, wheat, sugar beets, hops, corn, onion, mint, lavender, apples, grapes, and pasture. There are also many dairy farms and livestock facilities in the area that use the irrigated grains to feed their animals. Along with the agricultural use, residents in the urbanized areas use water for lawn and garden irrigation. Though the main canals and laterals are open channels, there is a diverse mix of ditches, gravity irrigation pipelines, pressurized pipelines and pressurized sprinkler systems throughout the project.

The current and projected water demand does not meet the current water supply, especially following a low snowpack and precipitation year. With a high agricultural acreage, the supply did not meet the allotted amount. Table 1 shows the water allotment for the 2012 to 2018 irrigation seasons:

Table 1 - Allotment

YEAR	ALLOTMENT (acre-feet per acre)	DATE
2012	1.90	August 1
2013	1.00 1.40	April 22 June 5
2014	2.25	June 18
2015	1.65 2.35 2.95	April 16 June 3 June 12
2016	2.60	June 15
2017	2.45 2.60	July 14 July 26
2018	2.65	June 15

The supply has not met the demand, in 2015 and 2016, approximately 75 accounts within the BPBC service area purchased approximately 9,300 acre-feet of river water from the Water District #63 to help augment their irrigation water supply.

The proposed project is for a new hydroelectric power plant on an existing irrigation canal. The renewable energy will be generated from building a new pipeline parallel with the existing canal and dropping the water 48 vertical feet. There is an executed power sales agreement with Idaho Power to sell the energy as a non-seasonal renewable. Idaho Power owns and operates several fossil fuel power plants. The generation of this renewable energy facility will likely reduce the non-renewable energy generated by these facilities.

BPBC has been the recipient of several grants from the Bureau of Reclamation including most recently a grant in 2016 to replace 400 lineal feet of lining in the New York Canal near Roosevelt Street; 2017 for Automation of the Platt & Miller Checks and 2018 Automation of the Deer Flat Low Line #3.

PROJECT LOCATION

The MC-6 Hydroelectric project is located within Ada County and approximately 3 miles east of Kuna, Idaho. The project's latitude is 43°29'1.55" N, and longitude -116°21'20.00" W.

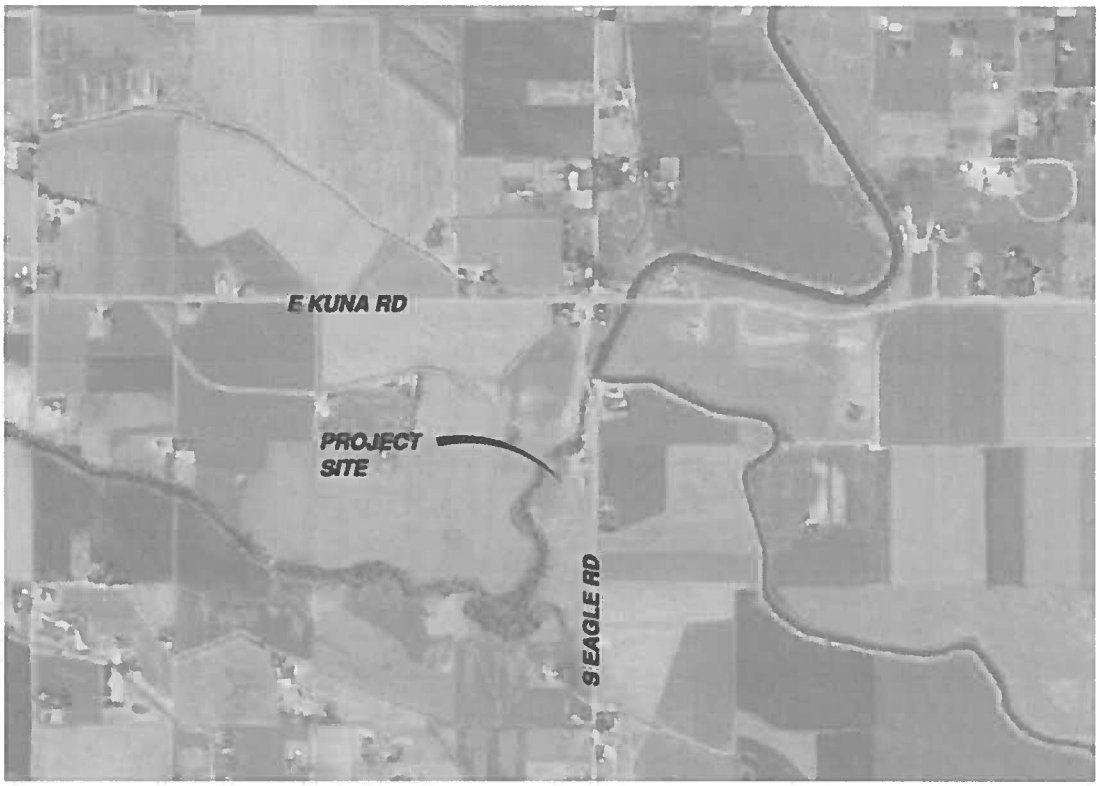


Figure 2 – Map of Proposed Project

TECHNICAL PROJECT DESCRIPTION

The 2.1 MW project proposes to replace 3,000 feet of existing Indian Creek Canal with steel pipe. A new intake/diversion structure will be constructed just downstream of the head of Indian Creek Canal. The intake structure will direct the water into the steel pipe. There will be 1,060 L.F. of 120-inch steel pipe and 740 L.F. of 100-inch diameter steel pipe to convey water to the powerhouse. Flow will then return to the existing canal.

Project features are summarized below and shown on design drawings in Attachment A.

Canal System

The portion of the Indian Creek Canal in the project area is a canal drop which services various irrigation projects as well as feeding Lake Lowell. The water quality will be unaltered.

Intake Structure

The intake structure will be a steel reinforced concrete structure approximately 29' long by 60' wide by 24' high. This will convey water from the feeder canal to the penstock. A steel bar trash screen will be installed in the structure to remove debris.

Penstock (Steel Pipe)

The new steel penstock will convey water from the intake structure to the powerhouse. The penstock will be 10 feet in diameter for 1,060 L.F. and 100 inches in diameter for 740 L.F.

Power House Structure

Intake Structure- The intake structure will be a steel reinforced concrete structure approximately 29' long by 60' wide by 24' high. This will convey water from the feeder canal to the penstock. A steel bar trash screen will be installed in the structure to remove debris.

Generation Unit

The turbines will be two horizontal Francis turbines. The turbines will be connected to a single generator. This allows a wide range of flows (120-600 cfs) at an economical cost.

Turbine 1	Francis
Wicket Gates	Yes
Arrangement	Horizontal
Rated Flow	120-300 cfs
Rated Head	48 ft.
Speed	200 RPM
Rated Runway Speed	400 RPM

Turbine 2	Francis
Wicket Gates	Yes
Arrangement	Horizontal
Rated Flow	120-300 cfs
Rated Head	48 ft.
Speed	200 RPM
Rated Runway Speed	300 RPM

Generator	Synchronous
Rated Speed	200 RPM
Rated Output	2.1 MW
Power Factor	0.90
Exciter	Brushless
Frequency	60 Hertz
Voltage	4,160 Volts

See Attachment B for additional turbine and generator details.

Mechanical Equipment

The turbine wicket gates will operate hydraulically. The hydraulic power unit will be of American make – with accumulators for black shutdown. The governor will be digital. Level sensors (differential pressure) in the forebay will be utilized to provide information to the powerhouse programmable logic controllers (PLC) to maintain constant head in the upstream forebay and thus in the feeder canal.

Powerhouse Electrical Controls

Powerhouse controls will be utility grade. The switchgear/controls will be backed by 120 volt DC service battery system for operation of essential features during power outages, specifically turbine shutdown and maintenance of flow in the canal system. The control panel will be fitted with an automatic telephone dialer to alert of alarm conditions. A dial-in signal will allow remote monitoring of the plant including critical variables (bearing temperature, voltage etc.) from any telephone.

Substation and Transmission Line

The power will be sold to Idaho Power Company. Idaho Power Company has an overhead 12.4 kV line approximately 1.67 miles from the power house location. A new overhead line will be constructed to connect to the existing transmission line.

A switchyard will be constructed at the powerhouse with a transformer capable of stepping up the power generated at 4,160 V to the interconnection voltage of 12.4 kV.

EVALUATION CRITERIA

E.1.1 Evaluation Criterion A: Quantifiable Water Savings

Describe the amount of estimated water savings. *For projects that conserve water, please state the estimated amount of water expected to be conserved (in acre-feet per year) as a direct result of this project.*

It is estimated approximately 1,732 acre-feet of water is lost per year.

Describe current losses*: Please explain where the water that will be conserved is currently going (e.g., back to the stream, spilled at the end of the ditch, seeping into the ground)?*

The current losses are seeping into the ground.

Describe the support/documentation of estimated water savings*: Please provide sufficient detail supporting how the estimate was determined, including all supporting calculations. Note: projects that do not provide sufficient supporting detail/calculations may not receive credit under this section. Please be sure to consider the questions associated with your project type*

(listed below) when determining the estimated water savings, along with the necessary support needed for a full review of your proposal.

BPBC has not performed any specific testing; however, the proposed site has been historically known for seepage. A study was performed by Charles Berenbrock with the US Geological Survey in 1997 titled "Streamflow Gains and Losses in the Lower Boise River Basin, Idaho, 1996-1997" (see Attachment C). This study was held during flood control and before the irrigation season began, therefore no deliveries were being made at the time of the study. The study recorded a loss of 4.1 cubic foot per second per mile on March 20, 1997 and another loss of 8.4 $ft^3/s/mi$ on March 27, 1997. Based upon this study, approximately 4.77 cfs of water is lost to seepage within the proposed project site. With an average irrigation season of 183 days, 1,732 acre-feet of water is lost annually.

Please address the following questions according to the type of project you propose for funding.

1) ***Canal Lining/Piping**: Canal lining/piping projects can provide water savings when irrigation delivery systems experience significant losses due to canal seepage. Applicants proposing lining/piping projects should address the following:*

   a) *How has the estimated average annual water savings that will result from the project been determined? Please provide all relevant calculations, assumptions, and supporting data.*

      No formal testing has been performed. As previously mentioned, according to the study held in 1997, a loss of 4.1 cfs and 8.4 cfs per mile was recorded. Using the 8.4 $ft^3/s/mi$ loss as a basis, 4.77 cfs is lost per 3,000 feet. The average irrigation season is 183 days. The annual water savings is 1,732 acre-feet per year.

      $$(8.4/5{,}280)*3{,}000 = 4.77 \text{ cfs} * 183 \text{ days} = 1{,}732 \text{ acre-feet}$$

   b) *How have average annual canal seepage losses been determined? Have ponding and/or inflow/outflow tests been conducted to determine seepage rates under varying conditions? If so, please provide detailed descriptions of testing methods and all results. If not, please provide an explanation of the method(s) used to calculate seepage losses. All estimates should be supported with multiple sets of data/measurements from representative sections of canals.*

      As previously mentioned, no recent testing has been performed. However, a study was held in March 1997 during flood control discharge. Seepage loss was measured at 4.1 $ft^3/s/mi$ and 8.4 $ft^3/s/mi$ on two separate days (Attachment C).

   c) *What are the expected post-project seepage/leakage losses and how were these estimates determined (e.g., can data specific to the type of material being used in the project be provided)?*

      Seepage is expected to be minimal based on the materials and installation techniques. The proposed project will be closely monitored and documented.

d) *What are the anticipated annual transit loss reductions in terms of acre-feet per mile for the overall project and for each section of canal included in the project?*

The 3,000 feet of the proposed project is estimated at losing 9.47 acre-feet of water per day. This equates to 16.66 acre-feet per mile.

e) *How will actual canal loss seepage reductions be verified?*

In March, water is diverted down the Indian Creek Canal to Lake Lowell before water deliveries begin. Measurements will be taken at various locations, both upstream and downstream from the project site using the SonTek RiverSurveyor.

f) *Include a detailed description of the materials being used.*

The pipe is composed of steel with a cold tar enamel on the inside and a cold tar epoxy on the outside to resist corrosion, increase pipe longevity, and decrease water friction (which will in turn increase energy production of the hydroelectric project). The life expectance of the steel pipe is 30 to 50 years.

E.1.2. Evaluation Criterion B – Water Supply Reliability

Please address how the project will increase water supply reliability. Proposals that will address more significant water supply shortfalls benefitting multiple sectors and multiple water users, will be prioritized. General water supply reliability benefits (e.g., proposals that will increase resiliency to drought) will also be considered. Please provide sufficient explanation of the project benefits and their significance. These benefits may include, but are not limited to, the following:

1) *Will the project make water available to address a specific water reliability concern? Please address:*

   - *Explain and provide detail of the specific issue(s) in the area that is impacting water reliability, such as shortages due to drought, increased demand, or reduced deliveries.*

     Drought conditions continue to impact the water uses of the BPBC service area. According to the National Drought Mitigation Center, the drought is rated as Abnormally Dry in Ada County. Therefore, the snowpack runoff has been below normal for the past 8 of 10 years. Table 2 below indicates the results of snow surveys compared on a percentage basis with an 84 year normal runoff in acre-feet. (Source: BPBC 2017 Annual Report).

Table 2 - Snow Survey

Year	Average (Acre-Feet)	Runoff Oct to Oct (Acre-Feet)	Percent of Normal
2007	1,816,169	1,227,943	67.6
2008	1,941,750	1,761,110	90.7
2009	1,938,537	1,684,719	86.9
2010	1,914,789	1,502,883	78.5
2011	1,909,584	2,375,397	124.4
2012	1,940,574	2,106,400	108.5
2013	1,930,166	1,066,299	55.2
2014	1,929,154	1,695,179	87.8
2015	1,855,802	1,337,229	72.0
2016	1,833,964	1,724,313	94.0
2017	1,868,276	2,584,776	138.4

The demand for water is also increasing in the 2015 and 2016 water seasons, approximately 75 accounts within the BPBC service area purchased approximately 9,300 acre-feet of river water from the Water District #63 to help augment their irrigation water supply.

- *Will the project directly address a heightened competition for finite water supplies and over-allocation (e.g., population growth)?*

  The proposed project will not address a heightened competition for finite water supplies and over-allocation. The allocation is based on the water supply for that year. By preventing the water from seepage, the water will remain in the canal and overall, more water will remain in the reservoirs.

- *Describe how the project will address the water reliability concern?*

  As the project will prevent over 1,732 acre-feet of water from seeping into the ground, it will aid in allowing this water to be delivered to the water users. The conserved water also allows for more power production at the proposed MC-6 Hydroelectric project and several low-head hydro power plants further downstream that BPBC owns.

- *Provide a description of the mechanism that will be used, if necessary, to put the conserved water to the intended use.*

  The mechanism that will be used to put the conserved water to the intended use is by installing the steel pipe which will prevent the seepage of 1,732 acre-feet per year which allows the water to be available to our water users.

- *Indicate the quantity of conserved water that will be used for the intended purpose.*

  The quantity of conserved water is estimated at 1,732 acre-feet of water that will be used for its intended purpose, irrigating crops and landscaping.

2) *Will the project make water available to achieve multiple benefits or to benefit multiple water users? Consider the following:*

   - *Will the project benefit multiple sectors and/or users (e.g. agriculture, municipal and industrial, environmental, recreation, or other)?*

     The conserved water will benefit multiple types of users. The majority of the irrigation water is consumed by farmers, followed by landscaping for subdivisions. As the conserved water stays in the reservoirs, this allows the recreational use of the water. Arrowrock and Lucky Peak Reservoirs are all used recreationally, including waterskiers, boaters, fishermen, and parasailers.

     - *Will the project benefit species (e.g., federally threatened or endangered, a federally recognized candidate species, a state listed species, or a species of particular recreational, or economic importance).*

       Any amount of water conserved from seepage will remain in the reservoir which will benefit fish in the reservoirs and the fishermen.

     - *Will the project benefit a larger initiative to address water reliability?*

       No.

   - *Will the project benefit Indian tribes?*

     No.

   - *Will the project benefit rural or economically disadvantaged communities?*

     The proposed project will benefit the entire BPBC service areas in Ada County. According to the Census Bureau and the 2012-2016 American Community Survey 5-Year Estimates, 12.2 % individuals live below the poverty line in Ada County.

   - *Describe how the project will help to achieve these multiple benefits. In your response, please address where the conserved will go and where it will be used, including whether the conserved water will be used to offset groundwater pumping, used to reduced diversions, used to address shortages that impact diversions or reduce deliveries, made available for transfer, left in the river system, or used to meet another intended use.*

     Any amount of water conserved from seepage has the potential to benefit multiple users. The water will remain in the reservoir which will benefit recreationists; it will benefit the fish in the reservoirs and the fishermen. Another potential benefactor of

conserved water is the economy of the area. When there is water in the reservoirs, more people go boating, fishing, and picnicking. All these activities require supplies, boats, gear, food, fuel, etc. The conserved water also prevents pumping of groundwater as the farmers and landowners have enough surface irrigation water to irrigate their crops.

3) *Does the project promote and encourage collaboration among parties in a way that helps increase the reliability of the water supply.*

   - *Is there widespread support for the project?*

     The BPBC delivers water on behalf of five (5) irrigation districts, and each district has at least one member on the Board of Directors for a total of 9 Board Members.

   - *What is the significance of the collaboration/support?*

     By preventing seepage and conserving water, there will be more water available for use by all users, from those who use the water for landscaping purposes to those who irrigate their crops.

   - *Is the possibility of future water conservation improvements by other water users enhanced by completion of this project?*

     Yes, BPBC believes the application of the proposed project will develop an appropriate way for other water users and other irrigation districts to follow in water conservation techniques.

   - *Will the project help to prevent a water-related crisis or conflict? Is there frequently tension or litigation over water in the basin?*

     Yes, this project will help prevent water-related crisis or conflicts. There is always a concern in the lack of water availability for crops. The BPBC has been involved in several lawsuits regarding water availability and the accounting system of the water.

   - *Describe the roles of any partners in the process. Please attach any relevant supporting documents.*

     BPBC has partnered with MC-6 Hydro LLC on the Project. MC-6 Hydro LLC will pay BPBC royalties for the first 30 years. After 30 years, MC-6 Hydro LLC will transfer ownership of the project to BPBC at no cost.

4) *Will the project address water supply reliability in other ways not described above?*

   No.

E.1.3. Evaluation Criterion C – Implementing Hydropower

Describe the amount of energy capacity. *For projects that implement hydropower systems, state the estimated amount of capacity (in kilowatts) of the system. Please provide sufficient detail supporting the stated estimate, including all calculations in support of the estimate.*

The capacity of the project is 2,100 KW. There will be 48 feet of vertical drop to build water pressure in the new water pipeline. The facility was designed for a maximum water capacity of 600 cfs. The capacity equation is shown below.

KW = [(flow (cfs) * net head (ft) * turbine efficiency * generator efficiency * 0.746) / 550] – transformation losses

Net head (ft) = vertical drop (ft) – head losses (ft)

Describe the amount of energy generated. *For projects that implement hydropower systems, state the estimated amount of energy that the system will generate (in kilowatt hours per year). Please provide sufficient detail supporting the stated estimate, including all calculations in support of the estimate.*

The project will generate an average of 6,800,000 MWHrs (6,800,000 KWHrs) a year. This was calculated by using 21 years of daily flow records. See Table 3 below.

Table 3 - Potential Production (MWHrs)

Year	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Annual Total
1993	-	-	711	1,169	1,375	1,254	1,044	544	79	28	-	-	6,204
1994	-	-	-	676	742	326	974	274	202	-	-	-	3,195
1995	-	-	-	1,334	1,279	1,170	683	836	1,323	492	-	-	7,117
1996	-	-	-	533	1,376	1,175	1,081	1,349	1,324	505	-	-	7,343
1997	-	-	-	980	1,376	1,247	1,150	1,313	1,334	670	-	-	8,070
1998	-	-	355	954	1,279	1,158	947	1,011	1,304	834	-	-	7,841
1999	-	-	-	1,156	1,378	1,111	839	1,125	1,323	834	-	-	7,767
2000	-	-	-	1,334	1,378	1,060	912	1,149	1,334	70	-	-	7,236
2001	-	-	-	352	482	703	694	835	371	-	-	-	3,437
2002	-	-	-	1,334	1,378	1,180	1,121	1,140	897	241	-	-	7,291
2003	-	-	-	1,334	1,376	1,315	1,249	1,354	1,334	359	-	-	8,321
2004	-	-	-	769	973	606	1,377	1,375	1,331	537	-	-	6,969
2005	-	-	-	125	964	1,202	868	794	1,052	280	-	-	5,285
2006	-	-	-	469	1,337	1,327	1,359	1,372	1,229	565	-	-	7,658
2007	-	-	-	1,008	1,344	1,330	1,158	869	1,310	43	-	-	7,063
2008	-	-	-	934	1,378	1,192	1,088	1,319	1,334	759	-	-	8,004
2009	-	-	-	1,058	1,002	1,239	926	1,001	1,301	789	-	-	7,317
2010	-	-	-	1,156	1,110	702	581	398	1,245	537	-	-	5,728
2011	-	-	-	947	1,351	1,284	928	950	1,296	757	-	-	7,514
2012	-	-	-	1,067	1,378	1,222	1,131	1,089	1,334	715	-	-	7,936
2013	-	-	133	1,100	863	895	496	463	92	-	-	-	4,043
2014	-	-	1,159	927	1,378	1,045	839	1,148	1,334	581	-	-	8,411
Average	**-**	**-**	**107**	**942**	**1,204**	**1,079**	**975**	**987**	**1,076**	**436**	**-**	**-**	**6,807**

This excel spreadsheet is available upon request. This facility is supplied by irrigation water. This irrigation flow is usually steadier than a natural river.

KWHr = KW * hours of generation

On average, the design flow of 600 cfs will be exceeded 47% of the time during the irrigation season.

Describe any other benefits of the hydropower project. *Please describe and provide sufficient detail on any additional benefits expected to result from the hydropower project, including:*

- *Anticipated benefits to other sectors/entities*
  An additional benefit of this project is as a distributed energy source, decreasing transmission line losses. Currently, the energy required to power the large irrigation pumps in the area is carried over long distances, likely from a fossil fuel power plant. The farther the energy is transported, the higher the transmission energy losses.

  This hydroelectric facility's energy generation correlates directly with peak demand in the area. The facility operates during irrigation season, which is when farmers are using high amounts of electricity to operate their irrigation pumps. This local consumption is well-matched to the facility's supply which increases the overall efficiency of the energy grid.

  Another benefit of this facility will be trash removal from the irrigation water. Hydroelectric turbines are susceptible to getting clogged by trash located in the water. Thus, 600 cfs of water will be strained and cleaned by the facility's trash racks that will be located in the intake. This can greatly help downstream farmers on the canal.

  Finally, the royalties and other economic benefits to BPBC will result in decreased assessments required of the water users. The water users can thus use this savings to reinvest in their farms and the surrounding communities.

Expected water needs, if any, of the system.

The hydroelectric facility will not consume any water.

E.1.5. Evaluation Criterion E – Department of Interior Priorities

Creating a conservation stewardship legacy second only to Teddy Roosevelt
As stewards of this vital natural resource, the Board of Directors and employees of BPBC work diligently to deliver water to their water users in a safe and efficient manner. This conservation project allows BPBC to continue to upgrade and maintain a safe water delivery system for the water users to receive their allotted water in a fair and consistent manner.

Utilizing our natural resources
This source of American renewable energy will be utilized to meet our security and economic needs. This energy source does not rely on foreign countries. It relies on domestic precipitation.

Restoring trust with local communities
As the Indian Creek Canal is the main delivery for many irrigators, projects such as this will continue to restore trust with and between all the local communities that benefit from the water. Trust is also restored as the local community and the residents along the canal see the

improvements being made to this facility as it shows the efforts of BPBC to conserve water and be a good neighbor. Further, the royalties and economic benefits of the project will reduce water assessments that water users are currently required to pay. Thus, they can reinvest the savings in their farms and local community.

Modernizing our infrastructure
This new construction of a hydroelectric facility is an upgrade and modernization to the existing canal system. This project will provide local energy sold to Idaho Power. The energy will likely be used for irrigation pumps. Currently, the energy for these irrigation pumps is generated far away and transmitted along lengthy powerlines, results in transmission line losses. The trash racks of the facility will also remove trash in the canal, a beneficial modernization.

E.1.6.Evaluation Criterion F – Implementation and Results

E.1.6.1. Subcriterion F.1 – Project Planning

Does the applicant have a Water Conservation Plan and/or System Optimization Review (SOR) in place? *Please self-certify, or provide copies of these plans where appropriate to verify that such a plan is in place.*

Provide the following information regarding project planning:

1) *Identify any district-wide, or system-wide, planning that provides support for the proposed project. This could include a Water Conservation Plan, SOR, Drought Contingency Plan or other planning efforts done to determine the priority of this project in relation to other potential projects.*

   The BPBC has adopted a Water Conservation Plan in 2010. This plan addresses the maintenance on canals and laterals to conserve water and prevent sediment deposits. The project implements a portion of the Project's Water Conservation Plan.

2) *Describe how the project conforms to and meets the goals of any applicable planning efforts, and identify any aspect of the project that implements a feature of an existing water plan(s).*

   The project relates to Objective #1 of the Water Conservation Plan on maintenance of the Indian Creek Canal by bypassing a section of the canal.

E.1.6.2. Subcriterion F.2 – Performance Measures

Provide a brief summary describing the performance measure that will be used to quantify actual benefits upon completion of the project (e.g., water saved or better managed, energy generated or saved).

Measurements will be taken at various locations upstream and downstream using our Sontek RiverSurveyor measuring device. Measurements will be taken when no water deliveries are occurring, allowing for more accurate data.

E.1.6.3. Subcriterion F.3 – Readiness to Proceed

- *Describe the implementation plan of the proposed project. Please include an estimated project schedule that shows the stages and duration of the proposed work, including major tasks, milestones, and dates.*

Task/Milestone	Start Date	End Date
Mobilize to Site	6/1/2019	
Excavate Powerhouse	7/1/2019	10/1/2019
Excavate Penstock	9/1/2019	1/1/2020
Excavate Intake	10/1/2019	12/1/2019
Construct Power House	10/1/2019	4/1/2020
Construct Intake	12/1/2019	3/1/2020
Place and Weld Penstock	4/1/2020	9/1/2020
Install Turbines and Generator	6/1/2020	12/1/2020
Complete Mechanical/Electrical Auxiliaries	7/1/2020	11/1/2020
Complete Transformer, Substation, Transmission Line Structures	6/1/2020	11/1/2020
Testing		11/1/2020
Completion		12/1/2020

- *Describe any permits that will be required, along with the process for obtaining such permits.*

  The MC-6 Hydroelectric Project has obtained a FERC exemption (P-5038) and a minor amendment to increase capacity is pending. A cultural report has been approved by the Idaho Historical Preservation Office and a memorandum of understanding is in place that describes measures to take to protect those resources. A United States Army Corps of Engineers (USACE) Permit No. 17 is pending. The project has received a letter from the Idaho Department of Environmental Quality that confirms that the project is exempt from a 401 Certification.

- *Identify and describe any engineering or design work performed specifically in support of the proposed project.*

  Engineering and design work already completed for this project are presented in the Technical Project Description section and the Design Drawings included in Attachment A.

- *Describe any new policies or administrative actions required to implement the project.*

  No new policies or administrative actions are required to implement the project.

- *Describe how the environmental compliance estimate was developed. Has the compliance cost been discussed with the local Reclamation office?*

  The environmental and regulatory compliance has already been completed. The project has a FERC License Exemption. This cost approximately $30,000. The compliance cost has not been discussed with the local Reclamation office.

E.1.7. Evaluation Criterion G – Nexus to Reclamation Project Activities

- *Is the proposed project connected to Reclamation project activities? If so, how? Please consider the following:*

  BPBC was formed to operate and maintain federally financed and owned facilities built under the Reclamation Act of August 30, 1890, and would not exist apart from the efforts of the Federal Government. Its entire history is closely intertwined with the USBR. It was created by the precursor to the USBR to operate and maintain the federal facilities constructed as part of the Boise Project on behalf of the five irrigation districts set forth above. Irrigation of the lands that BPBC serves would not be possible without the reservoir storage made possible by the Arrowrock and Anderson Ranch reclamation projects.

  - *Does the applicant receive Reclamation project water?*

    Yes, BPBC receives the majority its water from the reservoir storages in Arrowrock and Anderson Ranch Reservoirs and Boise River water rights.

  - *Is the project on Reclamation project lands or involving Reclamation facilities?*

    Yes, the Indian Creek Canal is a Reclamation facility.

  - *Is the project in the same basin as a Reclamation project or activity?*

    Yes, the Indian Creek Canal is located in the Boise River Basin Arrowrock Division of the Boise Project, a Reclamation facility.

  - *Will the proposed work contribute water to a basin where a Reclamation project is located?*

    Yes, the conserved water will remain in the Boise River Basin.

- *Will the project benefit any tribe(s)?*
  No.

E.1.8. Evaluation Criterion H – Additional Non-Federal Funding

$ 3,676,667 Non-Federal
$ 4,793,069 Total Project Costs = 77%

* Federal funding consists of the requested $1,000,000 from this grant proposal and $116,402 already awarded from USDA's REAP Grant.

PROJECT BUDGET

Funding Plan and Letters of Commitment

Please identify the sources of the non-Federal cost share contribution for the project, including:

- *Any monetary contributions by the applicant towards the cost-share requirement and sources of funds (e.g., reserve account, tax revenue, and/or assessments)*

  No financial contributions will be made directly by BPBC.
  MC-6 Hydro LLC will provide 30% of the non-Federal project costs. A letter of commitment from Ted and Gayle Sorenson (80% owners of MC-6 Hydro LLC) showing adequate availability of funds is included in Attachment D.

  A loan from Northwest Farm Credit Services to MC-6 Hydro LLC will provide 70% of the non-Federal project costs. A letter of commitment from Northwest Farm Credit Services is included in Attachment E.

- *Any costs that will be contributed by the applicant*

  No financial contributions will be made by BPBC.

- *Any third party in-kind costs (i.e., goods and services provided by a third party)*

  There are no third party in-kind costs.

- *Any grants received from other Federal entities:*

  The MC-6 Hydroelectric Project was awarded $116,402 on July 2, 2018 from the United State Department of Agriculture's (USDA) Rural Energy for America Program (REAP) grant. The official grant award letter is included in Attachment F.

- *Any cash requested or received from other non-Federal entities:*

  No cash has been requested or received from other non-Federal entities.

- *Any pending funding requests (i.e. grants or loans) that have not yet been approved and explained how the project will be affected if such funding is denied.*

  No other pending funding requests.

Project costs that have incurred prior to the aware are summarized in Table 4 below.

Table 4 - Project Costs prior to Award

Project Expenditure	Amount	Date of Cost Incurrence	Benefit to the Project
Power Purchase Agreement with Idaho Power	$10,000	2018	Major Revenue Component
Design	$150,000	2018-2019	Needed to perform economic analysis
FERC License Exemption	$30,000	2017-2018	Permit and Environmental Compliance
Steel Pipe Down Payment	$150,000	12/31/2016	Major Cost Component
Turbine Generator Down Payment	$191,040	12/17/2016	Major Cost Component

Budget Proposal

The total project costs necessary to complete the project are shown in Table 5 below. Letters of Commitment from these sources are included in Attachments D, E, and F.

Table 5 - Total Project Costs

Source	Amount
Costs to be reimbursed with the requested Federal funding	**$1,116,402**
USBR WaterSMART Grant	$1,000,000
USDA REAP Grant	$ 116,402
Costs to be paid by the applicant	**$3,676,667**
Northwest Farm Credit Services' Loan	$2,573,667
MC-6 Hydro LLC Funds	$1,103,000
Value of third party contributions	**$ 0**
Total Project Cost	**$ 4,793,069**

The budget proposal includes detailed information on all items of cost and are shown in Table 6 below.

Table 6 - Estimated Capital Cost

	Units	#Units		Unit Price		Total
1) Intake						
a) Intake Gate (incl install)(RSI Quote 3/2019)	LS	1	$	85,160	$	85,160
b) Bypass Gate (incl install)(RSI Quote 3/2019)	LS	1	$	64,225	$	64,225
c) Bull Noses (RSI Quote 3/2019)	LS	1	$	5,600	$	5,600
d) Trash Rack	LS	1	$	30,000	$	30,000
e) Siphons (fab only)	LS	2	$	30,000	$	60,000
f) Siphon Install (RSI Quote 3/2019)	LS	1	$	4,500	$	4,500
g) Vent Pipe	LS	1	$	4,000	$	4,000
h) Fill and Compact Intake	LS	1	$	15,000	$	15,000
2) Powerhouse/Intake						
a) Excav & Backfill (Sluder Construction Quote)	LS	1	$	120,544	$	120,544
b) Concrete - Quote from Cannon (incl intake)	LS	1	$	575,180	$	575,180
c) Roof Hatch	LS	1	$	10,000	$	10,000
d) Twin Frances turbines, one gen (FOB job site)	LS	1	$	1,086,000	$	1,086,000
e) Mechanical Installation	LS	1	$	80,000	$	80,000
f) Jib Cranes	LS	2	$	5,000	$	10,000
g) Crane to Install Unit	LS	1	$	15,000	$	15,000
h) Hydr Pwr Unit	LS	1	$	20,000	$	20,000
i) Fabricated Metal (stairs, handrail, etc.)	LS	1	$	50,000	$	50,000
j) Switchgear	LS	1	$	260,000	$	260,000
k) Electrical Wiring	LS	1	$	90,000	$	90,000
l) Step Up Transformer	LS	1	$	35,000	$	35,000
m) Fill and Compact Powerhouse	LS	1	$	20,000	$	20,000
3) Transmission Line to Idaho Power						
a) 12.47 KV Line Rebuild	LS	1	$	180,000	$	180,000
b) Idaho Power 4-Pole Interconnect	LS	1	$	180,000	$	180,000
c) Interconnect Studies	LS	1	$	20,000	$	20,000
4) Penstock / Tailrace						
a) Penstock Cost	LS	1	$	345,000	$	345,000
b) Penstock Install (quote from RSI)	LS	1	$	169,050	$	169,050
c) Penstock Lifting	LS	1	$	60,000	$	60,000
d) Paint Penstock Welds (RSI Quote 3/2019)	LS	1	$	3,420	$	3,420
e) Paint ID of Penstock	LS	1	$	57,000	$	57,000
f) Penstock Saddle Trees (RSI Quote 3/2019)	LS	2	$	8,700	$	17,400
g) 100" Dia 90 degree elbow	LS	1	$	24,445	$	24,445
h) 100" Dia Tee	LS	1	$	23,575	$	23,575
i) 120"-100" Dia reducer, 48" long	LS	3	$	17,200	$	51,600
j) Rock Blasting (quote from Eagle Rock)	LS	1	$	110,000	$	110,000
k) Fill and Compact Penstock	LS	1	$	20,000	$	20,000
l) Concrete Piers	LS	4	$	8,000	$	32,000
5) Environmental	LS	1	$	10,000	$	10,000
Subtotal					$	3,943,699
6) Miscellaneous						
a) Engineering	LS	1	$	400,000	$	400,000
b) Reclamtion review costs	LS	1	$	30,000	$	30,000
c) Legal and Misc	LS	1	$	25,000	$	25,000
d) Contingency	%	10.0%	$	3,943,699	$	394,370
Total Estimated Construction Cost (2019)						**$ 4,793,069**

Budget Narrative

The budget established for this project is from the project's engineer, Sorenson Engineering. The budget is based upon several past projects constructed, owned, and operated by Sorenson Engineering. Specifically, Sorenson commissioned the 1,200 KW North Gooding Main Hydroelectric project in 2017. This is located approximately 100 miles southwest of the MC-6 Hydroelectric Project, near Gooding, Idaho. Sorenson has designed 45 hydroelectric facilities and currently owns/leases and operates 20 facilities.

For simplicity, the WaterSMART grant money could be used for certain equipment costs (i.e. steel pipe purchase, etc.).

Salaries and Wages

The following key personnel from MC-6 Hydro LLC will be charging time on this project:

- [redacted]
- [redacted]

Ted's wage rate is $30.95/hr. Michael's wage rate is $28.87/hr.

Fringe Benefits

Fringe benefits include payroll taxes and health insurance at the following rates

Payroll taxes of Social Security & Medicare:	7.65%
Ted Sorenson Health Care Benefits -	$7.90/hr
Michael Jardine Health Care Benefits -	$7.40/hr

Equipment

Costs for equipment are listed in Capital Cost table above. Expected unit rates are listed below.

Excavator = $110/hr
Bull dozer = $140/hr
Concrete pump = $160/hr
100-ton Crane = $500/hr

MC-6 Hydro LLC will hire local contractors with the equipment necessary to complete the project. Additional information from subcontractors is available upon request.

Material and Supplies

Costs for materials and supplies are listed in the Capital Cost estimate table above. Additional information from suppliers is available upon request.

Environmental and Regulatory Compliance Costs

The environmental and regulatory compliance has already been completed. The project has a FERC License Exemption. This cost approximately $30,000.

Indirect Costs

BPBC is not requesting any reimbursements for indirect costs.

ENVIRONMENTAL AND CULTURAL RESOURCES CONSIDERATIONS

1) *Will the project impact the surrounding environment (e.g., soil [dust], air, water [quality and quantity], animal habitat)? Please briefly describe all earth-disturbing work and any work that will affect the air, water, or animal habitat in the project area. Please also explain the impacts of such work on the surrounding environment and any steps that could be taken to minimize the impacts.*

   During the project, no significant environmental impacts are anticipated. Most of the project work will take place after the completion of the 2019 irrigation season when temperatures are lower and increased precipitation levels reduce the potential of dust associated with the type of construction activities needed to complete the project. Should dust become an issue, water applications will be applied to ensure dust abatement. Most of the proposed work will occur when the canal is dewatered, therefore no impacts to water quality are expected. If work does occur while water is in the canal, silt fences will be utilized.

2) *Are you aware of any species listed or proposed to be listed as a Federal threatened or endangered species, or designated critical habitat in the project area? If so, would they be affected by any activities associated with the proposed project?*

   There are no known endangered or threatened species in the project site.

3) *Are there wetlands or other surface waters inside the project boundaries that potentially fall under CWA jurisdiction as "Waters of the United States?" If so, please describe and estimate any impacts the project may have.*

   The amount of wetlands potentially impacted by the project is below the threshold for USACE's Nationwide Permit No. 17.

4) *When was the water delivery system constructed?*

   The original New York Canal was constructed in the 1880's. Construction to enlarge the canal began in 1906, with completion in 1909, at which time it was connected to the Indian Creek Canal.

5) *Will the project result in any modification of or effects to, individual features of an irrigation system (e.g., headgates, canals, or flumes)? If so, state when those features were constructed and describe the nature and timing of any extensive alterations or modifications to those features completed previously.*

The existing upstream splitter box is old and will be superseded by a new headgate constructed as part of the MC-6 Hydroelectric Project. The new headgate will be automated and provide overflow protect from installed siphons. The project will also bypass 3,000 lineal feet of canal in the Indian Creek Canal with steel pipe.

6) *Are any buildings, structures, or features in the irrigation district listed or eligible for listing on the National Register of Historic Places? A cultural resources specialist at your local Reclamation office or the State Historic Preservation Office can assist in answering this question.*

The New York Canal, just upstream of the proposed intake structure, is on the National Register of Historic Places. For this reason, a cultural report has been approved by the Idaho Historical Preservation Office and a memorandum of understanding is in place that describes measures to take to protect those resources.

7) *Are there any known archeological sites in the proposed project area?*

There are no known archeological sites within the project area.

8) *Will the project have a disproportionately high and adverse effect on low income or minority populations?*

No, the project will not have any effect on any population.

9) *Will the project limit access to and ceremonial use of Indian sacred sites or result in other impacts on tribal lands?*

No, the project site is not within tribal lands.

10) *Will the project contribute to the introduction, continued existence, or spread of noxious weeds or non-native invasive species known to occur in the area?*

Removing current vegetation has the potential to introduce or spread of noxious weeds or non-native invasive species. Industry standards practices will be employed to prevent the spread of noxious weeds.

REQUIRED PERMITS OR APPROVALS

The MC-6 Hydroelectric Project has obtained a FERC exemption (P-5038) and a minor amendment to increase capacity is pending. A cultural report has been approved by the Idaho Historical Preservation Office and a memorandum of understanding is in place that describes measures to take to protect those resources. USACE Permit No. 17 is pending. The project has received a letter from the Idaho Department of Environmental Quality that confirms that the project is exempt from a 401 Certification.

OFFICIAL RESOLUTION

The Board of Directors of the Boise Project Board of Control will meet within 30 days of the submission of this application to approve and sign an Official Resolution. A copy of the Official Resolution will be sent to USBR.

UNIQUE ENTITY IDENTIFER AND SYSTEM FOR AWARD MANAGEMENT

The BPBC is registered with System for Award Management (SAM). The Unique Entity Identifier is 085321768. Registration in SAM will remain active.

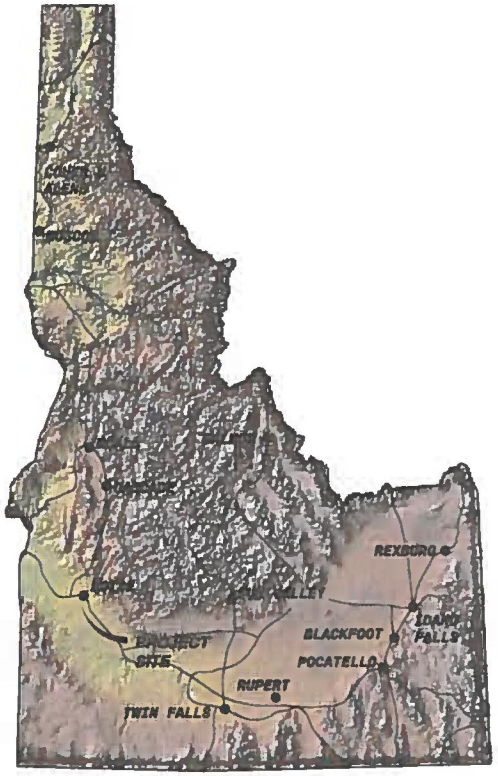
Attachment A

Design Drawings

MC-6 HYDROELECTRIC PROJECT

MC-6 HYDRO, LLC

MARCH 18, 2019



PROJECT LOCATION

INDEX TO SHEETS

SH NO	REV LTR	SHEET TITLE
GA-1	--	COVER, INDEX TO SHEETS PROJECT LOCATION & VICINITY MAP
GA-2	--	LEGEND, ABBREVIATIONS, & DETAIL/SECTION DESIGNATIONS
GA-3	--	GENERAL NOTES & SPECIFICATIONS
C-1	--	CIVIL SITE- OVERALL SITE PLAN
C-2	--	CIVIL SITE- INTAKE/BYPASS SITE PLAN
C-3	--	CIVIL SITE- POWERHOUSE SITE PLAN
C-4	--	CIVIL SITE- S. EAGLE RD BRIDGE CROSS SECTION
PP-1	--	CIVIL SITE- PLAN & PROFILE, NEW PENSTOCK
PP-2	--	CIVIL SITE- PLAN & PROFILE, NEW PENSTOCK
PP-3	--	CIVIL SITE- PLAN & PROFILE, NEW PENSTOCK
PP-4	--	CIVIL SITE- PLAN & PROFILE, NEW PENSTOCK
PP-5	--	CIVIL SITE- PLAN & PROFILE, NEW PENSTOCK
PP-6	--	CIVIL SITE- PLAN & PROFILE, NEW PENSTOCK
PP-7	--	CIVIL SITE- PLAN & PROFILE, NEW PENSTOCK
PP-8	--	CIVIL SITE- PLAN & PROFILE, NEW PENSTOCK
S-1	--	STRUCTURAL NOTES & SPECIFICATIONS
S-2	--	STRUCTURAL NOTES & SPECIFICATIONS
S-3	--	STRUCTURAL NOTES & DETAILS
S-4	--	STRUCTURAL- INTAKE/BYPASS- OVERALL PLAN VIEW
S-5	--	STRUCTURAL- INTAKE/BYPASS- OVERALL ELEVATION VIEW
S-6	--	STRUCTURAL- INTAKE/BYPASS- SECTION VIEW
S-7	--	STRUCTURAL- INTAKE/BYPASS- SECTION VIEW
S-10	--	STRUCTURAL- POWERHOUSE- OVERALL PLAN VIEW
S-11	--	STRUCTURAL- POWERHOUSE- SECTION VIEW
S-12	--	STRUCTURAL- POWERHOUSE- SECTION VIEW
S-13	--	STRUCTURAL- POWERHOUSE- MISC. DETAILS

VICINITY MAP

SORENSON ENGINEERING

ALWAYS THINK SAFETY

PROJECT
MC-6 HYDROELECTRIC PROJECT
MC-6 HYDRO, LLC
HYDROELECTRIC FACILITIES
COVER, INDEX TO SHEETS, PROJECT LOCATION & VICINITY MAP

COVER, INDEX TO SHEETS, PROJECT LOCATION & VICINITY MAP

GA-1

A-1

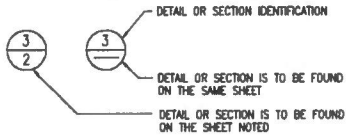
LEGEND

UTILITY POLE	
GATE OR FENCE POST	
SURVEY CONTROL POINT	
MONITORING WELL	
TELEPHONE PED.	
SURFACE WATER FLOW DIRECTION	
DRILL OR TEST HOLE	
SPOT ELEVATION (GRADING)	x 181.0
STRUCTURE ELEVATION	181.0
PROJECT BENCH MARK	
US BOR INSTURMENTATION POINT	
SLOPE DIRECTION INDICATOR	

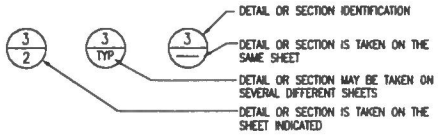
	FEATURE LINE
	HIDDEN FEATURE LINE
	SECTION LINE
	CENTERLINE
2840	EXISTING 5-FOOT CONTOUR
	EXISTING 1-FOOT CONTOUR
	FENCE LINE
OHP	OVERHEAD POWER LINE

DETAIL & SECTION DESIGNATION

TYPICAL CALLOUT WHERE DETAIL OR SECTION IS TAKEN



TYPICAL CALLOUT WHERE DETAIL OR SECTION IS SHOWN



ABBREVIATIONS

AB	ANCHOR BOLT
AC	ASPHALTIC CONCRETE
ADDL	ADDITIONAL
AL	ALUMINUM
APPROX	APPROXIMATE
BC	BOTTOM OF CURB OR BOLT CIRCLE
BLDG	BUILDING
BM	BENCH MARK
BOT	BOTTOM
BVC	BEGIN VERTICAL CURVE
C	CONDUIT
CI	CAST IRON
CISP	CAST IRON SOIL PIPE
CJ	CONSTRUCTION JOINT
CL	CENTERLINE
CLR	CLEAR
CMP	CORRIGATED METAL PIPE
CMU	CONCRETE MASONRY UNIT
CONC	CONCRETE
CONN	CONNECT OR CONNECTION
CONST	CONSTRUCTION
CONT	CONTINUATION
CORP	CORPORATION
CPLG	COUPLING
CTR	CENTER
CU	CUBIC
CW	COLD WATER
CF	CUBIC FEET
D	DRAIN
DI	DUCTILE IRON
DIMJ	DUCTILE IRON MECHANICAL JOINT
DET	DETAIL
DIA	DIAMETER
DIM	DIMENSION
DWG	DRAWING
E	EAST
EA	EACH
EF	EACH FACE
EFF	EFFLUENT
EG	EXISTING GRADE
EJ	EXPANSION JOINT
ELB	ELBOW
ELEC	ELECTRICAL
EQ	EQUAL
EQUIP	EQUIPMENT
EVC	END VERTICAL CURVE
EW	EACH WAY
EWEF	EACH WAY EACH FACE
EXP	EXPANSION OR EXPAND
EXIST	EXISTING
EXT	EXTERIOR
F	FLANGE
FCA	FLANGED COUPLING ADAPTER
FF	FINISHED FLOOR
FG	FINAL GRADE
FLEX	FLEXIBLE
FL	FLOW LINE
FLG	FLANGE
FM	FORCE MAIN
FIN	FINISH
FT	FOOT OR FEET
FTG	FOOTING OR FITTING
FUT	FUTURE
GALV	GALVANIZED
GD	GROUND
HORIZ	HORIZONTAL
HW	HOW WATER
IE	INVERT ELEVATION
INF	INFLUENT
INV	INVERT
INT	INTERIOR OR INTERSECTION
L	LENGTH
LB	POUND
LF	LINEAL FEET
LG	LONG
MATL	MATERIAL
MAX	MAXIMUM
MECH	MECHANICAL
MFGR	MANUFACTURER
MH	MAN HOLE
MIN	MINIMUM
MJ	MECHANICAL JOINT
N	NORTH
NIC	NOT IN CONTRACT
NO.	NUMBER
NTS	NOT TO SCALE
OC	ON CENTER
OPNG	OPENING
PC	POINT OF CURVE
PT	POINT OF TANGENT
PCF	POUNDS PER CUBIC FOOT
PEN	PENETRATION
PE	PLAIN END
PERF	PERFORATED
PI	POINT OF INTERSECTION
PJF	PREMOLDED JOINT FILLER
PL	PLATE
PNL	PANEL
PRC	POINT OF REVERSE CURVE
PRES	PRESSURE
PSF	POUNDS PER SQUARE FOOT
PUD	PUBLIC UTILITY DISTRICT
PVC	POLYVINYL CHLORIDE
RAD,R	RADIUS
RCP	REINFORCED CONCRETE PIPE
RD	ROAD
REINF	REINFORCING
REM	REMOVE
REQD	REQUIRED
RM	ROOM
ROW	RIGHT OF WAY
SCH	SCHEDULE
SG	SUB GRADE
SH OR SHT	SHEET
SIM	SIMILAR
SL OR S	SLOPE
SPEC	SPECIFICATION
SQ	SQUARE
SS	STAINLESS STEEL
STA	STATION
STD	STANDARD
STL	STEEL
SYM	SYMBOL
T	TANGENT
T&B	TOP & BOTTOM
TBD	TO BE DETERMINED
TC	TOP OF CURVE
THK	THICK OR THICKNESS
THRU	THROUGH
TYP	TYPICAL
UD	UNDER DRAIN
VERT	VERTICAL
VPI	VERTICAL POINT OF INTERSECTION
W	WATER LINE
W/	WITH
W/O	WITHOUT
WS	WELDED STEEL
WWF	WELDED WIRE FABRIC
WWM	WELDED WIRE MESH
YD	YARD

SORENSON ENGINEERING

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PROJECT
MC-6 HYDROELECTRIC PROJECT
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HYDROELECTRIC FACILITIES
LEGEND, ABBREVIATIONS, & DETAIL/SECTION DESIGNATIONS

LEGEND, ABBREVIATIONS, & DETAIL/SECTION DESIGNATIONS

GA-2

GENERAL NOTES (UNLESS OTHERWISE SPECIFIED)

1. ALL INSTRUCTIONS AND SPECIAL CONDITIONS CONTAINED ON THIS PLAN SET SHALL BE STRICTLY ADHERED TO. ANY DEVIATIONS SHALL BE APPROVED IN WRITING BY SORENSON ENGINEERING.

2. THE CONSTRUCTION METHODS AND MATERIALS SHALL MEET THE STANDARDS OF THE PROJECT ENGINEER AND AS SHOWN ON THESE PLANS AND SPECIFICATIONS. IN AREAS OF CONFLICT, THE DECISION OF THE ON-SITE PROJECT ENGINEER SHALL APPLY UNLESS OTHERWISE DIRECTED BY SORENSON ENGINEERING.

3. VERIFY THE EXACT LOCATION AND DEPTH OF UNDERGROUND FEATURES, POSSIBLE PIPELINES OR ELECTRICAL SERVICE AND WATERLINES TO IDENTIFY POSSIBLE AREAS OF CONFLICTS AND TO PREVENT DAMAGE TO SUCH UNDERGROUND UTILITIES. UNDERGROUND UTILITIES. THE ACTUAL LOCATIONS ARE TO BE VERIFIED BY THE CONTRACTOR PRIOR TO THE COMMENCEMENT OF ANY EXCAVATION ACTIVITIES.

4. GRADE ALL DISTURBED OR CUT AND FILLED AREAS ON SITE, AFTER CONSTRUCTION, WITH A UNIFORM SLOPE THAT WILL DRAIN WITHOUT PONDING OR DAMAGE TO EITHER ON-SITE OR OFF-SITE PROPERTY IMPROVEMENTS. GRADE ALL DISTURBED OR CUT AND FILL AREAS ON THE EXISTING EMBANKMENT TO MATCH THE EXISTING ADJOINING EMBANKMENT FINISHED GRADE SLOPES UNLESS OTHERWISE SPECIFIED.

5. THE CONTRACTOR SHALL BE RESPONSIBLE FOR PROVIDING AN AS-CONSTRUCTED DRAWING RECORD FOR THIS PROJECT. THE ENGINEER SHALL PROVIDE ONE ADDITIONAL SET OF DRAWINGS TO THE CONTRACTOR FOR THIS PURPOSE. THE AS-CONSTRUCTED DRAWING RECORD SHALL INDICATE ALL CHANGES OR DEVIATIONS FROM THE ENGINEERS DESIGN AS SHOWN ON THESE PLANS. APPROVED CHANGES OF FITTINGS, APPURTENANCES, GRADES, STRUCTURE DEPTHS, STATIONING AND ALIGNMENT SHALL BE DULY NOTED ON THESE AS-CONSTRUCTED PLANS. THE CONTRACTOR SHALL MAINTAIN THE AS-CONSTRUCTED DRAWINGS AND THE DEVIATIONS OF CONSTRUCTION FROM THE APPROVED CONSTRUCTION DRAWINGS AS WELL AS ALL FIELD VERIFIED LOCATIONS AND DEPTHS OF ALL EXISTING UTILITIES ENCOUNTERED SHALL BE NOTED. THE AS-CONSTRUCTED DRAWINGS SHALL BE KEPT UP-TO-DATE AT ALL TIMES AND AVAILABLE FOR DAILY INSPECTIONS BY THE ON SITE PROJECT ENGINEER. AT THE COMPLETION OF CONSTRUCTION, THE AS-CONSTRUCTED DRAWINGS WILL BE RETURNED TO THE ENGINEER ALONG WITH A "STATEMENT OF COMPLETION IN ACCORDANCE WITH THE AS-CONSTRUCTED DRAWINGS".

6. THE CONTRACTOR SHALL BE RESPONSIBLE FOR INITIATING, MAINTAINING, SUPERVISING, AND COMPLYING WITH ALL APPLICABLE FEDERAL SAFETY AND HEALTH REGULATIONS AS DETERMINED BY THE STATE OF IDAHO AND BUREAU OF RECLAMATION HEALTH AND SAFETY REQUIREMENTS. THE CONTRACTOR SHALL BE REQUIRED TO COMPLY WITH ALL REGULATIONS AND REQUIREMENTS OF LOCAL COUNTY CODES & ORDINANCES.

7. SHOP DRAWINGS, INCLUDING SUPPLIERS MANUFACTURERS DRAWINGS, DATA SHEETS, CATALOG CUTS, BROCHURES OR OTHER PRINTED INFORMATION THAT CLEARLY DESCRIBES THE ITEM PROPOSED FOR USE AND ITS INSTALLATION CONFIGURATION SHALL BE SUBMITTED TO THE ENGINEER FOR REVIEW AND ACCEPTANCE FOR ALL SPECIFIED EQUIPMENT AND MATERIALS PRIOR TO SITE DELIVERY. THIS INCLUDES, BUT IS NOT LIMITED TO BUILDING SYSTEMS, CONTROLS, VALVES & PIPING ACCESSORIES, ELECTRICAL CONDUCTORS AND CONDUITS J-BOXES, AND MISCELLANEOUS HARDWARE.

NOTES (UNLESS OTHERWISE SPECIFIED)

G1 SCOPE
THE NOTES & TABLES ON THIS SHEET ARE GENERAL AND APPLY TO THE ENTIRE PROJECT EXCEPT WHERE THERE ARE SPECIFIC INDICATIONS TO THE CONTRARY.

G2 APPLICABLE SPECIFICATIONS AND CODES
CONSTRUCTION SHALL BE IN ACCORDANCE WITH THE CURRENT EDITION OF THE UNIFORM BUILDING CODE. THE ABOVE SHALL GOVERN EXCEPT WHERE OTHER APPLICABLE CODES OR THE FOLLOWING NOTES ARE MORE RESTRICTIVE.

G3 ALTERNATIVE DESIGNS
THE STRUCTURAL SYSTEMS AND DETAILS ON THESE PLANS ARE THE PRIORITY DESIGN. ALTERNATIVE SYSTEMS AND DETAILS MAY BE USED IF THE CONTRACTOR SUBMITS PLANS WITH SUBSTANTIATING CALCULATIONS AND TEST DATA, AND IF THE ALTERNATIVE PLANS ARE ACCEPTED BY THE ENGINEER.

G4 DIMENSIONS
STRUCTURAL DIMENSIONS CONTROLLED BY OR RELATED TO MECHANICAL OR ELECTRICAL EQUIPMENT SHALL BE VERIFIED BY THE CONTRACTOR PRIOR TO CONSTRUCTION.

G5 PROVISIONS FOR EQUIPMENT
MECHANICAL AND ELECTRICAL EQUIPMENT SUPPORTS, ANCHORAGES, OPENINGS, RECESSES AND EMBEDMENTS NOT SHOWN ON THE STRUCTURAL DRAWINGS BUT REQUIRED BY OTHER CONTRACT DRAWINGS SHALL BE PROVIDED PRIOR TO CASTING CONCRETE.

G6 CONSTRUCTION LOADS
STRUCTURES HAVE BEEN DESIGNED FOR OPERATIONAL LOADS ON COMPLETED STURCTURES AFTER THEY HAVE BEEN PROPERLY CURED. DURING CONSTRUCTION THE STRUCTURES SHALL BE PROTECTED BY BRACING AND SHORING WHEREEVER EXCESSIVE LOADS MAY OCCUR.

G7 DRAINAGE SURFACES
SLOPE DRAINAGE SURFACES UNIFORMLY TO DRAIN. SLOPE SHALL BE 1/4" PER FOOT EXCEPT WHERE OTHERWISE NOTED OR SHOWN ON THE PLANS.

G8 FLOOR DRAINS & FLOOR GRATES
SEE MECHANICAL DRAWINGS FOR SIZE AND TYPES.

STRUCTURAL STEEL (UNLESS OTHERWISE SPECIFIED)

S1 APPLICABLE CODE
STEEL CONSTRUCTION SHALL CONFORM TO THE SPECIFICATIONS AND STANDARDS PRESENTED IN THE LATEST EDITION OF AMERICAN INSTITUTE OF STEEL CONSTRUCTION (AISC) MANUAL OF STEEL CONSTRUCTION.

S2 MATERIALS
ALL STRUCTURAL SHAPES, BARS, PLATES AND SHEETS INDICATED ON THE DRAWINGS SHALL BE CARBON STEEL MEETING THE REQUIREMENTS OF ASTM A36, ASTM A529 OR AS NOTED ON THE PLAN SHEETS.

S3 WELDING
WELDING SHALL CONFORM TO THE AMERICAN WELD SOCIETY SPECIFICATIONS FOR STRUCTURAL WELDING. INSPECTION AND NON-DESTRUCTIVE TESTING OF WELDS SHALL BE ACCOMPLISHED IN ACCORDANCE WITH ANSI/AWS B1.10-86, LATEST EDITION. THE WELDING AND NON-DESTRUCTIVE TESTING SYMBOLS ARE IN ACCORDANCE WITH THE AWS A2.4-79, LATEST REVISION.

S4 ENCASED STEEL
STEEL COMPLETELY ENCASED IN CONCRETE SHALL NOT BE GALVANIZED OR PAINTED AND SHALL HAVE A RUST FREE CLEAN SURFACE FOR BONDING TO CONCRETE. GALVANIZED ANCHOR BOLTS MAY BE PLACED IN CONCRETE.

S5 PAINTING
ALL STRUCTURAL STEEL SHALL BE PAINTED IN ACCORDANCE WITH THE SPECIFICATIONS OR AS NOTED ON THE FABRICATION DRAWING SHEETS.

SPECIFICATIONS (UNLESS OTHERWISE SPECIFIED)

EMBANKMENT REPAIR/CONSTRUCTION

THE PORTION OF THE EXISTING EMBANKMENT AND/OR EXISTING NATIVE MATERIALS THAT WILL BE EXCAVATED FOR THE CONSTRUCTION OF FEATURES ASSOCIATED WITH THIS PROJECT SHALL BE REPLACED IN ACCORDANCE WITH THE PLANS AND SPECIFICATIONS PREPARED FOR THIS PROJECT. BACKFILL MATERIALS SHALL BE PLACED IN ACCORDANCE WITH THE PROJECT PLANS AND SPECIFICATIONS. EXCAVATION BELOW THE BOTTOM ELEVATIONS SHOWN ON THE PLAN SHEETS SHALL BE REPLACED WITH CLASS 2200 CONCRETE. THE REQUIRED COMPACTION IN PIPE ZONES SHALL BE 95% OF LABORATORY STANDARD MAXIMUM DENSITY AND W/ ± 2% OPTIMUM MOISTURE CONTENT IN ACCORDANCE WITH AASHTO T99, CLASS C1. BACKFILL IN THE PIPE ZONE SHALL BE PLACED IN 8-INCH MAXIMUM THICK LIFTS AND COMPACTED PRIOR TO THE PLACEMENT OF THE NEXT LIFT. COMPACTION ABOVE THE PIPE ZONE SHALL BE AS SHOWN ON THE PLAN SHEETS.
COMPACTION FOR THE FEEDER CANAL AND ALL WATER STORAGE EMBANKMENTS WILL BE TO 85% OF STANDARD MAXIMUM DENSITY WITH ± 2% OPTIMUM MOISTURE CONTENT. ANY COMPACTION REQUIRED BENEATH CONCRETE STRUCTURES, WITHIN 50 FEET OF CONCRETE STRUCTURES, OR AS DESIGNATED CRANE SET-UP AREA WILL REQUIRE 95% OF STANDARD MAXIMUM DENSITY WITH ± 2% OPTIMUM MOISTURE CONTENT. BACKFILL SHALL BE PLACED IN 8-INCH MAXIMUM THICK LIFTS AND COMPACTED PRIOR TO THE PLACEMENT OF THE NEXT LIFT.

EROSION CONTROL FABRIC

THE EROSION CONTROL FABRIC SHALL BE A BIODEGRADABLE NATURAL FIBER EROSION CONTROL FABRIC MANUFACTURED FROM UN-DYED AND UN-BLEACHED WOVEN JUTE MAT. THE MATERIAL SHALL HAVE A GRAB TENSILE OF 300 LBS/FT DRY AND 125 LBS/FT WET IN ACCORDANCE WITH ASTM D-4632. THE MATERIAL SHALL HAVE AN OPEN AREA OF 60 TO 65 PERCENT. THE MATERIAL SHALL BE ATTACHED TO THE COVERED SLOPE IN ACCORDANCE WITH THE SUPPLIER RECOMMENDATIONS. THE MATERIAL SHALL BE TOTALLY BIODEGRADEABLE WITHIN TWO YEARS. THE EROSION CONTROL FABRIC SHALL BE ANTI-WASH GEOJUTE AS MANUFACTURED BY BELTON INDUSTRIES, 8613 ROSWELL ROAD, ATLANTA, GA. 30350 (800) 225-4099 OR APPROVED EQUAL.

3/4" BACKFILL

PERCENTAGE BY WEIGHT PASSING SQUARE MESH SIEVES

SIEVE SIZE	JOB MIX TARGET LIMITS	JOB MIX TOLERANCE
1 INCH (25.4 MM)	100	
¾ INCH (19.0 MM)	82-88	± 8
⅜ INCH (9.5 MM)	52-64	± 12
NO. 4 (4.75 MM)	36-48	± 12
NO. 40 (0.425 MM)	16-24	± 10
NO. 200 (0.075 MM)	0-2	± 2

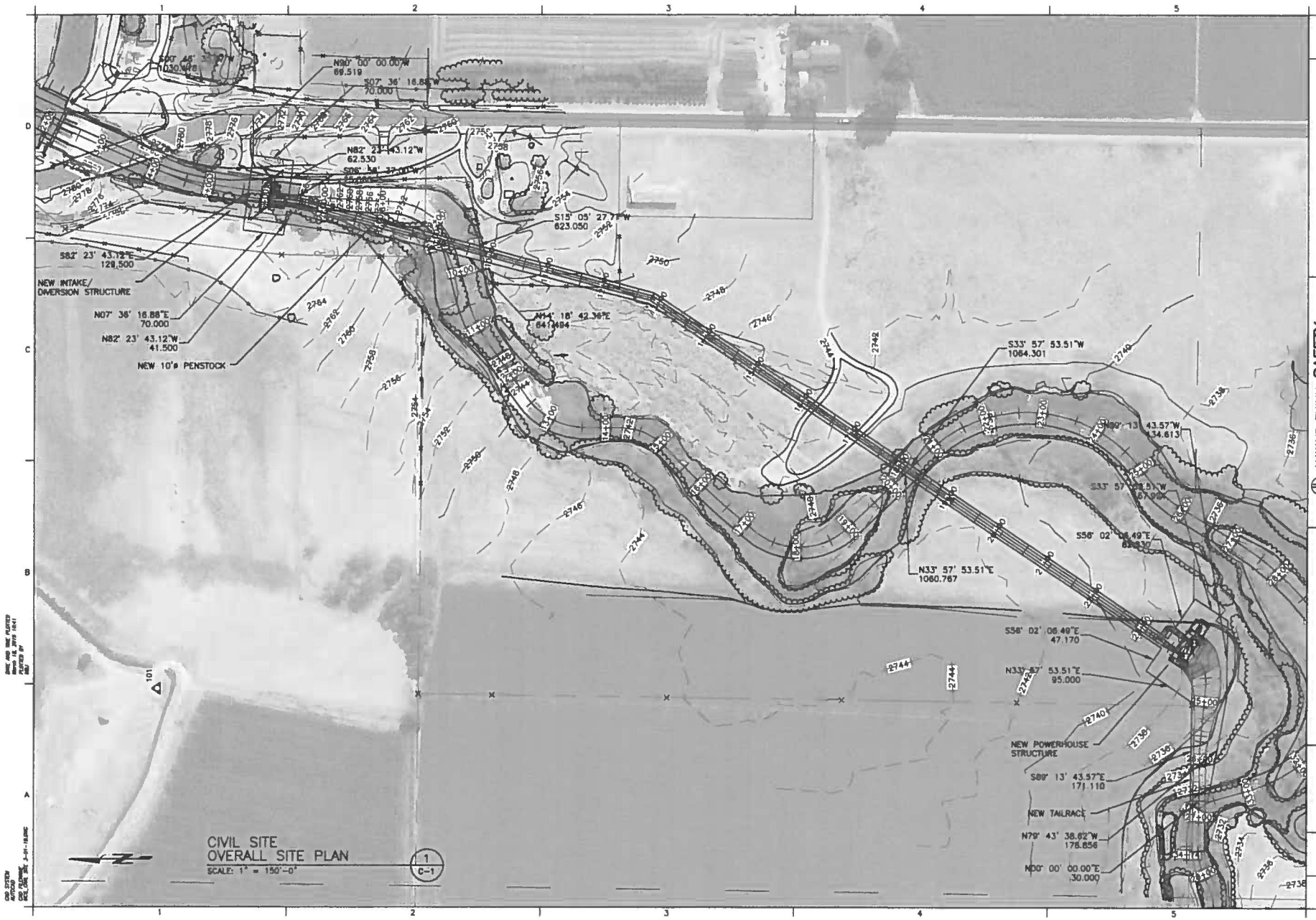
SORENSON ENGINEERING

ALWAYS THINK SAFETY

PROJECT
MC-6 HYDROELECTRIC PROJECT
MC-6 HYDRO, LLC
HYDROELECTRIC FACILITIES
GENERAL NOTES & SPECIFICATIONS

GENERAL NOTES & SPECIFICATIONS

GA-3



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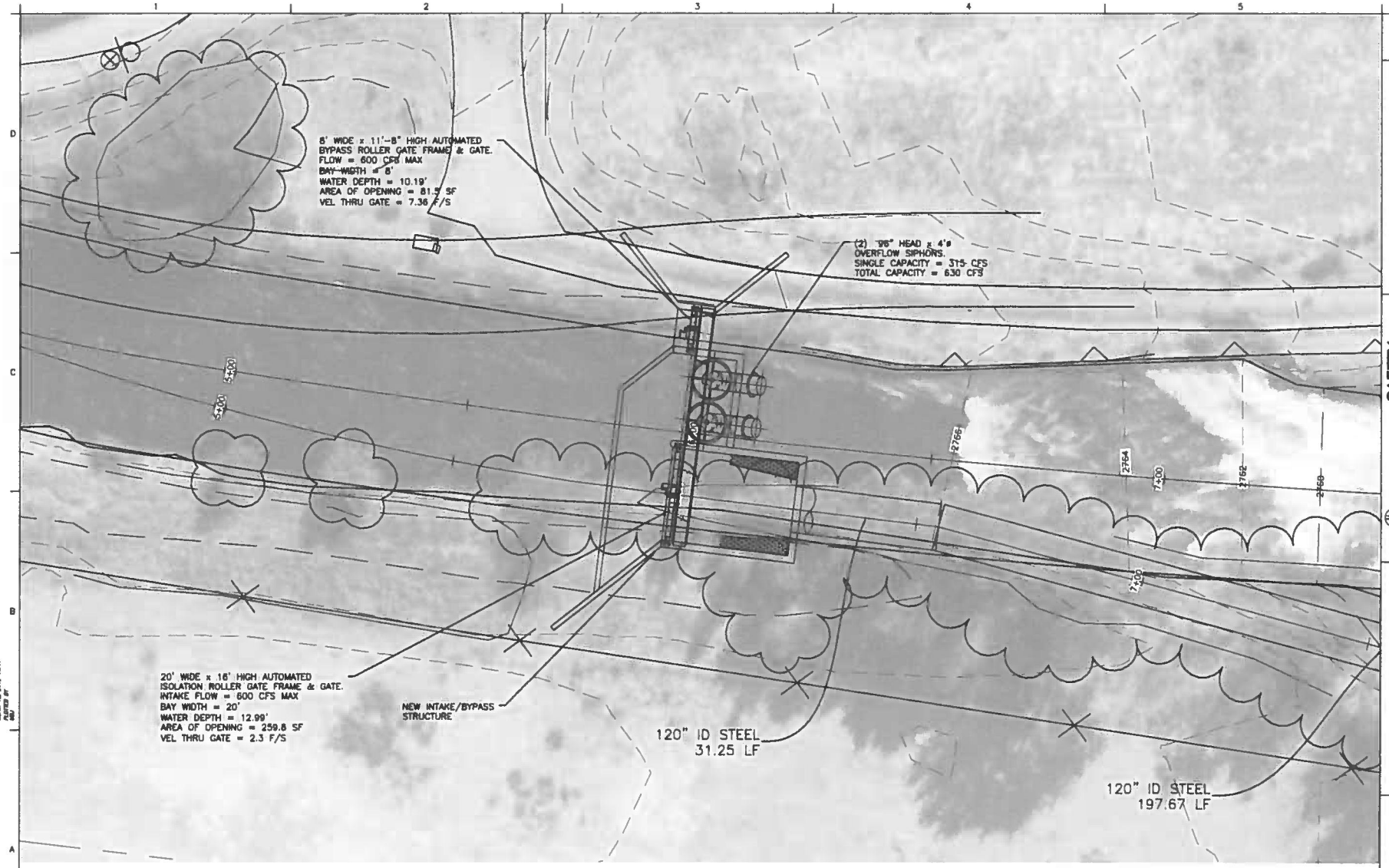
PROJECT

MC-6 HYDROELECTRIC PROJECT
MC-6 HYDRO, LLC
HYDROELECTRIC FACILITIES
CIVIL SITE
OVERALL SITE PLAN

CIVIL SITE
OVERALL SITE PLAN

C-1

A-4



CIVIL SITE
INTAKE/BYPASS STRUCTURE (1 / C-2)
SCALE: 1" = 20'-0"

SORENSON ENGINEERING

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PROJECT
MC-6 HYDROELECTRIC PROJECT
MC-6 HYDRO, LLC
HYDROELECTRIC FACILITIES
CIVIL SITE
INTAKE/BYPASS SITE PLAN

CIVIL SITE
INTAKE/BYPASS SITE PLAN

C-2

CIVIL SITE
POWERHOUSE STRUCTURE (1 / C-3)
SCALE: 1" = 20'-0"

SORENSON ENGINEERING

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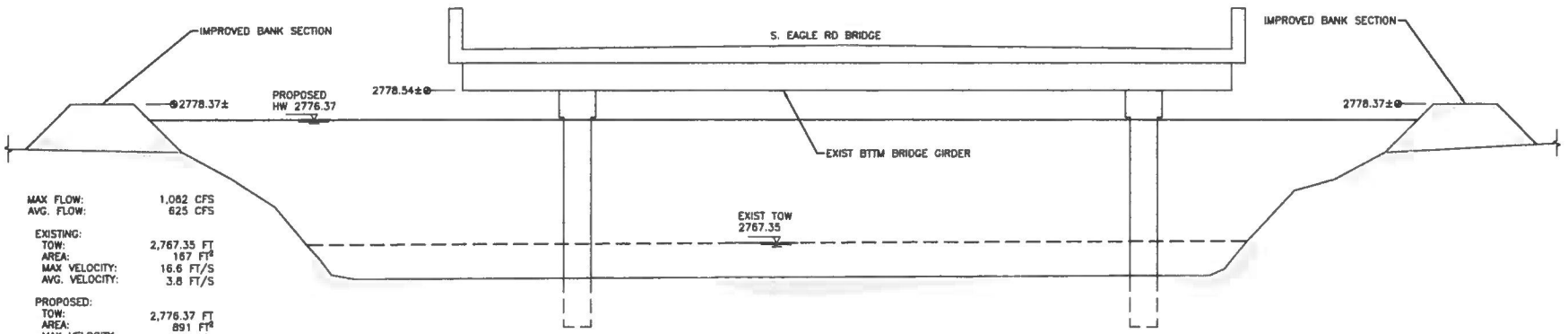
PROJECT
MC-6 HYDROELECTRIC PROJECT
MC-6 HYDRO, LLC
HYDROELECTRIC FACILITIES
CIVIL SITE
POWERHOUSE SITE PLAN

CIVIL SITE
POWERHOUSE SITE PLAN

C-3

A-6



MAX FLOW:	1,062 CFS
AVG. FLOW:	625 CFS
EXISTING:	
TOW:	2,767.35 FT
AREA:	167 FT²
MAX VELOCITY:	16.6 FT/S
AVG. VELOCITY:	3.8 FT/S
PROPOSED:	
TOW:	2,776.37 FT
AREA:	891 FT²
MAX VELOCITY:	1.2 FT/S
AVG. VELOCITY:	0.7 FT/S

S. EAGLE RD-- BRIDGE CROSS SECTION (1 / C-4)

SCALE: 1/8" = 1'-0"

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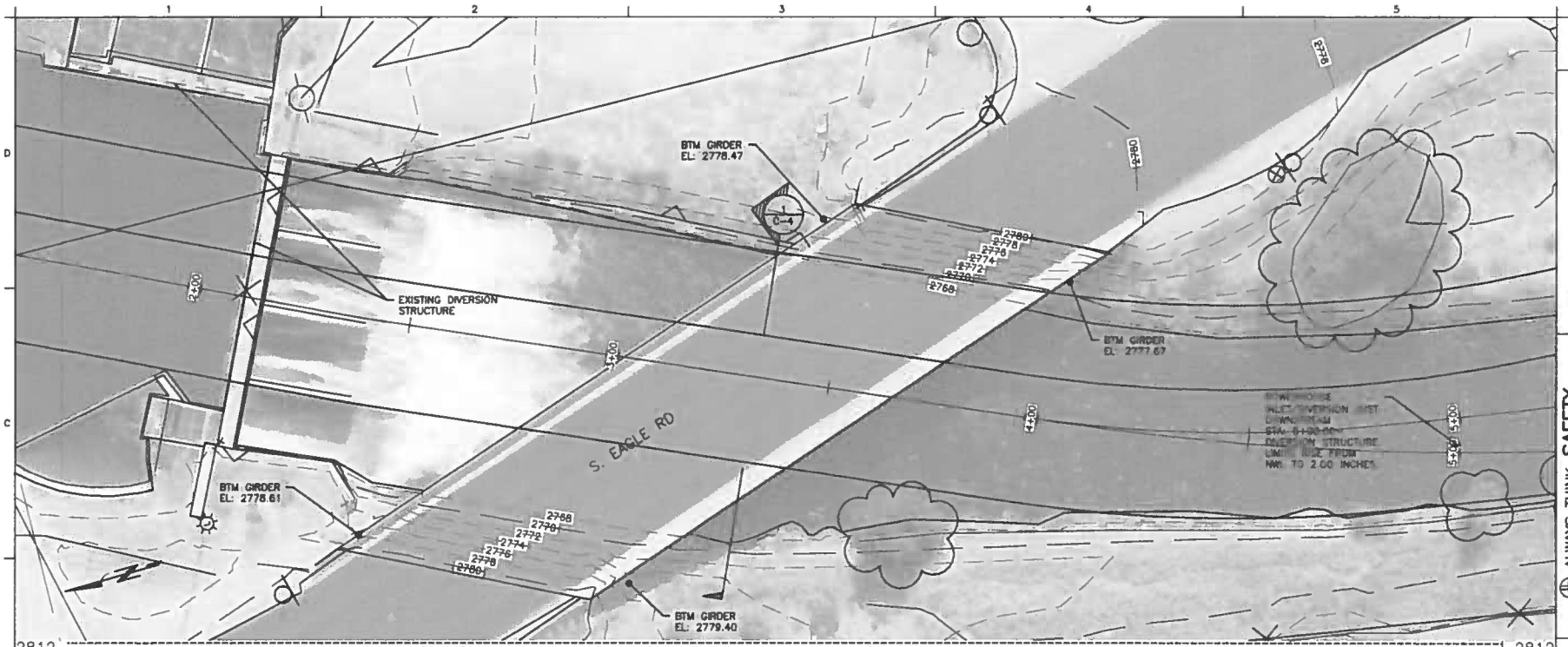
PROJECT
MC-6 HYDROELECTRIC PROJECT
MC-6 HYDRO, LLC
HYDROELECTRIC FACILITIES

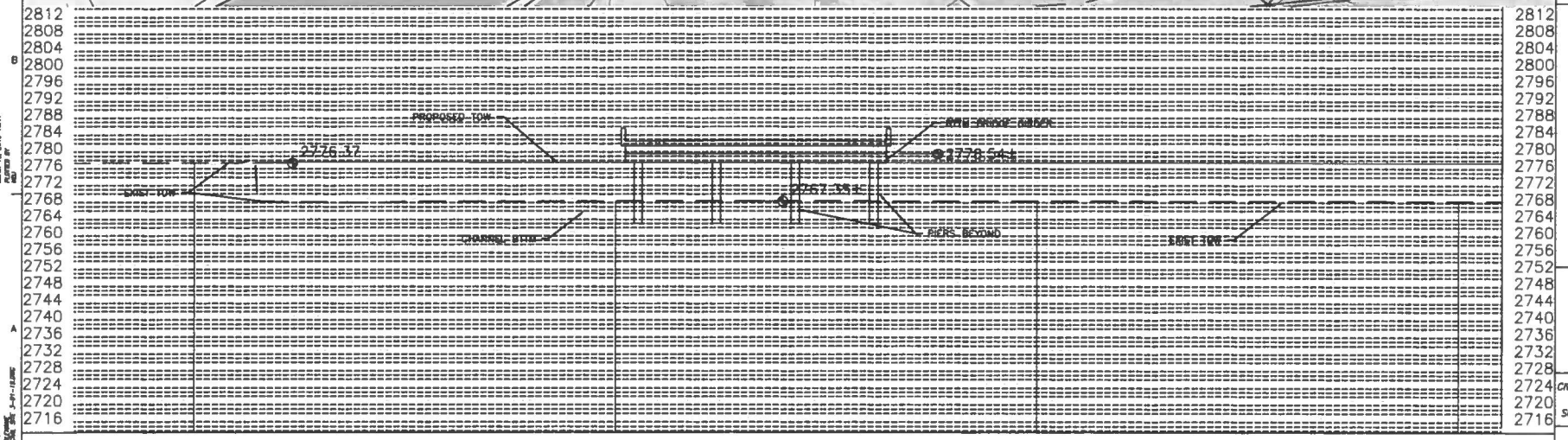
CIVIL SITE-
S. EAGLE RD BRIDGE
CROSS SECTION

DEVELOPMENT DRAWINGS
NOT FOR CONSTRUCTION
DATE AND TIME PLOTTED
March 18, 2019 10:41

CIVIL SITE-
S. EAGLE RD BRIDGE
CROSS SECTION

C-4





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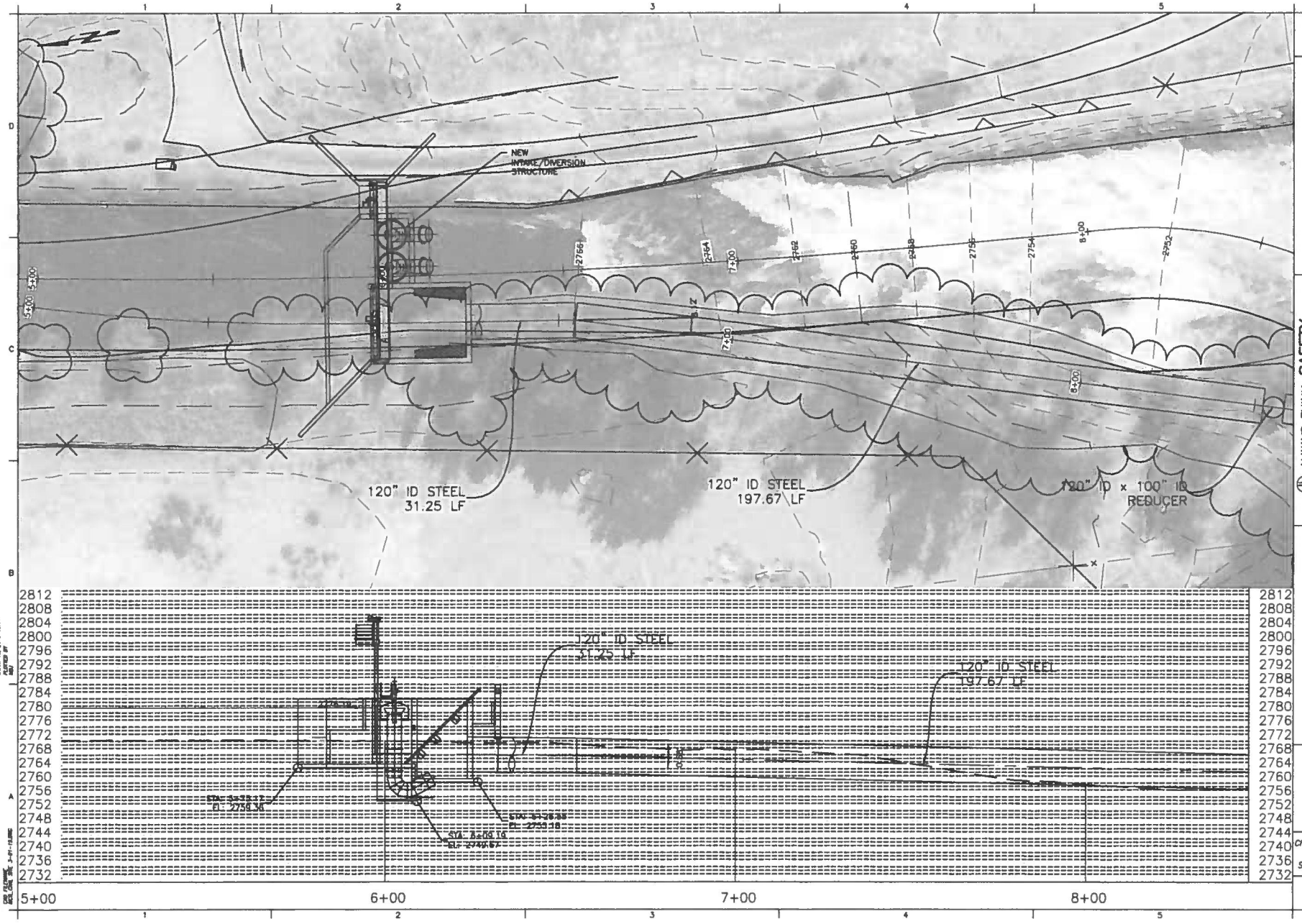
PROJECT

MC-6 HYDROELECTRIC PROJECT
MC-6 HYDRO, LLC
HYDROELECTRIC FACILITIES
CIVIL SITE- PLAN & PROFILE
INTAKE/BYPASS SITE PLAN

CIVIL SITE- PLAN & PROFILE
NEW PENSTOCK
SCALE: 1" = 25'-0" 1H:1V

PP-1

A-8



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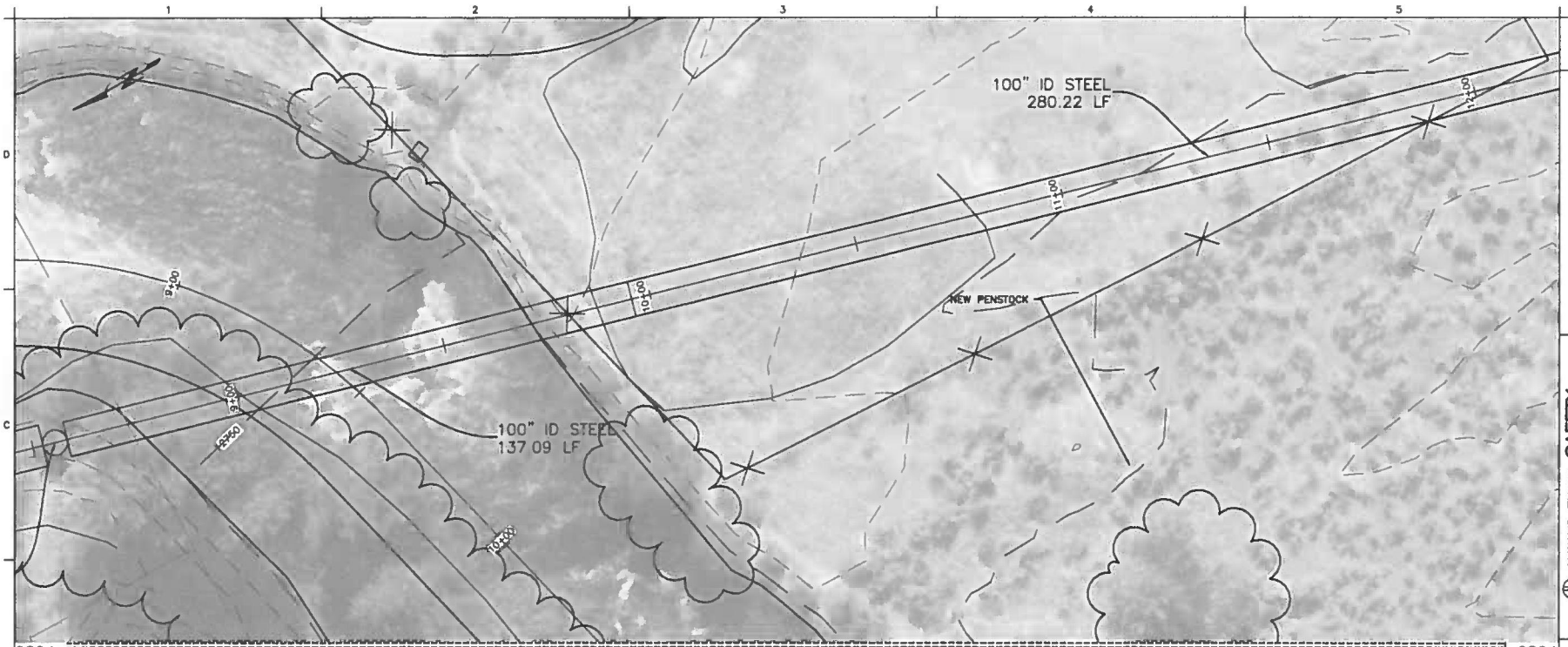
PROJECT

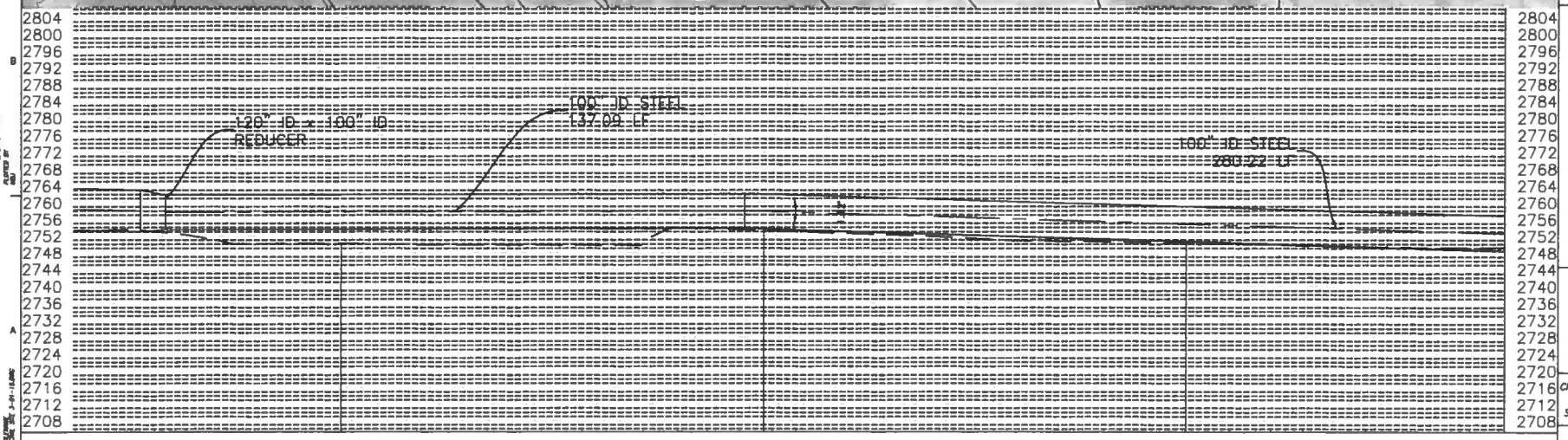
MC-6 HYDROELECTRIC PROJECT
MC-6 HYDRO, LLC
HYDROELECTRIC FACILITIES
CIVIL SITE- PLAN & PROFILE
INTAKE/BYPASS SITE PLAN

CIVIL SITE- PLAN & PROFILE
NEW PENSTOCK
SCALE: 1" = 25'-0" 1H:1V

PP-2

A-9





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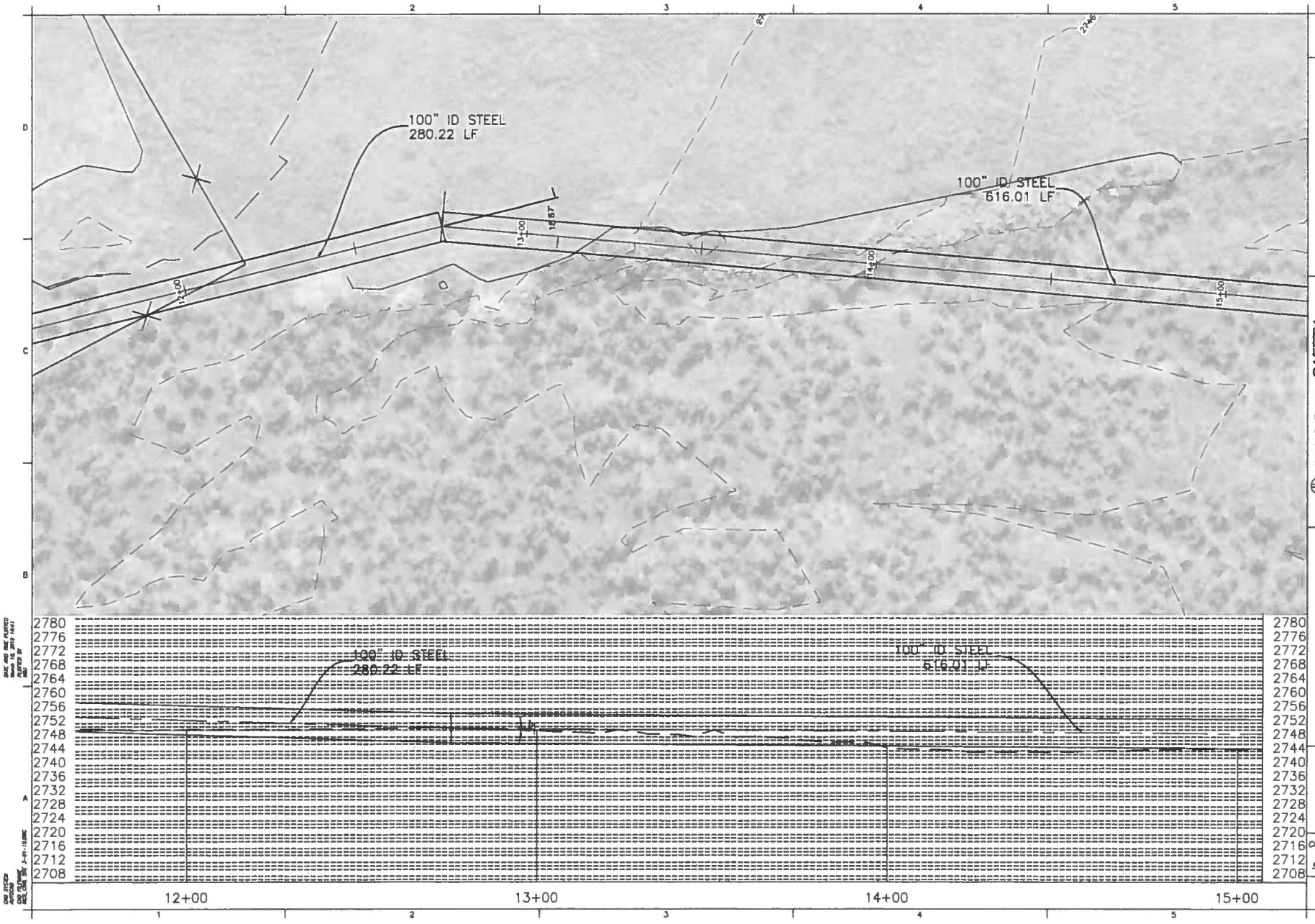
PROJECT

MC-6 HYDROELECTRIC PROJECT
MC-6 HYDRO, LLC
HYDROELECTRIC FACILITIES
CIVIL SITE- PLAN & PROFILE
INTAKE/BYPASS SITE PLAN

CIVIL SITE- PLAN & PROFILE
NEW PENSTOCK
SCALE: 1" = 25'-0" 1H:1V

PP-3



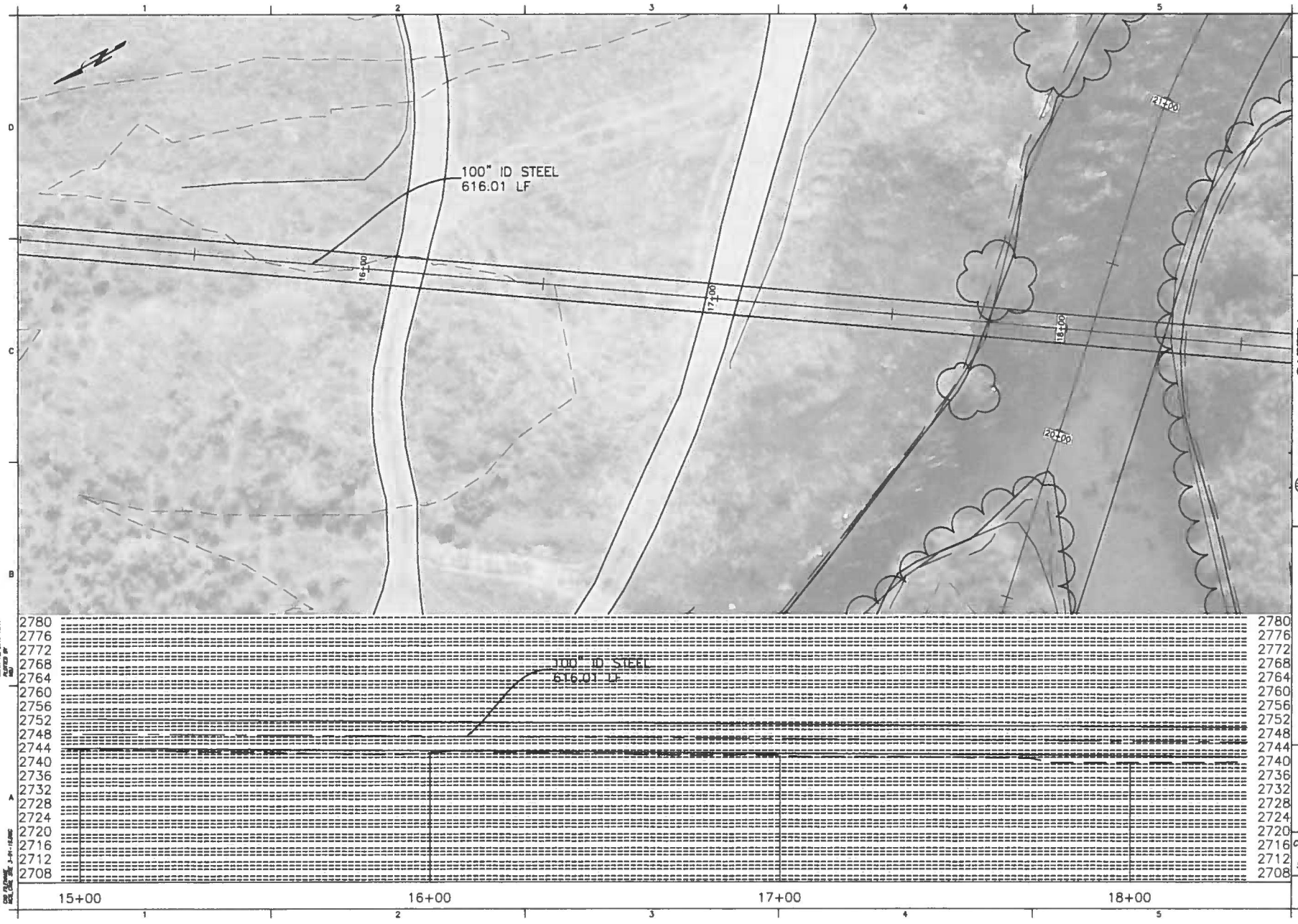
SORENSON ENGINEERING

ALWAYS THINK SAFETY

PROJECT
MC-6 HYDROELECTRIC PROJECT
MC-6 HYDRO, LLC
HYDROELECTRIC FACILITIES
CIVIL SITE- PLAN & PROFILE
INTAKE/BYPASS SITE PLAN

CIVIL SITE- PLAN & PROFILE
NEW PENSTOCK
SCALE: 1" = 25'-0" 1H:1V

PP-4



SORENSON ENGINEERING

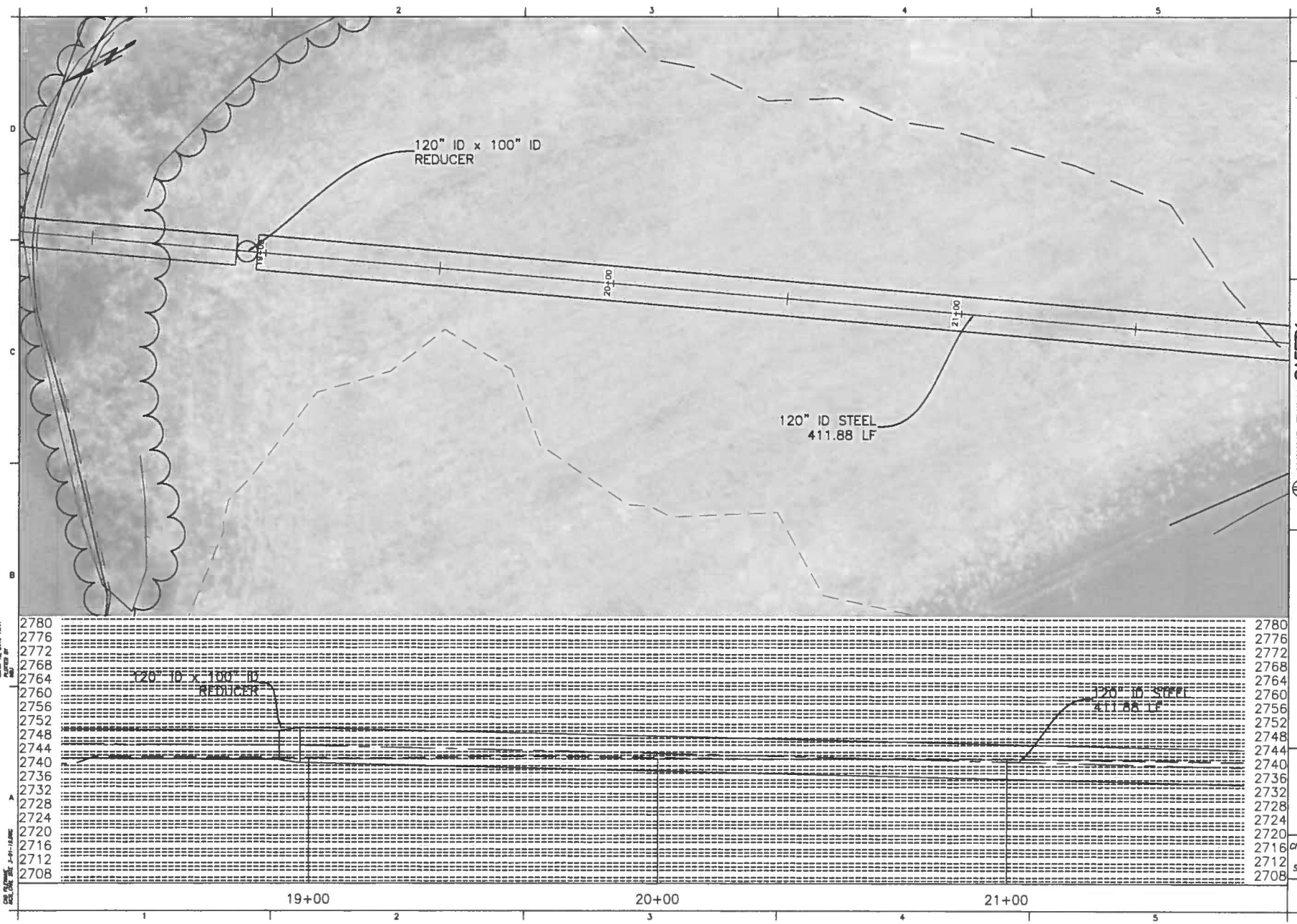
ALWAYS THINK SAFETY

PROJECT

MC-6 HYDROELECTRIC PROJECT
MC-6 HYDRO, LLC
HYDROELECTRIC FACILITIES
CIVIL SITE- PLAN & PROFILE
INTAKE/BYPASS SITE PLAN

CIVIL SITE- PLAN & PROFILE
NEW PENSTOCK
SCALE: 1" = 25'-0" 1H:1V

PP-5



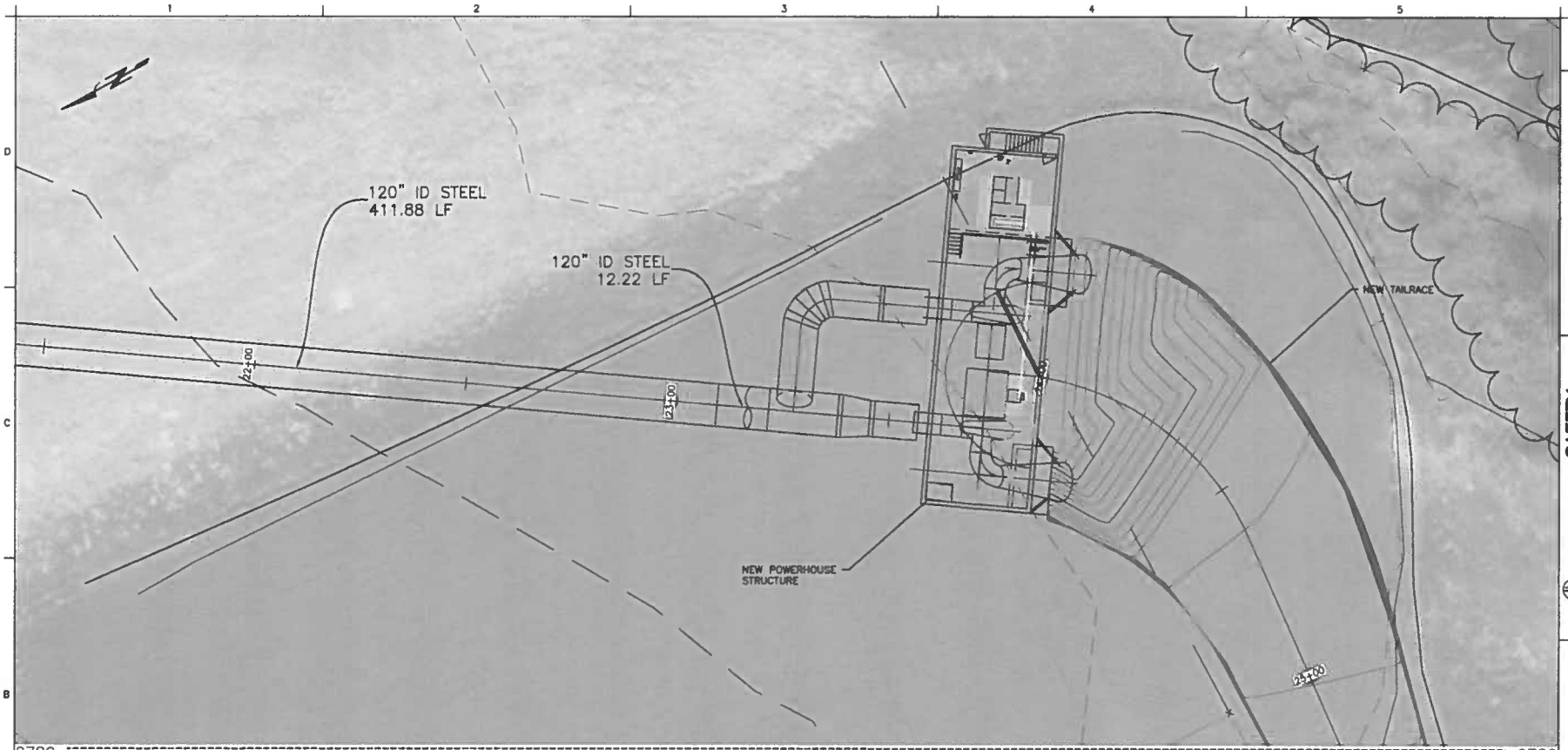
SORENSON ENGINEERING

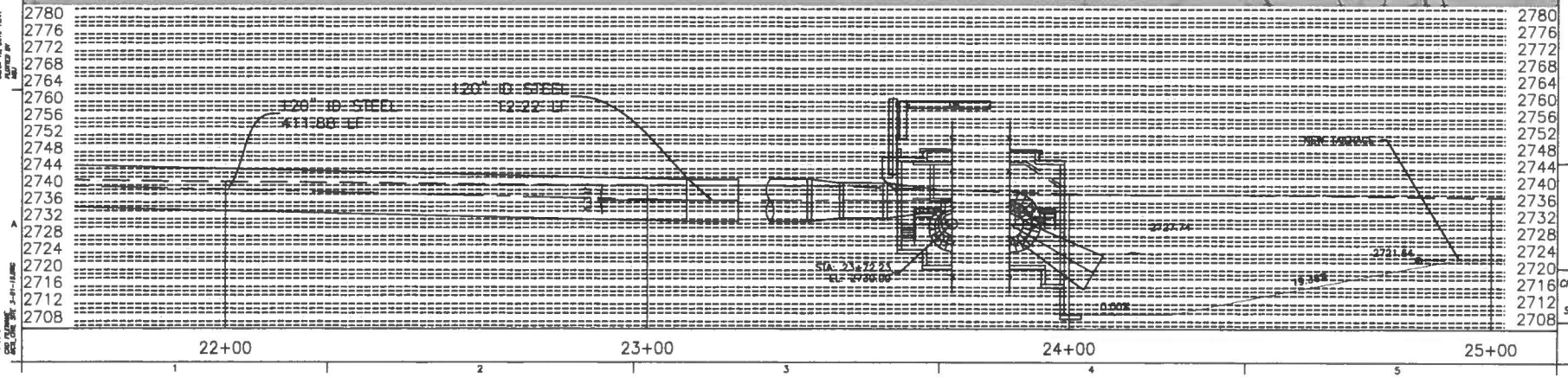
ALWAYS THINK SAFETY

PROJECT
MC-6 HYDROELECTRIC PROJECT
MC-6 HYDRO, LLC
HYDROELECTRIC FACILITIES
CIVIL SITE- PLAN & PROFILE
INTAKE/BYPASS SITE PLAN

CIVIL SITE- PLAN & PROFILE
NEW PENSTOCK
SCALE: 1" = 25'-0" 1H:1V

PP-6





SORENSON ENGINEERING

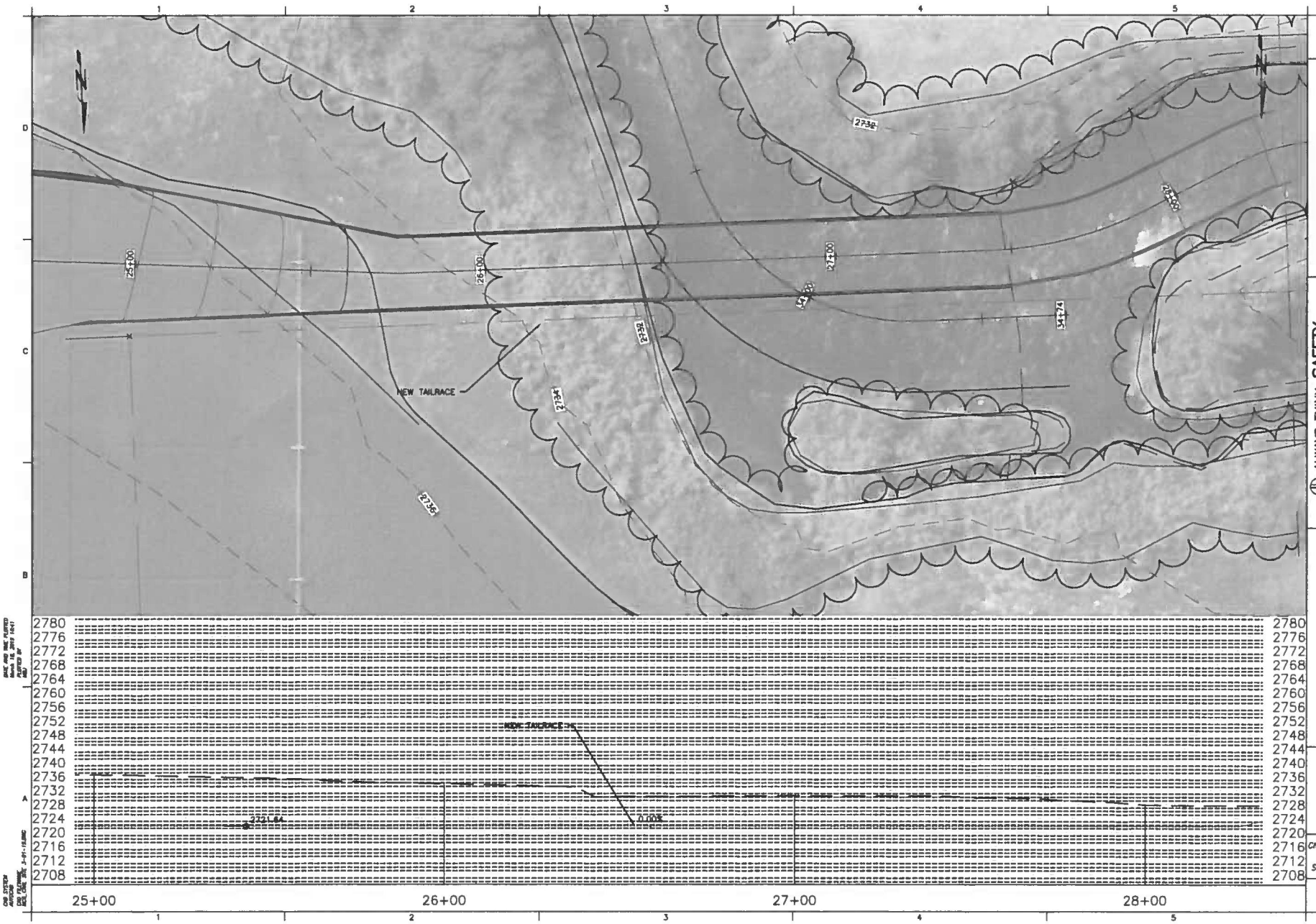
ALWAYS THINK SAFETY

PROJECT

MC-6 HYDROELECTRIC PROJECT
MC-6 HYDRO, LLC
HYDROELECTRIC FACILITIES
CIVIL SITE- PLAN & PROFILE
INTAKE/BYPASS SITE PLAN

CIVIL SITE- PLAN & PROFILE
NEW PENSTOCK
SCALE: 1" = 25'-0" 1H:1V

PP-7



SORENSON ENGINEERING

ALWAYS THINK SAFETY

PROJECT

MC-6 HYDROELECTRIC PROJECT
MC-6 HYDRO, LLC
HYDROELECTRIC FACILITIES
CIVIL SITE- PLAN & PROFILE
INTAKE/BYPASS SITE PLAN

CIVIL SITE- PLAN & PROFILE
NEW PENSTOCK
SCALE: 1" = 25'-0" 1H:1V

PP-8

A. DESIGN CODE:

1. INTERNATIONAL BUILDING CODE (IBC) 2015
2. ALL REFERENCE TO OTHER CODES AND STANDARDS (ACI, ASTM, ETC.) SHALL BE FOR THE LATEST OR MOST CURRENT EDITION AVAILABLE.
3. ACI 350-06 "ENVIRONMENTAL ENGINEERING CONCRETE STRUCTURES"

B. PRE-ENGINEERED METAL BUILDING DESIGN CRITERIA:

NOT USED

C. GENERAL:

1. UNLESS OTHERWISE NOTED, ALL MATERIAL AND DESIGN SPECIFICATIONS CITED HEREIN SHALL CONFORM TO THE MOST RECENTLY ADOPTED SPECIFICATION OF CODE.
2. THESE STRUCTURAL NOTES ARE A SUPPLEMENT TO THE PROJECT SPECIFICATIONS. ANY DISCREPANCY FOUND AMONG THE DRAWINGS, SPECIFICATIONS, THESE NOTES, AND ANY SITE CONDITIONS SHALL BE REPORTED IN A TIMELY MANNER TO THE ENGINEER OF RECORD WHO SHALL CORRECT ANY DISCREPANCY IN WRITING. ANY WORK DONE BY THE CONTRACTOR AFTER DISCOVERY OF SUCH DISCREPANCY SHALL BE DONE AT THE CONTRACTOR'S RISK.
3. THE CONTRACTOR SHALL VERIFY AND COORDINATE THE DIMENSIONS AMONG DRAWINGS PRIOR TO PROCEEDING WITH ANY WORK OR FABRICATION.
4. THE STRUCTURAL DRAWINGS REPRESENT THE COMPLETED STRUCTURE AND ARE NOT INTENDED TO INDICATE THE MEANS AND METHOD OF CONSTRUCTION. THE CONTRACTOR IS RESPONSIBLE FOR ALL DEMOLITION AND CONSTRUCTION MEANS, METHODS, TECHNIQUES, SEQUENCING, AND SAFETY REQUIRED FOR THIS PROJECT.
5. THE CONTRACTOR IS RESPONSIBLE FOR THE DESIGN AND CONSTRUCTION OF ALL ERECTION BRACING, FORM WORK, AND TEMPORARY SHORING REQUIRED FOR THIS PROJECT.
6. SEE SUBMITTAL KEY FOR REQUIRED SHOP DRAWING SUBMITTALS. UNLESS STATED OTHERWISE IN THE PROJECT SPECIFICATIONS, PROVIDE A MINIMUM OF TWO SETS OF SUBMITTALS FOR APPROVAL OR CORRECTIONS.
7. ALL FEATURES OF CONSTRUCTION NOT FULLY SHOWN SHALL BE OF THE SAME TYPE AND CHARACTER AS SHOWN FOR SIMILAR CONDITIONS SUBJECT TO REVIEW BY THE ARCHITECT AND STRUCTURAL ENGINEER OF RECORD.
8. ALL PRODUCTS AND MATERIALS USED BY THE CONTRACTOR SHALL BE APPLIED, PLACED, ERECTED OR INSTALLED IN STRICT ACCORDANCE WITH THE MANUFACTURER'S INSTRUCTIONS.
9. THESE DOCUMENTS CONTAIN NOTES THAT MAY APPLY GENERALLY TO ALL STRUCTURAL ELEMENTS, SPECIFICALLY TO ONE SHEET, OR SPECIFICALLY TO ONE OR MORE STRUCTURAL ELEMENTS. THE NOTES ARE NOT MERE GUIDELINES, THEY ARE PART AND PARCEL OF OUR DESIGN. ANY WORK THAT IS PERFORMED THAT IS NOT IN COMPLIANCE WITH THE NOTES IS NOT IN COMPLIANCE WITH THE DESIGN AND IS SUBJECT TO REJECTION. ANY ALTERATION, MODIFICATION, DELETION, OR ADDITION TO THE NOTES BY WRITING, ACT OR FAILURE TO ACT, SHALL BE CARRIED OUT ONLY WITH THE PRIOR EXPRESS WRITTEN CONSENT AND APPROVAL OF SORENSON ENGINEERING.

D. FOUNDATIONS:

1. FOUNDATION SIZES ARE BASED UPON A MAXIMUM TOTAL LOAD BEARING SOIL PRESSURE = 1500 PSF FOR BEARING ON NATIVE SOILS.
2. FOOTINGS SHALL BE FOUNDED ON UNDISTURBED NATIVE SOILS.
3. ALL DISTURBED SOIL SHALL BE REMOVED BY HAND OPERATION FROM FOOTING
4. ALL GENERAL EXCAVATIONS AND FOOTINGS SHALL BE INSPECTED AND APPROVED PRIOR TO THE PLACEMENT OF ANY SOIL BACKFILL AND/OR CONCRETE.

E. CONCRETE (CAST IN PLACE):

1. ALL CONCRETE SHALL BE NORMAL WEIGHT AND SHALL DEVELOP A MINIMUM 28 DAY LABORATORY CURED COMPRESSIVE-CYLINDER STRENGTH OF:
   4000 PSI FOR FOUNDATION WALLS AND FLOORS
   4000 PSI FOR FILL CONCRETE AROUND EQUIPMENT, STRUCTURES AND PENSTOCKS.
2. A MINIMUM OF 4 CONCRETE TEST CYLINDERS SHALL BE PROVIDED FOR EACH 50 CU. YARDS OF EACH CONCRETE STRENGTH, EACH DAY. CYLINDERS SHALL BE TESTED AS FOLLOWS: 1 AT 7 DAYS, 1 AT 14 DAYS, 1 AT 28 DAYS, AND 1 HELD IN RESERVE. SLUMP, AIR ENTRAINMENT, LOCATION IN STRUCTURE, ETC., SHALL BE MEASURED AND RECORDED FOR EACH SET OF CYLINDERS, PER ASTM.
3. CONCRETE CYLINDER AND TESTING SHALL CONFORM TO ASTM SPECIFICATIONS OUTLINED IN THE QCIP FOR THIS PROJECT.
4. CONCRETE, FORMS, MIXING, PLACING AND CURING SHALL CONFORM TO ACI MANUAL OF CONCRETE PRACTICE, LATEST EDITION, AND SPECIFICATIONS.
5. CONCRETE WATER CEMENT RATIO SHALL NOT EXCEED 0.45.
6. CONCRETE EXPOSED TO WEATHER SHALL HAVE 6% ± 1% ENTRAINED AIR.
7. CONCRETE SLUMP NOT TO EXCEED 4 INCHES, MUST DEMONSTRATE ABILITY TO MAINTAIN 4,000 PSI CONCRETE STRENGTH..
8. CONCRETE SUPPLIER TO PROVIDE STAMPED MIX DESIGN CALCULATIONS AND TEST RESULTS TO ENGINEER OF RECORD FOR REVIEW PRIOR TO POURING OF CONCRETE
9. SIZE AND LOCATION OF SLEEVES THRU FLOORS OR WALLS FOR MECHANICAL OR ELECTRICAL ACCESS SHALL BE APPROVED BY THE ENGINEER PRIOR TO PLACING CONCRETE.
10. ALL BOLTS IN CONCRETE SHALL CONFORM TO ASTM SPECIFICATION A307 (UNLESS NOTED OTHERWISE ON DRAWINGS) AND SHALL BE OF THE SIZE INDICATED ON THE DRAWINGS. INSTALL STAINLESS STEEL ANCHORS WHERE CONNECTIONS WILL BE EXPOSED TO MOISTURE.
11. ALL CONCRETE REMOVAL & REPAIR SHALL CONFORM TO "GUIDE FOR CONCRETE REPAIR" BY THE UNITED STATES DEPARTMENT OF THE INTERIOR, BUREAU OF RECLAMATION.

F. REINFORCING STEEL:

1. ALL REINFORCING BARS SHALL CONFORM TO ASTM A-615 OF THE FOLLOWING GRADES: ASTM A615 GRADE 60 FOR ALL REINFORCEMENT INCLUDING BEAM STIRRUPS, COLUMN TIES AND AS NOTED.
2. ALL WELDED REINFORCING BARS SHALL CONFORM TO ASTM A-706 OF THE FOLLOWING GRADES: GRADE 60 FOR ALL WELDED REINFORCEMENT
3. ALL WELDED REINFORCING STEEL, METAL INSERTS AND CONNECTIONS SHALL CONFORM TO IBC STANDARDS NO. 19-2.
4. ALL WELDING OF REINFORCING STEEL SHALL CONFORM TO AWS SPECIFICATIONS. ALL WELDING SHALL BE DONE BY WELDERS CERTIFIED UNDER AWS SPECIFICATIONS USING LOW HYDROGEN E70XX ELECTRODES.
5. REINFORCEMENT SHALL BE DETAILED, FABRICATED AND PLACED IN ACCORDANCE WITH ACI CODE 318 AND ACI MANUAL 315, UNLESS OTHERWISE NOTED. ALL REINFORCEMENT SHALL BE FREE OF LOOSE MILL AND RUST SCALE, OIL, DIRT AND COATINGS OF ANY MANNER THAT WILL REDUCE BOND. ALL REINFORCEMENT IS CONTINUOUS WITH ADEQUATE LAPS.
6. REINFORCEMENT SHALL BE SECURED IN FORMS WITH SUITABLE TIES AND ANCHORAGE TO PREVENT DISPLACEMENT. BARS ADJACENT TO EARTH SHALL BE SUPPORTED BY CEMENT MORTAR CUBES.
7. REINFORCING STEEL SHALL NOT BE DISPLACED FOR THE CONVENIENCE OF OTHER TRADES UNLESS APPROVED BY THE STRUCTURAL ENGINEER OF RECORD.
8. 'WET SETTING' OF REINFORCEMENT, ANCHOR BOLTS, AND INSERTS IS NOT PERMITTED
9. THE FOLLOWING MINIMUM CONCRETE COVER SHALL BE PROVIDED FOR CAST-IN-PLACE REINFORCEMENT:

A)	CONCRETE CAST AGAINST AND PERMANENTLY EXPOSED TO EARTH	3"
B)	CONCRETE EXPOSED TO EARTH OR WEATHER	
	#6 THROUGH #18 BARS	2"
	#5 BAR AND SMALLER	1-½"
C)	CONCRETE NOT EXPOSED TO EARTH OR WEATHER	
	SLABS, WALLS AND JOISTS: #14 AND #18 BARS	1-½"
	#11 BAR AND SMALLER	¾"
	BEAMS AND COLUMNS: PRIMARY REINFORCEMENT, TIES, STIRRUPS, SPIRALS	1-½"

10. PLACE 2'-0" x 2'-0" BARS AT CORNERS AND INTERSECTIONS FOR WALLS AND FOUNDATIONS EQUAL IN SIZE, NUMBER AND SPACING TO HORIZONTAL REINFORCING U.N.O.
11. REINFORCEMENT SPLICES, SHALL BE 48 BAR DIA. (24" MIN.), UNLESS NOTED OTHERWISE.
12. UNLESS OTHERWISE NOTED, DOWEL CONCRETE WALLS TO FOOTING WITH BARS OF SAME SIZE & SPACING AS WALL REINFORCEMENT.
13. UNLESS OTHERWISE NOTED, PLACE 2-#6 OVER, 2-#6 UNDER AND 2-#6 EACH SIDE OF ALL WALL OPENINGS, VERTICAL BARS STORY HEIGHT + 2'-6" HORIZONTAL BARS OPENING WIDTH + 4'-0" EACH END, PLACE 2-#6 x 4'-0" DIAGONAL BARS AT EACH CORNER OF ALL OPENINGS.
14. BEAM, JOIST OR SLAB TOP REINFORCING BARS THAT TERMINATE IN A WALL OR COLUMN SHALL HAVE A STANDARD 90 DEGREE HOOK, UNLESS OTHERWISE DETAILED. BEAM, JOIST OR SLAB BOTTOM BARS THAT TERMINATE IN A COLUMN OR WALL SHALL EXTEND TO WITHIN 2" OF OPPOSITE FACE OF COLUMN OR WALL, UNLESS DETAILED OTHERWISE.
15. PLACE 2-#6 x OPENING DIMENSION PLUS 4'-0" EACH SIDE OF ALL OPENINGS AND 2-#6 x 4'-0" DIAGONAL BARS AT EACH CORNER OF ALL SLAB OPENINGS GREATER THAN 1'-6" IN DIMENSION.
16. PROVIDE CARRIER BAR #6 @ 3'-0" O/C MAX. SPACING FOR ALL SLAB, JOIST AND WALL REINFORCING NOT SUPPORTED BY OTHER TRANSVERSE REINFORCING.
17. IN ALL LOCATIONS WHERE CONSTRUCTION REQUIRES THE CUTTING OF EXISTING CONCRETE & EXPOSING THE EXISTING REINFORCING BARS AND THE NEW CONSTRUCTION DOES NOT CONTINUE THE REINFORCING, THE FOLLOWING BAR PROTECTION SHALL BE ACCOMPLISHED TO PROTECT THE EXISTING REBAR CUT ENDS FROM CORROSION OR OTHER DAMAGE. REMOVE THE EXISTING REBAR TO A DEPTH OF 2-INCHES BELOW THE CUT SURFACE FACE OF CONCRETE. REMOVE THE CONCRETE BY DRILLING OR OTHER APPROVED METHODS. THE HOLE SHALL BE CLEANED AND EVACUATED OF ALL METAL DUST, DAMAGED CONCRETE OR OTHER FOREIGN MATERIALS TO INSURE ADEQUATE BOND. THE PREPARED HOLE SHALL BE FILLED WITH DRY PACK AS DESCRIBED IN THE BUREAU OF RECLAMATION "GUIDE TO CONCRETE REPAIR" CHAPTER IV, SECTION 28, PAGES 48 TO 50.

G. PRE-ENGINEERED METAL BUILDING:

NOT USED

H. COMPACTION:

1. OVER EXCAVATION BELOW THAT SHOWN ON THE PLANS SHALL BE FILLED WITH NON-STRUCTURAL CONCRETE.
2. ALL EARTH EMBANKMENTS w/CONCRETE CORE WALLS ARE TO BE FOUNDED ON EXISTING BEDROCK.
3. TESTING TO BE COMPLETED UNDER THE DIRECTION OF THE ENGINEER AS OUTLINED IN THE QCIP.
4. SEE SHEET GA-3 FOR ADDITIONAL COMPACTION REQUIREMENTS.

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MC-6 HYDROELECTRIC PROJECT
MC-6 HYDRO, LLC
HYDROELECTRIC FACILITIES
STRUCTURAL NOTES
& SPECIFICATIONS

STRUCTURAL NOTES & SPECIFICATIONS

S-1

A-16

I. RIPRAPPING:

RIPRAP, WHERE CALLED FOR ON THE PLANS, FOR EROSIONS SHALL BE RANDOM RIPRAP CONSISTING OF HARD, DURABLE ROCK PLACED TO A THICKNESS OF APPROXIMATELY 12 INCHES, UNLESS OTHERWISE STATED, AT LOCATIONS DESIGNATED ON THE PLANS. SIZE OF ROCK MAY BE FROM TWO (2) INCHES MINIMUM TO EIGHT (8) INCHES MAXIMUM. ROCK SHALL BE ANGULAR QUARRIED ROCK OR ANGULAR BOULDERS WITH INDIVIDUAL STONES THAT ARE APPROXIMATELY RECTANGULAR IN CROSS SECTION. THE ROCK SHALL BE REASONABLY WELL GRADED FROM THE MAXIMUM SIZE DOWN TO THE MINIMUM SIZE AND SHALL CONTAIN LESS THAN FIVE (5) PERCENT BY WEIGHT, STONES THAT HAVE A LENGTH TO THICKNESS OR WIDTH RATIO GREATER THAN 3. THE ROCK SHALL HAVE A SPECIFIC GRAVITY GREATER THAN 2.5, A SOUNDNESS (SODIUM-SULFATE METHOD) TEST RESULT OF LESS THAN 15 PERCENT LOSS OF WEIGHT AFTER 5 CYCLES, AND AN ABRASION (USING LOS ANGELES MACHINE) GRADING RESULT OF LESS THAN 40 PERCENT LOSS OF WEIGHT AFTER 550 REVOLUTIONS. ROCK NEED NOT BE HAND-PLACED, BUT SHALL BE GENTLY SET AS TO NOT DAMAGE THE LINER. CONTRACTOR SHALL ASSURE THE COMPLETED WORK IS STABLE WITHOUT TENDENCY TO SLIDE.

J. STRUCTURAL STEEL:

1. STRUCTURAL STEEL SHALL CONFORM TO THE FOLLOWING MINIMUM ASTM SPECIFICATIONS AND GRADES:

WIDE FLANGE SECTIONS	ASTM A-992, GRADE 50 (Fy=50 KSI)
CHANNELS, ANGLES, PLATES	ASTM A-36 (Fy=36 KSI)
HOLLOW STRUCTURAL SECTIONS	A-500, GRADE B (Fy=46 KSI)
PIPE	ASTM A53, TYPE E OR S (Fy=35 KSI)

2. ALL FABRICATION, ERECTION AND IDENTIFICATION OF STRUCTURAL STEEL SHALL CONFORM TO AISC-LRFD, AISC 335, OR AISC-HSS.
3. ALL WELDING SHALL CONFORM TO AWS SPECIFICATIONS. ALL WELDING SHALL BE DONE BY WELDERS QUALIFIED UNDER AWS SPECIFICATIONS, USING E70XX, LOW HYDROGEN, ELECTRODES.
4. ALL SHOP WELDING SHALL BE PERFORMED IN AN AWS APPROVED SHOP.
5. WELD TESTING AND INSPECTION SHALL CONFORM TO THE MINIMUM REQUIREMENTS OF AWS D1.1 AND AISC.
6. THE STEEL FABRICATOR AND ERECTOR SHALL DEVELOP A WELDING PROCEDURE SPECIFICATION (WPS) PER AWS D1.1 FOR ALL WELDS. SUBMIT WRITTEN COPIES TO THE INSPECTOR FOR APPROVAL.
7. ALL BOLTED CONNECTIONS SHALL BE MADE WITH MACHINE BOLTS (M.B.) CONFORMING TO ASTM A307. INSTALL STAINLESS STEEL ANCHORS WHERE CONNECTIONS WILL BE EXPOSED TO MOISTURE.
8. HIGH STRENGTH (H.S.) BOLTS SHALL CONFORM TO ASTM A325-SC WHERE NOTED.
9. SUBMIT ALL PRE QUALIFIED JOINT WELDING PROCEDURES FOR REVIEW.
10. ALL FULL PENETRATION WELDS SHALL BE INSPECTED BY ULTRASONIC OR OTHER APPROVED NON-DESTRUCTIVE TESTING PROCEDURES. RESULTS OF TESTS SHALL BE SUBMITTED IN WRITING TO THE ENGINEER OF RECORD.
11. ALL STEEL EXPOSED TO WEATHER, MOISTURE, SOIL, OR AS NOTED SHALL BE HOT DIP GALVANIZED PER ASTM A-123, OR HAVE AN APPROVED PROTECTIVE COATING.
12. THE DRAWINGS ARE DIMENSIONED FOR GENERAL LAYOUT AND NOT NECESSARILY DIMENSIONED PER AISC STANDARDS. IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO PROVIDE SHOP DRAWINGS WITH DETAIL DIMENSIONS PER AISC CODE OF STANDARD PRACTICE.

K. STEEL/CONCRETE ACCESORIES:

1. HEADED STUDS SHALL BE NELSON HEADED ANCHORS WITH FLUXED ENDS OR APPROVED EQUAL.
2. DEFORMED BARS ANCHORS (DBA) SHALL BE NELSON TYPE D2L OR APPROVED EQUAL.
3. HEADED STUDS AND DBA SHALL BE AUTOMATICALLY END WELDED WITH MANUFACTURER'S STANDARD EQUIPMENT, PER MANUFACTURER'S PRODUCT SPECIFICATIONS.

L. METAL DECKING:

1. ALL METAL DECKING SHALL CONFORM TO THE SPECIFICATIONS OF METAL STEEL DECK INSTITUTE.
2. METAL DECKING SHALL BE UNSHORED VERCO FORMLOCK W3 x 18 GAGE, GALVANIZED 36" WIDE DECKING OF TYPES INDICATED IN THE DRAWINGS.
3. DECKING SHALL BE CONTINUOUS ON 3 OR MORE SUPPORTS.
4. DECK SIDE LAPS TO BE CONNECTED BY (1) OF THE FOLLOWING METHODS:
   A) PUNCHLOK TOOL @ 36" O.C. MAX.
   B) 1-1\2" TOP SEAM WLD @ 36" O.C. MAX
   C) BUTTON PUNCH @ 36" O.C. MAX
5. CONNECT DECKING TO SUPPORTING MEMBERS WITH 1/2" DIA. PUDDLE WELDS, 4 WELDS PER SHEET.
6. DECKING LAID PARALLEL TO SUPPORTING WALLS OR FRAMES SHALL BE CONNECTED WITH 1/2" DIA. PUDDLE WELDS AT 12" O.C.
7. ALL WELDING SHALL BE DONE BY WELDERS QUALIFIED UNDER AWS SPECIFICATIONS USING E60XX, ELECTRODES.
8. WELDERS SHALL BE AWS QUALIFIED FOR LIGHT GAGE METAL WELDING.

M. DEFERRED SUBMITTALS:

A) PURSUANT TO THE IBC, SUBMITTAL DOCUMENTS FOR DEFERRED ITEMS SHALL BE PROVIDED TO THE ENGINEER AND/OR THE STRUCTURAL ENGINEER OF RECORD FOR REVIEW.

ITEM	STRUCTURAL ENGINEER OF RECORD
1. STRUCTURAL STEEL SHOP DRAWINGS	X
2. GROUT/CONCRETE MIX DESIGN	X
3. REINF. STEEL SHOP DRAWINGS	X
4. WELDING PROCED. SPECS (AWS D1.1)	X

N. SPECIAL INSPECTIONS:

A) CONCRETE (SECTION 1704.4, TABLE 1704.4)
   1. INSPECTION OF REINFORCING STEEL, INCLUDING PLACEMENT (PERIODIC)
   2. TAKING OF TEST SPECIMENS (CONTINUOUS)
   3. BOLTS CAST IN CONCRETE (CONTINUOUS)

B) STEEL (SECTION 1704.3, TABLE 1704.3)
   1. FABRICATOR/ERECTOR SHALL SUBMIT WPS TO INSPECTOR, WITH THE EXCEPTION OF SHOP WELDING PERFORMED BY AN APPROVED FABRICATION FACILITY IN ACCORDANCE WITH THE IBC.
   2. HIGH-STRENGTH BOLTING , BEARING TYPE (PERIODIC)
   3. COMPLETE AND PARTIAL PENETRATION GROOVE WELDS (CONTINUOUS)
   4. MULTI-PASS FILET WELDS (CONTINUOUS)
   5. SINGLE PASS FILLET WELDS NOT EXCEEDING 5/16" (PERIODIC)

C) EPOXY ANCHORS (CONTINUOUS)
   1. DURING THE PREPARATION FOR EPOXY ANCHOR INSTALLATION
   2. INSTALLATION OF EPOXY ANCHORS

M. CONCRETE MIX DESIGN:

1. THE CONCRETE MIX DESIGN SHALL BE A MIN 4,000 PSI MIX. MIX DESIGN MUST BE APPROVED BY THE ENGINEER PRIOR TO USE.

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MC-6 HYDRO, LLC
HYDROELECTRIC FACILITIES
STRUCTURAL NOTES & SPECIFICATIONS

STRUCTURAL NOTES & SPECIFICATIONS

S-2

CONCRETE (UNLESS OTHERWISE SPECIFIED)

C1 APPLICABLE CODES

CONCRETE CONSTRUCTION SHALL CONFORM TO THE LATEST EDITION OF THE AMERICAN CONCRETE INSTITUTE BUILDING CODE REQUIREMENTS FOR REINFORCED CONCRETE (ACI 318).

C2 REINFORCING STEEL DETAILS

ALL DETAILING, FABRICATION, AND ERECTION OF REINFORCING BARS SHALL BE IN ACCORDANCE WITH THE MANUAL OF STANDARD PRACTICE FOR DETAILING REINFORCED CONCRETE STRUCTURES (ACI 315), LATEST EDITION.

C3 DESIGN STRESSES

A. CLASS 4000 CONCRETE:
f'c=4,000 PSI ULTIMATE COMPRESSIVE STRESS AT 28 DAYS.
ALL STRUCTURAL CONCRETE AND INFILL CONCRETE SHALL BE CLASS 4000 CONCRETE

B. REINFORCING STEEL
THE REINFORCING STEEL REQUIRED FOR THIS PROJECT SHALL BE AS NOTED IN THE PROJECT SPECIFICATIONS.
REBAR FOR CONCRETE REINFORCING SHALL BE GRADE 60 IN ACCORDANCE WITH ASTM A615. IN LOCATIONS WHERE THE CONTRACTOR CHOOSES TO UTILIZE WELDABLE REBAR FOR SPLICING IN PLACE OF LAP SPLICING, THE REBAR SHALL BE GRADE 60 WELDABLE REBAR IN ACCORDANCE WITH ASTM A706.

C4 CONCRETE COVER

CONCRETE COVER FOR REINFORCING BARS SHALL BE AS FOLLOWS WITH MINIMUM COVER OF ONE BAR DIAMETER:
A. CONCRETE CAST AGAINST EARTH – 3"
B. CONCRETE TO BE IN CONTACT WITH LIQUID – 2"
C. CONCRETE TO BE IN CONTACT WITH EARTH OR WEATHER:
(1) BARS #5 OR LESS – 1 1/2"
(2) BARS GREATER THAN #5 – 2"
D. CONCRETE NOT EXPOSED TO EARTH, WEATHER OR LIQUID:
(1) SLABS, WALLS AND JOISTS – 3/4"
(2) BEAMS AND COLUMNS – 1 1/2"

C5 ADDED TOP STEEL IN SLABS

WHERE BEAMS OR WALLS ARE PARALLEL TO MAIN REINFORCING IN SLAB, PROVIDE #4 @ 18" OC IN TOP OF SLAB NORMAL TO THE BEAM OR WALL. EXTEND BARS 2'-0" BEYOND THE FACE OF THE BEAM OR WALL. WHEN THE SLAB IS ON ONE SIDE ONLY, TERMINATE THE BARS WITH A STANDARD HOOK ON THE OTHER SIDE OF THE BEAM OR WALL.

C6 EXTRA ACCESSORY BARS

IN ADDITION TO NORMAL ACESSORIES USED TO HOLD REINFORCING STEEL FIRMLY IN POSITION, EXTRA ACCESSORY BARS SHALL BE USED AS FOLLOWS:
A. IN SLABS, #3 RAISER BARS AT 36" OC MAXIMUM TO SUPPORT THE TOP LAYER OF REINFORCING STEEL.
B. IN WALLS WITH TWO CURTAINS #3 U OR Z SHAPE SPACERS AT 6' OCEW.

C7 BAR LAP SPLICES

DOWELS SHALL BE THE SAME SIZE AND SPACING AS THE BARS WITH WHICH THEY ARE LAPPED. VERTICAL REINFORCING BAR SPLICES IN COLUMNS SHALL BE AS NOTED ON THE DRAWINGS, AND ALL OTHER BAR SPLICES SHALL BE LAPPED AS FOLLOWS UNLESS OTHERWISE NOTED:

BAR SIZE	SPLICE LENGTH
#3	15"
#4	20"
#5	25"
#6	30"
#7	35"
#8	40"
#9	50"

THE LENGTH OF THE LAP SPLICES SHALL BE MADE IN ACCORDANCE WITH THE AMERICAN CONCRETE INSTITUTE BUILDING CODE REQUIREMENTS FOR REINFORCED CONCRETE (ACI 318, LATEST EDITION) IF THE SPLICE LENTH SHOWN ON THE PLAN SHEETS IS DIFFERENT FROM THAT LISTED IN THE ACI 318, THE ACI 318 SHALL GOVERN. LAP SPLICES MAY BE MADE BY WELDING IN ACCORDANCE WITH THE AMERICAN WELD SOCIETY SPECIFICATION AWS D1.4, LATEST EDITION.

C8 RESTRICTIVE BAR ANCHORAGE

IN CASES WHERE REINFORCING BARS CANNOT BE EXTENDED AS FAR AS REQUIRED DUE TO THE LIMITED EXTENT OF THE ADJACENT CONCRETE STRUCTURE, THE BARS SHALL EXTEND AS FAR AS POSSIBLE AND END IN STANDARD HOOKS.

C10 STANDARD HOOKS

BARS ENDING IN RIGHT ANGLE BENDS OR HOOKS SHALL CONFORM TO THE REQUIREMENTS OF SECTION 7 OF THE AMERICAN CONCRETE INSTITUTE BUILDING CODE REQUIREMENTS FOR REINFORCED CONCRETE (ACI 318, LATEST EDITION).

C11 SLOPING SLABS

MONOLITHIC SLABS WITH TOPS THAT ARE SLOPED SHALL HAVE BOTTOMS SLOPED THE SAME AMOUNT, MAINTAINING A UNIFORM SLAB THICKNESS, UNLESS OTHERWISE NOTED ON THE PLAN SHEETS.

C12 GROUND SUPPORTED SLABS

CONCRETE SLABS SUPPORTED BY GROUND, UNLESS OTHERWISE NOTED, SHALL BE 4" THICK AND REINFORCED WITH 4 x 4 W2.9 WWF AT MID-DEPTH OF THE SLAB AND DOWELED ALONG THE EDGE OF THE SLAB TO ALL ADJACENT WALLS, COLUMNS AND FOUNDATIONS WITH #4 @ 8" OC THAT LAP 12" WITH THE WWF AND EXTEND INTO THE WALLS, COLUMNS AND FOUNDATIONS AT LEAST 12". IF THE SLAB IS DESIGNATED AS AN ISOLATED SLAB ON THE DRAWINGS, OMIT THE DOWELS AND SUBSTITUTE 1/4" THICK PRE-MOLDED JOINT FILLER TO ISOLATE THE SLAB FROM CONTACT WITH THE STRUCTURE ALONG ITS PERIMETER.

C13 CHAMFERS

EXCEPT AS OTHERWISE NOTED, EXPOSED CONCRETE CORNERS AND EDGES SHALL HAVE 3/4" CHAMFERS. RE-ENTRANT CORNERS (INSIDE) SHALL NOT HAVE FILLETS.

C14 ANCHOR BOLTS

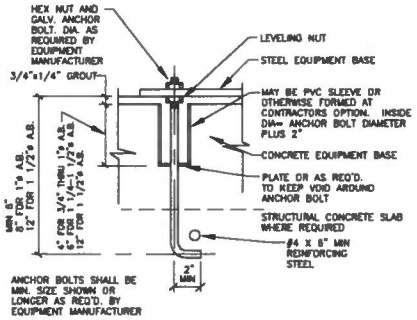
THE USE OF ANCHOR BOLTS SHALL BE GOVERNED BY THE FOLLOWING TABLE UNLESS OTHERWISE SPECIFIED ON THE DRAWING SHEETS:

BOLT DIA	1/2"	5/8"	3/4"	7/8"	1"	1 1/8"	1 1/4"
MIN EMBED.	8"	8"	8"	8"	10"	12"	12"
ALLOWABLE SHEAR	1000#	1500#	1780#	2075#	2175#	2250#	2650#

ALL BOLTS SHALL BE HOT DIPPED GALVANIZED UNLESS OTHERWISE NOTED. EMBEDMENT LENGTH FOR BOLTS SHALL BE AS SHOWN ON THE PLAN SHEET OR AS DETERMINED BY THE ENGINEER.

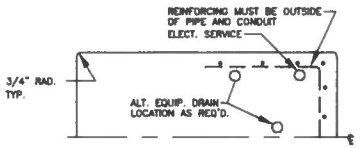
C15 DOWELS IN WALL

DOWELS FROM FOOTING OR SLAB SHALL LAP WITH THE WALL OR COLUMN REINFORCEMENT BY THE FOLLOWING LENGTHS:
#5 AND SMALLER – 2'-0"
#6 AND #7 – 2'-6"
#8 AND LARGER – 4'-0"

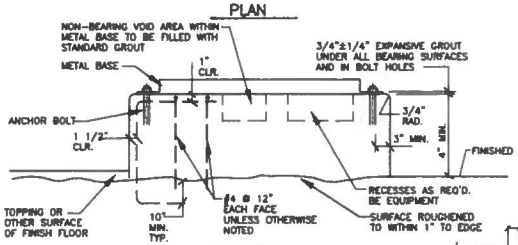


ANCHOR BOLTS SHALL BE MIN. SIZE SHOWN OR LONGER AS REQ'D. BY EQUIPMENT MANUFACTURER

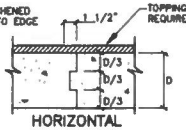
ANCHOR BOLT FOR EQUIPMENT



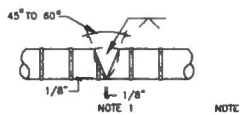
PLAN



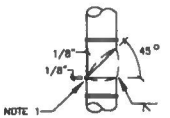
SECTION
EQUIPMENT BASE



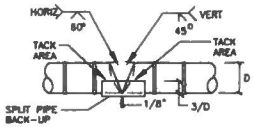
HORIZONTAL JOINT IN SLAB
(UNLESS OTHERWISE NOTED ON PLAN SHEETS)



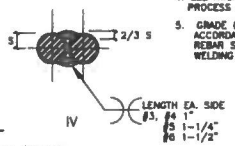
I – HORIZONTAL



III – VERTICAL



II – HORIZONTAL AND VERTICAL

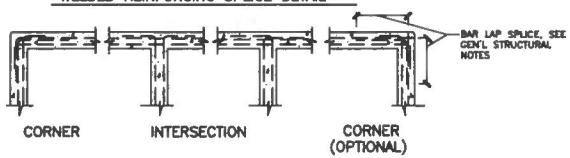


IV

REINFORCING WELDING NOTES:

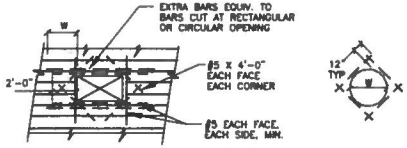
1. CHIP, GRIND OR GOUGE TO SOUND METAL BEFORE WELDING OTHER SIDE.
2. DETAIL I AND III FOR NO. 9 AND LARGER. DETAIL II FOR NO. 8 AND SMALLER. DETAIL IV FOR NO. 6 AND SMALLER.
3. E70 ELECTRODE FOR GR40 E90 ELECTRODE FOR GR60.
4. SEE AWS D12-1 FOR WELDING PROCESS AND OTHER DETAILS.
5. GRADE 60 WELDABLE REBAR IN ACCORDANCE WITH ASTM A706 REBAR SHALL BE USED WHEN WELDING OF REBAR IS REQUIRED.

WELDED REINFORCING SPLICE DETAIL



DETAIL
NTS

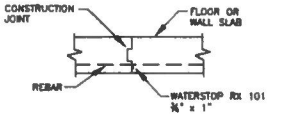
NOTE:
ALL 90° BENDS SHALL BE STANDARD HOOKS PER ACI 315 UNLESS OTHERWISE SPECIFIED.



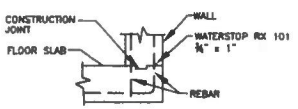
REINFORCEMENT AT SLAB AND WALL OPENINGS

NOTES:

1. TRANSVERSE REINFORCEMENT NOT SPECIFIED, BUT SHALL BE TREATED IN SAME MANNER AS BARS SHOWN.
2. W= DIMENSION OF OPENING PERPENDICULAR TO BARS CUT. FOR CIRCULAR OPENINGS W= DIAMETER.
3. SEE MECH AND SRCH DRAWINGS FOR SLAB AND WALL OPENINGS NOT SPECIFIED ON STUCTURAL DRAWINGS.
4. SUPPLEMENTARY REINF. MAY BE OMITTED ONLY WHERE OPENING IS FRAMED BY BEAMS OR WALLS.



FLOOR OR WALL JOINT



FLOOR SLAB TO WALL

NOTE: PLACE WATER STOPS WHERE SHOWN ON THE PLANS AND AS REQUIRED BY THE SPECIFICATIONS. INSTALLATION SHALL BE PER THE SUPPLIER INSTRUCTIONS.

COLD JOINT WATER STOP DETAIL

NOTE:
WATER STOP SHALL BE A PVC MATERIAL, 6" WIDE & AND RATED FOR 25 FT OF HEAD PRESSURE AS MANUFACTURED BY THE GREENSTREAK GROUP, INC. 1-800-325-9504 OR 1" x 3/8" VOLCLAY RX-101 WATERSTOPS AS CALLED OUT ON THE DRAWINGS AND NOTED IN THE PROJECT SPECIFICATIONS. USE A MIN. OF 3" COVER REQUIREMENT FOR ALL VOLCLAY RX-101 AS RECOMMENDED BY THE MANUFACTURER.

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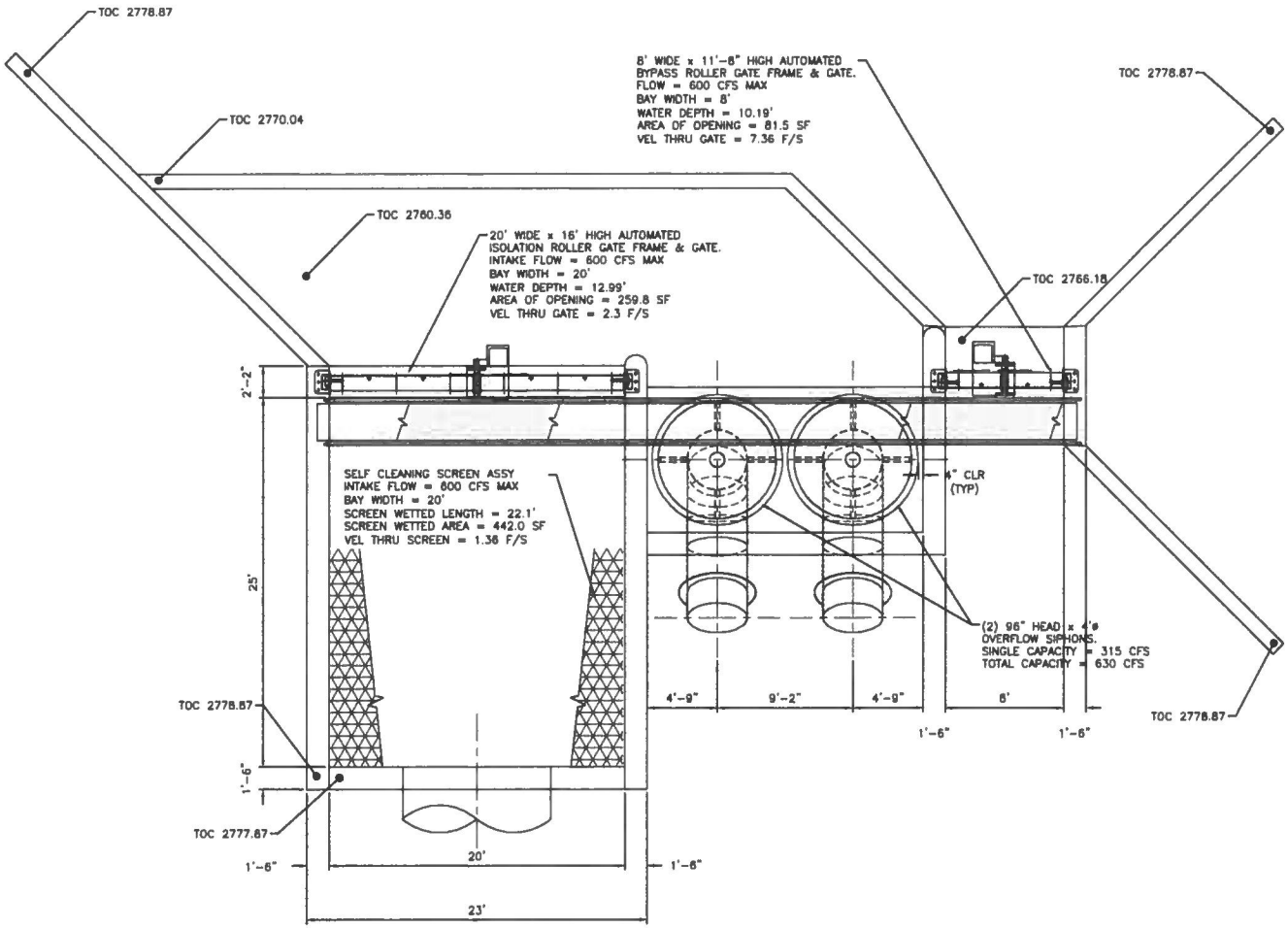
MC-6 HYDRO, LLC
HYDROELECTRIC FACILITIES
STRUCTURAL NOTES & SPECIFICATIONS

STRUCTURAL NOTES & SPECIFICATIONS

S-3

A-18



INTAKE STRUCTURAL
OVERALL PLAN VIEW (1 / S-4)
SCALE: 1/8" = 1'-0"

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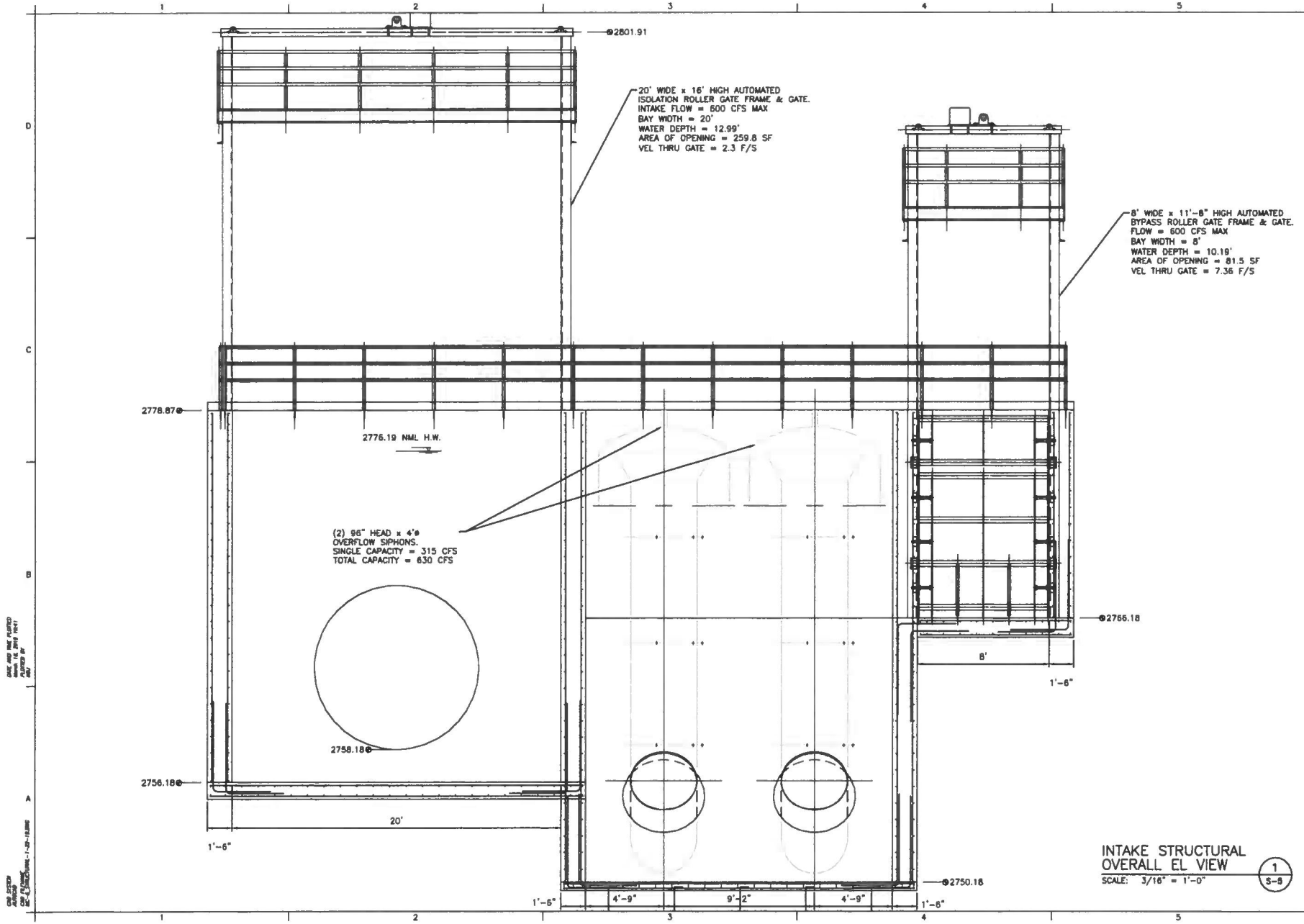
INTAKE/BYPASS STRUCTURAL
OVERALL PLAN VIEW

DEVELOPMENT DRAWINGS
NOT FOR CONSTRUCTION
DATE AND TIME PLOTTED
March 18, 2019 10:41

INTAKE/BYPASS STRUCTURAL
OVERALL PLAN VIEW

S-4



INTAKE STRUCTURAL
OVERALL EL VIEW

SCALE: 3/16" = 1'-0"

1
S-5

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INTAKE/BYPASS STRUCTURAL
OVERALL EL VIEW

DEVELOPMENT DRAWINGS
NOT FOR CONSTRUCTION
DATE AND TIME PLOTTED
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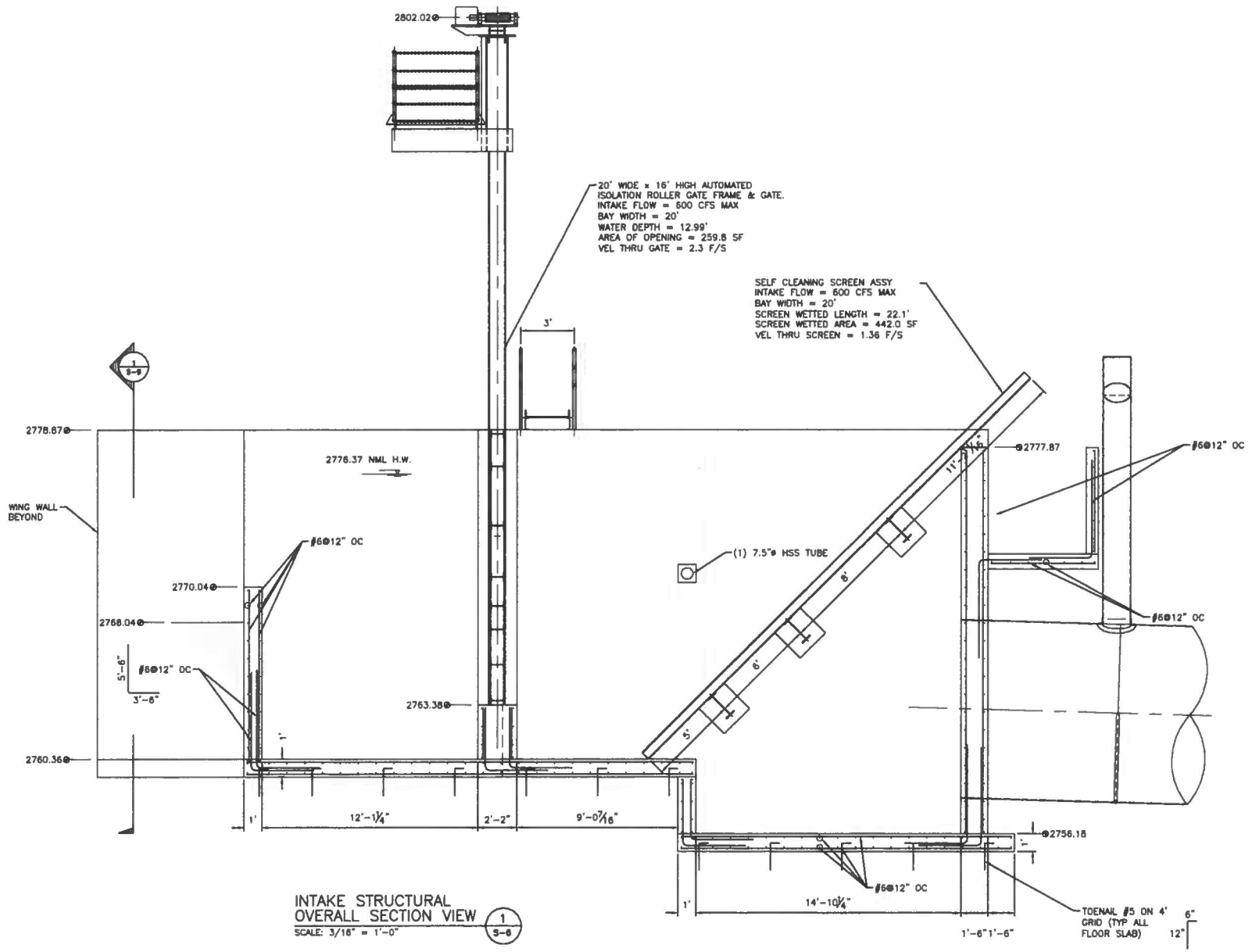
INTAKE/BYPASS STRUCTURAL
OVERALL EL VIEW

S-5



INTAKE STRUCTURAL OVERALL SECTION VIEW (1 / S-6)

SCALE: 3/16" = 1'-0"

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INTAKE/BYPASS STRUCTURAL
SECTION VIEW

DEVELOPMENT DRAWINGS
NOT FOR CONSTRUCTION
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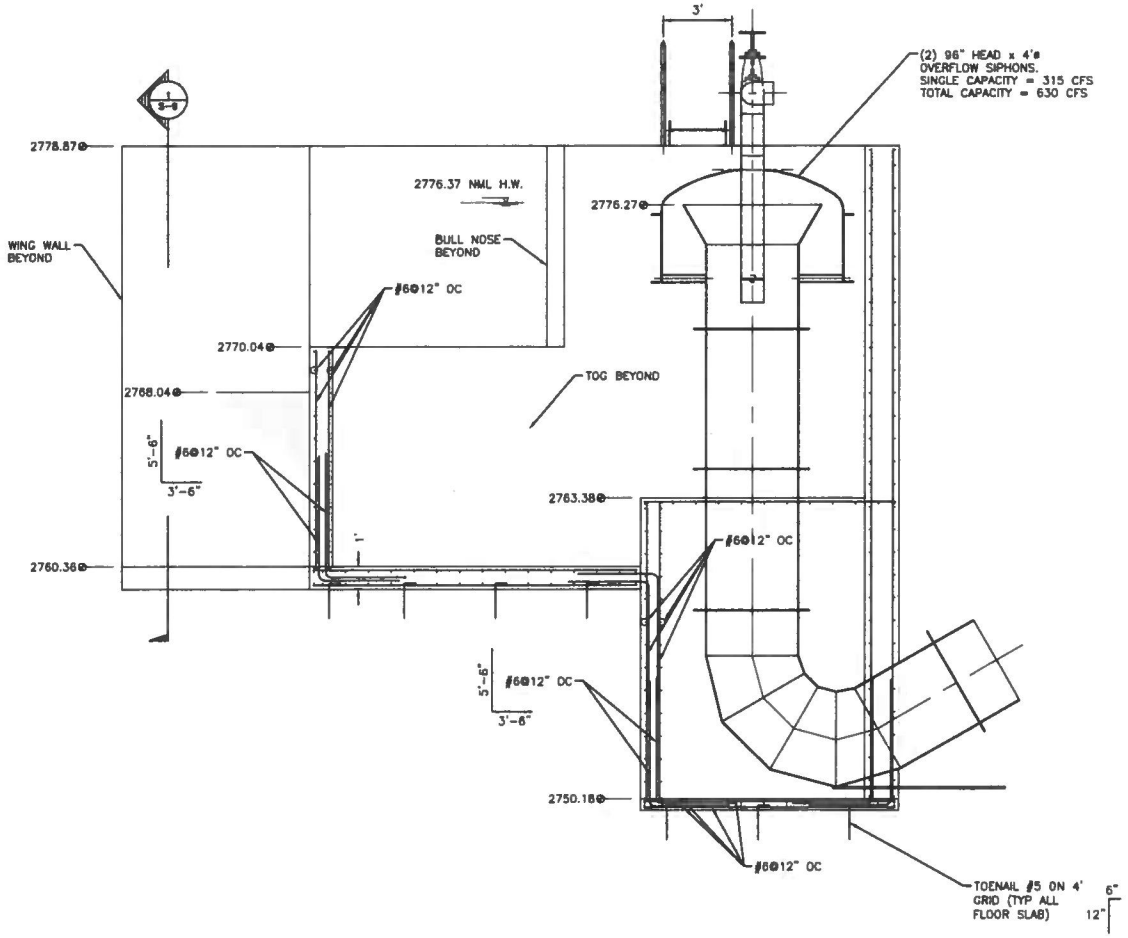
INTAKE/BYPASS STRUCTURAL SECTION VIEW

S-6



INTAKE STRUCTURAL SIPHON SECTION (1 / S-7)

SCALE: 3/16" = 1'-0"

SORENSON ENGINEERING

ALWAYS THINK SAFETY

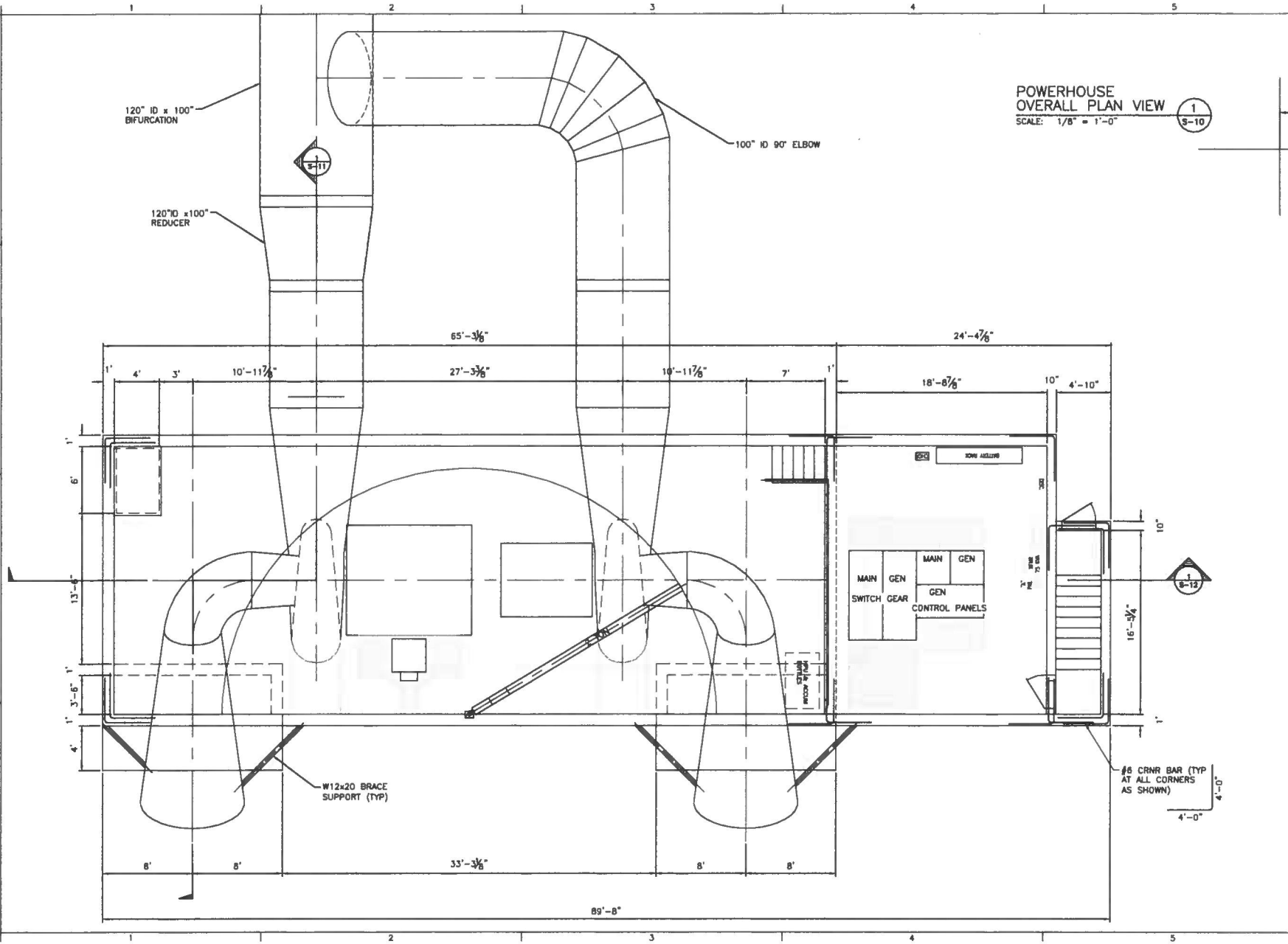
PROJECT

MC-6 HYDROELECTRIC PROJECT
MC-6 HYDRO, LLC
HYDROELECTRIC FACILITIES
INTAKE/BYPASS STRUCTURAL SECTION VIEW

DEVELOPMENT DRAWINGS
NOT FOR CONSTRUCTION
DATE AND TIME PLOTTED
March 18, 2019 10:41

INTAKE/BYPASS STRUCTURAL SECTION VIEW

S-7



POWERHOUSE
OVERALL PLAN VIEW
SCALE: 1/8" = 1'-0"
1 / S-10

SORENSON ENGINEERING

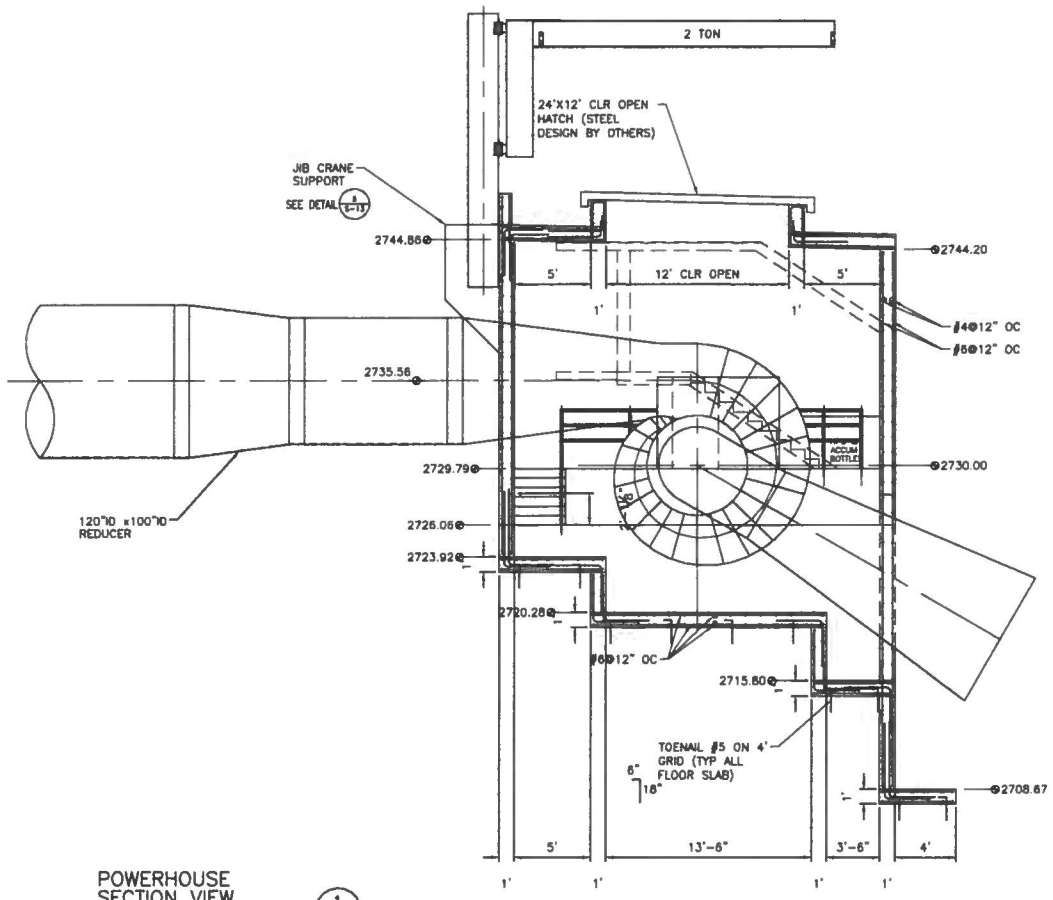
ALWAYS THINK SAFETY

PROJECT
MC-6 HYDROELECTRIC PROJECT
MC-6 HYDRO, LLC
HYDROELECTRIC FACILITIES
POWERHOUSE STRUCTURAL
OVERALL PLAN VIEW

DEVELOPMENT DRAWINGS
NOT FOR CONSTRUCTION
DATE AND TIME PLOTTED
March 18, 2019 10:41

POWERHOUSE STRUCTURAL
OVERALL PLAN VIEW

S-10



POWERHOUSE SECTION VIEW

SCALE: 1/8" = 1'-0"

1 / S-11

SORENSON ENGINEERING

ALWAYS THINK SAFETY

PROJECT

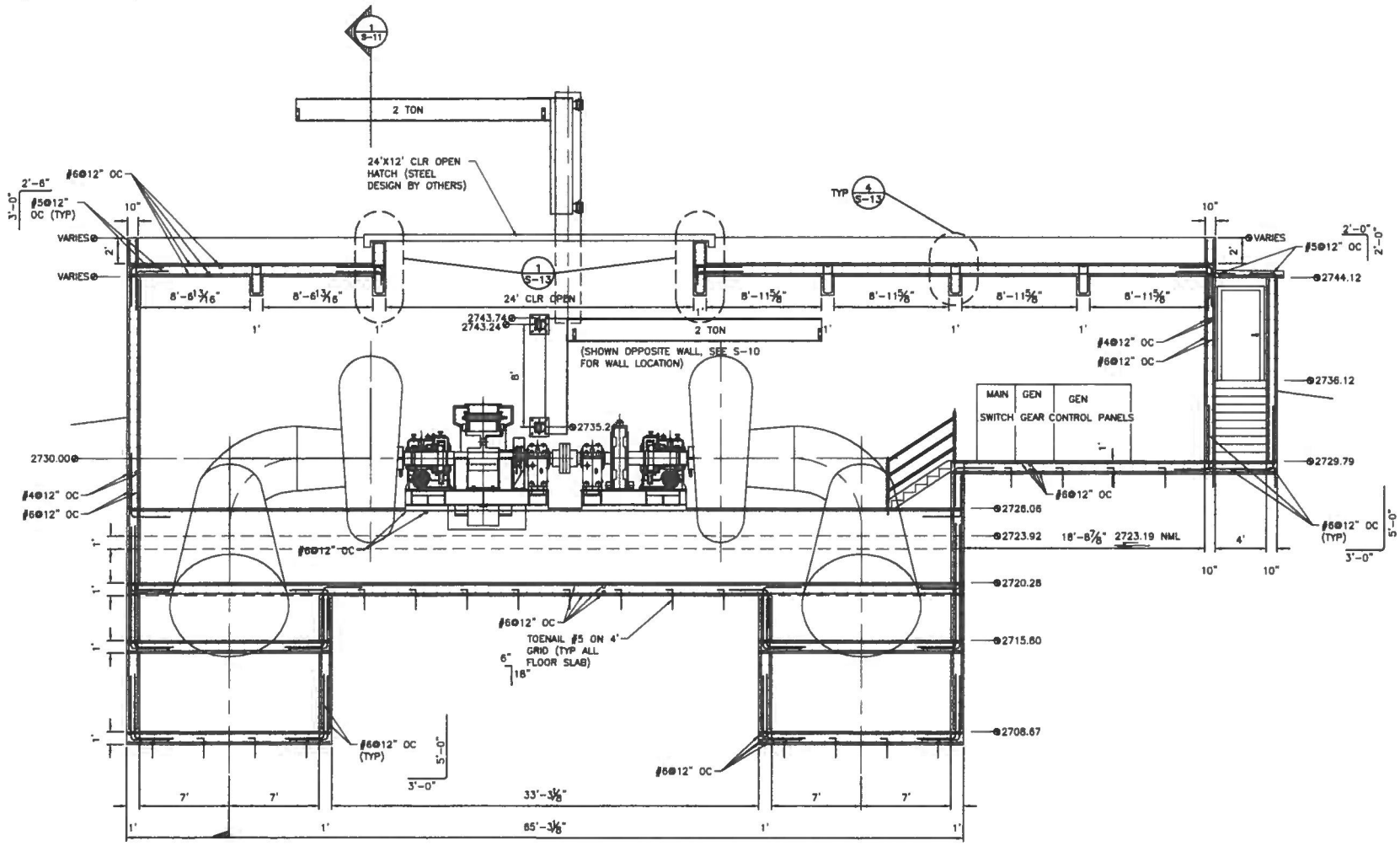
MC-6 HYDROELECTRIC PROJECT
MC-6 HYDRO, LLC
HYDROELECTRIC FACILITIES
POWERHOUSE STRUCTURAL SECTION VIEW

DEVELOPMENT DRAWINGS
NOT FOR CONSTRUCTION
DATE AND TIME PLOTTED
March 18, 2019 10:41

POWERHOUSE STRUCTURAL SECTION VIEW

S-11

NOTES:
1. TOENAIL #5 BAR INTO OUTER ROCK WALL ON A 4' GRID BETWEEN 2723.0 AND 2734.0 (EPOXY w/MIN 10" EMBEDMENT)
2. NA



POWERHOUSE SECTION VIEW
SCALE: 1/8" = 1'-0"
1/S-12

SORENSON ENGINEERING

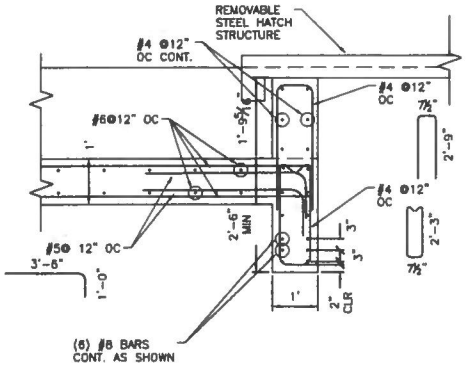
ALWAYS THINK SAFETY

PROJECT
MC-6 HYDROELECTRIC PROJECT
MC-6 HYDRO, LLC
HYDROELECTRIC FACILITIES
POWERHOUSE STRUCTURAL SECTION VIEW

DEVELOPMENT DRAWINGS
NOT FOR CONSTRUCTION
DATE AND TIME PLOTTED
March 18, 2019 10:41

POWERHOUSE STRUCTURAL SECTION VIEW

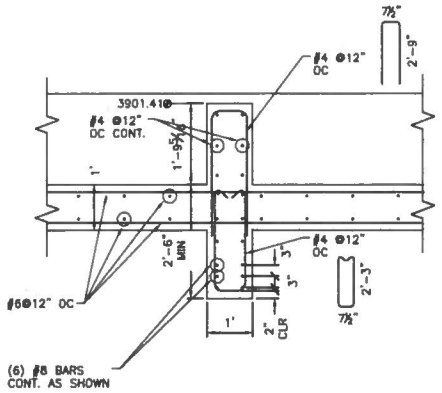
S-12



CONCRETE BEAM AT ROOF HATCH

SCALE: 3/8" = 1'-0"

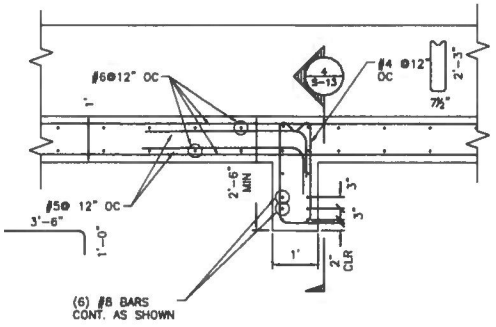
1 S-13



CONCRETE BEAM AT ROOF HATCH

SCALE: 3/8" = 1'-0"

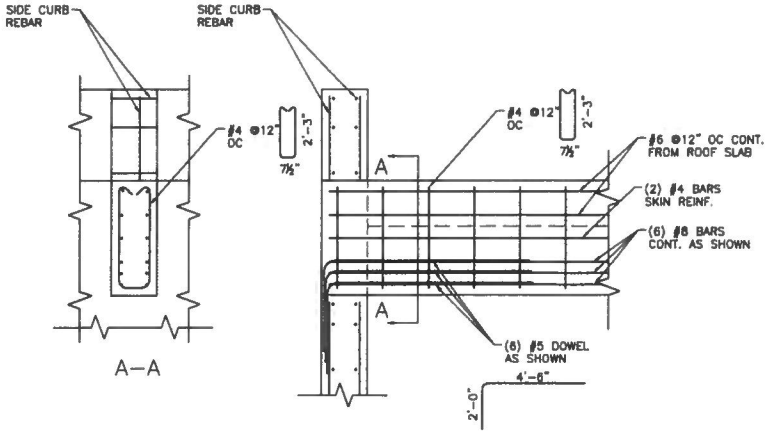
2 S-13



CONCRETE BEAM AT SIDE WALL

SCALE: 3/8" = 1'-0"

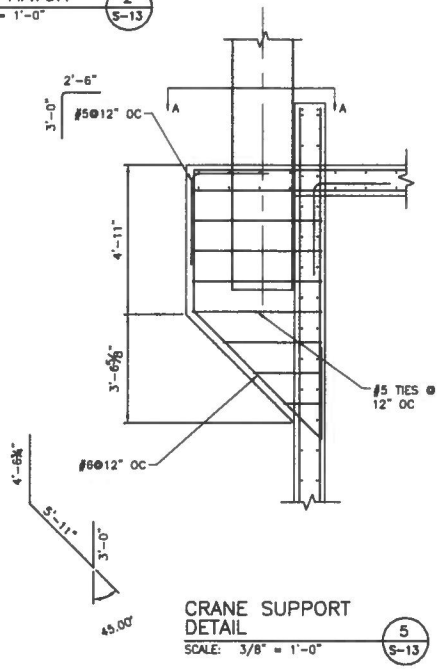
3 S-13



CONCRETE BEAM AT SIDE WALL

SCALE: 3/8" = 1'-0"

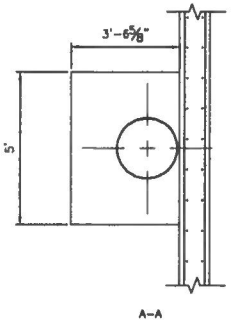
4 S-13



CRANE SUPPORT DETAIL

SCALE: 3/8" = 1'-0"

5 S-13



SORENSON ENGINEERING

ALWAYS THINK SAFETY

PROJECT

MC-6 HYDROELECTRIC PROJECT
MC-6 HYDRO, LLC
HYDROELECTRIC FACILITIES
POWERHOUSE STRUCTURAL
MISC. DETAILS

DEVELOPMENT DRAWINGS
NOT FOR CONSTRUCTION
DATE AND TIME PLOTTED
March 18, 2019 10:41

POWERHOUSE STRUCTURAL
MISC. DETAILS

S-13

Attachment B

Turbine and Generator Details

Net Head	48 ft
Maximum Flow	600 cfs
Installed Capacity	2100 kW
1. Hydro Turbine	
Code	HL240C-WJ-122
Type	Horizontal Francis, Double Turbine, Single
Runner Diameter D_1	1220 mm
Runner Blades Number	15
Rated Speed	225 rpm
Runaway Speed	400 rpm
Net Head	48 ft
Maximum Flow	300 cfs
Efficiency at Max. Flow	90.5%
Maximum Output	1100 kW
Cavitation σ_c	0.24
Turbine Setting	Above TWL 2.5 m
2. Generator	
Code	SFW2100-32/3250
Type	Horizontal, Synchronous
Rated Capacity	2333 kVA
Rated Power	2100 kW
Rated Voltage	2400 V
Rated Power Factor	0.9
Rated Current	561.3 A
Rated Frequency	60 Hz
Rated Speed	225 rpm
Rated Efficiency	94.0%
Runaway Speed	400 rpm
Insulation Class	Class F
Exciting System	Static

Expected Turbine Performance

Net Head (ft)	48	48	48	48	48	48	48	48	48	48
Flow (cfs)	75	100	125	150	175	200	225	250	275	300
Efficiency (%)	50.0	68.0	76.0	80.0	82.5	85.8	91.0	91.60	92.0	90.5
Output (kW)	152	275	385	486	585	695	829	928	1025	1100

Attachment C

"Streamflow Gains and Losses in the Lower Boise River Basin, Idaho, 1996-1997" Excerpt

Streamflow Gains and Losses in the Lower Boise River Basin, Idaho, 1996–97

By Charles Berenbrock

Water-Resources Investigations Report 99–4105

In cooperation with the
Idaho Department of Water Resources

Boise, Idaho
1999

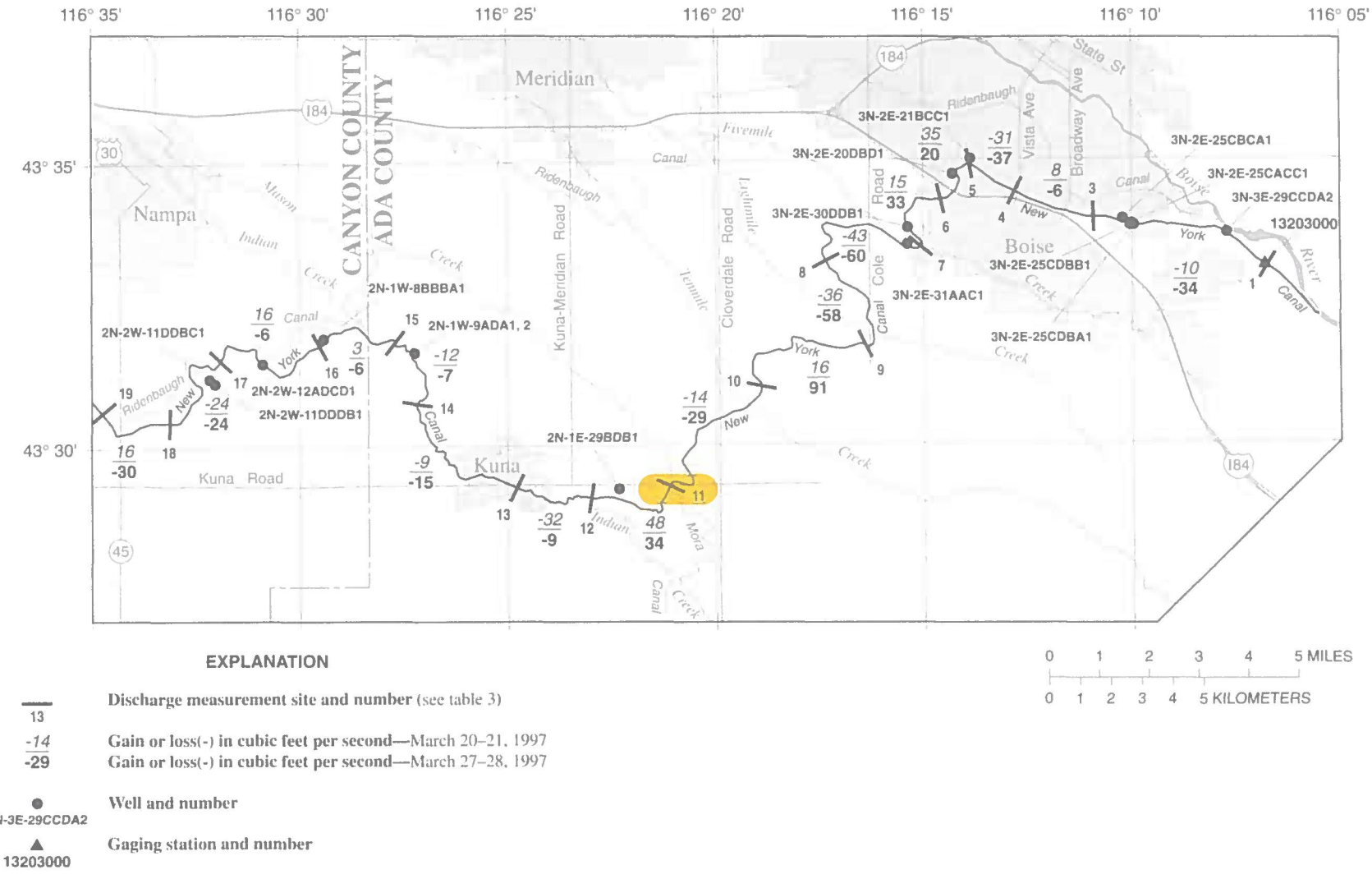


Figure 9. Location of measurement sites and gains and losses(-) along the New York Canal in the lower Boise River Basin, Idaho, March 1997.

Table 3. Flow gains and losses (-) along the New York Canal in the lower Boise River Basin, Idaho, March 1997

[Site locations shown in figure 9; No., number; mi, miles; ft³/s, cubic feet per second, ft³/s/mi, cubic feet per second per mile]

Site No.	Distance from Lake Lowell (mi)	Bridge site name	County	Latitude	Longitude	Measurement date	Discharge (ft³/s)	Measured gain or loss (-) along subreaches (ft³/s)	(ft³/s/mi)	Measurement date	Discharge (ft³/s)	Measured gain or loss (-) along subreaches (ft³/s)	(ft³/s/mi)
1	39.5	13203000 New York Canal downstream from Diversion Dam . near Boise	Ada	43°33'08"	116°06'44"	20	439			27	862		
3	35.7	Gekeler Road	Ada	43°34'01"	116°10'55"	20	429	-10	-2.6	27	828	-34	-8.9
4	34.0	Vista Avenue	Ada	43°34'27"	116°12'48"	20	437	8	4.8	27	822	-6	-3.6
5	32.9	Roosevelt Street	Ada	43°34'58"	116°13'58"	20	406	-31	-26.5	27	785	-37	-31.6
6	31.8	Orchard Street	Ada	43°34'21"	116°14'35"	21	441	35	31.8	28	805	20	18.2
7	30.1	Gowen Road	Ada	43°33'29"	116°15'03"	21	456	15	9.1	28	838	33	19.9
8	27.0	Desert Street	Ada	43°33'15"	116°17'20"	21	413	-43	-13.7	28	778	-60	-19.2
9	24.6	Cole Road	Ada	43°31'47"	116°16'25"	21	377	-36	-15.5	28	720	-58	-24.9
10	21.4	Hubbard Road	Ada	43°31'03"	116°18'55"	21	393	16	4.9	28	811	91	27.8
11	17.9	Kuna Road	Ada	43°29'18"	116°21'08"	20	379	-14	-4.1	28	782	-29	-8.4
12	15.8	Strobel Road	Ada	43°29'05"	116°23'00"	20	427	48	22.8	28	816	34	16.1
13	14.0	Swan Falls Road	Ada	43°29'15"	116°24'47"	20	395	-32	-17.6	28	807	-9	-5.0
14	10.7	Black Cat Road	Ada	43°30'46"	116°27'11"	20	386	-9	-2.7	28	792	-15	-4.5
15	8.8	Ridgewood Road	Ada	43°31'51"	116°27'42"	21	374	-12	-6.5	28	785	-7	-3.8
16	6.9	Robinson Road	Ada	43°31'48"	116°29'32"	21	377	3	1.5	28	779	-6	-3.1
17	4.0	South Side Boulevard	Canyon	43°31'32"	116°31'56"	20	393	16	5.6	28	773	-6	-2.1
18	1.6	Power Line Road	Canyon	43°30'28"	116°33'07"	20	369	-24	-10.1	28	749	-24	-10.1
19	0.0	Lake Shore Drive	Canyon	43°30'37"	116°34'45"	20	385	16	9.8	28	719	-30	-18.4
				Total gain or loss (-) =				-54				-143	

Attachment D

Letter of Commitment from MC-6 Hydro LLC

MC-6 HYDRO LLC
CERTIFICATION OF FUNDS

The undersigned hereby certify as follows:

We are the owners of the majority of the units of MC-6 Hydro LLC

We have the following funds in our personal bank accounts which are available to use for our MC-6 projects:

Bank of Idaho Checking # 1	$41,305
Bank of Idaho Checking # 2	$130,405
Bank of Idaho Savings	$203,972
Chase Bank Checking	$9,183
Chase Bank Savings	$457,400
First Interstate Checking	$45,603
First Interstate Savings	$498,345
Wells Fargo Checking	$10,331
Wells Fargo Savings	$54,324
Total	$1,450,868

Dated: 3/18/2019

Ted S. Sorenson

Gayle A. Sornson

Subscribed and sworn to before me the undersigned,
a Notary Public in and for the State of Utah.

Miriah Ruth Elliott
Notary Public
State of Utah
My Commission Expires Feb. 10, 2020
#687453

Miriah ~~Elloitt~~ Elliott
Notary Public in and for the State of Utah
Residing at: Ivins, UT 84738
My Commission Expires: 2/10/20

BANK of IDAHO
COMMITTED TO COMMUNITY
Member FDIC LENDER

P.O. Box 1487 • Idaho Falls, ID 83403

ACCOUNT NUMBER

STATEMENT DATE
Feb 22, 2019

0

TED SORENSON
GAYLE A SORENSON
1032 GRANDVIEW DR
IVINS UT 84738

E-Statement

****
Rewards Qualification Summary is displayed towards the bottom of your statement. When monthly qualifications are met, a summary of purchase refunds posted to your account is also displayed.

When monthly cycle qualifications are met, the refund amount will be based on amount of purchases made in current statement cycle. Purchases must contain the word(s) iTunes or Amazon in the description posted on bank statement.

Electronic Funds Disclosure Change in Terms Effective 4/1/2019:

Consumer Debit Card: Point of Sale Transaction may not exceed more than $2,000 per day.

Fee Notices Change in Terms Effective April 1st, 2019

Continuous Overdraft Charge:
When Daily Overdraft balance is $6.00 and greater - $5.00 per business day (Monday - Friday)

Domestic Wire Transfer (outgoing) - $25.00

Deposit Item Return Charge - $7.00

Overdraft Item Fee (per check, in person or electronic items other than ATM/POS): Consumer - $32.00

Overdraft Item Fee (per check, in person, ATM withdrawals or electronic items): Business - $32.00

Return Item Fee (per check or other electronic item) - $32.00
****

U-Earn

01/23/2019	Beginning Balance		34,529.70
	11 Deposits/Other Credits	+	359,567.76
	31 Checks/Other Debits	-	351,975.81
02/22/2019	Ending Balance 31 Days in Statement Period		42,121.65

BANK of IDAHO
COMMITTED TO COMMUNITY
Member FDIC LENDER
P.O. Box 1487 · Idaho Falls, ID 83403

ACCOUNT NUMBER

STATEMENT DATE
Feb 22, 2019

GAYLE A SORENSON
TED SORENSON
1032 GRANDVIEW DR
IVINS UT 84738

0

E-Statement

****
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Deposit Item Return Charge - $7.00

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Overdraft Item Fee (per check, in person, ATM withdrawals or electronic items): Business - $32.00

Return Item Fee (per check or other electronic item) - $32.00
****

U-Earn

01/23/2019	Beginning Balance		316,943.09
	8 Deposits/Other Credits	+	142,912.66
	2 Checks/Other Debits	-	320,000.00
02/22/2019	Ending Balance 31 Days in Statement Period		139,855.75

BANK of IDAHO
COMMITTED TO COMMUNITY
Member FDIC EQUAL HOUSING LENDER
P.O. Box 1487 • Idaho Falls, ID 83403

ACCOUNT NUMBER

STATEMENT DATE
Feb 23, 2019

0

TED SORENSON
GAYLE A SORENSON
1032 GRANDVIEW DR
IVINS UT 84738

E-Statement

****

Regulatory Limitation:

Preauthorized transactions made by check, draft, debit card, telephone transfer (including data transmission), automatic transfer, ACH or similar order payable to third parties are limit to 6 transactions per calendar month or similar period.Transfers and withdrawals made in person, by messenger, by mail or at an ATM are unlimited.

Electronic Funds Disclosure Change in Terms Effective 4/1/2019:

Consumer Debit Card: Point of Sale Transaction may not exceed more than $2,000 per day.

Fee Notices Change in Terms Effective April 1st, 2019

Continuous Overdraft Charge:
When Daily Overdraft balance is $6.00 and greater - $5.00 per business day (Monday - Friday)

Domestic Wire Transfer (outgoing) - $25.00

Deposit Item Return Charge - $7.00

Overdraft Item Fee (per check, in person or electronic items other than ATM/POS): Consumer - $32.00

Overdraft Item Fee (per check, in person, ATM withdrawals or electronic items): Business - $32.00

Return Item Fee (per check or other electronic item) - $32.00

****

U-Save

01/24/2019	Beginning Balance		273,968.88
	3 Deposits/Other Credits	+	60,002.55
	3 Checks/Other Debits	-	130,000.00
02/23/2019	Ending Balance 31 Days in Statement Period		203,971.43

CHASE

JPMorgan Chase Bank, N.A.
P O Box 182051
Columbus, OH 43218-2051

January 26, 2019 through February 26, 2019
Primary Account: [redacted]

CUSTOMER SERVICE INFORMATION

Web site:	**Chase.com**
Service Center:	**1-888-262-4273**
Deaf and Hard of Hearing:	1-800-242-7383
International Calls:	1-713-262-1679

00012612 DRE 702 210 05819 NNNNNNNNNNN 1 000000000 37 0000
GAYLE A SORENSON
OR TED S SORENSON
1032 GRANDVIEW DR
IVINS UT 84738-6465

CONSOLIDATED BALANCE SUMMARY

ASSETS

Checking & Savings	ACCOUNT	BEGINNING BALANCE THIS PERIOD	ENDING BALANCE THIS PERIOD
Chase Sapphire Checking	000000[redacted]	$1,683.65	$9,183.68
Chase Plus Savings	0000[redacted]	457,396.57	457,400.52
Total		**$459,080.22**	**$466,584.20**
TOTAL ASSETS		**$459,080.22**	**$466,584.20**

CHASE SAPPHIRE CHECKING

GAYLE A SORENSON
OR TED S SORENSON

Account Number: 000000[redacted]

CHECKING SUMMARY

	AMOUNT
Beginning Balance	**$1,683.65**
Deposits and Additions	7,500.03
Ending Balance	**$9,183.68**
Annual Percentage Yield Earned This Period	0.01%
Interest Paid This Period	$0.03
Interest Paid Year-to-Date	$0.04

Your account ending in 7600 is linked to this account for overdraft protection.

Interest paid in 2018 for account 000000138702280 was $0.42.

Good News. Your Chase Sapphire Checking Monthly Service Fee was waived because you kept an average daily balance of $75,000 in qualifying linked deposits and investments during the statement period.

First Interstate Bank
PO Box 5010
Great Falls, MT 59403-5010

RETURN SERVICE REQUESTED

GAYLE A SORENSON
TED S SORENSON
1633 LAKE BLAINE RD
KALISPELL MT 59901-7637

Statement Ending 02/26/2019

GAYLE A SORENSON
Account Number: XXXXXXXXXXX8782

Managing Your Accounts

Client Contact Center	855-342-3400
Website	firstinterstate.com

Summary of Accounts

Account Type	Account Number	Ending Balance
00 REGULAR CHECKING	XXXXXXXXXXX8782	$45,603.50
18 INSURED MARKET SAVINGS	XXXXXXXXXXX2479	$498,343.64
Total Current Value		**$543,947.14**

00 REGULAR CHECKING-XXXXXXXXXXXX8782

Account Summary

Date	Description	Amount
01/23/2019	**Beginning Balance**	**$45,603.50**
	0 Credit(s) This Period	$0.00
	0 Debit(s) This Period	$0.00
02/26/2019	**Ending Balance**	**$45,603.50**

Account Activity

Post Date	Description	Debits	Credits	Balance
01/23/2019	**Beginning Balance**			**$45,603.50**
	No activity this statement period			
02/26/2019	**Ending Balance**			**$45,603.50**

Overdraft and Returned Item Fees

	Total for this period	Total year-to-date	Previous year-to-date
Total Overdraft Fees	$0.00	$0.00	$0.00
Total Returned Item Fees	$0.00	$0.00	$0.00

18 INSURED MARKET SAVINGS-XXXXXXXXXXXX2479

Account Summary

Date	Description	Amount
01/23/2019	**Beginning Balance**	**$497,842.39**
	1 Credit(s) This Period	$501.25
	0 Debit(s) This Period	$0.00
02/26/2019	**Ending Balance**	**$498,343.64**

Interest Summary

Description	Amount
Annual Percentage Yield Earned	1.05%
Interest Days	35
Interest Earned	$501.25
Interest Paid This Period	$501.25
Interest Paid Year-to-Date	$839.96
Average Ledger Balance	$497,842.39

Account Activity

Post Date	Description	Debits	Credits	Balance
01/23/2019	**Beginning Balance**			**$497,842.39**
02/26/2019	INTEREST		$501.25	$498,343.64
02/26/2019	**Ending Balance**			**$498,343.64**

WELLS FARGO

Wells Fargo Portfolio Checking

Activity summary

Balance on 2/1	8,872.16
Deposits/Additions	5,385.06
Withdrawals/Subtractions	- 5,031.00
Balance on 2/28	**$9,226.22**

Account number:

GAYLE SORENSON
TED SORENSON

Wells Fargo Bank, N.A. (Member FDIC)

IDAHO account terms and conditions apply

Questions about your account: **1-800-742-4932**

Worksheet to balance your account and General Statement Policies can be found towards the end of this statement.

Overdraft protection

Your account is linked to the following for Overdraft Protection:

■ Savings -

Interest you've earned

Interest paid this statement	$0.36
Interest earned this statement period	$0.36
Average collected balance	$9,317.90
Annual percentage yield earned	0.05%
Interest paid this year	$0.76
Total interest paid in **2018**	$7.75

Transaction history

Date	*Description*	*Check No.*	*Deposits/ Additions*	*Withdrawals/ Subtractions*	*Ending Daily Balance*
Beginning balance on 2/1					**8,872.16**
2/4	Withdrawal Made In A Branch/Store			1,970.00	6,902.16
2/12	Online Transfer From Sorenson R Ref #Ib05SC9Ng8 Custom Management(Rm) Vietnam Trip		5,384.70		12,286.86
2/19	Online Transfer to Sorenson R Ref #Ib05T6B3X4 Custom Management(Rm) Dermatology			110.00	
2/19	Online Transfer to Sorenson R Ref #Ib05T6Jwxr Custom Management(Rm) 2018 Roth IRA Contribution			2,750.00	
2/19	Online Transfer to Sorenson R Ref #Ib05T6Sn6H Custom Management(Rm) Cambodian Visas			112.00	9,314.86
2/28	Recurring Transfer to Sorenson R Ref #Op05Vfwjtl Custom Management(Rm) Orange Theory Fitness			89.00	
2/28	Interest Payment		0.36		9,226.22
Ending balance on 2/28					**9,226.22**
Totals			**$5,385.06**	**$5,031.00**	

WELLS FARGO

Wells Fargo Platinum Savings

Activity summary

Balance on 2/1	54,311.72
Deposits/Additions	12.50
Withdrawals/Subtractions	- 0.00
Balance on 2/28	**$54,324.22**

Account number:

GAYLE SORENSON
TED SORENSON

Wells Fargo Bank, N.A. (Member FDIC)

IDAHO account terms and conditions apply

Questions about your account: **1-800-742-4932**

Worksheet to balance your account and General Statement Policies can be found towards the end of this statement.

Interest you've earned

Interest paid this statement	$12.50
Interest earned this statement period	$12.50
Average collected balance	$54,311.72
Annual percentage yield earned	0.30%
Interest paid this year	$26.33
Total interest paid in **2018**	$421.73

Transaction history

Date	*Description*	*Deposits/ Additions*	*Withdrawals/ Subtractions*	*Ending Daily Balance*
Beginning balance on 2/1				**54,311.72**
2/28	Interest Payment	12.50		54,324.22
Ending balance on 2/28				**54,324.22**
Totals		**$12.50**	**$0.00**	

Attachment E

Letter of Commitment from Northwest Farm Credit Services

Northwest FARM CREDIT SERVICES
1215 Pier View Dr
Idaho Falls, ID 83402-4966
Voice: 208.552.2300 *Fax:* 208.552.2305

March 18, 2019

Ted Sorenson
MC6 Hydro, LLC
1032 Grandview Drive
Ivins, UT 84738

Subject: USBR WaterSMART Grant – MC6 Hydro, LLC

Dear Ted

This letter is being provided at your request to support your USBR WaterSMART Grant for the MC6, Hydro Project near Kuna, Idaho. Northwest Farm Credit Services, FLCA has conditionally approved a loan commitment for $2,573,667.00 to fund the capital cost of the project. Funding for the loan can be in place by April 19, 2019 or any time prior to June 1, 2019. Ted and Gayle Sorenson are existing customers of Northwest Farm Credit Services, FLCA and have paid all obligations as agreed. Please let me know if you need any additional information to support your application for the USBR WaterSMART Grant for MC6 Hydro, LLC. I look forward to working with you on this project.

Sincerely,

Eric Gray

Eric Gray
Relationship Manager / VP

Attachment F

Letter of Commitment from USDA REAP Grant

June 26, 2018

MC6 Hydro, LLC
Ted Sorenson, Managing Member
1032 Grandview Drive
Ivins, UT 84738

RE: Rural Energy for America Program (REAP)
Renewable Energy System (RES) Grant – $116,402
Project – Hydroelectric Power Plant

Dear Mr. Sorenson:

Letter of Conditions
Rural Energy for America Program
Renewable Energy System

We are pleased to inform you that your application for a Fiscal Year 2018 Rural Energy for America Program grant (REAP) has been selected for funding. This letter establishes conditions which must be understood and agreed to by you before further consideration can be given to your application. The grant will be administered on behalf of the Rural Business and Cooperative Services (Agency) by the State staff of United States Department of Agriculture (USDA), Rural Development. All terms and conditions outlined 7 CFR Section 4280 Subpart B and the Notice of Solicitation of Applications published in the Federal Register March 13, 2018, apply to the project and disbursement of any grant funds.

This letter does not constitute grant approval, nor does it ensure that funds are or will be available for the project. Please refrain from making any announcements regarding these awards as this will be done by the Secretary at a later date. No notification should be made to the congressional or media; that will be done at the time of formal announcement.

Any changes in project cost, source of funds, scope of services, or any other significant changes in the project or applicant, must be reported to and approved by the Agency, by written amendment to this letter. If significant changes are made without obtaining such approval, the Agency may discontinue processing of the application.

Please complete and return the attached Form RD 1942-46, "Letter of Intent to Meet Conditions," and Form RD 1940-1, "Request for Obligation of Funds," within 30 days of the date of this letter, if you desire that further consideration be given to your application.

The docket may be completed on the basis of the following:

1. **PROJECT FUNDS:** Grant funds will be used for the purchase and installation of a hydroelectric renewable energy system. The use of funds must be in compliance with the grant application project budget. Any revisions in this financing plan must have the Agency concurrence. All documented funding must total the project amount. Grantee must maintain all receipts and other documentation for all transactions where grant and matching funds are used for the project cost, and provide copies to the Agency.

2. **GRANT AMOUNT:** The application may be completed on the basis of a grant not to exceed $116,402.00. It should be noted that grant funds will be used only for eligible costs as identified in RD Instruction 4280-B. The grant will not exceed 25 percent of the total eligible project costs. In the event the money from other sources is more than estimated in the financing plan, or the bids are different than estimated, the Agency reserves the right to recalculate its funding. After paying for all authorized costs, any remaining REAP grant funds will be refunded to the Agency. Any grant funds remaining more than 180 days after construction is substantially complete may be de-obligated by the Agency.

3. **MATCHING FUNDS/PROJECT FUNDS:** You will be required to contribute at least $4,109,668.00 from other resources. Written evidence of Matching Funds and other funds needed to complete the project must be provided to the Agency before execution of the Financial Assistance Agreement and must be in effect (i.e., must not have expired) at the time Financial Assistance Agreement is executed. A firm commitment must be verified through a Construction Note, Letter of Commitment, or documented equity capital. The applicant contribution will be the first funds expended on a project.

   Without specific statutory authority, other Federal grants cannot be used to meet the matching fund requirement.

   A verification of other federal awards and/or benefits for the same project will be completed before approval of a RBS grant or loan award. Based upon the information submitted in the application, no other federal funds will be used to finance the project. In order to ensure a duplication of assistance did not or will not occur, notification will be made by the Grantee to Rural Development if other federal awards are pending or have been received for this project.

4. **PROJECT BUDGET:**

Purpose	REAP	Matching Funds	Total
Geothermal RES System	$	$ 3,220,070.00	$ 3,220,070.00
Install Labor, Shipping, Design	$ 116,402.00	$ 889,598.00	$ 1,006,000.00
Total	$ 116,402.00	$ 4,109,668.00	$ 4,226,070.00
	25%	75%	100%

5. **PROJECT OWNERSHIP:** At the time of grant closing the Grantee must be the owner of the proposed project.

6. **CERTIFICATIONS:** The grantee will be required to complete the following certifications:

   a) Form AD-1047, "Certification Regarding Debarment, Suspension, and Other Responsibility Matters-Primary Covered Transactions," to certify that your organization is not debarred or suspended from Government assistance.

   b) Form AD-1049, "Certification Regarding Drug-Free Workplace Requirements (Grants) Alternative 1 –For Grantees Other Than Individuals," to certify that you will provide a drug-free awareness program for employees.

   c) RD Instruction 1940-Q, Exhibit A-1, "Certification for Contracts, Grants and Loans," acknowledging you are prohibited from influencing or attempting to influence an officer or employee of any Agency, any member of Congress, or an employee or officer of any member of Congress to obtain specific Federal awards.

   d) AD-3031, "Representations Regarding Felony Convictions Or Tax Delinquent Status For Corporate Applicants."

7. **EQUAL OPPORTUNITY AND NONDISCRIMINATION REQUIREMENTS:** The Grantee will comply with Title VI of the Civil Rights Act of 1964, "Nondiscrimination in Federally Assisted Programs, "42 U.S.C. 2004d4, Section 504 of the Rehabilitation Act for Federally Conducted Programs and Activities, the Age Discrimination Act of 1975 and the Americans with Disabilities Act.

   RD Form 400-1, Equal Opportunity Agreement and 400-4, Assurance Agreement, must be signed by the grantee.

8. **FINANCIAL ASSISTANCE AGREEMENT:** Form RD 4280-2, Rural Business and Cooperative Service Financial Assistance Agreement, is attached for your review. All sites being improved, and all equipment being purchased with grant funds are described on the agreement.

9. **TITLE TO PROPERTY/SITE CONTROL:** Sites for the renewable energy system or energy efficiency improvement projects must be controlled by the grantee. Satisfactory evidence of title to property or a lease of the site that has a term of at least as long as the life expectancy of the RES must be supplied to the Agency for the location of the project. This may include but is not limited to copies of tax statements, existing title insurance policies, deeds, copy of the executed lease, etc.

10. **WARRANTIES:** Provide a copy of the warranty as specified in the application.

11. **INSURANCE:** Insurance coverage will be submitted for the Agency review and concurrence prior to the start of construction. The owner and the contractor(s) should carry adequate insurance on the following:

    a) Property Coverage,

    b) Liability Coverage,

c) National flood insurance per 7 CFR part 1806, subpart B, as applicable.

d) Business Interruption Insurance.

12. **BUSINESS OPERATION, ACCOUNTS AND RECORDS:** Grantee agrees to maintain financial management and records as follows:

a) Accurate, current and complete disclosure of the financial results of each grant.

b) Records that identify adequately the source and application of funds for grant-supported activities, together with documentation to support the records.

c) Effective control over and accountability for all funds.

d) Retain financial records, supporting documentation, and all records pertinent to the grant for a period of at least 3 years after completion of grant activities.

13. **CONSTRUCTION PLANNING AND PERFORMING DEVELOPMENT:** Grantee is responsible for providing the engineering, architectural, and environmental services necessary for planning, designing, bidding, contracting, inspecting, and constructing their facilities. Engineers and architects must be licensed in the State where the project is to be constructed.

The requirements of RD Instruction 4280-B, §4280.124 apply for planning, designing, bidding, contracting, and constructing renewable energy systems and energy efficiency improvement projects as applicable.

For projects with total project costs of $200,000 and greater the technical service and procurement documents must be approved by the Agency.

The design, installation, monitoring, testing prior to commercial operation, and project completion certification must be completed by a licensed professional engineer (PE) or team of licensed PE's.

Final plans and specifications must be reviewed by the Agency and approved prior to the start of the construction.

Projects proposing to be constructed using contract methods must comply with RD Instruction 4280.124(e).

Projects involving procurement must comply with RD Instruction 4280.124(f).

Grantee will comply with the applicable procurement requirements of 2 CFR part 200 regarding standards of conduct, open and free competition, access to contractor records and equal employment opportunity requirements.

For construction contracts in excess of $10,000, Grantee agrees to have each contractor or vendor execute Form RD 400-6, "Compliance Statement.

For construction contracts in excess of $25,000, Grantee agrees to have each contractor or vendor execute Form AD-1048, "Certification Regarding Debarment, Suspension, Ineligibility and Voluntary Exclusion-Lower Tier Covered Transactions".

For construction contracts in excess of $100,000, Grantee agrees to have each contractor or vendor execute and provide to the Agency, RD Instruction 1940-Q Exhibit A-1, "Certification for Contracts, Grants and Loans", acknowledging they are prohibited from influencing or attempting to influence an officer or employee of any Agency, any member of Congress, or an employee or officer of any member of Congress to obtain specific Federal awards.

In some instances, grantees may wish to perform a part of the work themselves. Grantees may accomplish construction by using their own personnel and equipment, provided the grantee possesses the necessary skills, abilities, and resources to perform the work and there is not a negative impact to their business operation. For a grantee to provide a portion of the work, with the remainder to be completed by a contractor:

a) A clear understanding of the division of work must be established and delineated in the contract,
b) Grantees are not eligible for payment for their own work,
c) Warranty requirements applicable to the technology must cover the grantee's work, and
d) Inspection and acceptance of the grantee's work must be completed by either:
    i. An inspector that will inspect as applicable and accept construction, and furnish inspection reports, or
    ii. A licensed engineer that will prepare design drawings and specifications, inspect as applicable and accept construction, and furnish inspection reports.

Upon completion of the project, the grantee must submit to the Agency a copy of the contractor's certification of final completion for the project and a statement that the grantee accepts the work completed. At its discretion, the Agency may require the Applicant to have an Inspector certify that the project is constructed and installed correctly.

Prior to making payment the grantee must provide the Agency with Form 1924-9, "Certificate of Contractor's Release" and Form RD 1924-10, "Release by Claimants", or similar forms, executed by all persons who furnished materials or labor in connection with the contract.

SURETY Grantee will, for construction contracts in excess of $100,000, provide performance and payment bonds for 100 percent of the contract price, unless otherwise specified in 7 CFR part 4280, subpart B, §4280.124. Surety may be provided using either a bank letter of credit or performance bonds and payment bonds. Cash deposit in escrow of at least 50 percent of the contract amount is required.

Exceptions to surety may be requested by the applicant in writing if:
a) Small acquisition and construction procedures as specified in 4280.118 (c) and (d) or 4280.119 (c) and (d) as applicable are used.
b) The proposed project is for equipment purchase and installation only and the contract costs for the equipment purchase and installation are $200,000 or less.

c) The proposed project is for equipment purchase and installation only and the contract costs for the equipment purchase and installation are more than $200,000 and the following requirements can be met:
   i. The project involves two or fewer subcontractors, and
   ii. The equipment manufacturer or provider must act as the general contractor
d) Construction projects that only have one contractor performing the work.

When surety is not provided, contractors must furnish evidence of payment in full for all materials, labor and any other items.

14. **GRANT DISBURSEMENT:**

Unless extended by the Agency, the grant disbursement period will encompass two years after the date the Agency signs the Financial Assistance Agreement. If an extension is needed, grantees must submit a written request for the no-cost extension no later than 30 days before the expiration date of the Financial Assistance Agreement describing the extenuating circumstances that were beyond their control to complete the project and why approval is in the government's best interest. Grant funds not expended within the 2-year or approved extended timeframe, will be returned to the Agency.

Unless authorized by the Agency to do so, requests for reimbursement may be submitted no more frequently than monthly. Ordinarily, payment will be made within 30 days after receipt of a proper request for reimbursement. The final 10 percent of grant funds will be held until construction of the project is completed, operational and has met or exceeded the test run requirements as established in the application. In addition, the Agency reserves the right to request additional information or testing if upon a final site visit the 30 day steady state operating level is not found acceptable to the Agency.

Grantees must not request reimbursement for the Federal share of amounts withheld from contractors to ensure satisfactory completion of work until after it makes those payments.

When the project has been completed please contact our office and schedule an inspection. The documentation required for requesting reimbursement will be reviewed at that time but will include the following:

a. Grantee Certification (attached).
b. Contractor 30-Day Certification (attached).
c. Copy of the final invoice.
d. Evidence of Payment. (i.e. copy of cashed check, receipt, invoice marked paid in full, etc.)
e. RD Form 1924-9 "Certificate of Contractor's Release". Contractor needs to sign this form to evidence that they have received payment and are releasing the grantee from any further obligation (attached).
f. SF 425 "Federal Financial Report" (attached).
g. SF PPR "Performance Progress Report" (attached).
h. SF 271 "Outlay Report and Request for Reimbursement For Construction Programs" (attached).
i. Final Report (attached).

Grant funds will be transferred to the Grantee via Electronic Funds Transfer (EFT). The Grantee will complete and deliver to Grantor, Form SF-3881, "Electronic Funds Transfer Payment Enrollment Form."

15. **REPORTING REQUIREMENTS:**

Grantees shall constantly monitor performance to ensure that the time schedules are being met and projected goals by time periods are being accomplished. See the Financial Assistance Agreement for the complete detailed requirements.

a) Forms SF-425, "Financial Status Report" and a Project Performance Report will be required on a semi-annual basis between grant approval and the completion of the project. The reports are due 30 working days after June 30 and December 31 of each year.

The financial status report must show how grant and leveraged funds have been used to date and project funds needed and their purposes for the next semi-annual period. A final report may serve as the last semi-annual report. A copy of the SF-425 is attached.

The semi-annual project performance report must report on accomplishments towards objectives or reasons why objectives were not met, and provide objectives and timetables for the next reporting period.

A Semi-Annual Project Performance Report is attached for your information.

b) A final project development report will be provided by the Grantee, including a detailed project funding and expense summary and a summary of the project's installation/construction process, including recommendations for development of similar projects by future Applicants to the program.

c) After construction, annual outcome project performance reports are required. Renewable energy project grantees will provide a report for each of 3 years commencing the first full calendar year following the year in which the project construction was completed. Energy efficiency project grantees will provide a report for each of 2 years commencing the first full calendar year following the year in which project construction was completed. An Outcome Project Performance Report is attached for your information.

16. **ENVIRONMENTAL**: The environmental assessment and supporting documentation have been reviewed and found to be in acceptable compliance with the Agency regulations, as such, the environmental assessment is approved.

17. **SYSTEM FOR AWARD MANAGEMENT (SAM):**

a) The Grantee is required to complete the attached certification that certifies the application process for registering with the System for Award Management at www.sam.gov was initiated prior to April 30, 2018.

b) No grant funds will be disbursed until it is confirmed that the Grantee has registered with the System for Award Management and has an active Commercial and Government Entity (CAGE) code.
c) Grantee must maintain the registration in the System for Award Management at www.sam.gov until final disbursement.

18. **SECTION 106 REVIEW**
The section 106 review must be completed by the State Historical Preservation Office (SHPO) prior to project construction and disbursement of funds. The Agency reserves the right to de-obligate funding prior to or after award or construction if Section 106 compliance is not met.

19. **OTHER REQUIREMENTS:**
The Grantee will be responsible for any additional requirements of federal, state, or local governments that may apply in accordance with 7 CFR 4280 Part B. All requirements and permits of the governing agencies will be followed for any activities related to the project.

The above conditions are based on the proposed use of funds as outlined and financing arrangements as stated. The conditions as stated may be modified in the scope or cost of the Project is changed or the financial arrangements are adjusted. Any change or modification of the conditions of the Project must have prior approval by Grantor.

The Grantee will follow the requirements in the Letter of Conditions and the Financial Assistance Agreement. No further processing will occur on this application until the attached Forms RD 1942-46 and 1940-1 are signed and returned.

If you have any questions concerning this letter, please contact me or Dale Lish, Area Director, at (208) 690-3538.

Sincerely,

DARYL G. MOSER
Director, Business Programs

Cc: Dale Lish, Area Director, Blackfoot Area Office

Enclosures:

-Form RD 1942-46, "Letter of Intent to Meet Conditions"
-Form RD 1940-1, "Request for Obligation of Funds"
-Form RD 4280-2, "Rural Business and Cooperative Service Grant Agreement"
-Form AD 1047, "Certification Regarding Debarment, Suspension, and Other ---Responsibility Matters-Primary Covered Transactions"
-Form AD 1049, "Certification Regarding Drug-Free Workplace Requirements"
-RD Instruction 1940-Q, Exhibit A-1, "Certification for Contracts, Grants and Loans"
-AD-3031, "Representations Regarding Felony Convictions or Tax Delinquent Status for Corporate Applicants"

-Form RD 400-1, "Equal Opportunity Agreement"
-Form RD 400-4, "Assurance Agreement"
-Form AD 1048, "Certification Regarding Debarment, Suspension, Ineligible and Voluntary Exclusion-Lower Tier Covered Transactions"
-Form RD 400-6 "Compliance Statement" (contracts over $10,000)
-Form RD 1924-9, "Certificate of Contractor's Release"
-Form RD 1924-10, "Release by Claimants"
-Form SF-3881, "Electronic Funds Transfer Payment Enrollment Form"
-Form SF 425 "Federal Financial Report"
-Form SF PPR "Performance Progress Report"
-Form SF 271 "Outlay Report and Request for Reimbursement For Construction Programs"
-Final Report (REAP)
-Grantee Certification (REAP)
-Grantee Certification of date of application for System for Award Management (SAM)

BOISE PROJECT BOARD OF CONTROL

(FORMERLY BOISE U.S. RECLAMATION PROJECT)

2465 OVERLAND ROAD
BOISE, IDAHO 83705-3155

TEL: (208) 344-1141
FAX: (208) 344-1437

OFFICIAL RESOLUTION FOR
WATERSMART: WATER AND ENERGY EFFICIENCY GRANTS FOR FY2019

WHEREAS, The U. S. Bureau of Reclamation is seeking proposals from irrigation districts who want to leverage their money and resources in partnership with Reclamation to conserve and use water more efficiently through the WaterSMART: Water and Energy Efficiency Grants for FY 2019 Program;

WHEREAS, the Boise Project Board of Control desires to apply for funding through Reclamation's WaterSMART Grant Program;

NOW THEREFORE BE IT RESOLVED that the Board of Directors of the Boise Project Board of Control agree and authorize the following:

1. The Board has reviewed and supports this proposal to bypass 3000 lineal feet of canal in the Indian Creek Canal with steel pipe and install a 2.1 MW hydroelectric facility with 6,800,000 KWHr production every year;
2. The MC-6 Hydro LLC is capable of providing the amount of funding and/or in-kind contributions as specified in the funding plan; and
3. If selected for the WaterSMART Grant, the Boise Project Board of Control will work with Reclamation to meet established deadlines for entering into a grant.
4. Bob Carter, Project Manager, has the legal authority to sign and enter into the agreement.

Passed and adopted by the Board of Directors of the Boise Project Board of Control during its regular meeting on the 3rdth day of April, 2019.

Clinton C. Pline
Chairman of the Board