

STATE OF IDAHO
DEPARTMENT OF WATER RESOURCES
BENEFICIAL USE FIELD REPORT

A. GENERAL INFORMATION

Permit No: 63-9206

Exam Date: 8/17/2015

1. Current Owner: BOISE PROJECT BOARD OF CONTROL
2465 OVERLAND RD
BOISE ID 83705
(208)344-1141

2. Accompanied by: Chris White (FERC inspector), Danielle Merriman (IDWR Western Region), Sandra Thiel (IDWR State office), Tim Page (BPBC), other BPBC personnel, and Terry Daugherty and Dennis Daugherty (Riverside, Inc)

Phone No:

Address:

Relationship to Permit Holder:

3. SOURCE

BOISE RIVER

TRIBUTARY

SNAKE RIVER

B. OVERLAP REVIEW

1. Other water rights with the same place of use: There are no other water rights for power use at this powerhouse.
2. Other water rights with the same point of diversion: Multiple rights are also diverted from the Boise River at the Diversion dam.

C. DIVERSION AND DELIVERY SYSTEM**1. LOCATION OF POINT(S) OF DIVERSION:**

BOISE RIVER lot 17 (NW1/4SW1/4) Sec. 3, Twp 02N, Rge 03E, B.M.

ADA County

Method of Determination:

The POD was determined by aerial photography and a review of existing spatial data points. Spatial data point #365674 at the Diversion Dam is the best representation of the POD.

This portion of the Boise River was resurveyed in 2013. The POD location has not changed but the government lot number in the PLSS address has changed.

2.

PLACE OF USE:

POWER

Twp	Rge	Sec	NE				NW				SW				SE				Totals
			<u>NE</u>	<u>NW</u>	<u>SW</u>	<u>SE</u>	<u>NE</u>	<u>NW</u>	<u>SW</u>	<u>SE</u>	<u>NE</u>	<u>NW</u>	<u>SW</u>	<u>SE</u>	<u>NE</u>	<u>NW</u>	<u>SW</u>	<u>SE</u>	
02N	01W	33											X						

Method of Determination:

The powerhouse is visible in aerial photography.

3. ☒ Delivery System Diagram Attached (required). Indicate all major components and distances between components. See attached engineering drawings
- ☐ Map Attached Showing Location(s) of point(s) of diversion and place(s) of use (required). Scale must be 1:24,000 or greater.
- ☐ Aerial Photo Attached (required for irrigation of 10+ acres).
- ☐ Photo of Diversion and System Attached

4.

Well or Diversion ID No.*

<u>Generator Make</u>	<u>Hp or kW</u>	<u>Generator Type</u>	<u>Turbine Make</u>	<u>Turbine Discharge Size</u>
	1900 kW	Synchronous		rated for 600 cfs at 38 ft head

*Code to correspond with No. on map and aerial photo

Turbine-generator set is manufactured by China Chang Jiang Energy Corp. (CCJEC).

The turbine is a vertical shaft Kaplan type.

D. FLOW MEASUREMENTS

1.

<u>Measurement Equipment</u>	<u>Type</u>	<u>Make</u>	<u>Model No.</u>	<u>Serial No.</u>	<u>Size</u>	<u>Calib. Date</u>

2. Measurements:

Instantaneous generation and wicket and bypass gate positions were available from a combination of instrumentation displays in the powerhouse. The type of meter, accuracy of measurements and calibration date(s) are not known.

During the site visit, the project was generating 1015 kW. See the attached photo of the instrument panel. Riverside, Inc. personnel and BPBC personnel stated that the flow through the plant was approximately 580 cfs at the time.

I requested and received data from the development period of this permit which confirmed beneficial use.

E. FLOW CALCULATIONS X Additional Computation Sheets Attached

Measured Method:

The flow through the Mora project is calculated from not measured.

The period-of-record data provided by the applicant's representative shows that the project has not yet utilized the full rate authorized by the permit. To date, the maximum rate of water used for power generation was 597 cfs. That use occurred on July 7, 2014. See the last page of Exhibit E from that data submittal.

During the development period, the maximum rate of water used for power generation was 450 cfs. That use occurred on September 1, 2006. See Exhibits D-1 and F from that data submittal.

F. VOLUME CALCULATIONS

1. Volume Calculations for Irrigation: not applicable

$$V_{I.R.} = (\text{Acres Irrigated}) \times (\text{Irrigation Requirement}) =$$

$$V_{D.R.} = [\text{Diversion Rate (cfs)}] \times (\text{Days in Irrigation season}) \times 1.9835 =$$

$$V = \text{Smaller of } V_{I.R.} \text{ and } V_{D.R.} =$$

2. Volume Calculations for Other Uses:

Effective 3/29/2012, the Beneficial Use Examination Rules exempt on-stream, run-of-the-river, power generation from the volume reporting requirement. This project does not fit this description. However, I am not recommending a volume for this license. Refer to the narrative below.

G. NARRATIVE/REMARKS/COMMENTSOwnership

The ownership of this hydro project is complex.

Boise Project Board of Control (BPBC) is the operating agent for five irrigation districts: Boise-Kuna Irrigation District, Big Bend Irrigation District, Nampa & Meridian Irrigation District, New York Irrigation District, and Wilder Irrigation District. BPBC's purpose is to manage irrigation facilities and related works and to deliver water to the districts' landowners. It was created in 1926 as a result of contracts between the U.S. Bureau of Reclamation and the five irrigation districts. The contracts are not water rights but they do define the space allocations for water that is stored in reservoirs on the Boise River system.

According to a letter from the United States Department of the Interior, the Mora Drop and related right-of-ways and facilities "are reserved from the land as an easement under the Act of August 30, 1980." (See a copy of the letter and the Act in the application submitted by BPBC to FERC in WR 63-33599)

This water right, the FERC Exemption from Licensing, and the canal system structures are held by the Boise Project Board of Control.

The POD is located on USBoR property and water is provided to the project through an agreement with USBoR.

The powerhouse and power generation equipment are currently owned and operated by Riverside Hydro I, LLC. And the current energy sales agreement is between Idaho Power Company and Riverside Hydro I, LLC.

POU

Available Canyon County taxlot information shows that the project land is owned by the Boise Project Board of Control. The project is located at Mora Drop on the BPBC's Mora Canal.

POD

The government lots near the Diversion Dam (the POD) have recently been renumbered and are not consistent with the available GIS layer. A comparison of the BLM's Government Land Office maps for 1910, 2001 and 2013 confirms that three different government lots represent the same location. The 2013 dependent resurvey of Township 2 North, Range 3 East, shows the POD in government lot 17, which is the address I use for the license. Available GIS data in ArcMap is based on a 2001 dependent resurvey and shows this POD in government lot 13. Recent SRBA partial decrees show this same POD in government lot 9, which appears to be the address from the original 1910 survey.

The PLSS address of the POD now includes a government lot number. Adding a government lot is considered a clarification so an amendment of the permit is not required.

Priority Date

The priority date was advanced one day when the permit was reinstated by Glen Saxton on March 6, 1992.

Water Use

Although the applicant had requested an extension of time to submit beneficial use and had until March 1, 2010 to submit proof, the Proof-of-Beneficial-Use statement was submitted on January 9, 2007. The project had been online only a few weeks in the previous year, from September 2006 through the first two weeks in October 2006. So the development period was inadvertently cut very short.

At my request, additional information was provided by the permit holder.

Idaho Power Company identifies the Mora Drop project as #21615200. Monthly summary reports from Idaho Power Company show hourly average generation. The reports confirm that beneficial use occurred during the development period of the permit and that the season-of-use is appropriate. The records also indicate that more water was used after the development period than was used during the time that the permit was active.

Operation strategy

No storage for power use is authorized by the permit. The stilling area at this project's headworks on the Upper Mora Canal holds less than one day's worth of water. The project is operated in run-of-river mode.

Rate

I am recommending 450 cfs for the license.

This recommendation is based on the maximum daily average flow rate which occurred during the development period and confirmed by companion generation.

The turbine performance table indicates that the turbine cannot generate on flows less than ~250 cfs.

Volume

I am not recommending a volume for the license.

Mora Drop receives and uses only the water that comes to it via storage releases for other purposes. The rate and volume of water released from Boise's system of reservoirs is not under the control of the power plant operator. Because the water contained in the canal system is managed for the benefit of irrigation and not necessarily for the benefit of hydroelectric power generation, I contend that this right qualifies for exemption from the volume requirement. Power production is an additional, incidental use of the water delivered for irrigation use.

SOU

Permit 63-9206 authorized a SOU from 3/15-11/15 which is not equivalent to the current irrigation season for the area. Generation records indicate that the project has confined power production to the permitted season-of-use.

Point-of-Discharge

The Mora Drop Hydroelectric powerhouse is built onto the Boise Project Board of Control canal system. The penstock diverts water from the canal system and the turbine discharges that water back into the canal system. Any water discharged from the project and not used by downstream irrigators is eventually returned to the Snake River. No water is returned to the Boise River.

Conditions

The project is being operated in compliance with the conditions on the permit. However, Permit 63-9206 was issued on March 5, 1983, which is before the Idaho Supreme Court's decision in the Idaho Power Company v Idaho case involving Idaho Power Company's water rights at Swan Falls Dam. Because of that timing, this permit was issued without a subordination condition and without a director's term review condition. I am adding conditions of both types to the license.

Term limit

On December 18, 1980, FERC issued an order granting an Exemption from Licensing for a Conduit Hydroelectric Project to the BPBC for this project. The project is known to FERC as the Mora Drop Hydroelectric Project, docket or project #3403.

The project is self-certified with FERC as a qualifying facility for the purposes of selling the power that is generated. IPUC has approved a Firm Energy Sales Agreement (FESA) between Riverside Hydro I, LLC., (the operators of the project), and Idaho Power Company. A copy of the IPUC Order 30088 on Case IPC-E-06-13 and the FESA are attached. The agreement has a 20-year term and is set to expire on April 13, 2026.

Have conditions of permit approval been met? ☒ Yes ☐ No

H. RECOMMENDATIONS

I recommend that Boise Project Board of Control apply for an additional permit to cover the additional rate that the project has proven to be capable of using.

1. Recommended Amounts

<u>BENEFICIAL USE</u>	<u>PERIOD OF USE</u>	<u>DIVERSION RATE</u>	<u>ANNUAL VOLUME</u>
POWER	3/15 to 11/15	450.00 CFS	N/A
<u>Totals:</u>		450.00 CFS	N/A

2. Recommended Amendments

☐ Change P.D. as reflected above ☐ Add P.D. as reflected above ☒ None

☐ Change P.U. as reflected above ☐ Add P.U. as reflected above ☐ Other

I. AUTHENTICATION

Field Examiner's Name Michele Edl Date 11/13/2015

Reviewer _____ Date _____





Beneficial Use Field Report 63-9206

TOWNSHIP 2 NORTH, RANGE 3 EAST, OF THE BOISE MERIDIAN, IDAHO

DEPENDENT RESURVEY, SUBDIVISION, AND METES-AND-BOUNDS SURVEY

A history of surveys is contained in the field notes.

This plat represents the dependent resurvey of portions of the subdivisional lines and subdivision of sections 3, 4, 10, and 11, designed to restore the corners in their true original locations according to the best available evidence, and the further subdivision of section 4, and metes-and-bounds surveys in sections 3, 4, 10, and 11, T. 2 N., R. 3 E., Boise Meridian, Idaho.

For those lines not depicting bearings and distances, refer to the plats accepted May 12, 1911, November 12, 1912, and July 31, 2001.

Except as depicted hereon, the lottings and areas are as shown on the plats accepted May 12, 1911 and July 31, 2001.

Survey executed by Keith C. Brooks, Cadastral Surveyor, Bureau of Reclamation, beginning October 18, 2011 and completed July 15, 2012, pursuant to special instructions dated October 17, 2011, for Group No. 1386, Idaho.

NOTE: Dashed line is the present right bank of the Boise River and is shown for informational purposes only.

UNITED STATES DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT

Boise, Idaho

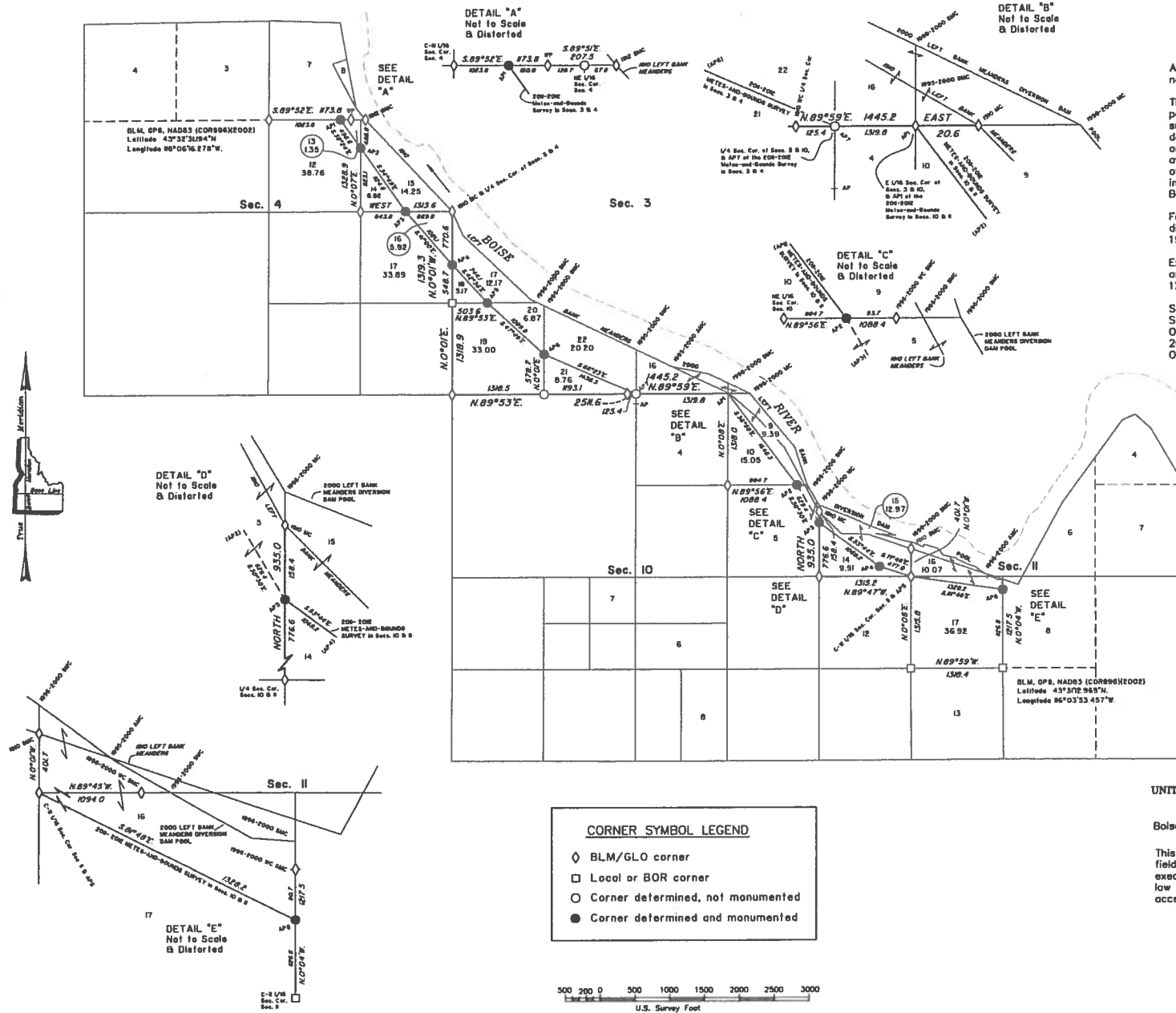
May 29, 2013

This plat is strictly conformable to the approved field notes and the survey, having been correctly executed in accordance with the requirements of law and the regulations of this Bureau, is hereby accepted.

For the Director

Stanley L. French
Chief Cadastral Surveyor for Idaho

Vol. R545
p55-1-14



WR# 63-9206
view of the re-diversion works
from the Mora canal (east) side



08/17/2015

WR# 63-9206

view of the re-diversion works from the west



WR# 63-9206
looking east across the penstock intake

NOTICE
PRIVATE PROPERTY
KEEP OUT

DANGER
ABSOLUTELY
NO 
SWIMMING

08/17/2015



WR# 63-9206
view looking upstream at the bypass intake

WR# 63-9206
view of the powerhouse from the intake



08/17/2015

GENERATOR FREQUENCY METER
50
58 62
56 64
55 65
HERTZ



SYND SCOPE
SEC



WR# 63-9206
instrument display panel

GENERATOR VOLT METER
0 1000 2000 3000 4000 5000 5250
VOLTS



TACHOMETER
0 100 200 300 400 500 600
RPM



POWER METER
PM



AMMETER
0 100 200 300 400
AMPERES



BUS VOLT METER
0 1000 2000 3000 4000 5000 5250
VOLTS



WICKET GATE POSITION
0 20 40 60 80 100
PERCENT



HOURLY METER
HOURS



BYPASS GATE #1 POSITION
0 20 40 60 80 100
PERCENT



BYPASS GATE #2 POSITION
0 20 40 60 80 100
PERCENT



CANAL GATE POSITION
0 20 40 60 80 100
PERCENT



TURBINE INLET GATE STATUS
ALL CLOSED OPEN FULL OPEN



CONTROL STATUS
STOP START



RECLOSER STATUS
OPEN CLOSED



SEE COND. ON LIGHT
W/ST. NO. 10 WHEN ALARM

MAIN BREAKER STATUS
OPEN CLOSED



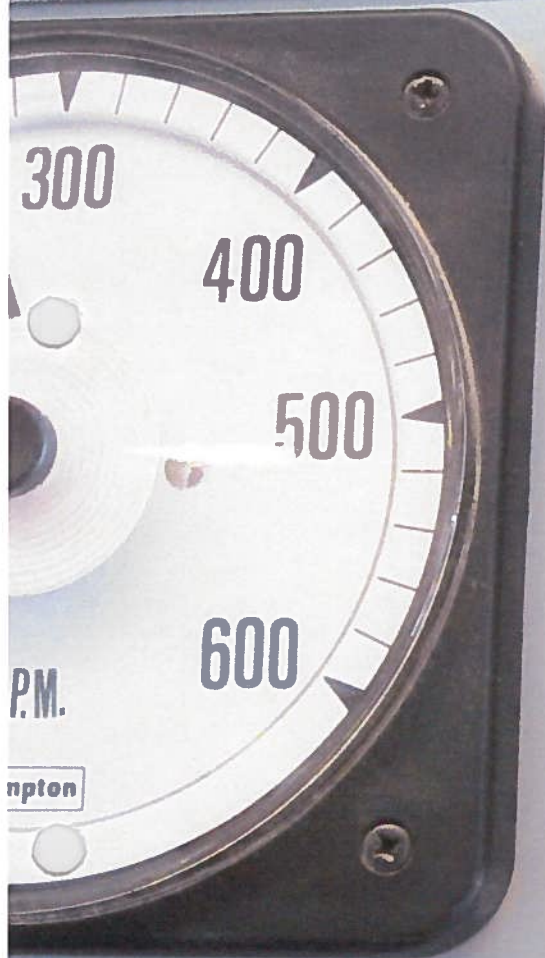
SEE COND. ON LIGHT
W/ST. NO. 10 WHEN ALARM



WR# 63-9206 close-up

CHOMETER
TACH

POWER METER
PM



Crompton

Integra 1000

Sys Volts •
Volts L1-N
Volts L1-2
Amps L1

Sys Amps •
Volts L2-N
Volts L2-3
Amps L2

Sys kW •
Volts L3-N
Volts L3-1
Amps L3

4289.

139.3

1015.

x1000
Amps N
kVar
kWh
kVArh
x1000
Hz
kVA
kWD
Max kWD
x1000
P.F.
AD
Max AD



The bottom display shows instantaneous power generation.

METER
M

BYPASS GATE #1 POSITION
BGP1

BYP



TURBINE & GENETATOR SET

TURBINE

TYPE	ZZA834-LJ-180	
RATED CAP.	1900 KW	kw
RATED HEAD	38	ft
RATED FLOW	600	cf/s
RATED SPEED	257	r/min
MIN.HEAD	37	ft
MAX.HEAD	39	ft
MAX.CAP.	1900 KW	kw
PRODUCT STD	GB/T15468-1995	
PRODUCT NO.	74S /1	

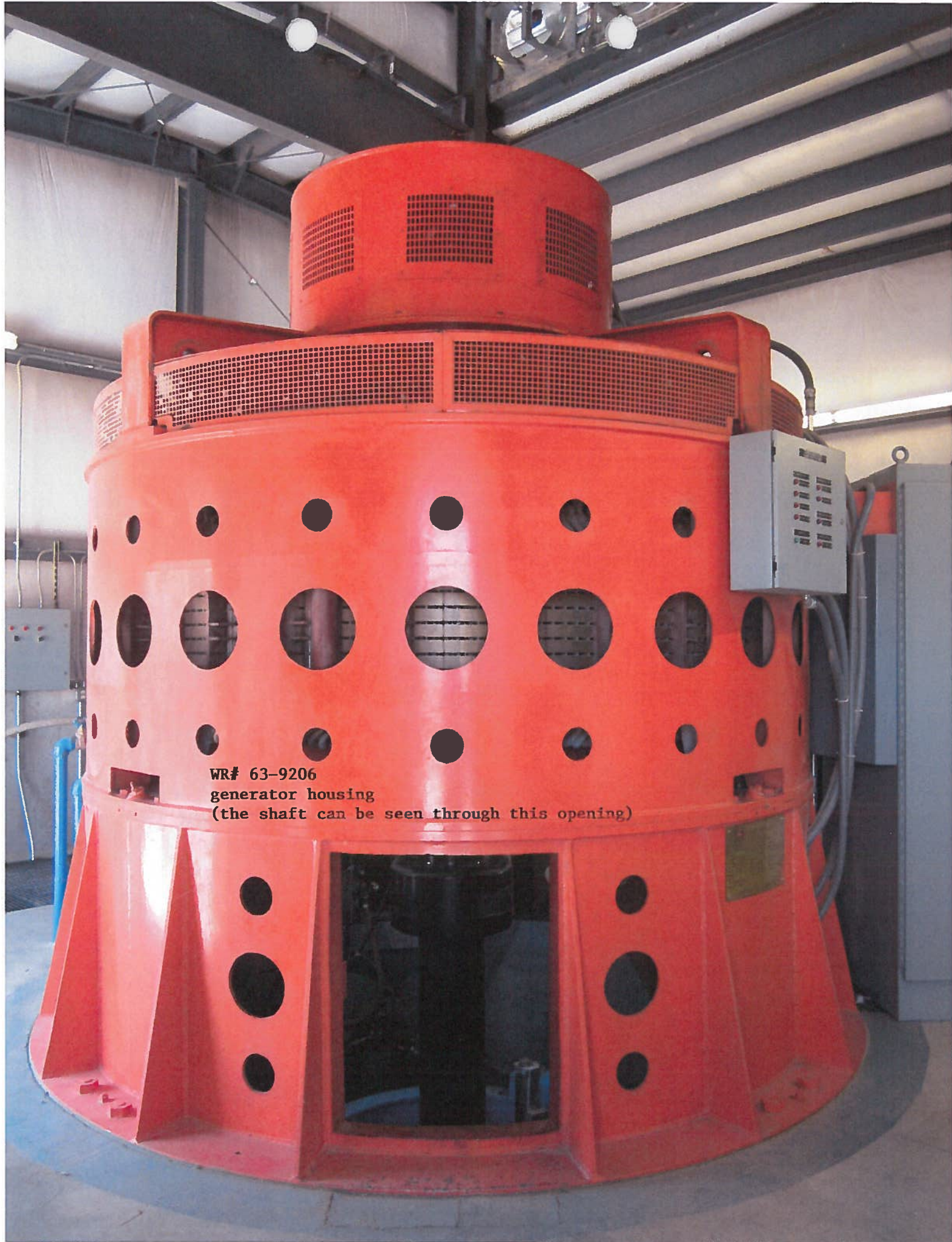
GENERATOR

TYPE	SF1600-28/2600	RATED FACTOR	.94 S.F.
RATED PWR.	1600 kw	RATED EXCITING VOLT.	114 V
RATED VOLT.	4160 V	RATED EXCITING CUR.	186 A
RATED CUR.	247 A	PHASE	3
RATED FREQ.	60 Hz	STATOR CONNECTION	Y
RUNAWAY SPEED	590 r/min	TEMP.CLASS.	F/B
PRODUCT STD	GB/T7894-2001	TOTAL SET WEIGHT	76535 kg
PRODUCT NO.	207F /1	PRODUCED DATE	2006.3

WUHAN STEAM TURBINE & GENERATOR CO.LTD

WR# 63-9206

nameplate on the turbine-generator



WR# 63-9206
generator housing
(the shaft can be seen through this opening)

WR# 63-9206

close-up of the shaft and control works



WR# 63-9206
view showing the bypass flow



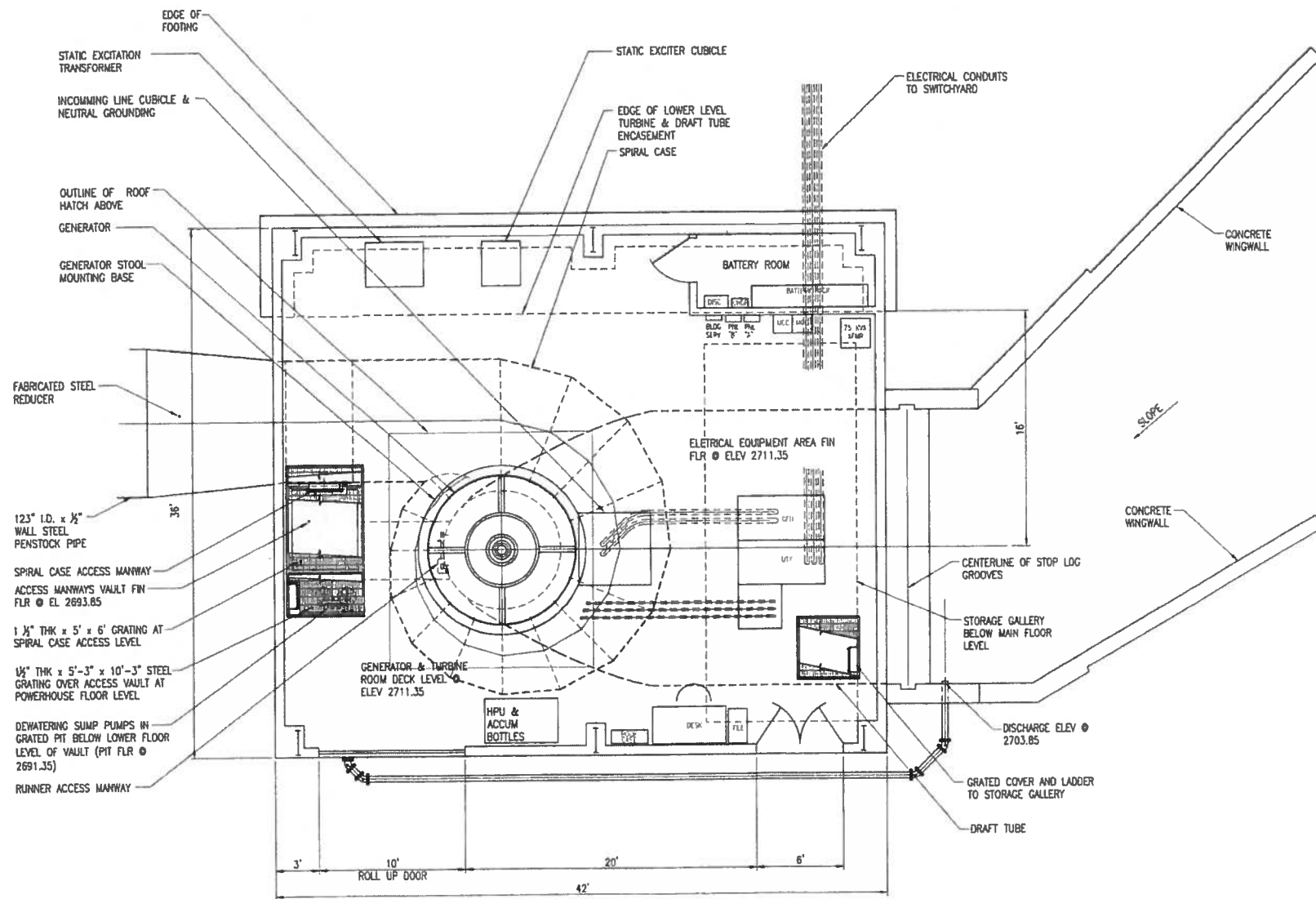
WR# 63-9206
view showing the turbine discharge



Engineering Drawing Attachments to Beneficial Use Field Exam Report 63-9206

The following seven, as-built drawings were printed from the CD which was provided by the permit holder on October 15, 2015.

Sheet No A-1	Powerhouse Architectural Main Level Plan
Sheet No A-2	Powerhouse Architectural Elevation Thru Turbine & Draft Tube
Sheet No A-3	Powerhouse Architectural East Elevation
Sheet No C-3	Penstock Profile
Sheet No C-4	Bypass Pipeline Profile
Sheet No S-13	Powerhouse Structure Section Thru Turbine / Draft Tube Centerline
Sheet No S-20	Intake Structure Plan Penstock & Bypass



POWERHOUSE ARCHITECTURAL
MAIN LEVEL PLAN
SCALE: 1/4" = 1'-0"

REV	DATE	BY	CHK	REVISIONS
1	JULY 2005	SPB	SPB	AS-BUILT 2007
2		SPB	SPB	
3		TSS	TSS	

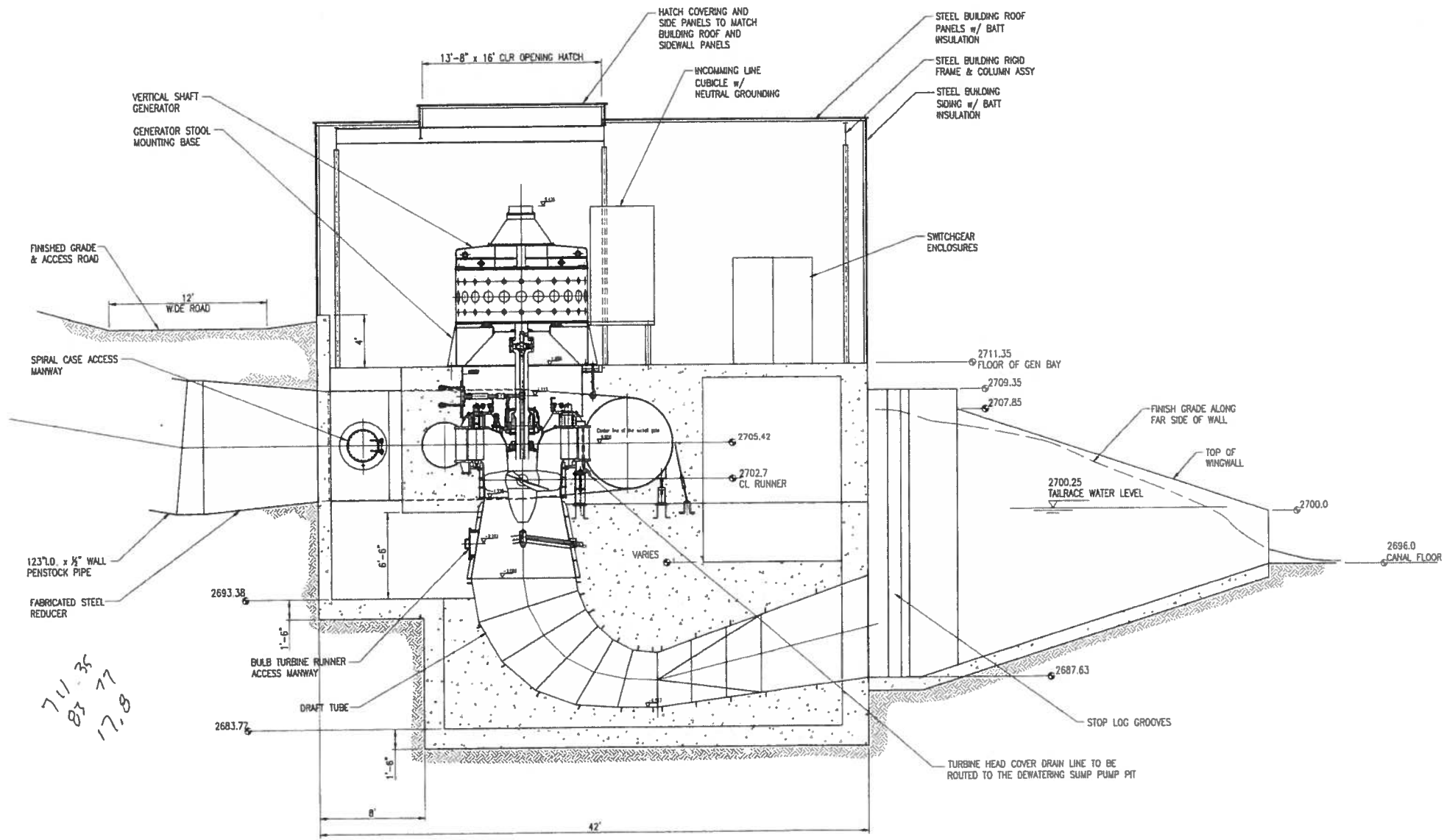
MORA DROP HYDROELECTRIC PROJECT
RIVER SIDE INCORPORATED
POWERHOUSE ARCHITECTURAL MAIN LEVEL PLAN
FERC PROJECT NO. 3403



SORENSEN ENGINEERING
CONSULTING ENGINEERS
IDAHO FALLS, IDAHO
GRAPEVIEW, WASHINGTON

THIS DRAWING SHEET HAS
BEEN REDUCED TO ONE-HALF
SIZE--REDUCE SCALES
ACCORDINGLY

DRAWING NO.
005-0720
SHEET NO.
A-1

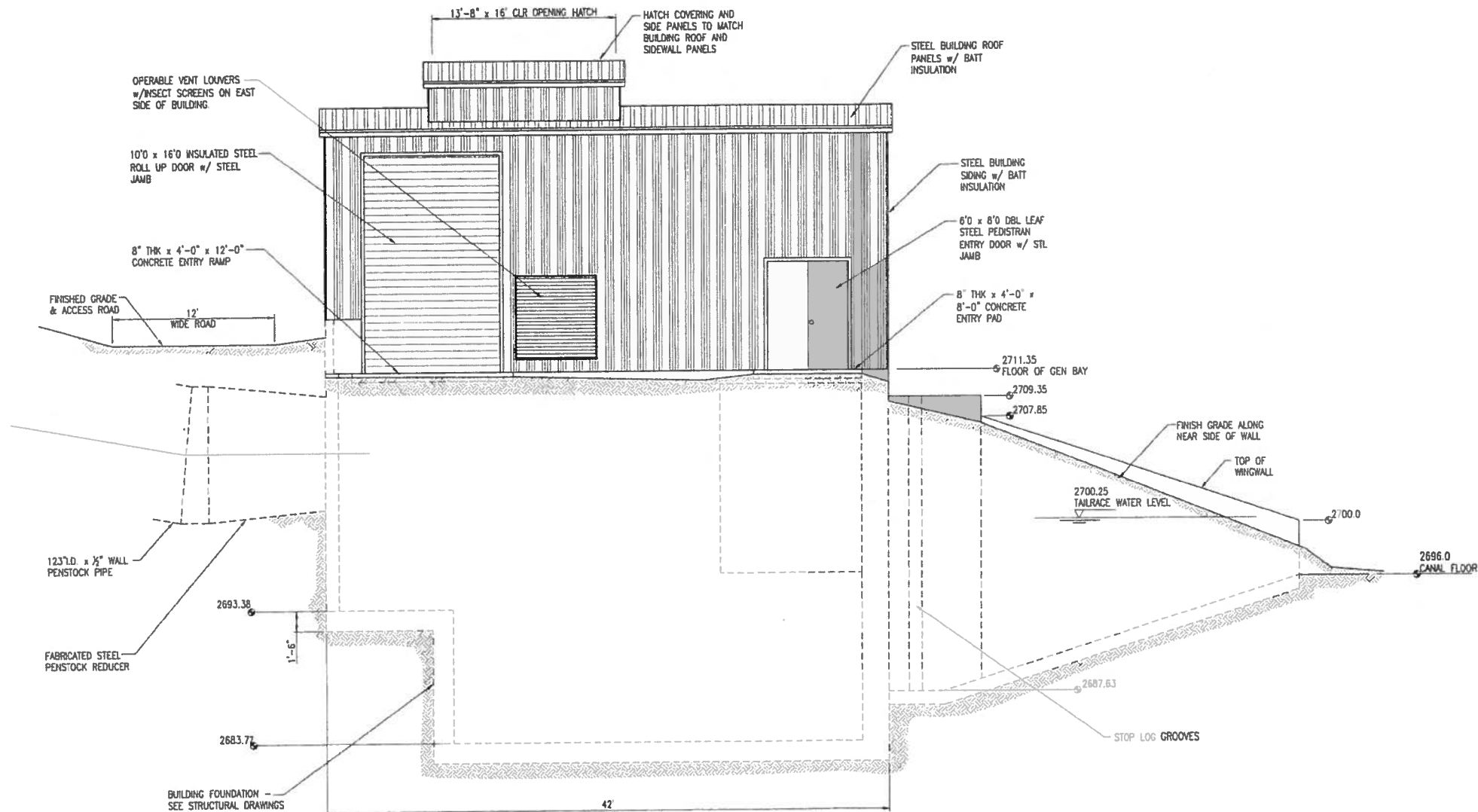


711.35
83.77
17.8

POWERHOUSE ARCHITECTURAL
ELEVATION THRU TURBINE & DRAFT TUBE
SCALE: 1/4" = 1'-0"

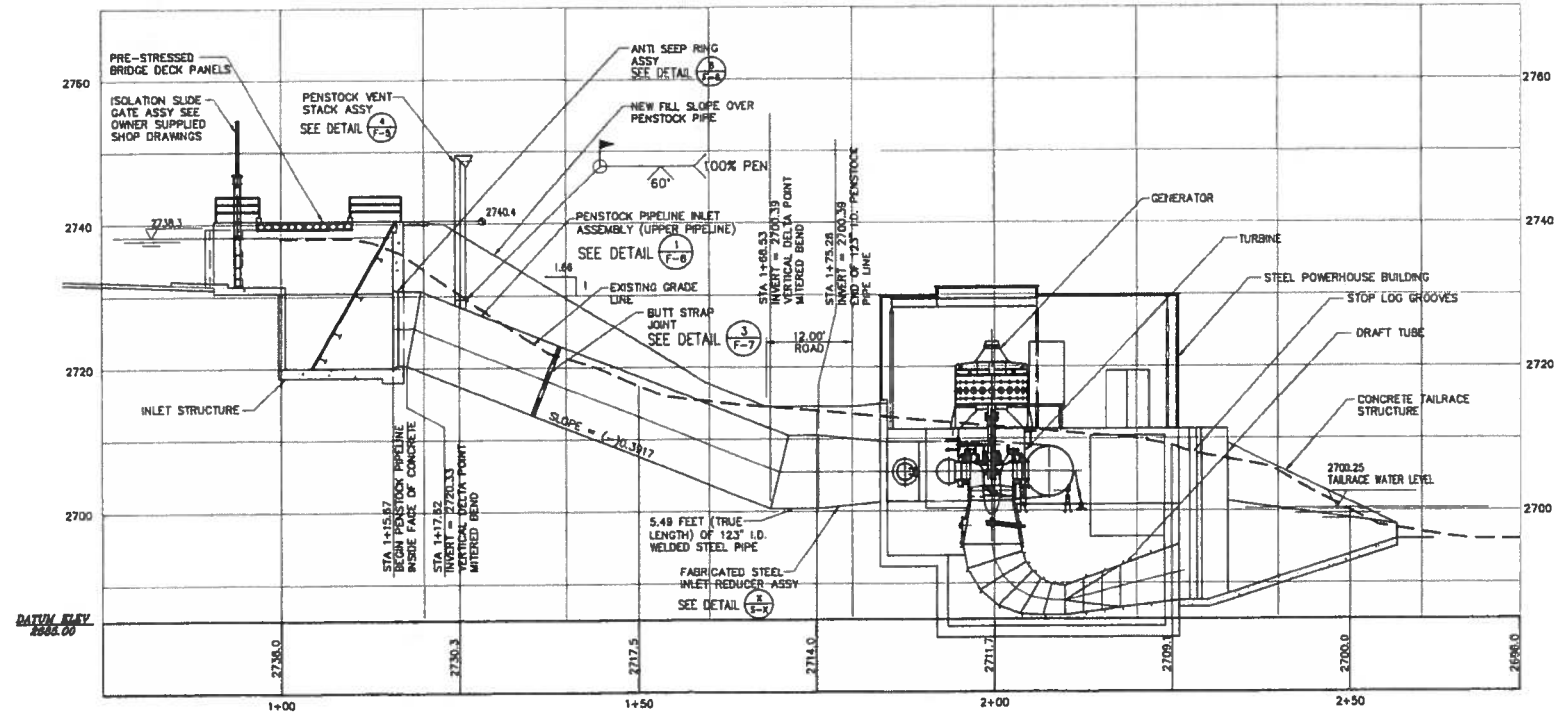
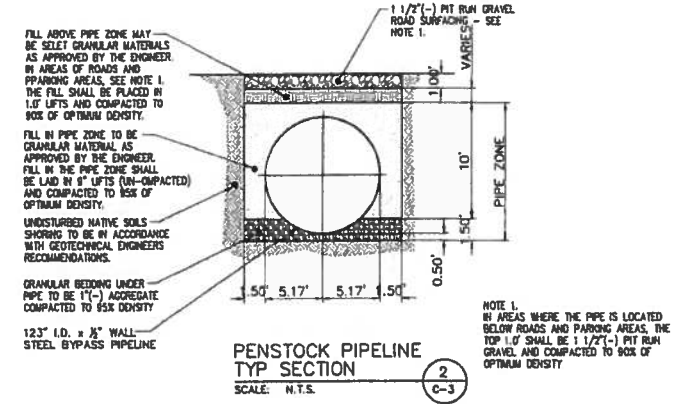
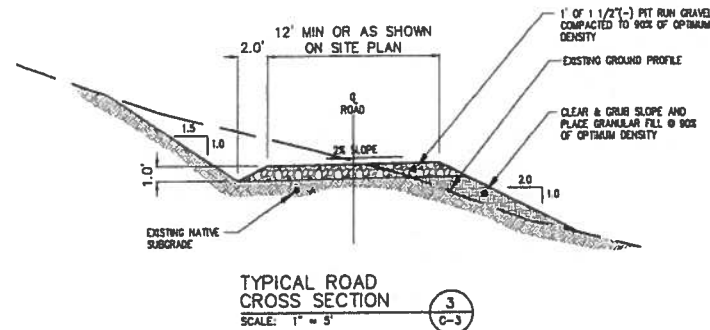
THIS DRAWING SHEET HAS
BEEN REDUCED TO ONE-HALF
SIZE--REDUCE SCALES
ACCORDINGLY

REVISIONS 1 JULY 2005 SPB SUB TSS 2 AS-BUILT 2007	
MORA DROP HYDROELECTRIC PROJECT RIVER SIDE INCORPORATED POWERHOUSE ARCHITECTURAL ELEVATION THRU TURBINE & DRAFT TUBE FERC PROJECT NO. 3403	
SORENSON ENGINEERING CONSULTING ENGINEERS IDAHO FALLS, IDAHO GRAPEVIEW, WASHINGTON	
SCALE:	SHEET NO. A-2



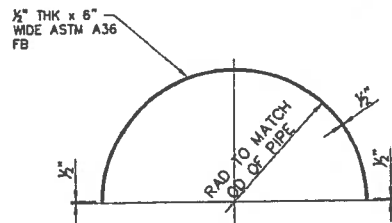
POWERHOUSE ARCHITECTURAL
EAST ELEVATION
SCALE: 1/4" = 1'-0"

REVISIONS			
NOVEMBER, 2005	A	AS-BUILT 2007	
SPB			
SJB			
TSS			
MORA DROP HYDROELECTRIC PROJECT RIVER SIDE INCORPORATED			
POWERHOUSE ARCHITECTURAL EAST ELEVATION FERC PROJECT NO. 3403			
SORENSEN ENGINEERING CONSULTING ENGINEERS IDAHO FALLS, IDAHO GRAPEVIEW, WASHINGTON			
SCALE			
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DRAWING NO. 005-0720 SHEET NO. A-3			

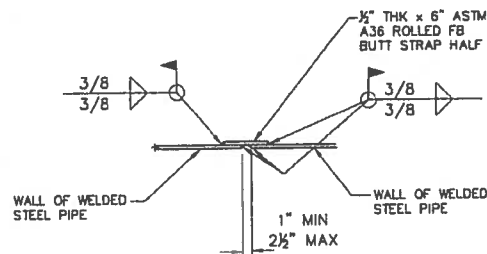


NOTE:
ALL PIPE JOINTS SHALL BE BUTT STRAP TYPE
IN ACCORDANCE WITH THE DETAILS SHOWN ON
SHEET C-4.

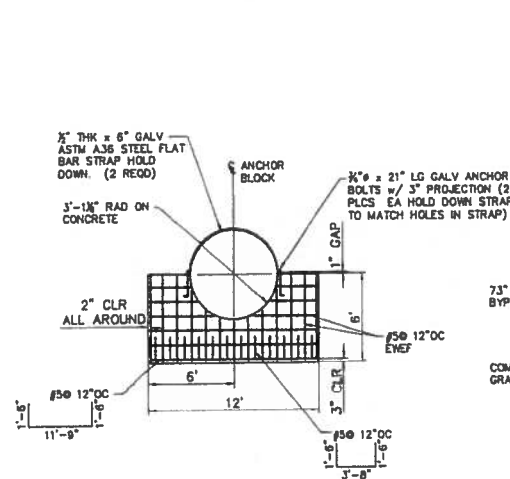
DATE		AUGUST 2005		REV		A		REVISIONS	
BY		SPB		DATE		AS-BUILT 2007			
CHECKED		S.B.		DATE					
APPROVED		TSS		DATE					
PROJECT				DATE					
MORA DROP HYDROELECTRIC PROJECT RIVER SIDE INCORPORATED				PENSTOCK PROFILE FERC PROJECT NO. 3403					
									
SORENSEN ENGINEERING CONSULTING ENGINEERS IDAHO FALLS, IDAHO GRAPEVIEW, WASHINGTON									
NOTED									
DRAWING NO.		05-0702							
SHEET NO.		C-3							



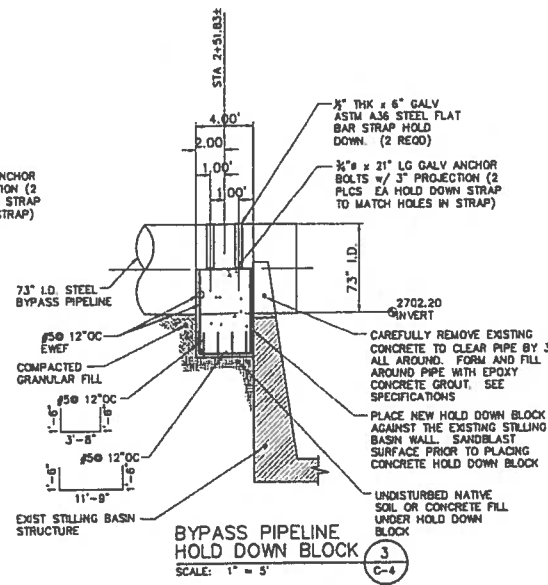
PIPE BUTT STRAP DETAIL
SCALE: N.T.S. (5) C-4



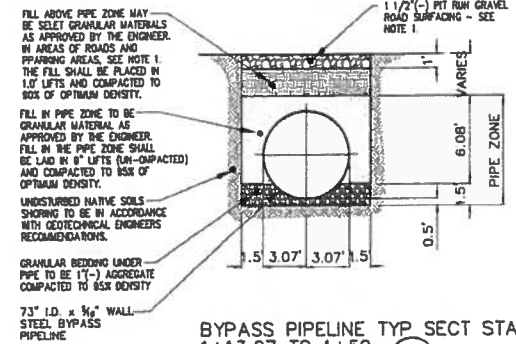
PIPE BUTT STRAP WELD DETAIL
SCALE: N.T.S. (6) C-4



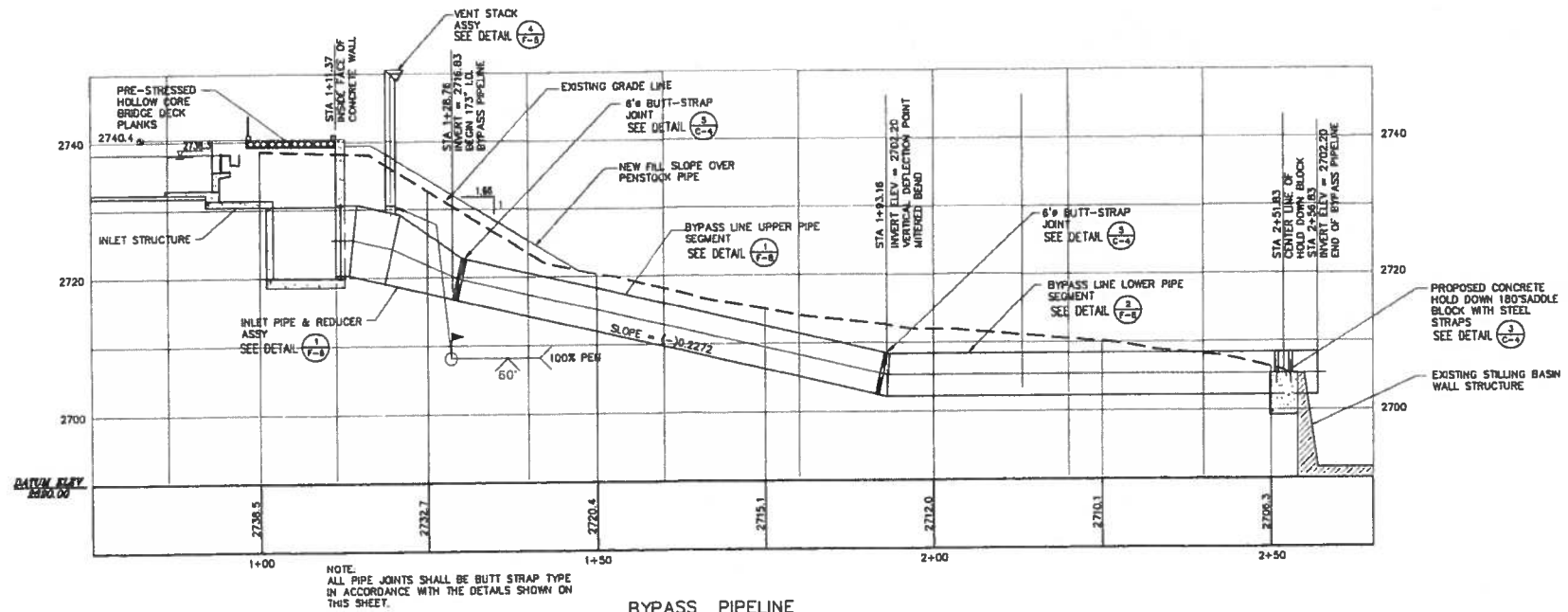
BYPASS PIPELINE HOLD DOWN BLOCK
SCALE: 1" = 5" (4) C-4



BYPASS PIPELINE HOLD DOWN BLOCK
SCALE: 1" = 5" (3) C-4

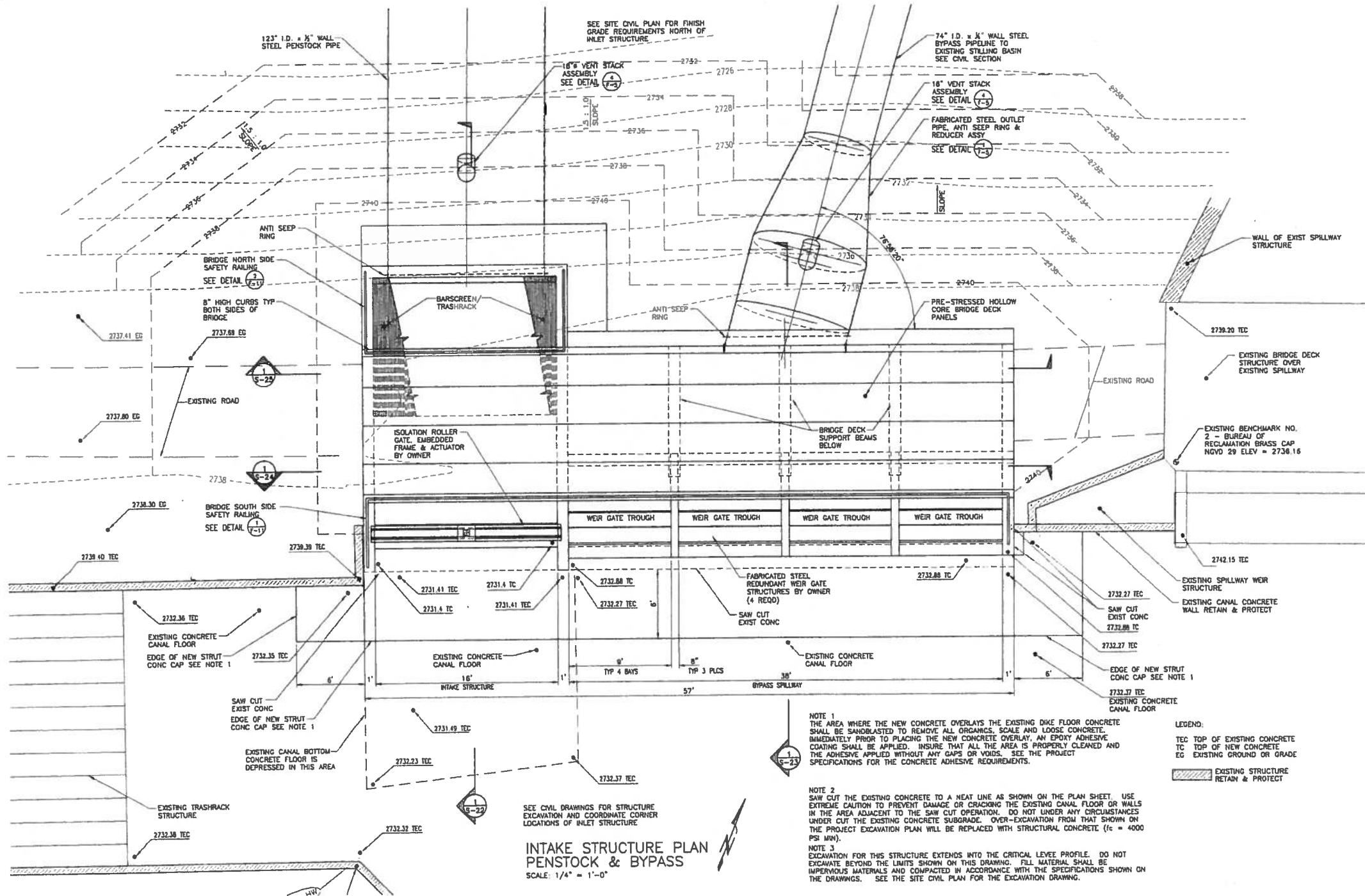


BYPASS PIPELINE TYP SECT STA 1+13.07 TO 1+50
SCALE: 1" = 5" (2) C-4



BYPASS PIPELINE PROFILE
SCALE: 1" = 10' (1) C-4

SORENSEN ENGINEERING CONSULTING ENGINEERS IDAHO FALLS, IDAHO GRAPEVIEW, WASHINGTON				MORA DROP HYDROELECTRIC PROJECT RIVER SIDE INCORPORATED		AUGUST 2005		REV L/R	REVISIONS
SCALE NOTED	DRAWING NO. D05-0702					DESIGNED SPB		A	AS-BUILT 2007
SHEET NO.				BYPASS PIPELINE PROFILE		CHECKED SAB			
				FERC PROJECT NO. 3403		APPROVED TSS			
						DESIGNED			



INTAKE STRUCTURE PLAN
PENSTOCK & BYPASS

SCALE: 1/4" = 1'-0"

NOTE 1
THE AREA WHERE THE NEW CONCRETE OVERLAYS THE EXISTING DIKE FLOOR CONCRETE SHALL BE SANDBLASTED TO REMOVE ALL ORGANICS, SCALE AND LOOSE CONCRETE. IMMEDIATELY PRIOR TO PLACING THE NEW CONCRETE OVERLAY, AN EPOXY ADHESIVE COATING SHALL BE APPLIED. INSURE THAT ALL THE AREA IS PROPERLY CLEANED AND THE ADHESIVE APPLIED WITHOUT ANY GAPS OR VOIDS. SEE THE PROJECT SPECIFICATIONS FOR THE CONCRETE ADHESIVE REQUIREMENTS.

NOTE 2
SAW CUT THE EXISTING CONCRETE TO A NEAT LINE AS SHOWN ON THE PLAN SHEET. USE EXTREME CAUTION TO PREVENT DAMAGE OR CRACKING THE EXISTING CANAL FLOOR OR WALLS IN THE AREA ADJACENT TO THE SAW CUT OPERATION. DO NOT UNDER ANY CIRCUMSTANCES UNDER CUT THE EXISTING CONCRETE SUBGRADE. OVER-EXCAVATION FROM THAT SHOWN ON THE PROJECT EXCAVATION PLAN WILL BE REPLACED WITH STRUCTURAL CONCRETE (f_c = 4000 PSI MIN).

NOTE 3
EXCAVATION FOR THIS STRUCTURE EXTENDS INTO THE CRITICAL LEVEE PROFILE. DO NOT EXCAVATE BEYOND THE LIMITS SHOWN ON THIS DRAWING. FILL MATERIAL SHALL BE IMPERVIOUS MATERIALS AND COMPACTED IN ACCORDANCE WITH THE SPECIFICATIONS SHOWN ON THE DRAWINGS. SEE THE SITE CIVIL PLAN FOR THE EXCAVATION DRAWING.

LEGEND:
TEC TOP OF EXISTING CONCRETE
TC TOP OF NEW CONCRETE
EG EXISTING GROUND OR GRADE
EXISTING STRUCTURE
RETAIN & PROTECT

REVISIONS

AS-BUILT 2007

AUGUST 2005

SPB

SJB

TSS

MORA DROP HYDROELECTRIC PROJECT
RIVER SIDE INCORPORATED

INTAKE STRUCTURE PLAN
PENSTOCK & BYPASS
FERC PROJECT NO. 3403



SORENSEN ENGINEERING
CONSULTING ENGINEERS

IDAHO FALLS, IDAHO
GRAPEVIEW, WASHINGTON

NOTED

005-0720

S-20

THIS DRAWING SHEET HAS
BEEN REDUCED TO ONE-HALF
SIZE--REDUCE SCALES
ACCORDINGLY