



State of Idaho

DEPARTMENT OF WATER RESOURCES

1301 North Orchard Street, Boise, ID 83706 - P.O. Box 83720, Boise, ID 83720-0098
Phone: (208) 327-7900 Fax: (208) 327-7866 Web Site: www.idwr.state.id.us

DIRK KEMPTHORNE
Governor

KARL J. DREHER
Director

September 17, 2004

Ryan N. Adelman, PE
Civil Engineer, Power Production
PO Box 70
Boise, ID 83707

Re: Pahsimeroi Fish Hatchery Broad Crested Weir

Dear Ryan,

I have reviewed the plans you provided IDWR for the proposed weir at the IPCo Hatchery near Ellis, ID. These plans show sufficient detail for proper construction and placement of the new weir. The proposed size of weir is sufficient for the licensed flows of water right numbers 73-7006 and 73-7055 for this point of diversion.

This letter should be considered as certification of approval that the proposed measuring device meets or exceeds IDWR standards. If you have further questions, don't hesitate to call.

Sincerely

Steve Burrell, P.E.
Water Distribution Section

c: Water District file



IDAHO POWER COMPANY
P.O. BOX 70
BOISE, IDAHO 83707

RECEIVED

SEP 14 2004

DEPARTMENT OF
WATER RESOURCES

Ryan N. Adelman, PE
Civil Engineer, Power Production

(208) 388-2483
(208) 388-6689 (Fax)

September 13, 2004

Mr. Steve Burrell
Idaho Department of Water Resources
State Office
1301 N. Orchard
Boise, ID 83706

Re: Lower Pahsimeroi Fish Hatchery
Ellis, ID

Dear Steve;

As we discussed a few weeks ago on the phone, please find enclosed the Project Plan Sheet for the Ramped Broad Crested Weir design at the above mentioned project location. During our discussions, you mentioned IDWR would need to perform a quick review on the design. In addition to the Plan Sheet, I am also enclosing the WinFlume32 summary print.

Per your direction, I contacted Brian Hamilton with the Bureau of Reclamation in Salmon, Idaho to discuss this design. He mentioned most of the Pahsimeroi Valley is a good candidate location to install this type of measuring device.

For your information, we have submitted a Joint Application For Permits with the US Army Corps of Engineers in Idaho Falls, ID. It appears we will qualify for a Nationwide 3 or 18 Permit based on the work we are doing. We anticipate starting construction around October 11, 2004.

If you have any questions regarding the submitted information, please feel free to call me at (208) 388-2483.

Sincerely,

Ryan N. Adelman, PE
Civil Engineer, Power Production
Idaho Power Company

Cc: Paul Abbott; Idaho Power Company Hatchery Manager

Enclosures

SCANNED

MAY 31 2007

BROAD CRESTED WEIR DESIGN:

* DESIGN BASED ON WINFLUME PROGRAM
FROM BUREAU OF RECLAMATION WEBSITE

BOTTOM OF STRUCTURE (FLOOR) = 4662.0

WATER SURFACE ELEVATION (DOWNSTREAM, MILLWATER)

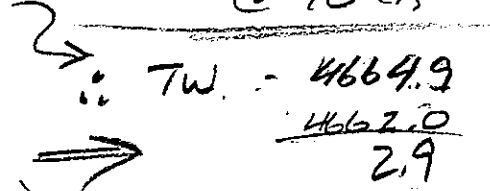
- CONTROLLED BY CREST STRUCTURE
NEAR ADULT POND

MEASURED T.W. Elev.
Aug. 4, 2004

BOTTOM OF
STRUCTURE SET
@ 4662.0'

(SAME AS DIVERSION
FLOOR ELEVATION)

@ 40 cfs.



ULTIMATE H.W.
MARK =

4665.2
- 4662.0

3.2

SET TOP OF CONCRETE WALL @

⇒ 4667.0.

* SEE ATTACHED WINFLUME32 OUTPUT FOR DESIGN

SUMMARY EVALUATION OF FLUME DESIGN

Design is acceptable.

EVALUATION OF FLUME DESIGN FOR EACH DESIGN REQUIREMENT

Ok.	Froude number at $Q_{max} = 0.111$	Maximum allowed = 0.500
Ok.	Freeboard at $Q_{max} = 1.573$ ft	Minimum allowed = 0.235 ft
Ok.	Tailwater at $Q_{max} = 2.900$ ft <i>40 cfs</i>	Maximum allowed = 3.224 ft Submergence Protection at $Q_{max} = 0.324$ ft
Ok.	Tailwater at $Q_{min} = 2.136$ ft	Maximum allowed = 2.855 ft Submergence Protection at $Q_{min} = 0.719$ ft
Ok.	Head at $Q_{max} = 1.177$ ft	Minimum for accuracy = 0.699 ft Expected discharge measurement error at $Q_{max} = \pm 2.82$ %
Ok.	Head at $Q_{min} = 0.752$ ft	Minimum for accuracy = 0.317 ft Expected discharge measurement error at $Q_{min} = \pm 3.79$ %

CONTROL SECTION DATA

Section shape = RECTANGULAR
Bottom width = 10.000 ft
Sill Height, $p_1 = 2.250$ ft

DESIGN CRITERIA

Structure Type: Stationary Crest
Freeboard design criterion: Freeboard $\geq 20\%$ of upstream sill-referenced head
Allowable discharge measurement errors for a single measurement:
 At minimum discharge: ± 8 %
 At maximum discharge: ± 4 %
Head detection method: Staff gage in stilling well, $Fr=0.2$
 Expected measurement error = ± 0.016404 ft
Design discharges and associated tailwater levels:
 Minimum discharge = 20.000 cu. ft/s Minimum tailwater depth = 2.136 ft
 Maximum discharge = 40.000 cu. ft/s Maximum tailwater depth = 2.900 ft
Tailwater calculation method: Power curve using 2 $Q-y_2$ measurements
 $Q = 40.000$ cu. ft/s ---> $y_2 = 2.900$ ft
 $Q = 50.000$ cu. ft/s ---> $y_2 = 3.200$ ft

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MAY 31 2007

User: Ryan N. Adelman, PE WinFlume32 - Version 1.05.0023
C:\Program Files\WinFlume\Pahsimeroi-62-0.Flm - Revision 30
Ramped BCW - Pahsimeroi
Printed: 9/2/2004 3:59:11 PM

FLUME DATA REPORT

GENERAL DATA ON FLUME

Type of structure: Stationary Crest
Type of lining: Concrete - smooth [custom]
Roughness height of flume: 0.000492 ft

BOTTOM PROFILE DATA

Length per section: Approach section, La = 2.000 ft
Converging transition, Lb = 6.750 ft
Control section, L = 3.000 ft
Diverging transition, Ld = 6.750 ft (truncated)

Vertical dimensions: Upstream channel depth = 5.000 ft
Height of sill, pl = 2.250 ft
Bed drop = 0.000 ft
Diverging transition slope = 6.000:1

-- APPROACH SECTION DATA --

Section shape = RECTANGULAR
Bottom width = 10.000 ft

-- CONTROL SECTION DATA --

Section shape = RECTANGULAR
Bottom width = 10.000 ft

-- TAILWATER SECTION DATA --

Section shape = SIMPLE TRAPEZOID
Bottom width = 20.000 ft
Side slopes = 1.00:1

User: Ryan N. Adelman, PE WinFlume32 - Version 1.05.0023
C:\Program Files\WinFlume\Pahsimeroi-62-0.Flm - Revision 28
Ramped BCW - Pahsimeroi
Printed: 9/2/2004 3:51:10 PM

SUMMARY EVALUATION OF FLUME DESIGN

Design is acceptable.

EVALUATION OF FLUME DESIGN FOR EACH DESIGN REQUIREMENT

- Ok. Froude number at Qmax = 0.129 Maximum allowed = 0.500
- Ok. Freeboard at Qmax = 1.391 ft Minimum allowed = 0.272 ft
- Ok. Tailwater at Qmax = 3.200 ft *50 ds* Maximum allowed = 3.386 ft
Submergence Protection at Qmax = 0.186 ft
- Ok. Tailwater at Qmin = 2.136 ft Maximum allowed = 2.855 ft
Submergence Protection at Qmin = 0.719 ft
- Ok. Head at Qmax = 1.359 ft Minimum for accuracy = 0.699 ft
Expected discharge measurement error at Qmax = ±2.62 %
- Ok. Head at Qmin = 0.752 ft Minimum for accuracy = 0.317 ft
Expected discharge measurement error at Qmin = ±3.79 %

CONTROL SECTION DATA

Section shape = RECTANGULAR
Bottom width = 10.000 ft
Sill Height, p1 = 2.250 ft

DESIGN CRITERIA

Structure Type: Stationary Crest
Freeboard design criterion: Freeboard >= 20% of upstream sill-referenced head
Allowable discharge measurement errors for a single measurement:
At minimum discharge: ±8 %
At maximum discharge: ±4 %
Head detection method: Staff gage in stilling well, Fr=0.2
Expected measurement error = ±0.016404 ft
Design discharges and associated tailwater levels:
Minimum discharge = 20.000 cu. ft/s Minimum tailwater depth = 2.136 ft
Maximum discharge = 50.000 cu. ft/s Maximum tailwater depth = 3.200 ft
Tailwater calculation method: Power curve using 2 Q-y2 measurements
Q = 40.000 cu. ft/s ---> y2 = 2.900 ft
Q = 50.000 cu. ft/s ---> y2 = 3.200 ft

User: Ryan N. Adelman, PE WinFlume32 - Version 1.05.0023
C:\Program Files\WinFlume\Pahsimeroi-62-0.Flm - Revision 28
Ramped BCW - Pahsimeroi
Printed: 9/2/2004 3:51:12 PM

FLUME DATA REPORT

GENERAL DATA ON FLUME

Type of structure: Stationary Crest
Type of lining: Concrete - smooth [custom]
Roughness height of flume: 0.000492 ft

BOTTOM PROFILE DATA

Length per section: Approach section, La = 2.000 ft
Converging transition, Lb = 6.750 ft
Control section, L = 3.000 ft
Diverging transition, Ld = 6.750 ft (truncated)

Vertical dimensions: Upstream channel depth = 5.000 ft
Height of sill, pl = 2.250 ft
Bed drop = 0.000 ft
Diverging transition slope = 6.000:1

-- APPROACH SECTION DATA --

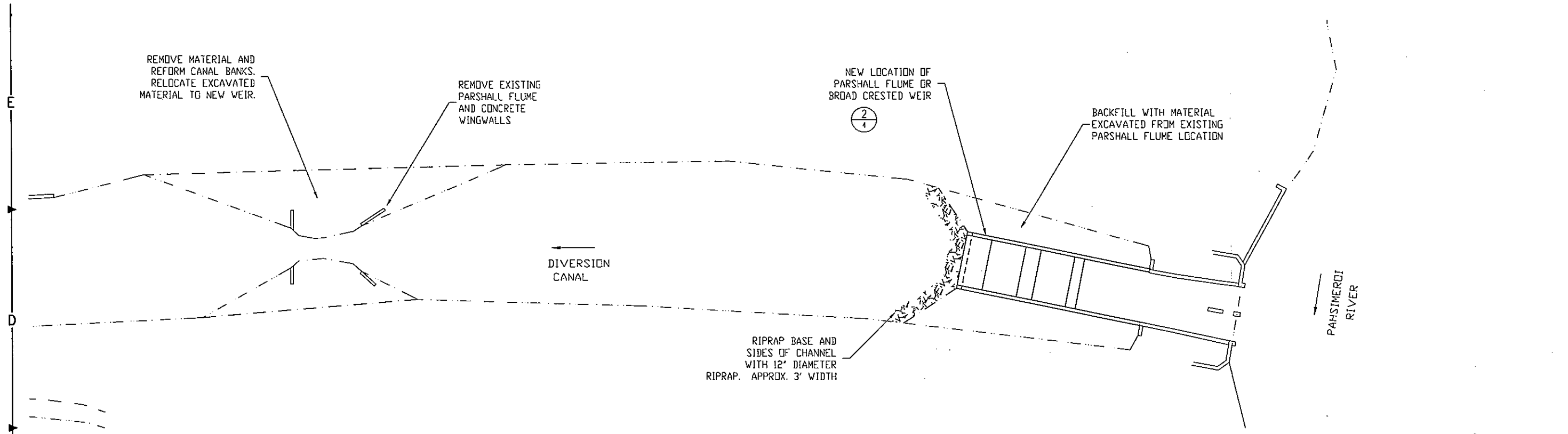
Section shape = RECTANGULAR
Bottom width = 10.000 ft

-- CONTROL SECTION DATA --

Section shape = RECTANGULAR
Bottom width = 10.000 ft

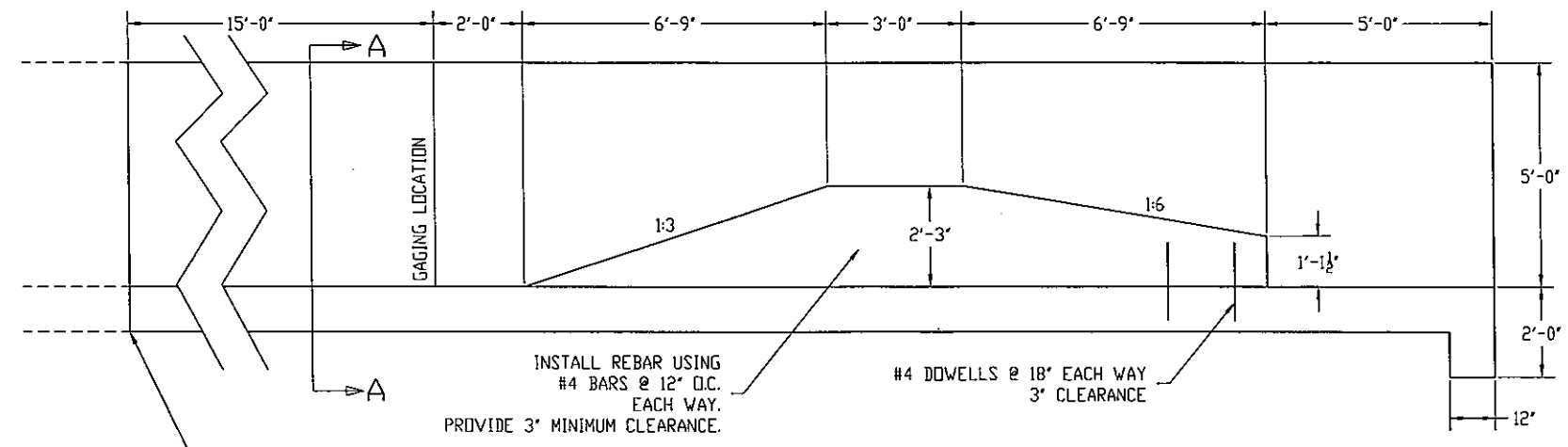
-- TAILWATER SECTION DATA --

Section shape = SIMPLE TRAPEZOID
Bottom width = 20.000 ft
Side slopes = 1.00:1

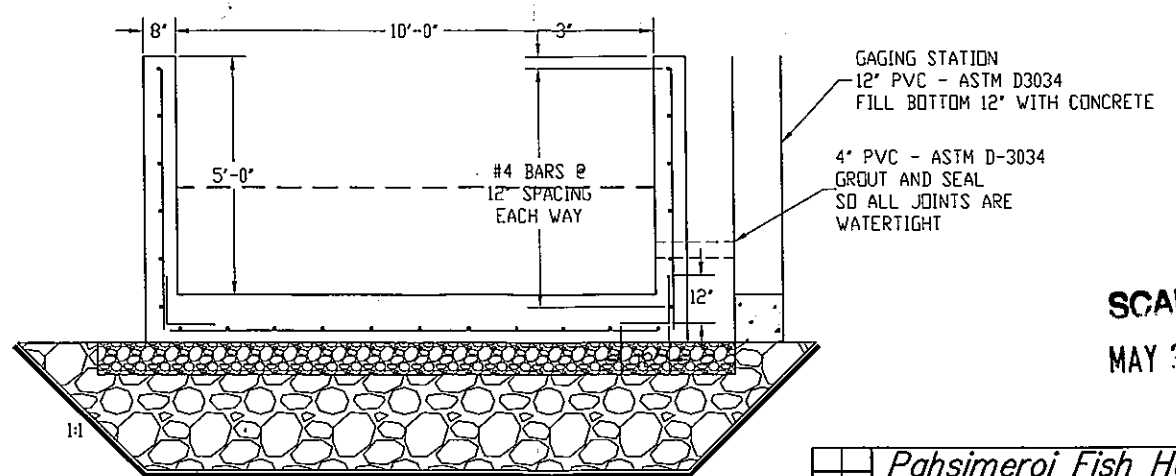


- NOTES:
- SUBGRADE SEPERATION GEOTEXTILE TO BE USE IN ALL NEW CONCRETE CONSTRUCTION LOCATIONS HAVING THE FOLLOWING SPECIFICATIONS:
 - WOVEN OR NONWOVEN MADE FROM POLYOLEFINS OR POLYESTERS
 - ELONGATION GREATER THAN 50% COMPLYING WITH ASTM D4632
 - GRAB TENSILE STRENGTH: 180 LBF MIN.; ASTM D4632
 - TEAR STRENGTH: 70 LBF MIN.; ASTM D4533
 - PUNCTURE STRENGTH: 70 LBF MIN.; ASTM D4833
 - APPARENT OPENING SIZE: NO. 30 SIEVE MAX.; ASTM D4751
 - PERMITTIVITY: 0.02 PER SEC. MIN.; ASTM D4491

PLAN VIEW 1
SCALE: 1"=10'



BROAD CRESTED WEIR 2
SCALE: 1"=4'



SECTION A
SCALE: 1"=2'

SCANNED
MAY 31 2007

Pahsimeroi Fish Hatchery Broad Crested Weir Details	
IDAHO POWER COMPANY BOISE, IDAHO	
SCALE: For 22"x34" Sheet DATE: August 25, 2004	
DS. RNA	APPROVED
DR. RNA	20D-.....

Pahsimeroi River
Lemhi County, Idaho