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**NOTE:**
GREY ROWS REPRESENT SHEETS THAT HAVE NOT YET BEEN CREATED BUT WILL BE ADDED TO FUTURE SUBMITTAL.
ENLOE DAM DEWATERING SYSTEM - CONSTRUCTION SEQUENCE:

1. Modify the access road near the dam to make it easier to bring construction equipment to the site.
2. Construct a temporary bridge across the ravine adjacent to the right bank intake structure.
3. Remove rock from the right bank knap using a hoe to allow equipment to pass by.
4. Remove the approximately 300 feet of the remaining portion of the 7-foot diameter wood stave penstock downstream of the right abutment at the dam.
5. Remove debris, concrete supports above grade, vegetation, and slide rock and soil material from the existing bench where the existing wood stave penstocks were located. Regrade the existing bench to receive the new dewatering penstocks and their footings. Clear a work bench and access road down to the existing penstock elevations.
6. Downstream of the existing intakes and the existing dam right bank abutment, install the reinforced concrete footings with the anchors and foundation saddle supports for the new 82-inch steel dewatering pipes.
7. Clean all loose material from the inside of the steel, existing 84-inch O.D. x 14.7-inch pipe "thimbles" at the downstream side of the right abutment. Including removing any loose or spalled concrete from the concrete conduit surface up to the downstream side of the existing intake gates.
8. Insert the new 82-inch steel pipes into the existing 84-inch O.D. pipe thimbles and extend 15'-0" into the existing concrete at the right abutment. With the new pipe held centered in place in the existing conduit, route the annulus between the new pipe O.D. to the existing conduit O.D. from the bottom to the top to force out any air pockets.
9. Install the full length of each new penstock.
10. Install the steel pipe straps and the concrete downstream thrust block to fully secure the penstock assemblies.
11. Sawcut and remove gate lift corbels, per sheet S-103.
12. Diver crews will be utilized to remove all silt and rubble from the intake cell. Material will have to be loaded out of the area in small loads.
13. Using divers, place bulkhead slot reinforcing plates in the bulkhead slots.
14. Using divers and the pre-drilled holes in the bulkhead slot reinforcing plates as a template, hammer drill the anchor holes in the concrete monolith.
15. Using divers, install the epoxy anchor bolts underwater.
16. After the epoxy has cured, and using divers, tighten the anchor bolts to the torque values specified.
17. Using divers, pressure fill the gap between the bulkhead slot and the existing concrete of the monolith with tremie concrete grout from the bottom up.
18. Install new fabricated bulkhead gates in the stoplog slots.
19. After the bulkhead gates are installed and sealed in the existing repaired stoplog slots, pumps will be utilized to dewater the intake cell, drying out the area(s) of the new bulkhead gates.
20. With the bulkhead gates installed in the stoplog slots, workers in the dry upstream of the existing gates shall remove each existing gate and its track from the upstream side at each conduit. Torch cutting or abrasive cutting of the bolts fastening each gate and track to the concrete is anticipated to be required.
21. Installation of the new waterman slide gates will occur in the dry, behind the sealed bulkhead gates.
22. Before the bulkhead gates are removed, test the new gates over the full range of motion and close them.
23. Remove the bulkhead gates from stoplog slots.
24. Test and operate the new waterman slide gates over their full range of motion, with consideration for permit requirements and streamflow conditions. Open the new gates over the full range of motion and close them. The new gates will discharge water through the new penstocks. Open one new gate at a time during this initial testing.
25. Upon initial opening of the slide gates with the temporary bulkhead gates removed, a significant amount of sediment is expected to be transmitted downstream. The construction sequence does not include any provisions for mitigation or removal of sediment from the forebay, upstream of the intake structure.
26. At the appropriate scheduled time, open the new gates on the right bank and dewater the downstream face of the dam for inspection and/or repair purposes.
RIGHT BANK SITE PLAN

S-101

CONCRETE PIPE SUPPORT BENTS TYP (4) LOCATIONS

STEEL SUPPORT BEAMS WITH SADDLES TYP (20)

VARIES WITH CONCRETE BENTS

6" N D STEEL DISCHARGE PIPES TYP

B R I D G E

A C C E S S R O A D (E X I S T I N G)

10'-0" STEEL DISCHARGE PIPES TYP

CONCRETE THRUST BLOCK

12'-0" STEEL THRUST BEAMS TYP

Copyright: Tetra Tech
PLAN - DOWNSTREAM THRUST BLOCK

1" Ø WILLIAMS ALL-THREAD GRouted ROCK ANCHORS, Prestressed W-1/2" Holes. Total (3) for downstream thrust block.

Pipe 6'-10" Ø x 3/8" Wall Thickness per AWWA

Bolted pipe flanges (Typ) 6" x 6" of concrete thrust block.

REINFORCED CONCRETE THRUST BLOCK

PIPE 6'-10" Ø x 3/8" WALL THICKNESS PER AWWA

Hillside slopes up

DISCHARGE 35°

PUD NO. 1 OF OKANOGAN COUNTY ENLOE HYDROELECTRIC PROJECT ENLOE DAM DEWATERING SYSTEM

Copyright: Tetra Tech

DRAFT - NOT FOR CONSTRUCTION
1/2" WILLIAMS ALL-THREAD GROUTED ROCK ANCHORS, PRESTRESSED WITH 4-1/2" HOLES. (3) TOTAL.

HILLSIDE

DOWNSTREAM THRUST BLOCK ELEVATION

SCALE: 1/4" = 1'-0"
BAR MEASURES 1 INCH

Copyright: Tetra Tech

DRAFT - NOT FOR CONSTRUCTION

PUD NO. 1 OF OKANOGAN COUNTY
ENLOE HYDROELECTRIC PROJECT
ENLOE DAM DEWATERING SYSTEM

MGH AT BST

STOPLOG SLOT AND BULKHEAD DETAILS 2
S-122

UNITED STATES OF AMERICA

10" EXISTING SLOT

10" 

3/8" STAINLESS STEEL, THREADED RODS
AT 2'-0" O.C. VERTICAL SPACING
APPROVED FOR UNDERWATER INSTALLATION

3/8" PL, STAINLESS STEEL
FULL HEIGHT OF BULKHEAD SLOT

UHMW BEARING PADS

WELD NUT TO BOLT AFTER EPOXY HAS CURED. TYP (2) LOC

3/8" STAINLESS STEEL, THREADED RODS
AT 2'-0" O.C. VERTICAL SPACING
WITH HIGH STRENGTH EPOXY
APPROVED FOR UNDERWATER INSTALLATION

FOAM RUBBER STRIP TO SEAL GROUT

BULKHEAD SLOT REINFORCING

0 3" 6" 9" 12" 15" 18" 21" 24" 27" 30" 33" 36" 39" 42" 45" 48" 51" 54" 57" 60" 63" 66" 69" 72" 75" 78" 81" 84" 87" 90" 93" 96" 99" 102" 105" 108" 111" 114" 117" 120" 123" 126" 129" 132" 135" 138" 141" 144" 147" 150" 153" 156" 159" 162" 165" 168" 171" 174" 177" 180" 183" 186" 189" 192" 195" 198" 201" 204" 207" 210" 213" 216" 219" 222" 225" 228" 231" 234" 237" 240" 243" 246" 249" 252" 255" 258" 261" 264" 267" 270" 273" 276" 279" 282" 285" 288" 291" 294" 297" 300" 303" 306" 309" 312" 315" 318" 321" 324" 327" 330" 333" 336" 339" 342" 345" 348" 351" 354" 357" 360" 363" 366" 369" 372" 375" 378" 381" 384" 387" 390" 393" 396" 399" 402" 405" 408" 411" 414" 417" 420" 423" 426" 429" 432" 435" 438" 441" 444" 447" 450" 453" 456" 459" 462" 465" 468" 471" 474" 477" 480" 483" 486" 489" 492" 495" 498" 501" 504" 507" 510" 513" 516" 519" 522" 525" 528" 531" 534" 537" 540" 543" 546" 549" 552" 555" 558" 561" 564" 567" 570" 573" 576" 579" 582" 585" 588" 591" 594" 597" 600" 603" 606" 609" 612" 615" 618" 621" 624" 627" 630" 633" 636" 639" 642" 645" 648" 651" 654" 657" 660" 663" 666" 669" 672" 675" 678" 681" 684" 687" 690" 693" 696" 699" 702" 705" 708" 711" 714" 717" 720" 723" 726" 729" 732" 735" 738" 741" 744" 747" 750" 753" 756" 759" 762" 765" 768" 771" 774" 777" 780" 783" 786" 789" 792
NOTES:

1. CONTRACTOR TO FIELD VERIFY ALL EXISTING CONDITIONS AND DIMENSIONS.

2. INSTALL NEW 90" x 90" WATERMAN SLIDE GATE TYPE SS251-1-1.5 OR EQUIVALENT WITH NEW VERTICAL TRACK RAILS AND MANUAL ACTUATOR THAT CAN BE OPERATED BY PORTABLE DRILL. (REPLACES EXISTING GATE AND TRACK).

CHECKED BY: ____________________________

DRAFT - NOT FOR CONSTRUCTION

PUD NO. 1 OF OKANOGAN COUNTY
ENLOE HYDROELECTRIC PROJECT
ENLOE DAM DEWATERING SYSTEM
VERTICAL SLIDE GATE DETAILS

S-132

SCALE: 1/2" = 1'

96" x 90" WATERMAN SLIDE GATE
TYPE SS-251-1-1.5 OR EQUIVALENT

EMBED DETAIL
S-131
SCALE: 6" = 1'

EMBED DETAIL
S-131
SCALE: 6" = 1'

SLIDE GATE OPERATOR

DETAILED - VERTICAL SLIDE GATE

SCALE: 1/2" = 1'