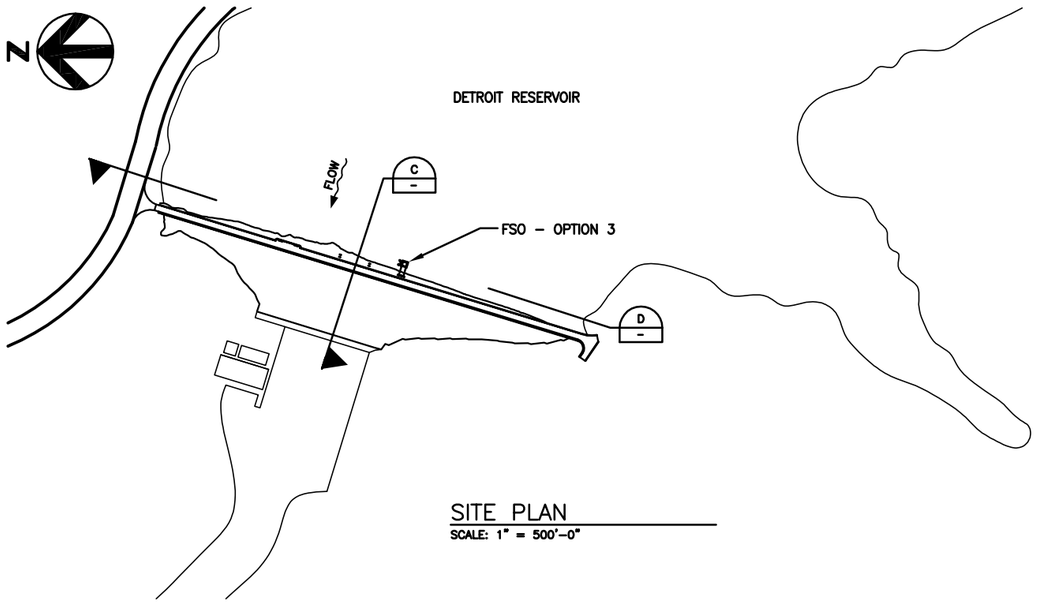
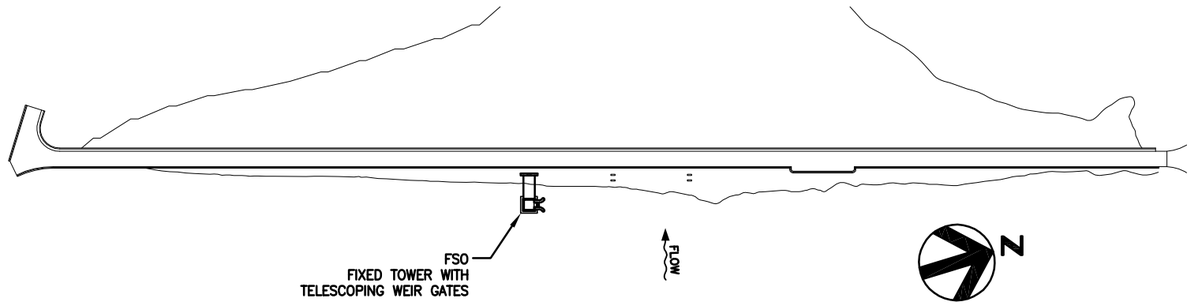
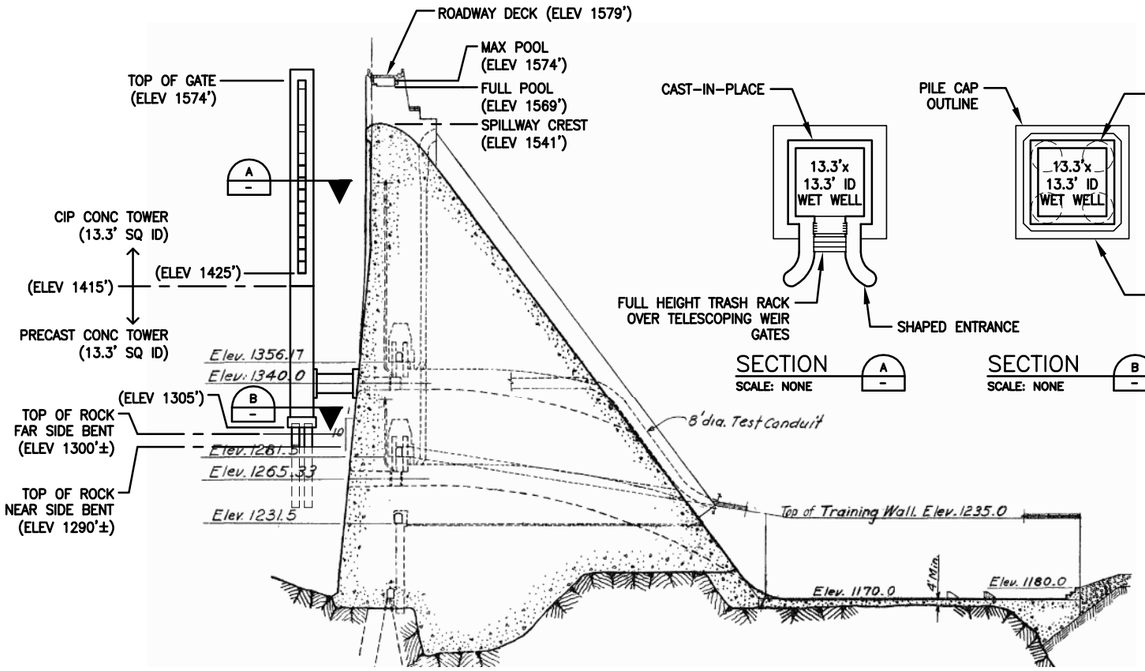


SITE PLAN
SCALE: 1" = 500'-0"



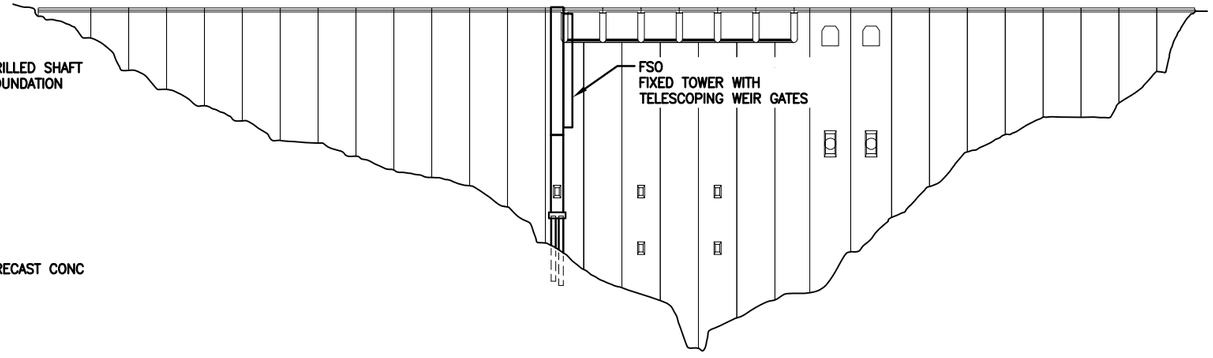
PLAN
SCALE: 1" = 200'-0"



SECTION
SCALE: NONE
C

SECTION
SCALE: NONE
A

SECTION
SCALE: NONE
B



SECTION
SCALE: 1" = 200'-0"
D

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PROJECT TITLE
USACE DETROIT DAM
SELECTIVE WITHDRAW STRUCTURE

SHEET TITLE
FLOATING SURFACE OUTLET - OPTION 3
FIXED TOWER WITH TELESCOPING WEIR GATES CONCEPT

PROJECT NUMBER
236600

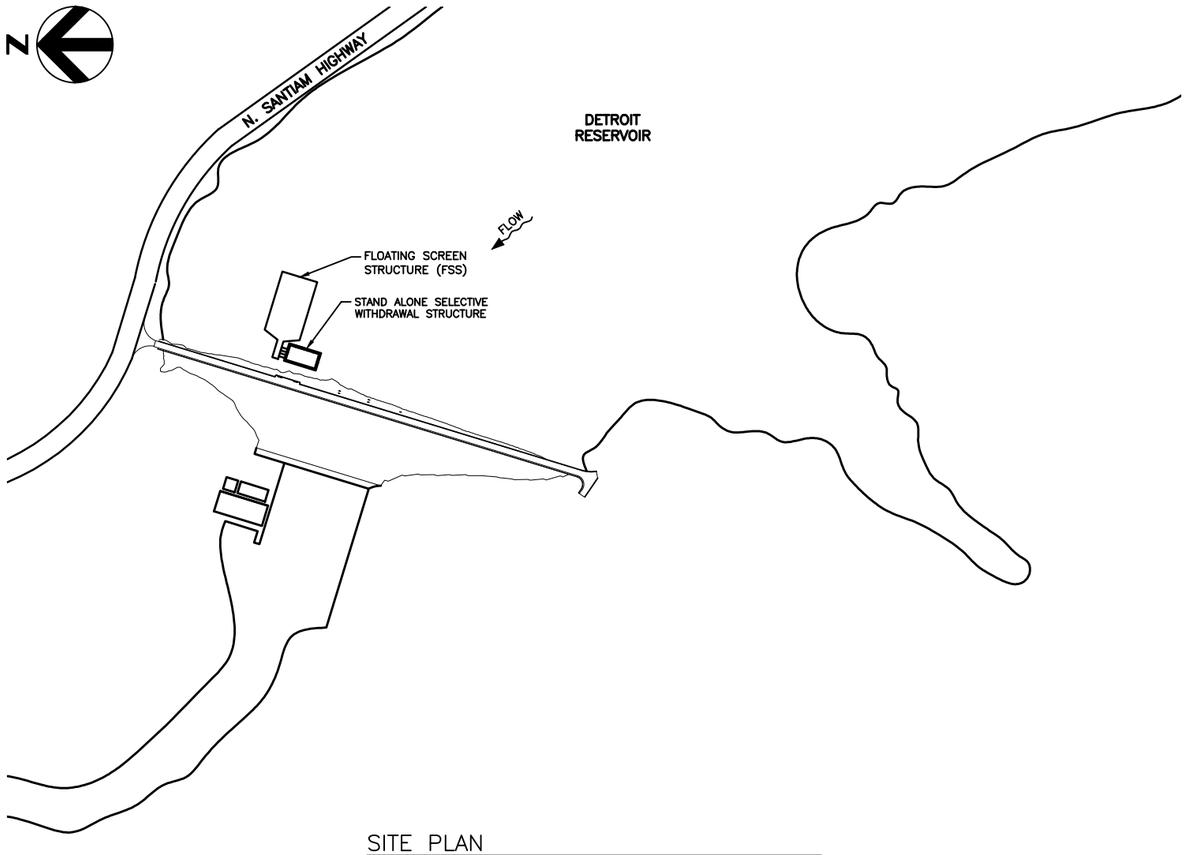
PROJECT MANAGER
Shane Cline

DATE
October 2014

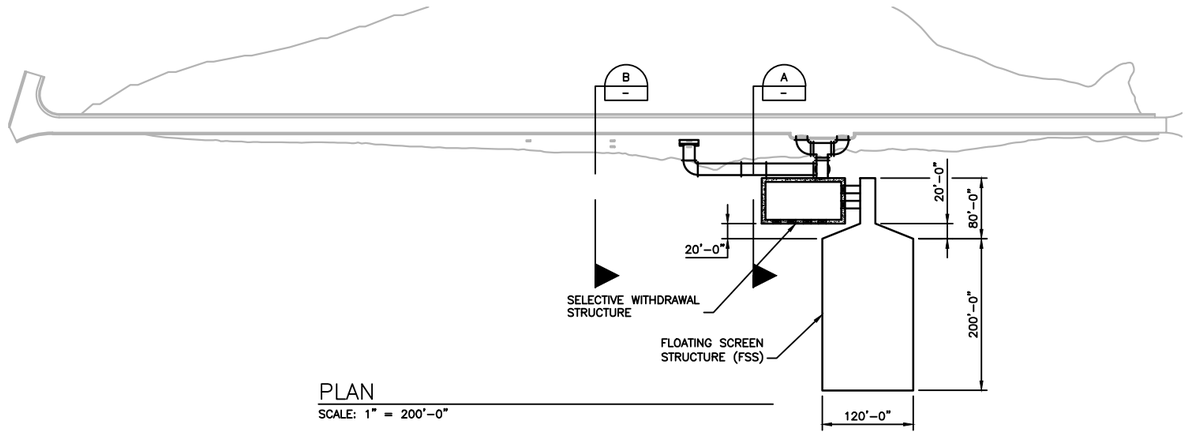
REFERENCE SHEET
–

REFERENCE DOCUMENT
General Assessment of Concepts

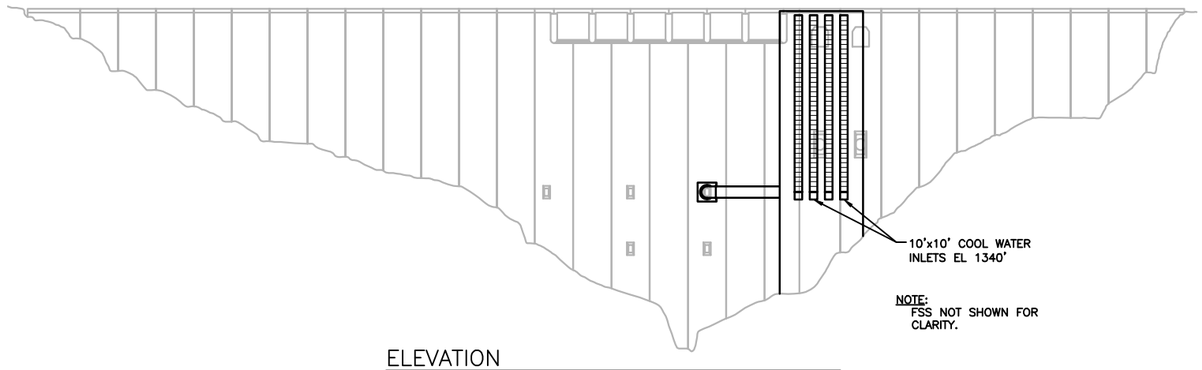
EXHIBIT NUMBER
FSO–1



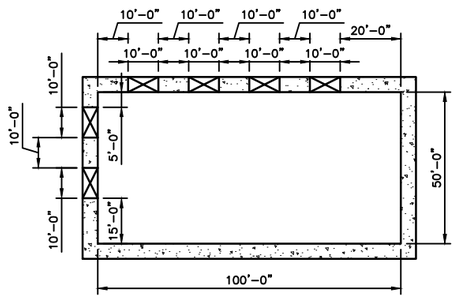
SITE PLAN
SCALE: 1" = 500'–0"



PLAN
SCALE: 1" = 200'–0"



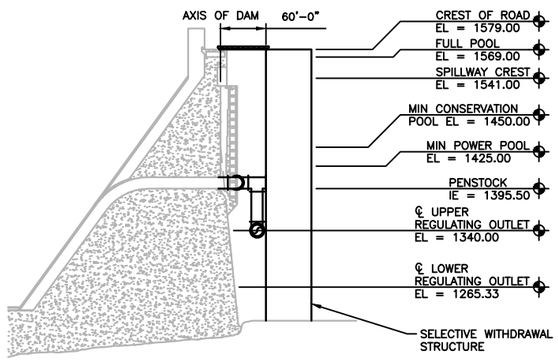
ELEVATION
SCALE: 1" = 200'–0"



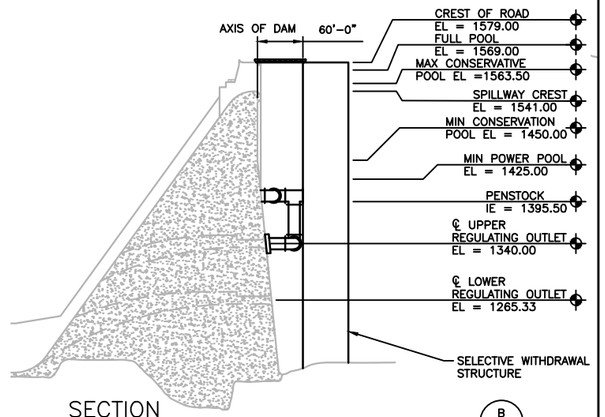
DETAIL 1
SCALE: 1" = 50'–0"

NOTES:

1. ROCK OR STIFF SOIL IS ASSUMED AT THE BASE OF THE STRUCTURE.
2. SILT LAYER ABOVE THE FOUNDATION SOIL WILL BE DREDGED AND REMOVED.



SECTION A
SCALE: 1" = 200'–0"



SECTION B
SCALE: 1" = 200'–0"

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PROJECT TITLE USACE DETROIT DAM
SELECTIVE WITHDRAW STRUCTURE

SHEET TITLE
STAND-ALONE SWS OPTION 3

PROJECT NUMBER
236600

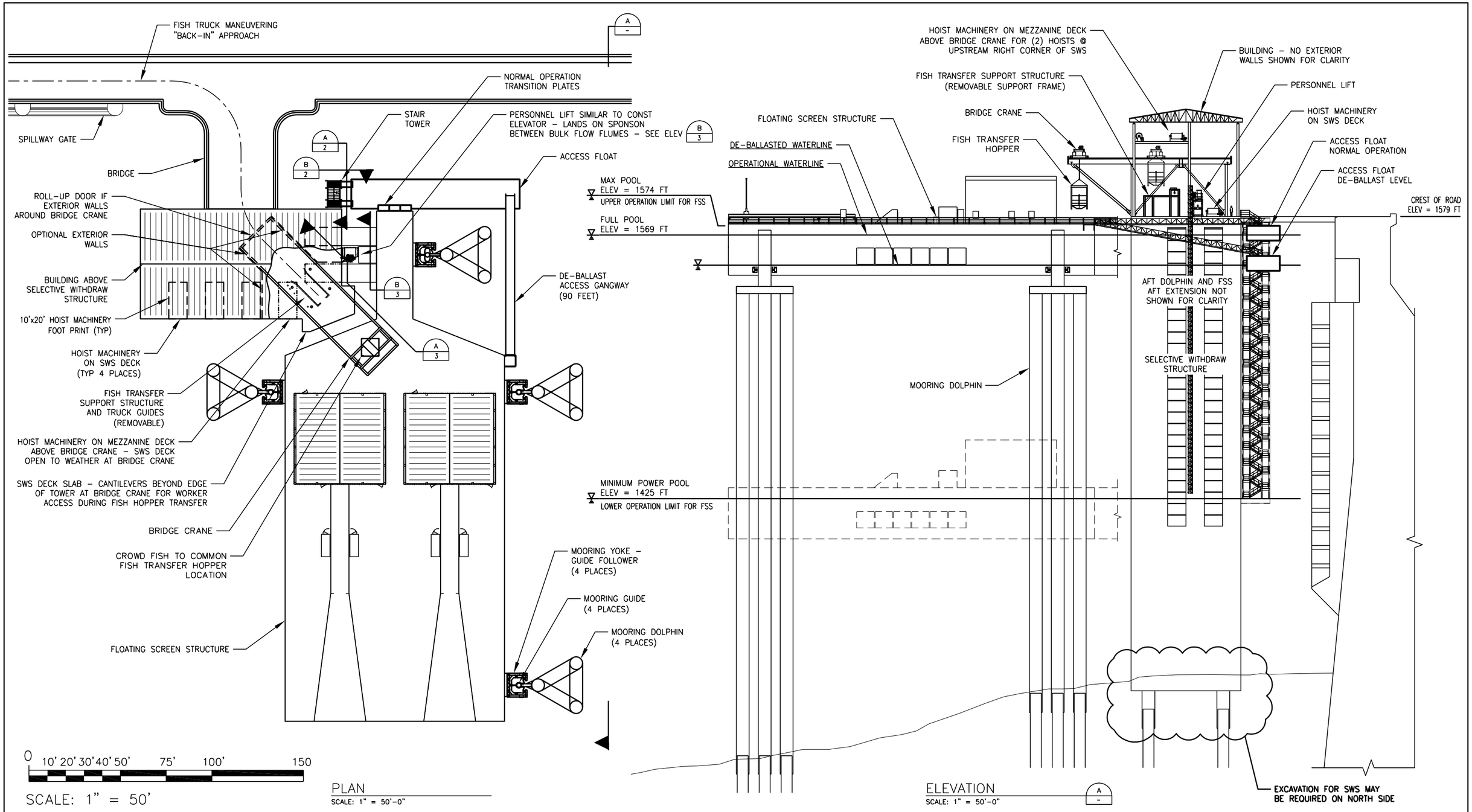
PROJECT MANAGER
Shane Cline

DATE
October 2014

REFERENCE SHEET
–

REFERENCE DOCUMENT
Gen. Assessment of Concepts

EXHIBIT NUMBER
SWS–1



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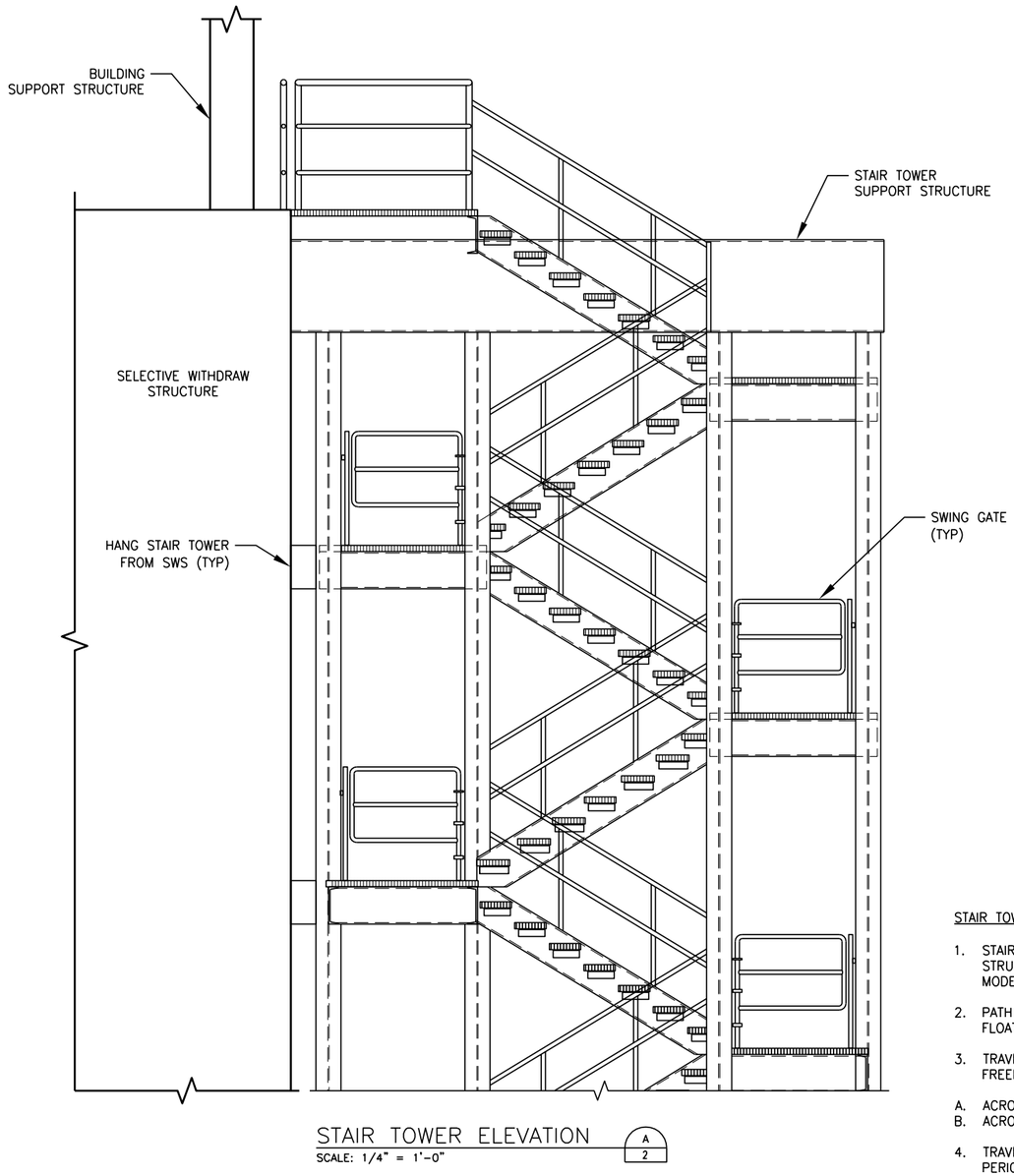
PROJECT TITLE USACE DETROIT DAM
SELECTIVE WITHDRAW STRUCTURE

SHEET TITLE
FLOATING SCREEN STRUCTURE
PERSONNEL AND OPERATIONAL ACCESS LAYOUT

CONCEPT FOR DISCUSSION

PROJECT NUMBER 236600
PROJECT MANAGER Shane Cline
DATE 10/16/2014

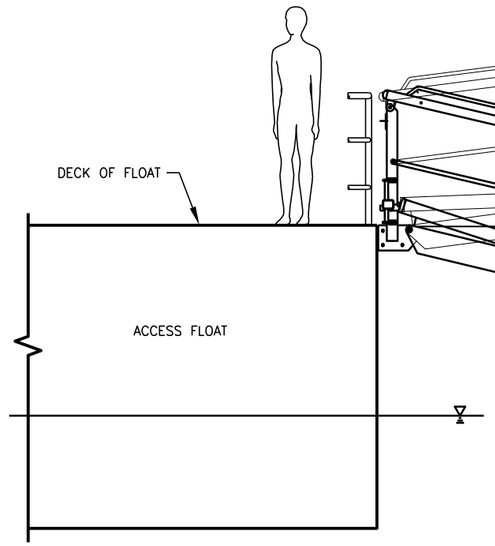
REFERENCE SHEET –
REFERENCE DOCUMENT Personnel Access Concept
EXHIBIT NUMBER –



STAIR TOWER ELEVATION (A/2)
SCALE: 1/4" = 1'-0"

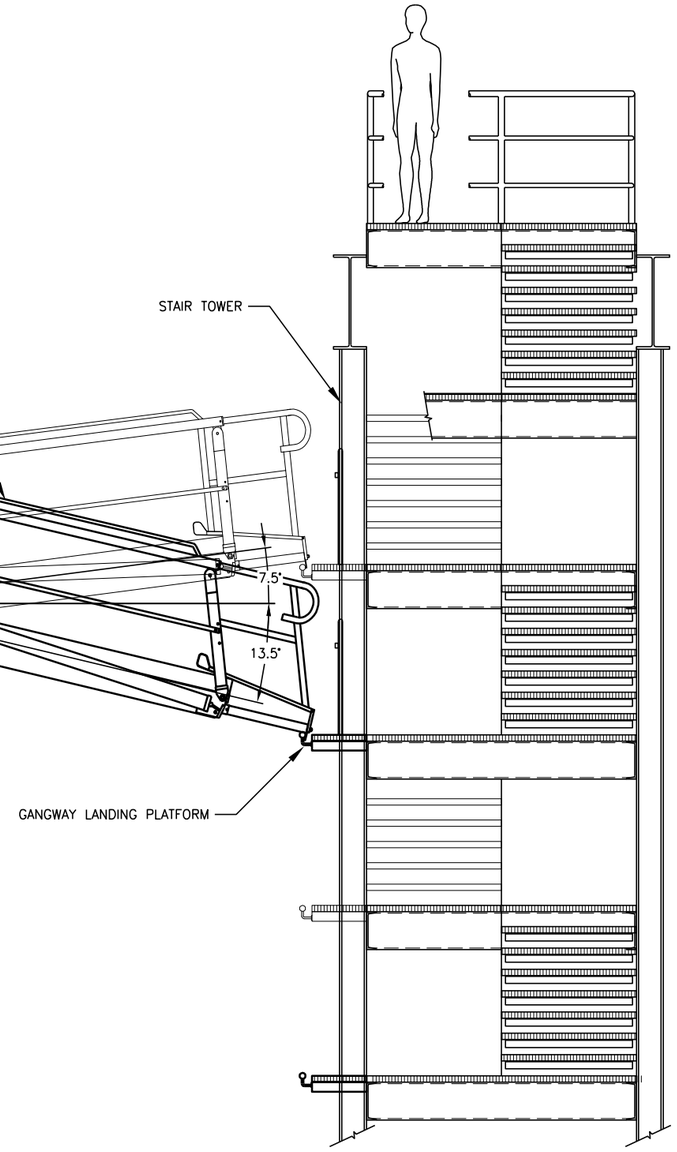
0 1' 2' 3' 4' 6' 8' 12'

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



STAIR TOWER NOTES:

1. STAIR TOWER IS ALTERNATE/EMERGENCEY INGRESS & EGRESS TO FLOATING SCREEN STRUCTURE; ELECTRIC MOTOR DRIVE RACK & PINION ELEVATOR IS PRIMARY ACCESS MODE.
2. PATH OF TRAVEL TO & FROM FSS VIA THE STAIR TOWER IS ACROSS THE ACCESS FLOAT.
3. TRAVERSING FROM FSS TO ACCESS FLOAT DURING NORMAL OPERATION; I.E. WHEN FREEBOARDS OF FLOATS ARE EQUAL:
   A. ACROSS TRANSITION PLATES
   B. ACROSS 90 FOOT LONG GANGWAY
4. TRAVERSING FROM FSS TO ACCESS FLOAT DURING FSS DE-BALLASTED MAINTENANCE PERIOD; I.E. WHEN FREEBOARD HEIGHT IS OFFSET 18 FEET:
   A. ACROSS 90 FOOT LONG GANGWAY.
5. THIRD PATH OF INGRESS/EGRESS IS VIA WORK BOAT MOORED AT ACCESS FLOAT; RAMP LOW POOL LEVEL OPERATIONAL LIMIT IS ELEVATION ____. THERE IS NO UPPER LIMIT FOR BOAT RAMP ACCESS WHEN POOL IS FULL.



STAIR TOWER SECTION (B/2)
SCALE: 1/4" = 1'-0"

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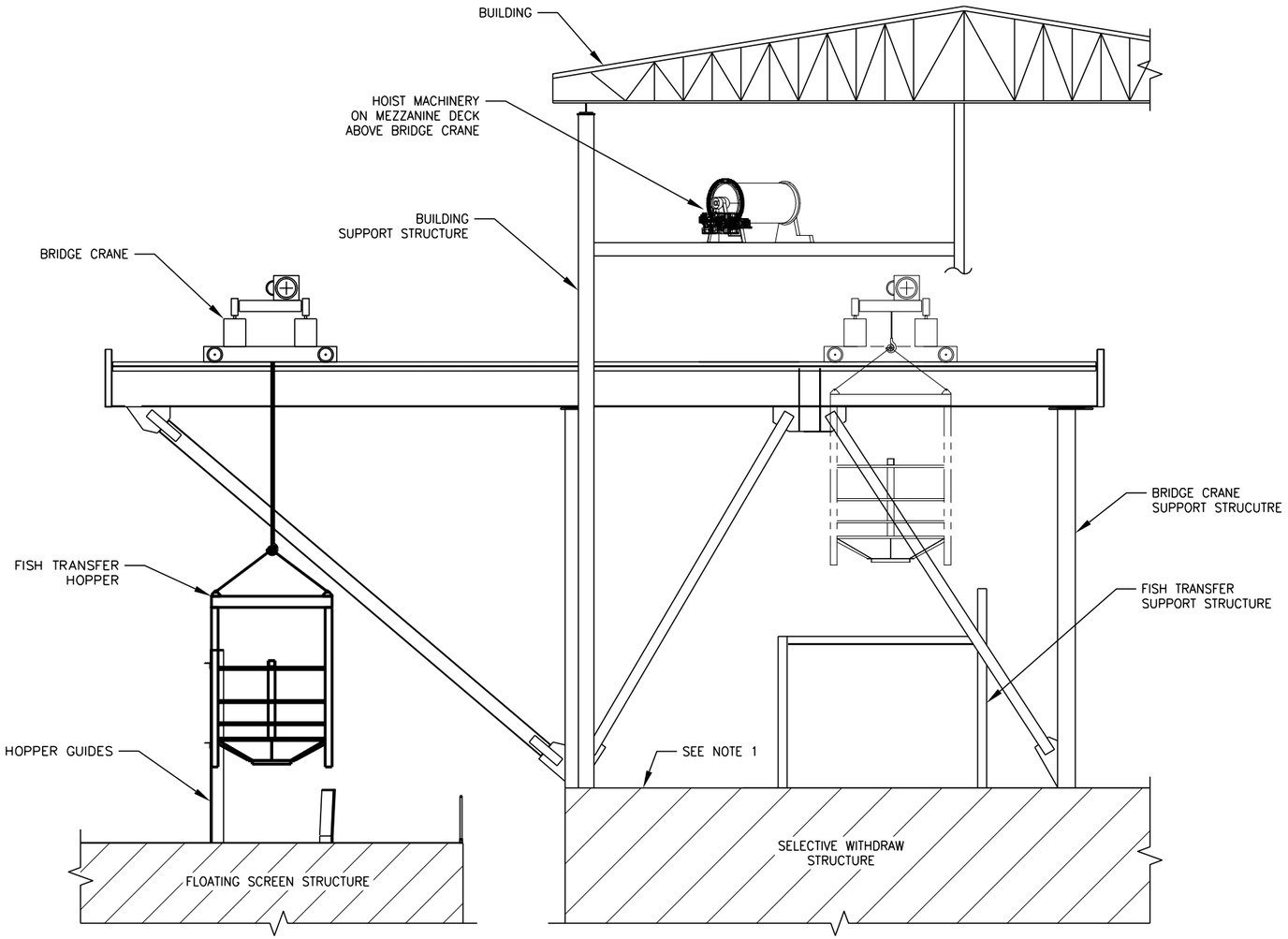
SELECTIVE WITHDRAW STRUCTURE

SHEET TITLE
FLOATING SCREEN STRUCTURE
PERSONNEL AND OPERATIONAL ACCESS LAYOUT

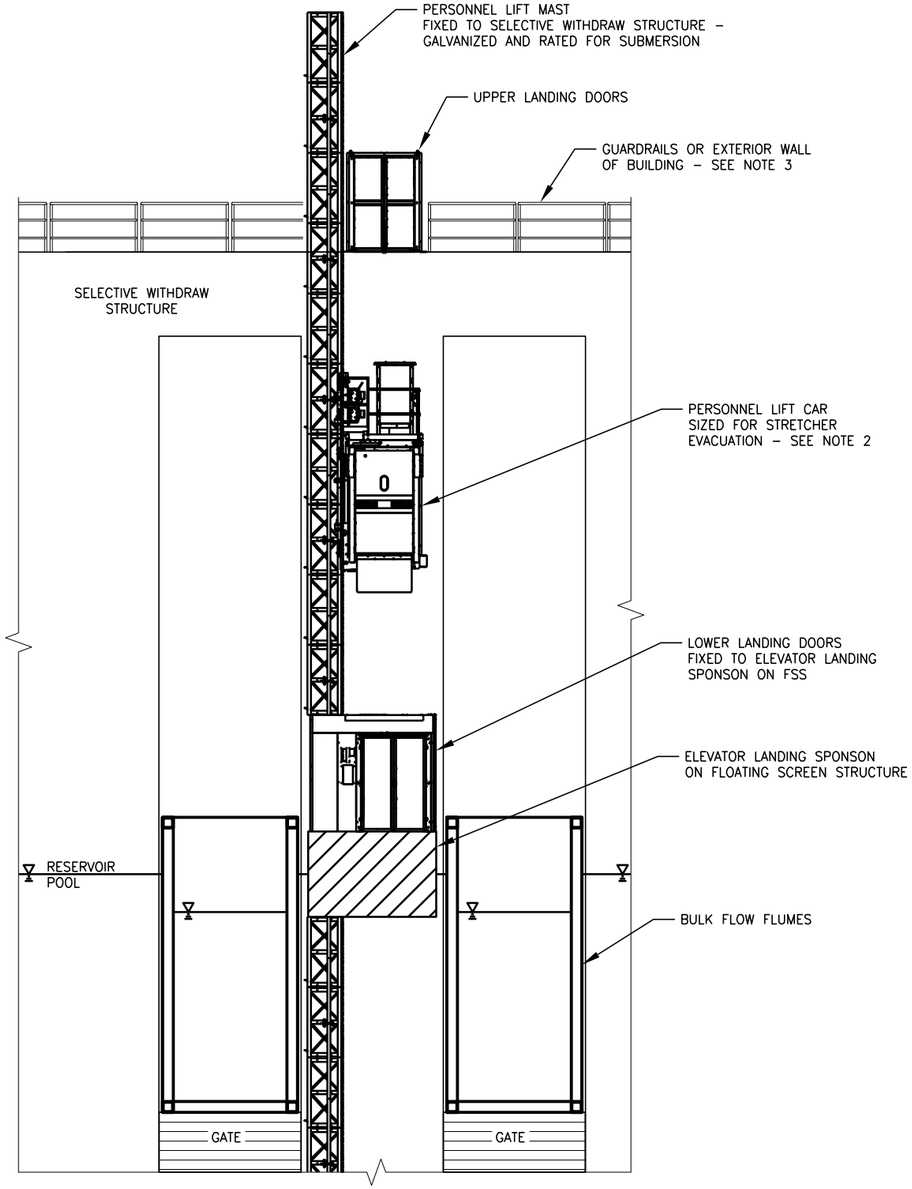
CONCEPT FOR DISCUSSION

PROJECT NUMBER: 236600
PROJECT MANAGER: Shane Cline
DATE: 10/16/2014

REFERENCE SHEET: –
REFERENCE DOCUMENT: Personnel Access Concept
EXHIBIT NUMBER: –



BRIDGE CRANE ELEVATION (A/3)
SCALE: 3/32" = 1'-0"



PERSONNEL LIFT ELEVATION (B/3)
SCALE: 3/32" = 1'-0"

NOTES:

1. SWS DECK OPEN TO WEATHER IN-WAY-OF BRIDGE CRANE (I.E. NO WALLS). BUILDING WALLS OPTIONAL OUTSIDE CRANE FOOT PRINT & AFT EXTERIOR OF MEZZANINE DECK.
2. PERSONNEL LIFT IS AN ELECTRIC DRIVE RACK & PINION ANSI-RATED INDUSTRIAL ELEVATOR SIMILAR TO A CONSTRUCTION LIFT. LIFT TRAVEL HEIGHT IS VARIABLE W/ AUTOMATED CONTROL TO ALIGN WITH FIXED UPPER ELEVATION AND VARIABLE LOWER ELEVATION LANDING DOORS.
3. BRIDGE CRANE AND BUILDING NOT SHOWN FOR CLARITY.

0 2' 4' 6' 8' 10' 12' 16' 20' 24' 32'

SCALE: 3/32" = 1'-0"

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CONCEPT FOR DISCUSSION

PROJECT NUMBER: 236600
PROJECT MANAGER: Shane Cline
DATE: 10/16/2014

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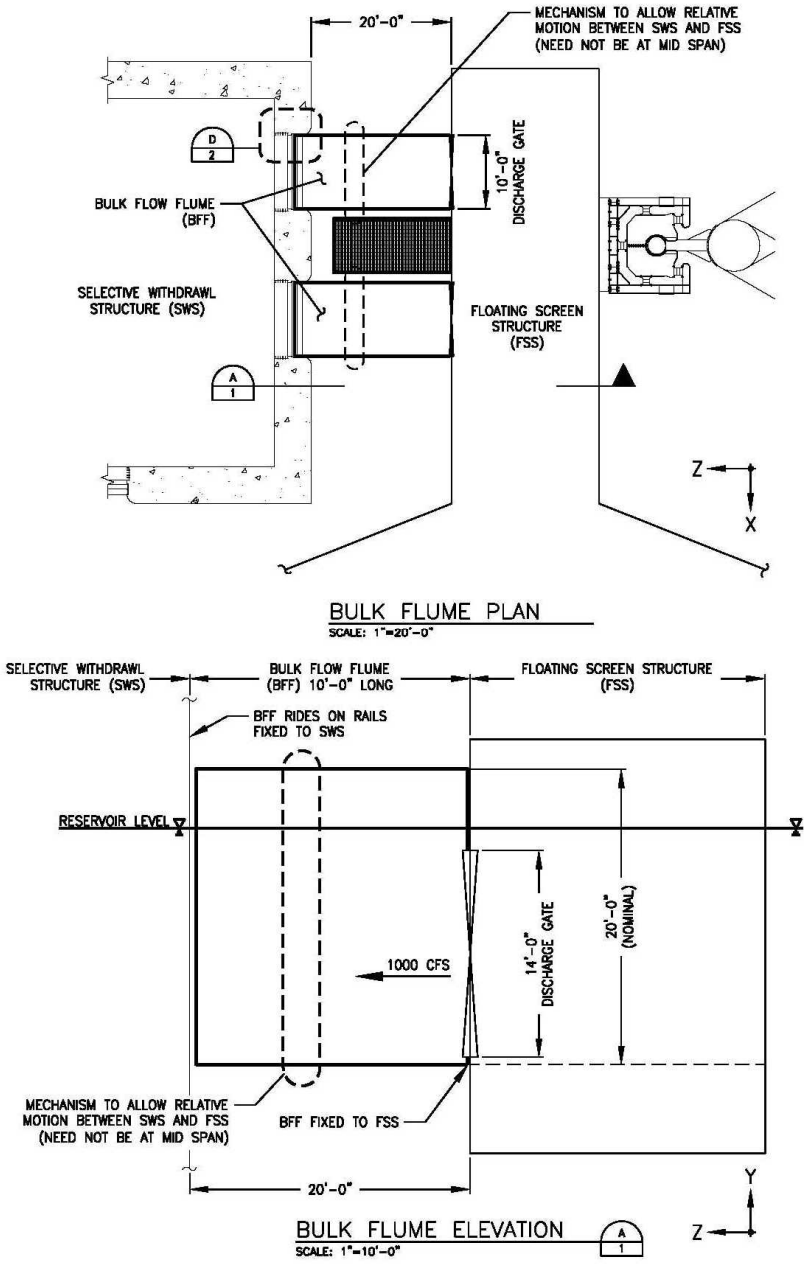

Figure 10: BFF Plan and Elevation

Relative Motion

In the absence of external forces arising from intake water flow, discharge water flow, current, wind, and waves the BFF can be considered aligned with the discharge gates on

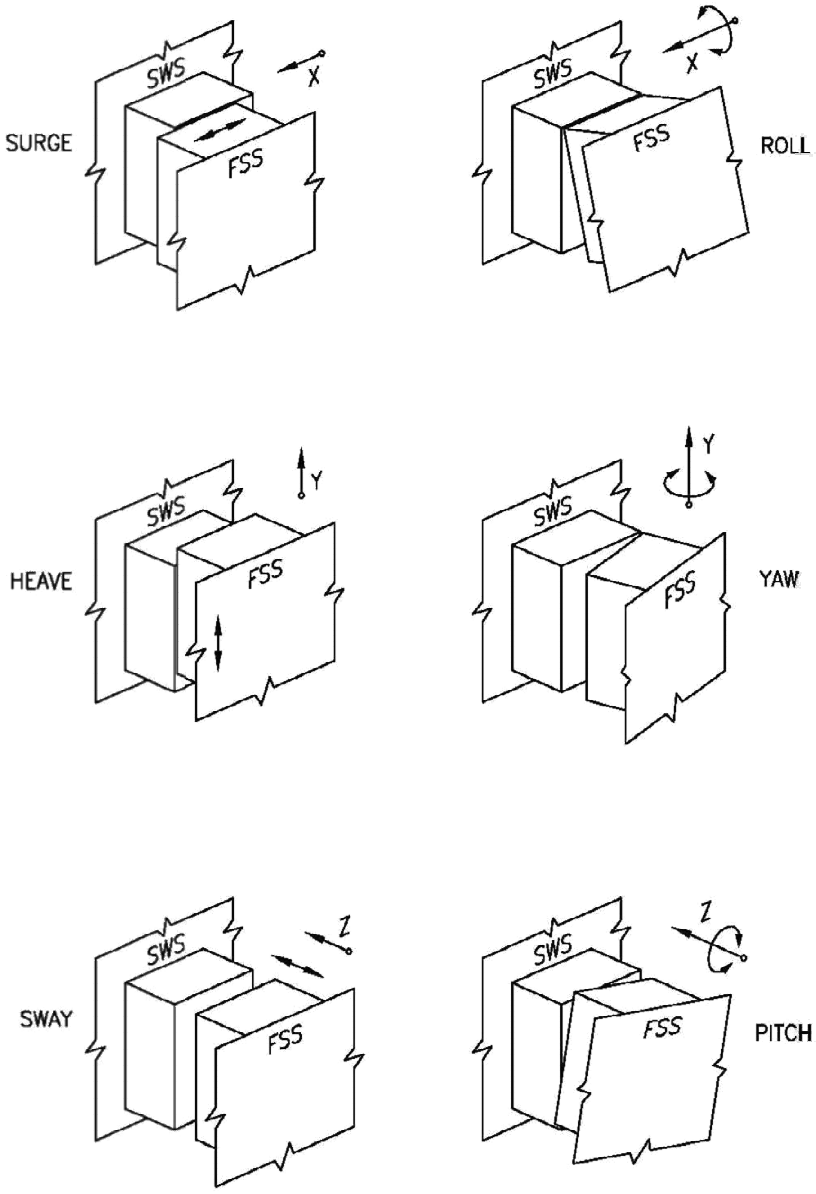

Figure 11: Six Degrees of Relative Motions

A mechanism that allows for all six (6) relative motions must be incorporated into the BFF.

Structural Arrangement

Loads on BFF structure are expected to be relatively small. Fluid flow through the BFF will be tangential to the sides and bottom thus not generating significant loads on the structure.

SELECTED RELATIVE MOTION MECHANISM

As endorsed by the CENWP's PDT the pantograph relative motion mechanism is selected for further conceptual developing.

A planar pantograph mechanism will be installed on both sides, bottom and top of the BFF at the midpoint between the FSS and the SWS. These comprise the compliant portion of the relative motion mechanism. The distance between the fixed portions varies with the relative motion (Note 1 in Figure 14). The fixed portion at the SWS will ride in guide rails built into the SWS structure (Note 2 in Figure 14). The fixed portions of the BFF will be constructed of structural frame lined with UHMW or hard rubber on both sides and the bottom (Note 3 in Figure 14). An elevation of the pantograph concept is shown in Figure 14.

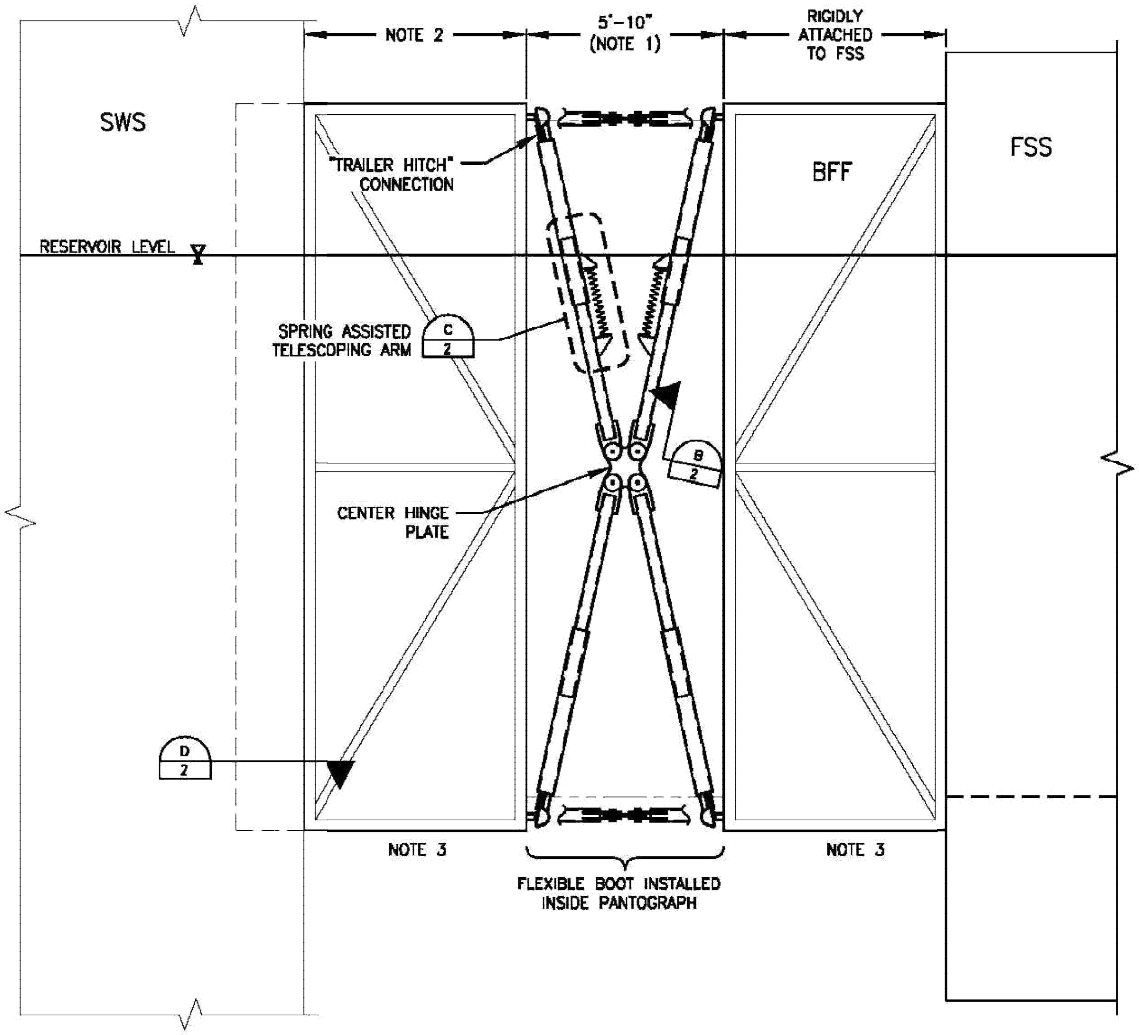

Figure 14: Pantograph Connection Elevation