US-OR-32-8 METRO:
SMITH BYBEE WATER CONTROL STRUCTURES FACILITY IMPROVEMENTS

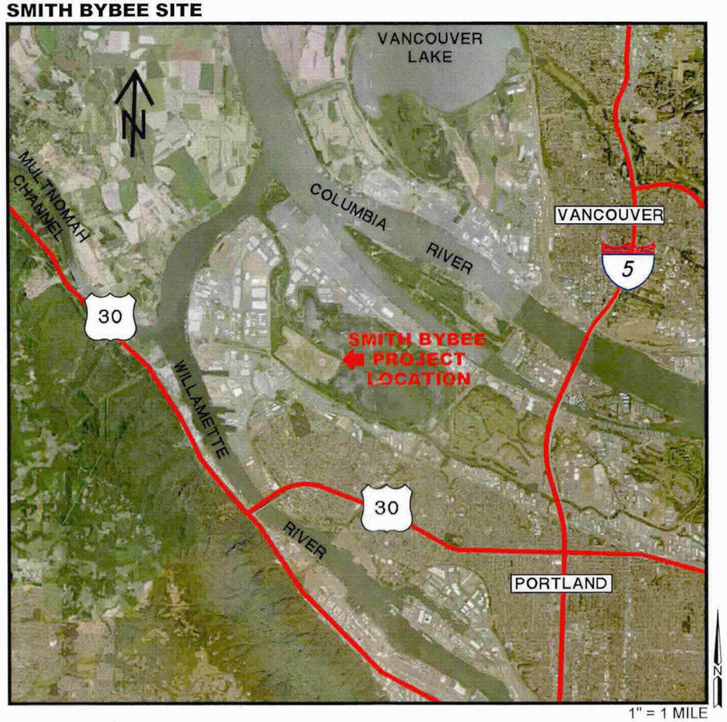
DUCKS UNLIMITED
17700 S. E. MILL PLAIN BLVD. SUITE 100
VANCOUVER, WA. 98683
PH. (360) 885-2011

METRO

WORK ITEMS:
1. GATE MODIFICATION AND REPLACEMENTS.
2. ALUMINUM STOP LOGS.
3. METAL GRATING SYSTEM.
4. RAILINGS & LOCK ROD SYSTEMS.
5. FISH LADDER MODIFICATIONS.
6. DEBRIS BOOM AND ANCHORAGE.

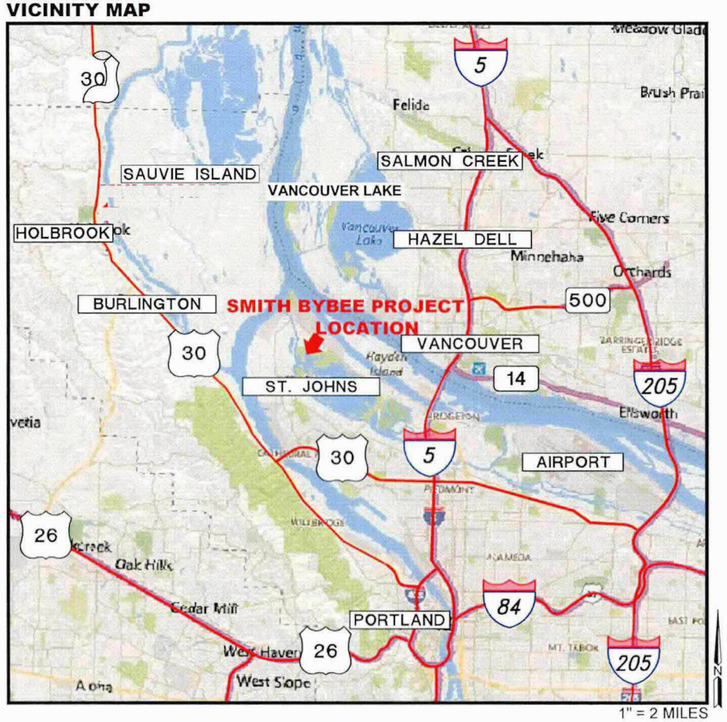
REGISTERED PROFESSIONAL ENGINEER 16110 OREGON JULY 21, 1992 GUS S. WILLIAMS
EXP. 6/18

SMITH BYBEE SITE



1" = 1 MILE

VICINITY MAP



1" = 2 MILES

SHEET INDEX

RECORD SET

REVISIONS			
REV. NO.	DESCRIPTION	DATE	APPROVED
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1			

DUCKS UNLIMITED

PROJECT NO. US-OR-32-8	DATE: 10/15/17	DESIGNED BY:	GW
METRO: MULTNOMAH CHANNEL & SMITH BYBEE UNITS WATER CONTROL STRUCTURE IMPOVEMENTS		DRAWN BY:	DMC
		SURVEYED BY:	JPS
		CHECKED BY:	
LOCATION MAP		SHEET NO.	1 of 9

GENERAL NOTES:

1. Ducks Unlimited makes no representations as to the existence or nonexistence of utilities. It is the responsibility of the contractor to comply with the provisions of all applicable utility notification regulations. The contractor will be liable for any damage to utilities caused by construction activities.

2. The engineer does not represent that the location of utilities shown on the plans are exact or complete. It shall be the responsibility of the contractor to determine the presence of, actual locations of and make provisions for all watercourses and utilities. The contractor shall verify location, depth and height. Their verification shall be coordinated by the contractor with the appropriate utility company.

3. The contractor shall exercise extreme caution when working in the vicinity of overhead power lines. Verify location in the field and protect in place.

4. The contractor shall comply with all local and state requirements relative to the notificatciton of the applicable unerground service alert.

5. At least 2 working days prior to beginning any digging or excavation work, the contractor shall notify underground service alert

6. In accordance with generally accepted construction practices, the contractor will be solely and completely responsible for the conditions of the job site including safety of all persons and property during performance of the work. The contractor shall ensure that all work is performed in accordance with occupational safety laws, including the design and construction of proper shoring of trenches. The duties of the project engineer do not include review of the adequacy of the contractor's safety in, on, or near the job site.

7. It is the responsibility of the contractor to be knowledgeable about the project specifications and permits. All work shall be completed in compliance with the contract documents. The contractor shall have copies of the most current approved plans, specifications and permit conditions on site during all work operations.

8. The project site and adjacent areas contain sensitive habitat areas for protected wildlife, and may include endangered species. The contractor shall protect wildlife and water quality, and minimize possible air, waterway, and subsoil contamination or pollution or other undesirable effects.

9. Should it appear that the work to be done, or any matter relative thereto, is not sufficiently detailed or explained on these plans or in the specifications, the contractor shall contact the construction manager for such further explanations as may be necessary.

10. Should the contractor find any discrepancies between the conditions existing in the field and the information shown on the drawings, he shall notify the construction manager before proceeding with construction.

Unauthorized Changes & Uses

The engineer preparing these plans will not be responsible for, or liable for, unauthorized changes to or uses of these plans. All changes must be in writing and must be approved by the preparer of these plans.

Utility Notification Center
CALL BEFORE YOU DIG

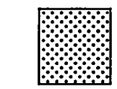
SURVEY POINT DESCRIPTORS

CTBM	Bench Mark (permanent)
CTBT	Bench Mark (temporary)
CTCP	Survey Control Point (permanent)
CTCT	Survey Control Point (temporary)
DIFL	Ditch Flowline
DIGB	Ditch Grade Break
DITO	Ditch Toe
DITP	Ditch Top
ELBX	Electric, Box or Pullbox
ELGY	Electric, Guy Wire
ELPP	Electric, Power Pole
ELSN	Electric, Warning Sign
ELTR	Electric, Transformer
ELTW	Electric, Tower
ELVT	Electric, Vault
FNAP	Fence Angle Point
FNCR	Fence Corner
FNGT	Fence Gate
FNLN	Fence Line
IRCO	Irrigation Concrete Pad
IRCP	Irrigation Control Panel
IRPI	Irrigation Pipe Invert
IRPM	Irrigation Pump
IRPT	Irrigation Pipe Top
IRVL	Irrigation Valve
IRWL	Irrigation Well
LVCL	Levee Centerline
LVGB	Levee Grade Break
LVTO	Levee Toe of Slope
LVTP	Levee Top of Slope
RDCL	Road, Centerline
RDED	Road, Edge of Dirt Road
RDEG	Road, Edge of Gravel Road
RDEP	Road, Edge of Paved Road
RDGB	Road Grade Break
RDSH	Road Shoulder
RDSN	Road Sign
RDTO	Road, Toe of Slope
RDTP	Road, Top of Slope
SDMH	Storm Drain, Manhole
SDPI	Storm Drain, Pipe Invert
SDPT	Storm Drain, Pipe Top
SSMH	Sanitary Sewer, Manhole
SWFL	Swale Flowline
SWGB	Swale Grade Break
SWTO	Swale Toe
SWTP	Swale Top
TFBL	Topo Feature, Building
TFBR	Topo Feature, Brush
TFCO	Topo Feature, Concrete (pad, slab, etc.)
TFFL	Topo Feature, Flowline
TFGB	Topo Feature, Grade Break
TFGS	Topo Feature, Ground Shot
TFRK	Topo Feature, Rock Or Rocky Area Boundary
TFTL	Topo Feature, Tree line
TFTO	Topo Feature, Grade Break at Toe
TFTP	Topo Feature, Grade Break at Top
TFTR	Topo Feature, Tree
WAEW	Edge of Water
WAHW	High Water Mark
WAUW	Under Water Ground Shot
WAWS	Water Surface
WCFL	Water Control Structure, Flowline/Invert at Structure
WCFR	Water Control Structure, Frame Top
WCHW	Water Control Structure, Headwall
WCPI	Water Control Structure, Pipe Invert at Outlet
WCPT	Water Control Structure, Pipe Top at Outlet
WCST	Water Control Structure, Top of Structure
WCWW	Water Control Structure, Wing Wall

ABBREVIATIONS

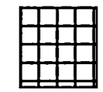
AB	Aggregate Base
AC	Acre
APPROX	Approximate
BM	Benchmark
CAP	Corrugated Aluminum Pipe
CC	Center to Center
CF	Cubic Foot
CFS	Cubic Foot Per Second
CL	Centerline
CMP	Corrugated Metal Pipe
CMPA	Corrugated Metal Arch Pipe
CONC	Concrete
CP	Control Point
CY	Cubic Yard
DEMO	Demolish
DIA	Diameter
Dp	Pipe Diameter
Dr	Riser Diameter
DU	Ducks Unlimited, Inc.
D/S	Downstream
E	East
EG	Existing Ground
EL	Elevation
EX, EXIST	Existing
FRG	Final Rough Grade
FG	Finished Grade
FL	Flowline
FT	Foot, Feet
FTG	Fitting, Footing
GA	Gauge
GB	Grade Break
H	Height
HDPE	High-Density Polyethylene
ID	Inside Diameter
IE	Invert Elevation
IN	Inch, Inches
INV	Invert
IPS	Iron Pipe Size
L	Length, Left
LBF	Pounds-Force
LF	Linear Feet
MAINT	Maintenance
MAX	Maximum
MIN	Minimum
MISC	Miscellaneous
(N)	New
N	North
NIC	Not In Contract
NTS	Not To Scale
OC	On Center
OD	Outside Diameter
PIP	Pressure Irrigation Pipe
PP	Power Pole
PSI	Pounds per Square Inch
PVC	Polyvinyl Chloride
QTY	Quantity
R	Right
RCB	Reinforced Concrete Box
RD	Road
REF	Reference Dimension
REQD	Required
ROW	Right Of Way
S	South
SCH	Schedule
SS	Stainless Steel
SDR	Standard Dimension Ratio
SF	Square Feet
SHT	Sheet
SP	Special
SPECS	Specifications
SY	Square Yard
STA	Station
STD	Standard
TBD	To Be Determined by Engineer
TBM	Temporary Benchmark
TE	Top Elevation
TEMP	Temporary
TOL	Top of Levee
TOB	Top of Berm
TYP	Typical
USA	Underground Service Alert
U/S	Upstream
VLV	Valve
W	Width, West (where applicable)
W/	With
WCS	Water Control Structure
WS	Water Surface
WSEL	Water Surface Elevation
WWF	Welded Wire Fabric
X:1	Slope, Horizontal:Vertical

LEGEND & STANDARD SYMBOLS

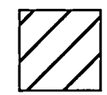


CONCRETE

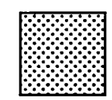
DEBRIS BOOM



NEW GRATING

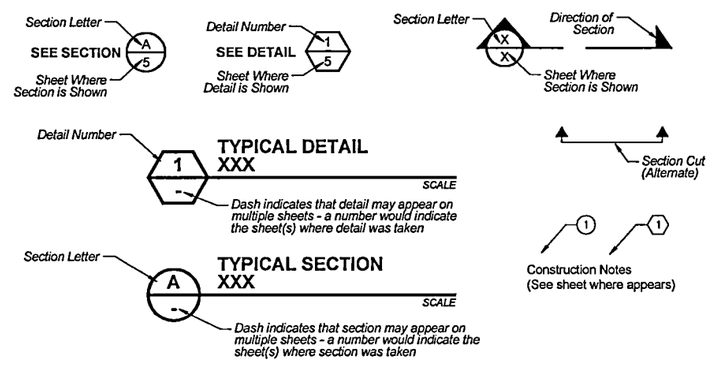


EXISTING GRATING



FISH LADDER MODIFICATIONS

DETAILING CONVENTIONS



RECORD SET

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DUCKS UNLIMITED

PROJECT NO. US-OR-32-8 DATE: 10/15/17

METRO: MULTNOMAH CHANNEL & SMITH BYBEE UNITS
WATER CONTROL STRUCTURE IMPOVEMENTS

DRAWING INFORMATION

DESIGNED BY:	GW
DRAWN BY:	DMC
SURVEYED BY:	JPS
CHECKED BY:	
SHEET NO.	2 of 9

0 600 1,200 FEET
SCALE

1 / 12 SMITH BYBEE VICINITY MAP

0 20 40 FEET
SCALE

2 / 12 SMITH BYBEE SITE ACCESS

RECORD SET

Unauthorized Changes & Uses
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DUCKS UNLIMITED

PROJECT NO. US-OR-32-8	DATE: 10/15/17	DESIGNED BY:	GW
METRO: SMITH BYBEE		DRAWN BY:	DMC
		SURVEYED BY:	
WATER CONTROL STRUCTURE IMPOVEMENTS		CHECKED BY:	
SITE ACCESS		SHEET NO.	3 of 9

0 15 30 FEET
SCALE

INFORMATION ONLY

EXISTING

FISH LADDER

WATER CONTROL STRUCTURE

WOOD LOG
DEBRIS BOOM

BYBEE LAKE

NORTH SLOUGH

1/13 EXISTING SITE PLAN

0 15 30 FEET
SCALE

ITEMS OF WORK:
1. GATE MODIFICATION AND REPLACEMENTS.
2. ALUMINUM STOP LOGS
3. METAL GRATING SYSTEM
4. RAILING SYSTEM & LOCK RODS. RAILING REPAIR
5. FISH LADDER MODIFICATIONS
6. DEBRIS BOOM AND ANCHORAGE

NOTES:
1. OTHER METRO CONTRACTOR (OMC) WILL SHARE WORKSITE ACCESS FOR DEWATERING SMITH BYBEE LAKE. OMC WILL INSTALL TEMPORARY BLOCKAGE OF TIDAL FLOWS FROM NORTH SLOUGH INTO SMITH BYBEE LAKE. LEAKAGE FROM OMC BLOCKAGE SHALL BE DEWATERED BY CONTRACTOR AS REQUIRED TO PERFORM WORK ITEMS.
2. OMC SHALL COMPLETE INSTALLATION OF BLOCKAGE PRIOR TO CONTRACTOR MOBILIZING TO SITE. OMC SHALL REMOVE BLOCKAGE.

DEBRIS BOOM
18" HT. ELASTIC PERMAFENCE OR EQUAL
MAX. FLOW RATE 2 FT/S. VERTICAL RANGE 20FT.

DEBRIS BOOM SYSEM
126 lf

MODIFY EXISTING SLIDING ALUMINUM TIDE GATE
ADD BEVEL GEAR OPERATOR AND FLAP LOCK SYSTEM.

REPLACE (2) 54" TIDE GATES W/ 54" SLIDING S.S. FLAP GATES W/ BEVEL GEAR OPERATOR & FLAP LOCK GATE SYSTEM FOR UNSEEDING HEAD. FLAP LOCK SYSTEM DESIGNED BY GATE MANUFACTURER. W/ GATE FULLY OPEN ACCESS TO FLAP LOCK SHALL BE DEMONSTRATED BY CONTRACTOR AND APPROVED BY ENGINEER.

MODIFY FISHWAY BAFFLES

BYBEE LAKE

DEBRIS BOOM
SYSTEM 140 lf
DEMO EXISTING BOOM

INSTALL METAL GRATING WORK PLATFORM. INSTALL NEW RAILING AND LOCK ROD SYSTEM. REPAIR EXISTING RAILING. PAINT ALL EXISTING AND NEW RAILINGS.

SWIVEL TRASH RACKS
NOT IN CONTRACT (N.I.C.)

REPAIR AND PAINT EXISTING RAILING SYSTEM

NORTH SLOUGH

TOP EL. TO MATCH ROAD TOP EL. AT STRUCTURE

6'x6'x6' CIP CONCRETE BALLAST BLOCK W/1.25" DIA. 4' LG. GALVANIZED ANCHOR. CAGE REINF. #4 @ 9" O.C. E.W., 3" CL TYPICAL.

2'

4'

2/13 WCS IMPROVEMENTS

RECORD SET

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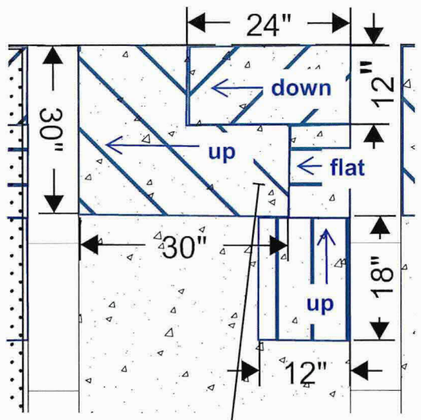
DUCKS UNLIMITED

PROJECT NO. US-OR-32-8 DATE: 10/15/17
METRO: SMITH BYBEE
MODIFICATIONS
SITE PLAN DEBRIS BOOM, GATES, PLATFORM,RAILINGS & FISH LADDER

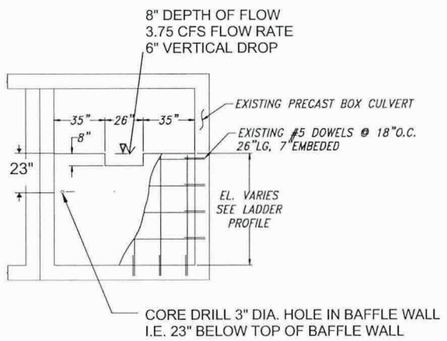
DESIGNED BY: GW
DRAWN BY: DMC
SURVEYED BY:
CHECKED BY:
SHEET NO. 4 of 9



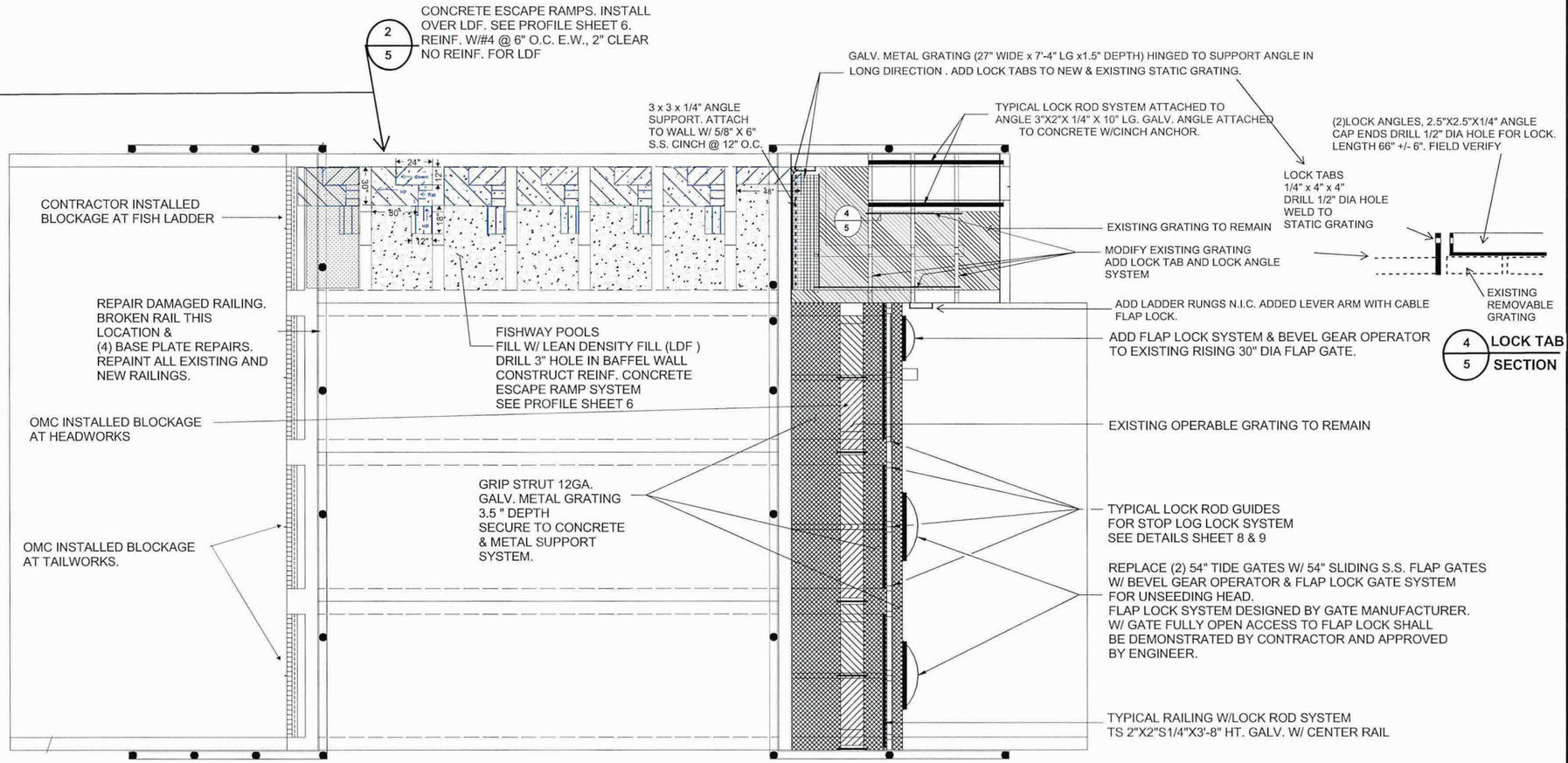
RAKE FINISH PERPENDICULAR TO SLOPE

2/5 **DETAIL ESCAPE RAMPS**
PLAN VIEW

SEE SHEET 6 FOR ADDITIONAL DETAILS



3/5 **CORE DRILL EXISTING FISH LADDER BAFFLES**
ELEVATION



1/5 **WCS IMPROVEMENTS**
WCS PLAN VIEW NTS

ITEMS OF WORK:
1. GATE MODIFICATION AND REPLACEMENTS.
2. ALUMINUM STOP LOGS
3. METAL GRATING SYSTEM
4. RAILING SYSTEM & LOCK RODS. RAILING REPAIR
5. FISH LADDER MODIFICATIONS

RECORD SET

Utility Notification Center
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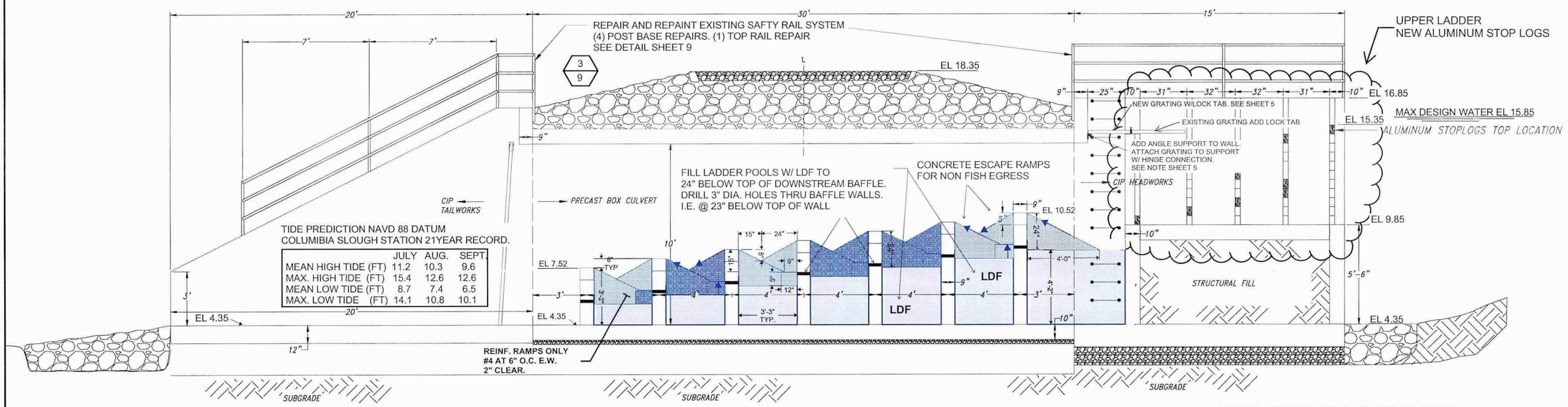
DUCKS UNLIMITED

PROJECT NO. US-OR-32-8 DATE: 10/15/17
METRO: SMITH BYBEE
MODIFICATIONS
PLAN FISH LADDER, TRASH RACK, PLATFORM, RAILINGS, LOCKRODS & GATES

DESIGNED BY: GW
DRAWN BY: DMG
SURVEYED BY:
CHECKED BY:
SHEET NO. 5 of 9

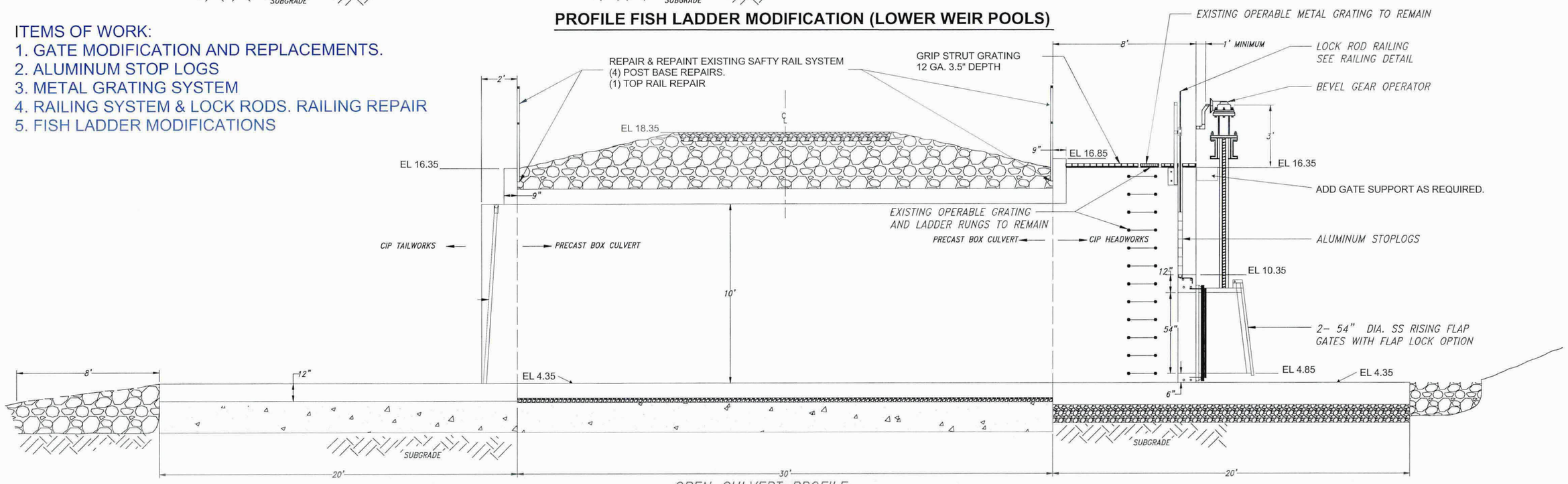


TIDE PREDICTION NAVD 88 DATUM
COLUMBIA SLOUGH STATION 21YEAR RECORD.

	JULY	AUG.	SEPT.
MEAN HIGH TIDE (FT)	11.2	10.3	9.6
MAX. HIGH TIDE (FT)	15.4	12.6	12.6
MEAN LOW TIDE (FT)	8.7	7.4	6.5
MAX. LOW TIDE (FT)	14.1	10.8	10.1

ITEMS OF WORK:
1. GATE MODIFICATION AND REPLACEMENTS.
2. ALUMINUM STOP LOGS
3. METAL GRATING SYSTEM
4. RAILING SYSTEM & LOCK RODS. RAILING REPAIR
5. FISH LADDER MODIFICATIONS

PROFILE FISH LADDER MODIFICATION (LOWER WEIR POOLS)



OPEN CULVERT PROFILE

1/15 PROFILE OPEN CULVERT MODIFICATIONS

RECORD SET

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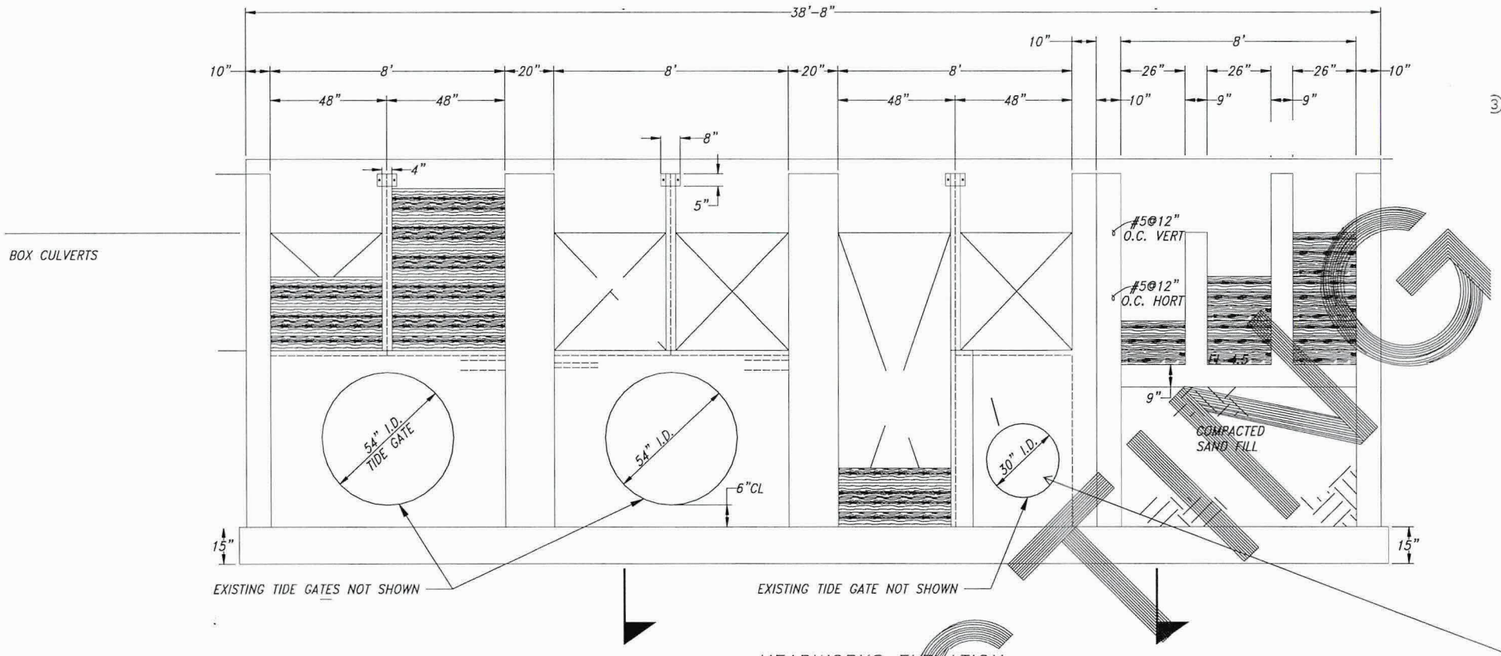
DUCKS UNLIMITED

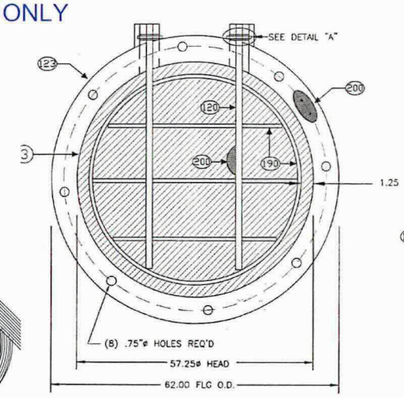
PROJECT NO. US-OR-32-8 DATE: 10/15/17
METRO: SMITH BYBEE
MODIFICATIONS
ELEVATION FISH LADDER, GATES,RAILINGS, LOCKRODS, STOPLOGS & TRASHRACK

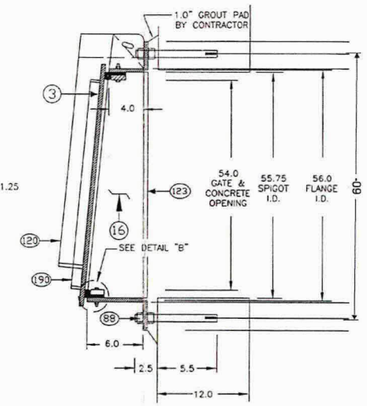
DESIGNED BY: GW
DRAWN BY: DMC
SURVEYED BY:
CHECKED BY:
SHEET NO. 6 of 9

INFORMATION ONLY

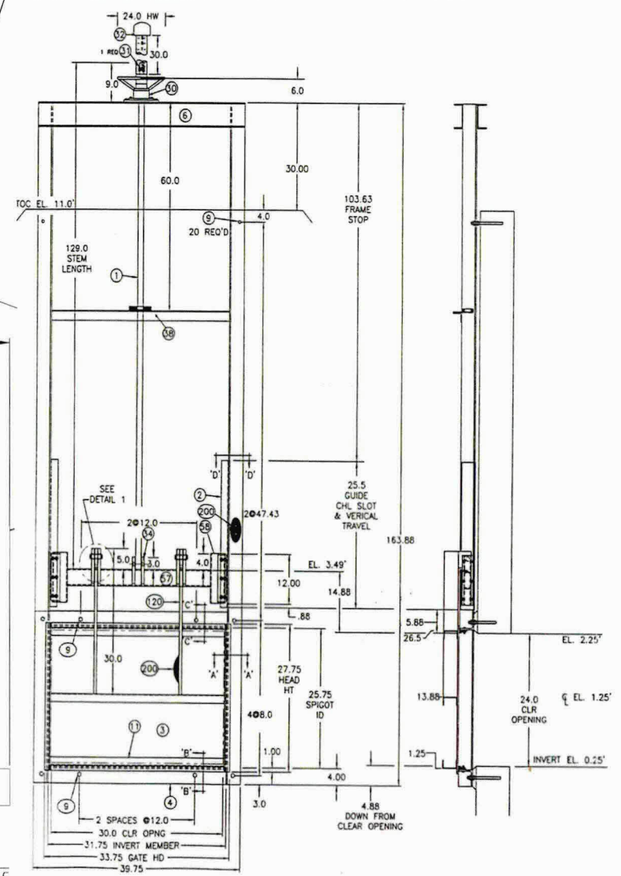


HEADWORKS ELEVATION
NOT TO SCALE

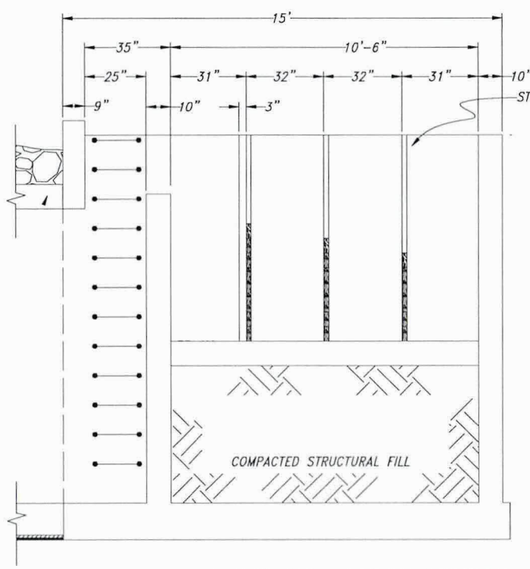




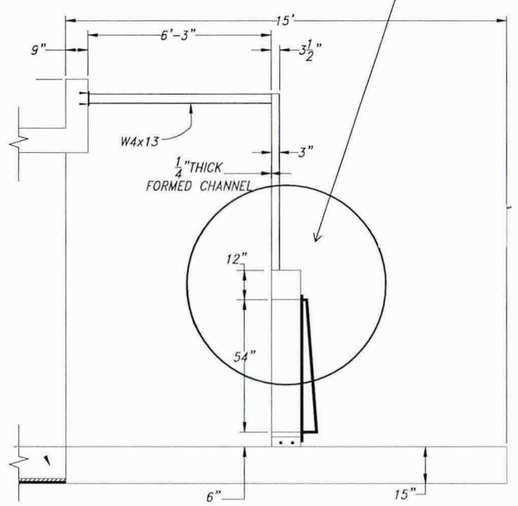
EXISTING 54" DIAMETER TIDE GATE



EXISTING 30" SLIDE FLAP GATE



ADJUSTABLE LADDER SECTION
NOT TO SCALE



TIDE GATE SECTION
NOT TO SCALE

EXISTING WATER CONTROL STRUCTURE

RECORD SET

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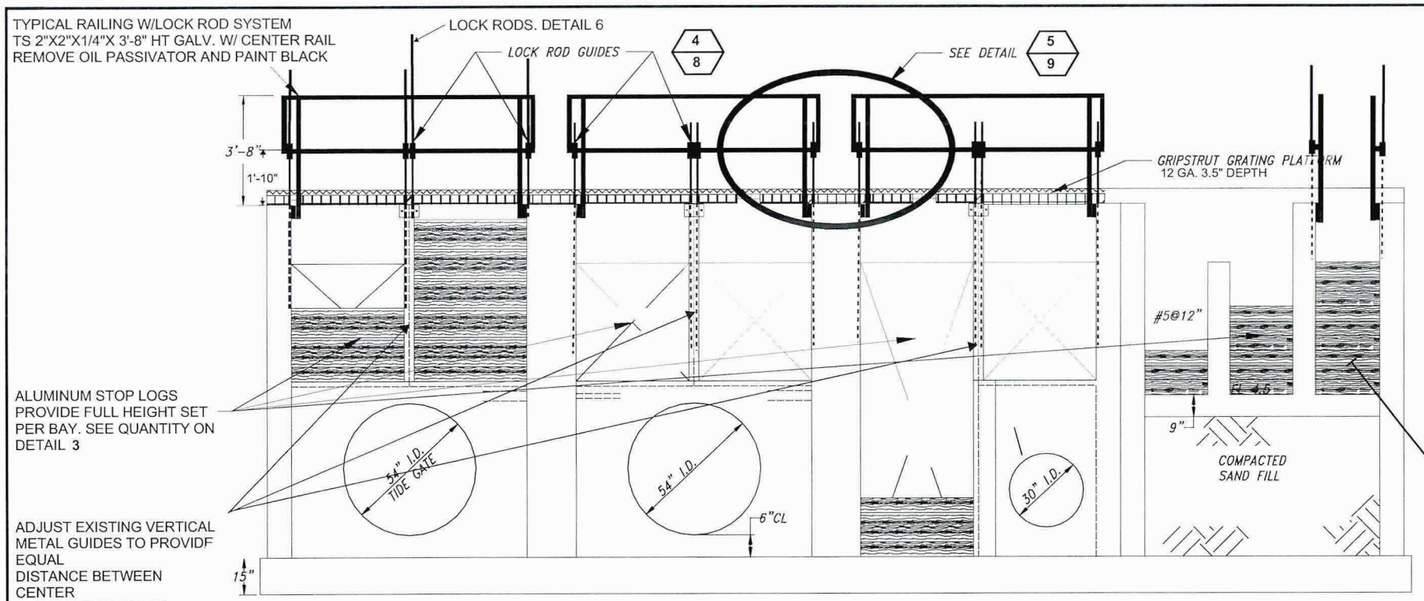
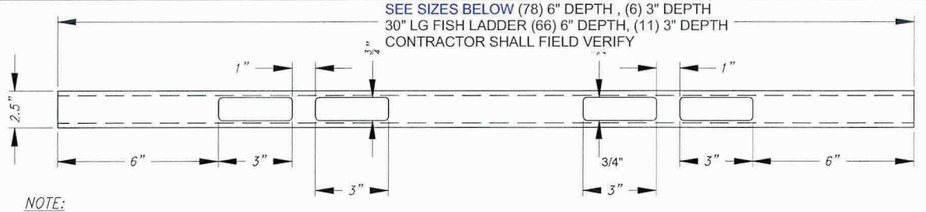
DUCKS UNLIMITED

PROJECT NO. US-OR-32-8 DATE: 10/20/17
METRO: SMITH BYBEE
EXISTING INFORMATION
EXISTING WCS DETAILS

DESIGNED BY: GW
DRAWN BY: DMC
SURVEYED BY:
CHECKED BY:
SHEET NO. 7 of 9

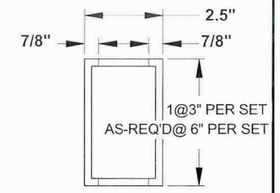


1/8 **STOPLOGS & LOCK ROD RAIL SYSTEM IMPOVEMENTS ELEVATION**



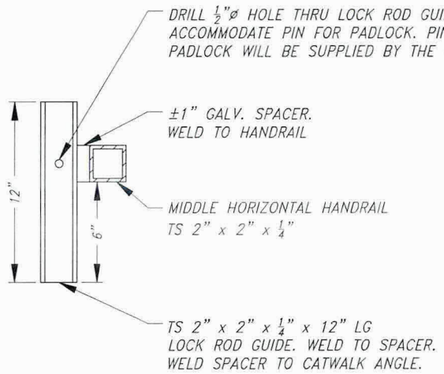
NOTE:
ALL ALUMINUM STOPLOGS SHALL BE SUPPLIED BY THE CONTRACTOR

CONTRACTOR IS RESPONSIBLE FOR CUTTING STOPLOGS TO PROPER LENGTH AND FABRICATING THE HOLES IN ALL STOPLOGS AS SHOWN. THE ¾" DIMENSION IS CRITICAL AND NEEDS TO BE CENTERED IN THE STOPLOG TO AVOID LEAKAGE. THE FINISHED SURFACE SHALL BE SMOOTH TO PROVIDE A FLAT SURFACE FOR THE STOPLOG.

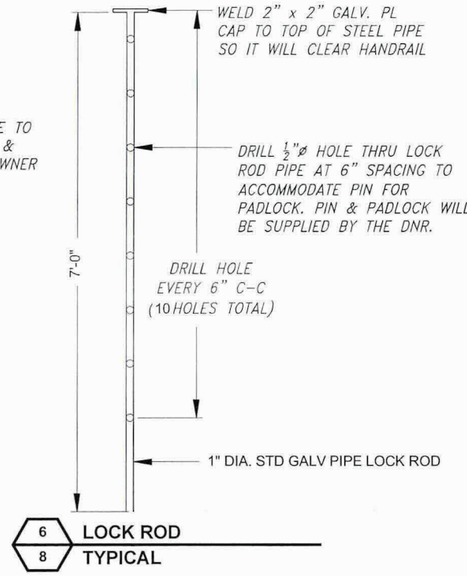


1ST SET STOPLOGS 18" FROM TOP OF WALL. DOWNSTREAM SET 6" LOWER PER POOL. EACH SET SHALL INCLUDE 6" HT STOPLOGS WITH ONE 3" HT STOPLOG. SEE SHEET 17 FOR QUANTY

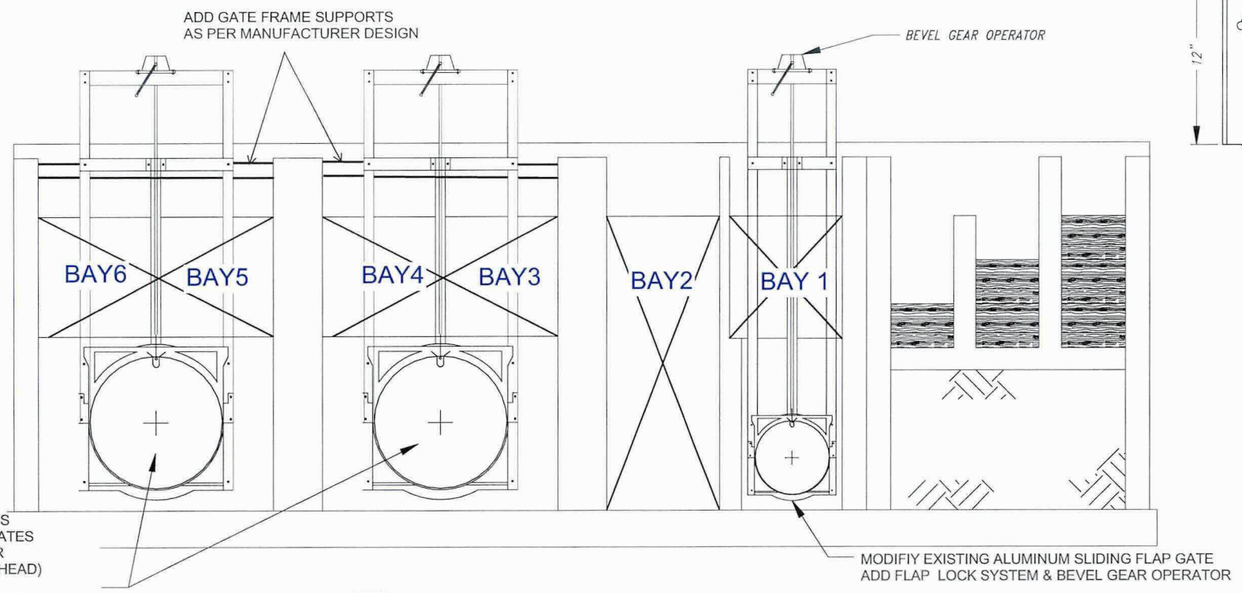
3/8 **ALUMINUM STOPLOG TYPICAL**



4/8 **LOCK ROD GUIDE TYPICAL**



6/8 **LOCK ROD TYPICAL**



2/8 **GATES IMPROVEMENTS ELEVATION**

STOP LOG HT, (QUANTITY), LG SPECIFIC TO EACH BAY

BAY 1: 6" HT (11) 48.5" LG,	3" HT (1) 48.5"
BAY 2: 6" HT (13) 49.0" LG, (4)49.875"),(5)50.375,	3" HT (1) 50.375"
BAY 3: 6" HT (11) 49.25" LG,	3" HT (1) 49.25"
BAY 4: 6" HT (11) 48.625" LG,	3" HT (1) 48.625"
BAY 5: 6" HT (11) 48.5" LG,	3" HT (1) 48.5"
BAY 6: 6" HT (11) 49.0" LG,	3" HT (1) 49.0"

Unauthorized Changes & Uses

The engineer preparing these plans will not be responsible for, or liable for, unauthorized changes to or uses of these plans. All changes must be in writing and must be approved by the preparer of these plans.

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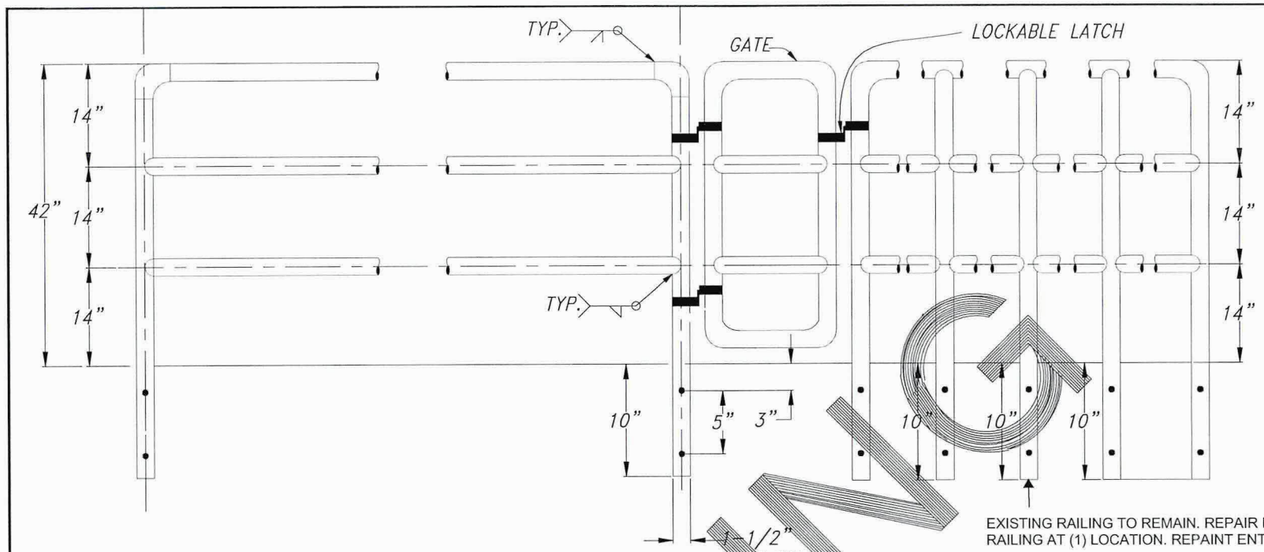
ITEMS OF WORK:
1. GATE MODIFICATION AND REPLACEMENTS.
2. ALUMINUM STOP LOGS
3. METAL GRATING SYSTEM
4. RAILING SYSTEM & LOCK RODS. RAILING REPAIR
5. FISH LADDER MODIFICATIONS

RECORD SET

REVISIONS			
REV. NO.	DESCRIPTION	DATE	APPROVED
5			
4			
3			
2			
1			

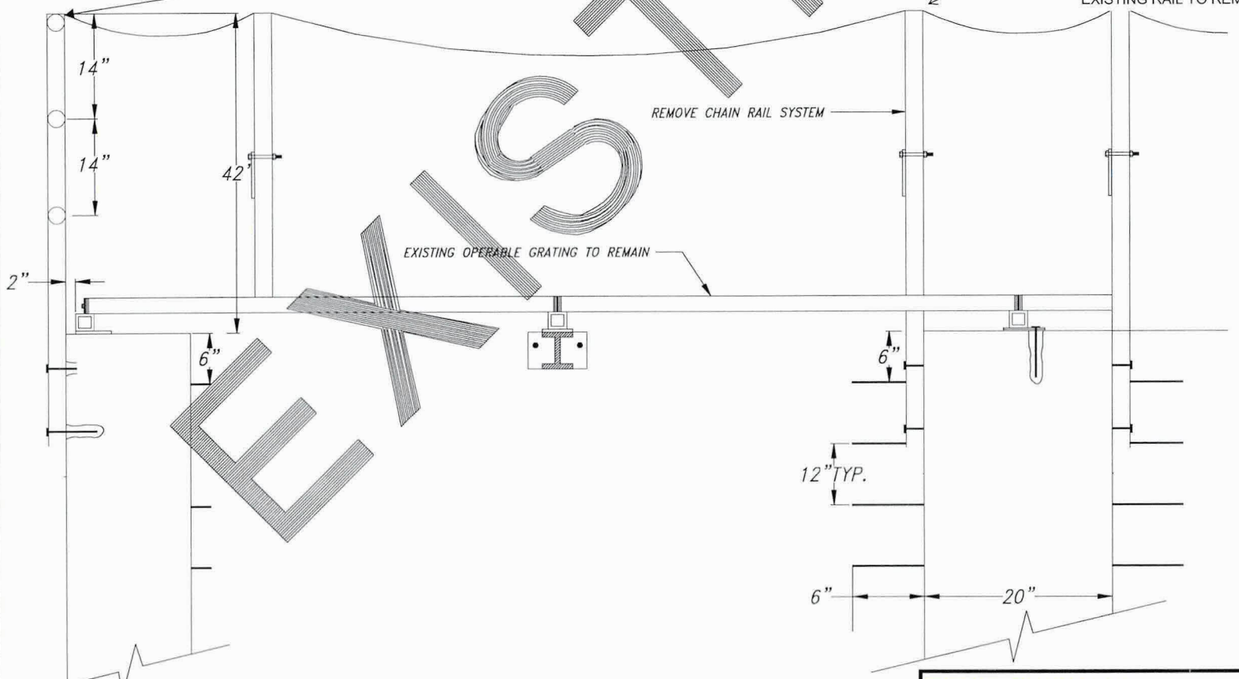
DUCKS UNLIMITED

PROJECT NO. US-OR-32-8 DATE: 10/15/17	DESIGNED BY: GW
METRO: SMITH BYBEE	DRAWN BY: DMC
MODIFICATIONS	SURVEYED BY:
	CHECKED BY:
ELEVATIONS/DETAILS GATES, PLATFORM, RAILINGS, LOCKRODS & STOPLOGS	SHEET NO. 8 of 9

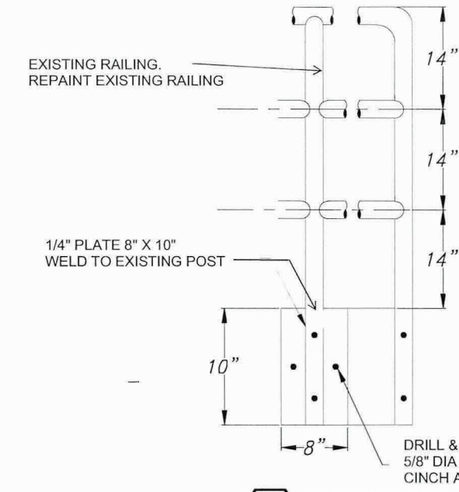


EXISTING RAILING TO REMAIN. REPAIR DAMAGED POSTS (4) LOCATIONS RAILING AT (1) LOCATION. REPAINT ENTIRE RAIL SYSTEM. SEE DETAIL 3.

1/9 GUARDRAIL SYSTEM EXISTING



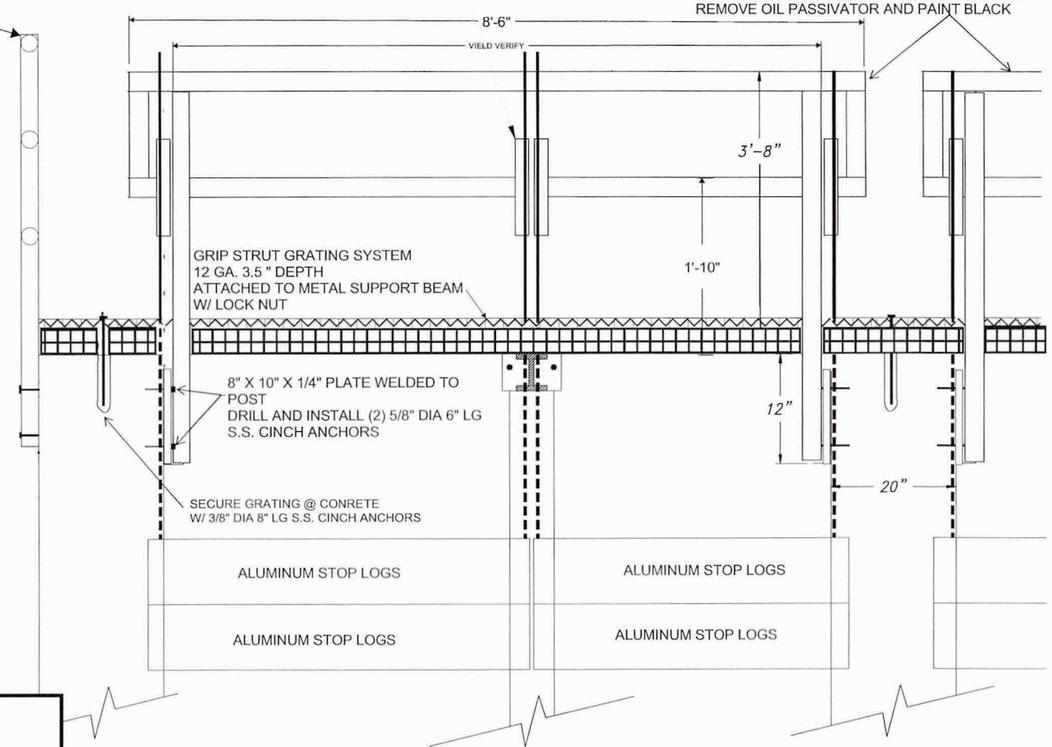
2/8 CHAIN RAIL & GRATING SYSTEM EXISTING



3/9 POST ANCHOR REPAIR TYPICAL

4/8 SEE DETAIL

TYPICAL RAILING W/LOCK ROD SYSTEM
TS 2"X2"X1/4"X 3'-8" HT GALV. W/ CENTER RAIL
REMOVE OIL PASSIVATOR AND PAINT BLACK



5/8 RAILING W/ LOCK RODS, GRATING & STOP LOGS ELEVATION TYPICAL

RECORD SET

ITEMS OF WORK:
1. ALUMINUM STOP LOGS
2. METAL GRATING SYSTEM
3. RAILING SYSTEM & LOCK RODS. RAILING REPAIR AND DEMOLITION.

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REVISIONS			
REV. NO.	DESCRIPTION	DATE	APPROVED
5			
4			
3			
2			
1			

DUCKS UNLIMITED

PROJECT NO. US-OR-32-8 DATE: 10/15/17
METRO: SMITH BYBEE
MODIFICATIONS
ELEVATIONS/DETAILS
PLATFORM,RAILINGS, LOCK RODS & STOPLOGS

DESIGNED BY: GW
DRAWN BY: DMC
SURVEYED BY:
CHECKED BY:
SHEET NO. 9 of 9