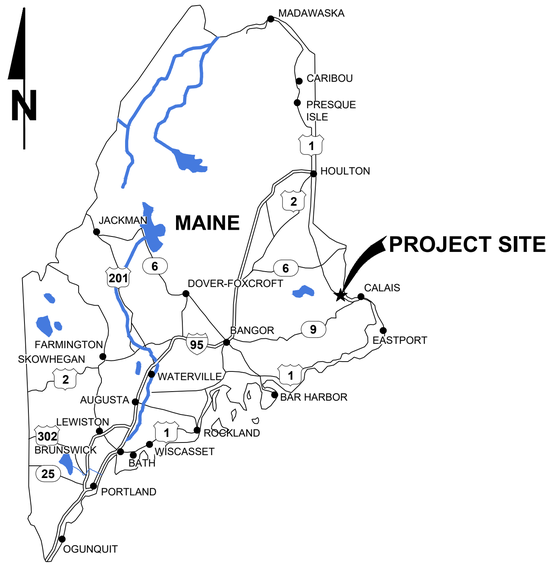
WOODLAND FISH LIFT PASSAGE DESIGN

PREPARED FOR

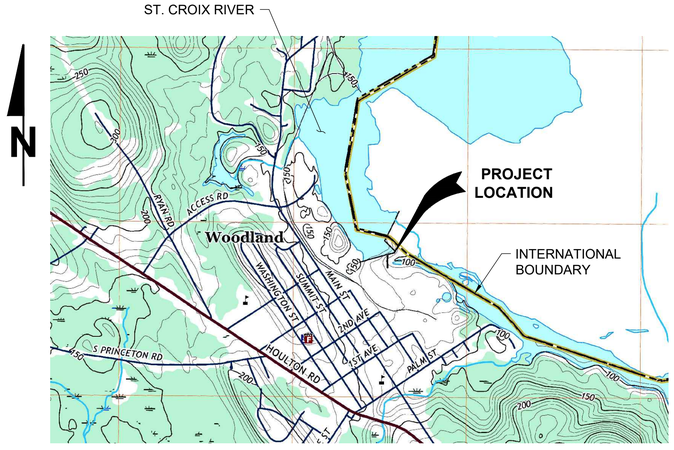
MAINE DEPARTMENT OF MARINE RESOURCES

PREPARED BY

ALDEN
a verdantas company



LOCATION MAP
SCALE: NTS



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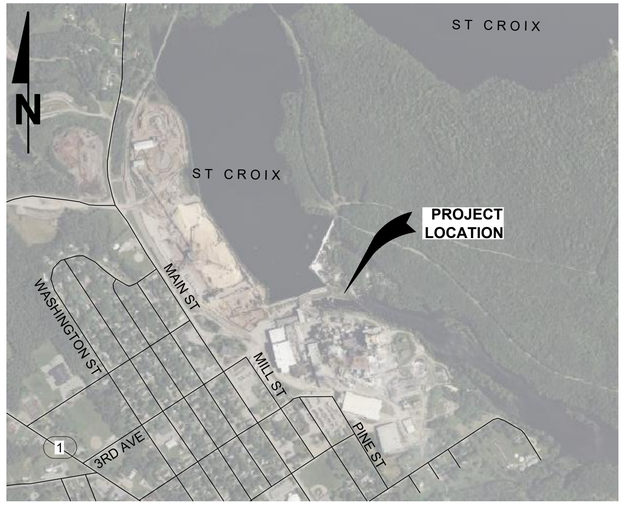

VICINITY MAP
SCALE: NTS

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5/2/2025	ISSUED FOR BID	M. GRAESER

VERIFY SCALE
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WOODLAND FISH LIFT PASSAGE DESIGN

MAINE DEPARTMENT OF MARINE RESOURCES

COVER SHEET, LOCATION MAPS & VICINITY MAP

PROJECT:	16667
DRAWN BY:	C. HAGLER
DESIGNER:	A. MENGERT
APPROVED BY:	M. GRAESER
SHEET:	1 OF 240
DRAWING:	G-001

DRAWING LIST

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239	M-163	DOWNSTREAM ISOLATION GATE (IG-16)
240	M-200	WATER LEVEL SENSOR (WLS) AND STAFF GAUGE DETAILS

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WOODLAND FISH LIFT PASSAGE DESIGN

MAINE DEPARTMENT OF MARINE RESOURCES

DRAWING LIST

PROJECT:	16667
DRAWN BY:	C. HAGLER
DESIGNER:	A. MENGERT
APPROVED BY:	M. GRAESER
SHEET:	2 OF 240
DRAWING:	G-002

GENERAL NOTES:

1. LOCATIONS, ELEVATIONS, AND DIMENSIONS OF EXISTING UTILITIES, STRUCTURES, AND OTHER FEATURES ARE SHOWN ACCORDING TO THE BEST INFORMATION AVAILABLE AT THE TIME OF THE PREPARATION OF THESE DRAWINGS, BUT DO NOT PURPORT TO BE ABSOLUTELY CORRECT OR ACCURATE. THE CONTRACTOR SHALL VERIFY THE LOCATIONS, ELEVATIONS, AND DIMENSIONS OF ALL EXISTING UTILITIES, STRUCTURES, AND OTHER FEATURES AFFECTING THE WORK. SHOULD THE CONTRACTOR IDENTIFY ANY UTILITIES, STRUCTURES OR FEATURES NOT SHOWN ON THE PLANS, THE CONTRACTOR SHALL NOTIFY THE ENGINEER IMMEDIATELY.

2. ALL UTILITIES SHALL BE KEPT IN OPERATION EXCEPT WITH THE EXPRESS WRITTEN CONSENT OF WOODLAND PULP. IT IS THE CONTRACTOR'S RESPONSIBILITY TO PRESERVE EXISTING UTILITIES. ANY AND ALL DAMAGE TO EXISTING UTILITIES AS A RESULT OF THE CONTRACTOR'S ACTIONS, SHALL BE REPAIRED IMMEDIATELY AT THE CONTRACTOR'S EXPENSE.

3. REMOVE, REPLACE OR RELOCATE ALL OVERHEAD INTERFERENCE WHICH MAY AFFECT OPERATION DURING CONSTRUCTION AND TAKE ALL NECESSARY PRECAUTIONS TO AVOID DAMAGE TO SAME. USE EXTREME CAUTION WHEN WORKING NEAR OVERHEAD OR UNDERGROUND POWER, GAS OR OTHER UTILITIES SO AS TO SAFELY PROTECT ALL PERSONNEL AND EQUIPMENT. THE CONTRACTOR SHALL BE RESPONSIBLE FOR ALL COSTS AND LIABILITY IN CONNECTION THEREWITH. THE ELEVATED ELECTRICAL DUCT SHALL NOT BE REMOVED OR RELOCATED. THE ELEVATED ELECTRICAL DUCT SHALL REMAIN IN SERVICE DURING CONSTRUCTION.

4. COORDINATE UNDERGROUND UTILITY MARKING WITH THE EXISTING UTILITIES BY COORDINATING WITH WOODLAND PULP AND CONTACTING DIGSAFE AT 1-888-344-7233 OR 811. DIGSAFE MUST BE CONTACTED A MINIMUM OF 72 HOURS PRIOR TO CONSTRUCTION OR GROUND DISTURBANCE.

5. THE CONTRACTOR SHALL REVIEW THE SITE TO DETERMINE EXISTING CONDITIONS. ANYTHING NOT SHOWN ON THESE DRAWINGS SHALL BE BROUGHT TO THE ATTENTION OF THE ENGINEER AND SHALL NOT CONSTITUTE AN EXTRA, UNLESS RECOMMENDED BY THE ENGINEER AND APPROVED BY MAINE DMR.

6. CONTACT THE ENGINEER IMMEDIATELY OF ANY CONFLICTS ARISING DURING THE CONSTRUCTION OF ANY IMPROVEMENTS SHOWN ON THESE DRAWINGS.

7. PRESERVE ALL SURVEY MARKERS AND MONUMENTATION WHEREVER POSSIBLE. THOSE REQUIRING REMOVAL SHALL BE RE-ESTABLISHED IN ACCORDANCE WITH THE LOCAL, STATE, OR FEDERAL GOVERNING AUTHORITY.

8. ALL DRAWINGS AND DETAILS INCLUDED IN THE CONTRACT DOCUMENTS SHALL FULLY APPLY TO THE WORK WHETHER SPECIFICALLY REFERENCED OR NOT.

9. LIMIT CONSTRUCTION OPERATIONS TO WITHIN THE RIGHT-OF-WAY, EASEMENTS, AND DESIGNATED WORK AREAS AS INDICATED. THE CONTRACTOR IS SOLELY RESPONSIBLE FOR ANY DAMAGES OUTSIDE THE DESIGNATED WORK AREAS SHOWN ON THE DRAWINGS.

10. RESTORE ALL AREAS DISTURBED BY CONSTRUCTION ACTIVITIES. REFER TO SPECIFICATION SECTION 32 90 10 SITE RESTORATION.

11. THE CONTRACTOR SHALL REPLACE ALL ROADS, STABILIZED EARTH, FENCES, AND DRIVEWAYS, ETC., WITH THE SAME TYPE OF MATERIAL THAT WAS REMOVED DURING CONSTRUCTION.

12. SHORING REQUIRED FOR THE STABILITY OF THE UNCOMPLETED STRUCTURE OR FOR INSTALLATION OR MODIFICATION OF STRUCTURAL MEMBERS SHALL BE THE CONTRACTOR'S RESPONSIBILITY.

13. DIMENSIONS OF VALVES, FITTINGS AND OTHER EQUIPMENT MAY VARY DEPENDING UPON MANUFACTURER. CONTRACTOR SHALL REVIEW SHOP DRAWINGS BEFORE SETTING BASES, SUPPORTS, ETC.

14. EXISTING FENCING DISTURBED OR REMOVED SHALL BE REPLACED IN KIND

15. IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO PROVIDE A SECURE PROJECT SITE. WOODLAND PULP WILL NOT BE RESPONSIBLE FOR STOLEN OR VANDALIZED PROPERTY.

16. AT THE CLOSE OF EACH WORKING SHIFT, WHERE THE NEXT SHIFT WILL NOT IMMEDIATELY FOLLOW, PROTECT AND SECURE OPEN EXCAVATION.

17. AREAS WHERE PERMANENT DISTURBANCE IS NOT AUTHORIZED, AREAS SHALL BE RESTORED TO THEIR ORIGINAL CONDITION AND ELEVATION, WHICH UNDER NO CIRCUMSTANCE, SHALL BE HIGHER THAN THE PRE-CONSTRUCTION ELEVATION. ORIGINAL CONDITIONS MEANS CAREFUL PROTECTION AND/OR REMOVAL OF EXISTING SOIL AND VEGETATION, AND REPLACEMENT BACK TO THE ORIGINAL LOCATIONS THAT THE ORIGINAL SOIL LAYERING AND VEGETATION SCHEMES ARE APPROXIMATELY THE SAME, UNLESS OTHERWISE AUTHORIZED.

18. VERTICAL DATUM IN THE DRAWINGS IS BASED ON NAVD88.

19. HORIZONTAL DATUM IS THE STATE PLAN COORDINATE SYSTEM NAD83 MAINE EAST ZONE.

FISH PASSAGE NOTES:

1. POWERHOUSE

- 3,200 CFS NOMINAL CAPACITY

2. RIVER FLOW

- DESIGN LOW 895 CFS (95% EXCEEDANCE)
- AVERAGE 2,350 CFS (50% EXCEEDANCE)
- DESIGN HIGH 7,620 CFS (5% EXCEEDANCE)

3. WATER LEVELS

HEAD POND ELEVATIONS (NAVD 88)

- DESIGN LOW 144.0 FT
- NORMAL 144.6 FT
- DESIGN HIGH 145.4 FT
- DAM CREST 138.6 FT CANADIAN SIDE
- DAM CREST 140.4 FT AMERICAN SIDE
- T/ FLASHBOARDS 145.0 FT

TAILWATER ELEVATIONS (NAVD 88)

- DESIGN LOW 95.6 FT (95% EXCEEDANCE)
- NORMAL 96.8 FT
- DESIGN HIGH 99.7 FT (5% EXCEEDANCE)
- 100 YEAR FLOOD 109.0 FT

4. TARGET SPECIES POPULATIONS (MAINE DEPARTMENT OF MARINE RESOURCES)

- AMERICAN SHAD 165,000
- ALEWIVES 26,000,000
- BLUEBACK HERRING 1,597,213

FISH PASSAGE FACILITIES WILL BE OPERATIONAL FROM MAY 1ST TO JULY 15TH FOR UPSTREAM PASSAGE. DOWNSTREAM PASSAGE FACILITIES WILL BE OPERATIONAL FROM MAY 1ST TO NOVEMBER 15TH.

5. FISH LIFT ENTRANCE

- 6 INCH HEAD DROP (UP TO 2 FEET)
- HINGED FLAP GATE TO MAINTAIN TARGET HEAD DROP AND VELOCITY
- INVERT EL. 90.0 FT
- 8 FT ENTRANCE WIDTH
- MINIMUM SUBMERGENCE OF ENTRANCE SHALL BE 3 FEET

6. FISH LIFT ATTRACTION WATER SYSTEM

- TOTAL ATTRACTION FLOW 160 CFS
- FISH LIFT ENTRANCE UP TO 160 CFS (5% OF STATION CAPACITY)
- AWS INTAKE SCREENS 0.25 INCH SLOT WIDTH WEDGE WIRE
- AWS SCREEN APPROACH VELOCITY 0.5 FT/SEC
- AWS SCREEN OPEN AREA 50%
- AWS DESIGN FLOW 0.5 CFS/SQ FT

7. FISH LIFT DESIGN FEATURES

- FISH LIFT CYCLE TIME 15 MIN (ASSUMED FISHING TIME OF 7 MINUTES)
- TWO SIDED BRAIL, 9.5 DEGREE SLOPE, SMOOTH ALUMINUM W/ 50% POROSITY
- HOPPER VOLUME 490 CUFT
- ADJUSTABLE V-TRAP OPENING BETWEEN 1'-0" AND 6'-5"
- EXIT FLUME 8 FT WIDE FLUME

8. POOL AND CHUTE LADDER DESIGN FEATURES

- DROP PER POOL 9 INCHES
- WEIR WIDTH 24 INCHES
- WEIR NORMAL DEPTH 21 INCHES
- ORIFICE 10 BY 10 INCHES
- POOL DIMENSIONS 8 FT WIDE BY 8 FT LONG
- 65 POOLS
- SLOPE 9.375%
- ENTRANCE INVERT EL 91.60 FT
- EXIT INVERT EL. 138.60 FT
- NORMAL DEPTH 4.75 FT
- NORMAL LADDER FLOW 18 CFS

9. DOWNSTREAM PASSAGE FEATURES

- BAR RACK WITH 0.75 INCH CLEAR SPACING
- BAR RACK AVERAGE APPROACH VELOCITY 0.7 FT/SEC
- 2 BYPASSES WITHIN RACK FACE 3 FT WIDE BY 6 FT DEEP
- RACK BYPASS APPROACH VELOCITY 2.2 FT/SEC
- RACK BYPASS FLOW 80 CFS (40 CFS EACH BYPASS)
- RACK BYPASS DISCHARGED NEAR LADDER ENTRANCE
- EXIT FLUME BYPASS 80 CFS
- EXIT FLUME BYPASS DISCHARGED NEAR FISH LIFT ENTRANCE
- TOTAL DOWNSTREAM PASSAGE FLOW 160 CFS

10. EEL BYPASS FEATURES

- 3 BYPASSES AT SILL OF INTAKE WITH 6" DIAMETER BELL MOUTH ENTRANCE.
- 6" DIAMETER BYPASS PIPE TO BYPASS FLUME
- FLOW: 0.5 CFS EACH
- ENTRANCE VELOCITY: 2.4 FT/SEC

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MAY 2, 2025

REVISION	DESCRIPTION OF ISSUE / REVISION	REVISED BY
5/2/2025	ISSUED FOR BID	M. GRAESER

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WOODLAND FISH LIFT PASSAGE DESIGN

MAINE DEPARTMENT OF MARINE RESOURCES

GENERAL NOTES

PROJECT:	16667
DRAWN BY:	C. HAGLER
DESIGNER:	A. MENGERT
APPROVED BY:	M. GRAESER
SHEET:	3 OF 240
DRAWING:	G-003

ABBREVIATIONS:

'	FEET
"	INCHES
&	AND
@	AT
Ø	DIAMETER
#	NUMBER
±	PLUS OR MINUS
%	PERCENT
100 FP	100-YEAR FLOOD PLAIN
AASHTO	AMERICAN ASSOCIATION OF STATE HIGHWAY AND TRANSPORTATION OFFICIALS
ACI	AMERICAN CONCRETE INSTITUTE
ADD'L	ADDITIONAL
AISC	AMERICAN INSTITUTE OF STEEL CONSTRUCTION
ALUM	ALUMINUM
APPROX	APPROXIMATE
ASCE	AMERICAN SOCIETY OF CIVIL ENGINEERS
ASTM	AMERICAN SOCIETY OF TESTING MATERIALS
AVE	AVENUE
AWS	AUXILIARY WATER SYSTEM/AMERICAN WELDING SOCIETY
B/O, B.O., BO	BOTTOM OF
BOC	BOTTOM OF CONCRETE
BTM	BOTTOM
BTWN	BETWEEN
C	CHANNEL SECTION
C/C	CENTER TO CENTER
C/L, CL, ℄	CENTERLINE
Ce	EXPOSURE FACTOR
CFS	CUBIC FEET PER SECOND
CJ	CONSTRUCTION JOINT
CL	CENTERLINE
CLR	CLEAR
CO	COMPANY
COL	COLUMN
CONC	CONCRETE
CONST	CONSTRUCTION
CONT	CONTINUOUS
CONT'D	CONTINUED
COORD	COORDINATED
CUFT	CUBIC FEET
CY	CUBIC YARDS
D	DEPTH
D/S	DOWNSTREAM
db	REBAR DIAMETER
DEG	DEGREE
DEMO	DEMOLISH
DIA	DIAMETER
DIMS	DIMENSIONS
DWG	DRWING
EA	EACH
EF	EACH FACE
EL, ELEV	ELEVATION
ELF	EQUIVALENT LATERAL FORCE
EMBED	EMBEDMENT
EPDM	ETHYLENE PROPYLENE DIENE MONOMER
EQ	EQUAL
EQUIV	EQUIVALENT
EW	EACH WAY
f'c	COMPRESSIVE STRENGTH OF CONCRETE
FLG	FLANGE
FLGS	FLANGES
FP	FLOOD PLAIN
FT	FOOT/FEET
fy	YIELD STRENGTH
GA	GAUGE
GALV	GALVANIZED
GP	GUSSET PLATE
H	HIGH
HAS	HEADED ANCHOR STUD
HDPE	HIGH-DENSITY POLYETHYLENE
HL	HEIGHT LIMIT
HORIZ	HORIZONTAL
HSS	HOLLOW STRUCTURAL SECTION
HWL	HIGH WATER LEVEL
I	IMPORTANCE FACTOR (ICE)
IBC	INTERNATIONAL BUILDING CODE
ID	INSIDE DIAMETER
Ie	IMPORTANCE FACTOR (EARTHQUAKE)
IN	INCH
INV	INVERT
Is	IMPORTANCE FACTOR (SNOW)
Iw	IMPORTANCE FACTOR (WIND)
JT	JOINT
KSI	KIPS PER SQUARE INCH
L	ANGLE/LENGTH
LB	POUND
LBS	POUNDS

Ld	DEVELOPMENT LENGTH
LF	LINEAR FEET
LH	LEFT HAND
LOC	LOCATIONS
LWL	LOW WATER LEVEL
MAX	MAXIMUM
MC	MC CHANNEL SECTION
MFR	MANUFACTURE/MANUFACTURER
MIN	MINUTES
MIN	MINIMUM
MISC	MISCELLANEOUS
MPH	MILES PER HOUR
N&F	NEAR AND FAR
NAVD	NORTH AMERICAN VERTICAL DATUM
NHW	NORMAL HIGH WATER LINE
NIC	NOT IN CONTRACT
NL	NO LIMIT
NOAA	NATIONAL OCEANIC & ATMOSPHERIC ADMINISTRATION
NPS	NORMAL PIPE SIZE
NTS	NOT TO SCALE
NWL	NORMAL WATER LEVEL
OC	ON CENTERS
OCBF	ORDINARY CONCENTRICALLY BRACED FRAME
OD	OUTSIDE DIAMETER
OHW	ORDINARY HIGH WATER LINE
OHW	OVERHEAD WIRE
OPNG	OPENING
PCF	POUNDS PER CUBIC FOOT
Pg	GROUND SNOW
PI	POINT OF INTERSECTION
PL	PLATE
PP	POLYPROPYLENE
PSF	POUNDS PER SQUARE FOOT
PSI	POUNDS PER SQUARE INCH
PVC	POLYVINYL CHLORIDE
R	RISERS
R	RADIUS
RD	ROAD
REINF	REINFORCING
REQ'D	REQUIRED
RH	RIGHT HAND
SCH, SCHED	SCHEDULE
SEC	SECOND
SF	SILT FENCE
SF	SQUARE FEET
SIM	SIMILAR
SQ	SQUARE
SS, SST	STAINLESS STEEL
ST	STREET
STA	STATION
STD	STANDARD
STL	STEEL
STRUC	STRUCTURE
SYM	SYMMETRICAL
T	TREAD (FOR STAIRS)
T	FOOTING THICKNESS
T&B	TOP AND BOTTOM
T/O, T.O., TO	TOP OF
TBD	TO BE DETERMINED
TC	TURBIDITY CURTAIN
TEL	TELEPHONE
THK	THICK
THRU	THROUGH
TOC	TOP OF CONCRETE
TOG	TOP OF GRATING
TOS	TOP OF STEEL
TOW	TOP OF WALL
TPI	THREADS PER INCH
TYP	TYPICAL
U/S	UPSTREAM
UNO	UNLESS NOTED OTHERWISE
UON	UNLESS OTHERWISE NOTED
USACE	UNITED STATES ARMY CORPS OF ENGINEERS
VERT	VERTICAL
W	WIDE FLANGE SECTION
W	WIDTH
W/	WITH
WP	WORKPOINT
WS	WATERSTOP
WSL	WATER SURFACE LEVEL
WT	STRUCTURAL T SECTION
XXS	EXTRA EXTRA STRONG
YD	YARD
YR	YEAR

LEGEND & SYMBOLS

- SF — SF — SILT FENCE
- TC — TC — TURBIDITY CURTAIN
- COFFERDAM / BULKHEAD / DEWATERING STRUCTURE
- CONSTRUCTION LIMITS
- EXISTING STRUCTURE(S) BOUNDARY/LIMITS
- GRATING SPAN DIRECTION
- HAND RAILING
- FLOW
- OHW — OVERHEAD WIRES
- GW — GW — GUIDE WIRES
- EBP — EBP — EXISTING BURIED PIPE
- EP — EP — EXISTING PIPE
- EED — EED — EXISTING ELECTRICAL

- UNDISTURBED SOIL
- DEMOLITION
- CONCRETE
- GRATING
- FLOW FILL
- EXCAVATE BEDROCK
- GRAVEL
- BEDROCK
- CONTRACTOR STAGING AREA

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5/2/2025	ISSUED FOR BID	M. GRAESER

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WOODLAND FISH LIFT PASSAGE DESIGN

MAINE DEPARTMENT OF MARINE RESOURCES

ABBREVIATIONS & LEGEND

PROJECT:	16667
DRAWN BY:	C. HAGLER
DESIGNER:	A. MENGERT
APPROVED BY:	M. GRAESER
SHEET:	4 OF 240
DRAWING:	G-004

NOTE:

1. THE CONTRACTOR SHALL VERIFY THE LOCATIONS, ELEVATIONS, AND DIMENSIONS OF ALL EXISTING UTILITIES AND STRUCTURES.

LEGEND

- OHW — OVERHEAD WIRES
- GW — GW — GUIDE WIRES
- EBP — EBP — EXISTING BURIED PIPE
- EP — EP — EXISTING PIPE
- EED — EED — EXISTING ELECTRICAL

ST. CROIX RIVER

HEAD POND
NWL EL 144.6

FLOW

TOP OF DAM
EL 150.20

TOP OF DAM EL 145.8±

MILL INTAKE BUILDING (3/G-101)

OHW

OVERHEAD TRANSMISSION LINES (1/G-101)

EXISTING FISH LADDER

42" MILL WATER INTAKE PIPE (4/G-101)

CONC. BLOCK
EL 112.6

FENCE

CONCRETE WALL

TOC EL 146.4±

WOODLAND DAM HYDROELECTRIC GENERATOR ROOM

ELECTRICAL SUB-STATION

CONC. BASE

24" DOWSTREAM BYPASS PIPE

ELEVATED ELECTRIC DUCTS (2/G-101)

ST. CROIX RIVER

FLOW

TOC/TOG EL 102.7

16" CAST IRON AWS PIPE

GUY WIRE

ELEVATED ELECTRIC DUCT (2/G-101)

42" MILL WATER INTAKE PIPE (4/G-101)

TAILRACE
NWL EL 96.8'

OVERHEAD TRANSMISSION LINES (1/G-101)

12" DIA PIPE

METAL DECK

36" DIA PIPE

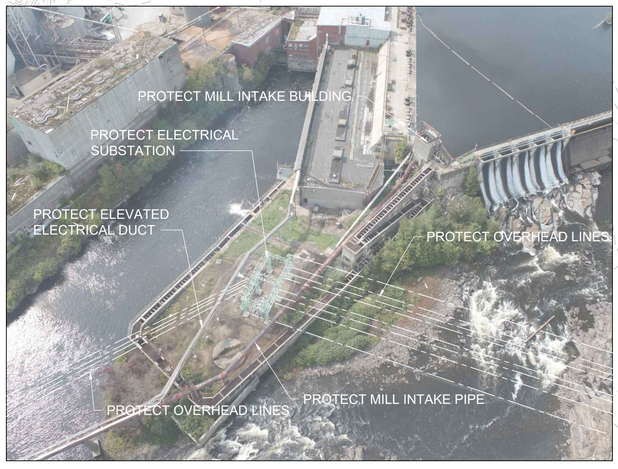
CONCRETE CASING

36" DIA PIPE (5/G-101)

MACHINE ROOM BUILDING

FINISHING ROOM BUILDING

PAVEMENT



OVERVIEW OF UTILITIES TO BE PROTECTED DURING CONSTRUCTION
SCALE: NTS

N

SITE PLAN
SCALE: 1"=40'
40' 0 40' 80'

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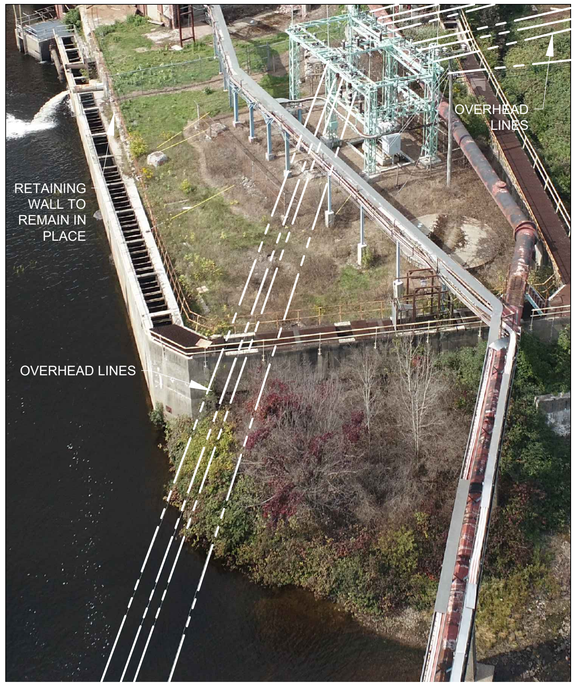
WOODLAND FISH LIFT PASSAGE DESIGN

MAINE DEPARTMENT OF MARINE RESOURCES

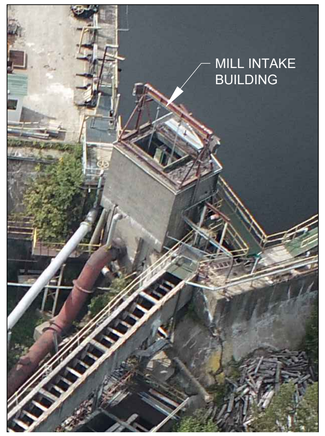
EXISTING CONDITIONS - OVERALL SITE PLAN

PROJECT:	16667
DRAWN BY:	C. HAGLER
DESIGNER:	A. MENGERT
APPROVED BY:	M. GRAESER
SHEET:	5 OF 240
DRAWING:	G-100



1 G-100 **OVERHEAD LINES**
SCALE: NTS

2 G-100 **ELEVATED DUCT BANK**
SCALE: NTS



3 G-100 **EXISTING MILL INTAKE BUILDING**
SCALE: NTS

4 G-100 **MILL WATER INTAKE PIPE**
SCALE: NTS

5 G-100 **36" PIPE WITH CONCRETE CASING**
SCALE: NTS

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WOODLAND FISH LIFT PASSAGE DESIGN

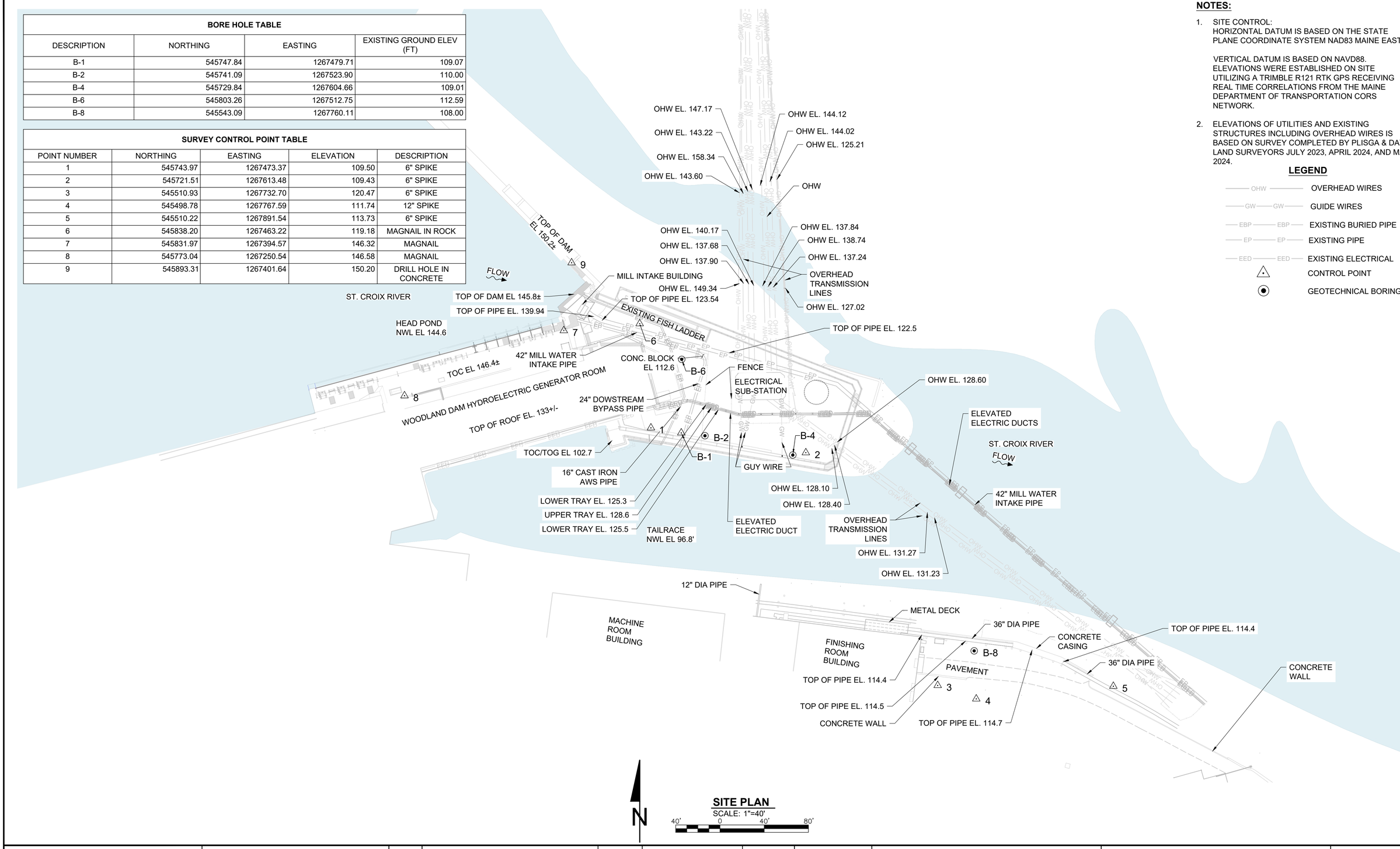
MAINE DEPARTMENT OF MARINE RESOURCES

UTILITIES TO BE PROTECTED

PROJECT:	16667
DRAWN BY:	C. HAGLER
DESIGNER:	A. MENGERT
APPROVED BY:	M. GRAESER
SHEET:	6 OF 240
DRAWING:	G-101

BORE HOLE TABLE			
DESCRIPTION	NORTHING	EASTING	EXISTING GROUND ELEV (FT)
B-1	545747.84	1267479.71	109.07
B-2	545741.09	1267523.90	110.00
B-4	545729.84	1267604.66	109.01
B-6	545803.26	1267512.75	112.59
B-8	545543.09	1267760.11	108.00

SURVEY CONTROL POINT TABLE				
POINT NUMBER	NORTHING	EASTING	ELEVATION	DESCRIPTION
1	545743.97	1267473.37	109.50	6" SPIKE
2	545721.51	1267613.48	109.43	6" SPIKE
3	545510.93	1267732.70	120.47	6" SPIKE
4	545498.78	1267767.59	111.74	12" SPIKE
5	545510.22	1267891.54	113.73	6" SPIKE
6	545838.20	1267463.22	119.18	MAGNAIL IN ROCK
7	545831.97	1267394.57	146.32	MAGNAIL
8	545773.04	1267250.54	146.58	MAGNAIL
9	545893.31	1267401.64	150.20	DRILL HOLE IN CONCRETE



NOTES:

1. SITE CONTROL:
   HORIZONTAL DATUM IS BASED ON THE STATE PLANE COORDINATE SYSTEM NAD83 MAINE EAST.

   VERTICAL DATUM IS BASED ON NAVD88. ELEVATIONS WERE ESTABLISHED ON SITE UTILIZING A TRIMBLE R121 RTK GPS RECEIVING REAL TIME CORRELATIONS FROM THE MAINE DEPARTMENT OF TRANSPORTATION CORS NETWORK.

2. ELEVATIONS OF UTILITIES AND EXISTING STRUCTURES INCLUDING OVERHEAD WIRES IS BASED ON SURVEY COMPLETED BY PLISGA & DAY LAND SURVEYORS JULY 2023, APRIL 2024, AND MAY 2024.

LEGEND

- OHW — OVERHEAD WIRES
- GW — GUIDE WIRES
- EBP — EXISTING BURIED PIPE
- EP — EXISTING PIPE
- EED — EXISTING ELECTRICAL
- CONTROL POINT
- GEOTECHNICAL BORING

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MAY 2, 2025

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5/2/2025	ISSUED FOR BID	M. GRAESER

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WOODLAND FISH LIFT PASSAGE DESIGN

MAINE DEPARTMENT OF MARINE RESOURCES

GEOTECHNICAL BORINGS & SURVEY CONTROL

PROJECT:	16667
DRAWN BY:	C. HAGLER
DESIGNER:	A. MENGERT
APPROVED BY:	M. GRAESER
SHEET:	7 OF 240
DRAWING:	G-110

SOIL BORING LOG

verdantas

Client: Maine Department of Marine Resources | **Boring Identification:** B-1
Project: Woodland Fish Passage Design | **Sheet:** 1 of 1
Location: Woodland Dam, St. Croix River, Baileyville, Maine | **Checked By:** CJS | **Project Number:** 16667

Drilling Company: New England Boring Contractors | **Boring Location Lat/Long:** 45.15851173°/ -67.40196874°
Foreman: Devon Share | **Ground Surface Elevation:** 109' | **Datum:** NAVD88
Verdantas Engineer/Geologist: Begum Kurtoglu | **Date Started:** 11/07/2023 | **Date Completed:** 11/08/2023

DRILLING METHOD	SAMPLER
Vehicle: M1	**Type:** SS 2" - NQ Core
Model: Soil Scout	**Hammer (lb):** 140
Method: Drive and Wash 4" and 3"	**Fall (in):** 24*

GROUNDWATER MEASUREMENTS			
Date	**Depth (ft)**	**Reference**	**Stabilization**
11/08/2023	8.1	Ground Surface	After Drilling

DEPTH (ft)	SAMPLE INFORMATION #	Pen/Rec (in)	Depth (ft)	Blows/6"	SAMPLE DESCRIPTION	STRATUM DESCRIPTION	FIELD SCREENING (ppm)	NOTE
0	S1	24/11	0 - 2	3	S1: Medium dense, brown and gray, fine to coarse SAND, some Gravel and Rock Fragments, little Silt, dry.	FILL		
				10				
1				13				
				19				
2	S2	24/7	2 - 4	11	S2: Dense, beige and gray, fine to coarse SAND, some Rock Fragments, little Gravel, trace Silt, dry. **Note:** Concrete fragments encountered at the tip of the spoon.			
				18				
3				31				
				26				
4	S3	24/0	4 - 6	6	S3: No recovery.			
				8				
5				4				
				18				
6	S4	24/1	6 - 8	22	S4: Medium dense, gray, ROCK FRAGMENTS, little Gravel and Sand, damp.			
				15				
7				10				
				11	**Note:** Bedrock encountered at 8.2 ft below ground surface. Coring started at 8.2 ft below ground surface.			
8								
9	C1	33/24	8.2 - 10.9	-	C1: Gray, fine-grained, WACKE and ARENITE, moderately soft, moderately weathered, 6.3 fractures per foot (RQD: 0%; Very Poor) [Cookson Group]. Rock Coring Rate (min:sec) 8.2 - 9.2 ft: 07:15; 9.2 - 10.2 ft: 07:37; 10.2 - 10.9 ft: 10:39	BEDROCK		
10								
11	C2	7/7	10.9 - 11.5	-	C2: Gray, fine-grained, WACKE and ARENITE, moderately hard, highly weathered, 6.7 fractures per foot (RQD: 0%; Very poor) [Cookson Group]. Rock Coring Rate (min:sec) 10.9 - 11.5 ft: 15:03			
12	C3	25/20	11.5 - 13.6	-	C3: Gray, fine-grained, WACKE and ARENITE, moderately hard, moderately weathered, 4.3 fractures per foot (RQD: 0%; Very Poor) [Cookson Group]. Rock Coring Rate (min:sec) 11.5 - 11.9 ft: 06:26; 11.9 - 12.9 ft: 07:25; 12.9 - 13.6 ft: 07:42			
13								
14					Boring terminated at 13.6 ft bgs.			
15								
16								
17								
18								
19								
20								

GRANULAR SOILS		COHESIVE SOILS	
Blows/ft.	**Density**	**Blows/ft.**	**Consistency**
0-4	V. LOOSE	<2	V. SOFT
5-10	LOOSE	2-4	SOFT
11-30	M. DENSE	4-8	M. STIFF
31-50	DENSE	8-15	STIFF
>50	V. DENSE	15-30	V. STIFF
		>30	HARD

NOTES
1. Boring terminated at 13.6ft. Boring backfilled with cuttings to ground surface.
2. Ground surface elevation approximated based on Existing Conditions Plan dated 4/10/2023.
3. Lat/Long coordinates approximated from Google Earth.

bgs = below the ground surface
* Short and inconsistent hammer drop height using rope and cathead with donut hammer; cannot be correlated to standard N-values

SOIL BORING LOG

verdantas

Client: Maine Department of Marine Resources | **Boring Identification:** B-1 (Offset)
Project: Woodland Fish Passage Design | **Sheet:** 1 of 2
Location: Woodland Dam, St. Croix River, Baileyville, Maine | **Checked By:** CJS | **Project Number:** 16667

Drilling Company: New England Boring Company | **Boring Location Lat/Long:** 45.15851173°/ -67.40196874°
Foreman: Tom | **Ground Surface Elevation:** 109' | **Datum:** NAVD88
Engineer/Geologist: Joel Morin | **Date Started:** 4/3/24 | **Date Completed:** 4/4/24

DRILLING METHOD	SAMPLER
Vehicle: ATV	**Type:** SS 2" - NQ Core
Model: Soil Scout	**Hammer (lb):** 140
Method: SSA/Driven casing/rock hammer	**Fall (in):** ~18

GROUNDWATER MEASUREMENTS			
Date	**Depth (ft)**	**Reference**	**Stabilization**
04/04/2024	Not observed	Ground Surface	During Drilling

DEPTH (ft)	SAMPLE INFORMATION #	Pen/Rec (in)	Depth (ft)	Blows/6"	SAMPLE DESCRIPTION	STRATUM DESCRIPTION	FIELD SCREENING (ppm)	NOTE
0								
1								
2					**Note:** Solid stem auger to 5 ft bgs; casing driven to 5 ft bgs.			
3								
4						FILL		
5	S1	24/2	5-7	5	S1: Loose*, brown, GRAVEL and silty SAND, moist.			
6				4				
				9				
7				8				
8					**Note:** Bedrock encountered at 8 ft bgs; air hammer to 10 ft bgs.			
9						HIGHLY FRACTURED BEDROCK		
10	C1	60/60	10-15	-	C1: Gray/light gray, fine to coarse grained, interbedded WACKE and thinly laminated ARENITE, Several core barrel jams, and starting and stopping to clear jams [Cookson Group]. Estimated Recovery: 100% RQD: 8%. Rock Coring Rate (min:sec) 10-11 ft 1:03; 11 - 12 ft 5:42; 12 - 13 ft 7:35; 13 - 14 ft 9:32; 14 - 15 ft 12:05 **Note:** 14-15 ft, Sheen observed on extracted cored rock and in water exiting borehole.	BEDROCK		
11								
12								
13								
14								
15	C2	51.6/50.5	15-19.3	-	C2: Gray/light gray, fine to coarse grained, interbedded WACKE and thinly laminated ARENITE, Several core barrel jams, and starting and stopping to clear jams [Cookson Group]. Recovery: 98% RQD: 66%. Rock Coring Rate (min:sec) 15 - 16 ft 3:36; 16 - 17 ft 6:12; 17 - 18 ft 5:23; 18 - 19.3 ft 8:45			
16								
17								
18								
19								
20								

GRANULAR SOILS		COHESIVE SOILS	
Blows/ft.	**Density**	**Blows/ft.**	**Consistency**
0-4	V. LOOSE	<2	V. SOFT
5-10	LOOSE	2-4	SOFT
11-30	M. DENSE	4-8	M. STIFF
31-50	DENSE	8-15	STIFF
>50	V. DENSE	15-30	V. STIFF
		>30	HARD

NOTES
1. Boring backfilled with cuttings to the ground surface.
2. Ground surface elevation approximated based on Existing Conditions Plan dated 4/10/2023.
3. Lat/Long coordinates approximated from Google Earth.

bgs = below the ground surface
* Short and inconsistent hammer drop height using rope and cathead with donut hammer; cannot be corelated to standard N-values

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5/2/2025	ISSUED FOR BID	M. GRAESER

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WOODLAND FISH LIFT PASSAGE DESIGN

MAINE DEPARTMENT OF MARINE RESOURCES

GEOTECHNICAL BORING LOGS

PROJECT:	16667
DRAWN BY:	C. HAGLER
DESIGNER:	A. MENGERT
APPROVED BY:	M. GRAESER
SHEET:	8 OF 240
DRAWING:	G-111

SOIL BORING LOG

verdantas — PEOPLE FOCUSED FUTURE

Client: Maine Department of Marine Resources
Project: Woodland Fish Passage Design
Location: Woodland Dam, St. Croix River, Baileyville, Maine
Boring Identification: B-1 (Offset)
Sheet: 2 of 2
Checked By: CJS
Project Number: 16667

Drilling Company: New England Boring Company
Foreman: Tom
Engineer/Geologist: Joel Morin
Boring Location Lat/Long: 45.15851173°/ -67.40196874°
Ground Surface Elevation: 109'
Datum: NAVD88
Date Started: 4/3/24
Date Completed: 4/4/24

DRILLING METHOD	SAMPLER
Vehicle: ATV	**Type:** SS 2" - NQ Core
Model: Soil Scout	**Hammer (lb):** 140
Method: SSA/Driven casing/rock hammer	**Fall (in):** ~18

GROUNDWATER MEASUREMENTS

Date	Depth (ft)	Reference	Stabilization
04/04/2024	Not observed	Ground Surface	During Drilling

DEPTH (ft)	SAMPLE INFORMATION #	Pen/Rec (in)	Depth (ft)	Blows/6"	SAMPLE DESCRIPTION	STRATUM DESCRIPTION	FIELD SCREENING (ppm)	NOTE
20	C3	60/60	19.3-24.3	-	C3: Gray/light gray, fine to coarse grained, interbedded WACKE and thinly laminated ARENITE, Few core barrel jams, and starting and stopping to clear jams [Cookson Group]. Recovery: 100% RQD: 44%. Rock Coring Rate (min.sec) 19.3 - 20.3 ft 6:21; 20.3 - 21.3 ft 5:06; 21.3 - 22.3ft 4:44; 22.3 - 23.3 ft 4:27; 23.3 - 24.3 ft 4:35	BEDROCK		
21								
22								
23								
24					Boring terminated at 24 ft bgs.			
25								
26								
27								
28								
29								
30								
31								
32								
33								
34								
35								
36								
37								
38								
39								
40								

GRANULAR SOILS		COHESIVE SOILS	
Blows/ft.	Density	Blows/ft.	Consistency
0-4	V. LOOSE	<2	V. SOFT
5-10	LOOSE	2-4	SOFT
11-30	M. DENSE	4-8	M. STIFF
31-50	DENSE	8-15	STIFF
>50	V. DENSE	15-30	V. STIFF
		>30	HARD

NOTES

1. Boring backfilled with cuttings to the ground surface.
2. Ground surface elevation approximated based on Existing Conditions Plan dated 4/10/2023.
3. Lat/Long coordinates approximated from Google Earth.

bgs = below the ground surface
* Short and inconsistent hammer drop height using rope and cathead with donut hammer; cannot be corelated to standard N-values

SOIL BORING LOG

verdantas — PEOPLE FOCUSED FUTURE

Client: Maine Department of Marine Resources
Project: Woodland Fish Passage Design
Location: Woodland Dam, St. Croix River, Baileyville, Maine
Boring Identification: B-2
Sheet: 1 of 1
Checked By: CJS
Project Number: 16667

Drilling Company: New England Boring Contractors
Foreman: Devon Share
Verdantas Engineer/Geologist: Begum Kurtoglu
Boring Location Lat/Long: 45.15849158°/ -67.40179781°
Ground Surface Elevation: 110'
Datum: NAVD88
Date Started: 11/09/2023
Date Completed: 11/09/2023

DRILLING METHOD	SAMPLER
Vehicle: M1	**Type:** SS 2" - NQ Core
Model: Soil Scout	**Hammer (lb):** 140
Method: Drive and Wash 4" and 3"	**Fall (in):** 24*

GROUNDWATER MEASUREMENTS

Date	Depth (ft)	Reference	Stabilization
11/09/2023	9.2	Ground Surface	After Drilling

DEPTH (ft)	SAMPLE INFORMATION #	Pen/Rec (in)	Depth (ft)	Blows/6"	SAMPLE DESCRIPTION	STRATUM DESCRIPTION	FIELD SCREENING (ppm)	NOTE
0	S1	24/6	0 - 2	3	S1: Dense, brown, GRAVEL and fine to coarse SAND, trace Silt, dry. Concerete pieces are encountered at the tip of the spoon.	FILL		
1				29				
				17				
2				13				
3						URBAN FILL		
4								
5								
6	S2	24/0	5.5 - 7.5	3	S2: No recovery.			
				7				
7				3				
				6				
8								
9					**Note:** Bedrock encountered at 9.3 ft bgs. Coring started at 9.3 ft bgs.			
10	C1	60/60	9.3 - 14.3	-	C1: Gray, fine-grained, WACKE and ARENITE, moderately hard, slightly to moderately weathered, 3.0 fractures per foot (RQD: 40%; Poor) [Cookson Group]. Rock Coring Rate (min:sec) 9.3 - 10.3 ft: 04:22 10.3 - 11.3 ft: 03:57 11.3 - 12.3 ft: 04:30 12.3 - 13.3 ft: 05:03 13.3 - 14.3 ft: 05:32	BEDROCK		
11								
12								
13								
14								
15	C2	23/23	14.3 - 16.2	-	C2: Gray, fine-grained, WACKE and ARENITE, moderately hard, slightly to moderately weathered, 2.6 fractures per foot (RQD: 0%; Very Poor. [Cookson Group]. Rock Coring Rate (min:sec) 14.3 - 15.3 ft: 05:35 15.3 - 16.2 ft: 05:51			
16								
17	C3	37/37	16.2 - 19.3	-	C3: Gray, fine-grained,WACKE and ARENITE, moderately hard, slightly to moderately weathered, 2.9 fractures per foot (RQD: 65%; Fair) [Cookson Group].			
18								
19								
20					Boring terminated at 19.3 ft bgs.			

GRANULAR SOILS		COHESIVE SOILS	
Blows/ft.	Density	Blows/ft.	Consistency
0-4	V. LOOSE	<2	V. SOFT
5-10	LOOSE	2-4	SOFT
11-30	M. DENSE	4-8	M. STIFF
31-50	DENSE	8-15	STIFF
>50	V. DENSE	15-30	V. STIFF
		>30	HARD

NOTES

1. Boring Terminated at 19.3 ft bgs. Boring backfilled with cuttings to ground surface.
2. Ground surface elevation approximated based on Existing Conditions Plan dated 4/10/2023.
3. Lat/Long coordinates approximated from Google Earth.

bgs = below the ground surface
* Short and inconsistent hammer drop height using rope and cathead with donut hammer; cannot be correlated to standard N-values

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REVISION	DESCRIPTION OF ISSUE / REVISION	REVISED BY
5/2/2025	ISSUED FOR BID	M. GRAESER

VERIFY SCALE
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WOODLAND FISH LIFT PASSAGE DESIGN

MAINE DEPARTMENT OF MARINE RESOURCES

GEOTECHNICAL BORING LOGS

PROJECT:	16667
DRAWN BY:	C. HAGLER
DESIGNER:	A. MENGERT
APPROVED BY:	M. GRAESER
SHEET:	9 OF 240
DRAWING:	G-112

SOIL BORING LOG

verdantas

Client: Maine Department of Marine Resources
Project: Woodland Fish Passage Design
Location: Woodland Dam, St. Croix River, Baileyville, Maine
Boring Identification: B-4
Sheet: 1 of 1
Checked By: CJS
Project Number: 16667

Drilling Company: New England Boring Company
Foreman: Tom
Engineer/Geologist: Joel Morin
Boring Location Lat/Long: 45.15845772°/ -67.40148536°
Ground Surface Elevation: 109'
Datum: NAVD88
Date Started: 4/5/24
Date Completed: 4/5/24

DRILLING METHOD	SAMPLER
Vehicle: ATV	**Type:** SS 2" - NQ Core
Model: Soil Scout	**Hammer (lb):** 140
Method: SSA/Driven casing/rock hammer	**Fall (in):** ~18*

GROUNDWATER MEASUREMENTS			
Date	Depth (ft)	Reference	Stabilization
04/05/2024	Not observed	Ground Surface	During Drilling

DEPTH (ft)	SAMPLE INFORMATION #	Pen/Rec (in)	Depth (ft)	Blows/6"	SAMPLE DESCRIPTION	STRATUM DESCRIPTION	FIELD SCREENING (ppm)	NOTE
0–5					**Note:** Solid Stem auger through 10 ft of loose silty SAND, laden with boulders.	FILL		
10					Boring terminated at 10 bgs.			

GRANULAR SOILS		COHESIVE SOILS	
Blows/ft.	Density	Blows/ft.	Consistency
0-4	V. LOOSE	<2	V. SOFT
5-10	LOOSE	2-4	SOFT
11-30	M. DENSE	4-8	M. STIFF
31-50	DENSE	8-15	STIFF
>50	V. DENSE	15-30	V. STIFF
		>30	HARD

NOTES

1. Boring backfilled with cuttings to the ground surface.
2. Ground surface elevation approximated based on Existing Conditions Plan dated 4/10/2023.
3. Lat/Long coordinates approximated from Google Earth.

bgs = below the ground surface
* Short and inconsistent hammer drop height using rope and cathead with donut hammer; cannot be corelated to standard N-values

SOIL BORING LOG

verdantas

Client: Maine Department of Marine Resources
Project: Woodland Fish Passage Design
Location: Woodland Dam, St. Croix River, Baileyville, Maine
Boring Identification: B-6
Sheet: 1 of 1
Checked By: CJS
Project Number: 16667

Drilling Company: New England Boring Company
Foreman: Tom
Engineer/Geologist: Joel Morin
Boring Location Lat/Long: 45.15866249°/ -67.40183773°
Ground Surface Elevation: 112'
Datum: NAVD88
Date Started: 4/4/24
Date Completed: 4/5/24

DRILLING METHOD	SAMPLER
Vehicle: ATV	**Type:** SS 2" - NQ Core
Model: Soil Scout	**Hammer (lb):** 140
Method: SSA/Driven casing/rock hammer	**Fall (in):** ~18

GROUNDWATER MEASUREMENTS			
Date	Depth (ft)	Reference	Stabilization
04/05/2024	Not observed	Ground Surface	During Drilling

DEPTH (ft)	SAMPLE INFORMATION #	Pen/Rec (in)	Depth (ft)	Blows/6"	SAMPLE DESCRIPTION	STRATUM DESCRIPTION	FIELD SCREENING (ppm)	NOTE
0–5					**Note:** Solid stem auger to 5 ft bgs; casing driven to 5 ft bgs.	FILL		
5–10					**Note:** Weathered and highy fractured bedrock encounted at 8.1 ft bgs. Attempted air hammer initially; replaced by rolller bit and flowing water to 11 ft bgs.	HIGHLY FRACTURED BEDROCK		
11	C1	60/56	11-16	-	**Note:** Bedrock encountered at 11 ft bgs. Coring started at 11 ft bgs. C1: Gray/light gray, fine to coarse grained, interbedded WACKE and thinly laminated ARENITE, Several core barrel jams, and starting and stopping to clear jams [Cookson Group]. Recovery: 93% RQD: 65%. Rock Coring Rate (min:sec) 11 - 12 ft 2:54; 12 - 13 ft 4:36; 13 - 14 ft 3:51; 14 - 15 ft 5:12; 15 - 16 ft 7:01	BEDROCK		
16					Boring terminated at 16 ft bgs.			

GRANULAR SOILS		COHESIVE SOILS	
Blows/ft.	Density	Blows/ft.	Consistency
0-4	V. LOOSE	<2	V. SOFT
5-10	LOOSE	2-4	SOFT
11-30	M. DENSE	4-8	M. STIFF
31-50	DENSE	8-15	STIFF
>50	V. DENSE	15-30	V. STIFF
		>30	HARD

NOTES

1. Boring backfilled with cuttings to the ground surface.
2. Ground surface elevation approximated based on Existing Conditions Plan dated 4/10/2023.
3. Lat/Long coordinates approximated from Google Earth.

bgs = below the ground surface
* Short and inconsistent hammer drop height using rope and cathead with donut hammer; cannot be corelated to standard N-values

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REVISION	DESCRIPTION OF ISSUE / REVISION	REVISED BY
5/2/2025	ISSUED FOR BID	M. GRAESER

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WOODLAND FISH LIFT PASSAGE DESIGN

MAINE DEPARTMENT OF MARINE RESOURCES

GEOTECHNICAL BORING LOGS

PROJECT:	16667
DRAWN BY:	C. HAGLER
DESIGNER:	A. MENGERT
APPROVED BY:	M. GRAESER
SHEET:	10 OF 240
DRAWING:	G-113

SOIL BORING LOG

verdantas

Client: Maine Department of Marine Resources | **Boring Identification:** B-8

Project: Woodland Fish Passage Design | **Sheet:** 1 of 1

Location: Woodland Dam, St. Croix River, Baileyville, Maine | **Checked By:** | **Project Number:** 16667

Drilling Company: New England Boring Contractors | **Boring Location Lat/Long:** 45.15793977°/ -67.40089266°

Foreman: Devon Share | **Ground Surface Elevation:** 108' | **Datum:** NAVD88

Verdantas Engineer/Geologist: Begum Kurtoglu | **Date Started:** 11/10/2023 | **Date Completed:** 11/10/2023

DRILLING METHOD	SAMPLER
Vehicle: Drill 28	**Type:** SS 2" - NQ Core
Model: B53	**Hammer (lb):** 140
Method: Drive and Wash 3"	**Fall (in):** 30

GROUNDWATER MEASUREMENTS

Date	Depth (ft)	Reference	Stabilization
11/10/2023	5.8	Ground Surface	After Drilling

DEPTH (ft)	SAMPLE INFORMATION #	Pen/Rec (in)	Depth (ft)	Blows/6"	SAMPLE DESCRIPTION	STRATUM DESCRIPTION	FIELD SCREENING (ppm)	NOTE
0					Note: Hand excavated to 2.1 ft below ground surface to confirm no utilities present at boring location.	FILL		
1								
2	S1	6/0	2.1 - 2.6	21	S1: No recovery.			
3				50/0"				
				-				
4				-				
	S2	22/5	4.0 - 5.9	4	S2: Loose, gray, GRAVEL and fine to coarse SAND, some Rock Pieces, trace Silt, dry.			
5				4				
				5				
6				50/4"	**Note:** Weathered bedrock encountered starting from 5.8 ft to 6.3 ft bgs. Coring started at 6.3 ft bgs.	WEATHERED BEDROCK		
	C1	60/60	6.3 - 11.3	-	C1: Gray, fine-grained, WACKE and ARENITE, moderately hard, moderately to highly weathered, 5.4 fractures per foot (RQD: 0%; Very poor) [Cookson Group]. Rock Coring Rate (min:sec) 6.3 - 7.3 ft: 01:38 7.3 - 8.3 ft: 01:51 8.3 - 9.3 ft: 01:39 9.3 - 10.3 ft: 01:41 10.3 - 11.3 ft: 01:56	BEDROCK		
7								
8								
9								
10								
11								
12					Boring terminated at 11.3 ft bgs.			
13								
14								
15								
16								
17								
18								
19								
20								

GRANULAR SOILS		COHESIVE SOILS	
Blows/ft.	Density	Blows/ft.	Consistency
0-4	V. LOOSE	<2	V. SOFT
5-10	LOOSE	2-4	SOFT
11-30	M. DENSE	4-8	M. STIFF
31-50	DENSE	8-15	STIFF
>50	V. DENSE	15-30	V. STIFF
		>30	HARD

NOTES

1. Boring backfilled with cuttings to the ground surface.
2. Ground surface elevation approximated based on Existing Conditions Plan dated 4/10/2023.
3. Lat/Long coordinates approximated from Google Earth.

bgs= below ground surface

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5/2/2025	ISSUED FOR BID	M. GRAESER

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WOODLAND FISH LIFT PASSAGE DESIGN

MAINE DEPARTMENT OF MARINE RESOURCES

GEOTECHNICAL BORING LOGS

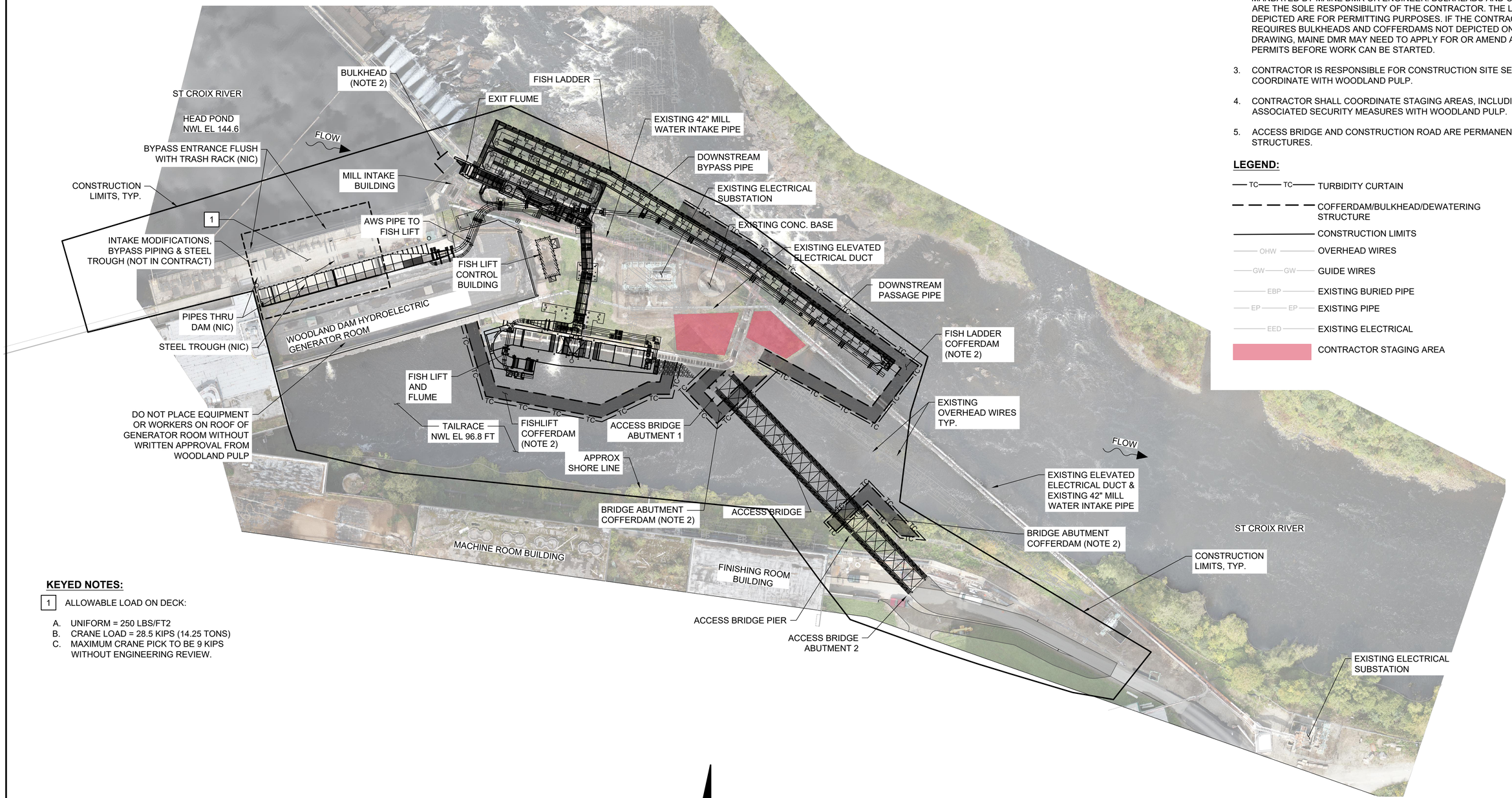
PROJECT:	16667
DRAWN BY:	C. HAGLER
DESIGNER:	A. MENGERT
APPROVED BY:	M. GRAESER
SHEET:	11 OF 240
DRAWING:	G-114

NOTES:

1. THE CONTRACTOR SHALL VERIFY THE LOCATIONS, ELEVATIONS, AND DIMENSIONS OF ALL EXISTING UTILITIES AND STRUCTURES.
2. BULKHEADS AND COFFERDAMS DEPICTED ON THIS DRAWING ARE NOT MANDATED BY MAINE DMR OR ENGINEER. BULKHEADS AND COFFERDAMS ARE THE SOLE RESPONSIBILITY OF THE CONTRACTOR. THE LOCATIONS DEPICTED ARE FOR PERMITTING PURPOSES. IF THE CONTRACTOR REQUIRES BULKHEADS AND COFFERDAMS NOT DEPICTED ON THIS DRAWING, MAINE DMR MAY NEED TO APPLY FOR OR AMEND APPLICABLE PERMITS BEFORE WORK CAN BE STARTED.
3. CONTRACTOR IS RESPONSIBLE FOR CONSTRUCTION SITE SECURITY. COORDINATE WITH WOODLAND PULP.
4. CONTRACTOR SHALL COORDINATE STAGING AREAS, INCLUDING ASSOCIATED SECURITY MEASURES WITH WOODLAND PULP.
5. ACCESS BRIDGE AND CONSTRUCTION ROAD ARE PERMANENT STRUCTURES.

LEGEND:

- TC — TC — TURBIDITY CURTAIN
- COFFERDAM/BULKHEAD/DEWATERING STRUCTURE
- CONSTRUCTION LIMITS
- OHW — OVERHEAD WIRES
- GW — GW — GUIDE WIRES
- EBP — EXISTING BURIED PIPE
- EP — EP — EXISTING PIPE
- EED — EXISTING ELECTRICAL
- CONTRACTOR STAGING AREA



KEYED NOTES:

1 ALLOWABLE LOAD ON DECK:

A. UNIFORM = 250 LBS/FT2
B. CRANE LOAD = 28.5 KIPS (14.25 TONS)
C. MAXIMUM CRANE PICK TO BE 9 KIPS WITHOUT ENGINEERING REVIEW.

N

SITE PLAN
SCALE: 1"=40'
0 40' 80'

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5/2/2025	ISSUED FOR BID	M. GRAESER

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WOODLAND FISH LIFT PASSAGE DESIGN

MAINE DEPARTMENT OF MARINE RESOURCES

CONSTRUCTUION LIMITS & STAGING AREAS

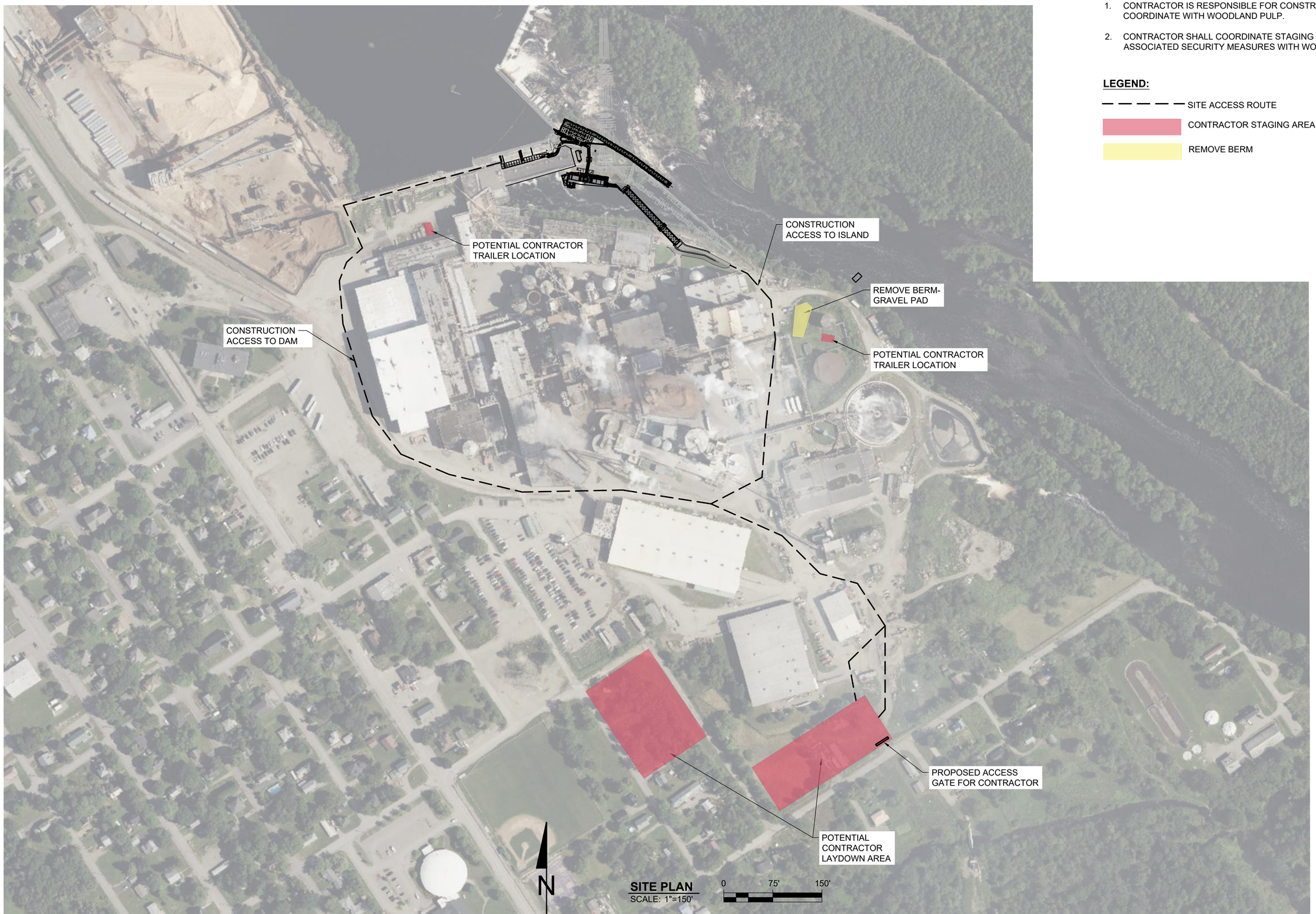
PROJECT:	16667
DRAWN BY:	C. HAGLER
DESIGNER:	A. MENGERT
APPROVED BY:	M. GRAESER
SHEET:	12 OF 240
DRAWING:	G-120

NOTES:

1. CONTRACTOR IS RESPONSIBLE FOR CONSTRUCTION SITE SECURITY. COORDINATE WITH WOODLAND PULP.
2. CONTRACTOR SHALL COORDINATE STAGING AREAS, INCLUDING ASSOCIATED SECURITY MEASURES WITH WOODLAND PULP.

LEGEND:

- SITE ACCESS ROUTE
- CONTRACTOR STAGING AREA
- REMOVE BERM



SITE PLAN
SCALE: 1"=150'

0 75' 150'

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MAY 2, 2025

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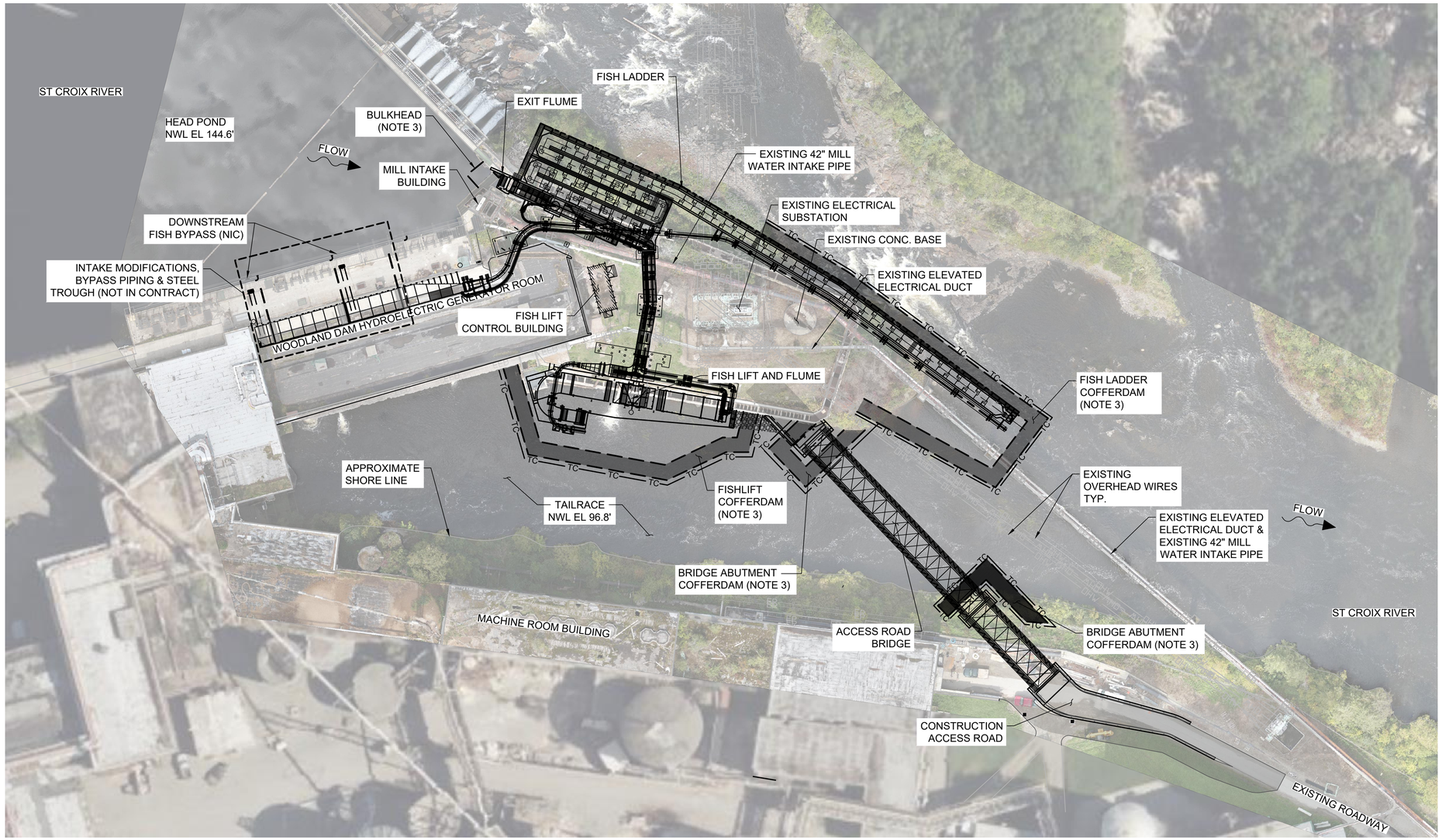
WOODLAND FISH LIFT PASSAGE DESIGN

MAINE DEPARTMENT OF MARINE RESOURCES

SITE ACCESS & STAGING AREAS

PROJECT:	16667
DRAWN BY:	C. HAGLER
DESIGNER:	A. MENGERT
APPROVED BY:	M. GRAESER
SHEET:	13 OF 240
DRAWING:	G-121



SITE PLAN
SCALE: 1"=40'

N

40' 0 40' 80'

NOTES:

1. THE CONTRACTOR SHALL VERIFY THE LOCATIONS, ELEVATIONS, AND DIMENSIONS OF ALL EXISTING UTILITIES AND STRUCTURES.
2. SEE DRAWING G-131 FOR TYPICAL EROSION CONTROL AND DEWATERING DETAILS.
3. BULKHEADS AND COFFERDAMS DEPICTED ON THIS DRAWING ARE NOT MANDATED BY THE MAINE DMR OR ENGINEER. BULKHEADS AND COFFERDAMS ARE THE SOLE RESPONSIBILITY OF THE CONTRACTOR.
4. AREAS WHERE PERMANENT DISTURBANCE IS NOT AUTHORIZED SHALL BE RESTORED TO THEIR ORIGINAL CONDITION AND ELEVATION, WHICH UNDER NO CIRCUMSTANCE SHALL BE HIGHER THAN THE PRE-CONSTRUCTION ELEVATION. ORIGINAL CONDITIONS MEANS CAREFUL PROTECTION AND/OR REMOVAL OF EXISTING SOIL AND VEGETATION, AND REPLACEMENT BACK TO THE ORIGINAL LOCATIONS SUCH THAT THE ORIGINAL SOIL LAYERING AND VEGETATION SCHEMES ARE APPROXIMATELY THE SAME, UNLESS OTHERWISE AUTHORIZED.
5. VERTICAL DATUM IS BASED ON NAVD88
6. HORIZONTAL DATUM IS THE STATE PLANE COORDINATE SYSTEM NAD83 MAINE EAST ZONE.

LEGEND:

- SF — SF — SILT FENCE
- TC — TC — TURBIDITY CURTAIN
- COFFERDAM/BULKHEAD/DEWATERING STRUCTURE
- X — X — EXISTING FENCE
- OHW — OVERHEAD WIRES
- GW — GW — GUIDE WIRES
- EBP — EXISTING BURIED PIPE
- EP — EP — EXISTING PIPE
- EED — EXISTING ELECTRICAL

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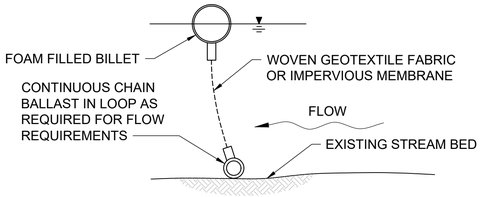
WOODLAND FISH LIFT PASSAGE DESIGN

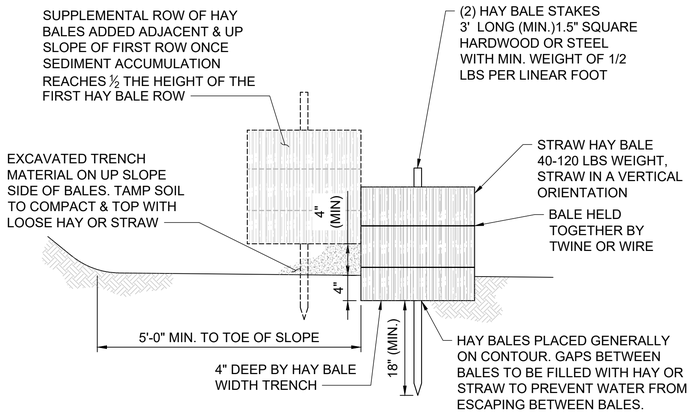
MAINE DEPARTMENT OF MARINE RESOURCES

EROSION CONTROL & DEWATERING PLAN

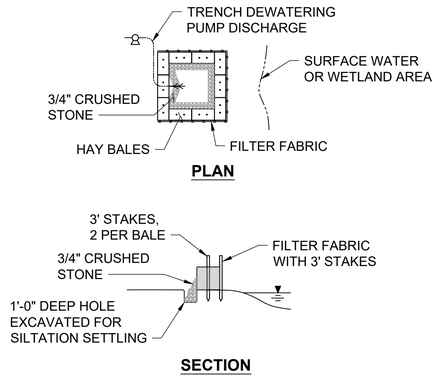
PROJECT:	16667
DRAWN BY:	C. HAGLER
DESIGNER:	A. MENGERT
APPROVED BY:	M. GRAESER
SHEET:	14 OF 240
DRAWING:	G-130



1 - TURBIDITY CURTAIN
SCALE: NTS



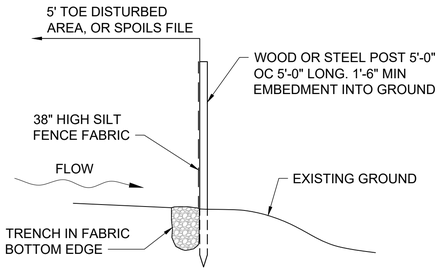
2 - HAY BALE BARRIER
SCALE: NTS

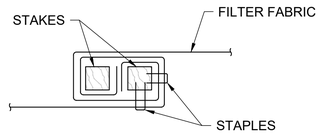


3 - DEWATERING/SETTLING BASIN
SCALE: NTS

SOIL EROSION & SEDIMENT CONTROL NOTES:

1. SEDIMENTATION/SETTLING BASIN: SEDIMENT LADEN WATER SHALL NOT BE RELEASED INTO ANY WATERWAY. CONTRACTOR SHALL PROVIDE APPROPRIATE SIZED SEDIMENTATION BASIN, WATER FILTERING BAGS OR OTHER APPROVED SEDIMENT REMOVAL DEVICES FOR ALL DEWATERING OR WATER DIVERSION ACTIVITIES.
2. SILT FENCE: IF NEEDED TO CONTROL WATER CONTAMINATION. PROVIDE SILT FENCE CONFORMING TO THE FOLOWING:
   - EQUIVALENT OPENING - SIZE OF A US STANDARD SIEVE SIZED 40 (MAX), 70 (MIN).
   - MULLEN BURST STRENGTH - 200 PSI.
   - GRAB STRENGTH - 120 LBS MIN.
   - SPUN-BONDED NYLON FABRIC - REINFORCED WITH POLYESTER NETTING, OR POLYPROPYLENE FABRIC WITH 2" x 4" 12 GA WOVEN WIRE BACKING FENCE.
3. SEDIMENTATION/SETTLING BASINS OR WATER FILTERING BAGS OR OTHER APPROVED SEDIMENT REMOVAL DEVICES ON SHORE SHALL HAVE A VEGETATIVE BUFFER FOR THE DISCHARGE. BASINS NEED TO BE ACCESSIBLE FOR MAINTENANCE BUT OUT OF THE WAY OF LAYDOWN AND CONSTRUCTION ACTIVITIES.





JOINING FENCE DETAIL

NOTES:

1. PROVIDE SILT FENCE ON DOWNSLOPE SIDE OF SOIL DISTURBANCES OR ALL STOCKPILES UNTIL PERMANENT VEGETATION IS ESTABLISHED.
2. FILTER FABRIC FENCE MUST BE INSTALLED AT EXISTING LEVEL GRADE. BOTH ENDS OF EACH FENCE SECTION MUST BE EXTENDED AT LEAST 8 FEET UPSLOPE AT 45 DEGREES TO THE MAIN FENCE ALIGNMENT.
3. SEDIMENT MUST BE REMOVED WHERE ACCUMULATIONS REACH ⅓ THE ABOVE GROUND HEIGHT OF THE FENCE.
4. SILT FENCE TO BE INSPECTED AFTER EACH RUNOFF EVENT AND AT LEAST WEEKLY.

4 - SILT FENCE
SCALE: NTS

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MAY 2, 2025

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5/2/2025	ISSUED FOR BID	M. GRAESER

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WOODLAND FISH LIFT PASSAGE DESIGN

MAINE DEPARTMENT OF MARINE RESOURCES

EROSION CONTROL & DEWATERING DETAILS

PROJECT:	16667
DRAWN BY:	C. HAGLER
DESIGNER:	A. MENGERT
APPROVED BY:	M. GRAESER
SHEET:	15 OF 240
DRAWING:	G-131

NOTES:

1. COORDINATE DEMOLITION AND CONCRETE REMOVAL WITH WOODLAND PULP AND ENGINEER PRIOR TO WORK.
2. CONTRACTOR'S OPTION TO KEEP EXISTING FISH LADDER CONCRETE WALLS AT FULL HEIGHT OR REMOVE THE TOP OF THE FISH LADDER CONCRETE WALLS DOWN TO EL 110.0' FOR ACCESS DURING CONSTRUCTION.

LEGEND:

- DEMOLITION OR FULL CONCRETE REMOVAL
- FISH LADDER CONCRETE REMOVAL DOWN TO EL 110.0'. SEE NOTE 2
- FISH LADDER CONCRETE REMOVAL DOWN TO EL 107.75' FOR NEW BRIDGE ACCESS
- TC — TURBIDITY CURTAIN
- COFFERDAM/BULKHEAD/DEWATERING STRUCTURE
- EXISTING STRUCTURE(S) BOUNDARY/LIMITS

ST. CROIX RIVER

HEAD POND
NWL EL 144.6

FLOW

BULKHEAD

PROTECT MILL INTAKE BUILDING

REMOVE EXISTING FISH LADDER CONCRETE

REMOVE EXISTING GRATING & STAIRS

REMOVE EXISTING THRUST BLOCK AND STAIRS

PROTECT EXISTING 42" MILL WATER INTAKE PIPE

APPROX. EXISTING OVERHEAD TRANSMISSION LINES

REMOVE EXISTING CONCRETE WALL (5/D-101)

CONTRACTOR SHALL DEMO EXISTING FISH LADDER TO ACCOMMODATE INSTALLATION OF THE DOWNSTREAM BYPASS PIPE

FISH LADDER COFFERDAM

ST. CROIX RIVER

FLOW

REMOVE EXISTING GRATING & STAIRS

NOTE 2

REMOVE EXISTING 24" DOWNSTREAM BYPASS PIPE

PROTECT EXISTING ELEVATED ELECTRIC DUCT

REMOVE EXISTING 16" PIPE

PROTECT EXISTING RETAINING WALL

RELOCATE GUIDE WIRES

PROTECT EXISTING ELECTRICAL SUB-STATION

EXISTING CONC. BASE

REMOVE EXISTING FISH TRAP STRUCTURE (1/D-101)

PROTECT EXISTING ELEVATED ELECTRICAL DUCT & EXISTING 42" MILL WATER INTAKE PIPE

REMOVE EXISTING GATE STRUCTURE (GRATING, GATES, CONCRETE, & RAILING) (4/D-101)

REMOVE EXISTING GRATING & STAIRS

REMOVE EXISTING FISH LADDER CONCRETE & PIPING (3/D-101)

REMOVE EXISTING GRATING

FISH LADDER TO REMAIN IN PLACE. CONTRACTOR TO STABILIZE FISH LADDER DURING DEMOLITION WORK

APPROX. EXISTING OVERHEAD TRANSMISSION LINES

FISH LIFT COFFERDAM

TAILRACE
NWL EL 96.8

WOODLAND DAM HYDROELECTRIC GENERATOR ROOM

1/- CONTRACTOR TO RELOCATE DUCTWORK AROUND NEW BYPASS FLUME, COORDINATE W/ WOODLAND PULP (NIC)

E/D-103 (NIC)

B/D-104 (NIC)

D/D-103 (NIC)

A/D-104 EXISTING PIPE IN CONCRETE DAM

D/D-102

C/D-102

A/D-102

2/- (NOTE 2)

2/D-101

1/D-101

5/D-101

6.0'±

66.2'±

73.6'±

5.8'±

5.3'±

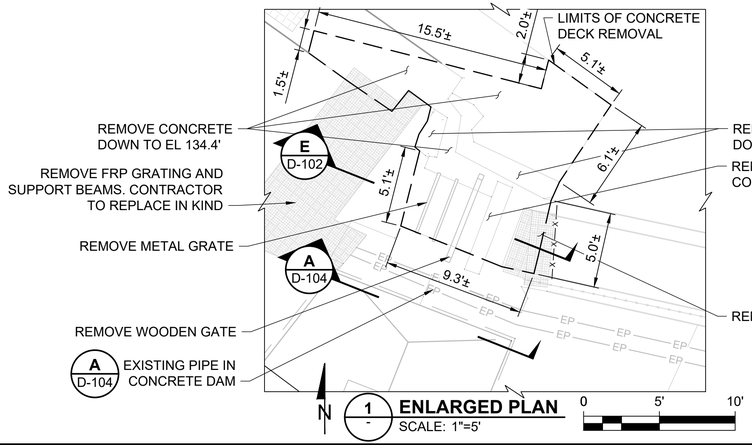
129.1'±

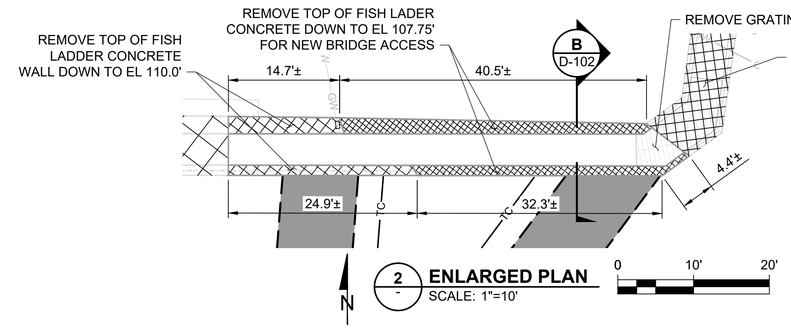
54.7'±

SITE PLAN
SCALE: 1"=20'

0 20' 40'

N





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WOODLAND FISH LIFT PASSAGE DESIGN

MAINE DEPARTMENT OF MARINE RESOURCES

DEMOLITION PLAN

PROJECT:	16667
DRAWN BY:	C. HAGLER
DESIGNER:	A. MENGERT
APPROVED BY:	M. GRAESER
SHEET:	16 OF 240
DRAWING:	D-100

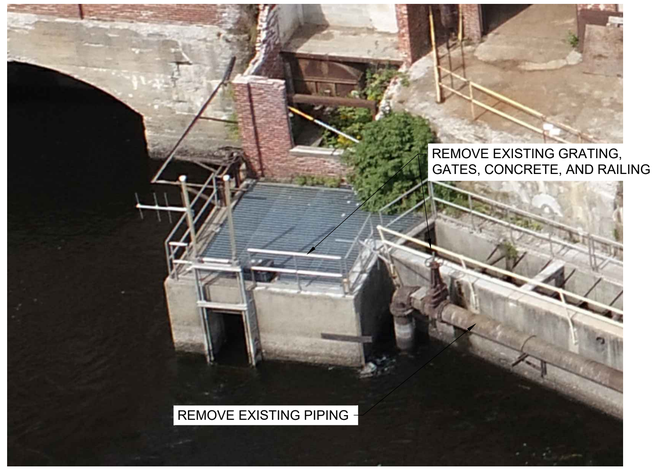
NOTE:

1. COORDINATE DEMOLITION AND CONCRETE REMOVAL WITH WOODLAND PULP AND ENGINEER PRIOR TO WORK.

1 EXISTING FISH TRAP STRUCTURE
D-100 SCALE: NTS

2 EXISTING FISH LADDER AND GRATING
D-100 SCALE: NTS

3 EXISTING FISH LADDER AND PIPING
D-100 SCALE: NTS



4 EXISTING GATE STRUCTURE
D-100 SCALE: NTS

5 EXISTING RETAINING WALL
D-100 SCALE: NTS

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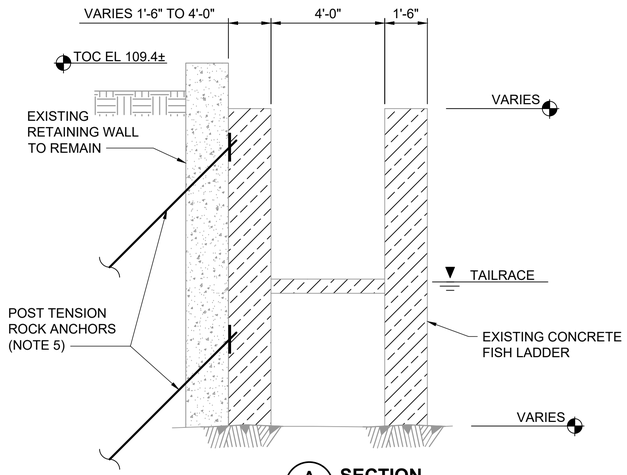
WOODLAND FISH LIFT PASSAGE DESIGN

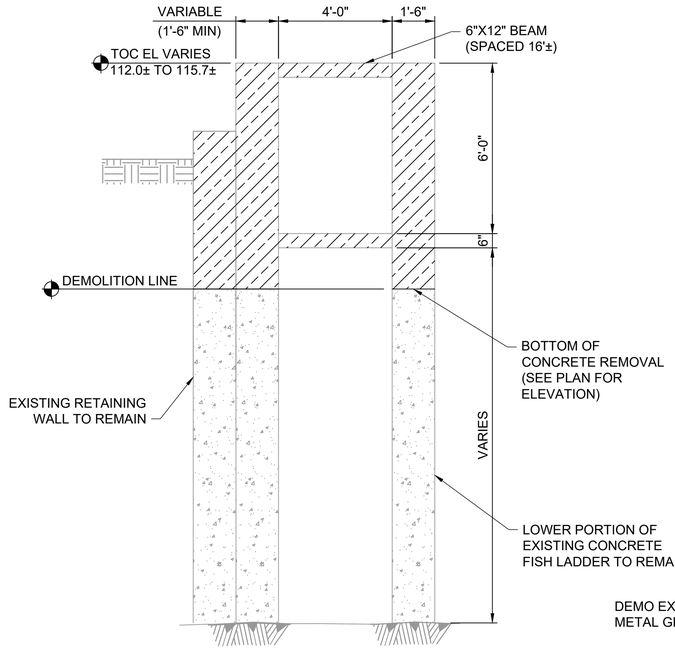
MAINE DEPARTMENT OF MARINE RESOURCES

DEMOLITION VIEWS

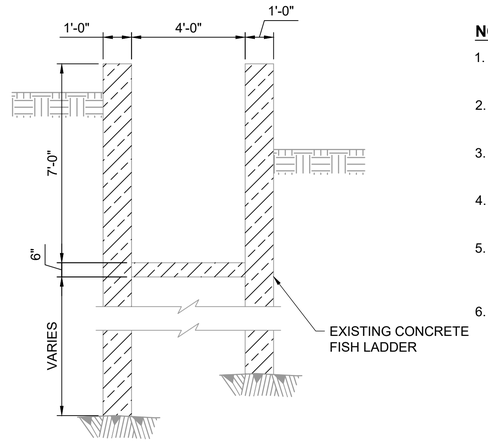
PROJECT:	16667
DRAWN BY:	C. HAGLER
DESIGNER:	A. MENGERT
APPROVED BY:	M. GRAESER
SHEET:	17 OF 240
DRAWING:	D-101



A D-100 **SECTION**
SCALE: 3/8"=1'-0"
0 2' 4'



B D-100 **SECTION**
SCALE: 3/8"=1'-0"
0 2' 4'



C D-100 **SECTION**
SCALE: 3/8"=1'-0"
0 2' 4'

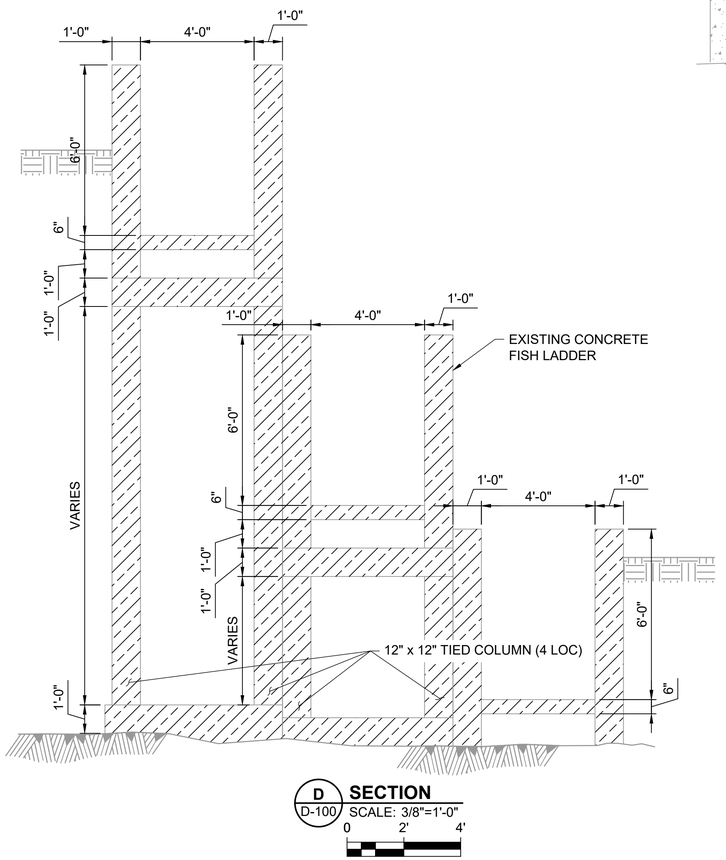
NOTES:

1. COORDINATE DEMOLITION AND CONCRETE REMOVAL WITH WOODLAND PULP AND ENGINEER PRIOR TO WORK.
2. REFER TO RECORD DRAWINGS FOR EXISTING STRUCTURE ELEVATIONS AND DIMENSIONS
3. CONTRACTOR TO FIELD VERIFY ALL EXISTING CONDITION DIMENSIONS PRIOR TO CONCRETE REMOVAL.
4. REMOVAL OF EXISTING CONCRETE SHOULD BE DOWN TO BEDROCK, UNLESS NOTED OTHERWISE.
5. CONTRACTOR SHALL DESIGN POST-TENSION ROCK ANCHORS OR OTHER MEASURES TO KEEP EXISTING RETAINING WALL IN PLACE DURING ROCK EXCAVATION FOR THE NEW FISH LIFT FLUME.
6. BULKHEADS DEPICTED ON THIS DRAWING ARE NOT MANDATED BY THE MAINE DMR OR ENGINEER. BULKHEADS ARE THE SOLE RESPONSIBILITY OF THE CONTRACTOR.

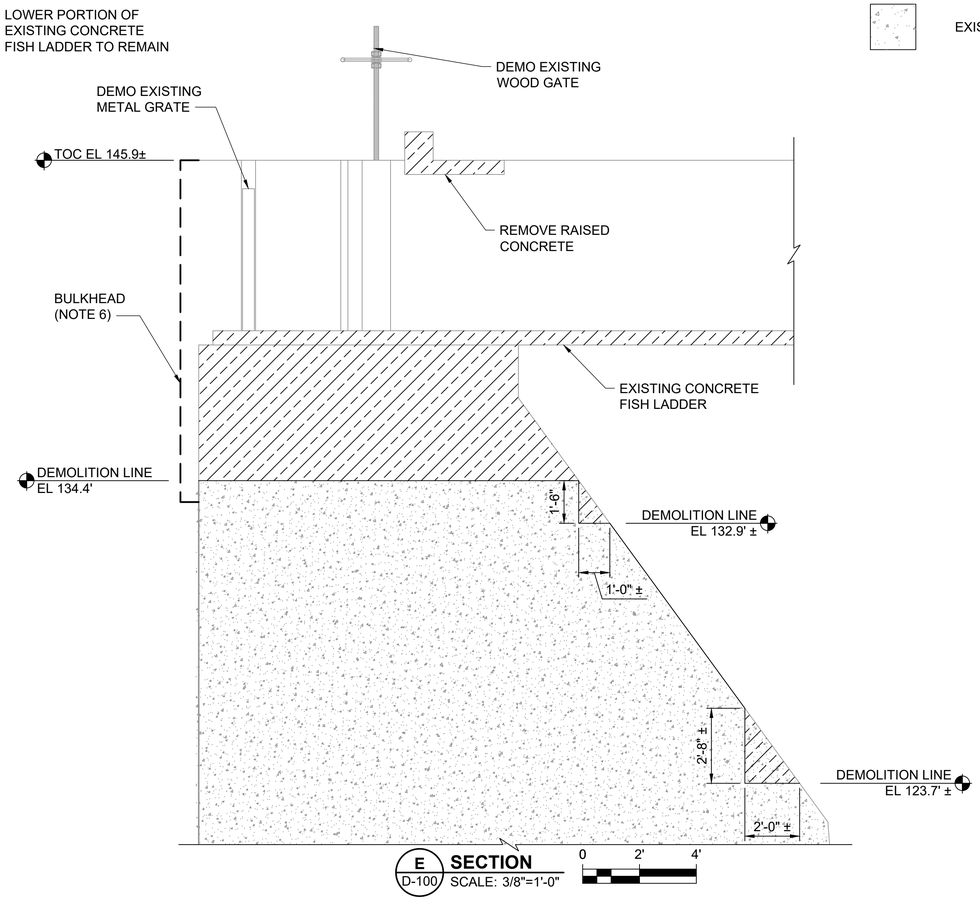
LEGEND:

CONCRETE REMOVAL

EXISTING CONCRETE



D D-100 **SECTION**
SCALE: 3/8"=1'-0"
0 2' 4'



E D-100 **SECTION**
SCALE: 3/8"=1'-0"
0 2' 4'

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WOODLAND FISH LIFT PASSAGE DESIGN

MAINE DEPARTMENT OF MARINE RESOURCES

CONCRETE REMOVAL SECTIONS

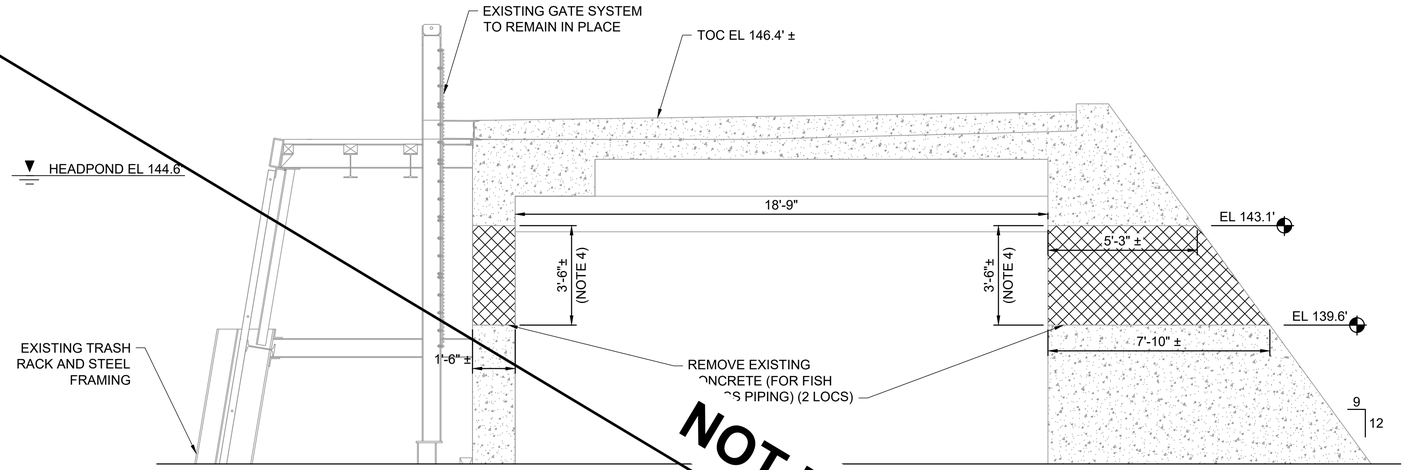
PROJECT:	16667
DRAWN BY:	C. HAGLER
DESIGNER:	A. MENGERT
APPROVED BY:	M. GRAESER
SHEET:	18 OF 240
DRAWING:	D-102

LEGEND:

CONCRETE REMOVAL

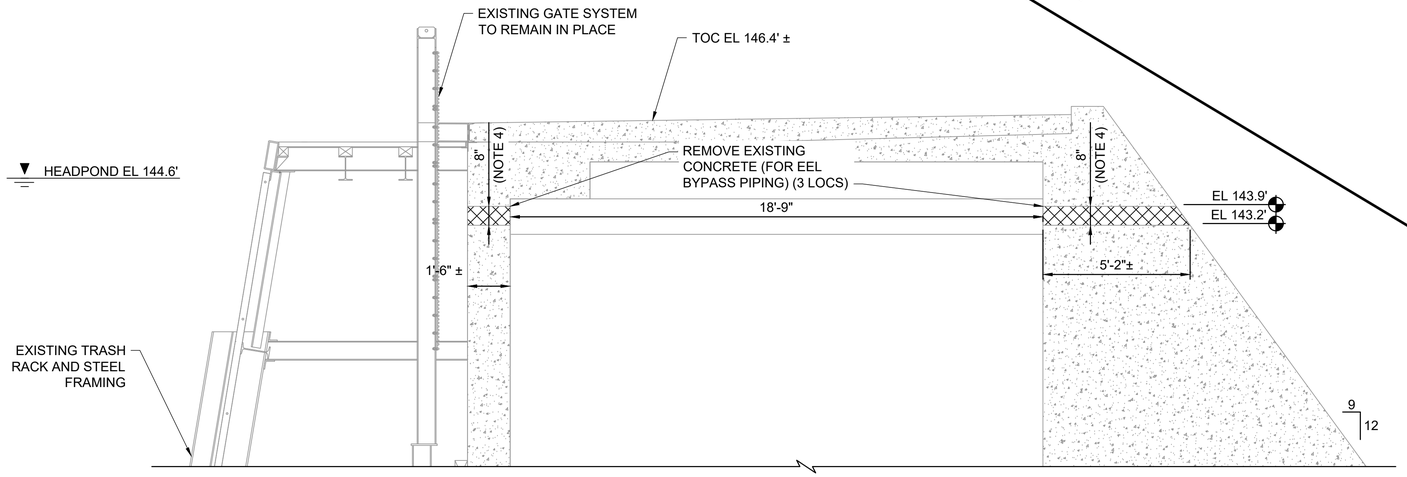
CONCRETE REMOVAL NOTES:

1. SUBMIT PLAN AND COORDINATE DEMOLITION AND CONCRETE REMOVAL WITH WOODLAND PULP AND ENGINEER PRIOR TO WORK.
2. REFER TO RECORD DRAWINGS FOR EXISTING STRUCTURE ELEVATION, DIMENSIONS, AND MEMBER SIZES.
3. CONTRACTOR TO FIELD VERIFY ALL EXISTING CONDITION DIMENSIONS PRIOR TO CONCRETE REMOVAL.
4. CONCRETE CORE/REMOVAL SIZE SHOWN IS APPROXIMATE. CONCRETE REMOVAL SHALL BE AS REQUIRED TO INSTALL NEW PIPE, LINK SEAL, AND GROUT.



D / D-100 **CONCRETE REMOVAL SECTION (FOR FISH BYPASS, 2 LOCS)**
SCALE: 3/8"=1'-0"
0 2' 4'

1 / D-100 **EXISTING DUCTWORK AT BACK OF DAM**
SCALE: N.T.S.



E / D-100 **CONCRETE REMOVAL SECTION (FOR NEW EEL BYPASS, 3 LOCS)**
SCALE: 3/8"=1'-0"
0 2' 4'

NOT IN CONTRACT

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WOODLAND FISH LIFT PASSAGE DESIGN

MAINE DEPARTMENT OF MARINE RESOURCES

CONCRETE REMOVAL AT INTAKE DAM (NOT IN CONTRACT)

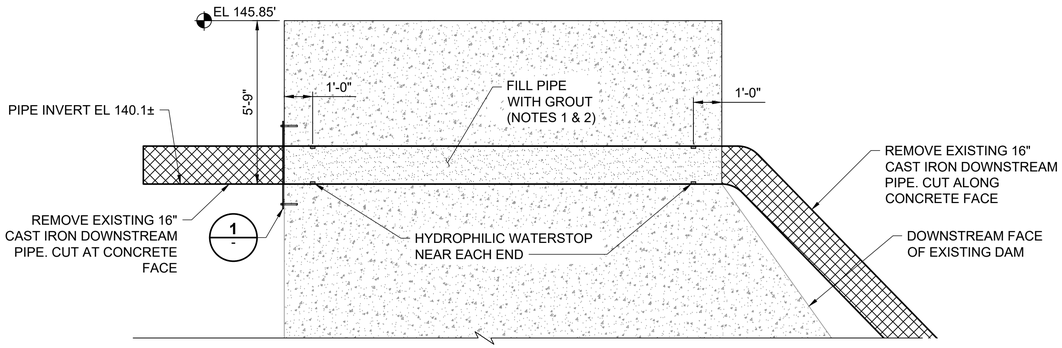
PROJECT:	16667
DRAWN BY:	C. HAGLER
DESIGNER:	A. MENGERT
APPROVED BY:	M. GRAESER
SHEET:	19 OF 240
DRAWING:	D-103

NOTES:

1. FILL THE PIPE VIA PRESSURE GROUT.
2. INCLUDE AIR VENT HOLES/PORTS TO PREVENT AIR POCKETS.
3. ALL ELEVATIONS SHOWN ARE APPROXIMATE.

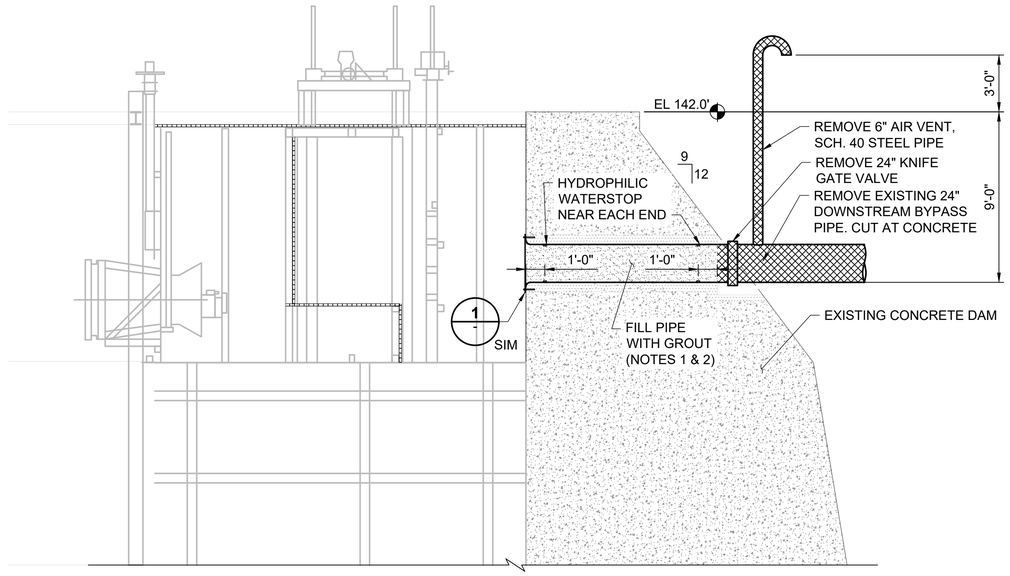
PIPE ITEMS TO REMOVE

NEW GROUT



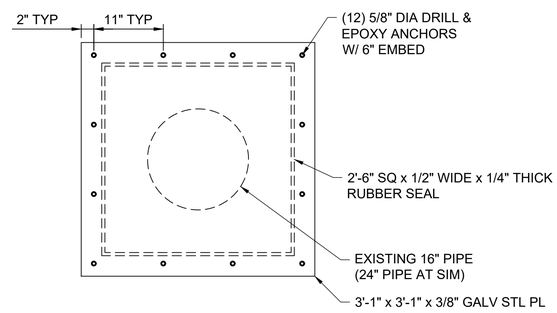
A D-100 **PIPE PLUG**
SCALE: 3/8"=1'-0"

0 2' 4'



B D-100 **PIPE PLUG**
SCALE: 1/4"=1'-0"

0 4' 8'



1 - **WALL PLATE**
SCALE: 1" = 1'-0"

0 1' 2'

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WOODLAND FISH LIFT PASSAGE DESIGN

MAINE DEPARTMENT OF MARINE RESOURCES

PIPE PLUGS AT DAM

PROJECT:	16667
DRAWN BY:	C. HAGLER
DESIGNER:	A. MENGERT
APPROVED BY:	M. GRAESER
SHEET:	20 OF 240
DRAWING:	D-104