

# STRATHCONA REGIONAL DISTRICT

CLIENT

ADDRESS / CONTACT INFO.

990 CEDAR STREET, CAMPBELL RIVER, BC V9W 7Z8

PROJECT NAME

SURGE NARROWS MARINE REVITALIZATION PROJECT

DESCRIPTION

DESIGN OF WHARF, GANGWAY AND FLOATS

McELHANNEY PROJECT

2211-71343-01

STATUS

ISSUED FOR CLIENT REVIEW (100% DESIGN)



KEY PLAN



1211 Ryan Road  
 Courtenay BC  
 Canada V9N 3R6  
 Tel 250 338 5495

DRAWING LIST		REVISIONS						
		PA	PB	PC	PD	PE	0	1
S000	COVER SHEET							
S001	DESIGN CRITERIA AND GENERAL NOTES - SHEET 1 OF 2							
S002	DESIGN CRITERIA AND GENERAL NOTES - SHEET 2 OF 2							
S100	SITE PLAN - EXISTING AND PROPOSED							
S101	DEMOLITION PLAN							
S200	GENERAL ARRANGEMENT - PLAN, SECTIONS AND DETAILS							
S300	PILES - PLAN, LIST AND DETAILS							
S400	WHARF - PLAN, SECTIONS AND DETAILS							
S500	GANGWAY - PLAN AND SECTIONS							
S501	GANGWAY - CONNECTION DETAILS							
S600	ACCESS FLOAT - PLAN AND SECTIONS							
S601	MOORING FLOAT - PLAN AND SECTIONS							

DESIGN CRITERIA

1.0 CODES AND STANDARDS

1.1 DESIGN IS IN ACCORDANCE WITH THE FOLLOWING CODES AND STANDARDS:

- CAN/CSA S6 CANADIAN HIGHWAY BRIDGE DESIGN CODE
- CAN/CSA S7 PEDESTRIAN, CYCLING AND MULTIUSE BRIDGE DESIGN GUIDELINE
- BCBC 2024 BRITISH COLUMBIA BUILDING CODE 2024
- BS6349 SERIES SUPPLEMENTAL MARINE CODE WHERE GUIDANCE IS NOT AVAILABLE IN S6
- AS 3962 SUPPLEMENTAL MARINE CODE WHERE GUIDANCE IS NOT AVAILABLE IN S6

2.0 DESIGN LIFE

2.1 DESIGN LIFE OF THE STRUCTURES IS VARIABLE, SEE BELOW:

- WHARF STRUCTURE AND PILES: 50 YEARS
FLOATS: 25 YEARS\*
\*PROVIDED REGULAR INSPECTIONS AND MAINTENANCE ARE PERFORMED

3.0 PROJECT DATUM, AND TIDE ELEVATIONS

3.1 ALL THE ELEVATIONS ON THE DRAWINGS ARE IN METERS AND ARE REFERENCED TO CANADIAN HYDROGRAPHIC SERVICE (CHS) TIDE AND CHART DATUM UNLESS NOTED OTHERWISE.

3.2 TIDE ELEVATIONS ON THE SITE ARE AS FOLLOWS:

- HIGHER HIGH WATER LEVEL (LARGE TIDE) HHWLT +5.3 m
- HIGH WATER LEVEL HWL +4.7 m
- MEAN WATER LEVEL MWL +3.2 m
- LOW WATER LEVEL LWL +1.2 m
- LOWER LOW WATER LEVEL (LARGE TIDE) LLWLT +0.2 m

3.3 THE HORIZONTAL DATUM FOR THE PROJECT IS NAD83 ZONE 10.

4.0 ENVIRONMENTAL CONDITIONS

4.1 NHC PROVIDED THE 2-MINUTE AVERAGE WIND SPEED FROM CENTURY SHOAL AT A VARIETY OF RETURN PERIODS FOR THE GOVERNING WIND DIRECTIONS ONSITE.

- 1/10 YEAR EVENT: 15.9 m/s (NORTHWEST)
- 1/50 YEAR EVENT: 17.4 m/s (NORTHWEST)

4.2 CHARACTERISTIC SNOW LOAD (CAMPBELL RIVER, PER BCBC2024):

- Ss (1/50): 2.8 kPa
- Sr (1/50): 0.4 kPa

4.3 WAVE LOAD PARAMETERS (PROJECT SITE, PER NHC STUDY):

Table with 4 columns: RETURN PERIOD, Hs (m), Tp (s), Tm (s). Row 1: 1/50 YEARS, 0.55, 2.4, 1.9

4.4 CURRENT (PROJECT SITE, PER NHC STUDY):

- vULS: 0.5m/s

5.0 DESIGN LOADS

5.1 DEAD LOAD:

- THE DEAD LOAD INCLUDES THE WEIGHT OF ALL CONSTRUCTION MATERIALS.

5.2 LIVE LOAD:

- UNIFORMLY DISTRIBUTED LIVE LOAD DUE TO ASSEMBLY (UDL):
- WHARF: 4.8 kPa
- GANGWAYS: 4.8 kPa
- FLOATS: 3.0 kPa
- VEHICULAR LOAD: 500 kg (QUAD)

5.3 THE CONTRACTOR SHALL ENSURE THAT THE CONSTRUCTION LOADS DO NOT EXCEED THE DESIGN LOADS LISTED ABOVE.

5.4 SEISMIC LOADS

- SITE CLASS: C
- DESIGN SEISMIC EVENT: 1 IN 2475 YEAR
- PEAK GROUND ACCELERATION: 0.251 g
- SPECTRAL ACCELERATION:
- Sa (0.2) = 0.525
- Sa (0.5) = 0.493
- Sa (1.0) = 0.348
- Sa (2.0) = 0.228
- Sa (5.0) = 0.083
- Sa (10.0) = 0.030

GENERAL NOTES

1.0 GENERAL

1.1 DETAILED REQUIREMENTS FOR MATERIALS AND FABRICATION ARE DESCRIBED IN THE SPECIFICATIONS FOR CONVENIENCE. CERTAIN EXTRACTS ARE REPRODUCED BELOW. ANY DISCREPANCIES SHALL BE IMMEDIATELY BROUGHT TO THE ATTENTION OF OWNER'S REPRESENTATIVE.

1.2 WHERE CODES AND STANDARDS ARE REFERENCED, THE REVISIONS AS OF AUGUST 1, 2025 SHALL APPLY.

1.3 CONSTRUCTION SHALL COMPLY WITH THE CODES AND STANDARDS LISTED ON THE DRAWINGS AS WELL AS ALL APPLICABLE FEDERAL, PROVINCIAL AND MUNICIPAL REGULATIONS AND BYLAWS.

1.4 ALL WORK SHALL CONFORM TO INDUSTRIAL HEALTH AND SAFETY REGULATIONS OF WORKSAFE BC.

1.5 DIMENSIONS ARE IN MILLIMETRES UNLESS NOTED OTHERWISE.

1.6 ONLY USE WRITTEN DIMENSIONS. DO NOT SCALE OFF THE DRAWINGS.

1.7 THE CONTRACTOR SHALL CHECK AND VERIFY ALL DIMENSIONS BEFORE COMMENCING THE WORK. ANY ERRORS OR OMISSIONS SHALL BE BROUGHT TO THE ATTENTION OF THE OWNER'S REPRESENTATIVE.

1.8 THE CONTRACTOR SHALL COMPARE ALL RELATED DRAWINGS BEFORE COMMENCING ANY WORK AND NOTIFY THE OWNER'S REPRESENTATIVE OF ANY DISCREPANCIES OR INCONSISTENCIES BETWEEN DRAWING OF OTHER DISCIPLINES.

1.9 THESE DRAWINGS ARE FOR THE COMPLETED STRUCTURE ONLY. THE CONTRACTOR IS RESPONSIBLE FOR THE DESIGN, INSTALLATION AND INSPECTION OF ALL TEMPORARY BRACING, FALSEWORK, FORMWORK, SHORING, AND RESHORING REQUIRED TO SUPPORT CONSTRUCTION LOADS AND TO KEEP THE STRUCTURE PLUMB AND LEVEL DURING CONSTRUCTION. TEMPORARY SUPPORTS SHALL COMPLY WITH THE OCCUPATIONAL HEALTH AND SAFETY (OHS) REGULATION.

1.10 DO NOT INSTALL OPENINGS, SET INSERTS, DRILL OR ATTACH TO STRUCTURAL ELEMENTS WITHOUT AUTHORIZATION FROM THE OWNER'S REPRESENTATIVE, UNLESS NOTED OTHERWISE.

1.11 UPON COMPLETION OF THE WORK, REMOVE ALL DEBRIS AND SURPLUS MATERIALS FROM SITE AND DISPOSE OF IN ACCORDANCE WITH ALL APPROPRIATE FEDERAL, PROVINCIAL, AND MUNICIPAL REGULATIONS. LEAVE THE WORK AREA IN A CLEAN AND NEAT CONDITION TO THE SATISFACTION OF THE OWNER'S REPRESENTATIVE.

1.12 SUBMIT DETAILS OF PROPOSED SCHEDULE AND WORK METHODS TO THE OWNER'S REPRESENTATIVE PRIOR TO PROCEEDING WITH THE WORK.

1.13 THE CONTRACTOR SHALL SUBMIT SHOP DRAWINGS TO THE OWNER'S REPRESENTATIVE FOR REVIEW PRIOR TO FABRICATION. THESE SHOP DRAWINGS SHALL BE PREPARED AND SEALED BY AN ENGINEER REGISTERED IN THE PROVINCE OF BRITISH COLUMBIA.

2.0 DEMOLITION

2.1 TAKE ALL NECESSARY PRECAUTIONS TO CONTAIN THE DEMOLITION WITHIN THE LIMITS SPECIFIED. THE CONTRACTOR SHALL BE LIABLE FOR ANY DAMAGE TO PROPERTY, EXISTING STRUCTURES OR UTILITIES NOT INTENDED FOR REMOVAL.

2.2 REMOVE AND DISPOSE OF DEMOLISHED MATERIAL OFF SITE IN ACCORDANCE WITH ALL MUNICIPAL, PROVINCIAL AND FEDERAL REGULATIONS, AND THE CONTRACTOR'S APPROVED ENVIRONMENTAL MANAGEMENT PLAN.

2.3 STABILITY OF THE EXISTING STRUCTURE DURING DEMOLITION SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR.

2.4 TIMBER PILES SHALL BE REMOVED IN THEIR ENTIRETY WHERE POSSIBLE, BY USE OF A VIBRATORY HAMMER OR OTHER METHODS. THE CONTRACTOR SHALL MAKE MULTIPLE ATTEMPTS TO REMOVE EXISTING PILES PRIOR TO CUTTING. IF A PILE BREAKS ABOVE MUDLINE DURING REMOVAL, THE PILE SHALL BE CUT OFF AT THE MUDLINE.

2.5 UPON COMPLETION OF THE WORK, REMOVE ALL DEBRIS AND SURPLUS MATERIAL FROM SITE. THE WORK AREA SHALL BE LEFT IN A CLEAN AND NEAT CONDITION TO THE SATISFACTION OF THE OWNER'S REPRESENTATIVE.

3.0 FIELD REVIEWS

3.1 THE OWNER'S REPRESENTATIVE SHALL BE NOTIFIED OF THE CONSTRUCTION SCHEDULE IN ORDER TO SCHEDULE FIELD REVIEWS. IF THE OWNER'S REPRESENTATIVE IS NOT AFFORDED THE OPPORTUNITY TO REVIEW THE STRUCTURAL WORKS PRIOR TO CONCEALMENT, THEN FINAL CERTIFICATION OF THE PROJECT WILL NOT BE ISSUED.

3.2 ALL WORK SHALL BE MADE ACCESSIBLE FOR INSPECTION. FAILURE TO GIVE REQUIRED NOTIFICATION AND ACCESSIBILITY MAY RESULT IN THE OWNER'S REPRESENTATIVE REQUIRING THE REMOVAL AND REPLACEMENT OF THE WORK AT THE CONTRACTOR'S EXPENSE.

3.3 THE CONTRACTOR SHALL REVIEW SUB-CONTRACTORS' WORK PRIOR TO THE OWNER'S REPRESENTATIVE FIELD REVIEW.

3.4 FIELD REVIEWS ARE PROVIDED ONLY FOR THE WORK SHOWN ON THE STRUCTURAL DRAWINGS PREPARED BY THE OWNER'S REPRESENTATIVE. REVIEWS ARE PERIODIC, AND AT THE PROFESSIONAL JUDGEMENT OF THE OWNER'S REPRESENTATIVE TO DETERMINE THAT THE WORK IS IN GENERAL CONFORMANCE WITH THE DRAWINGS AND CONTRACT DOCUMENTS.

3.5 FIELD REVIEWS SHALL NOT RELIEVE THE CONTRACTOR OF THEIR RESPONSIBILITY AND OBLIGATION TO COMPLY WITH DRAWINGS AND CONTRACT DOCUMENTS. QUALITY CONTROL REMAINS THE SOLE RESPONSIBILITY OF THE CONTRACTOR.

3.6 MANUFACTURERS OF ELEMENTS DESIGNED BY THEIR ENGINEER, FOR EXAMPLE GANGWAYS, SHALL PROVIDE SEALED CERTIFICATION FOR THEIR MANUFACTURE AND INSTALLATION.

3.7 ADDITIONAL FIELD REVIEWS THAT ARE REQUIRED DUE TO DEFICIENT OR INCOMPLETE WORK SHALL BE AT THE CONTRACTOR'S EXPENSE.

4.0 STRUCTURAL STEEL

4.1 STRUCTURAL STEEL SHALL BE DESIGNED AND FABRICATED TO CSA-S16 AND THE CISC CODE OF STANDARD PRACTICE.

4.2 STRUCTURAL STEEL SHALL CONFORM TO THE FOLLOWING UNLESS NOTED OTHERWISE:

- ROLLED SECTIONS: CSA-G40.21 GRADE 350W
- HOLLOW STRUCTURAL SECTIONS: CSA-G40.21 GRADE 350W, CLASS C
- PLATES: CSA-G40.21 GRADE 300W
- STRUCTURAL BOLTS, NUTS, WASHERS: ASTM F3125 GRADE A325M, TYPE 1
- STAINLESS STEEL: TYPE 316, MIN YIELD STRENGTH 290 MPa
- ANCHOR BOLTS: ASTM F1554 GRADE 36 UNLESS NOTED OTHERWISE
- ANCHORS, CHAIN HOOKS, LIFTING HOOKS: ASTM 436

4.3 WELDING SHALL BE IN ACCORDANCE WITH CSA-W59 BY COMPANIES AND WELDERS CERTIFIED TO CSA-W47.1 BY CWB.

4.4 WELDS SHALL BE MADE USING E490XX (E70XX) ELECTRODES OR BETTER UNLESS NOTED OTHERWISE.

4.5 UNLESS NOTED OTHERWISE, WELDS BETWEEN ADJACENT MEMBERS SHALL BE 6 mm CONTINUOUS FILLET WELDS ALL ROUND. ALL WELDS SHALL BE SEAL WELDS.

4.6 FIELD WELDING IS NOT PERMITTED UNLESS SPECIFIED OR AUTHORIZED BY THE OWNER'S REPRESENTATIVE.

4.7 ALL WELDS SHALL BE SUBJECT TO NON-DESTRUCTIVE EXAMINATION (NDE) BY A WELDING INSPECTOR CERTIFIED TO CSA-W178.2 IN ACCORDANCE WITH THE SPECIFICATIONS. UNLESS NOTED OTHERWISE THE FOLLOWING SHALL APPLY:

- COMPLETE PENETRATION: 100% RADIOGRAPHIC AND ULTRASONIC
ALL OTHER WELDS: 10% MAGNETIC PARTICLE + 100% VISUAL

4.8 HSS SECTIONS SHALL BE PROVIDED WITH SEAL WELDED CAP PLATES AT OPEN ENDS AND DRAIN HOLES AT THE BASE.

4.9 FASTENERS INSTALLED IN HARDENED CONCRETE SHALL BE WITH HILTI HIT-RE ADHESIVE AND STANDARD EMBEDMENT TYPE 316 STAINLESS STEEL ANCHORS, UNLESS NOTED OTHERWISE. USE OF HILTI ADHESIVE PRODUCTS SHALL BE BY TRAINED APPLICATORS ONLY. INSTALLED ANCHORS SHALL BE SUBJECT TO VERIFICATION TESTING IN ACCORDANCE WITH THE SPECIFICATIONS.

4.10 BEARING PLATES AND BASE PLATES SUPPORTED BY CONCRETE SHALL BE GROUTED SOLID WITH NON-METALLIC, NON-SHRINK GROUT HAVING A MINIMUM 7-DAY COMPRESSIVE STRENGTH OF 50 MPa IN ACCORDANCE WITH THE MANUFACTURER'S WRITTEN INSTRUCTIONS.

4.11 EXTERIOR STRUCTURAL STEEL AND STRUCTURAL STEEL EXPOSED TO THE GROUND SHALL BE HOT-DIP GALVANIZED IN ACCORDANCE WITH CSA-G164 AND ASTM A123 UNLESS NOTED OTHERWISE.

4.12 DAMAGED GALVANIZING COMPOUND SHALL BE TOUCHED UP WITH TWO COATS OF LANCO GALVAICON GC-243 COLD GALVANIZING COMPOUND OR APPROVED EQUIVALENT IN ACCORDANCE WITH THE MANUFACTURER'S WRITTEN INSTRUCTIONS.

5.0 STEEL PIPE PILES

5.1 PILE DIMENSIONS ARE SPECIFIED ON THE DRAWINGS.

5.2 PILES SHALL BE MANUFACTURED AND FABRICATED IN ACCORDANCE WITH THE SPECIFICATIONS.

5.3 UNLESS NOTED OTHERWISE, PILES SHALL BE SEAMLESS OR LONGITUDINALLY WELDED PIPE CONFORMING TO CAN/CSA Z245.1 CATEGORY 2 AND SHALL BE GRADE 359.

5.4 PIPE SPLICES SHALL BE COMPLETE PENETRATION BUTT WELDS IN ACCORDANCE WITH THE SPECIFICATION.

5.5 PILES SHALL BE DRIVEN TO THE MINIMUM EMBEDMENT INDICATED. ENSURE PILES ARE NOT OVERDRIVEN CAUSING DAMAGE TO THE PILE ENDS. CUT OFF PILES NEATLY AND HORIZONTALLY AT ELEVATION INDICATED. CONTRACTOR SHALL HAVE THE ABILITY TO DRILL PILES INTO ROCK SHOULD ROCK BE ENCOUNTERED.

5.6 THE FOLLOWING PILE INSTALLATION TOLERANCES SHALL APPLY:

- TOLERANCE ON PLAN POSITION AT TOP OF PILE: 75 mm
- TOLERANCE ON VERTICALITY (OUT OF PLUMB): 1:150

5.7 STEEL PIPE PILES SHALL BE COATED PER THE PROJECT SPECIFICATIONS.

5.8 IF AN OBSTRUCTION TO THE PILE IS ENCOUNTERED DURING INSTALLATION THAT PREVENTS THE INSTALLATION TO THE REQUIRED PENETRATION, THE CONTRACTOR SHALL NOTIFY THE OWNER'S REPRESENTATIVE IMMEDIATELY BASED ON REVIEW OF THE SITUATION. THE CONTRACTOR MAY BE DIRECTED BY THE OWNER'S REPRESENTATIVE TO RELOCATE THE PILE AS TO AVOID THE OBSTRUCTION. ALTERNATIVELY, THE CONTRACTOR MAY BE DIRECTED BY THE OWNER'S REPRESENTATIVE TO REMOVE THE OBSTRUCTION. FINALLY, CLEAN OUT OF THE ANNULUS OF THE PILE MAY BE REQUIRED.

5.9 PILES TO BE COATED IN ACCORDANCE WITH S300 AND THE SPECIFICATIONS.

6.0 CONCRETE

6.1 CONCRETE MATERIALS AND METHODS OF CONSTRUCTION SHALL CONFORM TO CSA-A23.1.

6.2 UNLESS NOTED OTHERWISE, THE SPECIFIED CONCRETE EXPOSURE CLASS, 28-DAY COMPRESSIVE STRENGTHS AND COVERS SHALL BE AS FOLLOWS:

Table with 5 columns: ITEM, EXPOSURE CLASS, MIN. COMPRESSIVE STRENGTH (f'c), MINIMUM TOP COVER, MINIMUM BOTTOM COVER. Rows for CAST-IN-PLACE and CONCRETE CAST AGAINST THE EARTH.

6.3 THE TOLERANCE ON REINFORCEMENT COVER SHALL BE +15 mm/-0 mm

6.4 UNLESS NOTED OTHERWISE, ALL CONCRETE SHALL BE CURED IN ACCORDANCE WITH CURING TYPE 3, EXTENDED WET CURING IN ACCORDANCE WITH CSA-A23.1 AND CSA-A23.4.

6.5 CONCRETE SHALL BE TESTED IN ACCORDANCE WITH CSA-A23.2 BY A TESTING AGENCY CERTIFIED IN ACCORDANCE WITH CSA-A283.

6.6 PROVIDE 25 mm CHAMFERS ALONG ALL EXPOSED EDGES AND 25 mm FILLETS AT RE-ENTRANT CORNERS UNLESS NOTED OTHERWISE.

6.7 UNLESS NOTED OTHERWISE, CONCRETE SURFACE FINISHES SHALL BE AS FOLLOWS:

- FORMED SURFACES: STANDARD GRADE
UNFORMED SURFACES: BROOM FINISH

6.8 FORMWORK SHALL BE DESIGNED AND CONSTRUCTED IN ACCORDANCE WITH PART 20 OF THE OSH REGULATION AND CSA-S269.3.

6.9 FORMWORK SHALL BE LEFT IN PLACE UNTIL THE CONCRETE HAS ATTAINED SUFFICIENT STRENGTH TO SUPPORT ITS OWN WEIGHT AND CONSTRUCTION LOADS.

6.10 GROUT SHALL BE CEMENTITIOUS NON-SHRINK GROUT WITH A MINIMUM COMPRESSIVE STRENGTH OF 50 MPa AT 7 DAYS UNLESS NOTED OTHERWISE.

7.0 CONCRETE REINFORCEMENT

7.1 REINFORCING STEEL SHALL BE BILLET STEEL DEFORMED BARS CONFORMING TO CSA G30.18 GRADE 400W.

7.2 REINFORCING STEEL SHALL BE DETAILED, FABRICATED AND PLACED IN ACCORDANCE WITH CSA-A23.1 AND THE RISC MANUAL OF STANDARD PRACTICE.

7.3 REINFORCING STEEL SHALL NOT BE WELDED UNLESS SPECIFIED OR AUTHORIZED IN WRITING BY THE OWNER'S REPRESENTATIVE.

7.4 WELDING OF REINFORCING SHALL CONFORM TO CSA-W186.

7.5 REINFORCING STEEL SHALL BE CONTINUOUS, AND ADEQUATELY LAPPED AT SPLICES.

7.6 NO MORE THAN 50% OF REINFORCEMENT TO BE SPLICED AT ONE LOCATION.

7.7 SPLICES ARE NOT PERMITTED WHERE BAR LENGTHS HAVE BEEN SPECIFIED ON THE DRAWINGS UNLESS AUTHORIZED BY THE OWNER'S REPRESENTATIVE.

7.8 MINIMUM LAP LENGTHS FOR REINFORCING SPLICES SHALL BE AS FOLLOWS:

Table with 2 columns: BAR SIZE, LAP LENGTH. Rows for 10M, 15M, 20M, 25M, 30M, 35M.

7.9 PLACEMENT OF REINFORCEMENT SHALL BE IN ACCORDANCE WITH CSA A23.1.

7.10 CORNER BARS WITH LAP SPLICES TO MATCH ALL REINFORCEMENT SHALL BE PROVIDED AT ALL CORNERS.

7.11 DOWELS MUST BE SECURELY TIED INTO POSITION PRIOR TO PLACING CONCRETE. WET DOWELING IS NOT PERMITTED.

7.12 STANDARD HOOKS SHALL BE FABRICATED AS FOLLOWS:

- 180° BEND PLUS AN EXTENSION AT THE END OF THE BAR OF AT LEAST 4 BAR DIAMETERS, BUT NOT LESS THAN 60 mm.
- 90° BEND PLUS AN EXTENSION AT THE END OF THE BAR OF AT LEAST 12 BAR DIAMETERS.
- STIRRUPS AND TIES ONLY: EITHER A 90° OR 135° BEND PLUS AN EXTENSION AT THE END OF THE BAR OF AT LEAST 6 BAR DIAMETERS.

7.13 ALL STANDARD HOOKS SHALL BE ANCHORED AROUND AND IN CONTACT WITH A LONGITUDINAL BAR OF EQUAL OR GREATER DIAMETER THAN THAT OF THE HOOK.

7.14 MINIMUM BEND DIAMETERS SHALL BE AS FOLLOWS:

Table with 3 columns: BAR SIZE, BEND DIAMETER, ALL OTHER BENDS. Rows for 10M, 15M, 20M, 25M, 30M, 35M.

Revision table with columns: Rev, Date, Description, Drawn, Design, App'd. Includes entries for PD, PC, PB, PA and a final Rev row.

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McElhanney logo and contact information: 1211 Ryan Road, Courtenay BC V9N 3R6, Tel. 250 338 5495

PRELIMINARY NOT FOR CONSTRUCTION

STRATHCONA REGIONAL DISTRICT, 990 CEDAR STREET, CAMBELL RIVER, BC V9W 7Z8. SURGE NARROWS DESIGN CRITERIA AND GENERAL NOTES SHEET 1 OF 2

Drawing No. S001, Project Number 2211-71343-01, Rev. PD

**8.0 COLD WEATHER CONCRETE**

- 8.1 COLD WEATHER CONCRETING, I.E. WHEN THERE IS A PROBABILITY OF THE AIR TEMPERATURE FALLING BELOW 5°C WITHIN 24 HOURS OF PLACING, SHALL BE CARRIED OUT IN ACCORDANCE WITH CSA-A23.1 AND THE SPECIFICATIONS LISTED BELOW.
- 8.2 SNOW AND ICE SHALL BE REMOVED FROM ALL SURFACES THAT CONCRETE WILL BE PLACED AGAINST. DE-ICING SALTS SHALL NOT BE USED.
- 8.3 CONCRETE SHALL HAVE A MINIMUM TEMPERATURE OF 10°C, WHICH SHALL BE MAINTAINED FOR THE DURATION OF THE REQUIRED CURING PERIOD. AGGREGATE AND MIXING WATER SHALL BE HEATED AS REQUIRED. THE CONTRACTOR SHALL COVER, INSULATE AND HEAT THE CONCRETE AS REQUIRED.
- 8.4 CONCRETE SHALL NOT BE PLACED AGAINST SURFACES OR REINFORCING STEEL WITH A TEMPERATURE OF LESS THAN 5°C. SLABS THINNER THAN 1 m (40") SHALL NOT BE PLACED AGAINST SURFACES OR REINFORCING STEEL WITH A TEMPERATURE OF LESS THAN 10°C.
- 8.5 COVERS SHALL NOT BE REMOVED AFTER THE HEATING IS SHUT OFF UNTIL THE CONCRETE HAS COOLED DOWN TO NO MORE THAN 12°C ABOVE AIR TEMPERATURE.

**9.0 STAINLESS STEEL**

9.1 STAINLESS STEEL SHALL CONFORM TO THE FOLLOWING UNLESS NOTED OTHERWISE:

- PLATES: ASTM A276 TYPE 316L
- BARS & STRUCTURAL SHAPES: ASTM A240 TYPE 316L
- HSS: ASTM A269 TYPE 316L
- PIPES: ASTM A312 TYPE 316L
- BOLTS: ASTM A193 GRADE B8M

9.2 STAINLESS STEEL SHALL BE WELDED IN ACCORDANCE WITH AWS D1.6.

**10.0 ALUMINIUM**

10.1 ALUMINIUM SHALL CONFORM TO THE FOLLOWING UNLESS NOTED OTHERWISE:

- PLATES: ASTM B209 TYPE 6061-T6
- BARS & STRUCTURAL SHAPES: ASTM B308 TYPE 6061-T6
- TUBES & PIPES: ASTM B429 TYPE 6061-T6

10.2 FASTENERS FOR ALUMINIUM SHALL CONFORM TO THE FOLLOWING UNLESS NOTED OTHERWISE:

- ALUMINIUM BOLTS: ASTM F464
- GALVANIZED BOLTS: ASTM F3125 GRADE 325 & ASTM A153
- STAINLESS STEEL BOLTS: ASTM F593

10.3 ALUMINIUM SHALL BE WELDED IN ACCORDANCE WITH CSA-W59.2 BY COMPANIES CERTIFIED TO CSA-W47.2.

10.4 ALUMINIUM SHALL BE PROTECTED FROM CORROSION WHERE IT IS EXPOSED TO AGGRESSIVE ENVIRONMENTS OR IN CONTACT WITH DISSIMILAR METALS IN MOIST CONDITIONS.

**11.0 FOUNDATIONS**

- 11.1 THE CONTRACTOR SHALL VERIFY THE LOCATION OF EXISTING STRUCTURES AND UTILITIES PRIOR TO EXCAVATION AND ENSURE THEY ARE PROTECTED DURING CONSTRUCTION.
- 11.2 THE CONTRACTOR IS RESPONSIBLE FOR TEMPORARY SITE DRAINAGE AND STABILITY OF EXCAVATIONS.
- 11.3 SOIL SURFACES FOR BEARING SHALL BE PROTECTED AGAINST FREEZING PRIOR TO AND AFTER CONCRETE IS PLACED.

**12.0 TIMBER**

- 12.1 TIMBER CONSTRUCTION SHALL CONFORM TO CSA-086.
- 12.2 GRADING AND IDENTIFICATION OF ALL HEAVY TIMBER BEAMS AND COLUMNS TO CONFORM WITH REQUIREMENTS SET OUT IN NLGA STANDARD GRADING RULES FOR CANADIAN LUMBER AND CSA 0141.
- 12.3 CONTRACTOR TO VERIFY AND CONFIRM ALL DIMENSIONS PRIOR TO FABRICATION INCLUDING COORDINATION WITH STEEL SHOP DRAWINGS.
- 12.4 SAWN LUMBER SHALL CONFORM TO CSA-0141 AND BE OF THE FOLLOWING SPECIES AND GRADES OR BETTER UNLESS NOTED OTHERWISE:
  - TIMBER: YELLOW CEDAR No. 1
  - DIMENSION LUMBER: YELLOW CEDAR No. 1/2
- 12.5 ALL TIMER SIZES INDICATED ON THE DRAWINGS ARE DRESSED SIZES, UNLESS NOTED OTHERWISE.
- 12.6 SAWN TIMBER GRADES TO MATCH THOSE INDICATED ON DRAWINGS. ALL TIMBERS TO BE SEASONED TO MAXIMUM 15% MOISTURE CONTENT PRIOR TO FABRICATION.
- 12.7 ALL 'BEAM AND STRINGER' GRADES CANTILEVERING OR CONTINUOUS OVER SUPPORTS SHALL BE RE-GRADED FOR BENDING RESISTANCE ALONG FULL LENGTH OF MEMBER.
- 12.8 PLATE WASHERS SHALL BE USED UNDER THE HEADS AND NUTS OF ALL BOLTS BEARING ON TIMBER.
- 12.9 FASTENERS SHALL BE HOT-DIP GALVANIZED IN ACCORDANCE WITH ASTM A123/A123M UNLESS NOTED OTHERWISE AND SHALL CONFORM TO THE FOLLOWING:
  - BOLTS, LAG SCREWS, NUTS, WASHERS: ASTM A307 GRADE A

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PB	2025-09-22	ISSUED FOR CLIENT REVIEW (100% DESIGN)	JTH	ZT	MF	
PA	2025-09-05	ISSUED FOR CLIENT REVIEW (95% DESIGN)	JTH	ZT	MF	
Rev	Date	Description	Drawn	Design	App'd	

ORIGINAL DWG SIZE: ANSI D (22" x 34")



**PRELIMINARY  
NOT FOR  
CONSTRUCTION**

THIS DRAWING HAS NOT BEEN APPROVED AND MAY CONTAIN ERRORS AND OMISSIONS

**STRATHCONA REGIONAL DISTRICT**  
990 CEDAR STREET, CAMBELL RIVER, BC V9W 7Z8

**SURGE NARROWS  
DESIGN CRITERIA AND  
GENERAL NOTES  
SHEET 2 OF 2**

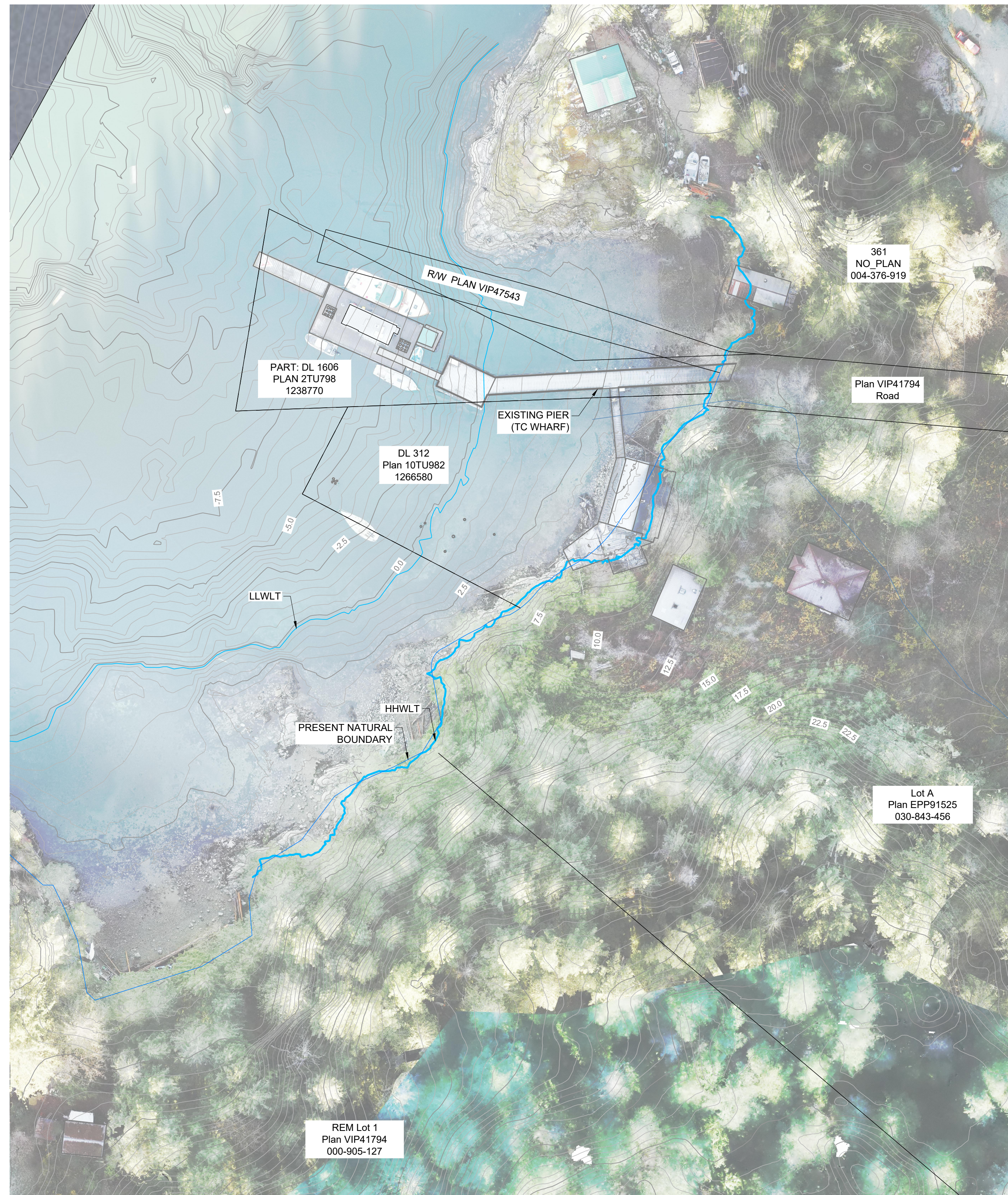
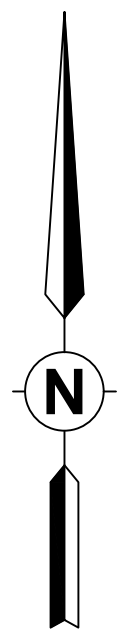
Drawing No.

**S002**

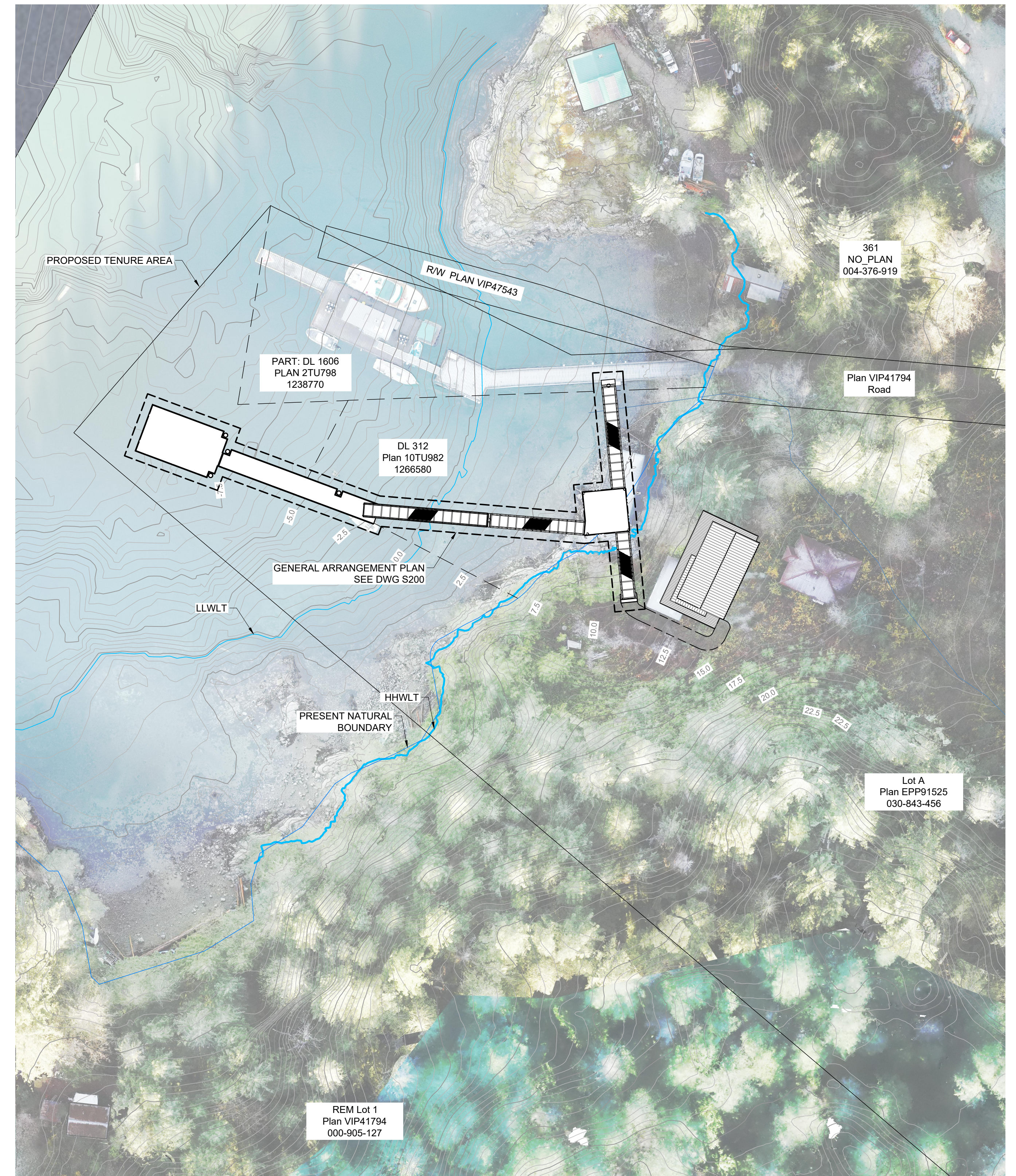
Project Number  
2211-71343-01

Rev.  
PB

DATE: 2025-09-22 10:27 FILE: X:\21112-PROJ\21112-PROJ\21112-01-001-SURF\21112-01-001-SURF-Plan-Existing and Proposed.dwg McElhanney ANS D - 2019-04-16



**PLAN - EXISTING**  
SCALE 1:500



**PLAN - PROPOSED**  
SCALE 1:500

- NOTES:**
- SEE DWG S001 AND S002 FOR DESIGN CRITERIA AND GENERAL NOTES.
  - PROPOSED ONSHORE BUILDING SHOWN FOR REFERENCE ONLY, REFER TO ARCHITECTURAL DRAWINGS, ISSUED SEPERATELY.

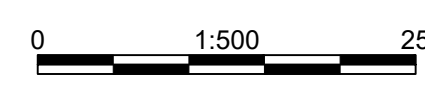
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PD	2025-09-22	ISSUED FOR CLIENT REVIEW (100% DESIGN)	JTH	ZT	MF
PC	2025-09-05	ISSUED FOR CLIENT REVIEW (95% DESIGN)	JTH	ZT	MF
PB	2025-02-27	ISSUED FOR CLIENT REVIEW (90% DESIGN)	JTH	ZT	GH
PA	2024-10-04	ISSUED FOR CLIENT REVIEW (65% DESIGN)	JTH	ZT	GH

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ORIGINAL DWG SIZE: ANSI D (22" x 34")



**McElhanney**

1211 Ryan Road,  
Courtenay BC V9N 3R6  
Tel. 250 338 5495

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**STRATHCONA REGIONAL DISTRICT**  
990 CEDAR STREET, CAMBELL RIVER, BC V9W 7Z8

**SURGE NARROWS  
SITE PLAN  
EXISTING AND PROPOSED**

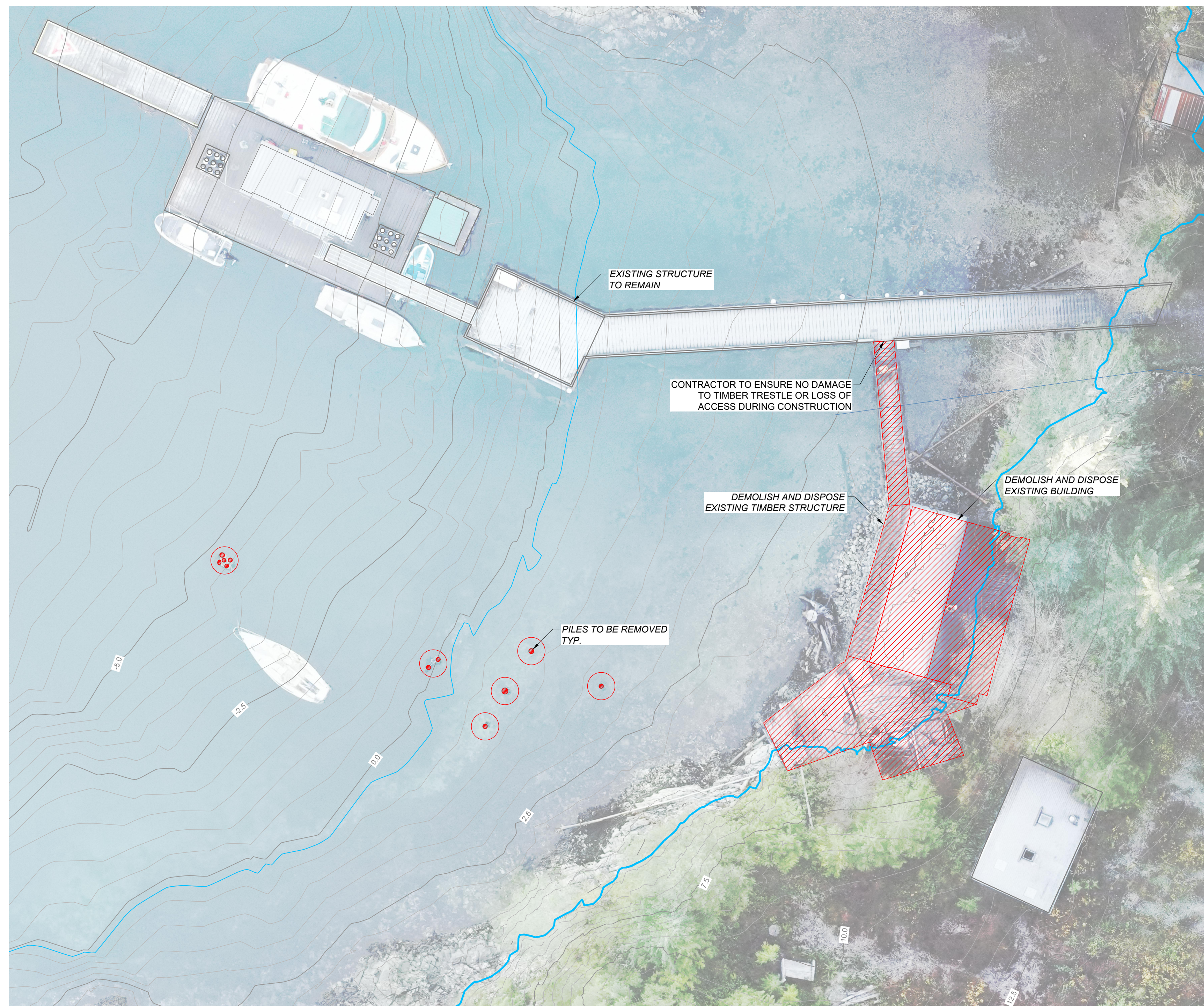
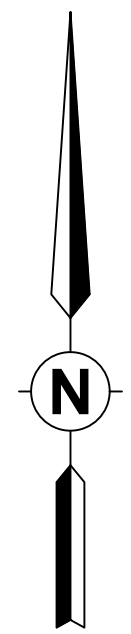
Drawing No.  
**S100**

Project Number  
2211-71343-01

Rev.  
PD

DESTROY ALL PRINTS BEARING PREVIOUS REVISION

DATE: 2024-09-23 10:27 FILE: X:\2110-PROJECTS\2110-01-SRD-Surge Narrows\01-DRAWINGS\01-Sheets\T243-S001-S101-Demolition Plan.dwg



**PLAN**  
SCALE 1: 200



PHOTO 1



PHOTO 2



PHOTO 3



PHOTO 4



PHOTO 5



PHOTO 6

**LEGEND**  
 AREA OF DEMOLITION

**NOTES:**  
 1. SEE DWG S001 AND S002 FOR DESIGN CRITERIA AND GENERAL NOTES.

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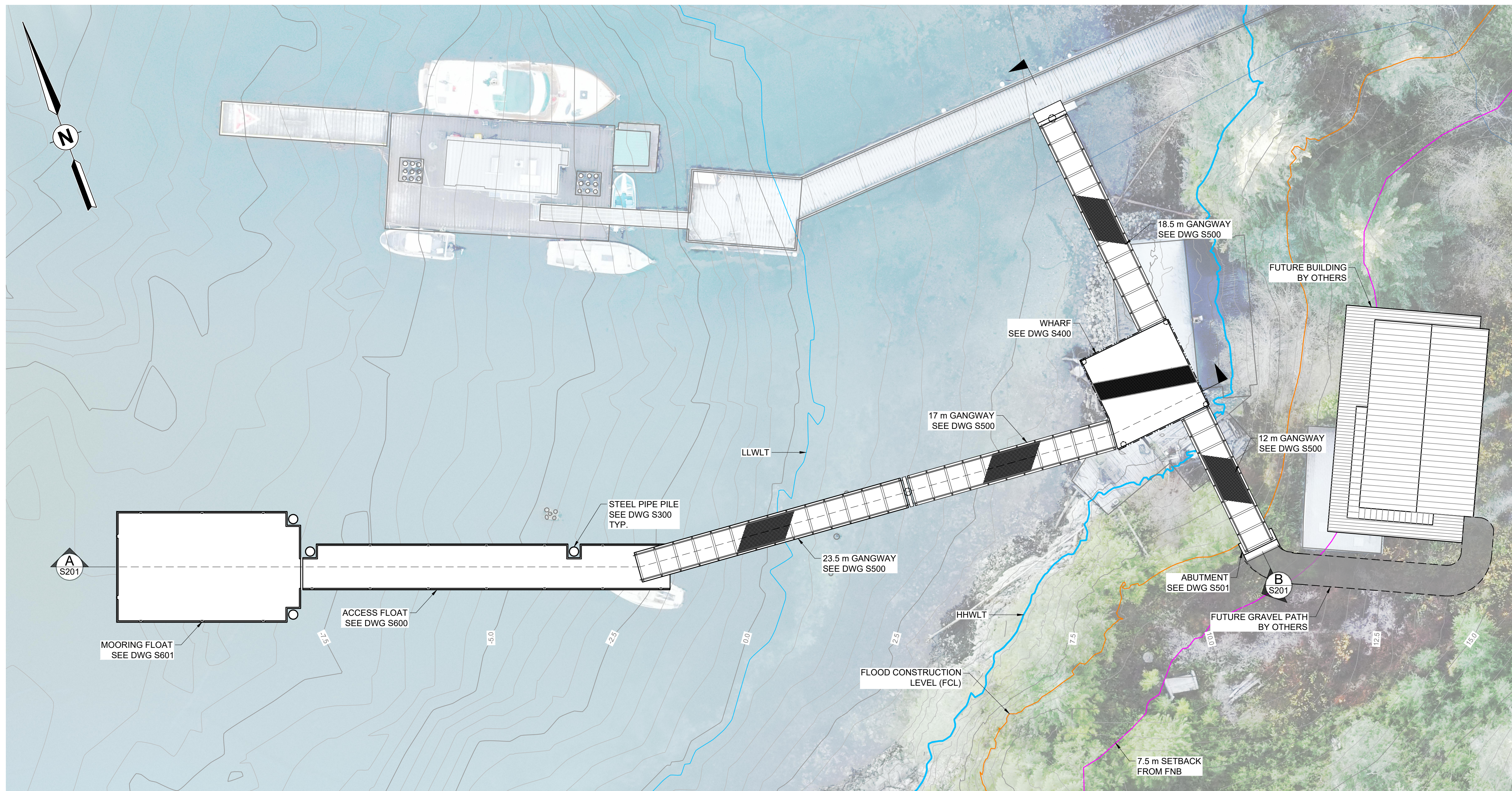
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 990 CEDAR STREET, CAMPELL RIVER, BC V9W 7Z8  
**SURGE NARROWS  
 DEMOLITION PLAN**

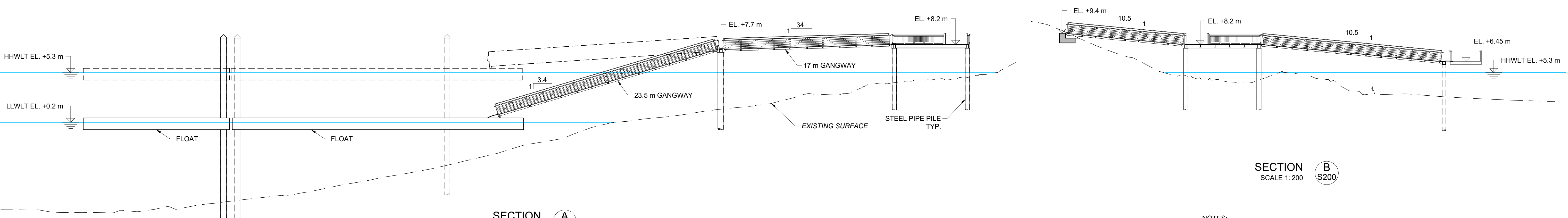
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**S101**  
 Project Number  
 2211-71343-01  
 Rev.  
 PD

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**PLAN**  
SCALE 1: 200

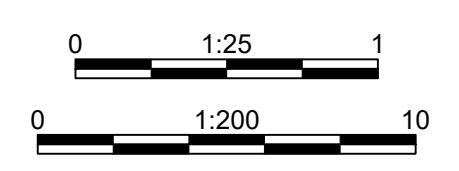


**SECTION A**  
SCALE 1: 200

**SECTION B**  
SCALE 1: 200

- NOTES:
- SEE DWG S001 AND S002 FOR DESIGN CRITERIA AND GENERAL NOTES.
  - ELEVATIONS ARE IN METERS AND ARE REFERRED TO CHART DATUM. CONTOUR INTERVAL IS 0.5m.

PE	2025-09-22	ISSUED FOR CLIENT REVIEW (100% DESIGN)	JTH	ZT	MF	<small>THIS DRAWING AND DESIGN IS THE PROPERTY OF McELHANNEY AND SHALL NOT BE USED, REUSED OR REPRODUCED WITHOUT THE CONSENT OF McELHANNEY. McELHANNEY WILL NOT BE HELD RESPONSIBLE FOR THE IMPROPER OR UNAUTHORIZED USE OF THIS DRAWING AND DESIGN.</small> <small>THIS DRAWING AND DESIGN HAS BEEN PREPARED FOR THE CLIENT IDENTIFIED TO MEET THE STANDARDS AND REQUIREMENTS OF THE APPLICABLE PUBLIC AGENCIES AT THE TIME OF PREPARATION. McELHANNEY, ITS EMPLOYEES, SUBCONSULTANTS AND AGENTS WILL NOT BE LIABLE FOR ANY LOSSES OR OTHER CONSEQUENCES RESULTING FROM THE USE OR RELIANCE UPON, OR ANY CHANGES MADE TO, THIS DRAWING, BY ANY THIRD PARTY, INCLUDING CONTRACTORS, SUPPLIERS, CONSULTANTS AND STAKEHOLDERS, OR THEIR EMPLOYEES OR AGENTS, WITHOUT McELHANNEY'S PRIOR WRITTEN CONSENT.</small> <small>INFORMATION ON EXISTING UNDERGROUND FACILITIES MAY NOT BE COMPLETE OR ACCURATE. McELHANNEY, ITS EMPLOYEES AND DIRECTORS ARE NOT RESPONSIBLE NOR LIABLE FOR THE LOCATION OF ANY UNDERGROUND CONDUITS, PIPES, CABLES OR OTHER FACILITIES WHETHER SHOWN OR OMITTED FROM THIS PLAN. PRIOR TO CONSTRUCTION CONTRACTOR SHALL EXPOSE LOCATIONS OF ALL EXISTING FACILITIES BY HAND DIGGING OR HYDROVAC AND NOISE THE ENGINEER OF POTENTIAL CONFLICTS.</small>
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Rev	Date	Description	Drawn	Design	App'd	



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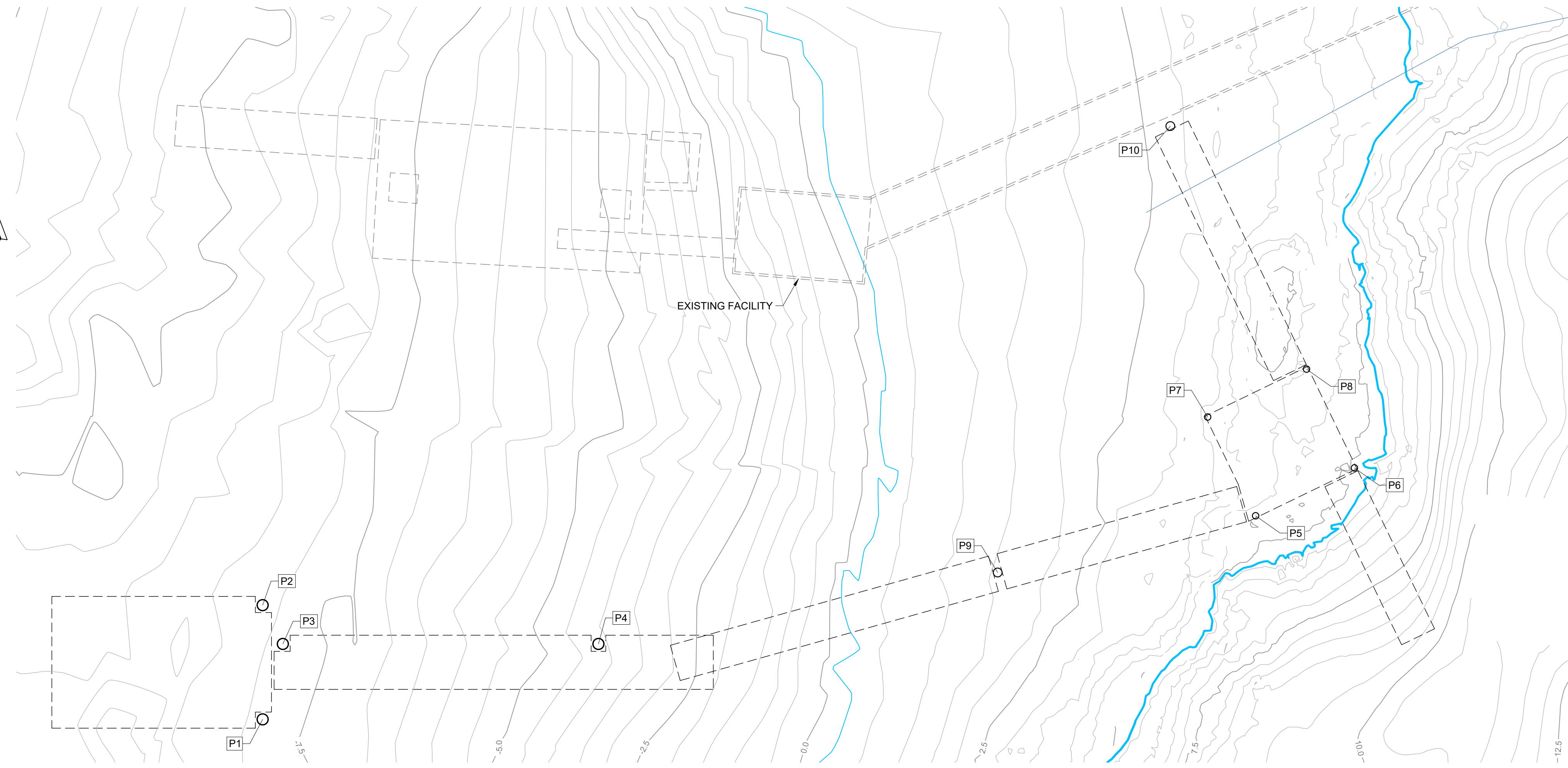
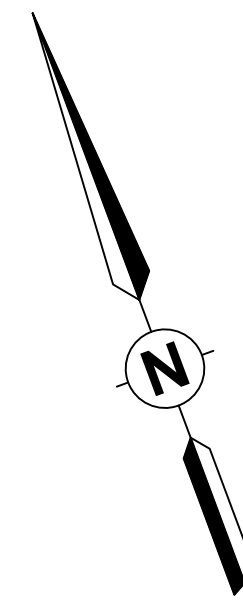
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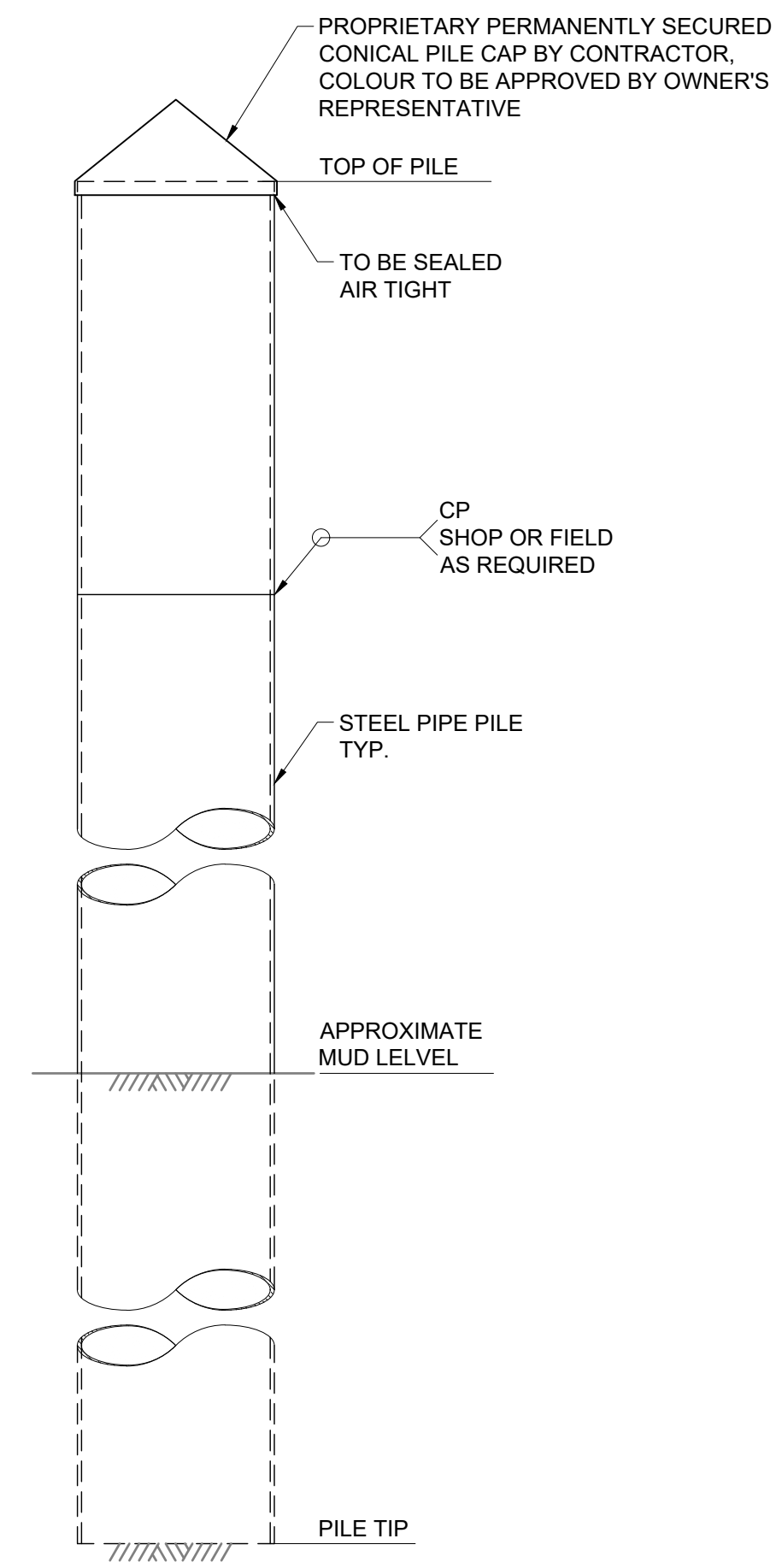
**SURGE NARROWS  
GENERAL ARRANGEMENT  
PLAN, SECTIONS AND DETAILS**

Drawing No.	
<b>S200</b>	
Project Number	Rev.
2211-71343-01	PE

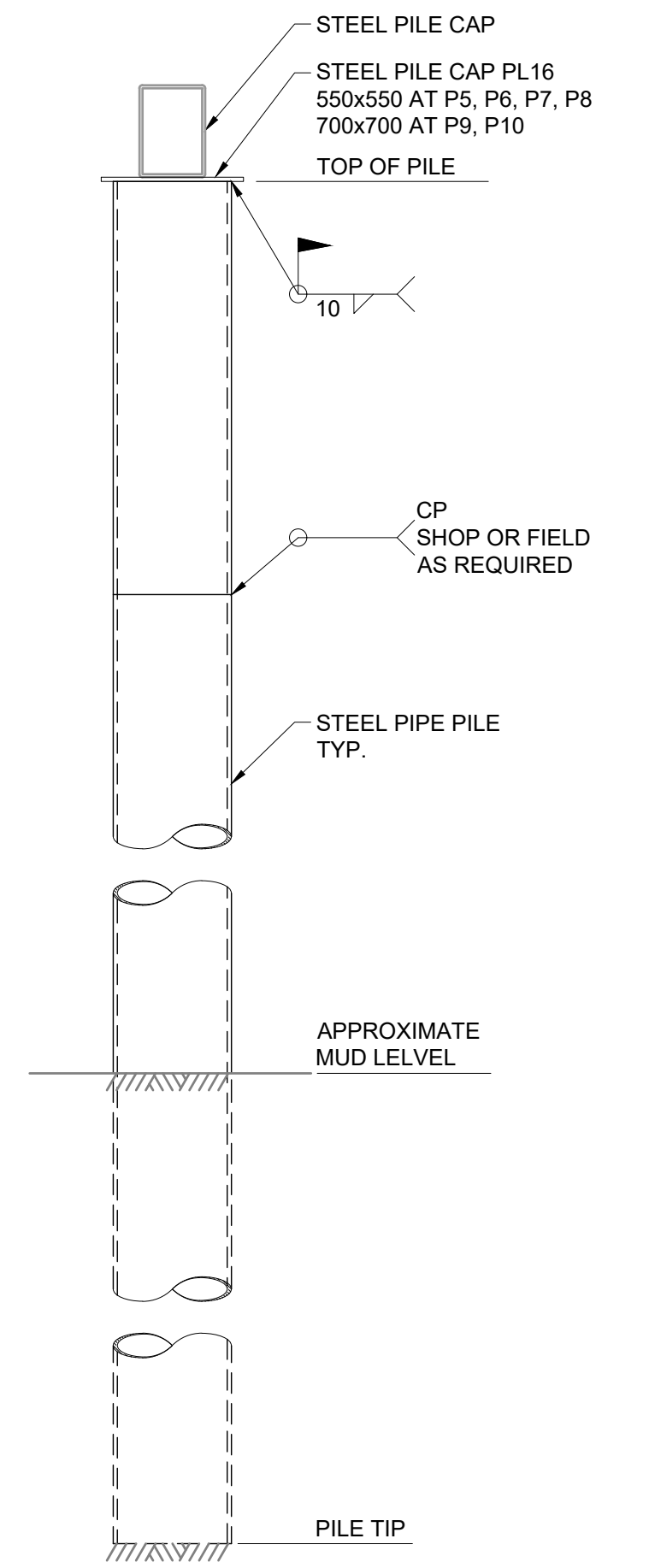
DESTROY ALL PRINTS BEARING PREVIOUS REVISION



**PLAN**  
SCALE 1:200



**PILE**  
SCALE 1:25



**PILE**  
SCALE 1:25

**PILE TABLE**

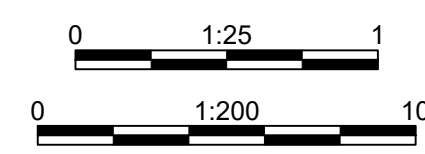
STRUCTURE	PILE NUMBER	PILE DIAMETER (mm)	PILE WALL THICKNESS (mm)	COATED LENGTH	NORTHING	EASTING	ESTIMATED CUT-OFF EL. (m)	ESTIMATED MUDDLIN EL. (m)	ESTIMATED PILE TIP EL. (m)	ESTIMATED TOTAL PILE LENGTH (m)
FLOAT	P1	762	15.9	UNCOATED	5565978.541	349333.760	8.91	-7.86	TBD	TBD
	P2	762	15.9	UNCOATED	5565985.850	349336.483	8.91	-8.16	TBD	TBD
	P3	762	15.9	UNCOATED	5565982.885	349336.851	8.91	-7.86	TBD	TBD
	P4	762	15.9	UNCOATED	5565975.362	349357.052	8.91	-4.15	TBD	TBD
WHARF	P5	457	9.5	FULL LENGTH	5565967.901	349402.172	7.80	4.75	TBD	TBD
	P6	457	9.5	FULL LENGTH	5565968.613	349409.638	7.80	5.21	TBD	TBD
	P7	457	9.5	FULL LENGTH	5565975.368	349401.460	7.80	3.60	TBD	TBD
	P8	457	9.5	FULL LENGTH	5565976.079	349408.926	7.80	4.26	TBD	TBD
GANGWAY	P9	610	9.5	FULL LENGTH	5565970.420	349384.309	7.38	1.55	TBD	TBD
	P10	610	9.5	FULL LENGTH	5565994.883	349406.007	7.38	2.82	TBD	TBD

- NOTES:
- PILE EMBEDMENT TO COME FOLLOWING THE FINALIZED GEOTECHNICAL PILE DESIGN.
  - PILE TOLERANCE TO BE NO MORE THAN 75 mm OUT OF THEORETICAL POSITION IN PLAN.
  - PILES TO BE COATED TO A MINIMUM OF 1 m BELOW MUDDLIN AND IN ACCORDANCE WITH THE SPECIFICATIONS.

- NOTES:
- SEE DWG S001 AND S002 FOR DESIGN CRITERIA AND GENERAL NOTES.
  - CONTRACTOR SHALL HAVE THE ABILITY TO DRILL PILES INTO ROCK SHOULD ROCK BE ENCOUNTERED.

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Rev	Date	Description	Drawn	Design	App'd	

ORIGINAL DWG SIZE: ANS D (22" x 34")



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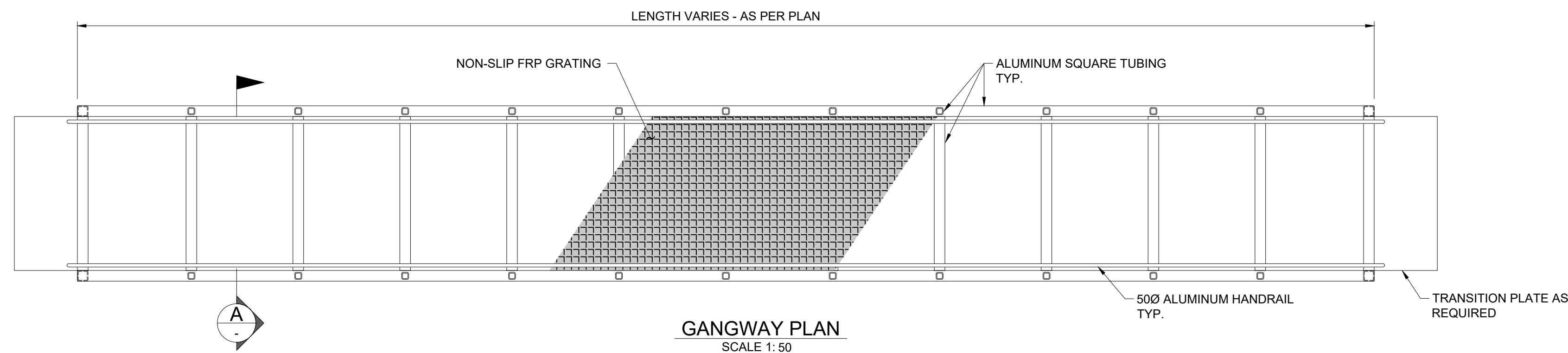
**SURGE NARROWS  
PILES  
PLAN, LIST AND DETAILS**

Drawing No.  
**S300**

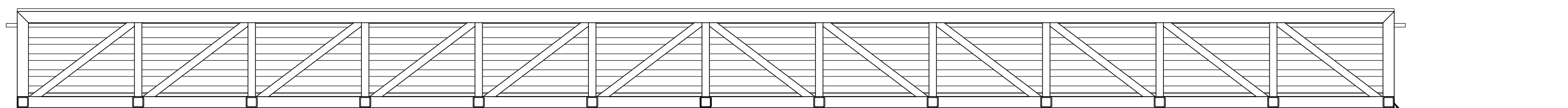
Project Number  
2211-71343-01

Rev.  
PD





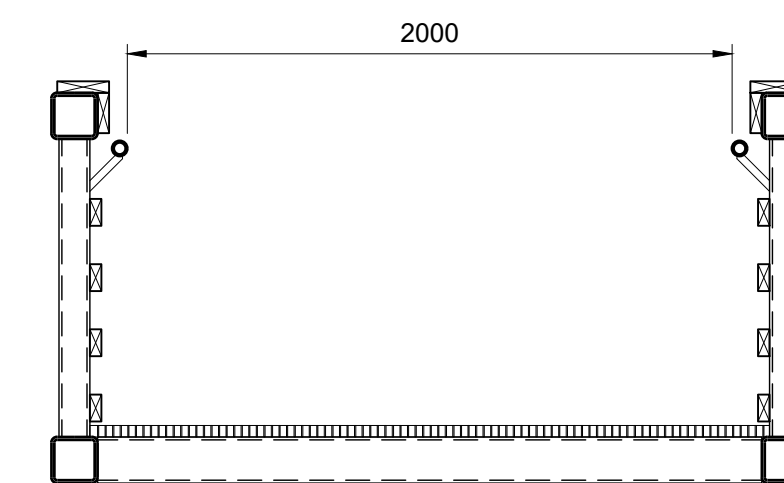
**GANGWAY PLAN**  
SCALE 1:50



**GANGWAY ELEVATION**  
SCALE 1:50

**NOTES:**

1. 18.5m GANGWAY SHOWN.
2. PROVIDE TIMBER DRESSING SIMILAR TO PHOTO.
3. PHOTO OF TIMBER DRESSING IS INDICATIVE ONLY.
4. TIMBER DRESSING TO BE INCLUDED IN SHOP DRAWINGS FOR REVIEW BY OWNER AND OWNER'S REPRESENTATIVE.



**TYPICAL ALUMINUM GANGWAY SECTION**  
SCALE 1:25

**NOTE:**

1. HANDRAILS AND ASSOCIATED GUARDING ELEMENTS INCLUDING, BUT NOT LIMITED TO, KICKPLATES, MIDRAILS, MESH, OR OTHER SHALL BE SUBMITTED AND APPROVED BY OWNER'S REPRESENTATIVE PRIOR TO FABRICATION.



**PHOTO: TIMBER DRESSING**

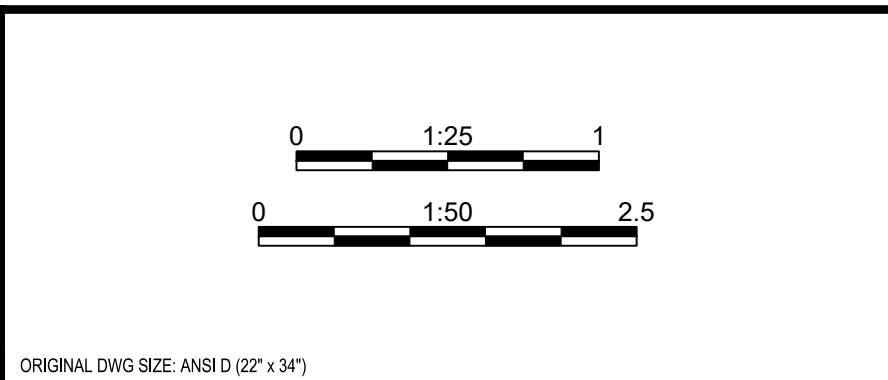
**PERFORMANCE REQUIREMENTS AND SCOPE OF WORK FOR GANGWAYS**

1. DESIGN, DETAIL AND FABRICATE ALL COMPONENTS OF GANGWAYS.
2. PROVIDE TO THE OWNERS REPRESENTATIVE A DESIGN REPORT FOR REVIEW AND APPROVAL PRIOR TO COMMENCING FABRICATION. THE REPORT SHALL PRESENT, AS REQUIRED, DETAILED CALCULATIONS/JUSTIFICATIONS/DOCUMENTATION VALIDATING THE DESIGN OF THE ALUMINUM GANGWAY MEETS THE PROJECT REQUIREMENTS AND PERFORMANCE REQUIREMENTS AND SHALL BE SIGNED AND SEALED BY A PROFESSIONAL ENGINEER REGISTERED IN THE PROVINCE OF BRITISH COLUMBIA.
3. PREPARE SHOP DRAWINGS AND SUBMIT TO OWNERS REPRESENTATIVE FOR REVIEW PRIOR TO FABRICATION. THE SHOP DRAWINGS SHALL BE SIGNED AND SEALED BY A PROFESSIONAL ENGINEER REGISTERED IN THE PROVINCE OF BRITISH COLUMBIA FOR STRUCTURAL ADEQUACY OF ALL COMPONENTS.
4. FABRICATION AND SHOP DRAWINGS MUST CONFORM TO CSA S6:19 SECTION 17 AND S7 AS APPLICABLE.
5. GANGWAYS SHALL BE DESIGNED TO CARRY THE FOLLOWING LIVE LOADS:  
 UNIFORM LOAD OF 4.8 kPa  
 CONCENTRATED VERTICAL LOAD OF 4.5 kN APPLIED OVER AN AREA OF 750mmx750mm AT ANY POINT ON THE GANGWAYS  
 SNOW LOAD AS PER BCBC 2024  
 WIND LOAD AS PER CSA S6  
 SEISMIC LOAD AS PER CSA S6  
 HANDRAIL LOAD AS PER CSA S6:19 CLAUSE 3.8.8.2
6. DESIGN, DETAILING AND FABRICATION SHALL CONFORM TO CSA S6:19, CANADIAN HIGHWAY BRIDGE DESIGN CODE.
7. GANGWAYS SHALL BE CAMBERED TO COMPENSATE FOR DEAD LOAD DEFLECTIONS.
8. MAXIMUM DEFLECTION OF ACCESS WALKWAY UNDER FULL LIVE LOAD SHALL NOT EXCEED 1/240 OF ITS LENGTH.
9. MATERIAL SHALL BE ALUMINUM ALLOY, GRADE TO COMPLY WITH ASTM B211/B211M FOR ROLLED OR COLD FINISHED BAR AND ASTM B221/B221M FOR EXTRUDED BARS, RODS, PROFILES AND TUBES. GENERAL ALLOY STRENGTH SHALL COMPLY WITH ASTM 6061-T6 MARINE GRADE OR AS OTHERWISE PROPOSED BY CONTRACTOR SUBJECT TO REVIEW AND APPROVAL BY OWNER'S REPRESENTATIVE.
10. FASTENERS IN CONTACT WITH ALUMINUM SHALL BE STAINLESS STEEL.
11. LENGTH OF GANGWAYS TO BE FIELD VERIFIED BY THE CONTRACTOR PRIOR TO FABRICATION.
12. THE STRUCTURAL GENERAL ARRANGEMENT IS AT THE DISCRETION OF THE CONTRACTOR. DIMENSIONS AT THE ENDS OF GANGWAYS SHOWN ON THIS DRAWING ARE FIXED DIMENSIONS. ALL OTHER DIMENSIONS OMITTED ARE AT THE CONTRACTORS DISCRETION.

**NOTES:**

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Rev	Date	Description	Drawn	Design	App'd	



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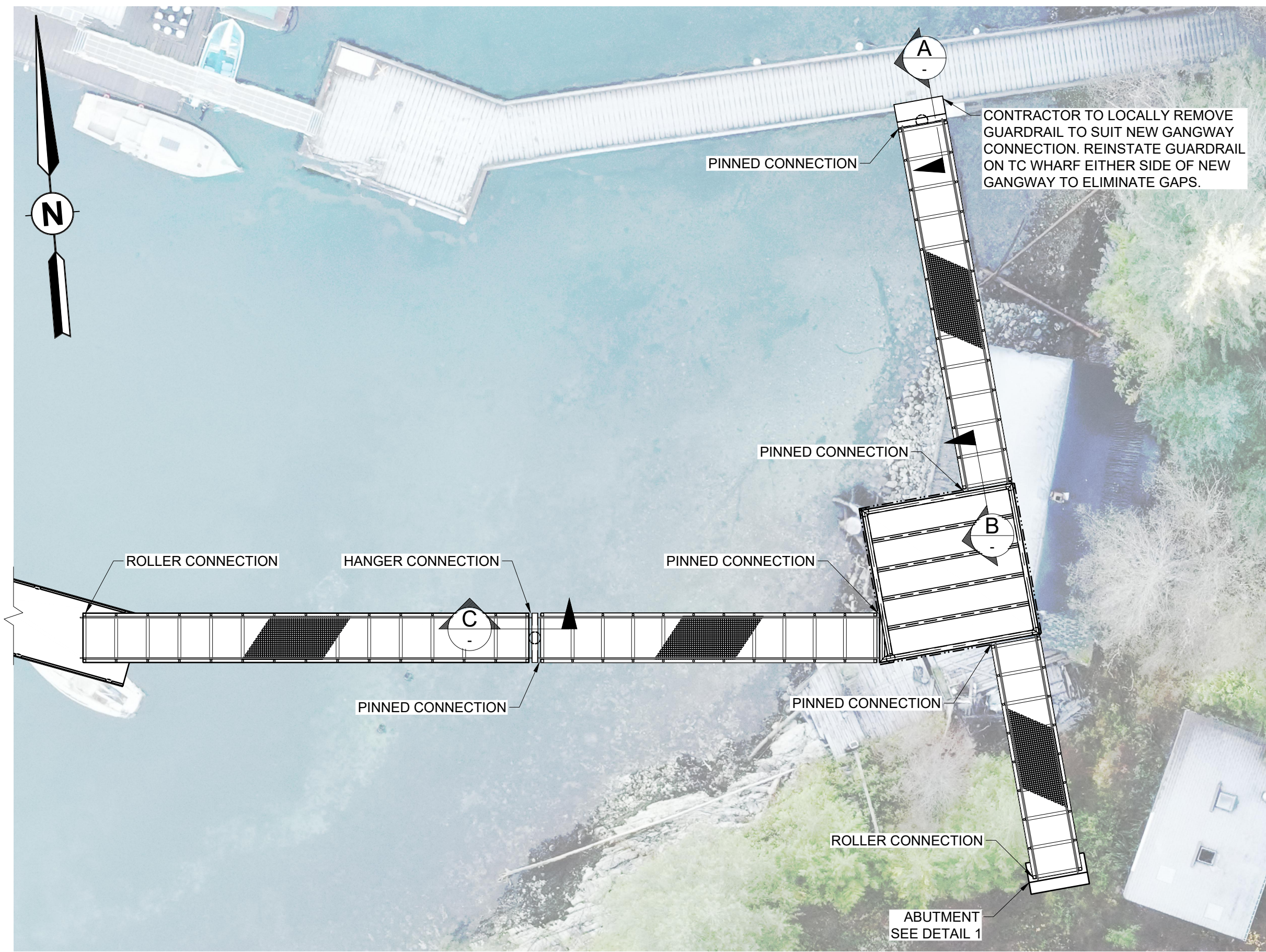
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**STRATHCONA REGIONAL DISTRICT**  
 990 CEDAR STREET, CAMBELL RIVER, BC V9W 7Z8

**SURGE NARROWS  
GANGWAY  
PLAN AND SECTIONS**

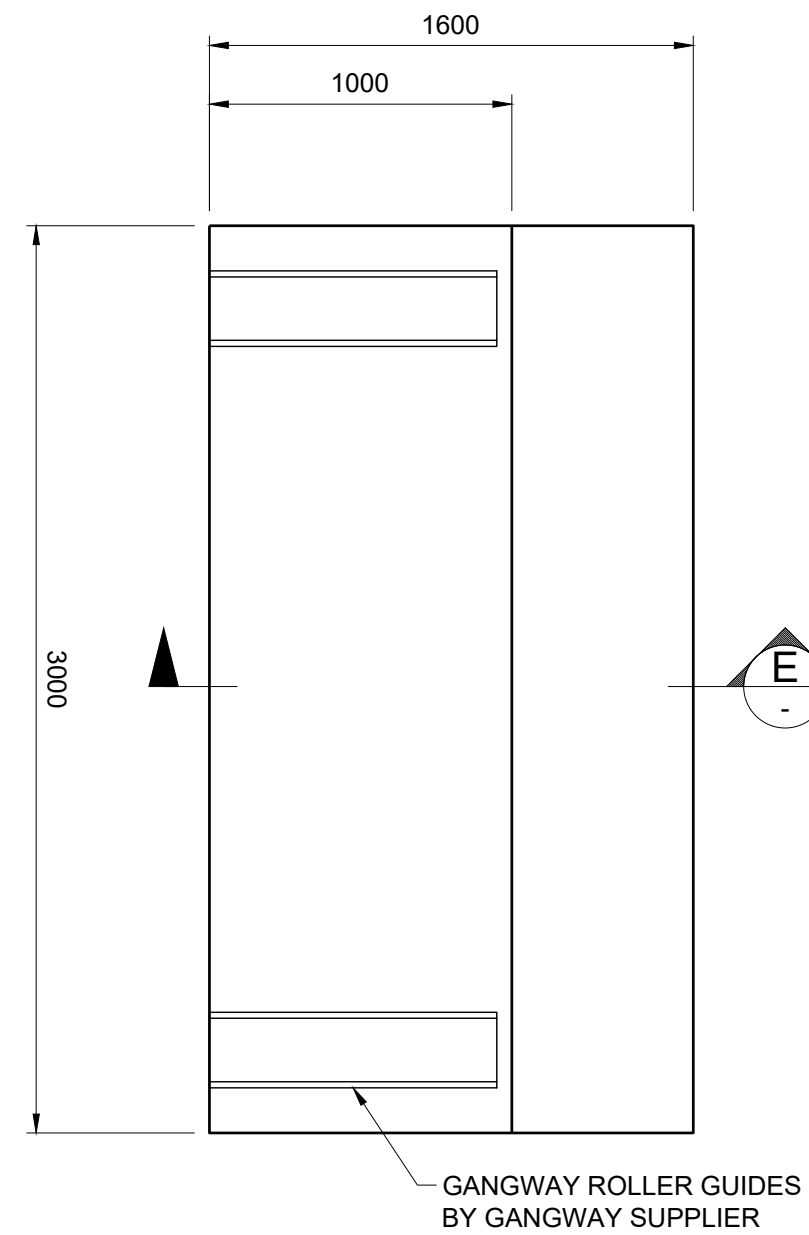
Drawing No.	<b>S500</b>
Project Number	2211-71343-01
Rev.	PE

DATE: 2024-09-23 10:33 FILE: X:\21112-PROJECTS\21112-001-Surge Narrows\DWG\Drawings\Sheet\21112-001-S501-Gangway Connection Details.dwg

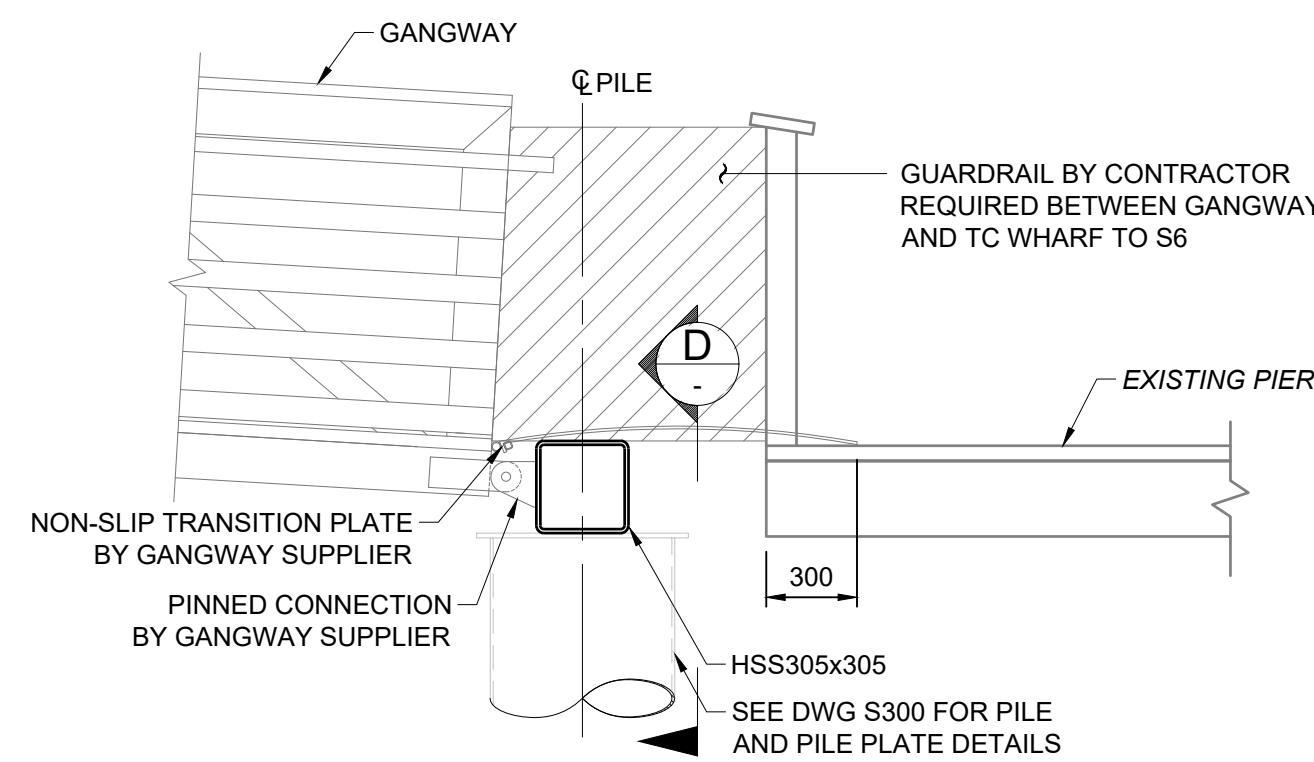


**PLAN**  
SCALE 1: 200

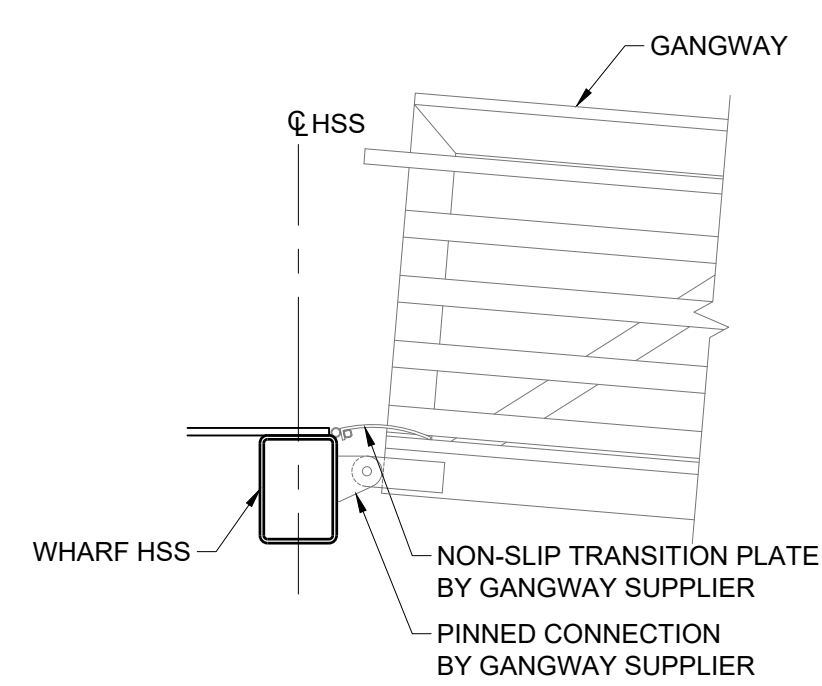
**NOTE:**  
1. CONTRACTOR IS RESPONSIBLE FOR DETAILED DESIGN OF GANGWAY CONNECTIONS.



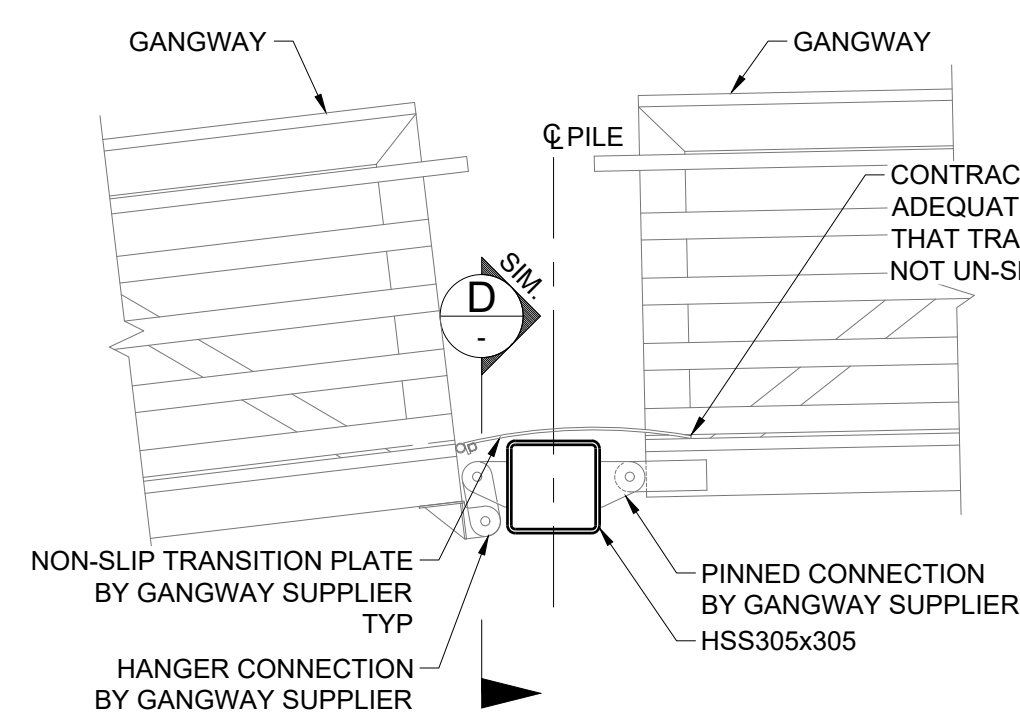
**PLAN - ABUTMENT 1**  
SCALE 1: 25



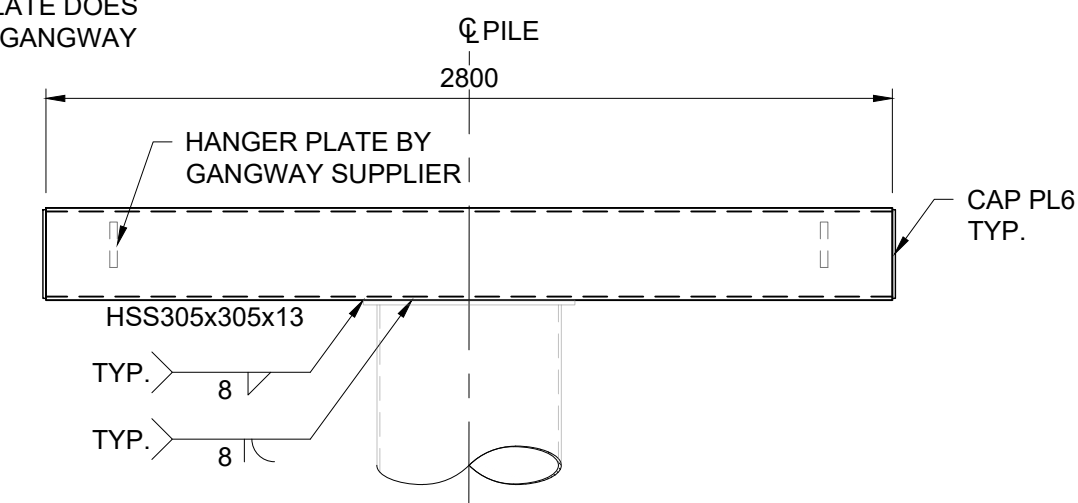
**SECTION A**  
SCALE 1: 25  
**TC WHARF GANGWAY CONNECTION DETAIL**



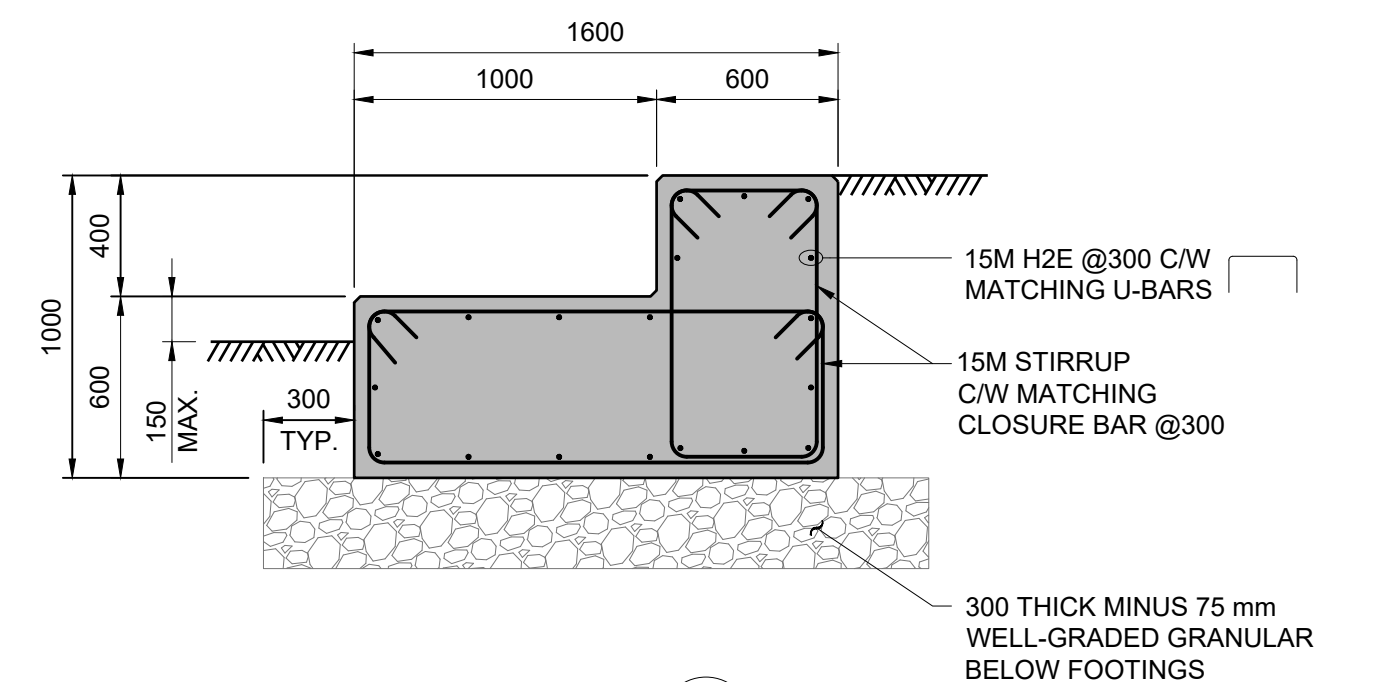
**SECTION B**  
SCALE 1: 25  
**WHARF GANGWAY CONNECTION DETAIL**



**SECTION C**  
SCALE 1: 25  
**INT. BENT GANGWAY CONNECTION DETAIL**



**VIEW D**  
SCALE 1: 25



**SECTION E**  
SCALE 1: 25

**NOTES:**  
1. SEE DWG S001 AND S002 FOR DESIGN CRITERIA AND GENERAL NOTES.

Rev	Date	Description	Drawn	Design	App'd
PD	2025-09-22	ISSUED FOR CLIENT REVIEW (100% DESIGN)	JTH	ZT	MF
PC	2025-09-05	ISSUED FOR CLIENT REVIEW (95% DESIGN)	JTH	ZT	MF
PB	2025-02-27	ISSUED FOR CLIENT REVIEW (90% DESIGN)	JTH	ZT	GH
PA	2024-10-04	ISSUED FOR CLIENT REVIEW (65% DESIGN)	JTH	ZT	GH

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ORIGINAL DWG SIZE: ANSI D (22" x 34")

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**SURGE NARROWS  
GANGWAY  
CONNECTION DETAILS**

Drawing No. **S501**

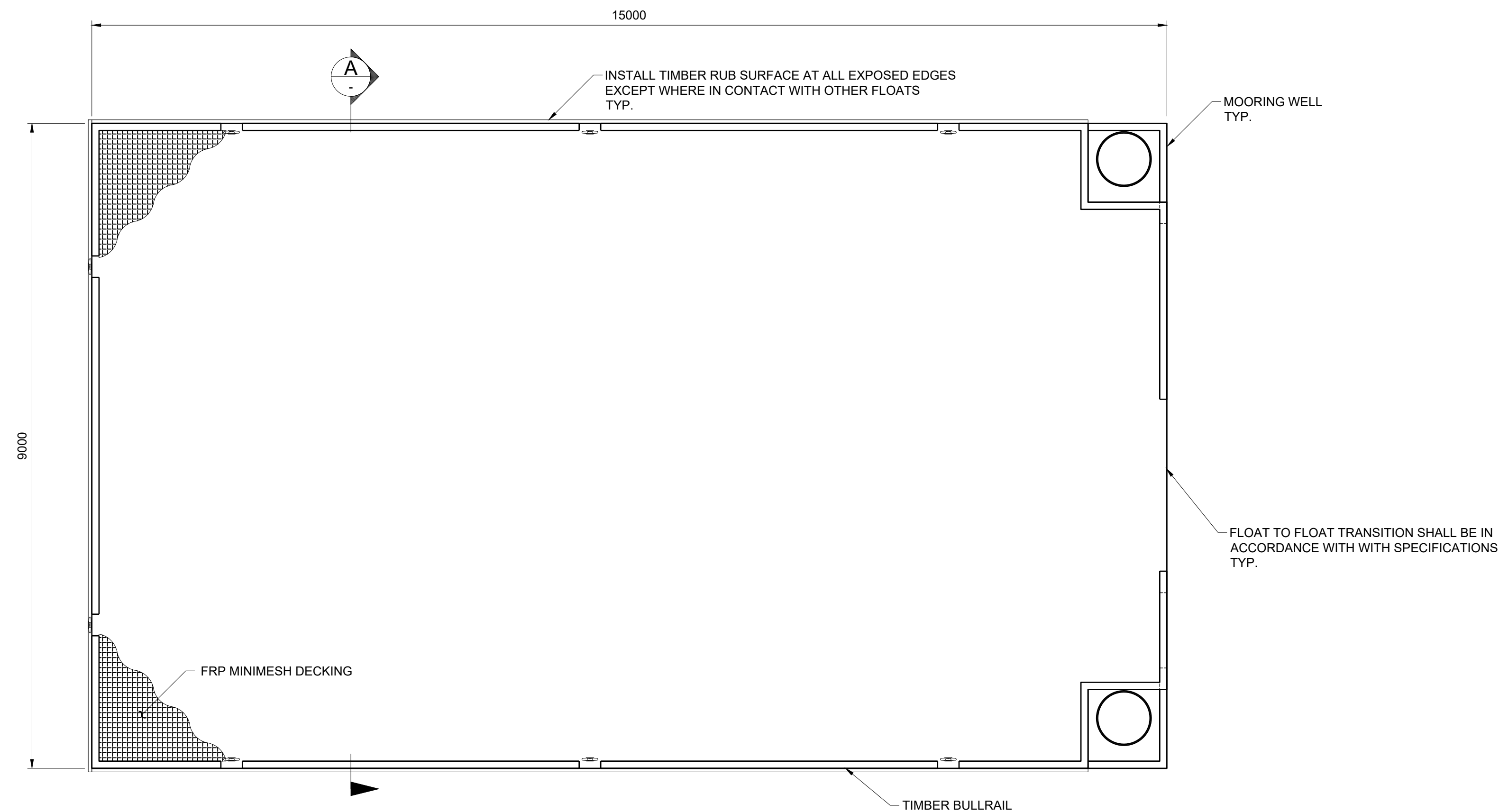
Project Number 2211-71343-01

Rev. PD

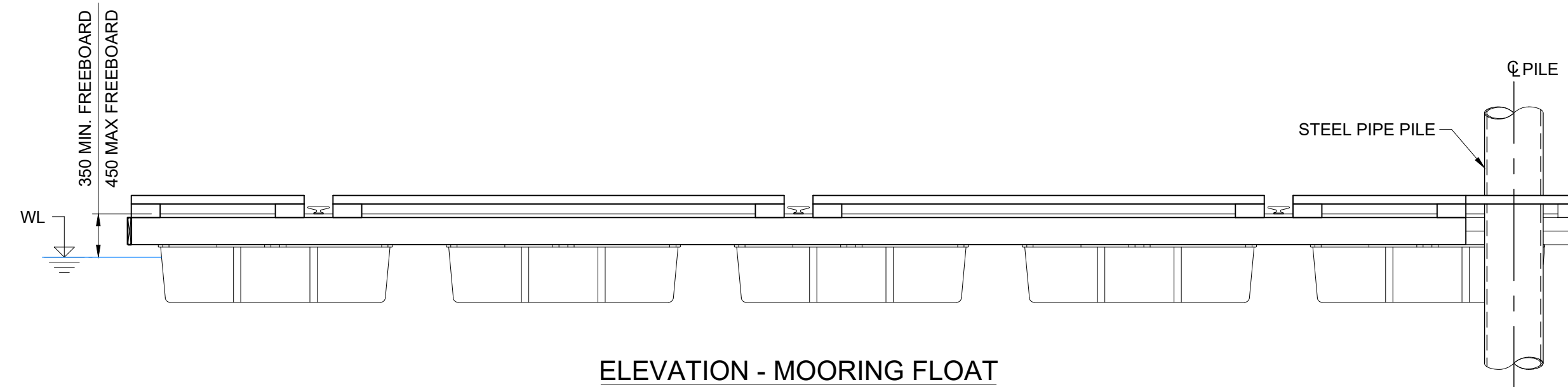
DESTROY ALL PRINTS BEARING PREVIOUS REVISIONS



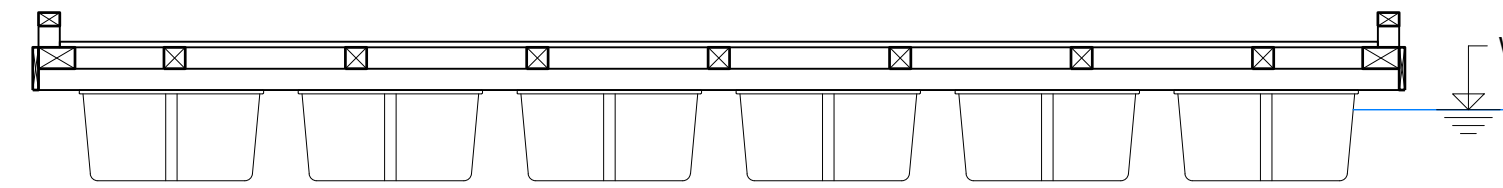
DATE: 2024-02-27 10:29 FILE: X:\2110\_PROJECTS\211007\_159922\17153-01-000\_Surge Narrows\07\_DRAWINGS\07\_Sheets\17153-S007\_S601 - Mooring Float - Plan and Sections.dwg McElhanney ANS D - 2019-04-16



PLAN - MOORING FLOAT  
SCALE 1:50



ELEVATION - MOORING FLOAT  
SCALE 1:50



SECTION A  
SCALE 1:50

NOTES:

- SEE DWG S001 AND S002 FOR DESIGN CRITERIA AND GENERAL NOTES.
- SEE DWG S600 FOR FLOAT PERFORMANCE SPECIFICATIONS AND REQUIREMENTS.

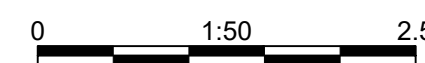
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**SURGE NARROWS  
MOORING FLOAT  
PLAN AND SECTIONS**

Drawing No.  
**S601**

Project Number  
2211-71343-01

Rev.  
PD

DESTROY ALL PRINTS BEARING PREVIOUS REVISION