

PROPOSED TEMPORARY LOG DUMP ON HARRISON LAKE (NORTH)

SITE: HN 999

(49° 43' 55" N , 122° 05' 08" W)



DWG No: 1132-4-HN999LOGDUMP-001		SHEET: 1 OF 7		DRAWING INDEX: SHEET 2 OF 7 - NOTES SHEET 3 OF 7 - 1:2000 PLAN VIEWS SHEET 4 OF 7 - 1:250 PLAN VIEW SHEET 5 OF 7 - SKIDWAY PROFILE & DETAIL VIEWS SHEET 6 OF 7 - SKIDWAY CROSS SECTION VIEW SHEET 7 OF 7 - PHOTOS
PREPARED FOR:		PREPARED BY:	ONSITE ENGINEERING LTD. NORTH VANCOUVER 2 - 252 1ST ST E NORTH VANCOUVER, BC, V7L 1B3 PH.: 778-628-4968 FAX: 866-235-6943	
		DESIGN BY: MICHAEL FOSTER, P.ENG. DESIGN DATE: AUGUST 13, 2019 REVIEWED BY: JEREMY ARAKI, P.ENG. DRAWN BY: ANDREW BRABANDT, AScT SITE SURVEY BY: ONSITE ENGINEERING LTD. SITE SURVEY DATE: APRIL 25, 2019 FILE NAME: HN999LOGDUMP.DWG SCALE: AS NOTED REVISION NUMBER: 3 REVISION DATE: NOVEMBER 25, 2019 ALL MEASUREMENTS IN m UNLESS OTHERWISE NOTED.		

NOTES:

1. COORDINATING REGISTERED PROFESSIONAL:

- 1.1. CRP TO BE DETERMINED BY TIMBER SALE LICENSE HOLDER

2. DURATION:

- 2.1. FOR THE PURPOSES OF THIS DESIGN THE TERM TEMPORARY AS IT REFERS TO DURATION OF THIS INSTALLATION MEANS TEN (10) YEARS OR LESS.

3. DESIGN LIVE LOADS:

- 3.1. DESIGN VEHICLE: BCFS L-100 AS PER MOFLNRORD (STD-EC-000-001 TO 002).
3.2. ADDITIONAL DESIGN LIVE LOAD: 2 80 TON BUNDLES OF LOGS

4. WATER LEVEL NOTES:

- 4.1. PRESENT WATER LEVEL DISPLAYED ON THIS DRAWING WAS SURVEYED ON APRIL 25, 2019 USING A TRIMBLE R6 RTK GPS UNIT
4.2. UNDERWATER TOPOGRAPHIC DATA COLLECTED BY ONSITE ENGINEERING LTD. USING A COMBINATION OF RTK GPS AND SONAR BATHYMETRY SURVEY TECHNOLOGY.
4.3. MAXIMUM HIGH AND LOW WATER LEVELS DISPLAYED ON THIS DRAWING HAVE BEEN DETERMINED USING REAL TIME AND HISTORICAL HYDROMETRIC DATA GRAPHS REPRESENTING WATER LEVEL MEASUREMENTS FROM ACTIVE STATION #08MG012 (HARRISON LAKE NEAR HARRISON HOT SPRINGS). HYDROMETRIC DATA GRAPHS PROVIDED BY THE GOVERNMENT OF CANADA WATER OFFICE. <https://wateroffice.ec.gc.ca>
4.4. PRESENT WATER LEVEL = 9.45m (APRIL 25, 2019)
4.5. MAXIMUM RECORDED WATER LEVEL (HIGH WATER) = 12.42m (JUNE 25, 2012)
4.6. MINIMUM RECORDED WATER LEVEL (LOW WATER) = 8.29m (MAY 22, 1993)

5. GEOTECHNICAL:

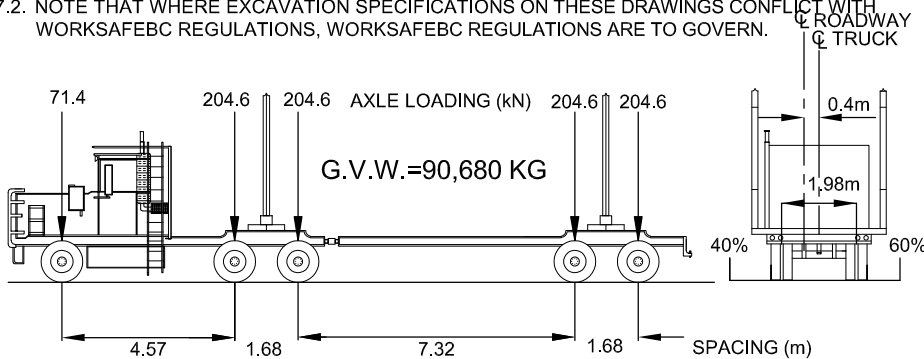
- 5.1. FOUNDATION DESIGN REFERENCES THE CANADIAN FOUNDATION ENGINEERING MANUAL. SUBSURFACE INFORMATION HAS BEEN INFERRED FROM SITE OBSERVATIONS OF SOIL AND BEDROCK EXPOSURES IN ROAD CUTS AND ALONG THE LAKE BANKS (SEE DESCRIPTION ON SHEET 4). NO DETAILED SUBSURFACE FIELD INVESTIGATION WAS CONDUCTED (LARGE TEST PITS OR BORE HOLES). FIELD CONDITIONS MAY VARY FROM THOSE INFERRED. IF, UPON EXCAVATION, FIELD CONDITIONS VARY FROM THOSE INFERRED, THEN CHANGES TO THE FOUNDATION DESIGN OR INSTALLATION MAY BE REQUIRED. POTENTIAL ISSUES MAY INCLUDE WOODY DEBRIS OR UNSUITABLE MATERIAL IN THE EXCAVATION OR BEDROCK.

6. FIELD REVIEWS:

- 6.1. A PROFESSIONAL ENGINEER OR THEIR DESIGNATE IS REQUIRED TO INSPECT THE FOLLOWING ACTIVITIES PRIOR TO PROVIDING RECORD DRAWINGS AND A CROSSING ASSURANCE STATEMENT:
- LAYOUT OF LOG CRIB LOCATION PRIOR TO INITIAL EXCAVATION
 - FOUNDATION SOILS FOLLOWING EXCAVATION
 - RIPRAP PLACEMENT AND LOG BEDDING / CRIB CONSTRUCTION
 - BACKFILL MATERIAL AND COMPACTION TECHNIQUE
 - OTHER SITE INSPECTIONS AT THE DISCRETION OF THE PROFESSIONAL

7. INSTALLATION NOTES:

- 7.1. RIPRAP SOURCE HAS BEEN IDENTIFIED, WITHIN 5km OF THE SITE.
7.2. NOTE THAT WHERE EXCAVATION SPECIFICATIONS ON THESE DRAWINGS CONFLICT WITH WORKSAFEBC REGULATIONS, WORKSAFEBC REGULATIONS ARE TO GOVERN.



BCFS L-100 OFF HIGHWAY LOADING DIAGRAM
SCALE 1:200



ENVIRONMENTAL NOTES:

1. WORK TO PROCEED IN ACCORDANCE WITH DFO AND BCMOE CONDITIONS NOTED AT THE WEB SITE: <http://www.dfo-mpo.gc.ca/pnw-ppe/measures-mesures/index-eng.html>. THE BCMOE REGIONAL TERMS AND REGIONAL PERIODS OF LEAST RISK TO RESIDENT FISH SPECIES AND FISH REMOVAL/RELOCATION FOR IN-LAKE WORK ALSO APPLY IF THE LAKE HAS FISH PRESENT.
2. ALTERATION BELOW THE HIGH WATER LINE (EXPECTED) SHOULD BE SUPERVISED BY AN ENVIRONMENTAL MONITOR.
3. A SEDIMENT MANAGEMENT PLAN WITH SPECIFIC MITIGATION MEASURES TO MINIMIZE SILTATION MUST BE ON SITE. THE PLAN MUST BE PREPARED AND APPROVED BY THE LICENSEE / PERMITEE PRIOR TO UNDERTAKING ANY CONSTRUCTION WORKS AT THE SITE.
4. MACHINERY IS TO BE CLEAN AND LEAK FREE WHILE ON SITE. PETROLEUM PRODUCTS MUST BE CAREFULLY MONITORED WITH NO FUELING WITHIN THE RIPARIAN MANAGEMENT AREA.
5. REFER TO "AQUATIC ENVIRONMENTAL ASSESSMENT FOR THE NORTH HARRISON LAKE LOG HANDLING FACILITY RE-ACTIVATION" PREPARED BY GRAHAM/WALL CONSULTING LTD.
6. DIRECT SURFACE WATER AWAY FROM WORK SITE DURING CONSTRUCTION. ENSURE DITCH WATER AND SURFACE RUNOFF FROM THE ROAD DOES NOT FLOW DIRECTLY INTO THE LAKE.
7. LICENSEES WILL BE REQUIRED TO HAVE A FUEL STORAGE PLAN WHICH MUST MEET ALL LEGAL AND BCTS EMS REQUIREMENTS.

PARTIAL MATERIALS LIST

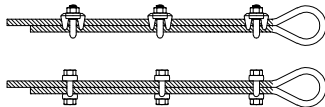
QTY	ITEM DESCRIPTION
5	SKID WAY LOGS: 0.8m Ø X 30m LENGTH
2	NEEDLE BEAM LOGS: 0.6m Ø X 8m LENGTH
26	LINEAL METRES OF 0.6m Ø BROW LOGS
3	FACE LOGS: 0.8m Ø X 10m LENGTH
2	SILL LOGS: 0.8m Ø X 10m LENGTH
2	TRANSFER BUNK FOUNDATION LOGS: 0.8m Ø X 6.8m LENGTH
2	DEBRIS RETAINING LOGS: 0.8m Ø X 3m LENGTH
12	TIE-BACK LOGS (8 FOR SKIDWAY CRIB, 4 FOR TRANSFER BUNK FOUNDATION): 0.5m Ø X 5m LENGTH
1	DEADMAN LOG: 0.5m Ø X 8m LENGTH
30	STEEL PINS (FOR CRIB LOG CONNECTIONS): 19mmØ (3/4") X 0.7m LENGTH
2	STEEL PINS (FOR DEBRIS RETAINING LOG CONNECTIONS): 19mmØ (3/4") X 1.2m LENGTH
150m	STEEL CABLE: MIN. 5/8" Ø FOR LASHING AND ANCHOR C/W STAPLES
100	G-450 CROSBY CLAMPS FOR 5/8" CABLE ANCHOR LINES (SEE THIS SHEET FOR INSTALLATION DETAILS)
1	0.8m Ø X 7m LONG FACE LOG FOR BARGE GRID
2	0.5m Ø X 5m LONG HEMLOCK TIEBACKS FOR BARGE GRID
1	ROLL MIRAFI 180N NON-WOVEN GEOTEXTILE OR APPROVED EQUIVALENT
18	STANDARD CONCRETE LOCK BLOCK (FLAT TOP OR INTERLOCKING)

U-BOLT CLIP INSTALLATION PROCEDURES

WIRE ROPE CLIPS

BASIC REQUIREMENTS FOR PROPER TERMINATION:

- SELECT PROPER SIZE CLIPS AND TURN BACK.
- PLACE CLIPS ON IN PROPER SEQUENCE.
- TORQUE ALL CLIPS EVENLY WITH A TORQUE WRENCH.
- APPLY FIRST LOAD AND RE-TORQUE WITH A TORQUE WRENCH.



TURN BACK IS MEASURED FROM THE END OF THE ROPE TO THE BASE OF THE EYE OR TO THE THIMBLE. THIS PART OF THE ROPE IS OFTEN REFERRED TO AS THE DEAD END. SINCE THE U-BOLT CLIP HAS A SINGLE SADDLE, WORKERS MUST NOT SADDLE THE DEAD HORSE.

THE TABLE BELOW DEFINES THE INFORMATION REQUIRED FOR EACH WIRE ROPE CLIP TO ACHIEVE MAXIMUM EFFICIENCY.

TABLE 1

CLIP SIZE (INCHES)	ROPE SIZE (INCHES)	MIN. NO. OF CLIPS	AMOUNT OF ROPE TO TURN BACK (INCHES)	*TORQUE (Ft. Lbs.)
1/2	1/2	3	11 1/2	65
5/8	5/8	3	12	95
3/4	3/4	4	18	130
7/8	7/8	4	19	225
1	1	5	26	225

IF A GREATER NUMBER OF CLIPS ARE USED THAN SHOWN IN THE TABLE, THE AMOUNT OF TURNBACK SHOULD BE INCREASED PROPORTIONATELY.

*THE TIGHTENING TORQUE VALUES SHOWN ARE BASED UPON THE THREADS BEING CLEAN, DRY AND FREE OF LUBRICATION.

1. REFER TO TABLE 1 IN FOLLOWING THESE INSTRUCTIONS. TURN BACK SPECIFIED AMOUNT OF ROPE FROM THIMBLE TO LOOP. APPLY FIRST CLIP ONE BASE WIDTH FROM DEAD END OF ROPE. APPLY U-BOLT OVER DEAD END OF WIRE ROPE - LIVE END RESTS IN SADDLE (NEVER SADDLE A DEAD HORSE!). USE TORQUE WRENCH TO TIGHTEN EVENLY, ALTERNATE FROM ONE NUT TO THE OTHER UNTIL REACHING THE RECOMMENDED TORQUE.
2. WHEN TWO CLIPS ARE REQUIRED, APPLY THE SECOND CLIP AS NEAR THE LOOP OR THIMBLE AS POSSIBLE. USE TORQUE WRENCH TO TIGHTEN EVENLY, ALTERNATING UNTIL REACHING THE RECOMMENDED TORQUE. WHEN MORE THAN TWO CLIPS ARE REQUIRED, APPLY THE SECOND CLIP AS NEAR THE LOOP OR THIMBLE AS POSSIBLE, TURN NUTS ON SECOND CLIP FIRMLY, BUT DO NOT TIGHTEN. PROCEED TO STEP 3.
3. WHEN THREE OR MORE CLIPS ARE REQUIRED, SPACE ADDITIONAL CLIPS EQUALLY BETWEEN FIRST TWO - TAKE UP ROPE SLACK - USE TORQUE WRENCH TO TIGHTEN NUTS ON EACH U-BOLT EVENLY, ALTERNATING FROM ONE NUT TO THE OTHER UNTIL REACHING RECOMMENDED TORQUE.



FIGURE 1



FIGURE 2



FIGURE 3

DWG No: 1132-4-HN999LOGDUMP-002

SHEET: 2 OF 7

PREPARED FOR:



PREPARED BY:

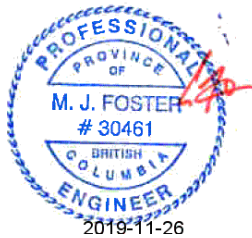
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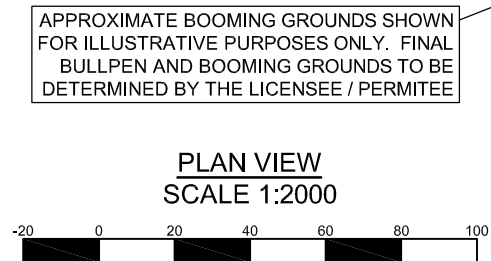
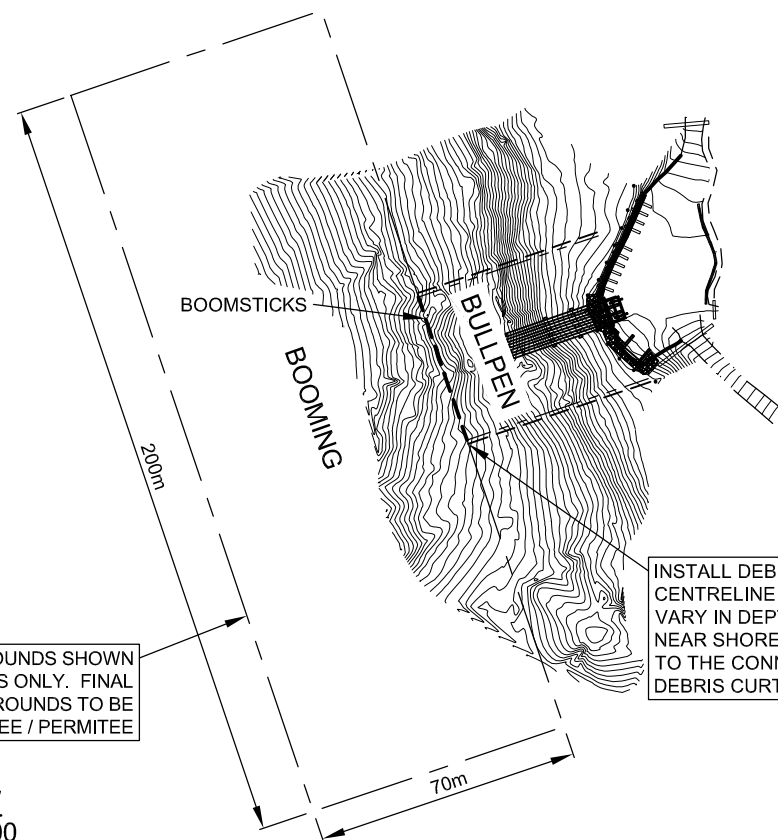
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DESIGN BY: MICHAEL FOSTER, P.ENG.
DESIGN DATE: AUGUST 13, 2019
REVIEWED BY: JEREMY ARAKI, P.ENG.
DRAWN BY: ANDREW BRABANDT, AS&T
SITE SURVEY BY: ONSITE ENGINEERING LTD.
SITE SURVEY DATE: APRIL 25, 2019
FILE NAME: HN999LOGDUMP.DWG
SCALE: AS NOTED
REVISION NUMBER: 3
REVISION DATE: NOVEMBER 25, 2019
ALL MEASUREMENTS IN m UNLESS OTHERWISE NOTED.

PROPOSED TEMPORARY LOG DUMP ON HARRISON LAKE (NORTH)
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SEAL OF B.C. P.ENG.





INSTALL DEBRIS CURTAIN 20m EACH SIDE OF SKIDWAY CENTRELINE AROUND THE BULLPEN. THE DEBRIS CURTAINS VARY IN DEPTH, WITH THE SHORTEST (2m DEEP) IN THE NEAR SHORE AREA AND THE DEEPEST (4m DEEP) ATTACHED TO THE CONNECTION WITH THE BOOMING GROUNDS. DEBRIS CURTAINS TO EXTEND 50m FROM SHORELINE.



CAUTION:
DRAWING SCALE MAY BE
DISTORTED WITH PRINTING.

INTENDED TO BE PRINTED
ON 11"X17" PAPER.

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PROPOSED TEMPORARY LOG DUMP ON HARRISON LAKE (NORTH)
SITE: HN 999
(49° 43' 55" N , 122° 05' 08" W)

DWG No: 1132-4-HN999LOGDUMP-003

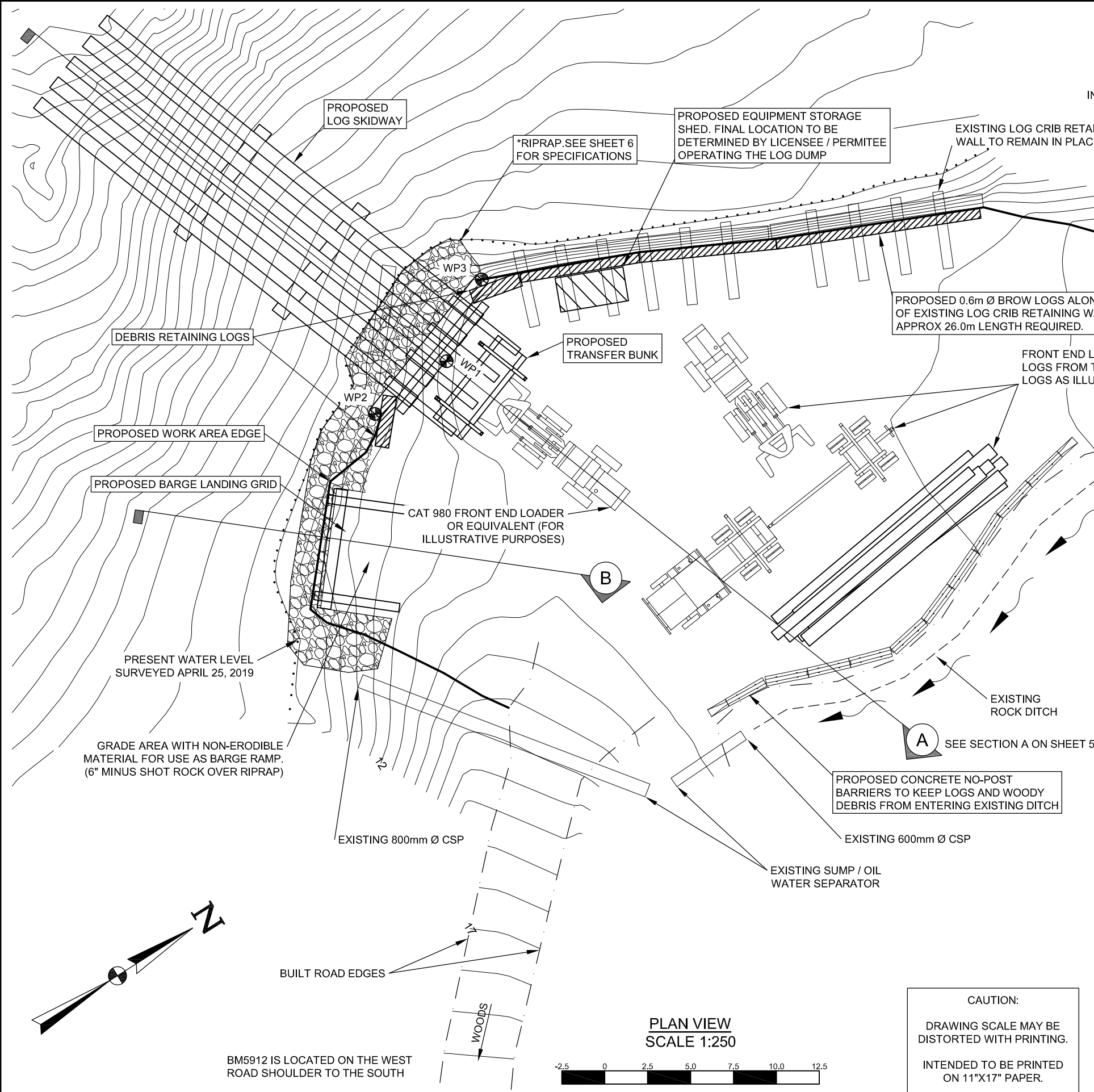
SHEET: 3 OF 7

DESIGN BY: MICHAEL FOSTER, P.ENG.
DESIGN DATE: AUGUST 13, 2019
REVIEWED BY: JEREMY ARAKI, P.ENG.
DRAWN BY: ANDREW BRABANDT, ASCT
SITE SURVEY BY: ONSITE ENGINEERING LTD.
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SEAL OF B.C. P.ENG.



BOOMING GROUNDS — — — — —
BOOMSTICKS — — — — —
DEBRIS CURTAIN — — — — —



WP	N	E	ELEV
WP1	5509231.92	565897.22	12.33
WP2	5509226.75	565897.57	11.78
WP3	5509236.20	565894.30	11.78
BM6556	5509271.37	565910.11	22.65
BM5912	5509202.28	565934.14	31.47

COORDINATES ARE DERIVED FROM UTM ZONE 10, NAD83. ELEVATIONS ARE DERIVED FROM THE CGVD28 VERTICAL DATUM

WORKPOINT 1 LOCATED AT THE UNDERSIDE OF THE CENTER SKIDWAY LOG (TOP END). WORKPOINTS 2 & 3 LOCATED AT THE TOPSIDE CENTER OF THE TOP CRIB FACE LOG

WOOD WASTE LANDFILL AND LOCATION TO BE DETERMINED BY LICENSEE / PERMITEE.

FUEL STORAGE IS AT STAGING LOCATION.

PREPARED FOR:



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SITE: HN 999
(49° 43' 55" N , 122° 05' 08" W)

DWG No: 1132-4-HN999LOGDUMP-004

SHEET: 4 OF 7

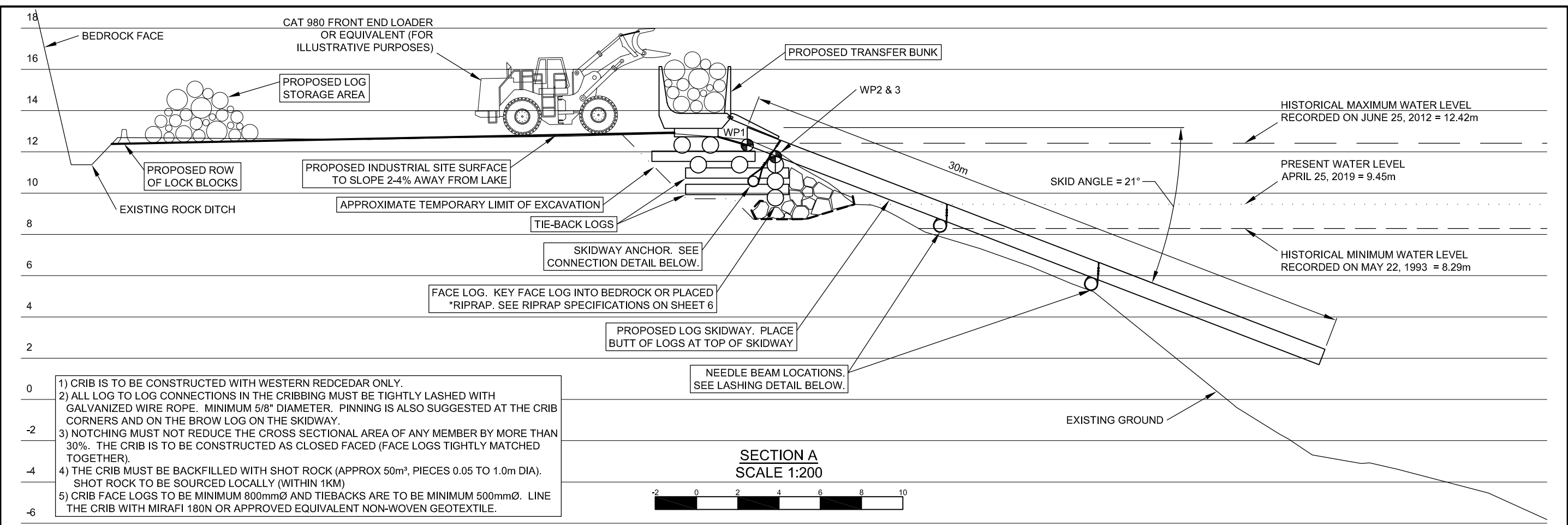
DESIGN BY: MICHAEL FOSTER, P.ENG.
DESIGN DATE: AUGUST 13, 2019
REVIEWED BY: JEREMY ARAKI, P.ENG.
DRAWN BY: ANDREW BRABANDT, ASCT
SITE SURVEY BY: ONSITE ENGINEERING LTD.
SITE SURVEY DATE: APRIL 25, 2019
FILE NAME: HN999LOGDUMP.DWG
SCALE: AS NOTED
REVISION NUMBER: 3
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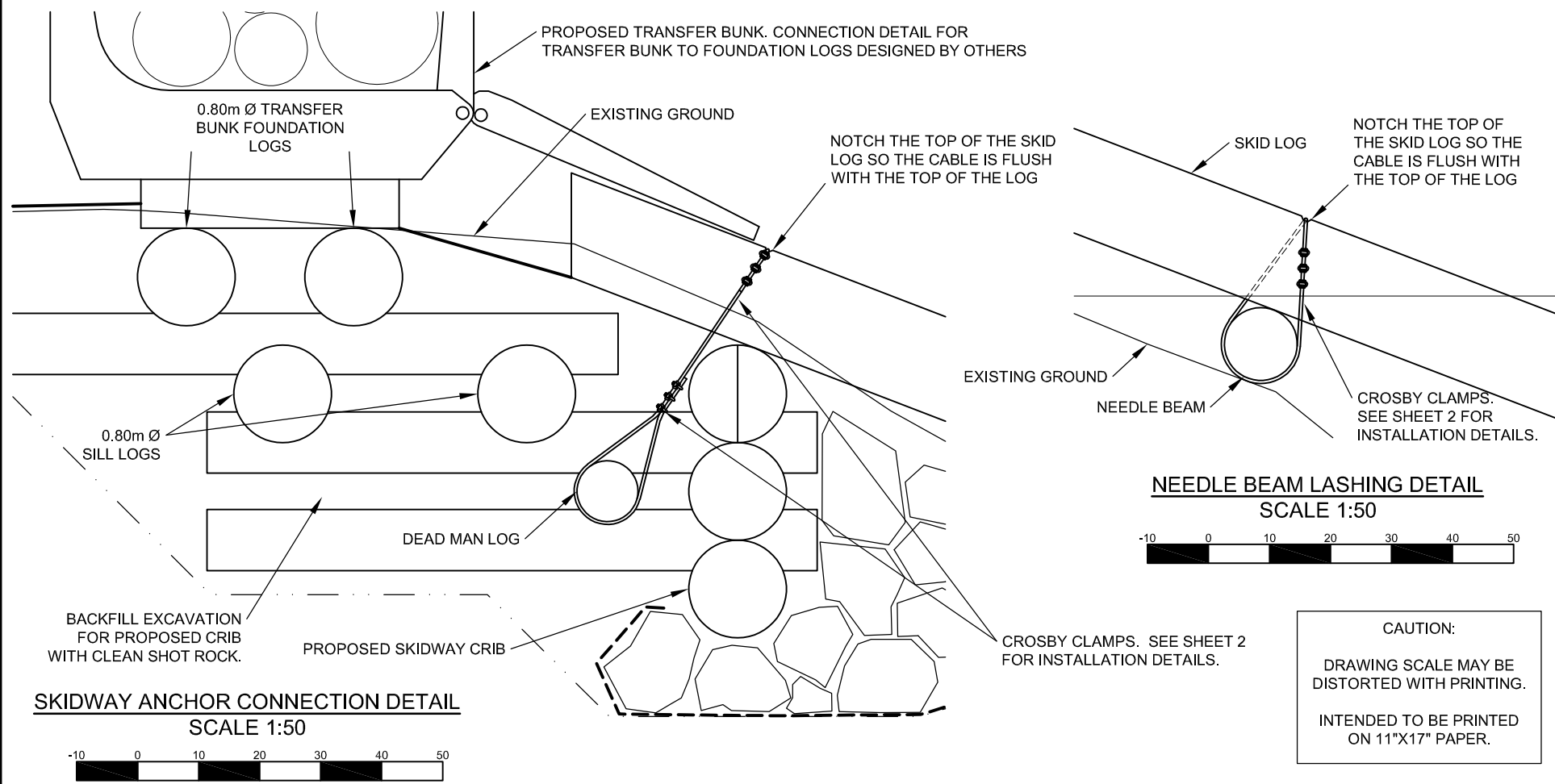
DESIGNED ROAD EDGES —————
EXISTING DITCH LINE - - - - -
EXISTING ROAD EDGES - . - . -
PRESENT WATER LEVEL

WORKPOINT WP1
BENCH MARK BM1
DITCH FLOW

CAUTION:
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- 1) CRIB IS TO BE CONSTRUCTED WITH WESTERN REDCEDAR ONLY.
- 2) ALL LOG TO LOG CONNECTIONS IN THE CRIBBING MUST BE TIGHTLY LASHED WITH GALVANIZED WIRE ROPE. MINIMUM 5/8" DIAMETER. PINNING IS ALSO SUGGESTED AT THE CRIB CORNERS AND ON THE BROW LOG ON THE SKIDWAY.
- 3) NOTCHING MUST NOT REDUCE THE CROSS SECTIONAL AREA OF ANY MEMBER BY MORE THAN 30%. THE CRIB IS TO BE CONSTRUCTED AS CLOSED FACED (FACE LOGS TIGHTLY MATCHED TOGETHER).
- 4) THE CRIB MUST BE BACKFILLED WITH SHOT ROCK (APPROX 50m³, PIECES 0.05 TO 1.0m DIA). SHOT ROCK TO BE SOURCED LOCALLY (WITHIN 1KM)
- 5) CRIB FACE LOGS TO BE MINIMUM 800mmØ AND TIEBACKS ARE TO BE MINIMUM 500mmØ. LINE THE CRIB WITH MIRAFI 180N OR APPROVED EQUIVALENT NON-WOVEN GEOTEXTILE.



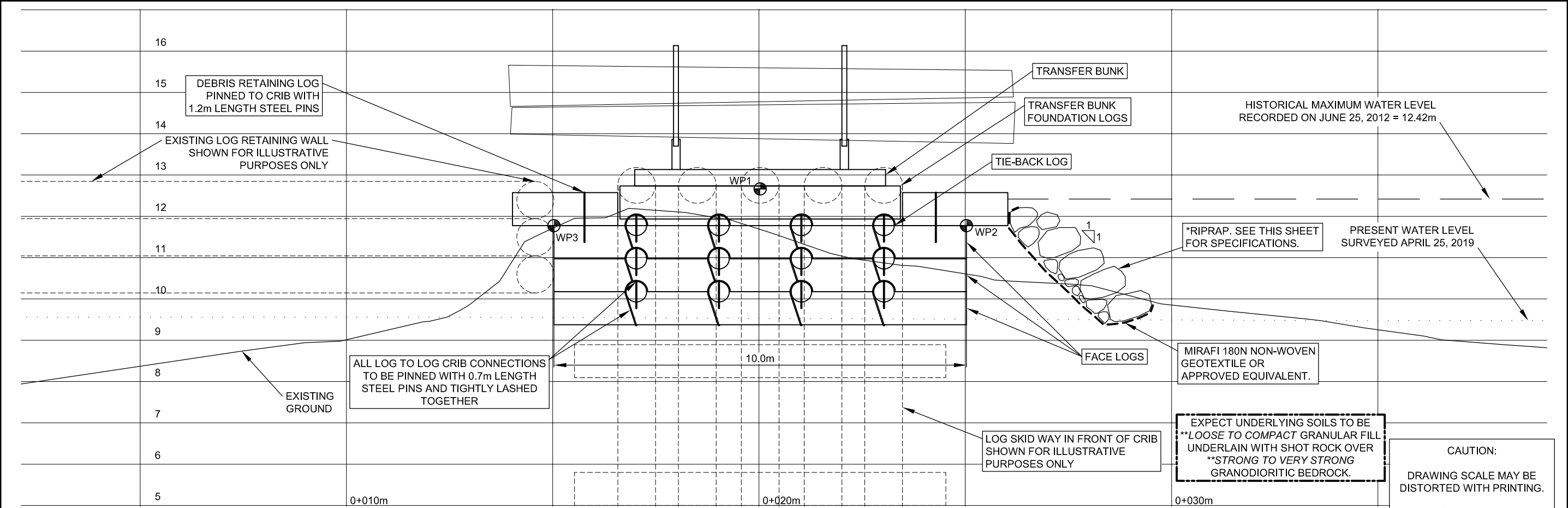
NEEDLE BEAM LASHING DETAIL
SCALE 1:50



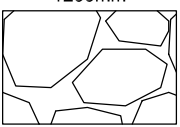
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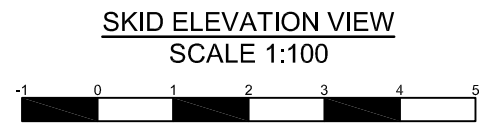
<p>PREPARED FOR:</p> 		<p>PREPARED BY:</p> <p>ONSITE ENGINEERING LTD.</p> <p>NORTH VANCOUVER 2 - 252 1ST ST E NORTH VANCOUVER, BC, V7L 1B3 PH.: 778-628-4968 FAX: 866-235-6943</p>	
<p>PROPOSED TEMPORARY LOG DUMP ON HARRISON LAKE (NORTH) SITE: HN 999 (49° 43' 55" N , 122° 05' 08" W)</p>			
<p>DWG No: 1132-4-HN999LOGDUMP-005</p>		<p>SHEET: 5 OF 7</p>	
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<p>APPROXIMATE LIMIT OF EXCAVATION</p> <p>PRESENT WATER</p> <p>MAX WATER LEVEL</p> <p>MIN. WATER LEVEL</p>			



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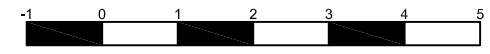
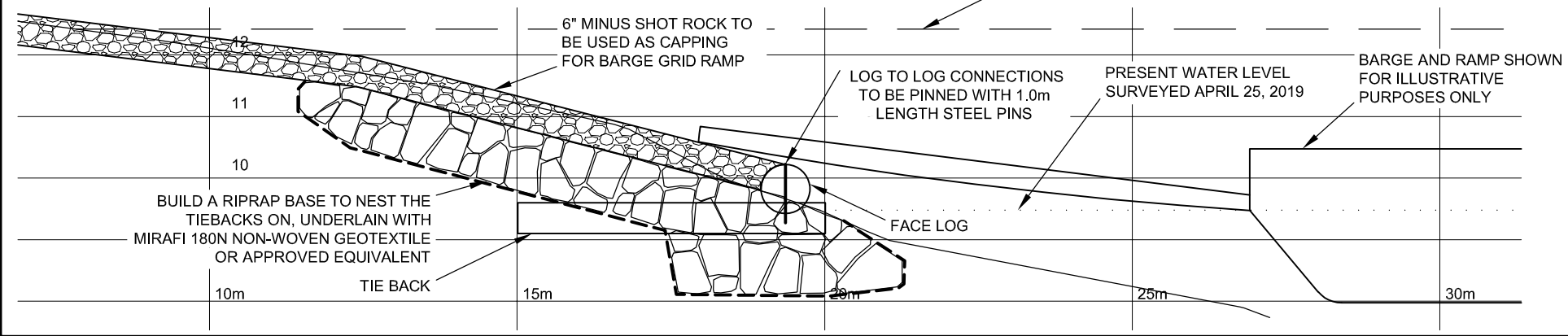
***RIPRAP: CLEAN ANGULAR ROCK**
CLASS 500kg RIPRAP
ROCK GRADATION
PERCENT SMALLER THAN GIVEN
ROCK MASS kg(mm)
15% 50(330)
50% 500(715)
85% 1500(1030)
NOMINAL THICKNESS OF RIPRAP
1200mm

ALL ROCK TO BE PLACED TO
MAXIMIZE INTERLOCKING
BETWEEN PIECES. ALL ROCK
TO BE UNDERLAIN WITH MIRAFI
180N OR APPROVED EQUIVALENT
NON-WOVEN GEOTEXTILE.
APPROXIMATELY 185m³ OF
RIPRAP REQUIRED.

**ROCK STRENGTH	
EXTREMELY WEAK	INDENTED BY THUMBNAIL
VERY WEAK	CRUMBLES UNDER FIRM BLOW OF HAMMER; CAN BE PEELED WITH A POCKET KNIFE
WEAK	CAN BE PEELED BY POCKET KNIFE (DIFFICULT); SHALLOW INDENTS FROM FIRM BLOW OF HAMMER POINT
MEDIUM STRONG	CANNOT BE SCRAPPED OR PEELED WITH KNIFE; FRACTURES WITH SINGLE BLOW OF HAMMER
STRONG	REQUIRES MORE THAN ONE BLOW OF HAMMER TO FRACTURE
VERY STRONG	REQUIRES MANY BLOWS OF HAMMER TO FRACTURE
EXTREMELY STRONG	CAN ONLY BE CHIPPED BY HAMMER



**SOIL DENSITY	
VERY LOOSE	EASILY EXCAVATED WITH A SPADE
LOOSE	SOME RESISTANCE TO SPADE
COMPACT	CONSIDERABLE RESISTANCE TO SPADE
DENSE	REQUIRES PICK FOR EXCAVATION
VERY DENSE	HIGH RESISTANCE TO PICK

SECTION B
SCALE 1:100



PREPARED FOR:



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PROPOSED TEMPORARY LOG DUMP ON HARRISON LAKE (NORTH)
SITE: HN 999
(49° 43' 55" N , 122° 05' 08" W)

DWG No: 1132-4-HN999LOGDUMP-006

DESIGN BY: MICHAEL FOSTER, P.ENG.
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SHEET: 6 OF 7



EXISTING GROUND _____
PRESENT WATER _____



PHOTO #1 - VIEW FROM WOODS APPROACH TOWARDS PROPOSED SKIDWAY



PHOTO #2 -VIEW OF EXISTING OIL SEPARATION CULVERTS



PHOTO #3 - VIEW FROM WORK AREA TOWARDS WOODS APPROACH



PHOTO #4 - VIEW FROM WORK AREA TOWARDS CAMP APPROACH

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PREPARED BY:

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DWG No: 1132-4-HN999LOGDUMP-007

SHEET: 7 OF 7

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