

GENERAL NOTES:

1.0 CIVIL NOTES:

- 1.1) REFER TO THE SPECIFICATION FOR DETAILED REQUIREMENT, IN CASE OF CONFLICT THE MOST STRINGENT REQUIREMENT AND/OR THE NOTES ON EACH INDIVIDUAL DRAWING TAKE PRECEDENCE OVER THE GENERAL NOTES.
- 1.2) OBSERVE AND ENFORCE ALL CONSTRUCTION SAFETY MEASURES REQUIRED BY THE OWNER, WORKSAFEBC AND NATIONAL BUILDING CODE.
- 1.3) ALL DIMENSIONS IN MILLIMETERS UNLESS OTHERWISE SPECIFIED. ALL ELEVATIONS ARE GEODETIC METRIC.
- 1.4) OIL WATER SEPARATOR SHALL BE AE CONCRETE PRECAST MODEL 385 OIL INTERCEPTOR (CPS) (WITH COALESCING PLATES) COMPLETE WITH T-PIPE ASSEMBLIES.
- 1.5) OIL STOP VALVE SHALL BE ENQUIP FLO STOP VALVE, OR APPROVED EQUIVALENT SPECIFIC GRAVITY OF OIL IS 0.87.
- 1.6) OIL WATER SEPARATOR SHALL BE DESIGNED TO WITHSTAND
 - A. LATERAL SOIL PRESSURE
 - B. H-20 TRAFFIC LOAD RATED
- 1.7) THE MANUFACTURER SHALL PREPARE FABRICATION DRAWINGS UNDER THE DIRECTION OF AND SEALED BY A PROFESSIONAL ENGINEER OF BC FOR ACCEPTANCE OF THE ENGINEER.
- 1.8) CONCRETE FOR OIL/WATER SEPARATOR SHALL HAVE XTPX ADMIX C-1000 ADDED TO THE CONCRETE MIX FOR WATER PROOFING PURPOSES, ALL IN ACCORDANCE WITH THE MANUFACTURER'S RECOMMENDATIONS.
- 1.9) EXCAVATE TO SOUND SUBGRADE, TO BE VERIFIED BY OWNER'S SITE REPRESENTATIVE. FILL TO BOTTOM OF FOOTING WITH COMPACTED GRANULAR 'B' FILL.
- 1.10) ALL CONSTRUCTION JOINTS OF OIL CONTAINMENT PIT SHALL BE PROVIDED WITH WATERSTOPS.
- 1.11) CRUSHED DRAIN ROCK FOR OIL CONTAINMENT PIT SHALL CONSIST OF PREWASHED CLEAN CRUSHED ROCK, 100 PERCENT FRACTURED ON AT LEAST TWO FACES, EVENLY GRADED FROM 19 TO 38mm AND FREE FROM SAND, SILT, CLAY AND ORGANIC MATTERS. POROSITY TO BE 35% MINIMUM.
- 1.12) JOINT SEALANT SHALL BE SIKAFLEX 1A. APPLICATION SHALL BE AS PER MANUFACTURER'S INSTRUCTIONS.
- 1.13) EXCAVATE WITH CARE ADJACENT TO EXISTING FOOTINGS, CONCRETE TRENCHES, DUCT BANKS, STEEL STRUCTURES, UNDERGROUND CABLES AND GROUNDING CABLES AND RODS. DO NOT UNDERMINE THE EXISTING FOOTINGS. PROVIDE TEMPORARY SUPPORT IF NECESSARY. MAKE SURE FOOTINGS ARE SITTING ON UNDISTURBED SOIL OR COMPACTED FILL.
- 1.14) CONTRACTOR TO FIELD VERIFY DIMENSIONS AND ELEVATIONS OF EXISTING ITEMS AND REPORT ANY DISCREPANCIES TO OWNER'S SITE REPRESENTATIVES PRIOR TO ANY NEW DETAILING OR FABRICATION.
- 1.15) DIMENSIONS SHOWN (REF.) WERE OBTAINED FROM OTHER DRAWING SOURCES AND ARE FOR REFERENCE PURPOSES ONLY AND DO NOT CONTROL CONSTRUCTION.
- 1.16) DESIGN DATA:
 - MAXIMUM 60 MINUTE RAIN (1/10) = 25mm
 - ESTIMATED FROST DEPTH = 600mm

2.0 CONCRETE NOTES:

- 2.1) CONCRETE DESIGN CONFORMS TO CSA A23.3-04. PLAN AND REINFORCED CONCRETE SHALL CONFORM TO THE REQUIREMENTS OF CAN/CSA A23.1 CONCRETE MATERIALS AND METHODS OF CONCRETE CONSTRUCTION AND CAN/CSA A23.2 METHODS OF TEST AND STANDARD PRACTICES FOR CONCRETE. THE MIX SHALL BE DESIGNED IN ACCORDANCE WITH CSA A23.1-M AND THE FOLLOWING REQUIREMENTS:

LOCATION	28 DAYS MINIMUM COMPRESSIVE STRENGTH, f _{c'} (MPa)	CEMENT TYPE	MAXIMUM AGGREGATE SIZE (mm)	MAXIMUM WATER/CEMENT RATIO (BY WEIGHT)	AIR CONTENT BY VOLUME (%)	MAXIMUM SLUMP (mm)	EXPOSURE CONDITION	CURING TYPE
ALL	30	10	20	0.500	5-8	80	F-2	BASIC

- 2.2) REFER TO CSA A23.1 FOR CURING REQUIREMENTS. CEMENT SHALL BE NORMAL (TYPE 1 0) PORTLAND CEMENT OR GENERAL USE (TYPE GU) HYDRAULIC CEMENT. AT TIMES, FOR EXPEDIENCY AND WITH THE ACCEPTANCE OF CLIENT'S REPRESENTATIVE, THE CONTRACTOR MAY USE HIGH EARLY (TYPE 30) PORTLAND CEMENT OR HIGH EARLY STRENGTH (TYPE HE) HYDRAULIC CEMENT AT NO ADDITIONAL COST TO THE CLIENT. CALCIUM CHLORIDE ADMIXTURE SHALL NOT BE USED. ALL CONCRETE SHALL BE NORMAL DENSITY CONCRETE WITH AN AIR-DRY DENSITY OF 2400kg/m.
- 2.3) CONCRETE COVER TO REINFORCEMENT SHALL BE AS FOLLOWS UNLESS NOTED OTHERWISE: 75mm WHERE CONCRETE IS PLACED DIRECTLY AGAINST EARTH. 50mm FOR OTHER LOCATIONS.
- 2.4) CONCRETE EDGES EXPOSED TO VIEW SHALL BE CHAMFERED 20mm AND VERTICALLY TO A POINT 150mm BELOW GRADE UNLESS NOTED OTHERWISE.
- 2.5) STEEL REINFORCEMENT SHALL BE MINIMUM GRADE 400 MPa DEFORMED BARS CONFORMING TO CSA G30. 18- D9.
- 2.6) UNLESS NOTED OTHERWISE, LAP SPLICES OF REINFORCING BARS SHALL NOT BE LESS THAN THE FOLLOWING:
 - 10M - 510mm.
 - 15M - 730mm,
 - 20M - 890mm,
 - 25M - 1440mm.
- 2.7) FIELD OPERATIONS SHALL MAKE SPECIAL NOTE OF THE HAZARDS ASSOCIATED WITH SILICA DUST CREATED BY DRILLING AND CUTTING CONCRETE. PRIOR TO DRILLING ANCHORS A HAZARD ASSESSMENT SHALL BE CONDUCTED AND ADEQUATE CONTROLS PUT IN PLACE TO APPROPRIATELY ADDRESS THE HAZARD OF EXPOSURE TO SILICA DUST. REFER TO WORKSAFE BC OCCUPATIONAL HEALTH AND SAFETY REGULATIONS FOR MORE INFORMATION.
- 2.8) TO BOND FRESH CONCRETE TO EXISTING CONCRETE: BONDING AGENT SHALL BE SIKADUR 32 HI-MOD OR APPROVED EQUIVALENT. PRIOR TO APPLYING SIKADUR 32 HI-MOD, EXISTING CONCRETE SURFACES MUST BE CLEAN AND SOUND. IT MAY BE DRY OR DAMP BUT FREE OF STANDING WATER, REMOVE DUST, LAITANCE, GREASE, CURING COMPOUNDS, IMPREGNATES, WAXES, FOREIGN PARTICLES AND DISINTEGRATED MATERIALS. APPLY SIKADUR 32 HI-MOD BY SPRAY. PLACE FRESH CONCRETE WHILE SIKADUR 32 HI-MOD IS STILL TACKY. IF COATING BECOMES GLOSSY AND LOSSES TACKINESS, REMOVE ANY SURFACE CONTAMINATES, THEN COAT WITH ADDITIONAL SIKADUR 32 HI-MOD AND PROCEED.

3.0 FILL, BACKFILL AND SURFACING MATERIAL FILL:

- 3.1) BACKFILL AND SURFACING MATERIALS SHALL MEET THE FOLLOWING GRADATIONS. SEE CONTRACT SPECIFICATIONS FOR MATERIAL TESTING, PREPARATION, PLACEMENT, MOISTURE CONTENT, COMPACTION AND OTHER REQUIREMENTS AND DETAILS.

GRANULAR 'A' FILL		
ASTM SIEVE	ISO METRIC SIEVE (mm)	PERCENT BY WEIGHT PASSING
6"	150	100
3"	75	80 - 100
1.5"	37.50	65 - 100
3/4"	19	35 - 100
3/8"	9.50	25 - 85
#4	4.75	15 - 75
#50	0.30	3 - 37
#200	0.075	0 - 10

GRANULAR 'B' FILL		
ASTM SIEVE	ISO METRIC SIEVE (mm)	PERCENT BY WEIGHT PASSING
3"	75	100
1.5"	37.50	60 - 100
3/4"	19	35 - 100
3/8"	9.50	25 - 80
#4	4.75	15 - 60
#50	0.297	3 - 10
#200	0.075	0 - 5

ROAD MULCH		
ASTM SIEVE	ISO METRIC SIEVE (mm)	PERCENT BY WEIGHT PASSING
3/4"	19	100
3/8"	9.5	60 - 100
#4	4.75	40 - 75
#10	2.0	25 - 55
#40	0.425	10 - 30
#200	0.075	2 - 10

BEDDING SAND FOR DIRECT BURIED LOW VOLTAGE CABLES		
ASTM SIEVE	ISO METRIC SIEVE (mm)	PERCENT BY WEIGHT PASSING
#20	0.85	100
#40	0.425	45 - 90
#60	0.25	10 - 60
#200	0.075	0 - 12

GRANULAR PIPE BEDDING		
ASTM SIEVE	ISO METRIC SIEVE (mm)	PERCENT BY WEIGHT PASSING
1"	25	100
3/4"	19	90-10
1/2"	12.5	65-85
3/8"	9.5	50-75
#4	4.75	25-50
#8	2.36	10-35
#16	1.18	6-26
#30	0.60	3-17
#200	0.075	0-5

DRAIN ROCK TO SURROUND PERFORATED DRAIN PIPE		
ASTM SIEVE	ISO METRIC SIEVE (mm)	PERCENT BY WEIGHT PASSING
1.5"	38	100
3/4"	19	50 - 100
3/8"	9.5	0 - 50
#4	4.75	0 - 5

BEDDING SAND FOR PIPES AND DUCTS		
ASTM SIEVE	ISO METRIC SIEVE (mm)	PERCENT BY WEIGHT PASSING
3/8"	9.75	100
#4	4.75	95 - 100
#10	2.0	75 - 100
#20	0.85	35 - 75
#40	0.425	15 - 45
#60	0.250	8 - 25
#200	0.075	0 - 10

25mm MINUS WELL GRADED BASE		
ASTM SIEVE	ISO METRIC SIEVE (mm)	PERCENT BY WEIGHT PASSING
1"	25	100
3/4"	19	80 - 100
3/8"	9.5	50 - 100
#4	4.75	35 - 70
#8	2.38	25 - 50
#16	1.18	15 - 35
#50	0.30	5 - 20
#200	0.075	0 - 5

CRUSHED SCREENINGS FOR DIRECT BURIED HIGH VOLTAGE CABLES		
ASTM SIEVE	ISO METRIC SIEVE (mm)	PERCENT BY WEIGHT PASSING
3/8"	9.5	100
#4	4.75	82 - 100
#10	2.00	49 - 71
#20	0.85	28 - 49
#40	0.425	18 - 34
#100	0.15	8 - 19
#200	0.075	5 - 15

STONE PIPE BEDDING		
ASTM SIEVE	ISO METRIC SIEVE (mm)	PERCENT BY WEIGHT PASSING
1"	25	100
3/4"	19	100
2/3"	16	65-90
3/8"	9.5	20-55
#4	4.75	0-10

- 3.2) STONE BEDDING SHALL BE CLEAN, SOUND, WELL-GRADED, QUARRIED AND CRUSHED DURABLE, SOUND INERT MATERIAL, AGGREGATED GRAVEL FREE FROM LIMESTONE, CRUSHED CONCRETE OF ASPHALT, LUMPS, AND ORGANIC MATERIALS.
- 3.3) STONE BEDDING SHALL BE USED ONLY WHERE SPECIFIED ON STANDARD DETAIL DRAWINGS OF CONTRACT DRAWINGS. USE OF STONE BEDDING OTHER THAN SPECIFIED REQUIRES THE APPROVAL OF OWNER'S REPRESENTATIVE AFTER EXAMINATION OF SOILS AGAINST WHICH STONE BEDDING WILL BE PLACED.

4.0 FOUNDATION:

- 4.1) NEW FOUNDATIONS HAVE BEEN DESIGNED FOR THE SOIL BEARING CAPACITY INDICATED IN THE GEOTECHNICAL REPORT SUBMITTED BY McELHANNY CONSULTING SERVICES LTD., MATTHEW REN, P.ENG. DATED APRIL 30, 2014.
- 4.2) GEOTECHNICAL REPORT SHALL BE CONSULTED FOR FURTHER INFORMATION RELATED TO THE SOIL CONDITIONS.
- 4.3) BEARING SURFACES MUST BE APPROVED BY THE GEOTECHNICAL ENGINEER BEFORE PROCEEDING WORK.
- 4.4) FOUNDATION DESIGN BEARING CAPACITY: 90 kPa ALLOWABLE BEARING PRESSURE
- 4.5) REFER TO GEOTECHNICAL REPORT FOR FOUNDATION SUB-GRADE PREPARATION REQUIREMENT INCLUDING OVER-EXCAVATION AND STRUCTURAL FILL REPLACEMENT AND OTHER SPECIFIC DESIGN REQUIREMENTS FOR FOOTINGS.

5.0 OIL SPILL CONTAINMENT CALCULATIONS:

OIL SPILL CONTAINMENT CALCULATION	
VOL. OF OIL IN TX 'A'	9,625 litres
VOL. OF OIL IN TX 'B'	2,086 litres
TOTAL VOL. OF OIL	11,711 litres
VOLUME A +10% TOTAL VOL. OF OIL	10,796 litres
LIQUID TYPE	TRANSFORMER OIL
SPECIFIC GRAVITY OF OIL	0.88
CATCHMENT AREA	87m ²
RAINWATER VOL. (87x25)	2,175 litres
CONTAINMENT VOL. REQUIRED (100% VOL. OF OIL + RAINWATER VOL.)	12,971 litres
CONTAINMENT PROVIDED	14,500 litres



PRELIMINARY **ISSUED FOR TENDER ONLY**

PROFESSIONAL ENGINEER
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MAY 25, 2015

ENGINEERING CONSULTANT

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FISHERIES AND OCEANS CANADA
REAL PROPERTY AND TECHNICAL SUPPORT

CONUMA RIVER HATCHERY
CONTRACT NO. F1700-150694
138 kV SUBSTATION UPGRADE
OIL CONTAINMENT SYSTEM
GENERAL NOTES

SCALE AS SHOWN
 DATE APRIL 2015
 DRAWING NUMBER 32-18-282
 REVISION 0

DWG. NO.	DRAWING REFERENCES	NOTES	NO.	DATE	REVISIONS
			0	MAY 25/2015	ISSUED FOR TENDER

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