ATTACHMENT 1

Design Drawings

VANCOUVER FRASER PORT AUTHORITY

HABITAT ENHANCEMENT PROGRAM

TSAWWASSEN EELGRASS

SITE 1 AND SITE 2

DRAWING LIST:

34-348-EN-6020 - TITLE SHEET

34-348-EN-6021 - GENERAL NOTES

34-348-EN-6022 - SITE PLAN

34-348-EN-6023 - SITE 1 AND SITE 2 GRADING PLAN

34-348-EN-6024 - SITE 1 AND SITE 2 SECTIONS AND DETAILS SHEET 1 OF 2

34-348-EN-6025 - SITE 1 AND SITE 2 SECTIONS AND DETAILS SHEET 2 OF 2

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Ref.No. REFERENCE

moffatt & nichol 777 WEST BROADWAY, SUITE 301 VANCOUVER, BC, CANADA, V5Z 4J7 604-707-9004

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HABITAT ENHANCEMENT PROGRAM TSAWWASSEN EELGRASS TITLE SHEET

34-348-EN-6020

- 1.2 THE CONTRACTOR SHALL ABIDE BY ALL APPLICABLE ENVIRONMENTAL REQUIREMENTS, LAWS AND REGULATIONS.
- 1.3 THE CONTRACTOR SHALL COORDINATE ALL ONSITE ACTIVITIES WITH THE OWNER'S REPRESENTATIVE TO ENSURE MINIMAL IMPACT ON THE EXISTING SENSITIVE EELGRASS BEDS. UNDER NO CIRCUMSTANCES SHALL BARGES OR OTHER VESSELS BE ALLOWED TO GROUND ON THE EXISTING EELGRASS BEDS OR OTHERWISE DISTURB THE EXISTING EELGRASS BEDS (DISTURBANCE AS A RESULT OF VESSEL PROPELLER WASH), EXCEPT WITHIN THE FOOTPRINT OF THE FILL OR EXCEPT THAT BARGES MAY BE SECURED WITH THE USE OF SPUDS.
- 1.4 THE CONTRACTOR SHALL ABIDE BY ALL APPLICABLE SAFETY REGULATIONS (I.E. OHS, WBC). SAFE CONSTRUCTION EXCAVATION SLOPES AND SHORING ARE THE RESPONSIBILITY OF THE CONTRACTOR AND SHOULD COMPLY WITH ALL APPLICABLE SAFETY REGULATIONS. METHODS OF DEMOLITION AND CONSTRUCTION OF MATERIAL ARE THE RESPONSIBILITY OF THE CONTRACTOR.
- 1.5 ALL EQUIPMENT AND MACHINERY WORKING ON SITE MUST BE IN GOOD WORKING CONDITION AND FREE OF LEAKS OR EXCESS OIL AND GREASE. A FUEL AND SPILL PREVENTION/CONTINGENCY PLAN IS TO BE REVIEWED WITH THE AUTHORITY'S REPRESENTATIVE. SPILL CONTAINMENT EQUIPMENT AND CLEANUP SUPPLIES SHALL BE ONSITE PRIOR TO CONSTRUCTION.
- 1.6 PRIOR TO SUBMITTING A BID, CONTRACTORS SHALL VISIT THE SITE AND FAMILIARIZE THEMSELVES WITH THE SITE CONDITIONS. MANAGEMENT OF ENVIRONMENTAL EFFECTS SUCH AS WIND, TIDAL STATE, AND WAVE CONDITIONS ARE THE SOLE RESPONSIBILITY OF THE CONTRACTOR.
- 1.7 THE CONTRACTOR SHALL CHECK THE DRAWINGS AGAINST THE SITE OF THE WORK AND NOTIFY THE AUTHORITY'S REPRESENTATIVE IN WRITING OF ANY DISCREPANCIES IN DIMENSIONS OR SITE CONDITIONS. THE CONTRACTOR SHALL NOT BEGIN CONSTRUCTION IN ANY SUCH AFFECTED AREA UNTIL THE DISCREPANCY HAS BEEN RESOLVED BY THE AUTHORITY'S REPRESENTATIVE.
- 1.8 ALL DIMENSIONS ARE GIVEN IN MILLIMETERS UNLESS NOTED OTHERWISE. ELEVATIONS AND CONTOURS ARE GIVEN IN METRES AND DECIMALS THEREOF. SCALE INDICATED ON DRAWING IS APPROPRIATE TO SCALE AT FULL SIZE (D) 22" X 34"
- 1.9 NOTES AND DETAILS ON THE DRAWINGS SHALL TAKE PRECEDENCE OVER THESE GENERAL NOTES. REFER TO RELATED SPECIFICATIONS OF THE PROJECT SPECIFICATIONS FOR ADDITIONAL PROJECT REQUIREMENTS.

2.0 SURVEY, WATER LEVELS AND DATUM

- 2.1 ALL ELEVATIONS ARE REFERENCED TO TIDE AND CHART DATUM. UNDERWATER HYDROGRAPHIC SURVEY DATA (2012) WAS PROVIDED BY ATEK HYDROGRAPHIC SURVEYS LTD.
- 2.2 PROPERTY LINES WERE PROVIDED BY VANCOUVER FRASER PORT AUTHORITY (VFPA).
- 2.3 COORDINATES ARE UTM (NAD 83) ZONE 10 MAPPING PLANE COORDINATES.
- 2.4 SURVEY REFERENCE BENCHMARK (BM 77C010) IS LOCATED ALONG THE TSAWWASSEN FERRY CAUSEWAY (NEAR THE BOAT RAMP).

(2004) VALUES FOR BM 77C010 ARE: EL 6.371m CD (3.499m GEODETIC), N 5429,259.61m, E 491,478.72m.

2.5 TIDAL PARAMETERS (REFERENCE: CANADIAN HYDROGRAPHIC SERVICES) FOR TSAWWASSEN ARE AS FOLLOWS:

TIDAL PARAMETER	ELEVATION (CD)
HIGHER HIGH WATER LARGE TIDE (HHWLT)	4.8m
HIGHER HIGH WATER MEAN TIDE (HHWMT)	4.1m
MEAN WATER LEVEL (MWL)	3.0m
LOWER LOW WATER MEAN TIDE (LLWMT)	1.2m
LOWER LOW WATER LARGE TIDE (LLWLT)	0.1m

3.0 SITE ACCESS AND WORK RESTRICTIONS

REFERENCE

- 3.1 VFPA IS RESPONSIBLE FOR OBTAINING ALL AGREEMENTS AND PERMISSIONS REQUIRED TO ACCESS THE SITE AND PERFORM THE WORKS AS SHOWN.
- 3.2 SITE ACCESS (MARINE BASED EQUIPMENT) IS GENERALLY FROM THE EXISTING BOATING CHANNEL. IT CAN BE HEAVILY USED BY RECREATIONAL BOATERS TO ACCESS THE BOAT RAMP ON THE FERRY CAUSEWAY. THE CONTRACTOR SHALL PROVIDE ADEQUATE MARINE TRAFFIC SIGNAGE, MARKERS, AND OTHER MEANS (SUCH AS DEBRIS SCREENS) TO ADEQUATELY SEPARATE AND SECURE THE SITE FROM THE RECREATIONAL BOAT TRAFFIC.
- 3.3 THE CONTRACTOR SHALL NOT STOCKPILE MATERIAL WITHIN THE EXISTING BOATING CHANNEL OR PERFORM THE WORK THAT CAUSES INTERFERENCE WITHIN THE BOATING TRAFFIC WITHIN THE CHANNEL, OR IS HARMFUL TO THE SURROUNDING SENSITIVE ENVIRONMENT.
- 3.4 AGGREGATE MATERIALS SHALL BE PLACED IN A MANNER THAT MINIMIZES DISTURBANCE OF THE SURROUNDING SENSITIVE EELGRASS (I.E. MINIMIZE TURBIDITY). AGGREGATE MATERIALS SHALL BE CAREFULLY PLACED AND NOT DROPPED FROM A HEIGHT GREATER THAN 1.0M VERTICALLY. DO NOT PLACE AGGREGATE MATERIALS BY END DUMPING FROM BARGES.
- 3.5 THE CONTRACTOR SHALL CONFINE THE WORK TO THE LIMIT OF WORK AS SHOWN ON THE DRAWINGS.

4.0 SITE SURVEYS

- 4.1 HYDROGRAPHIC SURVEY WAS COMPLETED IN JANUARY 2012 AND DECEMBER 2014, AND THE RESULTS WILL BE MADE AVAILABLE TO THE CONTRACTOR FOR REFERENCE. THE SURVEY RESULTS SHALL REPRESENT THE INITIAL SITE CONDITIONS AND FORM THE REFERENCE BASELINES FOR QUANTITY VERIFICATION FOR PAYMENT. THE CONTRACTOR MAY, AT HIS OWN OPTION AND EXPENSE, CONDUCT A HYDROGRAPHIC SURVEY PRIOR TO THE CONSTRUCTION TO VERIFY THE SURVEY RESULTS.
- 4.2 THE CONTRACTOR SHALL CONDUCT PROGRESS SURVEYS DURING CONSTRUCTION AND A FINAL SURVEY UPON COMPLETION OF THE WORK. THE SURVEYS SHALL CONSIST OF CROSS SECTIONS AND COMPUTATIONS FOR THE FULL WIDTH OF THE WORKS AT 25M INTERVALS ALONG THE WORKS. SUBMIT TO THE AUTHORITY'S REPRESENTATIVE FOR APPROVAL THE PROGRESS AND FINAL SURVEYS TO ESTABLISH THE MEASUREMENT AND PAYMENT QUANTITIES FOR PROGRESS CLAIMS AND FOR ACCEPTANCE BY THE AUTHORITY'S REPRESENTATIVE OF THE FINAL COMPLETED LINES AND GRADES, RESPECTIVELY.
- 4.3 THE FINAL SURVEY SHALL BE CONDUCTED AT LEAST ONE MONTH AFTER THE FINAL PLACEMENT OF THE INFILL SAND TO CONFIRM DESIGN ELEVATIONS HAVE BEEN ACHIEVED. IF REQUIRED, ADDITIONAL MAKE UP SAND INFILL SHALL BE PLACED. FINAL ACCEPTANCE BY THE AUTHORITY'S REPRESENTATIVE WILL BE BASED ON THE RESULTS OF THE FINAL SURVEY, AND ANY ADDITIONAL MAKE UP SAND REQUIRED.
- 4.4 THE FINAL SURFACE OF SAND INFILL SHALL BE REASONABLY EVEN AND UNIFORM. THE MAXIMUM PERMISSIBLE VARIATION IN ELEVATION FROM THE SPECIFIED GRADE AND SIDE SLOPES, MEASURED VERTICALLY, SHALL BE PLUS 0.15 METERS AND MINUS 0.0 METERS.

5.0 AGGREGATE MATERIAL (QUARRY SCREENING, QUARRY RUN, SAND)

- 5.1 QUARRY RUN SHALL BE IMPORTED CLEAN, ROUGH ANGULAR QUARRIED STONE OF A DENSE, HARD, DURABLE CHARACTER, FREE OF ORGANIC MATERIAL, IN-FILLED JOINTS, SEAMS, OR OTHER DEFECTS, RESISTANT TO BREAKDOWN BY HANDLING OR WEATHERING OR EXPOSED TO SEA WATER THAT MEETS THE TEST REQUIREMENTS PROVIDED IN THE SPECIAL PROVISIONS, UNLESS NOTED OTHERWISE.
- 5.2 QUARRY SCREENING AND RIVER SAND SHALL BE NATURALLY OCCURRING, NON-MANUFACTURED CLEAN GRANULAR MATERIAL FREE OF ORGANIC MATTER, VEGETATION AND OTHER DELETERIOUS MATERIAL.
- 5.3 QUARRY SCREENINGS SHALL MEET THE FOLLOWING GRADATION:

SIEVE SIZE (mm)	GRADATION LIMITS % PASSING BY DRY WEIGHT
9.5	100
4.75	70 – 85
2.36	40 – 50
1.18	25 – 35
0.60	15 - 25
0.30	10 - 20
0.15	5 – 15
0.075	5 – 10

5.4 QUARRY RUN SHALL MEET THE FOLLOWING GRADATION:

SIEVE SIZE (mm)	GRADATION LIMITS % PASSING BY DRY WEIGHT			
150	100			
75	0 - 40			
5	0 – 5			

5.5 SAND (FRASER RIVER SAND) SHALL BE FREE OF ORGANIC MATERIAL AND MEET THE FOLLOWING GRADATION:

SIEVE SIZE (mm)	GRADATION LIMITS % PASSING BY DRY WEIGHT
19	100
4.76	80 - 100
0.60	20 - 100
0.42	10 - 100
0.25	0 - 80
0.15	0 - 50
0.074	0 - 4

5.6 THE CONTRACTOR SHALL PROVIDE AGGREGATE SUPPLIER'S TEST RESULTS THAT THE AGGREGATE MATERIALS SUPPLIED CONFORMS TO THE REFERENCED SPECIAL PROVISIONS / GRADATIONS.

6.0 EELGRASS PLANTING

- 6.1 EELGRASS PLANTING SHALL BE CONDUCTED UPON ACCEPTANCE OF THE SAND INFILL BY THE AUTHORITY'S REPRESENTATIVE. A MINIMUM OF ONE MONTH IS REQUIRED AFTER FINAL PLACEMENT TO ALLOW THE MATERIAL TO SETTLE AND STABILIZE.
- 6.2 PLANT WITH ZOSTERA MARINA AT DENSITIES OF 8-10 SHOOTS PER SQUARE METER. PLANTING METHODS SHOULD FOLLOW THE PROTOCOL DEVELOPED BY PRECISION IDENTIFICATION (DURANCE 2007).
- 6.3 PLANTING SHALL BE COMPLETED BETWEEN APRIL AND SEPTEMBER.
- 6.4 REFER TO SPECIAL PROVISIONS FOR ADDITIONAL PLANTING REQUIREMENTS

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SCALE

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