

March 12th, 2015

Port Metro Vancouver
100 The Point, 999 Canada Place
Vancouver, British Columbia
V6H 1B8

MN File No. 8107/22

Attention: Mr. Gord Ruffo, Project Manager

REFERENCE: Westham Island Tidal Marsh Project – Response to Delta Farmer’s Institute

Dear Mr Ruffo:

This letter is provided to Port Metro Vancouver (PMV) in response to inquiries from the Delta’s Farmer Institute (DFI) regarding the proposed Westham Island/Canoe Pass Tidal Marsh Project. The DFI has expressed concerns about the potential for impacts from the proposed project on the flood boxes on the Westham Island Dyke Road; specifically, the DFI is concerned about the potential increase of sediment buildup at the flood boxes as well as the potential alteration of the salinity in Canoe Pass.

To fully understand the concerns of the DFI, a site visit to Westham Island was held on Friday February 20th, 2015 with representatives from the DFI, PMV and Moffatt & Nichol (M&N). Figures 1 through 3 show the closest flood box which is located approximately 400 m downstream of the proposed project. DFI representatives explained that this flood box has a dual purpose: to drain the adjacent farmers’ fields through a network of ditches connected to the flood box and to intake fresh water when water levels allow during the summer months which can be stored in the same network of ditches for use on the crops (Figure 4). A number of additional flood boxes along Dyke Road were visited, each displaying varying degrees of siltation and buildup of log and other debris (Figures 5 and 6).

The proposed marsh project, as well as the flood boxes, are located within a natural deposition zone on the inside bend of Canoe Pass; the proposed project is not designed to alter existing depositional patterns. Conversely, the river bank opposite of the proposed project site experiences higher flow and therefore has been armoured with riprap to prevent erosion. In addition, it is understood that necessary navigational maintenance activities on the main arm of the Fraser River, and possibly local activities such as the moorage of houseboats near the Westham Island bridge, may have also affected historical deposition rates on the inside bend of Canoe Pass.

The proposed project will be defined by a low riprap containment berm to protect and elevate existing sand bars. The design elevation of the marsh is slightly below the mean water level (El. -0.25 m Geodetic), which matches the elevation of the existing surrounding low marsh. The invert of the closest flood box downstream of the project site has been surveyed at an elevation of 1.2 m Geodetic, which corresponds to higher high water mean tide (HHWMT) and is well above the proposed marsh elevation. It is understood that there is a lack of maintenance on the closest flood box shown in Figures 1 through 3 as it remains generally clear of sediment from natural flushing. However, the flow capacity of the remaining flood boxes

along the Dyke Road (Figures 5 and 6) is reduced due to an accumulation of logs and sediment fronting the flood boxes.

Given the location of the flood boxes within an area of natural deposition, it can be expected that, similar to historical activities, periodic maintenance of the flood boxes would be required. To reduce the maintenance requirements for the flood boxes, an alternative engineered design of the flood boxes incorporating an outlet pipe extending to the deep water portions of the river or clearly defined and maintained drainage channels would have to be incorporated. Furthermore, it is not clear if the intake of fresh water into the farmers' drainage channels is an original design feature of the flood boxes.

The layout of the proposed habitat project generally follows the planform lay of the existing channels and bars and acts as neither a retarder, accelerator, nor diverter of flow. Reference drawings 34-348-EN-SK-1 and 34-348-EN-SK-2 appended to this memorandum show plan and sections for the proposed project. As is shown, the top of the proposed marsh (El. -0.25 m Geodetic) is below the flood box invert of El. 1.2 m Geodetic. Also shown in 34-348-EN-SK-2, the reduction in cross sectional area of Canoe Pass attributed to the proposed project located 400 m upstream is approximately 4% to 5%. At the nearest flood box there is no change to the cross section of the river. Typically, only structures which create a discontinuity initiate significant change to the flow behavior and therefore, the project is not expected to modify local flow behavior.

Salinity in Canoe Pass is a result of the mixing of salt water from the Strait of Georgia and the freshwater discharge of the Fraser River. Salinity levels within Canoe Pass typically vary with the amount of freshwater discharge from the Fraser River, with salt wedge intrusion ranging from Deas Island during freshet and upstream to St. Mungo's bend during winter low flow. For the proposed project to alter the salinity of Canoe Pass, the project would have to change the volume of freshwater discharge on the Fraser River or the volume of salt water propagating up the Fraser River. The proposed project does not introduce, remove or divert the flow of salt water or freshwater in the Fraser River. Therefore, no alteration to the existing salinity levels will result due to the project.

Sincerely,

MOFFATT & NICHOL

Prepared by:



Mike Tranmer, P.Eng.
Project Engineer

Reviewed by:



Christopher Devick, P.E.
Coastal Engineer

Approved by:



Michael Cho, P.Eng.
Project Manager

Site Photographs



Figure 1 Westham Island Flood Box - Located Approximately 400 m Downstream of the Proposed Habitat Project



Figure 2 Westham Island Flood Box Detail - Located Approximately 400 m Downstream of the Proposed Habitat Project



Figure 3 Drainage Channel from Westham Island Flood Box - Located Approximately 400 m Downstream of the Proposed Habitat Project



Figure 4 Farmers' Fields Drainage Channel - Located Approximately 400 m Downstream of the Proposed Habitat Project

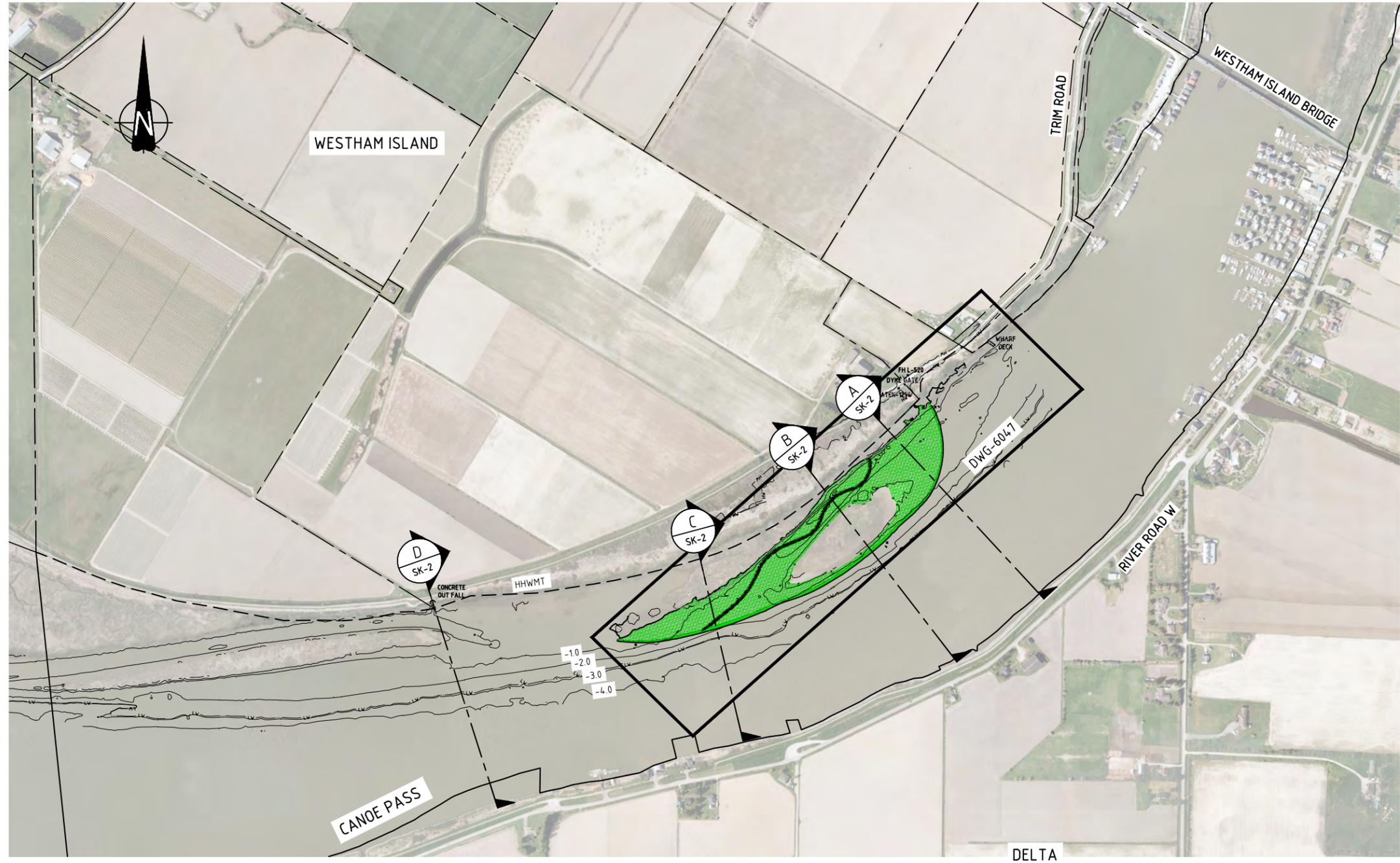


Figure 5 Log Buildup Fronting Westham Island Flood Box - Located Approximately 1100 m Downstream along Dyke Road from the Proposed Habitat Project



Figure 6 Sediment Buildup Fronting Westham Island Flood Box - Located Approximately 1400 m Downstream along Dyke Road from the Proposed Habitat Project

Drawings



LOCATION PLAN:
NTS (REF. CHS #3492)

NOTES:

1. EXISTING GROUND BATHYMETRY (CANOE PASS) ARE TAKEN FROM PWGSC/CANADIAN COAST GUARD PUBLISHED SURVEYS (CANOE PASS - BRIDGE TO BRUNSWICK PT. - JAN. 2010)
2. EXISTING GROUND BATHYMETRY (MARSH AREA) AND TOPO FEATURES ARE TAKEN FROM ATEK HYDROGRAPHIC SURVEYS LTD. (2012)
3. ALL ELEVATIONS ARE TO GEODETIC DATUM.
CHART DATUM = (GEODETIC DATUM) + (2.2 METERS)
4. TIDAL PARAMETERS FOR THE SITE ARE AS FOLLOWS:

| TIDAL PARAMETER | ELEVATION (GEODETIC) |
|--------------------------------------|----------------------|
| HIGHER HIGH WATER LARGE TIDE (HHWLT) | 1.8m |
| HIGHER HIGH WATER MEAN TIDE (HHWMT) | 1.2m |
| MEAN WATER LEVEL (MWL) | 0.0m |
| LOWER LOW WATER MEAN TIDE (LLWMT) | -1.8m |
| LOWER LOW WATER LARGE TIDE (LLWLT) | -2.9m |



NOT FOR CONSTRUCTION

| Ref.No. | REFERENCE |
|---------|-----------|
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| | |

CONSULTANT

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

IN ASSOCIATION WITH:

| No. | Date | REVISION | Dr'n | Ch'd |
|-----|-----------|-----------------------|------|------|
| A | FEB.16/15 | ISSUED FOR DISCUSSION | AM | MC |
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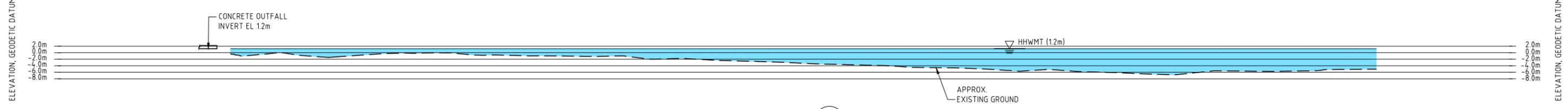
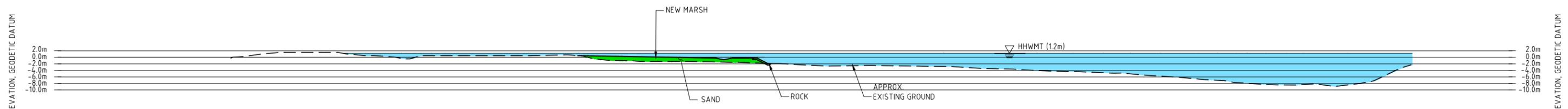
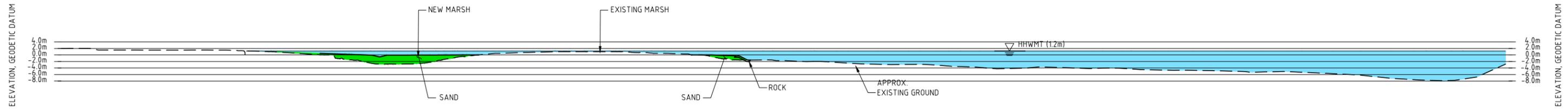
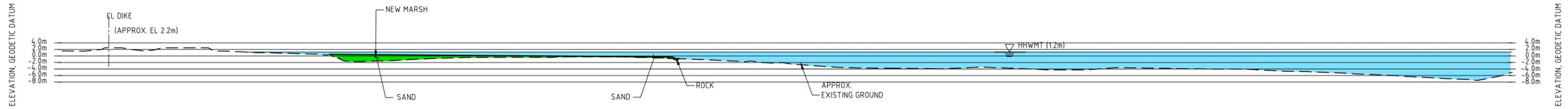
PORT METRO
vancouver

VANCOUVER FRASER PORT AUTHORITY
ENGINEERING DEPARTMENT

| | |
|-----------|--------------|
| DESIGN BY | AM |
| DRAWN BY | AM |
| APPROVED | MC |
| DATE | JAN 21, 2015 |
| SCALE | 1:4,000 |
| PMV SITE | |

HABITAT ENHANCEMENT PROGRAM
WESTHAM ISLAND/CANOE PASS TIDAL MARSH PROJECT
LOCATION PLAN

| | | | | |
|------|------|----------------|-------|------|
| SIZE | DWG. | 34-348-EN-SK-1 | SHEET | REV. |
| D | | | | A |



NOTES:

1. SEE GENERAL NOTES DWG SK-1



NOT FOR CONSTRUCTION

| Ref.No. | REFERENCE |
|---------|-----------|
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| | |

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PORT METRO
vancouver

VANCOUVER FRASER PORT AUTHORITY
ENGINEERING DEPARTMENT

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|-----------|--------------|
| DESIGN BY | AM |
| DRAWN BY | AM |
| APPROVED | MC |
| DATE | JAN 21, 2015 |
| SCALE | AS SHOWN |
| PMV SITE | |

HABITAT ENHANCEMENT PROGRAM
WESTHAM ISLAND/CANOE PASS TIDAL MARSH PROJECT
SECTIONS AND DETAILS

| | | | | |
|------|------|----------------|-------|------|
| SIZE | DWG. | 34-348-EN-SK-2 | SHEET | REV. |
| D | | | | A |