



City of Richmond

Report to Committee

To: Public Works and Transportation Committee
From: John Irving, P.Eng. MPA
 Director, Engineering
Re: Shell Road North Drainage Pump Station

Date: August 9, 2017
File: 10-6340-20-
 P.16308/Vol 01

Staff Recommendation

That the design concept for the Shell Road North Drainage Pump Station as detailed in Attachment 1 of the staff report titled "Shell Road North Drainage Pump Station" dated August 9, 2017 from the Director, Engineering be approved.

John Irving, P.Eng. MPA
 Director, Engineering
 (604-276-4140)

Att. 1

REPORT CONCURRENCE		
ROUTED TO:	CONCURRENCE	CONCURRENCE OF GENERAL MANAGER
Parks Services Sewerage & Drainage	<input checked="" type="checkbox"/> <input checked="" type="checkbox"/>	
REVIEWED BY STAFF REPORT / AGENDA REVIEW SUBCOMMITTEE	INITIALS: 	APPROVED BY CAO

Staff Report

Origin

The Shell Road North Drainage Pump Station was constructed in the 1970's. Council approved an upgrade to this drainage pump station as part of the 2016 Capital Program. Staff have advanced the design to the point whereby the general layout and architectural features have been identified.

The purpose of this report is to provide Council information regarding the intended pump station layout, including potential architectural and landscape features.

This report supports Council's 2014-2018 Term Goal #6 Quality Infrastructure Networks:

Continue diligence towards the development of infrastructure networks that are safe, sustainable, and address the challenges associated with aging systems, population growth, and environmental impact.

Analysis

The City's extensive flood protection and drainage system includes 49 kilometres of dikes, a series of ditches/canals, underground pipe and 41 drainage pump stations. The drainage system is designed to prevent the City from flooding during up to a 1:10 year rainfall event.

The existing Shell Road North Drainage Pump Station services the area approximately bounded by the midpoint between Shell Road and No.4 Road, the midpoint between Shell Road and No. 5 Road, and Granville Avenue to the south. This station was constructed in the 1970's, contains old, antiquated equipment and is in need of a pumping capacity increase to adequately meet current flood protection standards.

Design of the upgraded Shell Road North Drainage Pump Station commenced earlier in 2017 and has advanced to a point whereby the general layout and architectural features have been identified (Attachment 1).

In general, the architectural character is responding to the utilitarian aspects of the building functions and the backdrop of the south shore of the North Arm of the Fraser River. The design includes two structures, one is the modified existing wet well/flood box structure, and the other is the proposed new Motor Control Center (MCC)/Generator building with stairs for access between both buildings. The conceptual design allows for low maintenance in response to potential vandalism and additionally takes advantage of the opportunity to be perceived as an amenity for local recreational users of the Bridgeport recreational trail that ends on the west side of the site.

Architectural landscape elements of this pump station will celebrate the stories of water and land using the watercourse mapping cast in concrete façade of the MCC/Genset building, and the geologic map of sediment deposits formed by the course of the river delta in concrete façade of the modified wet well/flood box structure. Both mapping casts provide an opportunity for education and graphical symbolism to be integrated within the infrastructure, along with an

opportunity to encourage an understanding of the river and surrounding land. As the detailed design progresses, these features will continue to be refined and integrated into the overall project.

This station is also incorporated into the existing and future dike trail system along the north dike. Accordingly, the pump station maintenance accesses will be appealing and complimentary to the existing and future trails while at the same time providing the necessary means for pump station operations and maintenance activities. It is also proposed that short sections of the adjacent dike be raised to 4.7 metres geodetic, which is consistent with the City's Long Term Flood Management Strategy to address sea level rise. The pump station components will be designed to accommodate future dike raising to 5.5 metres geodetic if required. The current elevation of the dike is approximately 3.3 metres geodetic.

It is anticipated that design will be completed by Fall 2017, with construction to follow thereafter.

Financial Impact

Funding to complete the Shell Road North Drainage Pump Station upgrades has been approved by Council as part of the 2016 Capital Program.

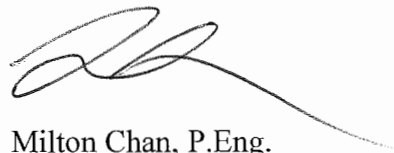
This project is included in the 2016 Flood Protection Program. The Province of British Columbia is providing the City with \$16.63M for the replacement of 4 drainage pump stations and approximately 1.2km of dike upgrades. The provincial funding is based on a 2/3 to 1/3 provincial to municipal share of eligible costs.

Conclusion

The Shell Road North Drainage Pump Station has been approved in the 2016 Capital Program. Design has progressed to the point where the general layout and architectural features/opportunities have been identified. Subject to Council's support, work will continue on advancing the design concept to a full detailed design.



Elena Paller, P.Eng.
Project Engineer
(604-276-4023)



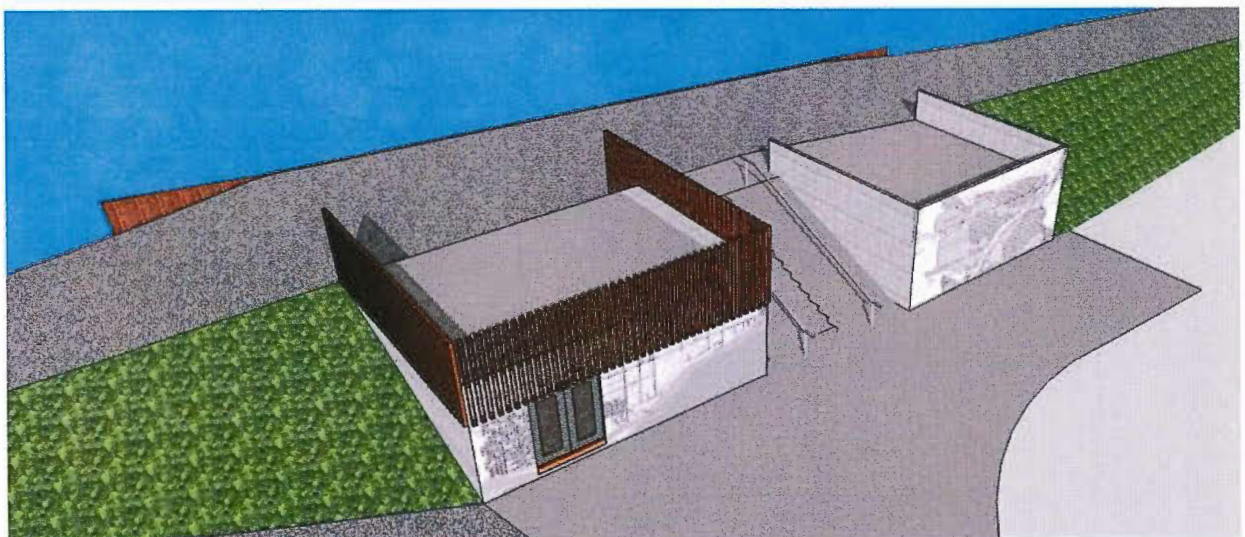
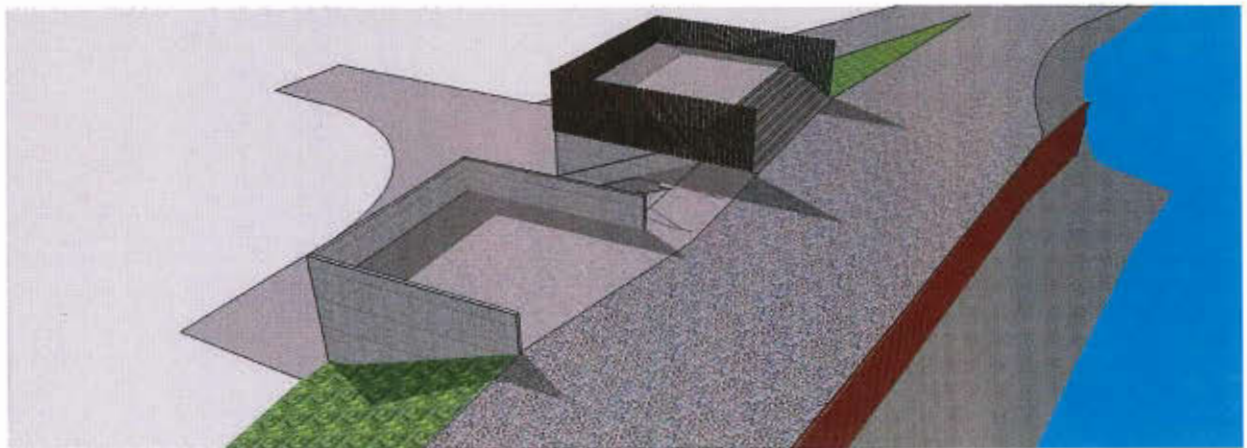
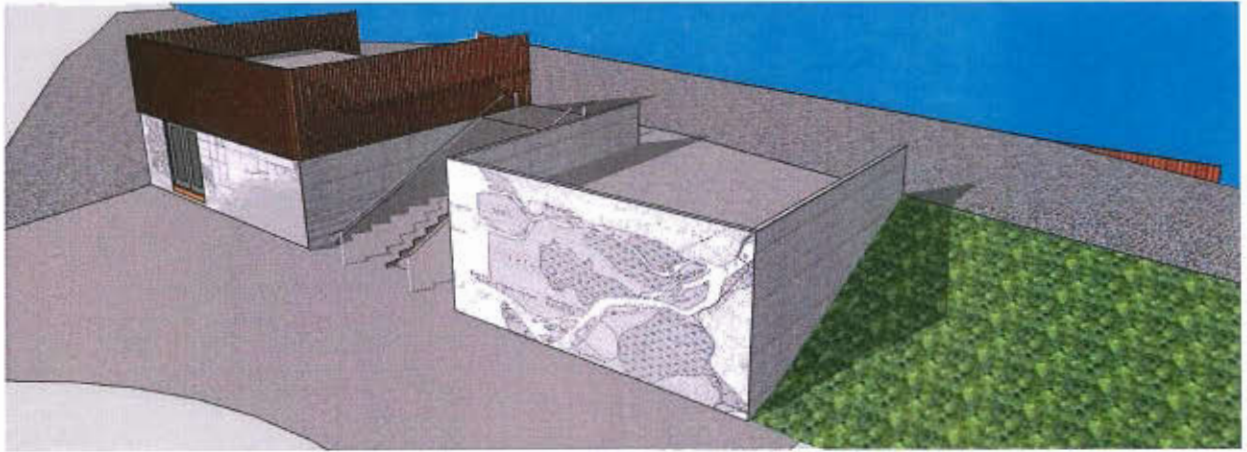
Milton Chan, P.Eng.
Manager, Engineering Design and Construction
(604-276-4377)

EP:ep

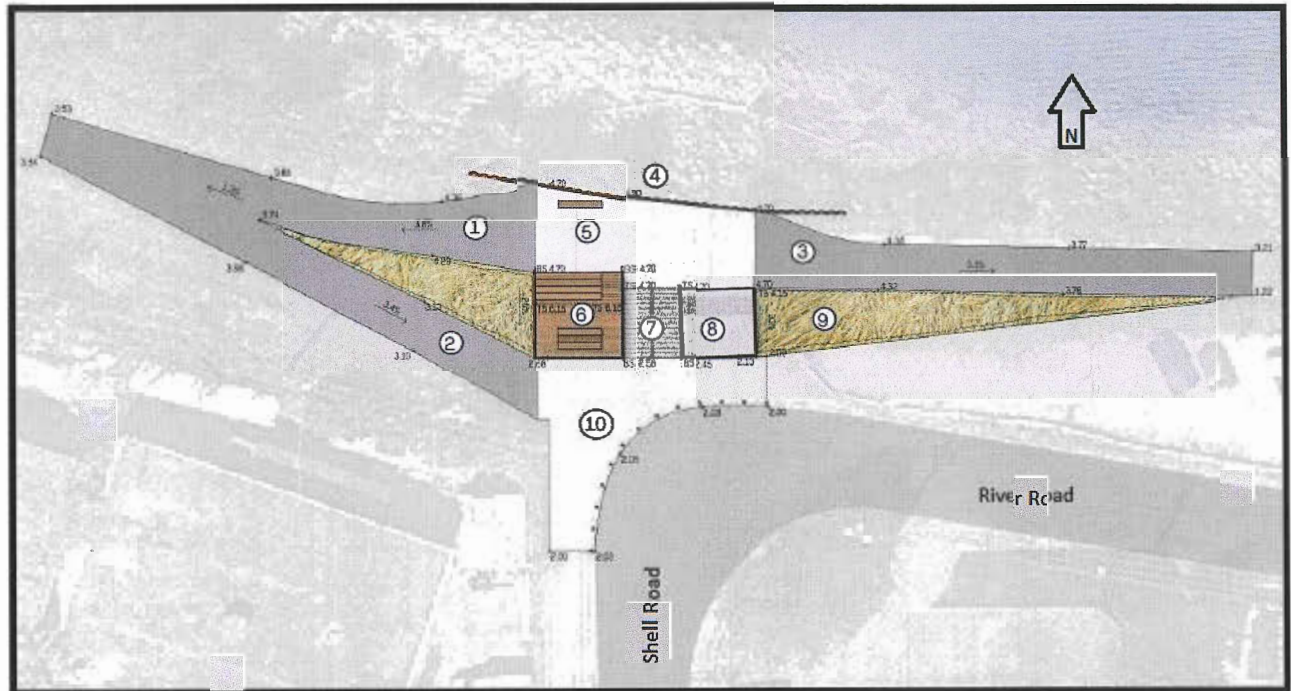
Att. 1: Shell Road North Pump Station

Attachment 1 - Shell Road North Pump Station Preliminary Design Images

1. 3D Renderings – Multiple views

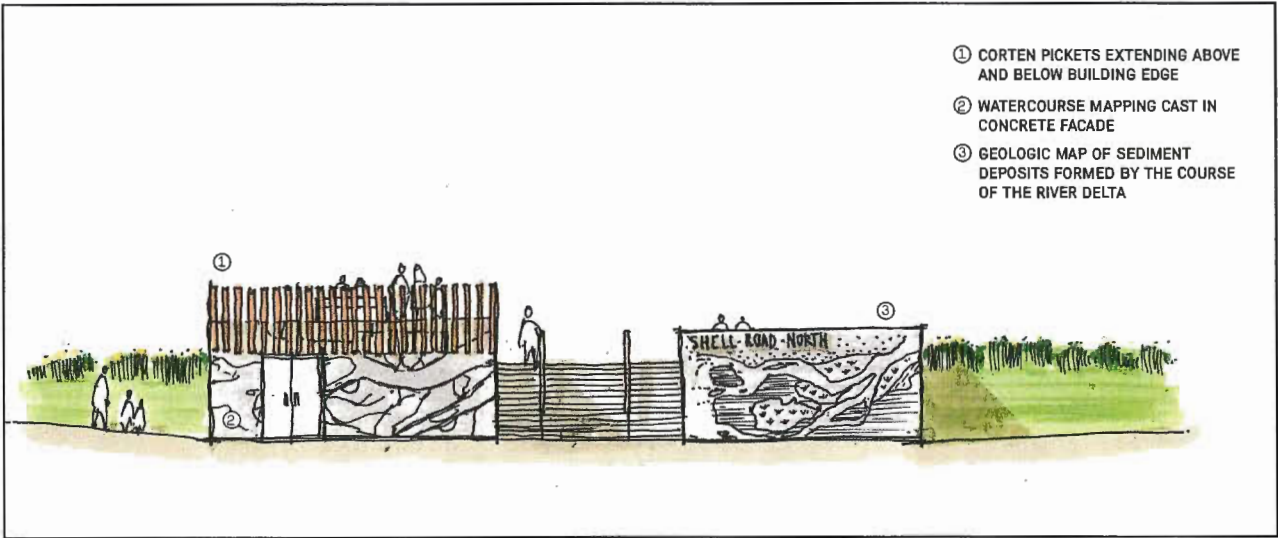


2. General Site Location

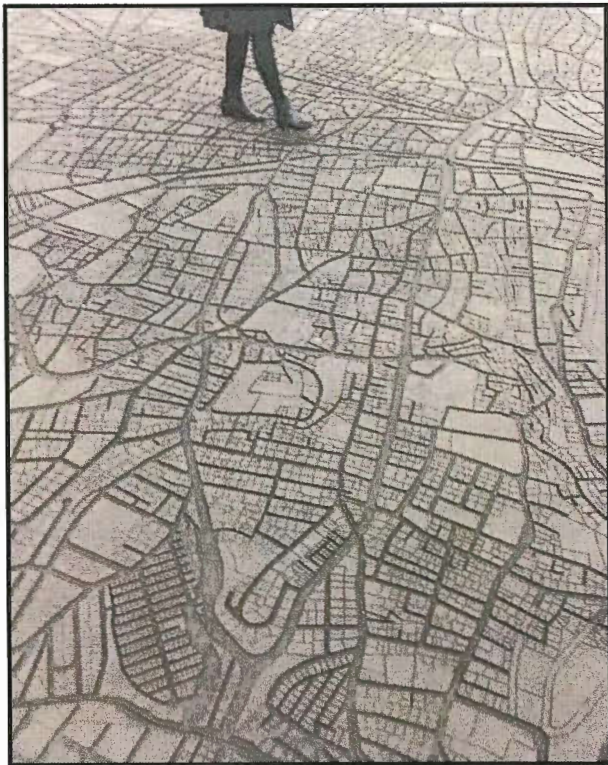


- 1) ASPHALT DIKE TRAIL / ACCESS
- 2) ASPHALT DIKE TRAIL / ACCESS
- 3) ASPHALT DIKE TRAIL / ACCESS
- 4) NEW SHEET PILE RETAINING WALL
- 5) CIP CONCRETE PAVING WITH HEAVY TIMBER SEATING FOR VIEWING ON DIKE
- 6) WOOD DECKING ON TOP OF GENSET WITH HEAVY TIMBER SEATING
- 7) FOLDED STEEL, WOOD, OR CONCRETE STAIR WITH BIKE RAMP AND HANDRAIL CONTINUOUS WITH GUARDRAILS
- 8) CIP CONCRETE PAVING ON TOP OF GENSET
- 9) NATIVE GRASS PLANTING
- 10) CIP CONCRETE PAVING WITH BOLLARDS TO RESTRICT VEHICULAR ACCESS AND DISCOURAGE PEDESTRIAN CROSSING OF SHELL ROAD

3. View of Shell Road North Pump Station (looking North)



4. Sample Map Image in Concrete



5. Sample Corten Picket Railing

