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Included in the Pitt Polder Pump Station Project is the construction of a new pump station adjacent to the existing Pitt Polder Pump Station, as well as, upgrades to the existing Pitt River Culverts where the Sturgeon Slough meets the Pitt River. This document will serve as a description of the works associated with the proposed pump station only.

## Project Introduction

ISL Engineering and Land Services (ISL) was retained by the City of Pitt Meadows to undertake the design and construction services for a new pump station to replace the aging, existing Drainage Area 4 (Pitt Polder) pump station. In 2013, ISL completed a feasibility study which reviewed various conceptual design options. Following a conceptual level analysis of the various options, ISL provided a recommendation for the implementation of an archimedean screw pump station. ISL completed the preliminary design of the station based on the archimedean screw pump concept, however, the estimated cost of the station was higher than the previously anticipated construction cost estimate. Due to budget constraints and new technologies available since the 2013 study, ISL developed another design option using a fish friendly submersible pump in lieu of the archimedean screw pump.

## Background

The City of Pitt Meadows is located at the confluence of the Fraser and Pitt Rivers within the Lower Mainland of British Columbia. A large portion of the City (approximately 86%) is located within a flood plain. The City is divided into four drainage areas that are protected with continuous dike system. The drainage areas convey flows through a network of ditches, floodboxes and six pump stations for flood protection.

The Pitt Polder Pump Station serves Drainage Area 4 which is the second largest drainage area in Pitt Meadows, about 1650 ha. The existing Pitt Polder Pump Station was constructed in 1952. The station was transferred from the Dewdney Alouette Regional District to the City of Pitt Meadows in 1995.

The existing station will be replaced and decommissioned as a part of this project. The current pump station is situated in the north east section of the City of Pitt Meadows at the east end of the Sturgeon Slough, the area is commonly known as the Pitt Polder area. The pump station is approximately 720m inland from Rannie Road and is accessible via a dike access road. Previously this access road travelled across private land, however, as of February 8th, 2018, a right of way agreement was put in place with the Aquilini Group for official access to the pump station.

## Site Works

Work at the Pitt Polder Pump station location will include the construction of a new concrete superstructure and wet well that will house two submersible fish friendly pumps. The superstructure and pump wet well will be built adjacent to the existing pump station. A new operations building will be built adjacent to the proposed superstructure and will house all of the electrical and motor control centers. As part of the project, an emergency backup generator will be installed to the north of the operations building, and a transformer will be constructed to the south of the superstructure for connection to BC Hydro power supply.

The two submersible vertical pumps will discharge through the dike (east to west) via two (2) large diameter Weholite pipes. A concrete outlet structure will be constructed complete with grating and stop-logs which will be used to isolate either pump. An existing flood box at the Pitt Polder Pump Station is proposed to be upgraded to a 1500mm diameter 'Weholite' pipe with an actuating sluice gate on the downstream side of the existing flood box. At the outlet of the culvert (west side), a motorized combination slide/flap gate will be installed.

Localized raising of the dike will be completed to facilitate the operation of the new pump station. ISL Engineering retained Thurber Engineering for geotechnical consultation for the localized dike improvements. Due to sub-surface ground conditions as outlined in the geotechnical reports provided by Thurber, the proposed dike fill will be placed at slopes of 3H:1V in order to reduce potential settlement, and increase the factor of safety in the case of a seismic



event. A sheet pile seepage control wall will be installed and stone columns will be installed due to the differential head.

Additionally, a mechanical rake screen has been designed to remove debris and organic material that notoriously collects in the Sturgeon Slough and the existing screens. To accommodate access to the mechanical rake screen and the back of the superstructure, a back access road has also been designed and is to be constructed to aid City of Pitt Meadow's operations staff in operating the pump station. Furthermore, as the existing dike was not built to current guidelines, a turn-around area has been proposed for roughly 200m west of the pump station's location. This will allow better access to the pump station during construction and during maintenance periods.

Throughout the construction the existing pump station and flood box are to remain operational, and will be demolished/sealed post construction once the proposed station has been commissioned.



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