

HABITAT ASSESSMENT

Katzie Reserve No. 1, Pitt Meadows BC

PREPARED FOR: Katzie First Nation and EPTA Development Corp.



PREPARED BY:



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List of Acronyms

AIA	Archaeological Impact Assessment
BCAWQG	BC Approved Water Quality Guidelines
BCCDC	British Columbia Conservation Data Centre
BCSEE	British Columbia Species & Ecosystems Explorer
BEC	Biogeoclimatic
BMP	Best Management Practices
CEMP	Construction Environmental Management Plan
COSEWIC	Committee on the Status of Endangered Wildlife in Canada
CWH	Coastal Western Hemlock
DFO	Department of Fisheries and Oceans
DP	Development Permit
EA	Environmental Assessment
EDC	EPTA Development Corporation

EM	Environmental Monitor
ESC	Erosion and Sediment Control
FIDQ	Fish Inventories Data Queries
GIS	Geographic Information System
HA	Habitat Assessment
HCA	Heritage Conservation Act
HWM	High Water Mark
KFN	Katzie First Nation
LUP	Land Use Plan
MLWRS	Ministry of Land, Water, and Resource Stewardship
MoF	Ministry of Forests
MoT	Ministry of Transportation
NHC	Northwest Hydraulics
PLG	Pacific Land Group
QEP	Qualified Environmental Professional
RAPR	Riparian Areas Protection Regulation
SAR	Species at Risk
SHIM	Sensitive Habitat Inventory Mapping
SIFT	Soil Information Finder Tool
SPEA	Sensitive Protection and Enhancement Area
VEC	Valuable Ecosystem Component
VFPA	Vancouver Fraser Port Authority
WSA	<i>Water Sustainability Act</i>

Appendices

Appendix A – CEMP

Appendix B – Hub Engineering Designs

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1 INTRODUCTION

Pacific Land Resource Group Inc. ("PLG") was retained by EPTA Development Corporation ("EDC"; "the Developer/Client") to prepare an Environmental Assessment ("EA") as part of a Development Permit ("DP") application for a warehouse/distribution facility ("Eagle Meadows Business Park", or "Project"), comprised of six (6) properties and one (1) unopened road (Lots 6-2; 6-1-2; 6-1-3; 6-1-4; 6-1-5; 6-1-7 within Katzie Reserve No. 1) (referred to as the "Subject Site"). The six legal lots and one unopened road right of way, total approximately 7.1 hectares (17.52 acres). This Habitat Assessment ("HA") report has been prepared in addition to the EA to support the Vancouver Fraser Port Authorities ("VFPA") environmental review process. This HA details the presence of significant aquatic and terrestrial resources, including any sensitive and rare species or habitats, which may potentially be affected by the Project.

This HA has been developed in accordance with the VFPA PER Guidelines for Habitat Assessment (2015).

2 PROJECT OVERVIEW

2.1 Project Location

The Project / Subject Site is located within the Katzie Reserve No. 1 bordering Pitt Meadows, BC and is comprised of six (6) properties and one (1) unopened road (Figure 1, below). A proposed building plan has also been included in Figure 2 below.

The following information summarizes the specific location of the Subject Site:

Civic Address: Lots 6-2; 6-1-2; 6-1-3; 6-1-4; 6-1-5; 6-1-7

Current Registered Owners: Refer to the attached Property Titles document for information pertaining to current registered owners.

Current Land Use Designation: Land Use Plan: Katzie Commercial Centre

Site Latitude: 49°12'10.5"N

Site Longitude: 122°40'40.6"W

The VFPA has jurisdiction over proposed works south of River Road (specifically works occurring along the river bank). See below Figures 1-3 for the approximate works area.

2.2 Study Area

The outfall installation works are located within the VFPA managed federal lands and waters (see Figure 2, below). The land use for the works area is on the border of "Special Study" and "Commercial", see Figure 2, below.



Figure 1. Project location and proposed work area (red outline). Works occurring in VFPAs jurisdiction has been identified in blue (box), below.

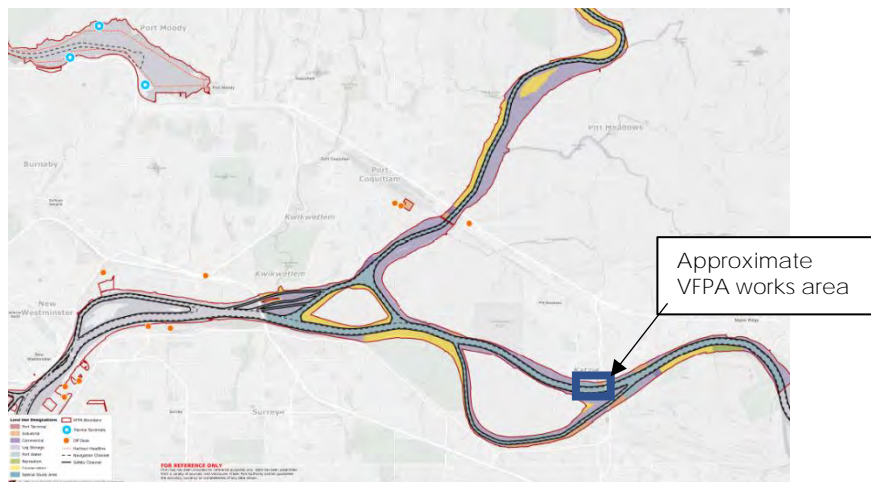
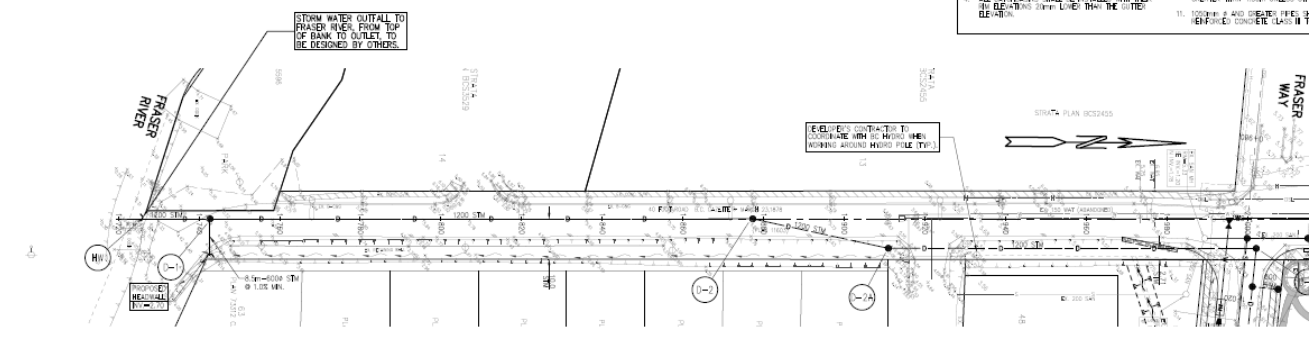


Figure 2. VFPA Land Use and approximate works area (blue box)



3b



1. ALL WORKS TO BE DONE IN ACCORDANCE WITH THE VFPA AND THE CITY OF PITT MEADOWS STANDARDS AND CITY OF PITT MEADOWS STANDARDS (LAKE & BEACHES)
2. DESIGN SHALL BE TO THE GRAVELL DESIGN AND SECTION 20001 - 11.1
3. DESIGN SHALL BE TO THE LOCAL AND REGIONAL STANDARDS AND THE GRAVELL DESIGN AND SECTION 20001 - 11.1
4. ALL UTILITY LINES SHALL BE INSTALLED WITH THE OUTFALL AT A DEPTH OF 1.5 METERS
5. ALL WORKS ARE TO BE DONE IN ACCORDANCE WITH THE VFPA AND THE CITY OF PITT MEADOWS STANDARDS AND CITY OF PITT MEADOWS STANDARDS (LAKE & BEACHES)
6. ALL JOINTS TO BE OPEN JOINTS
7. ALL WORKS ARE TO BE DONE IN ACCORDANCE WITH THE VFPA AND THE CITY OF PITT MEADOWS STANDARDS AND CITY OF PITT MEADOWS STANDARDS (LAKE & BEACHES)
8. DESIGN SHALL BE TO THE GRAVELL DESIGN AND SECTION 20001 - 11.1
9. DESIGN SHALL BE TO THE LOCAL AND REGIONAL STANDARDS AND THE GRAVELL DESIGN AND SECTION 20001 - 11.1
10. DESIGN SHALL BE TO THE GRAVELL DESIGN AND SECTION 20001 - 11.1
11. DESIGN SHALL BE TO THE GRAVELL DESIGN AND SECTION 20001 - 11.1

Figure 3a and 3b. [3a] Proposed outfall location within the VFPA jurisdiction, on the Fraser River foreshore, as identified by Northwest Hydraulics (NHC) [3b] Lot grading and utilities plan identifying the new sanitary storm main and proposed outfall within the VFPA jurisdiction (Hub Engineering Ltd.)

2.3 Project Dates

The project is anticipated to begin as soon as approvals are received from KFN, VFPA, DFO, the province (i.e., Section 11 approval) and the DP is approved by the City of Pitt Meadows. Works will follow the least risk timing window for fish between August 1 – September 15.

2.4 Project Rationale

Eagle Meadows Business Park consists of two (2) light industrial warehouse buildings totalling 370,390 ft² (34,410 m²) of floor area. The Project intends to provide a development that is:

- Attractive and provides a strong entrance into Katzie Reserve No. 1;

- Sensitive to the current and future surrounding land uses;
- Achieves the goals and objectives of the Katzie First Nation Land Use Plan; and
- Adaptable to market trends.

The Subject Site is designated as “Katzie Commercial Centre” in the Katzie First Nation (“KFN”) Land Use Plan (“LUP”). It is envisioned to be a central neighbourhood commercial area serving the Katzie community and surrounding Pitt Meadows residents with retail uses. Pedestrian connectivity via a greenway along Bonson Road is envisioned. Employment and revenue generating uses such as warehousing, storage, and other light industrial uses may be permitted in the designation as well. Light industrial uses are limited to those not generating significant amounts of odour, dust, noise, fumes, or nuisance to the surrounding neighbourhood. The development should also be visually appealing from the street and adjacent properties.

Policies in the Commercial Centre designation encourage connectivity, community use enhancement/contribution, amenity dedication, landscaping, and public art.

Eagle Meadows Business Park would like to ensure that there are local and regional community benefits resulting from the development. From a land use perspective, industrial floor space and designated industrial land is in short supply in the Metro Vancouver Region. However, the industrial land base contributes a quarter of the region’s total employment with important links to transportation, trade, and tax dollars. The recent Regional Industrial Lands Strategy (2020) along with several research papers demonstrate the continued shortage of industrial land supply in the region and the regional interest to protect and intensify industrial uses in the region.

The vacant industrial land supply in the Region is forecasted to be substantially absorbed by the 2030s (Metro Vancouver Industrial Lands Inventory, 2015). The proposed light-industrial use of the Subject Site will provide additional supply to support the regional economy and employment.

Eagle Meadows Business Park will bring additional employment opportunities to operate and manage the light-industrial warehouse use. The employment use will give KFN, Pitt Meadows, and Maple Ridge residents an opportunity to work close to where they live.

Amenity contributions are also central to the proposed development. The KFN LUP includes a provision for an amenity dedication of a minimum of 5% of the development land or a cash-in-lieu contribution of up to 5% of the development construction value. The cash-in-lieu is provided to the KFN for the development of community facilities and amenities such as parks, recreation areas, playgrounds and public art.

Eagle Meadows Business Park proposes to integrate the 5% cash-in-lieu contribution (of the development construction value) with the provision of public art on the Subject Site. The landscape drawings by Prospect & Refuge identify three potential locations for public art installation. A call for KFN artist submissions is proposed to feature public art pieces by local artists. The public art pieces will also serve as an entrance/place-making feature that celebrates KFNs culture and community.

3 PROJECT DESCRIPTION

EDC is proposing to construct a warehouse/distribution facility (“Eagle Meadows Business Park”), comprised of six (6) properties and one (1) unopened road (Lots 6-2; 6-1-2; 6-1-3; 6-1-4; 6-1-5; 6-1-7 within Katzie Reserve No. 1). The six legal lots and one unopened road right of way total approximately 7.1 hectares (17.52 acres) as shown in Figure 1, above.

3.1 Works Outside VFPA Jurisdiction

The Subject Site is currently undeveloped and bounded by Wharf Street (also referred to as Fraser Way) to the south, single family residential uses and Bonson Road to the west, a mini storage/outdoor storage uses to the north, and a soil/gravel material storage use to the east. The Subject Site is in close proximity to Golden Ears Way and the Golden Ears Bridge, providing regional connections to Lougheed Highway, Trans-Canada Highway, and South Fraser Perimeter Road (Figure 3, below).

Property Title Review

Table 1. Property Title Review of Subject Properties

	Civic Address	Legal Description	PIN	Charges on Title
1	None	LOT 6-2 CLSR 51256	902008382	Right of Way for Dyke, Ditch and Road Crossing – Registration Number X13822 and X13844
2	None	LOT 6-1-2 CLSR 71874	902009250	Joint Tenant Ownership - Refer to the attached Property Titles document (Appendix A) for information pertaining to current registered owners. No Easements/Permits or Related Instruments registered.
3	None	LOT 6-1-3 CLSR 71874	902009252	
4	None	LOT 6-1-4 CLSR 71874	902009253	
5	None	LOT 6-1-5 CLSR 71874	902009254	
6	None	LOT 6-1-7 CLSR 76491	902007832	
		Unopened Road Right of Way		
		Bonson Road Right-of-Way		No title established as land is a municipal road right-of-way. Applicant currently coordinating with Diking Authority and City of Pitt Meadows. Bernie McDonnell, P.Eng- Flood Authorizations Specialist, Deputy Inspector of Dikes. Cameron Reimer, P. Eng Manager of Operations, City of Pitt Meadows.

A Right of Way for the Dyke, Ditch and Road Crossing are registered in two (2) documents: X13822 and X13844. X13822 contains a report concerning the history of right of way, land status and correspondence in relation to a flood control agreement. X13844 approves the construction of a dyke through the Katzie Reserve lands with the consent of the Band. The dyke is maintained by the Municipality of Pitt Meadows.

3.2 Works Proposed Within the VFPA Jurisdiction

Storm and outfall infrastructure are proposed within the Bonson Road Right-of-Way, with the outfall location proposed immediately south of River Road and within the VFPA jurisdiction. As the work occurring within the road is a municipal roadway, there is no title or easements associated with this land. The applicant is required to work with the municipality of Pitt Meadows to ensure proposed works account for any other municipal infrastructure that may be located in the Bonson Road Right-of-Way. VFPA will review and approve the outfall works that are proposed within their jurisdiction adjacent to the Fraser River, in addition to reviews and approvals by DFO.

3.3 Regulatory Framework

The proposed development includes on-Site and off-Site works that are governed by a series of different levels of government. As KFN is a self-governing First Nation, they have established laws to regulate land use and development activity that is at the core of this proposed development and the need for this EA. Other regulatory bodies include the City of Pitt Meadows who provides KFN with servicing and owns municipal road Rights-of-Way that will facilitate specific servicing improvements. The Province of British Columbia is another regulatory body involved as KFN have adopted the provincial *Riparian Areas Protection Regulation* ("RAPR") which applies to watercourses adjacent to the site and KFN has also established Flood Construction Level requirements based on those regulated by the Ministry of Environment. As Wharf Street is constructed on a dyke, the Province of British Columbia will also need to be engaged to receive approvals to undertake works on or over the dyke. Finally, the Federal Government of Canada is also involved in this development project as the proponent must seek approval from the Department of Fisheries and Oceans ("DFO") Canada and VFPA for approval of the proposed storm outfall connection into the Fraser River. The project seeks approval to install a new outfall on the banks of the Fraser River foreshore, triggering review and approval by multiple agencies, including the VFPA. Further, a BC *Water Sustainability Act* ("WSA") Section 11 Application has been made to the province to seek approval to infill three ditches and create one new ditch within the new greenway. Water from the greenway ditch and new infrastructure upgrades will ultimately be discharged at the outfall into the Fraser River. Per communication received from DFO on August 3, 2022 via an Avoid and Mitigate Letter, DFO confirms that the proposed works are not likely to result in contravention of the Federal Fisheries Act. Specific best practices outlined in the Avoid and Mitigate Letter must be adhered to, and as such, the program is of the view that project works are not likely to result in contravention of the *Fisheries Act*. The August 3, 2022 Avoid and Mitigate Letter has been provided to the VFPA independent of this report.

3.4 Project Components

The Project proposes two (2) large light industrial warehouses approximately 371,000 square feet (34,467 square metres) in size. Full off-Site upgrades include: new sidewalks; an east west public greenway along Wharf Street, and necessary site servicing (Storm, sanitary and water). A new storm outfall is proposed south on Bonson Road to the Fraser River.

The Project includes three (3) main phases, (each phase has been identified as under VFPA jurisdiction, or outside):

- Phase 1: Site preparation (VFPA Jurisdiction: NO);
- Phase 2a: Off-Site servicing
 - Ditch infill and creation of new habitat within a greenway (VFPA Jurisdiction: NO)
 - Installation of a new outfall to the Fraser River (VFPA Jurisdiction: YES); and
- Phase 2b: On-Site construction (VFPA Jurisdiction: NO).

Phase 1 site preparation is estimated to take approximately 4 months. Site preparation will begin once the Soil Authorization is issued. The project lands currently have approximately 140,000 cubic metres of fill that needs to be removed prior to construction. Three (3) potential sites have been identified for potential suitable relocation of the fill: one (1) within the City of Pitt Meadows and the other two (2) within Katzie Reserve No. 1. Also prior to construction works, the work zone should be clearly delineated in the field based on the Project drawings to clearly define the Project boundaries. All necessary **erosion and sediment control ("ESC") measures, as outlined in PLG's Construction Environmental Management Plan ("CEMP"; Appendix A, attached)**, will be implemented during this phase of the project, prior to the commencement of phases 2a and 2b. Site access for fill removal will be from the existing driveway along Wharf Street.

Phase 2a for off-Site servicing includes outfall construction down Bonson Road to the Fraser River, as well as the construction of a new greenway, including a new ditch along the south end of Wharf Street, under **BC Ministry of Land, Water, and Resource Stewardship ("MLWRS"; formerly MFLNRORD) WSA Section 11 Authorization**. Phase 2b consists of building(s) construction. Phase 2a and 2b will run concurrently after the DP is approved. Works will include, but are not limited to:

- Clearing approximately 3 m² of low-lying, primarily non-native, herbaceous vegetation;
- Excavation of 6 m³ of soils;
- Placement of one pre-cast headwall (no concrete pouring, only grouting);
- Material stockpiling;
- Placement of one backflow preventer valve (up Bonson, out of VFPA jurisdiction); and
- Partially instream works including installation of 12 m² of riprap¹.

New Site access points will be constructed throughout phases 2a and 2b, and will be used by on-Site staff once they are available.

¹ this work is expected to occur below the high water mark ("HWM"), with remaining work occurring above the HWM.

3.5 Materials and Equipment

Materials and equipment are dictated by the Contractor and any limitations outlined in the project approvals. A generic list of materials and equipment required, specific to the outfall installation, have been identified below:

- Cement/grout;
- Riprap;
- Standard fuel;
- Culvert/headwall (pre-fabricated);
- Exclusion fencing for in-stream fish salvage works during outfall installation; and
- Physical equipment (i.e., excavator/loader etc.), as required by the Contractor.

A more exhaustive and finalized list of materials and equipment will be available once a contractor has been selected for the work.

3.6 Proposed Work Plan

The EDC is proposing to construct a warehouse/distribution facility ("Eagle Meadows Business Park"), comprised of six (6) properties and one (1) unopened road (Lots 6-2; 6-1-2; 6-1-3; 6-1-4; 6-1-5; 6-1-7 within Katzie Reserve No. 1). The six legal lots and one unopened road right of way total approximately 7.1 hectares. Proposed works include the closure of two (2) unnamed ditches. Improved servicing includes a new re-sized stormwater outfall which will be approved by the VFPA. Offsetting works are required as part of the ditch infill and will be approved under a forthcoming Section 11 WSA Approval (works outside of VFPA jurisdiction) and are not discussed further in this HA.

3.6.1 Headwall Design

NHC provided hydrotechnical engineering services for the Bonson Road stormwater outfall designs. The new outfall is expected to replace an existing outfall that is located approximately 900 metres downstream of the Golden Ears Bridge, 400 metres downstream of the upstream end of Barnston Island and less than 20 metres downstream of an existing pier and dock gangway.

The below information was obtained directly from the NHC (February 2022) report and design for the project.

"NHCs scope of work included the design of a headwall for a concrete stormwater outfall pipe at the south end of the Bonson Road that discharges into the Fraser River. The stormwater outfall pipe was designed by HUB Engineering Inc. to convey the 10-year storm (1.11 m³/s) and the 100-year storm (1.75m³/s) with a slope of 0.45%. NHC was provided with the pipe diameter (1.2 m) and

alignment by HUB Engineering. It is estimated that at the outlet, during the design discharge the pipe will be around 60% with an average flow velocity of less than 2.5 m/s. Despite the design not being part of the current design scope, it is recommended that the pipe at the outlet be concrete. This is to provide sufficient weight to resist buoyancy forces when Fraser River water levels are above the pipe. Since the pipe crosses through a dike, geotechnical design must include a means to retain and prevent the migration of soils along the path of the pipe surface (MFLNRO, 2014).

Based on the specification received from a local supplier, NHC recommended a custom precast headwall as shown on the attached drawings (i.e., Figure 4, below). The headwall is to include sufficient clearance to install the floodgate and a minimum rise between the bottom of the gate and floor of the outfall of 0.2 m to limit the risk of blockage from debris or sediment (as shown on the attached drawing). It is expected that handrails are required to meet local government safety requirements."

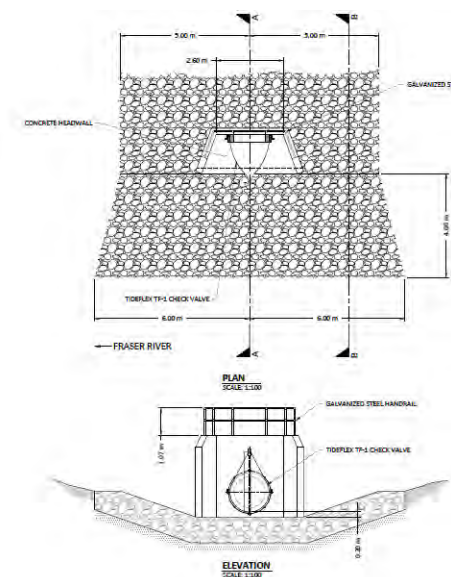


Figure 4. NHC Headwall Designs (plan and profile view).

3.6.2 Floodgate Design

The below floodgate information has been obtained from the NHC design report.

"A floodgate is to be installed to the headwall to prevent backflow through the culvert during Fraser River water levels. The standard approach is to use a top hinged, cast iron flap gate. This approach is generally the most cost effective, however it is susceptible to debris and sediment obstructing the opening and closing of the gate. The likelihood of obstruction increases with lowering the position of the outfall. A low outfall elevation is desired to better accommodate upstream stormwater collection and conveyance. The proposed elevation is at 0.8 m, this is roughly 0.2 m below the existing grade of the surrounding bed at the proposed outfall location. Despite the expectation of localized scour at the outfall (resulting from Fraser River flow and the discharge from the outfall), the site maybe susceptible to intermittent sedimentation. In order to reduce the susceptibility to obstruction, an elastomer duckbill style floodgate is proposed.

The riprap is to protect the banks as well as extend out from the bank as an apron. The apron is to resist erosion and scour from outfall flow as well as Fraser River flows around the outfall. The bank and apron riprap as designed is to be sufficient to withstand erosion for flow velocities expected during the Fraser River flows up to the 500-year flood as well as from the outflow from the outfall. During extreme Fraser River flood flows, river levels will be overbank. In addition to this condition, design checks of riprap stability were conducted for high flows contained within the banks, more extreme flood flows expected with climate change (moderate climate change projection from FLNRO 2014), and wave events potentially occurring at this site from wind and vessel traffic (design wave height of 0.5 m).

The proposed riprap armouring and concrete outfall structure have been designed to provide protection against scour and erosion for the outfall, and in doing so, exceeds the existing resistance to such actions. However, this localized bank work is not part of, nor attempts to provide erosion protection for the dike set back on Bonson Road (MWLAP, 2003)."

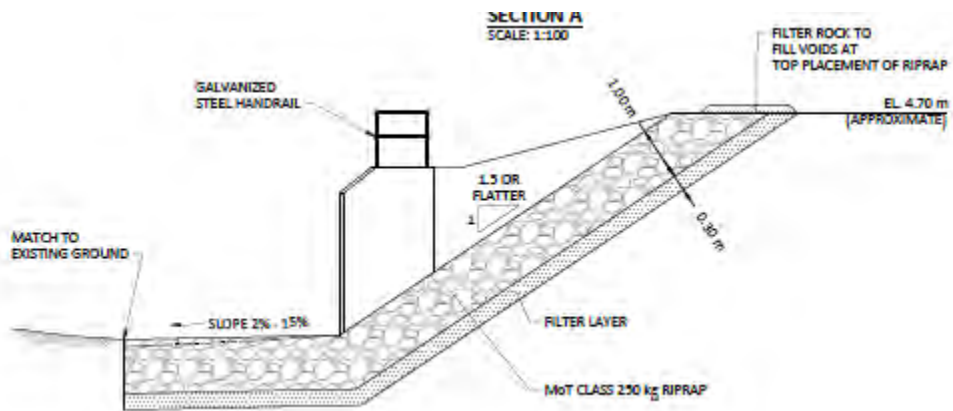


Figure 6. Riprap bank armouring design.

4 DESCRIPTION OF EXISTING ENVIRONMENT

The following sections summarize the environmental characteristics and features of the Site including a background review of publicly available online databases, field surveys, and reviews of reports and written and oral history from KFN (where applicable to the VFPA work area). The objectives are to identify potential sensitivities that might require further investigation or that may be affected by Project works and undertakings.

4.1 Background Review

The setting and condition of the works area located in VFPA jurisdiction, were assessed by reviewing previously completed reports, reviewing community plans and development regulations, conducting database searches, and retaining information provided by members of the KFN through consultation with designated contacts. The objectives of this review were to identify potential environmental concerns and issues that may require further investigation, and to collect relevant biophysical information to identify Valuable Ecosystem Component's ("VEC")

that may be affected by the proposed development, specifically the area of impact related to the storm outfall and works within VFPA jurisdiction.

This section summarizes the findings of the background information and database searches, which included a review of potential sensitive plant and animal species, as well as sensitive habitat areas that may occur on or adjacent to the Site. The background review included the following publicly available online databases, separated into four (4) watercourse and fisheries focused databases, and five (5) Species at Risk ("SAR") focused databases:

Watercourse and Fisheries Databases

- City of Pitt Meadow's Online Mapping System, Mapview
- Fish Inventories Data Queries ("FIDQ")
- Habitat Wizard
- Sensitive Habitat Inventory Mapping ("SHIM") Atlas

SAR Databases

- Provincial
 - British Columbia Conservation Data Centre ("BCCDC")
 - British Columbia Species & Ecosystems Explorer ("BCSEE")
 - iMapBC
- Federal
 - SAR Public Registry
 - Committee on the Status of Endangered Wildlife in Canada ("COSEWIC")

The following sub-sections, separated into the two (2) database types noted above, briefly describe the specific details or results relevant to these databases that facilitated the identification of VECs within and adjacent to the Subject Site.

Field Survey Methods

PLG completed the field reviews in a personal vehicle to navigate through the southern portion of Subject Site, and traversed the site (VFPA area and also upper site) on foot (i.e., in areas where vehicle access was difficult/restricted) (Photographs 1 and 2, below). A printed Mapview map showing recent aerial imagery (most recent year available) was used to guide the field survey. Written field notes and photographic documentation were obtained and completed in the field to document the assessment findings. Field information per each site visit has been included below:

June 24, 2020 – Time on-site: 2 hours Weather: Muggy and approximately 19 °C

December 9, 2021 – Time on-site: 2 hours Weather: Heavy rains and approximately 5°C

Field protocols used to complete general nesting bird surveys and terrestrial land use surveys are based on the following publicly available guidance documents:

- *Develop with Care 2014: Environmental Guidelines for Urban and Rural Land Development in British Columbia (2014). Section 4 – Environmentally Valuable Resources*²;
- *Develop with Care 2014: Environmental Guidelines for Urban and Rural Land Development in British Columbia (2014)*³;
- *Environment Canada's Safeguarding: Protecting migratory birds, colonies, nesting, guidelines, and management practices*⁴.
- *BC Ministry of Environment (MOE) RISC – Inventory Methods for Raptors, Version 2.0 (2001)*⁵; and
- *Guidelines for Raptor Conservation during Urban and Rural Land Development in British Columbia (2013)*⁶.
- *Guidelines for Nocturnal Owl Monitoring in North America (2001)*⁷
- *BC MOE RISC - Inventory and Survey Methods for Rare Plants (2018)*⁸;
- *BC "Living with Wildlife in BC" Management Guides #1-9 (2013)*⁹

4.1.1 Watercourse and Fisheries Databases Review

City of Pitt Meadow's Mapview

A background review of Mapview identified the Fraser River to the south of the Subject Site. The database did not yield information on any additional watercourses or aquatic features within or adjacent to the Subject Site; however, it should be noted that there is a known presence of Bonson Slough, Katzie Slough, and several unnamed perimeter ditches within the area that have also been included in the background searches.

The summary of fish present in the Fraser River included 74 different fish species, with the most recently documented fish observation occurring in March 2019 for White Sturgeon (*Acipenser transmontanus*). The summary of fish present in Katzie Slough indicated use by 21 different fish species, with the most recently documented fish observations for sculpin (general) and stickleback (general) occurring in August 2015.

²<https://www2.gov.bc.ca/assets/gov/environment/natural-resource-stewardship/best-management-practices/develop-with-care/dwc-section-4.pdf>

³<https://www2.gov.bc.ca/assets/gov/environment/natural-resource-stewardship/best-management-practices/develop-with-care/dwc-section-5-6-south-coast-region.pdf>

⁴<https://www.canada.ca/en/environment-climate-change/services/avoiding-harm-migratory-birds.html>

⁵https://www2.gov.bc.ca/assets/gov/environment/natural-resource-stewardship/nr-laws-policy/risc/rapt_ml_v2.pdf

⁶https://www2.gov.bc.ca/assets/gov/environment/natural-resource-stewardship/best-management-practices/raptor_conservation_guidelines_2013.pdf

⁷<https://www.bsc-eoc.org/download/Owl.pdf>

⁸https://www2.gov.bc.ca/assets/gov/environment/natural-resource-stewardship/nr-laws-policy/risc/inventory_and_survey_methods_for_rare_plants_and_lichens.pdf

⁹<https://www.rdos.bc.ca/public-works/living-with-wildlife-in-bc/>

Habitat Wizard

Habitat Wizard was also consulted for information on the Fraser River, Bonson Slough, Katzie Slough, and the unnamed perimeter ditches, and provided results comparable to the FIDQ database (Figure 7; Appendix C, attached). It should be noted that although “Bonson Slough” was not searchable on the FIDQ database, it is mapped on Habitat Wizard and information for this feature is provided under the Watershed Code 100-026700-02800-85900. The summary of fish species present in “Bonson Slough” indicated use by eight (8) different fish species, with the most recently documented fish observations occurring in October 2015 for brassy minnow (*Hybognathus hankinsoni*), brown catfish (*Ameiurus nebulosus*), carp (general), pumpkinseed (*Lepomis gibbosus*), and threespine stickleback (*Gasterosteus aculeatus*). Habitat Wizard Stream Reports for the Fraser River, Bonson Slough, and Katzie Slough can be found in Appendix D attached.

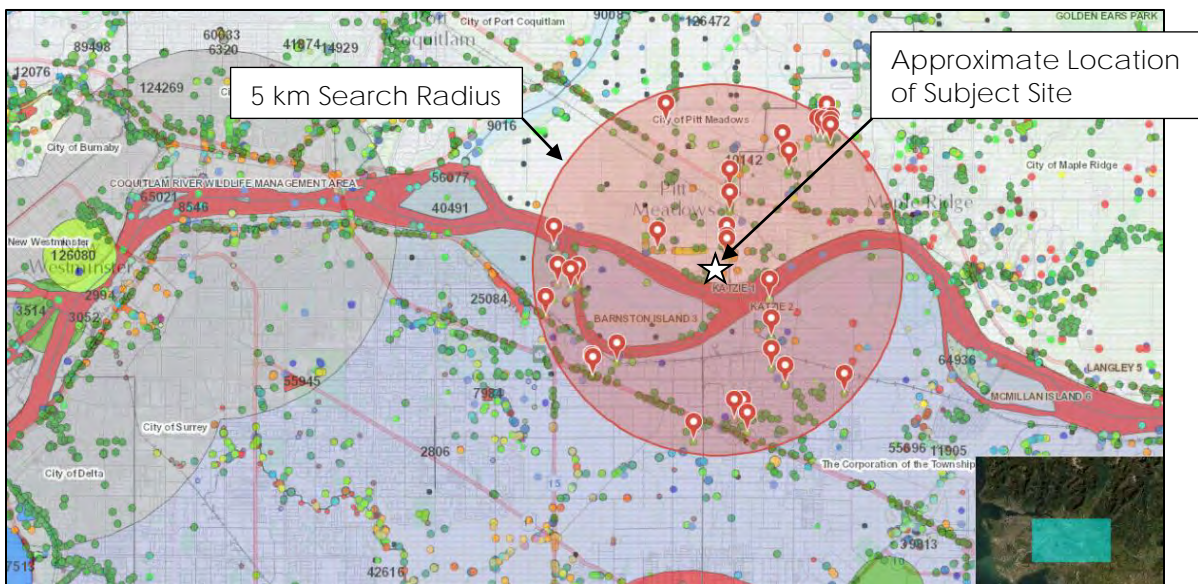


Figure 7. Habitat Wizard results for known watercourses and documented fish observations within a 5 km search radius (transparent red circle) from the approximate centre of the Subject Site (white star).

SHIM Atlas

The SHIM Atlas is a publicly available interactive Geographic Information System (“GIS”) tool for use in land-planning that identifies sensitive aquatic and terrestrial habitats; however, it should be noted that the database was last updated in April 2018, so information obtained from it now may not be completely accurate. SHIM mapping also relies on public information, so if no new or updated information is provided to SHIM, the information is considered historical.

The SHIM Atlas was accessed to determine whether any sensitive aquatic or terrestrial habitat is currently present within 5.0 km from the approximate centre of the Subject Site. The database identified several “Lower Fraser Watercourses 03 2020” within the search radius, including the

Fraser River (identified in red colour to denote "FISH" designation) to the south of the Subject Site, and multiple yellow coloured "UNKNOWN" designated watercourses within and adjacent to the Subject Site. It should be noted that greater number of watercourses were identified on the SHIM Atlas database compared to the City of Pitt Meadow's Mapview database.

4.1.2 SAR Databases

The following five (5) databases have identified SAR with the potential to be present regionally (within a 5.0 km search radius from the approximate centre of the Subject Site), and within the Subject Site, based on required habitat type and availability with respect to the applicable Biogeoclimatic ("BEC") zone associated with the Subject Site.

Provincial BCCDC

The BCCDC database maps areas of land and water where a Red listed or Blue listed species, or ecological communities at risk are known to occur. The Red list includes indigenous elements considered to be extirpated, endangered or threatened in BC. Endangered elements are facing imminent extirpation or extinction, whereas threatened elements are likely to become endangered if limiting factors are not reversed. Species on the Blue list are considered to be vulnerable or particularly sensitive to human activities or natural events (CDC 2014). The mapping database is updated nightly, and also provides a list of all the potential rare species and ecosystems occurring within the Lower Mainland Environmental Region. This list determines whether any additional species might occur on the Subject Site that are not present in the BCCDC rare element database.

The BCCDC Rare Element Occurrence Mapping Resource was queried for mapped documentation of provincially listed species documented within a 5.0 km search radius from the approximate centre of the Subject Site (Figure 8 below; Appendix D, attached). The search completed on November 19, 2020 returned seven (7) records of rare wildlife species results within the search radius (Great blue heron, Pacific Water Shrew, Painted Turtle, Trowbridge's Shrew, Western Screech Owl, White Sturgeon and Oregon Forest Snail), refer to Table 2 below. Based on the proposed work location and known available habitat, QEPs have determined that foreshore works associated with outfall installation are not expected to affect any of these species (see rationale in Table 2 below). CDC species reports for the three (3) species with the potential to occur within the Subject Site have been included in Appendix D (attached). Further, it should be noted that no rare plant SAR, ecological communities at risk, or known masked SAR occurrences were recorded within the 5.0 km search radius.

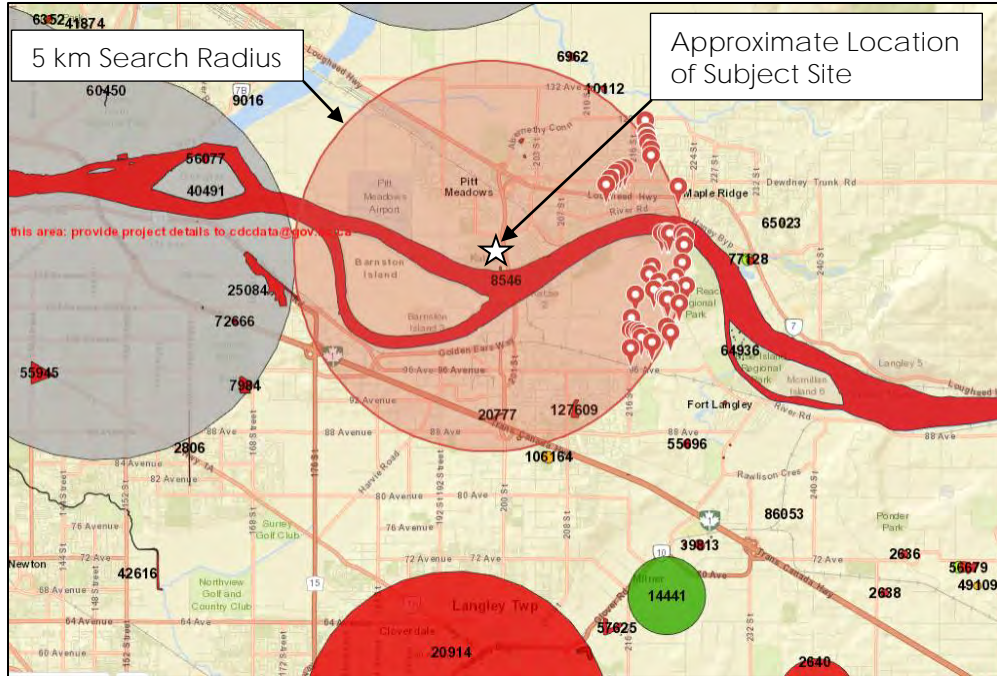


Figure 8. BCCDC search results for known and masked SAR within a 5 km search radius (transparent red circle) from the approximate centre of the Subject Site (white star).

Table 2. Mapped Observations of Wildlife SAR Within a 5.0 km Search Radius from the Approximate Centre of the Subject Site, Including Occurrence Potential Within the Subject Site¹⁰¹¹.

Common Name	Scientific Name	Provincial Status and List	Federal Status		Approximate Location Relative to Subject Site (km) ¹²	Most Recent Observation (Year)	Habitat Association	On-Site Occurrence	
			COSEWIC	SARA				Potential ¹³	Rationale
Vertebrate Animals									
Great Blue Heron, <i>fannini</i> subspecies	<i>Ardea herodias fannini</i>	S2S3B, S4N (2018) – Blue	SC (2008)	Schedule 1-SC (2010)	2.7 km NE	2013	TERRESTRIAL: Woodland Broadleaf, Forest Broadleaf, Forest Mixed; RIVERINE: Riparian	Low	The preferred habitat of this species includes dense canopy cover for nesting, and slow-moving water/estuarine conditions with riparian fringe for foraging. Works above the HWM of the Fraser River are not expected to affect habitat utilized by the species.
Pacific Water Shrew	<i>Sorex bendirii</i>	S2? (2015) – Red	E (2016)	Schedule 1-E (2003)	4.9 km W	2009	PALUSTRINE: Ditch; TERRESTRIAL: Forest Mixed	Low	Given the lack of vegetation and cover and steep slopes with erosion, the foreshore where the outfall is proposed is not expected to provide habitat for PWS.
Painted Turtle – Pacific Coast Population	<i>Chrysemys picta</i> pop. 1	S1S2 (2018) – Red	T (2016)	Schedule 1-E (2007)	5.0 km NE (Jerry Sulina Municipal Park)	2017	LACUSTRINE: Shallow Water, Riparian	Nil	The existing habitat on-Site (i.e., early seral stage deciduous forest) does not support the potential occurrence of this species, as the preferred habitat of this species is slow-moving, shallow lakes with open canopies for basking.
Trowbridge's Shrew	<i>Sorex trowbridgii</i>	S3 (2015) – Blue	No Status	No Status	4.0 km S (Latimer Creek)	2001	TERRESTRIAL; FOREST MIXED; CREEK; RIPARIAN	Low	The existing habitat near the outfall location does not provide habitat for this species.
Western Screech-Owl, <i>kennicottii</i> subspecies	<i>Megascops kennicottii</i>	S2S3 (2017) – Blue	T (2012)	Schedule 1-T (2005)	4.3 km SE (Walnut Grove Park)	2008	TERRESTRIAL: Woodland Mixed; RIVERINE: Riparian	Nil	The existing habitat on-Site does not support the potential occurrence of this species, as the habitat consists primarily of an early seral stage forest with mostly deciduous trees. The preferred habitat of this species is dense conifer forests (e.g., dead trees and snags, which serve as nest sites and roosts).
White Sturgeon (Lower Fraser River Population)	<i>Acipenser transmontanus</i> pop. 4	S1S2 (2018) -Red	T (2012)	No Status	0.3 km S (Fraser River)	2004	RIVERINE: Big River, High Gradient, Low Gradient, Moderate Gradient; ESTUARINE: River Mouth, Tidal Flat	Low	Although works are occurring on the upper banks of the Fraser River, works are not expected to affect spawning or rearing habitat for White Sturgeon.
Invertebrate Animals									
Oregon Forestsnail	<i>Allogona townsendiana</i>	S2 (2015) – Red	E (2013)	Schedule 1-E (2005)	4.6 km S	2012	TERRESTRIAL: Urban, Woodland Broadleaf; RIVERINE: Riparian	Low	The existing habitat on-Site does not support the potential occurrence of this species

¹⁰ Data obtained from the CDC Species Report for each species listed on November 19, 2020 (Appendix E, attached). As the BCCDC database is updated nightly, current species results within the search radius may differ from the above results obtained on November 19, 2020.

¹¹ No rare plant SAR or ecological communities were identified within the search radius.

¹² Approximate distance measurement obtained using the distance feature on the BCCDC map.

¹³ On-Site occurrence potential was evaluated based on existing available habitat within the Subject Property, and proximity of the most recent observation occurrence documented on the BCCDC map.

Provincial BCSEE

The BCSEE database stores information for over 22,000 plants, animals and ecological communities in BC, and is linked to data contained in the BCCDC mapping database. The BCSEE database allows users to generate lists based on chosen search criteria (e.g., conservation status, legal designation, area, etc.), and investigate what species potentially occur in an area of interest.

Available information obtained from the BCSEE database for each species identified in the BCCDC search was comparable, and no discrepancies in status or listing were noted.

Provincial iMapBC

The iMapBC database is a publicly available mapping tool that allows users to view and analyze thousands of geographic datasets stored in the BC Geographic Warehouse. The dataset topics are wide-ranging and include both anthropogenic and biotic categories, such as agriculture, archaeology and culture, education, fish wildlife and plant species, fresh water and marine, geology and soils, physical infrastructure, transportation, and waste.

A 5.0 km search radius from the approximate centre of the Subject Site for species and/or ecosystems at risk was completed in iMapBC using the “Critical Habitat for Federally-Listed Species at Risk – Posted” and “Species and Ecosystems at Risk – Publicly Available Occurrences – Conservation Data Centre” subcategories under the main “Fish Wildlife and Plant Species” layer, and the database yielded information comparable to the other database searches.

Federal SAR Public Registry

The Public Registry of the SARA provides information on rare species that may occur in the local area/or region of the Site. Species listed in Schedule 1 of the federal SARA and their critical habitats are protected in Canada. Federally listed species are designated as being Extinct, Extirpated, Endangered, Threatened, Special Concern, Data Deficient, or Not at Risk. An Extinct wildlife species no longer exists, while an Extirpated wildlife species no longer exists in the wild in Canada but occurs elsewhere. An Endangered species is facing imminent extirpation or extinction, a Threatened species is likely to become endangered if limiting factors are not reversed and a species of Special Concern may become threatened or endangered because of a combination of biological characteristics and identified threats. A wildlife species designated as Data Deficient indicates that there is inadequate information to make a direct, or indirect, assessment of its risk of extinction, while a Not At-Risk species has been evaluated and found to be not at risk of extinction given the current circumstances.

The SAR Public Registry was accessed to collect information on SAR that may occur on within 5.0 km from the approximate centre of the Subject Site, and to determine their current status under the SARA. Table 2 above lists the seven (7) SARA listed species that were identified in the search, with three (3) having the potential to occur on-Site based on an initial review of available habitat within the relevant BEC zone for the Subject Site. Available information

obtained from the SAR Public Registry for each species identified in Table 2 above was comparable, and no discrepancies in status or listing were noted.

Federal COSEWIC

COSEWIC is an independent advisory panel to the Minister of Environment and Climate Change Canada ("ECCC") that assesses the status of wildlife species at risk of extinction. The members who make up this panel consist of wildlife biology experts from various public and private sectors who are responsible for designating wildlife SAR in Canada. A comprehensive status report is prepared for each designated wildlife SAR in Canada, which includes information on the basic biology of a wildlife species, as well as species distribution in Canada, population sizes and trends, habitat availability and trends, and threats.

The COSEWIC wildlife species search engine was accessed to determine the recommendations and status for species placed on the SARA Schedule 1, 2, or 3 lists, and to investigate the presence of, and review, associated status reports, habitat requisites, and recovery strategies of the SARA species listed by the occurrence records within a 5.0 km search radius from the approximate centre of the Subject Site.

4.1.3 Geophysical Setting

BEC Zone

According to iMapBC, the Subject Site lies within the Coastal Western Hemlock ("CWH") zone, specifically within the Eastern Very Dry Maritime (CWHxm1) subzone. The CWH zone occurs at low to mid elevations along much of the coast of BC. The maritime subzones are located further inland, with the drier zones located in the rain shadows of the Coast Mountains (Centre for Forest Conservation Genetics, 2019).

Highly productive coniferous forests, commonly called temperate rainforests, are characteristic in this climate. Forests within the CWHxm1 subzone are dominated by tree species such as the Douglas-fir (*Pseudotsuga menziesii*), the Western hemlock (*Tsuga heterophylla*) and the Western red cedar (*Thuja plicata*). The well-developed understory shrub layer is typically composed of salal (*Gaultheria shallon*), dull Oregon-grape (*Mahonia nervosa*), and red huckleberry (*Vaccinium parvifolium*). Herbs typically found in the understory include twinflower (*Linnaea borealis*), sword fern (*Polystichum munitum*), bracken fern (*Pteridium aquilinum*), and vanilla leaf (*Achlys triphylla*; The Ecology of the Coastal Western Hemlock Zone, 1999).

Soil

Soil conditions are a key factor affecting drainage within the Subject Site. A background review of the British Columbia Soil Information Finder Tool ("BC SIFT") indicates the property soil type is a combination of HALLERT, FAIRFIELD, and KATZIE. The approximate eastern half of the Subject Site is comprised of 100% HALLERT soil, which is described as poorly drained silt loam. The approximate western half of the Subject Site is comprised of 70% FAIRFIELD soil and 30% FAIRFIELD soil is imperfectly drained silty clay loam, and KATZIE soil is poorly drained silty clay loam. These soils are typically low productivity and high erodibility. Soil results from SIFT

are consistent with information obtained from Map Sheet 38 in the Soils of Langley-Vancouver Map Area (Volume 6) for BC Soils Survey mapping.

Further, it should be noted that the Subject Site has been filled with non-native soil material in the early 2000's, which has raised the ground elevation from approximately 4 metres to 10 metres (i.e., additional 6 metres of non-native material).

Geology

A preliminary Geotechnical Investigation report has been prepared by GeoPacific Consultants Ltd. (GeoPacific) in September 2019 for the Subject Site. The preliminary Geotechnical Investigation was completed to provide preliminary recommendations for the design and construction of the proposed development, and included a summary of existing soil conditions. A brief summary of findings is included below:

- GeoPacific completed eight (8) solid stem auger test holes and seven (7) cone penetration test ("CPT") soundings with one (1) shear wave velocity profile within the Subject Site on June 4 and 5, 2019; and
- Soil profiles were variable through the test locations, but all indicated silty SAND and GRAVEL FILL, overlying a thin layer of soft to firm SILT to silty SAND, overlying firm to stiff silty CLAY, with some interbedded compact SAND to silty SAND.

4.1.4 *Atmospheric Setting*

The closest weather station to the Subject Site is "Pitt Meadows CS British Columbia" (Station ID 6830). This station is located approximately 0.5 km southwest of the Subject Site (Latitude: 49°12'29.964" N, Longitude: 122°41'24.076' W, Climate ID 1106178), at an elevation of 5.00 metres above sea level, and is currently operated by ECCC – Meteorological Service of Canada.

Recent data obtained from the Government of Canada's Historical Climate Data Search for this weather station indicates that the annual precipitation from January 1, 2020 to January 1, 2021 was a total of 2,301.1 mm, with an average monthly precipitation of 171.1 mm. The highest recorded precipitation occurred during January 2020 (485.9 mm) and the lowest recorded precipitation occurred during April 2020 (40.2 mm). The coldest average monthly temperature recorded during this period was 3.8°C in January 2020, and the warmest average month temperature recorded was 18.9°C in August 2020.

4.1.5 *Aquatic Setting*

Surface Water

The Fraser River (Watershed Code 100) is an off-Site Habitat Wizard mapped feature located along the entire southern boundary of the Subject Site and is considered to be a fish-bearing stream under all applicable legislation and regulations. Katzie Slough (Watershed Code 100-026700-02800) and Bonson Slough (Watershed Code 100-026700-02800-85900) were also identified on the Habitat Wizard database as off-Site features located N-S within the eastern

portion of the Subject Site and to the north of the Site along Airport Way, respectively (Figure 9). Katzie Slough is a mapped connection between the Fraser River to the south and the Pitt River to the northwest of the Site. The proposed development within the Site is located approximately 275 metres away from the Fraser River, approximately 225 metres away from Katzie Slough, and approximately 245 metres away from Bonson Slough.

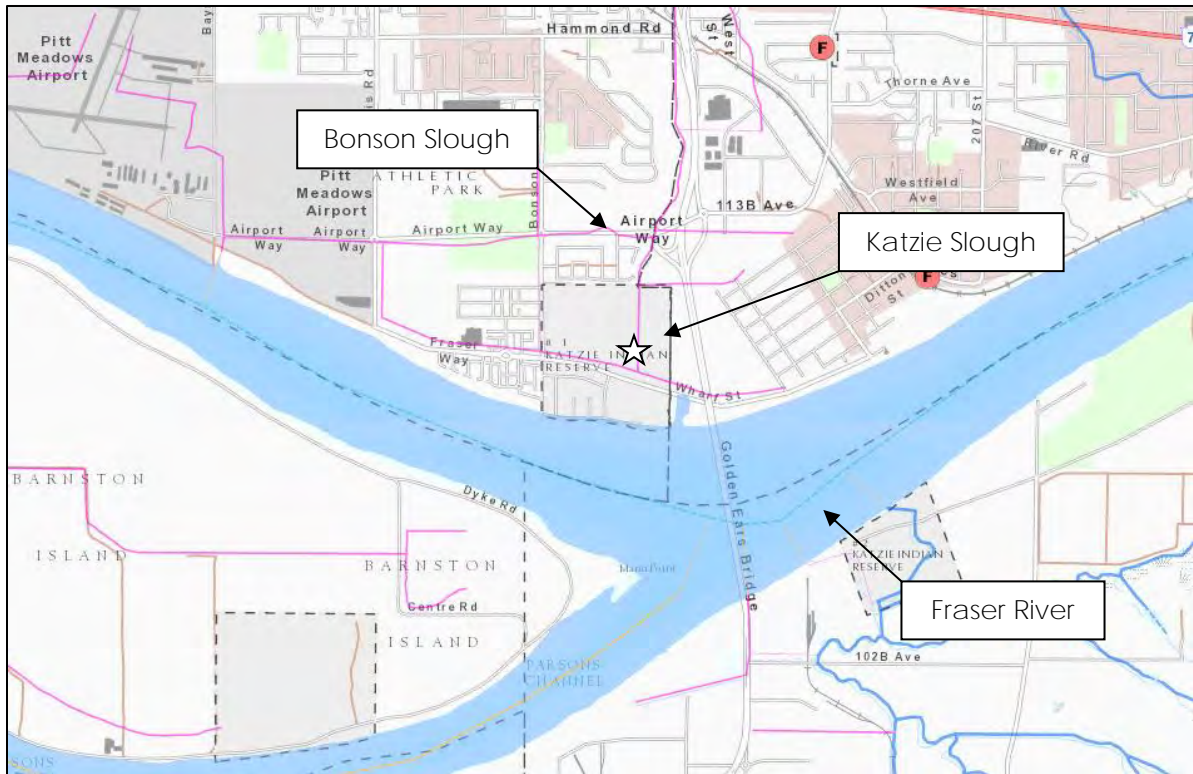


Figure 9. Habitat Wizard mapped streams (pink and blue lines) within and adjacent to the Katzie Reserve No. 1 (white star).

In addition, several mapped, unnamed “stream routes” were identified on the background search databases along roadways within and adjacent to the Subject Site, and all appeared to be connected to Bonson Slough and/or Katzie Slough. Please refer to Section 4.2 for additional surface water observations made during PLG’s field survey.

Groundwater

The existence of groundwater and perched water within the Subject Site is highly likely, given the presence of poorly and imperfectly draining soils and presence of impermeable non-native soil material.

A preliminary Geotechnical Investigation was completed by GeoPacific in September 2019, and indicated the following with respect to groundwater within the Subject Site:

- The groundwater table is estimated to be between 1 to 3 metres below off-Site grades, and 4 to 12 metres below site grades, due to the presence of significant fills;

- Perched water is expected in the surficial fill material and above relatively impermeable layers; and
- Groundwater levels are expected to vary seasonally with generally higher levels following sustained precipitation and by tidal fluctuations.

Drainage

No on-Site drainage features (e.g., ditches, culverts, headwalls, etc.) other than Unnamed Ditches 1 and 2 are mapped on Mapview; however, due to the Site's proximity to the Fraser River and visual interpretation of the available 2018 aerial imagery, several unmapped features (e.g., roadside ditches) are present within and adjacent to the Subject Site (please refer to Section 4.2 for drainage observations made during PLG's field survey). One (1) roadside ditch is located along the southern end of Wharf Street, however; this feature has been confirmed to have been isolated at several locations, and has no connectivity to the ditches noted along the northern end of Wharf Street or along Bonson Road. Due to this lack of connectivity, this feature does not meet the definition of a stream under relevant legislation.

Further, it is expected that post-development drainage from Project works will be directed south towards the Fraser River. Lot grading and drainage plans will be appropriately prepared by a professional engineer; however, a new outfall to the Fraser River is proposed to facilitate this drainage strategy and off-Site engineering drawings prepared by Hub Engineering Inc. Installation of the outfalls to be completed under appropriate permits (e.g., WSA Notification application, under Section 39 of the WSR).

4.1.6 *Terrestrial Setting*

Portions of the Subject Site are located within a Flood Hazard Zone and within the Fraser River floodplain. Wharf Street is a Provincially constructed Dike that has had historical influence on the terrestrial conditions onsite. **A Flood Assessment was completed as part of GeoPacific's preliminary Geotechnical Report, and a follow-up Flood Assessment Letter was prepared to provide further clarification. A brief summary of the flood assessment findings is provided below:**

- **The Subject Site is located within the Fraser River Floodplain boundary, and the design floodplain elevation is 5.8 geodetic;**
- **GeoPacific determined that current grades for most of the Subject Site, with the exception of the south extent, are above the floodplain elevation;**
- **It is expected that the site can be graded so slab-on-grade top of slab elevations are constructed above Flood Elevation Level ("FEL"); however, in the event structures are constructed below FEL, a flood which results in water inundation of the structure is not expected to have any impact on the foundations of the proposed buildings;**
- **Further, the existing Pitt Meadows South Dike will provide additional flooding protection for the Subject Site during higher probability flood events; and**

- GeoPacific confirmed that the land may be used safely for the intended use (i.e., proposed industrial development), adhering to the considerations and recommendations outlined in their Geotechnical Investigation report and Flood Assessment letter.

4.1.7 *Wildlife and Plant Species*

Wildlife on the lands include ducks, geese, pheasants, muskrats and frogs along the ditches. Based on discussion with local first nations members, Memories of other wildlife include a sighting of a Snowy Owl and a Red Fox on the land. Due to the effects of historical filling, historical wildlife migration and native plant species have been affected. Given the historical land disturbance vegetation availability is young/early seral and plant wildlife use is limited to opportunistic species and some migratory species (primarily avian and amphibian).

4.1.8 *Archaeological Setting*

Off-Site Works – VFPA Jurisdiction

The project off-Site works include upgrades to services down Bonson Road to the Fraser River where a stormwater outfall into the River is planned. It is noted that the works down Bonson Road are not within Katzie First Nation, and subsequently will require a provincial heritage permitting prior to commencement of works. Engineering off-Site drawings have been prepared by Hub Engineering Inc (Appendix B, attached).

An Archaeological information request was submitted to the Provincial Archaeology Branch on January 29, 2021. The results from information request attached in Appendix E indicate that there are no known archaeological sites recorded on the Subject Site; however, previously recorded archaeological site DhRq-5 is recorded at the south end of the Katzie IR#1, and there is a possibility that the site extends beyond the Reserve boundary. Archaeological potential modelling for the area indicates there is high potential for previously unidentified archaeological sites to exist within the majority of the Katzie Reserve lands. Indian Reserves fall under Federal Jurisdiction and any archaeological sites located on Reserves are not protected under the HCA.

Heather Kendall of Katzie Development Limited Partnership has indicated that site DHRQ5 is located within close vicinity to the future storm outfall and Archaeological Impact Assessment ("AIA") for works down Bonson at the Fraser River will be required. EDC has requested a work plan from Heather and intends to engage the firm to complete the works.

4.2 *Biophysical Field Survey*

PLG's team of QEPs conducted two (2) field surveys on June 24, 2020 and December 9, 2021, to evaluate the biophysical conditions within the Subject Site, including observations pertaining to existing buildings/structures, fish and fish habitat, vegetation, and wildlife. The objective of the field survey was to collect additional biophysical information from the Subject Site, to supplement existing background information gathered during the desktop survey (refer to Section 4.1, above). A summary of the field survey methodology used and results has been provided in the following sections.

4.2.1 Field Survey Methodology

PLG completed the field reviews in a personal vehicle to navigate through the southern portion of Subject Site, and traversed the more complex terrain in the northern portion on foot (i.e., in areas where vehicle access was difficult/restricted) (Photographs 1 and 2, below). A printed Mapview map showing recent aerial imagery (most recent year available) was used to guide the field survey. Written field notes and photographic documentation were obtained and completed in the field to document the assessment findings. Field information per each site visit has been included below:

June 24, 2020 – Time on-site: 2 hours Weather: Muggy and approximately 19 °C

December 9, 2021 – Time on-site: 2 hours Weather: Heavy rains and approximately 5°C

4.2.2 Field Survey Observations – Existing Environment

All mapped and unmapped surface water/drainage features within and adjacent to the Subject Site were reviewed as part of the field survey. The following sections summarize the three (3) mapped streams, three (3) unmapped perimeter drainage features, isolated seasonal surface pools, and overland flow observations obtained during the field survey.

Fraser River

The Fraser River was observed off-Site to the south of the Subject Site, flowing east-west during the field survey, and is considered to be a fish-bearing stream based on information collected from the background database searches. Although the majority of proposed development is located approximately 300 metres away from the Fraser River a new drainage outfall will be installed immediately above the high-water-mark of the Fraser River. The Fraser River foreshore was observed to have undercut banks due to fluctuating water levels, significant erosion impact observed and benched areas resulting from seasonal sediment distribution.



Photographs 1-2. (1) Facing east, looking at the Fraser River foreshore, immediately south of Bonson Road. Erosion was visible and unprotected banks were noted. (2) Facing north, looking at vertical banks and failing riprap (Photographs from NHC, 2022).

Vegetation

Vegetation available immediately south of River Road is limited to opportunistic juvenile alder growth, some blackberry, grasses and tansy (Photograph 3, below). Vegetation has limited ability to thrive at this location due to the poor soils and compacted area as a result of rock armouring and riprap placement.



Photograph 3. View facing west, looking at commonly occurring vegetation within the future outfall works location. Vegetation was indicative of historical land alterations, with opportunistic clusters of invasive species and juvenile alder regeneration being clear signs of past disturbance.

Wildlife/Fish

No mammals were observed during the Site visit; however, close proximity to the Fraser River and an urban area (e.g., residential neighbourhoods to the north and west) may result in small rodents and mammals such as rat (*Rattus*), raccoon (*Procyon lotor*) and coyote (*Canis latrans*) to be found within the Site. Songbirds visually and audibly detected during the field survey included American crow (*Corvus brachyrhynchos*), American robin (*Turdus migratorius*), black-capped chickadee (*Poecile atricapillus*), rufous hummingbird (*Selasphorus rufus*), and song sparrow (*Melospiza melodia*). Further, no mammal SAR (as defined in the SARA) were observed. Given the proximity to the Fraser River, at low tide the foreshore may be a suitable hunting and foraging area for raptor species and Great blue heron (Photograph 4, below).

No fish were observed during the Site visit; however, the projects works, particularly the outfall works, are within close proximity to the Fraser River where there are known fish occurrences (see section “4.1.1 Watercourse and Fisheries Databases Review” above for potentially present fish species). Given works will be planned in appropriate work windows and tides, no

impacts to fish species are expected (and confirmed by DFO) and implementation of industry best practices and mitigation (please also refer to the CEMP in Appendix A).

A background review of the SARA species database (i.e., SAR Public Registry) did not identify any known SARA listed species within the Subject Site; however, several SAR were identified within the 5 km search radius from the Site (refer to Table 2, above).



Photograph 4. View facing north, looking at available foreshore area for opportunistic wildlife foraging north of the proposed work location.

5 POTENTIAL IMPACTS

5.1 Impacts Related to Design, Construction, Operation

Based on drawings provided by NHC and assuming a typical water level of 2.2 m CGVD28 the total permanent footprint of disturbance associated with the new outfall is as follows:

- Above typical water: 60 m²
- Below typical water: 70 m²
- Total: 130 m²

The permanent impacts to wildlife, fish, and/or vegetation are as follows:

- Approximately 3 m² of low-lying, primarily non-native, herbaceous vegetation will be removed in advance of riprap and concrete headwall installation resulting in low quality habitat removal for small mammals and birds;
- Approximately 12 m² of the Fraser River slope bank will be covered in riprap; however, there is no known occurrence of fish (including sturgeon) spawning habitat close to the Subject Property and no impact of riprap installation is anticipated for fish. Additionally, riprap is isolated to the immediate river bank

therefore, no impact is anticipated for low-tide foraging habitat (e.g., great blue heron) along the Fraser River foreshore; and

- New flows introduced from the outfall into the Fraser River could alter water contribution to the Fraser River impacting low-tide foraging habitat or fish habitat in the area. Given the flows are storm and managed by a backflow preventer, new flows are not expected to change the water contribution to the Fraser River, as the outlet is designed to ensure pre and post flows already being generated from the upstream Site are maintained.

Given the outfall installation works are planned for mostly above the active HWM of the Fraser River and within an area with limited available vegetation, impacts related to construction are minimal. It should also be noted that once the outfall is installed, maintenance is not anticipated.

Temporary impacts to wildlife, fish, and/or vegetation are as follows:

- Introduction of deleterious substances (e.g., fuel, oil and erosion materials) during outfall construction to the Fraser River impacting fish habitat and low-tide wildlife foraging habitat;
- Noise disturbance during construction potentially impacting fish and wildlife; and
- Potential introduction or spread of invasive species through heavy machinery and other construction equipment, impacting vegetation biodiversity for fish and wildlife habitat.

All temporary impacts are construction related and are addressed in the attached CEMP (Appendix A). Fish habitat is not expected to be affected given the work is not occurring in the channel. A slight increase in noise may occur during routine equipment operations, but there is a very low risk for direct fish mortality or long-term habitat (riparian or aquatic).

Equipment selected to work in proximity to the Fraser River must be in good working order and cleaned in advance to ensure any residual vegetation is removed to avoid the spread of invasive or non-native species onto the Fraser River foreshore and bank area. Further, all works pertaining to outfall works will be include equipment work from above the bank (including material deliveries) and no barging of equipment/materials is required.

6 MITIGATION MEASURES

The following avoidance and mitigation measures have been developed in consideration of habitat assessment findings specific to the works occurring in the VFPA works and approval area. In addition to the below best practices and mitigation measures, an Environmental Monitor should be present during outfall works and additional environmental protection measures identified in the projects overarching CEMP must be adhered to.

- An EM must be present during outfall construction works;
- Project works must maintain compliance with the City of Pitt Meadows Noise Control Bylaw and VPFA permitted work hours;
- Temporary ESC controls must be in place prior to mobilizing equipment to the outfall works location, this may also include equipment necessary for work zone isolation (i.e., coffer dam, bulk bags etc.);
- Water quality monitoring will be obtained during works in proximity to the Fraser River by the observing EM;
- Any required in-water works must be completed only in the least risk work window (typically May – August);
- Removal of low growing herbaceous vegetation should be limited to the project footprint, and should not occur within the defined SPEA;
- Complete the works during dry weather as quickly as possible once they have started;
- Equipment must be operated from above the bank of the Fraser River and cannot operate from within the River itself;
- Ensure materials such as rip rap, pipes etc. are free of silt and debris potentially harmful to aquatic life;
- Deleterious substances must be prevented from entering the Fraser River;
- Equipment selected for construction will be appropriately maintained (i.e., leak free and cleaned in advance to control the spread of non-native and invasive species);
- Spill kits will be available on all equipment and will be sized appropriately and contain products necessary for the control of potential spills within the project area;
- Re-fuelling should occur off-site;
- No wastewater will be discharged into the Fraser River; and
- All permits, licenses and authorisations for the work will be secured and copies will be available on-site for review if asked by authorized agents.

Additional best practices and construction requirements have been identified in the CEMP attached in Appendix A.

7 ENVIRONMENTAL MONITORING PROGRAM

The following environmental monitoring and maintenance program has been prepared to guide the Contractor and Applicant/Landowner during all stages of work, as described above.

The overall objectives of the monitoring program are to protect existing aquatic resources and wildlife habitat, provide general oversight of Project works conducted in and around water, and upland from valuable aquatic resources. The program confirms that mitigation measures are being appropriately applied and are effective, documenting and responding to environmental emergencies and concerns (including follow up reporting as applicable), and providing guidance and adaptive measures where required, providing records and reports to the appropriate stake holders.

7.1 Environmental Monitoring During Outfall Installation

Outfall installation will be supervised by a qualified professional EM/QEP. The EM is required to be on-Site full-time during construction activities and is responsible for observing the methods of construction. The EM will prepare information and report on the compliance of the construction activities, including, but not limited to, completion of the following:

- Ensure all BMPs and mitigation measures are in place to avoid and minimize environmental impact to the land and to the fish and fish habitat of the existing streams;
- Ensure ESC measures are constructed, installed, and maintained appropriately for the full duration of outfall works;
- In the event of an environmental incident (e.g., spill) or non-compliance with any of the terms or conditions of the forthcoming WSA Change Approval and/or WSR Notification, notify the Water Manager (604-586-4400) within 24 hours from the time the event occurred;
- Be granted authority to stop the work authorized under this approval if deemed necessary to address risks to the environment;
- Conduct water quality sampling upstream and downstream of Project works to confirm that water quality in the existing streams is not being adversely impacted by construction works. The EM/QEP will confirm that on-Site turbidity measurements do not exceed 100 Nephelometric Turbidity Units [NTU; as per the BC Approved Water Quality Guidelines for Aquatic Life ("BCAWQG")]; and
- Document (via photographs and field notes) that the drainage outfall has been appropriately constructed and graded (as per Hub Engineering's design plans attached).

8 SUMMARY AND CONCLUSIONS

This report was completed based on the results of background reviews, publicly available information, public consultation with members of the KFN, and a site visit in June 2020/December 2021. Additional feedback from the process will be made available, where necessary.

Conclusions and recommendations documented in this report are expected to provide the necessary information and best practices and mitigation measures to reduce, but not fully eliminate the potential for environmental impacts to occur, as a result of the proposed Project. In addition to potential temporary but manageable cumulative effects as a result of the proposed development, the majority of these effects are temporary and/or managed through suitable mitigation measures.


PLG's Professional Team has considered the information herein. In consideration of projects of similar nature, the results of this report, identified impacts related to design and construction, and recommended mitigation measures prior, during and post construction, it is our opinion that the works, as proposed, are not expected to result in significant effects to the environment.

This report has been prepared and reviewed by PLG professionals who have the credentials and knowledge of the applicable public laws, regulations and/or policies which apply to this report.

We trust that the information provided within this HA is sufficient and gives a clear overview of the environmental characteristics within the Subject Site and appropriately summarizes the proposed development. Should you have any comments or questions regarding this correspondence, please contact the undersigned at (604) 501-1624.

Sincerely,

PACIFIC LAND RESOURCE GROUP INC.



Bridgette Knowlan, BIT, BC-CESCL
Junior Biologist



Kyla Bryant-Milne, RPBio, QEP
Biologist

APPENDIX A – CEMP

CONSTRUCTION ENVIRONMENTAL MANAGEMENT PLAN

Katzie Reserve No. 1, Pitt Meadows BC

PREPARED FOR: Katzie First Nations and EPTA Development Corp.



PREPARED BY:



Pacific Land Resource Group Inc.
212-12992 76 Avenue | Surrey, British Columbia | V3W 2V6 | 604-501-1624
20-2065

Version	Date	Notes
1	April 2022	General CEMP for use as part of the complete development application
2	August 2022	Edits to address VFPA review comments

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Appendix A – 6 Steps to Spill Response

List of Acronyms

AIA	Archaeological Impact Assessment
APB	Association of Professional Biology
ASPB	Alberta Society of Professional Biologists
BCAWQG	British Columbia Approved Water Quality Guidelines
BIT	Biologist in Training
BMPs	Best Management Practices
BNS	Bird Nest Survey
CAB	College of Applied Biology
CEAA	Canadian Environmental Assessment Act
CESCL	Certified Erosion Sediment Control Lead
CANUTEC	Canadian Transport Emergency Centre
CB	Catch Basin
CEMP	Construction Environmental Management Plan
CSR	Contaminated Sites Regulations
DFO	Fisheries and Oceans Canada
DP	Development Permit
ECCC	Environmental and Climate Change Canada
EDC	Epta Development Corporation
EIR	Environmental Incident Report
EM	Environmental Monitor
EMA	Environmental Management Act
EMBC	Emergency Management British Columbia
ESC	Erosion and Sediment Control
ESCAC	Erosion Sediment Control Association of Canada
FA	Fisheries Act
GIS	Geographic Information System
IAA	Impact Assessment Act
LUP	Land Use Plan
MBCA	Migratory Birds Convention Act
MFLNRORD	Ministry of Forests, Lands, Natural Resource Operations & Rural Development
MOE	Ministry of Environment
MSDS	Material Safety Data Sheets
NTU	Nephelometric Turbidity Units

OHS	Occupational Health and Safety
PEP	Provincial Emergency Program
PLG	Pacific Land Resource Group Inc.
QEP	Qualified Environmental Professional
RAPR	Riparian Areas Protection Regulation
RCMP	Royal Canadian Mounted Police
RFR	Request for Review
RFP	Registered Professional Forester
RPBio	Registered Professional Biologist
SARA	Species at Risk Act
SHIM	Sensitive Habitat Inventory Mapping
SPEA	Streamside Protection and Enhancement Area
SRE	Significant Rainfall Event
SRP	Spill Response Plan
TDG	Transportation of Dangerous Goods
TSS	Total Suspended Solids
VFPA	Vancouver Fraser Port Authority
WA	Wildlife Act
WHMIS	Workplace Hazardous Materials Information System
WMA	Waste Management Act
WQM	Water Quality Monitoring
WSA	Water Sustainability Act
WSR	Water Sustainability Regulation

1.0 INTRODUCTION

Pacific Land Resource Group Inc., (PLG) on behalf of Epta Development Corporation ("EDC"; "the Developer/Client"), has prepared this Construction Environmental Management Plan ("CEMP") as part of a Development Permit ("DP") application for Eagle Meadows Business Park. The proposed warehouse/distribution facility is comprised of six (6) properties and one (1) unopened road within Katzie Reserve No. 1 ("Subject Property/Site"). The Project proposes two (2) large light industrial warehouses approximately 371,000 square feet (34,467 square metres) in size. Full off-Site upgrades include: new sidewalks; an east west public greenway along Wharf Street, and necessary site servicing (storm, sanitary and water). A new storm outfall is proposed south on Bonson Road to the Fraser River; all information in this CEMP pertaining to the storm outfall on the Fraser River foreshore applies to works within Vancouver Fraser Port Authority (VFPA) jurisdiction.

As part of this CEMP, Best Management Practices (BMPs) are included to ensure that construction does not negatively affect environmentally sensitive areas that have been identified on and adjacent to the Subject Property. Measures, as set forth in this CEMP, will be developed and implemented to reduce risk to areas within and around the Project area.

1.1 Objectives of the CEMP

The objectives of this CEMP are to:

- Describe the work procedures to be undertaken to minimize and mitigate adverse impacts to the environment resulting from this Project;
- Provide Contractors and subcontractors with sound advice for environmental protection planning and recommend BMPs to guide work activities on the Project;
- Identify any elements of the Project that could present a potential risk to the environment;
- Identify acceptable water quality criteria to guide environmental monitoring during Project works (if required); and
- Describe emergency response procedures to be undertaken to contain and limit impacts to the environment in the event of a spill incident resulting from this Project.

1.2 CEMP Revisions

This CEMP will be used as a guide and resource for the Client, Contractors, the designated Environmental Monitor (EM), VFPA (for outfall works only), and government agencies (if applicable) to measure compliance with the environmental protection and mitigation requirements of the Project [specifically, as part of external reviews by the Department of Fisheries and Oceans Canada (DFO) and VFPA (for outfall works only) and review of proposed environmental works by the Ministry of Forests, Lands, Natural Resource Operations and Rural Developments (MFLNRORD)]. Environmental monitoring is a component of the Project and is described in the body of this CEMP.

This CEMP is considered a working report and will be updated as required following local and senior government agency review, and when Project timelines and scope changes occur.

2.0 PROJECT INFORMATION

2.1 Project Works Description and Rationale

EDC is proposing to construct a warehouse/distribution facility ("Eagle Meadows Business Park"), comprised of six (6) properties and one (1) unopened road (Lots 6-2; 6-1-2; 6-1-3; 6-1-4; 6-1-5; 6-1-7 within Katzie Reserve No. 1). The six legal lots and one unopened road right of way total approximately 7.1 hectares (17.52 acres), as shown in Figure 1.

The Subject Site is currently undeveloped and bounded by Wharf Street (also referred to as Fraser Way) to the south, single family residential uses and Bonson Road to the west, a mini storage/outdoor storage uses to the north, and a soil/gravel material storage use to the east. The Subject Site is in close proximity to Golden Ears Way and the Golden Ears Bridge, providing regional connections to Lougheed Highway, Trans-Canada Highway, and South Fraser Perimeter Road.



Figure 1. Location of Subject Site (red star)

Eagle Meadows Business Park consists of two (2) light industrial warehouse buildings totalling 370,390 ft² (34,410 m²) of floor area. The Project intends to provide a development that is:

- Attractive and provides a strong entrance into Katzie Reserve No. 1;
- Sensitive to the current and future surrounding land uses;
- Achieves the goals and objectives of the Katzie First Nation Land Use Plan; and
- Adaptable to market trends.

The Subject Site is designated as a "Katzie Commercial Centre" in the Land Use Plan. It is envisioned to be a central neighbourhood commercial area serving the Katzie community and surrounding Pitt Meadows residents with retail uses. Pedestrian connectivity via a greenway along Bonson Road is envisioned. Employment and revenue generating uses such as warehousing, storage, and other light industrial uses may be permitted in the designation as well. Light industrial uses are limited to those not generating significant amounts of odour, dust, noise,

fumes, or nuisance to the surrounding neighbourhood. The development should also be visually appealing from the street and adjacent properties.

Policies in the Commercial Centre designation encourage connectivity, community enhancement/contribution, amenity dedication, landscaping, and public art.

Eagle Meadows Business Park would like to ensure that there are local and regional community benefits resulting from the development. From a land use perspective, industrial floor space and designated industrial land is in short supply in the Metro Vancouver Region. However, the industrial land base contributes a quarter of the region's total employment with important links to transportation, trade, and tax dollars. The recent Regional Industrial Lands Strategy (2020) along with several research papers demonstrate the continued shortage of industrial land supply in the region and the regional interest to protect and intensify industrial uses in the region.

The vacant industrial land supply in the Region is forecasted to be substantially absorbed by the 2030s (Metro Vancouver Industrial Lands Inventory, 2015). The proposed light-industrial use of the Subject Site will provide additional supply to support the regional economy and employment.

Eagle Meadows Business Park will bring additional employment opportunities to operate and manage the light-industrial warehouse use. The employment use will give Katzie, Pitt Meadows, and Maple Ridge residents an opportunity to work close to where they live.

Amenity contributions are also central to the proposed development. The Katzie First Nation Land Use Plan ("LUP") includes a provision for an amenity dedication of a minimum of 5% of the development land or a cash-in-lieu contribution of up to 5% of the development construction value. The cash-in-lieu is provided to the Katzie First Nation for the development of community facilities and amenities such as parks, recreation areas, playgrounds and public art.

Eagle Meadows Business Park proposes to integrate the 5% cash-in-lieu contribution (of the development construction value) with the provision of public art on the Subject Site. The landscape drawings by Prospect & Refuge identify three potential locations for public art installation. A call for Katzie First Nation artist submissions is proposed to feature public art pieces by local artists. The public art pieces will also serve as an entrance/place-making feature that celebrates Katzie First Nation's culture and community.

2.2 Project Location

The Project / Subject Site is located within the Katzie Reserve No. 1 bordering Pitt Meadows, BC and is comprised of six (6) properties and one (1) unopened road (Figure 2 below). A proposed building plan has also been included in Figure 3 below.

The following information summarizes the specific location of the Subject Site:

Civic Address: Lots 6-2; 6-1-2; 6-1-3; 6-1-4; 6-1-5; 6-1-7

Current Registered Owners: Connie Lynn Bailey, Lisa Marie Adams, Peggy Ann Adams, Robert John Adams, Robin Ann Green, Kelly Pierre

Current Land Use Designation: Land Use Plan: Katzie Commercial Centre

Site Latitude: 49°12'10.5"N

Site Longitude: 122°40'40.6"W

The VFPA has jurisdiction over proposed works south of River Road (specifically works occurring along the river bank). See below Figure 2 for the approximate works area.

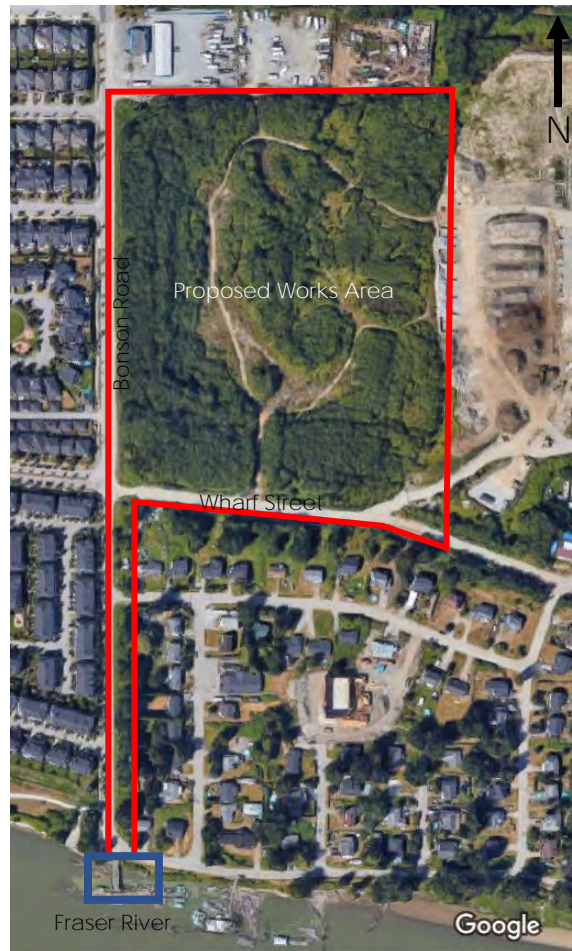


Figure 2. Location and Works Area (red outline), including works occurring in VFPAs jurisdiction (blue outline).

2.3 Project Works

The following sections describe the proposed project works, including a high level summary of on and off-Site infrastructure, general construction plans and post construction operational activities.

Project Facilities and Infrastructure

The Project proposes two (2) large light industrial warehouses approximately 371,000 square feet (34,467 square metres) in size. Full off-Site upgrades include: new sidewalks; an east west public greenway along Wharf Street, and necessary site servicing (Storm, sanitary and water). A new storm outfall is proposed south on Bonson Road to the Fraser River (works under VFPA jurisdiction).

Construction Activities

The Project includes three (3) main phases:

- Phase 1: Site preparation;
- Phase 2a: Off-Site servicing (works under VFPA jurisdiction); and
- Phase 2b: On-Site construction.

Site preparation will begin once the Soil Authorization is issued. The project lands currently have approximately 140,000 cubic metres of fill that needs to be removed prior to construction. Three (3) potential sites have been identified for potential suitable relocation of the fill: one (1) within the City of Pitt Meadows and the other two (2) within Katzie Reserve No. 1.

Phase 1 site preparation is estimated to take approximately 4 months. Phase 2a for off-Site servicing includes outfall construction down Bonson Road to the Fraser River. Phase 2b consists of building(s) construction. Phase 2a and 2b will run concurrently after the DP is approved.

Operational Activities

The building(s) proposed for the Project are anticipated to function as a warehouse and/or distribution facility. EDC will be working closely with the building design team, include the architect, mechanical engineer, and the electrical engineer to ensure that the building(s) are energy efficient.

Eagle Meadows Business Park will bring additional employment opportunities to operate and manage the light-industrial warehouse use. The employment use will give Katzie First Nation, Pitt Meadows, and Maple Ridge residents an opportunity to work close to where they live.

Bunt & Associates prepared a Transportation Impact Study to assess the proposed access to the site from Bonson Road and Fraser Way/Wharf Street. The Study was requested by the City of Pitt Meadows and the City of Maple Ridge. Seven (7) intersections were included in the weekday peak-hour capacity analyses for the time horizons up to year 2035. The Study concluded that the Eagle Meadows Business Park is expected to generate 63 to 67 trips during the AM and PM peak hours, respectively. Trip generation of 100 vehicle trips or fewer is not expected to have material impact on the adjacent street network. The Study finds that all accesses to the Subject Site and residential intersections along Bonson Road are anticipated to operate within acceptable performance criteria for all time horizons after the development of the light-industrial warehouse buildings.

Capacity issues for the intersection of Bonson Road and Airport Way were previously identified in a 2016 McElhanney "South Bonson Traffic Study" prepared for the City of Pitt Meadows. The Bunt report prepared for the subject development confirms the intersection will reach capacity for certain movements in the 2035 Background and 2030 Total horizons with or without the development of the Subject Site. The Golden Ears Way and Airport Way/113b Avenue interchange was also identified as requiring further modification with or without the development of the Subject Site.

3.0 CONTACTS AND RESPONSIBILITIES

3.1 Key Project Personnel/Project Team

Table 1. Project Team Roles, Qualifications and Contact Information

Name:	Qualification:	Contact Information	Position on the project and company:
Kyla Milne*	RPBio	604-501-1624	QEP for PLG
Melissa Zheng	BIT, BC-CESCL	604-501-1624	Project Biologist for PLG
Laura Jones	MCIP, RPP	604-501-1624	Senior Development Planner for PLG
Rosa Shih	M.A. (Planning)	604-501-1624	Planner for PLG
Mathew Shields	ISA Certified Arborist, Registered Professional Forester ("RPF")	604-733-4886	Arborist for Diamond Head Consulting
Trevor Cox	MCIP, RPP	604-733-4886	Principal Diamond Head Consulting
Wyatt Johnson	B.Eng., EIT	604-439-0922	Project Engineer for GeoPacific Consultants
Matt Kokan	M.A.Sc., P. Eng	604-439-0922	Principal for GeoPacific Consultants
Steve Boyce	BA., LEED G.A	778-737-3488	Associate, Project Manager for Active Earth Engineering
Marek Downarowicz	B.Sc.	778-737-3488	Junior Environmental Professional for Active Earth Engineering
Tony Vigni	Vice President of Development	604-638-1212	Prime Contractor/Field Lead for Construction for Wales McLelland Construction
Ian Cowan	Director of Lands and Civil Services	T. 604-465-8921 Ext. 411 F. 604-465-8934	Director of Lands and Civil Services for Katzie First Nation
Angelo & Alex Tsakumis	EDC Contacts	604-270-1890	Representatives from EDC

*Primary Qualified Environmental Professional (QEP)

**As the Project is in the MFLNRORD/DFO review stages, the Project Manager/Site Supervisor and EM for the proposed works will be determined prior to commencement of proposed construction works (as outlined in this CEMP).

3.2 Environmental Monitor Responsibilities

The responsibilities of the EM may consist of, but are not limited to, the following:

- Attendance at a Project kick-off meeting to identify and clearly mark environmentally sensitive areas within the Site, and to discuss potential mitigation measures to be implemented during construction;
- Conducting regular monitoring Site visits during active construction (i.e., weekly or biweekly, as ESC monitoring requirements change seasonally), specifically during concrete pouring, instream works, culvert/headwall installation works, during

construction activities that occur during a Significant Rainfall Event (SRE; >25 mm in 24 hours);

- Conducting Water Quality Monitoring (WQM), as required, and during instream works, for surface water runoff that may be required to be directed towards on- or off-Site watercourses or drainage infrastructure [e.g., catch basins (CBs)];
- Preparation of environmental monitoring reports, including photographic documentation, which describe Site conditions, on-Site construction observations, work progress, recommendations for environmental protection and mitigation, and scheduled upcoming Project activities;
- Collecting background water quality measurements from the receiving environment (e.g., surface water drainages) to be used for monitoring water quality against the British Columbia Approved Water Quality Guidelines (BCAWQG). Background measurements will be collected prior to Project commencement as well as daily, prior to commencing work and throughout the Project's lifespan;
- Walking construction areas and confirming that environmental protection measures outlined in this CEMP are being appropriately implemented (e.g., environmentally sensitive areas have been flagged/delineated with silt fencing and avoided during Project works, spill kits are in place at construction areas and clearly visible and accessible, spill pads are stored with heavy equipment, garbage is being disposed of appropriately, etc.);
- Documenting environmental or wildlife observations reported by others or noted during EM visits;
- Providing a brief summary of environmental issues and mitigation measures during the daily tailgate meeting (if required);
- Notifying the Representative in Charge of the need to stop work to ensure Site safety, environmental integrity and ecologically sensitive areas are maintained (if necessary). Only the EM for the Project will have the authority to immediately stop work on-Site;
- Preparation and submission of weekly environmental monitoring reports, including photographic documentation and field data, which describe Site conditions and construction observations, and provide recommendations for improving environmental protection practices when required; and
- Attend to the preparation of monthly water quality reports and an annual comprehensive WQM report summarizing the water quality results.

3.3 Contractor Responsibilities

The Contractor during construction must adhere to the following responsibilities (to be refined and/or expanded at any time prior to or during the Project, based on the needs of the Project), including:

- The Contractor will review the Project CEMP with their staff and sub-contractors prior to commencing works;
- The Contractor will comply with all agency permits or licenses issued for the Project [e.g., *Water Sustainability Act (WSA) Change Approval*, DFO RFR], as well as all other

applicable federal, provincial and municipal laws, statues, by-laws, regulations, orders and policies;

- The Contractor must cooperate with the EM appointed for the work. They must comply with written or verbal instructions with respect to conducting activities in compliance with the mitigation measures outlined in this CEMP; and
- The Contractor will correct deficiencies and any non-compliance issues upon direction from the EM whether written or verbal. Corrections should be made as soon as reasonably possible, ideally within 24 hours of directions. The Contractor or EM will notify the Client immediately in the event of a non-compliance.

4.0 RELEVANT ENVIRONMENTAL LEGISLATION

4.1 Federal Legislation

The Project team will follow and comply with the following Federal Acts and Guidelines, including, but not limited to:

- *Impact Assessment Act [IAA (previously CEAA)]*
- *Federal Fisheries Act (FA)*
- *Federal Migratory Birds Convention Act (MBCA) – Bird Breeding Window March 1 – August 31 (at a minimum)*
- *Federal Species at Risk Act (SARA), Schedule 1*
- *Ministry of Environment (MOE) and DFO Land Development Guidelines for the Protection of Aquatic Habitat*
- *Navigation Protection Act ("NPA") / Canadian Navigable Waters Act ("CNWA")*

4.2 Provincial Legislation

The Project team will follow and comply with the following Provincial Acts and Regulations, including, but not limited to:

- *BC Environmental Management Act (EMA)*
 - Contaminated Sites and Hazardous Waste Regulations
 - Spill Reporting Regulations
- *BC Riparian Areas Protection Regulation (RAPR)*
- *BC Waste Management Act (WMA)*
- *BC Wildlife Act (WA)*
- *BC WSA*
- *WorkSafeBC Occupational Health and Safety (OHS) Regulations*

It is expected that the Contractor will consider and proactively address any incidents which may result in non-compliance with applicable above legislation (e.g., spills of reportable quantity, workplace accidents, etc.). Such incidents must be appropriately documented and immediately reported to the relevant agency or authority [e.g., Environmental and Climate Change Canada (ECCC), DFO and Emergency Management British Columbia (EMBC)

Program, formerly Provincial Emergency Program (PEP); refer to Section 8.2 "Environmental Spill Response Plan" below].

4.3 Municipal Legislation

The Project team will follow and comply with the following Municipal Bylaws, including, but not limited to:

- Boulevard Maintenance Bylaw No. 2377 (2008)
- Drainage System Protection Bylaw No. 2266 (2007)
- Floodplain Designation and Construction Control Bylaw No. 2384 (2008)
- Noise Control Bylaw No. 2138 (2004)
- Soil Removal and Fill Deposit Regulation Bylaw No. 2593 (2013)
- Waterworks Bylaw No. 2343 (2008)

Numerous BMPs have been developed by industry associations and government agencies for activities near environmentally sensitive areas. In addition, the provincial document, *Develop with Care 2014 – Environmental Guidelines for Urban and Rural Land Development in British Columbia*, provides a comprehensive set of guidelines and BMPs that may be applicable to Project works.

In this CEMP, Project works are addressed with respect to various environmental protection measures that can be applied directly or with modification, as required. These measures aim to promote environmental management by protecting the existing Site conditions and reducing the potential for migration of Project-related materials and products off-Site. As the Project involves instream work (i.e., ditch elimination and culvert/headwall outfall installation), other necessary permits (i.e., WSA Section 11 Change Approval and DFO Authorization/letter of advice), will be secured in advance (where required) of the commencement of Project works.

5.0 ENVIRONMENTAL RESOURCES AND IMPACTS

Please refer to the detailed Environmental Assessment (EA) prepared by PLG for the Subject Property (dated March, 2020), for a detailed description of observations from the PLG Site visits, including summary of evaluated aquatic resources, vegetation, and wildlife (e.g., birds, mammals, fish, aquatic species) within the Site. For the new outfall works under VFPA jurisdiction please refer to the detailed Habitat Assessment (HA) prepared by PLG for the Subject Property (dated August, 2022).

6.0 GENERAL MITIGATION MEASURES

To minimize or avoid potential adverse effects to existing environmental values on and adjacent to the Site, the following general measures will be implemented during construction, operations and post-construction maintenance:

- During the pre-construction meeting, this CEMP and the environmental protection measures will be reviewed by the Lead Contractor and employees, as well as any other applicable parties;

- All Project construction activities must comply with the conditions outlined in the Federal (i.e., DFO Authorization/letter of advice), Provincial (i.e., WSA Change Approval), municipal, and general construction permits (if applicable), and all permits must be readily producible on-Site in the event of an inspection by an overarching agency representative. All Project construction activities related to the outfall works on the Fraser River foreshore fall under VFPA jurisdiction and must also comply with conditions outlined in VFPA permits;
- Prior to commencing work at the Site, appropriate spill prevention, containment, and cleanup contingency plans will be in place for safe management of hydrocarbon products and other deleterious substances that may be used in association with the Project works. Appropriate and up-to-date spill response equipment will be readily available on-Site for use in the event of an accidental spill. Trained Site Representatives will be available for spill response and reporting;
- The limits of disturbance will be clearly delineated in the field, to ensure that no disturbance occurs within the environmentally sensitive areas (e.g., identified on-Site and adjacent off-Site watercourses) as a result of the proposed Project works;
- All equipment will be clean and maintained in good operating condition;
- Equipment refuelling will be undertaken by self-contained, contracted fuel providers, and off-Site prior to arriving, if possible;
- For equipment that is engine-powered or contains oils and greases (e.g., small excavators/bob cats, welding machines, drills, concrete trucks) and require periodic maintenance or servicing, a qualified mechanic will mobilize to the Site with all necessary supplies to undertake such activities and contain any potentially deleterious substances;
- All debris and deleterious substances generated by the construction activities associated with the Project will be appropriately contained in the immediate work area and appropriately disposed of in accordance with applicable legislation, guidelines, and BMPs;
- The protection of adjacent off-Site catch basins (with inserts, where applicable) to prevent the off-Site migration of deleterious substances; and
- Construction areas and temporary stockpiles will be covered or otherwise stabilized on a daily basis, so as to prevent erosion and off-Site sedimentation.

The EM will be responsible for surveying/monitoring ongoing Project works, including pre-clearing bird nest surveys, providing guidance where required, facilitating environmental protection, and reporting all potential concerns to the Contractor in a timely manner.

The following sections provide an overview of environmental management practices for specific components of work or anticipated environmental concerns associated with the Project. Where applicable, guidance documents have been referenced for more information.

7.0 SITE-SPECIFIC ENVIRONMENTAL PROTECTION MEASURES

The following sections provide Site-specific environmental protection measures for the Project. These sections should be referenced and updated as required throughout the life of the Project.

7.1 Site Access, Mobilization and Laydown Area Management

Prior to construction, a detailed Site access plan will be prepared for the Project (typically by the Contractor) and include planned temporary laydown and stockpiling locations within the Site. The Contractor will ensure that all Site access/mobilization routes and laydown/stockpile locations adhere to the following protection measures:

- Mobilization will be planned to minimize the number of trips to and from the Site, where possible; and
- A temporary laydown area for storage of equipment and materials will be established prior to commencement of works within the Site. It should be located on a flat, stable area, and ideally at least 30 metres from any existing waterbody (e.g., the Fraser River).

7.2 Air Quality and Dust Management

Regardless of the point of origin, dust control will be required to prevent dispersal onto adjacent vegetation, into on- or off-Site watercourses during Site grading (e.g., material stockpiling, storm infrastructure, etc.) and culvert/headwall installations, and to prevent visual disturbances to nearby land owners and highway traffic (i.e., maintain air quality).

To appropriately control dust during Project works, the following measures shall be applied by the Contractor:

- Construction vehicles entering and leaving the construction area must be monitored for excess material on the tires;
- Dust must be controlled for the duration of the work by regular sweeping of access road surfaces and by the conservative application of water (if necessary);
- If water is required, it must be brought to the Site and must not be drawn from the existing on- or off-Site watercourses;
- Chemicals are not to be utilized as a dust suppression mechanism;
- Material loads entering and exiting the Site will be covered; and
- Equipment and vehicles will not be left to idle, whenever possible.

7.3 Noise and Vibration Management

The Project is located in a mixed urban-residential setting, and is not expected to create noise levels greater than existing urban use (i.e., adjacent neighbourhoods, vehicle traffic). Under the City of Pitt Meadows Noise Bylaw No. 2138 (2004), allowable hours for construction are from 07:00 am – 21:00, with restrictions on Saturdays and Sundays. For works falling under VFPA jurisdiction (i.e., outfall construction), allowable hours for construction are 07:00 – 20:00 from Monday to Saturday, with no work permitted on Sundays or holidays. If works within VFPAs jurisdiction is required outside regular hours, the VFPA will consider requests for extended work hours under extenuating circumstances, where offsite noise impacts are not anticipated, or where noise mitigations that will prevent disturbance to neighbouring properties can be put in place¹. Noise and construction related vibrations (e.g., excavation, foundation installation, ditch infill, etc.) are not expected to be an environmental concern as a result of this Project; however, appropriate

¹<https://www.portvancouver.com/wp-content/uploads/2021/02/2021-02-24-Construction-Outside-Regular-Work-Hours-Guideline.pdf>

environmental monitoring (e.g., WQM, pre-clearing bird nest surveys, etc.) will be completed by a QEP to ensure the Project is in compliance with all regulatory requirements.

7.4 Aquatic Resource Management

As work within identified on-Site water features has been included in the scope of this Project (i.e., ditch infill and outfall installation) appropriate BMPs must be followed during Project works for aquatic protection of downstream resources. It should be noted that works in and about a stream must be undertaken at a time of year when the risk of negative impacts to aquatic organisms is low. In general, the lowest risk period for fish streams is when no fish spawning is taking place, there are no egg or alevins within the stream gravels, and no over-wintering juveniles are present ((i.e., during the regional fish window, August 1 – September 15). Further, as most of the proposed environmental work is located within areas currently without a water feature (i.e., non-instream work), this work is proposed to be completed outside of the fish window. Outfall works will target timing within the regional fish window, with low Fraser River flows (i.e., September through April), low daytime tides (i.e., April through September), and without elevated stormwater flows (i.e., February through September), as per Northwest Hydraulic Consultant's report dated September 30, 2021. To comply with these conditions, outfall works are proposed to occur in late September.

To ensure overall protection to the natural environment, the Contractor will:

- Ensure that works in and around a stream (e.g., infill, stream closures, storm infrastructure installation) only occur under the supervision of a qualified EM (e.g., QEP) and are completed within the regional timing window and in the dry (e.g., no rain), in the dry and while diversions are in place, where possible;
- Employ temporary sediment control devices (e.g., catch basin filter socks, silt fencing), where necessary and practical, to prevent the dispersal of sediments outside the construction zone (refer to Section 7.8 "ESC Management" below for details);
- Protect CBs, by fitting them with filter socks to prevent migration of construction silts and fines off-Site;
- Confirm that surface water runoff, or generated sediment-laden water, meets legislated BCAWQG criteria (via WQM) or Project activity must cease until mitigations are applied and water is running clear of sediments (refer to Section 7.4.1 "Water Quality Monitoring" below for details);
- Restore the Site to a finished grade once excavation is completed within an area, to prevent disturbance to downstream watercourses/adjacent drainage infrastructure from sediment migration; and
- Copies of relevant permits and Project design plans must be on-Site and readily available in the event a representative from City, Katzie, MFLNRORD, and/or DFO attend the Site for an inspection.

7.4.1 Water Quality Monitoring

WQM is especially important when works are in proximity to a watercourse or instream work is proposed. The Project EM will conduct routine WQM, as needed during Project works, for run-off that may be generated by construction and/or instream activities, as noted above.

Where needed, water quality will be tested for potential contaminants, general sampling parameters will be measured (e.g., turbidity, pH, water temperature, etc.), and the results compared to the BCAWQG. Based on the BCAWQG, a discharge value of 25 mg/L Total Suspended Solids (TSS) during dry weather and 75 mg/L TSS during storm events, and a pH range of 6.5–9.0, is the maximum allowable discharge water quality measurements associated with the Project works.

Field evaluations of aquatic turbidity [i.e., measured using Nephelometric Turbidity Units (NTU)] will be used as a suitable surrogate for TSS, to provide contractors with real time information on the quality of discharge water. The relationship between turbidity and TSS can vary depending on the conditions of the Site, and confirmatory TSS samples may be collected for laboratory analysis to ensure compliance with the BCAWQG freshwater turbidity criteria for sustained aquatic life. The Project works will be monitored for any of the following NTU measurement/water quality changes:

- Change of 8 NTU from any one background measure for a period of 24 h in all waters during clear flows or in clear waters;
- Change of 2 NTU from any one background measure for a duration of 30 days in all waters during clear flows or in clear waters;
- Change of 5 NTU at any time when background ranges from 8 NTU to 50 NTU during high flows or in turbid waters; and
- Change of 10% when background is >50 NTU at any time during high flows or in turbid waters.

The EM will assist the Contractor in confirming that water with the potential to enter any of the identified on- and off-Site watercourses meets the above criteria by monitoring the quality of the discharge. If evidence of contamination or potential contamination is observed during Project works (e.g., sheening, hydrocarbon odour, etc.), or WQM samples exceed the allowable TSS/NTU and/or pH readings, additional samples may be collected by the EM and submitted to the laboratory for further analysis.

Further information regarding environmental monitoring is provided in Section 9.0 "Environmental Monitoring Program" below for details.

7.4.2 *Instream Works Monitoring*

Instream works monitoring (i.e., during ditch infill, storm infrastructure installation) should be completed by a qualified EM (e.g., QEP) assigned to this Project for Project activities, as described above.

The responsibilities of the EM may consist of, but are not limited to, the following:

- Completing a pre-construction Site visit to establish and confirm baseline conditions, confirming that all ESC and pre-instream work requirements are in place to protect aquatic resources;

- Full-time monitoring during all works pertaining to the proposed Section 11 WSA Change Approval works, including confirmation works are completed in isolation of flow (i.e., dry conditions);
- Conducting regular WQM Site visits during instream works, including laboratory analysis coordination (if necessary);
- Preparation of regular environmental monitoring reports, including photographic documentation, which describe Site conditions, on-Site instream work observations, work progress, recommendations for environmental protection and mitigation, and scheduled upcoming Project activities.

7.5 Vegetation Management

It is understood that Project works include clearing portions of the Site to accommodate proposed development. To minimize the potential to negatively affect vegetation to be retained within the Site, the following BMPs should be in place for the protection of existing vegetation:

- The work zone should be clearly delineated in the field based on the Project drawings prior to construction works to clearly define the Project boundaries;
- Access routes requiring vegetation removal will be planned to minimize damage to existing vegetated areas, whenever possible, and be limited to the extent that has been authorized by the Project scope;
- Any ground disturbance activities (e.g., tree/vegetation clearing) must be completed outside of the regional breeding nest window (i.e., March 1 to August 31); however, if this cannot be achieved, the Contractor must adhere to the following expectations:
 - Bird nest survey(s) will be completed by a QEP prior to any ground disturbance activities (e.g., clearing); and
 - If a nest is found, bird nest setbacks will be determined based on bird species present and appropriately confirmed by a QEP prior to any construction works. Once a nest survey is conducted, PLG's survey results are valid for up to five (5) days. If clearing works has not been completed within five (5) days, the nest survey must be repeated prior to Project works. Note, report validity duration may vary between different consulting firms, and should be confirmed by the Contractor prior to commencement of work; and
- Machine operators should take extra care when backing up or swinging around during Project works, to avoid damaging existing overhanging limbs and nearby trees to be retained.

To prevent the introduction and/or spread of invasive species on Site the following BMPs should be followed:

- Any seed laid on-Site (if necessary) should be certified weed free and be supplied by a certified supplier (e.g., Premier Pacific Seeds);
- Work boots and gear should be removed of plants, insects, and mud prior to entering and leaving the Site;

- Tires of any vehicles or heavy machinery should be checked for mud and plant parts and cleaned prior to entering and leaving the Site; and
- Any invasive species on Site should be removed from the work area and appropriately disposed of prior to the commencement of works to avoid tracking and spreading invasive species to other areas on- or off-Site.

7.6 Wildlife Management (Protection and Mitigation)

As the Project is located in an urban-residential area, non-local wildlife encounters are unlikely to be a concern for regulatory compliance under the BC *Wildlife Act* or SARA. In the unlikely event of an atypical wildlife encounter (e.g., bears, large ungulates), or any encounter with wildlife or SAR, for the protection of both wildlife and Site personnel, the Contractor will:

- Avoid disturbance or harm to any wildlife, if observed on-Site during Project work. This includes avoiding disturbance or harm to a bird (including raptors), its eggs, or the nest of a bird when occupied by a bird or egg (Section 34 of the BC *Wildlife Act*);
- Allow safe and undisturbed passage through the Site for any wildlife encountered during Project activities;
- Limit the use of machinery/loud noises while wildlife is present within or near the Project work area, and the Project EM/QEP may issue a stop work order if wildlife is present on-Site for an extended period of time;
- Complete amphibian salvage and fish salvage (if necessary) in advance of construction activities;
- Adhere to authorized work timing windows to ensure that there is no excessive disturbance during wildlife breeding seasons (e.g., bird nesting period March 1–August 31);
- Where possible, vegetation clearing should be planned outside of the regional bird nesting window. If this is not possible, pre-clearing bird nesting survey(s) must be completed by a QEP in advance of clearing works, and protection buffers (if necessary) established depending on the result of the survey(s);
- Dispose of garbage in secure bins and ensure that staging areas are clean and free of food items to avoid attracting wildlife on-Site (e.g., coyotes, racoons, crows, etc.);
- Pre-clearing sweeps for species at risk such as amphibians or snails should be conducted prior to the commencement of works; and
- If any species at risk are encountered prior to or during Project works, a stop work order must be issued and Project EM/QEP consulted for next steps.

7.7 Soil and Groundwater Management

It is understood that Project works will require the importation of soil/structural fill to be utilized during grading activities. The following mitigation measures are included to minimize potential impacts to existing soil within the Site and when working with existing and imported soils/fill during Project activities:

- Stockpiles of soil/fill must be covered with poly-sheeting or other similar material that extends to the edges of the piles, and must be weighted down to prevent being blown away by wind. Surface run-off generated from Project activities must be directed away from the stockpile to avoid pile erosion into on- and off-Site watercourses; and
- When required, the Contractor will be responsible for providing documentation that any imported soils/fill meet the applicable provincial and environmental regulations and standards of the BC Contaminated Sites Regulations (CSR), 2014.

7.8 ESC Management

Prior to the commencement of Project works, the limits of construction will be clearly marked, including the installation of temporary protective fencing (e.g., silt fencing) for the existing drainage infrastructure/identified on- and adjacent off-Site watercourses.

ESC measures required for this Project may vary depending on local Site conditions and weather at the time Project work is undertaken and can be confirmed by the Project EM. The ESC measures must be Site-specific and adaptable. Site-specific measures that the Contractor will adhere to are as follows:

- Utilize existing paved areas (e.g., driveways, roads) when accessing the Site, by foot or equipment, to minimize soil/sediment disturbance and erosion, especially on soft soils within the Project work areas;
- Maintain temporary rock access entrance and exit pads to ensure no sediment is tracked into the Site or out onto public roads (e.g., 15 Avenue cul-de-sac, 16 Avenue);
- Sweep on-Site pavement and unnamed access road to the Site daily to keep all paved surfaces free of debris, sediment or other potential pollutants;
- Take reasonable care to avoid damage to freshly disturbed areas and where soils have been recently disturbed, so as not to generate sediments that could potentially migrate or become tracked off-Site;
- Minimize the potential to generate sediment-laden water within the Site (e.g., undertaking a section of work that can reasonably be completed within a work shift, and covering exposed stockpiles to remain on-Site for an extended period of time);
- Where pumping is required, water will be directed to adjacent on-Site vegetation areas, to disperse naturally and will not be pumped directly into a watercourse or drainage infrastructure (e.g., CBs);
- Imported fill and soils to be utilized during grading work shall be protected when stockpiled with tarpaulin or polyethylene sheeting to prevent the dispersal of silts and fines outside of the delineated work zone;
- Soils of any kind shall not be placed on adjacent roads or curbs;
- Temporary silt fencing and catch basin inserts will be installed by qualified personnel along the boundary of the work area and within adjacent off-Site CBs, to act as sediment barriers by preventing the dispersal of silts and fines outside of the delineated work zone for the duration of the Project;
- Re-grading of the Site will be completed as soon as possible in order to ensure that disturbed areas and exposed soils are stabilized; and

- Specific ESC plans must be developed for the instream work (i.e., grading/construction of ditch infill, and infrastructure installation), in addition to the overall ESC plan prepared for the Site.

Silts and fine materials displaced during Project activities (e.g., excavation, grading, Site paving, stream closures, etc.) can have adverse effects on existing aquatic resources and local drainages. Please refer to Section 5.0 “Environmental Resources and Impacts” and Section 9.0 “Environmental Monitoring Program” for more details.

7.9 Waste Management

The Contractor will comply with all applicable laws, regulations, permit conditions and requirements of the contract when disposing of waste including, but not limited to, asphalt, concrete, sewage disposal, non-hazardous wastes, hazardous wastes (e.g., used paint, epoxies or waste batteries), or other materials not authorized for on-Site disposal. In addition, only facilities approved by authorities having jurisdiction may be used for disposal or recycling of waste. At no time will any waste material be allowed to enter a watercourse or drainage (either directly or by introduction from off-Site discharge). The Contractor will be responsible for assuring that all reasonable efforts are made to eliminate or minimize waste production, and adhere to the following BMPs for waste management:

- The Contractor is expected to adhere to all applicable legislation with respect to the handling, transportation, and/or disposal of all materials related to this Project (waste or otherwise). These regulations may include (but not be limited to) the BC Hazardous Waste Regulations, Spill Reporting Regulations, Workers Compensation Board Regulations, etc.;
- Hazardous wastes generated from Site works could include waste petroleum products (e.g., engine oils, lubricants, etc.) from machinery and equipment, spent batteries, solvents and cleaning agents, etc. The Contractor will provide labelled separate container(s) for potentially hazardous waste generated from Site works, such as oily rags and hydrocarbon absorbent pads;
- All hydrocarbon products and other hazardous wastes potentially present during Project activities will be identified and the associated Workplace Hazardous Materials Information System (WHMIS) and Material Safety Data Sheets (MSDS) made available to all Project team members; and
- All recyclable or compostable materials will be collected separately from general waste.

7.9.1 Concrete/Asphalt

The two (2) main environmental concerns associated with concrete/asphalt work are:

- 1) Toxicity from the high alkaline pH of concrete/asphalt, and
- 2) Physical effects of smothering through the release of solids.

The pH level of concrete/asphalt and wash-off water from concrete/asphalt is 12 (very alkaline) and must be kept out of surface waters. The BCAWQG have specified an acceptable pH range of 6.5 to 9.0, understanding that deviations will likely be small, short-term in nature and not be

harmful. If a large concrete/asphalt spill occurs, applicable treatment should be initiated by the EM in order to reduce the impact of pH and reduce the pH to an acceptable level.

The following mitigative measures shall be applied by the Contractor during concrete/asphalt work:

- Concrete/asphalt work (e.g., foundation and road construction, sidewalk installation, etc.) must be conducted so that wash water and excess concrete/asphalt slurry from concrete/asphalt works and equipment do not contaminate on-Site/off-Site aquatic features or enter drainage infrastructure (e.g., off-Site CBs);
- Excess concrete/asphalt, grout, drilling wastes and other liquid waste products must be directed to secure containment facilities for subsequent removal and disposal at an appropriate facility. If concrete/asphalt material (solid form) has entered the water and it can be recovered, the material must be removed from the water, as it will continue to provide alkaline material into the surrounding water;
- Fresh concrete/asphalt pours will follow BMPs, be scheduled during periods of dry weather, and be protected from rainfall with an impermeable cover (i.e., polyethylene sheeting or tarpaulin) until the concrete/asphalt cures;
- No washing of concrete/asphalt trucks or equipment shall be permitted on-Site;
- No discharge of concrete/asphalt wash water will occur on-Site; and
- Any water that has come in contact with concrete/asphalt will be tested by the EM to ensure that it meets the BCAWQG for acceptable pH between 6.5 and 9.0.

7.9.2 *Solid Waste*

It is anticipated that solid waste will primarily be comprised of general construction debris, garbage, recyclables, and non-hazardous equipment waste materials. The Contractor, with assistance from the EM, will determine the appropriate measures to dispose of general solid wastes throughout Project works as follows:

- Non-hazardous paper, paper products, wood, plastic, glass, and discarded food items, will be stored in closed, leak-proof storage bins that are secure against nuisance wildlife (e.g., coyotes, racoons, crows, etc.). The Contractor is responsible for the proper collection and transportation of garbage and recyclable waste to disposal facilities (e.g., sanitary landfill or appropriate recycling facilities where available);
- Used oil filters and antifreeze must be drained into a waste oil container and drained filters placed in an appropriate trash container before disposal at a recycling or other approved facility; and
- Used acid-lead batteries must be stored on an impervious surface, under cover, and disposed of at an approved recycling facility.

7.9.3 *Hazardous Waste*

Project works may require the use of hazardous materials (e.g., petroleum products, solvents, etc.), which will be brought in and out by the Contractor during each phase of the Project. It is the Contractor's responsibility to determine whether any waste generated by the Project has

hazardous or toxic characteristics or is considered "Hazardous Waste" by MFLNRORD, or any other authority having jurisdiction, and to manage it accordingly. The proper handling of hazardous wastes will also be included in the Contractor's own OHS Program.

If an item cannot be located in published Hazardous Waste guidelines, the Contractor will determine if a particular characteristic of the waste makes it hazardous. Subsequently, the Contractor will comply with the *Standards Applicable to Transporters of Hazardous Waste* as defined by MFLNRORD.

7.10 Machinery and Equipment Fuelling and Servicing

Project activities (e.g., excavation/grading, Site paving, stream closures, etc.) will require that some large machines, as well as small engine-powered equipment and tools (e.g., generators), be located and stored for periods of time on-Site. The off-Site migration of fuel, lubricating oils and hydraulic fluids can have an adverse effect on surrounding terrestrial and aquatic environments.

The Contractor will ensure that the accidental release of contaminants is mitigated immediately if introduction occurs. The following measures are to be adhered to during Project activities:

- All machinery operating within the Site will be free of excess oil and grease, and will be in good mechanical order so that no leaks occur, preventing release of fluids into the on-Site aquatic environment;
- All grease and oil required for maintenance will be carefully applied. Any excess must be cleaned up and disposed of in a prompt and environmentally appropriate manner;
- It is anticipated that equipment re-fuelling will occur off-Site, however, if refuelling occurs on-Site, vehicles utilized for refueling will be equipped with automatic back-pressure shut-off valves, and nozzles will be kept locked at all times, except during refueling;
- Refuelling of any machinery and equipment must occur greater than 30 metres away from identified on- and off-Site watercourses and adjacent drainage infrastructure (e.g., CBs);
- While re-fuelling is undertaken, equipment should be contained within a suitable drip pan;
- Refuelling procedures and handling of flammable liquids must also be covered within the Contractor's own OHS Program; and
- Spill response kits including spill pads, sorbent booms, and spill trays must be readily available within the work Site and on mobile equipment. Provisions of spill kits will be the responsibility of the Contractor.

7.11 Fire Management (Prevention and Mitigation)

The following measures and procedures will be implemented on-Site to avoid potential fire, and to fight any fire that may occur:

- No open fires or burning will be permitted within the Project zone; and
- Fire extinguishers and other emergency response equipment and supplies must be kept in known, visible and accessible locations. Gas- or diesel-powered equipment must have

a fire extinguisher attached or inside the cab. Fire extinguishers are to be routinely inspected and certified, as are other fire-suppressant equipment and materials.

7.12 Archaeology Resources Protection and Management

The Contractor must ensure that archaeological resources are not impacted during Project-related activities; however, archaeological resources have not been previously identified within the Site. The following procedures should be established to mitigate impact in the event that evidence of what is suspected to be an archaeological resource is encountered:

- Immediately stop any activity that might disturb the archaeological resource or the location in which it is contained;
- Do not move or otherwise disturb the artifacts or other remains present at the Site;
- Clearly identify/mark (i.e., with stakes or flagging) the area the archeological resource is found to prevent additional disturbances; and
- Immediately notify the Katzie First Nation representative, the City of Pitt Meadows, the Client, and the Provincial Archaeological Branch.

8.0 SPILL PREVENTION AND EMERGENCY RESPONSE

Under Section 1 of the BC *EMA Spill Reporting Regulation*, a "spill" is defined as a release or discharge of a listed substance in an amount equal or greater than that specified in Column 1 of the Schedule of this Regulation. The reportable quantities (included in Column 2 of the Schedule) vary according to class of substance, ranging from any amount to 200 kg or 200 L, depending on the nature of the material that has been spilled. Contractors will be responsible for complying with the sections below, and ensuring emergency procedures and spill cleanup steps are followed as described in this CEMP.

8.1 Spill Prevention

To prevent potential adverse environmental impacts to the Site, the Contractor will implement the following mitigation measures to minimize potential impacts to the Site and surrounding area and ensure adequate emergency response in the event of a spill:

- Vehicles and equipment will be inspected prior to the start of work each day;
- Vehicles and equipment that are not in good working order will not be permitted on the Site;
- Used oil, filter and grease cartridges, lubrication containers, and other equipment maintenance products will be collected in appropriately labelled waste containers, stored in a secure on-Site location, and protected from weather until removal from Site and disposal at the nearest registered hazardous waste facility can be arranged;
- The storage of fuel, lubricants, and oils on-Site should be avoided whenever practical; however, where fuel, lubricants, and oils are brought to the field/Site, designated storage areas should be identified and secondary containment should be employed;
- Fuel storage enclosures are to be sufficient to contain total stored volume plus precipitation products (minimum 120%), with additional seepage protection measures (e.g., impermeable membranes);

- If encountered items to be disposed of cannot be readily identified, they will be assessed by the EM who will assist in determining the appropriate containment/storage and disposal methods;
- Storage areas should be located at least 100 m from any watercourse or drainage infrastructure (e.g., CBs);
- A catch tray/drip pan of sufficient size and depth should be used during on-Site re-fuelling and equipment repairs (if necessary) to reduce the risk of environmental impact from spills and/or leaks;
- Spill response kits containing necessary materials and equipment (e.g., absorbent pads, booms, leak-proof containers) must be kept on-Site and be readily available in order to respond to a spill, should one occur. Spill kits should be adequately sized, given the equipment and products that are on-Site, and trained personnel will be available to ensure proper deployment, if needed;
- Used spill response materials will be bagged in heavy-duty polyethylene bags and any waste oil or other spill materials will be removed from Site, as soon as possible, in accordance with Transportation of Dangerous Goods (TDG) requirements and the BC Hazardous Waste Regulation;
- Fire extinguishers and other emergency response equipment and supplies must be kept in known and visible locations. Access shall not be blocked to this equipment;
- A list of spill response emergency contacts must be posted or kept at a predetermined known location and will be updated prior to construction (refer to Table 3 "Emergency Contact List", below for details); and
- Equipment operators and spill responders will review the Spill Response Plan (SRP; refer to Section 8.2 "Environmental Spill Response Plan" below) regularly to ensure it is up to date and all required materials are accessible on-Site.

It is anticipated that equipment will be utilized on-Site to complete Project works. For this reason, fuelling of equipment shall occur off-Site at an approved facility whenever possible, to prevent a fuel spill on-Site; however, due to the large size and location of the Site, it is recognized that on-Site fuelling may be required. In addition to the above mitigation measures (where applicable), the following must also be adhered to during on-Site fuelling:

- Where equipment must be re-fuelled on-Site, it should be carried out in a designated area, preferably on a concrete or paved surface or in a contained area, with the use of sorbent pads, and at least 30 metres from any watercourse;
- On-Site staging areas will be appropriately equipped with spill kits, fire extinguishers, etc. in the event a spill occurs; and
- Staff will be appropriately trained in spill prevention prior to any on-Site fuelling activities.

8.2 Environmental Spill Response Plan

The Contractor will develop and implement a Site-specific Environmental SRP based on the type and amount of equipment, and the activities using potentially deleterious substances. The purpose of the SRP is to identify potential risks at, or in proximity to the Site, provide procedures to facilitate rapid deployment of resources in the event of a spill, and to minimize the impact and risk to the environment, the public and personnel on-Site. The Contractor will be familiar with

regulatory requirements and be adequately prepared to respond within the shortest possible time. A Spill Response Team will be assembled from suitably qualified members of the workforce. Emergency preparedness must also be covered under the Contractor's own OHS Program.

All spills, regardless of size or location will be reported to the EM and Contractor. In the event of a spill, the EM will follow the "6 Steps to Spill Response" Guide (Appendix A, attached) and will ensure that all appropriate representatives, adjacent landowners, and authorities have been notified. The 6 Steps are presented as general guidelines for responding to spills of oil-based materials (e.g., fuels, insulating oil, lube oil). Circumstances or the specific material spilled may dictate another sequence of action.

All personnel are to be made aware of the contents of the SRP, "6 Steps to Spill Response" Guide, location of response materials, emergency contact names and numbers (refer to Table 3 "Emergency Contact List", below for details). The "6 Steps to Spill Response" Guide should be printed and posted in an easily visible area (e.g., Site trailer/entrance) for reference in the event of a spill. Emergency spill response equipment and supplies must be kept in accessible and visible locations. The locations of such equipment are to be made known during Site safety orientations, as locations may vary or change as the Project progresses.

8.3 Spill Notification & Contact Information

In the event of a spill exceeding regulatory thresholds (Table 2, below), the incident must immediately be reported to the EMBC at 1-800-663-3456 (24-hour emergency line) and the local Fire Department. Spill response advice can also be obtained from EMBC.

Table 2. Reportable Spill Quantities

Category	Substances	Threshold Amount
Fuels and Oils	Diesel, gasoline, hydraulic fluid, solvents, waste oil	100 L
Dangerous Goods	MIBC, nitric acid, sulphuric acid, ethylene glycol, litharge lead oxide, sodium hydroxide	5 L
Flammable Gases	Propane and acetylene	10 kg
Miscellaneous	Borax, propylene glycol, paint	200 L

Any spills within 24 hours of occurrence, regardless of its location within the construction area, will also be reported to:

- Project Manager(s)
- Construction Manager / Contractor
- EM

A list of Project-relevant contact numbers has been provided (Table 3, below) and should be referenced for use in the event of a spill. In the event of a spill exceeding regulatory thresholds, the District of Hope and its Fire Department will also be notified when it is safe to do so.

Table 3. Emergency Contact List

Agency/Program	Contact Number
BC One Call	6886 or 1-800-474-6886
BC Emergency Spill Reporting Line (i.e., EMBC)	24-hour toll free: 1-800-663-3456
BC Forest Fire Reporting	5555 or 1-800-663-5555
Canadian Transport Emergency Centre (CANUTEC)	*666 or 1-888-226-8832 (1-888-CAN-UTEC)
Emergency Services (24/7)	911
PLG Environmental Division	Kyla: 604-996-7666 Melissa: 778-242-3505

8.4 Spill Cleanup Supplies

All Project staff will be made familiar with available spill supplies and will be appropriately trained on how to use and dispose of supplies in the event of a spill.

Spill kits will be located at various locations on-Site and on mobile equipment (e.g., pickup trucks, etc.). Each kit should contain but is not limited to the following general list of spill response supplies which is consistent with *A Field Guide to Fuel Handling, Transportation and Storage*. At a minimum, the following items should always be available and restocked when necessary:

- Box of rags
- Caution tape
- Chemical goggles
- Disposal bags (40)
- Drum for materials disposal (with lid)
- Hand cleaner
- High visibility vest
- Poly tarps
- Rubber gloves
- Small shovel
- Sorbent booms
- Sorbent pads (minimum 100)
- Wire cutters and knives
- Wooden stakes

8.5 Environmental Incident Reporting

An environmental incident is defined as one that has caused, or has the potential to cause, one or more of the following:

- Environmental damage;
- An adverse effect on fish, wildlife or other environmental resources;
- Heightened publicity associated with a negative effect on the environment; and
- Legal action with respect to environmental noncompliance and/or damage.

If an environmental incident occurs during the Project, a written Environmental Incident Report (EIR) must be prepared by the Contractor within 24 hours of the incident regardless of whether it is a working day or not, to describe the occurrence, summarizing events, actions and

recommendations for future avoidance. Immediate action must be taken to minimize environmental consequences and manage resolution of the incident. The EM will assist the Contractor in preparing the EIR, and document the following information to prevent future incidents:

- The contact information for the individual making the report, the responsible person in relation to the spill, and the owner of the substance spilled;
- The date, reporting time and location of spill site, including the time the incident occurred or was first noticed;
- The location of the spill site, including a description of the spill site, surrounding area and weather at the time of the incident;
- A description of the spill source, the type and quantity of the substance spilled, and details of the circumstances, known or possible cause(s) and adverse effects of the spill to facilitate prevention of future incidents;
- A summary of response actions, including an approximate timeline; and
- The names of the applicable personnel, stakeholders, regulatory authorities and government agencies at the spill site and those advised about the spill.

The EIR must be submitted to the Environmental Representative for the Project, the EM, the District of Hope, and any other applicable stakeholders or regulatory authorities. The EIR should be updated as necessary (e.g., if new information arises), and resubmitted to the applicable parties.

9.0 ENVIRONMENTAL MONITORING PROGRAM / ADAPTIVE MANAGEMENT PLAN

Environmental Monitoring services will be provided by a qualified individual (e.g., QEP, EM) assigned to the Project for Project activities, as described in the sections above. The qualified EM will meet the objectives of this CEMP and provide recommendations, as guided by Project works. The EM will document conditions and provide guidance to the Contractor to maintaining compliance with this CEMP and applicable environmental legislation.

The overall objectives of the monitoring program are to protect existing aquatic resources and wildlife habitat, provide general oversight of Project works conducted in and around water and downstream valuable aquatic resources, confirming that mitigation measures are being appropriately applied and are effective, documenting and responding to environmental emergencies and concerns (including follow-up reporting, as applicable), and providing guidance and adaptive measures where required, providing records and reports to the appropriate stake holders.

9.1 Environmental Monitoring and Reporting

The EM will work with the Contractor in matters related to the protection of the environment, and be on-Site during identified sensitive Project work including, but not limited to, the following:

- Installation of ESC devices (e.g., CB inserts, silt fencing)
- Asphalt/cement pours
- On-Site vegetation removal

- On-Site instream works, including ditch closures, and new outfall installation
- Water management/surface water discharge
- Following SREs (> 25 mm in 24 hours)

In addition, the EM will keep a dedicated field notebook, including a photographic record as Project work progresses, and will document compliance by preparing a weekly monitoring report. During Site visits, the EM will:

- **Meet with the Contractor's on-Site supervisor** to discuss Project work, as well as potential environmental issues and appropriate mitigation measures to be considered;
- Confirm that the Contractor/Site personnel are aware of the relevant environmental policies and BMPs, and will advise on environmentally sound approaches and practices;
- Provide technical assistance on environmental matters to on-Site staff and regulatory personnel;
- Ensure the ESC permit sign is secure and displayed correctly at the Site entrance (e.g., on Site trailer);
- Inspect the Site, taking notes of Project activities and the potential for adverse environmental effects;
- Record any environmental protection measures implemented (e.g., silt fencing, temporary access pads), including their condition, as well as any other notable features or incidents;
- Inspect any ESC measures that have been implemented for effectiveness, and recommend additional measures on an as-needed basis (e.g., repair broken silt fencing, addition of more gravel for access pad);
- If applicable, collect WQM samples and report water quality data obtained during Site visits (e.g., pH, turbidity, etc.), as well as laboratory analyses as they become available (if necessary); and
- Stop Project work if it appears that permit or approval conditions, or municipal bylaws are not being followed.

Monitoring reports will be submitted by the EM to the Project Team, following each Site visit, for submission to other designated representatives (if required). Reports will include a list of Project activities, WQM results, and any environmental protection measures implemented during each visit. The monitoring report will document, and bring to the attention of the Site Supervisor/Contractor, any deficiencies that occurred during Project works and the subsequent correction measures to be implemented ahead of the next scheduled monitoring visit, for compliance with this CEMP. Any events of non-compliance will be tracked with the measures taken to correct those deficiencies. The EM has the authority to issue a stop work order in the event of non-compliance with any part of this CEMP.

Environmental Monitoring Reports will include, at a minimum, the following information:

- Name(s) of EM(s)
- Period covered by the report
- Date the report was submitted

- Report recipient(s)
- Contractor(s) undertaking work during the reporting period
- Overall weather conditions during the reporting period
- Amount of rainfall recorded during the 24 hours prior to the visit (i.e., for SRE only)
- Description and photos of key Project/construction activities
- Water quality monitoring results (i.e., taken in the field and obtained from the lab, if applicable)
- Summary of Site observations made by the EM, including a description of environmental issues or concerns raised by the EM and the measures taken to address those issues or concerns
- A summary of environmental incidents that occurred during the reporting period (if applicable)

Additional content which may be applicable to the Project includes:

- A summary of environmental monitoring data collected and all results received during the reporting period, such as water sampling;
- A map showing the location of the monitoring activities and the area of active construction;
- An organized checklist or table of key mitigation requirements of this CEMP and/or applicable permit conditions verifying implementation and effectiveness at the relevant stages of the Project;
- A list of Project related meetings and other communications and a summary of key issues discussed; and
- An overview of fish and/or wildlife observations, and potential negative interactions with Project activities.

9.1.1 *Instream Works (Ditch Infill), Outfall Works Monitoring and Reporting*

As instream works are proposed as part of the Project instream works monitoring must also be completed by the Project EM/QEP. Pending approval from MFLNROD and DFO, all instream works must adhere to conditions set forth in the pending approval document including, but not limited to, the following:

- Instream works to be completed in the dry and under the full-time supervision of an EM/QEP;
- Daily monitoring, including WQM at pre-determined, designated upstream and downstream sampling locations, during infill works to be completed by an EM/QEP;
- Ensure there is sufficient rip rap material around the new culvert areas for increased erosion protection; and
- Formal reporting to external agencies databases by an EM/QEP following completion of instream works.

9.1.2 *Outfall Function Monitoring*

An inspection conducted by the project engineer and/EM will occur on an annual basis to confirm the proper functioning of the outfall. Inspections will be scheduled during high rain events to properly evaluate the functionality of the outfall, which may include quarterly water quality sampling.

The OEP will prepare information and reports (where necessary) on the following parameters:

- Slope and bank stability;
- Erosion/scouring of the banks adjacent to the river; and
- Any comments or recommendations from the project designer, hydrogeologist and EM.

10.0 STATEMENT OF LIMITATIONS

This CEMP is meant to be a living and flexible document that can be used to provide guidance in environmental protection measures that can be implemented during routine Project activities, as well as unanticipated events or requirements that may arise during the course of Project works.

This report has been prepared solely for the internal use of PLG, the City of Pitt Meadows, the Client, and their Contractor pursuant to the agreement with PLG. Any use which other parties make of this report, or any reliance on or decisions made based on it, are the responsibility of such parties. PLG accepts no responsibility for damages, if any, suffered by other parties as a result of decisions made or actions based on this report.

11.0 PROFESSIONAL STATEMENT

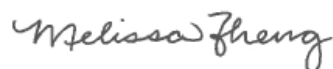
This report entitled *Construction Environmental Management Plan*, has been prepared by Ms. Melissa Zheng (Project Biologist) and Ms. Kyla Milne (Lead Biologist/ESC Supervisor).

I, Kyla Milne, certify that the work described herein fulfills standards acceptable of a Professional Biologist.

Please contact the undersigned should you have comments or questions regarding this correspondence.

Sincerely,

PACIFIC LAND RESOURCE GROUP INC.



Melissa Zheng, BIT, BC-CESCL
Project Biologist



Kyla Milne, RPBio, OEP
Lead Biologist / ESC Supervisor

Appendix A – 6 Steps to Spill Response

6 STEPS TO SPILL RESPONSE

1) Ensure Your Safety

- Immediately notify the Site Supervisor and Environmental Monitor, if on-Site;
- Do not try to clean the spill unless trained to do so and contact trained personnel, if necessary;
- Review spill response procedures; and
- Identify spill material(s), consult MSDS sheets, if necessary, and wear the appropriate Personal Protective Equipment (PPE).

2) Stop the Source

- Assess the source of the flow/spill; and
- Shut off machinery, if needed, close all valves and pumps, plug or trap leaks, set containers upright and carry out emergency repairs.

3) Evacuate & Secure the Area

- Evacuate non-essential emergency spill personnel;
- Remove or secure all ignition sources;
- Consider wind directions and stay upwind or uphill of the spill, if possible; and
- Inform the Site Contractor or the owners of the property of the spill as soon as reasonably possible.

4) Contain the Spill

- Evaluate the direction of flow and intercept by diking, absorbents, or absorbent booms, if possible;
- If a spill kit is not available, or contents are inadequate to contain the spill, use available earth/sod;
- Do not flush products down sewers or drains;
- Protect stormwater drains/catch basins, sensitive habitats, and wildlife; and
- Continue to monitor potential source(s) of spill material and mark off contaminated areas.

5) Notify / Report

- Notify the Site Supervisor or Environmental Monitor of all spills as soon as possible;
- The Site Supervisor must **INTERNALLY REPORT**:
 - a) All spills, regardless of quantity, to the Client within 24 hours and submit a completed Investigation Report Form to the Client and EM
- The Site Supervisor must **EXTERNALLY REPORT**:
 - a) Any spills to land above reportable quantities to **Emergency Management BC (EMBC) 1-800-663-3456**;
 - b) All spills to water and any spills to land that may reach water to the **Fisheries and Oceans Canada (DFO) Regional Office**;
 - c) All spills that enter a storm or sanitary drain, or drinking water source to **local municipalities or Regional District**; and
 - d) A spill of any substance in a Transportation of Dangerous Goods (TDG) class released while in transport or above reportable quantities to **local police and CANUTEC 613-996-6666**.

6) Clean-Up

- Wearing proper PPE, collect all used sorbent materials and contaminated soils and store in a water tight container with polyethylene liner, appropriate for temporary storage and disposal;
- Label containers with ID number, description of contents, shipping name, origin and date;
- If large quantities of contaminated soils are generated, place soils on a liner and cover with a tarp, away from any storm drains, until it can be transferred to containers; and
- Store all wastes in a secure location until transport and disposal, in accordance with applicable Acts & Regulations, can be achieved.

APPENDIX B – HUB ENGINEERING DESIGN PLANS

CLIENT : EM BUSINESS PARK LTD.
 1910 – 117 WEST HASTINGS STREET
 VANCOUVER, B.C., V6E 2K3

PROJECT : EAGLE MEADOWS BUSINESS PARK
 KATZIE RESERVE No. 1

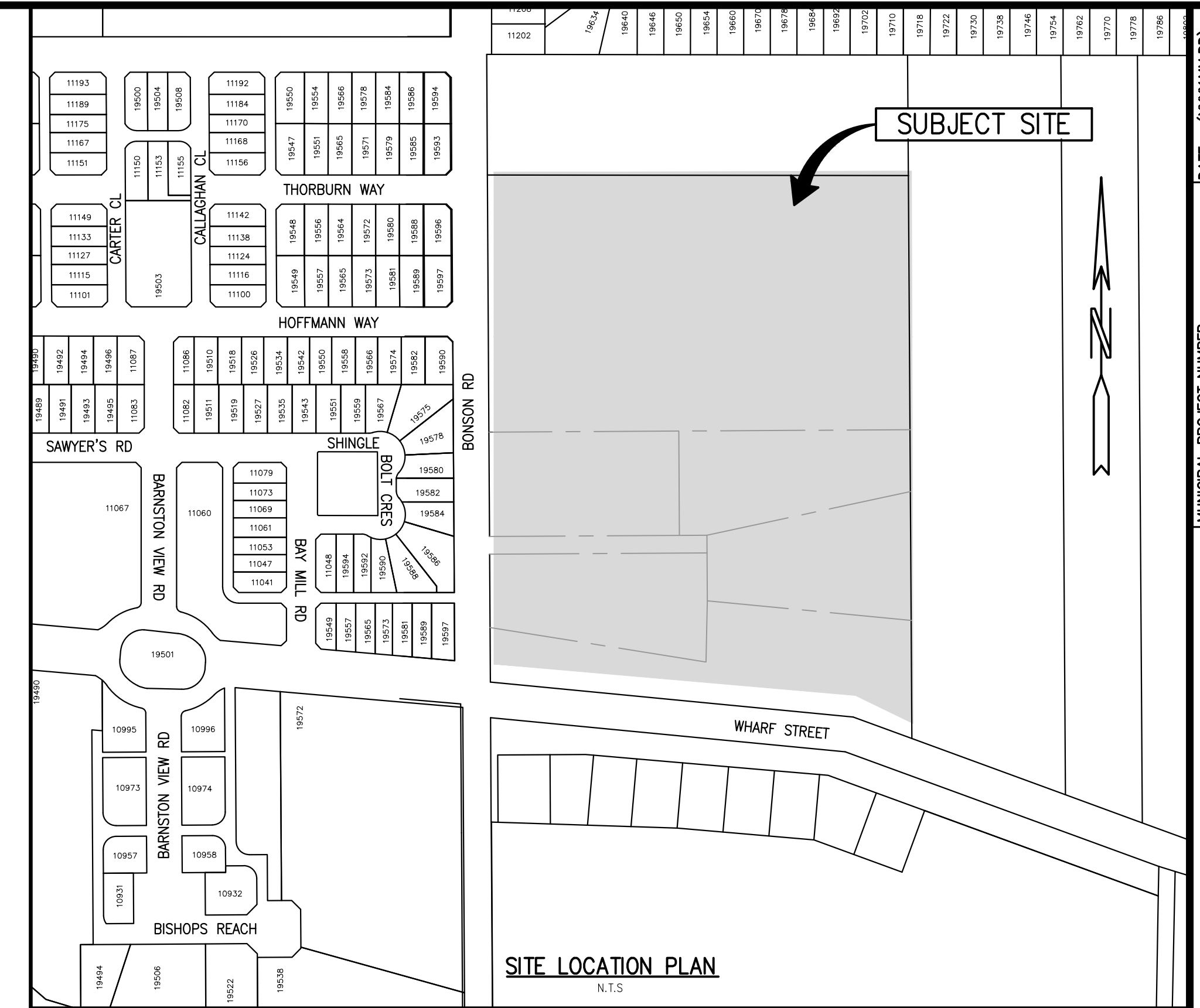
LEGAL DESCRIPTION :

Hub Engineering Inc.

Engineering and Development Consultants

EGBC Permit to Practice Number: 1003404

Suite 212, 12992 - 76 Avenue, Surrey, B.C. V3W 2V6
 tel: 604-572-4328 | fax: 604-501-1625 | mail@hub-inc.com
 www.hub-inc.com



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STREET LIGHTING	B
BONSON ROAD OUTFALL	1 OF 2
BONSON ROAD OUTFALL	2 OF 2

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Hub No. 20001
Mun. No. –
Sheet No. 1

CONSULTANT	EM BUSINESS PARK LTD. 1910 – 117 WEST HASTINGS STREET VANCOUVER, B.C., V6E 2K3	MUNICIPAL PROJECT NUMBER -	DATE (YYYYMMDD) FEB 2020
	TITLE SITE LOCATION PLAN LEGAL DESCRIPTION & DRAWING INDEX	DESIGNED MC/KK DRAWN AKG REVIEWED KL/RFG	CONSULTANT PROJ. NO. 20001 DWC. NO. 1
			
Engineering and Development Consultants <small>EGBC Permit to Practice Number: 1003404</small> Suite 212, 12992 - 76 Avenue, Surrey, B.C. V3W 2V6 tel: 604-572-4328 fax: 604-501-1625 mail@hub-inc.com www.hub-inc.com		<small>© Project 2020, all rights reserved. Drawings to be covered [Cover] 2/17/2022 1:38PM</small>	

CONSULTANT SUPPLEMENTARY NOTES

GENERAL NOTES

- All elevations are geodetic and are referred to Surrey Monument No. 88H0617, Elevation 6.525m located at --, Surrey's survey monuments within the project boundaries are to be protected and should they require to be reset or relocated, the Developer's Contractor shall notify Surrey's Survey Department at least 72 hours in advance of scheduling work affecting them.
- All existing pavement, boulevards, driveways, etc. which are disturbed during construction shall be shaped across width of boulevard to form smooth transition with new pavement. Finished pavement surface over trench excavations shall blend in smoothly with existing pavement.
- Driveway boulevard crossing location to be determined in the field prior to construction of sidewalk and boulevard landscaping. On roads where barrier curb is used, crossing shall be located prior to construction of curb.
- Figured dimensions shall govern over scaled dimensions.
- Service connections shall be installed in accordance with Surrey Standard Drawing No. SSD-G1 unless otherwise noted.
- All existing live services shall be maintained operational during construction.
- Upon completion, Contractor shall provide as-built survey certified by a BCLS, P.Eng or ASCT, all as per Hub standard.

ROAD WORK NOTES

- Changes of grade and alignment shall be formed by smooth curves.
- All subgrade and granular base materials to be compacted to 95% modified proctor maximum dry density.
- Arrows on pavement indicate direction of drainage.
- Positive grade indicates rise in the direction of increasing chainage.
- Asphaltic pavement shall be laid in 2 lifts; second lift shall be 35mm thick and unless otherwise required by Surrey Municipality, shall be performed later by others.
- Curb returns shall have min. 9m radius unless otherwise noted.
- The conditions for placing asphalt pavement and P.C. concrete shall conform with specifications detailed in Master Municipal Construction Documents (MMCD) applicable at the time of construction. Should deviances be allowed from these specifications, the contractor is to assume all responsibility for these products.

STORM SEWER NOTES

- Storm sewer pipe shall conform to spec.'s detailed in the Master Municipal Construction Documents (MMCD) applicable at time of construction. Where pipe bedding is sand it shall meet Surrey Spec. for 13mm sand. Concrete pipe shall be ASTM C-14 Class 3 non-reinforced or ASTM C-76 Class III reinforced for sizes up to and including 675mm diameter. For sizes larger than 675mm concrete pipe shall be ASTM C-76 Class III reinforced. P.V.C. pipe & fittings up to 300mm diameter may be used & shall have min. S.D.R. 28 for services and S.D.R. 35 for main lines when tested in accordance with ASTM D3034. Pipe stiffness (F/Y) shall be 315 Kpa at 5% Deflection when tested in accordance with ASTM 2412. P.V.C. pipe shall be closed jointed. All storm sewer pipe with less than 0.9m cover to finished grade shall be reinforced concrete ASTM C-76-74 Class III and all pipe with less than 0.45m cover to finished grade shall be reinforced concrete ASTM C-76-74 Class IV.
- Unless otherwise noted, all catchbasin (CB) leads to be 200mm dia. for single and 250mm dia. for double catch basins.
- Where storm services are to be installed in same trench as water and/or san. services which are to be installed by City of Surrey, Contractor shall coordinate installation of storm services in conjunction with installation of water and/or san. services by City of Surrey forces.

SANITARY SEWER NOTES

- Sanitary sewer pipe to conform with specifications detailed in the Master Municipal Construction Documents (MMCD) applicable at the time of construction.
- The contractor shall install and secure a red painted cap at the end of the sanitary connection stub on private property.
- The contractor shall paint a red strip around the top area of the sanitary inspection chamber riser pipe.

WATERWORKS NOTES

- Prior to any construction, existing watermains at tie-in points to be exposed by Developer's Contractor who shall verify elevations and locations and in event of any discrepancies shall notify the Engineer. Any changes required must be approved by the Municipality.
- Hydrants shall have 1.0m offset from property line unless otherwise noted or specified in Surrey specifications. During the construction and, at any time prior to acceptance and pressurizing of watermains by the Municipality, the Developer's Contractor shall install a 300mm x 300mm square 18mm sheet of plywood over the pumper nozzle of each hydrant to indicate that the hydrant is not in use.
- Minimum cover over watermain to be 1.0 metre unless concrete surround used.
- Ductile iron (D.I.) watermain shall be AWWA C151, Pressure Class 350, cement mortar lined to AWWA C104. Polyvinyl Chloride (P.V.C.) watermain can only be used with written permission from The City of Surrey and Hub Engineering, and shall meet AWWA Spec. C900 (DR18).
- All fittings shall be ductile iron tyton joint with closed lugs unless noted otherwise.
- Curb stops to be fitted with Mueller telescoping service boxes or approved equal.
- Minimum grade on watermain to be 0.1%.
- Pipe joints shall not be deflected more than the following amounts, which correspond to half the manufacturer's recommended maximum deflection:

PIPE MATERIAL	PIPE SIZE(mm)	MAX. DEFLECTION
PVC	100-250	1.5' (2.6%)
	300	1.25' (2.1%)
Ductile Iron	100-300	2.5' (4.3%)
	350-400	2.0' (3.5%)
	450-900	1.5' (2.6%)

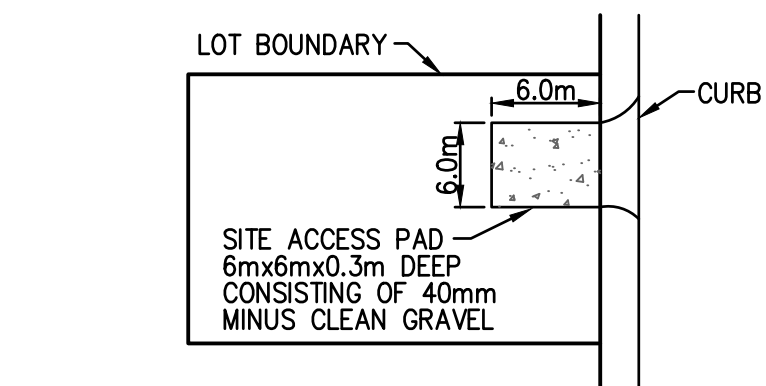
All deflections shown above require appropriate thrust restraint.

WORK AROUND TREES

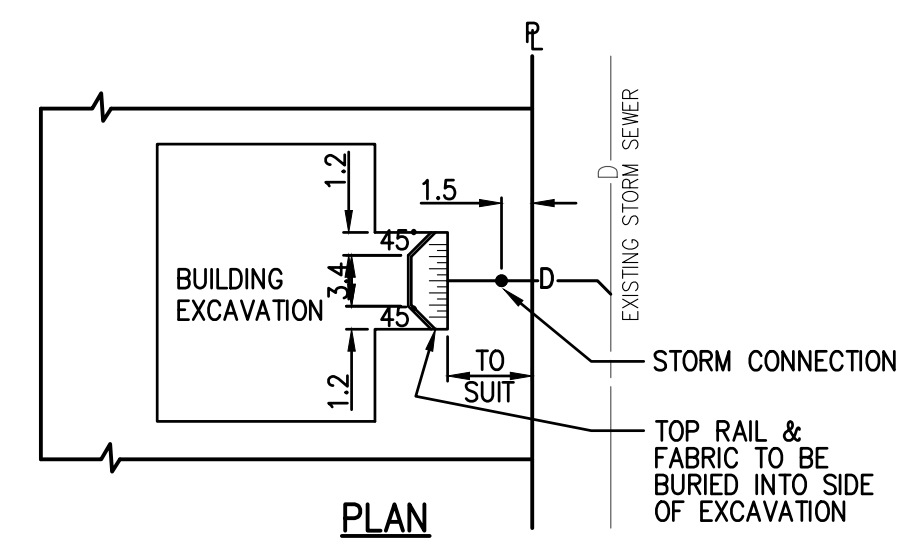
- The Contractor shall not perform any excavation near any trees without first determining whether the excavation work will have any impact on the trees. If unsure, the Contractor shall retain and pay for an arborist to determine impact.
- Should the Contractor need to excavate near any trees or encounter tree roots, the Contractor shall retain and pay for an arborist to review the excavation area and determine the necessary action (i.e. saw cut tree roots, pruning, hand excavation, etc.).
- The Contractor shall have the arborist provide a written sign off that the works in and about any trees was completed to the satisfaction of the arborist.
- Where tree protection barrier is required, the Contractor shall install wood frame and snow fencing around the tree to the extent of the tree drip line, roots or as otherwise directed by the arborist.

DRIVEWAY NOTES

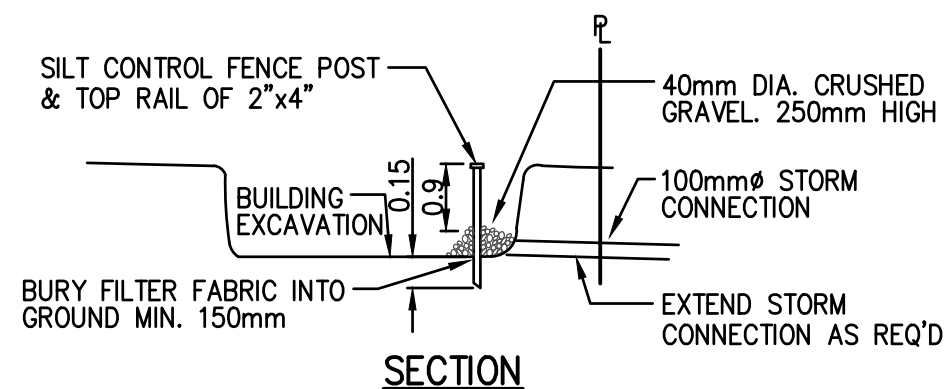
- Contractor and/or Builder to maintain 1.0 metre clearance from street lighting, powerpoles and hydrants for all driveway installations.
- The Contractor and/or Builder shall provide a concrete box with steel lid suitable to H20 loading (or equivalent) for protection of such services where a driveway is located over a Sanitary or Storm Inspection Chamber or Water Meter.



INDIVIDUAL LOT GRAVEL DRIVEWAY ACCESS PAD
N.T.S.



PLAN



SECTION

INDIVIDUAL LOT SILT CONTROL FOR BUILDING EXCAVATIONS
N.T.S.

EROSION & SEDIMENT CONTROL

- The contractor shall ensure that:
 - All work is undertaken and completed in such a manner as to prevent the release of sediment laden water into any water course or storm sewer system and comply with The KATZIE RESERVE No. 1's ESC By-law.
 - The builder will construct a sediment control facility as per detail prior to uncapping the storm connection or allowing any water to discharge from the lot;
 - while site construction is ongoing, the site contractor is responsible for ensuring that the sediment control facility(s) is maintained and working adequately to control all discharges from the lands. All facilities shall be inspected by the contractor on a weekly basis to ensure proper operation until its (their) removal.
 - The builder is supplied with the correct filter fabric as specified and details of individual sediment control facilities.
 - The complete sediment control facility(s) remain in place and be maintained by:
 - the builder(s) until after framing inspection for individual facilities; or,
 - the contractor until 90% of house construction of the lands is complete for the major facility(s).
 - No silt laden water from excavations shall be pumped out or otherwise directly discharged to a storm sewer system by passing the sediment control facility(s).
- Silt fence is to be "kontrol silt fence plus" or equivalent as specified and approved by the engineer. Fence to have minimum clear water flow rate of 0.0305 cms/sm (0.10 cfs/sf). Fence to be staked at 150mm o/c to 100mm dia. treated posts spaced at 1m o/c. bottom of fence to be anchored as per detail.
- The Contractor to install and maintain the sediment and erosion control system in the development in order to prevent silt discharges to the storm drainage system and watercourses.

GENERAL LEGEND		
EXISTING	PROPOSED	DESCRIPTION
		EDGE OF PAVEMENT
		CURB & GUTTER
		BENCH MARK - GEODETIC DATUM
		TEMPORARY BENCH MARK - GEODETIC DATUM
		SANITARY SEWER
		SANITARY CONNECTION & INSPECTION CHAMBER
		STORM SEWER
		STORM CONNECTION & INSPECTION CHAMBER
		STORM SEWER SERVICE
		FRENCH DRAIN
		SWALE
		DITCH
		SIDEWALK (ASPHALT)
		SIDEWALK (CONCRETE)
		WATERMAIN
		WATER SERVICE CONNECTION
		HYDRANT AND VALVE ASSEMBLY
		CAPPED END
		WATER VALVE
		AIR VALVE
		WATER METER
		BLOW-OFF
		UNDERGROUND TELEPHONE & MANHOLE
		UNDERGROUND ELECTRICAL & MANHOLE
		GAS MAIN
		TRAFFIC SIGNAL & STREET LIGHT U/G DUCTS
		CATCH BASIN - TOP INLET & SIDE INLET
		LAWN DRAIN
		JUNCTION BOX
		ORNAMENTAL STREET LIGHT - DAVIT
		ORNAMENTAL STREET LIGHT - POST TOP
		UTILITY POLE
		UTILITY POLE W/LIGHT
		U/G HYDRO/TEL SERVICE
		SILTATION CONTROL FACILITY

PROTECTION OF FISH HABITAT

- All work to be undertaken in accordance with section 32(2) of the Fisheries Act and completed in such a manner as to prevent release of silt-laden water into any ditch, watercourse or storm sewer. A sediment control facility acceptable to the B.C. Ministry of Environment shall be developed and implemented prior to site preparation and construction. This facility shall be monitored regularly by a designated responsible member of the contractor's forces to ensure that it is working satisfactorily at all times including weekends and holidays and shall be properly maintained to ensure it operates satisfactorily throughout the development process.
- Major land clearing operations or disruption of natural vegetation or soil near any fish bearing creek system shall not be undertaken during the wet season from November 15th to April 15th of any calendar year.
- No machinery work, placement of fill or any other disruptive activity is to take place in any creek corridor, i.e. within 12 metres of the centreline of any creek, or within 9 metres of the top of any creek bank covered by a restrictive covenant.
- All swales in drainage right-of-ways and all detention basins shall be stabilized as soon as possible by sodding or seeding or such other finished surface treatment as may be called for in the drawings, to prevent release of silt.
- All construction and excavation wastes, overburden, soil or other substances deleterious to aquatic life shall be disposed of in such a manner as to prevent their entry into any watercourse, ravine, or storm sewer disposal system.
- B.C. Ministry of Environment, Lower Mainland region, 10334 - 152A St., Surrey, B.C. Telephone 604-592-5200, shall be contacted a minimum of 5 working days prior to the start of any work on any detention pond or in any creek corridor.
- All work within the wetted perimeter and disturbance to the streambed and banks shall be undertaken and completed during the period between August 1 to September 15 of any given year. 8. Stream flow shall be isolated from all work within the wetted perimeter of the stream in a manner satisfactory to the Federal and Provincial Fisheries authorities.

LEGAL DESCRIPTION: ----			
SURVEY BENCHMARK MON: 88H0617		SCALE FACTOR: ELEV.: 6.525m (GEODETIC)	
REV.	DATE	DESCRIPTION	BY
2	FEB 10/22	ADDRESS COMMENTS	KK
1	NOV 17/21	ISSUED FOR MUNICIPAL REVIEW	KK

CONSULTANT
Hub Engineering Inc.
Engineering and Development Consultants
EGBC Permit to Practice Number: 1003404
Suite 212, 12992 - 76 Avenue, Surrey, B.C. V3W 2V6
tel: 604-572-4328 | fax: 604-501-1625 | mail@hub-inc.com
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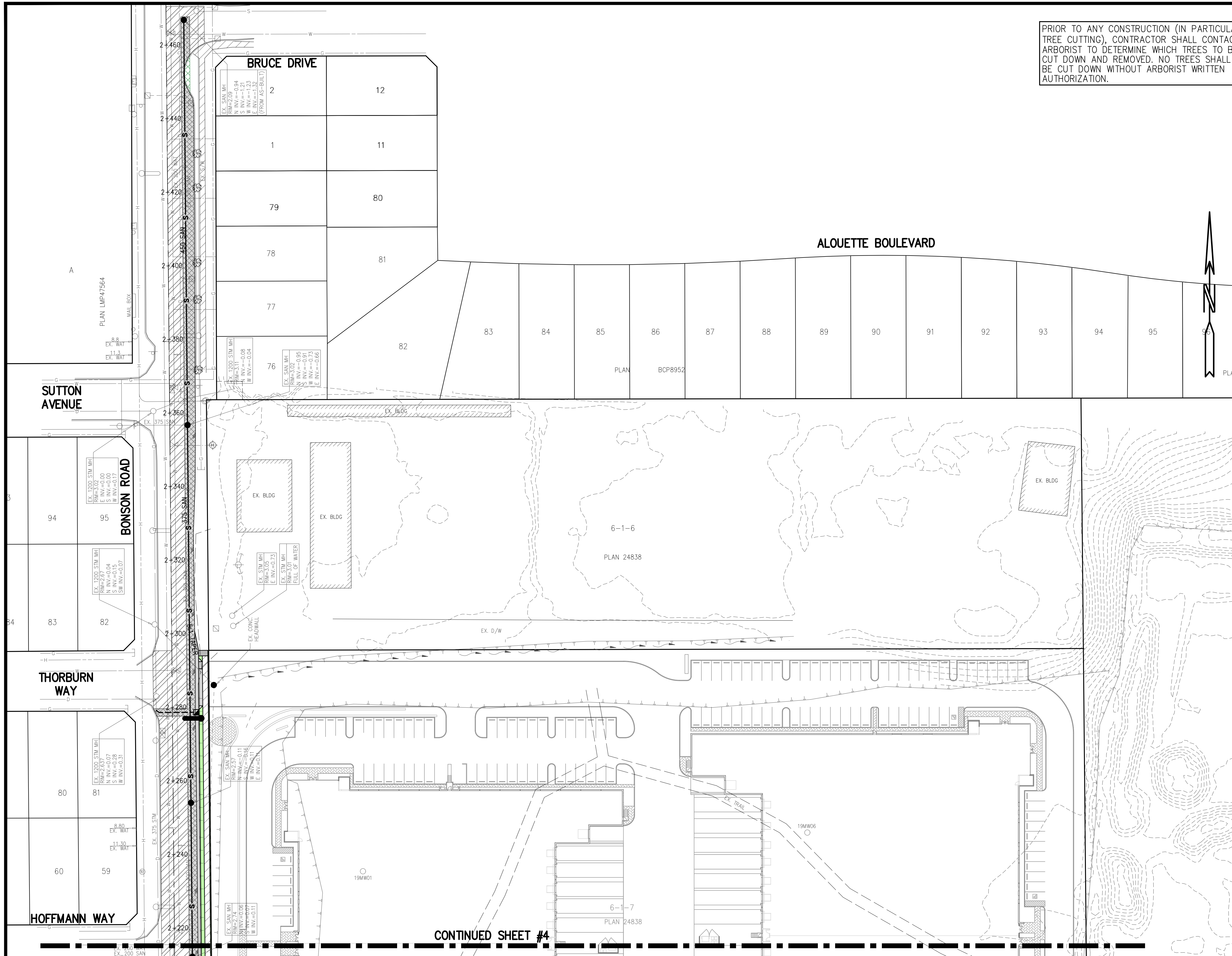


CLIENT
EM BUSINESS PARK LTD.
1910 - 117 WEST HASTINGS STREET
VANCOUVER, B.C., V6E 2K3

TITLE
GENERAL NOTES AND LEGEND

SEAL
Feb 11, 2022

SCALE: HOR. VERT.	DATE (YYYY-MM-DD) FEB 2020	MUNICIPAL PROJECT NUMBER -
DESIGNED MC/KK	CONSULTANT PROJ. NO. 20001	DRAWING TYPE
DRAWN AKG	DWG. NO.	NOTES
REVIEWED KL/RFG	REV. 2	



PRIOR TO ANY CONSTRUCTION (IN PARTICULAR TREE CUTTING), CONTRACTOR SHALL CONTACT ARBORIST TO DETERMINE WHICH TREES TO BE CUT DOWN AND REMOVED. NO TREES SHALL BE CUT DOWN WITHOUT ARBORIST WRITTEN AUTHORIZATION.

- LEGEND**
- NEW ASPHALT PAVEMENT AS PER GEOTECHNICAL ENGINEER RECOMMENDATIONS (BY DEVELOPER'S CONTRACTOR)
 - MILL AND REPAVE EXISTING PAVEMENT AS REQUIRED (BY DEVELOPER'S CONTRACTOR)
 - PAVEMENT CUT AND PATCH
 - MIN. 450mm TOPSOIL AND SOD
 - REINSTATE DISTURBED BOULEVARD WITH TOPSOIL AND SOD (TYP.)
 - EXISTING TREE TO BE REMOVED
CONIFEROUS DECIDUOUS
 - EXISTING TREE TO BE RETAINED w/ TREE ROOT ZONE

- NOTES:**
1. ALL DIMENSIONS ARE METRIC UNLESS NOTED OTHERWISE.
 2. CONTRACTOR SHALL REINSTATE ALL DISTURBED WORKS TO PRE-CONSTRUCTION CONDITION OR BETTER AND TO CURRENT KATZIE RESERVE STANDARDS AND CITY OF PITT MEADOWS STANDARDS.
 3. ALL NEW SERVICE CONNECTIONS SHALL CONFORM TO CURRENT KATZIE RESERVE STANDARDS AND CITY OF PITT MEADOWS STANDARDS.
 4. ASPHALT PAVEMENT CUTS AND PATCHES SHALL CONFORM TO CURRENT KATZIE RESERVE STANDARDS AND CITY OF PITT MEADOWS STANDARDS.
 5. ALL EXISTING UNDERGROUND WORKS AND SERVICES SHOWN HEREIN ARE APPROXIMATE ONLY AND BASED ON AS-CONSTRUCTED RECORDS. CONTRACTOR SHALL EXPOSE AND VERIFY (VERT.) LOCATION, MATERIAL TYPE AND SIZE OF ANY AND ALL EXISTING UNDERGROUND WORKS AND SERVICES AT TIE-IN AND CROSSING POINTS PRIOR TO CONSTRUCTION, AND ADVISE HUB ENGINEERING INC. IMMEDIATELY OF ANY DISCREPANCY.
 6. CONTRACTOR SHALL REPLACE ANY NATIVE BACKFILL OVER EXISTING MAINS WITH IMPORTED GRANULAR BACKFILL.
 7. ALL NEW ELECTRICAL AND TELECOMMUNICATIONS SERVICE CONNECTIONS TO BE LOCATED UNDERGROUND.
 8. ALL BOULEVARD AREAS SHALL BE GRADED BY CONTRACTOR TO CURRENT MMCO, KATZIE RESERVE STANDARDS, AND CITY OF PITT MEADOWS STANDARDS.
 9. CONTRACTOR SHALL ADJUST ALL EXISTING RIMS AND COVERS FLUSH WITH NEW SURFACE GRADES (UNLESS NOTED OTHERWISE).
 10. CONTRACTOR TO TIE-IN ALL NEW SURFACE WORKS TO EXISTING SURFACE WORKS FORMING A SMOOTH TRANSITION.
 11. CONTRACTOR SHALL MAKE ARRANGEMENTS WITH KATZIE RESERVE AND CITY OF PITT MEADOWS TO INSTALL ALL WATER SERVICES, TIE-INS AND RELOCATES AS IDENTIFIED ON DRAWINGS, AND ADVISE HUB ENGINEERING'S SITE REVIEWER OF INSTALL DATE(S).
 12. ALL EXISTING BUILDINGS, FENCES, DRIVEWAYS, STRUCTURES, POOLS, SEPTIC TANKS AND DISPOSAL FIELDS ON THE SITE SHALL BE DEMOLISHED AND DISPOSED OFFSITE PRIOR TO CONSTRUCTION WITH A DEMOLITION PERMIT. NO DEMOLITION TO COMMENCE UNTIL ALL EXISTING SERVICES HAVE BEEN DISCONNECTED. CONTRACTOR SHALL PROVIDE COPY OF DEMOLITION SIGN OFF LETTER FROM KATZIE RESERVE TO HUB ENGINEERING INC.
 13. REMOVE ALL TOPSOIL AND UNSUITABLE MATERIAL WITHIN ROAD DEDICATION AND DISPOSE OFFSITE.
 14. CONTRACTOR SHALL PREVENT RELEASE OF SEDIMENT LADEN WATER TO ANY DITCH, WATERCOURSE OR STORM SEWER FOR DURATION OF CONSTRUCTION. PREVENTIVE MEASURES INCLUDE (BUT ARE NOT LIMITED TO):
 - CONSTRUCTION OF SWALES c/w SILT FENCES AT DOWNSTREAM SIDE OF ROADS.
 - SILT FENCES REQUIRED IN ALL DITCHES THAT MAY COLLECT DRAINAGE OFF THE CONSTRUCTION SITE.
 - STREET SWEEPING TO BE PROVIDED.
 - CATCHBASIN SUMPS TO BE CLEANED REGULARLY.
 - ALL NEW SWALES TO BE SODDED IMMEDIATELY AFTER CONSTRUCTION.
 - CONTRACTOR SHALL MAKE ALL EFFORTS TO PERFORM SITE STRIPPING (AND PLACE CLEAN GRAVEL ON EXPOSED SURFACES) AND PERFORM CONSTRUCTION DURING DRY WEATHER.
 15. a) NEW STORM CONNECTION SHALL BE 600mm PVC AT MIN. 2% UNLESS NOTED OTHERWISE.
 b) NEW SANITARY CONNECTION SHALL BE 300mm PVC AT MIN. 2% UNLESS NOTED OTHERWISE.
 c) NEW WATER CONNECTION SHALL BE 300mm UNLESS NOTED OTHERWISE.
 16. ALL CATCHBASIN (CB) LEADS TO BE 200mmØ AT MIN. 1% SLOPE.

LEGAL DESCRIPTION: ----

SURVEY BENCHMARK: MON: 88H0617 SCALE FACTOR: ELEV.: 6.525m (GEODETIC)

REV.	DATE	DESCRIPTION	BY
4	FEB 10/22	ADDRESS COMMENTS	KK
3	DEC 02/21	DESIGN REVISION	KK
2	NOV 17/21	ISSUED FOR MUNICIPAL REVIEW	KK
1	JUN 22/21	ISSUED FOR MUNICIPAL PRELIMINARY REVIEW	MC
-	FEB 02/21	ISSUED FOR DEVELOPMENT PERMIT	MC

CONSULTANT

Hub Engineering Inc.
Engineering and Development Consultants
EGBC Permit to Practice Number: 1003404
Suite 212, 12992 - 76 Avenue, Surrey, B.C. V3W 2V6
tel: 604-572-4328 | fax: 604-501-1625 | mail@hub-inc.com
www.hub-inc.com



CLIENT

EM BUSINESS PARK LTD.
1910 - 117 WEST HASTINGS STREET
VANCOUVER, B.C., V6E 2K3

TITLE

KEY PLAN - NORTH
KATZIE RESERVE No. 1

SCALE: HOR. 1:500
VERT.

DATE (YYYY.MM.DD)
FEB 2020

CONSULTANT PROJ. NO.
20001

DESIGNED
MC/KK

DRAWN
AKG

REVIEWED
KL/RFG

DWG. NO.
3

REV. 4

MUNICIPAL PROJECT NUMBER

DRAWING TYPE
KEY PLAN

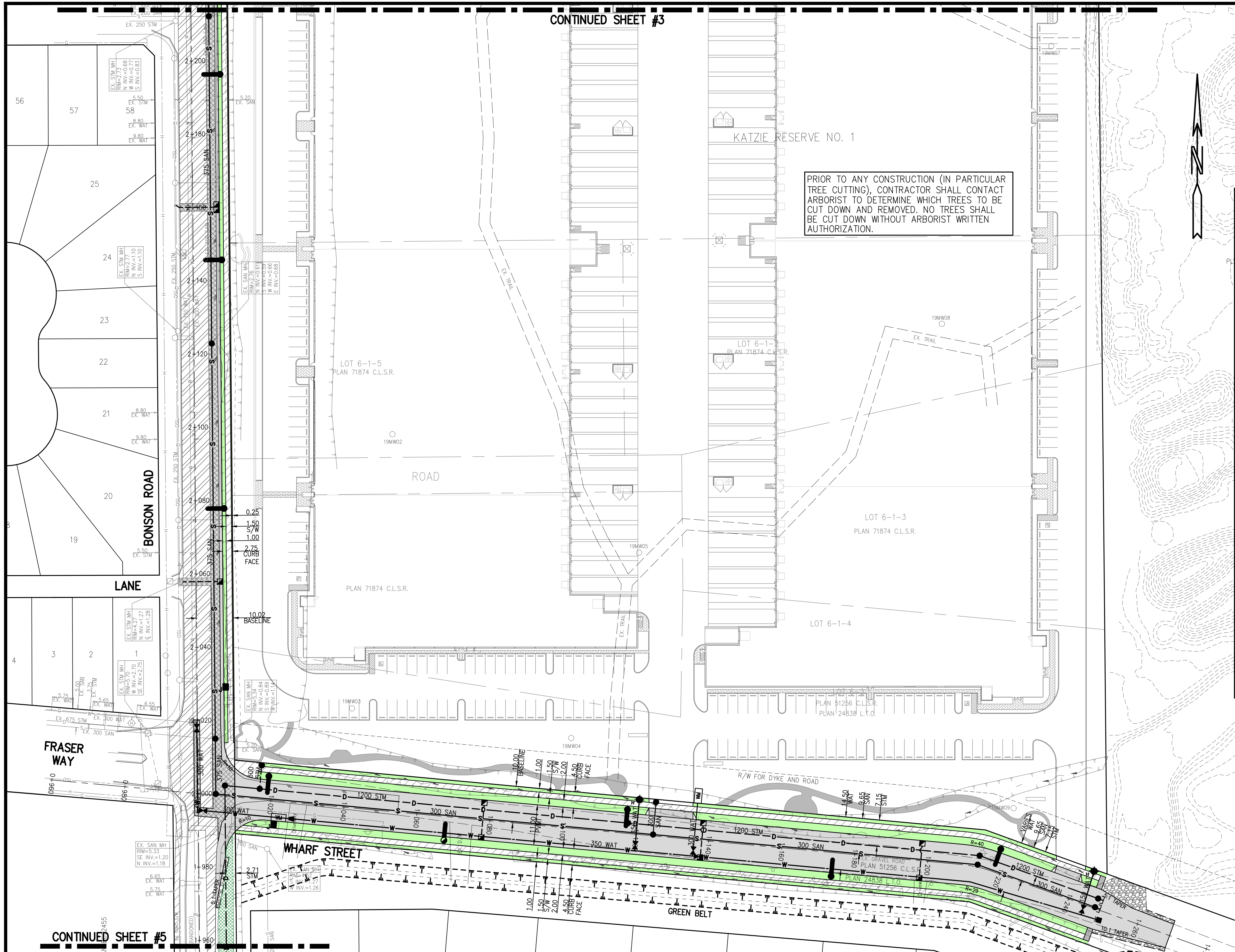
SEAL

Feb 11, 2022

0m 10m 20m 30m 40m 50m

SCALE: 1:500

DESTROY ALL PRINTS BEARING PREVIOUS NUMBER



CONTINUED SHEET #3

PRIOR TO ANY CONSTRUCTION (IN PARTICULAR TREE CUTTING), CONTRACTOR SHALL CONTACT ARBORIST TO DETERMINE WHICH TREES SHALL BE CUT DOWN AND REMOVED. NO TREES SHALL BE CUT DOWN WITHOUT ARBORIST WRITTEN AUTHORIZATION.

- LEGEND**
- NEW ASPHALT PAVEMENT AS PER GEOTECHNICAL ENGINEER RECOMMENDATIONS (BY DEVELOPER'S CONTRACTOR)
 - MILL AND REPAVE EXISTING PAVEMENT AS REQUIRED (BY DEVELOPER'S CONTRACTOR)
 - PAVEMENT CUT AND PATCH
 - MIN. 450mm TOPSOIL AND SOD
 - REINSTATE DISTURBED BOULEVARD WITH TOPSOIL AND SOD (TYP.)
 - EXISTING TREE TO BE REMOVED
 - EXISTING TREE TO BE RETAINED w/ TREE ROOT ZONE

- NOTES:**
1. ALL DIMENSIONS ARE METRIC UNLESS NOTED OTHERWISE.
 2. CONTRACTOR SHALL REINSTATE ALL DISTURBED WORKS TO PRE-CONSTRUCTION CONDITION OR BETTER AND TO CURRENT KATZIE RESERVE STANDARDS AND CITY OF PITT MEADOWS STANDARDS.
 3. ALL NEW SERVICE CONNECTIONS SHALL CONFORM TO CURRENT KATZIE RESERVE STANDARDS AND CITY OF PITT MEADOWS STANDARDS.
 4. ASPHALT PAVEMENT CUTS AND PATCHES SHALL CONFORM TO CURRENT KATZIE RESERVE STANDARDS AND CITY OF PITT MEADOWS STANDARDS.
 5. ALL EXISTING UNDERGROUND WORKS AND SERVICES SHOWN HEREIN ARE APPROXIMATE ONLY AND BASED ON AS-CONSTRUCTED RECORDS. CONTRACTOR SHALL EXPOSE AND VERIFY INVERT, LOCATION, MATERIAL TYPE AND SIZE OF ANY AND ALL EXISTING UNDERGROUND WORKS AND SERVICES AT THE TIE-IN AND CROSSING POINTS PRIOR TO CONSTRUCTION, AND ADVISE HUB ENGINEERING INC. IMMEDIATELY OF ANY DISCREPANCY.
 6. CONTRACTOR SHALL REPLACE ANY NATIVE BACKFILL OVER EXISTING MAINS WITH IMPORTED GRANULAR BACKFILL.
 7. ALL NEW ELECTRICAL AND TELECOMMUNICATIONS SERVICE CONNECTIONS TO BE LOCATED UNDERGROUND.
 8. ALL BOULEVARD AREAS SHALL BE GRADED BY CONTRACTOR TO CURRENT MMCD, KATZIE RESERVE STANDARDS, AND CITY OF PITT MEADOWS STANDARDS.
 9. CONTRACTOR SHALL ADJUST ALL EXISTING RIMS AND COVERS FLUSH WITH NEW SURFACE GRADES (UNLESS NOTED OTHERWISE).
 10. CONTRACTOR TO TIE-IN ALL NEW SURFACE WORKS TO EXISTING SURFACE WORKS FORMING A SMOOTH TRANSITION.
 11. CONTRACTOR SHALL MAKE ARRANGEMENTS WITH KATZIE RESERVE AND CITY OF PITT MEADOWS TO INSTALL ALL WATER SERVICES, TIE-INS AND RELOCATES AS IDENTIFIED ON DRAWINGS, AND ADVISE HUB ENGINEERING'S SITE REVIEWER OF INSTALL DATE(S).
 12. ALL EXISTING BUILDINGS, FENCES, DRIVEWAYS, STRUCTURES, POOLS, SEPTIC TANKS AND DISPOSAL FIELDS ON THE SITE SHALL BE DEMOLISHED AND DISPOSED OFFSITE PRIOR TO CONSTRUCTION WITH A DEMOLITION PERMIT. NO DEMOLITION TO COMMENCE UNTIL ALL EXISTING SERVICES HAVE BEEN DISCONNECTED. CONTRACTOR SHALL PROVIDE COPY OF DEMOLITION SIGN OFF LETTER FROM KATZIE RESERVE TO HUB ENGINEERING INC.
 13. REMOVE ALL TOPSOIL AND UNSUITABLE MATERIAL WITHIN ROAD DEDICATION AND DISPOSE OFFSITE.
 14. CONTRACTOR SHALL PREVENT RELEASE OF SEDIMENT LADEN WATER TO ANY DITCH, WATERCOURSE OR STORM SEWER FOR DURATION OF CONSTRUCTION. PREVENTIVE MEASURES INCLUDE (BUT ARE NOT LIMITED TO):
 - CONSTRUCTION OF SWALES c/w SILT FENCES AT DOWNSTREAM SIDE OF ROADS.
 - SILT FENCES REQUIRED IN ALL DITCHES THAT MAY COLLECT DRAINAGE OFF THE CONSTRUCTION SITE.
 - STREET SWEEPING TO BE PROVIDED.
 - CATCHBASIN SUMPS TO BE CLEANED REGULARLY.
 - ALL NEW SWALES TO BE SODDED IMMEDIATELY AFTER CONSTRUCTION.
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 15. a) NEW STORM CONNECTION SHALL BE 600mm PVC AT MIN. 2% UNLESS NOTED OTHERWISE.
 b) NEW SANITARY CONNECTION SHALL BE 300mm PVC AT MIN. 2% UNLESS NOTED OTHERWISE.
 c) NEW WATER CONNECTION SHALL BE 300mm UNLESS NOTED OTHERWISE.
 16. ALL CATCHBASIN (CB) LEADS TO BE 200mmØ AT MIN. 1% SLOPE.

LEGAL DESCRIPTION: -----

SURVEY BENCHMARK: MON: 88H0617 SCALE FACTOR: ELEV.: 6.525m (GEOID TIC)

REV.	DATE	DESCRIPTION	BY
5	FEB 10/22	ADDRESS COMMENTS	KK
4	DEC 20/21	ADD RELOCATION OF DITCH	KK
3	DEC 02/21	DESIGN REVISION	KK
2	NOV 17/21	ISSUED FOR MUNICIPAL REVIEW	KK
1	JUN 22/21	ISSUED FOR MUNICIPAL PRELIMINARY REVIEW	MC

CONSULTANT

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CLIENT

EM BUSINESS PARK LTD.
1910 - 117 WEST HASTINGS STREET
VANCOUVER, B.C., V6E 2K3

TITLE

KEY PLAN - SOUTH
KATZIE RESERVE No. 1

SCALE: HOR: 1:500
VERT.

DESIGNED: MC/KK
DRAWN: AKG
REVIEWED: KL/RFG

DATE (YYYY.MM.DD)
FEB 2020

CONSULTANT PROJ. NO.
20001

DWG. NO.
4

REV. 5

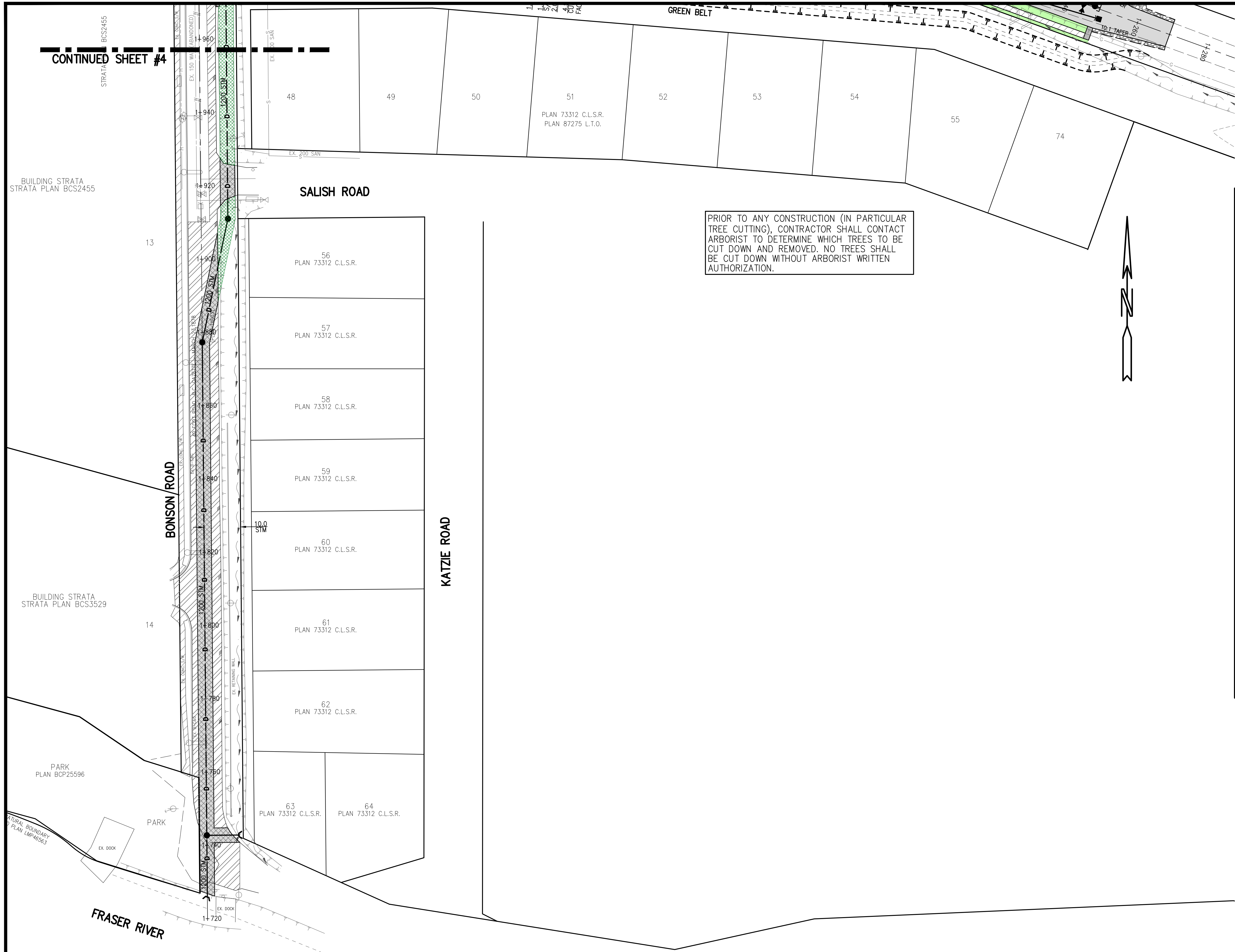
Feb 11, 2022

MUNICIPAL PROJECT NUMBER

DRAWING TYPE

KEY PLAN

DESTROY ALL PRINTS BEARING PREVIOUS NUMBER

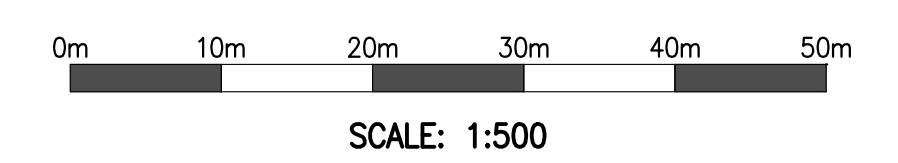


CONTINUED SHEET #4

PRIOR TO ANY CONSTRUCTION (IN PARTICULAR TREE CUTTING), CONTRACTOR SHALL CONTACT ARBORIST TO DETERMINE WHICH TREES TO BE CUT DOWN AND REMOVED. NO TREES SHALL BE CUT DOWN WITHOUT ARBORIST WRITTEN AUTHORIZATION.

- LEGEND**
- NEW ASPHALT PAVEMENT AS PER GEOTECHNICAL ENGINEER RECOMMENDATIONS (BY DEVELOPER'S CONTRACTOR)
 - MILL AND REPAVE EXISTING PAVEMENT AS REQUIRED (BY DEVELOPER'S CONTRACTOR)
 - PAVEMENT CUT AND PATCH
 - MIN. 450mm TOPSOIL AND SOD
 - REINSTATE DISTURBED BOULEVARD WITH TOPSOIL AND SOD (TYP.)
 - EXISTING TREE TO BE REMOVED
 - EXISTING TREE TO BE RETAINED w/ TREE ROOT ZONE

- NOTES:**
1. ALL DIMENSIONS ARE METRIC UNLESS NOTED OTHERWISE.
 2. CONTRACTOR SHALL REINSTATE ALL DISTURBED WORKS TO PRE-CONSTRUCTION CONDITION OR BETTER AND TO CURRENT KATZIE RESERVE STANDARDS AND CITY OF PITT MEADOWS STANDARDS.
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 10. CONTRACTOR TO TIE-IN ALL NEW SURFACE WORKS TO EXISTING SURFACE WORKS FORMING A SMOOTH TRANSITION.
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 - SILT FENCES REQUIRED IN ALL DITCHES THAT MAY COLLECT DRAINAGE OFF THE CONSTRUCTION SITE.
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 16. ALL CATCHBASIN (CB) LEADS TO BE 200mmØ AT MIN. 1% SLOPE.



LEGAL DESCRIPTION: ----

SURVEY BENCHMARK: MON: 88H0617

SCALE FACTOR: ELEV.: 6.525m (GEOID TIC)

REV.	DATE	DESCRIPTION	BY
4	FEB 10/22	ADDRESS COMMENTS	KK
3	DEC 02/21	DESIGN REVISION	KK
2	NOV 17/21	ISSUED FOR MUNICIPAL REVIEW	KK
1	JUN 22/21	ISSUED FOR MUNICIPAL PRELIMINARY REVIEW	MC
-	FEB 02/21	ISSUED FOR DEVELOPMENT PERMIT	MC

CONSULTANT

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 Engineering and Development Consultants

EGBC Permit to Practice Number: 1003404

Suite 212, 12992 - 76 Avenue, Surrey, B.C. V3W 2V6
 tel: 604-572-4328 | fax: 604-501-1625 | email@hub-inc.com
 www.hub-inc.com



CLIENT

EM BUSINESS PARK LTD.
 1910 - 117 WEST HASTINGS STREET
 VANCOUVER, B.C., V6E 2K3

TITLE

KEY-BONSON
 KATZIE RESERVE No. 1

SEAL

SCALE: HOR. 1:500
 VERT. -

DESIGNED: MC/KK
 DRAWN: AKG
 REVIEWED: KL/RFG

DATE (YYYY.MM.DD)
 FEB 2020

CONSULTANT PROJ. NO.
 20001

DWG. NO.
 5

REV. 4

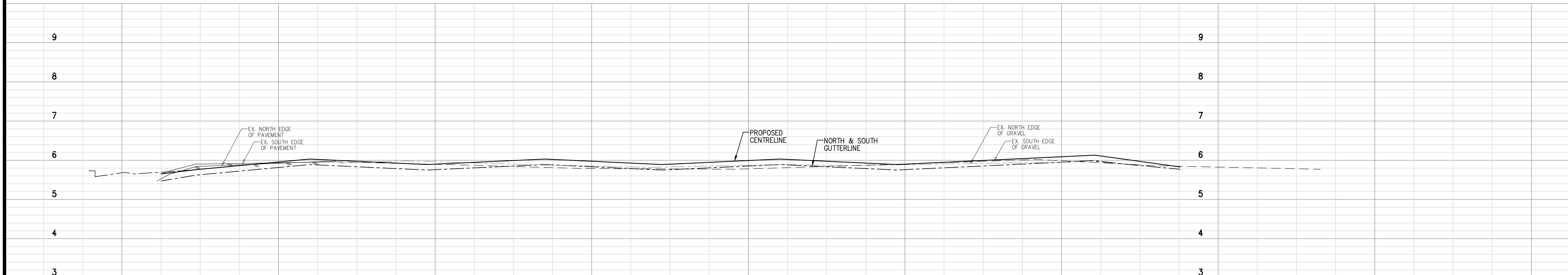
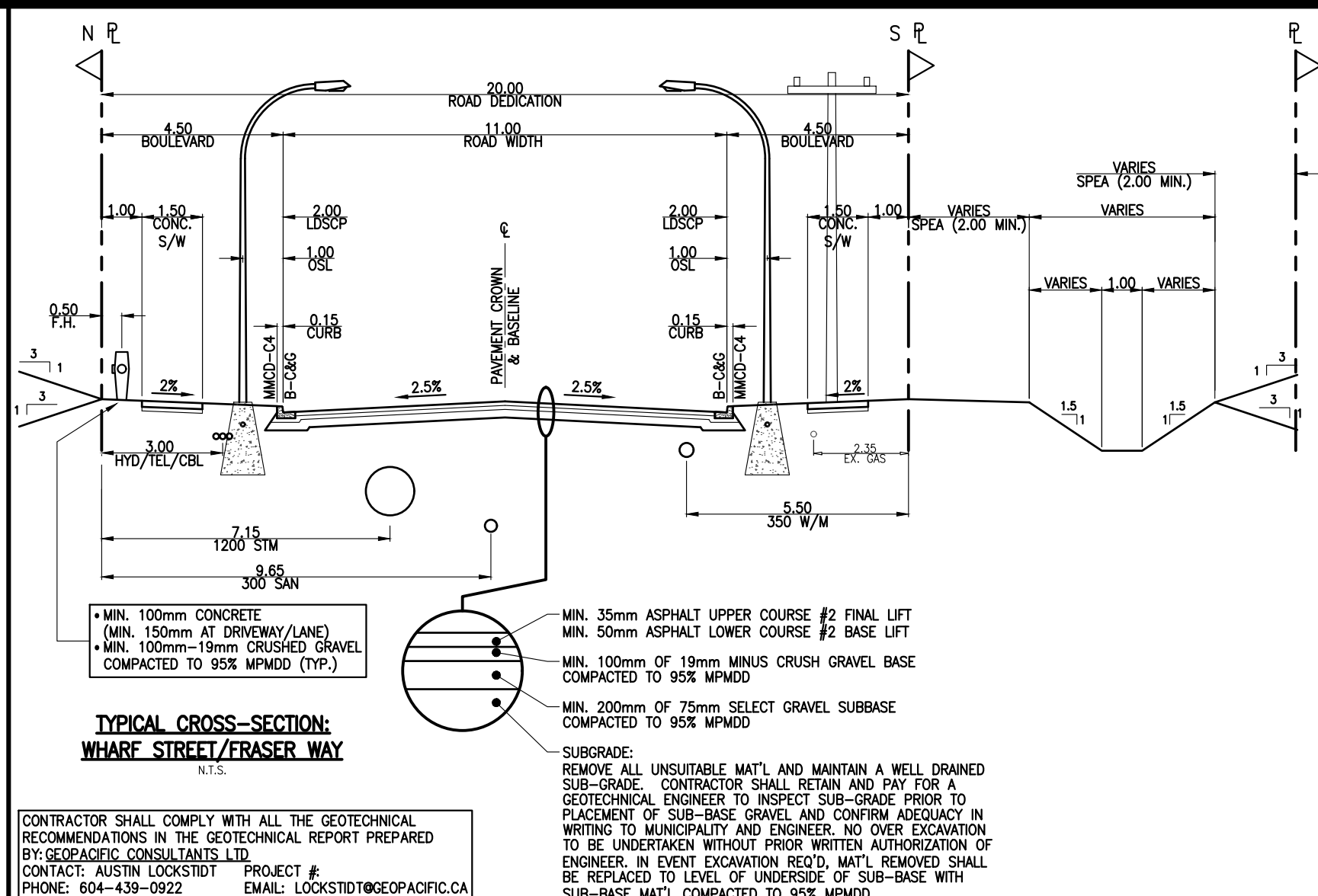
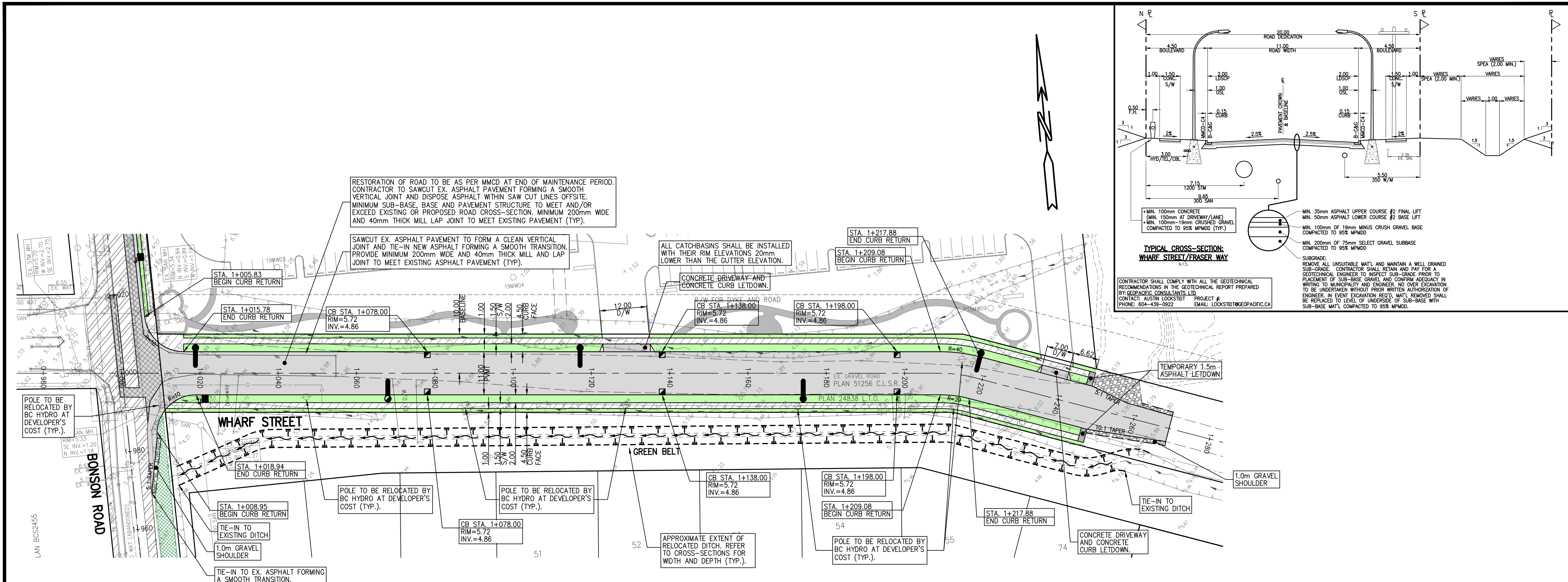
MUNICIPAL PROJECT NUMBER -

DRAWING TYPE
KEY PLAN

Feb 11, 2022

DESTROY ALL PRINTS BEARING PREVIOUS NUMBER

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CHAINAGE	EXISTING	PROPOSED	FINISHED PAVEMENT ELEV. AT BASELINE	ORIGINAL GROUND ELEV. AT BASELINE
1+000	5.47 N	5.65	5.47 N	5.47 N
1+010.00	5.68 S	5.76	5.68 S	5.68 S
1+018.94	5.62 N	5.62 N	5.62 N	5.62 N
1+020	5.69 S	5.77	5.69 S	5.69 S
1+040	5.81 N	5.95	5.81 N	5.81 N
1+045.00	5.81 N	6.03	5.81 N	5.81 N
1+060	5.89 N	5.97	5.89 N	5.89 N
1+078.00	5.76 N	5.80	5.76 N	5.76 N
1+080	5.76 S	5.90	5.76 S	5.76 S
1+100	5.99	5.99	5.99	5.99
1+108.00	6.03	6.03	6.03	6.03
1+120	5.97	5.97	5.97	5.97
1+138.00	5.89	5.89	5.89	5.89
1+140	5.76 N	5.80	5.76 N	5.76 N
1+160	5.77 S	5.99	5.77 S	5.77 S
1+168.00	6.03	6.03	6.03	6.03
1+180	5.97	5.97	5.97	5.97
1+198.00	5.90	5.90	5.90	5.90
1+200	5.91 S	5.76 N	5.91 S	5.91 S
1+220	5.92 N	5.99	5.92 N	5.92 N
1+240	6.02 S	6.09	6.02 S	6.02 S
1+246.50	5.94 N	6.13	5.94 N	5.94 N
1+248.98	5.99 N	5.99 S	5.99 N	5.99 S
1+257.07	5.89 N	5.89 S	5.89 N	5.89 S
1+260	5.86 N	5.86 S	5.86 N	5.86 S
1+270.30	5.80 N	5.83	5.80 N	5.80 N
1+280	5.74 N	5.77 S	5.74 N	5.74 N
1+300	5.77 S	5.77 S	5.77 S	5.77 S
1+320				

LEGAL DESCRIPTION: ----

SURVEY BENCHMARK: MON: 88H0617

SCALE FACTOR: ELEV.: 6.525m (GEODETIC)

REV.	DATE	DESCRIPTION	BY
4	FEB 10/22	ADDRESS COMMENTS	KK
3	DEC 20/21	ADD RELOCATION OF DITCH	KK
2	DEC 02/21	DESIGN REVISION	KK
1	NOV 17/21	ISSUED FOR MUNICIPAL REVIEW	KK
-	JUN 22/21	ISSUED FOR MUNICIPAL PRELIMINARY REVIEW	MC

CONSULTANT

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CLIENT

EM BUSINESS PARK LTD.
1910 - 117 WEST HASTINGS STREET
VANCOUVER, B.C., V6E 2K3

TITLE

WHARF STREET
STA. 1+010 to STA. 1+270.30
PLAN/PROFILE

SEAL

SCALE: HOR. 1:500
VERT. 1:50

DATE (YYYY.MM.DD)
FEB 2020

CONSULTANT PROJ. NO.
20001

DESIGNED MC/KK
DRAWN AKG
REVIEWED KL/RFK

DWG. NO.
6

REV. 4

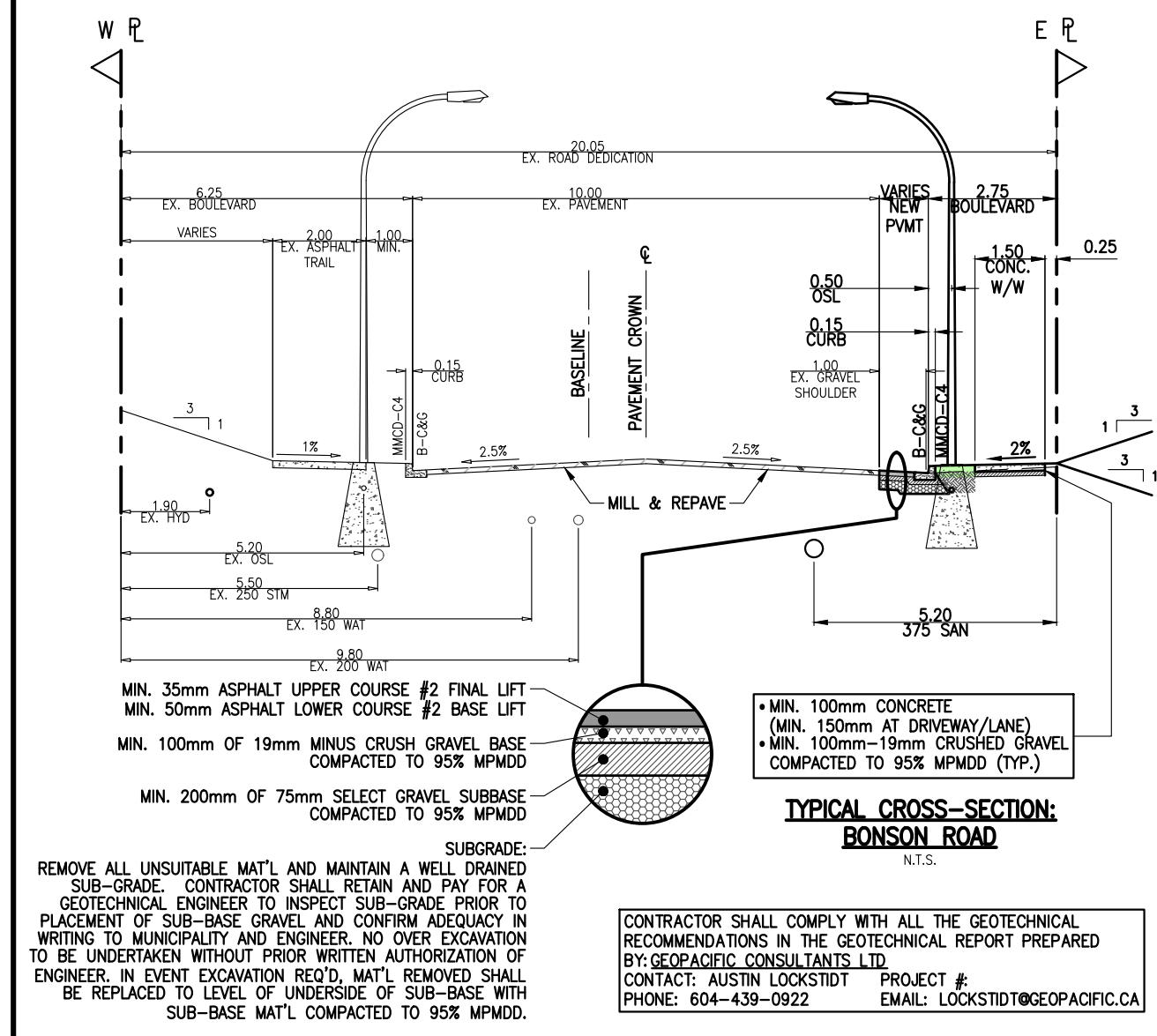
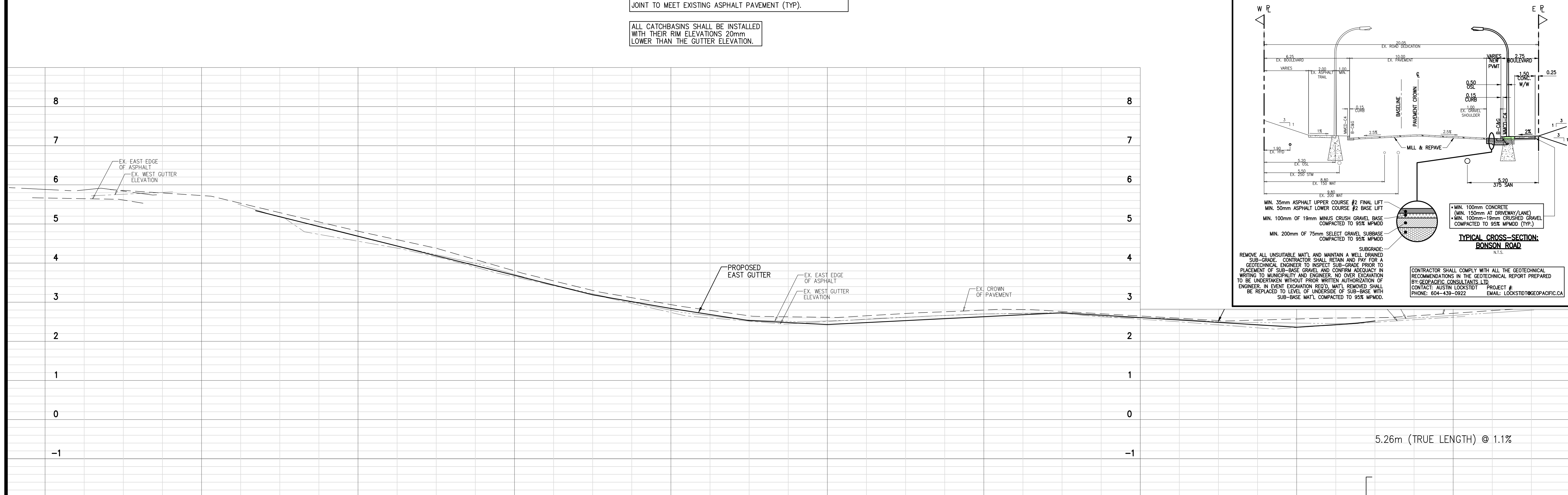
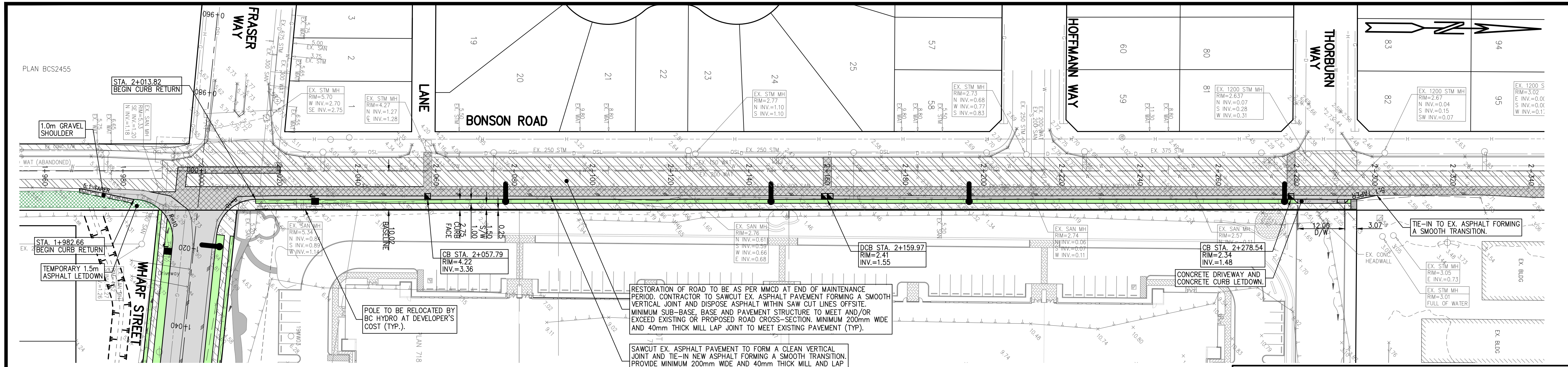
Feb 11, 2022

MUNICIPAL PROJECT NUMBER

DRAWING TYPE

ROADWORKS

DESTROY ALL PRINTS BEARING PREVIOUS NUMBER



FINISHED LENGTH & GRADE AT BASELINE	FINISHED PAVEMENT ELEV. AT BASELINE	ORIGINAL GROUND ELEV. AT BASELINE	CHAINAGE
86.18m @ -2.5%	5.34 E	5.53 E	2+000
	5.19 E	5.71 E	2+013.82
	4.69 E	5.20 E	2+020
	4.19 E	5.13 W	2+040
	3.99 E	5.23 E	2+060
	3.19 E	4.98 W	2+080
	2.84 E	4.88 E	2+100
	2.53 E	4.78 E	2+120
	2.43 E	4.37 W	2+140
	2.53 E	4.49 E	2+160
	2.53 E	4.38 E	2+180
	2.63 E	4.10 W	2+200
	2.73 E	4.93 E	2+220
	2.61 E	3.76 W	2+240
	2.48 E	3.74 E	2+260
	2.36 E	4.48 E	2+280
	2.46 E	3.25 W	2+300
	2.52 E	3.27 E	2+320
	2.87 E	3.10 E	2+340

LEGAL DESCRIPTION: ----

SURVEY BENCHMARK: MON: 88H0617

SCALE FACTOR: ELEV.: 6.525m (GEODETIC)

REV.	DATE	DESCRIPTION	BY
2	FEB 10/22	ADDRESS COMMENTS	KK
1	NOV 17/21	ISSUED FOR MUNICIPAL REVIEW	KK
-	JUN 22/21	ISSUED FOR MUNICIPAL PRELIMINARY REVIEW	MC

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www.hub-inc.com



CLIENT

EM BUSINESS PARK LTD.
1910 - 117 WEST HASTINGS STREET
VANCOUVER, B.C., V6E 2K3

TITLE

BONSON ROAD
STA. 2+000 to STA. 2+340
PLAN/PROFILE

SEAL

SCALE: HOR. 1:500
VERT. 1:50

DATE (YYYY.MM.DD)
FEB 2020

CONSULTANT PROJ. NO.
20001

DESIGNED: MC/KK

DRAWN: AKG

REVIEWED: KL/RFG

DWG. NO.
7

REV.
2

MUNICIPAL PROJECT NUMBER

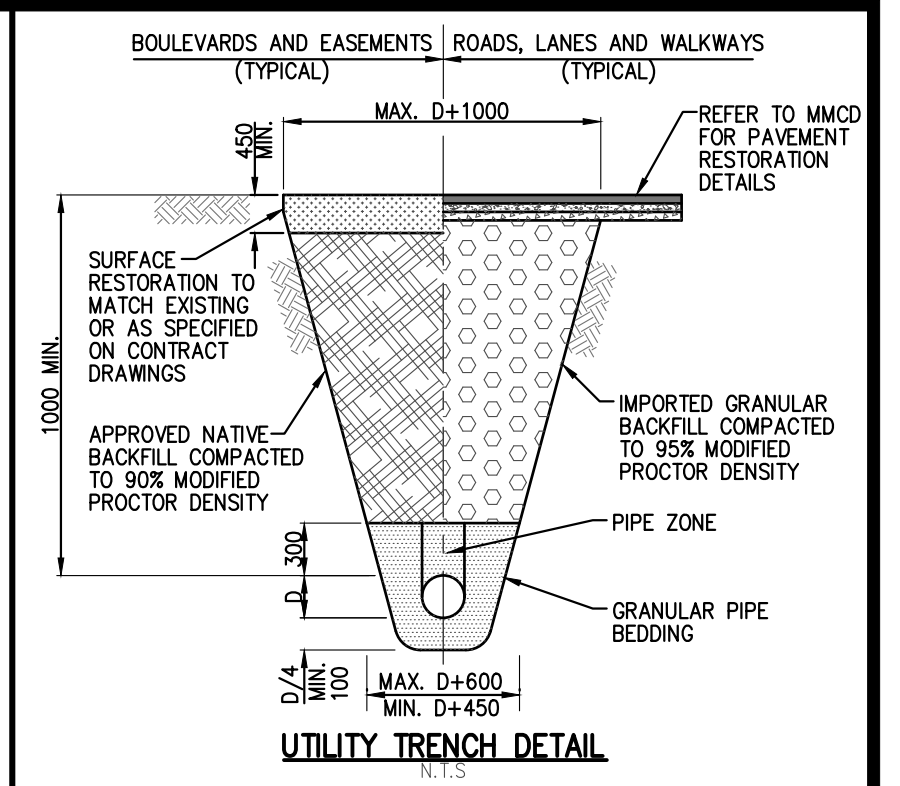
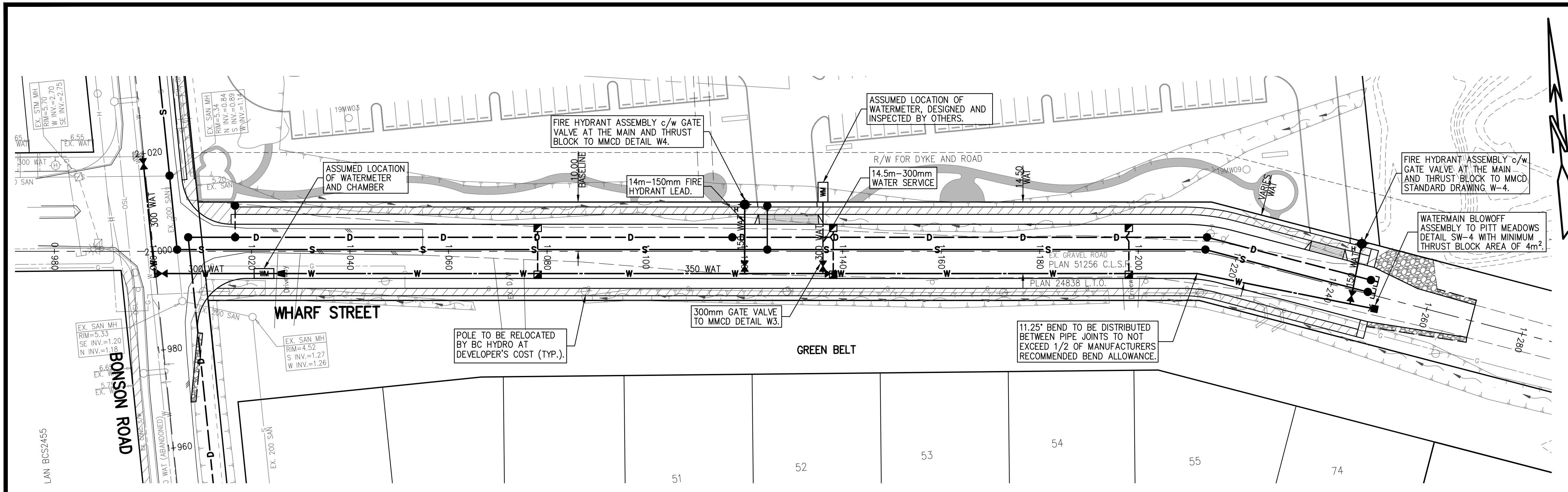
DRAWING TYPE

ROADWORKS

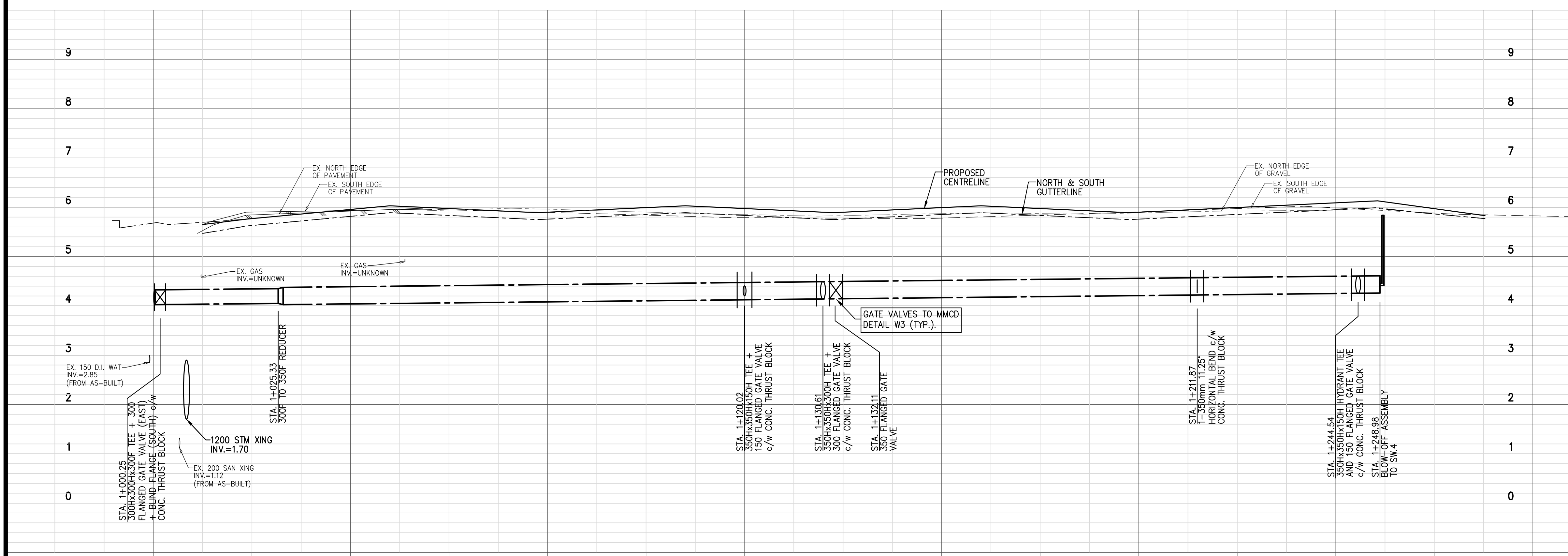
Feb 11, 2022

DESTROY ALL PRINTS BEARING PREVIOUS NUMBER

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- WATER NOTES:**
- ALL WORKS TO BE DONE IN ACCORDANCE WITH MASTER MUNICIPAL CONSTRUCTION DOCUMENTS, KATZIE RESERVE STANDARDS AND CITY OF PITT MEADOWS STANDARDS (LATEST EDITIONS).
 - BEDDING SHALL BE 19.0mm GRANULAR BEDDING AND SURROUND MATERIAL AS PER MMCD CL-2.7 SECTION 310517 - TYPE "1".
 - TRENCH BACKFILL UNDER LANES, LOCAL AND COLLECTOR ROADWAYS SHALL BE 100mm IMPORTED GRANULAR MATERIAL AS PER MMCD CL-2.3, SECTION 310517 COMPACTED TO 95% MPD, UNLESS OTHERWISE NOTED.
 - CONTRACTOR TO EXPOSE AND VERIFY EXISTING W/M. AT ALL POINTS OF TIE-IN, PRIOR TO START OF CONSTRUCTION AND REPORT ANY DISCREPANCIES IMMEDIATELY TO THE ENGINEER.
 - DI WATERMAIN PIPES SHALL BE IN ACCORDANCE WITH AWWA C151 PRESSURE CLASS 350 WITH STANDARD MORTAR LINING TO AWWA C104.
 - INSTALL ASPHALT APRONS AROUND ALL NEW GATE VALVES WITHIN BOULEVARD AREAS.
 - "CERTAIN-TEED" COUPLINGS TO BE USED FOR VERTICAL DEFLECTIONS.
 - THRUST BLOCKS SHALL BE PROVIDED AS PER MMCD DWG. W1.
 - ALL WATER CONNECTIONS TO BE METERED TO BC PLUMBING CODE STANDARDS. DETAILS TO BE PROVIDED AT BUILDING PERMIT STAGE.



DIAMETER & CLASSIFICATION	300mm DIAMETER D.I. AWWA C151 PC 350 WATERMAIN	350mm DIAMETER D.I. AWWA C151 PC 350 WATERMAIN
WATERMAIN LENGTH, INVERT, & GRADE	4.00 N 4.00 E 25.08m @ 0.1% 4.03 E 4.03 W	223.7m @ 0.1%
CHAINAGE	1+000 1+000.25 1+020 1+025.33 1+040 1+080 1+100 1+120 1+140 1+160 1+180 1+200 1+220 1+240 1+248.98 1+260 1+280	

LEGAL DESCRIPTION: ----

SURVEY BENCHMARK: MON: 88H0617

SCALE FACTOR: ELEV.: 6.525m (GEODETIC)

REV.	DATE	DESCRIPTION	BY
3	FEB 10/22	ADDRESS COMMENTS	KK
2	DEC 02/21	DESIGN REVISION	KK
1	NOV 17/21	ISSUED FOR MUNICIPAL REVIEW	KK
-	JUN 22/21	ISSUED FOR MUNICIPAL PRELIMINARY REVIEW	MC

CONSULTANT

Hub Engineering Inc.
Engineering and Development Consultants
EGBC Permit to Practice Number: 1003404

Suite 212, 12992 - 76 Avenue, Surrey, B.C. V3W 2V6
tel: 604-572-4328 | fax: 604-501-1625 | mail@hub-inc.com
www.hub-inc.com



CLIENT

EM BUSINESS PARK LTD.
1910 - 117 WEST HASTINGS STREET
VANCOUVER, B.C., V6E 2K3

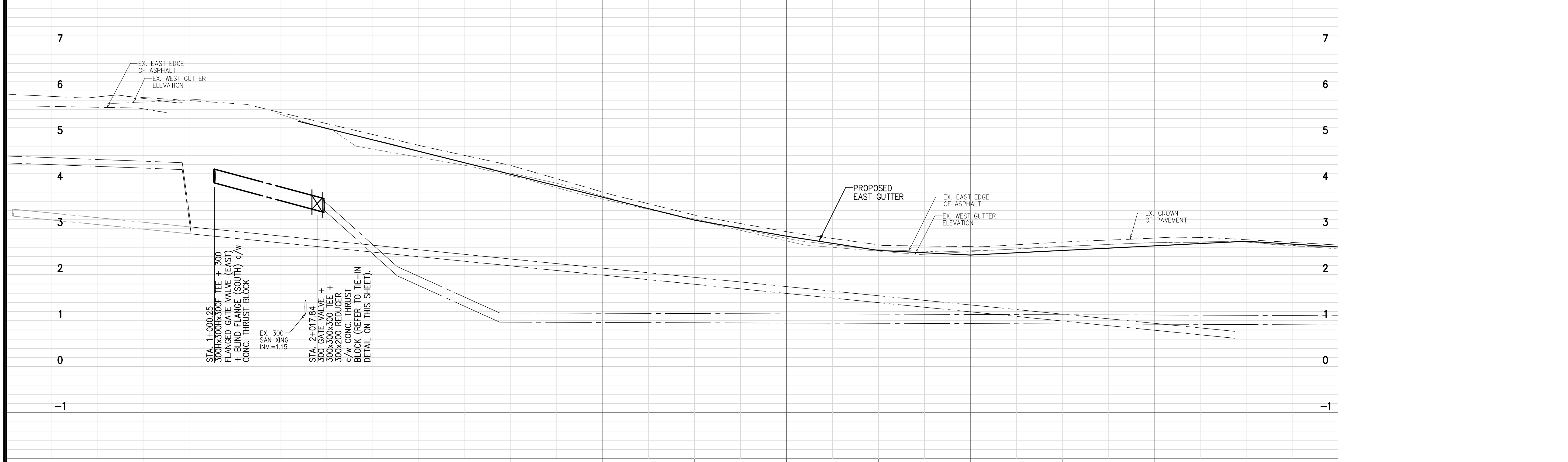
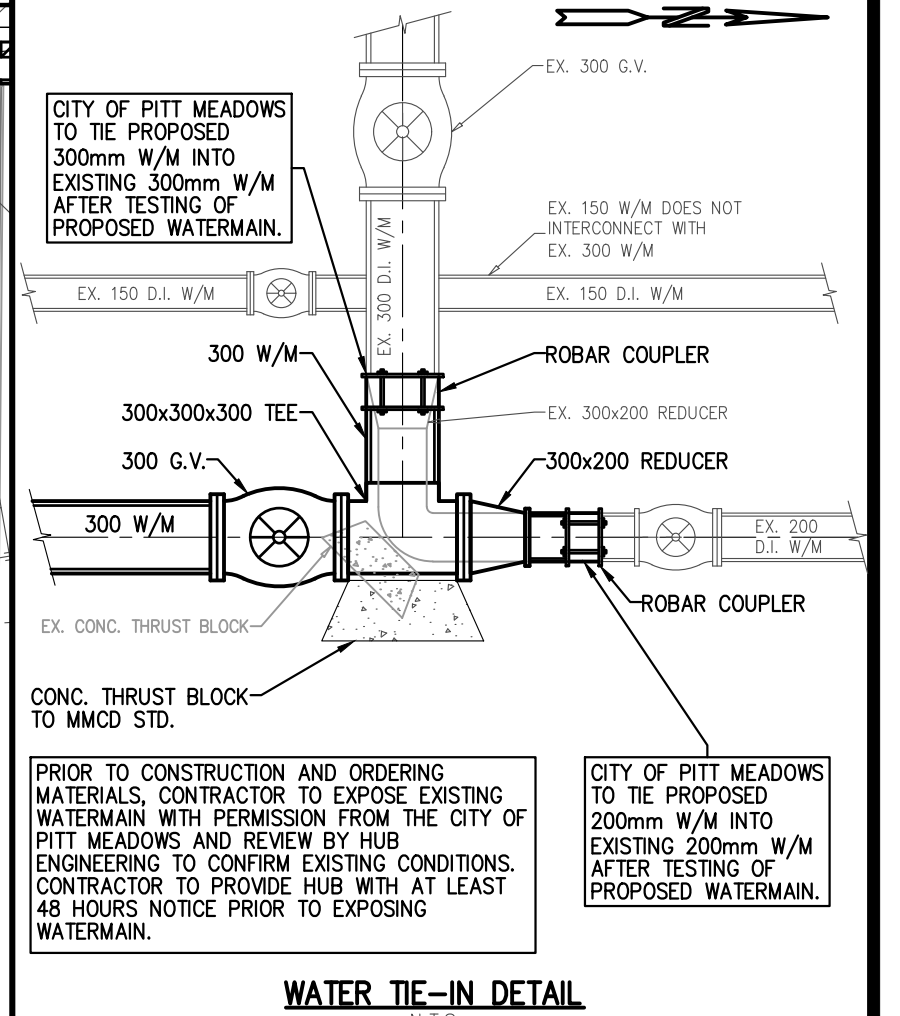
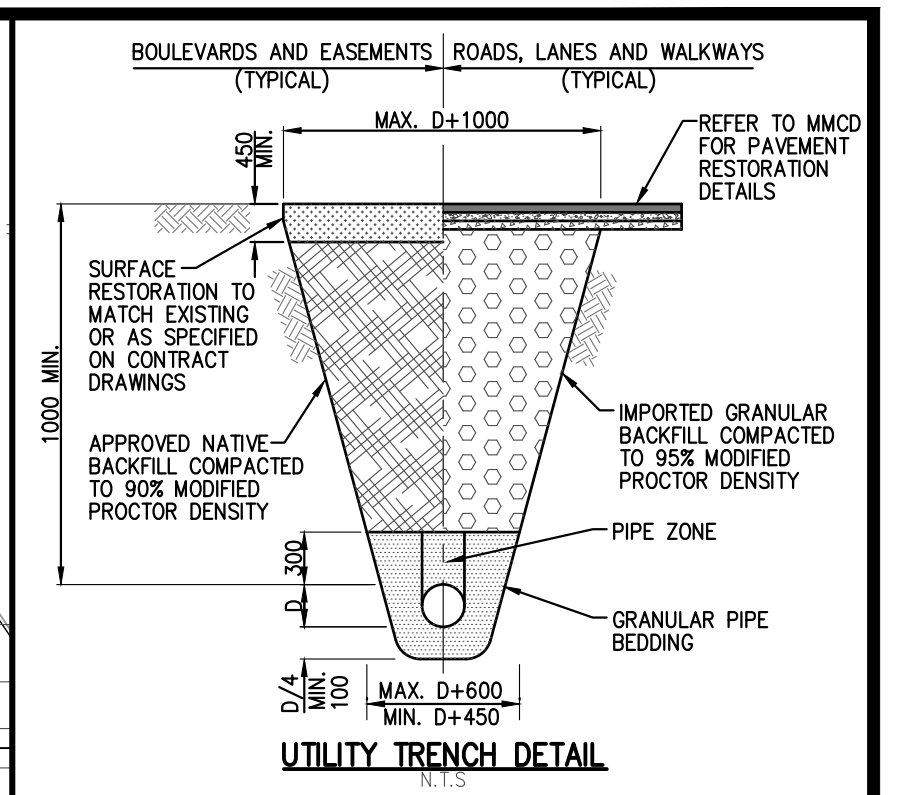
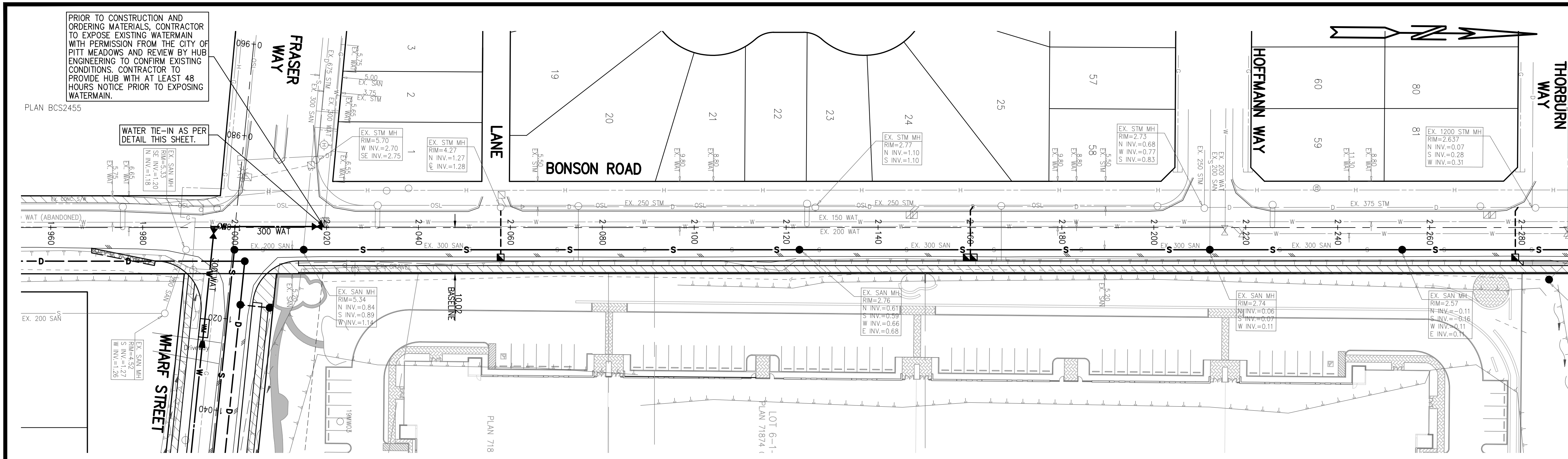
TITLE

WHARF STREET
STA. 1+000 to STA. 1+248.98
PLAN/PROFILE

SEAL

Feb 11, 2022

SCALE: HOR. 1:500 VERT. 1:50	DATE (YYYY.MM.DD) FEB 2020	MUNICIPAL PROJECT NUMBER -
DESIGNED MC/KK	CONSULTANT PROJ. NO. 20001	DRAWING TYPE WATER
DRAWN AKG	DWG. NO. 8	REV. 3
REVIEWED KL/RFG		



- WATER NOTES:**
- ALL WORKS TO BE DONE IN ACCORDANCE WITH MASTER MUNICIPAL CONSTRUCTION DOCUMENTS, KATZIE RESERVE STANDARDS AND CITY OF PITT MEADOWS STANDARDS (LATEST EDITIONS).
 - BEDDING SHALL BE 19.0mm GRANULAR BEDDING AND SURROUND MATERIAL AS PER MMCD CL-2.7 SECTION 310517 - TYPE "1".
 - TRENCH BACKFILL UNDER LANES, LOCAL AND COLLECTOR ROADWAYS SHALL BE 100mm IMPORTED GRANULAR MATERIAL AS PER MMCD CL-2.3, SECTION 310517 COMPACTED TO 95% MPD, UNLESS OTHERWISE NOTED.
 - CONTRACTOR TO EXPOSE AND VERIFY EXISTING W/M, AT ALL POINTS OF TIE-IN, PRIOR TO START OF CONSTRUCTION AND REPORT ANY DISCREPANCIES IMMEDIATELY TO THE ENGINEER.
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 - INSTALL ASPHALT APRONS AROUND ALL NEW GATE VALVES WITHIN BOULEVARD AREAS.
 - "CERTAIN-TIED" COUPLINGS TO BE USED FOR VERTICAL DEFLECTIONS.
 - THRUST BLOCKS SHALL BE PROVIDED AS PER MMCD DWG. W1.
 - ALL WATER CONNECTIONS TO BE METERED TO BC PLUMBING CODE STANDARDS. DETAILS TO BE PROVIDED AT BUILDING PERMIT STAGE.

CHAINAGE	1+980	1+995.50	2+000	2+019.35	2+020	2+040	2+060	2+080	2+100	2+120	2+140	2+160	2+180	2+200	2+220
DIAMETER & CLASSIFICATION		300mm DIAMETER D.I. AWWA C151 PC 350 WATERMAIN													
WATERMAIN LENGTH, INVERT, & GRADE		4.00	23.85m @ 2.7%	3.36	3.41										
						EXISTING	PROPOSED								

LEGAL DESCRIPTION: ----

SURVEY BENCHMARK: MON: 88H0617

SCALE FACTOR: ELEV.: 6.525m (GEODETIC)

REV.	DATE	DESCRIPTION	BY
3	FEB 10/22	ADDRESS COMMENTS	KK
2	DEC 02/21	DESIGN REVISION	KK
1	NOV 17/21	ISSUED FOR MUNICIPAL REVIEW	KK
-	JUN 22/21	ISSUED FOR MUNICIPAL PRELIMINARY REVIEW	MC

CONSULTANT

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Engineering and Development Consultants

EGBC Permit to Practice Number: 1003404

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tel: 604-572-4328 | fax: 604-501-1625 | mail@hub-inc.com
www.hub-inc.com



CLIENT

EM BUSINESS PARK LTD.
1910 - 117 WEST HASTINGS STREET
VANCOUVER, B.C., V6E 2K3

TITLE

BONSON ROAD
STA. 1+995.50 TO STA. 2+019.35
PLAN/PROFILE

SEAL

SCALE: HOR. 1:500
VERT. 1:50

DATE (YYYY-MM-DD)
FEB 2020

CONSULTANT PROJ. NO.
20001

DESIGNED
MC/KK

DRAWN
AKG

REVIEWED
KL/RFG

DWG. NO.
9

REV.
3

Feb 11, 2022

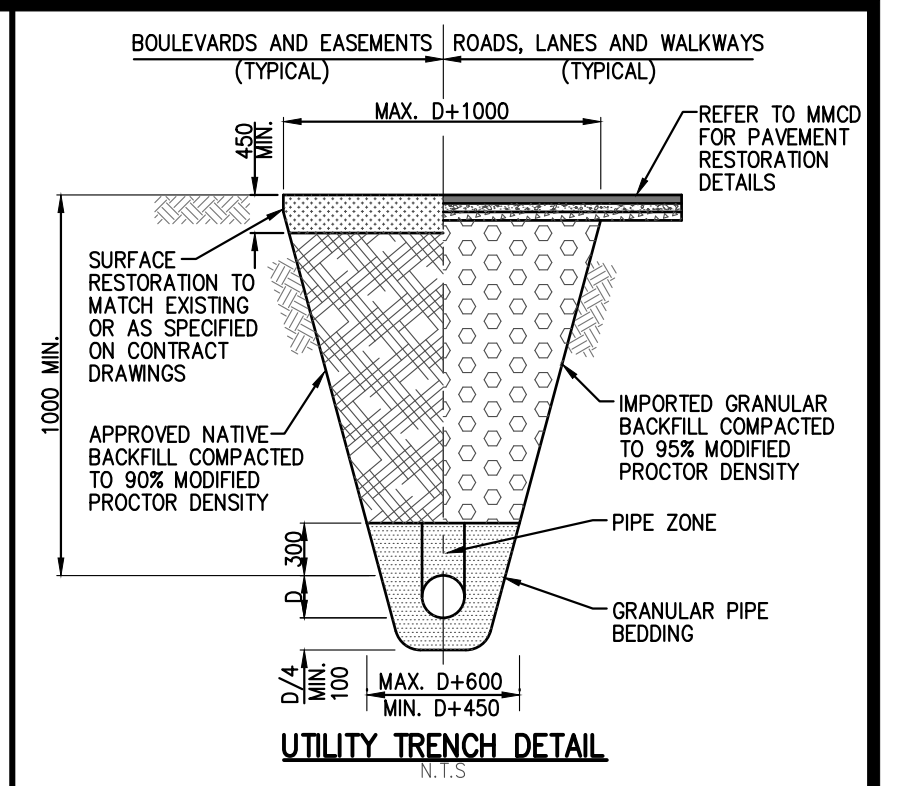
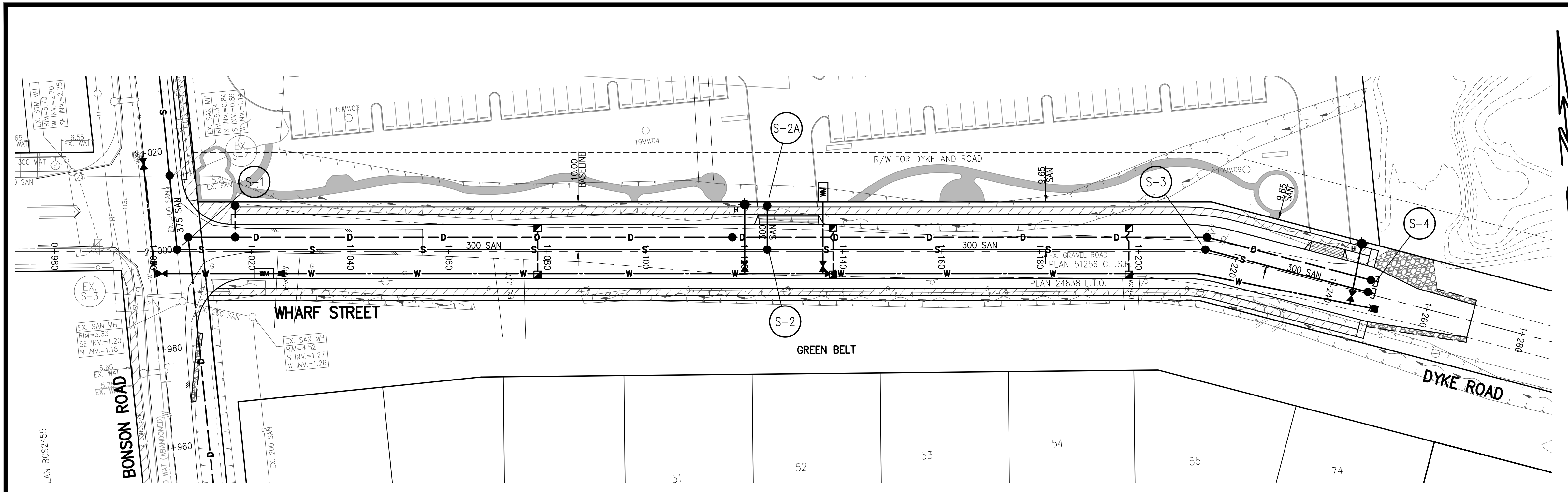
MUNICIPAL PROJECT NUMBER

DRAWING TYPE

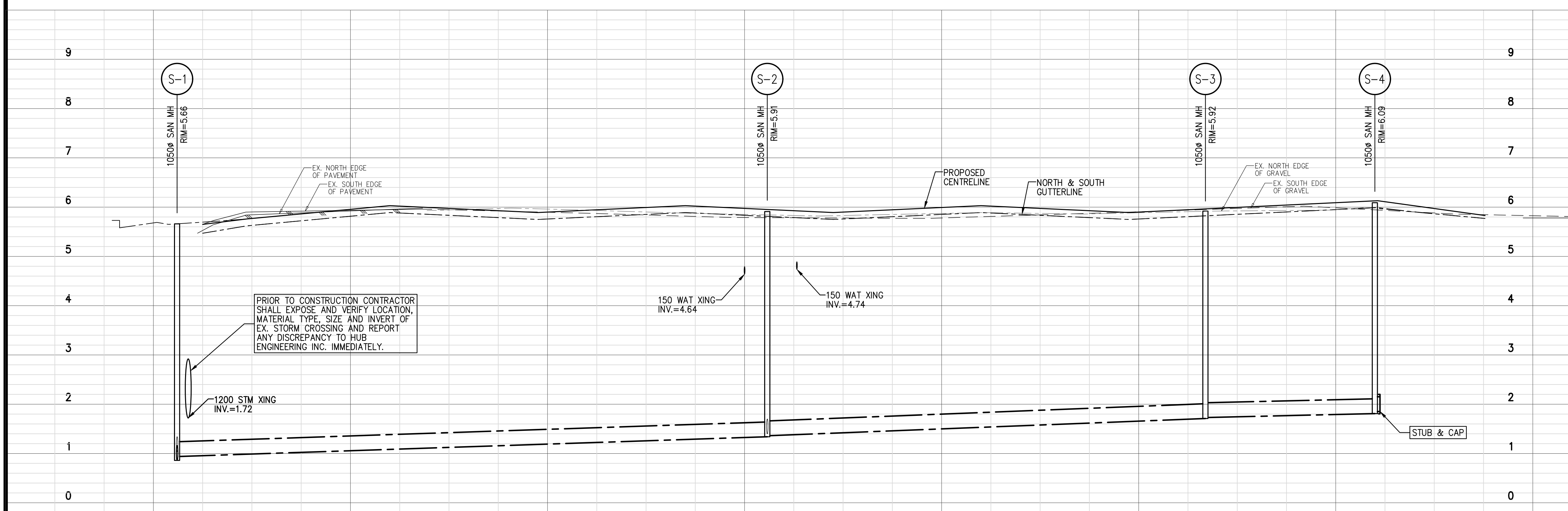
WATER

DESTROY ALL PRINTS BEARING PREVIOUS NUMBER

G:\Projects\2020\20001\Drawings\20001-Water\BONSON.PLT



- SANITARY NOTES:**
1. ALL WORKS TO BE DONE IN ACCORDANCE WITH MASTER MUNICIPAL CONSTRUCTION DOCUMENTS, KATZIE RESERVE STANDARDS AND CITY OF PITT MEADOWS STANDARDS (LATEST EDITIONS)
 2. BEDDING SHALL BE 19.0mm GRANULAR BEDDING AND SURROUND MATERIAL AS PER MMCD CL-2.7 SECTION 310517 - TYPE "1".
 3. TRENCH BACKFILL UNDER LANES, LOCAL AND COLLECTOR ROADWAYS SHALL BE 100mm IMPORTED GRANULAR BACKFILL AS PER MMCD CL-2.3 SECTION 310517, COMPACTED TO 95% MODIFIED PROCTOR DENSITY UNLESS OTHERWISE NOTED.
 4. ALL M.H.'S ARE 1050mm Ø UNLESS OTHERWISE NOTED.
 5. ALL JOINTS TO BE CLOSED JOINTS.
 6. ALL MAINLINES SHALL BE PVC (SDR-35) UNLESS OTHERWISE NOTED.
 7. ALL 100mm Ø SERVICE CONNECTIONS SHALL BE PVC (SDR-28) UNLESS OTHERWISE NOTED.



SANITARY LENGTH, SIZE, TYPE, & GRADE	119.90m-300mm DIA. SDR-35 PVC SAN @ 0.33%	88.93m (TRUE LENGTH)-300mm DIA. SDR-35 PVC SAN @ 0.39%	34.23m-300mm DIA. SDR-35 PVC SAN @ 0.35%
INVERT ELEVATION	0.04 S 0.86 N 0.94 E	1.34 W 1.36 E 1.40 N	1.71 W 1.73 E 1.85 NW 1.87 NW
CHAINAGE	1+000 1+004.68 1+020 1+040 1+060 1+080	1+100 1+120 1+124.61 1+140	1+160 1+180 1+200 1+213.48 1+220 1+240 1+247.47 1+260

LEGAL DESCRIPTION: ----

SURVEY BENCHMARK: MON: 88H0617 SCALE FACTOR: ELEV.: 6.525m (GEODETIC)

REV.	DATE	DESCRIPTION	BY
3	FEB 10/22	ADDRESS COMMENTS	KK
2	DEC 02/21	DESIGN REVISION	KK
1	NOV 17/21	ISSUED FOR MUNICIPAL REVIEW	KK
-	JUN 22/21	ISSUED FOR MUNICIPAL PRELIMINARY REVIEW	MC

CONSULTANT

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www.hub-inc.com



CLIENT

EM BUSINESS PARK LTD.
1910 - 117 WEST HASTINGS STREET
VANCOUVER, B.C., V6E 2K3

TITLE

WHARF STREET
STA. 1+004.68 to STA. 1+247.47
PLAN/PROFILE

SEAL

SCALE: HOR. 1:500
VERT. 1:50

DATE (YYYY.MM.DD)
FEB 2020

CONSULTANT PROJ. NO.
20001

DESIGNED: MC/KK

DRAWN: AKG

REVIEWED: KL/RFG

DWG. NO.
10

REV. 3

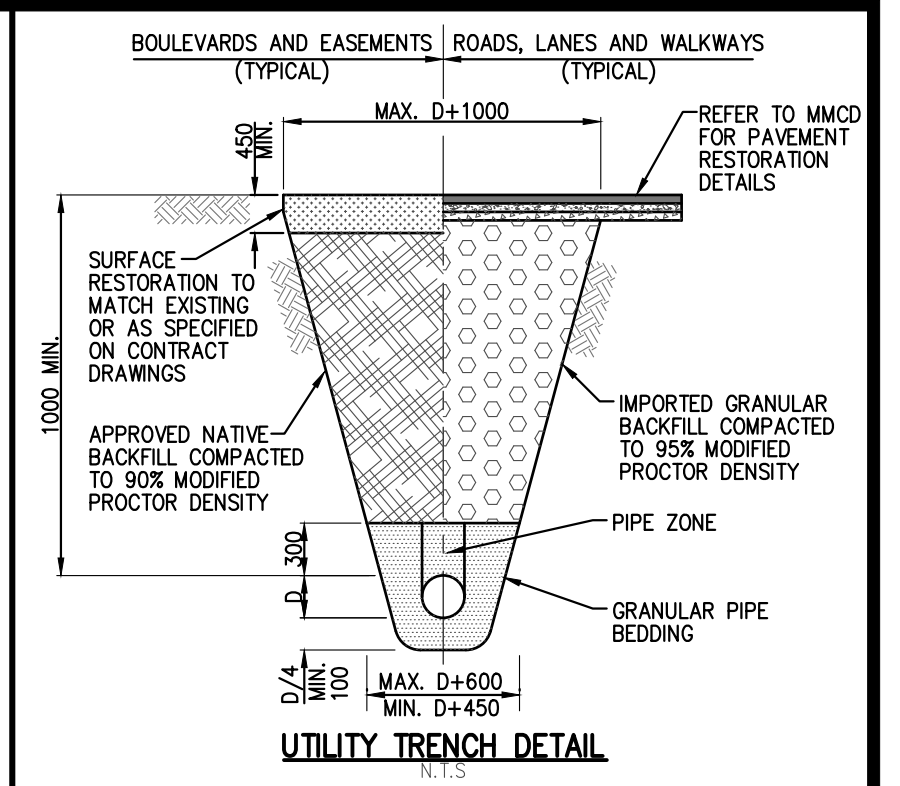
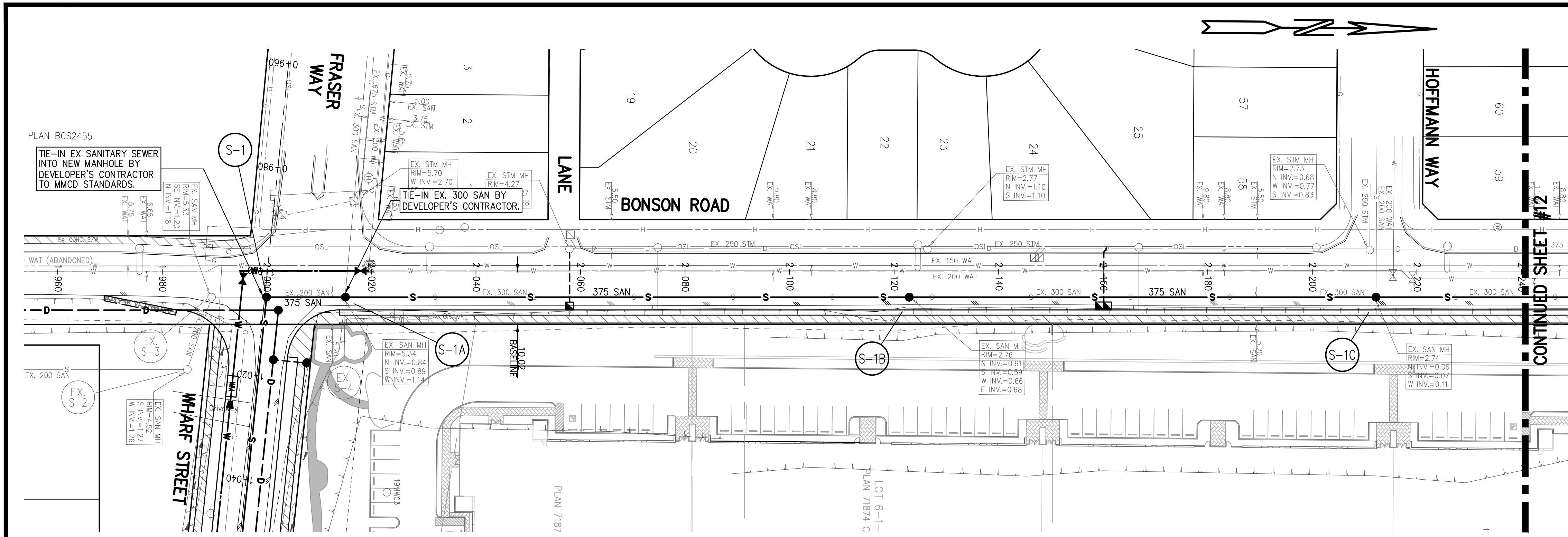
Feb 11, 2022

MUNICIPAL PROJECT NUMBER

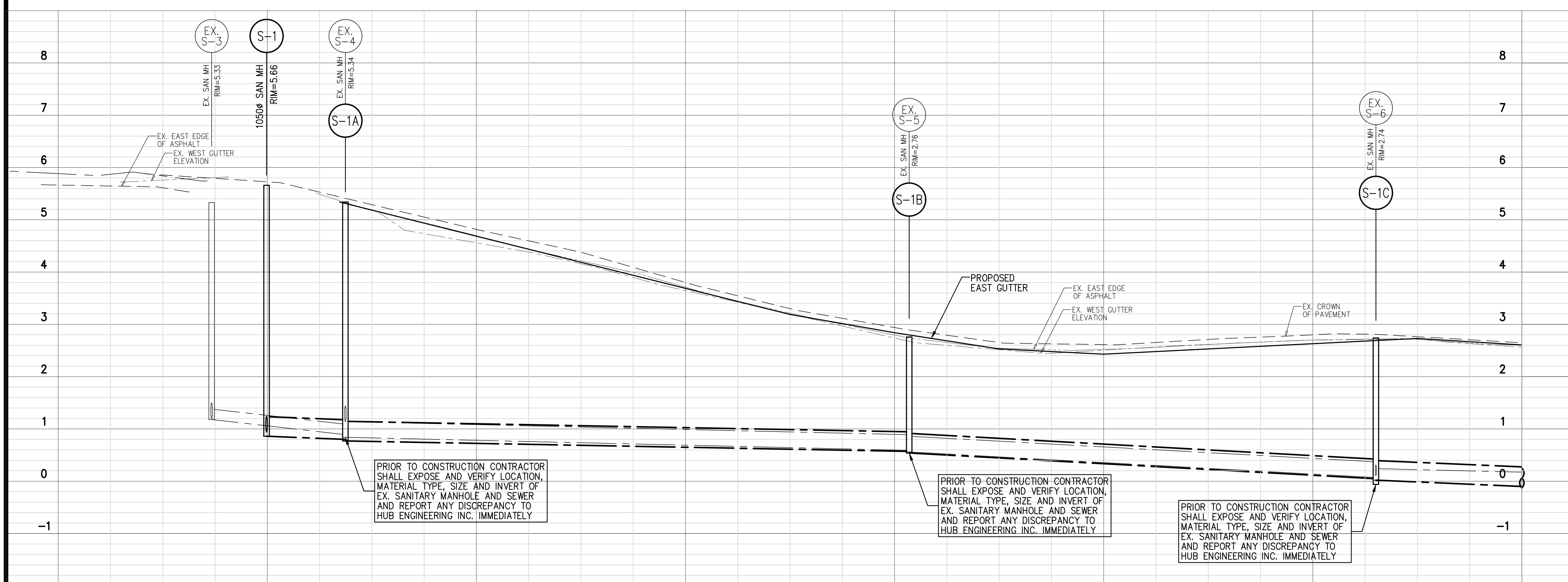
DRAWING TYPE

SANITARY

DESTROY ALL PRINTS BEARING PREVIOUS NUMBER



- SANITARY NOTES:**
- ALL WORKS TO BE DONE IN ACCORDANCE WITH MASTER MUNICIPAL CONSTRUCTION DOCUMENTS, KATZIE RESERVE STANDARDS AND CITY OF PITT MEADOWS STANDARDS (LATEST EDITIONS)
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 - ALL SERVICE CONNECTIONS SHALL BE PVC (SDR-28) UNLESS OTHERWISE NOTED.



SANITARY LENGTH, SIZE, TYPE, & GRADE	EXISTING 10.5m-200mm DIA. SDR-35 PVC SAN @ 1.3%	15.07m-375mm DIA. SDR-35 PVC SAN @ 0.40%	107.8m-375mm DIA. SDR-35 PVC SAN @ 0.19%	89.3m-375mm DIA. SDR-35 PVC SAN @ 0.55%	41.9m-375mm DIA. SDR-35 PVC SAN @ 0.43%
INVERT ELEVATION	1.20 SE 1.18 N	0.04 S 0.94 E	0.80 S 0.89 S 0.14 W 0.77 N	0.57 S 0.58 S 0.68 E 0.54 N	0.05 S 0.11 W 0.02 N
CHAINAGE	1+989.35 2+999.86	2+014.94	2+040 2+060 2+080 2+100 2+120 2+122.79	2+140 2+160 2+180	2+212.08 2+220

LEGAL DESCRIPTION: ----

SURVEY BENCHMARK: MON: 88H0617

SCALE FACTOR: ELEV.: 6.525m (GEODETIC)

REV.	DATE	DESCRIPTION	BY
3	FEB 10/22	ADDRESS COMMENTS	KK
2	DEC 02/21	DESIGN REVISION	KK
1	NOV 17/21	ISSUED FOR MUNICIPAL REVIEW	KK

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www.hub-inc.com



CLIENT

EM BUSINESS PARK LTD.
1910 - 117 WEST HASTINGS STREET
VANCOUVER, B.C., V6E 2K3

TITLE

BONSON - SOUTH
STA. 2+000.86 to STA. 2+014.94
PLAN/PROFILE

SCALE: HOR. 1:500
VERT. 1:50

DESIGNED: MC/KK

DRAWN: AKG

REVIEWED: KL/RFG

DATE (YYYY.MM.DD)
FEB 2020

CONSULTANT PROJ. NO.
20001

DWG. NO.
11

REV. 3

Feb 11, 2022

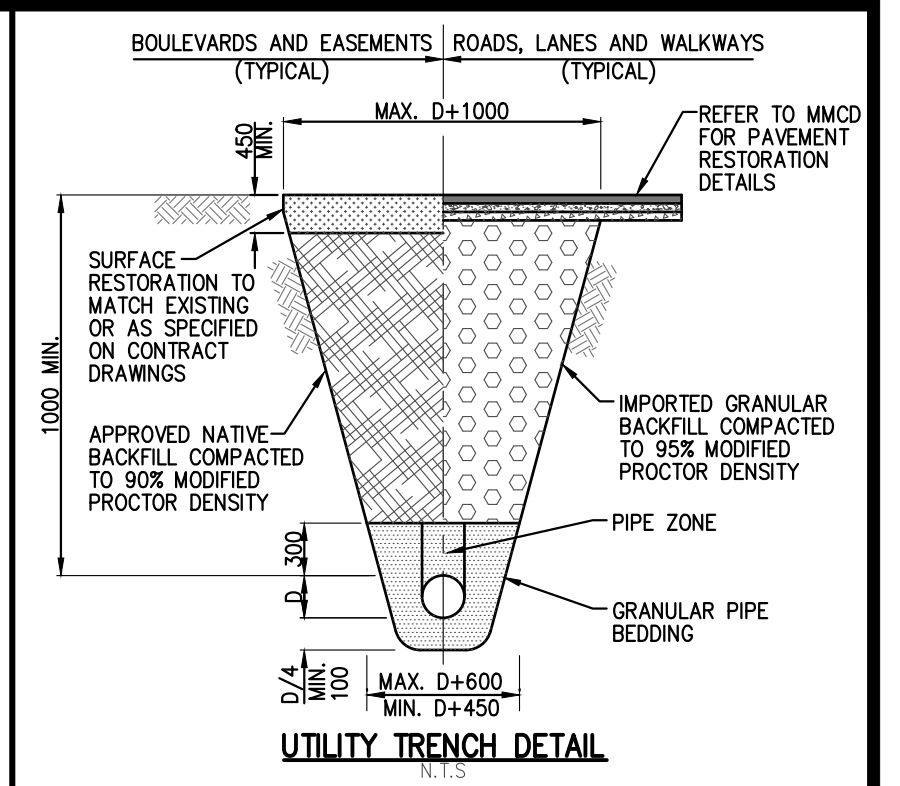
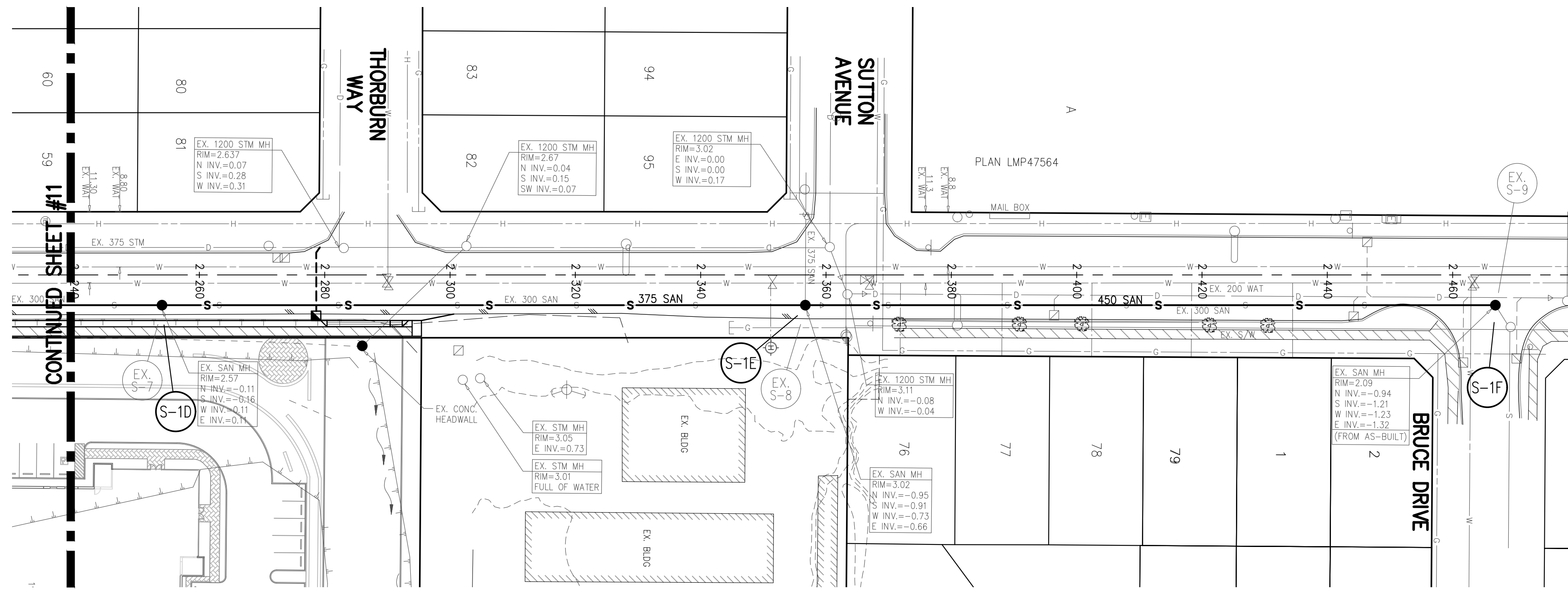
MUNICIPAL PROJECT NUMBER

DRAWING TYPE

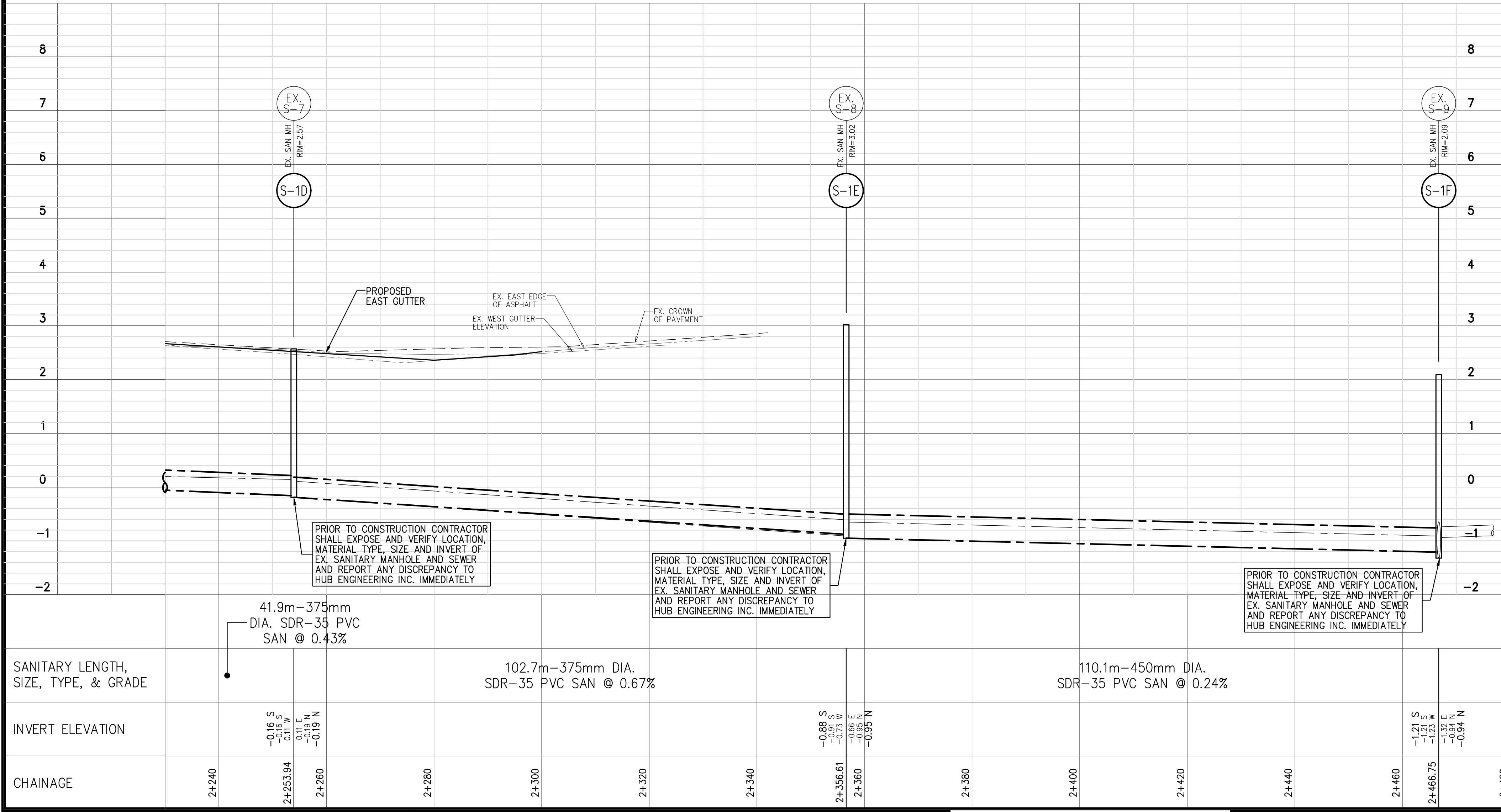
SANITARY

DESTROY ALL PRINTS BEARING PREVIOUS NUMBER

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- SANITARY NOTES:**
- ALL WORKS TO BE DONE IN ACCORDANCE WITH MASTER MUNICIPAL CONSTRUCTION DOCUMENTS, KATZIE RESERVE STANDARDS AND CITY OF PITT MEADOWS STANDARDS (LATEST EDITIONS)
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 - ALL 100mm Ø SERVICE CONNECTIONS SHALL BE PVC (SDR-28) UNLESS OTHERWISE NOTED.



LEGAL DESCRIPTION: ----

SURVEY BENCHMARK: MON: 88H0617

SCALE FACTOR: ELEV.: 6.525m (GEODETIC)

REV.	DATE	DESCRIPTION	BY
1	FEB 10/22	ADDRESS COMMENTS	KK

REV.	DATE	DESCRIPTION	BY

CONSULTANT

Hub Engineering Inc.

Engineering and Development Consultants

EGBC Permit to Practice Number: 1003404

Suite 212, 12992 - 76 Avenue, Surrey, B.C. V3W 2V6
tel: 604-572-4328 | fax: 604-501-1625 | mail@hub-inc.com
www.hub-inc.com

EAGLE MEADOWS
BUSINESS PARK

CLIENT

EM BUSINESS PARK LTD.

1910 - 117 WEST HASTINGS STREET
VANCOUVER, B.C., V6E 2K3

TITLE

BONSOON - NORTH

STA. 2+000.86 to STA. 2+014.94
PLAN/PROFILE

SEAL

Feb 11, 2022

SCALE: HOR. 1:500
VERT. 1:50

DATE (YYYY.MM.DD)
FEB 2020

CONSULTANT PROJ. NO.
20001

DESIGNED: MC/KK

DRAWN: AKG

REVIEWED: KL/RFG

DWG. NO.
12

REV. 1

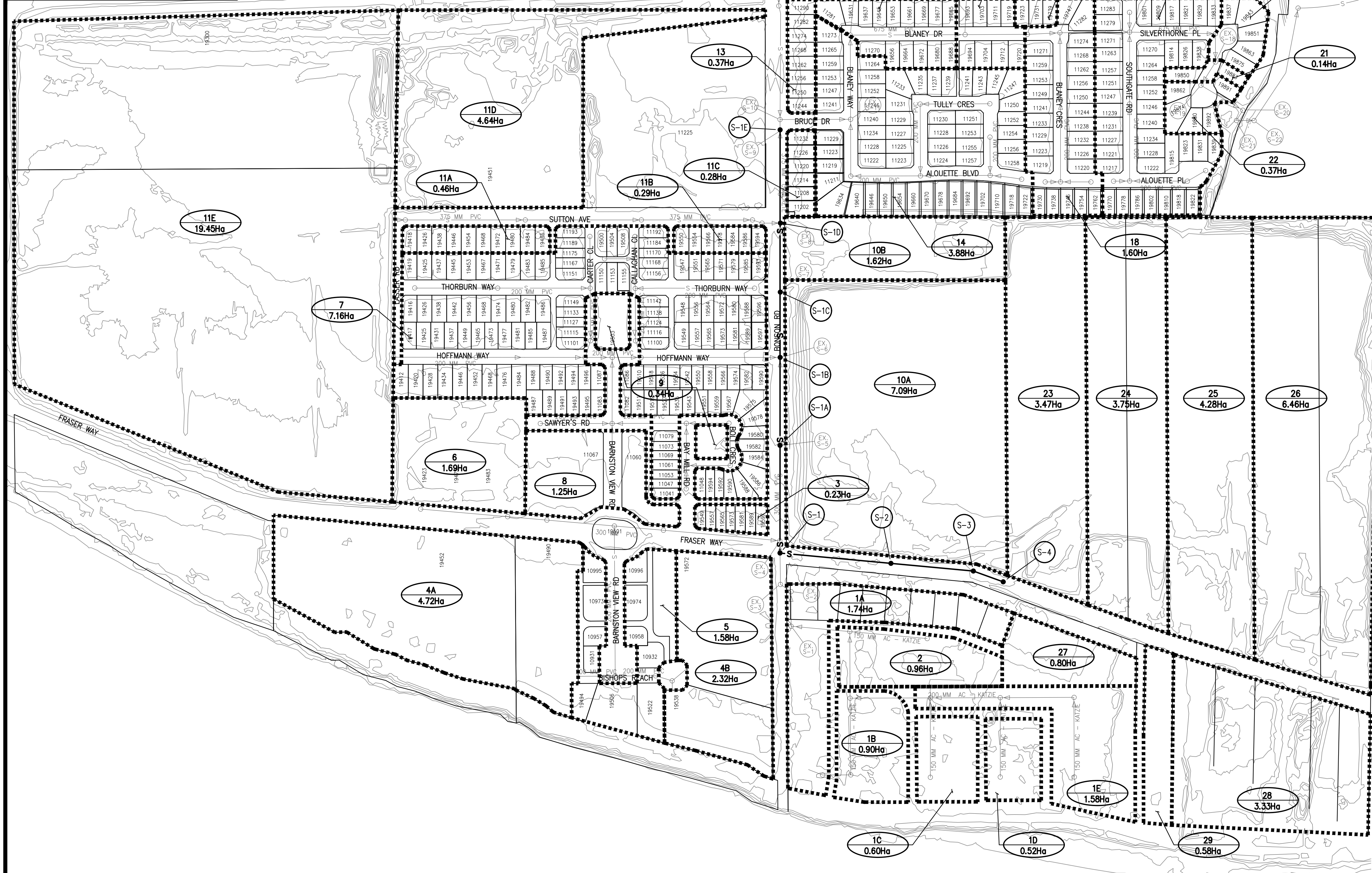
MUNICIPAL PROJECT NUMBER

DRAWING TYPE

SANITARY

LEGEND

- (D-X) MANHOLE NUMBER
- 4
2.30Ha LOT NUMBER AND AREA (Ha)
- DIRECTION OF FLOW FOR SURFACE RUNOFF AND SIDEYARD SWALE
- STORM SEWER
- SUB-CATCHMENT BOUNDARY
- CATCHMENT BOUNDARY
- 100 YR. FLOOD PATH IN PIPE
- 100 YR. FLOOD PATH BELOW GROUND SURFACE
- 100 YR. FLOOD PATH OVERLAND
- EXISTING GROUND CONTOUR
- EXISTING DITCH
- SUBJECT SITE



**EXISTING DEVELOPMENT
SANITARY SEWER DESIGN**

Manhole	Flow (L/s)	Flow (m³/d)	Flow (m³/y)	Flow (m³/d)	Flow (m³/y)	Flow (m³/d)	Flow (m³/y)	Flow (m³/d)	Flow (m³/y)
S-1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
S-2	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
S-3	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
S-4	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
S-1A	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
S-1B	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
S-1C	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
S-1D	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
S-1E	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

**EXISTING PLUS PROPOSED DEVELOPMENT
SANITARY SEWER DESIGN**

Manhole	Flow (L/s)	Flow (m³/d)	Flow (m³/y)	Flow (m³/d)	Flow (m³/y)	Flow (m³/d)	Flow (m³/y)	Flow (m³/d)	Flow (m³/y)
S-1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
S-2	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
S-3	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
S-4	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
S-1A	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
S-1B	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
S-1C	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
S-1D	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
S-1E	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

**ULTIMATE DEVELOPMENT
SANITARY SEWER DESIGN**

Manhole	Flow (L/s)	Flow (m³/d)	Flow (m³/y)	Flow (m³/d)	Flow (m³/y)	Flow (m³/d)	Flow (m³/y)	Flow (m³/d)	Flow (m³/y)
S-1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
S-2	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
S-3	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
S-4	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
S-1A	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
S-1B	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
S-1C	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
S-1D	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
S-1E	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

LEGAL DESCRIPTION: ---
 SURVEY BENCHMARK: MON: 88H0617
 SCALE FACTOR: 6.525m (GEODETIC)
 ELEV.: 6.525m (GEODETIC)

REV.	DATE	DESCRIPTION	BY
3	FEB 10/22	ADDRESS COMMENTS	KK
2	NOV 17/21	ISSUED FOR MUNICIPAL REVIEW	KK
1	OCT 07/21	ISSUED FOR REVIEW	KK
—	JUL 25/21	ISSUED FOR MUNICIPAL REVIEW	MC

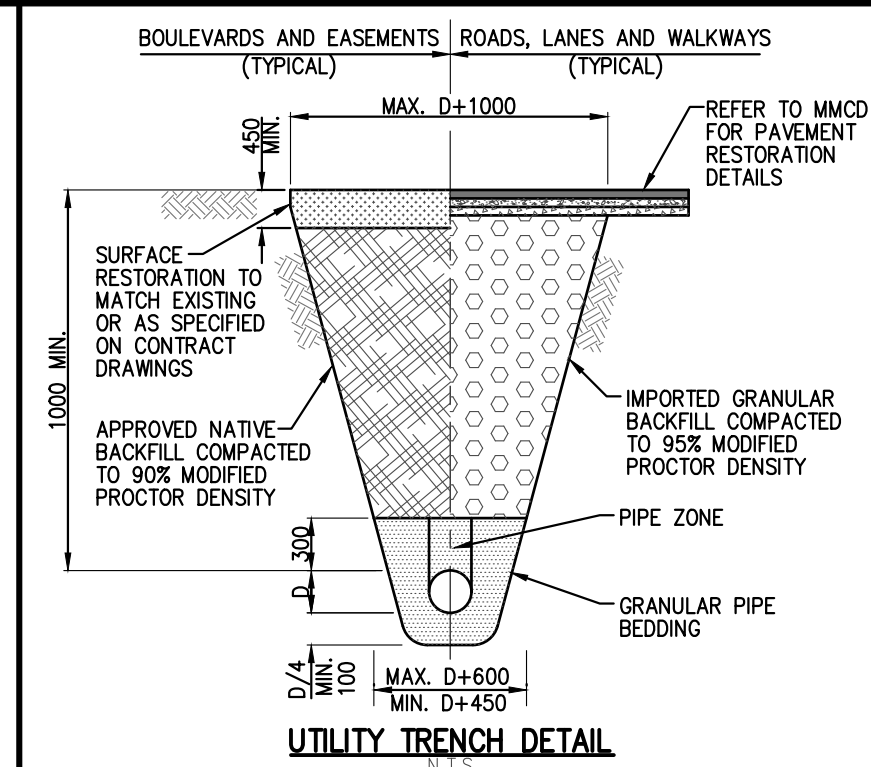
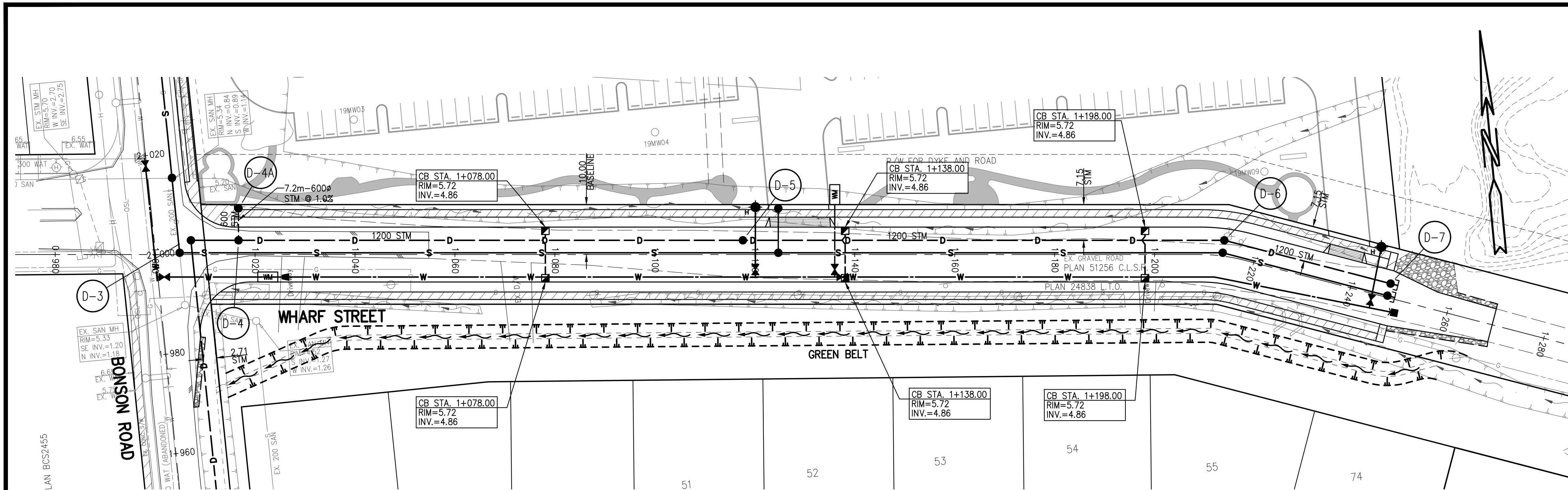
CONSULTANT	CLIENT
Hub Engineering Inc. Engineering and Development Consultants EGBC Permit to Practice Number: 1003404 Suite 212, 12992 - 76 Avenue, Surrey, B.C. V3W 2V6 tel: 604-572-4328 fax: 604-501-1625 mail@hub-inc.com www.hub-inc.com	EM BUSINESS PARK LTD. 1910 - 1177 WEST HASTINGS STREET VANCOUVER, B.C., V6E 2K3, TEL: (604) 270-1890



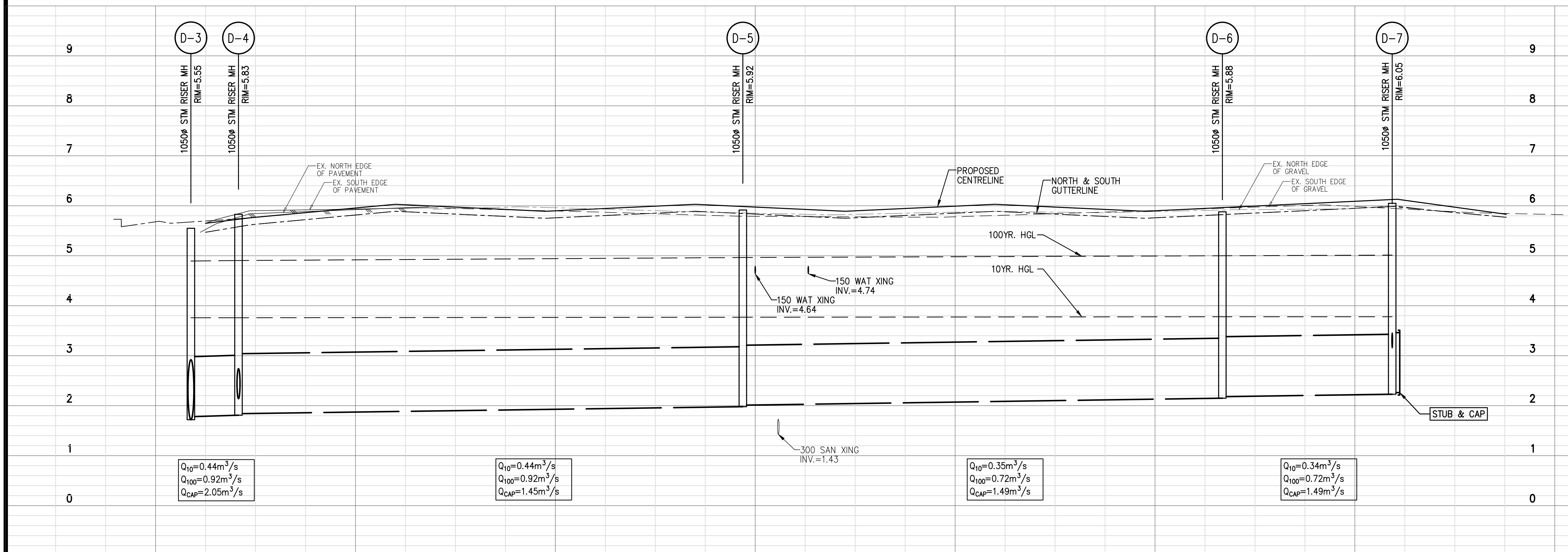
CONSULTANT	CLIENT
Hub Engineering Inc. Engineering and Development Consultants EGBC Permit to Practice Number: 1003404 Suite 212, 12992 - 76 Avenue, Surrey, B.C. V3W 2V6 tel: 604-572-4328 fax: 604-501-1625 mail@hub-inc.com www.hub-inc.com	EM BUSINESS PARK LTD. 1910 - 1177 WEST HASTINGS STREET VANCOUVER, B.C., V6E 2K3, TEL: (604) 270-1890

SCALE: HOR. 1:2500 VERT.	DATE (YYYY.MM.DD) FEB 2020	MUNICIPAL PROJECT NUMBER —
DESIGNED MC/KK	CONSULTANT PROJ. NO. 20001	DRAWING TYPE SANITARY
DRAWN AKG	DWG. NO. 13	REV. 3
REVIEWED KL/RFG	DATE Feb 11, 2022	DESTROY ALL PRINTS BEARING PREVIOUS NUMBER

C:\Projects\2020\20001\Drawings\Sanitary.dwg [S:\M-01] 2/11/2022 11:57AM



- STORM NOTES:**
- ALL WORKS TO BE DONE IN ACCORDANCE WITH MASTER MUNICIPAL CONSTRUCTION DOCUMENTS, KATZIE RESERVE STANDARDS AND CITY OF PITT MEADOWS STANDARDS (LATEST EDITIONS).
 - BEDDING SHALL BE 19.0mm GRANULAR BEDDING AND SURROUND MATERIAL AS PER MMCD CL-2.7 SECTION 310517 - TYPE "1".
 - TRENCH BACKFILL UNDER LANES, LOCAL AND COLLECTOR ROADWAYS SHALL BE 100mm IMPORTED GRANULAR BACKFILL AS PER MMCD CL-2.3 SECTION 310517, COMPACTED TO 95% MODIFIED PROCTOR DENSITY UNLESS OTHERWISE NOTED.
 - ALL CATCHBASINS SHALL BE INSTALLED WITH THEIR RIM ELEVATIONS 20mm LOWER THAN THE GUTTER ELEVATION.
 - ALL M.H.'S ARE 1050mm Ø UNLESS OTHERWISE NOTED.
 - ALL JOINTS TO BE OPEN JOINTS.
 - ALL 150mm Ø SERVICE CONNECTIONS SHALL BE PVC (SDR-28) UNLESS OTHERWISE NOTED.
 - 200mm Ø TO 375mm Ø PIPES SHALL BE PVC (SDR-35) UNLESS OTHERWISE NOTED.
 - 450mm Ø TO 900mm Ø SHALL BE NON-REINFORCED CONCRETE CLASS 3 TO ASTM C14 FOR DEPTH LESS THAN 4.5m UNLESS OTHERWISE NOTED.
 - 450mm Ø TO 900mm Ø SHALL BE REINFORCED CONCRETE CLASS III TO ASTM C76 FOR DEPTH GREATER THAN 4.5m UNLESS OTHERWISE NOTED.
 - 1050mm Ø AND GREATER PIPES SHALL BE REINFORCED CONCRETE CLASS III TO ASTM C76.



STORM LENGTH, SIZE, TYPE, & GRADE	INVERT ELEVATION	CHAINAGE
9.5m-1200mm DIA. CONC. STM @ 0.3%	1.72 S, 1.78 E	1+000 to 2+005.76
100.9m-1200mm DIA. CONC. STM @ 0.14%	1.81 W, 1.84 E, 2.14 N	2+015.59 to 1+020
96.3m-1200mm DIA. CONC. STM @ 0.15%	1.98 W, 2.01 E	2+117.52 to 1+120
34.3m (TRUE LENGTH)-1200mm DIA. CONC. STM @ 0.15%	2.15 W, 2.18 E, 2.23 W, 2.26 E, 3.14 S	2+213.48 to 1+240

LEGAL DESCRIPTION: ----

SURVEY BENCHMARK: MON: 88H0617

SCALE FACTOR: ELEV.: 6.525m (GEODETIQ)

REV.	DATE	DESCRIPTION	BY
5	FEB 10/22	ADDRESS COMMENTS	KK
4	DEC 02/21	DESIGN REVISION	KK
3	NOV 17/21	ISSUED FOR MUNICIPAL REVIEW	KK
2	OCT 07/21	ISSUED FOR REVIEW	KK
1	JUN 22/21	ISSUED FOR MUNICIPAL PRELIMINARY REVIEW	MC

CONSULTANT

Hub Engineering Inc.
Engineering and Development Consultants

EGBC Permit to Practice Number: 1003404

Suite 212, 12992 - 76 Avenue, Surrey, B.C. V3W 2V6
tel: 604-572-4328 | fax: 604-501-1625 | email@hub-inc.com
www.hub-inc.com



CLIENT

EM BUSINESS PARK LTD.
1910 - 117 WEST HASTINGS STREET
VANCOUVER, B.C., V6E 2K3

TITLE

WHARF STREET
STA. 2+005.76 to STA. 2+247.47
PLAN/PROFILE

SCALE: HOR. 1:500
VERT. 1:50

DATE (YYYY.MM.DD)
FEB 2020

CONSULTANT PROJ. NO.
20001

DESIGNED: MC/KK
DRAWN: AKG
REVIEWED: KL/RFK

DWG. NO.
14

REV. 5

Feb 11, 2022

MUNICIPAL PROJECT NUMBER

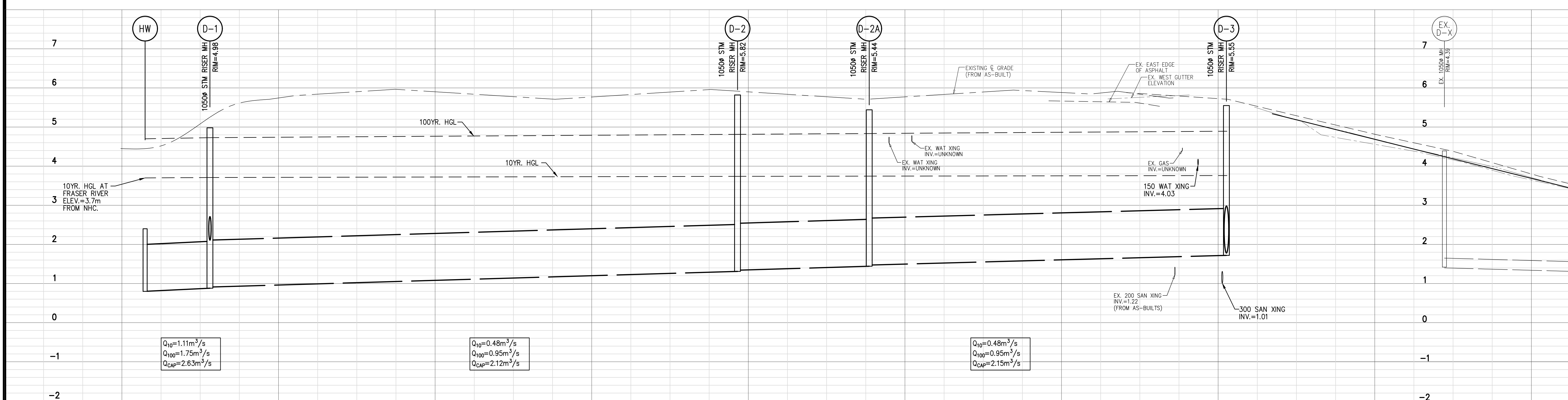
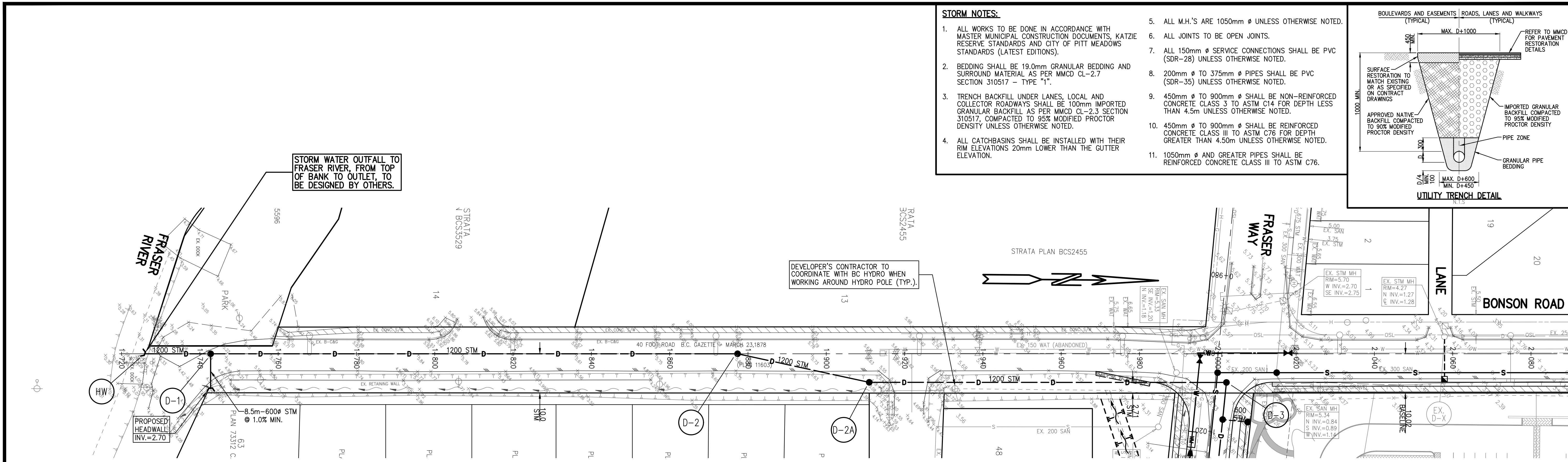
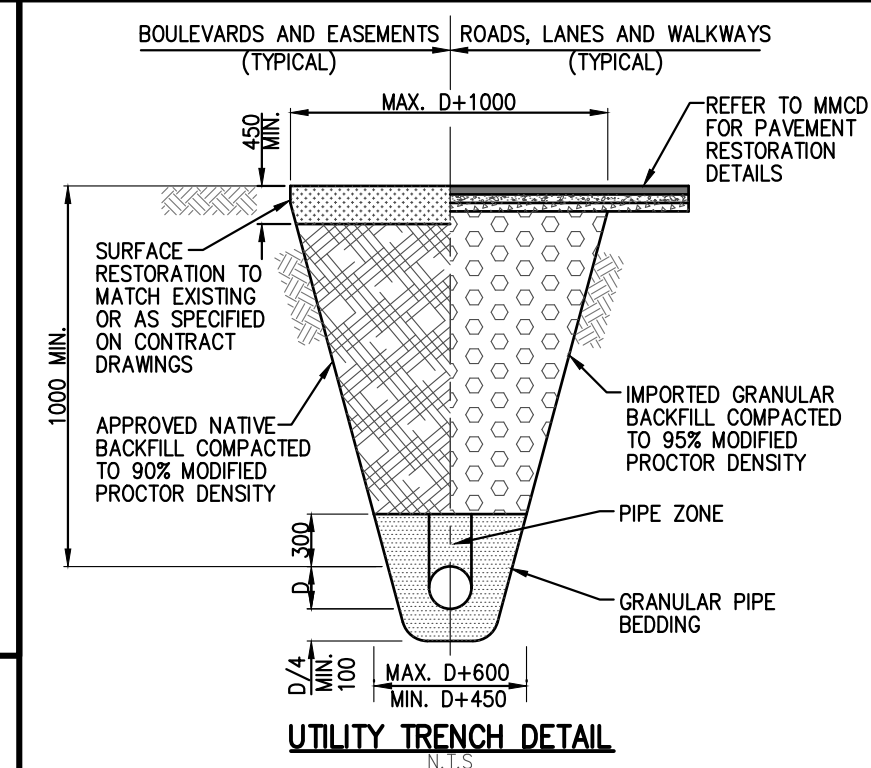
DRAWING TYPE

DRAINAGE

DESTROY ALL PRINTS BEARING PREVIOUS NUMBER

STORM NOTES:

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10. 450mm Ø TO 900mm Ø SHALL BE REINFORCED CONCRETE CLASS III TO ASTM C78 FOR DEPTH GREATER THAN 4.5m UNLESS OTHERWISE NOTED.
11. 1050mm Ø AND GREATER PIPES SHALL BE REINFORCED CONCRETE CLASS III TO ASTM C76.



STORM LENGTH, SIZE, TYPE, & GRADE	INVERT ELEVATION	CHAINAGE
16.6m-1200mm DIA. CONC. STM @ 0.45%		1+720 to 1+740
134.8m-1200mm DIA. CONC. STM @ 0.3%		1+740 to 1+900
34.2m (TRUE LENGTH) 1200mm DIA. CONC. STM @ 0.3%		1+877.25 to 1+900
91.2m-1200mm DIA. CONC. STM @ 0.3%		1+900 to 1+990

LEGAL DESCRIPTION: ----

SURVEY BENCHMARK: MON: 88H0617 SCALE FACTOR: ELEV.: 6.525m (GEOID TIC)

REV.	DATE	DESCRIPTION	BY
5	FEB 10/22	ADDRESS COMMENTS	KK
4	DEC 02/21	DESIGN REVISION	KK
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1	JUN 22/21	ISSUED FOR MUNICIPAL PRELIMINARY REVIEW	MC

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CLIENT

EM BUSINESS PARK LTD.
1910 - 117 WEST HASTINGS STREET
VANCOUVER, B.C., V6E 2K3

TITLE

BONSON ROAD
STA. 1+725.93 to STA. 2+002.25
PLAN/PROFILE

SEAL

Feb 11, 2022

SCALE: HOR. 1:500 VERT. 1:50	DATE (YYYY.MM.DD) FEB 2020	MUNICIPAL PROJECT NUMBER
DESIGNED MC/KK	CONSULTANT PROJ. NO. 20001	DRAWING TYPE
DRAWN AKG	DWG. NO. 15	DRAINAGE
REVIEWED KL/RFG	REV. 5	

**POST-DEVELOPMENT - BONSON ROAD
STORM SEWER DESIGN - RATIONAL METHOD**

Location: Eagle Meadows Business Park
 Ref No: 20001
 DF Curve: Pitt Meadows (Wetlands Yard)
 Return Period: 100 Year

Q_{max} = Design Flow (m³/s)
 A = Area (ha)
 R = Runoff Coefficient
 I = Rainfall Intensity (mm/hr)
 N = 0.02278

$T_c = T_i + T_t$
 T_c = Time of Concentration (min)
 T_i = Inlet Time (min)
 T_t = Travel Time (min)
 $I = at^{1.7}$ where a is mm/hr, T is hr
 $a = 29.143$
 $b = -0.545$

n = Roughness Coefficient
 V_{cap} = Velocity at Capacity (m/s)
 Q_{cap} = Flow at Capacity (m³/s)
 Date: 10-Jan-22
 Calc. By: Hub Engineering Inc. - MCKK
 Sheet: 2 of 2

Location	From MH	To MH	Area (ha)	R	I (mm/hr)	T _i (min)	T _t (min)	Runoff Coefficient	I (mm/hr)	Q _{cap} (m ³ /s)	Diameter (mm)	n	Slope (%)	V _{cap} (m/s)	Length (m)	HGL Condition	HGL Slope (%)		
CITY OF PITT MEADOWS - BONSON ROAD																			
EX-D-1	EX-D-2	A	0.13	0.55	0.07	0.07	10.00	1.69	11.69	71.0	0.014	0.033	250	0.013	0.310	0.67	66.5	IN GROUND	0.065
EX-D-2	EX-D-3	B	0.74	0.55	0.41	0.48	11.89	2.18	13.86	64.7	0.086	0.032	250	0.013	0.290	0.65	84.7	SURFACE	2.067
EX-D-3	EX-D-4	C	0.57	0.55	0.31	0.79	13.86	1.00	14.86	62.3	0.137	0.132	375	0.013	0.570	1.20	72.1	SURFACE	0.612
EX-D-4	EX-D-5	D	0.11	0.55	0.06	0.85	14.86	0.43	15.29	61.3	0.145	0.213	600	0.013	0.120	0.75	19.6	SURFACE	0.056
CITY OF PITT MEADOWS - BONSON ROAD																			
MH-D-8	EX-D-5	E	0.15	0.85	0.13	0.13	5.00	0.41	5.41	108.0	0.036	0.268	600	0.013	0.190	0.95	23.2	SURFACE	0.034
EX-D-5	EX-D-6			0.00	0.36	15.29	0.77	16.07	59.7	0.163	0.353	600	0.013	0.330	1.25	56.0	SURFACE	0.070	
			Σ 1.70 ha																

Jan-11-2022 - 4:56 PM G:\Projects\20001.ctb\B1 Design\Storm Analysis\2022-01-07 STMP Calculations.xlsx\100-YR Flow (Bonson Post)

**PRE-DEVELOPMENT - BONSON ROAD
STORM SEWER DESIGN - RATIONAL METHOD**

Location: Eagle Meadows Business Park
 Ref No: 20001
 DF Curve: Pitt Meadows (Wetlands Yard)
 Return Period: 100 Year

Q_{max} = Design Flow (m³/s)
 A = Area (ha)
 R = Runoff Coefficient
 I = Rainfall Intensity (mm/hr)
 N = 0.02278

$T_c = T_i + T_t$
 T_c = Time of Concentration (min)
 T_i = Inlet Time (min)
 T_t = Travel Time (min)
 $I = at^{1.7}$ where a is mm/hr, T is hr
 $a = 29.143$
 $b = -0.545$

n = Roughness Coefficient
 V_{cap} = Velocity at Capacity (m/s)
 Q_{cap} = Flow at Capacity (m³/s)
 Date: 10-Jan-22
 Calc. By: Hub Engineering Inc. - MCKK
 Sheet: 1 of 2

Location	From MH	To MH	Area (ha)	R	I (mm/hr)	T _i (min)	T _t (min)	Runoff Coefficient	I (mm/hr)	Q _{cap} (m ³ /s)	Diameter (mm)	n	Slope (%)	V _{cap} (m/s)	Length (m)	HGL Condition	HGL Slope (%)		
CITY OF PITT MEADOWS - BONSON ROAD																			
EX-D-1	EX-D-2	A	0.13	0.55	0.07	0.07	10.00	1.69	11.69	71.0	0.014	0.033	250	0.013	0.310	0.67	66.5	IN GROUND	0.056
EX-D-2	EX-D-3	B	0.74	0.55	0.41	0.48	11.89	2.18	13.86	64.7	0.086	0.032	250	0.013	0.290	0.65	84.7	SURFACE	2.097
EX-D-3	EX-D-4	C	0.57	0.55	0.31	0.79	13.86	1.00	14.86	62.3	0.137	0.132	375	0.013	0.570	1.20	72.1	SURFACE	0.612
EX-D-4	EX-D-5	D	0.11	0.55	0.06	0.85	14.86	0.43	15.29	61.3	0.145	0.213	600	0.013	0.120	0.75	19.6	SURFACE	0.056
CITY OF PITT MEADOWS - BONSON ROAD																			
MH-D-8	EX-D-5	E	0.15	0.85	0.13	0.13	5.00	0.41	5.41	116.0	0.036	0.268	600	0.013	0.190	0.95	23.2	SURFACE	3.970
EX-D-5	EX-D-6			0.00	0.36	15.29	0.77	16.07	59.7	0.163	0.353	600	0.013	0.330	1.25	56.0	SURFACE	4.007	
			Σ 32.31 ha																

Jan-11-2022 - 4:57 PM G:\Projects\20001.ctb\B1 Design\Storm Analysis\2022-01-07 STMP Calculations.xlsx\100-YR Flow (Bonson Pre)

**POST-DEVELOPMENT
STORM SEWER DESIGN - INFORWORKS ICM 13.1.5**

LOCATION: Katze Reserve No.1
 REF No.: 20001
 Rain Gauge: Katze Pump Station
 Return Period: 10 Year and 100 Year 24hr Rainstorms

INFORWORKS ICM 13.1.5

Q = Pipe Diameter (mm)
 n = Roughness Coefficient
 S = Slope of Pipe (%)
 V_{cap} = Velocity at Capacity (m/s)
 L = Length of Pipe (m)
 Q_{cap} = Flow at Capacity (m³/s)

Date: January 27, 2022
 Calc. By: MNI
 Sheet: 1 of 1

Location	From	To	Segment	Link Name	Area (ha)	Impervious (%)	Q-10 Year (m ³ /s)	Q-100 Year (m ³ /s)	Q _{cap} (m ³ /s)	Ø (mm)	n	S (%)	V _{cap} (m/s)	L (m)	100 yr. HGL Condition at Upstream Node
Fraser Way	FUT-D-11	FUT-D-10	MH-D-11.1	6	8.78	90	0.130	0.284	0.905	900	0.013	0.250	1.42	100.0	IN GROUND
	FUT-D-10	FUT-D-9	MH-D-10.1	5	6.81	90	0.222	0.511	0.905	900	0.013	0.250	1.42	100.0	IN GROUND
	FUT-D-9	FUT-D-8	MH-D-9.1	4	3.94	90	0.281	0.596	1.221	1050	0.013	0.200	1.41	100.0	IN GROUND
	FUT-D-8	D-7	MH-D-8.1	3	3.86	90	0.343	0.715	1.489	1200	0.013	0.146	1.32	85.5	IN GROUND
	D-7	D-6	MH-D-7.1	-	-	-	0.344	0.715	1.488	1200	0.013	0.146	1.32	34.3	IN GROUND
	D-6	D-5	MH-D-6.1	-	-	-	0.345	0.715	1.486	1200	0.013	0.145	1.31	96.3	IN GROUND
	D-5	D-4	MH-D-5.1	-	-	-	0.435	0.920	1.452	1200	0.013	0.139	1.28	100.9	IN GROUND
	D-4	D-3	MH-D-4.1	2	7.42	90	0.435	0.920	2.054	1200	0.013	0.278	1.82	10.8	IN GROUND
	Bonson Road	D-3	D-2A	MH-D-3.1	1	0.46	90	0.483	0.952	2.149	1200	0.013	0.304	1.90	92.0
D-2A		D-2	-	-	-	0.483	0.952	2.149	1200	0.013	0.304	1.90	34.0	IN GROUND	
D-2		D-1	MH-D-2.1	-	-	-	0.483	0.952	2.123	1200	0.013	0.297	1.88	134.8	IN GROUND
D-1		HW	MH-D-1.1	7	8.58	40	1.113	1.740	2.827	1200	0.013	0.455	2.32	17.6	IN GROUND

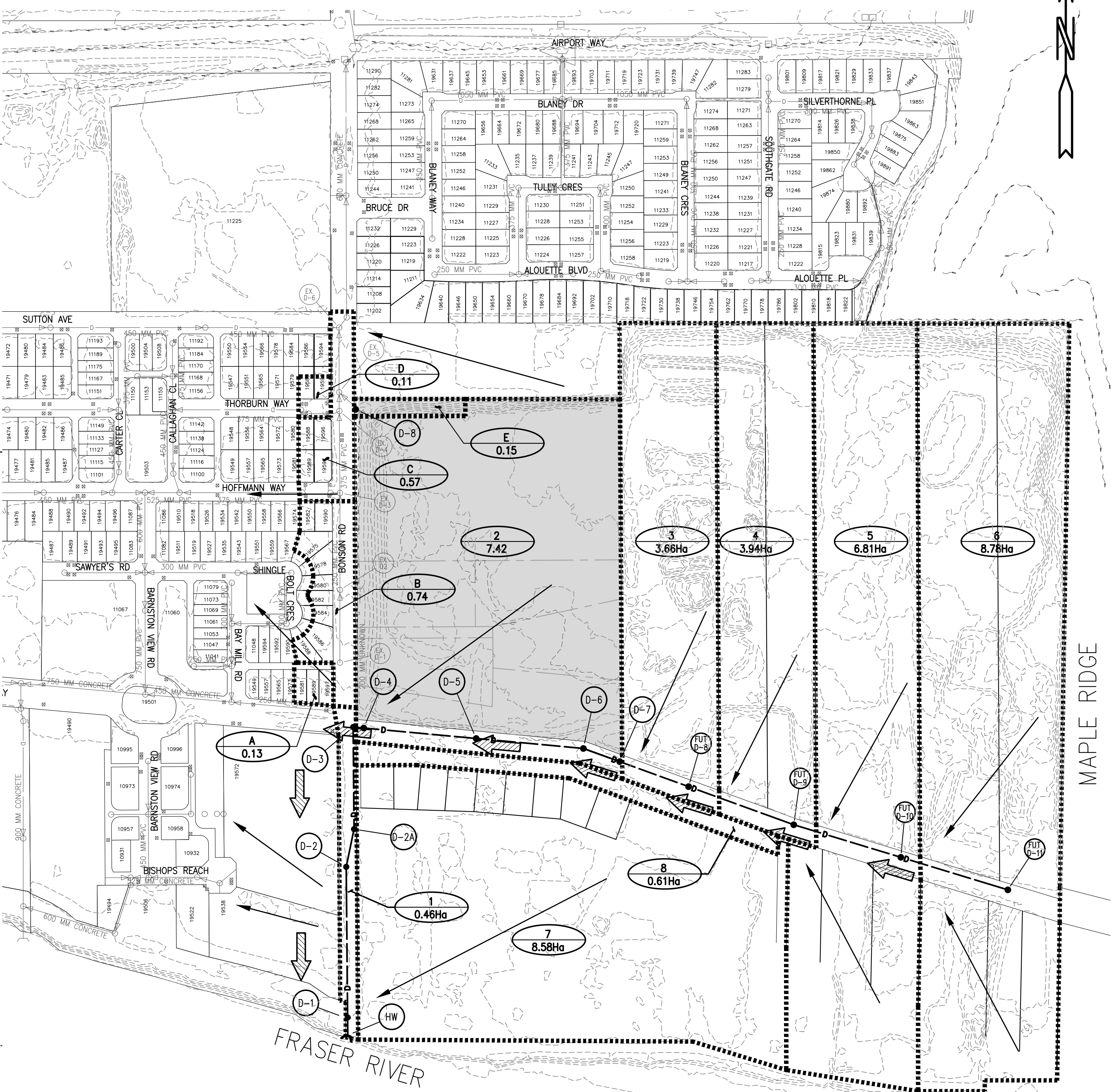
Note: Fraser River HGL elevations provided by Northwest Hydraulics Consultants (10yr = 3.7m) (100yr = 4.7m)
 Note: All commercial lots are assumed to restrict 100yr and 10yr flows to pre-development conditions.

Imperv. Roughness = 0.013
 Perv. Roughness = 0.250
 Imperv. Storage Depth = 0.071 mm
 Perv. Storage Depth = 0.280 mm
 Initial Infiltration = 76.00 mm/hr
 Limiting Infiltration = 2.50 mm/hr
 Decay Factor = 2.00 hr⁻¹
 Maximum Infiltration = 50 mm

Jan-27-2022 - 1:30 PM G:\Projects\20001.ctb\B1 Design\Storm Analysis\ICM Model\2022-01-27 SWCP for 20001.xlsx\Inforworks ICM INTERIM

LEGEND

- (D-X) MANHOLE NUMBER
- (4) 2.30Ha LOT NUMBER AND AREA (Ha)
- DIRECTION OF FLOW FOR SURFACE RUNOFF AND SIDEYARD SWALE
- STORM SEWER
- SUB-CATCHMENT BOUNDARY
- CATCHMENT BOUNDARY
- 100 YR. FLOOD PATH IN PIPE
- 100 YR. FLOOD PATH BELOW GROUND SURFACE
- 100 YR. FLOOD PATH OVERLAND
- EXISTING GROUND CONTOUR
- EXISTING DITCH
- SUBJECT SITE



LEGAL DESCRIPTION: ----

SURVEY BENCHMARK: MON: 88H0617
 SCALE FACTOR: 6.525m (GEODETIC)
 ELEV.: 6.525m (GEODETIC)

REV.	DATE	DESCRIPTION	BY
5	FEB 10/22	ADDRESS COMMENTS	KK
4	NOV 17/21	ISSUED FOR MUNICIPAL REVIEW	KK
3	OCT 07/21	ISSUED FOR REVIEW	KK
2	JUL 25/21	ISSUED FOR MUNICIPAL REVIEW	MC
1	JUN 17/21	ISSUED FOR MUNICIPAL CONCEPTUAL REVIEW	MC

CONSULTANT

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 www.hub-inc.com

**EAGLE MEADOWS
BUSINESS PARK**

CLIENT

EM BUSINESS PARK LTD.
 1910 - 1177 WEST HASTINGS STREET
 VANCOUVER, B.C., V6E 2K3, TEL: (604) 270-1890

TITLE

STORM WATER CATCHMENT PLAN

SCALE: HOR. 1:2500
 VERT. 1:2500

DESIGNED: MC/MN/KK
 DRAWN: AKG
 REVIEWED: KL/RFG

DATE (YYYY.MM.DD)
 FEB 2020
 CONSULTANT PROJ. NO.
 20001
 DWG. NO.
 16
 REV. 5

MUNICIPAL PROJECT NUMBER

DRAWING TYPE

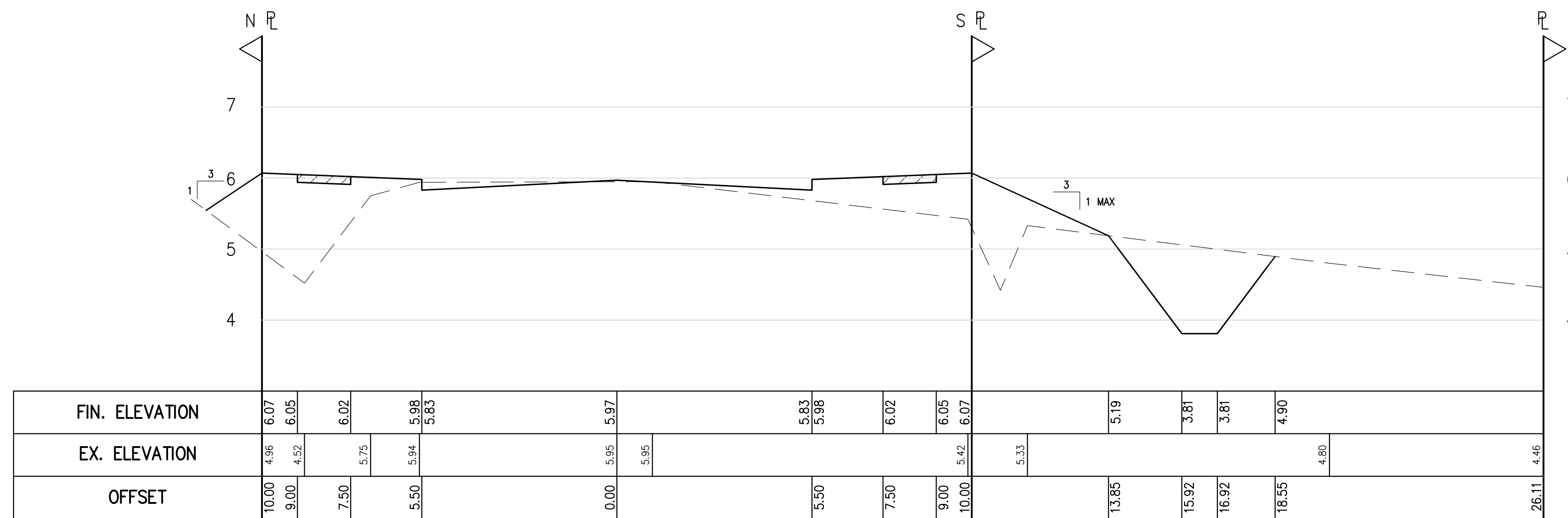
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SEAL

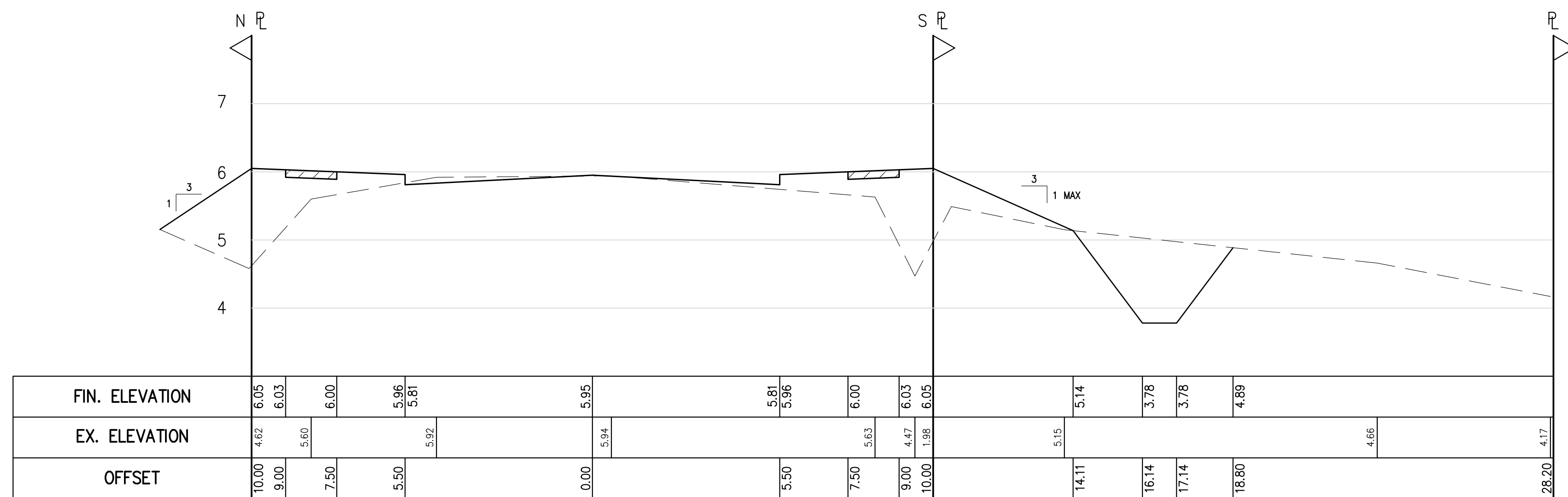
Feb 11, 2022

DESTROY ALL PRINTS BEARING PREVIOUS NUMBER

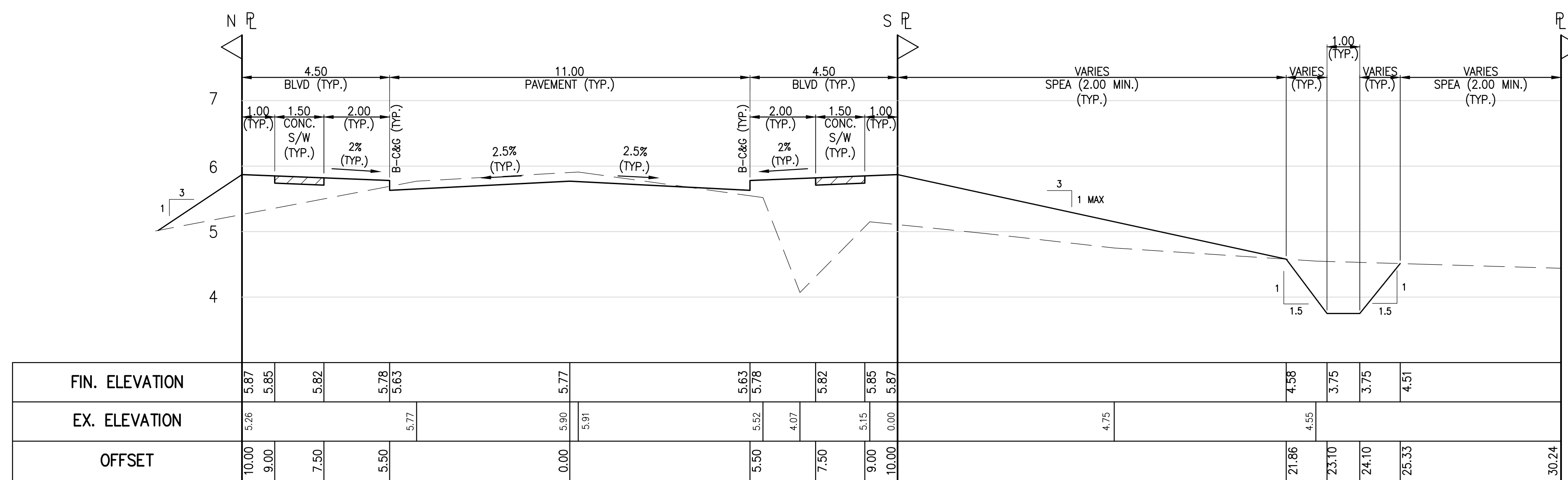
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STA. 1+060
WHARF STREET



STA. 1+040
WHARF STREET



STA. 1+020
WHARF STREET

LEGAL DESCRIPTION: ----

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CLIENT
EM BUSINESS PARK LTD.
1910 - 117 WEST HASTINGS STREET
VANCOUVER, B.C., V6E 2K3

TITLE
WHARF STREET
STA. 1+020 to STA. 1+060
SECTION

SEAL

SCALE: HOR. 1:100
VERT. 1:50

DATE (YYYY.MM.DD)
FEB 2020

CONSULTANT PROJ. NO.
20001

DESIGNED: MC/KK
DRAWN: AKG
REVIEWED: KL/RFG

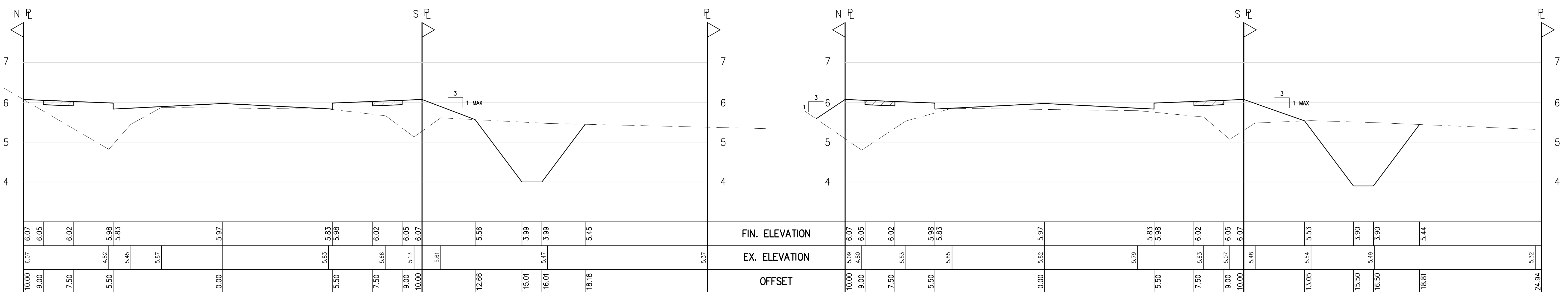
DWG. NO.
17

REV. 2

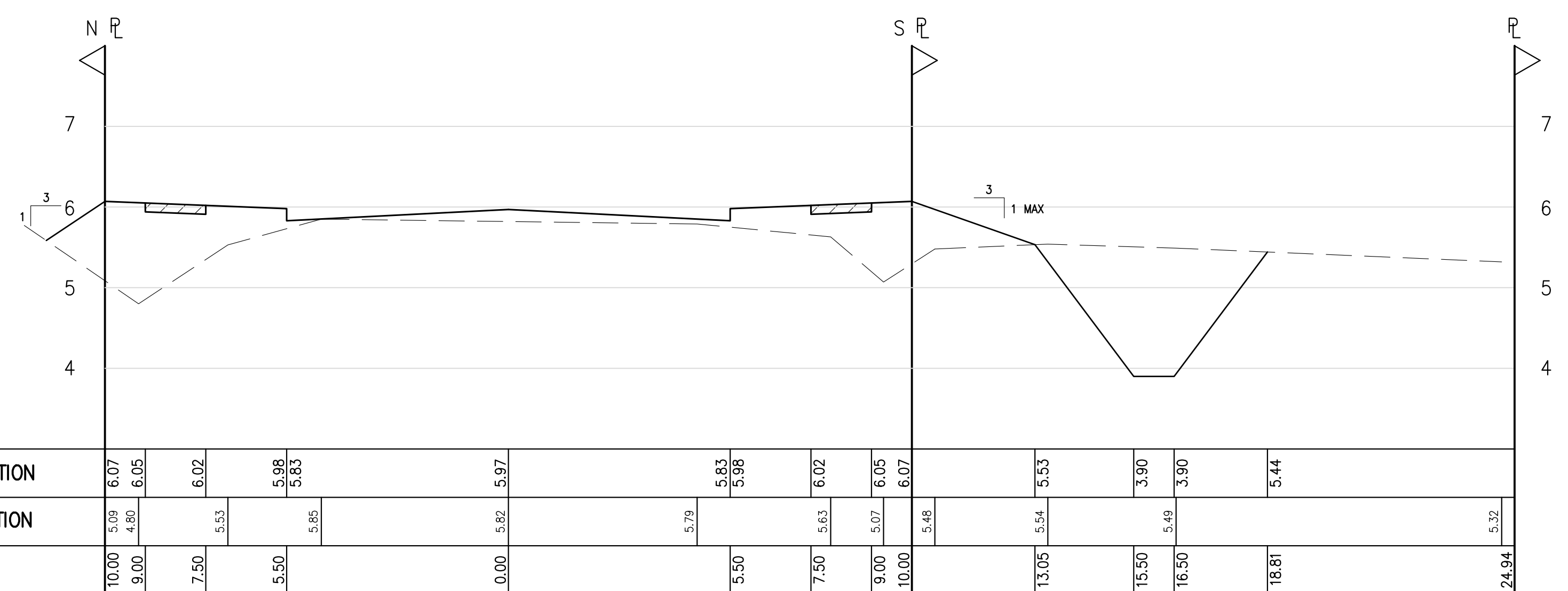
Feb 11, 2022

MUNICIPAL PROJECT NUMBER
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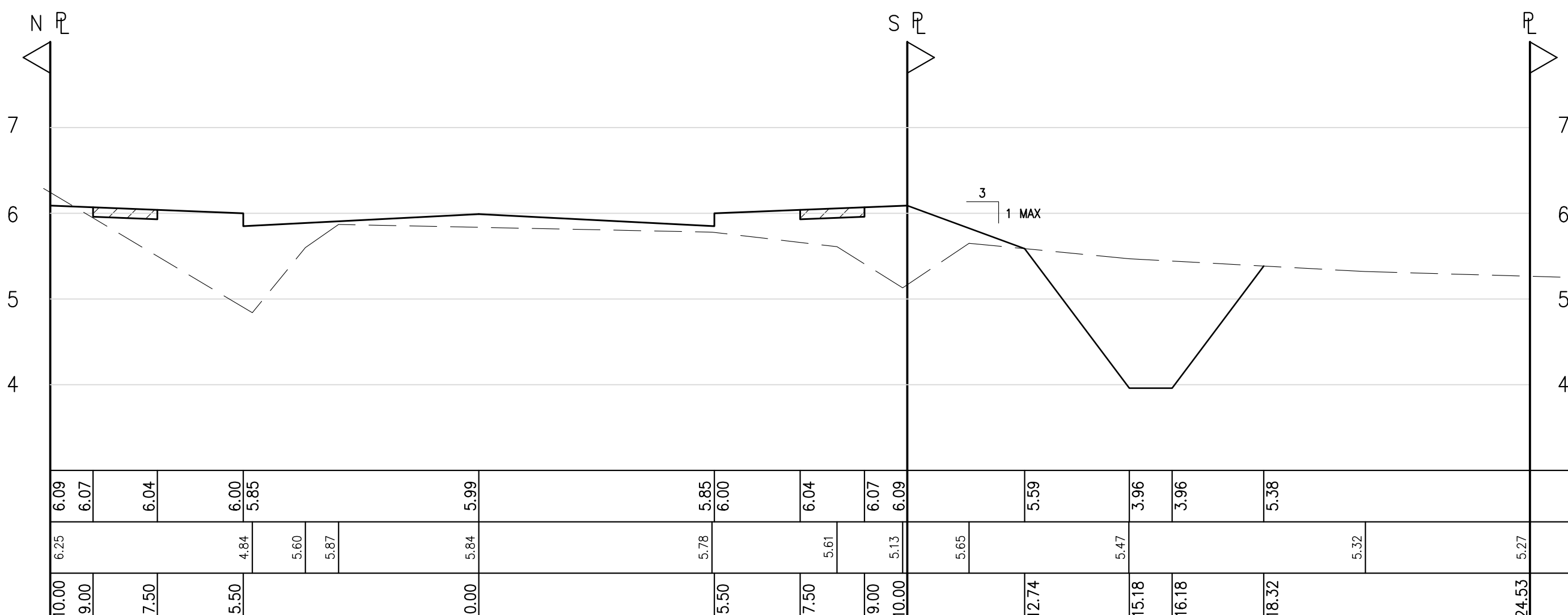
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ROADWORKS



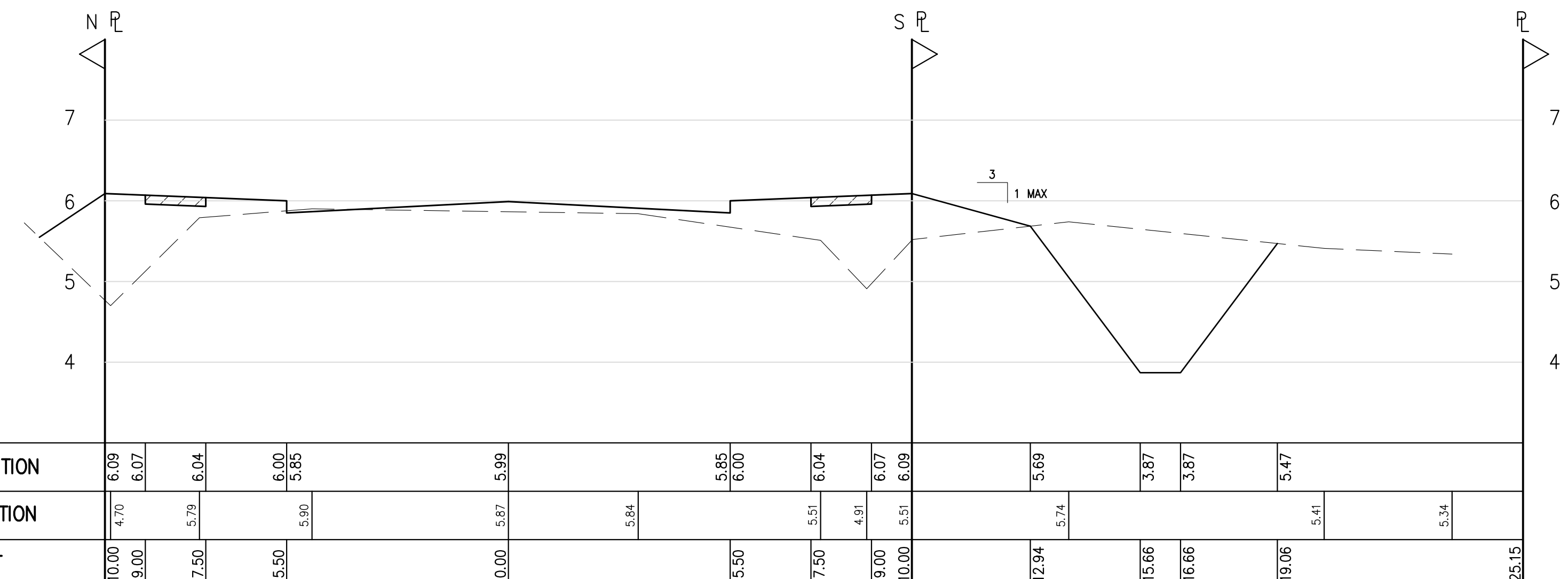
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WHARF STREET



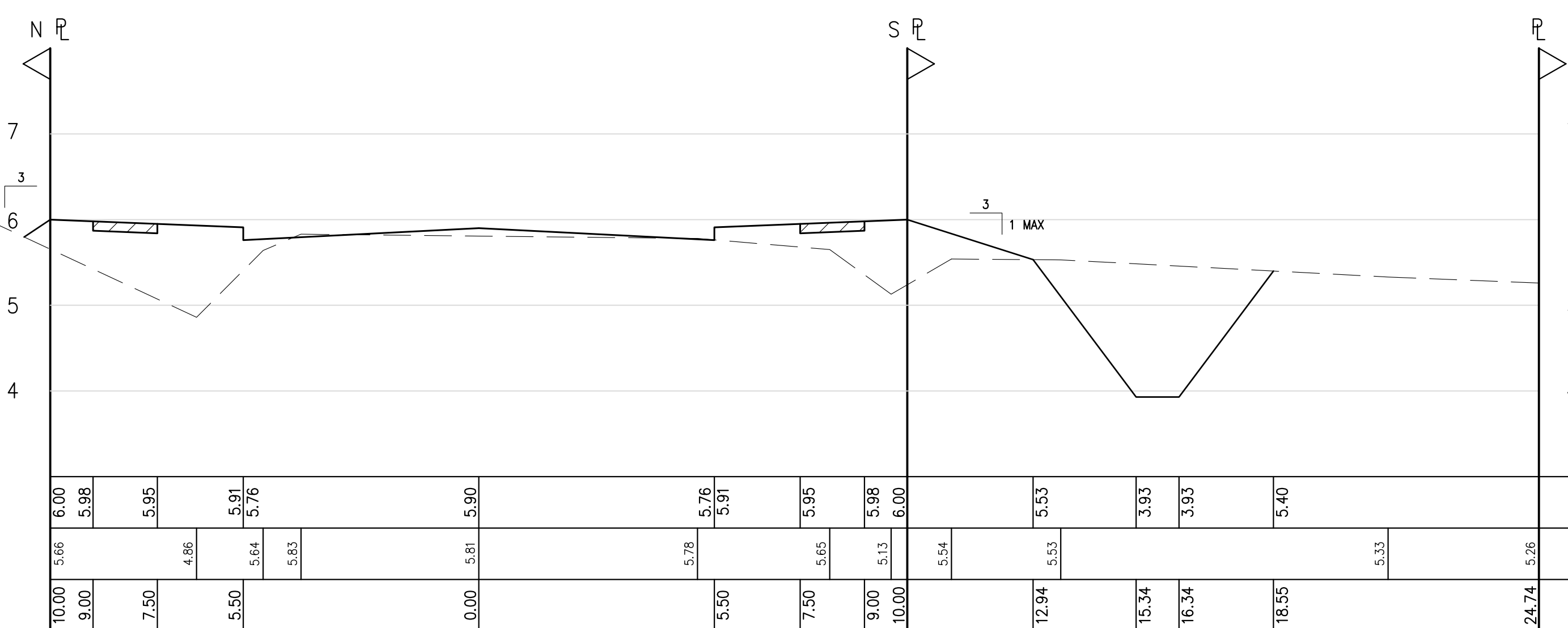
STA. 1+120
WHARF STREET



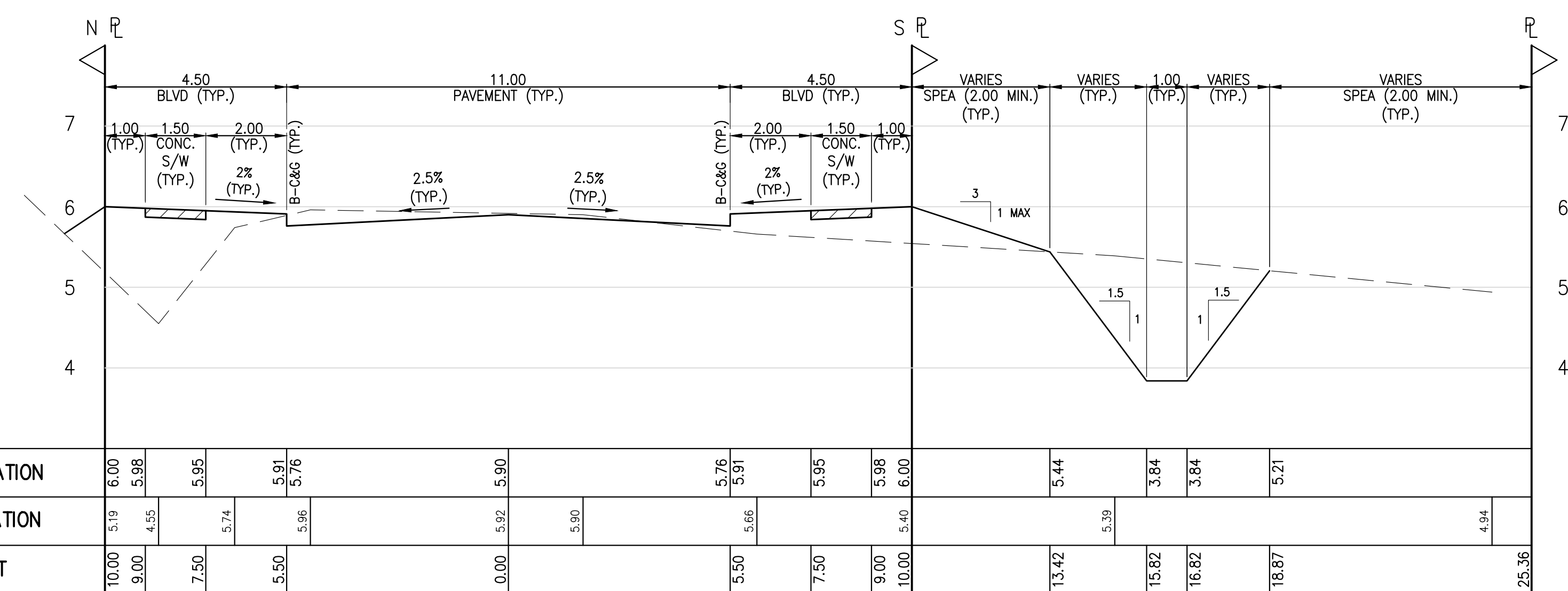
STA. 1+160
WHARF STREET



STA. 1+100
WHARF STREET



STA. 1+140
WHARF STREET



STA. 1+080
WHARF STREET

LEGAL DESCRIPTION: ----

SURVEY BENCHMARK: MON: 88H0617 SCALE FACTOR: ELEV.: 6.525m (GEODETIC)

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tel: 604-572-4328 fax: 604-501-1625 mail@hub-inc.com
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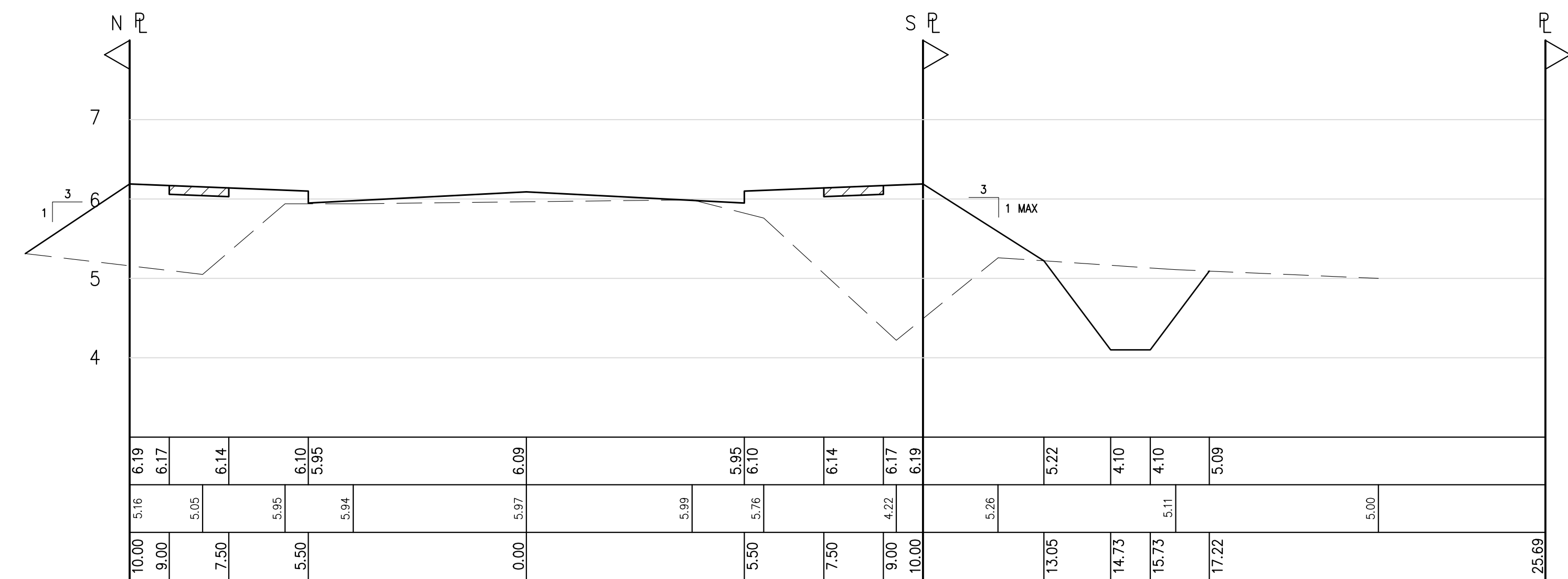
CLIENT
EM BUSINESS PARK LTD.
1910 - 117 WEST HASTINGS STREET
VANCOUVER, B.C., V6E 2K3
TITLE
WHARF STREET
STA. 1+080 to STA. 1+180
SECTION

SEAL
SCALE: HOR. 1:100 VERT. 1:50
DATE (YYYY.MM.DD) FEB 2020
CONSULTANT PROJ. NO. 20001
DESIGNED MC/KK
DRAWN AKG
REVIEWED KL/RFG
DWG. NO. 18
REV. 2
Feb 11, 2022

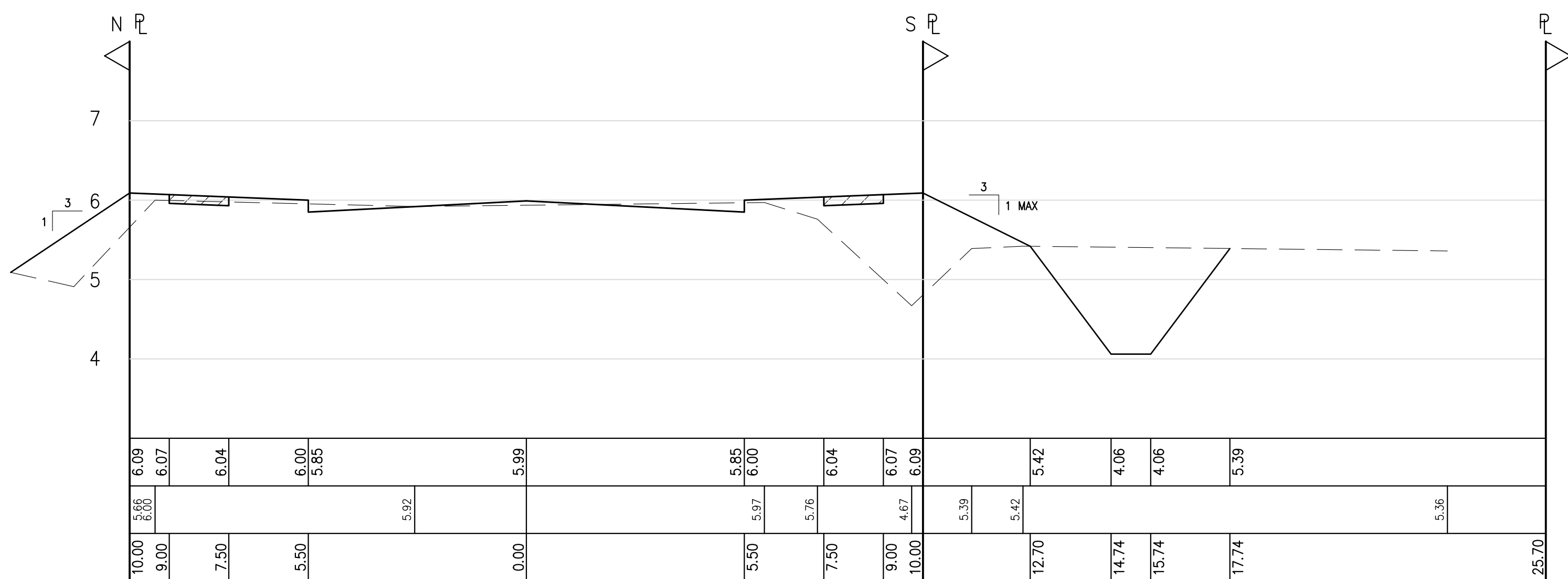
MUNICIPAL PROJECT NUMBER	-
DRAWING TYPE	ROADWORKS

DESTROY ALL PRINTS BEARING PREVIOUS NUMBER

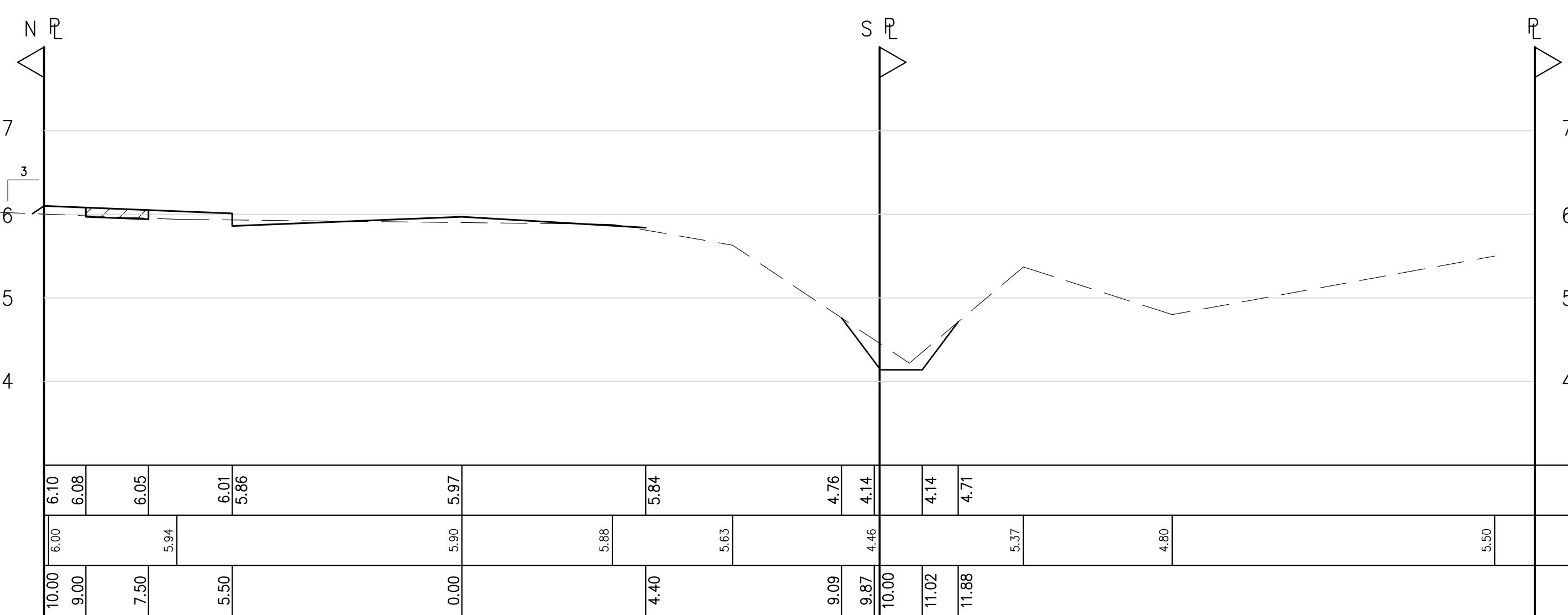
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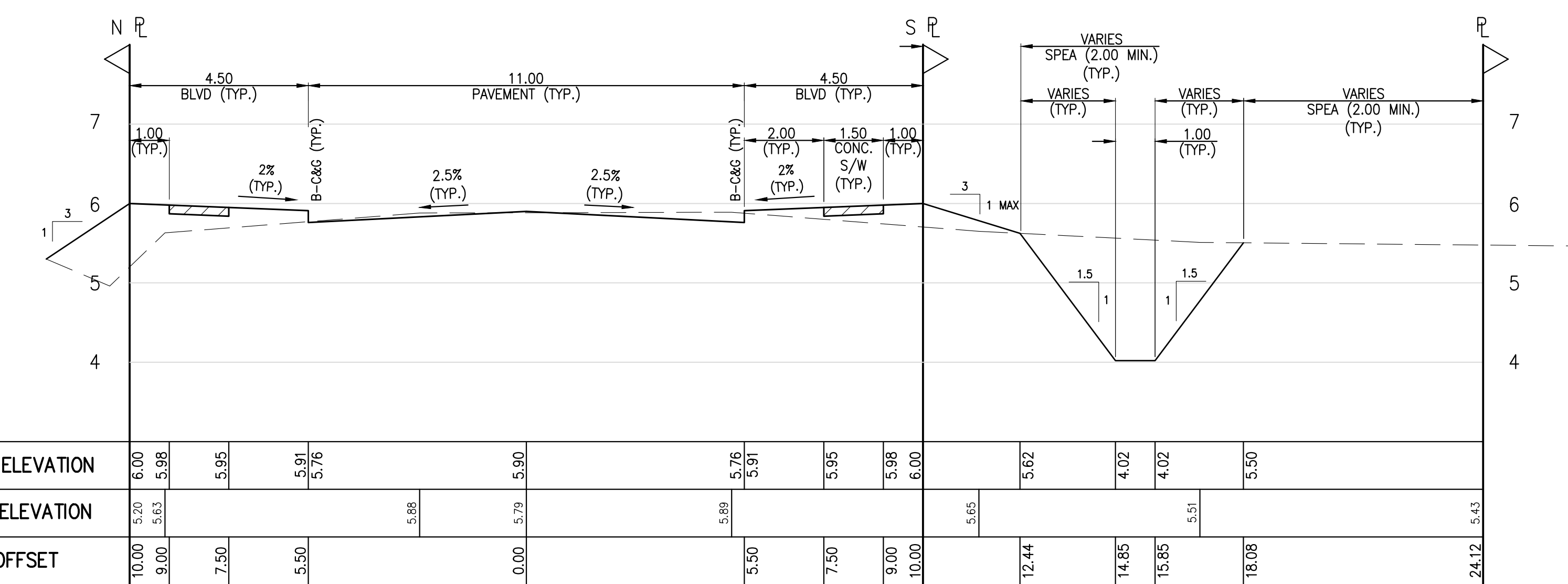
STA. 1+240
WHARF STREET



STA. 1+220
WHARF STREET



STA. 1+260
WHARF STREET



STA. 1+200
WHARF STREET

LEGAL DESCRIPTION: -----

SURVEY BENCHMARK: MON: 88H0617
SCALE FACTOR: ELEV.: 6.525m (GEODETIIC)

REV.	DATE	DESCRIPTION	BY
2	FEB 10/22	ADDRESS COMMENTS	KK
1	NOV 17/21	ISSUED FOR MUNICIPAL REVIEW	KK

CONSULTANT

Hub Engineering Inc.
Engineering and Development Consultants
EGBC Permit to Practice Number: 1003404

Suite 212, 12992 - 76 Avenue, Surrey, B.C. V3W 2V6
tel: 604-572-4328 | fax: 604-501-1625 | mail@hub-inc.com
www.hub-inc.com



CLIENT

EM BUSINESS PARK LTD.
1910 - 117 WEST HASTINGS STREET
VANCOUVER, B.C., V6E 2K3

TITLE

WHARF STREET
STA. 1+200 to STA. 1+260
SECTION

SEAL

SCALE: HOR. 1:100
VERT. 1:50

DATE (YYYY.MM.DD)
FEB 2020

CONSULTANT PROJ. NO.
20001

DESIGNED: MC/KK
DRAWN: AKG
REVIEWED: KL/RFG

DWG. NO.
19

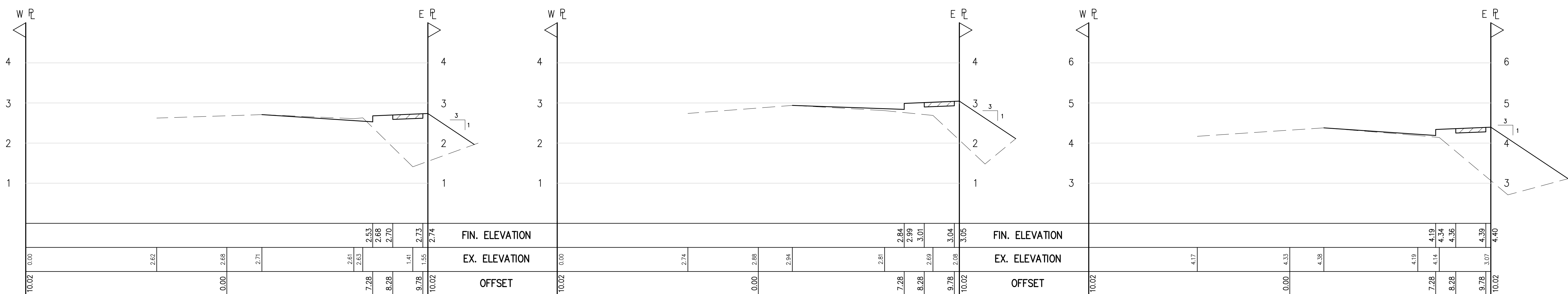
REV. 2

Feb 11, 2022

MUNICIPAL PROJECT NUMBER

DRAWING TYPE

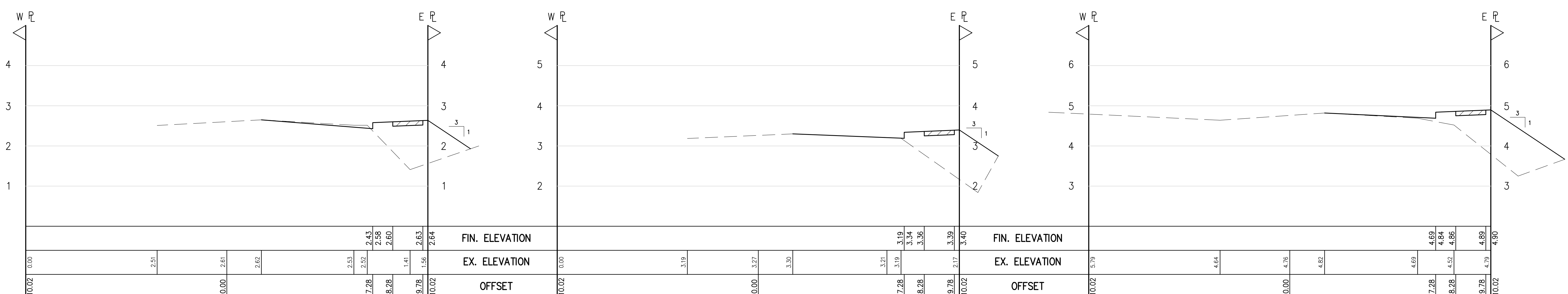
ROADWORKS



STA. 2+180
BONSON ROAD

STA. 2+120
BONSON ROAD

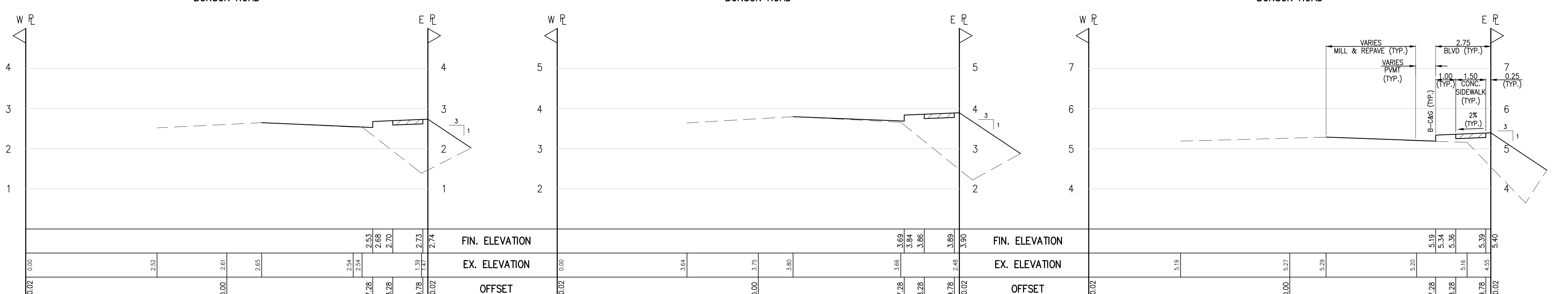
STA. 2+060
BONSON ROAD



STA. 2+160
BONSON ROAD

STA. 2+100
BONSON ROAD

STA. 2+040
BONSON ROAD



STA. 2+140
BONSON ROAD

STA. 2+080
BONSON ROAD

STA. 2+020
BONSON ROAD

LEGAL DESCRIPTION: ----

SURVEY BENCHMARK: MON: 88H0617 SCALE FACTOR: ELEV.: 6.525m (GEODETTIC)

REV.	DATE	DESCRIPTION	BY
2	FEB 10/22	ADDRESS COMMENTS	KK
1	NOV 17/21	ISSUED FOR MUNICIPAL REVIEW	KK

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1910 - 117 WEST HASTINGS STREET
VANCOUVER, B.C., V6E 2K3

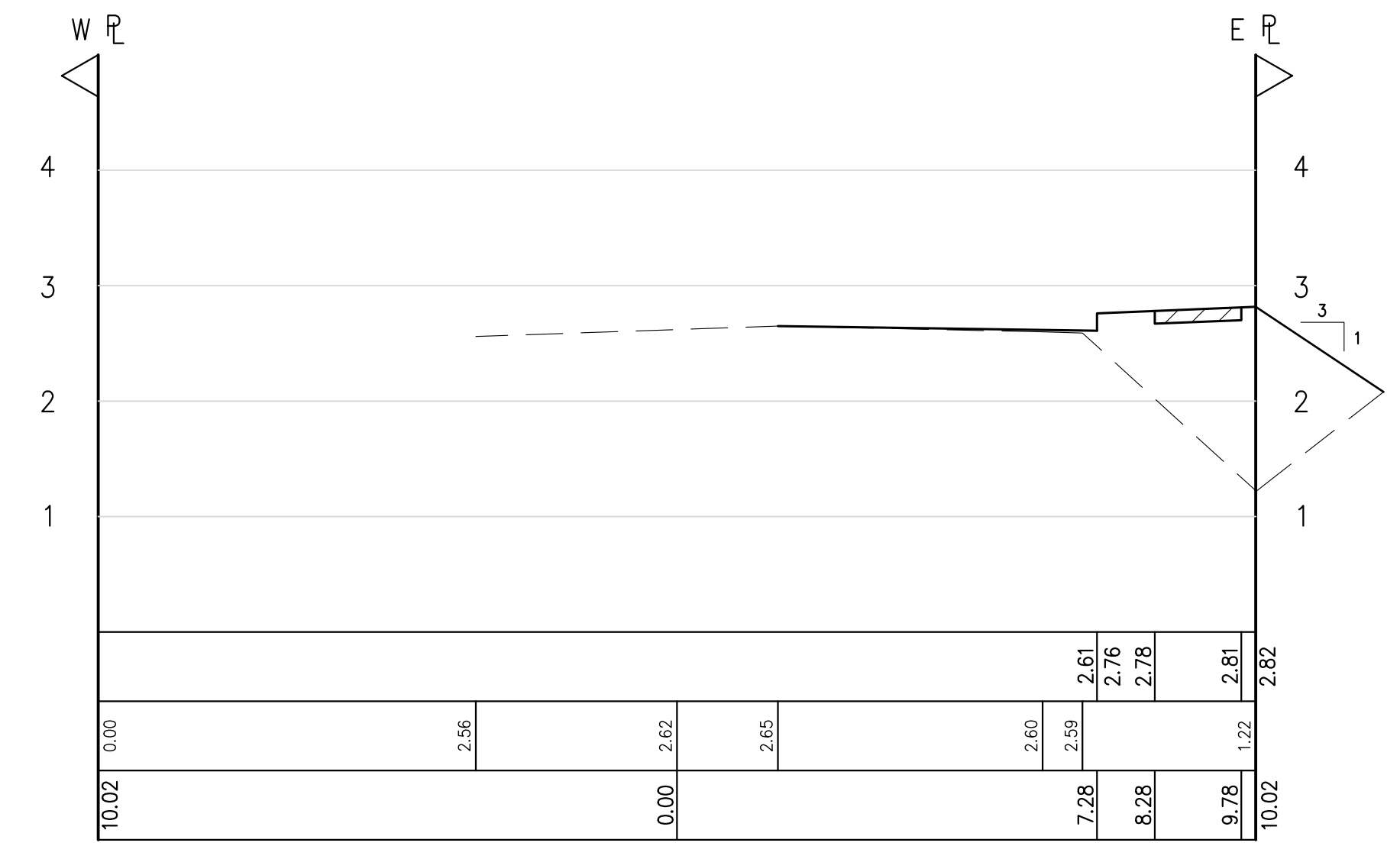
TITLE

BONSON ROAD
STA. 2+020 to STA. 2+180
SECTION

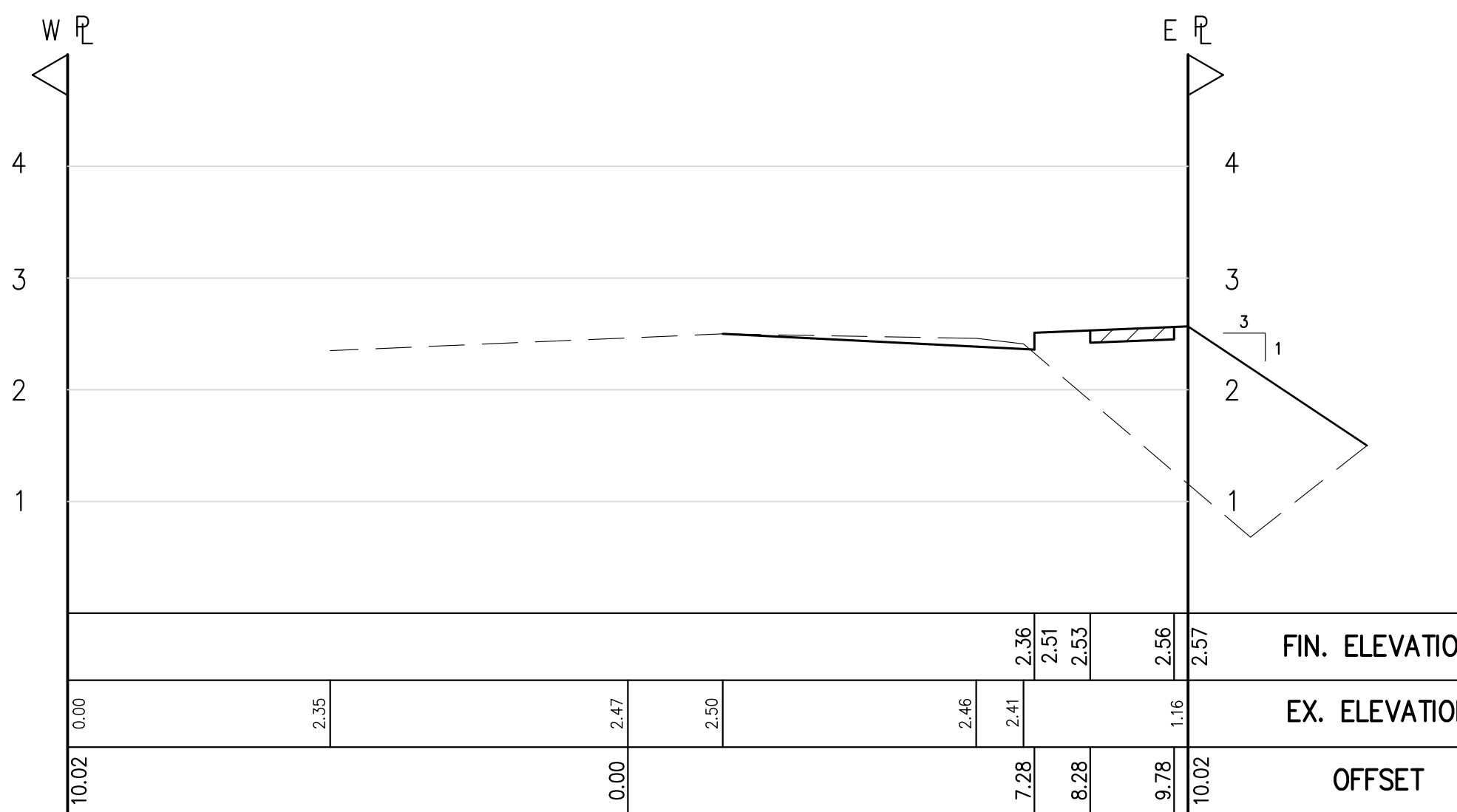
SEAL

Feb 11, 2022

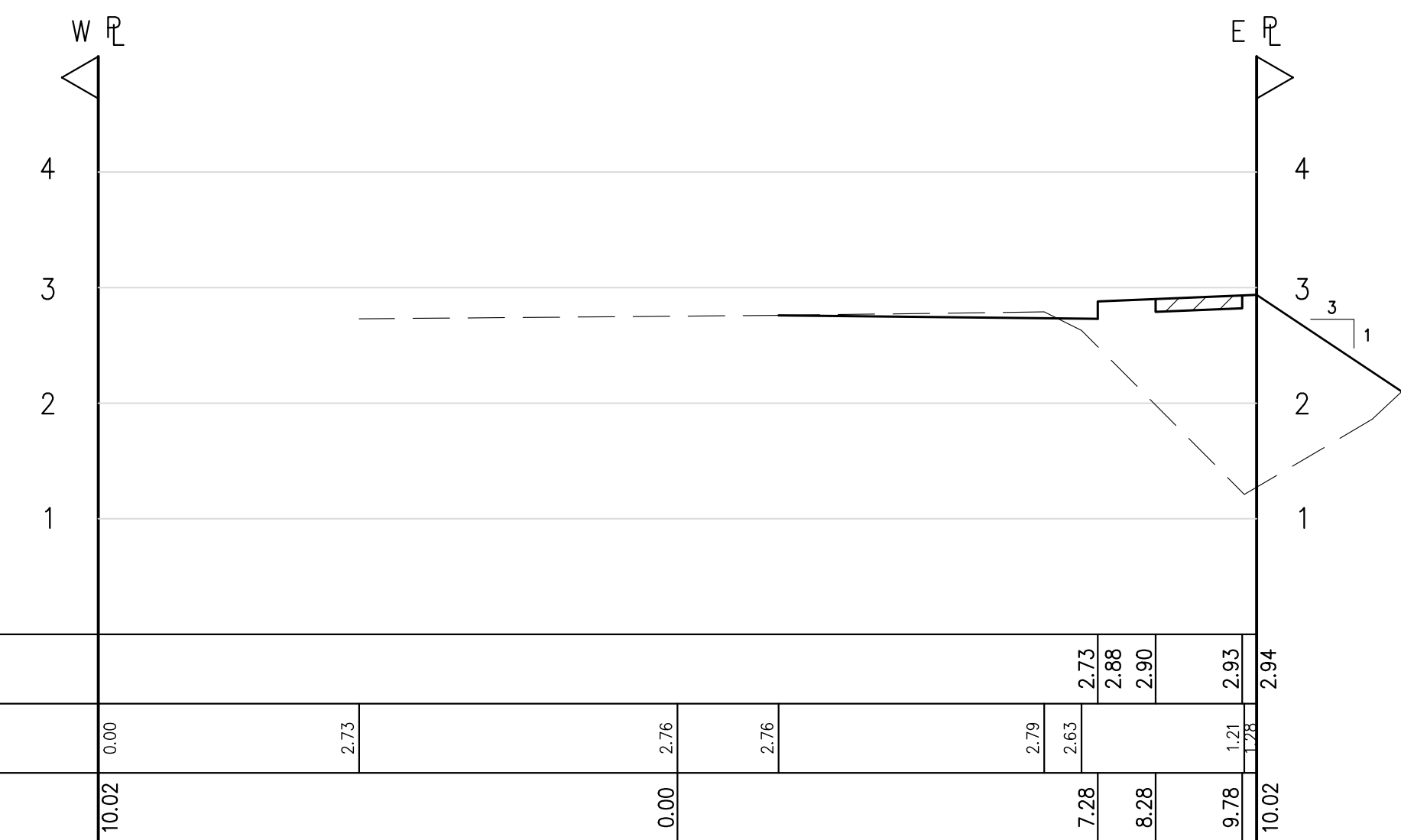
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DESIGNED MC/KK	CONSULTANT PROJ. NO. 20001	DRAWING TYPE ROADWORKS
DRAWN AKG	DWG. NO. 20	REV. 2
REVIEWED KL/RFG		



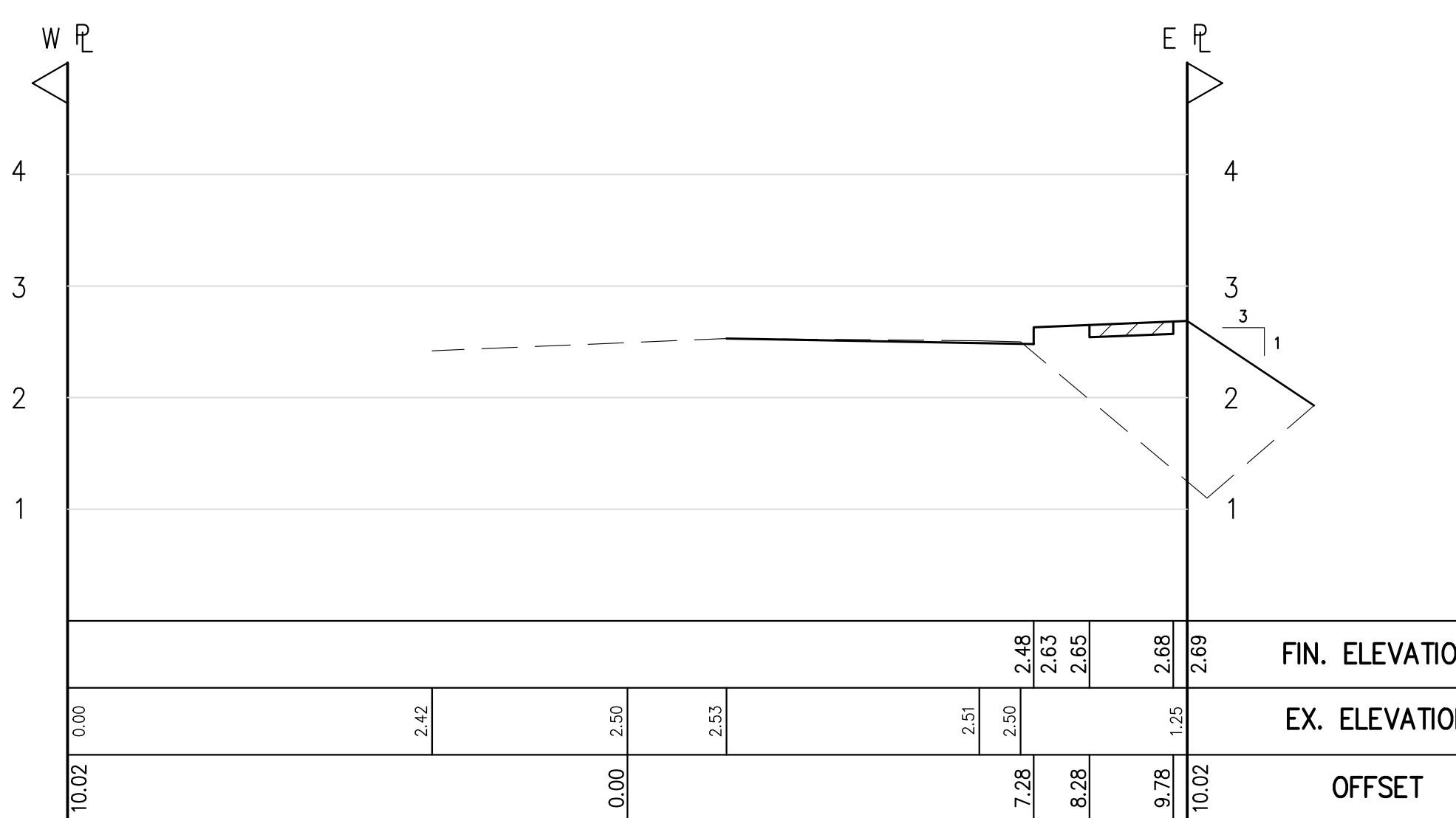
STA. 2+240
BONSON ROAD



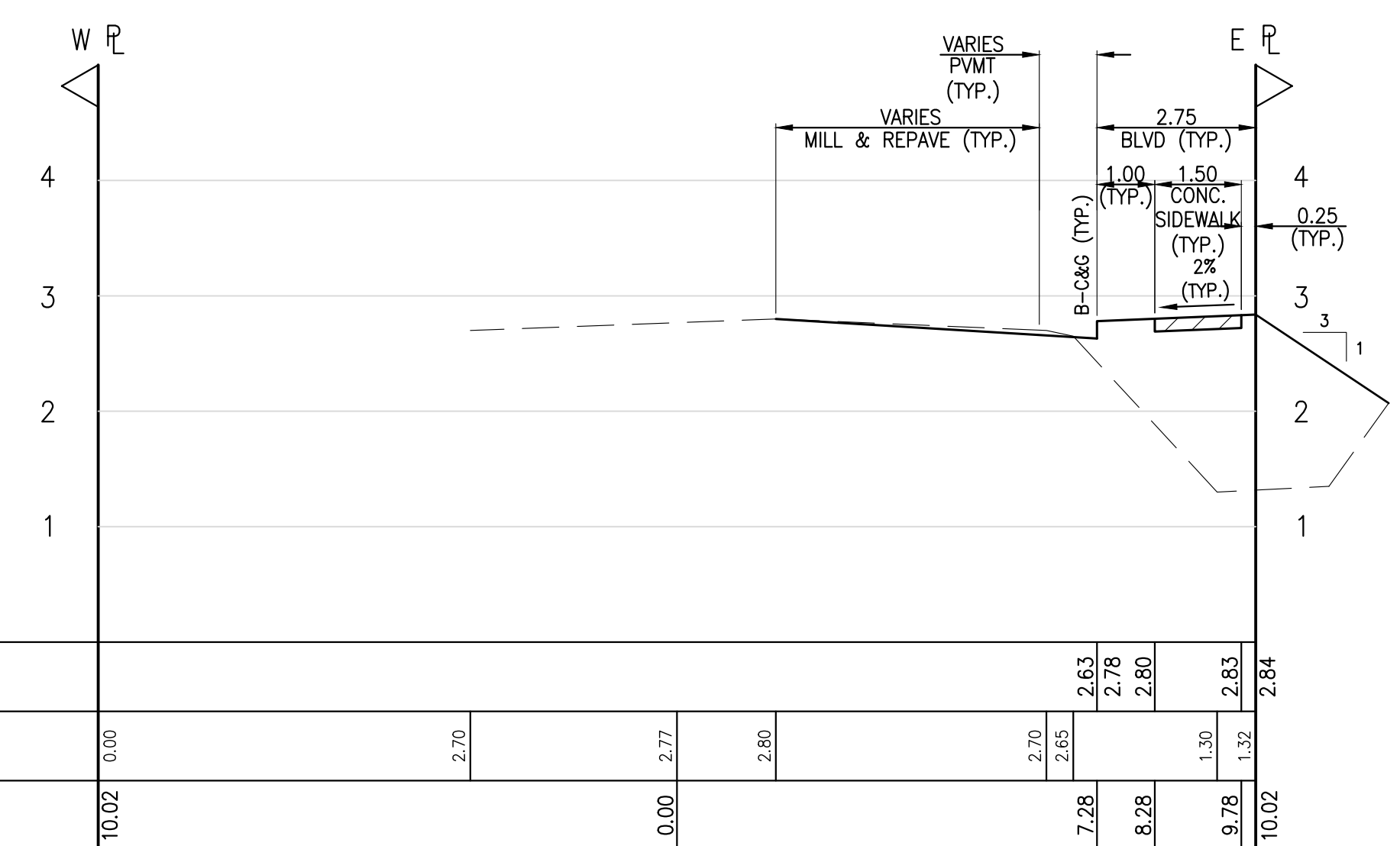
STA. 2+280
BONSON ROAD



STA. 2+220
BONSON ROAD



STA. 2+260
BONSON ROAD



STA. 2+200
BONSON ROAD

LEGAL DESCRIPTION: ----
SURVEY BENCHMARK: MON: 88H0617
SCALE FACTOR: 6.525m (GEODETIC)
ELEV.: 6.525m (GEODETIC)

REV.	DATE	DESCRIPTION	BY
2	FEB 10/22	ADDRESS COMMENTS	KK
1	NOV 17/21	ISSUED FOR MUNICIPAL REVIEW	KK

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CLIENT
EM BUSINESS PARK LTD.
1910 - 117 WEST HASTINGS STREET
VANCOUVER, B.C., V6E 2K3

TITLE
BONSON ROAD
STA. 2+200 to STA. 2+280
SECTION

SCALE: HOR. 1:100
VERT. 1:50

DATE (YYYY.MM.DD)
FEB 2020

CONSULTANT PROJ. NO.
20001

DESIGNED MC/KK
DRAWN AKG
REVIEWED KL/RFG

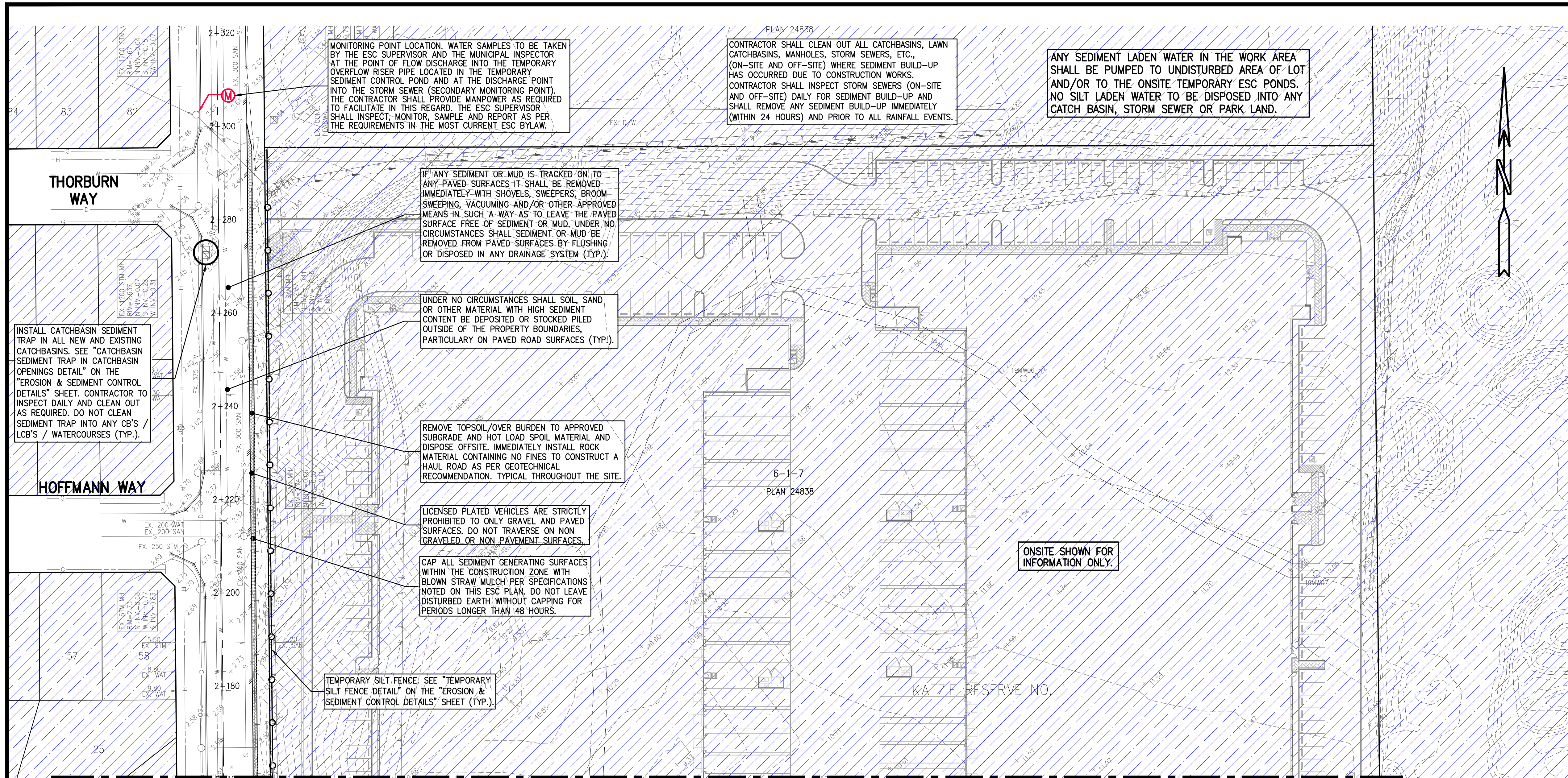
MUNICIPAL PROJECT NUMBER
-

DRAWING TYPE
ROADWORKS

REV. NO. 21

Feb 11, 2022

DESTROY ALL PRINTS BEARING PREVIOUS NUMBER



EROSION & SEDIMENT CONTROL LEGEND

- EXISTING GROUND SURFACE ELEVATION.
- EXISTING GROUND SURFACE CONTOUR ELEVATION.
- MEET EXISTING GROUND SURFACE ELEVATION.
- FINISHED GROUND SURFACE ELEVATION.
- NEW STORM SEWER.
- NEW SANITARY SEWER.
- NEW WATERMAIN.
- NEW MANHOLE.
- NEW CATCHBASIN.
- NEW LAWN DRAIN.
- NEW CLEANOUT.
- TEMPORARY CATCHBASIN SEDIMENT TRAP IN EXISTING CATCHBASIN.
- TEMPORARY CATCHBASIN SEDIMENT TRAP IN NEW CATCHBASIN.
- TEMPORARY CATCHBASIN SEDIMENT TRAP IN NEW LAWNBASIN.
- TEMPORARY OVERFLOW RISER PIPE IN TEMPORARY SEDIMENT CONTROL POND.
- TEMPORARY SILT FENCE.
- TEMPORARY STRAW WADDLE/COMPOST FILTER SOCK.
- TEMPORARY CONSTRUCTION SWALE.
- TEMPORARY LONGITUDINAL GRAVEL CHECK DAM.
- TEMPORARY STORM PIPE AND SANDBAG HEADWALLS.
- TEMPORARY EXCAVATED IN-GROUND SUMP.
- SLOPE AS PER GEOTECHNICAL REQUIREMENTS.
- DIRECTION OF SURFACE RUNOFF FLOW.
- SUB BASE AND BASE GRAVELS TO GEOTECHNICAL CONSULTANT'S REQUIREMENTS.
- TEMPORARY GRAVEL ACCESS PAD.
- APPROXIMATE DISTURBED AREAS.
- DO NOT DISTURB AREAS.
- APPROXIMATE AREA OF HYDRO SEED.
- MONITORING POINT LOCATION.

CONTINUED SHEET #21

CONTRACTOR SHALL COVER ALL EXPOSED ERODIBLE POTENTIAL SURFACES (EXCLUDING SAND AND GRAVEL SURFACES) IMMEDIATELY (WITHIN 48 HRS) WITH SPRAYED STRAW MULCH AND/OR WITH SPRAYED HYDROSEED.

HYDRO-SEED SHALL BE INSTALLED WITH THE FOLLOWING MINIMUM SPECIFICATIONS OR APPROVED EQUIVALENT:

SLOPE GRADIENT/CONDITION	RATE
≤ 4H:1V	2000lb/ac (2300kg/ha)
> 4H:1V AND < 3H:1V	2500lb/ac (2800kg/ha)
> 3H:1V AND < 2H:1V	3000lb/ac (3400kg/ha)

—SEED : COASTAL RE-VEGETATION MIX—SUPPLIED BY WESTERN SEED AND EROSION. APPLICATION RATE: 100lbs/ACRE.

—FERTILIZER : 18-18-18 50% PSCU. APPLICATION RATE : 250lbs/ACRE.

SEDIMENT CONTROL

1. THE CONTRACTOR SHALL ENSURE THAT:

- i) ALL WORK IS UNDERTAKEN AND COMPLETED IN SUCH A MANNER AS TO PREVENT THE RELEASE OF SEDIMENT LADEN WATER INTO ANY WATER COURSE OR STORM SEWER SYSTEM.
- ii) NO SILT LADEN WATER FROM EXCAVATIONS SHALL BE PUMPED OUT OR OTHERWISE DIRECTLY DISCHARGED TO A STORM SEWER SYSTEM.
- iii) IT IS THE CONTRACTOR AND THE SITE CONTRACTOR'S RESPONSIBILITY TO PROVIDE ADEQUATE ONGOING SEDIMENT CONTROL AND TO ENSURE THAT WATER BEING DISCHARGED FROM THE SITE DOES NOT CONTAIN TOTAL SUSPENDED SOLIDS GREATER THAN 75mg/L DURING HIGH WATER EVENTS AND 25mg/L UNDER NORMAL EVENTS ABOVE BACKGROUND LEVELS AND/OR OTHER LEVELS SPECIFIED BY THE KATZIE RESERVE & CITY OF PITT MEADOWS.

THE DEVELOPER AND/OR CONTRACTOR SHALL NOTIFY BOTH THE ENGINEER OF RECORD AND THE ESC SUPERVISOR PRIOR TO COMMENCEMENT OF THE CLEARING AND GRUBBING STAGE. THE DEVELOPER SHALL PROVIDE THE CLEARING AND GRUBBING CONTRACTOR WITH A COPY OF THE ESC PERMIT, APPROVED ESC DRAWINGS AND THE TREE CUTTING PERMIT PRIOR TO COMMENCEMENT OF THE CLEARING AND GRUBBING STAGE. THE SITE CLEARING AND GRUBBING CONTRACTOR TO CONFIRM THE ESC PERMIT HAS BEEN ISSUED. NO CLEARING AND GRUBBING IS TO PROCEED ON-SITE UNTIL ALL SEDIMENT CONTROL WORKS SHOWN ON THIS CLEARING AND GRUBBING STAGE HAVE BEEN INSTALLED AND HAVE BEEN APPROVED BY THE ENGINEER OF RECORD, ESC SUPERVISOR & MUNICIPALITY.

CONTRACTOR SHALL COMPLY WITH ALL THE GEOTECHNICAL RECOMMENDATIONS IN THE GEOTECHNICAL REPORT PREPARED BY: GEOPACIFIC CONSULTANTS LTD.

CONTACT: AUSTIN LOCKSTIDT PROJECT #: PHONE: 604-439-0922 EMAIL: LOCKSTIDT@GEOPACIFIC.CA

- #### EROSION & SEDIMENT CONTROL NOTES:
1. ALL SEDIMENT & EROSION CONTROL WORKS SHALL BE UNDERTAKEN IN FULL COMPLIANCE WITH THE "EROSION & SEDIMENT CONTROL DETAILS" SHEET, THE "EROSION & SEDIMENT CONTROL NOTES" SHEET AND THE CURRENT CITY OF PITT MEADOWS AND KATZIE RESERVE 1 BY-LAWS.
 2. REFER TO THE "UNDERGROUND SERVICES PLAN" FOR UNDERGROUND SERVICES AND REFER TO THE "LOT GRADING PLAN" FOR FINISHED GROUND SURFACE ELEVATIONS.
 3. THE CONTRACTOR SHALL ENSURE THAT ALL WORK UNDER THIS PROJECT IS UNDERTAKEN AND COMPLETED IN SUCH MANNER AS TO PREVENT THE RELEASE INTO ANY WATER COURSE, STORM SEWER, OR DRAINAGE SYSTEM OF ANY SEDIMENT LADEN WATER WHICH CONTAINS NO MORE THAN 50 NTU'S.
 4. RAIN GAUGE STATION: KATZIE PUMP STATION. REFER TO RAIN GAUGE FOR THE RAINFALL MONITORING VALUES FOR ALL STORM EVENTS. A SIGNIFICANT RAINFALL EVENT IS CONSIDERED TO BE 25mm OR GREATER OF TOTAL RAINFALL DEPTH IN A 24 HOUR PERIOD.
 5. ALL SEDIMENT CONTROL WORKS SHALL REMAIN IN PLACE UNTIL THE DEVELOPMENT HAS REACHED AT LEAST 80% ULTIMATE CONSTRUCTION COMPLETION AND CITY OF PITT MEADOWS & KATZIE RESERVE 1 PROVIDES WRITTEN PERMISSION TO DECOMMISSION AND REMOVE THE TEMPORARY SEDIMENT CONTROL WORKS.
 6. APPROXIMATE DISTURBED AREA = 7.09 Ha.
 7. CONTRACTOR SHALL COMPLY WITH ALL THE GEOTECHNICAL RECOMMENDATION IN THE GEOTECHNICAL REPORT PREPARED BY: GEOPACIFIC CONSULTANTS LTD.
 8. SOILS CONDITIONS ON THIS SITE GENERALLY CONSISTS OF SILTY SAND AND GRAVELS, UNDERLAIN BY SILTY TO SILTY SAND.

LEGAL DESCRIPTION: -----		SCALE FACTOR: -----	
SURVEY BENCHMARK: MON: 88H0617 LOC: --		ELEV.: 6.525m (GEOID/TIC)	
REV.	DATE	DESCRIPTION	BY
2	FEB 10/22	ADDRESS COMMENTS	KK
1	NOV 17/21	ISSUED FOR MUNICIPAL REVIEW	KK

CONSULTANT

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EGBC Permit to Practice Number: 1003404

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tel: 604-572-4328 | fax: 604-501-1625 | mail@hub-inc.com
www.hub-inc.com

EAGLE MEADOWS
BUSINESS PARK

CLIENT

EM BUSINESS PARK LTD.
1910 - 117 WEST HASTINGS STREET
VANCOUVER, B.C., V6E 2K3

TITLE

STAGE 1 (NORTH)
CLEARING AND GRUBBING
PLAN

SCALE: HOR. 1:500
VERT. 1:500

DESIGNED: MC/KK
DRAWN: AKG
REVIEWED: KL/RFG

DATE (YYYY.MM.DD)
FEB 2020

CONSULTANT PROJ. NO.
20001

DWG. NO.
22

REV. 2

Feb 11, 2022

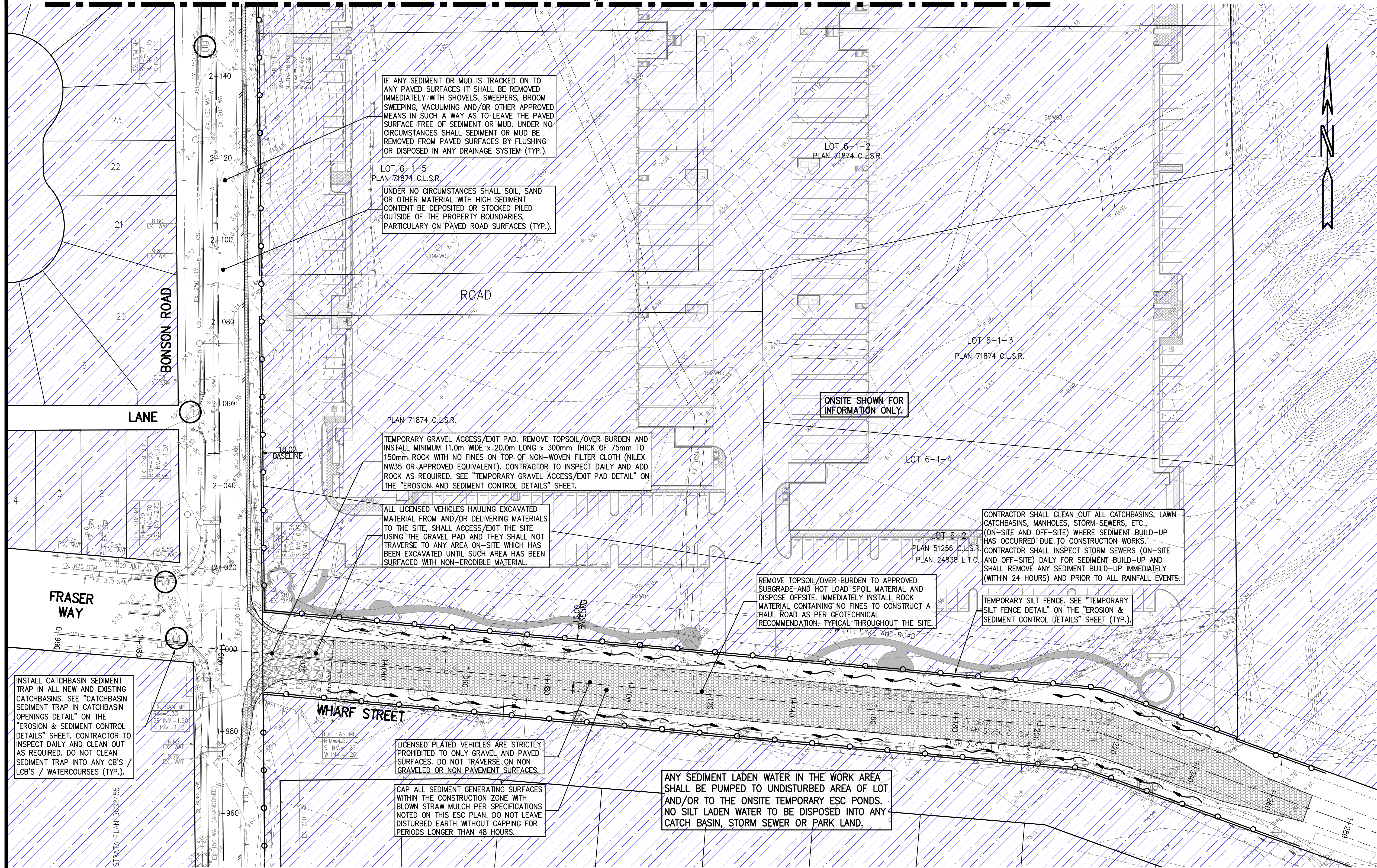
MUNICIPAL PROJECT NUMBER

DRAWING TYPE

EROSION & SEDIMENT CONTROL

DESTROY ALL PRINTS BEARING PREVIOUS NUMBER

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EROSION & SEDIMENT CONTROL LEGEND	
	EXISTING GROUND SURFACE ELEVATION.
	EXISTING GROUND SURFACE CONTOUR ELEVATION.
	MEET EXISTING GROUND SURFACE ELEVATION.
	FINISHED GROUND SURFACE ELEVATION.
	NEW STORM SEWER.
	NEW SANITARY SEWER.
	NEW WATERMAIN.
	NEW MANHOLE.
	NEW CATCHBASIN.
	NEW LAWN DRAIN.
	NEW CLEANOUT.
	TEMPORARY CATCHBASIN SEDIMENT TRAP IN EXISTING CATCHBASIN.
	TEMPORARY CATCHBASIN SEDIMENT TRAP IN NEW CATCHBASIN.
	TEMPORARY CATCHBASIN SEDIMENT TRAP IN NEW LAWNBASIN.
	TEMPORARY OVERFLOW RISER PIPE IN TEMPORARY SEDIMENT CONTROL POND.
	TEMPORARY SILT FENCE.
	TEMPORARY STRAW WADDLE/COMPOST FILTER SOCK.
	TEMPORARY CONSTRUCTION SWALE.
	TEMPORARY LONGITUDINAL GRAVEL CHECK DAM.
	TEMPORARY STORM PIPE AND SANDBAG HEADWALLS.
	TEMPORARY EXCAVATED IN-GROUND SUMP.
	SLOPE AS PER GEOTECHNICAL REQUIREMENTS.
	DIRECTION OF SURFACE RUNOFF FLOW.
	SUB BASE AND BASE GRAVELS TO GEOTECHNICAL CONSULTANT'S REQUIREMENTS.
	TEMPORARY GRAVEL ACCESS PAD.
	APPROXIMATE DISTURBED AREAS.
	DO NOT DISTURB AREAS.
	APPROXIMATE AREA OF HYDRO SEED.
	MONITORING POINT LOCATION.

EROSION & SEDIMENT CONTROL NOTES:

- ALL SEDIMENT & EROSION CONTROL WORKS SHALL BE UNDERTAKEN IN FULL COMPLIANCE WITH THE "EROSION & SEDIMENT CONTROL DETAILS" SHEET, THE "EROSION & SEDIMENT CONTROL NOTES" SHEET AND THE CURRENT CITY OF PITT MEADOWS AND KATZIE RESERVE 1 BY-LAWS.
- REFER TO THE "UNDERGROUND SERVICES PLAN" FOR UNDERGROUND SERVICES AND REFER TO THE "LOT GRADING PLAN" FOR FINISHED GROUND SURFACE ELEVATIONS.
- THE CONTRACTOR SHALL ENSURE THAT ALL WORK UNDER THIS PROJECT IS UNDERTAKEN AND COMPLETED IN SUCH MANNER AS TO PREVENT THE RELEASE INTO ANY WATER COURSE, STORM SEWER, OR DRAINAGE SYSTEM OF ANY SEDIMENT LADEN WATER WHICH CONTAINS NO MORE THAN 50 NTU'S.
- RAIN GAUGE STATION: KATZIE PUMP STATION. REFER TO RAIN GAUGE FOR THE RAINFALL MONITORING VALUES FOR ALL STORM EVENTS. A SIGNIFICANT RAINFALL EVENT IS CONSIDERED TO BE 25mm OR GREATER OF TOTAL RAINFALL DEPTH IN A 24 HOUR PERIOD.
- ALL SEDIMENT CONTROL WORKS SHALL REMAIN IN PLACE UNTIL THE DEVELOPMENT HAS REACHED AT LEAST 80% ULTIMATE CONSTRUCTION COMPLETION AND CITY OF PITT MEADOWS & KATZIE RESERVE 1 PROVIDES WRITTEN PERMISSION TO DECOMMISSION AND REMOVE THE TEMPORARY SEDIMENT CONTROL WORKS.
- APPROXIMATE DISTURBED AREA = 7.09 Ha.
- CONTRACTOR SHALL COMPLY WITH ALL THE GEOTECHNICAL RECOMMENDATION IN THE GEOTECHNICAL REPORT PREPARED BY: GEOPACIFIC CONSULTANTS LTD.
- SOILS CONDITIONS ON THIS SITE GENERALLY CONSISTS OF SILTY SAND AND GRAVELS, UNDERLAIN BY SILTY SAND.

CONTINUED SHEET #22

CONTRACTOR SHALL COVER ALL EXPOSED ERODIBLE POTENTIAL SURFACES (EXCLUDING SAND AND GRAVEL SURFACES) IMMEDIATELY (WITHIN 48 HRS) WITH SPRAYED STRAW MULCH AND/OR WITH SPRAYED HYDROSEED.

HYDRO-SEED SHALL BE INSTALLED WITH THE FOLLOWING MINIMUM SPECIFICATIONS OR APPROVED EQUIVALENT:

- MULCH : EOCIFIBER PLUS MIN. 3% TACK OR EQUIVALENT. APPLICATION RATE:

SLOPE GRADIENT/CONDITION	RATE
≤ 4H:1V	2000lb/ac (2300kg/ha)
> 4H:1V AND < 3H:1V	2500lb/ac (2800kg/ha)
> 3H:1V AND < 2H:1V	3000lb/ac (3400kg/ha)
- SEED : COASTAL RE-VEGETATION MIX-SUPPLIED BY WESTERN SEED AND EROSION. APPLICATION RATE: 100lbs/ACRE.
- FERTILIZER : 18-18-18 50% PSCU. APPLICATION RATE : 250lbs/ACRE.

THE DEVELOPER AND/OR CONTRACTOR SHALL NOTIFY BOTH THE ENGINEER OF RECORD AND THE ESC SUPERVISOR PRIOR TO COMMENCEMENT OF THE CLEARING AND GRUBBING STAGE. THE DEVELOPER SHALL PROVIDE THE CLEARING AND GRUBBING CONTRACTOR WITH A COPY OF THE ESC PERMIT, APPROVED ESC DRAWINGS AND THE TREE CUTTING PERMIT PRIOR TO COMMENCEMENT OF THE CLEARING AND GRUBBING STAGE. THE SITE CLEARING AND GRUBBING CONTRACTOR TO CONFIRM THE ESC PERMIT HAS BEEN ISSUED. NO CLEARING AND GRUBBING IS TO PROCEED ON-SITE UNTIL ALL SEDIMENT CONTROL WORKS SHOWN ON THIS CLEARING AND GRUBBING STAGE HAVE BEEN INSTALLED AND HAVE BEEN APPROVED BY THE ENGINEER OF RECORD, ESC SUPERVISOR & MUNICIPALITY.

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CONTACT: AUSTIN LOCKSTIDT PROJECT #:
 PHONE: 604-439-0922 EMAIL: LOCKSTIDT@GEOPACIFIC.CA

SCALE: 1:500

SEDIMENT CONTROL

1. THE CONTRACTOR SHALL ENSURE THAT:

- ALL WORK IS UNDERTAKEN AND COMPLETED IN SUCH A MANNER AS TO PREVENT THE RELEASE OF SEDIMENT LADEN WATER INTO ANY WATER COURSE OR STORM SEWER SYSTEM.
- NO SILT LADEN WATER FROM EXCAVATIONS SHALL BE PUMPED OUT OR OTHERWISE DIRECTLY DISCHARGED TO A STORM SEWER SYSTEM.
- IT IS THE CONTRACTOR AND THE SITE CONTRACTOR'S RESPONSIBILITY TO PROVIDE ADEQUATE ONGOING SEDIMENT CONTROL AND TO ENSURE THAT WATER BEING DISCHARGED FROM THE SITE DOES NOT CONTAIN TOTAL SUSPENDED SOLIDS GREATER THAN 75mg/L DURING HIGH WATER EVENTS AND 25mg/L UNDER NORMAL EVENTS ABOVE BACKGROUND LEVELS AND/OR OTHER LEVELS SPECIFIED BY THE KATZIE RESERVE & CITY OF PITT MEADOWS.

LEGAL DESCRIPTION: ----			
SURVEY BENCHMARK MON: 88H0617		SCALE FACTOR: ELEV.: 6.525m (GEOID TIC)	
REV.	DATE	DESCRIPTION	BY
2	FEB 10/22	ADDRESS COMMENTS	KK
1	NOV 17/21	ISSUED FOR MUNICIPAL REVIEW	KK

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EGBC Permit to Practice Number: 1003404	
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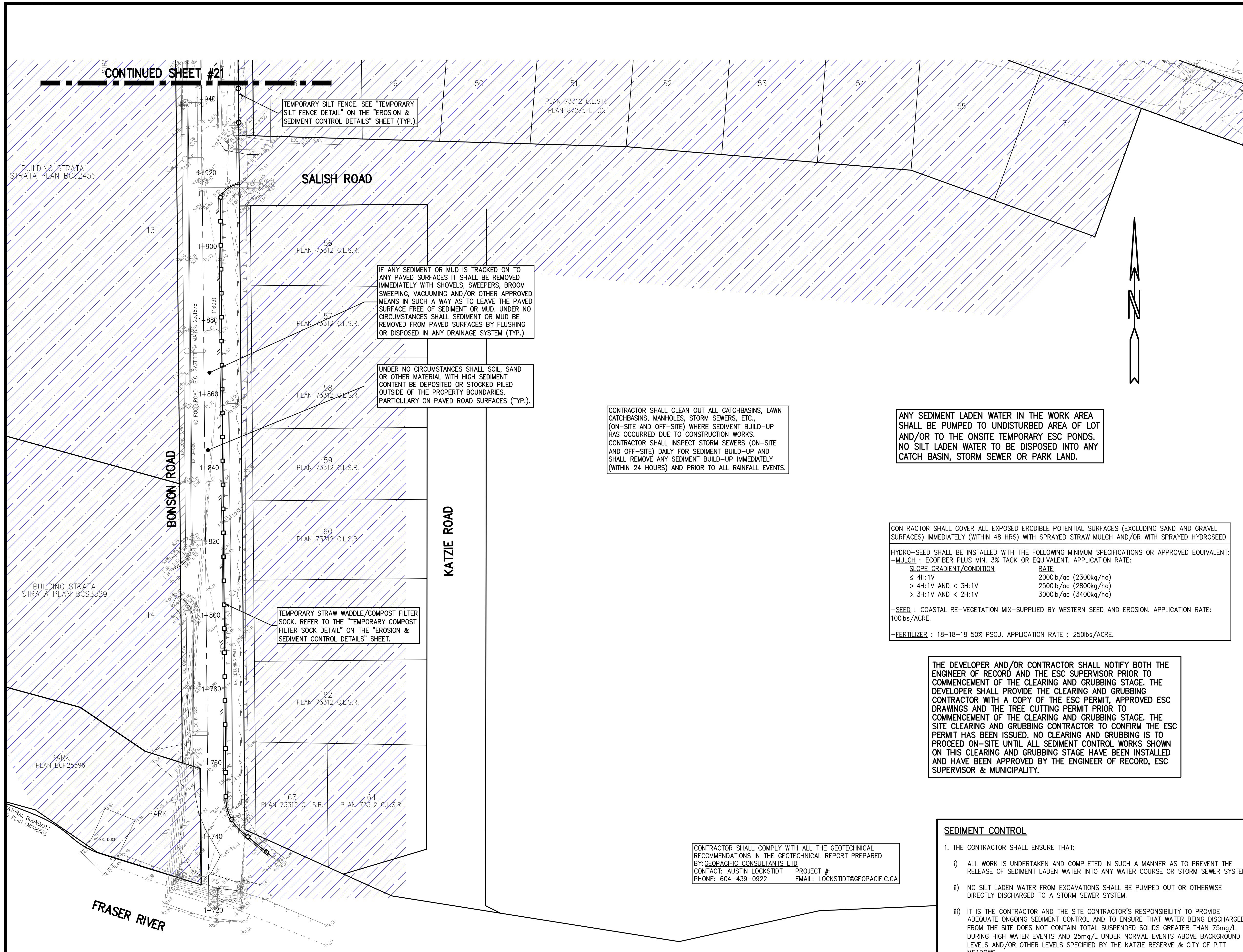
CLIENT	
EM BUSINESS PARK LTD.	
1910 - 117 WEST HASTINGS STREET	
VANCOUVER, B.C., V6E 2K3	
TITLE	
STAGE 1 (SOUTH)	
CLEARING AND GRUBBING PLAN	

SEAL	
SCALE: HOR. 1:500 VERT.	
DESIGNED MC/KK	DATE (YYYY.MM.DD) FEB 2020
DRAWN AKG	CONSULTANT PROJ. NO. 20001
REVIEWED KL/RFK	DWG. NO. 23
	REV. 2

MUNICIPAL PROJECT NUMBER	
-	
DRAWING TYPE	
EROSION & SEDIMENT CONTROL	

Feb 11, 2022

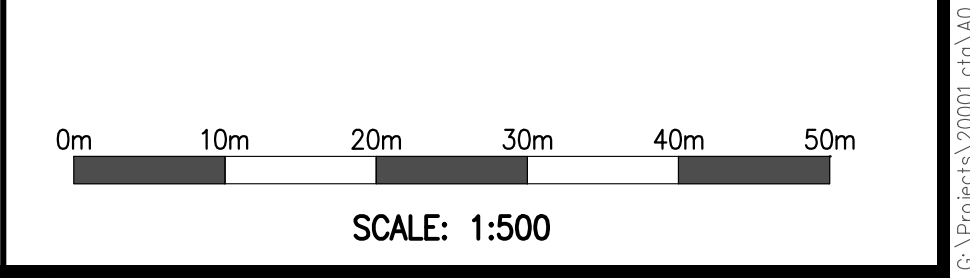
DESTROY ALL PRINTS BEARING PREVIOUS NUMBER



EROSION & SEDIMENT CONTROL LEGEND

- EXISTING GROUND SURFACE ELEVATION.
- EXISTING GROUND SURFACE CONTOUR ELEVATION.
- MEET EXISTING GROUND SURFACE ELEVATION.
- FINISHED GROUND SURFACE ELEVATION.
- NEW STORM SEWER.
- NEW SANITARY SEWER.
- NEW WATERMAIN.
- NEW MANHOLE.
- NEW CATCHBASIN.
- NEW LAWN DRAIN.
- NEW CLEANOUT.
- TEMPORARY CATCHBASIN SEDIMENT TRAP IN EXISTING CATCHBASIN.
- TEMPORARY CATCHBASIN SEDIMENT TRAP IN NEW CATCHBASIN.
- TEMPORARY CATCHBASIN SEDIMENT TRAP IN NEW LAWNBASIN.
- TEMPORARY OVERFLOW RISER PIPE IN TEMPORARY SEDIMENT CONTROL POND.
- TEMPORARY SILT FENCE.
- TEMPORARY STRAW WADDLE/COMPOST FILTER SOCK.
- TEMPORARY CONSTRUCTION SWALE.
- TEMPORARY LONGITUDINAL GRAVEL CHECK DAM.
- TEMPORARY STORM PIPE AND SANDBAG HEAD WALLS.
- TEMPORARY EXCAVATED IN-GROUND SUMP.
- SLOPE AS PER GEOTECHNICAL REQUIREMENTS.
- DIRECTION OF SURFACE RUNOFF FLOW.
- SUB BASE AND BASE GRAVELS TO GEOTECHNICAL CONSULTANT'S REQUIREMENTS.
- TEMPORARY GRAVEL ACCESS PAD.
- APPROXIMATE DISTURBED AREAS.
- DO NOT DISTURB AREAS.
- APPROXIMATE AREA OF HYDRO SEED.
- MONITORING POINT LOCATION.

- EROSION & SEDIMENT CONTROL NOTES:**
1. ALL SEDIMENT & EROSION CONTROL WORKS SHALL BE UNDERTAKEN IN FULL COMPLIANCE WITH THE "EROSION & SEDIMENT CONTROL DETAILS" SHEET, THE "EROSION & SEDIMENT CONTROL NOTES" SHEET AND THE CURRENT CITY OF PITT MEADOWS AND KATZIE RESERVE 1 BY-LAWS.
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 3. THE CONTRACTOR SHALL ENSURE THAT ALL WORK UNDER THIS PROJECT IS UNDERTAKEN AND COMPLETED IN SUCH MANNER AS TO PREVENT THE RELEASE INTO ANY WATER COURSE, STORM SEWER, OR DRAINAGE SYSTEM OF ANY SEDIMENT LADEN WATER WHICH CONTAINS NO MORE THAN 50 NTU'S.
 4. RAIN GAUGE STATION: KATZIE PUMP STATION. REFER TO RAIN GAUGE FOR THE RAINFALL MONITORING VALUES FOR ALL STORM EVENTS. A SIGNIFICANT RAINFALL EVENT IS CONSIDERED TO BE 25mm OR GREATER OF TOTAL RAINFALL DEPTH IN A 24 HOUR PERIOD.
 5. ALL SEDIMENT CONTROL WORKS SHALL REMAIN IN PLACE UNTIL THE DEVELOPMENT HAS REACHED AT LEAST 80% ULTIMATE CONSTRUCTION COMPLETION AND CITY OF PITT MEADOWS & KATZIE RESERVE 1 PROVIDES WRITTEN PERMISSION TO DECOMMISSION AND REMOVE THE TEMPORARY SEDIMENT CONTROL WORKS.
 6. APPROXIMATE DISTURBED AREA = 7.09 Ha.
 7. CONTRACTOR SHALL COMPLY WITH ALL THE GEOTECHNICAL RECOMMENDATION IN THE GEOTECHNICAL REPORT PREPARED BY: GEOPACIFIC CONSULTANTS LTD.
 8. SOILS CONDITIONS ON THIS SITE GENERALLY CONSISTS OF SILTY SAND AND GRAVELS, UNDERLAIN BY SILTY SAND.



LEGAL DESCRIPTION: -----

SURVEY BENCHMARK: MON: 88H0617 SCALE FACTOR: ELEV.: 6.525m (GEODETIIC) LOC: --

REV.	DATE	DESCRIPTION	BY
2	FEB 10/22	ADDRESS COMMENTS	KK
1	NOV 17/21	ISSUED FOR MUNICIPAL REVIEW	KK

DATE	DESCRIPTION	BY

CONSULTANT
Hub Engineering Inc.
 Engineering and Development Consultants
 EGBC Permit to Practice Number: 1003404
 Suite 212, 12992 - 76 Avenue, Surrey, B.C. V3W 2V6
 tel: 604-572-4328 | fax: 604-501-1625 | email@hub-inc.com
 www.hub-inc.com



CLIENT
EM BUSINESS PARK LTD.
 1910 - 117 WEST HASTINGS STREET
 VANCOUVER, B.C., V6E 2K3

TITLE
STAGE 1 (BONSON)
 CLEARING AND GRUBBING
 PLAN

SCALE: HOR: 1:500
 VERT. **DATE (YYYY.MM.DD)** FEB 2020

DESIGNED: MC/KK **CONSULTANT PROJ. NO.** 20001

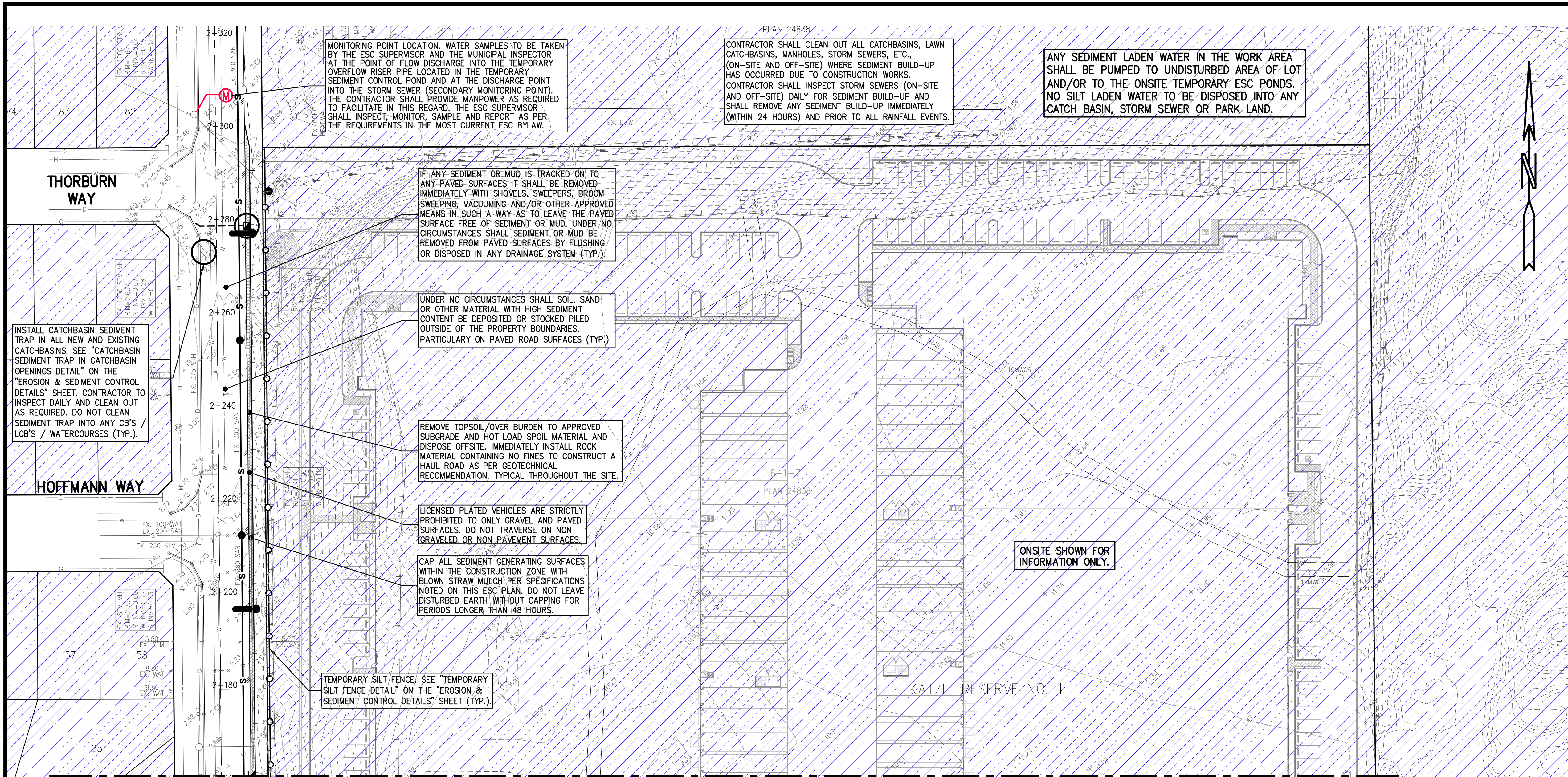
DRAWN: AKG **DWG. NO.** 24

REVIEWED: KL/RFG **REV.** 2

SEAL **Feb 11, 2022**

MUNICIPAL PROJECT NUMBER -

DRAWING TYPE
EROSION & SEDIMENT CONTROL



EROSION & SEDIMENT CONTROL LEGEND

- EXISTING GROUND SURFACE ELEVATION.
- EXISTING GROUND SURFACE CONTOUR ELEVATION.
- MEET EXISTING GROUND SURFACE ELEVATION.
- FINISHED GROUND SURFACE ELEVATION.
- NEW STORM SEWER.
- NEW SANITARY SEWER.
- NEW WATERMAIN.
- NEW MANHOLE.
- NEW CATCHBASIN.
- NEW LAWN DRAIN.
- NEW CLEANOUT.
- TEMPORARY CATCHBASIN SEDIMENT TRAP IN EXISTING CATCHBASIN.
- TEMPORARY CATCHBASIN SEDIMENT TRAP IN NEW CATCHBASIN.
- TEMPORARY CATCHBASIN SEDIMENT TRAP IN NEW LAWNBASIN.
- TEMPORARY OVERFLOW RISER PIPE IN TEMPORARY SEDIMENT CONTROL POND.
- TEMPORARY SILT FENCE.
- TEMPORARY STRAW WADDLE/COMPOST FILTER SOCK.
- TEMPORARY CONSTRUCTION SWALE.
- TEMPORARY LONGITUDINAL GRAVEL CHECK DAM.
- TEMPORARY STORM PIPE AND SANDBAG HEAD WALLS.
- TEMPORARY EXCAVATED IN-GROUND SUMP.
- SLOPE AS PER GEOTECHNICAL REQUIREMENTS.
- DIRECTION OF SURFACE RUNOFF FLOW.
- SUB BASE AND BASE GRAVELS TO GEOTECHNICAL CONSULTANT'S REQUIREMENTS.
- TEMPORARY GRAVEL ACCESS PAD.
- APPROXIMATE DISTURBED AREAS.
- DO NOT DISTURB AREAS.
- APPROXIMATE AREA OF HYDRO SEED.
- MONITORING POINT LOCATION.

MONITORING POINT LOCATION. WATER SAMPLES TO BE TAKEN BY THE ESC SUPERVISOR AND THE MUNICIPAL INSPECTOR AT THE POINT OF FLOW DISCHARGE INTO THE TEMPORARY OVERFLOW RISER PIPE LOCATED IN THE TEMPORARY SEDIMENT CONTROL POND AND AT THE DISCHARGE POINT INTO THE STORM SEWER (SECONDARY MONITORING POINT). THE CONTRACTOR SHALL PROVIDE MANPOWER AS REQUIRED TO FACILITATE IN THIS REGARD. THE ESC SUPERVISOR SHALL INSPECT, MONITOR, SAMPLE AND REPORT AS PER THE REQUIREMENTS IN THE MOST CURRENT ESC BYLAW.

CONTRACTOR SHALL CLEAN OUT ALL CATCHBASINS, LAWN CATCHBASINS, MANHOLES, STORM SEWERS, ETC., (ON-SITE AND OFF-SITE) WHERE SEDIMENT BUILD-UP HAS OCCURRED DUE TO CONSTRUCTION WORKS. CONTRACTOR SHALL INSPECT STORM SEWERS (ON-SITE AND OFF-SITE) DAILY FOR SEDIMENT BUILD-UP AND SHALL REMOVE ANY SEDIMENT BUILD-UP IMMEDIATELY (WITHIN 24 HOURS) AND PRIOR TO ALL RAINFALL EVENTS.

ANY SEDIMENT LADEN WATER IN THE WORK AREA SHALL BE PUMPED TO UNDISTURBED AREA OF LOT AND/OR TO THE ONSITE TEMPORARY ESC PONDS. NO SILT LADEN WATER TO BE DISPOSED INTO ANY CATCH BASIN, STORM SEWER OR PARK LAND.

IF ANY SEDIMENT OR MUD IS TRACKED ON TO ANY PAVED SURFACES IT SHALL BE REMOVED IMMEDIATELY WITH SHOVELS, SWEEPERS, BROOM SWEEPING, VACUUMING AND/OR OTHER APPROVED MEANS IN SUCH A WAY AS TO LEAVE THE PAVED SURFACE FREE OF SEDIMENT OR MUD. UNDER NO CIRCUMSTANCES SHALL SEDIMENT OR MUD BE REMOVED FROM PAVED SURFACES BY FLUSHING OR DISPOSED IN ANY DRAINAGE SYSTEM (TYP.).

UNDER NO CIRCUMSTANCES SHALL SOIL, SAND OR OTHER MATERIAL WITH HIGH SEDIMENT CONTENT BE DEPOSITED OR STOCKED PILED OUTSIDE OF THE PROPERTY BOUNDARIES, PARTICULARLY ON PAVED ROAD SURFACES (TYP.).

REMOVE TOPSOIL/OVER BURDEN TO APPROVED SUBGRADE AND HOT LOAD SPOIL MATERIAL AND DISPOSE OFFSITE. IMMEDIATELY INSTALL ROCK MATERIAL CONTAINING NO FINES TO CONSTRUCT A HAUL ROAD AS PER GEOTECHNICAL RECOMMENDATION. TYPICAL THROUGHOUT THE SITE.

LICENSED PLATED VEHICLES ARE STRICTLY PROHIBITED TO ONLY GRAVEL AND PAVED SURFACES. DO NOT TRAVERSE ON NON GRAVELED OR NON PAVEMENT SURFACES.

CAP ALL SEDIMENT GENERATING SURFACES WITHIN THE CONSTRUCTION ZONE WITH BLOWN STRAW MULCH PER SPECIFICATIONS NOTED ON THIS ESC PLAN. DO NOT LEAVE DISTURBED EARTH WITHOUT CAPPING FOR PERIODS LONGER THAN 48 HOURS.

TEMPORARY SILT FENCE. SEE "TEMPORARY SILT FENCE DETAIL" ON THE "EROSION & SEDIMENT CONTROL DETAILS" SHEET (TYP.).

INSTALL CATCHBASIN SEDIMENT TRAP IN ALL NEW AND EXISTING CATCHBASINS. SEE "CATCHBASIN SEDIMENT TRAP IN CATCHBASIN OPENINGS DETAIL" ON THE "EROSION & SEDIMENT CONTROL DETAILS" SHEET. CONTRACTOR TO INSPECT DAILY AND CLEAN OUT AS REQUIRED. DO NOT CLEAN SEDIMENT TRAP INTO ANY CB'S / LCB'S / WATERCOURSES (TYP.).

ONSITE SHOWN FOR INFORMATION ONLY.

CONTINUED SHEET #24

CONTRACTOR SHALL COVER ALL EXPOSED ERODIBLE POTENTIAL SURFACES (EXCLUDING SAND AND GRAVEL SURFACES) IMMEDIATELY (WITHIN 48 HRS) WITH SPRAYED STRAW MULCH AND/OR WITH SPRAYED HYDROSEED.

HYDRO-SEED SHALL BE INSTALLED WITH THE FOLLOWING MINIMUM SPECIFICATIONS OR APPROVED EQUIVALENT:

-MULCH : ECOFIBER PLUS MIN. 3% TACK OR EQUIVALENT. APPLICATION RATE:

SLOPE GRADIENT/CONDITION	RATE
≤ 4H:1V	2000lb/ac (2300kg/ha)
> 4H:1V AND < 3H:1V	2500lb/ac (2800kg/ha)
> 3H:1V AND < 2H:1V	3000lb/ac (3400kg/ha)

-SEED : COASTAL RE-VEGETATION MIX-SUPPLIED BY WESTERN SEED AND EROSION. APPLICATION RATE: 100lbs/ACRE.

-FERTILIZER : 18-18-18 50% PSCU. APPLICATION RATE : 250lbs/ACRE.

CONTRACTOR SHALL COMPLY WITH ALL THE GEOTECHNICAL RECOMMENDATIONS IN THE GEOTECHNICAL REPORT PREPARED BY: GEOPACIFIC CONSULTANTS LTD.

CONTACT: AUSTIN LOCKSTIDT PROJECT #:
PHONE: 604-439-0922 EMAIL: LOCKSTIDT@GEOPACIFIC.CA

0m 10m 20m 30m 40m 50m
SCALE: 1:500

SEDIMENT CONTROL

1. THE CONTRACTOR SHALL ENSURE THAT:

- i) ALL WORK IS UNDERTAKEN AND COMPLETED IN SUCH A MANNER AS TO PREVENT THE RELEASE OF SEDIMENT LADEN WATER INTO ANY WATER COURSE OR STORM SEWER SYSTEM.
- ii) NO SILT LADEN WATER FROM EXCAVATIONS SHALL BE PUMPED OUT OR OTHERWISE DIRECTLY DISCHARGED TO A STORM SEWER SYSTEM.
- iii) IT IS THE CONTRACTOR AND THE SITE CONTRACTOR'S RESPONSIBILITY TO PROVIDE ADEQUATE ONGOING SEDIMENT CONTROL AND TO ENSURE THAT WATER BEING DISCHARGED FROM THE SITE DOES NOT CONTAIN TOTAL SUSPENDED SOLIDS GREATER THAN 75mg/L DURING HIGH WATER EVENTS AND 25mg/L UNDER NORMAL EVENTS ABOVE BACKGROUND LEVELS AND/OR OTHER LEVELS SPECIFIED BY THE KATZIE RESERVE & CITY OF PITT MEADOWS.

- ### EROSION & SEDIMENT CONTROL NOTES:
1. ALL SEDIMENT & EROSION CONTROL WORKS SHALL BE UNDERTAKEN IN FULL COMPLIANCE WITH THE "EROSION & SEDIMENT CONTROL DETAILS" SHEET, THE "EROSION & SEDIMENT CONTROL NOTES" SHEET AND THE CURRENT CITY OF PITT MEADOWS AND KATZIE RESERVE 1 BY-LAWS.
 2. REFER TO THE "UNDERGROUND SERVICES PLAN" FOR UNDERGROUND SERVICES AND REFER TO THE "LOT GRADING PLAN" FOR FINISHED GROUND SURFACE ELEVATIONS.
 3. THE CONTRACTOR SHALL ENSURE THAT ALL WORK UNDER THIS PROJECT IS UNDERTAKEN AND COMPLETED IN SUCH MANNER AS TO PREVENT THE RELEASE INTO ANY WATER COURSE, STORM SEWER, OR DRAINAGE SYSTEM OF ANY SEDIMENT LADEN WATER WHICH CONTAINS NO MORE THAN 50 NTU'S.
 4. RAIN GAUGE STATION: KATZIE PUMP STATION. REFER TO RAIN GAUGE FOR THE RAINFALL MONITORING VALUES FOR ALL STORM EVENTS. A SIGNIFICANT RAINFALL EVENT IS CONSIDERED TO BE 25mm OR GREATER OF TOTAL RAINFALL DEPTH IN A 24 HOUR PERIOD.
 5. ALL SEDIMENT CONTROL WORKS SHALL REMAIN IN PLACE UNTIL THE DEVELOPMENT HAS REACHED AT LEAST 80% ULTIMATE CONSTRUCTION COMPLETION AND CITY OF PITT MEADOWS & KATZIE RESERVE 1 PROVIDES WRITTEN PERMISSION TO DECOMMISSION AND REMOVE THE TEMPORARY SEDIMENT CONTROL WORKS.
 6. APPROXIMATE DISTURBED AREA = 7.09 Ha.
 7. CONTRACTOR SHALL COMPLY WITH ALL THE GEOTECHNICAL RECOMMENDATION IN THE GEOTECHNICAL REPORT PREPARED BY: GEOPACIFIC CONSULTANTS LTD.
 8. SOILS CONDITIONS ON THIS SITE GENERALLY CONSISTS OF SILTY SAND AND GRAVELS, UNDERLAIN BY SILT TO SILTY SAND.

LEGAL DESCRIPTION: -----

REV.	DATE	DESCRIPTION	BY
2	FEB 10/22	ADDRESS COMMENTS	KK
1	NOV 17/21	ISSUED FOR MUNICIPAL REVIEW	KK

SCALE FACTOR:
ELEV.: 6.525m (GEODETIC)

CONSULTANT

Hub Engineering Inc.
Engineering and Development Consultants

EGBC Permit to Practice Number: 1003404

Suite 212, 12992 - 76 Avenue, Surrey, B.C. V3W 2V6
tel: 604-572-4328 | fax: 604-501-1625 | mail@hub-inc.com
www.hub-inc.com

EAGLE MEADOWS
BUSINESS PARK

CLIENT

EM BUSINESS PARK LTD.
1910 - 117 WEST HASTINGS STREET
VANCOUVER, B.C., V6E 2K3

TITLE

STAGE 2 (NORTH)
CIVIL CONSTRUCTION
PLAN

SCALE: HOR. 1:500
VERT.

DATE (YYYY.MM.DD)
FEB 2020

CONSULTANT PROJ. NO.
20001

DESIGNED MC/KK

DRAWN AKG

REVIEWED KL/RFG

DWG. NO.
25

REV. 2

Feb 11, 2022

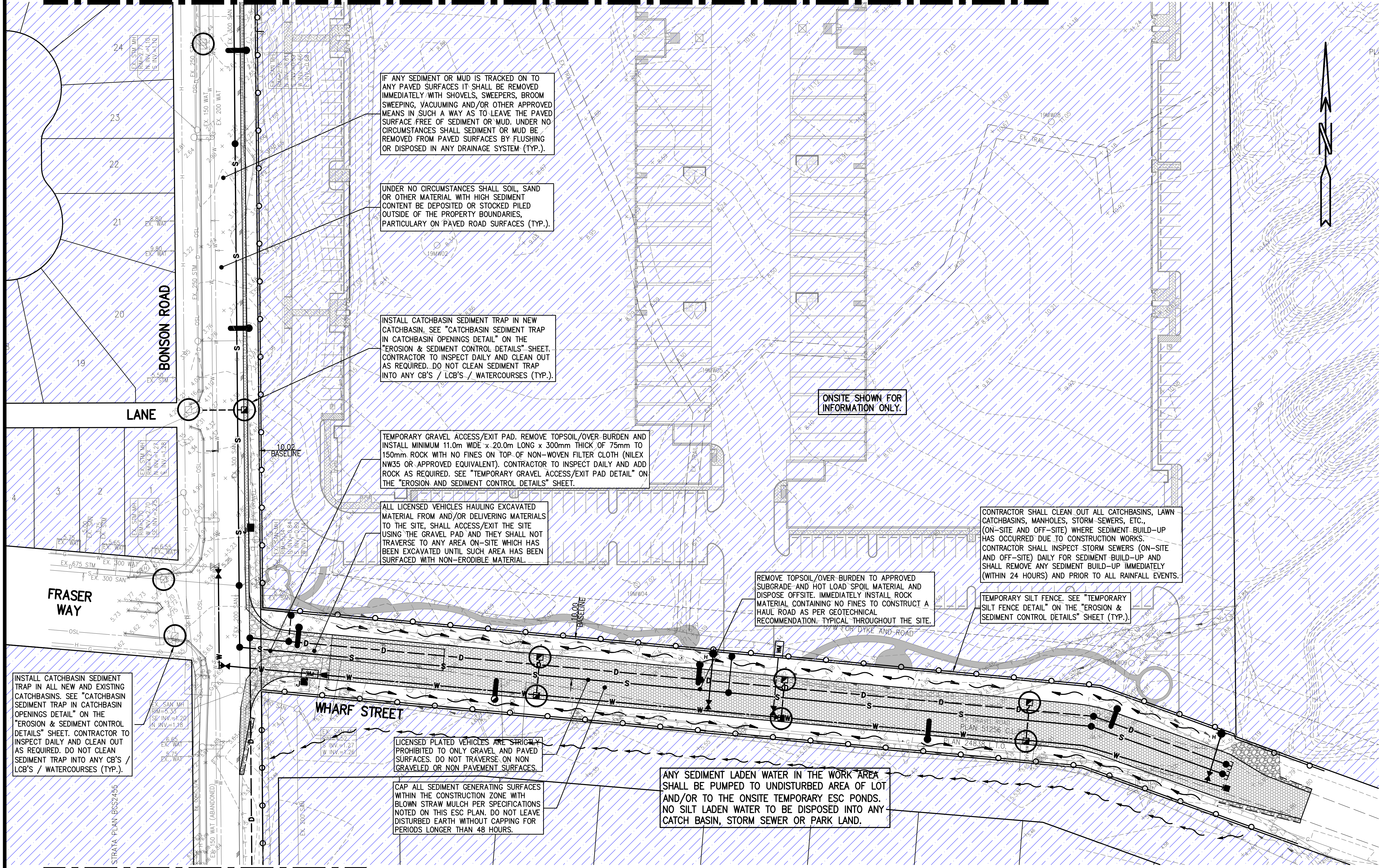
MUNICIPAL PROJECT NUMBER

DRAWING TYPE

EROSION & SEDIMENT CONTROL

DESTROY ALL PRINTS BEARING PREVIOUS NUMBER

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EROSION & SEDIMENT CONTROL LEGEND

- EXISTING GROUND SURFACE ELEVATION.
- EXISTING GROUND SURFACE CONTOUR ELEVATION.
- MEET EXISTING GROUND SURFACE ELEVATION.
- FINISHED GROUND SURFACE ELEVATION.
- NEW STORM SEWER.
- NEW SANITARY SEWER.
- NEW WATERMAIN.
- NEW MANHOLE.
- NEW CATCHBASIN.
- NEW LAWN DRAIN.
- NEW CLEANOUT.
- TEMPORARY CATCHBASIN SEDIMENT TRAP IN EXISTING CATCHBASIN.
- TEMPORARY CATCHBASIN SEDIMENT TRAP IN NEW CATCHBASIN.
- TEMPORARY CATCHBASIN SEDIMENT TRAP IN NEW LAWNBASIN.
- TEMPORARY OVERFLOW RISER PIPE IN TEMPORARY SEDIMENT CONTROL POND.
- TEMPORARY SILT FENCE.
- TEMPORARY STRAW WATTLE/COMPOST FILTER SOCK.
- TEMPORARY CONSTRUCTION SWALE.
- TEMPORARY LONGITUDINAL GRAVEL CHECK DAM.
- TEMPORARY STORM PIPE AND SANDBAG HEADWALLS.
- TEMPORARY EXCAVATED IN-GROUND SUMP.
- SLOPE AS PER GEOTECHNICAL REQUIREMENTS.
- DIRECTION OF SURFACE RUNOFF FLOW.
- SUB BASE AND BASE GRAVELS TO GEOTECHNICAL CONSULTANT'S REQUIREMENTS.
- TEMPORARY GRAVEL ACCESS PAD.
- APPROXIMATE DISTURBED AREAS.
- DO NOT DISTURB AREAS.
- APPROXIMATE AREA OF HYDRO SEED.
- MONITORING POINT LOCATION.

EROSION & SEDIMENT CONTROL NOTES:

1. ALL SEDIMENT & EROSION CONTROL WORKS SHALL BE UNDERTAKEN IN FULL COMPLIANCE WITH THE "EROSION & SEDIMENT CONTROL DETAILS" SHEET, THE "EROSION & SEDIMENT CONTROL NOTES" SHEET AND THE CURRENT CITY OF PITT MEADOWS AND KATZIE RESERVE 1 BY-LAWS.
2. REFER TO THE "UNDERGROUND SERVICES PLAN" FOR UNDERGROUND SERVICES AND REFER TO THE "LOT GRADING PLAN" FOR FINISHED GROUND SURFACE ELEVATIONS.
3. THE CONTRACTOR SHALL ENSURE THAT ALL WORK UNDER THIS PROJECT IS UNDERTAKEN AND COMPLETED IN SUCH MANNER AS TO PREVENT THE RELEASE INTO ANY WATER COURSE, STORM SEWER, OR DRAINAGE SYSTEM OF ANY SEDIMENT LADEN WATER WHICH CONTAINS NO MORE THAN 50 NTU'S.
4. RAIN GAUGE STATION: KATZIE PUMP STATION. REFER TO RAIN GAUGE FOR THE RAINFALL MONITORING VALUES FOR ALL STORM EVENTS. A SIGNIFICANT RAINFALL EVENT IS CONSIDERED TO BE 25mm OR GREATER OF TOTAL RAINFALL DEPTH IN A 24 HOUR PERIOD.
5. ALL SEDIMENT CONTROL WORKS SHALL REMAIN IN PLACE UNTIL THE DEVELOPMENT HAS REACHED AT LEAST 80% ULTIMATE CONSTRUCTION COMPLETION AND CITY OF PITT MEADOWS & KATZIE RESERVE 1 PROVIDES WRITTEN PERMISSION TO DECOMMISSION AND REMOVE THE TEMPORARY SEDIMENT CONTROL WORKS.
6. APPROXIMATE DISTURBED AREA = 7.09 Ha.
7. CONTRACTOR SHALL COMPLY WITH ALL THE GEOTECHNICAL RECOMMENDATION IN THE GEOTECHNICAL REPORT PREPARED BY: GEOPACIFIC CONSULTANTS LTD.
8. SOILS CONDITIONS ON THIS SITE GENERALLY CONSISTS OF SILTY SAND AND GRAVELS, UNDERLAIN BY SILT TO SILTY SAND.

CONTRACTOR SHALL COVER ALL EXPOSED ERODIBLE POTENTIAL SURFACES (EXCLUDING SAND AND GRAVEL SURFACES) IMMEDIATELY (WITHIN 48 HRS) WITH SPRAYED STRAW MULCH AND/OR WITH SPRAYED HYDROSEED.

HYDRO-SEED SHALL BE INSTALLED WITH THE FOLLOWING MINIMUM SPECIFICATIONS OR APPROVED EQUIVALENT:
 -MULCH : ECOFIBER PLUS MIN. 3% TACK OR EQUIVALENT. APPLICATION RATE:
 SLOPE GRADIENT/CONDITION RATE
 < 4H:1V 2000lb/ac (2300kg/ha)
 > 4H:1V AND < 3H:1V 2500lb/ac (2800kg/ha)
 > 3H:1V AND < 2H:1V 3000lb/ac (3400kg/ha)

-SEED : COASTAL RE-VEGETATION MIX-SUPPLIED BY WESTERN SEED AND EROSION. APPLICATION RATE: 100lbs/ACRE.
 -FERTILIZER : 18-18-18 50% PSCU. APPLICATION RATE : 250lbs/ACRE.

IF ANY SEDIMENT OR MUD IS TRACKED ON TO ANY PAVED SURFACES IT SHALL BE REMOVED IMMEDIATELY WITH SHOVELS, SWEEPERS, BROOM SWEEPING, VACUUMING AND/OR OTHER APPROVED MEANS IN SUCH A WAY AS TO LEAVE THE PAVED SURFACE FREE OF SEDIMENT OR MUD. UNDER NO CIRCUMSTANCES SHALL SEDIMENT OR MUD BE REMOVED FROM PAVED SURFACES BY FLUSHING OR DISPOSED IN ANY DRAINAGE SYSTEM (TYP.).

UNDER NO CIRCUMSTANCES SHALL SOIL, SAND OR OTHER MATERIAL WITH HIGH SEDIMENT CONTENT BE DEPOSITED OR STOCKED PILED OUTSIDE OF THE PROPERTY BOUNDARIES, PARTICULARLY ON PAVED ROAD SURFACES (TYP.).

INSTALL CATCHBASIN SEDIMENT TRAP IN NEW CATCHBASIN. SEE "CATCHBASIN SEDIMENT TRAP IN CATCHBASIN OPENINGS DETAIL" ON THE "EROSION & SEDIMENT CONTROL DETAILS" SHEET. CONTRACTOR TO INSPECT DAILY AND CLEAN OUT AS REQUIRED. DO NOT CLEAN SEDIMENT TRAP INTO ANY CB'S / LCB'S / WATERCOURSES (TYP.).

TEMPORARY GRAVEL ACCESS/EXIT PAD. REMOVE TOPSOIL/OVER BURDEN AND INSTALL MINIMUM 11.0m WIDE x 20.0m LONG x 300mm THICK OF 75mm TO 150mm ROCK WITH NO FINES ON TOP OF NON-WOVEN FILTER CLOTH (NILEX NW35 OR APPROVED EQUIVALENT). CONTRACTOR TO INSPECT DAILY AND ADD ROCK AS REQUIRED. SEE "TEMPORARY GRAVEL ACCESS/EXIT PAD DETAIL" ON THE "EROSION AND SEDIMENT CONTROL DETAILS" SHEET.

ALL LICENSED VEHICLES HAULING EXCAVATED MATERIAL FROM AND/OR DELIVERING MATERIALS TO THE SITE, SHALL ACCESS/EXIT THE SITE USING THE GRAVEL PAD AND THEY SHALL NOT TRAVERSE TO ANY AREA ON-SITE WHICH HAS BEEN EXCAVATED UNTIL SUCH AREA HAS BEEN SURFACED WITH NON-ERODIBLE MATERIAL.

REMOVE TOPSOIL/OVER BURDEN TO APPROVED SUBGRADE AND HOT LOAD SPOIL MATERIAL AND DISPOSE OFFSITE. IMMEDIATELY INSTALL ROCK MATERIAL CONTAINING NO FINES TO CONSTRUCT A HAUL ROAD AS PER GEOTECHNICAL RECOMMENDATION. TYPICAL THROUGHOUT THE SITE.

CONTRACTOR SHALL CLEAN OUT ALL CATCHBASINS, LAWN CATCHBASINS, MANHOLES, STORM SEWERS, ETC., (ON-SITE AND OFF-SITE) WHERE SEDIMENT BUILD-UP HAS OCCURRED DUE TO CONSTRUCTION WORKS. CONTRACTOR SHALL INSPECT STORM SEWERS (ON-SITE AND OFF-SITE) DAILY FOR SEDIMENT BUILD-UP AND SHALL REMOVE ANY SEDIMENT BUILD-UP IMMEDIATELY (WITHIN 24 HOURS) AND PRIOR TO ALL RAINFALL EVENTS.

TEMPORARY SILT FENCE. SEE "TEMPORARY SILT FENCE DETAIL" ON THE "EROSION & SEDIMENT CONTROL DETAILS" SHEET (TYP.).

ANY SEDIMENT LADEN WATER IN THE WORK AREA SHALL BE PUMPED TO UNDISTURBED AREA OF LOT AND/OR TO THE ONSITE TEMPORARY ESC PONDS. NO SILT LADEN WATER TO BE DISPOSED INTO ANY CATCH BASIN, STORM SEWER OR PARK LAND.

LICENSED PLATED VEHICLES ARE STRICTLY PROHIBITED TO ONLY GRAVEL AND PAVED SURFACES. DO NOT TRAVERSE ON NON GRAVELED OR NON PAVEMENT SURFACES.

CAP ALL SEDIMENT GENERATING SURFACES WITHIN THE CONSTRUCTION ZONE WITH BLOWN STRAW MULCH PER SPECIFICATIONS NOTED ON THIS ESC PLAN. DO NOT LEAVE DISTURBED EARTH WITHOUT CAPPING FOR PERIODS LONGER THAN 48 HOURS.

ON-SITE SHOWN FOR INFORMATION ONLY.

CONTRACTOR SHALL COMPLY WITH ALL THE GEOTECHNICAL RECOMMENDATIONS IN THE GEOTECHNICAL REPORT PREPARED BY: GEOPACIFIC CONSULTANTS LTD.
 CONTACT: AUSTIN LOCKSTIDT PROJECT #:
 PHONE: 604-439-0922 EMAIL: LOCKSTIDT@GEOPACIFIC.CA

0m 10m 20m 30m 40m 50m
 SCALE: 1:500

SEDIMENT CONTROL

1. THE CONTRACTOR SHALL ENSURE THAT:

- i) ALL WORK IS UNDERTAKEN AND COMPLETED IN SUCH A MANNER AS TO PREVENT THE RELEASE OF SEDIMENT LADEN WATER INTO ANY WATER COURSE OR STORM SEWER SYSTEM.
- ii) NO SILT LADEN WATER FROM EXCAVATIONS SHALL BE PUMPED OUT OR OTHERWISE DIRECTLY DISCHARGED TO A STORM SEWER SYSTEM.
- iii) IT IS THE CONTRACTOR AND THE SITE CONTRACTOR'S RESPONSIBILITY TO PROVIDE ADEQUATE ONGOING SEDIMENT CONTROL AND TO ENSURE THAT WATER BEING DISCHARGED FROM THE SITE DOES NOT CONTAIN TOTAL SUSPENDED SOLIDS GREATER THAN 75mg/L DURING HIGH WATER EVENTS AND 25mg/L UNDER NORMAL EVENTS ABOVE BACKGROUND LEVELS AND/OR OTHER LEVELS SPECIFIED BY THE KATZIE RESERVE & CITY OF PITT MEADOWS.

LEGAL DESCRIPTION: ----

SURVEY BENCHMARK: MON: 88H0617 SCALE FACTOR: ELEV.: 6.525m (GEOID TIC) LOC: --

REV.	DATE	DESCRIPTION	BY
2	FEB 10/22	ADDRESS COMMENTS	KK
1	NOV 17/21	ISSUED FOR MUNICIPAL REVIEW	KK

CONSULTANT

Hub Engineering Inc.
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 EGBC Permit to Practice Number: 1003404

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 tel: 604-572-4328 | fax: 604-501-1625 | mail@hub-inc.com
 www.hub-inc.com



CLIENT

EM BUSINESS PARK LTD.
 1910 - 117 WEST HASTINGS STREET
 VANCOUVER, B.C., V6E 2K3

TITLE

STAGE 2 (SOUTH)
 CIVIL CONSTRUCTION
 PLAN

SCALE: HOR. 1:500
 VERT.

DESIGNED: MC/KK
 DRAWN: AKG
 REVIEWED: KL/RFG

DATE (YYYY.MM.DD)
 FEB 2020

CONSULTANT PROJ. NO.
 20001

DWG. NO.
 26

REV. 2

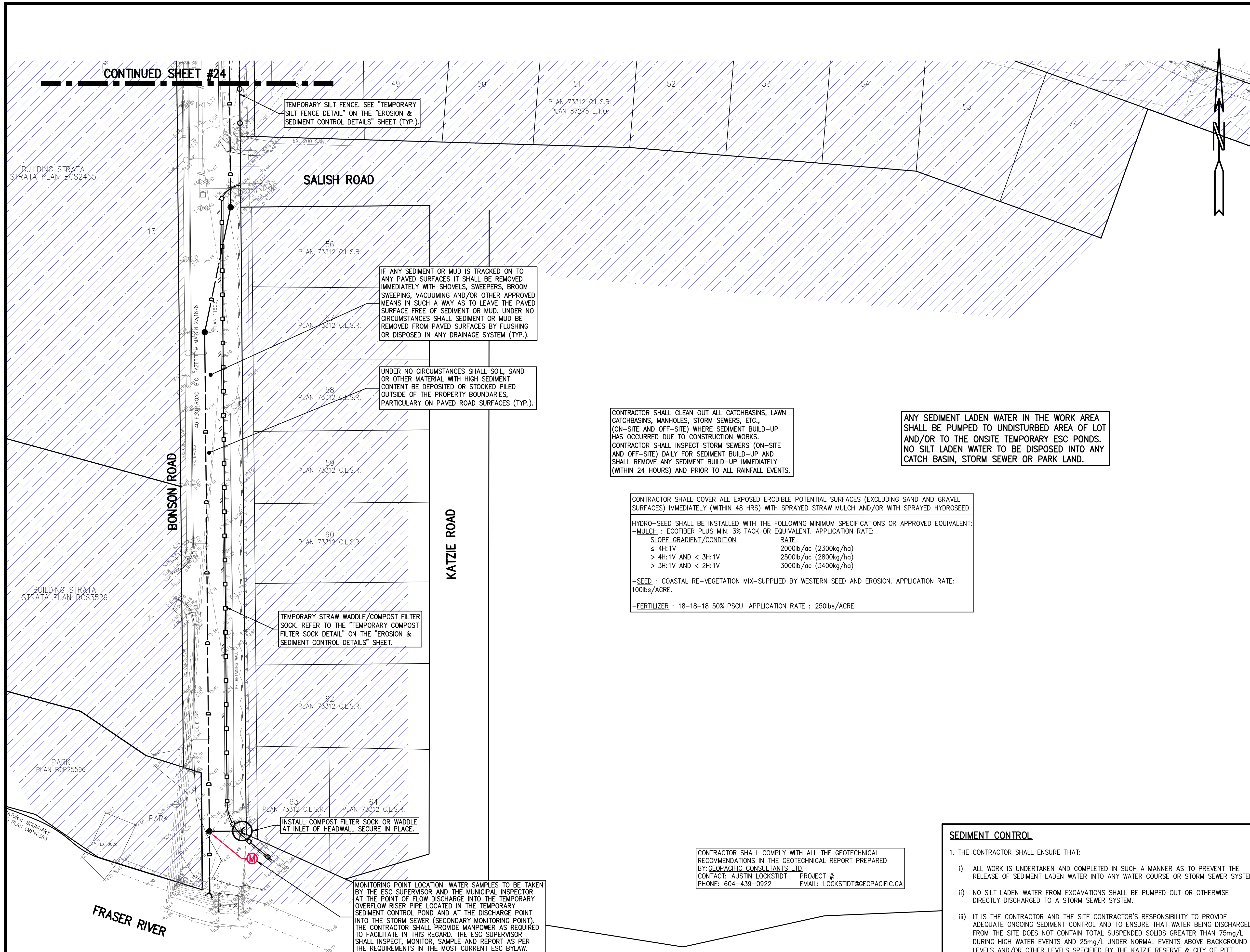
Feb 11, 2022

MUNICIPAL PROJECT NUMBER

DRAWING TYPE

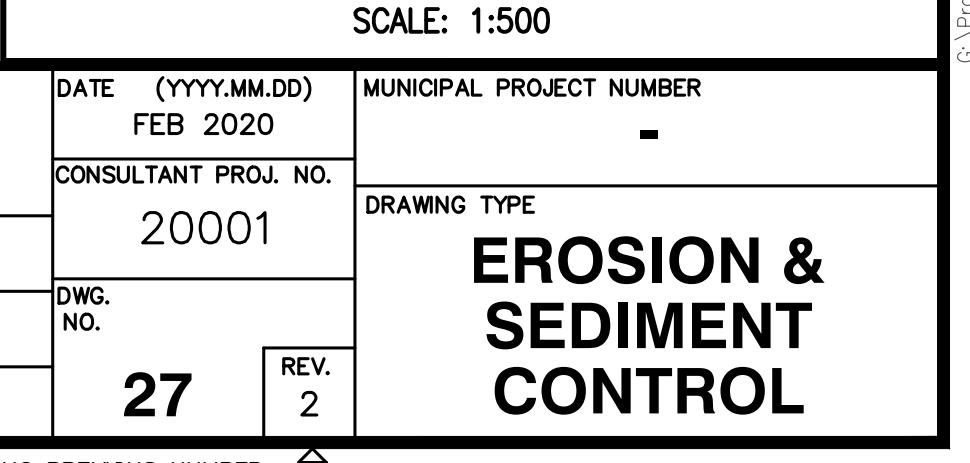
EROSION & SEDIMENT CONTROL

DESTROY ALL PRINTS BEARING PREVIOUS NUMBER



EROSION & SEDIMENT CONTROL LEGEND	
	EXISTING GROUND SURFACE ELEVATION.
	EXISTING GROUND SURFACE CONTOUR ELEVATION.
	MEET EXISTING GROUND SURFACE ELEVATION.
	FINISHED GROUND SURFACE ELEVATION.
	NEW STORM SEWER.
	NEW SANITARY SEWER.
	NEW WATERMAIN.
	NEW MANHOLE.
	NEW CATCHBASIN.
	NEW LAWN DRAIN.
	NEW CLEANOUT.
	TEMPORARY CATCHBASIN SEDIMENT TRAP IN EXISTING CATCHBASIN.
	TEMPORARY CATCHBASIN SEDIMENT TRAP IN NEW CATCHBASIN.
	TEMPORARY CATCHBASIN SEDIMENT TRAP IN NEW LAWNBASIN.
	TEMPORARY OVERFLOW RISER PIPE IN TEMPORARY SEDIMENT CONTROL POND.
	TEMPORARY SILT FENCE.
	TEMPORARY STRAW WATTLE/COMPOST FILTER SOCK.
	TEMPORARY CONSTRUCTION SWALE.
	TEMPORARY LONGITUDINAL GRAVEL CHECK DAM.
	TEMPORARY STORM PIPE AND SANDBAG HEADWALLS.
	TEMPORARY EXCAVATED IN-GROUND SUMP.
	SLOPE AS PER GEOTECHNICAL REQUIREMENTS.
	DIRECTION OF SURFACE RUNOFF FLOW.
	SUB BASE AND BASE GRAVELS TO GEOTECHNICAL CONSULTANT'S REQUIREMENTS.
	TEMPORARY GRAVEL ACCESS PAD.
	APPROXIMATE DISTURBED AREAS.
	DO NOT DISTURB AREAS.
	APPROXIMATE AREA OF HYDRO SEED.
	MONITORING POINT LOCATION.

- EROSION & SEDIMENT CONTROL NOTES:**
- ALL SEDIMENT & EROSION CONTROL WORKS SHALL BE UNDERTAKEN IN FULL COMPLIANCE WITH THE "EROSION & SEDIMENT CONTROL DETAILS" SHEET, THE "EROSION & SEDIMENT CONTROL NOTES" SHEET AND THE CURRENT CITY OF PITT MEADOWS AND KATZIE RESERVE 1 BY-LAWS.
 - REFER TO THE "UNDERGROUND SERVICES PLAN" FOR UNDERGROUND SERVICES AND REFER TO THE "LOT GRADING PLAN" FOR FINISHED GROUND SURFACE ELEVATIONS.
 - THE CONTRACTOR SHALL ENSURE THAT ALL WORK UNDER THIS PROJECT IS UNDERTAKEN AND COMPLETED IN SUCH MANNER AS TO PREVENT THE RELEASE INTO ANY WATER COURSE, STORM SEWER, OR DRAINAGE SYSTEM OF ANY SEDIMENT LADEN WATER WHICH CONTAINS NO MORE THAN 50 NTU'S.
 - RAIN GAUGE STATION: KATZIE PUMP STATION. REFER TO RAIN GAUGE FOR THE RAINFALL MONITORING VALUES FOR ALL STORM EVENTS. A SIGNIFICANT RAINFALL EVENT IS CONSIDERED TO BE 25mm OR GREATER OF TOTAL RAINFALL DEPTH IN A 24 HOUR PERIOD.
 - ALL SEDIMENT CONTROL WORKS SHALL REMAIN IN PLACE UNTIL THE DEVELOPMENT HAS REACHED AT LEAST 80% ULTIMATE CONSTRUCTION COMPLETION AND CITY OF PITT MEADOWS & KATZIE RESERVE 1 PROVIDES WRITTEN PERMISSION TO DECOMMISSION AND REMOVE THE TEMPORARY SEDIMENT CONTROL WORKS.
 - APPROXIMATE DISTURBED AREA = 7.09 Ha.
 - CONTRACTOR SHALL COMPLY WITH ALL THE GEOTECHNICAL RECOMMENDATION IN THE GEOTECHNICAL REPORT PREPARED BY: GEOPACIFIC CONSULTANTS LTD.
 - SOILS CONDITIONS ON THIS SITE GENERALLY CONSISTS OF SILTY SAND AND GRAVELS, UNDERLAIN BY SILTY SAND.



LEGAL DESCRIPTION: -----

SURVEY BENCHMARK: MON: 88H0617

SCALE FACTOR: ELEV.: 6.525m (GEOID/TIC)

REV.	DATE	DESCRIPTION	BY
2	FEB 10/22	ADDRESS COMMENTS	KK
1	NOV 17/21	ISSUED FOR MUNICIPAL REVIEW	KK

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CONSULTANT

Hub Engineering Inc.
Engineering and Development Consultants

EGBC Permit to Practice Number: 1003404

Suite 212, 12992 - 76 Avenue, Surrey, B.C. V3W 2V6
tel: 604-572-4328 | fax: 604-501-1625 | email@hub-inc.com
www.hub-inc.com

EAGLE MEADOWS
BUSINESS PARK

CLIENT

EM BUSINESS PARK LTD.
1910 - 117 WEST HASTINGS STREET
VANCOUVER, B.C., V6E 2K3

TITLE

STAGE 2 (BONSON)
CIVIL CONSTRUCTION
PLAN

SEAL

SCALE: HOR. 1:500
VERT.

DESIGNED: MC/KK
DRAWN: AKG
REVIEWED: KL/RFG

DATE (YYYY.MM.DD)
FEB 2020

CONSULTANT PROJ. NO.
20001

DWG. NO.
27

REV. 2

Feb 11, 2022

MUNICIPAL PROJECT NUMBER

DRAWING TYPE

EROSION & SEDIMENT CONTROL

DESTROY ALL PRINTS BEARING PREVIOUS NUMBER

TEMPORARY SILT FENCE. SEE "TEMPORARY SILT FENCE DETAIL" ON THE "EROSION & SEDIMENT CONTROL DETAILS" SHEET (TYP.).

IF ANY SEDIMENT OR MUD IS TRACKED ON TO ANY PAVED SURFACES IT SHALL BE REMOVED IMMEDIATELY WITH SHOVELS, SWEEPERS, BROOM SWEEPING, VACUUMING AND/OR OTHER APPROVED MEANS IN SUCH A WAY AS TO LEAVE THE PAVED SURFACE FREE OF SEDIMENT OR MUD. UNDER NO CIRCUMSTANCES SHALL SEDIMENT OR MUD BE REMOVED FROM PAVED SURFACES BY FLUSHING OR DISPOSED IN ANY DRAINAGE SYSTEM (TYP.).

UNDER NO CIRCUMSTANCES SHALL SOIL, SAND OR OTHER MATERIAL WITH HIGH SEDIMENT CONTENT BE DEPOSITED OR STOCKED PILED OUTSIDE OF THE PROPERTY BOUNDARIES, PARTICULARLY ON PAVED ROAD SURFACES (TYP.).

CONTRACTOR SHALL CLEAN OUT ALL CATCHBASINS, LAWN CATCHBASINS, MANHOLES, STORM SEWERS, ETC., (ON-SITE AND OFF-SITE) WHERE SEDIMENT BUILD-UP HAS OCCURRED DUE TO CONSTRUCTION WORKS. CONTRACTOR SHALL INSPECT STORM SEWERS (ON-SITE AND OFF-SITE) DAILY FOR SEDIMENT BUILD-UP AND SHALL REMOVE ANY SEDIMENT BUILD-UP IMMEDIATELY (WITHIN 24 HOURS) AND PRIOR TO ALL RAINFALL EVENTS.

ANY SEDIMENT LADEN WATER IN THE WORK AREA SHALL BE PUMPED TO UNDISTURBED AREA OF LOT AND/OR TO THE ONSITE TEMPORARY ESC PONDS. NO SILT LADEN WATER TO BE DISPOSED INTO ANY CATCH BASIN, STORM SEWER OR PARK LAND.

CONTRACTOR SHALL COVER ALL EXPOSED ERODIBLE POTENTIAL SURFACES (EXCLUDING SAND AND GRAVEL SURFACES) IMMEDIATELY (WITHIN 48 HRS) WITH SPRAYED STRAW MULCH AND/OR WITH SPRAYED HYDROSEED.

HYDRO-SEED SHALL BE INSTALLED WITH THE FOLLOWING MINIMUM SPECIFICATIONS OR APPROVED EQUIVALENT:

-MULCH: ECOFIBER PLUS MIN. 3% TACK OR EQUIVALENT. APPLICATION RATE:

SLOPE GRADIENT/CONDITION	RATE
≤ 4H:1V	2000lb/ac (2300kg/ha)
> 4H:1V AND < 3H:1V	2500lb/ac (2800kg/ha)
> 3H:1V AND < 2H:1V	3000lb/ac (3400kg/ha)

-SEED: COASTAL RE-VEGETATION MIX-SUPPLIED BY WESTERN SEED AND EROSION. APPLICATION RATE: 100lbs/ACRE.

-FERTILIZER: 18-18-18 50% PSCU. APPLICATION RATE: 250lbs/ACRE.

TEMPORARY STRAW WATTLE/COMPOST FILTER SOCK. REFER TO THE "TEMPORARY COMPOST FILTER SOCK DETAIL" ON THE "EROSION & SEDIMENT CONTROL DETAILS" SHEET.

INSTALL COMPOST FILTER SOCK OR WATTLE AT INLET OF HEADWALL SECURE IN PLACE.

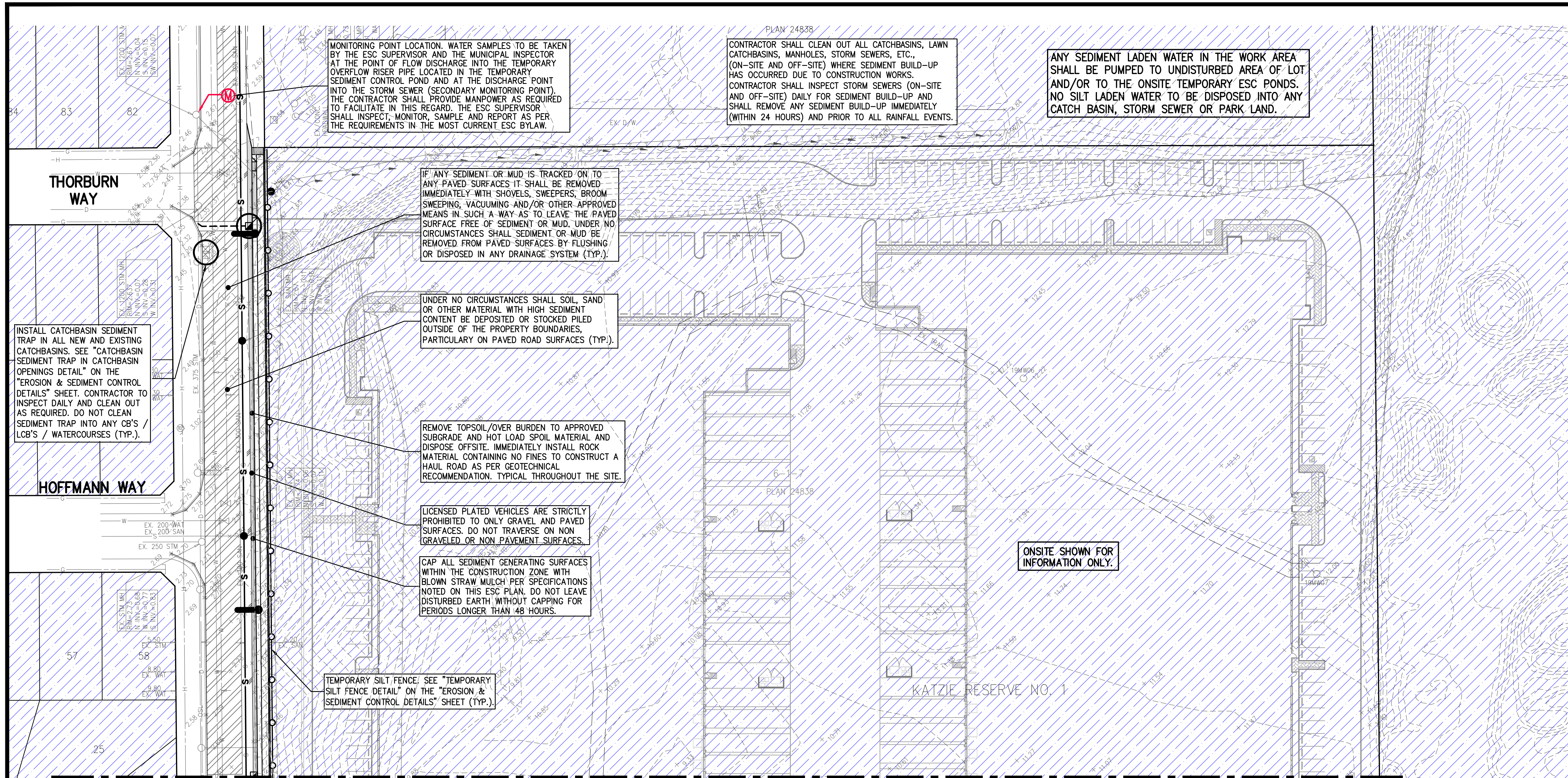
MONITORING POINT LOCATION. WATER SAMPLES TO BE TAKEN BY THE ESC SUPERVISOR AND THE MUNICIPAL INSPECTOR AT THE POINT OF FLOW DISCHARGE INTO THE TEMPORARY OVERFLOW RISER PIPE LOCATED IN THE TEMPORARY SEDIMENT CONTROL POND AND AT THE DISCHARGE POINT INTO THE STORM SEWER (SECONDARY MONITORING POINT). THE CONTRACTOR SHALL PROVIDE MANPOWER AS REQUIRED TO FACILITATE IN THIS REGARD. THE ESC SUPERVISOR SHALL INSPECT, MONITOR, SAMPLE AND REPORT AS PER THE REQUIREMENTS IN THE MOST CURRENT ESC BYLAW.

CONTRACTOR SHALL COMPLY WITH ALL THE GEOTECHNICAL RECOMMENDATIONS IN THE GEOTECHNICAL REPORT PREPARED BY: GEOPACIFIC CONSULTANTS LTD.
CONTACT: AUSTIN LOCKSTIDT PROJECT #
PHONE: 604-439-0922 EMAIL: LOCKSTIDT@GEOPACIFIC.CA

SEDIMENT CONTROL

1. THE CONTRACTOR SHALL ENSURE THAT:
- ALL WORK IS UNDERTAKEN AND COMPLETED IN SUCH A MANNER AS TO PREVENT THE RELEASE OF SEDIMENT LADEN WATER INTO ANY WATER COURSE OR STORM SEWER SYSTEM.
 - NO SILT LADEN WATER FROM EXCAVATIONS SHALL BE PUMPED OUT OR OTHERWISE DIRECTLY DISCHARGED TO A STORM SEWER SYSTEM.
 - IT IS THE CONTRACTOR AND THE SITE CONTRACTOR'S RESPONSIBILITY TO PROVIDE ADEQUATE ONGOING SEDIMENT CONTROL AND TO ENSURE THAT WATER BEING DISCHARGED FROM THE SITE DOES NOT CONTAIN TOTAL SUSPENDED SOLIDS GREATER THAN 75mg/L DURING HIGH WATER EVENTS AND 25mg/L UNDER NORMAL EVENTS ABOVE BACKGROUND LEVELS AND/OR OTHER LEVELS SPECIFIED BY THE KATZIE RESERVE & CITY OF PITT MEADOWS.

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EROSION & SEDIMENT CONTROL LEGEND

- EXISTING GROUND SURFACE ELEVATION.
- EXISTING GROUND SURFACE CONTOUR ELEVATION.
- MEET EXISTING GROUND SURFACE ELEVATION.
- FINISHED GROUND SURFACE ELEVATION.
- NEW STORM SEWER.
- NEW SANITARY SEWER.
- NEW WATERMAIN.
- NEW MANHOLE.
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- NEW LAWN DRAIN.
- NEW CLEANOUT.
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- TEMPORARY CATCHBASIN SEDIMENT TRAP IN NEW LAWNBASIN.
- TEMPORARY OVERFLOW RISER PIPE IN TEMPORARY SEDIMENT CONTROL POND.
- TEMPORARY SILT FENCE.
- TEMPORARY STRAW WADDLE/COMPOST FILTER SOCK.
- TEMPORARY CONSTRUCTION SWALE.
- TEMPORARY LONGITUDINAL GRAVEL CHECK DAM.
- TEMPORARY STORM PIPE AND SANDBAG HEADWALLS.
- TEMPORARY EXCAVATED IN-GROUND SUMP.
- SLOPE AS PER GEOTECHNICAL REQUIREMENTS.
- DIRECTION OF SURFACE RUNOFF FLOW.
- SUB BASE AND BASE GRAVELS TO GEOTECHNICAL CONSULTANT'S REQUIREMENTS.
- TEMPORARY GRAVEL ACCESS PAD.
- APPROXIMATE DISTURBED AREAS.
- DO NOT DISTURB AREAS.
- APPROXIMATE AREA OF HYDRO SEED.
- MONITORING POINT LOCATION.

CONTINUED SHEET #27

- ### EROSION & SEDIMENT CONTROL NOTES:
1. ALL SEDIMENT & EROSION CONTROL WORKS SHALL BE UNDERTAKEN IN FULL COMPLIANCE WITH THE "EROSION & SEDIMENT CONTROL DETAILS" SHEET, THE "EROSION & SEDIMENT CONTROL NOTES" SHEET AND THE CURRENT CITY OF PITT MEADOWS AND KATZIE RESERVE 1 BY-LAWS.
 2. REFER TO THE "UNDERGROUND SERVICES PLAN" FOR UNDERGROUND SERVICES AND REFER TO THE "LOT GRADING PLAN" FOR FINISHED GROUND SURFACE ELEVATIONS.
 3. THE CONTRACTOR SHALL ENSURE THAT ALL WORK UNDER THIS PROJECT IS UNDERTAKEN AND COMPLETED IN SUCH MANNER AS TO PREVENT THE RELEASE INTO ANY WATER COURSE, STORM SEWER, OR DRAINAGE SYSTEM OF ANY SEDIMENT LADEN WATER WHICH CONTAINS NO MORE THAN 50 NTU'S.
 4. RAIN GAUGE STATION: KATZIE PUMP STATION. REFER TO RAIN GAUGE FOR THE RAINFALL MONITORING VALUES FOR ALL STORM EVENTS. A SIGNIFICANT RAINFALL EVENT IS CONSIDERED TO BE 25mm OR GREATER OF TOTAL RAINFALL DEPTH IN A 24 HOUR PERIOD.
 5. ALL SEDIMENT CONTROL WORKS SHALL REMAIN IN PLACE UNTIL THE DEVELOPMENT HAS REACHED AT LEAST 80% ULTIMATE CONSTRUCTION COMPLETION AND CITY OF PITT MEADOWS & KATZIE RESERVE 1 PROVIDES WRITTEN PERMISSION TO DECOMMISSION AND REMOVE THE TEMPORARY SEDIMENT CONTROL WORKS.
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MONITORING POINT LOCATION. WATER SAMPLES TO BE TAKEN BY THE ESC SUPERVISOR AND THE MUNICIPAL INSPECTOR AT THE POINT OF FLOW DISCHARGE INTO THE TEMPORARY OVERFLOW RISER PIPE LOCATED IN THE TEMPORARY SEDIMENT CONTROL POND AND AT THE DISCHARGE POINT INTO THE STORM SEWER (SECONDARY MONITORING POINT). THE CONTRACTOR SHALL PROVIDE MANPOWER AS REQUIRED TO FACILITATE IN THIS REGARD. THE ESC SUPERVISOR SHALL INSPECT, MONITOR, SAMPLE AND REPORT AS PER THE REQUIREMENTS IN THE MOST CURRENT ESC BYLAW.

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REMOVE TOPSOIL/OVER BURDEN TO APPROVED SUBGRADE AND HOT LOAD SPOIL MATERIAL AND DISPOSE OFFSITE. IMMEDIATELY INSTALL ROCK MATERIAL CONTAINING NO FINES TO CONSTRUCT A HAUL ROAD AS PER GEOTECHNICAL RECOMMENDATION. TYPICAL THROUGHOUT THE SITE.

LICENSED PLATED VEHICLES ARE STRICTLY PROHIBITED TO ONLY GRAVEL AND PAVED SURFACES. DO NOT TRAVERSE ON NON GRAVELED OR NON PAVEMENT SURFACES.

CAP ALL SEDIMENT GENERATING SURFACES WITHIN THE CONSTRUCTION ZONE WITH BLOWN STRAW MULCH PER SPECIFICATIONS NOTED ON THIS ESC PLAN. DO NOT LEAVE DISTURBED EARTH WITHOUT CAPPING FOR PERIODS LONGER THAN 48 HOURS.

TEMPORARY SILT FENCE. SEE "TEMPORARY SILT FENCE DETAIL" ON THE "EROSION & SEDIMENT CONTROL DETAILS" SHEET (TYP.).

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ON-SITE SHOWN FOR INFORMATION ONLY.

SEDIMENT CONTROL

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CONTRACTOR SHALL COMPLY WITH ALL THE GEOTECHNICAL RECOMMENDATIONS IN THE GEOTECHNICAL REPORT PREPARED BY: GEOPACIFIC CONSULTANTS LTD.

CONTACT: AUSTIN LOCKSTIDT PROJECT #
PHONE: 604-439-0922 EMAIL: LOCKSTIDT@GEOPACIFIC.CA

SCALE: 1:500

LEGAL DESCRIPTION: -----			
SURVEY BENCHMARK MON: 88H0617		SCALE FACTOR: ELEV.: 6.525m (GEODETIC)	
REV.	DATE	DESCRIPTION	BY
2	FEB 10/22	ADDRESS COMMENTS	KK
1	NOV 17/21	ISSUED FOR MUNICIPAL REVIEW	KK

<p>CONSULTANT</p> <p>Hub Engineering Inc.</p> <p>Engineering and Development Consultants</p> <p>EGBC Permit to Practice Number: 1003404</p> <p>Suite 212, 12992 - 76 Avenue, Surrey, B.C. V3W 2V6 tel: 604-572-4328 fax: 604-501-1625 mail@hub-inc.com www.hub-inc.com</p>	<p>EAGLE MEADOWS BUSINESS PARK</p>
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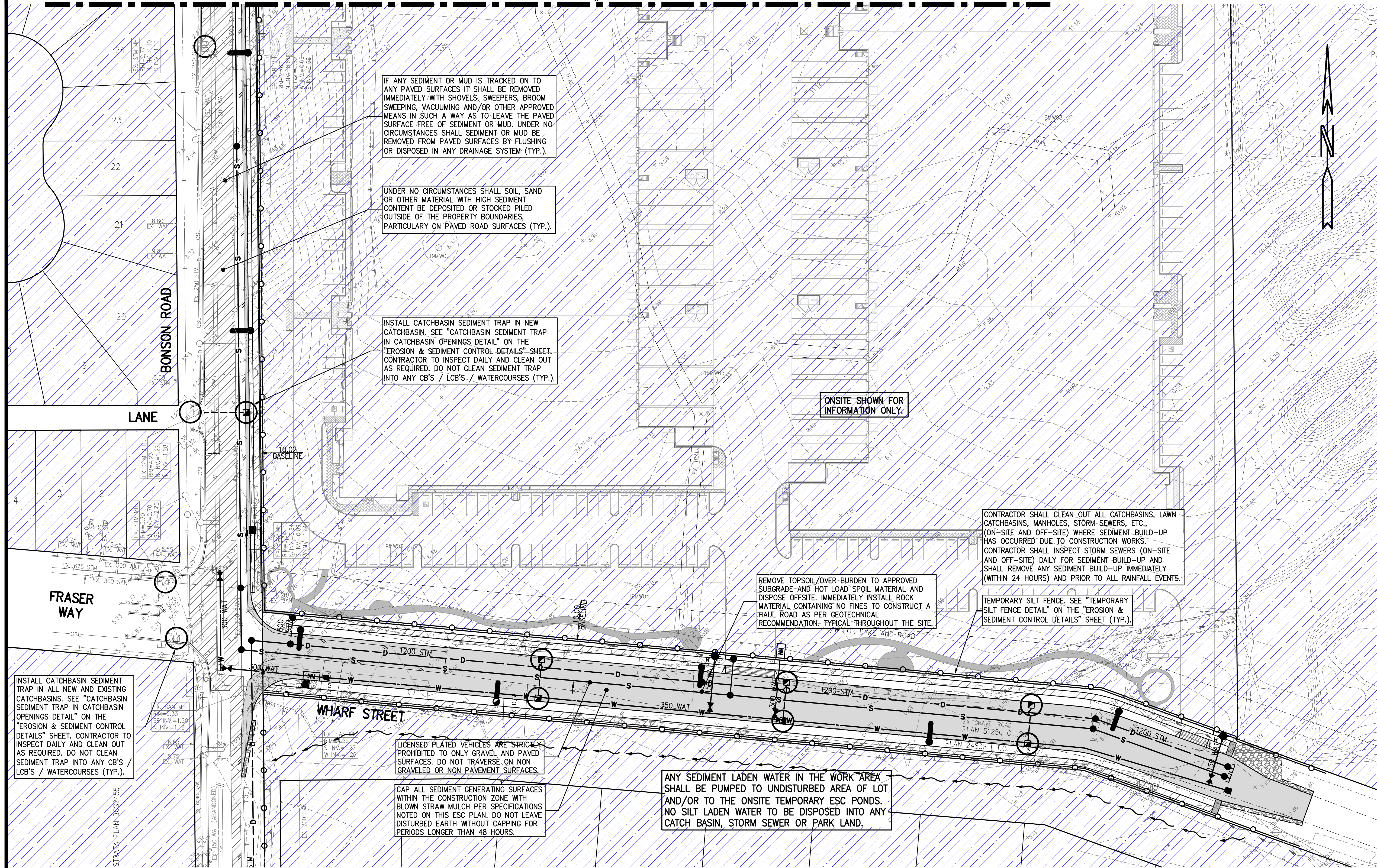
<p>CLIENT</p> <p>EM BUSINESS PARK LTD.</p> <p>1910 - 117 WEST HASTINGS STREET VANCOUVER, B.C., V6E 2K3</p>	<p>DATE (YYYY.MM.DD) FEB 2020</p> <p>CONSULTANT PROJ. NO. 20001</p> <p>DWG. NO. 28</p> <p>REV. 2</p>
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<p>TITLE</p> <p>STAGE 3 (NORTH)</p> <p>MAINTENANCE PLAN</p>	<p>SCALE: HOR. 1:500 VERT.</p> <p>DESIGNED: MC/KK</p> <p>DRAWN: AKG</p> <p>REVIEWED: KL/RFG</p> <p>DATE: Feb 11, 2022</p>
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<p>MUNICIPAL PROJECT NUMBER</p> <p>-</p>	<p>DRAWING TYPE</p> <p>EROSION & SEDIMENT CONTROL</p>
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<p>DESTROY ALL PRINTS BEARING PREVIOUS NUMBER</p>

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EROSION & SEDIMENT CONTROL LEGEND

- EXISTING GROUND SURFACE ELEVATION.
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- APPROXIMATE DISTURBED AREAS.
- DO NOT DISTURB AREAS.
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0m 10m 20m 30m 40m 50m
 SCALE: 1:500

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EAGLE MEADOWS
BUSINESS PARK

CLIENT
EM BUSINESS PARK LTD.
 1910 - 117 WEST HASTINGS STREET
 VANCOUVER, B.C., V6E 2K3

TITLE
STAGE 3 (SOUTH)
 MAINTENANCE PLAN

SEAL

SCALE: HOR. 1:500
 VERT.

DATE (YYYY.MM.DD)
 FEB 2020

CONSULTANT PROJ. NO.
 20001

DESIGNED
 MC/KK

DRAWN
 AKG

REVIEWED
 KL/RFG

DWG. NO.
 29

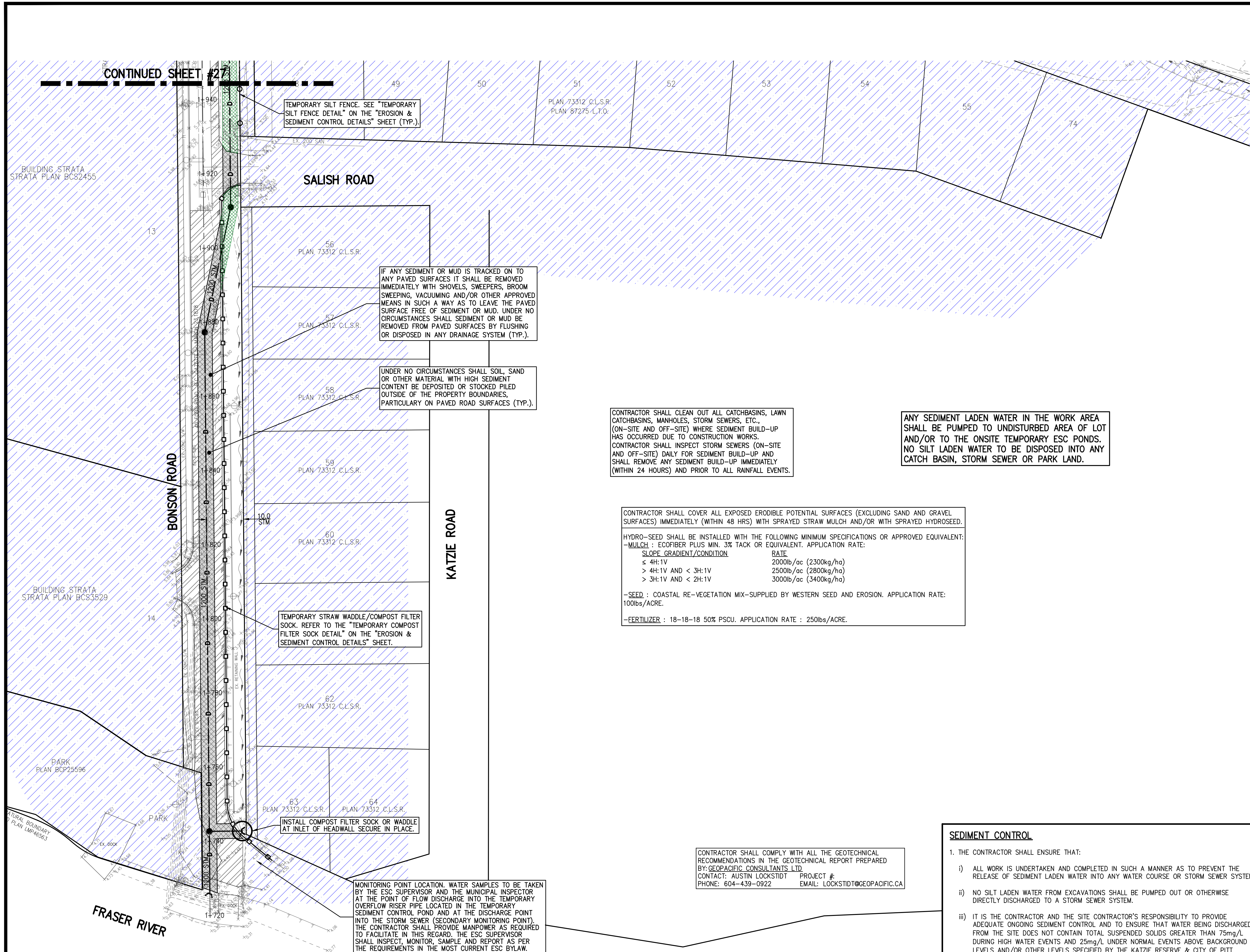
REV. 2

Feb 11, 2022

MUNICIPAL PROJECT NUMBER
 -

DRAWING TYPE
EROSION & SEDIMENT CONTROL

DESTROY ALL PRINTS BEARING PREVIOUS NUMBER



EROSION & SEDIMENT CONTROL LEGEND	
	EXISTING GROUND SURFACE ELEVATION.
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	APPROXIMATE DISTURBED AREAS.
	DO NOT DISTURB AREAS.
	APPROXIMATE AREA OF HYDRO SEED.
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ANY SEDIMENT LADEN WATER IN THE WORK AREA SHALL BE PUMPED TO UNDISTURBED AREA OF LOT AND/OR TO THE ONSITE TEMPORARY ESC PONDS. NO SILT LADEN WATER TO BE DISPOSED INTO ANY CATCH BASIN, STORM SEWER OR PARK LAND.

CONTRACTOR SHALL COVER ALL EXPOSED ERODIBLE POTENTIAL SURFACES (EXCLUDING SAND AND GRAVEL SURFACES) IMMEDIATELY (WITHIN 48 HRS) WITH SPRAYED STRAW MULCH AND/OR WITH SPRAYED HYDROSEED.

HYDRO-SEED SHALL BE INSTALLED WITH THE FOLLOWING MINIMUM SPECIFICATIONS OR APPROVED EQUIVALENT:

SLOPE GRADIENT/CONDITION	RATE
≤ 4H:1V	2000lb/ac (2300kg/ha)
> 4H:1V AND < 3H:1V	2500lb/ac (2800kg/ha)
> 3H:1V AND < 2H:1V	3000lb/ac (3400kg/ha)

-SEED : COASTAL RE-VEGETATION MIX-SUPPLIED BY WESTERN SEED AND EROSION. APPLICATION RATE: 100lbs/ACRE.

-FERTILIZER : 18-18-18 50% PSCU. APPLICATION RATE : 250lbs/ACRE.

SEDIMENT CONTROL

- THE CONTRACTOR SHALL ENSURE THAT:
 - ALL WORK IS UNDERTAKEN AND COMPLETED IN SUCH A MANNER AS TO PREVENT THE RELEASE OF SEDIMENT LADEN WATER INTO ANY WATER COURSE OR STORM SEWER SYSTEM.
 - NO SILT LADEN WATER FROM EXCAVATIONS SHALL BE PUMPED OUT OR OTHERWISE DIRECTLY DISCHARGED TO A STORM SEWER SYSTEM.
 - IT IS THE CONTRACTOR AND THE SITE CONTRACTOR'S RESPONSIBILITY TO PROVIDE ADEQUATE ONGOING SEDIMENT CONTROL AND TO ENSURE THAT WATER BEING DISCHARGED FROM THE SITE DOES NOT CONTAIN TOTAL SUSPENDED SOLIDS GREATER THAN 75mg/L DURING HIGH WATER EVENTS AND 25mg/L UNDER NORMAL EVENTS ABOVE BACKGROUND LEVELS AND/OR OTHER LEVELS SPECIFIED BY THE KATZIE RESERVE & CITY OF PITT MEADOWS.

CONTRACTOR SHALL COMPLY WITH ALL THE GEOTECHNICAL RECOMMENDATIONS IN THE GEOTECHNICAL REPORT PREPARED BY: GEOPACIFIC CONSULTANTS LTD.
 CONTACT: AUSTIN LOCKSTIDT PROJECT #
 PHONE: 604-439-0922 EMAIL: LOCKSTIDT@GEOPACIFIC.CA

MONITORING POINT LOCATION. WATER SAMPLES TO BE TAKEN BY THE ESC SUPERVISOR AND THE MUNICIPAL INSPECTOR AT THE POINT OF FLOW DISCHARGE INTO THE TEMPORARY OVERFLOW RISER PIPE LOCATED IN THE TEMPORARY SEDIMENT CONTROL POND AND AT THE DISCHARGE POINT INTO THE STORM SEWER (SECONDARY MONITORING POINT). THE CONTRACTOR SHALL PROVIDE MANPOWER AS REQUIRED TO FACILITATE IN THIS REGARD. THE ESC SUPERVISOR SHALL INSPECT, MONITOR, SAMPLE AND REPORT AS PER THE REQUIREMENTS IN THE MOST CURRENT ESC BYLAW.

LEGAL DESCRIPTION: -----

SURVEY BENCHMARK: MON: 88H0617 LOC: -- SCALE FACTOR: ELEV.: 6.525m (GEODETIC)

REV.	DATE	DESCRIPTION	BY
2	FEB 10/22	ADDRESS COMMENTS	KK
1	NOV 17/21	ISSUED FOR MUNICIPAL REVIEW	KK

CONSULTANT
Hub Engineering Inc.
Engineering and Development Consultants
EGBC Permit to Practice Number: 1003404
Suite 212, 12992 - 76 Avenue, Surrey, B.C. V3W 2V6
tel: 604-572-4328 fax: 604-501-1625 mail@hub-inc.com
www.hub-inc.com



CLIENT
EM BUSINESS PARK LTD.
1910 - 117 WEST HASTINGS STREET
VANCOUVER, B.C., V6E 2K3
TITLE
STAGE 3 (BONSON)
MAINTENANCE PLAN

SCALE: HOR. 1:500	DATE (YYYY.MM.DD)	MUNICIPAL PROJECT NUMBER
VERT.	FEB 2020	-
DESIGNED MC/KK	CONSULTANT PROJ. NO.	DRAWING TYPE
DRAWN AKG	20001	EROSION & SEDIMENT CONTROL
REVIEWED KL/RFG	DWG. NO.	REV.
	30	2

SEAL

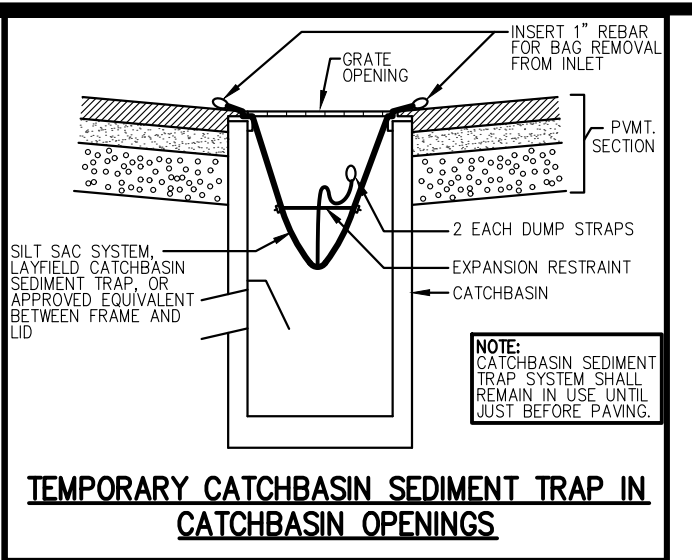
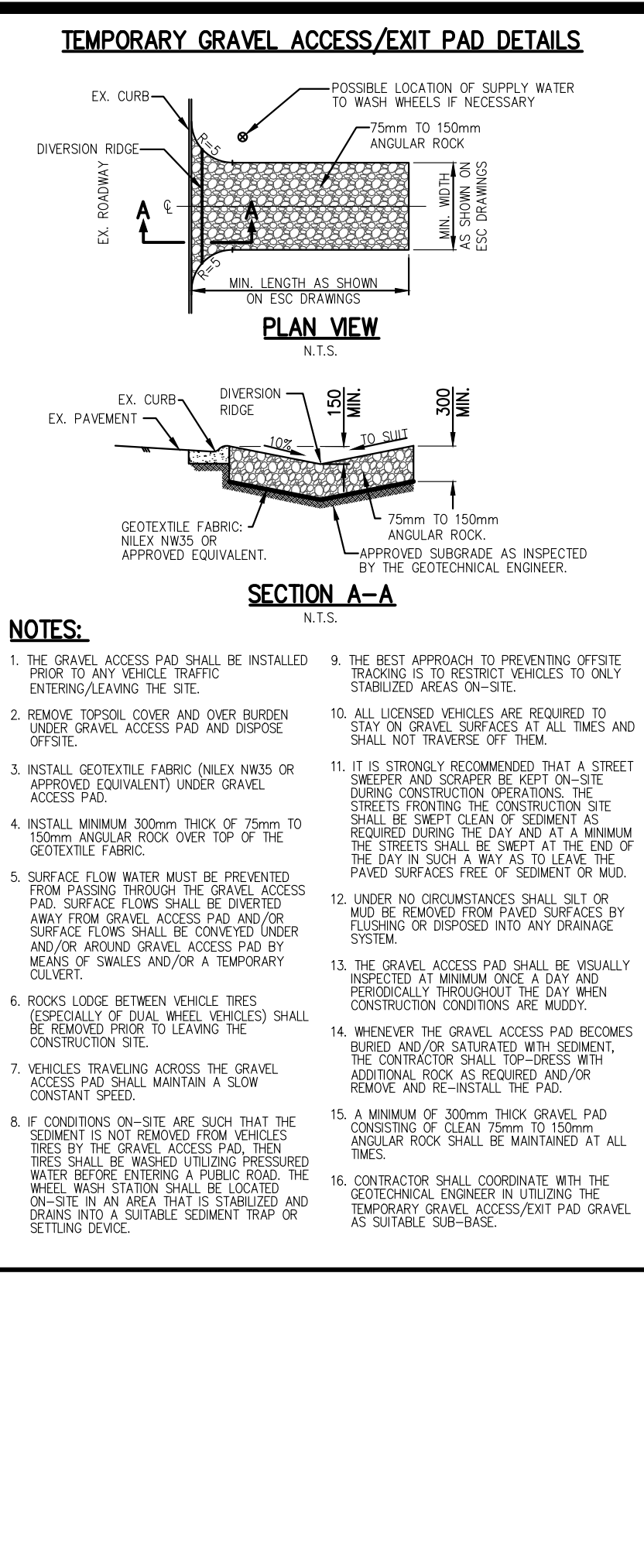
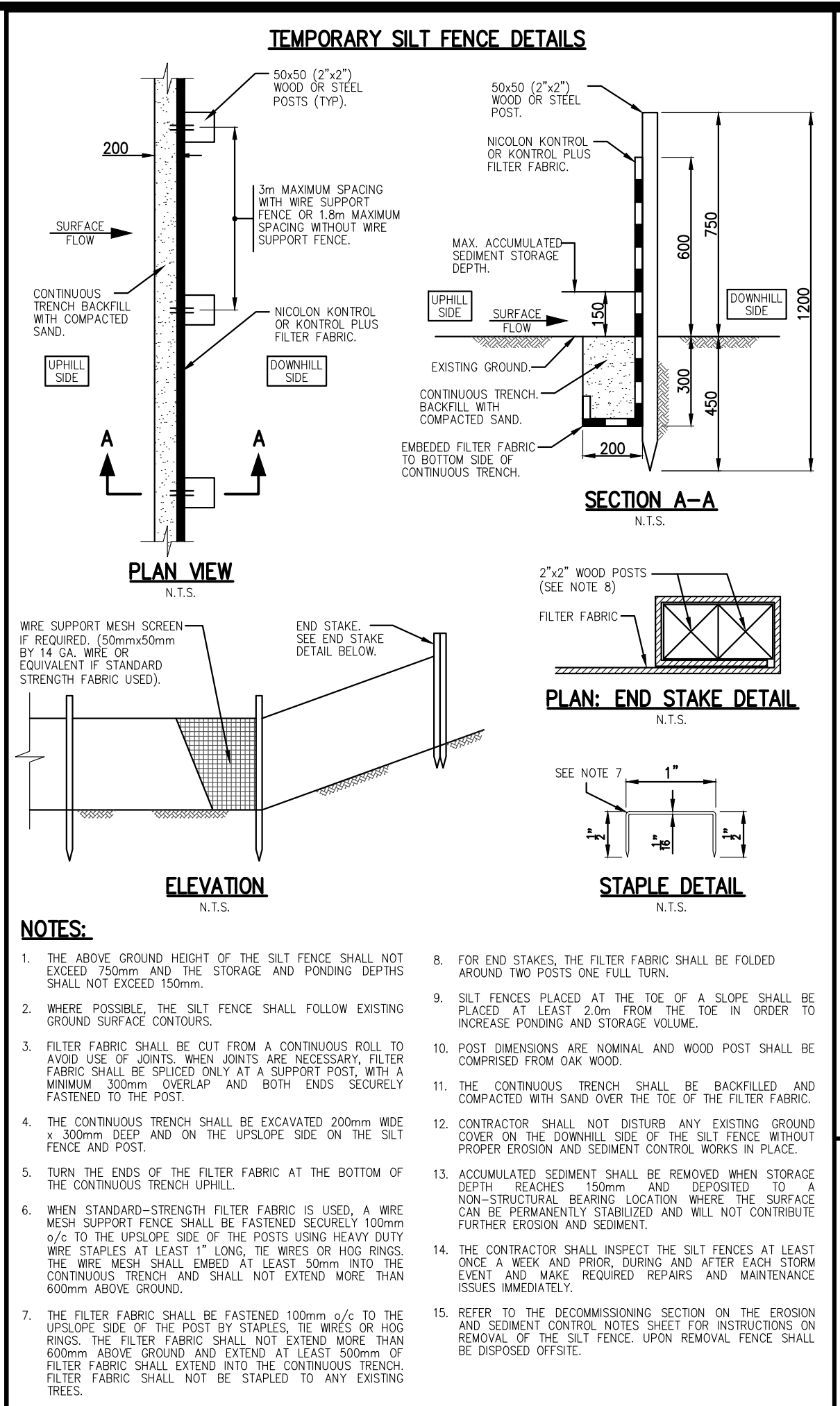
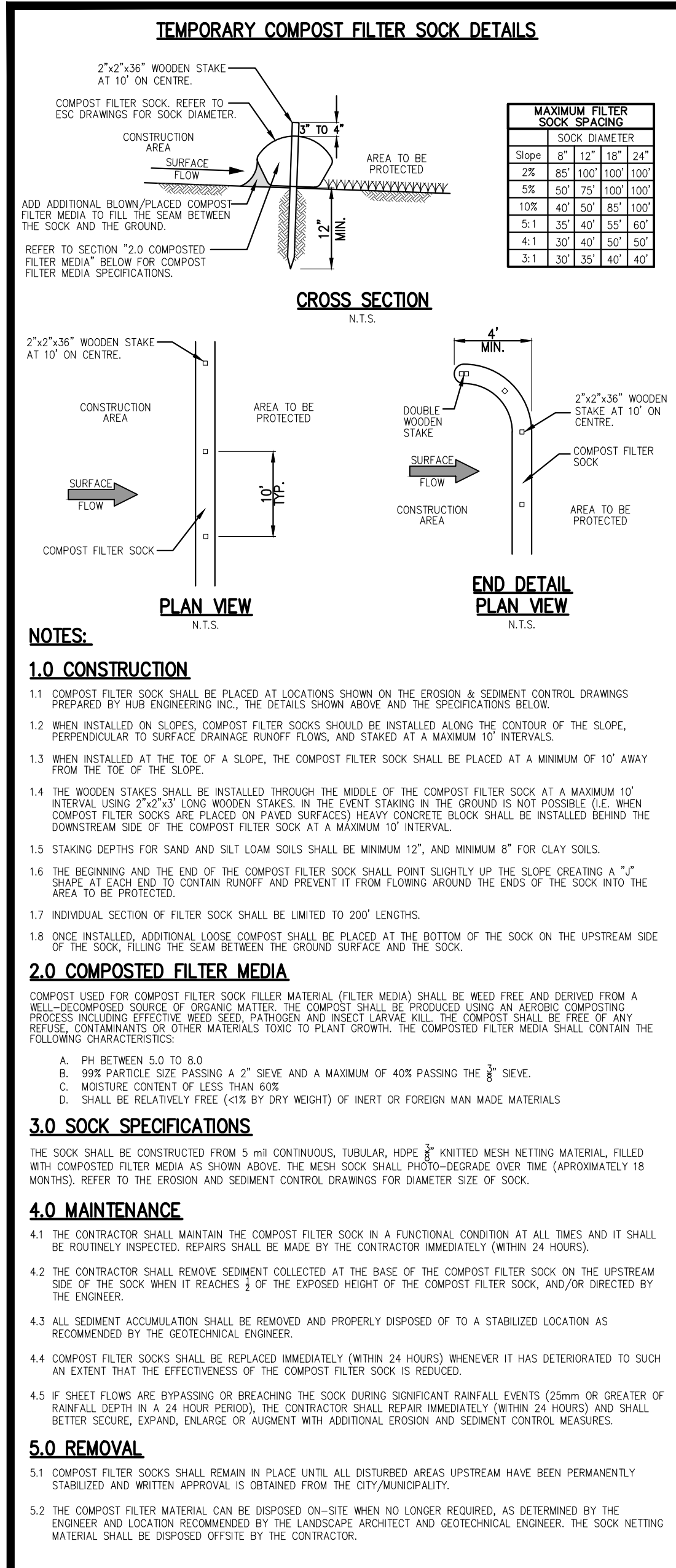
Feb 11, 2022

SCALE: 1:500

0m 10m 20m 30m 40m 50m

DESTROY ALL PRINTS BEARING PREVIOUS NUMBER

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LEGAL DESCRIPTION: ----			
SURVEY BENCHMARK MON: 88H0617		SCALE FACTOR: ELEV.: 6.525m (GEODETIIC)	
REV.	DATE	DESCRIPTION	BY
2	FEB 10/22	ADDRESS COMMENTS	KK
1	NOV 17/21	ISSUED FOR MUNICIPAL REVIEW	KK

CONSULTANT	
Hub Engineering Inc.	
Engineering and Development Consultants	
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Suite 212, 12992 - 76 Avenue, Surrey, B.C. V3W 2V6	
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www.hub-inc.com	

EAGLE MEADOWS BUSINESS PARK

CLIENT

EM BUSINESS PARK LTD.

1910 - 117 WEST HASTINGS STREET
VANCOUVER, B.C., V6E 2K3

TITLE

ESC DETAILS

SCALE: HOR. VERT.	DATE (YYYY.MM.DD) FEB 2020	MUNICIPAL PROJECT NUMBER -
DESIGNED MC/KK	CONSULTANT PROJ. NO. 20001	DRAWING TYPE EROSION & SEDIMENT CONTROL
DRAWN AKG	DWG. NO. 31	REV. 2
REVIEWED KL/RFG	REV. 2	

SEAL

Feb 11, 2022

DESTROY ALL PRINTS BEARING PREVIOUS NUMBER →

1.0 GENERAL

- 1.1 The Contractor shall ensure that all work under this project is undertaken and completed in such a manner as to prevent the release into any water course, storm sewer, or drainage system of any sediment laden water which contains NTU's in excess of 50.
1.2 Prior to commencing any construction on the site and prior to uncapping any storm connection or allowing any water to discharge from any part of the site, the Contractor shall construct the complete sediment control works as shown on these drawings under the applicable stage.
1.3 No sediment laden water from the construction site shall be pumped out or otherwise discharged directly to a storm sewer system, water course, or other drainage system in such a manner as to bypass the sediment control system.
1.4 Existing ground cover shall be left in place for as long as possible and shall only be removed immediately prior to and then only to the extent necessary to allow construction which has to be performed in the particular area covered by the ground cover in question. Each part of the subgrade shall be exposed for as short a time as possible and over as small an area as possible. Exposed subgrade shall, as soon as possible, be covered with at least the first layer of the finished surface with which it is ultimately to be covered (e.g., concrete, or the first 150mm of sub-base gravel or sand, or topsoil and seed in grassed areas).
1.5 Haul roads shall be constructed as and where necessary to provide adequate access and circulation for heavy equipment and/or vehicles to any point which they may be required to reach on the site. Such haul roads shall have a sufficient structure to ensure that when they are traversed by heavy equipment and/or vehicles, that sediment is not generated at the interface between the road structure and the subgrade by the passage of such heavy vehicles and/or equipment over such haul roads. Where passage of heavy vehicles and/or equipment under prevailing soil conditions and/or weather conditions on any part of the site could generate sediment such heavy equipment and/or vehicles shall not traverse any such part of the site except by adequate haul roads as defined above.
1.6 Whenever possible, work should be undertaken in dry weather. Work undertaken along banks during wet weather shall be carried out in such a manner so as to minimize any disturbance to the ground surface which could result in sediment generation.
1.7 All soil stockpiles and exposed banks which could potentially generate sediment shall be protected with seeding, sprayed mulch, polyethylene sheets and/or other approved material so as to prevent sediment generation. Where polyethylene sheeting is used it shall be tied down or otherwise anchored so as to prevent movement and shall only be temporarily removed as and when required to allow construction, and then only during dry weather.
1.8 Temporary swales shall be constructed in native undisturbed soil. As required, all temporary swales which are intended to carry sediment laden water shall be lined with woven grass matting or other approved means and shall have gravel check dams located at intervals not greater than 20 meters throughout their length as shown in the appropriate detail.
1.9 Where heavy equipment or vehicles need to cross temporary swales, a minimum 300mm diameter pipe shall be placed along the swale bottom and granular backfill shall be placed over the pipe with a sufficient depth of cover to protect the pipe from damage by such heavy equipment or vehicles.
1.10 In ground sediment basins shall be excavated into undisturbed native soil. Unless otherwise specified, fill material shall not be used to create any banks for sediment basins.
1.11 A temporary orange safety fence (shown on the "EROSION & SEDIMENT CONTROL DETAIL" sheet) complete with access door or other like barrier as required by the City shall be installed around the temporary sediment pond(s) and shall remain in place for the duration of the project. The Owner shall take ownership of this fence while in place. This fence shall be removed by the Contractor as part of the decommissioning and removal of the sediment control works.
1.12 All pipe outlets shall be tied into ditches and/or watercourses at not more than 45° to the direction of flow in the ditch or watercourse.
1.13 The contours shown on these plans were derived from topographic survey. Prior to construction, the Contractor shall verify all elevations which are critical to the works described herein and shall notify the Engineer immediately in the event of any discrepancy.
1.14 Unless otherwise specified, all dimensions, sizes and elevations shown on the drawings hereto are metric.
1.15 The Contractor shall install all of the sediment control works, perform all of his operations under this project, and shall ensure that the NTU's and any other applicable criteria for contaminants contained in the water being discharged from the site meet the latest criteria stipulated by the "Land Development Guidelines for the Protection of Aquatic Habitat," issued by the Habitat Management Division of the Department of Fisheries & Oceans Canada (DFO) the BC Ministry of Environment (MOE), and the Katzie Reserve/and City of Pitt Meadows Municipal Erosion and Sediment Control (ESC) By-law No. 2833, 2019 (the By-law).
1.16 All works required to be performed by the Contractor in respect to constructing, maintaining, inspecting, decommissioning and final clean-up of the sediment control works shall be performed by the Contractor at the Contractor's expense.
1.17 The Contractor shall supply and install all sediment control works shown in the Sediment Control Drawings in accordance with the provisions of the drawings, any applicable details shown on Drawings and any applicable clause in this specification.
1.18 Whenever the Sediment Control Drawings includes a detail which describes any of the work called for herein, such works shall be constructed in accordance with the applicable detail. The complete sediment control works shall remain in place and shall be maintained by the Contractor until approval for their removal has been granted by the ESC Supervisor, Engineer-of-Record, and all the government agencies having jurisdiction.

2.0 CLEARING, ROAD STRIPPING, GRAVELLING AND ROUGH GRADING STAGE

- 2.1 Developer and/or Contractor shall notify both the Engineer of Record and the ESC Supervisor prior to commencement of the clearing and grubbing stage. The Developer will be responsible to provide the clearing and grubbing Contractor with a copy of the ESC permit, approved ESC drawings and the tree cutting permit prior to commencement of clearing and grubbing stage. The site clearing and grubbing Contractor to confirm the ESC permit has been issued. Prior to leaving the site, the clearing and grubbing Contractor to obtain sign-off from the ESC Supervisor. The ESC supervisor shall provide sign-off documentation to the Engineer-of-Record and City.
2.2 Should the site contain or be adjacent to a park, the clearing and grubbing Contractor shall contact the Parks Department to discuss the removal of hazardous trees. Perimeter ESC measures to be installed after meeting with City Parks Department as applicable and prior to initiating the on-site clearing and grubbing.
2.3 Upon the commencement of the works, the ESC Supervisor shall conduct inspecting, monitoring, sampling and reporting as per the City's ESC By-law requirements.
2.4 As soon as they have been set to finished subgrade level, all exposed surfaces of landscape areas shall be immediately top soiled and seeded, and/or sprayed with mulch.
2.5 Install protective measures at or within new and existing catch/lawn basins as applicable and such works shall be constructed in accordance with the applicable detail.
2.6 Prior to leaving the site, on-site clearing and grubbing contractor to obtain sign off by the ESC supervisor.
2.7 Developer will be responsible to provide a copy of the ESC plan and permit to the general contractor.
2.8 Contractor to have a copy of the approved ESC plans and ESC permit on-site at all times, and ensure ESC signage is in place.
2.9 If any sediment is tracked on to any paved surfaces, it shall be removed immediately with shovels, sweeping and/or other approved means in such a way as to leave the paved surface free of sediment; under no circumstances shall sediment be removed from paved surfaces by flushing with water.

3.0 MAINTENANCE

- 3.1 The Contractor and ESC supervisor shall, at all times while construction is proceeding on-site, ensure that the sediment control works are properly maintained and working adequately to control the levels of sediment in water discharging from the site of the work to within the limits set forth herein.
3.2 The Contractor shall be responsible for the maintenance of the sediment control facility(ies) from the commencement of the work up to the decommissioning of the work. Maintenance by the Contractor shall ensure that the pond is functioning and cleaned as directed by the ESC Supervisor, Engineer-of-Record, City and/or the Owner. Pond maintenance shall include, but is not limited to the following works:
a) Cleaning out accumulated sediment from pond bottom and pond control structures including replacement of silt fences and gravels as required.
b) Repairing all features of sediment control facility such as fencing, slope, and control structures.
c) Vacuuming accumulated sediment in the inlet and outlet storm mains.
3.3 Should any part of the sediment control works become damaged or blocked, or in any other way not function properly, then the Contractor shall immediately take all steps necessary to repair and/or remove such damage, blockage, or other cause of malfunction and shall perform any other necessary remedial measures as follows:
a) Where the deficiency has been identified by the Contractor and where the Contractor reasonably considers that it is the appropriate course of action, the Contractor shall restore, to its original condition or better, that part of the sediment control works which is not functioning properly.
b) Where the Contractor does not consider restoring the deficient part of the sediment control works to its original condition or better to be the appropriate course of action, or where remedial works performed under the above clause do not result in the deficient part of the sediment control works functioning properly, the Contractor shall refer the matter to the Engineer-of-Record and ESC Supervisor for direction.
c) Where the Engineer-of-Record and/or ESC Supervisor directs that remedial measures be undertaken further by the above clause, or as a result of any other deficiency in any part of the sediment control works identified or noted during these periodic inspections, or otherwise brought to their attention, the Contractor shall immediately undertake such remedial measures in strict accordance with the directions of the ESC Supervisor.
3.4 Gravel access/exit pads are to be inspected daily by the Contractor to ensure functionality and the Contractor shall add additional rock as required.
3.5 The Contractor shall remove all settled sediment from all sediment basins after each storm event or whenever the volume of settled sediment has exceeded 30% of the design sediment storage capacity, whichever occurs first.
3.6 All catch basin sediment traps shall be inspected daily and/or prior to any expected storm events and during and following any storm events. sediment traps are to be cleaned at 40% sediment capacity.
3.7 Sediment fences/barriers to be inspected and repaired prior to any expected storm events and following all storm events or periods of extended rain. Accumulated sediment greater than 30% of the silt fence capacity or deficiencies shall be dealt with immediately.
3.8 Accumulated sediment deposition behind gravel check dams are to be removed at 50% sediment capacity.
3.9 Any truck wheel wash and all sumps shall be checked daily and shall be cleaned out when the depth of silt accumulated at the bottom exceeds 75mm.
3.10 Accumulated sediment removed during sediment basin maintenance, and sediment removed from any truck wheel wash or sump or any other part of the sediment control works, shall be disposed of in such a manner as to prevent its re-entry into the site drainage system, and/or into any other drainage system and/or into any watercourse and where necessary it shall be hauled offsite and disposed of in an approved manner at an approved offsite location at the Contractor's expense.
3.11 On lots under 2000 m², upon the issuance of a building permit the Developer/Owner/person(s) responsible will be held accountable for maintaining individual lot ESC measures; not negating the ESC Supervisor's responsibilities under the active permit.
3.12 All sediment removed from ESC control facilities to be disposed of in a manner as to not compound or compromise the sediment loading of other control measures.

4.0 INSPECTING, MONITORING & REPORTING

- 4.1 The appointed ESC Supervisor is responsible for inspecting and monitoring the ESC Facilities on the approved ESC plans including reporting to ensure sediment and sediment-laden water will not reach the City's drainage system. The ESC Supervisor shall keep detailed notes for each site visit in a logbook which shall contain the following minimum information:
-Water turbidity levels;
-NTU concentrations, (samples measured as per the City's sediment control policy);
-Observed ESC Facilities conditions, and
-Details of any remedial measures undertaken or recommendations made.
The logbook must be made available to the City and Engineer upon request.
4.2 The ESC Supervisor is responsible for immediately notifying the City, Engineer of Record, Contractor and Owner/Developer of when an infraction occurs or termination pursuant to the ESC By-law No. 2833, 2019 or ESC Permit.
4.3 A waterproof copy of any issued ESC Permit must be posted in a location visible from outside the Construction on the land, and for the duration of the Construction. In addition, the sign shall clearly state the name and phone number of the appointed ESC Supervisor and the City By-law Officer.
4.4 Once the erosion and sediment control works have been completed, and before the start of any other on-site construction, the Contractor shall notify the Engineer and ESC Supervisor, and they will inspect the sediment control works and the downstream drainage system to ensure that these systems are installed and constructed in accordance with the approved ESC drawings. The Engineer and/or ESC Supervisor will notify the Contractor of any deficiencies in the sediment control works, and the Contractor shall, before proceeding with any other on-site construction and to the satisfaction of the Engineer and ESC Supervisor, first rectify all such deficiencies in the sediment control works which are identified by the Engineer and/or ESC Supervisor.
4.5 The ESC Supervisor shall, throughout the duration of this project, perform weekly inspections and after each significant rainfall event (defined as any precipitation event which meets or exceeds the intensity of 25 mm of total rainfall depth in a 24-hour period) of all component parts of the sediment control works to verify that all component parts of the sediment control works are functioning properly and to provide adequate written reports. During extended periods of dry weather (i.e. summer months) the ESC Supervisor may perform bi-weekly inspections with written approval from the City.
4.6 Throughout the duration of this project, the Contractor shall inspect all components of the sediment control works at least once a week (except that the truck wheel wash shall be inspected daily if applicable), and during periods of significant rainfall at least daily to verify that all components of the sediment control system are functioning properly. In order to adequately fulfill this provision, this may require inspections to be performed during the night or on weekends.

5.0 SAMPLING

- 5.1 Samples of storm water runoff shall be taken at the locations as directed by the ESC Supervisor which might include any or all of the outlet(s) from the sediment basin as shown on the approved ESC Plan, the discharge point for drainage from the site into the receiving drainage facility, and within the receiving drainage facility both upstream and downstream of the point where it receives flows from the site.
5.2 When the first significant rainfall event following construction of the sediment control system commences, the Contractor shall immediately notify the ESC Supervisor and they shall take water samples during or immediately after this rainfall event.
5.3 The ESC Supervisor shall take water samples during a dry weather period shortly after construction of the sediment control system and when there is a flow discharging from the sediment basins.
5.4 The ESC Supervisor shall take water samples whenever any discharges are noted leaving the site during any inspections and during or immediately after each and every significant rainfall event.
5.5 Significant Rainfall Event is defined as any precipitation event which meets or exceeds the intensity of 25mm of total rainfall depth in a 24 hour period. Refer to closest rain gauge, Katzie Pump Station for all the rainfall monitoring values for all storm events using the applicable rain gauge station.
5.6 The NTU levels in storm water flows leaving the site must not be greater than 50 NTU's.
5.7 If the measured NTU levels exceed the limits set forth above, the Contractor shall either reduce or if necessary completely discontinue any construction activity which might generate sediment so as to bring the NTU levels to within the above limits. The Contractor shall not resume his full level of construction activity until appropriate remedial measures have been undertaken and the NTU levels have been brought down to and remain within the above limits.
5.8 If the allowable NTU levels are exceeded, the Contractor shall immediately consult with the ESC Supervisor, and the ESC Supervisor shall formulate appropriate corrective measures which shall be implemented immediately by the Contractor in strict accordance with the directions of the ESC Supervisor.
5.9 If sampling for other specified criteria for contamination is required, the laboratory shall provide testing for the specified contamination. If any contamination exceeds permitted levels, the Contractor shall immediately consult with the Environmental Consultant, and the Environmental Consultant shall formulate appropriate corrective measures which shall be implemented immediately by the Contractor in strict accordance with the directions of the Environmental Consultant.
5.10 All (storm) water samples shall be collected in approved sample bottles provided by the approved laboratory which bottles are to be clean and properly capped, and shall be sent to Norwest Labs (or approved equal) for total suspended solids determination.
5.11 Notwithstanding any other clauses herein, personnel and laboratory facilities used to sample and analyze the quality of the water being discharged from the site shall be acceptable to DFO and MOE.

6.0 UTILITY AND ROADWORKS INSTALLATION STAGE

- 6.1 Contractor to install temporary sediment containment and control measures as specified in the approved ESC plan and as directed by the ESC supervisor.
6.2 Contractor to install additional sediment fencing as indicated on the ESC plan and as directed by the ESC supervisor or Engineer-of-Record.
6.3 All access to and from site to be from the restricted entry-exit points.
6.4 ESC supervisor to conduct monitoring as per the Katzie Reserve/and City of Pitt Meadows monitoring and reporting requirements.
6.5 Contractor to ensure that ESC measures are well maintained, cleared, repaired, or replaced as required.
6.6 Catch/lawn basins complete with protective measures are to be installed by the contractor at the first opportunity.
6.7 Contractor to co-ordinate the elimination of temporary ESC facilities if they are no longer required or to facilitate site operations with the Engineer-of-Record and/or ESC supervisor. Additional ESC facilities may need to be installed as per the direction of the Engineer-of-Record and/or ESC supervisor.

7.0 FINAL GRADING STAGE THROUGH TO SUBSTANTIAL COMPLETION

- 7.1 General contractor to ensure that stormwater conveyance channels and discharge points to adjacent streams, ditches, or entry points to piped networks, are adequately protected.
7.2 Contractor to ensure that ESC facilities specified in the ESC plan or any addendums are implemented accordingly.
7.3 After final lot grading is completed, all disturbed areas are to be protected as per the ESC plan or Landscape Plan (as applicable).
7.4 Contractor to co-ordinate the elimination of temporary ESC facilities as they are no longer required with the Engineer-of-Record and/or the ESC Supervisor. Additional ESC facilities may need to be installed as per the direction of the Engineer-of-Record and/or the ESC Supervisor.
7.5 At final site inspection prior to the site going onto maintenance (if applicable), the Engineer-of-Record and the ESC Supervisor in association with the drainage and environment staff are to inspect and sign off on ESC measures prior to the site going onto maintenance.
7.6 Developer to ensure that the lot Owner and/or Builder are notified of existing ESC facilities and their responsibilities to ensure that individual private on-site sediment control measures are put in place and perform to the standard of the ESC bylaw.
7.7 Developer to retain the services of the ESC Supervisor until 100% of building construction including landscaping of the lot(s) has been completed. The ESC permit will be in full force and effect during this time period.

8.0 DECOMMISSIONING

- 8.1 The Contractor shall make a request for decommissioning the sediment control works once the site has reached substantial completion, which means at a minimum 100% of all house construction is complete and the land is ready for use, or is being used for the purpose intended.
8.2 Once written approval is granted to decommission the sediment control works, the Contractor shall remove all sediment control works which are required to be removed to complete the project, and, unless otherwise directed, shall dispose of any excess materials off-site in an approved manner at an approved offsite location, and shall reinstate or complete the construction of any works necessary to complete the project all to the complete satisfaction of the Engineer-of-Record, ESC Supervisor, and the City. These works shall only be completed during dry weather.
8.3 Following decommissioning of the sediment control works, the Contractor shall notify the ESC Supervisor, Engineer-of-Record, and the City for an inspection to verify that there are no unacceptable residual sediment levels in the downstream drainage system. The Contractor shall take any and all steps necessary to remove any such residual sediment levels in the downstream drainage system.
8.4 Where confirmed by the ESC supervisor, the Contractor shall remove the sediment pond and fill it with structural fill material. The Contractor shall retain and pay for a Geotechnical Engineer certifying the fill material is compacted and suitable for building construction.
8.5 Where informed by the ESC supervisor, the Contractor shall remove temporary plug(s), install plug(s) on temporary pipe(s) into the sediment pond, bench manholes to MMCD standards and clean the storm system.

9.0 RESPONSIBILITIES

- 9.1 Under this plan, all person(s) including but not limited to the Developer, Owner of the land, the Engineer of Record, ESC Supervisor, Contractor, Sub-Contractor, Builder, and Building Sub-Trades herein after referred to as the Owner/Developer/person(s) shall comply with all their applicable regulatory requirements specified by federal, provincial, and municipal authorities; pertaining to on-site management and discharge associated with erosion and sediment control regulations.
9.2 In accordance with Katzie Reserve/and City of Pitt Meadows Municipal Erosion & Sediment Control (ESC) By-law No. 2833, 2019 (the By-law), the ESC permit (the permit) of which this plan forms part thereof; deems the permit holder ultimately responsible for all site activities that result in a breach of compliance with the By-law for the duration of the permit.
9.3 The Developer/Owner/person(s) responsible shall ensure that all construction activities are undertaken in a manner that ensures best management practices are implemented to prevent and contain on-site sediment laden runoff that exceeds 50 NTU as specified by the By-law, from entering downstream drainage infrastructure and aquatic systems.
9.4 The ESC Supervisor specified under the ESC permit is responsible to monitor, inspect and report to the Developer, Contractor, Engineer of Record, and City on erosion and sediment control facilities and site discharge performance in accordance to the City's sediment control policies.
9.5 The Developer/Owner/person(s) responsible must comply with the ESC plan within the specified timeframe and comply with all instructions issued by the ESC Supervisor to rectify deficiencies that result in non-conformance with the permit.
9.6 On individual lots the Developer/Owner/person(s) responsible are held accountable during construction for implementing individual lot siltation controls as deemed necessary/specified to achieve the requirements of the By-law. Developer/Owners/person(s) responsible are required to implement appropriate sediment control measures regardless of the status of any permit on the lot.
9.7 All site and/or lot access from disturbed areas to paved surfaces is to be restricted to specified access facilities to limit the transport of sediment onto roadways. During the homebuilding phase, vehicles access to disturbed areas is to be limited to gravel pads only.

10.0 OFFENCES AND ENFORCEMENT

- 10.1 The General Manager of Engineering, a designated staff from the Engineering Department of the City, or any City By-law Enforcement officer may enter upon any Land to carry out field measurements and conduct inspections as reasonably necessary to ascertain whether there is compliance with the provisions of this By-law or an ESC Permit issued pursuant to the By-law.
10.2 Upon field measurements, or ESC Facilities inspection where the Owner and/or Developer has failed to maintain the validity of the ESC Permit or meet the provisions of the By-law, the General Manager of Engineering, a designated staff from the Engineering Department of the City, or any City By-law enforcement officer may serve on the Owner, Developer, or ESC Supervisor a Notice to Comply which requires the Owner and/or Developer to remedy the non-compliance within 24 hours. If in the opinion of the General Manager of Engineering special circumstances exist, the non-compliance shall be remedied on a date the General Manager of Engineering considers reasonable given the circumstances.
10.3 Following issuance of a Notice to Comply, all Construction on the Land shall cease except for those works necessary to achieve compliance.
10.4 The Notice to Comply must be served on the Owner and/or Developer and/or the named ESC Supervisor by personal service or return registered mail to the address of the Owner and/or Developer and/or ESC Supervisor of the ESC Permit as it appears on the ESC permit application. The Notice to Comply is deemed to have been served on the third day after mailing.
10.5 The City may notify the Department of Fisheries and Oceans Canada and the British Columbia Ministry of Environment of the issuance of any Notice to Comply.
10.6 All persons who commit an offence against the By-law shall be subjected to a violation ticket in the amount and for offences prescribed in Surrey Municipal Ticket Information Utilization By-law, 1994, No. 12508, as amended.
10.7 Any Persons who violates a provision of their ESC Permit or the By-law commits an offence punishable on summary conviction and shall be liable to a fine of not less than Two Thousand (\$2,000) Dollars and not more than Ten Thousand (\$10,000) Dollars for each day on which an offence exists or is continuing, together with such costs as a court of competent jurisdiction may order. For the purposes of enforcing any judgment of a court or collecting any fine levied hereunder, the provisions of the Offence Act, R.S.B.C. 1996 c. 338, as amended, shall apply.
10.8 Where an offence is a continuing offence, each day that the offence continues shall constitute a separate and distinct offence with the same minimum and maximum fines as set out above.

ALL SEDIMENT AND EROSION CONTROL WORKS SHALL BE UNDERTAKEN IN FULL COMPLIANCE WITH THE "EROSION & SEDIMENT CONTROL DETAILS" SHEET, THE EROSION & SEDIMENT CONTROL NOTES" SHEET AND THE CURRENT KATZIE RESERVE ESC BY-LAW NO. 2833, 2019.

NOTE: SIGNIFICANT RAINFALL EVENT IS CONSIDERED TO BE 25mm/24hrs.

LOCATION OF CITY RAIN GAUGE STATION: KATZIE PUMP STATION REFER TO KATZIE PUMP STATION RAIN GAUGE FOR THE RAINFALL MONITORING VALUES FOR ALL STORM EVENTS. A SIGNIFICANT RAINFALL EVENT IS CONSIDERED TO BE 25MM OR GREATER OF TOTAL RAINFALL DEPTH IN A 24 HOUR PERIOD.

SITE SOIL COMPOSITION: SILTY SAND AND GRAVELS, UNDERLAIN BY SILT TO SILTY SAND. APPROXIMATE DISTURBED AREA = 7.09 Ha.

Table with 4 columns: REV., DATE, DESCRIPTION, BY. Row 1: 2, FEB 10/22, ADDRESS COMMENTS, KK. Row 2: 1, NOV 17/21, ISSUED FOR MUNICIPAL REVIEW, KK.

Table with 2 columns: SURVEY BENCHMARK MON: 88H0617, SCALE FACTOR: 6.525m (GEODETIC). Row 1: 2, FEB 10/22, ADDRESS COMMENTS, KK.

CONSULTANT Hub Engineering Inc. Engineering and Development Consultants. EGBC Permit to Practice Number: 1003404. Suite 212, 12992 - 76 Avenue, Surrey, B.C. V3W 2V6. Tel: 604-572-4328 | Fax: 604-501-1625 | mail@hub-inc.com www.hub-inc.com

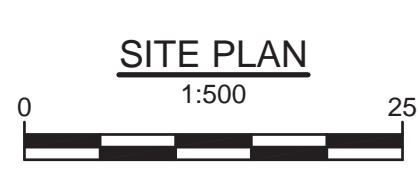
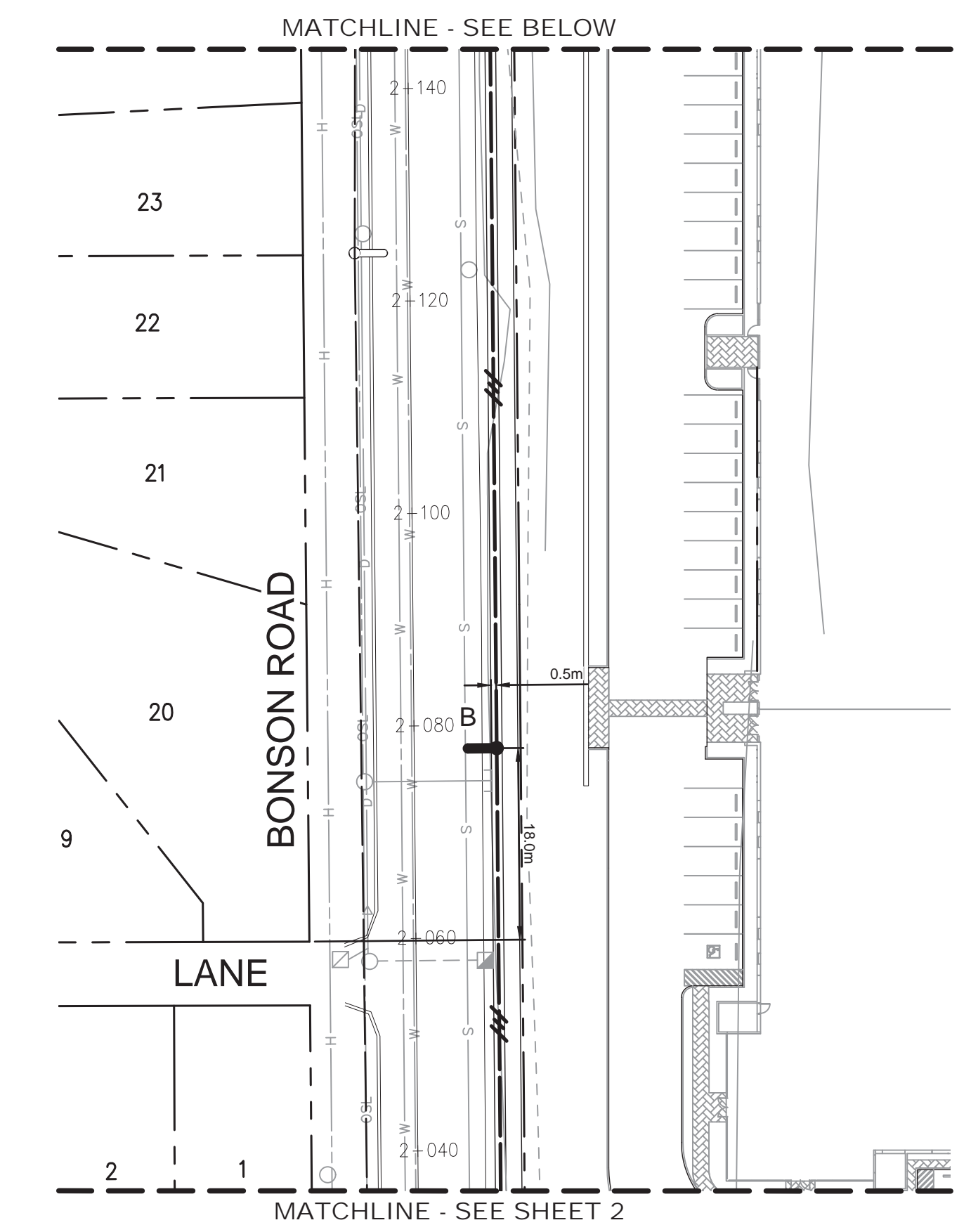
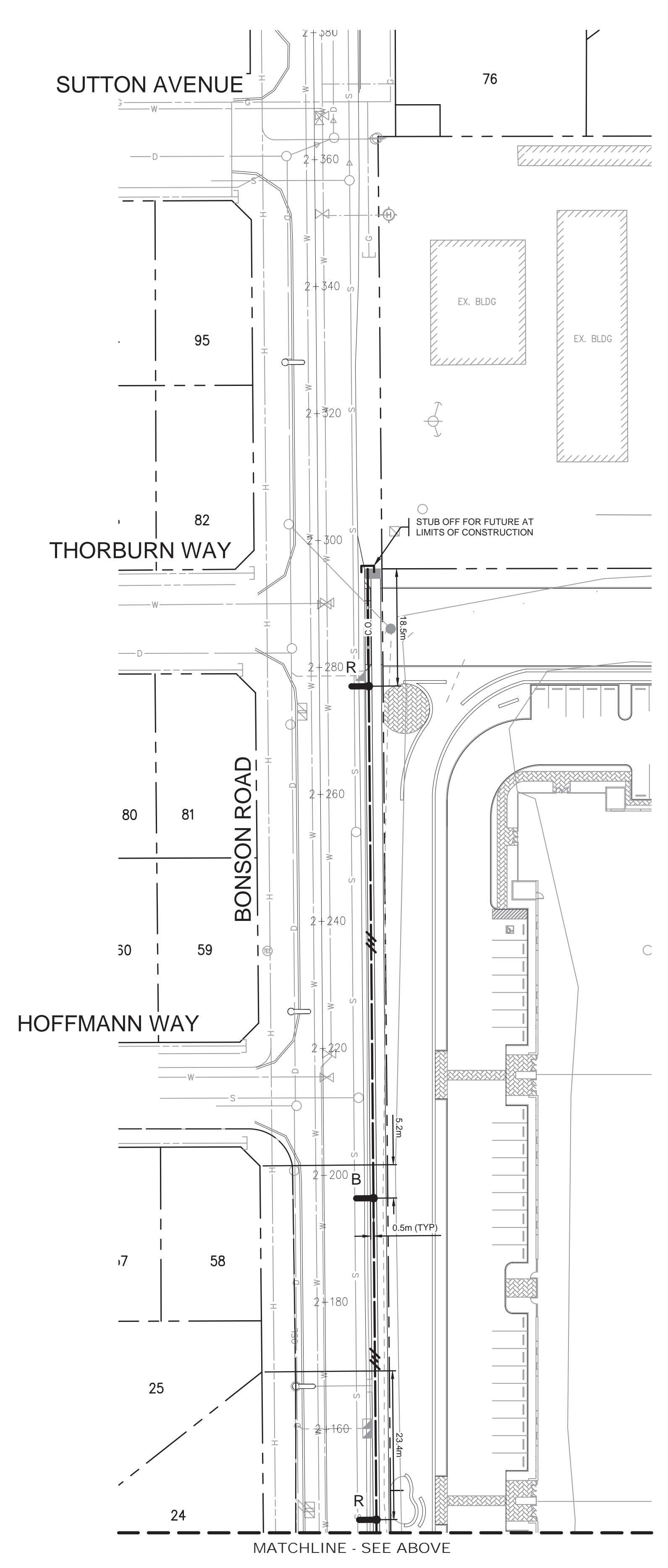
EAGLE MEADOWS BUSINESS PARK logo and name.

CLIENT EM BUSINESS PARK LTD. 1910 - 117 WEST HASTINGS STREET VANCOUVER, B.C., V6E 2K3. TITLE ESC NOTES.

SEAL Feb 11, 2022

SCALE: HOR. VERT. DATE: FEB 2020. CONSULTANT PROJ. NO. 20001. MUNICIPAL PROJECT NUMBER. DRAWING TYPE: EROSION & SEDIMENT CONTROL. REV. 2.

©: \projects\2020\esc\hub Drawings\esc-base.dwg [ESC-NOTES] 2/11/2022 1:52PM



LEGEND

- PROPOSED 9.0m DAVIT STREETLIGHT POLE ON A TYPE C CONCRETE BASE. REFER TO NOTES FOR DETAILS.
- PROPOSED 7.5m DAVIT STREETLIGHT POLE ON A TYPE C2 CONCRETE BASE. REFER TO NOTES FOR DETAILS.
- EXISTING DAVIT STREETLIGHT POLE
- EXISTING 8.1m DAVIT STREETLIGHT POLE w/ PHOTOCELL AND SERVICE PANEL IN A 0.9m SERVICE BASE
- EXISTING POST TOP STREETLIGHT POLE
- PROPOSED 3 No. 6 RW90 STREET LTG. AND 1 No. 8 RW90 BOND IN 35mm RPVC
- PROPOSED 35mm RPVC CONDUIT ONLY STUB OUT (CAP & MARK LOCATION)
- EXISTING CONDUIT AND CONDUCTORS
- EXISTING SERVICE CONDUCTORS IN CONDUIT
- PROPOSED LARGE ROUND JUNCTION BOX C/W BONDED GALVANIZED STEEL LID (2 SECTIONS DEEP)
- EXISTING BC HYDRO SERVICE BOX
- LUMINAIRE ON RED PHASE CONDUCTOR
- LUMINAIRE ON BLACK PHASE CONDUCTOR
- EXISTING BC HYDRO POLE

STREET LIGHTING NOTES:

1. ALL WORK SHALL BE CONSTRUCTED IN ACCORDANCE WITH THE PITT MEADOWS SUBDIVISION AND DEVELOPMENT SERVICING BY LAW 2013, No. 2589, THE MASTER MUNICIPAL CONSTRUCTION DOCUMENTS (MMCO) AND THESE DRAWINGS.
2. ALL LUMINAIRES SHALL HAVE 7-PIN RECEPTACLES AND BE APPROVED PER THE APPROVED MATERIALS LIST IN THE SUPPLEMENTARY MASTER MUNICIPAL CONSTRUCTION DOCUMENTS.
3. ALL STREET LIGHT POLES ARE TO BE HOT-DIPPED GALVANIZED.
4. IT IS THE RESPONSIBILITY OF THE DEVELOPER TO CONFIRM THE ADEQUACY OF THE EXISTING STREET LIGHT SERVICE, SERVICE BASE, CONDUIT AND CONDUCTORS AND MAKE ALL NECESSARY REPAIRS TO ADEQUATELY COMPLETE ALL CONNECTIONS INTO THE EXISTING STREET LIGHT SYSTEM.
5. THE DEVELOPER IS TO ENSURE THAT ALL STREET LIGHT POLES ARE A MINIMUM 3.0m CLEAR OF ALL BC HYDRO POLES AND OVERHEAD PRIMARY WIRES AND 1.0m CLEAR OF ALL OVERHEAD SECONDARY WIRES PRIOR TO INSTALLING BASES.
6. ALL STREET LIGHTS ARE TO BE MINIMUM 1.0m CLEAR OF ALL DRIVEWAYS.
7. CONDUCTORS INSIDE STREET LIGHT POLES SHALL BE: No. 12 RW90 X-LINK (C0) No. 12 RW90 BOND (C0)
8. A TRON HEB SERIES WEATHERPROOF FUSE HOLDER C/W A 10A BUSS KTK 10 FUSE AND 2" TYPE INSULATING BOOTS (OR APPROVED EQUAL), SHALL BE INSTALLED ON EACH LUMINAIRE LIVE CONDUCTOR IN THE HANDHOLE.
9. REFER TO LUMINAIRE PRODUCT LIST FOR LUMINAIRE SPECIFICATIONS.
10. POLE HANDHOLES TO BE ORIENTED DOWNSTREAM OF TRAFFIC.
11. ALL OFFSETS ARE FROM FACE OF CURB (F.O.C.) UNLESS OTHERWISE NOTED.
12. BOND ALL STEEL JUNCTION BOXES DIRECTLY ON LIDS (PLASTIC BONDING TAB SHALL NOT BE UTILIZED)

ROADWAY LIGHTING DESIGN CRITERIA		
STREET NAME(S)	BONSON ROAD	
LAND USE	RESIDENTIAL	
PEDESTRIAN CONFLICT	LOW	
ROAD CLASSIFICATION	COLLECTOR	
ILLUMINATION TYPE	81W LED, 9.0m DAVIT	
SPACING (MAX)	51.5m STAGGERED	
ITEM	DESIGN REQUIREMENTS	DESIGN ACHIEVED
ROADWAY ILLUMINANCE LEVEL (E _{av})	≥ 6.0 LUX	9.7 LUX
ROADWAY AVG UNIFORMITY RATIO (E _{min} /E _{av})	≤ 4.0:1	2.9:1

LUMINAIRE SCHEDULE				
LOCATION	MANUFACTURER	WATTAGE	SPECIFICATION	NOTES
ROADWAY LUMINAIRE	LUMEC	81W	RFM-80W48LED-4K-C2-R3M-UNV-DMG-RCD7-FAWS-G13	C/W SHORTING CAP

CITY TO CONFIRM LUMINAIRE MODEL AND COLOUR TEMPERATURE

**ISSUED FOR REVIEW
- NOT FOR CONSTRUCTION**

UTILITY CONFLICT VERIFICATIONS
UNDERGROUND UTILITIES SHOWN IN THE SITE PLAN ARE APPROXIMATE LOCATIONS AND SOME MAY NOT BE SHOWN. IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO VERIFY AND CONFIRM EXACT LOCATIONS OF ALL UNDERGROUND UTILITIES ON SITE PRIOR TO ORDER OF MATERIALS AND COMMENCING ANY WORK. IN THE EVENT OF ANY UTILITY CONFLICTS, THE CONTRACTOR SHALL NOTIFY THE CONSULTANT. FAILURE TO NOTIFY THE CONSULTANT WILL BE AT THE RISK OF THE CONTRACTOR.

CHECK OVERHEAD CLEARANCES
THE CONTRACTOR SHALL ENSURE THAT ALL POLES AND APPURTENANCES WILL MEET BC HYDRO AND WORK SAFE BC CLEARANCES PRIOR TO ORDER OF MATERIALS AND COMMENCING ANY WORK. THE CONTRACTOR SHALL REPORT ANY CONFLICTS TO THE CONSULTANT. FAILURE TO NOTIFY THE CONSULTANT WILL BE AT THE RISK OF THE CONTRACTOR.

BC ONE CALL
CALL BEFORE YOU DIG
1-800-474-6886 OR BY
CELLULAR 16886
VANCOUVER AREA 257-1940

CALL AT LEAST THREE FULL WORKING DAYS BEFORE YOU PLAN TO DIG

LEGAL DESCRIPTION: KATZIE RESERVE No. 1

SURVEY BENCHMARK MON: B8H0617		SCALE FACTOR: ELEV.: 6.525m (GEODETTIC)	
REV.	DATE	DESCRIPTION	BY
1	NOV. 17/21	ISSUED FOR REVIEW	TV

PRIMARY

BURNABY OFFICE
209 - 8327 Eastlake Drive
Burnaby, BC V5A 4W2
604.558.0401
burnaby@primaryeng.com
HR2955

CONSULTANT
Hub Engineering Inc.
Engineering and Development Consultants

Member
PACIFIC HUB GROUP

Suite 212, 12992 - 76 Avenue, Surrey, B.C. V3W 2V6
tel: 604-572-4328 | fax: 604-501-1625 | mail@hub-inc.com
www.hub-inc.com

EAGLE MEADOWS
BUSINESS PARK

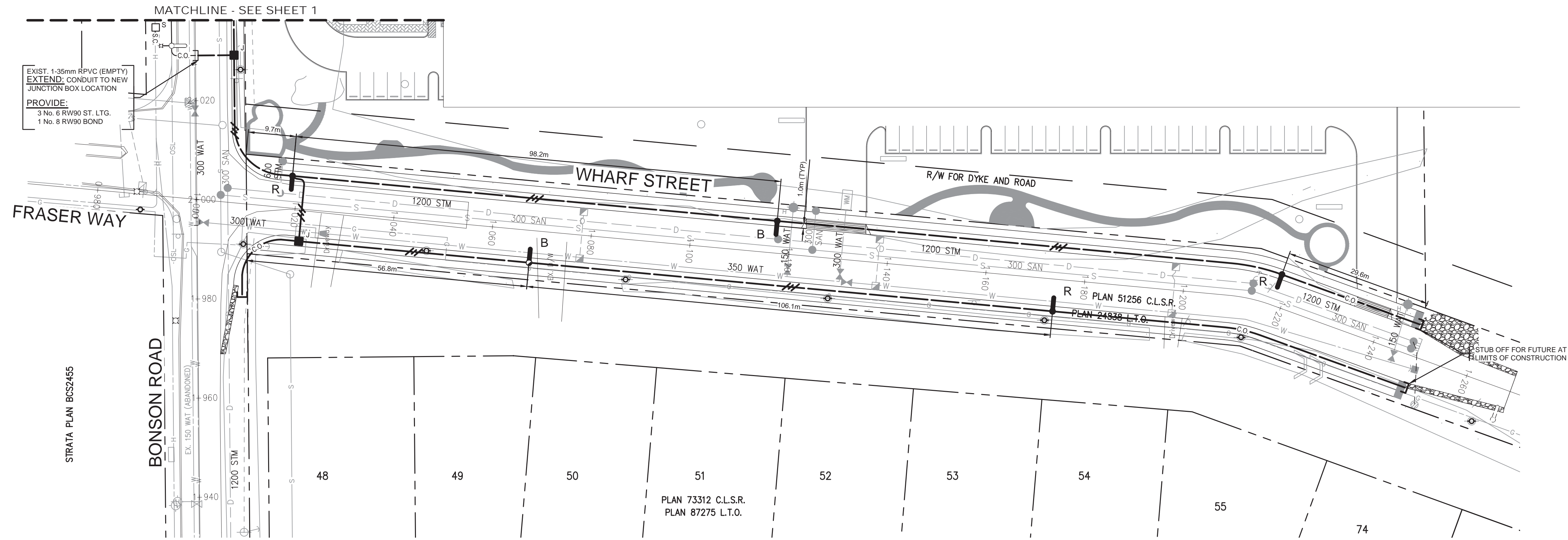
CLIENT
EPTA DEVELOPMENT CORP.
1910 - 117 WEST HASTINGS STREET
VANCOUVER, B.C., V6E 2K3

TITLE
STREET LIGHTING
KATZIE RESERVE No. 1

SEAL
PERMIT # 1002839
PROFESSIONAL
K S RAI
44910
ENGINEER
2021-12-07

SCALE: HOR. 1:500 VERT.	DATE (YYYY.MM.DD) 2021.08.30	DRAWING TYPE
DESIGNED TV	CONSULTANT PROJ. NO. 20001	STREET LIGHTING
DRAWN TV	DWG. NO.	
REVIEWED DIS/KR	REV. 1	

DESTROY ALL PRINTS BEARING PREVIOUS NUMBER




ROADWAY LIGHTING DESIGN CRITERIA		
STREET NAME(S)	WHARF STREET	
LAND USE	RESIDENTIAL	
PEDESTRIAN CONFLICT	LOW	
ROAD CLASSIFICATION	COLLECTOR	
ILLUMINATION TYPE	81W LED, 9.0m / 7.5m DAVIT	
SPACING (MAX)	55.0m STAGGERED	
ITEM	DESIGN REQUIREMENTS	DESIGN ACHIEVED
ROADWAY ILLUMINANCE LEVEL (E _{min})	≥ 6.0 LUX	9.1 LUX
ROADWAY AVG UNIFORMITY RATIO (E _{min} /E _{max})	≤ 4.0:1	3.0:1

ISSUED FOR REVIEW
- NOT FOR CONSTRUCTION

UTILITY CONFLICT VERIFICATIONS
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CALL AT LEAST THREE FULL WORKING DAYS BEFORE YOU PLAN TO DIG

LEGAL DESCRIPTION: KATZIE RESERVE No. 1

SURVEY BENCHMARK: MON: 88H0617 LOC: - SCALE FACTOR: ELEV.: 6.525m (GEODETTIC)

REV.	DATE	DESCRIPTION	BY
1	DEC. 02/21	ISSUED FOR REVIEW	TV

PRIMARY.

BURNABY OFFICE
209 - 8327 Eastlake Drive
Burnaby, BC V5A 4W2
604.558-0401
burnaby@ptimaryeng.com
HR2955

CONSULTANT
Hub Engineering Inc.
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EAGLE MEADOWS
BUSINESS PARK



CLIENT
EPTA DEVELOPMENT CORP.
1910 - 117 WEST HASTINGS STREET
VANCOUVER, B.C., V6E 2K3

TITLE
STREET LIGHTING
KATZIE RESERVE No. 1

SCALE: HOR. 1:500
VERT.

DATE (YYYY.MM.DD)
2021.08.30

CONSULTANT PROJ. NO.
20001

DESIGNED TV
DRAWN TV
REVIEWED DIS/KR

DWG. NO.
B

REV. 1

SEAL
PERMIT # 1002839
K. S. RAI
44910
2021-12-07

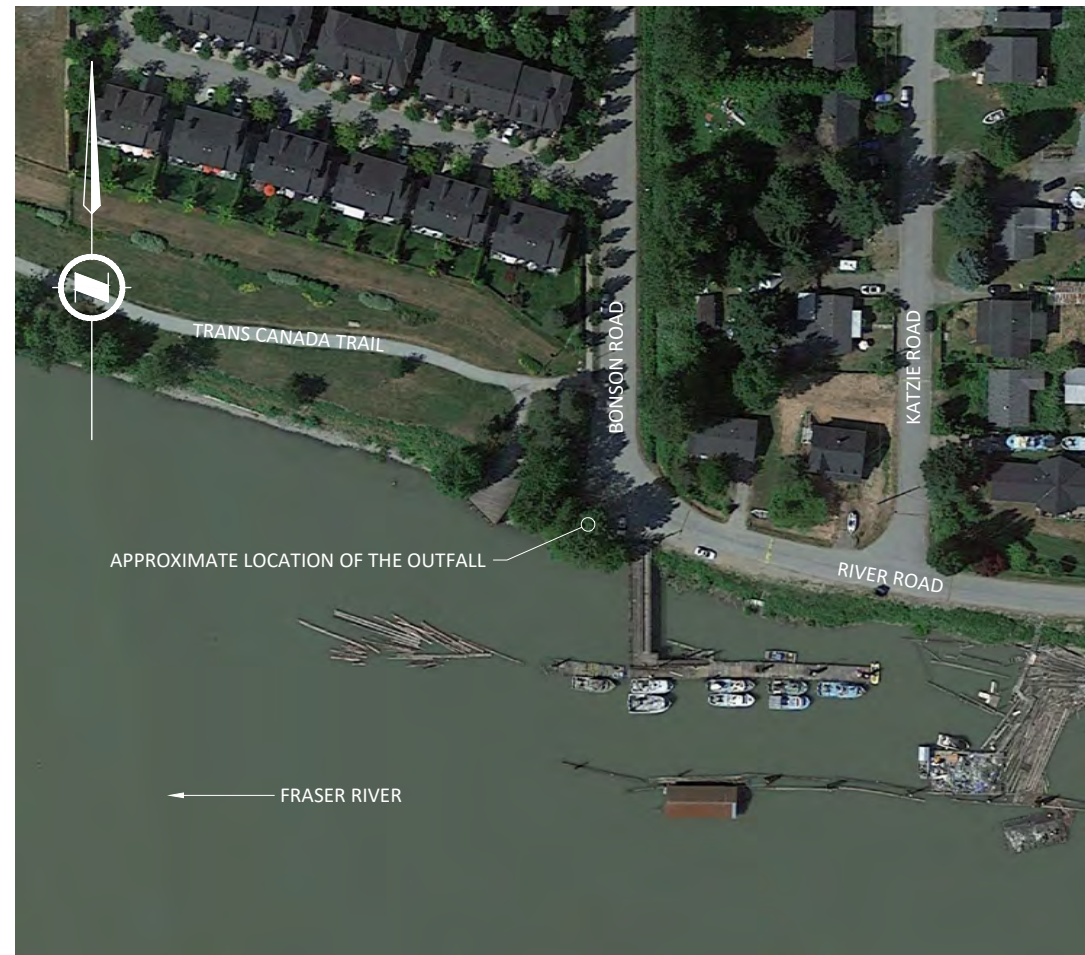
DRAWING TYPE
STREET LIGHTING

DESTROY ALL PRINTS BEARING PREVIOUS NUMBER

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EPTA DEVELOPMENT CORPORATION

BONSON ROAD OUTFALL



SITE PLAN
SCALE = NOT TO SCALE

DRAWING INDEX	
TITLE	REVISION
SITE PLAN, DRAWING INDEX, AND NOTES	0
PLAN, PROFILE, AND SECTIONS	0

1. GENERAL NOTES

- 1.1. ALL WORK IS TO COMPLY WITH CURRENT AUTHORIZATIONS AND PERMITS.
- 1.2. ALL ELEVATIONS, DIMENSIONS, AND QUANTITIES SHALL BE VERIFIED BEFORE CONSTRUCTION COMMENCEMENT.
- 1.3. DIMENSIONS ARE IN METRES UNLESS OTHERWISE STATED.
- 1.4. ALL ELEVATIONS ARE RELATIVE TO CANADIAN GEODETIC VERTICAL DATUM OF 1928 (CGVD28).
- 1.5. TABULATED ESTIMATES OF MASS AND VOLUMES ARE CLEAN LINE ESTIMATES AND ALLOWANCES FOR SETTLEMENT AND/LOSS ARE NOT INCLUDED.
- 1.6. SLOPES SHALL BE GRADED TO PROVIDE A SMOOTH, UNIFORM SURFACE. ALL STUMPS, LARGE ROCK, BRUSH, OR OTHER DEBRIS SHALL BE REMOVED. ALL DEPRESSIONS SHALL BE FILLED, AND LOOSE OR UNSTABLE SOILS SHALL BE REPLACED.
- 1.7. ESTIMATED MATERIAL QUANTITIES ARE BASED ON CLEAN LINE ESTIMATES. CONTRACTOR RESPONSIBLE TO CONFIRM QUANTITIES REQUIRED.

MATERIAL QUANTITIES			
ITEM	DESCRIPTION	UNIT	APPROXIMATE QUANTITY
1	CONCRETE OUTFALL	LS	1
2	FLOOD GATE	LS	1
3	HANDRAIL	LS	1
4	250-kg RIPRAP	m ³	130
5	GRANULAR FILTER	m ³	45
6	CRUSHED GRAVEL	m ³	1
7	DRAIN ROCK	m ³	3

2. MATERIALS

- 2.1. RIPRAP
 - 2.1.1. 250-kg RIPRAP IS TO BE USED FOR THE BANK ARMOURING.
 - 2.1.2. ROCK SHALL BE PREDOMINATELY ANGULAR AND BLOCKY.
 - 2.1.3. ROCK IS TO BE ROUGHLY EQUI-DIMENSIONAL; LENGTH NOT MORE THAN 2.4 TIMES THE WIDTH OR THICKNESS AS MEASURED AT THE MIDDLE OF THE STONE.
 - 2.1.4. PLACEMENT OF RIPRAP SHALL BE CARRIED OUT BY EXCAVATOR. END DUMPING USING CHUTES OR SIMILAR METHODS WILL NOT BE PERMITTED.
 - 2.1.5. RIPRAP GRADATION TO BE CONFIRMED PRIOR TO DELIVERY AND ON SITE BY THE SITE ENGINEER.
- 2.2. GRANULAR FILTER
 - 2.2.1. GRANULAR FILTER IS TO BE USED TO PROVIDE A FILTER LAYER BETWEEN THE RIPRAP AND THE UNDERLYING ROCK BANK/CHANNEL MATERIALS.
 - 2.2.2. THIS MATERIAL IS TO BE WELL GRADED GRAVEL, SAND, AND COBBLE.
 - 2.2.3. PLACEMENT OF THE FILTER ROCK SHALL BE INSPECTED BY THE SITE ENGINEER PRIOR TO BE PLACEMENT OF OVERLAYING MATERIAL, AND IMMEDIATE FOLLOWED BY PLACEMENT OF THE OVERLAYING MATERIALS.

2.3. CRUSHED GRAVEL

- 2.3.1. CRUSHED GRAVEL TO BE USED FOR HEADWALL FOUNDATION.
- 2.3.2. CRUSHED GRAVEL TO BE 19 mm CLEAR CRUSH AS PER MMCD STANDARD SPECIFICATION.
- 2.3.3. UNDERLYING SOIL TO BE VERIFIED BY GEOTECH ENGINEER BEFORE PLACEMENT OF GRAVEL.
- 2.3.4. GRAVEL PLACEMENT TO BE CONFIRMED BY GEOTECH ENGINEER PRIOR TO INSTALLATION OF HEADWALL.

2.4. DRAIN ROCK

- 2.4.1. DRAIN ROCK TO BE USED AT BACK SIDE (LANDSIDE) OF HEADWALL
- 2.4.2. DRAIN ROCK TO BE 25 mm DRAIN ROCK AS PER MMCD STANDARD SPECIFICATION.

2.5. ROCK GRADATION

ROCK GRADATION				
PERCENT PASSING (STONE SIZE IN MILLIMETRES FOR PERCENT PASSING)				
MATERIAL	15%	50%	85%	100%
250-kg RIPRAP	≥260	≥570	≥820	≤1000
GRANULAR FILTER	7.5-10	30-65	55-100	≤150

2.6. OUTFALL

- 2.6.1. OUTFALL TO BE CUSTOM PRECAST REINFORCED CONCRETE, ENGINEERED AND SUPPLIED BY LANGLEY CONCRETE (I.E. 2.7 X 2.5 m HEADWALL MAX SERIES) OR APPROVED EQUIVALENT.
- 2.6.2. OUTFALL TO BE APPROVED BY PROJECT ENGINEER PRIOR TO ORDERING.
- 2.6.3. CONTRACTOR TO VERIFY SELECTED HEADWALL, FLOODGATE, AND PIPE ARE COMPATIBLE (I.E. SUFFICIENT OPENING SIZE AND SPACING).
- 2.6.4. HANDLING, STORAGE, AND INSTALLATION TO FOLLOW SUPPLIER/MANUFACTURER'S RECOMMENDATIONS.

2.7. FLOODGATE

- 2.7.1. OUTFALL FLOODGATE TO BE NEOPRENE DUCK-BILL CHECK VALVE WITH STAINLESS STEEL FASTENERS, SUCH AS TIDEFLEX TF-1 OR APPROVED EQUIVALENT.
- 2.7.2. FLOOD GATE TO BE APPROVED BY PROJECT ENGINEER PRIOR TO ORDERING
- 2.7.3. CONTRACTOR TO VERIFY SELECTED HEADWALL, FLOODGATE, AND PIPE ARE COMPATIBLE (I.E. SUFFICIENT OPENING SIZE, SPACING, AND GATE FITS ON O.D. OF PIPE).
- 2.7.4. HANDLING, STORAGE, AND INSTALLATION TO FOLLOW SUPPLIER/MANUFACTURER'S RECOMMENDATIONS.

NOT FOR CONSTRUCTION



Epta Development Corporation
1910-1177 West Hastings Street
Vancouver, BC
Canada V6E 2K3



30 Gostick Place
North Vancouver, BC
Canada V7M 3G3
Office: 604.980.6011
Fax: 604.980.9264
www.nhcweb.com

REVISIONS			DRAWING INFORMATION	
0	14 Sep 2021	ISSUED FOR REVIEW	DATE	14 Sep 2021
			DESIGNED BY	HXH
			DRAWN BY	BXH
			CHECKED BY	DPM
			SHEET SIZE	B (11" x 17")

BONSON ROAD OUTFALL

Site Plan, Drawing Index, and Notes

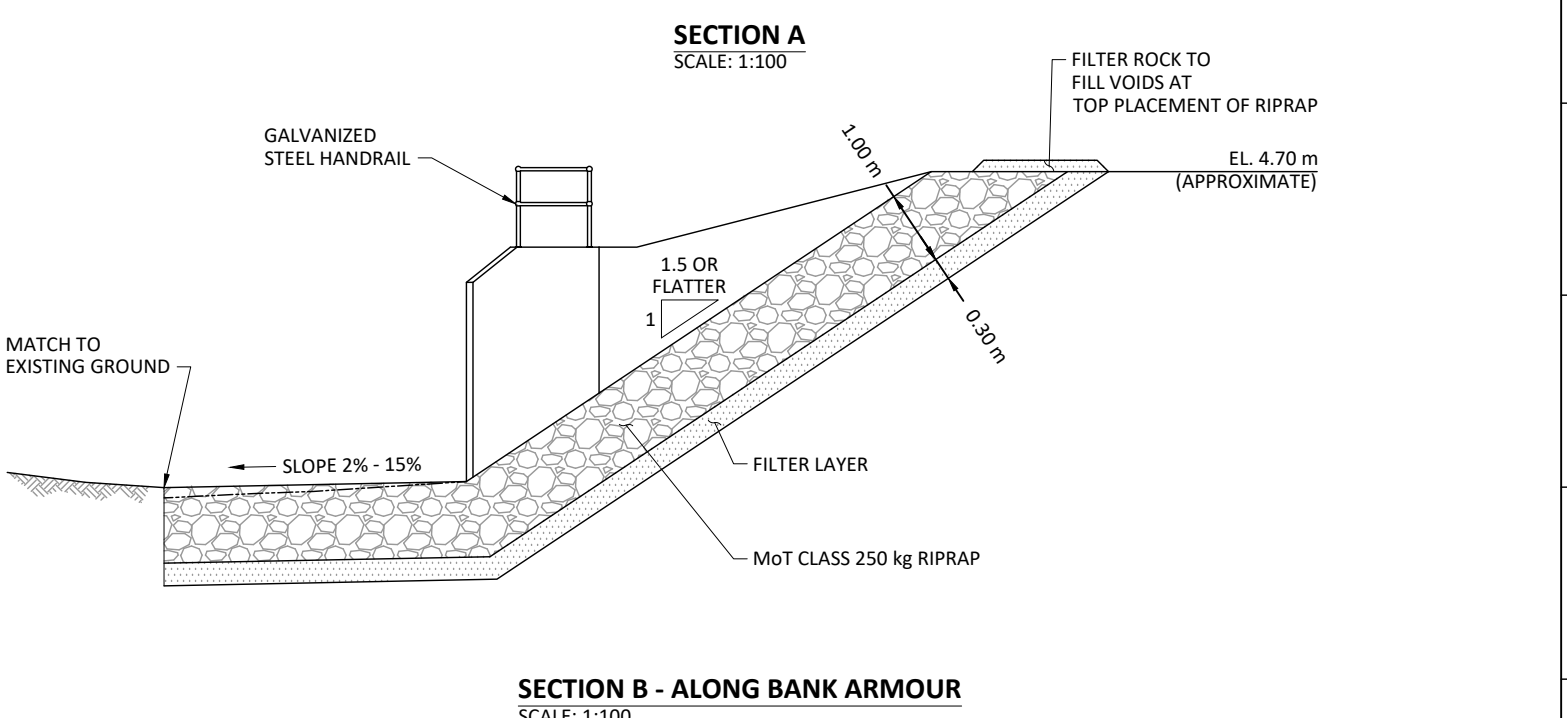
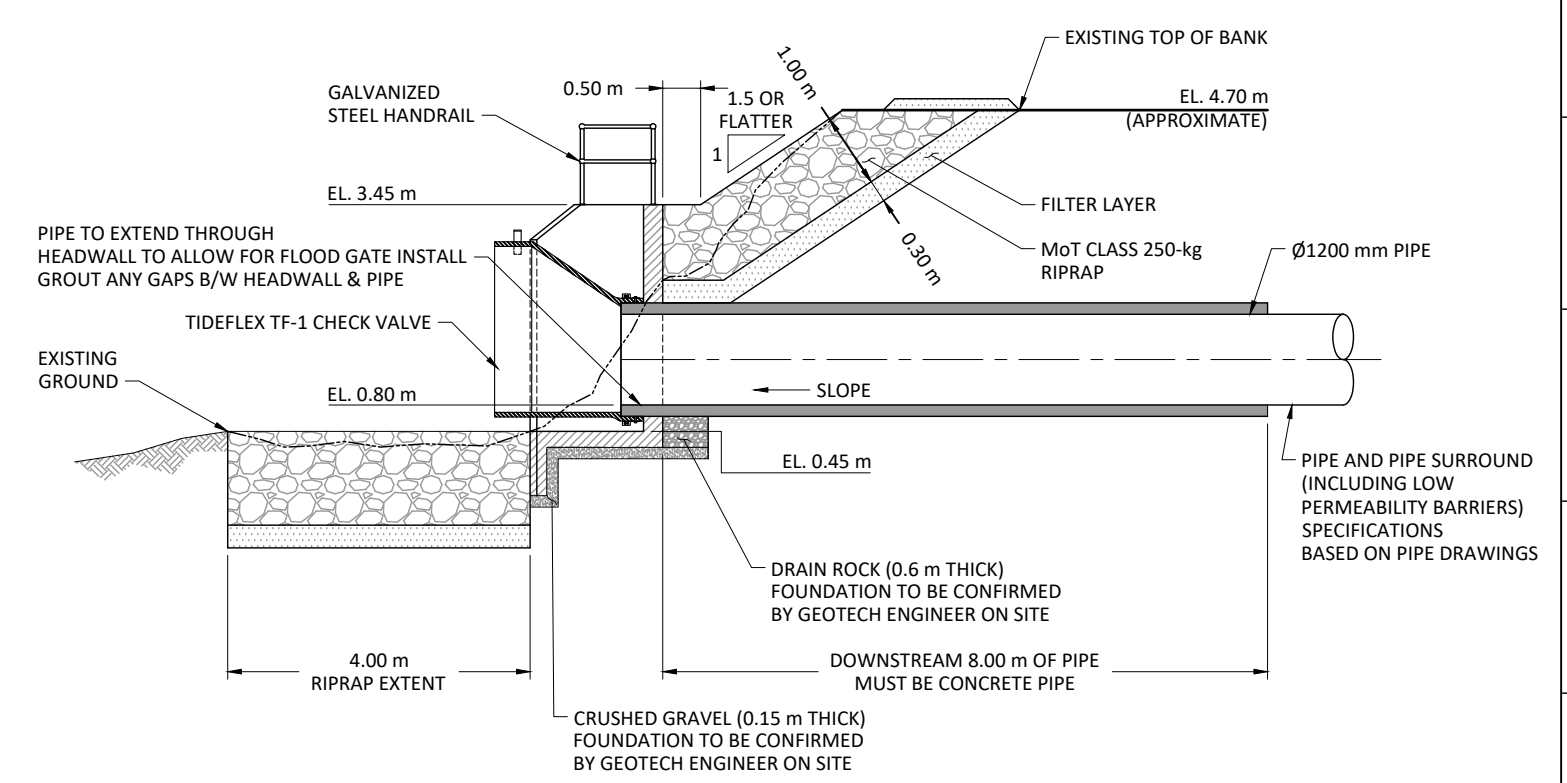
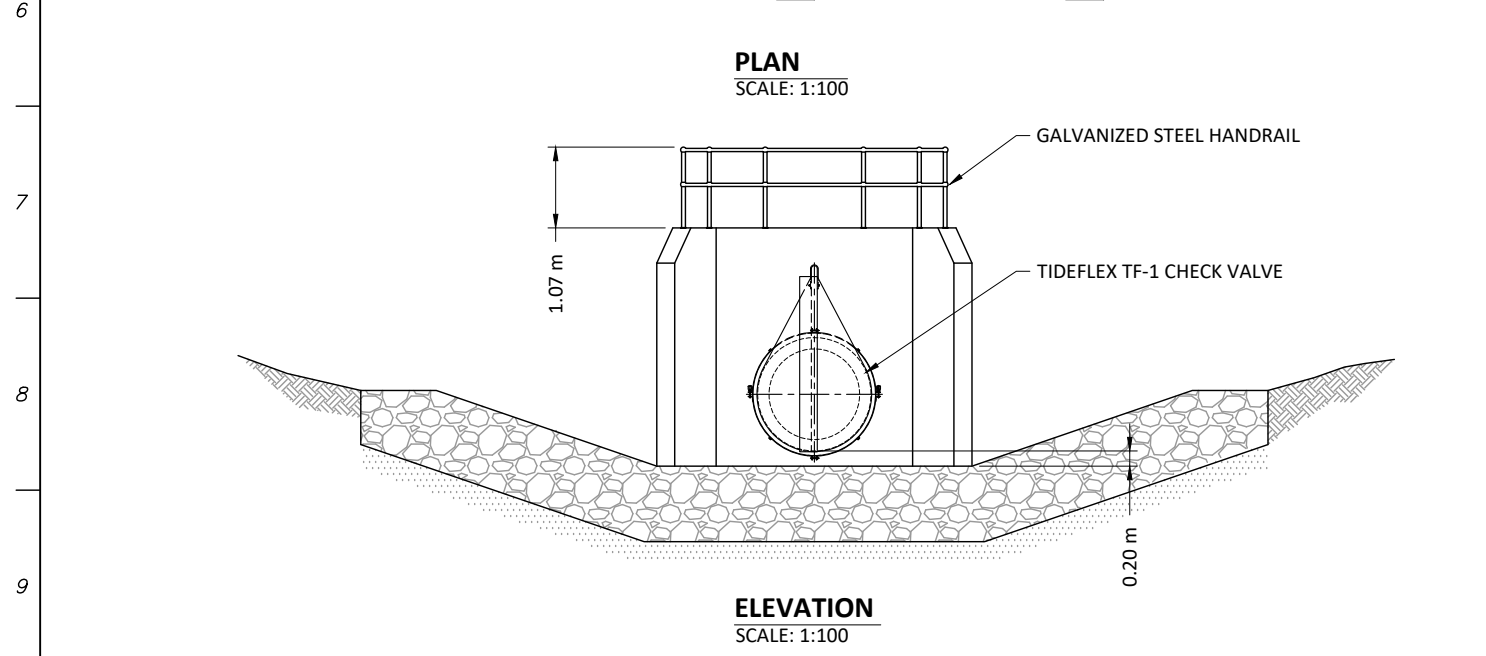
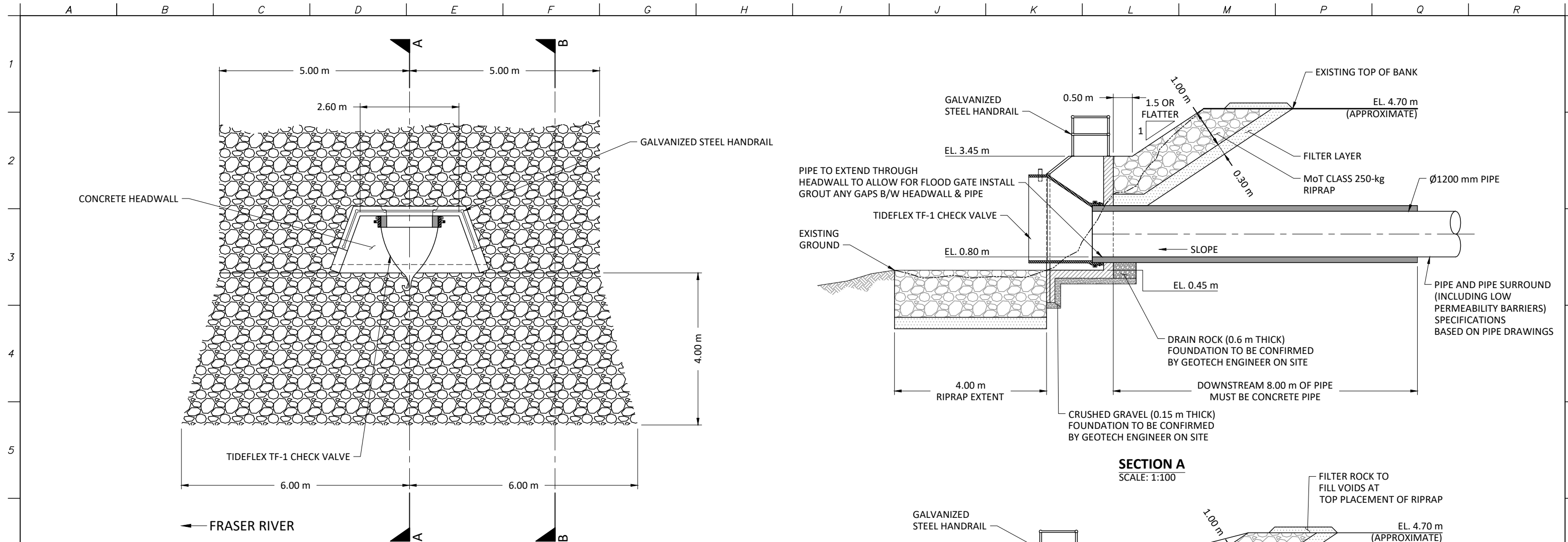
PROJECT NUMBER 3006489

DRAWING NUMBER 3006489-1

SHEET NUMBER

1 OF 2

REVISION 0



NOT FOR CONSTRUCTION

<p>Epta Development Corporation 1910-1177 West Hastings Street Vancouver, BC Canada V6E 2K3</p>	<p>northwest hydraulic consultants 30 Gostick Place North Vancouver, BC Canada V7M 3G3 Office: 604.980.6011 Fax: 604.980.9264 www.nhcweb.com</p>	<p>REVISIONS</p>		<p>DRAWING INFORMATION</p>		<p>BONSON ROAD OUTFALL</p> <p>Plan, Profile, and Sections</p>	<p>PROJECT NUMBER 3006489</p>
		<p>0 14 Sep 2021 ISSUED FOR REVIEW</p>	<p>DATE 14 Sep 2021</p>	<p>DESIGNED BY HXH</p>	<p>DRAWING NUMBER 3006489-2</p>		
						<p>CHECKED BY DPM</p>	<p>SHEET NUMBER</p>
						<p>SHEET SIZE B (11" x 17")</p>	<p>2 OF 2</p>
							<p>REVISION 0</p>

APPENDIX C – HABITAT WIZARD REPORT

Ministry of Environment

HABITAT WIZARD STREAMS REPORT

Nov. 13, 2020

WATERBODY INFORMATION

Name:	
Alias:	
Alias (2):	
UTM Co-ordinate (Stream Mouth):	UTM: 10 523993, 5450650
Primary Mapsheet:	092G02
Primary Region:	Lower Mainland
Watershed Code:	100-026700-02800-85900
Waterbody Identifier:	00000LFRA
Stream Length (m):	.58
Stream Order:	
Stream Magnitude:	

SPECIES PRESENT

FISH SPECIES	LAST KNOWN OBSERVATION DATE
Brassy Minnow	20-OCT-15
Brown Catfish (formerly Brown Bullhead)	20-OCT-15
Carp (General)	20-OCT-15
Lamprey (General)	16-OCT-15
Largemouth Bass	16-OCT-15
Pumpkinseed	20-OCT-15
Rainbow Trout	19-OCT-15
Threespine Stickleback	20-OCT-15

STOCKING INFORMATION

DATE	SPECIES	RELEASED	STOCK	LIFE STAGE	HATCHERY
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OBSTRUCTIONS

DESCRIPTION	HEIGHT	LENGTH	COMMENTS
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ONLINE WATER LEVELS

REFERENCE URL

This water body has online water level information available from Environment Canada and the Province of BC. Use the link(s) above to go directly to the station information on the BC River Levels website.

WATER QUANTITY INFORMATION

The most current water survey information is available from the following Water Survey of Canada website: <http://scitech.pyr.ec.gc.ca/waterweb/selectProvin> provides access to real-time water station information; <http://www.wsc.ec.gc.ca/hydat/H2> provides access to archived water station information.

STREAM SURVEY DATA

TRIBUTARY STREAMS

1:50,000 WATERSHED CODE	GAZETTED NAME	UTM	EASTING	NORTHING
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REFERENCES

REFERENCE ID	REFERENCE TITLE
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ADDITIONAL INFORMATION

Please see the Fisheries Information Data Queries (FIDQ) for additional and more detailed queries of fish and fish habitat information:

<http://www.env.gov.bc.ca/fish/fidq/index>

Please check the Ecological Reports Catalogue (EcoCat) for reference material and data that is available for online distribution:

<http://www.env.gov.bc.ca/ecocat/>

Ministry of Environment

HABITAT WIZARD STREAMS REPORT

Nov. 13, 2020

WATERBODY INFORMATION	
Name:	FRASER RIVER
Alias:	BIG EDDY, THE
Alias (2):	BISHOPS REACH
UTM Co-ordinate (Stream Mouth):	UTM: 10 486005, 5440487
Primary Mapsheet:	092G03
Primary Region:	Lower Mainland
Watershed Code:	100
Waterbody Identifier:	00000LFRA
Stream Length (m):	1387.85
Stream Order:	9
Stream Magnitude:	61800

SPECIES PRESENT	
FISH SPECIES	LAST KNOWN OBSERVATION DATE
All Salmon	18-SEP-07
American Shad	23-AUG-13
Black Crappie	19-AUG-17
Bluegill	25-OCT-17
Brassy Minnow	19-JUL-12
Bridgelip Sucker	01-JUN-96
Brown Catfish (formerly Brown Bullhead)	27-NOV-11
Bull Trout	12-AUG-17
Burbot	19-OCT-16
Carp	02-OCT-14
Carp (General)	31-AUG-13
Chinook Salmon	30-AUG-17
Chiselmouth (formerly Chiselmouth Chub)	01-JUN-96
Chub (General)	23-NOV-17
Chum Salmon	05-AUG-15
Coastal Cutthroat Trout	16-MAR-15
Coastrange Sculpin (formerly Aleutian Sculpin)	06-AUG-15
Coho Salmon	01-FEB-19
Cutthroat Trout	25-OCT-18
Cutthroat Trout (Anadromous)	17-MAY-19
Dace (General)	18-OCT-16
Dolly Varden	01-JUN-96
Emerald Shiner	01-NOV-00

Eulachon	01-JAN-79
Fathead Minnow	16-AUG-12
Fish Unidentified Species	26-AUG-18
Goldfish	10-NOV-10
Green Sturgeon	01-APR-98
Kokanee	01-FEB-73
Lake Chub	10-MAY-16
Lake Lamprey	02-SEP-11
Lamprey (General)	06-SEP-07
Largemouth Bass	25-OCT-18
Largescale Sucker	11-AUG-16
Leopard Dace	18-OCT-16
Longfin Smelt	01-JAN-79
Longnose Dace	11-AUG-16
Longnose Sucker	18-AUG-15
Minnow (General)	16-AUG-12
Mountain Whitefish	14-AUG-14
Northern Mountain Sucker	13-SEP-07
Northern Pikeminnow	25-OCT-18
Pacific Lamprey	19-OCT-16
Peamouth Chub	23-NOV-17
Perch (General)	20-SEP-07
Pink Salmon	30-AUG-17
Prickly Sculpin	25-OCT-18
Pumpkinseed	25-OCT-18
Pygmy Whitefish	01-FEB-73
Rainbow Trout	30-AUG-17
Redside Shiner	27-AUG-18
River Lamprey	01-JAN-79
Salmon (General)	01-NOV-00
Sculpin (General)	27-AUG-18
Signal Crayfish	27-AUG-18
Slimy Sculpin	19-AUG-10
Smallmouth Bass	28-AUG-17
Sockeye Salmon	30-AUG-17
Speckled Dace	06-AUG-14
Spottail Shiner	01-NOV-00
Staghorn Sculpin	16-AUG-12
Starry Flounder	16-AUG-12
Steelhead	30-AUG-17
Stickleback (General)	14-DEC-16
Sturgeon (General)	27-AUG-17
Sucker (General)	24-AUG-17

Surf Smelt	01-APR-98
Threespine Stickleback	01-FEB-19
Unidentifiable Trout - only fry <70mm in length	05-AUG-15
Western Pearlshell Mussel	01-AUG-98
Westslope (Yellowstone) Cutthroat Trout	01-FEB-73
White Sturgeon	11-MAR-19
White Sucker	21-OCT-16
Whitefish (General)	26-AUG-17

STOCKING INFORMATION

DATE	SPECIES	RELEASED	STOCK	LIFE STAGE	HATCHERY
17-MAY-19	Cutthroat Trout (Anadromous)	4150	FRASER R	Smolt	Chehalis River Hatch
15-MAY-19	Cutthroat Trout (Anadromous)	8878	FRASER R	Smolt	Chehalis River Hatch
30-MAY-18	Cutthroat Trout (Anadromous)	16161	FRASER R	Smolt	Chehalis River Hatch
30-MAY-17	Cutthroat Trout (Anadromous)	14960	FRASER R	Smolt	Chehalis River Hatch
11-MAY-17	Cutthroat Trout (Anadromous)	8620	FRASER R	Smolt	FRASER VALLEY HATCH
20-MAY-16	Cutthroat Trout (Anadromous)	6930	FRASER R	Smolt	FRASER VALLEY HATCH
16-MAY-16	Cutthroat Trout (Anadromous)	10500	FRASER R	Smolt	Chehalis River Hatch
25-MAY-15	Cutthroat Trout (Anadromous)	7000	FRASER R	Smolt	FRASER VALLEY HATCH
21-MAY-15	Cutthroat Trout (Anadromous)	10372	FRASER R	Smolt	Chehalis River Hatch
30-MAY-14	Cutthroat Trout (Anadromous)	20026	FRASER R	Smolt	Chehalis River Hatch
28-APR-14	Cutthroat Trout (Anadromous)	19167	FRASER R	Smolt	FRASER VALLEY HATCH
21-MAY-13	Cutthroat Trout (Anadromous)	15841	FRASER R	Smolt	FRASER VALLEY HATCH
16-MAY-13	Cutthroat Trout (Anadromous)	3238	FRASER R	Smolt	Chehalis River Hatch
16-MAY-13	Cutthroat Trout (Anadromous)	5980	FRASER R	Smolt	Chehalis River Hatch
15-MAY-13	Cutthroat Trout (Anadromous)	5638	FRASER R	Smolt	Chehalis River Hatch
04-JUN-12	Cutthroat Trout (Anadromous)	1700	FRASER R	Smolt	Chehalis River Hatch
04-JUN-12	Cutthroat Trout (Anadromous)	2040	FRASER R	Smolt	Chehalis River Hatch
04-JUN-12	Cutthroat Trout (Anadromous)	2040	FRASER R	Smolt	Chehalis River Hatch
04-JUN-12	Cutthroat Trout (Anadromous)	3060	FRASER R	Smolt	Chehalis River Hatch
17-MAY-11	Cutthroat Trout (Anadromous)	4000	FRASER R	Smolt	Chehalis River Hatch
17-MAY-11	Cutthroat Trout (Anadromous)	1500	FRASER R	Smolt	Chehalis River Hatch
19-MAY-10	Cutthroat Trout (Anadromous)	8176	FRASER R	Smolt	Chehalis River Hatch
05-JUN-09	Cutthroat Trout (Anadromous)	5000	FRASER R	Fry	Chehalis River Hatch
29-MAY-08	Cutthroat Trout (Anadromous)	3055	FRASER R	Fry	Chehalis River Hatch
25-JUN-07	Cutthroat Trout (Anadromous)	7326	FRASER R	Smolt	FRASER VALLEY HATCH
25-JUN-07	Cutthroat Trout (Anadromous)	7400	FRASER R	Smolt	FRASER VALLEY HATCH
25-MAY-06	Cutthroat Trout (Anadromous)	3660	FRASER R	Smolt	FRASER VALLEY HATCH
25-MAY-06	Cutthroat Trout (Anadromous)	3660	FRASER R	Smolt	FRASER VALLEY HATCH
16-MAY-05	Cutthroat Trout (Anadromous)	6649	FRASER R	Smolt	FRASER VALLEY HATCH
16-MAY-05	Cutthroat Trout (Anadromous)	6536	FRASER R	Smolt	FRASER VALLEY HATCH

07-MAY-04	Cutthroat Trout (Anadromous)	5992	FRASER R	Smolt	FRASER VALLEY HATCHERY
07-MAY-04	Cutthroat Trout (Anadromous)	6500	FRASER R	Smolt	FRASER VALLEY HATCHERY
16-MAY-03	Cutthroat Trout (Anadromous)	2338	FRASER R	Smolt	FRASER VALLEY HATCHERY
15-MAY-03	Cutthroat Trout (Anadromous)	4194	FRASER R	Smolt	FRASER VALLEY HATCHERY
15-MAY-03	Cutthroat Trout (Anadromous)	1914	FRASER R	Smolt	FRASER VALLEY HATCHERY
14-MAY-03	Cutthroat Trout (Anadromous)	4712	FRASER R	Smolt	FRASER VALLEY HATCHERY
10-MAY-02	Cutthroat Trout (Anadromous)	5596	FRASER R	Smolt	FRASER VALLEY HATCHERY
10-MAY-02	Cutthroat Trout (Anadromous)	8087	FRASER R	Smolt	FRASER VALLEY HATCHERY
15-JUN-01	Cutthroat Trout (Anadromous)	340	FRASER R	Smolt	FRASER VALLEY HATCHERY
15-JUN-01	Cutthroat Trout (Anadromous)	515	FRASER R	Smolt	FRASER VALLEY HATCHERY
08-JUN-01	Cutthroat Trout (Anadromous)	1467	FRASER R	Smolt	FRASER VALLEY HATCHERY
08-JUN-01	Cutthroat Trout (Anadromous)	1450	FRASER R	Smolt	FRASER VALLEY HATCHERY
01-JUN-01	Cutthroat Trout (Anadromous)	7188	FRASER R	Smolt	FRASER VALLEY HATCHERY
01-JUN-01	Cutthroat Trout (Anadromous)	7187	FRASER R	Smolt	FRASER VALLEY HATCHERY
27-APR-01	Cutthroat Trout (Anadromous)	8326	FRASER R	Smolt	FRASER VALLEY HATCHERY
16-MAY-00	Cutthroat Trout (Anadromous)	5000	FRASER R	Smolt	FRASER VALLEY HATCHERY
15-MAY-00	Cutthroat Trout (Anadromous)	10000	FRASER R	Smolt	FRASER VALLEY HATCHERY
18-APR-00	Cutthroat Trout (Anadromous)	843	FRASER R	Smolt	FRASER VALLEY HATCHERY
14-APR-00	Cutthroat Trout (Anadromous)	4400	FRASER R	Smolt	FRASER VALLEY HATCHERY
11-JUN-99	Cutthroat Trout (Anadromous)	3795	FRASER R	Smolt	FRASER VALLEY HATCHERY
11-JUN-99	Cutthroat Trout (Anadromous)	7325	FRASER R	Smolt	FRASER VALLEY HATCHERY
10-JUN-99	Cutthroat Trout (Anadromous)	11707	FRASER R	Smolt	FRASER VALLEY HATCHERY
10-MAR-99	Cutthroat Trout (Anadromous)	4700	FRASER R	Smolt	FRASER VALLEY HATCHERY
03-JUN-98	Cutthroat Trout (Anadromous)	3337	FRASER R	Smolt	FRASER VALLEY HATCHERY
03-JUN-98	Cutthroat Trout (Anadromous)	3336	FRASER R	Smolt	FRASER VALLEY HATCHERY
28-MAY-97	Cutthroat Trout (Anadromous)	4737	FRASER R	Smolt	FRASER VALLEY HATCHERY
27-MAY-97	Cutthroat Trout (Anadromous)	7023	FRASER R	Smolt	Inch Creek Hatchery
01-MAY-97	Cutthroat Trout (Anadromous)	3256	FRASER R	Smolt	FRASER VALLEY HATCHERY
30-MAY-96	Cutthroat Trout (Anadromous)	12367	FRASER R	Smolt	FRASER VALLEY HATCHERY
29-MAY-96	Cutthroat Trout (Anadromous)	11426	FRASER R	Smolt	Inch Creek Hatchery
27-MAR-96	Cutthroat Trout (Anadromous)	5000	FRASER R	Smolt	Inch Creek Hatchery
30-MAY-95	Cutthroat Trout (Anadromous)	5882	FRASER R	Smolt	FRASER VALLEY HATCHERY
18-MAY-95	Cutthroat Trout (Anadromous)	5000	FRASER R	Smolt	Inch Creek Hatchery
18-MAY-95	Cutthroat Trout (Anadromous)	13234	FRASER R	Smolt	Inch Creek Hatchery
30-MAY-94	Cutthroat Trout (Anadromous)	6000	FRASER R	Smolt	Inch Creek Hatchery
30-MAY-94	Cutthroat Trout (Anadromous)	15038	FRASER R	Smolt	Inch Creek Hatchery
26-MAY-93	Cutthroat Trout (Anadromous)	3960	FRASER R	Smolt	FRASER VALLEY HATCHERY
25-MAY-93	Cutthroat Trout (Anadromous)	14000	FRASER R	Smolt	Inch Creek Hatchery
25-MAY-93	Cutthroat Trout (Anadromous)	3500	FRASER R	Smolt	Inch Creek Hatchery
20-MAY-92	Cutthroat Trout (Anadromous)	4160	FRASER R	Smolt	Inch Creek Hatchery
20-MAY-92	Cutthroat Trout (Anadromous)	3120	FRASER R	Smolt	Inch Creek Hatchery
19-MAY-92	Cutthroat Trout (Anadromous)	9690	FRASER R	Smolt	Inch Creek Hatchery
19-MAY-92	Cutthroat Trout (Anadromous)	5304	FRASER R	Smolt	Inch Creek Hatchery

23-MAY-91	Cutthroat Trout (Anadromous)	5969	FRASER R	Smolt	Inch Creek Hatchery
22-MAY-91	Cutthroat Trout (Anadromous)	10039	FRASER R	Smolt	Inch Creek Hatchery
09-MAY-91	Cutthroat Trout (Anadromous)	3800	FRASER R	Smolt	FRASER VALLEY HATCHERY
09-MAY-91	Cutthroat Trout (Anadromous)	3040	FRASER R	Smolt	FRASER VALLEY HATCHERY
28-MAY-90	Cutthroat Trout (Anadromous)	5658	FRASER R	Smolt	Inch Creek Hatchery
28-MAY-90	Cutthroat Trout (Anadromous)	15153	FRASER R	Smolt	Inch Creek Hatchery
30-MAY-89	Cutthroat Trout (Anadromous)	16489	FRASER R	Smolt	Inch Creek Hatchery
05-MAY-89	Cutthroat Trout (Anadromous)	16000	FRASER R	Smolt	Inch Creek Hatchery
17-JUN-88	Cutthroat Trout (Anadromous)	15919	FRASER R	Smolt	Inch Creek Hatchery
02-MAY-88	Cutthroat Trout (Anadromous)	10823	FRASER R	Smolt	Inch Creek Hatchery
05-JUN-87	Cutthroat Trout (Anadromous)	12454	FRASER R	Smolt	Inch Creek Hatchery
05-JUN-87	Cutthroat Trout (Anadromous)	7227	FRASER R	Smolt	Inch Creek Hatchery
12-JUN-86	Cutthroat Trout (Anadromous)	11353	FRASER R	Smolt	Inch Creek Hatchery
12-JUN-86	Cutthroat Trout (Anadromous)	3820	FRASER R	Smolt	Inch Creek Hatchery
28-MAY-85	Cutthroat Trout (Anadromous)	5259	FRASER R	Smolt	Inch Creek Hatchery
27-MAY-85	Cutthroat Trout (Anadromous)	4947	FRASER R	Smolt	Inch Creek Hatchery
29-MAY-84	Cutthroat Trout (Anadromous)	7700	FRASER R	Smolt	Inch Creek Hatchery
05-JAN-84	Cutthroat Trout (Anadromous)	10974	FRASER R	Parr	Inch Creek Hatchery
05-JAN-84	Cutthroat Trout (Anadromous)	2352	FRASER R	Smolt	Inch Creek Hatchery
27-APR-83	Cutthroat Trout (Anadromous)	4000	FRASER R	Smolt	Inch Creek Hatchery
26-APR-83	Cutthroat Trout (Anadromous)	8000	FRASER R	Smolt	Inch Creek Hatchery
01-JUN-82	Cutthroat Trout (Anadromous)	2815	FRASER R	Smolt	Inch Creek Hatchery
28-MAY-82	Cutthroat Trout (Anadromous)	7376	FRASER R	Smolt	Inch Creek Hatchery
26-MAR-81	Cutthroat Trout (Anadromous)	9000	FRASER R	Smolt	Inch Creek Hatchery
01-JAN-63	Rainbow Trout	4000	UNKNOWN	Yearling	Cultus Lake Hatchery
01-JAN-59	Rainbow Trout	15000	UNKNOWN	Fingerling	Cultus Lake Hatchery
01-JAN-51	Rainbow Trout	10000	PETER HOPE	Fingerling	Smith Falls Hatchery
01-JAN-47	Rainbow Trout	2000	KNOUFF	Fingerling	Cultus Lake Hatchery
01-JAN-45	Rainbow Trout	4000	KNOUFF	Fingerling	Smith Falls Hatchery
01-JAN-44	Rainbow Trout	10000	PENNASK	Eyed Egg	Cultus Lake Hatchery
01-JAN-44	Rainbow Trout	4000	KNOUFF	Fingerling	Smith Falls Hatchery
01-JAN-43	Rainbow Trout	5000	PENNASK	Fingerling	Smith Falls Hatchery
01-JAN-42	Rainbow Trout	4000	KNOUFF	Fingerling	Smith Falls Hatchery
01-JAN-42	Cutthroat Trout	50000	UNKNOWN	Eyed Egg	Smith Falls Hatchery
01-JAN-41	Cutthroat Trout	110000	UNKNOWN	Eyed Egg	Smith Falls Hatchery
01-JAN-41	Rainbow Trout	11000	PENNASK	Eyed Egg	Cultus Lake Hatchery
01-JAN-40	Rainbow Trout	100000	PINANTAN	Eyed Egg	Smith Falls Hatchery
01-JAN-40	Steelhead	120000	SWELTZER RIVER	Eyed Egg	Smith Falls Hatchery

OBSTRUCTIONS

DESCRIPTION	HEIGHT	LENGTH	COMMENTS
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BEAVER DAM	0	0	HEAVY BEAVER ACTIVITY - DAMS MONITORED AND REMOVED AS NECESSARY.
BEAVER DAM	9999	9999	HEAVY BEAVER ACTIVITY - DAMS MONITORED AND REMOVED AS NECESSARY.
BEAVER DAM	0	0	UPSTREAM SIDDLE CREEK, MAJOR JAM (WITHIN NICOMEN SLOUGH)
BEAVER DAM	9999	9999	UPSTREAM SIDDLE CREEK, MAJOR JAM (WITHIN NICOMEN SLOUGH)
BEAVER DAM	0	0	
BEAVER DAM	9999	9999	
Canyon			
Culvert	0	0	CULVERT INSTALLATION HAS RESULTED IN THE RESTRICTION OF FLOWS AND AN INCREASE IN SEDIMENT ACCUMULATION
Culvert	2.4	9999	CULVERT INSTALLATION HAS RESULTED IN THE RESTRICTION OF FLOWS AND AN INCREASE IN SEDIMENT ACCUMULATION
Culvert	2.6	9999	CULVERT INSTALLATION HAS RESULTED IN THE RESTRICTION OF FLOWS AND AN INCREASE IN SEDIMENT ACCUMULATION
Culvert	0	0	FIRST CPR CROSSING: DIFFICULT PASSAGE
Culvert	2.4	9999	FIRST CPR CROSSING: DIFFICULT PASSAGE
Culvert	2.6	9999	FIRST CPR CROSSING: DIFFICULT PASSAGE
Culvert	0	0	
Culvert	2.4	9999	
Culvert	2.6	9999	
Dam	0	0	BLOCKS FRASER RIVER ACCESS AT TOP END OF NICOMEN DIKES (BELL'S DAM) (WITHIN NICOMEN SLOUGH)
Dam	9999	9999	BLOCKS FRASER RIVER ACCESS AT TOP END OF NICOMEN DIKES (BELL'S DAM) (WITHIN NICOMEN SLOUGH)
Dam	0	0	CPR CROSSING BLOCKS ALL BUT SEEPAGE FROM FRASER RIVER AT UPPER END OF SLOUGH.
Dam	9999	9999	CPR CROSSING BLOCKS ALL BUT SEEPAGE FROM FRASER RIVER AT UPPER END OF SLOUGH.
Dam	0	0	ROADWAY DAM
Dam	9999	9999	ROADWAY DAM
Falls	0	0	(OVERLANDER FALLS IS LOCATED APPROXIMATELY 17 KM UPSTREAM FROM REARGUARD FALLS IS IMPASSABLE. REF# = 29J-47)
Falls	9	0	(OVERLANDER FALLS IS LOCATED APPROXIMATELY 17 KM UPSTREAM FROM REARGUARD FALLS IS IMPASSABLE. REF# = 29J-47)
Falls	9	999	(OVERLANDER FALLS IS LOCATED APPROXIMATELY 17 KM UPSTREAM FROM REARGUARD FALLS IS IMPASSABLE. REF# = 29J-47)
Falls	0	0	(REARGUARD FALLS LOCATED 5 KM UPSTREAM OF TETE JAUNE ISLANDS IS PASSABLE. REF# = 29J-5) (HQ2324) THIS REFERENCE SUGGESTS THAT THE FALLS IS 10M HIGH AND IS IMPASSABLE.
Falls	9	0	(REARGUARD FALLS LOCATED 5 KM UPSTREAM OF TETE JAUNE ISLANDS IS PASSABLE. REF# = 29J-5) (HQ2324) THIS REFERENCE SUGGESTS THAT THE FALLS IS 10M HIGH AND IS IMPASSABLE.
Falls	9	999	(REARGUARD FALLS LOCATED 5 KM UPSTREAM OF TETE JAUNE ISLANDS IS PASSABLE. REF# = 29J-5) (HQ2324) THIS REFERENCE SUGGESTS THAT THE FALLS IS 10M HIGH AND IS IMPASSABLE.
Falls	0	0	TWO MAN-INDUCED ROCK SLIDES AT HELL'S GATE (1913 AND 1914) WERE THE MAJOR CAUSE OF THE STEADY DECLINE OF COMMERCIAL CATCH OF FRASER RIVER

			SALMON
Falls	9	0	TWO MAN-INDUCED ROCK SLIDES AT HELL'S GATE (1913 AND 1914) WERE THE MAJOR CAUSE OF THE STEADY DECLINE OF COMMERCIAL CATCH OF FRASER RIVER SALMON
Falls	9	999	TWO MAN-INDUCED ROCK SLIDES AT HELL'S GATE (1913 AND 1914) WERE THE MAJOR CAUSE OF THE STEADY DECLINE OF COMMERCIAL CATCH OF FRASER RIVER SALMON

ONLINE WATER LEVELS

REFERENCE URL

This water body has online water level information available from Environment Canada and the Province of BC. Use the link(s) above to go directly to the station information on the BC River Levels website.

WATER QUANTITY INFORMATION

The most current water survey information is available from the following Water Survey of Canada web <http://scitech.pyr.ec.gc.ca/waterweb/selectProvin> provides access to real-time water station in: <http://www.wsc.ec.gc.ca/hydat/H2> provides access to archived water station information

STREAM SURVEY DATA

SURVEY DATE:		AGENCY: Cornice Environmental Consulting Ltd.			
Project Name:	Project ID/Name: 33436/Bridge Deck Replacement Fraser River-2015; PG15-175421				
UTM Zone	11	Average Channel Width		Stream Order	3
UTM Easting	365075	Width Measurements	0	Surveyed Length	
UTM Northing	5872801	Water Temperature (C)		Gradient (%)	
Site Number	1	Intermittent Indicator	No	Conductivity	
Source	FDIS	Dewatering Indicator	No	No Visible Chan	No
SURVEY DATE:		AGENCY: Cornice Environmental Consulting Ltd.			
Project Name:	Project ID/Name: 33436/Bridge Deck Replacement Fraser River-2015; PG15-175421				
UTM Zone	11	Average Channel Width		Stream Order	3
UTM Easting	365075	Width Measurements	0	Surveyed Length	
UTM Northing	5872801	Water Temperature (C)		Gradient (%)	
Site Number	1	Intermittent Indicator	No	Conductivity	
Source	FDIS	Dewatering Indicator	No	No Visible Chan	No

SURVEY DATE:		AGENCY: Urban Systems			
Project Name:	Project ID/Name: 23729/CN Mile 56.44 Beaver Dam Removal - 2010; SU10-66492				
UTM Zone	10	Average Channel Width	1.5	Stream Order	3
UTM Easting	596059	Width Measurements	0	Surveyed Length	
UTM Northing	5455975	Water Temperature (C)		Gradient (%)	
Site Number	1	Intermittent Indicator	No	Conductivity	
Source	FDIS	Dewatering Indicator	No	No Visible Chan	No
SURVEY DATE:		AGENCY: Triton Environmental Consultants (Richmond)			
Project Name:	Project ID/Name: 604/Fraser/West Road Fish Inventory - 1998 & 1999				
UTM Zone	10	Average Channel Width	293.33	Stream Order	3
UTM Easting	511242	Width Measurements	0	Surveyed Length	300
UTM Northing	5901985	Water Temperature (C)	9	Gradient (%)	1.25
Site Number	244	Intermittent Indicator	No	Conductivity	100
Source	FDIS	Dewatering Indicator	No	No Visible Chan	No
SURVEY DATE:		AGENCY: Triton Environmental Consultants (Richmond)			
Project Name:	Project ID/Name: 604/Fraser/West Road Fish Inventory - 1998 & 1999				
UTM Zone	10	Average Channel Width	101.67	Stream Order	3
UTM Easting	521400	Width Measurements	0	Surveyed Length	200
UTM Northing	5887028	Water Temperature (C)	11.5	Gradient (%)	.67
Site Number	227	Intermittent Indicator	No	Conductivity	120
Source	FDIS	Dewatering Indicator	No	No Visible Chan	No
SURVEY DATE:		AGENCY: Triton Environmental Consultants (Richmond)			
Project Name:	Project ID/Name: 604/Fraser/West Road Fish Inventory - 1998 & 1999				
UTM Zone	10	Average Channel Width	280	Stream Order	3
UTM Easting	525278	Width Measurements	0	Surveyed Length	2000
UTM Northing	5885899	Water Temperature (C)	11.5	Gradient (%)	1
Site Number	226	Intermittent Indicator	No	Conductivity	120
Source	FDIS	Dewatering Indicator	No	No Visible Chan	No
SURVEY DATE:		AGENCY: Triton Environmental Consultants (Richmond)			
Project Name:	Project ID/Name: 604/Fraser/West Road Fish Inventory - 1998 & 1999				
UTM Zone	10	Average Channel Width	287.5	Stream Order	3
UTM Easting	517731	Width Measurements	0	Surveyed Length	400
UTM Northing	5892424	Water Temperature (C)	9	Gradient (%)	.5
Site Number	232	Intermittent Indicator	No	Conductivity	100
Source	FDIS	Dewatering Indicator	No	No Visible Chan	No

SURVEY DATE: 07/10/1998		AGENCY: Triton Environmental Consultants (Richmond)			
Project Name: Project ID/Name: 604/Fraser/West Road Fish Inventory - 1998 & 1999					
UTM Zone	10	Average Channel Width	288.33	Stream Order	3
UTM Easting	520152	Width Measurements	0	Surveyed Length	400
UTM Northing	5888132	Water Temperature (C)	9	Gradient (%)	.5
Site Number	229	Intermittent Indicator	No	Conductivity	100
Source	FDIS	Dewatering Indicator	No	No Visible Chan	No
SURVEY DATE: 01/06/1977		AGENCY: MOE			
Project Name:					
UTM Zone	10	Average Channel Width		Stream Order	3
UTM Easting	575405	Width Measurements	0	Surveyed Length	
UTM Northing	5992687	Water Temperature (C)		Gradient (%)	
Site Number	2	Intermittent Indicator		Conductivity	
Source	RAB	Dewatering Indicator		No Visible Chan	Yes

TRIBUTARY STREAMS					
1:50,000 WATERSHED CODE	GAZETTED NAME	UTM	EASTING	NORTHING	
100-000500	Unnamed tributary - 00000LFRA - 3	10	485502	5452178	
100-000800	Unnamed tributary - 00000LFRA - 5	10	485808	5447987	
100-001000	Unnamed tributary - 00000LFRA - 7	10	486592	5450917	
100-001700	Unnamed tributary - 00000LFRA - 12	10	487541	5438787	
100-002200	Unnamed tributary - 00000LFRA - 14	10	487932	5435968	
100-002250	Unnamed tributary - 00000LFRA -	10	488505	5435631	
	675892				
100-002270	Unnamed tributary - 00000LFRA -	10	488564	5435582	
	675893				
100-002400	Unnamed tributary - 00000LFRA -	10	489110	5435117	
	455022				
100-002450	Unnamed tributary - 00000LFRA -	10	489100	5435520	
	675894				
100-002500	LONDON SLOUGH	10	488595	5438542	
100-002600	TAMBOLINE SLOUGH	10	489161	5438200	
100-002800	Unnamed tributary - 00000LFRA - 18	10	489919	5435807	
100-003600	Unnamed tributary - 00000LFRA - 21	10	490536	5435891	
100-004000	Unnamed tributary - 00000LFRA - 22	10	491300	5439075	
100-004100	Unnamed tributary - 00000LFRA - 23	10	488981	5447059	
100-004550	Unnamed tributary - 00000LFRA -	10	491152	5437416	
	675900				

100-004570	Unnamed tributary - 00000LFRA - 675901	10	491534	5438154
100-004600	Unnamed tributary - 00000LFRA - 24	10	490161	5449374
100-005000	Unnamed tributary - 00000LFRA - 25	10	491697	5441039
100-005100	Unnamed tributary - 00000LFRA - 28	10	491871	5441162
100-005200	COHILUKTHAN SLOUGH	10	493781	5437756
100-005300	Unnamed tributary - 00000LFRA - 33	10	493031	5439512
100-006000	CRESCENT SLOUGH	10	494714	5439110
100-006010	Unnamed tributary - 00000LFRA - 675905	10	494262	5439443
100-009100	Unnamed tributary - 00000LFRA - 36	10	496571	5443693
100-009400	Unnamed tributary - 00000LFRA - 37	10	493452	5449329
100-010600	Unnamed tributary - 00000LFRA - 38	10	499095	5443269
100-010700	Unnamed tributary - 00000LFRA - 1198388			
100-010800	Unnamed tributary - 00000LFRA - 455036	10	499382	5444686
100-011000	Unnamed tributary - 00000LFRA - 39	10	498831	5449487
100-011500	Unnamed tributary - 00000LFRA - 40	10	500210	5444098
100-012000	Unnamed tributary - 00000LFRA - 41	10	500068	5448884
100-012100	Unnamed tributary - 00000LFRA - 46	10	500503	5448279
100-013900	Unnamed tributary - 00000LFRA - 47	10	503131	5444537
100-014000	Unnamed tributary - 00000LFRA - 61	10	503141	5445179
100-014500	COUGAR CANYON CREEK	10	504220	5444876
100-015300	Unnamed tributary - 00000LFRA - 65	10	502437	5448199
100-015800	Unnamed tributary - 00000LFRA - 73	10	505515	5446153
100-016200	GUNDERSEN SLOUGH	10	505526	5446277
100-017600	Unnamed tributary - 00000LFRA - 75	10	506491	5448552
100-017679	Unnamed tributary - 00000LFRA - 675908	10	502312	5447634
100-018500	Unnamed tributary - 00000LFRA - 76	10	507170	5449471
100-020100	BRUNETTE RIVER	10	507866	5451911
100-021000	Unnamed tributary - 00000LFRA - 104	10	509297	5451395
100-021400	NELSON CREEK	10	509836	5452529
100-021900	BARKER CREEK	10	510631	5451572
100-022200	COMO CREEK	10	510904	5452398
100-024200	Unnamed tributary - 00000LFRA - 112	10	513809	5451583
100-024500	COQUITLAM RIVER	10	514183	5452610
100-024800	Unnamed tributary - 00000LFRA - 222	10	514959	5451298
100-025700	Unnamed tributary - 00000LFRA - 223	10	515746	5452345
100-026700	PITT RIVER	10	516936	5452970
100-028200	Unnamed tributary - 00000LFRA - 829	10	518545	5451658

100-029000	Unnamed tributary - 00000LFRA - 830	10	519334	5450704
100-029200	Unnamed tributary - 00000LFRA - 833	10	519787	5451218
100-029900	Unnamed tributary - 00000LFRA - 835	10	520134	5449491
100-030800	Unnamed tributary - 00000LFRA - 839	10	521835	5450569
100-031100	Unnamed tributary - 00000LFRA - 844	10	521087	5447752
100-031200	Unnamed tributary - 00000LFRA - 845	10	521365	5447722
100-033150	Unnamed tributary - 00000LFRA - 675982	10	524473	5448866
100-033300	YORKSON CREEK	10	525167	5449309
100-035400	Unnamed tributary - 00000LFRA - 865	10	527685	5450665
100-035900	Unnamed tributary - 00000LFRA - 867	10	528292	5451140
100-036400	Unnamed tributary - 00000LFRA - 868	10	529100	5450952
100-036700	Unnamed tributary - 00000LFRA - 869	10	529367	5450703
100-037200	Unnamed tributary - 00000LFRA - 870	10	529562	5449782
100-037400	KANAKA CREEK	10	530179	5449845
100-038700	Unnamed tributary - 00000LFRA - 905	10	530616	5447932
100-038800	SALMON RIVER	10	530138	5447266
100-040000	Unnamed tributary - 00000LFRA - 985	10	532461	5447639
100-041400	Unnamed tributary - 00000LFRA - 988	10	534158	5446905
100-041600	WEST CREEK	10	534182	5445687
100-041800	PALMATEER CREEK	10	534567	5445688
100-042500	Unnamed tributary - 00000LFRA - 1006	10	535659	5446558
100-042700	Unnamed tributary - 00000LFRA - 1007	10	535739	5445843
100-043700	NATHAN CREEK	10	537283	5446012
100-045000	YORK CREEK	10	539001	5446835
100-045200	NATHAN SLOUGH	10	539295	5446246
100-045300	WHONNOCK CREEK	10	539333	5446875
100-046700	Unnamed tributary - 00000LFRA - 1032	10	541427	5446841
100-047100	STAVE RIVER	10	541996	5446747
100-048400	Unnamed tributary - 00000LFRA - 1369	10	542902	5444971
100-048700	Unnamed tributary - 00000LFRA - 1371	10	543684	5444945
100-049300	CHESTER CREEK	10	543968	5444655
100-049700	Unnamed tributary - 00000LFRA - 1376	10	544116	5443508
100-050100	HANNA CREEK	10	544311	5443084
100-051900	SILVERDALE CREEK	10	546803	5442480
100-052200	TONES CREEK	10	546629	5440796
100-053200	MANDALE SLOUGH	10	548603	5442025
100-053600	MCLENNAN CREEK	10	548119	5439652
100-054300	CLAYBURN CREEK	10	549470	5440000
100-056700	D'HERBOMEZ CREEK	10	552516	5443068
100-058500	LOWER HATZIC SLOUGH	10	554955	5443922

REFERENCES	
REFERENCE ID	REFERENCE TITLE
28B-40	Small Projects Unit. SPU Channel Data, June 1988.
29D-1	Fraser River, Howe Sound, Burrard Inlet, Indian Arm and Boundary Bay Salmon Escapements. Can. Data Rep. Fish. Aquat. Sci.(in prep.).
29D-11	Inventory of fisheries facilities and Habitat Improvement Projects (Lower Mainland Area) Habitat Management Unit. DFO. NewWestminster, B.C. 231p. 1985
29D-17	Small stream enhancement opportunities for searun cutthroat trout in the lower mainland and Sechelt Peninsula. Summary and Vol. 1-4. Fish Habitat Improvement Section. MOE. 1982
29D-26	A preliminary water quality survey of the lower Fraser River system. Technical Report no. 2 Westwater Research Center, UBC. 1973
29D-30	Hatchery releases to 1985
29D-45	Fisheries Guardian. Mission Subdistrict. Personal Communication. (Stream Files used). 1986
29D-46	Fisheries Officer. DFO. Mission Subdistrict. Personal Communication. (stream files used). 1986
29D-47	Fisheries Officer. DFO. Mission Subdistrict. Personal Communication. (Stream Files used). 1986
29D-5	A bio-physical survey of thirty small lower Fraser Valley streams. Can. MS Rep. Fish. Aquat. Sci. 1982
29D-52	Habitat Information Sheets - Salmon Stock Management Plan 1985
29D-55	Personal Communication: DFO Biologist. Biological Science Branch.
29D-6	Catalogue of salmon streams and spawning escapements of Statistical Area 29 Mission-Harrison. Can. Data Rep. Fish and Aquat.Sci. 518: xiv + 117p. 1985
29E-2	Catalogue of salmon streams and spawning escapements of Chilliwack/Hope Subdistrict. Can. Data Rep. Aquat. Sci. 203:167p. 1985
29E-55	Jones Creek pink salmon spawning channel: A biological assessment, 1954-1982. DFO, New Westminster Can. Tech. Rep. Fish, Aquatic Sci. No. 1188. 89p. 1983
29E-65	DFO, Fisheries Officer, Chilliwack, B.C. Personal Communication. 1986
29I-52	An assessment of the effects of the system E flood control proposal on the salmon resource of the Fraser River system. Prep.for Ecology Subcomm. of the Fraser River Upstream Storage Steering Committee by Fish. & Marine Service, Vancouver. 1974
29I-6	Juvenile chinook salmon studies in four tributaries to the Upper Fraser River, 1981. Prepared for Dept. of Fish. and Oceans by Beak Consultants Ltd. 158p. 1981
29J-33	Tete Jaune, Swiftcurrent Creek and Swift Creek adult chinook survey 1979 and 1980. Unpublished, Fraser River, Northern B.C. and Yukon Division.
29J-34	1983 Fraser River spawning ground recoveries of coded wire tagged chinook salmon. Unpublished MS. Report of Fraser River, Northern B.C. and Yukon Division. 38p. 1984
29J-37	Upper Fraser River system, a review of Fisheries related information.
29J-47	DFO, Fisheries Officer - Clearwater. Personal communication
29J-5	Catalogue of selected Fraser and Thompson River tributaries important to chinook and coho salmon and a preliminary assessment of their enhancement potential. MS Rep. of Fraser River, Northern B.C. and Yukon Division. 1982
2FBSRY	FISHERIES BRANCH, SURREY: FISHERIES FILES: INVENTORY; ENHANCEMENT; BIOPHYSICAL DATA; & RECORDS OF PERSONAL COMMUNICATION

2LM036	NICOMEN SLOUGH CUTTHROAT TROUT STUDY
2LM328.4	Small Stream Enhancement Possibilities for Sea-Run Cutthroat Trout in the Lower Mainland and Sechelt Peninsula: Enhancement Options Vol. 4
2PUB007	A Biophysical Survey of 30 Lower Fraser Valley Streams
2PUB1052	Catalogue of Salmon Streams and Spawning Escapements of Statistical Area 29 Mission-Harrison
2PUB114	Preliminary Catalogue of Salmon Streams and Spawning Escapements of Mission-Harrison Sub-District.
2PUB3243	Freshwater Commercial Coarse Fisheries Assessment Project. Volume I.
2PUB3243.1	Freshwater Commercial Coarse Fisheries Assessment Project
5001	BLACKWATER (WESTROAD) RIVER ASSESSMENT OF EXISTING AND POTENTIAL RESIDENT RAINBOW PRODUCTION DOWNSTREAM OF KLUSKOIL LAKE
5003	WINTER LIMNOLOGY DATABASE
5057	ROB DOLIGHAN PERSONAL COMMUNICATION
5058	FRASER AND THOMPSON RIVER DIOXIN/FURAN TREND MONITORING PROGRAM 1992 FINAL REPORT
5677	FRASER RIVER WHITE STURGEON MONITORING PROGRAM 1995 DATA REPORT
5678	RARE FRESHWATER FISH OF BRITISH COLUMBIA
DFO001	HRSEP 1999/2000 FINAL REPORT
DFO017	HRSEP 1999/2000 FINAL REPORT
DFO026	HRSEP 1999/2000 FINAL REPORT
DFO095	SOUTH FRASER ESTUARY WOOD REMOVAL AND RESTORATION
DFO113	LOWER MAINLAND ESTUARY WORK
DFO147	MARIA SLOUGH CHINOOK SPAWNING HABITAT - VAN DYK PROPERTY
DFO188	SOUTH FRASER RIVER WOOD REMOVAL & HABITAT RESTORATION
DFO199	LANGLEY SALMON HABITAT ENHANCEMENT PROJECT
DFO248	MARIA SLOUGH CHINOOK SPAWNING HABITAT
DFO322	YALE FISHWHEEL AND COHO TAGGING PROGRAM
DFO_HIST	LEGACY LIFE HISTORY AND TIMING OF SALMON SPECIES IN FRESHWATER WATERBODIES
DFP001	Addition of zones & points re: FISS maps for fish distribution for G.I.S. display purposes
EDI0020	A preliminary study of water quality in the Fraser River and its tributaries
EDI0022	Summary of fish collection on the upper Fraser River, fall 1993
EDI0024	Summary of the fish collected from the Fraser River at Prince George and Hansard and from Williston and Tudyah Lakes April 7 to May 25, 1988
EDI0027	Late winter sampling of juvenile salmonids in the Fraser River
EDI0057	Trapping and wire tagging of wild juvenile chinook salmon in the upper Fraser River, 1979-1981
EW016	Untitled
EW058	Wetlands of the Fraser Lowland, 1989: An Inventory technical report
EW067	Untitled
EW088	Untitled
EW201	Fraser-Thompson corridor review
EW279	Untitled
FHQ001	THE FRESH-WATER FISHES OF BRITISH COLUMBIA
FHQ002	FRESHWATER FISHES OF CANADA

FISSM01	FISS map/form information (source not indicated)
HQ0123	TRANS MOUNTAIN ROUTE MAPS
HQ0187	FRASER DELTA STRATEGIC ENVIRONMENTAL MAMAGEMENT PLAN.
HQ0377	JUVENILE CHINOOK SAMPLING DATA, SLIM CREEK AND THE UPPER FRASER RIVER MAINSTEM, BRITISH COLUMBIA, 1994
HQ0378	THE MIGRATION AND EXPLOITATION OF CHUM SALMON STOCKS OF THE JOHNSTONE STRAIT-FRASER RIVER STUDY AREA, 1962-1970
HQ0415	STOCK STATUS OF FRASER RIVER SOCKEYE
HQ0416	HYDROACOUSTIC ESTIMATION OF FRASER RIVER PINK SALMON ABUNDANCE AND DISTRIBUTION AT MISSION, B.C., IN 1987
HQ0417	PACIFIC SALMON & STEELHEAD TROUT
HQ0425	A REVIEW OF THE CHINOOK AND COHO SALMON OF THE FRASER RIVER
HQ0426	HABITAT COMPENSATION, RESTORATION AND CREATION IN FRASER RIVER ESTUARY
HQ0427	FRASER RIVER CHINOOK
HQ0428	FRASER RIVER CHUM
HQ0429	FRASER RIVER PINK
HQ0430	FRASER RIVER SOCKEYE SALMON
HQ0431	FRASER RIVER SOCKEYE 1994; PROBLEMS AND DISCREPANCIES
HQ0432	MIGRATORY BEHAVIOR OF ADULT FRASER RIVER SOCKEYE
HQ0433	PRESPAWNING MORTALITIES OF SOCKEYE SALMON IN THE FRASER RIVER SYSTEM AND POSSIBLE CAUSAL FACTORS
HQ0436	A PRELIMINARY STUDY OF HATCHERY CHINOOK SALMON SMOLTS MIGRATING IN THE LOWER FRASER RIVER, DETERMINED BY RADIOTAGGING
HQ0437	THE CHRONOLOGICAL ORDER OF FRASER RIVER SOCKEYE SALMON DURING MIGRATION, SPAWNING AND DEATH
HQ0438	POWER DEVELOPMENT AND FISH CONSERVATION ON THE FRASER RIVER
HQ0442	RESULTS OF PRELIMINARY MARK-RECAPTURE EXPERIMENTS WITH JUVENILE SALMONIDS ON STURGEON AND ROBERTS BANK, FRASER RIVER ESTUARY
HQ0443	THE DISTRIBUTION AND ABUNDANCE OF JUVENILE SALMON IN MARSH HABITATS OF THE FRASER RIVER ESTUARY
HQ0444	JUVINILE SALMON UTILIZATION OF TIDAL CHANNELS IN THE FRASER RIVER ESTUARY, BRITISH COLUMBIA
HQ0445	HYDROACOUSTIC ESTIMATION OF SOCKEYE SALMON ABUNDANCE AND DISTRIBUTION IN THE STRAIT OF GEORGIA
HQ0446	FIXED-ASPECT HYDROACOUSTIC ESTIMATION OF FRASER RIVER SOCKEYE ABUNDANCE AND DISTRIBUTION AT MISSION, B.C., IN 1986
HQ0447	EFFECTS OF ESTUARINE LOG STORAGE ON JUVENILE SALMON
HQ0448	POTENTIAL IMPACTS OF GLOBAL WARMING ON SALMON PRODUCTION IN THE FRASER RIVER WATERSHED
HQ0453	DIOXINS AND FURANS IN SEDIMENT AND FISH FROM THE VICINITY OF TEN INLAND PULP MILLS IN BRITISH COLUMBIA.
HQ0454	THE INDIAN FOOD FISHERY OF THE FRASER RIVER: 1986 SUMMARY
HQ0467	HISTORY AND PRESENT STATE OF THE ODD-YEAR PINK SALMON RUNS OF THE FRASER RIVER REGION
HQ0469	HYDROLOGY AND WATER USE FOR SALMON STREAMS IN THE CHILLIWACK/LOWER FRASER HABITAT MANAGEMENT AREA, BRITISH COLUMBIA
HQ0479	TRACE METALS AND SELECTED ORGANIC CONTAMINANTS IN FRASER RIVER FISH
HQ0488	ENUMERATION OF MIGRANT PINK SALMON FRY IN THE FRASER RIVER ESTUARY
HQ0698	UPPER FRASER RIVER ENVIRONMENTAL EFFECTS MONITORING (EEM) CYCLE ONE INTERPRETIVE REPORT

HQ0704	EFFECTS OF THE FISHERY AND OF OBSTACLES TO MIGRATION ON THE ABUNDANCE OF FRASER RIVER SOCKEYE SALMON (ONCHORYNCHUS NERKA)
HQ0759	ECOLOGICAL PERSPECTIVE CANADIAN HI-TECH MANUFACTURING SITE TILBURY ISLAND, DELTA
HQ0770	LOWER MAINLAND RESIDUAL CUTTHROAT SAMPLING ATTEMPT - AUGUST 1982
HQ0885	HYDROLOGY AND WATER USE FOR SALMON STREAMS IN THE CHILLIWACK/LOWER FRASER HABITAT MANAGEMENT AREA, BC
HQ0890	FRASER RIVER BASIN STRATEGIC WATER QUALITY PLAN LOWER FRASER RIVER
HQ0913	PRELIMINARY NECROPSY DATA ANALYSIS OF FALL, 1993 FISH SAMPLING IN THE FRASER RIVER, DOWNSTREAM OF HOPE, B.C.
HQ0982	THE CONSERVATION OF STURGEON STOCKS IN THE LOWER FRASER RIVER WATERSHED. A BASELINE INVESTIGATION OF HABITAT, DISTRIBUTION, AGE, AND POPULATION OF JUVENILE WHITE STURGEON (ACIPENSER TRANSMONTANUS) IN THE LOWER FRASER RIVER, DOWNSTREAM OF HOPE, B.C.
HQ0985	WHITE STURGEON (ACIPENSER TRANSMONTANUS) A MANAGEMENT PLAN FOR THE FISHERIES PROGRAM
HQ1115	FRASER RIVER WHITE STURGEON MONITORING PROGRAM REGION 3 (THOMPSON-NICOLA) 1996 INVESTIGATIONS
HQ1278	SUMMARY OF FISH COLLECTION ON THE UPPER FRASER RIVER, SPRING AND FALL 1994.
HQ1407	SUMMARY REPORT FOR FISH SAMPLING CARRIED OUT ON GOATSKIN CREEK'S FOUR TRIBUTARIES, SOUTH SNOWSHOE CREEK, AND WHITEFOOT CREEK
HQ1489	FRASER RIVER FISH STUDY - UBC
HQ1958	SEABIRD ISLAND ENVIRONMENTAL BASELINE STUDIES & FEASIBILITY ASSESSMENT OF FISHERIES ENHANCEMENT OPTIONS FOR MARIA SLOUGH
HQ2135	SELECTED WATERWAYS OF DELTA, SURREY, VANCOUVER AND RICHMOND
HQ2247	INDIGENOUS FISH SPEICES POTENTIALLY AT RISK IN BC WITH RECOMMENDATIONS AND PRIORITIES FOR CONSERVATION FORESTRY/RESOURCE USE, INVENTORY AND RESEARCH
HQ2251	CONSERVATION DATA CENTER WEBSITE
HQ2263	FRASER RIVER WHITE STURGEON MONITORING PROGRAM REGION 5 (CARIBOO-CHILCOTIN)
HQ2268	FRASER RIVER WHITE STURGEON MONITORING PROGRAM: REGION 3 (THOMPSON-NICOLA)
HQ2324	BRITISH COLUMBIA WILDLIFE VIEWING GUIDE
HQ2548	HABITAT-BASED ASSESSMENT OF STEELHEAD PRODUCTION AND ESCAPEMENT IN TRIBUTARIES OF THE MID-FRASER RIVER
NUSEDS-SUM	NUSEDS Database
RABOBST-SUM	RAB Obstructions
REL-SUM	RELEASE Database
SISSC01	SISS FISH HABITAT INVENTORY AND INFORMATION PROGRAM.
SISSM01	SISS map information (source not indicated)
STLHD-SUM	STEELHEAD Database
WSCANDB	LIST OF ALL WATER SURVEY CANADA STATIONS IN B.C. AND YUKON, OCTOBER 1, 2000.

ADDITIONAL INFORMATION

Please see the Fisheries Information Data Queries (FIDQ) for additional and more detailed queries of fish and fish habitat information:

<http://www.env.gov.bc.ca/fish/fidq/index>

Please check the Ecological Reports Catalogue (EcoCat) for reference material and data that is available for online distribution:

<http://www.env.gov.bc.ca/ecocat/>

Ministry of Environment

HABITAT WIZARD STREAMS REPORT

Nov. 13, 2020

WATERBODY INFORMATION	
Name:	KATZIE SLOUGH
Alias:	
Alias (2):	
UTM Co-ordinate (Stream Mouth):	UTM: 10 519389, 5454342
Primary Mapsheet:	092G02
Primary Region:	Lower Mainland
Watershed Code:	100-026700-02800
Waterbody Identifier:	00000LFRA
Stream Length (m):	10.16
Stream Order:	3
Stream Magnitude:	29

SPECIES PRESENT	
FISH SPECIES	LAST KNOWN OBSERVATION DATE
Black Crappie	01-SEP-97
Brassy Minnow	16-MAY-12
Brown Catfish (formerly Brown Bullhead)	16-APR-12
Bullhead (General)	01-JUL-11
Carp	07-FEB-08
Carp (General)	02-OCT-12
Chinook Salmon	16-MAY-12
Coho Salmon	18-JUN-13
Cutthroat Trout	29-APR-14
Fish Unidentified Species	31-OCT-07
Goldfish	29-APR-14
Largemouth Bass	16-APR-12
Northern Pikeminnow	11-NOV-11
Peamouth Chub	23-OCT-14
Prickly Sculpin	29-APR-14
Pumpkinseed	23-OCT-14
Redside Shiner	18-JUN-13
Sculpin (General)	06-AUG-15
Stickleback (General)	06-AUG-15
Sucker (General)	01-JUL-11
Threespine Stickleback	23-OCT-14

STOCKING INFORMATION

DATE	SPECIES	RELEASED	STOCK	LIFE STAGE	HATCHERY
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OBSTRUCTIONS

DESCRIPTION	HEIGHT	LENGTH	COMMENTS
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ONLINE WATER LEVELS

REFERENCE URL

This water body has online water level information available from Environment Canada and the Province of BC. Use the link(s) above to go directly to the station information on the BC River Levels website.

WATER QUANTITY INFORMATION

The most current water survey information is available from the following Water Survey of Canada web <http://scitech.pyr.ec.gc.ca/waterweb/selectProvin> provides access to real-time water station in: <http://www.wsc.ec.gc.ca/hydat/H2> provides access to archived water station information

STREAM SURVEY DATA

SURVEY DATE:		AGENCY: Letts Environmental Consultants Ltd			
Project Name:	Project ID/Name: 32895/Salvage, Ditch Maintenance Maple Ridge-2015; SU15-165985				
UTM Zone	10	Average Channel Width		Stream Order	3
UTM Easting	524491	Width Measurements	0	Surveyed Length	
UTM Northing	5452820	Water Temperature (C)		Gradient (%)	
Site Number	3	Intermittent Indicator	No	Conductivity	
Source	FDIS	Dewatering Indicator	Yes	No Visible Chan	No

SURVEY DATE:		AGENCY: Cascade Environmental Resource Group			
Project Name:		Project ID/Name: 33797/Fish Salvage Katzie Slough-2013; SU13-86303h			
UTM Zone	10	Average Channel Width		Stream Order	3
UTM Easting	522133	Width Measurements	0	Surveyed Length	
UTM Northing	5450616	Water Temperature (C)		Gradient (%)	
Site Number	1	Intermittent Indicator	No	Conductivity	
Source	FDIS	Dewatering Indicator	No	No Visible Chan	No

TRIBUTARY STREAMS					
1:50,000 WATERSHED CODE	GAZETTED NAME	UTM	EASTING	NORTHING	
100-026700-02800-01100	Unnamed tributary - 00000LFRA - 229	10	519414	5454313	
100-026700-02800-02000	CRANBERRY SLOUGH	10	519493	5454309	
100-026700-02800-09500	Unnamed tributary - 00000LFRA - 234	10	520194	5453922	
100-026700-02800-14000	Unnamed tributary - 00000LFRA - 237	10	520578	5453689	
100-026700-02800-20600	COOK SLOUGH	10	521147	5453836	
100-026700-02800-24100	Unnamed tributary - 00000LFRA - 240	10	521440	5454006	
100-026700-02800-34700	Unnamed tributary - 00000LFRA - 242	10	522535	5454095	
100-026700-02800-50400	Unnamed tributary - 00000LFRA - 243	10	523996	5453913	
100-026700-02800-53300	Unnamed tributary - 00000LFRA - 245	10	524111	5453643	
100-026700-02800-53900	Unnamed tributary - 00000LFRA - 246	10	524114	5453589	
100-026700-02800-56100	Unnamed tributary - 00000LFRA - 247	10	524185	5453366	
100-026700-02800-60700	Unnamed tributary - 00000LFRA - 253	10	524340	5452965	
100-026700-02800-61500	Unnamed tributary - 00000LFRA - 254	10	524317	5452862	
100-026700-02800-71500	Unnamed tributary - 00000LFRA - 255	10	524092	5452069	
100-026700-02800-85400	Unnamed tributary - 00000LFRA - 256	10	524001	5450684	
100-026700-02800-85900	Unnamed tributary - 00000LFRA - 257	10	523993	5450650	
100-026700-02800-88700	Unnamed tributary - 00000LFRA - 258	10	523921	5450410	
100-026700-02800-92600	Unnamed tributary - 00000LFRA - 259	10	523915	5449980	

REFERENCES	
REFERENCE ID	REFERENCE TITLE
2PU1040	KATZIE MARSH, BRITISH COLUMBIA FISH AND WATERFOWL MANAGEMENT
DFP001	Addition of zones & points re: FISS maps for fish distribution for G.I.S. display purposes
HQ0735	ENVIRONMENTAL MONITORING AT THE CP RAIL INTERMODAL YARD, PITT MEADOWS
HQ0922	THE LOWER MAINLAND NON-SALMONID HARVESTING GUIDELINES

ADDITIONAL INFORMATION

Please see the Fisheries Information Data Queries (FIDQ) for additional and more detailed queries of fish and fish habitat information:

<http://www.env.gov.bc.ca/fish/fidq/index>

Please check the Ecological Reports Catalogue (EcoCat) for reference material and data that is available for online distribution:

<http://www.env.gov.bc.ca/ecocat/>

APPENDIX D – BCCDC REPORT



BC Conservation Data Centre: Species Occurrence Report

Shape ID: 106164

Scientific Name: *Allogona townsendiana*

English Name: Oregon Forestsnail

Identifiers

Occurrence ID: 13667
Shape ID: 106164
Taxonomic Class: gastropods
Element Group: Invertebrate Animal

Status

Provincial Rank: S2
BC List: Red
Global Rank: G3G4
COSEWIC: E (APR 2013)
SARA Schedule: 1

Locators

Survey Site: LANGLEY, FOUR KM NORTH OF
Directions: North of Langley: east of 200th Street and south of Highway 1, north of 80th Avenue.
Biogeoclimatic Zone:
Ecosection: FRL

Area Description

General Description:

Lot 2 Highway 1 and 201A Street: Riparian area with overstory of red alder, understory of salmonberry and moss ground-cover with trailing blackberry (C. Lipp, pers. comm. 2013). 84th Ave, between 200 and 208 Streets: At the forest edge of a seepage area (Klinkenberg ND: E-Fauna photo gallery id #15484 and 15485).

Vegetation Zone:

Min. Elevation (m): Max. Elevation (m):

Habitat: TERRESTRIAL: Urban, Woodland Broadleaf; RIVERINE: Riparian

Occurrence Information

First Observation Date: 2011-06-22

Last Observation Date: 2012-11-03

Occurrence Data:

2012: One Oregon Forestsnail salvaged in 2012 (relocated to adjacent covenanted forest habitat) (C. Lipp, pers. comm. 2013); 2011: snails photographed (Klinkenberg ND: E-Fauna photo gallery id #15484 to 15486, and 15588).

Occurrence Rank and Occurrence Rank Factors

Rank: D : Poor estimated viability

Rank Date: 2012-11-03

Rank Comments:

One occurrence is a salvage due to highway construction and the other was found and then the site turned into 51 single family dwellings.

Condition of Occurrence:

Size of Occurrence:

Landscape Context:

Version

Version Date: 2017-02-12

Version Author: Davis, H.

Mapping Information

Estimated Representation Accuracy: Medium

Estimated Representation Accuracy Comments:

Confident that full extent is represented by Occurrence: N

Confidence Extent Definition: Confident full extent of EO is NOT known

Additional Inventory Needed: Y

Inventory Comments:

Documentation

References:

Klinkenberg, Brian (Editor). ND. E-Fauna BC: Electronic Atlas of the Fauna of British Columbia [www.efauna.bc.ca]. Lab for Advanced Spatial Analysis, Department of Geography, University of British Columbia, Vancouver.

Lipp, Cindy. Personal communication. McElhanney Consulting Services Ltd.

Specimen:

Suggested Citation:

B.C. Conservation Data Centre. 2014. Occurrence Report Summary, Shape ID: 106164, Oregon Forestsnail. B.C. Ministry of Environment. Available: <http://maps.gov.bc.ca/ess/hm/cdc>, (accessed Nov 19, 2020).



BC Conservation Data Centre: Species Occurrence Report

Shape ID: 25084

Scientific Name: *Sorex bendirii*
English Name: Pacific Water Shrew

Identifiers

Occurrence ID: 6597
Shape ID: 25084
Taxonomic Class: mammals
Element Group: Vertebrate Animal

Status

Provincial Rank: S2?
BC List: Red
Global Rank: G4
COSEWIC: E (APR 2016)
SARA Schedule: 1

Locators

Survey Site: SURREY, FRASER HEIGHTS
Directions: Approx. 300 m north of the intersection of 108th Ave. and 168th St. in Surrey; polygon approx. 1 km S of the Fraser River, point 100 m south of river (just south of Douglas Island).

Biogeoclimatic Zone:

Ecosection: FRL

Area Description

General Description:

The forested slough (drainage ditch) is in the Very Dry Maritime Coastal Western Hemlock Zone (CWHxm); vegetation includes reed canary grass, salmonberry, vine maple and red alder. Residential development is to the south and west of the occurrence and the CN Intermodal yard is to the north and east; the Fraser River is 1 km to the north (K.A. McIntosh, pers. comm.).

"Fraser Heights 2": Habitat description: wetted width of 2 m, max channel depth: 40 cm. Cover type: red alder and mixed coniferous forest. In stream vegetation: bulrushes. Channel substrate: soft bottom with large woody debris (M. McArthur, pers. comm. 2007).

PKI Ditch is a seasonal drainage ditch that receives input from rainwater, historical detention/water quality ponds to the south, and run-off from surrounding roadside ditches. It is hydraulically connected to SF Perimeter ditch to the north. PKI Ditch discharges into the wetland area to the west, which in turn drains into Centre Creek (Watershed Code: 100-029000). Prior to discharging into the wetland, it conflues with an upstream reach of Centre Creek (the designated release location; L. Kovics, pers. comm. 2009). The release site is adjacent to the reach of Centre Creek located immediately north of 104 Avenue. To the south of the release site, is a large pond complex (the result of beaver activity) with abundant coarse woody debris. In August 2009, Kiewit-Flatiron personnel responded to the BC Ministry of Environment (MoE), which was seeking clarification regarding the proposed release site prior to wildlife permit issuance. Specifically, Kiewit-Flatiron noted that Gebauer & Associates had recommended the proposed release site as it contains suitable habitat and is directly connected to PKI Ditch, the wetland, and Centre Creek to the north of the wetland area (currently isolated via trenched exclusion fencing). Moreover, the proposed

release site is well outside the construction footprint, while remaining in close proximity to the trap locations, thereby minimizing holding time and associated stress on captured animals following processing (C. Lee, pers. comm. 2009).

Vegetation Zone:

Min. Elevation (m): 5

Max. Elevation (m): 10

Habitat: PALUSTRINE: Ditch; TERRESTRIAL: Forest Mixed

Occurrence Information

First Observation Date: 2003-10-21

Last Observation Date: 2009-09-20

Occurrence Data:

2009: two more captures of Pacific Water Shrews were documented in September, both were released nearby at the pre-determined release site which is within the polygon (C. Lee, pers. comm. 2009). And, one Pacific Water Shrew videotaped swimming and walking on water (G. Ferguson, pers. comm. 2009).

2007: A (juvenile?) Pacific Water Shrew died in a minnow trap (M. McArthur, pers. comm. 2007).

2003: 1 adult(?) specimen collected from a forested slough - storm sewer outflow from a residential neighbourhood (K.A. McIntosh, pers. comm.).

Occurrence Rank and Occurrence Rank Factors

Rank: CD : Fair or poor estimated viability

Rank Date: 2009-09-20

Rank Comments:

Population has been found repeatedly between 2003-2009 but only sampled because site is under threat from development.

Condition of Occurrence:

Storm sewers from both the railyard and the housing development terminate in the slough (K.A. McIntosh, pers. comm.). Threats to site: Ministry of Transportation and Highways Gateway project, South Fraser Perimeter Road may require some infilling in this area. Also the City of Surrey sewer main construction project happening on this site. The new sewer has an above-ground crossing over the ditch where the "Fraser Heights 2" Pacific Water Shrew was captured (M. McArthur, pers. comm. 2007).

Size of Occurrence:

One Pacific Water Shrew observed in 2003, another died in a minnow trap 1.5 km away in 2007 (M. McArthur, pers. comm. 2007) and one observation (videotaped; G. Ferguson, pers. comm. 2009) and two more captures were documented in September 2009, both captures were released nearby at the pre-determined release site which is within the polygon (C. Lee, pers. comm. 2009).

Landscape Context:

The slough is contained by residential development to the south and west and the CN intermodal yard to the north and east (K.A. McIntosh, pers. comm.).

Version

Version Date: 2012-10-09

Version Author: Davis, H.

Mapping Information

Estimated Representation Accuracy: Medium

Estimated Representation Accuracy Comments:

Confident that full extent is represented by Occurrence: N

Confidence Extent Definition: Confident full extent of EO is NOT known

Additional Inventory Needed: Y

Inventory Comments:

Documentation

References:

Ferguson, Greg. Personal communication. Canadian Wildlife Service, Species at Risk Recovery Unit, 401 Burrard Street, Vancouver, BC.

Lee, C. Personal communication. AquaTerra Biological Consulting/Gebauer & Associates Ltd.

McArthur, M. Personal communication. Environmental Scientist, Triton Environmental Consultants Ltd.

McIntosh, K.A. 2004. Personal communication. Robertson Environmental Services, Langley, BC.

Pacific Water Shrew Recovery Team. 2010. Preliminary partial critical habitat identification for Pacific Water Shrew (*Sorex bendirii*)-DRAFT. 38 pp.

Specimen:

Suggested Citation:

B.C. Conservation Data Centre. 2014. Occurrence Report Summary, Shape ID: 25084, Pacific Water Shrew. B.C. Ministry of Environment. Available: <http://maps.gov.bc.ca/ess/hm/cdc>, (accessed Nov 19, 2020).



BC Conservation Data Centre: Species Occurrence Report

Shape ID: 20777

Scientific Name: *Sorex trowbridgii*
English Name: Trowbridge's Shrew

Identifiers

Occurrence ID: 6238
Shape ID: 20777
Taxonomic Class: mammals
Element Group: Vertebrate Animal

Status

Provincial Rank: S3
BC List: Blue
Global Rank: G5
COSEWIC:
SARA Schedule:

Locators

Survey Site: Latimer Creek
Directions: "the woodlot immediately on the northwest corner of Highway 1 and 200th Street in Langley, B.C. along the top-of-bank of Latimer Creek between 200th Street (east) and Highway 1 (westbound) (south)" (Michalak 2003).

Biogeoclimatic Zone:

Ecosection: FRL

Area Description

General Description:

Latimer Creek flows through a mature forest comprised mainly of western redcedar (*Thuja plicata*), western hemlock (*Tsuga heterophylla*), cottonwood (*Populus trichocarpa*) and red alder (*Alnus rubra*). The understory is primarily composed of ferns, Himalayan blackberry (*Rubus discolor*), skunk cabbage (*Lysichiton americanum*), salmonberry (*Rubus spectabilis*), and reed canary grass (*Phalarus arundinaceae*), (Michalak 2003).

Vegetation Zone:

Min. Elevation (m):

Max. Elevation (m):

Habitat: TERRESTRIAL; FOREST MIXED; CREEK; RIPARIAN

Occurrence Information

First Observation Date: 2001-05-04

Last Observation Date: 2001-05-06

Occurrence Data:

2001: Eight individuals captured over 2 nights in pitfall trapping (Michalak 2003).

Occurrence Rank and Occurrence Rank Factors

Rank: C? : Possibly fair estimated viability

Rank Date: 2003-10-27

Rank Comments:

The number of adults collected denotes a good population at this site, however the extreme isolation and fragmentation of the woodlot (albeit mature forest) brings down the rank of this occurrence.

Condition of Occurrence:

Size of Occurrence:

The isolated woodlot is 10 ha in total.

Landscape Context:

The site is in a remnant woodlot. The pools in the area contain bullfrog tadpoles (*Bufo borealis*) and is isolated in the landscape with a reed canary grass (*Phalarus arundinaceae*) hydro corridor separating the Serpentine River along the south. Trails for passive recreation radiate throughout the 10 ha property.

Version

Version Date: 2003-10-27

Version Author: Ramsay, L.

Mapping Information

Estimated Representation Accuracy: Medium

Estimated Representation Accuracy Comments:

Confident that full extent is represented by Occurrence: ?

Confidence Extent Definition: Uncertain whether full extent of EO is known

Additional Inventory Needed: N

Inventory Comments:

Documentation

References:

Michalak, L. Personal communication.

Specimen:

Suggested Citation:

B.C. Conservation Data Centre. 2014. Occurrence Report Summary, Shape ID: 20777, Trowbridge's Shrew. B.C. Ministry of Environment. Available: <http://maps.gov.bc.ca/ess/hm/cdc>, (accessed Nov 19, 2020).

APPENDIX E1/E2 – PROVINCIAL ARCHEAOLOGICAL BRANCH INFORMATION
REQUEST

Rosa Shih

From: Cooper, Diana FLNR:EX <Diana.Cooper@gov.bc.ca>
Sent: Thursday, February 25, 2021 4:31 PM
To: Melissa Zheng
Subject: RE: Data Request: Melissa Zheng - Pacific Land Resource Group Inc. (PLG)

Hello Melissa,

Thank you for your archaeological information request regarding a section of Bonson Road located to the west of the Katzie Reserve No. 1, Pitt Meadows. Please review the screenshot of the area below and notify me immediately if it does not represent the area described in your information request.

Results of Provincial Archaeological Inventory Search

According to Provincial records, there are no known archaeological sites recorded on the portion of Bonson Road indicated in the figure you attached to your request.

However, previously recorded archaeological site **DhRq-5** is recorded at the south end of the Katzie IR#1, and there is a possibility that the site extends beyond the Reserve boundary.

Additionally, archaeological potential modelling for the area indicates there is high potential for previously unidentified archaeological sites to exist within the area of interest, as indicated by the brown areas shown in the screenshot below.

Archaeological potential modelling is compiled using existing knowledge about archaeological sites, past indigenous land use, and environmental variables. Models are a tool to help predict the presence of archaeological sites but their results may be refined through further assessment.

Archaeology Branch Advice

If land-altering activities (e.g., home renovations, property redevelopment, landscaping, service installation) are planned for the area, a Provincial heritage permit is not required prior to commencement of those activities.

However, a Provincial heritage permit will be required if archaeological materials are exposed and/or impacted during land-altering activities. Unpermitted damage or alteration of a protected archaeological site is a contravention of the *Heritage Conservation Act* and requires that land-altering activities be halted until the contravention has been investigated and permit requirements have been established. This can result in significant project delays.

Therefore, the Archaeology Branch strongly recommends engaging an eligible consulting archaeologist prior to any land-altering activities. The archaeologist will review the proposed activities, verify archaeological records, and possibly conduct a walk-over and/or an archaeological impact assessment (AIA) of the project area to determine whether the proposed activities are likely to damage or alter any previously unidentified archaeological sites.

Please notify all individuals involved in land-altering activities (e.g., owners, developers, equipment operators) that if archaeological material is encountered during development, they **must stop all activities immediately** and contact the Archaeology Branch for direction at 250-953-3334.

Rationale and Supplemental Information

- There is high potential for previously unidentified archaeological deposits to exist within the area of interest.

- Archaeological sites are protected under the *Heritage Conservation Act* and must not be damaged or altered without a Provincial heritage permit issued by the Archaeology Branch. This protection applies even when archaeological sites are previously unidentified or disturbed.
- If a permit is required, be advised that the permit application and issuance process takes approximately 8-12 weeks; the permit application process includes referral to First Nations and subsequent engagement.
- The Archaeology Branch must consider numerous factors (e.g., proposed activities and potential impacts to the archaeological site[s]) when determining whether to issue a permit and under what terms and conditions.
- The Archaeology Branch has the authority to require a person to obtain an archaeological impact assessment, at the person's expense, in certain circumstances, as set out in the *Heritage Conservation Act*.
- Occupying an existing dwelling or building without any land alteration does not require a Provincial heritage permit.

How to Find an Eligible Consulting Archaeologist

An eligible consulting archaeologist is one who can hold a Provincial heritage permit to conduct archaeological studies. To verify an archaeologist's eligibility, ask an archaeologist if he or she can hold a permit in your area, or contact the Archaeology Branch (250-953-3334) to verify an archaeologist's eligibility. Consulting archaeologists are listed on the BC Association of Professional Archaeologists website (www.bcapa.ca) and in local directories.

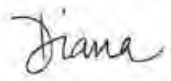
Questions?

For questions about the archaeological permitting and assessment process, please contact the Archaeology Branch at 250-953-3334 or archaeology@gov.bc.ca.

For more general information, visit the Archaeology Branch website at www.gov.bc.ca/archaeology.

Please let me know if you have any questions regarding this information.

Kind regards,

A handwritten signature in cursive script that reads "Diana".





Please note that subject lot boundaries (yellow), archaeological sites (red) and areas of archaeological potential (brown) indicated on the enclosed screenshot are based on information obtained by the Archaeology Branch on the date of this communication and may be subject to error or change.



Diana Cooper
Archaeologist/Archaeological Information Administrator
 Archaeology Branch | [Ministry of Forests, Lands, Natural Resource Operations and Rural Development](#)
 Phone: (250) 953-3343 | Email: diana.cooper@gov.bc.ca | Website www.gov.bc.ca/archaeology

From:

melissa@pacificlandgroup.ca <melissa@pacificlandgroup.ca> **On Behalf Of** ArchDataRequest@gov.bc.ca
Sent: January 29, 2021 1:42 PM
To: Arch Data Request FLNR:EX <ArchDataRequest@gov.bc.ca>
Subject: Data Request: Melissa Zheng - Pacific Land Resource Group Inc. (PLG)

Terms and Conditions Accepted Yes
 Name Melissa Zheng
 Email melissa@pacificlandgroup.ca

I am a Industry Representative (e.g., forestry, oil and gas, environmental)
Affiliation Pacific Land Resource Group Inc. (PLG)
Address 212-12992 76 Avenue
City Surrey
Province British Columbia
Postal Code V3W 2V6
Phone Number 604-501-1624

Information Requested I request information and advice about archaeological sites on the properties described below (In the text box below, include the Parcel Identifier (PID), street address, and the legal description if available. If you have maps, please upload them to the File Attachments section near the end of the form.):

Section of Bonson Road located to the west of the Katzie Reserve No. 1, Pitt Meadows, BC. This area does not have a specific PID, street address, or legal description. *See attached Google Maps aerial image showing the inquiry location outlined in red.

Why Site Information is Required Other (describe below):

PLG is the environmental consultant completing a comprehensive Environmental Assessment (EA) for the properties located to the east of the inquiry area (i.e., Katzie Reserve No. 1, Pitt Meadows). The information obtained from the BC Archaeology Branch for the inquiry location noted above will be included in PLG's EA report.

Third Party Access The following person(s) may have access to this information (Include the person's full name and relationship to you below. If you would like them to be copied on our email reply containing property information, please also include their email address):

- Ministry of Forests, Lands, Natural Resource Operations and Rural Development (MFLNRORD)
- Epta Development Corporation (Client) • Katzie First Nations

Format Required PDF, Excel, Access, Shapefile (ESRI, NAD 83, BC Albers Projection), Map(s)

Who Prompted PLG would like to include this information in the EA report, as part of a background review of the properties to the east of the inquiry area.

File Attachment#1 Google Maps Aerial Image - Bonson Road.png

File Attachment#2

File Attachment#3

File Attachment#4

File Attachment#5

Rosa Shih

From: Cooper, Diana FLNR:EX <Diana.Cooper@gov.bc.ca>
Sent: Thursday, January 28, 2021 3:51 PM
To: Melissa Zheng
Subject: RE: Data Request: Melissa Zheng - Pacific Land Resource Group Inc. (PLG)

Hello Melissa,

Regarding the properties described as:

Lot 6-1-2 CLSR 71874, Katzie Indian Reserve No. 1 (PIN: 902009250)

Lot 6-1-3 CLSR 71874, Katzie Indian Reserve No. 1 (PIN: 902009252)

Lot 6-1-4 CLSR 71874, Katzie Indian Reserve No. 1 (PIN: 902009253)

Lot 6-1-5 CLSR 71874, Katzie Indian Reserve No. 1 (PIN: 902009254)

Lot 6-1-7 CLSR 76491, Katzie Indian Reserve No. 1 (PIN: 902007832)

Lot 6-2 CLSR 51256, Katzie Indian Reserve No. 1 (PIN: 902008382)

There are no known archaeological sites recorded on any of the lots.

However, archaeological potential modelling for the area indicates there is high potential for previously unidentified archaeological sites to exist within the majority of the Reserve lands, as indicated by the brown coloured area shown in the second screenshot below. Archaeological potential modelling is compiled using existing knowledge about archaeological sites, past indigenous land use, and environmental variables. Models are a tool to help predict the presence of archaeological sites but their results may be refined through further assessment.

Indian Reserves fall under Federal Jurisdiction and any archaeological sites located on Reserves are not protected under the *Heritage Conservation Act*.

The Archaeology Branch cannot require any archaeological studies or work be conducted on Federal Land in areas of high archaeological potential prior to development. However, given the sensitive and non-renewable nature of archaeological sites, we recommend that archaeological standards and practices in place for private and Crown lands also be applied to Federal Lands.

Prior to any land-altering activities, an Eligible Consulting Archaeologist should be engaged to determine if development activities are likely to impact unknown archaeological sites. I am informing you of this archaeological potential so proponents are aware of the potential risk for encountering a site if they choose to conduct any land-altering activities within the AOI.

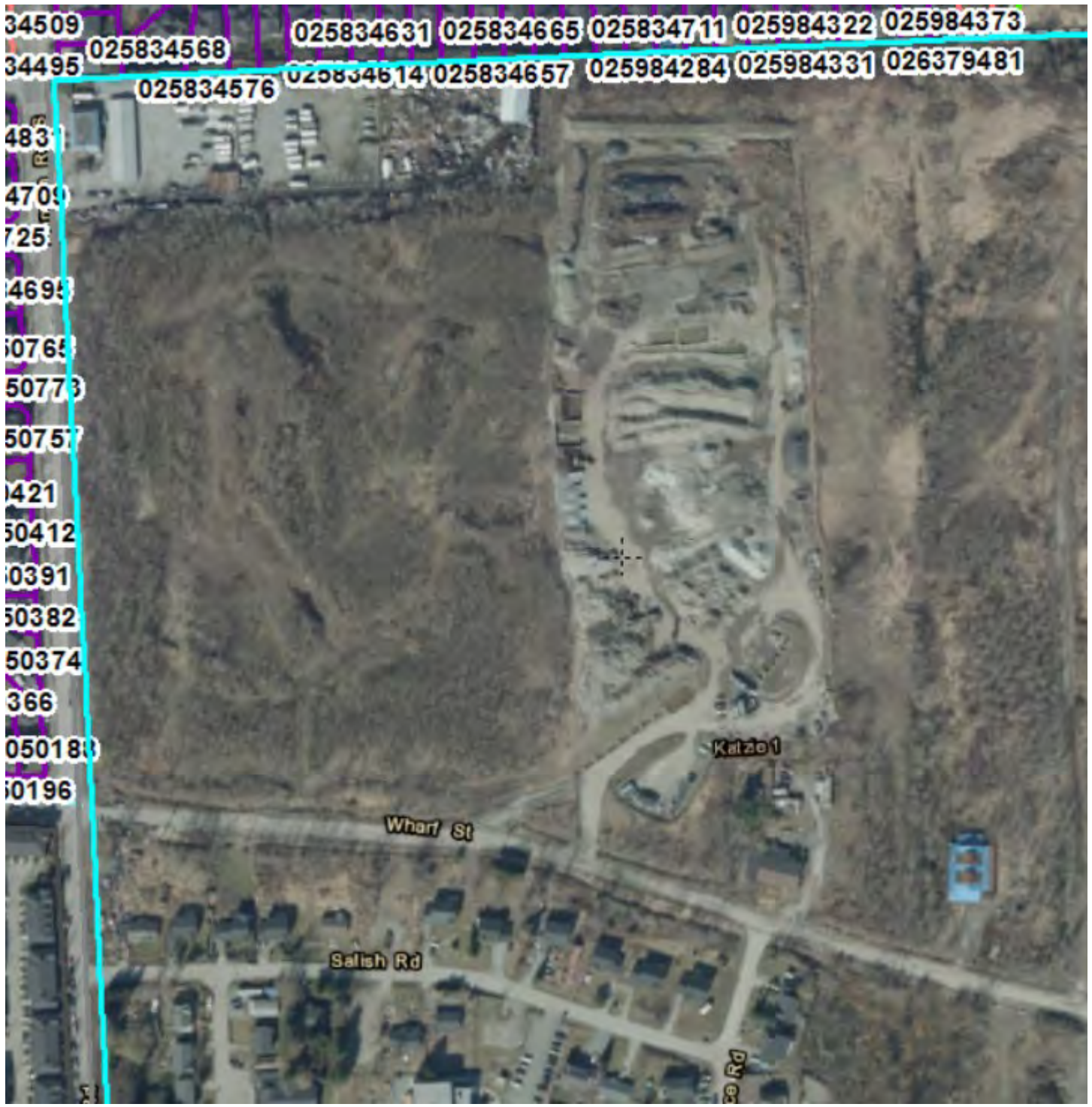
An Eligible Consulting Archaeologist is one who is able to hold a Provincial heritage permit that allows them to conduct archaeological studies. Ask an archaeologist if he or she can hold a permit, and contact the Archaeology Branch (250-953-3334) to verify an archaeologist's eligibility. Consulting archaeologists can be contacted through the BC Association of Professional Archaeologists (www.bcapa.ca) or through local directories.

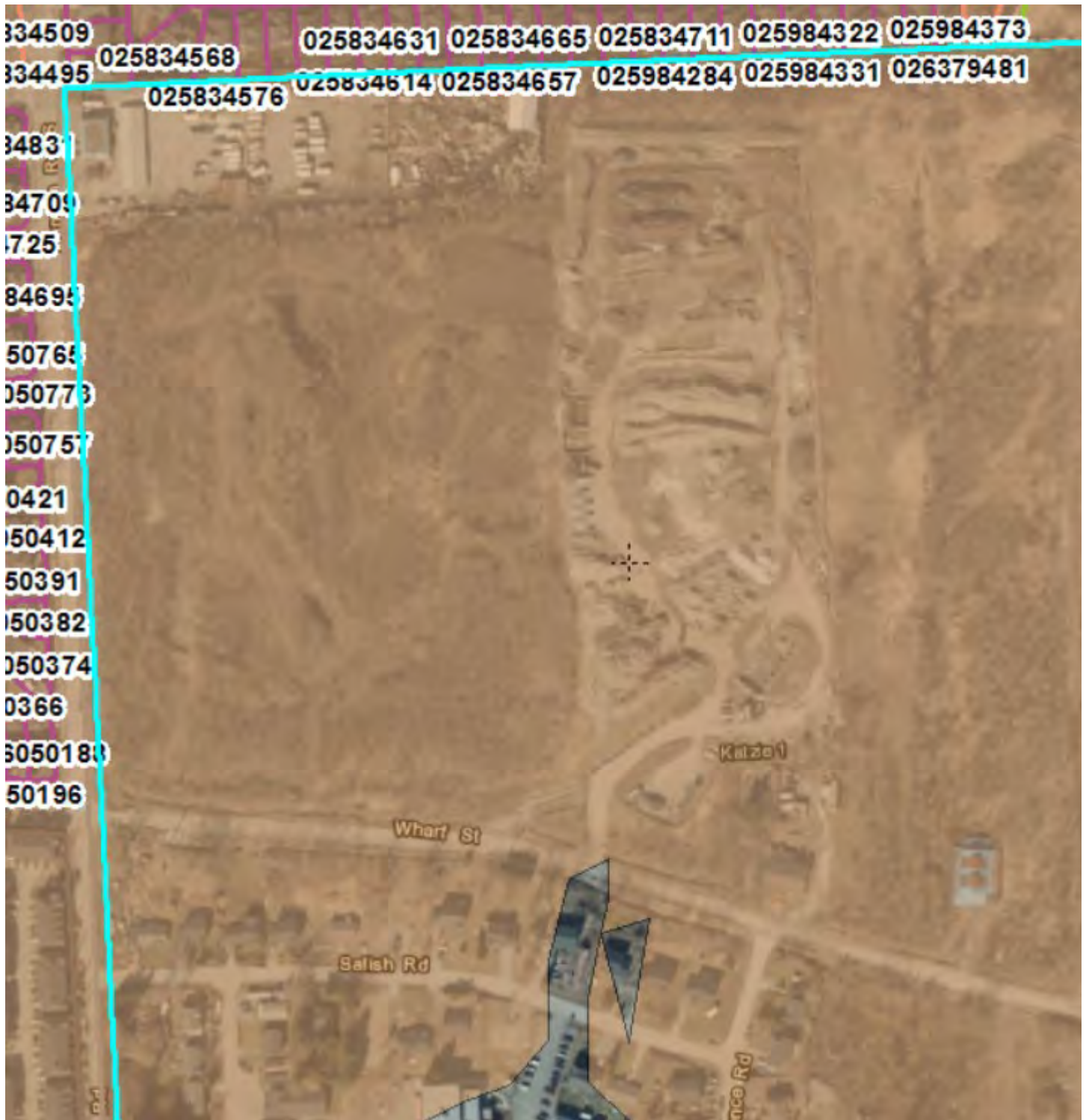
Below is a screenshot showing the area of interest (the reserve lands are outlined in light blue) in relation to the archaeological potential mapping (the orange-brown colour indicates high potential for unknown/unrecorded archaeological deposits). Unfortunately, there is no cadastral data for inside of Indian Reserves.

Please let me know if you have any questions regarding this information.

Kind regards,

Jiana





Please note that reserve boundaries (blue) and areas of archaeological potential (brown) indicated on the enclosed screenshot are based on information obtained by the Archaeology Branch on the date of this communication and may be subject to error or change.



Diana Cooper
Archaeologist/Archaeological Information Administrator
 Archaeology Branch | [Ministry of Forests, Lands, Natural Resource Operations and Rural Development](#)
 Phone: (250) 953-3343 | Email: diana.cooper@gov.bc.ca | Website: www.gov.bc.ca/archaeology

From: melissa@pacificlandgroup.ca <melissa@pacificlandgroup.ca> **On Behalf Of** ArchDataRequest@gov.bc.ca
Sent: January 7, 2021 1:28 PM
To: Arch Data Request FLNR:EX <ArchDataRequest@gov.bc.ca>
Subject: Data Request: Melissa Zheng - Pacific Land Resource Group Inc. (PLG)

Terms and Conditions Accepted Yes
Name Melissa Zheng
Email melissa@pacificlandgroup.ca
I am a Industry Representative (e.g., forestry, oil and gas, environmental)
Affiliation Pacific Land Resource Group Inc. (PLG)
Address 212-12992 76 Avenue
City Surrey
Province British Columbia
Postal Code V3W 2V6
Phone Number 604-501-1624

Information Requested I request information and advice about archaeological sites on the properties described below (In the text box below, include the Parcel Identifier (PID), street address, and the legal description if available. If you have maps, please upload them to the File Attachments section near the end of the form.):
Six (6) legal parcels located within Katzie Reserve No. 1, Pitt Meadows, BC, are described as follows (legal description and PIN number): 1) Lot 6-1-2 CLSR 71874 (PIN: 902009250); 2) Lot 6-1-3 CLSR 71874 (PIN: 902009252); 3) Lot 6-1-4 CLSR 71874 (PIN: 902009253); 4) Lot 6-1-5 CLSR 71874 (PIN: 902009254); 5) Lot 6-1-7 CLSR 76491 (PIN: 902007832); and 6) Lot 6-2 CLSR 51256 (PIN: 902008382). *See attached site map showing the Subject Property outlined in red.

Why Site Information is Required Other (describe below):
PLG is the environmental consultant completing a comprehensive Environmental Assessment (EA) for the above noted property. The information obtained from the BC Archaeology Branch will be included in the EA report.

Third Party Access The following person(s) may have access to this information (Include the person's full name and relationship to you below. If you would like them to be copied on our email reply containing property information, please also include their email address):
• Ministry of Forests, Lands, Natural Resource Operations and Rural Development (MFLNRORD) • Epta Development Corporation (Client) • Katzie First Nations

Format Required PDF, Excel, Access, Shapefile (ESRI, NAD 83, BC Albers Projection), Map(s)

Who Prompted PLG would like to include this information in the EA report, as part of a background review of the above noted property.

File Attachment#1
File Attachment#2
File Attachment#3
File Attachment#4
File Attachment#5

APPENDIX F – UBC AERIALS

BC5572

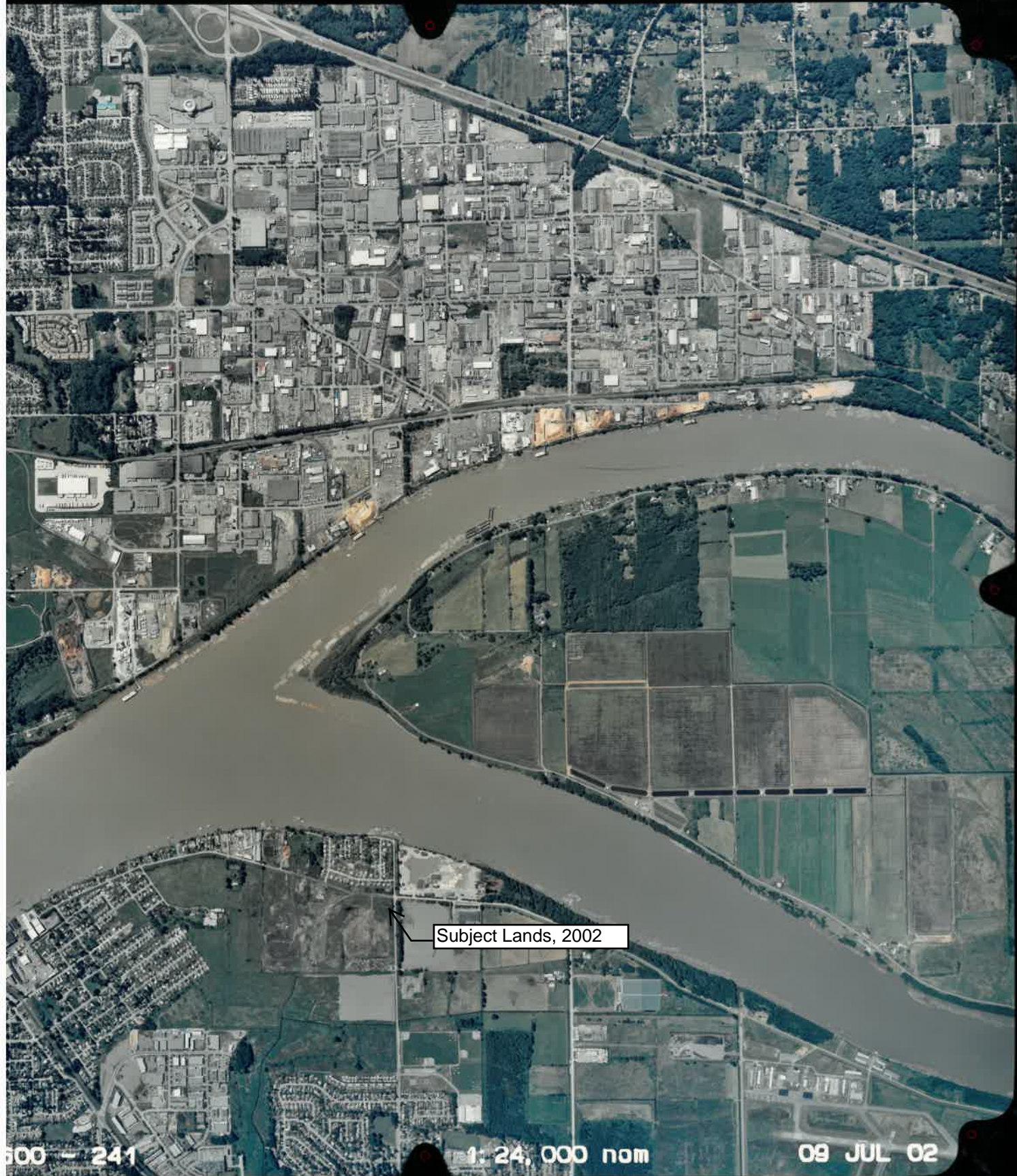
0053

Subject Lands, 1974





Subject Lands, 1996

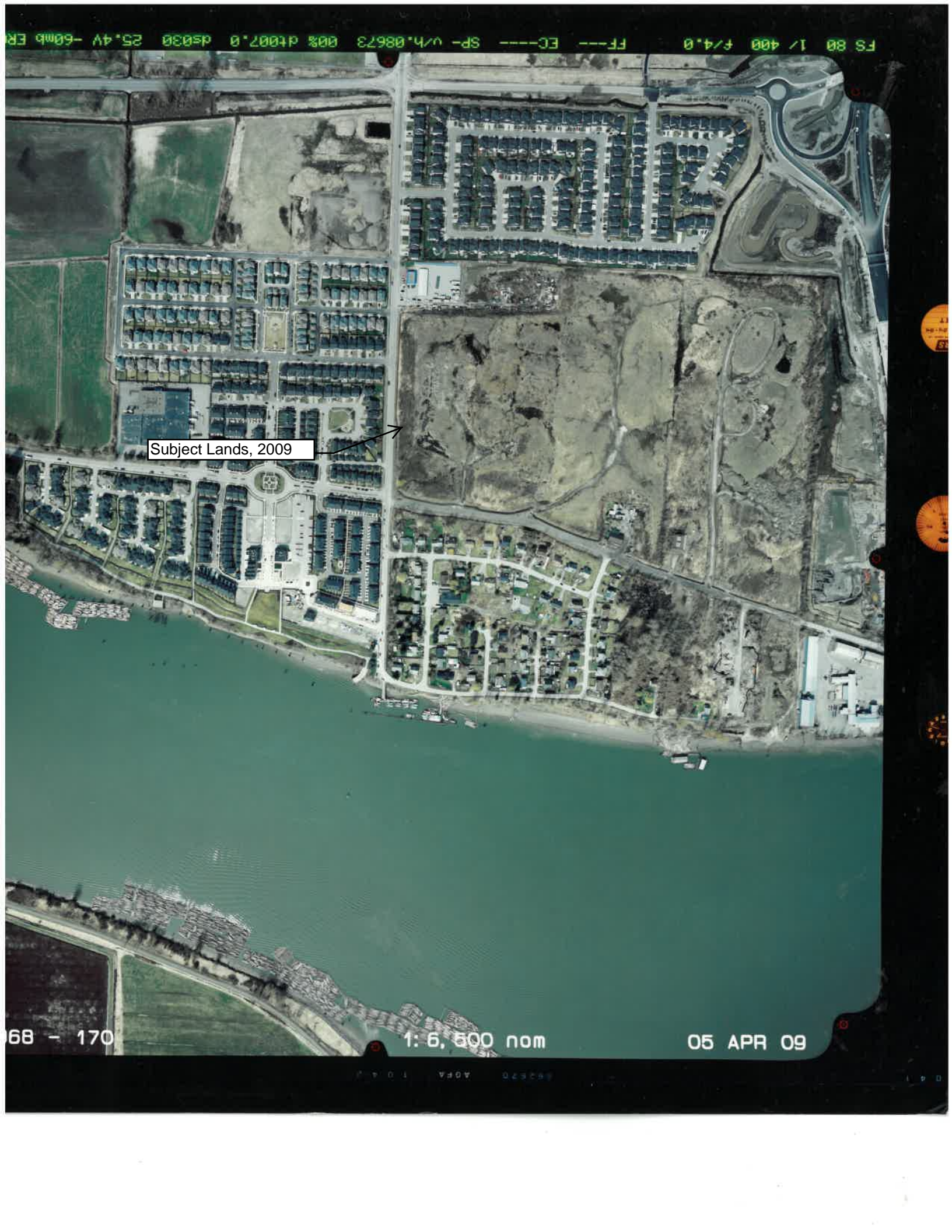


Subject Lands, 2002

500 - 241

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Subject Lands, 2009

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25.4V -60mb ER

05 APR 09

1:6,500 nom

68 - 170

A0FA 1 0 4 0



BCD16408: 271

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REFERENCE LIST

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Species at Risk Act, Schedule 1 (2002). <https://laws.justice.gc.ca/PDF/S-15.3.pdf>. Accessed February 12, 2021.

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