01

PROJECT OVERVIEW & OUTCOMES

1.1 BACKGROUND SUMMARY

Located within the traditional Coastal Salish territories of the Esquimalt and Songhees First Nations, the Esquimalt Graving Dock is a key piece of infrastructure supporting the federal commitment to support and strengthen the industrial marine sector on Canada's west coast.

The site encompasses tenant workshops, warehousing, administrative workspace along with outdoor laydown areas supporting various ship repair activities. EGD Operations maintains the dry dock, site infrastructure, support facilities and provides crane services for tenants.

The goal of the Conceptual Plan is to provide the vision and framework for future renewal and development at the dock.

EGD MANDATE

The Esquimalt Graving Dock is a strategic asset of the Government of Canada and serves the federal fleet, as well as supporting and strengthening the west coast industrial marine sector by providing a world-class ship repair, refit and maintenance Centre of Excellence in an open-access, multi-user and secure facility.

1.1.1 PREVIOUS STUDIES / WORK DONE TO DATE

With the intent to ensure the EGD mandate is met today and in the future, PSPC has been working over the past few years to define an ideal future-state to strengthen this valuable federal asset. Past studies identified the viability and re-development options to position EGD as a strong strategic economic driver on the west coast. Studies have included, but are not limited to:

- EGD Master Plan Recommendations, dated November 2017, prepared by KPMG
- Esquimalt Graving Dock - Land Use Plan Report, dated June 2018, prepared by KPMG and Klohn Crippen Berger
- Land Use Plan [presentation], dated August 2018, prepared by KPMG
- Esquimalt Graving Dock Engineering Asset Management Plan, dated September 2018, prepared by PwC
- EGD Redevelopment - Implementation Plan [draft presentation], dated March 24, 2020, prepared by PwC

With the rollout of the federal fleet through the National Shipbuilding Strategy, Kasian Architecture, Interior Design and Planning Ltd (Kasian) was engaged by Public Services Procurement Canada (PSPC) to under go Master Planning at the Esquimalt Graving Dock (EGD) in 2020. Building on previous studies this first assignment included defining options for redevelopment and expansion through a phased implementation strategy. Master Plan options strived to achieve best use of land with ideal adjacencies and workflows supporting both tenant and EGD Operations. Upland facilities on the north-west landing were driven by three (3) distinct marine wharf configurations, however key planning areas across the site, were studied independently and cohesively as a whole.

Brief summaries of the preliminary studies have been incorporated into the PSPC Esquimalt Graving Dock Master Plan 2020, prepared by Kasian, dated November 17. This report outlines the development options and also includes:

- Planning objectives (see Section 1.2 following)
- An overview of existing accommodations, workflows and future planning considerations. In tandem with preliminary master space program areas and engineering strategies.
- A high-level overview of the site to understand the physical characteristics and constraints at EGD. Challenges include, but are not limited to, a restrictive plannable area, contaminated soils, liquefiable soils within a high seismic zone, existing site infrastructure, sensitive habitats and archeological considerations.
- Options, evaluation and costing

Outcomes from this master planning process identified a preferred marine and upland facilities layout that has been further refined in this Conceptual Plan 2021.

The following projects are detailed in the Conceptual Plan 2021:

- North-west Landing & Ship Lift Expansion
- Lot 203 Parkade
- PBRF Complex
- Maplebank Tenant Warehouse
- EGD Operations Workshops Building
- EGD Operations (Repair Bays) & Shared Tenant Building
- Shared Tenant (Paintshop) Building
- Renovated Hangar Building 1004 and Victoria In-Service Support Contract Workshops Building (VISSC), Building 1003.
- Program Support Building / Parkade and East Gate Entry
- Overall Future Site Plan.

Additional projects, that have been identified in the Site Plan, but are not included in the scope of this assignment include:

- Expansion to the dry-dock (currently underway)
- Utility Corridor and North-West Landing Sub-Station (currently underway)
- Camosun Coastal Centre Expansion
- North-West Support / End of Trip Building
- Lockley Parkade
- Lockley Administration Building
- Existing Building 2025 Tenant Renovation
- Existing Building 2001 Tenant Renovation
- Waste Water Treatment Plant Relocation

In addition to background materials utilized for the Master Plan 2020, key client collateral studied by the design team includes, but is not limited to:

- Leasing Plan, prepared by EGD Operations, dated February 2020
- Fire Plan, prepared by EGD Operations, dated June 2021 (structures/building names)
- Base map prepared by PSPC dated, February 25, 2021
- Geotechnical (topographical) Survey [Lot 203], prepared by Focus, dated Feb. 28, 2012

1.2 PLANNING DIRECTIVES

- Geotechnical Survey [Program Support Building] prepared by SLR global environmental solutions, dated March 26, 2018
- Environmental Assessment (Species At Risk) prepared by Douglas Ecological Consultants, dated 2004
- Habitat/Wildlife Features: Valued Ecological Features diagram produced by Golder Associates, 2019
- Archaeological Assessment prepared by Golder Associates Ltd, dated 2012 (updated) 2018

The following references informed the Conceptual Plan, include, but are not limited to:

- Canadian geodetic datum +/-0 . Refer to Kasian 'levels matrix', in section 2.3 (illustrates the various references geodetic datum).
- PSPC Government Fit-Up Standards, May 2019;
- National Building Code 2015;
- CAN/CSA B651-12 (R2017) - Accessible design for the built environment, where applicable. Key buildings - accessible design is not a user requirement due to the nature of the work performed in the facility.
- National Energy Code.

Given the long-established history of EGD, as well as the significant investment it represents for Canada and PSPC, this 100-year plan to update and modernize facilities includes long-term objectives to:

- Solidify the vision for the site with a Preferred Site Development Plan and Phased Implementation Strategy complete with costing.
  - Create new upland and marine facilities (as required) on site, phased over time, that are designed with a lifespan of 50 - 100 years.
  - Maintain continual operations and capacity with consideration for the EGD Master Project Schedule, that takes into consideration all ongoing project work and vessel maintenance work.
  - Legacy facilities are renovated / replaced in a limited phased approach, with the consideration that after each phase, EGD is fully operational and not compromised (in the event that future funding is not available).
  - Master Plan strategies to focus on current and future needs, without impeding long-term future developments on the site.
- Create a Centre of Excellence of local marine industries and expertise on and for the west coast.
  - Enable on-going and future collaboration with on-site marine workgroups and outside partners and organizations, First Nations, academia, other government departments and community partners to support synergy within a west coast marine hub.
  - Provide a Marine Outreach Area with an Interpretative Historic and First Nations component.
  - Advocate civic and national pride: create a landmark facility, with special consideration for the new Program Support Building.
- As a good neighbour, consideration for the local context and surrounding residential area.
  - Where possible maintain sight-lines across the industrial site to the Esquimalt Harbour.
  - Maintain the natural hillside buffer between the industrial site and the residential neighbourhood if possible.
  - Regional context and transportation considerations as the EGD east entrance along Admirals Road is a congestion or bottleneck for Esquimalt traffic flow.
- Provide Modern Facilities to attract and retain talent.
  - Right mix of industrial workshop, warehouse and support spaces, in tandem with workspace, appropriate amenities and meeting / training spaces across the site.
  - Where applicable provide GCWorkplace. *The GCWorkplace is outlined by Public Services and Procurement Canada (source https://www.tpsgc-pwgsc.gc.ca/biens-property/mt-wp/mt-wp-eng.html#s2)*
  - Enable collaboration and touchdown workspace through the adoption of appropriate IT and technology strategy, including wireless connectivity across the EGD facilities.
- Apply Safety-by-Design Principles:
  - Provide a self-contained, secure facility. Align with PSPC, Defence Construction Canada (DCC), Department of Defense (DND), MARSEC and other appropriate security requirements.
  - Create site zoning restricting public front-of-house activities from back-of-house operations, and secure areas across the site.
  - Separate administrative and industrial functions where possible.
  - Support efficient and safe movement of staff, materials, equipment and vehicles with dedicated access routes and wayfinding in particular from workshops areas to in-service vessel repair areas and safe pedestrian routes across the site.
  - Consideration for Admirals Road and Maplebank Road intersections with safe entry/egress to EGD site and facilities.
- Increase Efficiency and Functionality of the site.
  - Support efficient and lean material handling.
  - Ensure the most valuable leased tenant land and facilities, are proximate to berths, dry-dock and future vessel repair areas; to enable the streamlining of operations in close proximity to vessels.
  - Consolidate (where possible) similar functions to gain operational efficiencies and reduced area requirements. Such as consolidated office or warehousing.

The site and associated properties are within the traditional Coastal Salish territories of the Esquimalt and Songhees First Nations. With direct adjacency to the Songhees territory.

- Create a dialogue and partnership with EGD to include the Esquimalt and Songhees First Nations input for subsequent planning phases
- Identify opportunities for involvement at EGD.
- Continue to strengthen the relationship between EGD, Camosun Coast College, marine industries and the Esquimalt and Songhees First Nations.

– Future-proofing / Adaptability:

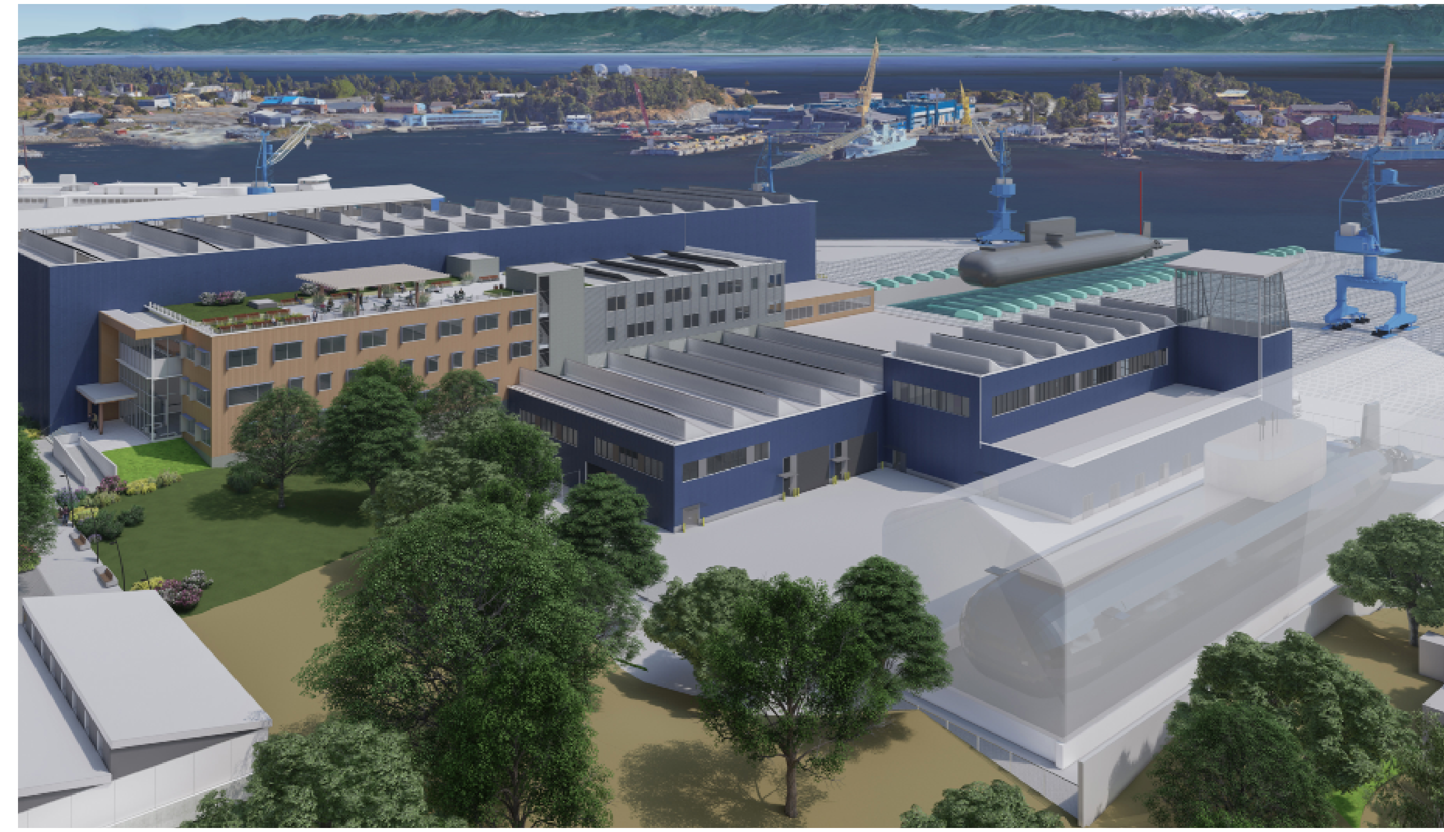
- Plan for current and future needs.
- The constant in the dock work environment is change. Allow for the ebb and flow of both downsizing and up-sizing outdoor work and material staging areas.
- Provide flexible, adaptive space in administrative, workshop and warehousing facilities to allow for changes in requirements for both tenants and EGD Operations over time.
- Design all facilities to accommodate universal design and accessibility requirements.
- Design future structures to best suit a harsh marine environment.

The future is green and connected. Holistic sustainability critically embraces social and economic considerations such as equity, health and wellness, accessibility, energy use, and the inherent human connection to nature and to place. Subsequent planning to apply a holistic sustainability lens to all aspects of the Master Plan, focusing on the intersectionality between different sustainability goals, and anticipating impacts across the wider community and economic context.

- Maintain the character and natural setting of the EGD site through Environmental Stewardship with habitat conservation and remediation projects.
  - Protect the sensitive vegetation (including Garry Oaks Ecosystems), animal habitats and species-at-risk on site; compensate for habitats effected by a project, including the in-fill of the north-west marina.
  - With the site-wide and water-lot soil remediation project completed (including introduction of kelp bed along north wharf), contaminated soils are dealt with on a project-by-project basis. Contaminates include, but are not limited to, naturally occurring salt.

Figure 1.1 (left) EGD Conceptual Plan, View to PBRF Complex

Figure 1.2 (right) EGD Conceptual Plan, East Entry & Program Support Building

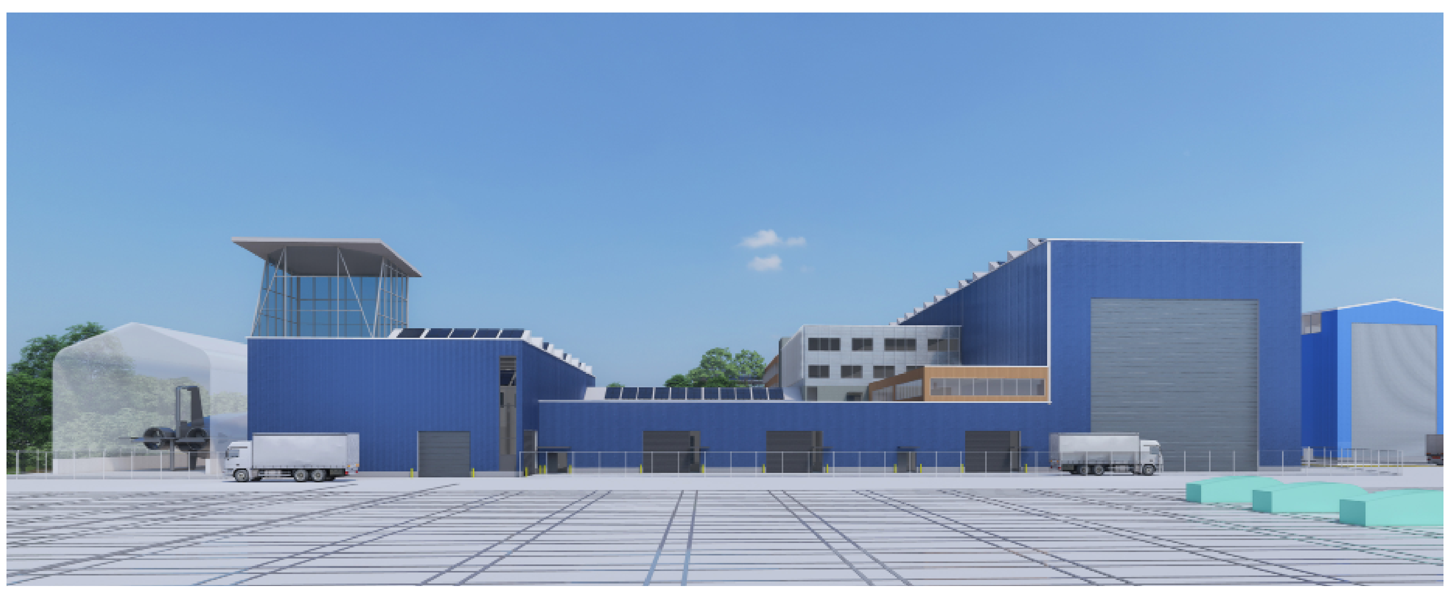


- Consideration for the temporary location of moved soils to stay on site for re-use if rather than temporary removal.
- Provide end of trip bike facilities, shower and change facilities.
- Provide electric vehicle charge stations for PSPC fleet vehicles (including golf carts), future consideration for visitor and staff electric vehicles charging stations.
- For new facilities, alignment with the Federal Sustainability Development Strategy, whereby LEED® Gold equivalency is targeted.
- Reduction in Greenhouse Gas Emissions.

- Improve Resiliency:
  - Plan for future sea level rise, extreme weather and temperatures, flooding, and storm surge.
  - Ensure all future buildings on site are designed to meet the standards of National Building Code (NBC) 2015, which ensures safe egress in the event of an emergency. Anticipated December 2021 updated version.
  - Buildings are designed to ensure life safety to safely egress a building during a seismic event or emergency, opposed to a post-disaster building that is intended to be in use immediately following an earthquake. Typically post-disaster requirements are driven by an operational need to maintain operations immediately following an event, opposed to applying post-disaster requirements for purely asset protection as there is a substantial cost for post-disaster construction.
  - For a post-disaster facility this may mean within a couple of minutes staff are utilizing the facility to rollout first responder or essential service activities, or alternatively access a bay for vehicles and equipment. At this time, key buildings or components to be considered for post-disaster construction (structural, mechanical, electrical) include:
  - PBRF Complex Canada's defence relies on this building sustaining a disaster and continuing to be operable.
  - EGD Program Support Building to ensure response continuity with the Maritime Forces Pacific (MARPAC) at CFB Esquimalt.
  - Ship-lift and North-West Wharf Expansion to maintain operations in the event that the dry-dock is compromised.
  - Larger site-wide systems (i.e. electrical distribution, water supply) need to function in order for programs to remain operational, and for individual buildings designated as post disaster to operate immediately following an event.

Figure 1.3 (left) EGD Conceptual Plan, View of North-Landing Wharf

Figure 1.4 (right) EGD Conceptual Plan, View of PBRF Complex & Shiplift



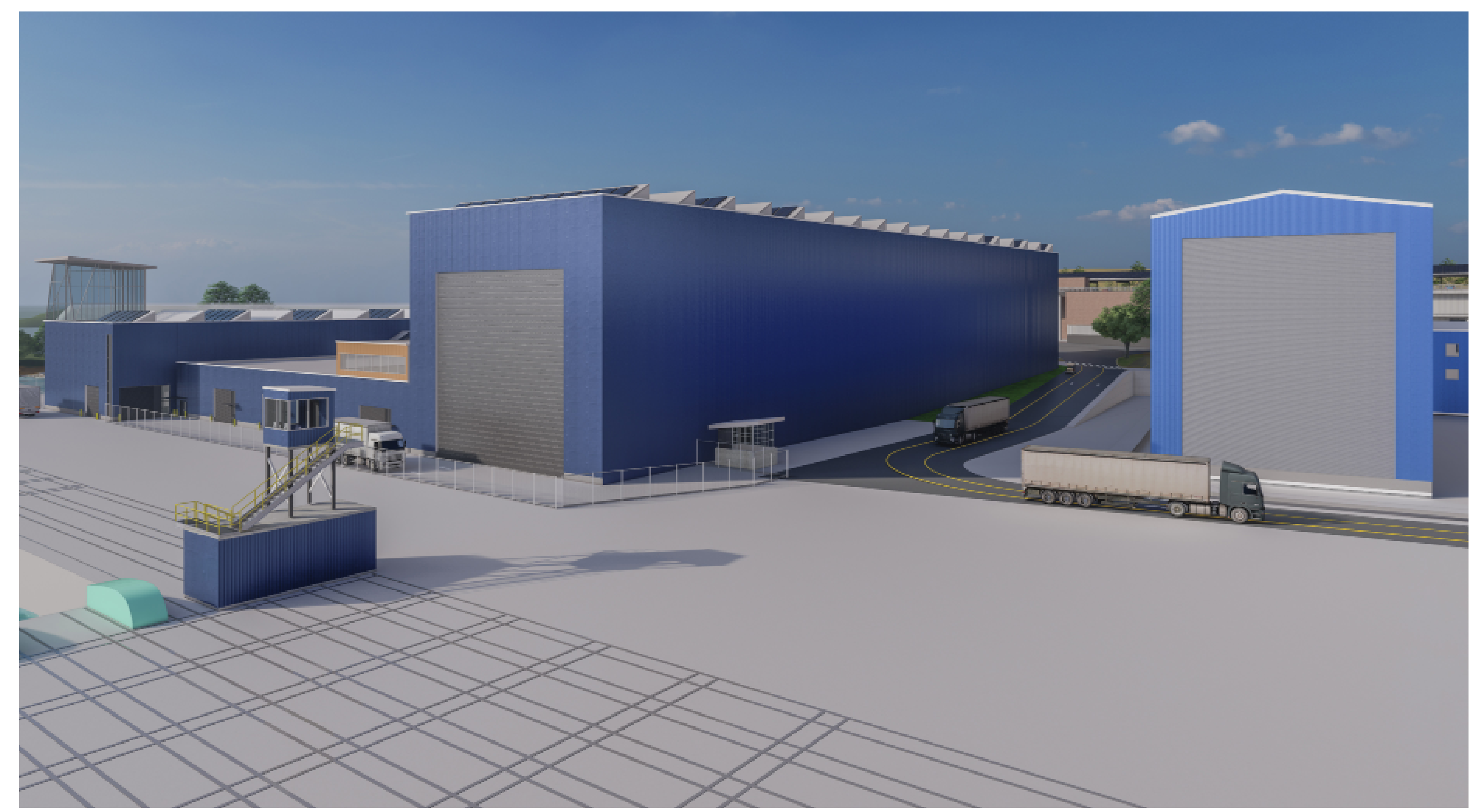


Figure 1.5 (top left) EGD Conceptual Plan, View of North Landing Wharf

Figure 1.6 (top right) EGD Conceptual Plan, Aerial View

Figure 1.7 (bottom left) EGD Conceptual Plan, View of PBFR Complex

Figure 1.8 (bottom right) EGD Conceptual Plan, View of PBRF Hangar

1.3 EGD TODAY OVERVIEW

LEGAL DESCRIPTION

The federally owned EGD operational site is comprised of the original parcel, in addition to parcels transferred over the years and anticipated future land transfers. The site also includes a long-term lease with the Songhees First Nation with direct adjacency to EGD. Total existing land area is 77.8 acres / 31 hectares.

1. EGD MAIN SITE

This original parcel includes the Graving Dock.

PID: 32699

Development Permit Area: Yes

Archaeology: Yes

Site Area: 48.08 acres (19.46 Ha)

Waterlot: ~13.76 acres (5.57 Ha)

2. EGD MONROE HEAD

This parcel includes the area of Monroe Head and houses a significant portion of the operational / auxiliary buildings and open material laydown areas that support site activities.

PID: 32281 (A)

Development Permit Area: Yes

Archaeology: Yes

Site Area: 11.46 acres (4.64 Ha)

Waterlot: ~0.94 acres (0.38Ha)

3. DND CFSA (April 2022)

Located in the north-west portion of the site, this parcel primarily contains DND lands currently used by the Canadian Forces Sailing Association (CFSA, 1001 Maplebank Road) including a clubhouse, materials storage and parking. The area of the CFSA wll be transferred to PSPC to become part of the main EGD site in April 2022.

PID: 32281 (B)

Development Permit Area: Yes

Archaeology: Yes

Site Area: 7.14 acres (2.89 Ha)

Waterlot: 8.17 acres (3.31 Ha)

4. LOCKLEY, LOT 1

This lot contains a small office building with a surface parking lot.

PID: 29938

Development Permit Area: Yes

Archaeology: Low Potential

Site Area: 1.05 acres (0.42 Ha)

5. LOCKLEY, LOT 2

This lot is a large surface parking lot to the south of the Lockley office buildings.

PID: 29938

Development Permit Area: Yes

Archaeology: Low Potential

Site Area: 4.86 acres (1.97 Ha)

6. DND NADEN (April 2022)

A small parcel of land and three buildings on the DND Naden lands adjacent to the east entry gate will be transferred to PSPC in April 2022 and become part of the EGD main site.

PID: Unavailable at time of issue

Development Permit Area: Yes

Archaeology: Yes

Site Area: 0.98 acres (0.4 Ha)

7. Leased Property, Lot 203

Located to the north-west of the main EGD site, Lot 203 is leased from the Songhees First Nation over a 20 year period that commenced January 1, 2012. The parcel contains a satellite branch of Camosun College. The northern section of LOT 203 is currently used by PSPC for materials storage and storage for soil remediation storage.

PID: BC268

Development Permit Area: Yes

Archaeology: Yes

Site Area: 3.28 acres (1.33 Ha)

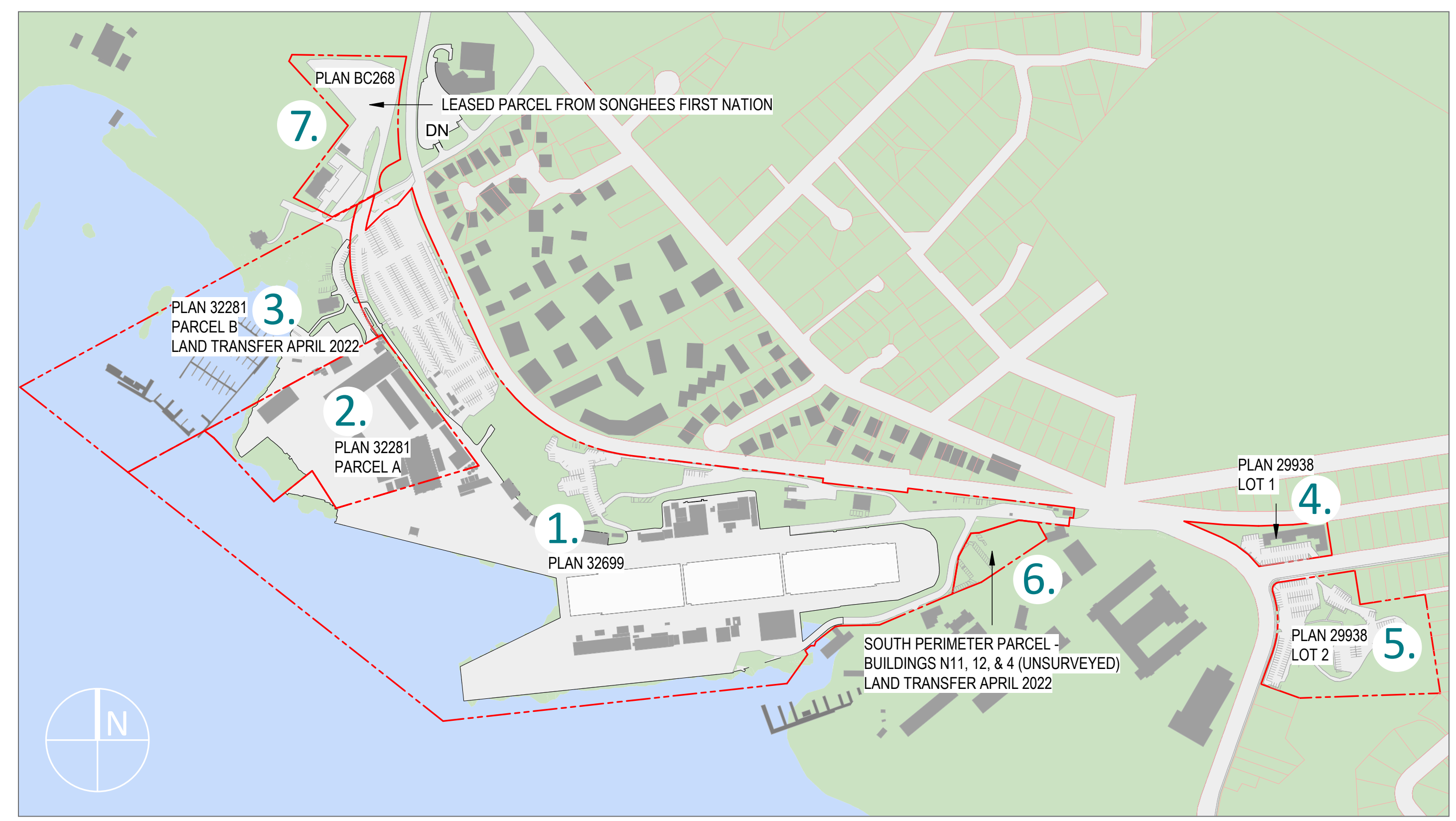


Figure 1.9 EGD Legal Parcel Boundaries

OVERALL SITE ORGANIZATION

The site has grown organically over the years to accommodated changing project demands and user requirements. Today the EGD site is divided into four (4) quadrants. Each quadrant contains a variety of workshop,office, service and auxiliary buildings, materials storage, utilities and parking which support the activities of the site.

EGD East

EGD East includes all the lands from the head of the Graving Dock itself to the main east entry gate, as well as the Lockley Road properties and the existing buildings on the adjacent Naden lands. This area includes the main entry point on Admirals Road.

EGD South Jetty

EGD South includes the South Jetty, located to the south of the Graving Dock. The jetty serves as a lay-by and repair berth and includes workshops, office, warehousing and support spaces. Additional floats are located on the south-side of the jetty for smaller work-boats.

EGD North

EGD North includes the areas just to the north of the Graving Dock. This area includes the Pumphouse and key workshops, office, with limited laydown adjacent to the Graving Dock. This area also includes the existing EGD Operations Building and Risk Management Trailer.

EGD North-West

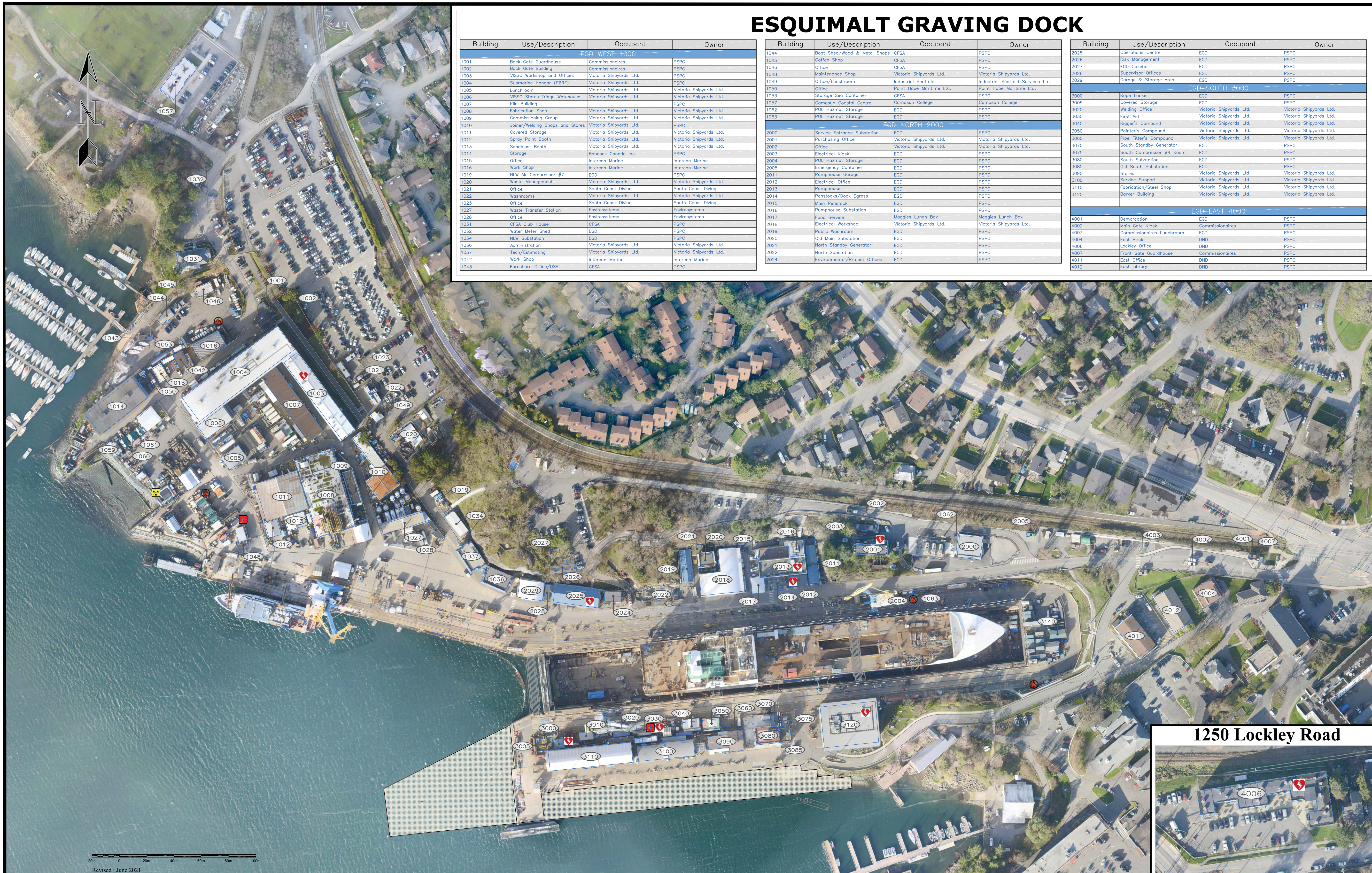
EGD West includes the areas of Munroe Head and the North Landing Wharf, in addition to the existing CFSA and Lot 203. The area also includes the west entry gate accessed from Maplebank Road. The North-West area contains the DND secure compound, in addition to tenant workshops, office, warehousing and material laydown.

Figure 1.10 (above) EGD Site Fly-Over YouTube, retrieved April 2020
Source: https://www.tpsgc-pwgsc.gc.ca/biens-property/cse-egd/propos-about-esquimalt-eng.html#c7

Figure 1.11 Aerial of EGD, Source Google Earth, retrieved April 2020, with overlay

ACCOMMODATIONS TODAY

The current state, with various structures is shown opposite for reference purposes. As such the Design Team has taken the following approach in preparing re-development options responding to the ebb and flow of on-going and ever changing project work.



ESQUIMALT GRAVING DOCK

Building	Use/Description	Occupant	Owner
EGD WEST 1000			
1001	Back Gate Guardhouse	Commissionaires	PSPC
1002	Back Gate Building	Commissionaires	PSPC
1003	VISSC Workshop and Offices	Victoria Shipyards Ltd.	PSPC
1004	Submarine Hangar (PBRF)	Victoria Shipyards Ltd.	PSPC
1005	Lunchroom	Victoria Shipyards Ltd.	Victoria Shipyards Ltd.
1006	VISSC Stores Triage Warehouse	Victoria Shipyards Ltd.	Victoria Shipyards Ltd.
1007	Kiln Building		PSPC
1008	Fabrication Shop	Victoria Shipyards Ltd.	Victoria Shipyards Ltd.
1009	Commissioning Group	Victoria Shipyards Ltd.	Victoria Shipyards Ltd.
1010	Joiner/Welding Shops and Stores	Victoria Shipyards Ltd.	PSPC
1011	Covered Storage	Victoria Shipyards Ltd.	Victoria Shipyards Ltd.
1012	Spray Paint Booth	Victoria Shipyards Ltd.	Victoria Shipyards Ltd.
1013	Sandblast Booth	Victoria Shipyards Ltd.	Victoria Shipyards Ltd.
1014	Storage	Babcock Canada Inc.	PSPC
1015	Office	Intercon Marine	Intercon Marine
1016	Work Shop	Intercon Marine	Intercon Marine
1019	NLW Air Compressor #7	EGD	PSPC
1020	Waste Management	Victoria Shipyards Ltd.	Victoria Shipyards Ltd.
1021	Office	South Coast Diving	South Coast Diving
1022	Washrooms	Victoria Shipyards Ltd.	Victoria Shipyards Ltd.
1023	Office	South Coast Diving	South Coast Diving
1027	Waste Transfer Station	Envirosystems	Envirosystems
1028	Office	Envirosystems	Envirosystems
1031	CFSA Club House	CFSA	PSPC
1032	Water Meter Shed	EGD	PSPC
1034	NLW Substation	EGD	PSPC
1036	Administration	Victoria Shipyards Ltd.	Victoria Shipyards Ltd.
1037	Tech/Estimating	Victoria Shipyards Ltd.	Victoria Shipyards Ltd.
1042	Work Shop	Intercon Marine	Intercon Marine
1043	Foreshore Office/DSA	CFSA	PSPC

Building	Use/Description	Occupant	Owner
1044	Boat Shed/Wood & Metal Shops	CFSA	PSPC
1045	Coffee Shop	CFSA	PSPC
1046	Office	CFSA	PSPC
1048	Maintenance Shop	Victoria Shipyards Ltd.	Victoria Shipyards Ltd.
1049	Office/Lunchroom	Industrial Scaffold	Industrial Scaffold Services Ltd.
1050	Office	Point Hope Maritime Ltd.	Point Hope Maritime Ltd.
1053	Storage Sea Container	CFSA	PSPC
1057	Camosun Coastal Centre	Camosun College	Camosun College
1062	POL Hazmat Storage	EGD	PSPC
1063	POL Hazmat Starage	EGD	PSPC
EGD NORTH 2000			
2000	Service Entrance Substation	EGD	PSPC
2001	Purchasing Office	Victoria Shipyards Ltd.	Victoria Shipyards Ltd.
2002	Office	Victoria Shipyards Ltd.	Victoria Shipyards Ltd.
2003	Electrical Kiosk	EGD	PSPC
2004	POL Hazmat Storage	EGD	PSPC
2005	Emergency Container	EGD	PSPC
2011	Pumphouse Garage	EGD	PSPC
2012	Electrical Office	EGD	PSPC
2013	Pumphouse	EGD	PSPC
2014	Penstocks/Dock Egress	EGD	PSPC
2015	Main Penstock	EGD	PSPC
2016	Pumphouse Substation	EGD	PSPC
2017	Food Service	Maggies Lunch Box	Maggies Lunch Box
2018	Electrical Workshop	Victoria Shipyards Ltd.	Victoria Shipyards Ltd.
2019	Public Washroom	EGD	PSPC
2020	Old Main Substation	EGD	PSPC
2021	North Standby Generator	EGD	PSPC
2022	North Substation	EGD	PSPC
2024	Environmental/Project Offices	EGD	PSPC

Building	Use/Description	Occupant	Owner
2025	Operations Centre	EGD	PSPC
2026	Risk Management	EGD	PSPC
2027	EGD Gazebo	EGD	PSPC
2028	Supervisor Offices	EGD	PSPC
2029	Garage & Storage Area	EGD	PSPC
EGD SOUTH 3000			
3000	Rope Locker	EGD	PSPC
3005	Covered Storage	EGD	PSPC
3020	Welding Office	Victoria Shipyards Ltd.	Victoria Shipyards Ltd.
3030	First Aid	Victoria Shipyards Ltd.	Victoria Shipyards Ltd.
3040	Rigger's Compund	Victoria Shipyards Ltd.	Victoria Shipyards Ltd.
3050	Painter's Compound	Victoria Shipyards Ltd.	Victoria Shipyards Ltd.
3060	Pipe Fitter's Compound	Victoria Shipyards Ltd.	Victoria Shipyards Ltd.
3070	South Standby Generator	EGD	PSPC
3075	South Compressor #4 Room	EGD	PSPC
3080	South Substation	EGD	PSPC
3085	Old South Substation	EGD	PSPC
3090	Stores	Victoria Shipyards Ltd.	Victoria Shipyards Ltd.
3100	Service Support	Victoria Shipyards Ltd.	Victoria Shipyards Ltd.
3110	Fabrication/Steel Shop	Victoria Shipyards Ltd.	Victoria Shipyards Ltd.
3120	Barker Building	Victoria Shipyards Ltd.	Victoria Shipyards Ltd.
EGD EAST 4000			
4001	Demarcation	EGD	PSPC
4002	Main Gate Kiosk	Commissionaires	PSPC
4003	Commissionaires Lunchroom	EGD	PSPC
4004	East Brick	DND	PSPC
4006	Lockley Office	DND	PSPC
4007	Front Gate Guardhouse	Commissionaires	PSPC
4011	East Office	DND	PSPC
4012	East Library	DND	PSPC

Figure 1.12 EGD Site Fire Plan 2021, prepared by Esquimalt Graving Dock

OCCUPANT WORKGROUPS

The open-access ship repair facility provides clientele and tenant service providers with a range of marine and upland support facilities including berths for in-water service, dry-dock and pumphouse services, along with crane and utility services.

The site includes both PSPC owned and operated facilities as well as tenant leased facilities or temporary structures and outdoor laydown areas. The Area Plan by Occupant Group on the right identifies the various indoor and outdoor site components based on occupant groups at EGD.

The review of tenant space is a snapshot in time as facilities are leased over the length of a contract or series of contracts. Future planning considerations are based on the tenants accommodated in the spring of 2020.

- EGD Operations
- EGD Security
- EGD Site Support
- EGD Infrastructure
- DND NADEN
- DND Canadian Forces Sailing Association(CFSA)
- Seaspan (VSL)
- Babcock Canada
- Seaspan (VSL) /Babcock
- Intercon Marine
- Camosun Coastal Centre
- Point Hope Maritime Ltd
- TerraPure
- Transport Canada [TBC]
- South Coast Diving
- Environment Canada (Weather Stn)
- Food Vendor
- Industrial Scaffold
- Clark & Pattison [Limited Outdoor]
- Lockheed Martin
- CME [Limited Outdoor]
- Lockley Office, Mult-Tenant [DND, Lockheed Martin, Babcock, Seaspan/VSL]

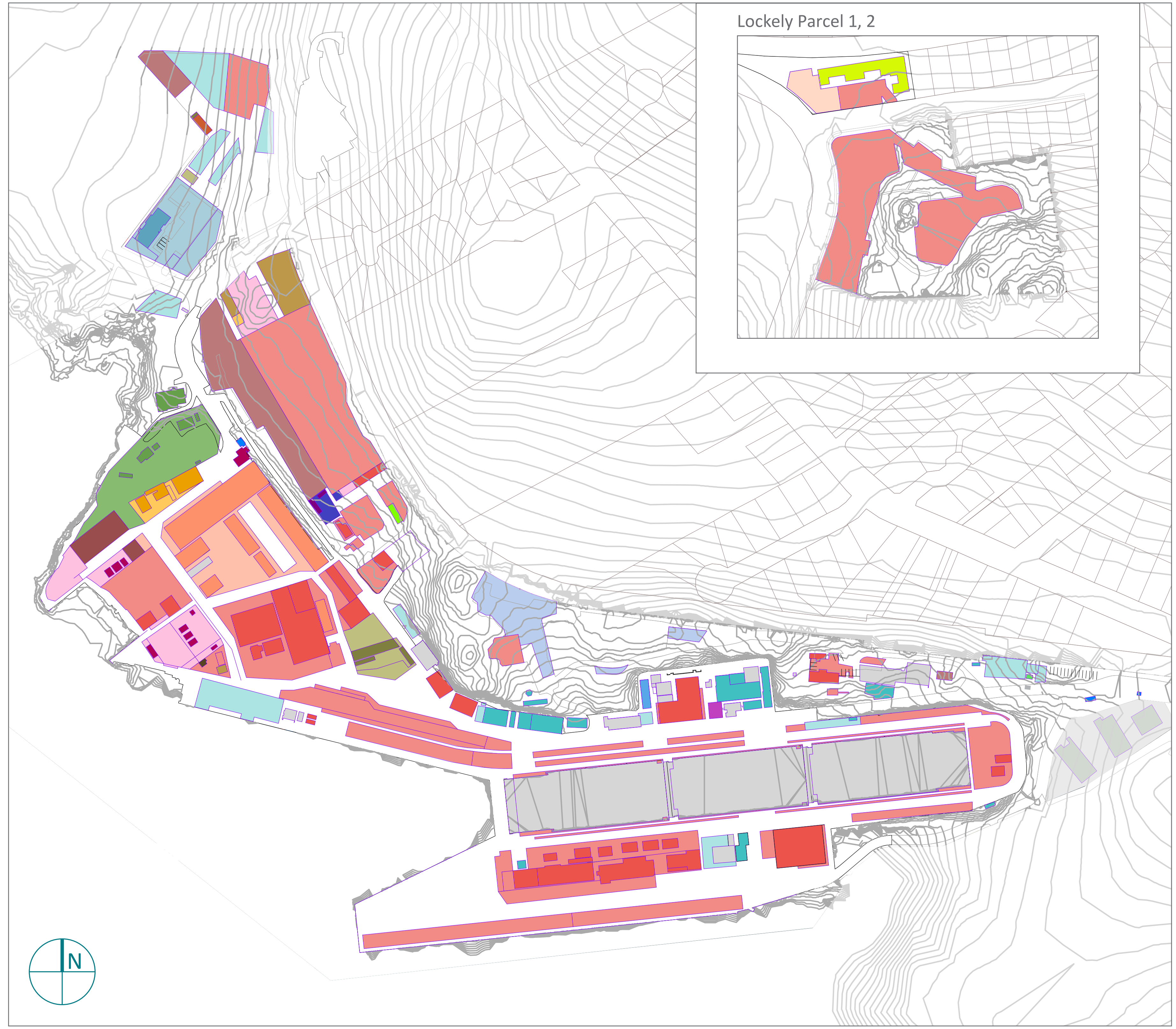


Figure 1.13 EGD Occupant Overview Area Plan, prepared April 2020

1.4 EGD CONCEPTUAL PLAN OVERVIEW

CONCEPTUAL PLAN PROCESS

A number of facility and infrastructure upgrades and projects are currently underway at the dock, including the expansion at the head of the dry-dock. The Conceptual Plan 2021 defines key components/buildings and ideal locations for future expansion projects across the site in tandem with circulation routes and infrastructure strategies.

The following projects, compete with building massing, plan layouts and preliminary engineering strategies are included in the Conceptual Plan 2021:

Component / Building	Future Occupants	Report Section
Overall Future Site Plan	-	2
North-west Landing & Ship Lift Expansion	EGD Ops, Tenants	2
Program Support Building / Parkade	EGD Ops, PSPC, Tenants	3
EGD Operations (Workshops) Building	EGD Ops	4
EGD Operations (Repair Bays) & Shared Tenant Building	EGD Ops, Tenants	5
Renovated Building 1004 (Hangar) and Building 1003 (Victoria In-Service Support Contract Workshops Building, VISSC)	EGD Ops, Tenants	6
Shared Tenant Building	Tenants	7
Maplebank Tenant Warehouse	Tenants	8
PBRF Complex	DND, Contract Provider (Tenant)	9
Lot 203 Parkade	-	10

In spring of 2021 the Kasian project team underwent high-level functional programming for each of the key buildings. Stakeholders included tenants, EGD Operations and the PSPC project team. At this preliminary planning phase various levels of consultation with stakeholders was needed to inform planning of the different buildings across the site. With the intent to provide a space summary of net areas per building indicating occupant, facility type (administrative, industrial, yard or parking), space type (workspace, storage, support, workshop or specialty space). Ideal workflows or critical adjacencies. Future growth for both tenants and EGD Operations was included in program areas. Functional relationship diagrams or floorplans illustrating ideal building configurations were developed. Tenant buildings were informed by the EGD existing leasing plan, EGD Master Plan 2020, and preliminary tenant future requirements information worksheets. Whereas the Program Support Building and EGD Operations Workshop & Repair Bays were developed in consultation with EGD Operations. Parkade options for Lot 203 were developed in consultation with PSPC to support negotiations with the Songhees First Nation. The future PBRF Complex was derived by the Master Plan 2020 site walk-through and limited engagement with DND and the current Contract Provider.

With the preliminary program information captured, the design team prepared a set of conceptual design drawings. Drawings include conceptual floorplan layouts by room, complete with internal circulation, building systems including preliminary structural grids and placeholder columns, building sections and elevations suitable for a refined Class D cost estimate. Parking structures show proposed stall configuration, complete with circulation, ramps, support areas and preliminary structural grids. Drawings per building also include 3d massing studies with preliminary indications of fenestration. A short form of generalized high-level design guidelines for Architecture, Civil, Structural, Mechanical and Electrical are outlined for each building.

An updated site plan showing buildings, parking areas and site circulation, incorporating marine layout (by SNC Lavalin).

Figure 1.14 (top) EGD Conceptual Plan, East Entry & Program Support Building

Figure 1.15 (bottom) EGD Conceptual Plan, PBRF Complex

CONCEPTUAL PLAN HIGHLIGHTS

Outcomes from the Master Plan 2020 evaluation and additional marine infrastructure studies identified a preferred option to move forward into conceptual planning.

Buildings/component in teal are detailed in the Conceptual Plan.

EAST GATE: Provides a Program Support Building / Parkade to create a Centre of Excellence hub of local marine industries and expertise on the west coast with upgrades to the east entry.

EAST LOCKLEY PARCELS: At this time the plan does not include redevelopment of the Lockley Parcels. Refer to the Master Plan 2020 for redevelopment options, including a potential future parking structure and additional administrative building.

DRY-DOCK EXPANSION: Work is underway to extend the dry-dock by 36m as illustrated.

SOUTH JETTY: The Old South Sub-Station is anticipated to be upgraded to allow for dry-temperature controlled storage for EGD Operations. EGD Site Support facilities, including food truck parking could be located on the jetty to allow trades and staff additional lunch facilities.

NORTH OF DRY-DOCK: The existing Mechanics Bay and Historic Sub-Station are anticipated to be upgraded to allow for dry-temperature controlled storage for EGD Operations. The existing EGD Operations Building (2025) and Tenant Building (2001) are anticipated to be renovated to suite small tenants, with demolition of the other existing facilities along the bedrock providing valuable laydown proximate to the dry-dock and cranes. EGD Site Support facilities, including food truck parking could be located by the existing gazebo to allow trades and staff additional lunch facilities.

NORTH-WEST MARINE COMPONENTS: The new property transfer to the north-west enables a significant Wharf Extension with Ship Lift, vessel repair and/or laydown areas with dedicated crane support. Section 2 includes the marine feasibility study assessing the options of the ship lift and transfer actions to evaluate vessels transfer efficiency to and from vessel repair areas including the new PBRF Complex. The study also reviewed the feasibility of expansion to the water lot to increase efficiency and berth capacity. Marine Option C is shown in the Conceptual Plan 2021, although Marine Option D is also under consideration at this time.

NORTH-WEST LANDING UPLANDS: Provides a new PBRF Complex including vessel repair hangar and supporting workshops, warehousing and workspace. Located north-of the complex are a new North-West Sub-Station/ Compressor Building (design is underway), EGD Site Support facilities, and West-Gate entry point. The available plannable area for upland facilities is a direct result of the marine configuration on the North-West Landing. The landing also includes the shared tenant area composed of a number of buildings. Including the renovation of the Building 1004 (Hangar) to tenant workshops and Building 1003 (Victoria In-Service Support Contract Workshops Building, VISSC) to tenant workshops and EGD Operations administrative workspace. New EGD Operations / Shared Tenant Building (Mechanics, Crane Crews) and a smaller Shared Tenant Building. The landing includes the Waste Water Treatment Plant and new consolidated card-access fuel storage.

NORTH-WEST, MAPLEBANK: Provides tenant storage in the Maplebank Tenant Warehouse, as well as future workshops in the EGD Operations Building (Electrical, Central Stores, Paint, Welding and Yard Crews). A secondary entrance/egress is provided via Maplebank Road. EGD Site Support facilities, including end of trip support spaces and food truck parking could be located here along with a new guardhouse for secured entry to EGD.

LOT 203: Provides options to include a Parking Structure and area to allow for future expansion of the Camosun Coastal Centre. The plan carries two parking structure options one of which includes rooftop amenity / community space for the Songhees First Nation.

SITE WIDE LAYDOWN: Laydown space is provided across the site.

Figure 1.16 (left) EGD Conceptual Plan, View East from North-West Landing

Figure 1.17 (right) EGD Conceptual Plan, Maplebank Tenant Warehouse Parking

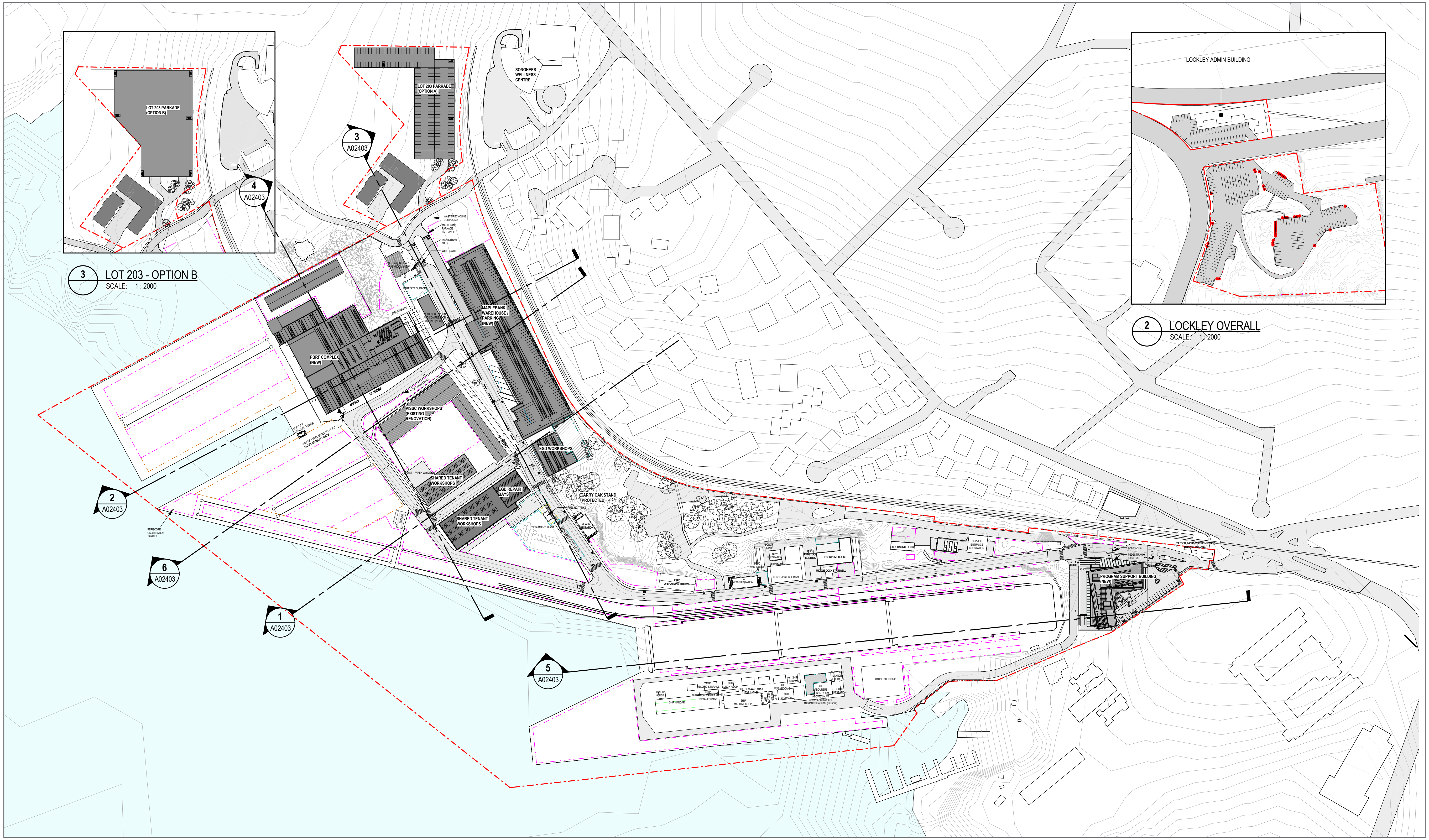


Figure 1.18 EGD Conceptual Plan Overview

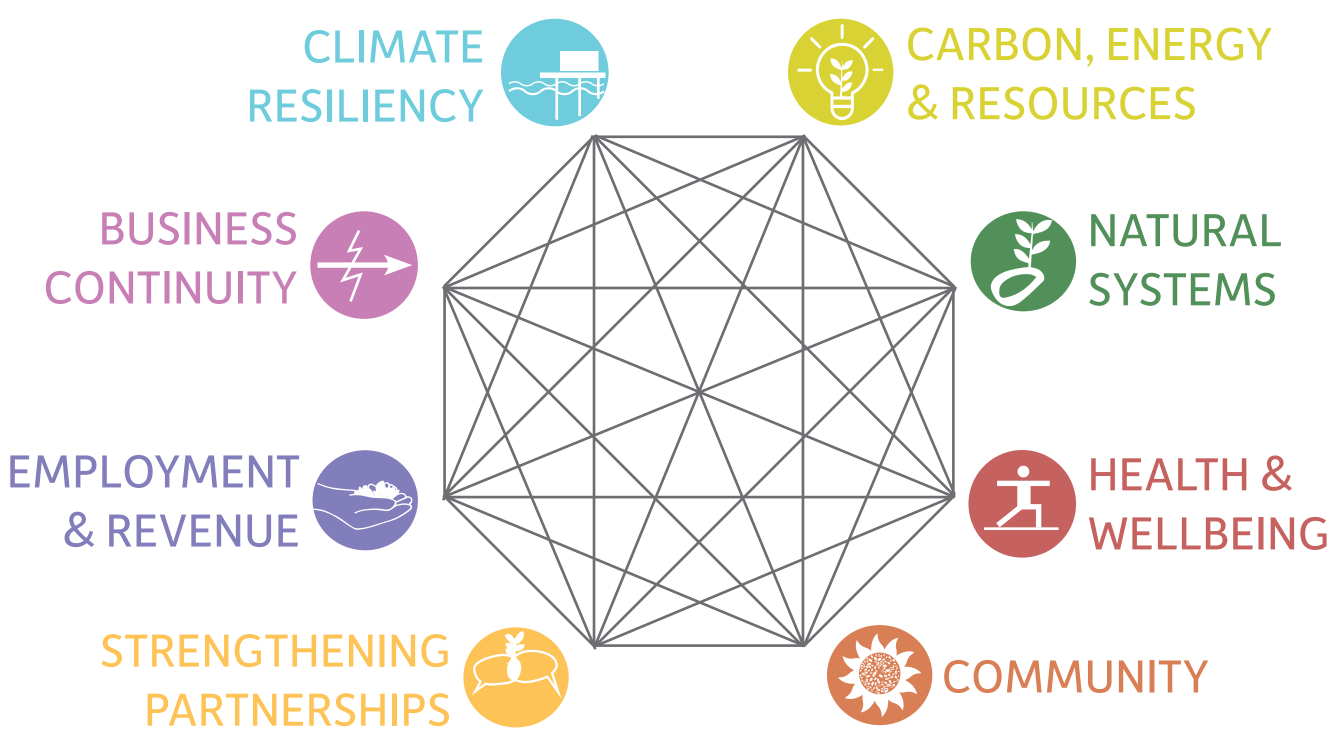
1.5 SUSTAINABILITY STRATEGY

As per the "Greening Government Strategy", the Government of Canada will transition to net-zero carbon and climate-resilient operations, while also reducing environmental impacts beyond carbon, including waste, water and biodiversity. This strategy is consistent with the United Nations' 2030 Agenda for Sustainable Development and the Federal Sustainable Development Strategy. It will also support Canada's sustainability goals already established under the Paris Agreement on climate change, the Pan-Canadian Framework on Clean Growth and Climate Change and commitments under the Convention on Biological Diversity.

To achieve this strategy, a holistic view of sustainability is needed, meaning that the project should address the Triple-Bottom Line, that is, not only the environmental aspects but also the economic and social ones. EGD involves several buildings in a large site, which will have a lasting impact not just for the Federal Government and its clients, but also the community, environment and resources used for and resulting from its operations.

With this in mind, the sustainability strategy for the project should not only focus on the individual buildings, but it should consider the site as a whole. Based on the scale of the project, its location, and relationships with the surrounding community, there is big potential to achieve a highly sustainable project.

What if the project could meet or exceed its carbon emissions objectives while improving the efficiency of services provided on-site and at the same time achieve real steps towards Reconciliation with the neighbouring Indigenous communities?



SUSTAINABILITY DESIGN DRIVERS

To achieve the sustainability strategy for EGD, 'Sustainability Design Drivers' for this project may include:

- Employment and Revenue - providing jobs to the local community and increasing revenue for the Federal Government by the efficiencies and improvements created by the Conceptual Plan 2021.
- Business Continuity - addressing the resiliency of the business ensuring that it can continue operating even in the case of disruptive situations.
- Climate Resiliency - addressing the resiliency of infrastructure and buildings impacted by environmental risks.
- Carbon, Energy & Resources - achieving the carbon emissions targets from the federal government while selecting appropriate energy sources, energy conservation measures, and managing resources.
- Natural Systems - conserving or regenerating the ecosystems present (or previously present) on site, while making the most out of the natural capital.
- Health and Wellbeing - providing facilities that will improve the health and wellbeing of tenants and federal government staff.
- Community - creating a positive impact in the surrounding community as well as developing a thriving culture at the workplace.
- Strengthening Partnerships - with EGD clients, suppliers, as well as with the neighbouring indigenous communities.

Figure 1.19 new EGD Conceptual Plan, Sustainability Drivers, Thought-Starters

A GUIDING FRAMEWORK FOR THE SITE

As EGD is essentially an infrastructure project, the design team recommends utilizing the Envision rating system in subsequent planning phases. This rating system corresponds to a framework that provides guidance in the planning, design and delivery of sustainable and resilient infrastructure projects, which would help address several of the sustainability design drivers. The framework provides a flexible system of criteria and performance objectives to aid decision makers and help project teams identify sustainable approaches during the life-cycle of an infrastructure project. This would complement the use of a sustainability rating system for buildings, specifically LEED, which would be applied to the individual buildings included in the project.

Envision was developed in joint collaboration between the Zofnass Program for Sustainable Infrastructure at the Harvard University Graduate School of Design and the Institute for Sustainable Infrastructure. The Envision rating system includes 64 sustainability and resilience indicators, called "credits", organized around the following five categories:

- Quality of Life
- Leadership
- Resource Allocation
- Natural World
- Climate and Resilience

Each of the 64 credits has different levels of achievement representing the range of possible performance goals, from slightly improving beyond conventional practice, to conserving and restoring communities and environments. In this way project teams are challenged to pursue higher levels of performance.

One key aspect of Envision is that community members impacted by the project are considered important stakeholders in the decision-making process. Engagement with those stakeholders and managing the process allowing them to contribute ideas and perspectives are important parts of the Envision framework. These processes would be particularly relevant in EGD for strengthening the partnership with the Esquimalt and Songhees First Nations. Stewardship of the land is one of the fundamental values of indigenous communities; therefore, sustainability could be the common ground to set the path for a real Reconciliation. Please refer to the next section of this document which discusses First Nation Collaboration.

CARBON EMISSIONS AND ENERGY SOURCES

The Government of Canada's operations will be net-zero emissions by 2050. To implement net-zero in real property and fleet operations, the Government of Canada will reduce absolute Scope 1 and Scope 2 GHG emissions by 40% by 2025 and by at least 90% below 2005 levels by 2050. On this emissions reduction pathway, the government will aspire to reduce emissions by an additional 10% each 5 years starting in 2025.

As per the Greening Government Strategy, departments will ensure that all new buildings and major building retrofits prioritize low-carbon and climate resilience. Investment decisions will be based on total cost of ownership:

- All new federal buildings (including build-to-lease and public-private partnerships) will be net-zero carbon unless a life-cycle cost benefit analysis indicates net-zero-carbon-ready construction.
- All major building retrofits, including significant energy performance contracts, require a GHG reduction life-cycle cost analysis to determine the optimal GHG savings.
- All new federal buildings, infrastructure and major building retrofits, including significant energy performance contracts, require a climate change risk assessment. Climate change adaptation and mitigation strategies will be incorporated into the design of the facilities at EGD.

Departments will implement low-carbon real property operations, which include:

- Using 100% clean electricity by 2022, and by 2025, at the latest, by producing or purchasing renewable electricity.

Based on these goals, the EGD project will be design to require no fossil fuels for site and buildings operation. Due to the location of the project at the shoreline and based on the characteristics of its buildings, EGD might have big potential to incorporate clean and sustainability energy sources. It is recommended that the project conducts a feasibility analysis for a low-carbon district energy system (DES) for the entire site. The individual buildings would be connected to this system. Likewise, renewable energy technologies could be incorporated on-site. Several buildings in the project include large roof areas which could be used for placing photovaltaic panels, supplying electricity to meet part of the energy demands. Further technologies could also be investigated, including the use of ground source heat pumps or even seawater source heat pumps for heat rejection and extraction.

OTHER SUSTAINABILITY STRATEGIES

WATER

The EGD project will be reducing its water consumption and its load on municipal systems using best practices in design and operation as well as tracking performance.

MATERIALS

The project will reduce the environmental impact of structural construction materials by conducting life cycle analysis for the major buildings and overall site infrastructure. Embodied carbon emissions will be reduced by at least 30%, starting in 2025.

WASTE

Tracking and disclosing waste diversion diverting at least 75% by weight of non-hazardous operational waste and plastic waste from landfills and between 90% to 100% of all construction and demolition waste.

MOBILITY AND FLEETS

Adopting low-carbon mobility solutions and infrastructure and modernizing the fleets. Encouraging staff to use low-carbon forms of transportation when commuting to work. Facility remote work and/or hybrid work style, when feasible. 80% of light-duty fleet would comprise at least 80% zero-emission vehicles (ZEVs) by 2030. Priority is to be given to purchasing ZEVs.

GREEN PROCUREMENT

The operations at EGD will transition to a net-zero, circular economy through green procurement that includes life-cycle assessment principles and the adoption of clean technologies and green products and services.

GREEN POLICIES

Greening and climate resilience policies will be implemented for the operation of the facilities.

As part of the design process, the following documents will also be followed:

- Greening Government Strategy: Real Property Guidance
- Real Property Sustainability Handbook
- Guideline-Project GHG Options Analysis Methodology
- GHG Optional Analysis Methodology, Technical Services Portfolio and Asset Management

INDIVIDUAL BUILDING STRATEGIES

For each individual building specific sustainability strategies will be implemented. As the guiding framework, the LEED green building rating system will be used. All major buildings will be targeting a LEED Gold level. In the case of the Program Support Building, as this corresponds to the "flagship" building on site, this could be a facility striving for higher levels of sustainability, which the Federal Government could use as an example for others in the building industry to follow. Therefore, in addition to the LEED Gold level, it is considered that this building should strive to achieve Passive House certification. The level of performance achieved by a Passive House certified building is what the local building code will be mandating around the year 2032. This would be a forward looking approach that would set EGD ahead of the industry. In a similar way, the Zero Carbon Building Standard could be considered for the Program Support Building.

Please refer to the following sections on the individual buildings, where the specific preliminary sustainability strategies have been indicated.

1.6 FIRST NATIONS COLLABORATION

The site and associated properties are within the traditional Coastal Salish territories of the Esquimalt and Songhees First Nations. With direct adjacency to the Songhees territory.

With the goal for PSPC and EGD Operations to strengthen their relationship between Esquimalt and Songhees First Nations, Camosun Coastal Centre and the marine industries the Conceptual Plan aims to advance the Reconciliation process by embracing the First Nations culture. Rather than simply applying commissions to a space the Conceptual Plan aspires to build a dialogue between PSPC, EGD and the Nations, to incorporate Indigenous principles and values, identify opportunities for First Nations involvement in the develop of the site, and to continue the shared stewardship of our land and aquatic ecosystems. For instance, how does the design best interact with natural systems, like the wind, tides, moon, seasons? It is about creating a partnership with Nations, learning from the Elders, Chiefs, Council and community members. Consider design from an inter-generational context and celebrate the spiritual connection to the land.

At this preliminary planning phase, without First Nations involvement, the Conceptual Plan (focused solely on space allotment across EGD) has identified key areas to showcase First Nations culture or commissions. Note this preliminary list is a thought starter for future First Nations dialogue and partnership at EGD.

Note the site has a number of sensitive areas, highlighted in Section 2.

SITE-WIDE:

- Signwork (suggest including traditional language) at key points (entrances, directions, archaeological sensitive points, environmentally sensitive areas)
- Consideration for aerial view commission, for instance mural across the north-west landing or rooftop.

EAST GATE / PROGRAM SUPPORT BUILDING:

- Public Entrance / Program Support Building serves to greet and orientate visitors, and allows for a front-of-house opportunity to incorporate a commission.
- Entrance Grounds provides an opportunity for a carving, sculpture or landscape consideration to welcome visitors.
- Outreach Area with an Interpretative Component to facilitate community engagement. Pending First Nations input a separate historical area detailing the construction and workings of the dry-dock may be proximate to or inclusive of the First Nations Outreach Interpretative Area.
- Engagement Meeting spaces allow for opportunities to incorporate murals or artwork.

SOUTH JETTY:

- Existing Area of Reflection provides an opportunity for a carving, sculpture or interpretative marker.

DRY-DOCK [EXISTING RETAINING WALL MURAL]:

In 2004, PSPC constructed a new retaining wall at the Graving Dock. PSPC retained a local artist, Thomas Kendall, to paint a mural on the new wall. Kendall partnered with Butch Dick of the Songhees Nation and students to design and execute the mural.

The overall mural is of a Roman aqueduct, surrounded by references to the EGD site and local history.

During the excavation process to build the retaining wall, archeological remains associated with Songhees Nation were found. In recognition of this, Butch Dick designed a feature panel to represent the First Nations on the site.

Other panels of the mural showcase the nautical history of the site, including one panel of a ship, taken from photographs of the site in the 1920s during construction.

Finally, several panels incorporate images of the flora and fauna associated with the site, present and past, that were found in historic photographs. One panel features a Garry Oak meadow in reference to the Garry Oaks that still exist on the site today.

WEST-GATE / MAPLEBANK & PBRF COMPLEX:

- Potential area proximate to Constance Cove and nearby PBRF Complex and Camosun Coastal Centre may provide an outdoor area of reflection or an opportunity to incorporate a commission.
- PBRF Complex may provide an opportunity for a mural/artwork.
- Mural/artwork on the backside of the long Maplebank warehouse.
- Existing Area of Reflection provides an opportunity for a carving, sculpture or interpretative marker.

LOT 203 PARKADE:

- The Songhees First Nations Wellness Centre overlooks the lower grounds. The inclusion of a parking structure may provide community amenity space in addition to event or weekend parking. Green space, community garden, area of reflection or playing field or such may extend the Wellness Centre programs to include this outdoor space.

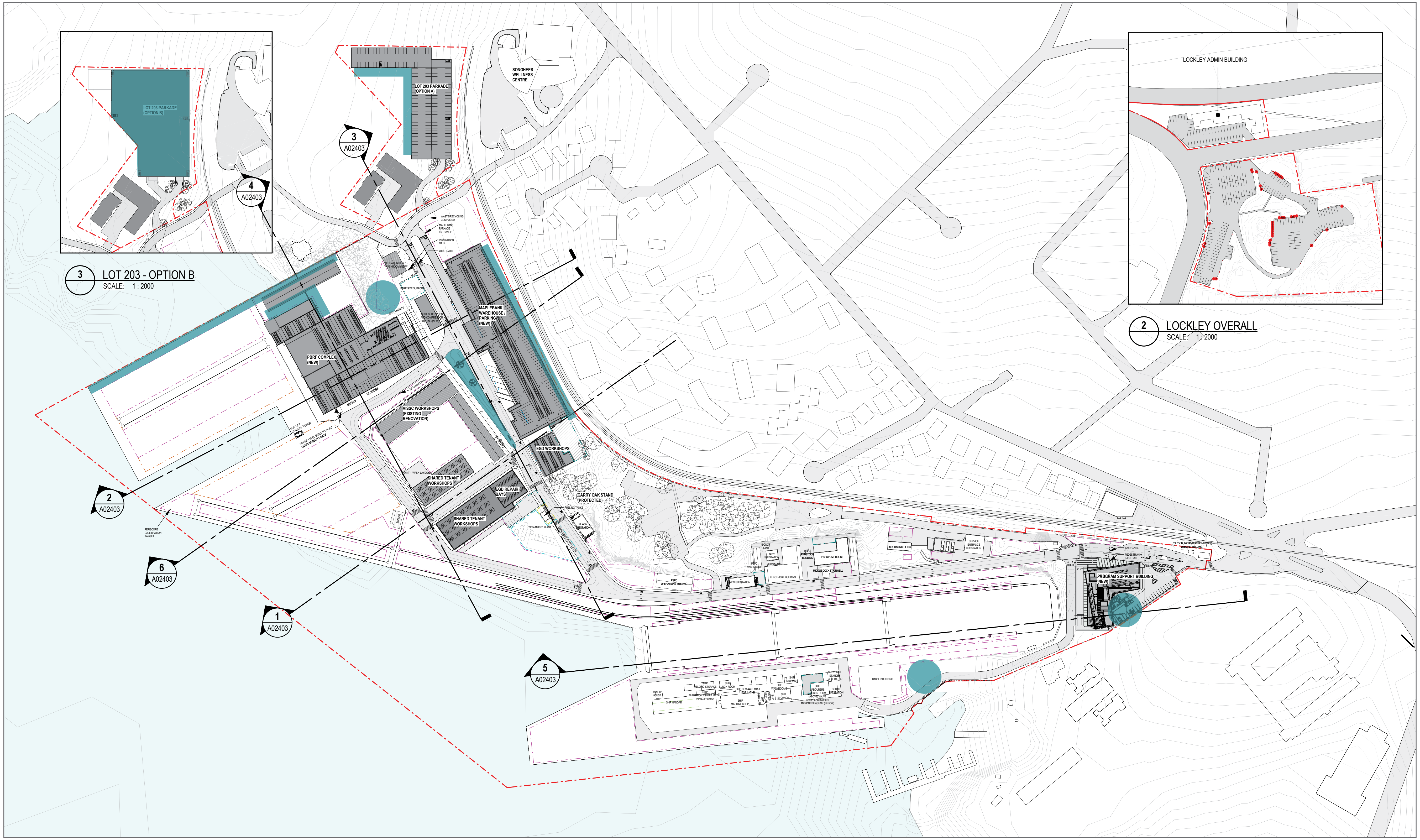


Figure 1.20 EGD Conceptual Plan, First Nation Opportunity Areas, Thought-Starters

1.7 UNIFYING FORM & CHARACTER

CURRENT CHARACTER

The graving dock was built from 1921 to 1926 to address a critical need for a larger facility to meet the shipping industry's evolving requirements. The existing dry dock, built in 1887 at a site across the Esquimalt Harbour, was no longer able to accommodate the increasing size of commercial vessels. A new site at the north of Constance Cove was identified and construction completed in 1926. The site was formally opened as part of the 1927 Diamond Jubilee celebrations. Within the boundaries of the site there are two structures that are Recognized Federal Heritage Buildings by the Government of Canada: Historic Pump-House (Building 2013) and Historic Sub-Station [Transformer House] (Building 2020).

The site has grown organically over the years to accommodated changing project demands and user requirements. The current state, includes a number of PSPC and tenant built structures. Due to the nature of the site use, the overall character, form and feel of the site and its existing buildings is industrial. The form and appearance of buildings across the site are highly functional and follow intended uses.

Distinct differences in appearance that can be observed on site include:

- The Historic Pump-House (Building 2013), Historic Sub-Station (Building 2020) and EGD Operations Building (2025) with their brick exterior contrast with the contemporary industrial site components with their functional metal cladding facades.
- The Historic Pump-House (#1 on diagram) and Historic Sub-Station (#2 on diagram) exhibit the utilitarian design of industrial buildings with modern classical inspiration in the early 20th century;
- The buildings present in a brick and concrete structure, clean lines and stringent grid that articulates as bays in the facade. The otherwise plain facade shows minimal surface decoration such as ornamental brick patterning, accentuating the vertical piers, and limestone trim decoration completing the building volume along the roof line. The Historic Pump-House opposed to the Historic Sub-Station has big steel framed windows consisting of small rectangular glass panes to maximize the incidence of daylight.

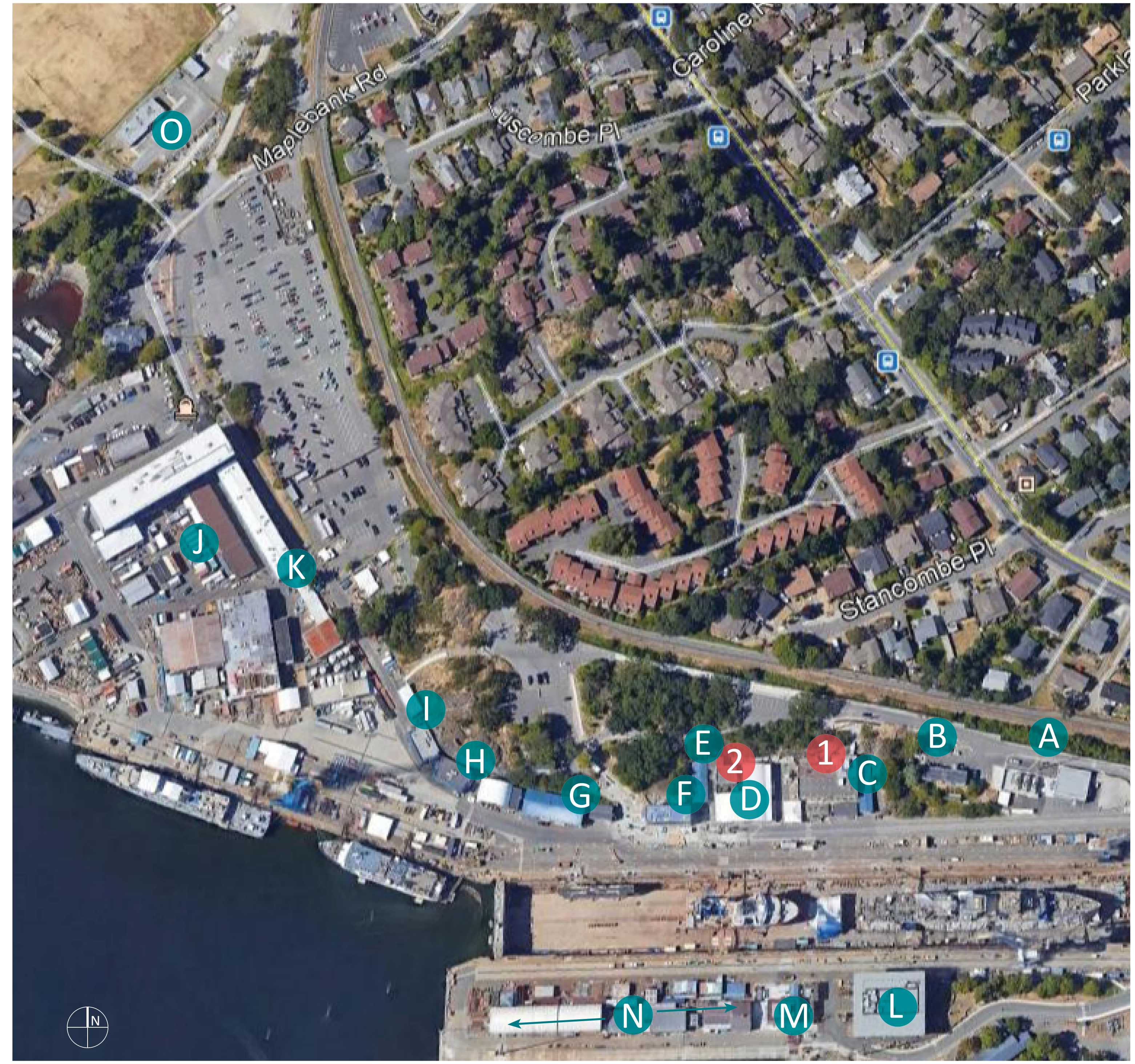


Figure 1.21 EGD Site with Existing Buildings Overlay, source: Google Earth, https://earth.google.com/web/, June 2021

The Parks Canada Directory of Federal Heritage Designations describes the Historic Pump-House (#1 on the diagram) and Historic Sub-Station [Transformer House] (#2 on the diagram). as follows:

Historical Value

The Pump House / Transformer House *'illustrates the theme of the shipping industry, a theme that has been integrally connected with the development of the Canadian economy.'*

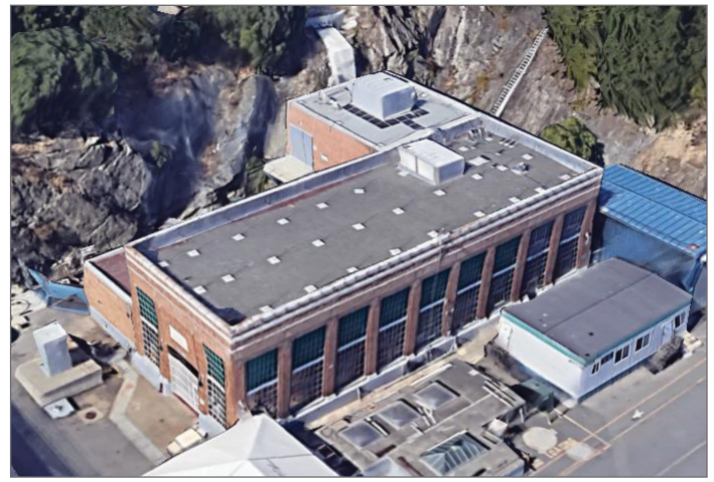
Architectural Value

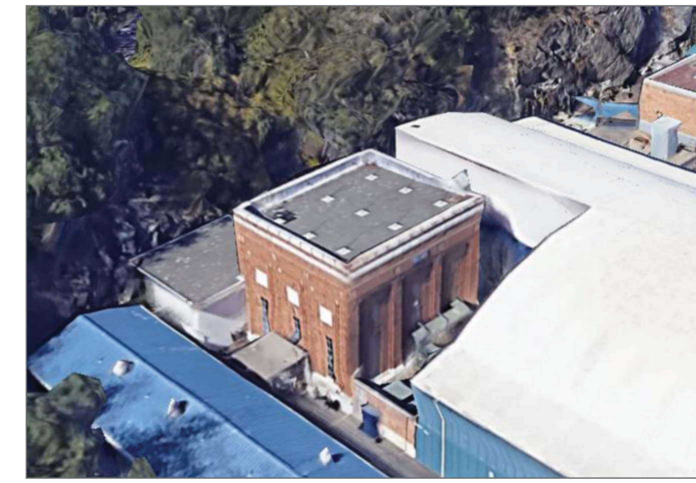
The Pump House Pump House / Transformer House '*is a very good example of utilitarian design exhibiting features characteristic of the Modern Classical style popular during the first half of the 20th century. The building also reflects an economic approach to construction typically employed for industrial plants. Similarly the interior layout is determined by functional consideration and machinery arrangement.'*

Environmental Value

'...utilitarian designs in combination with machinery, contribute to the industrial character of the Graving Dock.'

Furthermore the architectural features are described as follow:





1 PUMP HOUSE

Construction Date: 1925

'Description of Historic Place

...It is three storeys in height with two additions on the north elevation. The north and south façades have nine bays divided by piers. The west façade has a large central entrance flanked by two windows and the east façade has three bays. Ornamental brick patterning and limestone stringcourses decorate the otherwise plain façade.

Character-Defining Elements

...Its utilitarian design, modern classical features, very good quality craftsmanship and materials such as: its large three-storey rectangular, flat-roofed, massing on a well-defined concrete foundation; its division into clearly defined bays, and the regular arrangement of openings on these bays; its large vertical steel-framed windows divided into small panes; its decorative brickwork that includes the course stretchers on edge, the geometric panels with limestone infilling above the piers, the panel with the date stone above the entrance, and the patterning on the piers themselves.[1]

2 OLD SUB-STATIONS [TRANSFORMER HOUSE]

Construction Date: 1925

'Description of Historic Place

....is a tall brick building located on the north side of the Esquimalt Graving Dock. The south, east and west façades are divided into three bays. Ornamental brick patterning and limestone trim decorate the otherwise plain façades....

Character-Defining Elements

....Its utilitarian design, modern classical inspiration, very good quality craftsmanship and materials, for example: its substantial brick massing approximately three-storeys high, with a flat roof and resting on a well-defined concrete foundation; its south, east, and west façades divided into three bays; its decorative brickwork that includes the course of stretchers on edge, the geometric panels with limestone infilling above the piers, and the patterning in the bays and on the piers themselves.' [2]w

Figure 1.22 (left) Historic Pumphouse, source: Google Earth, https://earth.google.com/web/, June 2021

Figure 1.23 (middle) Historic Transformer House (Sub-Station), site tour February 2020

Figure 1.24 (right) Historic Transformer House (Sub-Station), source: Google Earth, https://earth.google.com/web/, June 2021

1 https://www.pc.gc.ca/apps/dfhd/page_fhbro_eng.aspx?id=4596

2 https://www.pc.gc.ca/apps/dfhd/page_fhbro_eng.aspx?id=4598&i=62253

The majority of existing buildings on site are purely functional and merely serve the purpose of protecting machines, equipment and materials from the natural elements and marine environment.

It seems that over time costly aesthetics like big windows and ornamental brick patterns that require very good quality craftsmanship were abandoned in favor of cheaper, quicker structures and more contemporary materials.

Most of the contemporary buildings on site present as steel structures with metal cladding facades in different shades of blue. It can be observed throughout the site that the colour blue is the trademark colour for the buildings on the Esquimalt Graving Dock site.

The use of brick veneer along the base or ground floor level of the EGD buildings in the North Quad, pays tribute to the architecture of the two (2) historic buildings on site. and the Graving Dock's historical context.

Following is a synopsis of key structures across the site to inform the current-state form and character.

A EGD SUB-STATION & GENERATORS COMPOUND (2000)

Building Characteristics:

- rectangular building footprint
- facade material: vertical corrugated metal cladding
- the roof line wraps in an U-shape around the east and west side of the building, cantilevering over the north and south facade, creating a protection for the entry doors.
- colour scheme: silver metal cladding along the south, north and lower west facade; blue metal cladding for the roof line; entry doors in the accent colour yellow.

B TENANT OFFICE BUILDING (2001)

Building Characteristics:

- flexible structure
- containerized building; 2x4 modules over 2 storeys; rectangular building footprint; flat roof
- facade material: metal
- colour scheme: dark blue metal facade with a lighter blue accent colour around the windows

C EGD MECHANICS BAY (2011)

Building Characteristics:

- narrow and long rectangular building footprint; 1 storey double height
- slightly pitched metal roof with overhang along the eaves
- the front of the building consists of a big silver/grey coloured overhead metal door
- facade: vertical metal siding
- colour scheme: blue vertical metal cladding facade with silver/grey overhead door

Figure 1.25 (left) EGD Sub-Station, site tour February 2020

Figure 1.26 (middle) Tenant Building, source: Google Earth, https://earth.google.com/web/, June 2021

Figure 1.27 (right) EGD Mechanics Bay, site tour February 2020

D TENANT ELECTRICAL WORKSHOP (2018)

Building Characteristics:

- flexible structure
- L-shape building footprint with vaulted, tarp roof constructed between two double stacks of sea-containers to create covered work and storage areas; double height space between sea-can stacks
- the front of the structure is closed off with big sliding doors
- facade: metal
- colour scheme: blue coloured containers with blue sliding doors and white tarp roof

E WASHROOM BLOCK (2019)

Building Characteristics:

- narrow and long rectangular building footprint; 1 storey
- low pitch metal roof with overhang along the eaves providing cover for the entry doors
- facade: brick veneer pedestal up to a height of approx. 0.8m providing a durable base for the wall; vertical corrugated metal cladding above pedestal
- colour scheme: blue metal cladding; yellow/sand coloured brick veneer

F NORTH LANDING SUB-STATION (2022)

Building Characteristics:

- rectangular building footprint; 2 storey with elevated ground floor level; floor to floor height appears to be over high; flat roof
- facade: pedestal, short building elevations and facade portions around the windows present with a light grey/silver vertical corrugated metal cladding; the long building elevations are predominately covered with grey horizontal corrugated metal panels; yellow horizontal trims break the verticality of the building and highlight the window portion in the elevation
- colour scheme: light grey/silver and grey metal cladding with yellow accent trims around the windows

G EGD OPERATIONS BUILDING (2025)

Building Characteristics:

- rectangular building footprint; 2 storey with over high ground floor level;
- low pitch metal roof with overhang along the eaves
- facade: 3/4 of the ground floor level present in brick veneer; rest of the facade consist of blue vertical metal cladding; punch windows and doors in various sizes provide natural light an access to the building; glass canopy above the two main entrance doors
- colour scheme: blue metal cladding and roof; yellow/sand coloured brick veneer

Figure 1.28 (left) Tenant Workshop, source: Google Earth, https://earth.google.com/web/, June 2021

Figure 1.29 EGD Site Washroom, site tour February 2020

Figure 1.30 EGD North Landing Sub-Station, site tour February 2020

Figure 1.31 (right) EGD Operations Building, site tour February 2020

H TENANT OFFICE BUILDINGS (1036, 1037)

Building Characteristics:

- rectangular building footprints; 2 storeys with elevated ground floor level
- pitched metal roof along the perimeter of the building with flat roof over the centre; overhang along the eaves
- facade: blue vertical corrugated metal cladding with white horizontal accent lines structuring the otherwise plain facade with white framed punch windows
- colour scheme: blue metal cladding and roof; white window frames, white horizontal accent trims; white eaves enclosure and rainwater leaders

I NORTH LANDING SUB-STATION (1034)

Building Characteristics:

- rectangular building footprint; 2 storey with elevated ground floor level; floor to floor height appears to be over high; flat roof
- facade: pedestal, short building elevations and facade portions around the windows present with a light grey/silver vertical corrugated metal cladding; the long building elevations are predominately covered with blue horizontal corrugated metal panels; yellow horizontal trims break the verticality of the building and highlight the window portion in the elevation
- colour scheme: light grey/silver and blue metal cladding

J PBRF HANGAR (1004)

Building Characteristics:

- narrow, long rectangular building footprint; approx. 25 m high structure
- low pitch metal roof
- facade: blue vertical corrugated metal cladding; silver metal roof; horizontal window band along the roof eaves on the long side of the building; large silver metal overhead door provides access towards the wharf
- colour scheme: blue metal cladding, silver metal roof; concrete wall base

K VICTORIA IN-SERVICE SUPPORT CONTRACT, VISSC BUILDING (1003)

Building Characteristics:

- narrow, long rectangular building footprint; 3 storeys with partially double height ground floor with mezzanine level
- low pitch metal roof
- facade: blue vertical corrugated metal cladding; silver metal roof; small punch windows; 3 large silver metal overhead doors provide access to the workshops on the ground floor
- colour scheme: blue metal cladding, silver metal roof; concrete wall base

Figure 1.32 (left) Tenant Office Building, site tour February 2020

Figure 1.33 EGD North-West Landing Sub-Station, site tour February 2020

Figure 1.34 (right) Hangar and Workshops Building, source: Google Earth, https://earth.google.com/web/, June 2021

L TENANT (BARKER) BUILDING (3120)

Building Characteristics:

- almost square building footprint; multistory building with double height ground floor
- metal shed roof
- facade: blue horizontal metal siding on the ground floor; a horizontal window ribbon separates the ground floor from the upper floors; silver, wide pane metal panels (vertical) dominate the facade of the upper floors aiding to tie the horizontal window ribbons of the offices together; the blue horizontal siding of the ground floor together with the blue siding of the upper floors and along the roof line, frames the silver vertical siding portion with the windows
- colour scheme: blue and silver metal siding; silver metal roof;

M EGD SUB-STATION, SOUTH JETTY (3080)

Building Characteristics:

- rectangular building footprint; 2 storeys over high flat roof
- facade: ground floor with brick veneer; 2nd level presents with blue vertical corrugated metal cladding; the interior layout is not obviously recognizable in the facade; the upper floor facade presents with silver cladding inlays in the blue siding appearing from a far as faux horizontal window elements; those elements break the otherwise plain metal facade
- colour scheme: blue and silver metal cladding; yellow/sand coloured brick veneer

N TENANT STRUCTURES, SOUTH JETTY (3100, 3110)

Building Characteristics:

- temporary structures
- rectangular building footprint; 1-2 storey
- with low pitch metal roof and partially flat roof or vaulted white tarp roof;
- facade: blue vertical corrugated metal cladding; no windows; overhead access doors
- colour scheme: blue and silver metal siding

O CAMOSUN COASTAL CENTRE, LOT 203 (1057)

Building Characteristics:

- rectangular building footprint; 1 storey with flat roof
- facade: grey vertical corrugated metal cladding; with windows
- colour scheme: light and dark grey metal siding and roof

Figure 1.35 (left) Tenant (Barker) Building, site tour February 2020

Figure 1.36 EGD South-Jetty Sub-Station, site tour February 2020

Figure 1.37 Tenant Workshops, site tour February 2020

Figure 1.38 Camosun Coast Centre, site tour February 2019

FUTURE UNIFYING FORM & CHARACTER

Located within the traditional Coastal Salish territories of the Esquimalt and Songhees First Nations, EGD is a key piece of infrastructure supporting the federal commitment to support and strengthen the industrial marine sector on Canada's west coast.

EGD is one of the many sites and communities surrounding the Esquimalt Harbour. The dry-dock is surrounded by a number of neighbouring uses. Opposite Constance Cove with shared access from Admirals Road is DND Naden / CFB Esquimalt. The Esquimalt communities of Gorge Vale and Rockheights flank Admirals Road, with the Esquimalt & Nanaimo (E&N) multi-use community trail running along the northern property boundary. As noted, the Esquimalt and Songhees First Nations are to the north-west with direct adjacency to the Songhees First Nation territory.

CENTRE OF EXCELLENCE

With the goal to create a west coast marine industry Centre of Excellence the redevelopment will advocate civic and national pride and showcase the sustainable marine industry hub. EGD has an opportunity to engage with marine industries, the local community and visitors. The Conceptual Plan 2021 strives to leverage this opportunity to strengthen EGD and the Federal Government's respected character and brand.

Alignment with the federal new building guidelines, including 'Technical Reference for Office Building Design (dated July 20, 2017), prepared by Public Services and Procurement Canada, (key guidelines include but are not limited to) page 4:

'2.2 Sustainable and Enduring Development

Ensure design solutions maximize a sustainable approach aimed at:

- *improving the social value to support more livable communities;*
- *creating economic efficiencies; and*
- *reducing our environmental footprint by reducing, recycling, and reusing.*

Design solutions must: ...

- *be tailored to the local climate to ensure the durability and high performance of building systems;*
- *have an effective choice of building materials and systems to ensure durability and meet predetermined durability targets set out for each project;*
- *be consistent with the Federal Sustainable Development Strategy (FSDS); and*
- *Comply with CSA-S478-95 Guidelines on Durability in Buildings.*

2.4 Inspiring and Attractive

Ensure design solutions take into consideration the physical expression of the asset and contribute positively to the local context.

Design solutions must:

- *enhance the immediate environment, both for direct users and the broader community;*
- *be recognizable as a federal office building, reflecting a positive image of the Crown and its core*
- *value of long-term sustainability;*
- *integrate visually within the unique context of the area; and*
- *provide clarity and consistency of architectural form and detailing.'*[1]

COLOUR PALETTE & MATERIALS

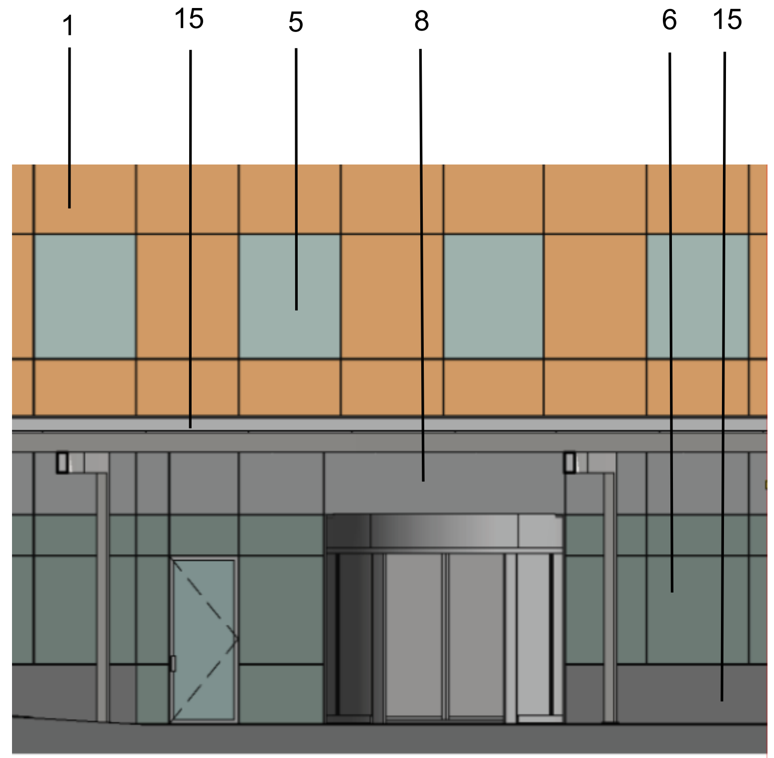
With the redevelopment at EGD, there is opportunity to create a cohesive character and unified building form across the site. The design team studied the new buildings proposed at EGD in tandem with the existing and historic buildings to provide an overall architectural visual language at the dry-dock, best suited for the harsh marine environment and surrounding natural ecosystems (prominate seagulls).

As the gateway building the Program Support Building is treated as a prominate feature on site with unique characteristics. Whereas the workshops and warehousing buildings form a secondary grouping with a similar approach for these buildings (EGD Operations Workshop Building, EGD Operations Repair Bays / Shared Tenant Building, Shared Tenant Building and Maplebank Tenant Warehouse. Lastly the PBRF Complex is treated in a similar fashion to the workshops with unique characteristics. The following pages showcase the proposed colour palette and materials.

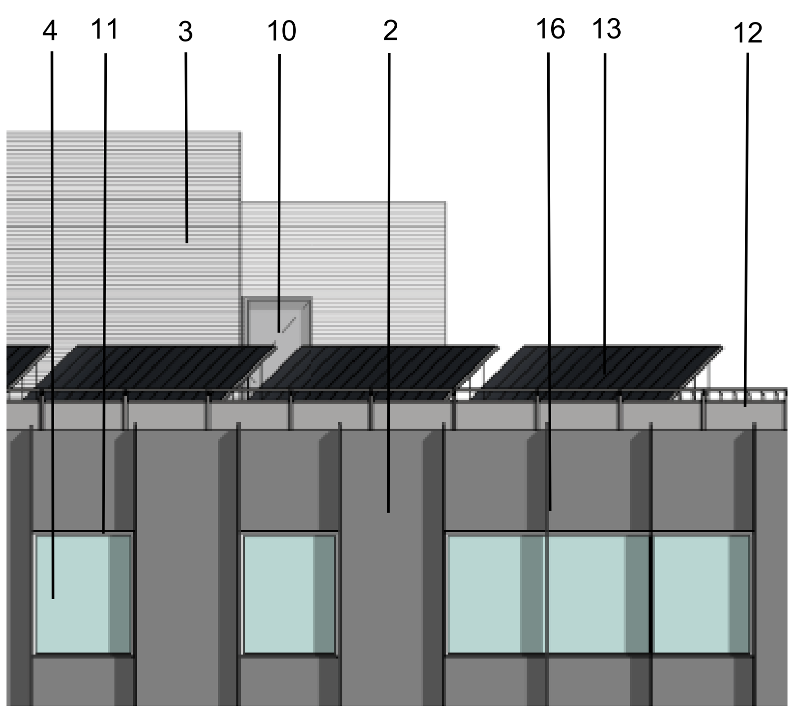
1 Source: https://buyandsell.gc.ca/cds/public/2020/09/02/ef9b1fd7bbb922bbaadf00aee508759e/technical_reference_for_office_building_design_p4-70-2017-eng.pdf, June 26, 2021.

Figure 1.39 (opposite) Program Support Building, Material Board

PROGRAM SUPPORT BUILDING



Detail View North Elevation
NTS



Detail View East Elevation
NTS

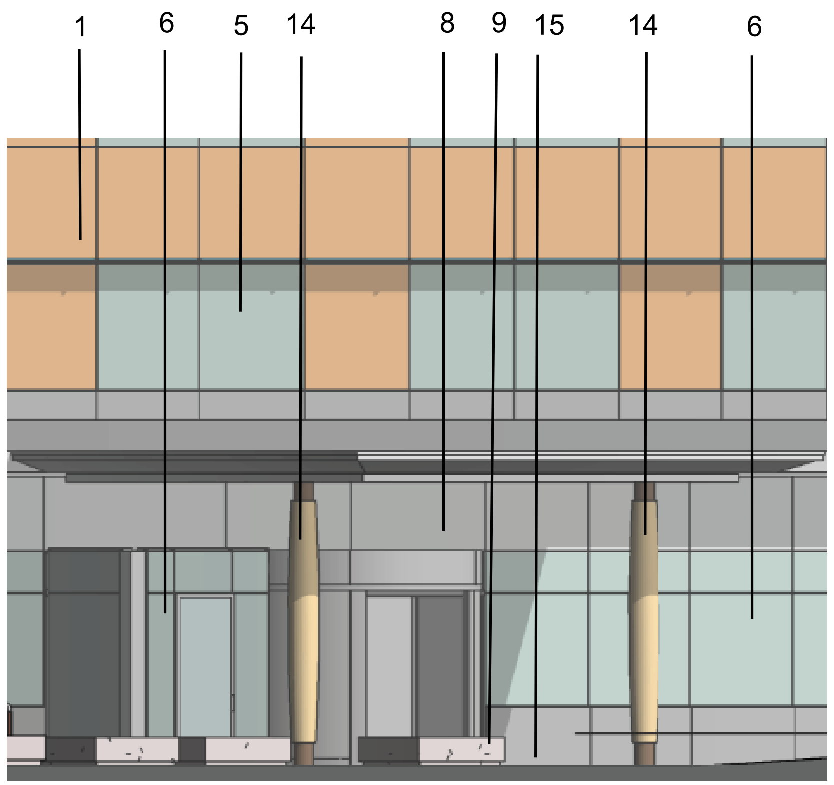
Materials Legend

1. Phenolic composite siding wood appearance
2. Fibre-cement panel system
3. Corrugated metal panel system horizontal
4. Triple glazed window
5. Sealed triple glazing
6. Sealed triple glazing SSG Curtain Wall System
7. Tempered clear glass Windscreen
8. Backpainted spandrel glass light gray
9. Concrete
10. Painted steel metal door
11. Aluminum mullions
12. Perforated metal panel guard
13. Solar panel
14. Glulam column
15. Painted concrete
16. Aluminum fins
17. Roof terraces trellis

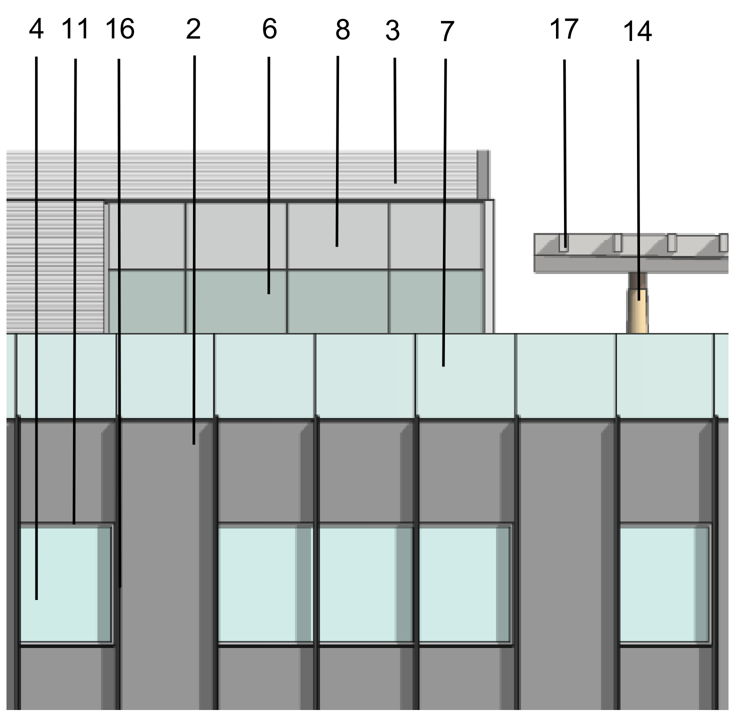
Program Support Building North Elevation
NTS

Program Support Building East Elevation
NTS

PROGRAM SUPPORT BUILDING



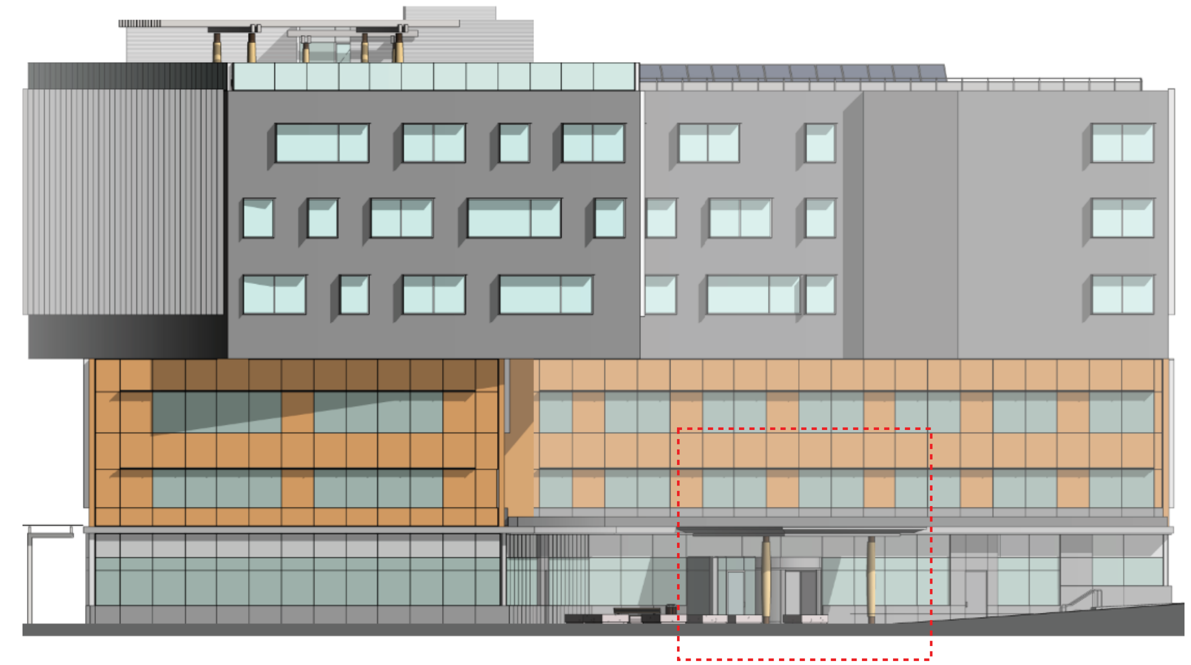
Detail View South Elevation
NTS



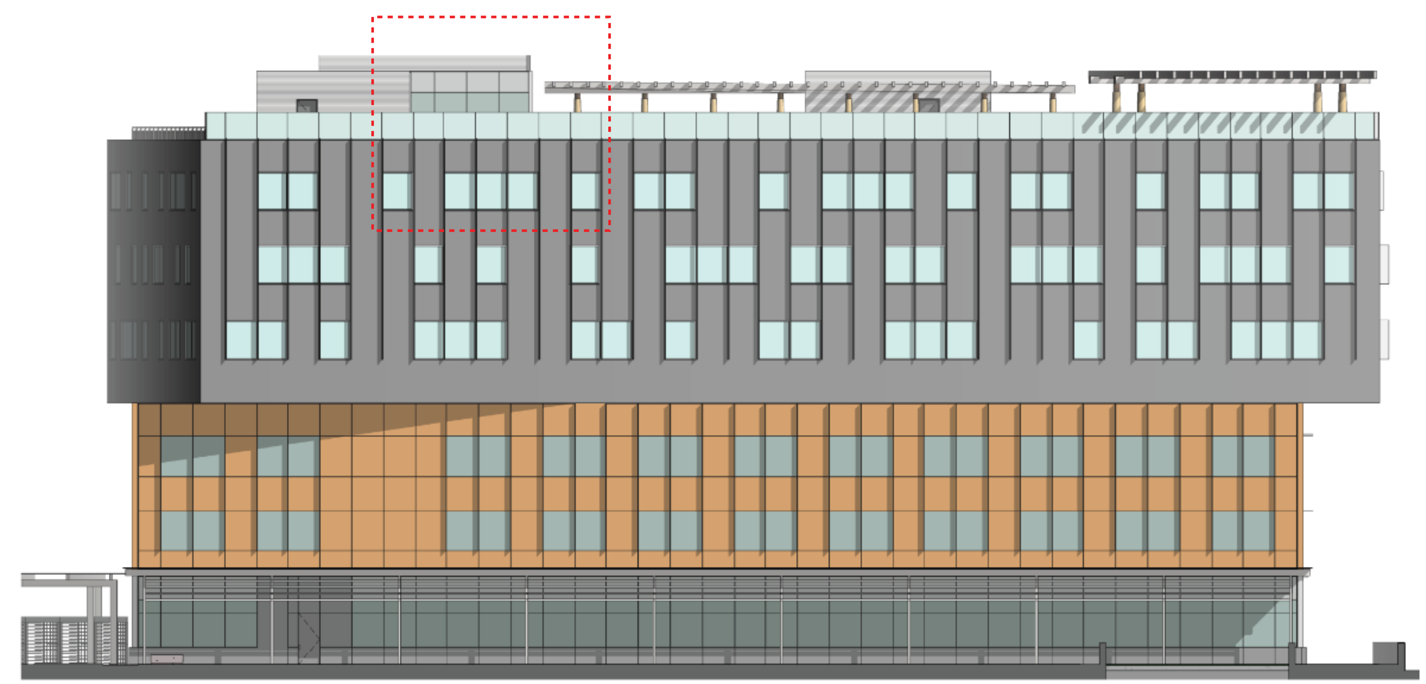
Detail View West Elevation
NTS

Materials Legend

1. Phenolic composite siding wood appearance
2. Fibre-cement panel system
3. Corrugated metal panel system horizontal
4. Triple glazed window
5. Sealed triple glazing
6. Sealed triple glazing SSG Curtain Wall System
7. Tempered clear glass Windscreen
8. Backpainted spandrel glass light gray
9. Concrete
10. Painted steel metal door
11. Aluminum mullions
12. Perforated metal panel guard
13. Solar panel
14. Glulam column
15. Painted concrete
16. Aluminum fins
17. Roof terraces trellis



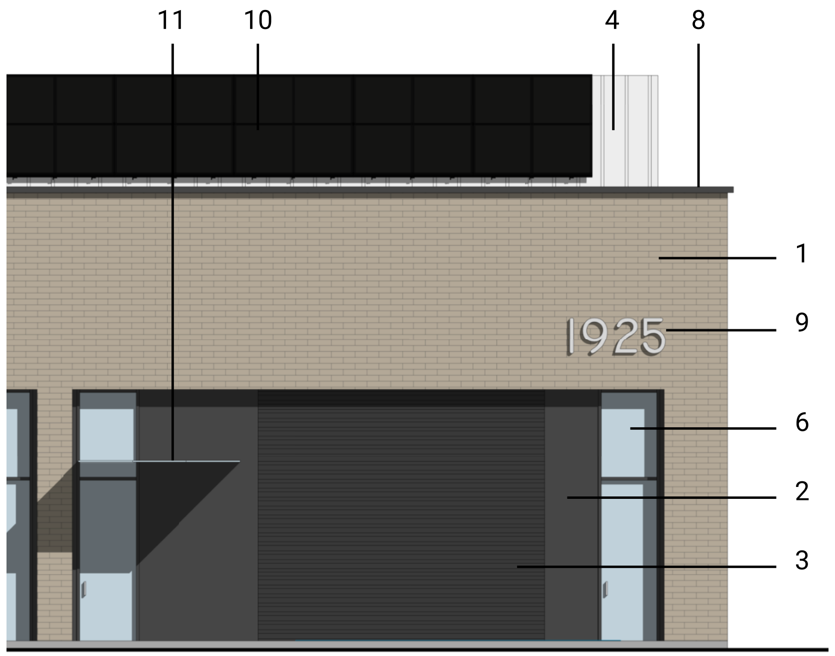
Program Support Building South Elevation
NTS



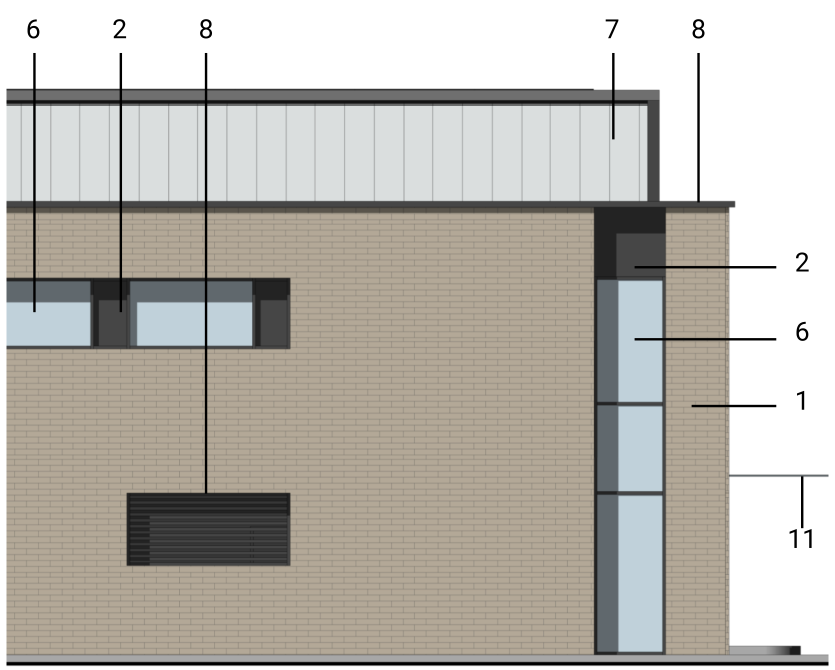
Program Support Building West Elevation
NTS

Figure 1.40 Program Support Building Material Board

EGD OPERATIONS (WORKSHOPS) BUILDING

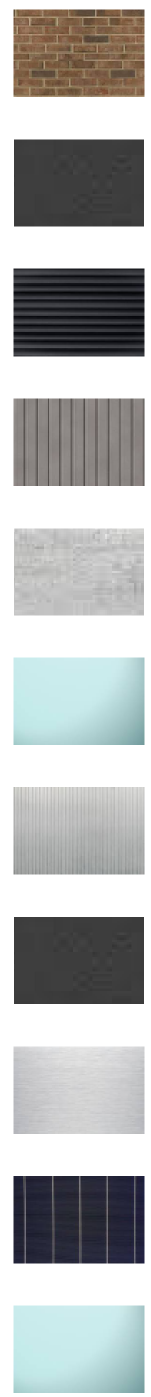


Detail View West Elevation
NTS

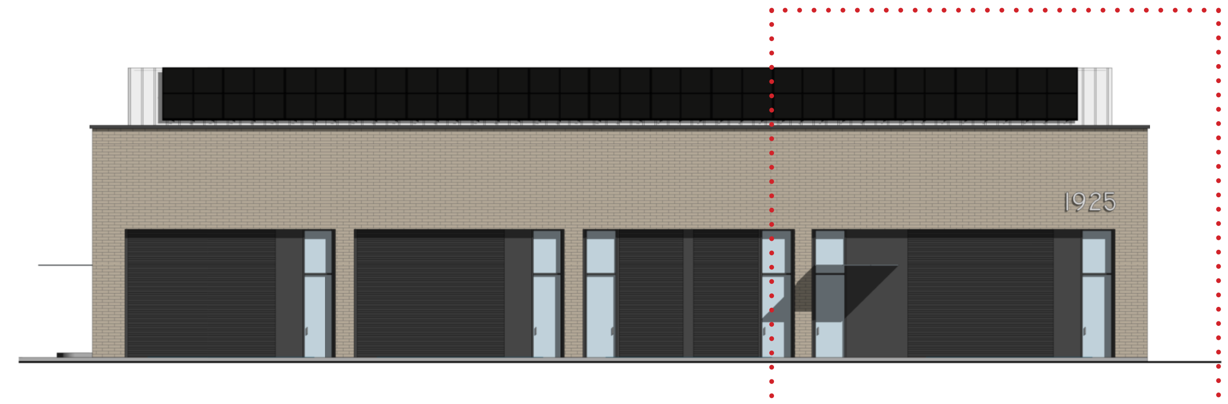


Detail View East Elevation
NTS

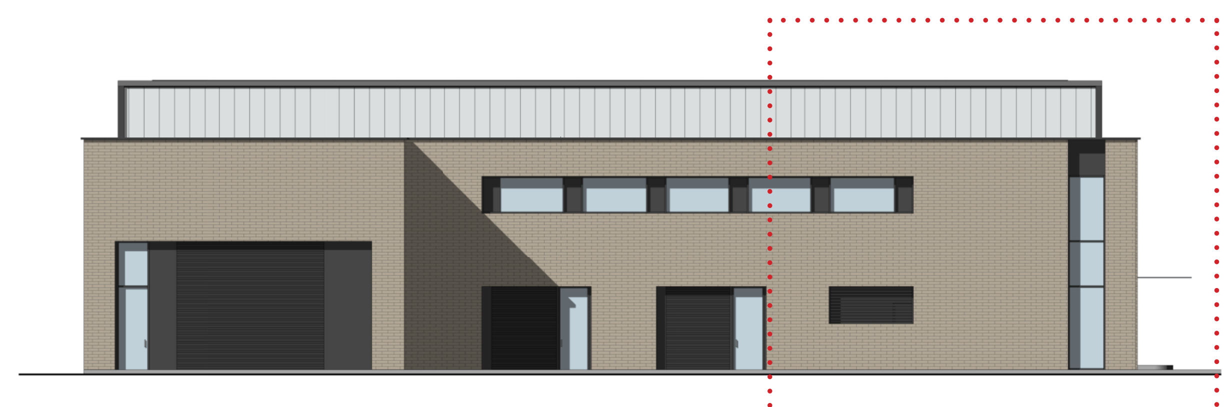
Materials Legend



1. Masonry clay brick, running bond; brown
2. Composite metal wall panel system; charcoal
3. Prefinished corrugated metal overhead door; charcoal
4. Prefinished standing seam metal roof; grey
5. Architectural concrete; natural
6. Clear glazing in curtain wall system
7. Translucent polycarbonate wall panel system
8. Miscellaneous metals: flashings, cornice, louvers, mullions, etc; charcoal
9. Brushed aluminum signage; natural
10. Photovoltaic solar panels; black
11. Clear, tempered glass canopy



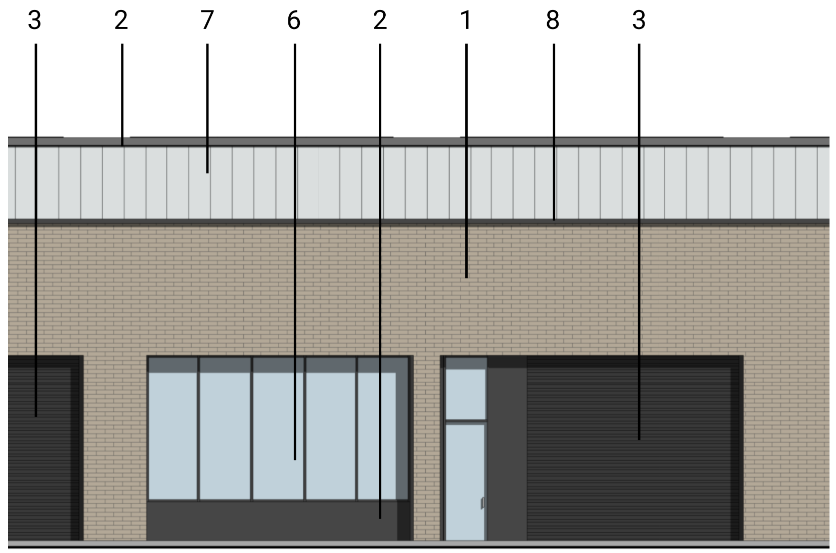
EGD Workshops Building West Elevation
NTS



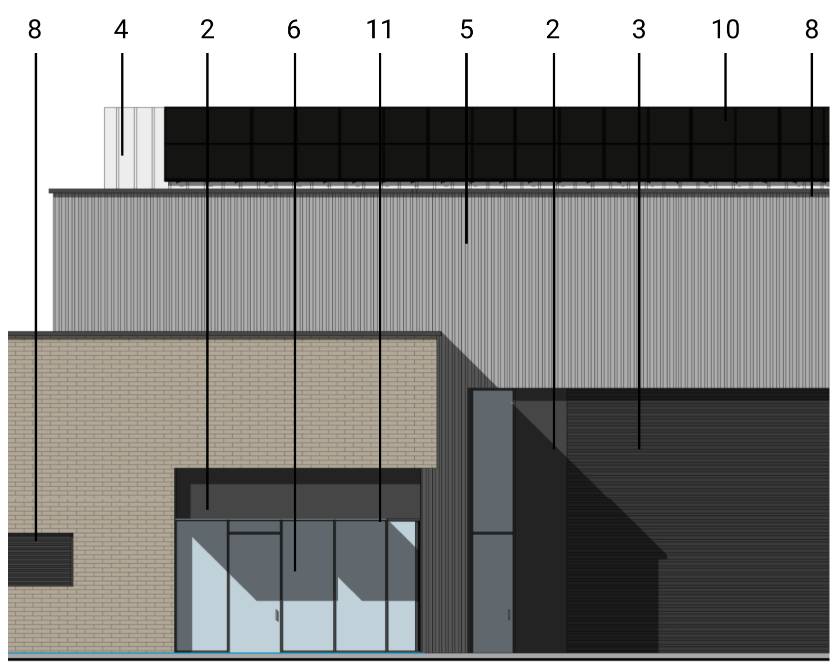
EGD Workshops Building East Elevation
NTS

Figure 1.41 EGD Workshops Building Material Board

EGD OPERATIONS (REPAIR BAYS) / SHARED TENANT BUILDING



Detail View North Elevation
NTS



Detail View South Elevation
NTS

Materials Legend

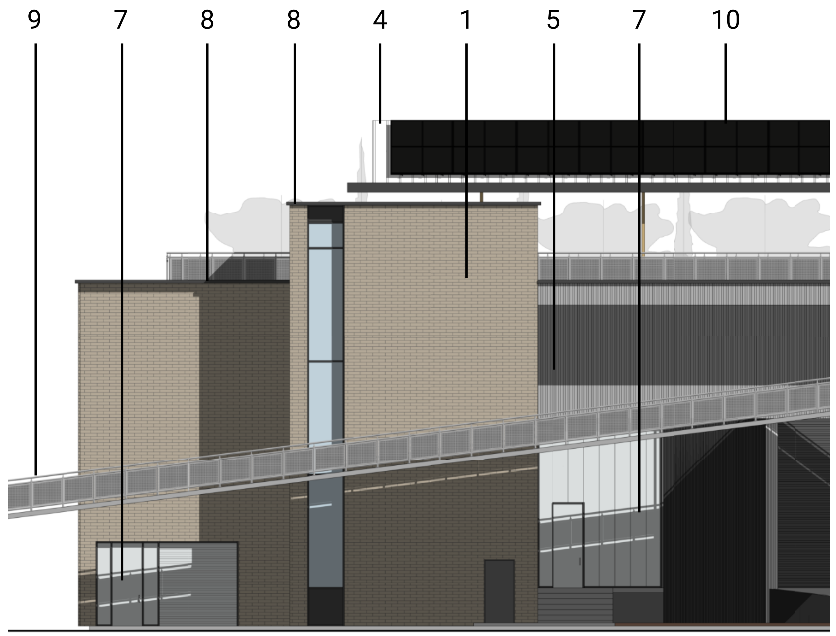
1. Masonry clay brick, running bond; brown
2. Composite metal wall panel system; charcoal
3. Prefinished corrugated metal overhead door; charcoal
4. Prefinished standing seam metal roof; grey
5. Prefinished corrugated metal wall panel system; grey
6. Clear glazing in curtain wall system
7. Translucent polycarbonate wall panel system
8. Miscellaneous metals: flashings, cornice, louvers, mullions, etc; charcoal
9. Brushed aluminum signage; natural
10. Photovoltaic solar panels; black
11. Clear, tempered glass canopy

Shared Tenant Building North Elevation
NTS

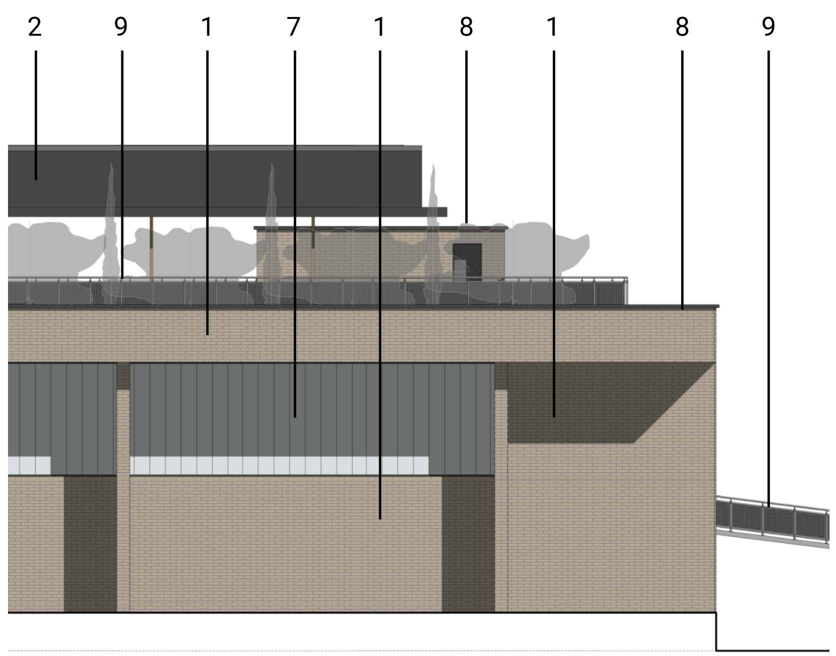
Shared Tenant Building South Elevation
NTS

Figure 1.42 EGD Repair Bays / Shared Tenant Building Material Board

MAPLEBANK TENANT WAREHOUSE (UPPER)

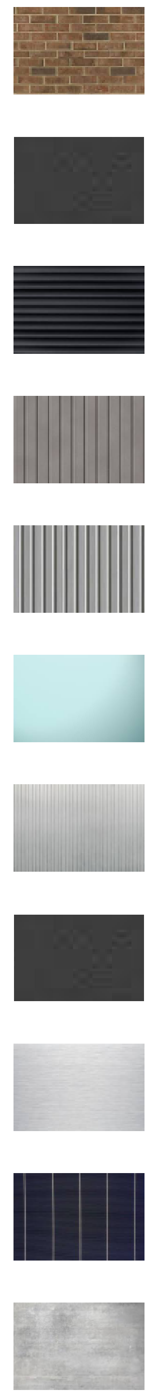


Detail View West Elevation
NTS

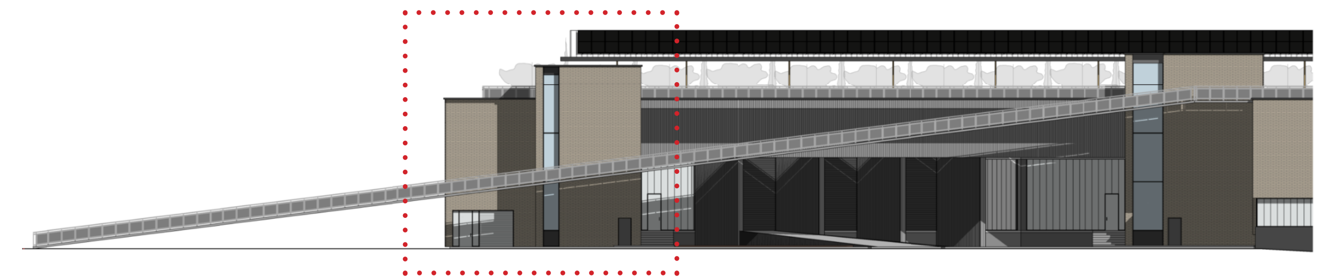


Detail View East Elevation
NTS

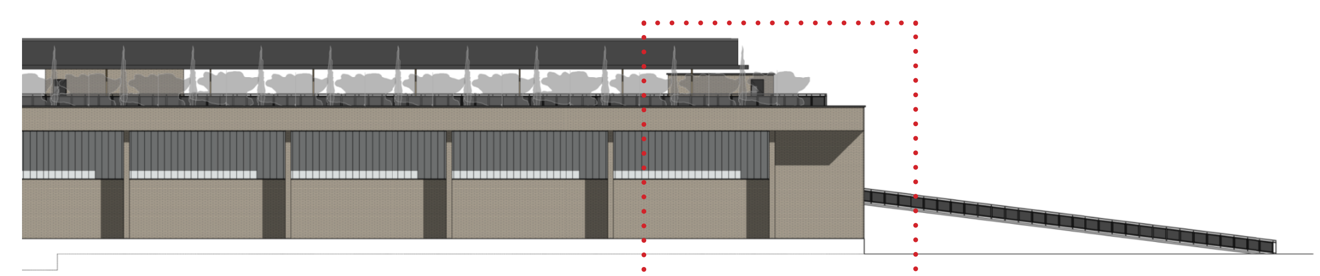
Materials Legend



1. Masonry clay brick, running bond; brown
2. Composite metal wall panel system; charcoal
3. Prefinished corrugated metal overhead door; charcoal
4. Prefinished standing seam metal roof; grey
5. Prefinished corrugated metal wall panel system; grey
6. Clear glazing in curtain wall system
7. Translucent polycarbonate wall panel system
8. Miscellaneous metals: flashings, cornice, louvers, mullions, etc; charcoal
9. Anodized steel guard with wire mesh infill panels
10. Photovoltaic solar panels; black
11. Architectural concrete; natural



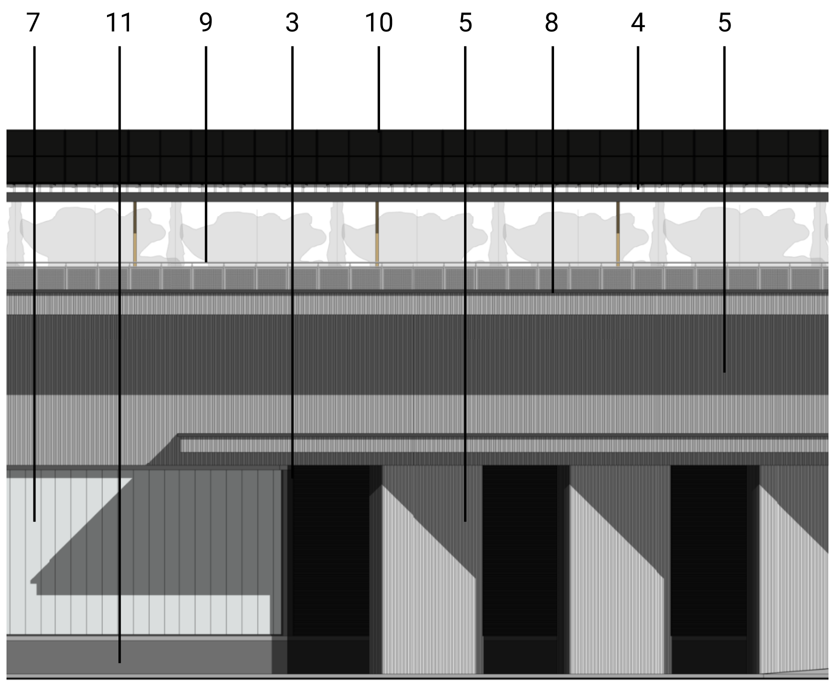
Maplebank Upper Warehouse West Elevation
NTS



Maplebank Upper Warehouse East Elevation
NTS

Figure 1.43 Maplebank Tenant Warehouse Material Board

MAPLEBANK TENANT WAREHOUSE (LOWER)

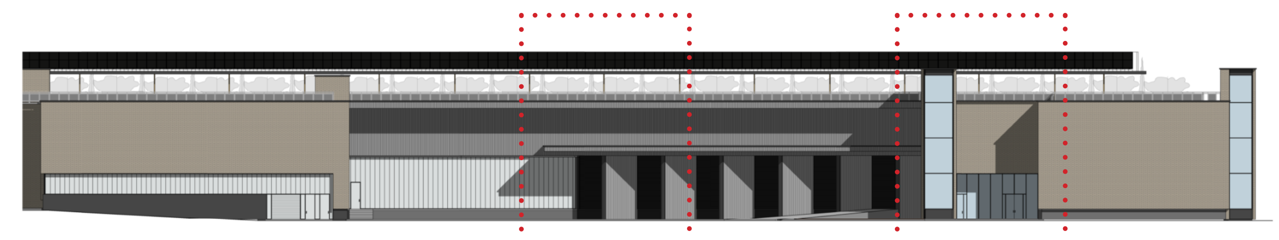


Detail View West Elevation
NTS

Detail View West Elevation
NTS

Materials Legend

1. Masonry clay brick, running bond; brown
2. Composite metal wall panel system; charcoal
3. Prefinished corrugated metal overhead door; charcoal
4. Prefinished standing seam metal roof; grey
5. Prefinished corrugated metal wall panel system; grey
6. Clear glazing in curtain wall system
7. Translucent polycarbonate wall panel system
8. Miscellaneous metals: flashings, cornice, louvers, mullions, etc; charcoal
9. Anodized steel guard with wire mesh infill panels
10. Photovoltaic solar panels; black
11. Architectural concrete; natural

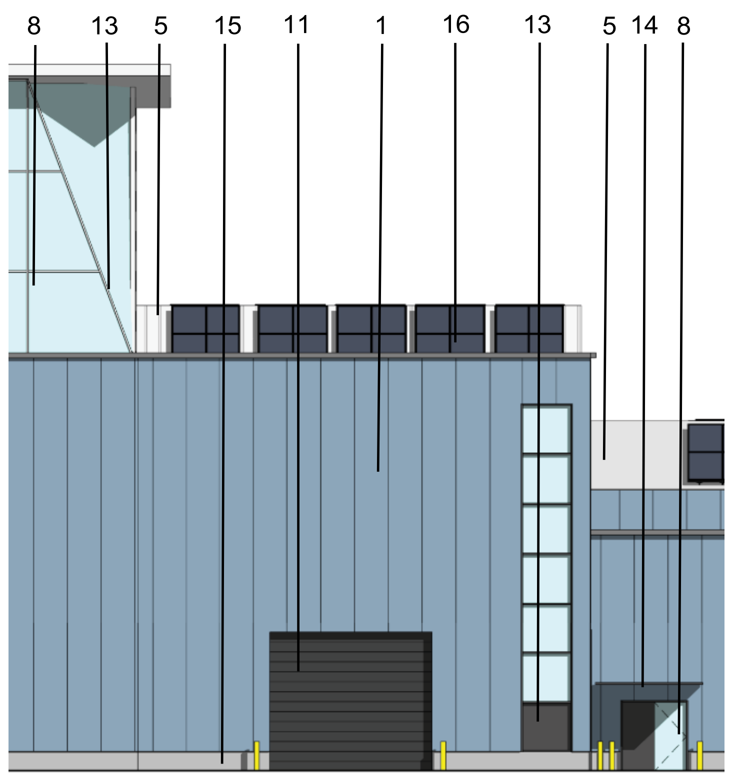


Maplebank Lower Warehouse West Elevation
NTS

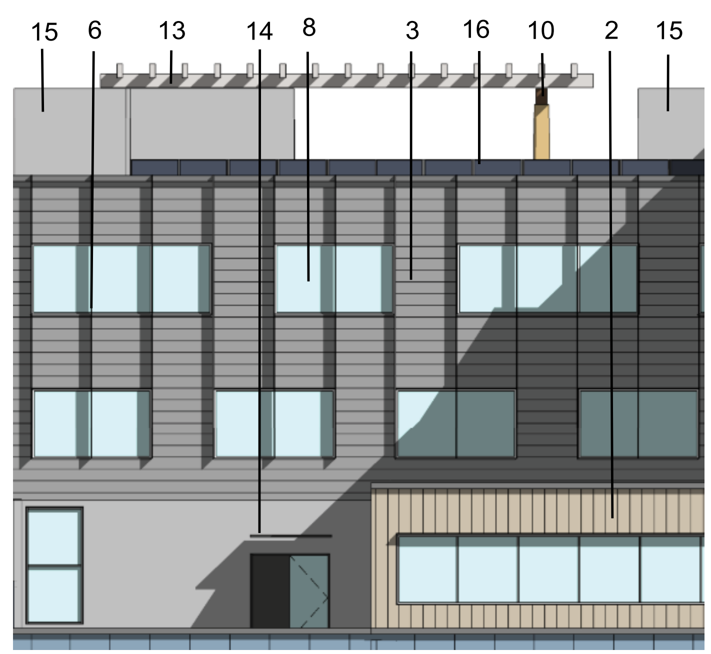
Maplebank Lower Warehouse East Elevation
NTS

Figure 1.44 Maplebank Tenant Warehouse Material Board

PBRF COMPLEX

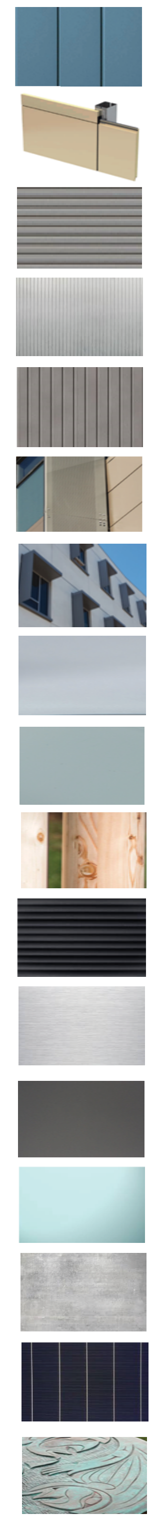


3 Detail View West Elevation
NTS

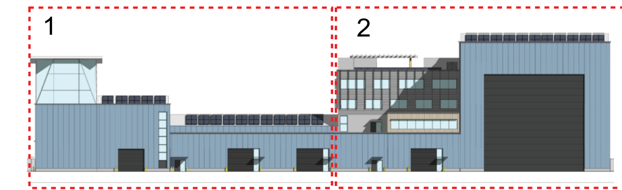


4 Detail View West Elevation
NTS

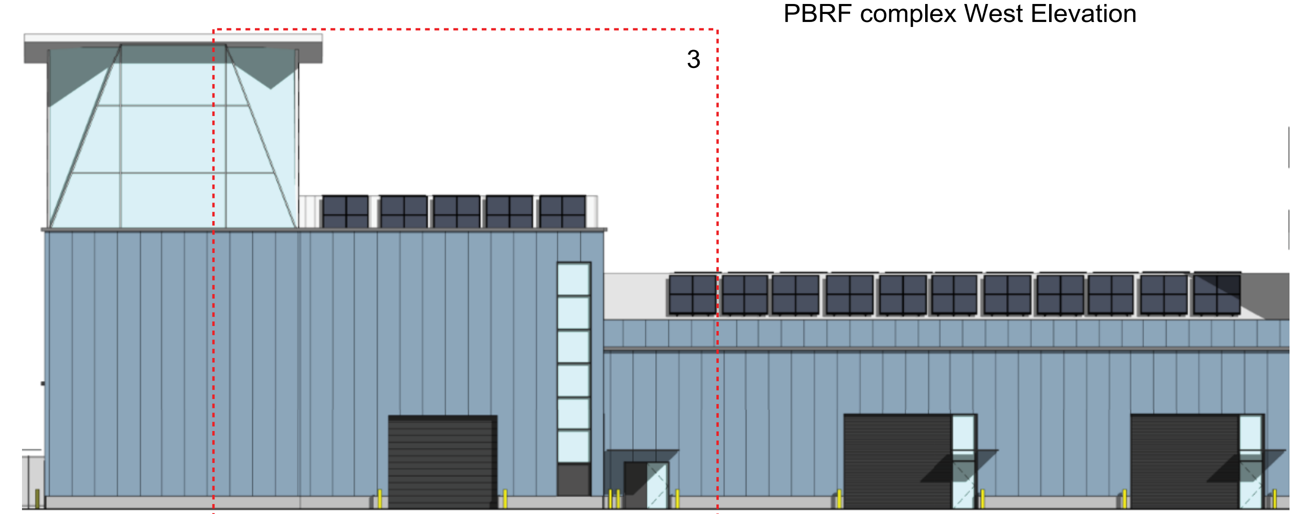
Materials Legend



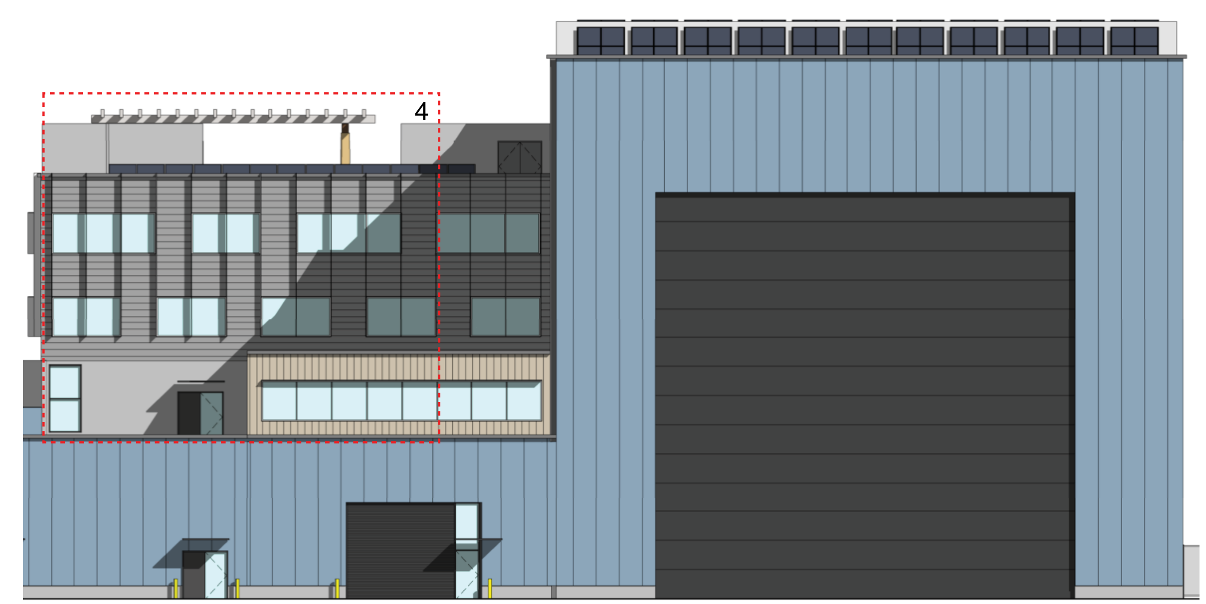
1. Composite metal wall panel system; blue colour
2. Composite metal wall panel system; brick colour
3. Composite metal wall panel system;light gray colour
4. Translucent polycarbonate wall panel system
5. Prefinished standing seam metal roof; grey
6. Aluminum vertical solar shading fins
7. Aluminum L shaped frame solar shading
8. Clear glazing in curtain wall system
9. Spandrel glazing in curtain wall system
10. Glulam column
11. Prefinished corrugated metal overhead door; charcoal
12. Anodized steel guard with wire mesh infill panels
13. Metal wall panel system, flashings,cornice,louvers, mullions,roof trellis; charcoal
14. Clear, tempered glass canopy
15. Architectural concrete; natural
16. Photovoltaic solar panels; black
17. Art display



PBRF complex West Elevation



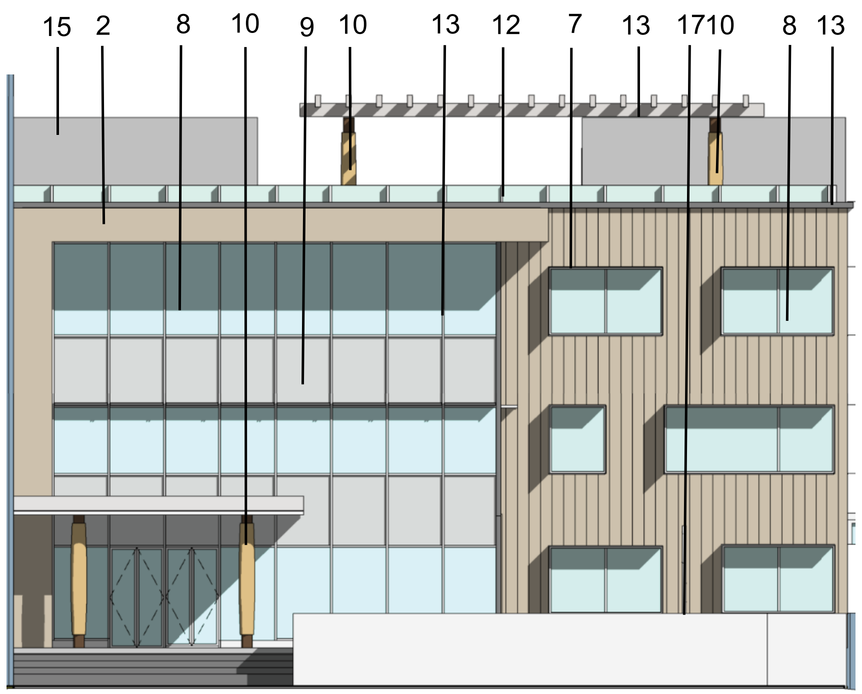
1 PBRF complex partial West Elevation
NTS



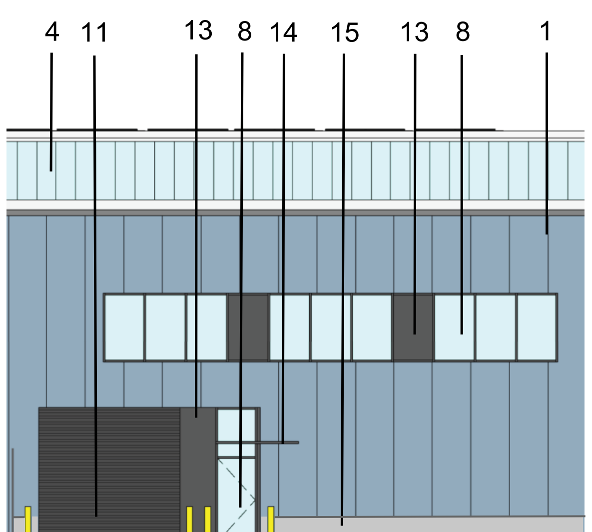
2 PBRF complex partial West Elevation
NTS

Figure 1.45 PBRF Complex Material Board

PBRF COMPLEX

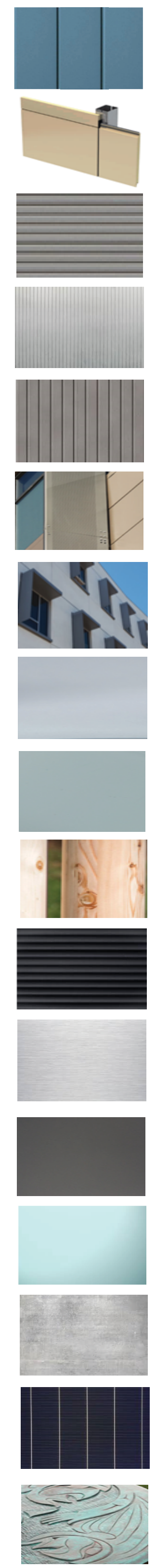


3 Detail View East Elevation
NTS

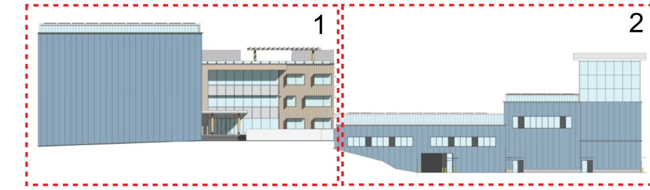


4 Detail View East Elevation
NTS

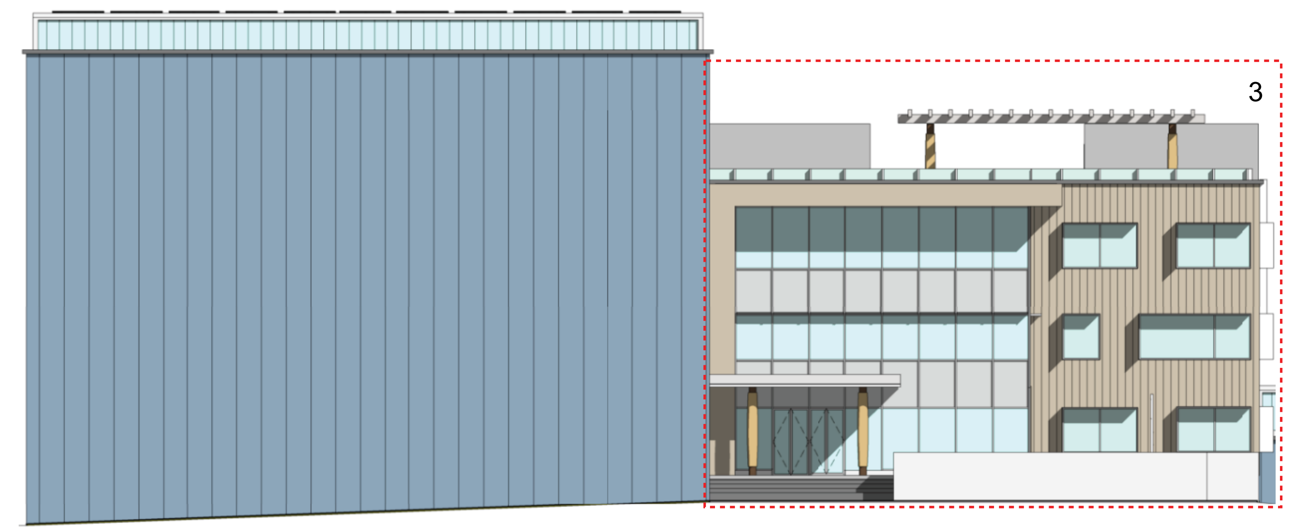
Materials Legend



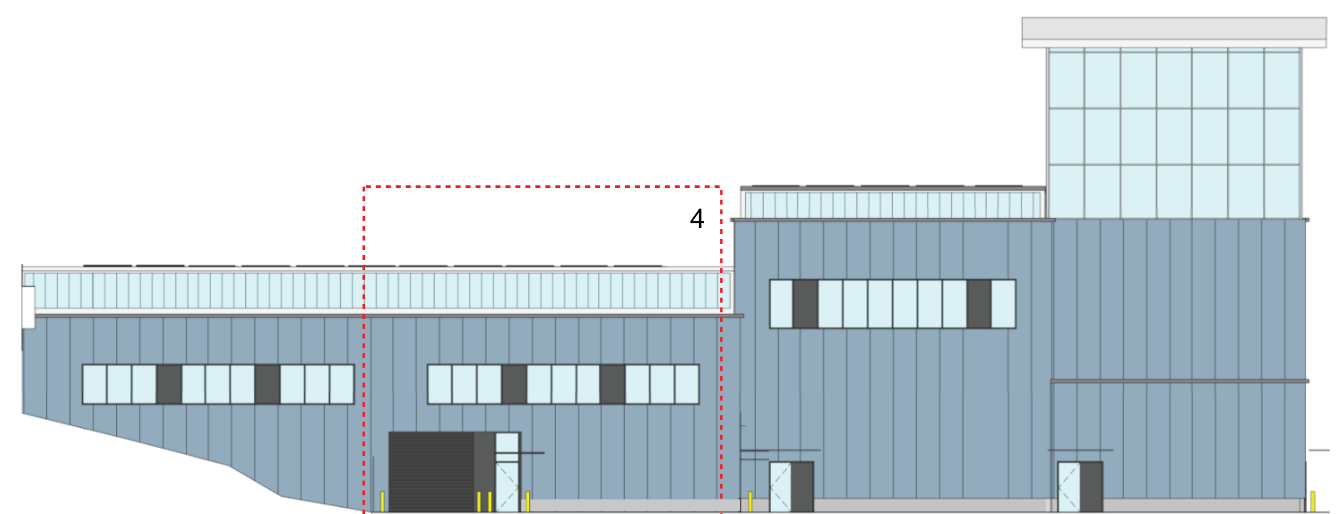
1. Composite metal wall panel system; blue colour
2. Composite metal wall panel system; brick colour
3. Composite metal wall panel system;light gray colour
4. Translucent polycarbonate wall panel system
5. Prefinished standing seam metal roof; grey
6. Aluminum vertical solar shading fins
7. Aluminum L shaped frame solar shading
8. Clear glazing in curtain wall system
9. Spandrel glazing in curtain wall system
10. Glulam column
11. Prefinished corrugated metal overhead door; charcoal
12. Anodized steel guard with wire mesh infill panels
13. Metal wall panel system, flashings,cornice,louvers, mullions,roof trellis; charcoal
14. Clear, tempered glass canopy
15. Architectural concrete; natural
16. Photovoltaic solar panels; black
17. Art display



PBRF complex East Elevation



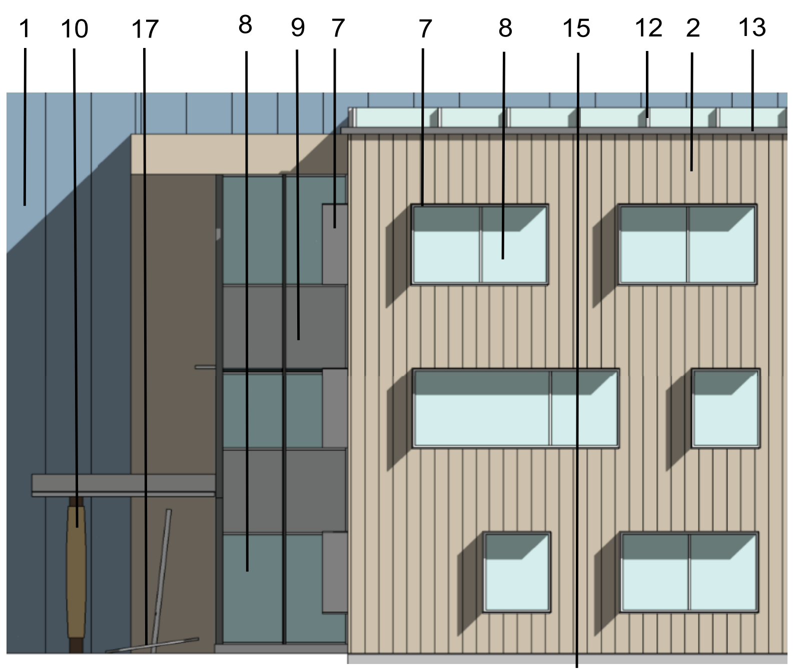
1 PBRF complex partial East Elevation
NTS



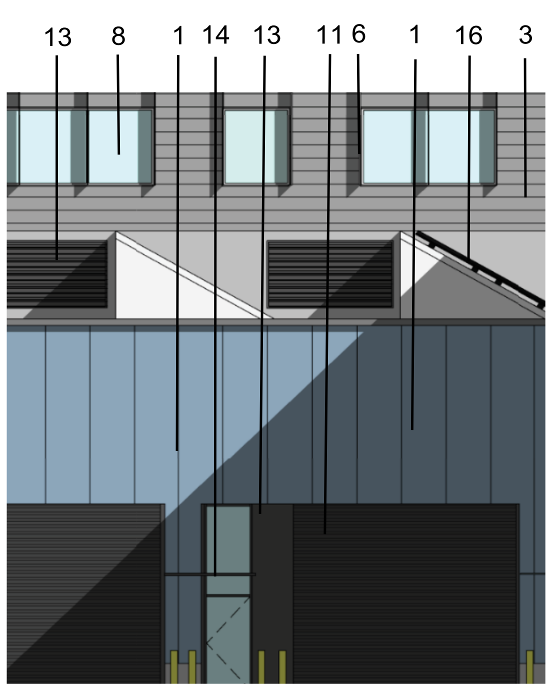
2 PBRF complex partial East Elevation
NTS

Figure 1.46 PBRF Complex Material Board

PBRF COMPLEX

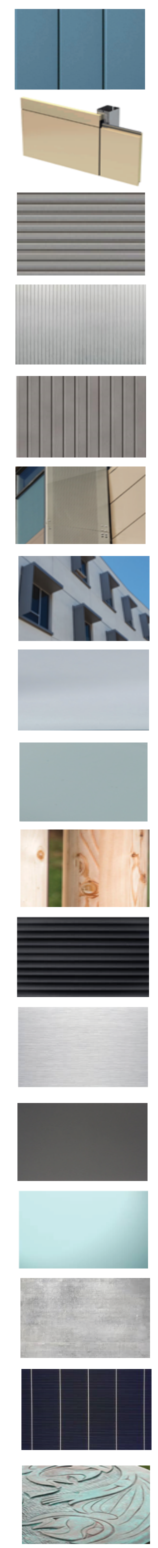


3 Detail View North Elevation
NTS

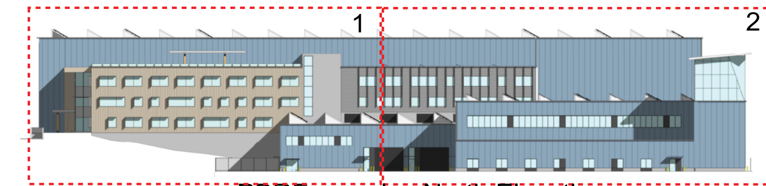


4 Detail View North Elevation
NTS

Materials Legend

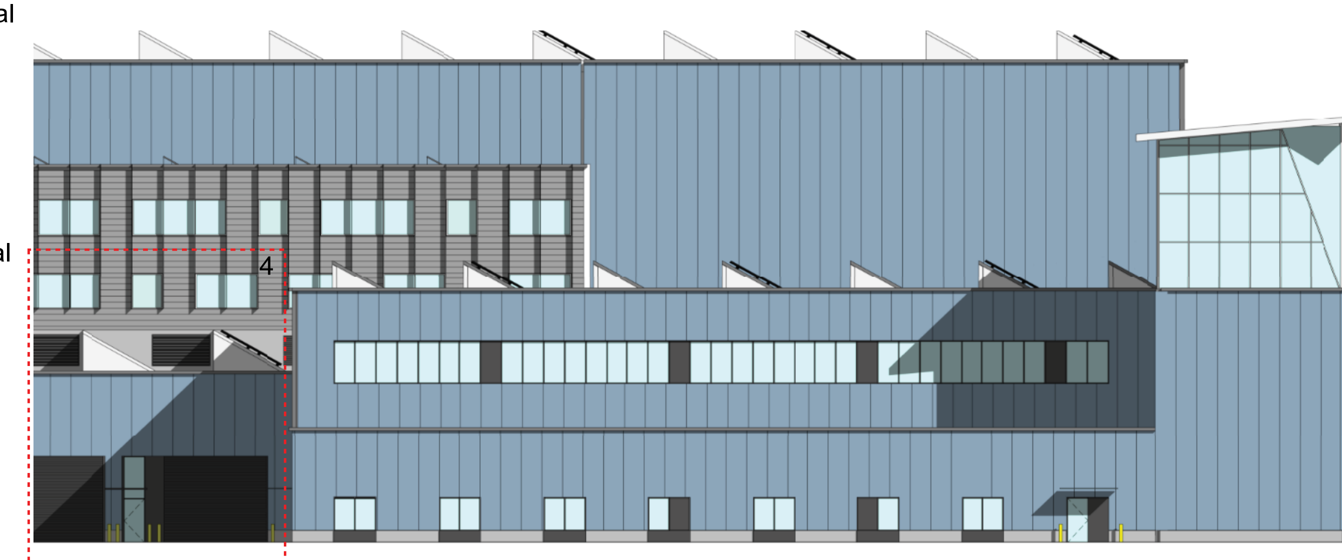


1. Composite metal wall panel system; blue colour
2. Composite metal wall panel system; brick colour
3. Composite metal wall panel system;light gray colour
4. Translucent polycarbonate wall panel system
5. Prefinished standing seam metal roof; grey
6. Aluminum vertical solar shading fins
7. Aluminum L shaped frame solar shading
8. Clear glazing in curtain wall system
9. Spandrel glazing in curtain wall system
10. Glulam column
11. Prefinished corrugated metal overhead door; charcoal
12. Anodized steel guard with wire mesh infill panels
13. Metal wall panel system, flashings,cornice,louvers, mullions,roof trellis; charcoal
14. Clear, tempered glass canopy
15. Architectural concrete; natural
16. Photovoltaic solar panels; black
17. Art display



PBRF complex North Elevation

1 PBRF complex partial North Elevation
NTS



2 PBRF complex partial North Elevation
NTS

Figure 1.47 PBRF Complex Material Board

1.8 PLANNING ASSUMPTIONS & NEXT STEPS

Assumptions made during EGD site planning will need to be further detailed and verified in subsequent design phases.

- With the intent to remain fully operational over the construction period the Phasing Strategies outline the proposed sequencing of projects (not including procurement and design) at EGD to inform the overall PSPC Implementation Plan.
  - Procurement Strategy to influence construction sequencing.
  - Construction sequencing to consider soil and rock staging.
  - Consideration for the new Malplebank Warehouse, non-secure storage area to be utilized as interim project storage during construction, prior to off-site storage accommodated at EGD.
- [Procurement Strategy] The Esquimalt Graving Dock Redevelopment Project is an extensive program of revitalization, expansion and replacement of the existing strategically vital facilities at this historic and culturally important location. By taking a coordinated, comprehensive approach to the project overall, the Government of Canada will be able to optimize procurement opportunities while minimizing community conflict, cost and schedule risk. The highly recommended first step in this process is to convene and overall Procurement Advisory Team (PAT) to help with the specifics of the procurement methods sought to best deliver the projects. The second important step is to prioritize and define the specific phased limits of the individual works that will be required to complete the entire complex paying special attention to those works which will need to be in place to support the commencement of other phases of the overall project. The third step is to look into procurement models that best address the situation of each phased package of works. In the third step the traditional Design-Bid-Build approach may possibly be replaced with a Design-Build approach for projects where performance standards may be clearly defined (i.e. warehouse), or a Unit Price approach where service delivery flexibility may be necessary (i.e. civil services project providing utilities for the entire site) or a Construction Management approach for more sensitive projects (i.e. secure office facility). Under the guidance and coordination of the PAT, opportunities in theses multi-aspect approaches will lead to gains in efficiencies while mitigating and minimizing risks to the Government of Canada and their stakeholders.
- [Industry Liaison] A significant next step will be to reach out to the construction industry to receive feedback on construction means and methods. This input will inform the phasing strategy already developed and provide key information regarding feasibility of some of the strategies that have been assumed in the preparation of the concept plan.
- [Sustainability] The design team recommends utilizing the Envision rating system in the next phases of the project to guide the overall site efforts towards high levels of sustainability for this infrastructure project.
- [Sustainability Rating Systems] Complementing Envision, it is recommended that the individual buildings follow the LEED rating system. The team should investigate the feasibility of setting a minimum target of LEED Gold level. In addition, it is strongly recommended that the Program Support Building also achieves Passive House certification. The Zero Carbon Building standard could be considered as well.
- [GHG Reduction Study] A study should be conducted for the overall site and individual buildings to define the best path to reduce both operational and embodied carbon emissions to meet the federal government targets over the next decades. It is expected that no fossil fuels will be used for building operation.
- [District Energy System (DES)] As part of this GHG Reduction Study it is recommended to conduct a feasibility analysis for the implementation of a low-carbon District Energy System (DES) serving the overall site and individual buildings. Use of renewable energy technologies should be included.
- Additional sustainability strategies addressing water, waste, mobility and fleet vehicles, green procurement, green policies, together with health and wellness should also be explored.
- Develop Mandatory Design Criteria (applied to new builds or renovations) that outlines specific health and wellness / accessibility initiatives and ergonomic principles.
- [First Nations] dialogue and partnership at EGD to further enhance the redevelopment of EGD through the lens of the Esquimalt and Songhees First Nations.
- [Traffic Study] to analyze and determine an optimal traffic flow throughout the EGD site. The traffic study should also seek solutions coordinated with the city of Esquimalt and extend to “offsite” areas such as major intersections at the east and west gates, neighbourhood context and traffic mitigation strategies including traffic volume controlled intersections.
- [Post-Disaster Strategy] confirmation and further development of a business continuity plan as outlined (Section 1.2) including the new Program Support Building, PBRF Complex, along with the North-West Wharf and Ship-lift. There may be challenges to addressing site and building mass from a structural design point. Post-disaster requirements and functions to be reviewed in subsequent planning phase.
- [Waste Water Treatment Capacity Assessment] Considerations for a study to review vessel waste water volumes and treatment plant requirements.
- North-West Wharf Expansion] PSPC is currently investigating the feasibility of extending the ship lift farther into the harbour (Marine Infrastructure Option D) in tandem with providing adjacent vessel berthing complete with a ro-ro ramp and wingwalls. Findings are anticipated to inform subsequent design phases for the north-west wharf extension project.
- [North-West Wharf Expansion] Refine requirements for the ship lift (with control tower) and confirm vendor capabilities. As well as refine requirements for craneage and confirm vendor capabilities.
- [PBRF Complex, North-West Wharf Expansion] Further investigation into phasing of the marine work is necessary to understand what reasonable options exist (including the feasibility for the wharf construction to be phased to enable the PBRF Complex to begin construction while the balance of the north-west landing is being completed) and evaluate the merits of each (i.e. cost, schedule, etc.) As noted in the Master Plan 2020 (outlined by SNC-Lavalin) there is likely a larger cost-benefit issue to be evaluated before making any declarations. It’s very difficult to say whether 15 months is a reasonable time line or not considering that within that time frame a number of activities will take place to get the PBRF Secure Complex portion of the site completed including:
  - Mobilization
  - Material/ equipment supply and fabrication
  - Marine demolition
  - Salvage/ removal of the marina
  - Salvage of habitat offsetting previously completed
  - Environmental remediation (upland contaminants)
  - Archaeological impacts – middens near shoreline
  - Blasting/ dredging (upland and marine)
  - Seabed preparation
  - Construction works
  - Wharf perimeter construction
  - Utilities
  - Fill materials

- Rail preparation/ installation (rail transfer and crane)
- Deck installation
- Another key factor in the schedule will be understanding in-water construction restrictions from the Fisheries Act etc. We may not be able to construct year round, which will obviously impact overall duration.

- [PBRF Complex, Aerial Location Study] Additional surveys to finalize the position for the aerials (i.e. for some of the frequencies like RF a survey is required to establish the optimum location for the aerial).

- [North-West Wharf Expansion] Confirmation of Hull Cleaning to be included at EGD. Currently not accommodated.

- [North-West Wharf Expansion] As noted by SNC-Lavalin, DND has authority (granted by Transport Canada) over the water lots outside of the EGD property boundaries. The Conceptual Plan illustrates a small vessel moored along the north face of the proposed new wharf knowing that gaining acceptance of this practice may not be too onerous.

- [Lot 203] Confirmation of available plannable area: Songhees First Nation Parkade Options A and B on Lot 203 with potential temporary project staging.

- [Site] At this stage the Conceptual Plan at EGD is informed by the existing state. Future activation of the Esquimalt - Nanaimo Railway line may be beneficial for reduced parking demands at EGD. Consideration for a future station may impact the Lockley Parcel 1. The line is a legal active Principal Branch Line, although not in current use.

- [Maplebank Warehouse Intersection] As per PSPC environmental team, this is a challenging location with consideration of:
  - Midden Relocation Area
  - Archaeological Significance
  - Arbutus Trees and Native Plants
  - Stormwater Drainage

As noted by PSPC: *'The area proposed for the roadway is adjacent to an archaeological significant area. There is the potential to find intact archaeological material based on the EGD Archaeological Overview Assessment. There is also a reburial site adjacent to the proposed roadway (marked with a FN wolf carving). It has also been dedicated as a midden relocation area. The space was built as part of one of the first substation projects. The project constructed a lock block wall with stormwater drainage and backfilled with midden material from a number of project excavations. Once full, the area was capped with soil and planted with native plant species. The area is also home to a number of large, mature native Arbutus trees. The "plan" was to extend the lock block wall to increase the space for midden relocation, and protect known intact material along the slope. Disruption of this area is feasible; however,*

- *Communication with the First Nations would be required to inform them of the need to relocate previously disturbed material and potential to impact intact material.*
- *Archaeologists and First Nations Assistants would be required to monitor all excavations and screen material prior to relocation.*
- *A relocation area on EGD property would need to be determined. Space is limited. It is likely an area would need to be improved to contain this amount of material, and future material (e.g. lock block wall and vegetation capping).*
- *Vegetation compensation recommended.*
- *Impact Assessment would be required.'*

- [All Buildings] It is anticipated that future Design Teams will continue to work collaboratively with user groups to define a functional program per project. This phased effort will allow users groups to evaluate proposed accommodations and ideally identify further efficiencies program areas (i.e. shared accommodations, utilization of vertical storage) and key workflows.

- [Program Support Building] Confirmation of tenant workspace accommodated in the industrial zone verses the new Program Support Building.

- [Program Support Building] Consultation with PSPC Pacific Accommodations to review the feasibility of ground level amenity and bookable meeting space strategy verses rentable workspace.

- [Site] Footprint to accommodate a food vendor has been identified with the understanding that a vendor may fit-up and maintain the space whether permanent or mobile in nature.

- [Site] EGD Operations to determine function of key laydown areas across the site, including the two (2) additional vessel staging areas shown in the Conceptual Plan 2021 and Master Plan 2020, compared to the 2018 KPMG Land Use Plan.

- [External Stakeholders] (future consultation consideration)
  - PSPC Marine Sustainment (Ottawa)
  - DND / Esquimalt Harbour Authority
  - Township of Esquimalt
  - View Royal (adjacent community)
  - Capital Regional District (CRD)
  - Greater Victoria Transit Authority
  - E&N Rail Line (Local), Technical Safety BC (Province) is the regulatory body for rails in accordance with Transport Canada.
  - Industry, Science and Economic Development Partners
  - Department of National Defence
  - Additional tenants may include but are not limited to: Thales, Lockheed Martin, Canadian Coast Guard, BC Ferries

- [Threat Risk Assessment] for the overall site and individual buildings.

- [Hazardous Material Assessments] (current and detailed) prior to demolition of buildings.

- [Geotechnical Assessment(s)] for proposed building locations. Note assessments are underway for Lot 203, Maplebank Warehouse and the North-West Sub-Station/Compressor Building.

- [Soil Mitigation Strategy] for Liquefiable Conditions where required.

- [Archeological Overview Assessment (AOA)] for proposed building locations.

- [Environmental (Contaminated Soils, Species At Risk)] further site investigations including for proposed building locations.

- [CCTV Camera Studies] for Sewer and Storm Drains

- [Utility Corridor Study] Finalize the utility corridor layout for the entire EGD site and outline a phased strategy for implementation.

- Design and construction of Utility Duct banks from the NLWSR to the Maplebank Warehouse and EGD Workshops.

- [New West Sub-Station] finalize overall sizing and preliminary design.

- [Site] Undertake flow monitoring for sanitary flows entering the EGD system from tenants and ships, and monitor flows leaving Lift Station 11 to get a better understanding of sanitary volumes entering the downstream connection. This will be required for future modifications to the offsite connection to the Township of Esquimalt sanitary system.

- [Site] undertake a Compressed Air Capacity Study which would measure existing compressed air demand on site and comparing that to EGD air compressor capacity.

- [High Mast Lighting Assessment] for lighting coverage of new Wharf area.

02

SITE & NORTH-WEST LANDING EXPANSION

2.1 MARINE INFRASTRUCTURE

The new property transfer to the north-west enables a significant North-West Wharf Extension with Ship Lift, vessel repair and/or laydown areas with dedicated crane support. This section includes the marine feasibility study, undertaken by SNC Lavalin, assessing the options of the ship lift and transfer actions to evaluate vessels transfer efficiency to and from vessel repair areas including the new PBRF Complex. The study also reviewed the feasibility of expansion to the water lot to increase efficiency and berth capacity.

With the goal to improve utility, flexibility and craneage layout Marine Option C for the north-west wharf extension is shown in the Conceptual Plan 2021, although Marine Option D is also under consideration by the PSPC Project Team at this time.

Three preliminary options for a Ro-Ro capability were also developed. For work on moored vessels, an alternative would be to provide vehicle access directly onto the vessels using a ramp. This is only useful for Roll-On, Roll-Off (Ro-Ro) vessels that already have ramps to allow vehicles aboard. BC Ferries vessels generally require “wingwalls” to lock the bow/stern of the vessel in place for ramp access. The geometry of the wingwalls would need to be customized to suit the intended vessel fleet - believed to be exclusively BC Ferries.

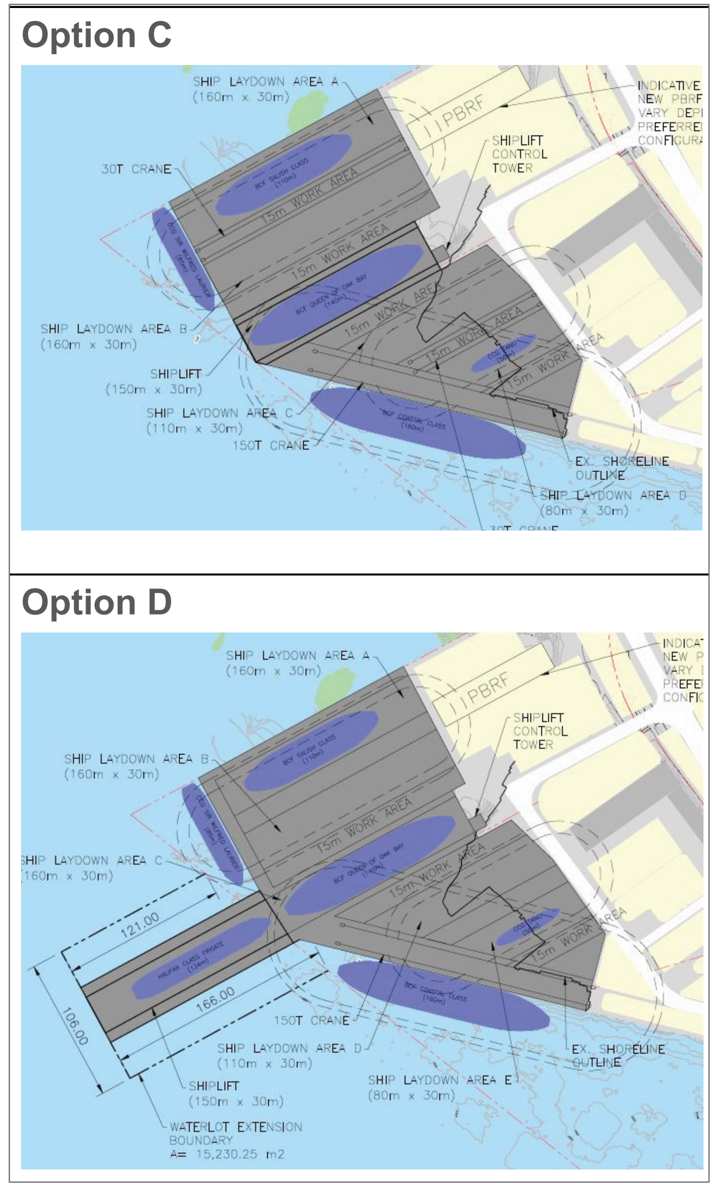
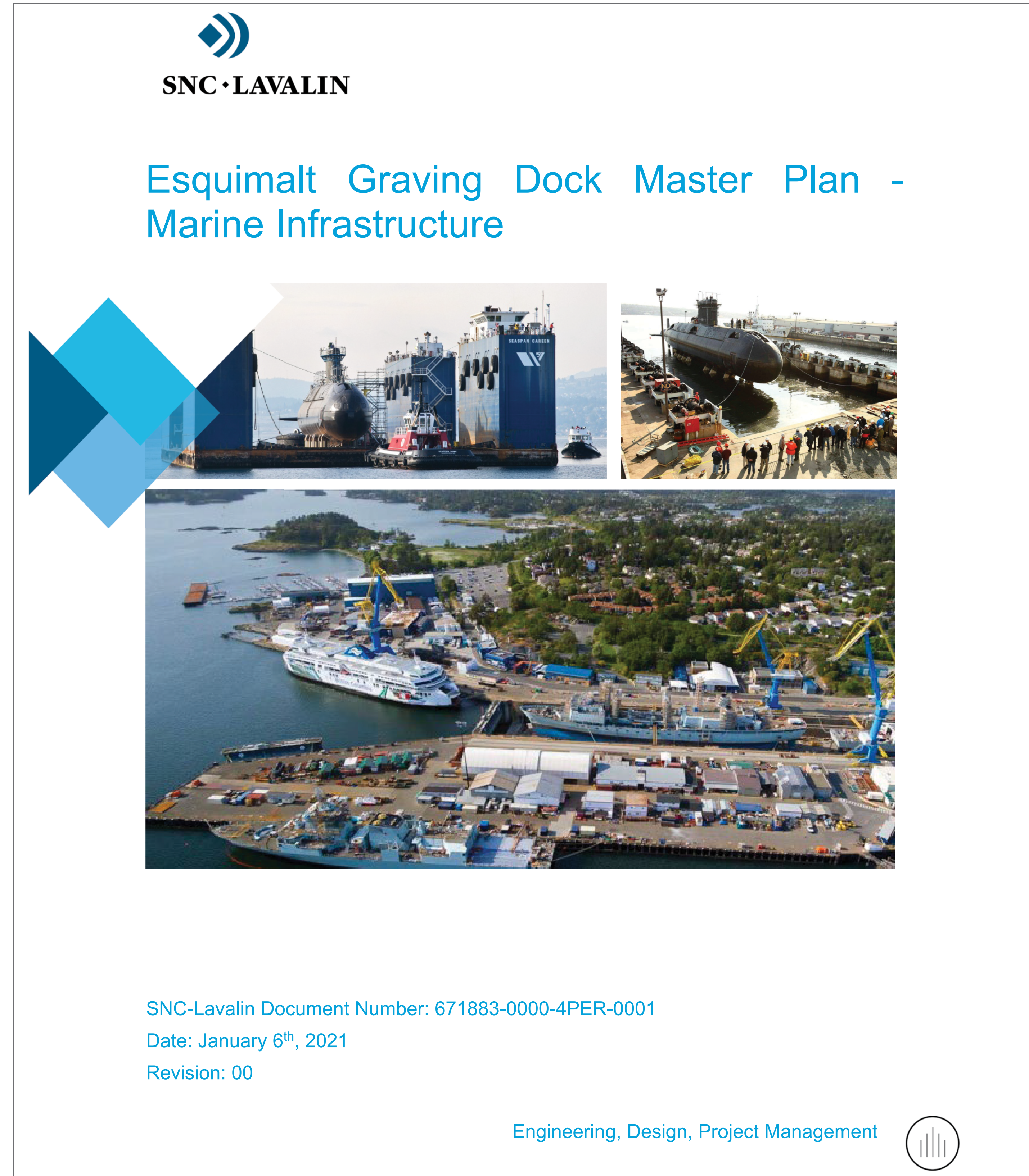


Figure 2.1 Preferred Marine Layouts, prepared by SNC Lavalin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Esquimalt Graving Dock Master Plan - Marine Infrastructure

SNC-Lavalin Document Number: 671883-0000-4PER-0001

Date: January 6th, 2021

Revision: 00

Engineering, Design, Project Management

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EGD West Master Plan - Marine
671883-0000-4PER-0001

 i

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CLIENT: Kasian Architecture Interior Design and Planning Ltd

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List of Abbreviations

AEP	Annual Exceedance Probability
CD	Chart Datum, the vertical datum used for elevations in this study
CSA	Canadian Standards Association
DND	Department of National Defense
EGD	Esquimalt Graving Dock
FCL	Flood Construction Level
HHWLT	Higher High Water Large Tide. The average of the highest high waters, one from each of 19 years of predictions
HHWMT	Higher High Water Mean Tide. The average from all the higher high waters from 19 years of predictions
MSL	Mean Sea Level
LLWLT	Lower Low Water Large Tide. The average of the lowest low waters, one from each of 19 years of predictions.
LLWMT	Lower Low Water Mean Tide. The average of all the lower low waters from 19 years of predictions.
LOA	Length Over All, the total vessel length.
NLW	North Landing Wharf
PBRF	Purpose-Built Refit Facility, the building to be used for submarine maintenance
PSPC	Public Services and Procurement Canada
Ro-Ro	Roll-On, Roll-Off
SLR	Sea Level Rise
SNCL	SNC-Lavalin
SPMT	Self Propelled Modular Transporters
UKC	Under-Keel Clearance

1 Introduction and Background

The Esquimalt Graving Dock (EGD) and related facilities are owned and operated by Public Services and Procurement Canada (PSPC). SNC-Lavalin understands that the EGD West lands require expansion and modernization to meet increasing demands for ship repair and maintenance. The existing graving dock, wharves and equipment are currently operating at, or near, capacity and it is forecast that demand will exceed capacity within the next five years. To meet the future demand, PSPC wishes to expand its out-of-water and in-water capacity and increase laydown area to support vessel maintenance and repairs.

SNC-Lavalin (SNCL) are providing advice on marine infrastructure development at EGD to Kasian Architecture Interior Design and Planning (Kasian), who are supporting development of the project masterplan. This Memo should be read in conjunction with the previous SNCL Memo 671883-0000-30CC-

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0004 describing proposed marine infrastructure and ship transfer systems and identifying expansion options. SNCL have been requested to further develop this assessment to:

- Investigate opportunities to expand the existing waterlot and marine infrastructure;
- Investigate vessel movements to/ from the ship lift and yard;
- Refine the layout of the yard to improve utility, flexibility and craneage layout.

Following commencement, further discussions have highlighted the need to consider:

- Use of a floating drydock to raise vessels out of the water and onto the hard -standing areas;
- Use of a pontoon for access to Roll-on, Roll-off vessels.

1.1 Objective

The objective of this memorandum is to expand the previous marine infrastructure options considered to include the aspects listed above, in order to identify the preferred marine infrastructure expansion option.

1.2 Scope

This memorandum deals exclusively with the marine infrastructure, all uplands development aspects are covered by Kasian. The scope of marine infrastructure development is limited to new infrastructure located at Munroe Head and the current Canadian Forces Sailing Association Marina (refer Figure 1).

The existing graving dock and south jetty are not part of the marine infrastructure scope considered, however the vessel service capacity of these facilities is included when considering the overall capacity of the developed site. Refer to the previous SNCL Memo for a description of existing conditions.

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Figure 1 - EGD Site Plan

2 Facility requirements

The marine infrastructure development concepts previously prepared in Memo 671883-0000-30CC-0004 were based upon the following requirements provided by PSPC:

- Proposed expansion and moored vessels must be contained within the water lots;
- Extend the north landing wharf to maximum practical extent;
- Provide a ship lift capable of accommodating proposed design vessels;
- Minimum water depth of -10m CD at wharf face;
- Raise the proposed new wharf by approximately 1m for sea level rise (SLR) and climate change;
- Wharf and ship lift to be post-disaster standard or equivalent;
- Wharf working area should be flexible to use for vessel, equipment or material laydown;
- Craneage services similar to existing services;
- Preference for utilities to be enclosed and accessible from the deck surface.

The majority of these requirements remain applicable, with the following exceptions and additions compiled from conversations with PSPC:

- Marine infrastructure may extend beyond the current water lot boundary. PSPC would like to maximise the utility of the site, however the effects on the Department of National Defense (DND) and adjacent water users must be considered.

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› The site currently services one submarine at a time in the Purpose-Built Refit Facility (PBRF) building. However, in future, it is expected that the facility will need to accommodate two submarines being serviced at the same time. The PBRF can house one submarine while the other can use either hard-standing areas or the drydock. An average of 1.6 submarines are expected to be present at the facility.

2.1 Design Standard

The requirement for infrastructure to be immediately serviceable post-disaster is noteworthy as this is likely to have cost implications. As Canada does not have a specific design standard for marine infrastructure, the governing standard for this infrastructure will be CAN/CSA S6-14, the Canadian Highway Bridge Design Code. The most relevant design event is the seismic criteria. This standard considers four different importance categories: Low, Normal, High, and Post-Disaster. "Post-Disaster" structures are expected to sustain only minor damage during the design 1 in 2,475-year event. In this category, steel structures cannot yield and foundations are limited to minor movement.

This differs substantially from a "Normal" structure where the governing criteria is to preserve life safety, not to remain serviceable. While a Normal structure must remain standing after the design event, extensive yielding and deflection is permitted. The "Post-Disaster" design requirement can be expected to result in significantly more robust structures than would otherwise be required, and there will be a corresponding increase in capital cost.

3 Assessment Criteria and Inputs

3.1 Design Life

It is understood that the intent is to confirm marine infrastructure for the master plan which aims to ensure the site has adequate capacity, and is efficient, for the long-term future. Marine infrastructure of this scale is typically designed for a minimum of 50 years. It is assumed that any new infrastructure would have a design life of 50 years, and the consideration period for the expansion is the next 25-50 years.

3.2 Tidal Levels

Design water levels for the site are as per Table 1. Design has included a 0.5m allowance for Sea Level Rise.

Table 1 - Design Water Levels

Water Level	Esquimalt Harbour [m CD]	With 0.5m SLR [m CD]
Highest recorded	+3.8	+4.3
HHWLT	+3.0	+3.5
HHWMT	+2.5	+3.0
MSL	+1.9	+2.4
LLWMT	+0.8	+1.3
LLWLT	-0.1	+0.4
Lowest recorded	-0.5	0

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3.3 Design Vessels

Table 2 identifies the design vessels that has been considered for the assessment.

Table 2 - Design Vessels for Marine Expansion Infrastructure

Vessel	Owner	LOA [m]	Beam [m]	Lightship Draught [m]	Lightship Displacement [t]	Notes
Halifax-Class	Canada (Navy)	134.1	16.4	4.9	3995	
Kingston-Class	Canada (Navy)	55.3	11.3	3.4	970*	
Victoria-Class (sub)	Canada (Navy)	70.26	7.2	7.0*	2000*	
MV Asterix	Canada (Navy)	182.5	25.2	7	N/A	
Harry Dewolf-Class	Canada (Navy)	103.6	19	5.7	5220*	Early 2020's
Protecteur-Class	Canada (Navy)	173.7	~24	~7.6	18,000*	Mid 2020's
Canada Surface Combatant / Type 26	Canada (Navy)	145-150	19-20	~5-5.2	5200*	Late 2020's
Collins-Class (sub)	Australia (Navy)	77.4	7.8	7	3100*	Existing
Attack-Class (sub)	Australia (Navy)	97	8.8	N/A	4500*	Early 2030's
I-16 (sub)	Japan (Navy)	109.3	9.1	5.3	2590*	
Barracuda-Class (sub)	France (Navy)	99.5	8.8	**7.3**	4760*	
Walrus-Class (sub)	Netherlands (Navy)	67.7	8.4	6.6	2350*	
Sir Wilfred Laurier	Canada (DFO)	83	16.2	6	4737*	
Sir Wilfred Grenfell	Canada (DFO)	68.5	15	5.4	3813*	
John P. Tully	Canada (DFO)	67.9	14	4.5	1800*	
Sir John Franklin	Canada (DFO)	63.4	16	6.2	3212*	
Bartlett	Canada (DFO)	57.7	13	4.1	1620*	
Tanu	Canada (DFO)	52.1	9.9	3.5	940*	
Gordon Reid	Canada (DFO)	50	11	5.4	N/A	
Hero-Class	Canada (DFO)	42.8	7	2.8	N/A	
Vector	Canada (DFO)	39.7	9.5	3.5	N/A	
Spirit (S) Class	BCF	167.5	27.1	4.2	9,021	
Coastal Class	BCF	**160**	**28.2**	4.91	**7993**	
Queen of Oak Bay	BCF	139.3	27.6	4.93	5100	
Salish Class	BCF	107.2	24	4.65	3576	
Northern Expedition	BCF	154.7	23.9	4.02	7586	
Island Class	BCF	80.8	17	3.2	N/A	
Queen of Capilano	BCF	96	21.2	4.6	2141	
Malaspina Sky	BCF	102.4	26.5	4.1	2494	Prev. "Island Sky"
Skeena Queen	BCF	110	24	3.41	1953	
Disney Wonder	Foreign	294	32	7.7		

* lightship displacement unconfirmed
Larger vessels not planned to use the shiplift shown grey
Governing maximum values for shiplift are **highlighted**

3.4 New Wharf Deck Level

The intent is to ensure that the infrastructure installed is adequately protected from coastal flooding for the anticipated design life of the site (which may be longer than the 50 years considered for individual infrastructure elements). Provincial guidance requires dwellings and places where people work to be constructed above a Flood Construction Level (FCL). As this site is owned by the Government of Canada, provincial and municipal planning requirements will not govern, however the standard of protection required is expected to remain similar. The current guidance for BC recommends that the FCL for a site be derived by considering a water level with an Annual Exceedance Probability (AEP) of 1:500, in combination with wave effects from an AEP event of 1:200 to 1:500. The FCL then also includes a freeboard allowance, climate change allowance, plus any expected subsidence. The overall resulting joint probability of the FCL is typically between 1:1000 and 1:10,000.

The FCL for the site should be established by a future, more detailed assessment. For the purposes of assessing conceptual expansion options, the deck level for the proposed expanded wharf area has been taken to be +5.8m CD.

3.5 Vessel Distribution

As the vessel maintenance slots being considered are proposed to be 30m wide, the key parameter for determining how many vessels can be serviced is Length Over All (LOA). The recorded list of vessels calling during 2013-2017 has been plotted in Figure 2. As can be seen from the graph, the majority of vessels (89%) calling at the site during this period had LOA less than 150m, which is the proposed length for a shiplift. The recorded vessel information also shows that there is a relatively large fraction made up by smaller vessels. Approximately 1/3 are less than 75m long and 57% are less than 100m.

The vessels over 150m long were limited to two types:

- BC Ferries vessels – Coastal Class (LOA = 160m), and Spirit Class (LOA = 168m)
- Cruise vessels – Up to LOA = 294m.

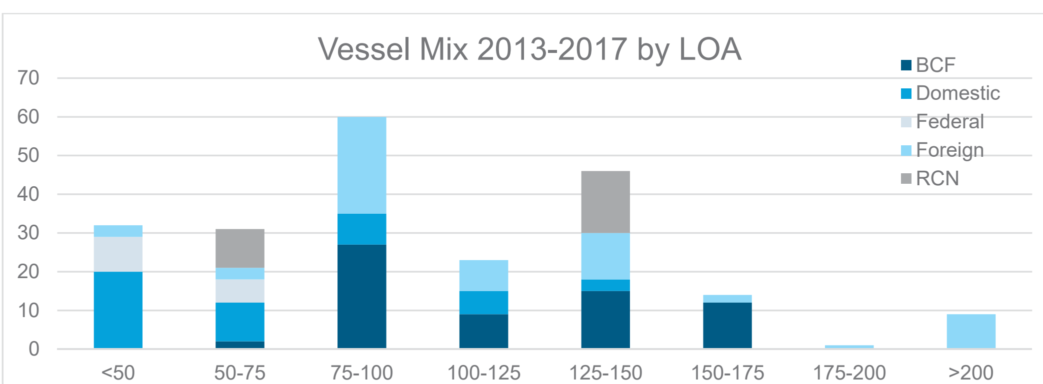

Figure 2 - Vessel Mix 2013-2017 by LOA

3.6 Vessel Movement Frequency

The various methods of elevating and moving vessels will have different lead times and constraints. A relevant consideration is the frequency of vessel moves to be accommodated. Figure 3 shows a record of vessels calling from 2013-2017. The record data shows that there have historically been graving dock moves on average every three weeks, and moored vessels moving every two weeks.

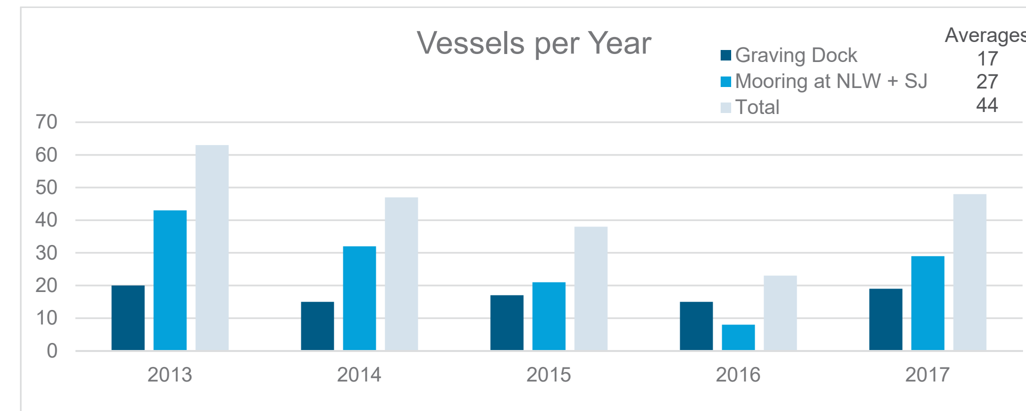

Figure 3 - Record of Vessels Calling 2013-2017

From discussions with PSPC it is understood that, if a ship-lift were installed at the site, there may be additional business from vessels requiring hull cleaning. These vessels would be taken out of the water for only 24-48 hours.

From the recorded vessel movements, and the potential for hull cleaning in future, it is believed that the expanded site would need to accommodate movements of dry and moored vessels as frequently as weekly in the future. For the purposes of conceptual assessment, it is assumed that the shiplift would be used approximately weekly.

3.7 Assessment Criteria

The following criteria have been used to develop and assess the marine infrastructure

- Safe vessel navigation into and out of the graving dock needs to be preserved;
- The intent is to maximise the space available with as much vessel working space as possible, and the areas provided should be as versatile as possible;
- Dry work space immediately adjacent to the shiplift is most versatile, those behind one or two other work spaces become less convenient/ efficient the further they are from tidal access;
- Mooring space alongside the wharf is also useful for vessel work. Mooring space with heavy crane access alongside is most useful, while mooring space with impeded access is less useful;

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- Consideration is given to how the development may be staged, in the event that not all the infrastructure is constructed from the outset. Staging would allow extra capacity to be added incrementally in future as required;
- Constraints and obstructions and additional procedures for vessel movement should be minimised. This includes aspects such as: tidal limitations, offsite activities, additional plan movements and rotations for vessels on hard-standing, rails in the deck obstructing vessel movement, etc.;
- The vessel movement system is planned to be owned and managed by the Government of Canada, without reliance on third parties;
- This phase of the study focuses on maximising functionality. Cost/functionality trade-offs are not part of the scope and are assumed to occur in a subsequent project stage.

4 Ship movement systems

For the expanded site to function as intended, vessels need to be raised out of the water, and positioned on the hard-standing area created by the expansion of the North Landing Wharf. The options for raising vessels out of the water, and then for transferring them horizontally around the site are discussed separately in the following sections.

4.1 Vessel Lifting

There are a number of possible ways the ships can be raised out of the water. Those discussed here are only those considered potentially feasible for the site. Slipways and ramps have not been considered due to the space requirements for these options.

4.1.1 Shiplift

Shiplifts use numerous winches along each side of a steel platform to raise vessels to deck level. A shiplift has long been discussed at EGD as it is believed to be the most efficient method of routinely raising the vessels onto the deck. The vessel cradles are positioned on the platform which is then lowered underwater to the lowest position. The vessel then manoeuvres into the shiplift and the platform is raised. Bogies or SPMT's can then be used to jack up the cradles and move the vessel out onto the deck.

For the purposes of the conceptual assessment, the shiplift is assumed to have the following design parameters (same as previous SNCL Memo 671883-0000-30CC-0004):

- 150m long x 30m wide platform;
- 9,000 tonne capacity;
- Hoists along both sides of the platform;
- Modular vessel cradles;
- Power unit, control system and cooling system;
- Control building.

The size of vessels that can be accommodated by this shiplift, have the following properties:

- Lightship (i.e. without load aboard) displacement of the vessel would need to be less than 9,000 tonnes minus the weight of cradles and transfer system elements.

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- The vessel beam needs to be less than 30m minus a clearance allowance each side, estimated to be approximately 28m maximum beam.
- The vessel length can be longer than the platform length, provided the keel can rest on the shiplift platform (i.e. the bow can cantilever seaward). It is estimated that the proposed shiplift could generally handle vessels less than approximately 165m.

For comparison, the BAE Systems shiplift at Henderson, Australia (Figure 4) has a capacity of 8,065 tonnes, platform length ~122m, width ~25m. This facility is stated to cater for vessels up to 140m long, 23m beam.

Figure 4 - HMAS Stuart at BAE Systems Henderson Facility, 8,065t Capacity (note tight winch spacing)

With the proposed design parameters, it is believed that the maximum design vessel from Table 2 that the shiplift could accommodate is the BC Ferries Coastal Class ferries. These vessels have beam 28.2m, lightship displacement 7,993t and length from landward vessel tip to the seaward extent of flat keel is approximately 140m.

The depth required for the shiplift involves considering:

- Lowest operable tide level;
- Maximum design vessel draft;
- Underkeel clearance;
- Cradle depth;
- Platform structural depth;

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- Clearance to bed;
- Bed level required under shiplift.

If the shiplift is required to be operable at all states of the tide, the depth required is significant and will require a dredge pocket. As dredging rock will be a major cost item, locating the shiplift in deeper water where less dredging is required, and the likely extent of rock dredging is reduced, may have cost advantages.

As with other equipment, there are a number of potential suppliers for the Shiplift. The system shown in Figure 4 uses a cable winch system, however there are also chain lift systems available as shown in Figure 5. The advantage of the chain systems is that chains are less vulnerable to corrosion and can also be "locked off" so that there is no reliance on a winch brake. Supplier advice is that the plan area for the winches/jacks is less for chains than a cable system, allowing more room for a potential lateral transfer system in between, but this has not been confirmed.

Figure 5 - A chain shiplift system

The primary advantages of the shiplift systems is that they allow quick and efficient raising of vessels. The mechanical equipment required is extensive, but relatively simple with only up and down movement. If the facility is installed with sufficient depth, there are no operational limitations from tides or weather. All necessary operations are relatively low-risk.

4.1.2 Floating drydock

A floating drydock (the Seaspan Careen) has been used to transfer submarines onto the wharf at EGD in the past, and has been considered as a possible method for raising vessels in the expanded case. Floating drydocks are U-shaped vessels (in section) which can lower themselves into the water to allow a vessel to manoeuvre between the outer walls before they are floated again (see example in Figure 6).

The floating drydock is raised and lowered by means of pumps that fill the hull with water, and there are many floating drydocks which can raise and lower in this manner. Floating drydocks which allow loads to roll on and off require additional functionality; their hull must be compartmentalised, and each compartment has its own pumping capacity. This allows the floating drydock to be dynamically ballasted, adjusting each compartment separately as the load moves along the deck, to ensure it stays stable and level. For this type of operation, the pump capacity of the drydock must be able to pump quickly enough to keep up with the load movements along the vessel, as well as the global level changes from tides.

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Figure 6 - Floating Drydock (Seaspan Careen) with BC Ferries C-Class Ferry Aboard

As the floating drydock requires a lot of floatation, the hull depth (from top of deck to the flat underside) is relatively deep, believed to be 7.3m for the Seaspan Careen. This means that relatively deep water is required to load vessels.

From discussions with those familiar with previous floating drydock operations at EGD, it is understood that the process is as follows:

- Vessel load onto floating drydock:
  - Tow drydock to the nearest sheltered deep water; understood to be ~15m CD required. Drydock cannot be moored alongside, needs to be held off the berth in between piers at Ogden Point using tugs.
  - Select high tide window and manoeuvre vessel/submarine onboard. Float the drydock again.
  - "Dead ship" tow back to Esquimalt Harbour.
- Vessel offloaded to shore
  - Select high tide window and pump out drydock to get deck to match wharf level. Offloading onto shore is generally planned for a dropping tide so that the raising effect when load is taken off the drydock is counteracted by the tide.
  - Vessel is rolled off using SPMT's, pumps compensate to keep the barge level and at the correct elevation.

While this operation is not uncommon, it is not typically done on a weekly or monthly basis. There is extensive planning required and multiple parties involved. There are also two operations which are tidally dependent, and involve the vessel slowly moving through a higher-risk exposure condition where it is half-on and half-off the barge. A failure or unexpected event during these periods could lead to significant consequences for both vessels and safety or personnel. There is a high degree of reliance on the pump systems to keep up with vessel movements and tidal constraints. It is understood that the dead-ship-tow condition also has risks, both from weather exposure while navigating back into the harbour, and from the shared responsibility amongst multiple parties. The expertise required for this series of operations is believed to be quite specialised and is likely to need to be contracted out.

When not in use, the floating drydock would need to be moored somewhere at the site. Mooring could either be alongside the wharf using bollards as any other vessel would, or if mooring dolphins are installed, could be orientated perpendicular to the wharf to occupy a similar footprint to the floating drydock shown in the sketch of Option F (Appendix A). In both of these configurations, the floating drydock would occupy wharf mooring space which could not then be used by vessels.

4.1.2.1 Assessment of Floating Drydock Tidal Constraints

The load on and off operations have been considered for a range of design vessel to assess how tidally limited they are likely to be. Assessment was undertaken considering a range of design vessel, being handled by either the Seaspan Careen, or an "off-the-shelf" floating drydock from Damen (Load Out Recovery Barge 13000). Assumptions include:

- Loading vessels on takes place at Ogden Point where bed depth is -15m CD;
- Allowances for 1m vessel under-keel clearance (UKC), 1m blocking and 0.75m drydock UKC;
- Sea Level Rise is ignored, the assessment is for present-day conditions only;
- New deck level at NLW will be +5.8m CD.

The results of the assessment are shown in Figure 7.

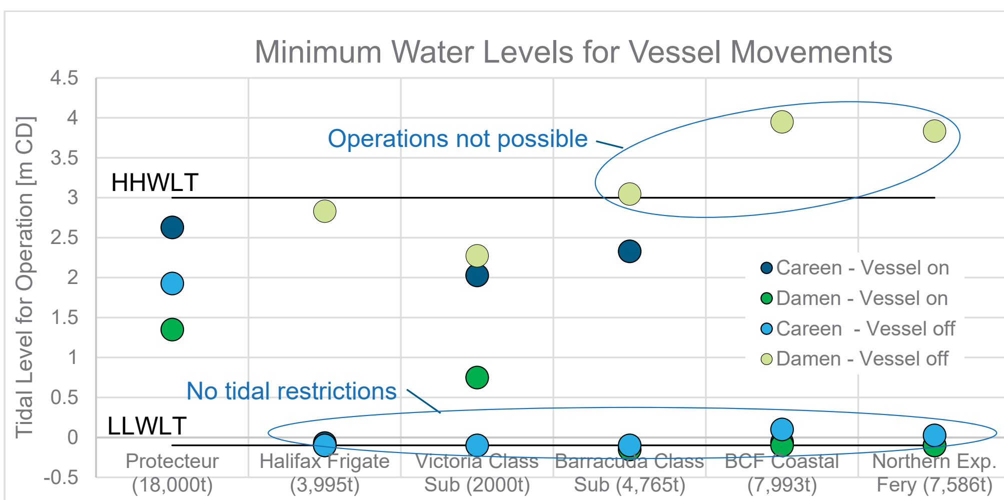


Figure 7 - Degree of Tidal Constraint for Floating Drydock Vessel Movement Operations

Key conclusions from the assessment are:

- While the plan dimensions of the two drydocks are quite similar, the Careen is deeper and has more than twice the stated lifting capacity of the Damen Recovery Barge;

- Due to the extra depth, the Careen is quite tidally constrained for loading vessels aboard, even with bed depth of 15m CD. However, the Careen can generally offload any of the vessels likely to be lifted in all tidal conditions;
- The Damen load out barge is less constrained for loading vessels aboard, but significantly more constrained for rolling them onto the wharf. It would not be possible to load a number of the heavier design vessels off using this barge as the deck does not sit high enough under any operational tide conditions;
- It is not feasible to load the design vessels aboard a drydock in Esquimalt Harbour where depths are limited to -12m CD;
- It is not feasible to avoid all tidal constraints for the design vessel range with a custom-designed floating drydock.

It is understood that PSPC intends for the facility provided at EGD to be owned by the Government of Canada and not reliant on any third parties. This would require PSPC to purchase a new (or used) floating drydock for this purpose.

Due to the considerations above, use of a floating drydock is considered a feasible method of moving vessels onto the wharf in the short term or for infrequent events. However, a floating drydock is considered impractical and excessively risky for the expected ultimate usage frequency where vessels may be lifted on a weekly basis.

4.1.3 Floating Drydock/ Barge with Loading Pad

A variation of the floating drydock option discussed above would be to construct a submerged rock platform for the barge to sit on when vessels are rolled on and off. This would allow the barge to be of simpler design (multiple hull chambers and roll-off functionality would not be required). It also eliminates the highest risk operation, when the vessel is half on, half off and could theoretically be left hung on the edge if tide level dropped. While there is less risk, this type of operation would still be tidally dependent for moving the vessel onto shore as the drydock would only be floated onto the platform at higher water levels.

This alternative is considered feasible, and lower risk that the fully-floating alternative. However, the risks associated with vessels boarding the floating drydock remotely remain, as do those regarding multiple specialist activities for each vessel moved. This type of operation could be used in the short term but is unlikely to be efficient enough to support weekly vessel lifts.

4.1.4 Submersible Barge

Another alternative involving a submersible vessel involves using a submersible barge. This type of barge is rectangular and does not have the two hulls either side like a floating drydock. It would not be compartmentalised for roll-on, roll-off operation but can be flooded to sit on the bottom. The method of operation would be:

- Put the barge in the existing graving dock and sink it to the bottom;
- Float the vessel in over the barge;
- Drain the drydock so that the vessel rests on the barge in the dry condition;
- Pump the barge out and flood the drydock again so that the vessel is aboard the floating barge.

In this manner, the existing graving dock is used as a method of loading vessels aboard barges. The barges would then be towed alongside the wharf where they could be worked on. The operation is expected to use approximately three days of drydock time for each vessel loaded and unloaded. The primary advantage of this scheme is that new infrastructure/ equipment is limited to purchase of the submersible barge(s). This would be a quick way to increase the number of vessels that can be worked on in the dry.

However, drawbacks of this approach are:

- The graving dock outer section would be taken out of service for the operation.
- The outer Section is ~122m in length, meaning the maximum vessel that could be lifted with this method would be ~115m LOA. From available records, about 1/3 of the vessels calling could not be handled in this manner.
- Vessels moored on barges are not as accessible as those on hard-standing.
- A submersible barge of the necessary dimensions may not be significantly less costly than a floating drydock but is less versatile. Without the chambers each side of a floating drydock, the system relies on the graving dock for stability when floating and sinking.

This approach is considered feasible as a way of lifting vessels but is not as efficient or operationally advantageous as a shiplift. The limitation to only handling smaller vessels is also believed to be unlikely to be preferred as the facility will remain reliant on the graving dock for a large fraction of the vessels calling.

4.1.5 Preferred Vessel Lifting System

Of the options considered, a shiplift is the only method considered to be adequately safe and efficient for frequent (approximately weekly) operation.

4.2 Transfer System

While there are a number of different technologies and equipment choices for moving vessels, at the highest level there is a decision of whether to build fixed rails into the site, or to use a movement system with tires such as SPMTs. These two alternatives are discussed below.

4.2.1 Rail system

Many shipyards around the world have traditionally been built with rail systems. Rails are cast into the deck and can be arrange in an orthogonal pattern to allow movement in two directions. The load moves on "bogies" which are groups of four rail wheels rigidly connected to each other but which may be rotationally released from the structure/body above (see Figure 8). The simplest version of a rail vessel transportation system would use non-driven rail bogies supporting the vessel sitting on a rigid steel frame. The vessel would then be towed using an external tractor. This type of system has a number of limitations:

- As the bogies are not self-driving, the tractor size becomes unfeasible for large vessels,
- As the entire system is rigid, there is no ability to spread loads or compensate for differences in verticality as the vessel moves. This increases the potential for concentrated loads to the vessel, bogies and supporting structures.

These limitations mean that the simplest rail system is only be suitable for smaller vessels, below the size range considered for this site (typically <5,000 tonnes).

For EGD, it is believed that a rail system would need to use hydraulically-driven modular bogies. Each of the bogies is connected by hydraulic lines and communication cables so that movements are synchronised

and load concentrations are compensated. When the bogies reach a junction in the rail grid, they can set the load down, raise and rotate onto the new alignment, and then raise the load again to move on the new alignment.

One of the central advantages identified of a rail system is that they can be implemented with shiplifts that move vessels transversely out of the lift (rather than longitudinally). For this operation, the bogies need to pass the winches, meaning the connecting structures for hydraulics and controls are arched over the winches (shown in Figure 8). While moving a ship laterally from the shiplift is possible in this manner, it restricts the bogie locations to being only between the winches. This will be a constraint for some vessels where support at tighter spacings would be preferable. This will be more of an issue for vessels with very uneven weight distribution or constraints on where hull support can be provided – a number of the submarine types considered are believed to fit this description.

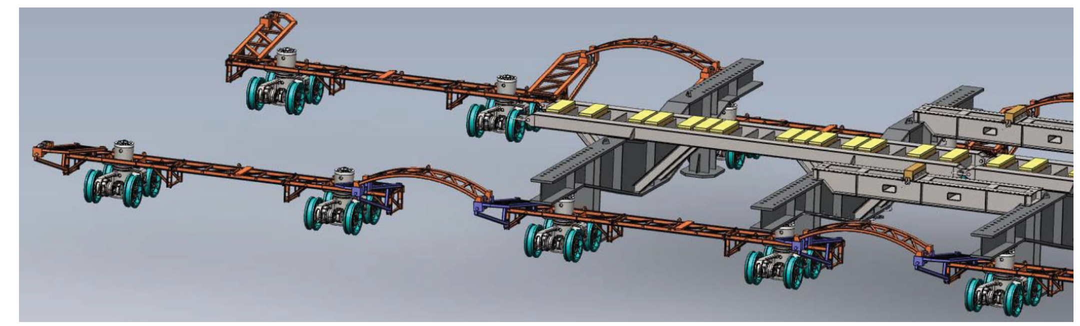


Figure 8 - Hydraulically Driven Modular Rail Bogies

While the bogies are self driven, the rail system would still need to be relatively flat. Rail bogies cannot drive up inclines as steep as tire systems. This is not expected to be a limitation as the current NLW level is approximately 1m below the existing PBRF building, but the proposal is to raise the new wharf to a level of +5.8m CD which can be level with the new buildings and operational areas behind the wharf extension.

The site layout options considered involve hard-standing maintenance berths alongside each other. With this layout, there is a consideration of how the rail bogies that end up on the landward side can be moved back to the shiplift to be used for other vessels. In this situation, the bogies can be decoupled (both structural connections and hydraulic lines) and forklifted back to the other side of the vessel.

4.2.2 Tire Movements Systems

Self Propelled Modular Transporters (SPMT's) are a transport method which uses a number of modular units with pneumatic tires, connected together in whatever configuration is required by the load. Units are driven by a hydraulic power pack that can drive up to 40 "lines" where a line is a pair of axles side-by-side. The modules do not need to be directly connected in a train or be powered by the same hydraulic power pack in order to be synchronised, but all need to be connected by controls and a 4" diameter hydraulic hose to balance hydraulic pressure. The lift height for SPMT's is about 1.2m, which is slightly higher than a rail-mounted bogie system. Figure 9 shows SMPT's in use (in a train configuration) and Figure 10 shows typical dimensions.

Figure 9 - Trains of SPMT's Moving a Vessel to a Shiplift in Henderson, Australia

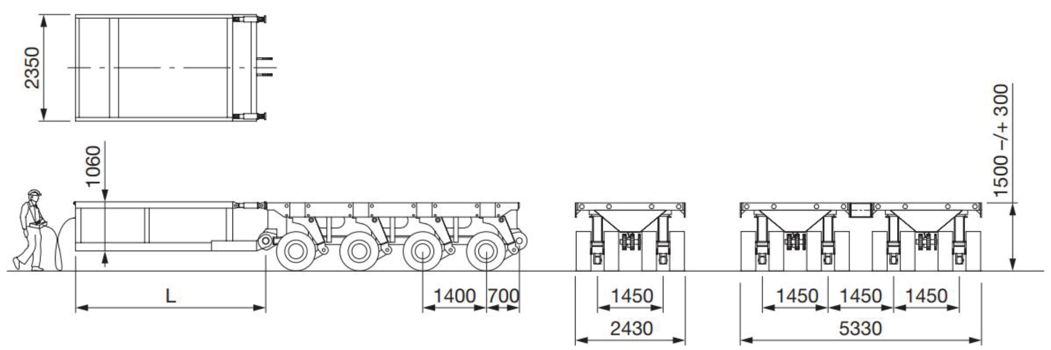


Figure 10 – An SPMT Unit with Hydraulic Power Pack

SPMT's can rotate their wheels in all directions on the spot making movement in all plan directions possible. They can also be programmed to "carousel" the vessels to change their orientation. Tire driven units have more tolerance for driving up slopes than rail systems and can also accommodate transitions.

There are a number of different suppliers for these types of transporters. The units themselves, and their control software, is not inter-operable meaning the entire fleet of units used would need to be the same make. Movements need to be planned and designed in advance, requiring some specialist expertise on site. It is understood that there was a number of SPMT's based at EGD in the past, however they were not used frequently enough to retain the necessary expertise for designing the lifts, so vessel movements were often contracted out to third parties. From the vessel movement frequency assessment in Section 3.6, it is believed that vessel movements will be frequent enough to warrant a continuous presence of specialist staff to operate the shiplift and transfer system.

4.2.3 Preferred Transfer System

The following considerations are relevant in considering the preferred transfer system:

- Transfer systems that need to move the vessel transversely out of the shiplift are expected to have more constraints than those that only require the vessel to exit longitudinally. This is because the transfer system, and the ship support frame, can only be located at particular spacings to avoid clashing with winches;
- The facility is expected to continue to accommodate a wide variety of vessel types. Tire systems give greater flexibility to accommodate different vessels and activities e.g. if a number of smaller vessels are being served at the same time, they could be positioned tighter than the typical 30m bay allowance;
- All options being considered include an irregular, semi-triangular hard-standing area. An orthogonal grid required for a rail system will not allow the space to be used as efficiently as a tire transport system could;
- A grid of rails limits movement to two directions, while the SMPT's can pivot and drive any direction. This is expected to result in more situations where vessels landward of others can be manoeuvred back to the shiplift that would otherwise remain land-locked with a rail system;
- Implementing an efficient fixed rail system would require selecting a design vessel mix and trying to optimise the rail arrangement for this fleet. This may unfairly prioritise or disadvantage particular customer groups now, or customer groups in the future if the vessel mix changes. Use of tire transport system allows for equal priority to be given to all current and potential future customers;
- In some instances (like container cranes) large loads can be concentrated on a rail beam, and the rest of the deck can be designed for a lighter load. This is not expected to apply in this instance due to the potential for vessels to be set down almost anywhere on the hard-standing area. Therefore, the required load capacity of the wharf is not believed to be a differentiating factor between the rail and tire options. Both options require reclamation rather than a piled deck;
- A rail system of the type required, would not necessarily be any simpler or have less maintenance. Synchronised and hydraulically driven bogies have many of the same maintenance aspects as SPMT's would;

Overall, a tire transport system using SPMT's or similar vehicles is believed to be strongly preferred due to the increased flexibility offered. However, if the configuration requires vessels to enter and exit the shiplift transversely, a rail system may be necessary for ease of operation.

4.3 Ro-Ro Access

For work on moored vessels, an alternative would be to provide vehicle access directly onto the vessels using a ramp. This is only useful for Roll-On, Roll-Off (Ro-Ro) vessels that already have ramps to allow vehicles aboard. BC Ferries vessels generally require "wingwalls" to lock the bow/stern of the vessel in place for ramp access. The geometry of the wingwalls would need to be customised to suit the intended vessel fleet - believed to be exclusively BC Ferries. Foreign Ro-Ro vessels (like car carriers) would be infrequent and also have diagonal stern ramps for side-loading, which would not suit a ferry berth.

Vehicle access would facilitate transfer of people and tools on and off the vessel, making minor works more efficient. However, it would not eliminate the need for external cranage and so would either be limited to minor works or would require crane-accessible areas alongside.

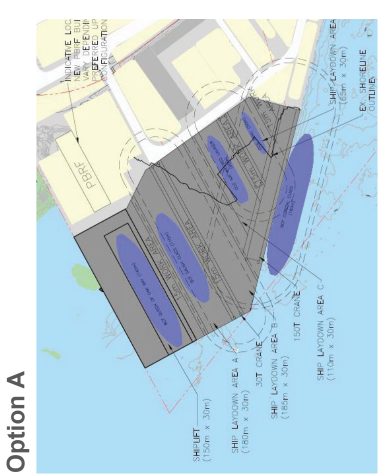
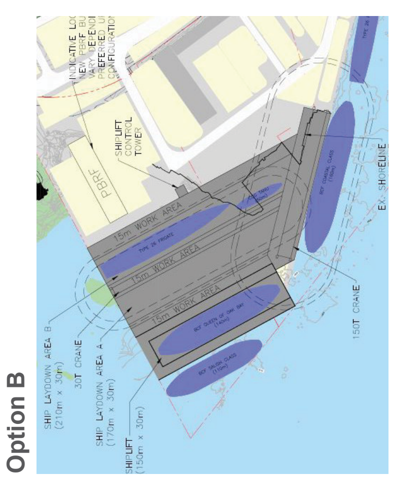
The functionality increase from this arrangement would be quite specific to ferries. However, the location for such a berth would ideally be located in an area that does not preclude others from using the mooring space when it is not occupied by a ferry. Drawing sheets 007 to 009 in Appendix A, show possible locations for this type of berth.

A specific Ro-Ro berth for BC Ferries vessels is considered a considerable addition to the development which would need to be implemented in such a way that the mooring space remains available for other vessels. Of the layouts considered, sheet 008 with the berth to the north of the shiplift is considered preferred.

5 Conceptual Options

The conceptual options considered are shown in Table 3. Options A to C are those previously considered in Memo 671883-0000-30CC-0004 that stay within the existing waterlot, while options D to F are new options extending beyond the current waterlot boundary.

Table 3 - Option Summary

Option	Description	Advantages	Disadvantages
Option A 	Shiplift is on the north end of the proposed wharf expansion and oriented northeast-southwest, aligning with proposed PBRF building. Four vessel laydown areas located on the south side of the shiplift. Northern side has 30m wide general laydown area that is not intended for long-term vessel use.	› Submarines directly aligned with proposed new PBRF building. › Within existing waterlot.	› Shiplift requires transverse entry/exit, meaning rail system likely to be required. › 'First in, last out' marshalling for all hardstanding berths. › Area to the north not useful for larger vessels. › Shiplift in shallow area expected to require rock dredging.
Option B 	Shiplift on the western edge of the proposed wharf expansion, orientated northwest-southeast. There are two vessel laydown areas located on the east side of the shiplift.	› Hardstanding maintenance bays are very long, good coverage from a central rail-mounted crane. › Within existing waterlot. › Less dredge required for shiplift, and less chance of rock dredging.	› Shiplift requires transverse entry/exit, meaning rail system likely to be required. › 'First in, last out' marshalling for all hardstanding berths. › Navigating into the shiplift involves a "u-turn", and brings vessels very close to mooring areas and the graving dock entrance. › Submarines need to be "carouselled" 90° to get into the PBRF. This is not possible with rails and also requires clearing vessels from the rest of the hardstanding. › Not expected to be a feasible option due to operational issues.

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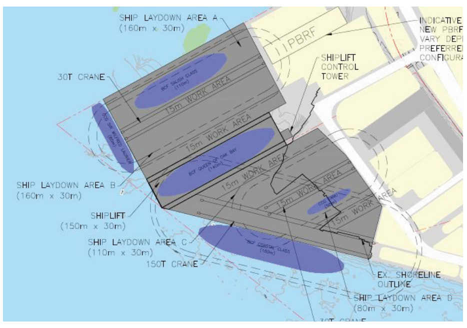
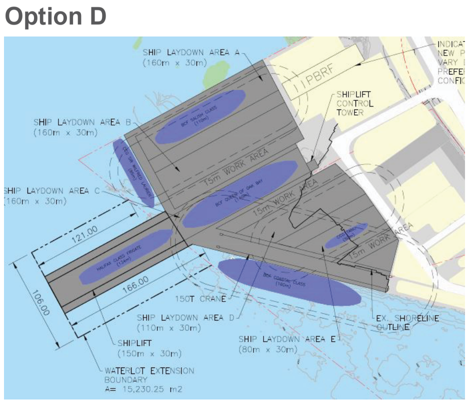
Option	Description	Advantages	Disadvantages
Option C 	Shiplift centrally located, orientated northeast-southwest. Four vessel laydown areas with two on the north side, and two on the south side of the shiplift.	› Increased access from shiplift to hard-standing relative to Options A and B with vessel laydown areas on both sides of the shiplift. › Within existing waterlot. › Less dredge required for shiplift, and less chance of rock dredging.	› Submarines will be transferred into the new PBRF with one lateral and one longitudinal maneuver. › Shiplift requires transverse entry/exit, meaning rail system likely to be required. › Shiplift in shallow area expected to require rock dredging.
Option D 	Shiplift protrudes out from reclamation, mooring length each side. Shiplift is centrally located on the reclamation, orientated northeast -southwest. Five vessel laydown areas on the reclamation.	› Longitudinal shiplift access makes SPMT's preferable, hard-standing area becomes much more flexible. › Overall increased hard-standing, and more area in close proximity to shiplift. › Shiplift in deeper water minimises dredging and potential for rock dredging.	› Submarines will be transferred into the new PBRF with one lateral and one longitudinal maneuver. › Extends outside waterlot. › Shiplift becomes a material consideration to vessels approaching the graving dock, and potentially DND operations in the harbour.

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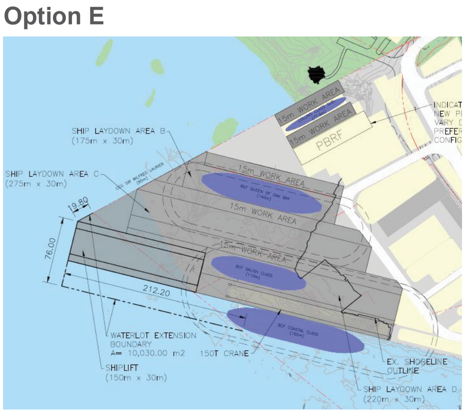
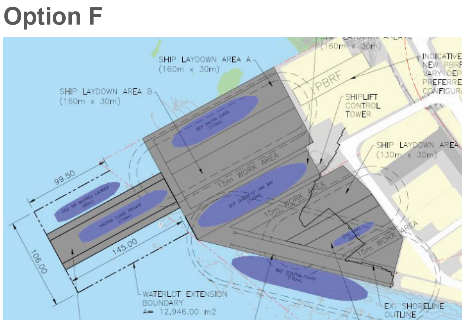
Option	Description	Advantages	Disadvantages
Option E 	Shiplift aligned with current NLW orientation, northwest-southeast. Extends outside waterlot but for a reduced extent. There is one vessel laydown area aligned with the shiplift to the southeast, and three more parallel laydown bays to the north.	› Longitudinal shiplift access makes SPMT's preferable, hard-standing area becomes much more flexible. › Long hard-standing bays are versatile and can accommodate many different combinations of vessels. › Can be staged - shiplift could be installed and be functional before full reclamation if complete. › Reduced waterlot expansion and no navigation issues with DND or drydock.	› 'First in, last out' marshalling for all hard-standing berths. › Submarines need to be "carouselled" 90° to get into the PBRF, would require clearing a lot of other hard-standing.
Option F 	Shiplift protrudes, similar to Option D, however located further north. Five vessel laydown areas on the reclamation.	› SPMT's preferable, increased flexibility for hard-standing area. › Shiplift in deeper water minimises dredging and potential for rock dredging. › Shiplift directly aligns with proposed PBRF. › Further from DND and graving dock approach meaning less potential for causing navigational issues.	› Extends outside waterlot. › With one maintenance slot to the north, and three to the south, the hard-standing area is slightly more constrained than Option D.

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6 Option Capacity Comparison

The options considered are compared in Figure 11 on the basis of how much additional capacity will be provided, relative to the existing condition. The comparison is based on the following criteria:

- Mooring length is counted only where it is -10m CD or deeper, and long enough to accommodate a significant number of the design vessels;
- As the maintenance bays and graving dock are all of a common width (approximately 30m), length is used as the metric for capacity. Note that this ignores the consideration that options compatible with SPMT's allow the flexibility to use narrower maintenance bays if the vessels being worked on, and the maintenance work planned, can allow them to be positioned tighter.
- Both mooring wharf length and dry working length are divided into different "priorities", where:
    - Priority 1:
        - Hardstanding areas with direct access to the shiplift, and the seaward section of the graving dock, where no other vessels impede deepwater access;
        - Mooring berths with heavy crane access immediately alongside the wharf.
    - Priority 2:
        - Hardstanding areas where there is one other vessel maintenance bay between it and the shiplift, and the middle section of the graving dock. These bays require co-ordinating movements with one other vessel/maintenance bay;
        - Mooring length with access alongside, but either not for heavy cranes, or not directly alongside (e.g. mooring alongside the shiplift).
    - Priority 3:
        - Hardstanding bays located behind two or more other bays, and the landward section of the graving dock;
        - Mooring space that can only be used by one class of vessel (e.g. ferry Ro-Ro berth).

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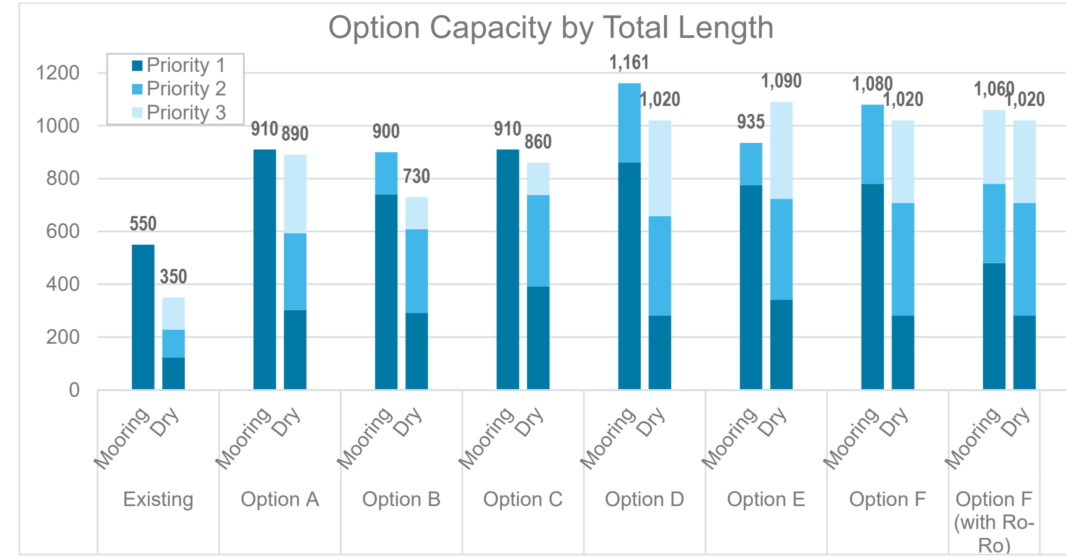

Figure 11 - Option Comparison

7 Conclusion and Recommendations

Key conclusions from this assessment are:

- Shiplift design criteria of approximately 150m long and 9000t capacity is believed to remain appropriate for the assumed design vessel fleet, on the basis that larger vessels are infrequent and can continue to use the graving dock;
- A defined vessel forecast for the design life was not available for the study. The assumed frequency of vessels calling suggests that shiplift use may need to be as frequently as weekly in the future;
- Floating drydock usage was investigated to assess the degree of tidal constraint that would apply. Conclusions were that it is not possible to avoid all tidal constraints for the design fleet. Floating drydock use is believed to be feasible, and risks could be reduced by constructing a rock pad for the floating drydock to sit on while vessels are rolled onto the wharf. However, these methods are not considered practical for the anticipated frequency and would remain dependent on third parties. The floating drydock would also need to be moored alongside the wharf when not in use, taking wharf length that could not then be used for vessels. Accordingly, floating drydock use is recommended as a possible interim measure until a shiplift is installed;
- Preliminary consideration was given to providing a Ro-Ro terminal for servicing floating ferries. This is recommended as a possible "add-on" for future. The location of the Ro-Ro berth should aim to preserve space that can also be used for mooring other vessels;
- Rail and tire vessel transport systems have been considered. A tire system, such as SPMT's, would bring significantly more versatility to the hard-standing area. The entire space would become

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flexible and could be varied to suit the activities taking place at the time. This is highly relevant for the triangular-shaped site and varied vessel mix expected;

- Systems that move vessel transversely into the shiplift rather than longitudinally come with more constraints due to the presence of the winches limiting where the ship support and transfer system elements can be located. If the shiplift location selected involves lateral transfers, it is expected to be preferable to use a rail system, as much of the flexibility of SPMT's would be lost, and the rail bogies can more readily move past the winches;
- In addition to the previous expansion option, three new layouts were considered which involve expanding the existing waterlot. The dry work area and mooring length provided by the new options is significantly more than existing. A key advantage of the options that involve expanding the waterlot are that they can accommodate longitudinal shiplift entry and SPMT's could be used for all vessel movements;
- In Options D and F, the shiplift would protrude well beyond the existing waterlot. However, the direction and extent is not expected to create issues for other vessels using the harbour, or vessels using the graving dock;
- Overall, the shiplift configuration Option F with SPMT's is considered to have the best functionality;
- If expansion outside of the waterlot cannot be accommodated, Option C would be preferred. Further consideration would need to be given regarding the transfer system. This may be rails site-wide, or potentially could involve rails into and out of the shiplift, with SPMT's for other situations required to efficiently use all of the hard-standing area.

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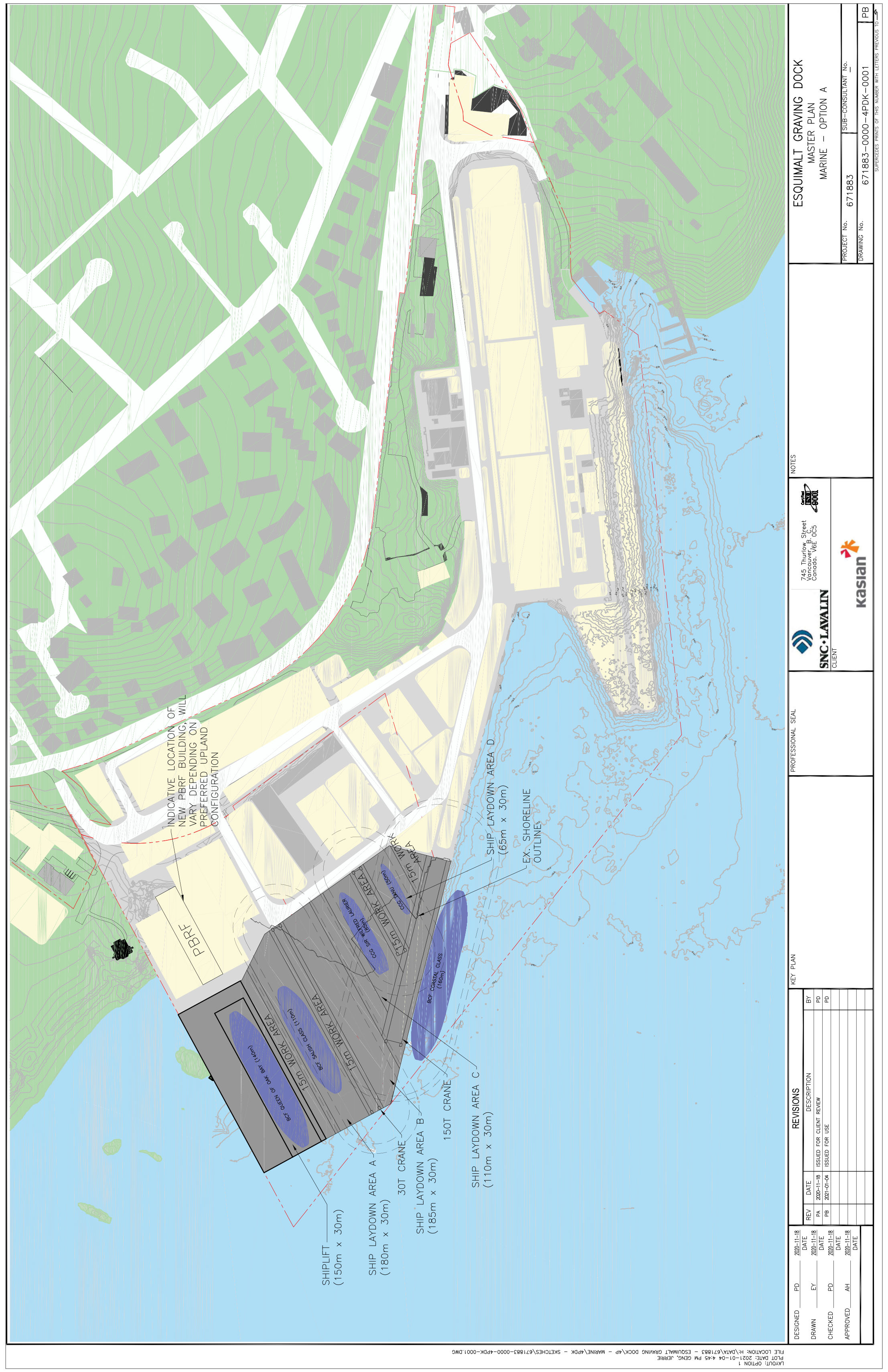
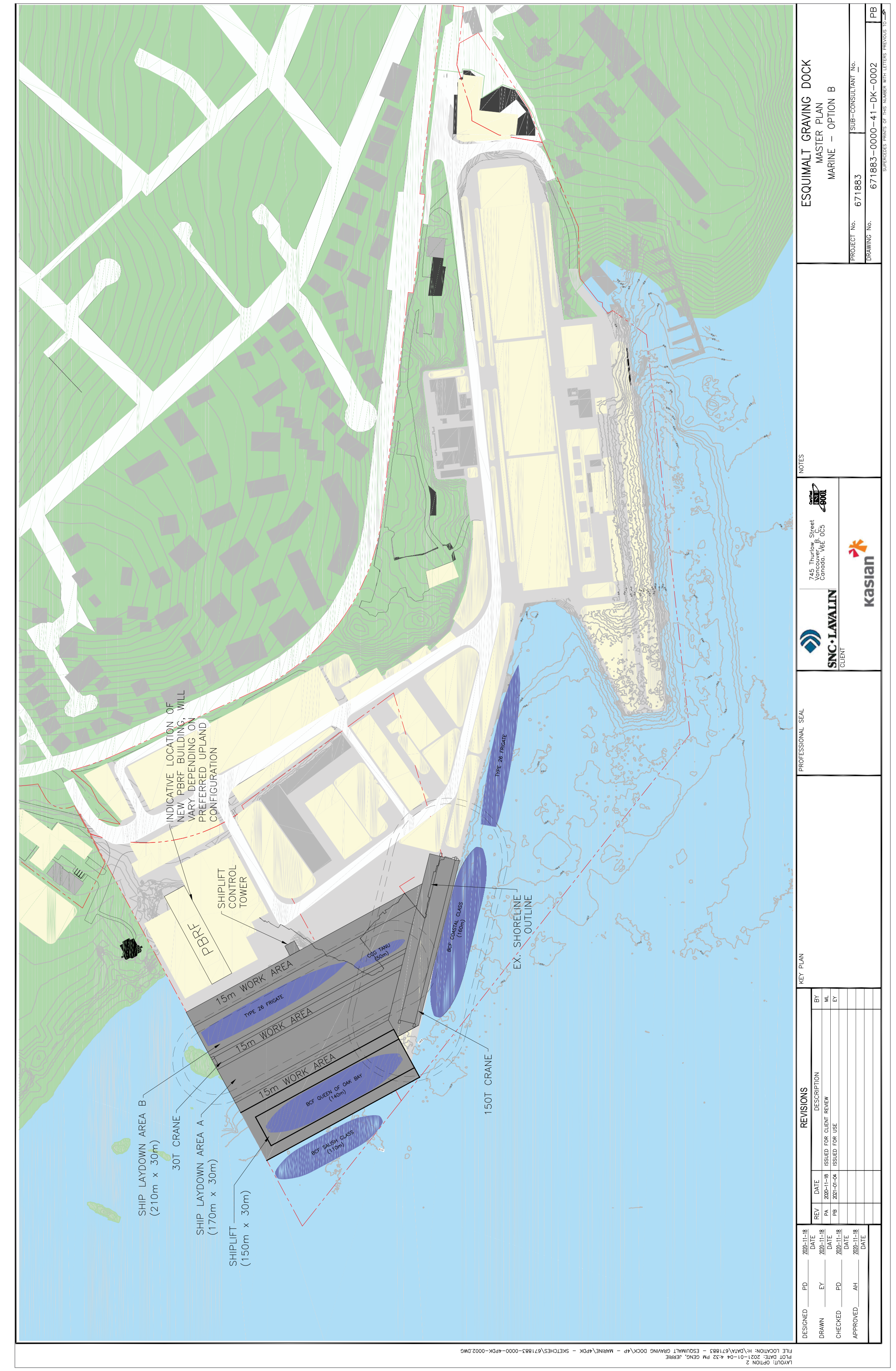
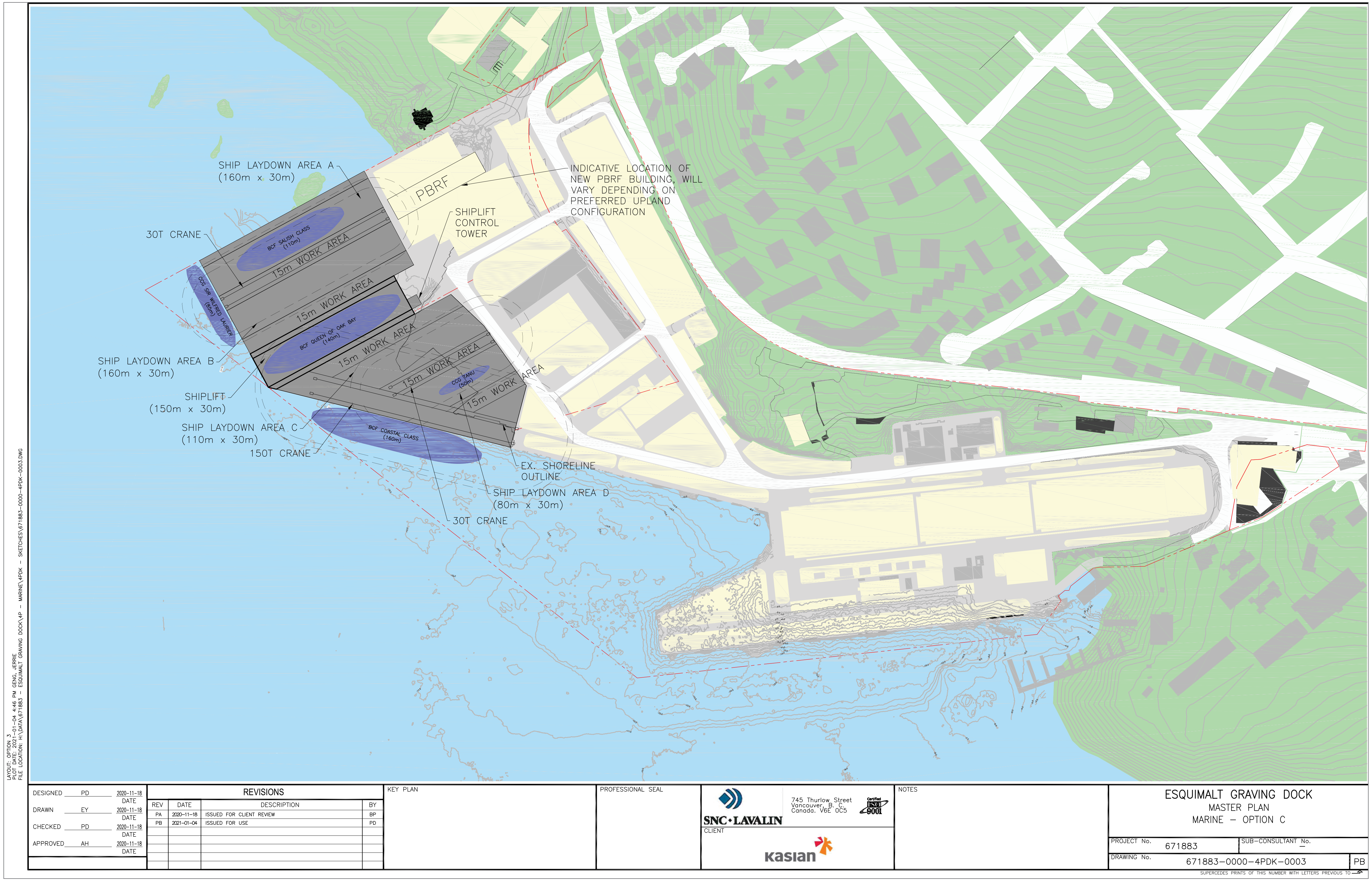
Appendix A – Option Sketches


ESQUIMALT GRAVING DOCK
MASTER PLAN
MARINE - OPTION A
SNC·LAVALIN
kasian
INDICATIVE LOCATION OF NEW PBRF BUILDING, WILL VARY DEPENDING ON PREFERRED UPLAND CONFIGURATION
PBRF
SHIP LAYDOWN AREA D (65m x 30m)
EX. SHORELINE OUTLINE
SHIP LAYDOWN AREA C (110m x 30m)
150T CRANE
SHIP LAYDOWN AREA B (185m x 30m)
30T CRANE
SHIP LAYDOWN AREA A (180m x 30m)
SHIPLIFT (150m x 30m)
REVISIONS


ESQUIMALT GRAVING DOCK
MASTER PLAN
MARINE - OPTION B
SNC·LAVALIN
kasian
INDICATIVE LOCATION OF NEW PBRF BUILDING, WILL VARY DEPENDING ON PREFERRED UPLAND CONFIGURATION
SHIPLIFT CONTROL TOWER
PBRF
15m WORK AREA
15m WORK AREA
15m WORK AREA
EX. SHORELINE OUTLINE
150T CRANE
SHIP LAYDOWN AREA B (210m x 30m)
30T CRANE
SHIP LAYDOWN AREA A (170m x 30m)
SHIPLIFT (150m x 30m)
REVISIONS


SHIP LAYDOWN AREA A
(160m x 30m)
PBRF
INDICATIVE LOCATION OF NEW PBRF BUILDING, WILL VARY DEPENDING ON PREFERRED UPLAND CONFIGURATION
SHIPLIFT CONTROL TOWER
30T CRANE
15m WORK AREA
15m WORK AREA
15m WORK AREA
15m WORK AREA
15m WORK AREA
SHIP LAYDOWN AREA B
(160m x 30m)
SHIPLIFT
(150m x 30m)
SHIP LAYDOWN AREA C
(110m x 30m)
150T CRANE
EX. SHORELINE OUTLINE
SHIP LAYDOWN AREA D
(80m x 30m)
30T CRANE
DESIGNED PD 2020-11-18 DATE
DRAWN EY 2020-11-18 DATE
CHECKED PD 2020-11-18 DATE
APPROVED AH 2020-11-18 DATE
REVISIONS
REV DATE DESCRIPTION BY
PA 2020-11-18 ISSUED FOR CLIENT REVIEW BP
PB 2021-01-04 ISSUED FOR USE PD
KEY PLAN
PROFESSIONAL SEAL
SNC·LAVALIN
745 Thurlow Street Vancouver, B. C. Canada. V6E 0C5
CLIENT
Kasian
NOTES
ESQUIMALT GRAVING DOCK
MASTER PLAN
MARINE – OPTION C
PROJECT No. 671883
SUB-CONSULTANT No. –
DRAWING No. 671883-0000-4PDK-0003
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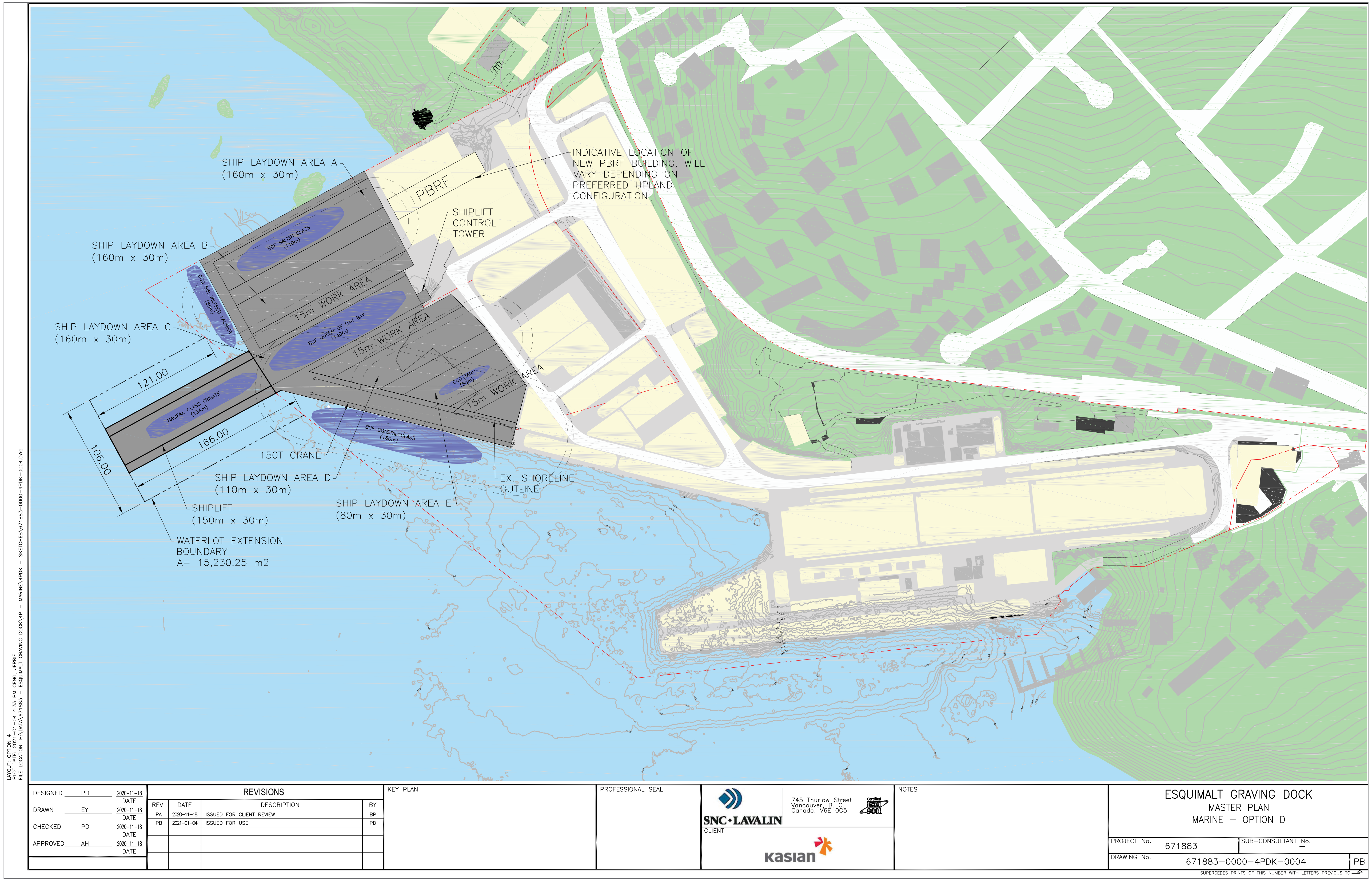
SHIP LAYDOWN AREA A
(160m x 30m)
PBRF
INDICATIVE LOCATION OF NEW PBRF BUILDING, WILL VARY DEPENDING ON PREFERRED UPLAND CONFIGURATION
SHIPLIFT CONTROL TOWER
SHIP LAYDOWN AREA B
(160m x 30m)
SHIP LAYDOWN AREA C
(160m x 30m)
15m WORK AREA
15m WORK AREA
15m WORK AREA
121.00
166.00
106.00
150T CRANE
SHIP LAYDOWN AREA D
(110m x 30m)
EX. SHORELINE OUTLINE
SHIPLIFT
(150m x 30m)
SHIP LAYDOWN AREA E
(80m x 30m)
WATERLOT EXTENSION BOUNDARY
A= 15,230.25 m2
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DRAWN EY 2020-11-18
CHECKED PD 2020-11-18
APPROVED AH 2020-11-18
REVISIONS
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PROFESSIONAL SEAL
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CLIENT
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MASTER PLAN
MARINE – OPTION D
PROJECT No. 671883
DRAWING No. 671883-0000-4PDK-0004
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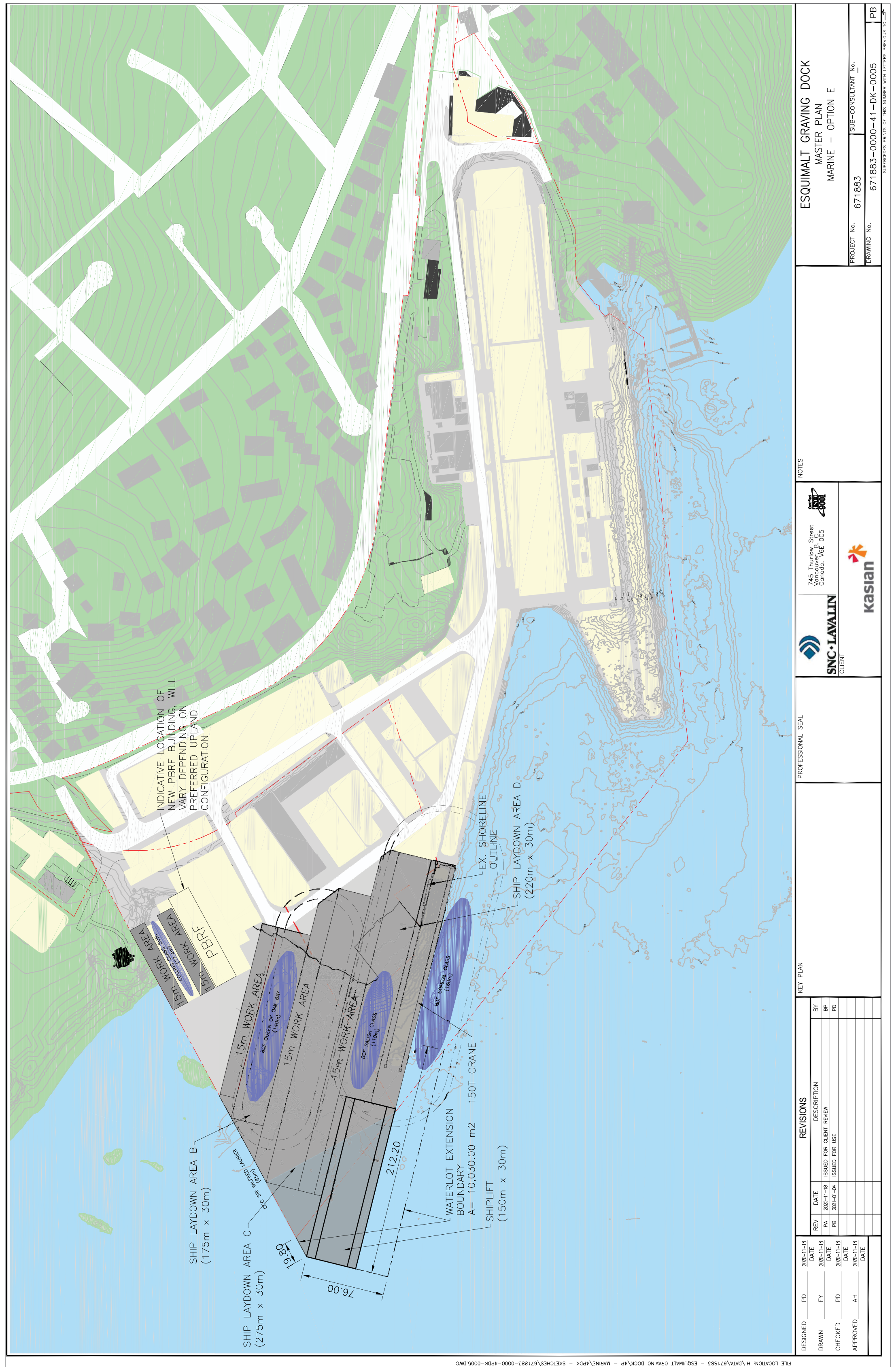
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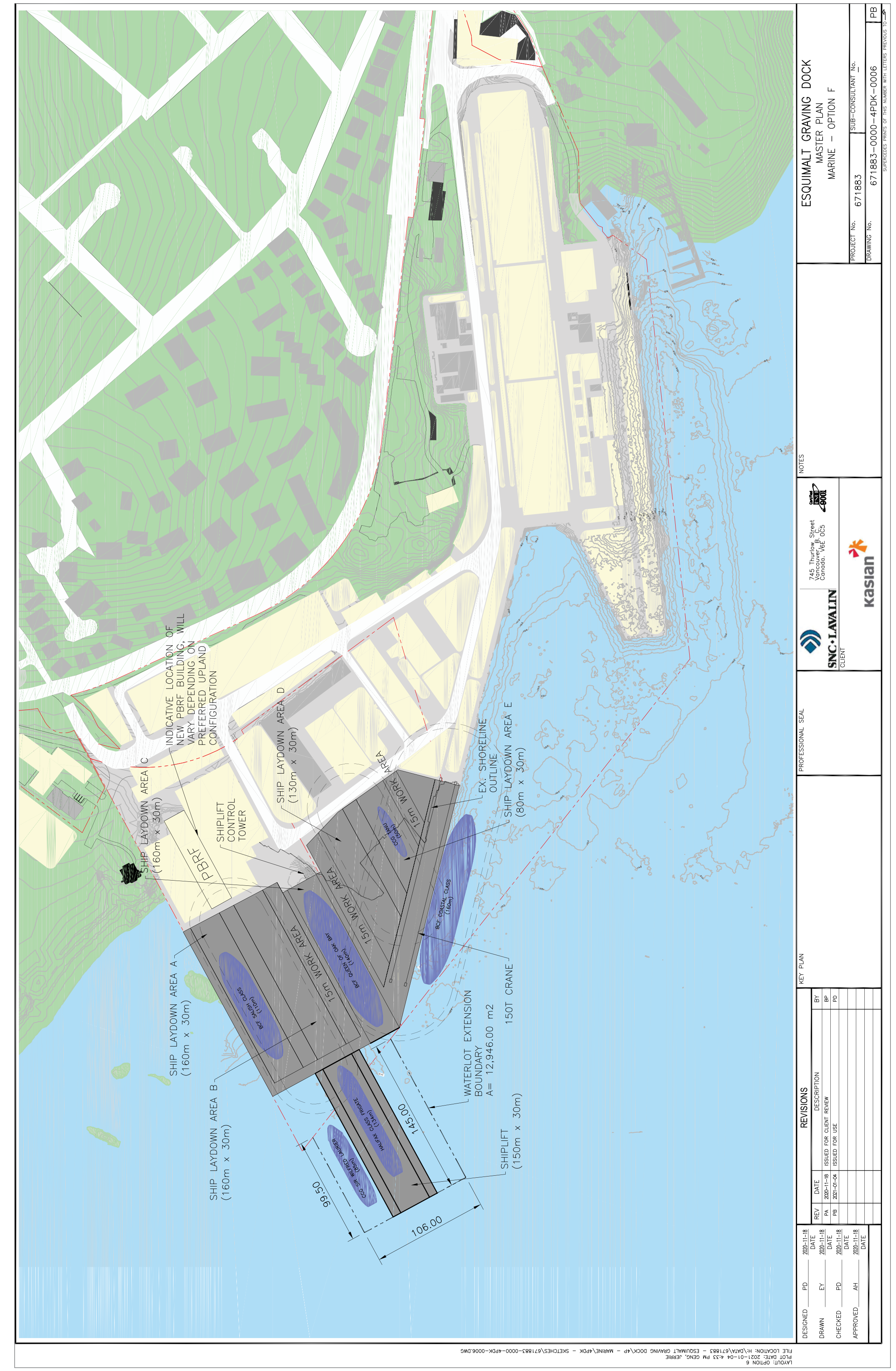
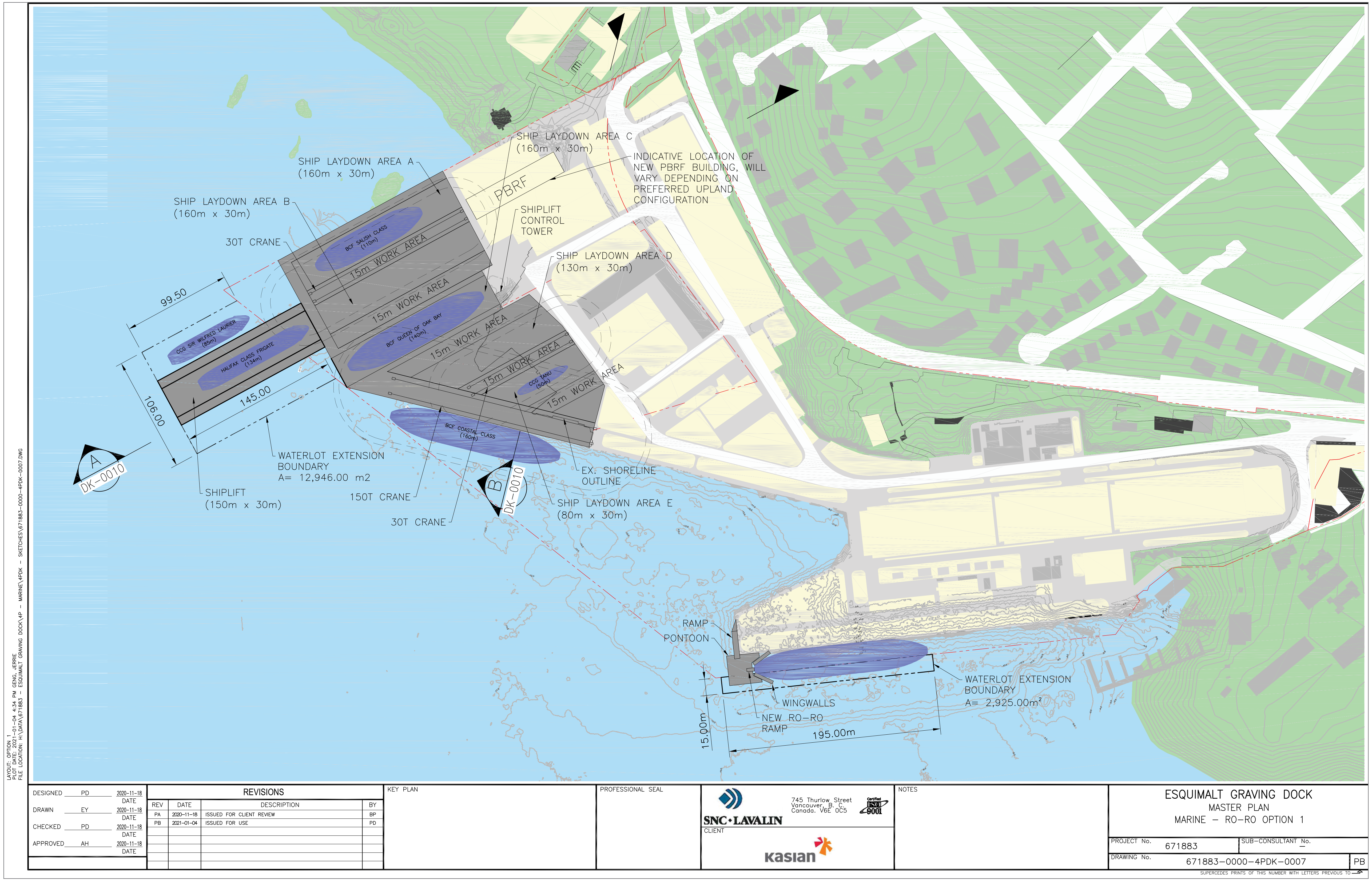
MASTER PLAN
MARINE – OPTION E
671883
671883-0000-41-DK-0005
SNC·LAVALIN
kasian
INDICATIVE LOCATION OF NEW PBRF BUILDING, WILL VARY DEPENDING ON PREFERRED UPLAND CONFIGURATION
PBRF
15m WORK AREA
EX. SHORELINE OUTLINE
SHIP LAYDOWN AREA D (220m x 30m)
SHIP LAYDOWN AREA B (175m x 30m)
SHIP LAYDOWN AREA C (275m x 30m)
WATERLOT EXTENSION BOUNDARY A= 10,030.00 m2
150T CRANE
SHIPLIFT (150m x 30m)
212.20
76.00
REVISIONS


ESQUIMALT GRAVING DOCK
MASTER PLAN
MARINE – OPTION F
671883
671883-0000-4PDK-0006
SNC·LAVALIN
kasian
INDICATIVE LOCATION OF NEW PBRF BUILDING, WILL VARY DEPENDING ON PREFERRED UPLAND CONFIGURATION
PBRF
SHIPLIFT CONTROL TOWER
SHIP LAYDOWN AREA C (160m x 30m)
SHIP LAYDOWN AREA D (130m x 30m)
SHIP LAYDOWN AREA E (80m x 30m)
EX. SHORELINE OUTLINE
15m WORK AREA
SHIP LAYDOWN AREA A (160m x 30m)
SHIP LAYDOWN AREA B (160m x 30m)
WATERLOT EXTENSION BOUNDARY A= 12,946.00 m2
150T CRANE
SHIPLIFT (150m x 30m)
145.00
99.50
106.00
REVISIONS


SHIP LAYDOWN AREA C (160m x 30m)
INDICATIVE LOCATION OF NEW PBRF BUILDING, WILL VARY DEPENDING ON PREFERRED UPLAND CONFIGURATION
SHIP LAYDOWN AREA A (160m x 30m)
SHIP LAYDOWN AREA B (160m x 30m)
PBRF
SHIPLIFT CONTROL TOWER
30T CRANE
SHIP LAYDOWN AREA D (130m x 30m)
15m WORK AREA
15m WORK AREA
15m WORK AREA
15m WORK AREA
15m WORK AREA
99.50
145.00
106.00
WATERLOT EXTENSION BOUNDARY A= 12,946.00 m2
SHIPLIFT (150m x 30m)
150T CRANE
30T CRANE
EX. SHORELINE OUTLINE
SHIP LAYDOWN AREA E (80m x 30m)
A DK-0010
B DK-0010
RAMP
PONTOON
WINGWALLS
NEW RO-RO RAMP
WATERLOT EXTENSION BOUNDARY A= 2,925.00m²
15.00m
195.00m
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DRAWN EY 2020-11-18 DATE
CHECKED PD 2020-11-18 DATE
APPROVED AH 2020-11-18 DATE
REVISIONS
REV DATE DESCRIPTION BY
PA 2020-11-18 ISSUED FOR CLIENT REVIEW BP
PB 2021-01-04 ISSUED FOR USE PD
KEY PLAN
PROFESSIONAL SEAL
SNC·LAVALIN
745 Thurlow Street Vancouver, B. C. Canada. V6E 0C5
CLIENT
kasian
NOTES
ESQUIMALT GRAVING DOCK
MASTER PLAN
MARINE – RO-RO OPTION 1
PROJECT No. 671883
SUB-CONSULTANT No. –
DRAWING No. 671883-0000-4PDK-0007 PB
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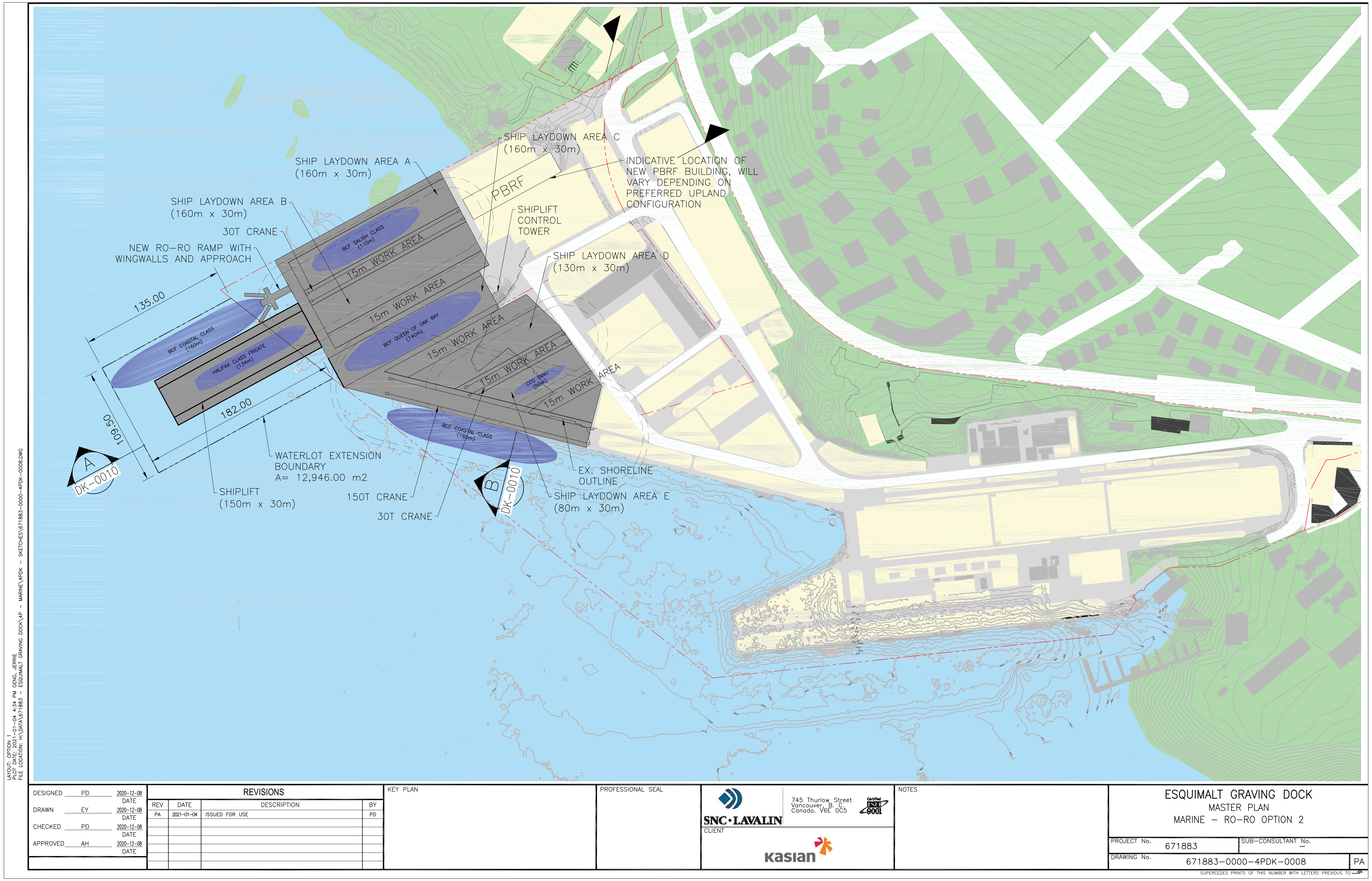
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(160m x 30m)
SHIP LAYDOWN AREA A
(160m x 30m)
INDICATIVE LOCATION OF NEW PBRF BUILDING, WILL VARY DEPENDING ON PREFERRED UPLAND CONFIGURATION
PBRF
SHIP LAYDOWN AREA B
(160m x 30m)
SHIPLIFT CONTROL TOWER
30T CRANE
NEW RO-RO RAMP WITH WINGWALLS AND APPROACH
SHIP LAYDOWN AREA D
(130m x 30m)
15m WORK AREA
135.00
182.00
109.50
A
DK-0010
B
DK-0010
WATERLOT EXTENSION BOUNDARY
A= 12,946.00 m2
SHIPLIFT
(150m x 30m)
150T CRANE
30T CRANE
EX. SHORELINE OUTLINE
SHIP LAYDOWN AREA E
(80m x 30m)
BCF COASTAL CLASS (160m)
HALIFAX CLASS FRIGATE (134m)
BCF QUEEN OF OAK BAY (140m)
BCF SALISH CLASS (110m)
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DRAWN EY 2020-12-08
CHECKED PD 2020-12-08
APPROVED AH 2020-12-08
REVISIONS
REV DATE DESCRIPTION BY
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KEY PLAN
PROFESSIONAL SEAL
745 Thurlow Street Vancouver, B. C. Canada, V6E 0C5
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CLIENT
Kasian
NOTES
ESQUIMALT GRAVING DOCK
MASTER PLAN
MARINE – RO-RO OPTION 2
PROJECT No. 671883
SUB-CONSULTANT No. –
DRAWING No. 671883-0000-4PDK-0008
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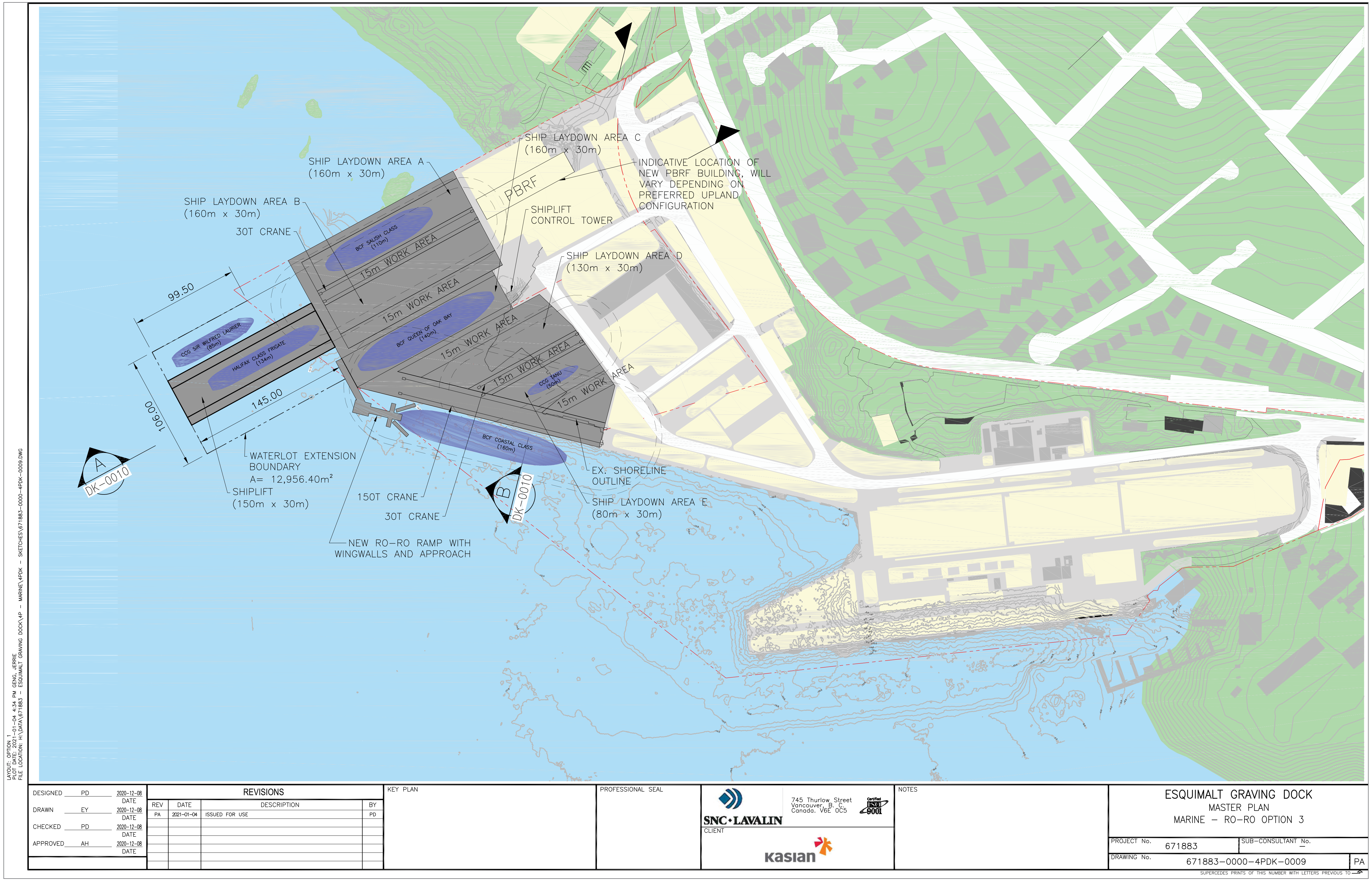
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(160m x 30m)
SHIP LAYDOWN AREA A
(160m x 30m)
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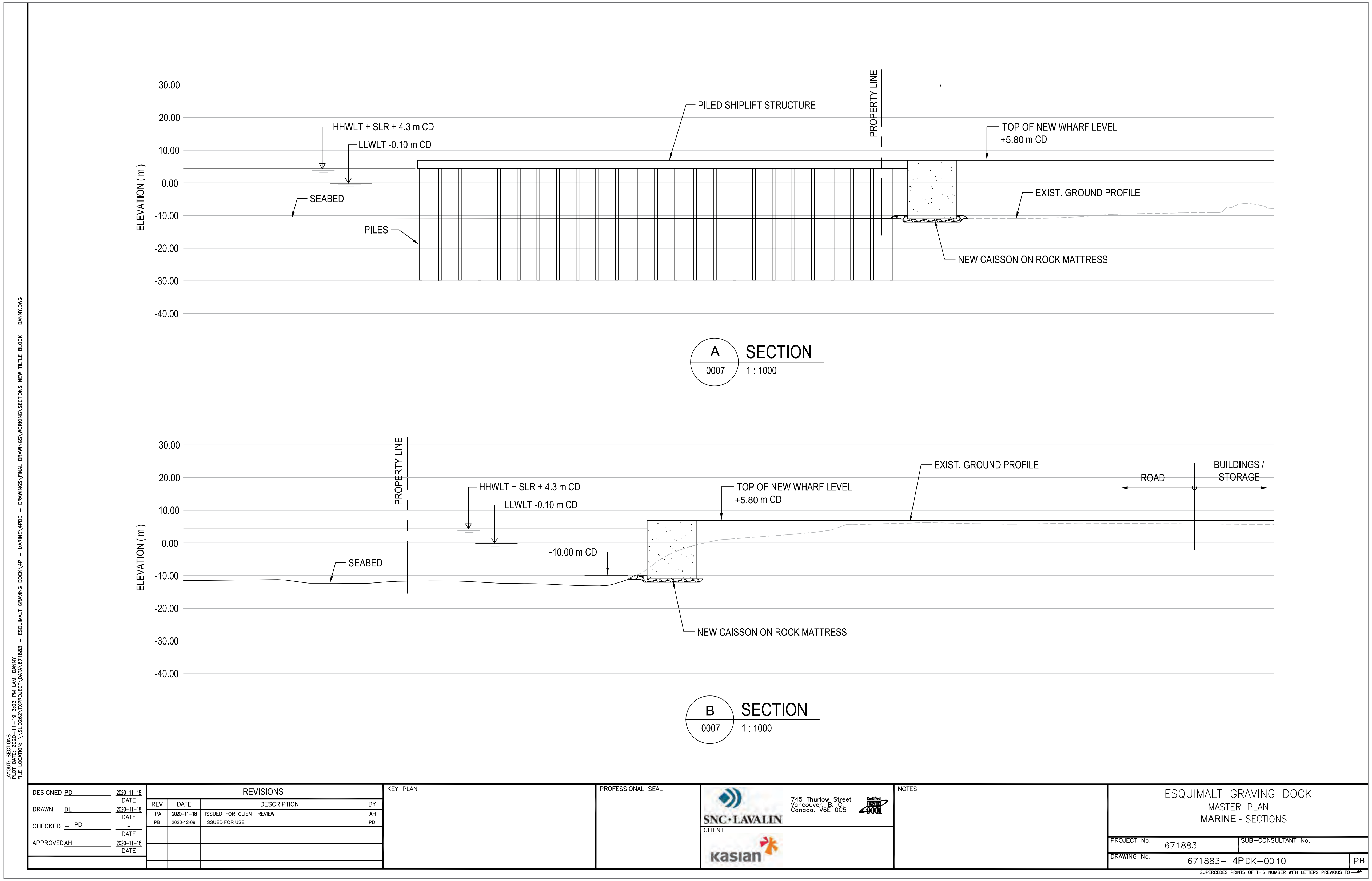
SHIP LAYDOWN AREA B
(160m x 30m)
PBRF
SHIPLIFT CONTROL TOWER
30T CRANE
15m WORK AREA
15m WORK AREA
15m WORK AREA
15m WORK AREA
15m WORK AREA
SHIP LAYDOWN AREA D
(130m x 30m)
99.50
145.00
106.00
WATERLOT EXTENSION BOUNDARY
A= 12,956.40m²
SHIPLIFT
(150m x 30m)
150T CRANE
30T CRANE
NEW RO-RO RAMP WITH WINGWALLS AND APPROACH
EX. SHORELINE OUTLINE
SHIP LAYDOWN AREA E
(80m x 30m)
A
DK-0010
B
DK-0010
DESIGNED PD 2020-12-08
DRAWN EY 2020-12-08
CHECKED PD 2020-12-08
APPROVED AH 2020-12-08
REVISIONS
REV DATE DESCRIPTION BY
PA 2021-01-04 ISSUED FOR USE PD
KEY PLAN
PROFESSIONAL SEAL
SNC·LAVALIN
745 Thurlow Street Vancouver, B.C. Canada, V6E 0C5
CLIENT
kasian
NOTES
ESQUIMALT GRAVING DOCK
MASTER PLAN
MARINE – RO-RO OPTION 3
PROJECT No. 671883
SUB-CONSULTANT No.
DRAWING No. 671883-0000-4PDK-0009 PA


PILED SHIPLIFT STRUCTURE
PROPERTY LINE
HHWLT + SLR + 4.3 m CD
LLWLT -0.10 m CD
TOP OF NEW WHARF LEVEL
+5.80 m CD
SEABED
EXIST. GROUND PROFILE
PILES
NEW CAISSON ON ROCK MATTRESS
ELEVATION (m)
30.00
20.00
10.00
0.00
-10.00
-20.00
-30.00
-40.00
A
0007
SECTION
1 : 1000
PROPERTY LINE
HHWLT + SLR + 4.3 m CD
LLWLT -0.10 m CD
TOP OF NEW WHARF LEVEL
+5.80 m CD
EXIST. GROUND PROFILE
ROAD
BUILDINGS / STORAGE
SEABED
-10.00 m CD
NEW CAISSON ON ROCK MATTRESS
B
0007
SECTION
1 : 1000
DESIGNED PD 2020-11-18
DRAWN DL 2020-11-18
CHECKED PD
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REVISIONS
REV DATE DESCRIPTION BY
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PROFESSIONAL SEAL
SNC·LAVALIN
745 Thurlow Street
Vancouver, B.C.
Canada. V6E 0C5
CLIENT
kasian
NOTES
ESQUIMALT GRAVING DOCK
MASTER PLAN
MARINE - SECTIONS
PROJECT No. 671883
SUB-CONSULTANT No.
DRAWING No. 671883- 4PDK-0010
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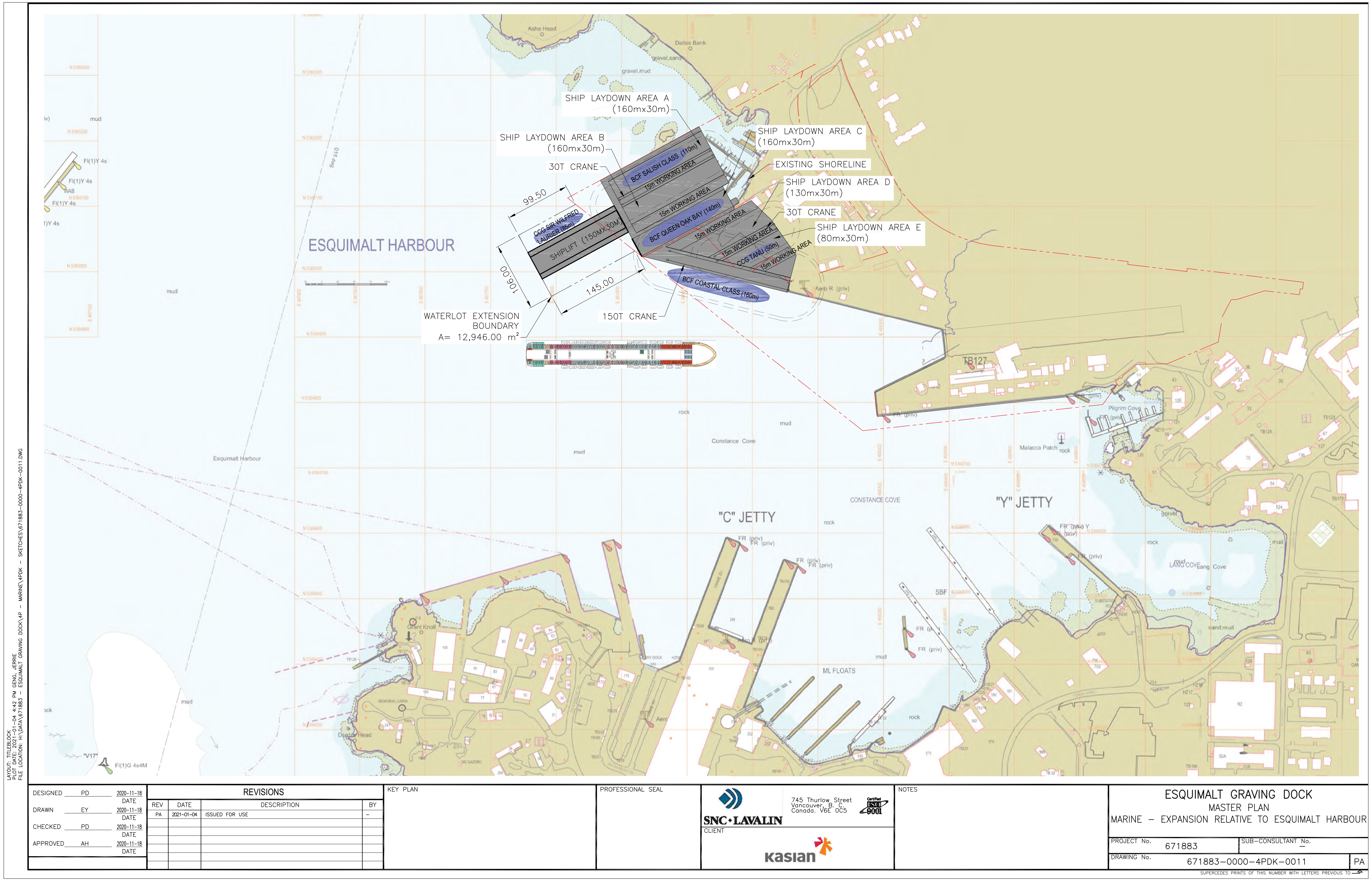

SHIP LAYDOWN AREA A
(160mx30m)
SHIP LAYDOWN AREA B
(160mx30m)
30T CRANE
SHIP LAYDOWN AREA C
(160mx30m)
EXISTING SHORELINE
SHIP LAYDOWN AREA D
(130mx30m)
30T CRANE
SHIP LAYDOWN AREA E
(80mx30m)
99.50
106.00
145.00
150T CRANE
WATERLOT EXTENSION
BOUNDARY
A= 12,946.00 m²
ESQUIMALT HARBOUR
"C" JETTY
"Y" JETTY
CONSTANCE COVE
ML FLOATS
DESIGNED PD 2020-11-18
DRAWN EY 2020-11-18
CHECKED PD 2020-11-18
APPROVED AH 2020-11-18
REVISIONS
REV DATE DESCRIPTION BY
PA 2021-01-04 ISSUED FOR USE
KEY PLAN
PROFESSIONAL SEAL
SNC·LAVALIN
745 Thurlow Street
Vancouver, B. C.
Canada. V6E 0C5
CLIENT
kasian
NOTES
ESQUIMALT GRAVING DOCK
MASTER PLAN
MARINE – EXPANSION RELATIVE TO ESQUIMALT HARBOUR
PROJECT No. 671883
SUB-CONSULTANT No.
DRAWING No. 671883-0000-4PDK-0011
PA

2.2 EXISTING SITE CHALLENGES & OPPORTUNITIES

The federally owned Crown property is within the traditional territory of the Coast Salish people of the Songhees and Esquimalt First Nations. The 76.8 acres (31 hectares) site is bounded by the Esquimalt Harbour to the south and west; Songhees territory to the west; CFB Esquimalt to the south and east; and Esquimalt residential neighborhoods to the north.

The Design Team reviewed the site to understand the physical characteristics and constraints at EGD. Challenges include, but are not limited to, a restrictive plannable area, contaminated soils, liquefiable soils within a high seismic zone, existing site infrastructure, sensitive habitats and archeological considerations.

Key diagrams are highlighted in the Conceptual Plan 2021, to inform subsequent planning activities are detailed below. Refer to the PSPC Esquimalt Graving Dock Master Plan 2020, prepared by Kasian for the full overview of the EGD site.

2.2.1 EXISTING UTILITIES

SANITARY

The sanitary collection system is a series of gravity sewers, forcemains and pump stations that generally direct sanitary flows to the DND site south of the EGD facility. On the north side of the EGD facility, sanitary flows run by gravity or are pumped to two main lift stations, which then transmit flows east along the north side of the wharf, south along the east edge, and then west along the south edge. From there, sanitary flows are repumped at another lift station and are transmitted to the DND facility offsite. Sanitary piping ranges in size from 100mm to 200mm for gravity sections and 75mm to 150mm for forcemain sections.

WATER

The EGD receives water from two sources: the CRD watermain located near the Main Gate in EGD East, and a second CRD water main near the northwest border of the site near the Maplebank Road access. Incoming pressure is reduced at onsite PRVs and then distributed to most buildings on the EGD site. There are many fire hydrants scattered throughout the site to provide suitable fire coverage. Watermain sizing is typically in the 50mm-200mm range.

STORMWATER

EGD has a large stormwater collection system that is generally directed to several outfall points to the inlet. For the North Landing Wharf section, there are storm pipes ranging in size from 150mm to 800mm with a series of catch basins and trench drains that collect stormwater in and around the existing buildings. This stormwater is conveyed to oil interceptor manholes and is then sent to outfalls near the west and north sections of the North Landing Wharf. The South Jetty section has a similar collection system, with pipes ranging from 100mm to 450mm. Outfalls are directed south of the South Jetty into the inlet, and storm runoff is treated with oil interceptors prior to release.

ELECTRICAL

Power Demarcation Point

The existing EGD site is currently serviced by a DND 15kV feeder from the Naden Naval Base this is an underground connection which is currently being replaced by Point of delivery Switchgear project to be complete in 2020, for dual parallel 15kV power feeders running underground from BC Hydro Substation in Esquimalt. The new project aims to provide a future 25kV power from BC Hydro once the power distribution from the utility is upgraded. Should EGD receive notice BC Hydro will be upgrading to 25kV, EGD would need to implement the 25kV readiness project which will upgrade all the SCADA setting for all the substations and replace the 15kV surge arrestors in all the substations.

From the demarcation point to the Service entrance substation is a dual set of parallel cables run in a set of dedicated high voltage manholes connected via underground concrete encased duct banks.

Service Entrance Substation (SES):

The SES Connects the two high voltage parallel runs and distributes to a common 15kV, 1200A bus which is connected to each other via a tie breaker. This HV bus is back up by three 750kW 600V generators through a closed transition transfer switch, and distributes high voltage power 25kV to each substation. The SES and all substations are controlled with an advanced metering and SCADA system for revenue generation and remote control of breakers. Each substation is connected in a star pattern from this substation and cables run in a set of dedicated high voltage manholes connected via underground concrete encased duct banks. The general connections and purposes for each substation listed below and at a high level so not all purposes are shown just for Master Planning purposes.

- Underground cable vault
- Close transition generator facility
- Main HV power distribution
- (future) The SES building is equipped with steel structure to accommodate a second floor for HV shore power
- HV power distribution to each substation.

Pump House Substation:

- Pump control regulators
- Feeds 1000HP 2.5kV pumps for de-watering the Graving Dock.
- Connects to the underground tunnel

North Substation:

- Feeds dry dock assemblies and kiosks embedded into dry dock
- Buildings on the North Side
- Regulated kiosks 2000A 430V – 630V
- Cables run in underground tunnel

South Side Substation:

- Feeds south dry dock assemblies and kiosks embedded into dry dock
- Buildings on south side
- Seaspan Barker building

North landing Wharf Substation:

- Feeds North landing kiosks
- Buildings on the NLW
- Regulated kiosks 2000A 430V – 630V
- (future) HV connection to Crane one spare HV breaker
- (future) Kiosk #9

GAS

Based on available records and conversations with PSPC the Design Team understands there are no buried gas lines present on the EGD property. As such there is no need for future relocation or removal.

COMPRESSED AIR

A 100mm compressed air line runs from the pumphouse to the North Landing Wharf. From there, the air line runs parallel along the North Landing Wharf face in both directions. There are connection points for ship access along the entire wharf frontage. The pipe size ranges from 50mm to 100mm. The compressed air line extends south to the South Jetty and services buildings throughout the South Jetty.

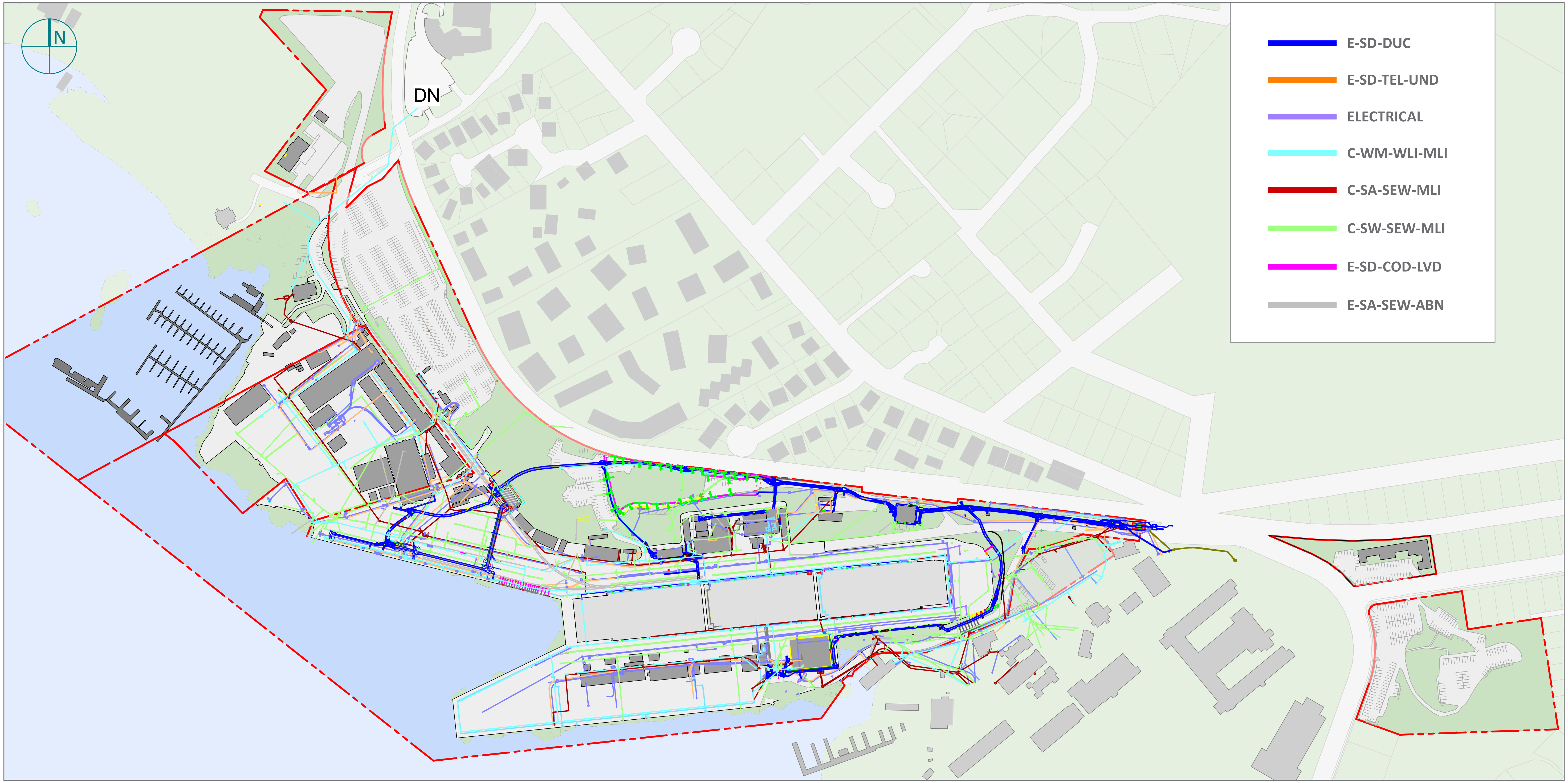


Figure 2.2 EGD Existing Site Services Plan

2.2.2. SENSITIVE HABITATS

ENVIRONMENTAL STEWARDSHIP

The EGD Environmental group works closely with PSPC and EGD ongoing operations and construction projects to protect the sensitive vegetation, animal habitats, and species-at-risk on site across the site. The EGD Environmental group has worked habitat conservation and remediation projects across the site and water lot.

GREENSCAPE

As a working ship repair facility, the majority of the site is industrial installation with pockets of natural vegetation and habitats. At the edge of the landing bedrock outcroppings transition to a hillside perimeter boundary of various coniferous and deciduous trees along the north boundary with additional pockets of shrubbery and trees across the site.

SIGNIFICANT TREES

The Township of Esquimalt Bylaw No. 2837 for the protection of trees located within the Township of Esquimalt, does not currently designate any specific trees within the EGD as Significant. Furthermore, as federal land, operated for federal government purposes, the protections of trees provided under the Township of Esquimalt's bylaws are not applicable to the EGD site. However, as part of the environmental management of the site, PSPC has engaged consultants to catalogue native vegetation species on site, identify vegetation species at risk and provide management recommendations.

A report provided by Douglas Ecological Consultants in 2004, created an inventory of vegetation species at risk on the site, and specifically identified two areas of Garry Oaks in EGD North. The southern tip of Vancouver Island, is part of the Garry Oak Ecosystem. As detailed by the Garry Oak Recovery Team:

> ' *Garry oak ecosystems are found on southeast Vancouver Island, on the Gulf Islands, and in two small areas in the Lower Fraser Valley. They occur nowhere else in Canada. These ecosystems are also found in Washington, Oregon and California (where the trees are known as Oregon white oaks). In Canada, the Garry oaks are at the northern extent of their range.*
>
> *Garry oak areas are the richest land-based ecosystems in southwest British Columbia, providing habitat for more than 100 species of birds, 7 amphibian species, 33 mammal species, more than 800 invertebrate species, and about 700 plant species.*

A subsequent review, performed by researchers from Royal Roads University, focused on the Garry Oak rock outcrop at the west end of EGD North and provided a complete inventory of native and invasive species in the area studied. They provided recommendations on the removal and management of invasive species and methods for native species enhancement to improve biodiversity, soil conditions and protect the Garry Oak ecosystem on site.

> *Garry oak areas are some of Canada's most endangered ecosystems. Once common in coastal areas of southwest British Columbia, less than 5% of these ecosystems remain in a near-natural condition.*'[1]

The 2004 report indicated that both areas of Garry Oaks on site were extremely degraded as the result of the introduction of non-native invasive species, such as grasses.

SPECIES AT RISK

The ecosystems of coastal British Columbia are home to many species that can live nowhere else. Approximately 100 varieties of plants, mammals, reptiles, birds, butterflies and insects have been officially designated "at risk" by the Capital Regional District (CRD) of southern Vancouver Island.

The list of at-risk species residing in Southern Vancouver Island include: [2]

- Red-legged frog (Special Concern)
- Painted Turtle (Endangered)
- Sharp-tailed Snake (Endangered)
- Barn Owl (Threatened)
- Western Screech Owl (Threatened)
- Great Blue Heron (Special Concern)
- Marbled Murrelet (Threatened)
- Northern Goshawk (Threatened)
- Peregrine Falcon (Special Concern)
- Coastal Vesper Sparrow (Endangered)
- Horned Lark (Endangered)
- Keen's Long-Eared Myotis Bat (Threatened)

Management practices are ongoing and changing with new data. The CRD recommends seeking expert advice prior to taking action on specific sites, to ensure species are preserved. Additionally, the following actions can be taken to preserve biodiversity:

- Conduct ecosystem mapping in your area;
- Restrict use of pesticides and herbicides;
- Limit human access in sensitive areas; and
- Restrict land use and management practices to appropriate sites and time of year

WATERLOT

As outlined in the Master Plan 2020 Golder Associates Ltd was retained to perform a wildlife habitat survey of the EGD waterlot. They mapped a series of kelp beds on site, in particular in the waters of the Canadian Armed Forces Sailing Association. The findings are shown in the figure opposite.

According to the CRD, kelp forests are among the most diverse and productive ecosystems in the world. They are critical habitat for marine species, providing shelter and food for fish, crustaceons, and marine mammals. Additionally, kelp dampens the energy of waves and currents, reducing coastal erosion.

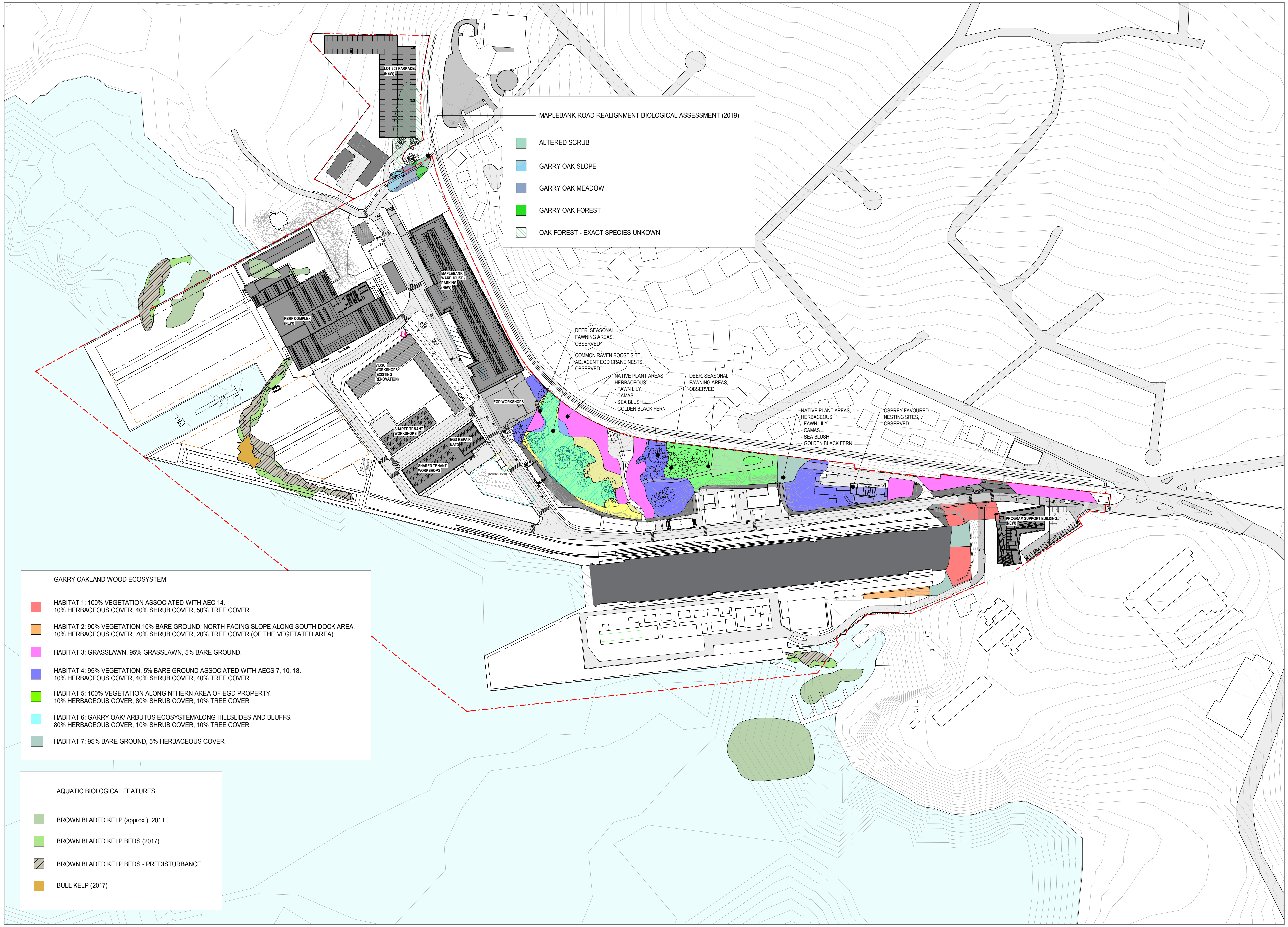
REHABILITATED AREAS

Biological features in tandem with as-built remediation features and substrates are detailed in the Habitat/ Wildlife Features: Valued Ecological Features diagram produced by Golder Associates, 2019 as shown in the Master Plan 2020.

1 Garry Oak Recovery Team: http://www.goert.ca/index.php

2 Source: Capital Regional District- https://www.crd.bc.ca/education/our-environment/wildlife-plants/terrestrial-species/at-risk-terrestrial-species

Figure 2.3 (opposite) EGD Sensitive Habitats


MAPLEBANK ROAD REALIGNMENT BIOLOGICAL ASSESSMENT (2019)
ALTERED SCRUB
GARRY OAK SLOPE
GARRY OAK MEADOW
GARRY OAK FOREST
OAK FOREST - EXACT SPECIES UNKOWN
LOT 203 PARKADE (NEW)
MAPLEBANK WAREHOUSE / PARKING (NEW)
PBRF COMPLEX (NEW)
GIZMO
EL KIOSK
DN
UP
VISSC WORKSHOPS (EXISTING RENOVATION)
EGD WORKSHOPS
SHARED TENANT WORKSHOPS
EGD REPAIR BAYS
SHARED TENANT WORKSHOPS
BUNKER
TREATMENT PLANT
DEER, SEASONAL FAWNING AREAS, OBSERVED
COMMON RAVEN ROOST SITE, ADJACENT EGD CRANE NESTS, OBSERVED
NATIVE PLANT AREAS, HERBACEOUS
- FAWN LILY
- CAMAS
- SEA BLUSH
- GOLDEN BLACK FERN
DEER, SEASONAL FAWNING AREAS, OBSERVED
NATIVE PLANT AREAS, HERBACEOUS
- FAWN LILY
- CAMAS
- SEA BLUSH
- GOLDEN BLACK FERN
OSPREY FAVOURED NESTING SITES, OBSERVED
PROGRAM SUPPORT BUILDING (NEW)
GARRY OAKLAND WOOD ECOSYSTEM
HABITAT 1: 100% VEGETATION ASSOCIATED WITH AEC 14.
10% HERBACEOUS COVER, 40% SHRUB COVER, 50% TREE COVER
HABITAT 2: 90% VEGETATION,10% BARE GROUND. NORTH FACING SLOPE ALONG SOUTH DOCK AREA.
10% HERBACEOUS COVER, 70% SHRUB COVER, 20% TREE COVER (OF THE VEGETATED AREA)
HABITAT 3: GRASSLAWN. 95% GRASSLAWN, 5% BARE GROUND.
HABITAT 4: 95% VEGETATION, 5% BARE GROUND ASSOCIATED WITH AECS 7, 10, 18.
10% HERBACEOUS COVER, 40% SHRUB COVER, 40% TREE COVER
HABITAT 5: 100% VEGETATION ALONG NTHERN AREA OF EGD PROPERTY.
10% HERBACEOUS COVER, 80% SHRUB COVER, 10% TREE COVER
HABITAT 6: GARRY OAK/ ARBUTUS ECOSYSTEMALONG HILLSLIDES AND BLUFFS.
80% HERBACEOUS COVER, 10% SHRUB COVER, 10% TREE COVER
HABITAT 7: 95% BARE GROUND, 5% HERBACEOUS COVER
AQUATIC BIOLOGICAL FEATURES
BROWN BLADED KELP (approx.) 2011
BROWN BLADED KELP BEDS (2017)
BROWN BLADED KELP BEDS - PREDISTURBANCE
BULL KELP (2017)

2.2.3 ARCHEOLOGICAL AREAS OF CONCERN

In 2010, PSPC engaged Golder Associates Ltd. to perform an archeological overview assessment of the EGD lands, the DND sites at Munroe Head and the Canadian Forces Sailing Association and Lot 203 on Songhees Nation land. The purpose of the report was to provide maps identifying locations of potential archeological sensitivity to help to guide future developments on the site. The initial report was provided in 2012 and was subsequently updated in 2018. The following is a summary of the key findings of the report.

The British Columbia Ministry of Aboriginal Relations and Reconciliation identified a series of First Nations with interests in the area including: the Esquimalt Nation, the Songhees Nation, the Panquachin First Nation, The Tsartlip First Nation, the Tsawout First Nation, the Tseycum First Nation, as well as the member First Nations of the Hul'qumi'num Treaty Group and the Te-mexw Treat Association.

There are six registered Archeological Sites within the project boundary:

1) DcRu -6: *this site contains human remains and stratified deposits containing diagnostic materials dating back 2,000 years. It is located on the south side of the Esquimalt Graving Dock and extends south and west around Pilgrim Cove*

2) DcRu-12: *is a shell midden site containing human burials. It is located in the northwest portion of Munroe Head and extends north to Ashe Head and Lot 203*

3) DcRU-789 and DcRu-790: *these sites contain small intact shell midden deposits. They are located to the west and northeast of the Pump House*

4) DcRu-1255: *this site contains intermittent pockets of disturbed, low-density shell middens. It is located along the north security fence from Parking Lot A to Parking Lot B and northwest of Lot B*

5) DcRu-1256: *this site is a designated location for stockpiling archeological sediments disturbed as a result of development on site. It is located at the head of the Graving Dock, within a green space.*

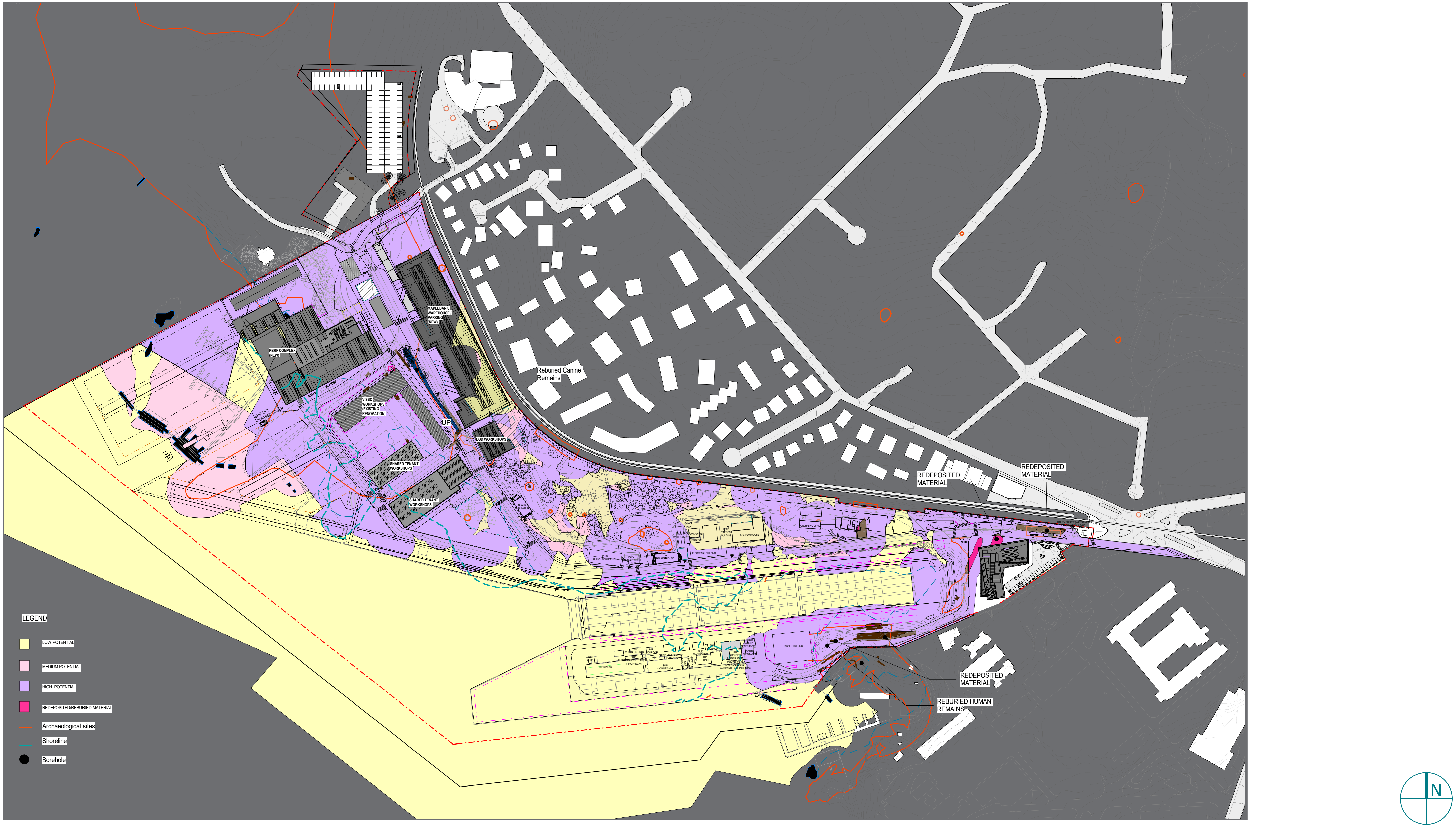
A considerable number of Archeological Impact Assessments (AIA) have been performed at Esquimalt Harbour and in and around the site. Golder Associates performed reviews of these reports and other available documentation such as borehole logs recorded in geotechnical reports prepared for the site. These reviewed documents suggested that precontact shell midden deposits may be present in other areas of the EGD beyond the six registered sites.

Based on materials reviewed, Golder Associates produced a predictive model of the site, identifying low, moderate and high probabilities of archeological sensitivity. These findings are represented in Areas of Concern figure opposite. As the figure shows, the areas along the historical coastline, which forms a large percentage of the EGD site, are areas with high potential for archeological findings.

Following the report by Golder Associates, PSPC engaged Wood Environment and Infrastructure Systems to perform an AIA on Lot 2 of the Lockley site as part of a review of proposed upgrades to the surface parking lot. In December 2020, Wood performed a site review that included 28 shovel tests and 8 auger tests. The tests did not reveal in any archeological resources or anthropogenic sediments. Based on those findings, wood recommended the area be classified as having low archeological potential. Those findings have been incorporated in the Areas of Concern figure.

Figure 2.4 A, B, C, D, E (above) Site Walk Through, Key Sites across EGD

Figure 2.5 (opposite) Archeological Areas of Concern


Reburied Canine Remains
REDEPOSITED MATERIAL
REDEPOSITED MATERIAL
REDEPOSITED MATERIAL
REBURIED HUMAN REMAINS
LEGEND
LOW POTENTIAL
MEDIUM POTENTIAL
HIGH POTENTIAL
REDEPOSITED/REBURIED MATERIAL
Archaeological sites
Shoreline
Borehole
N

HIGHEST VALUE OF LAND

Today the most sought after land at EGD is proximate to the graving dock and wharf faces. Cranes and other equipment utilize adjacent laydown areas for staging of vessel components, mobile workshops or support sea-can units or general flow of materials. As highlighted by the Esquimalt Graving Dock - Land Use Plan Report, dated June 2018, prepared by KPMG and Klohn Crippen Berger:

> *' Land at EGD is limited and should be developed for the highest and best use to ensure safe and economical delivery of services; a desirable place to work; efficient transportation and movement of people and goods; and the highest level of service to industry.'*
>
> *The most valuable land is the land adjacent to the water and Graving Dock, and should be reserved for ship refit and repair activities.'*

The Conceptual Plan 2021 includes a 25 meter wide area along the proposed new wharf face that is intended for crane travel and short-term marshaling of materials and equipment to support projects. As well, tenant space is proximate to the new vessel repair areas, the dry-dock and berths along the north-west wharf.

Figure 2.6 (top) Highest Value of Land

Figure 2.7 EGD Site Fly-Over YouTube, retrieved April 2020
Source: https://www.tpsgc-pwgsc.gc.ca/biens-property/cse-egd/propos-about-esquimalt-eng.html#c7

11

COSTING & IMPLEMENTATION STRATEGY

11.1 IMPLEMENTATION PHASING STRATEGY

With the intent to remain fully operational over the construction period the Phasing Strategy outlines the proposed sequencing of projects at EGD. **The time line indicates the sequence of construction projects on the main site and does not include the procurement and design. Next steps require PSPC to identify the procurement strategy to further to detail the design construction sequencing.**

The Phasing Strategy includes future site and structures, requiring a footprint, identified in the Conceptual Plan process to inform project sequencing and necessary construction staging at EGD. Note the tenant driven Camosun Coastal Centre expansion is excluded from the PSPC Delivery Plan and is not dependent on the Conceptual Plan. Some projects have already been initiated and may be under development such as the re-alignment of the Maplebank Road, Utilidor Corridor and North-West Sub-Station / Compressor Building as well as the expansion to the existing Dry-Dock. Note there may be additional projects and site improvements underway or forecasted that the Conceptual Plan does not detail.

The Phasing Strategy takes into consideration the transfer of land in April 2022 including the Naden and Canadian Forces Sailing Club properties.

Main construction projects and lower severity construction projects are indicated in dark and light blue respectively to indicate the critical path items. Outdoor laydown areas or smaller structures are carried in green.

The following pages diagram the proposed Implementation Phasing Strategy, refer to tabular summary for components in a particular phase.

FINAL STATE - CONCEPTUAL PLAN

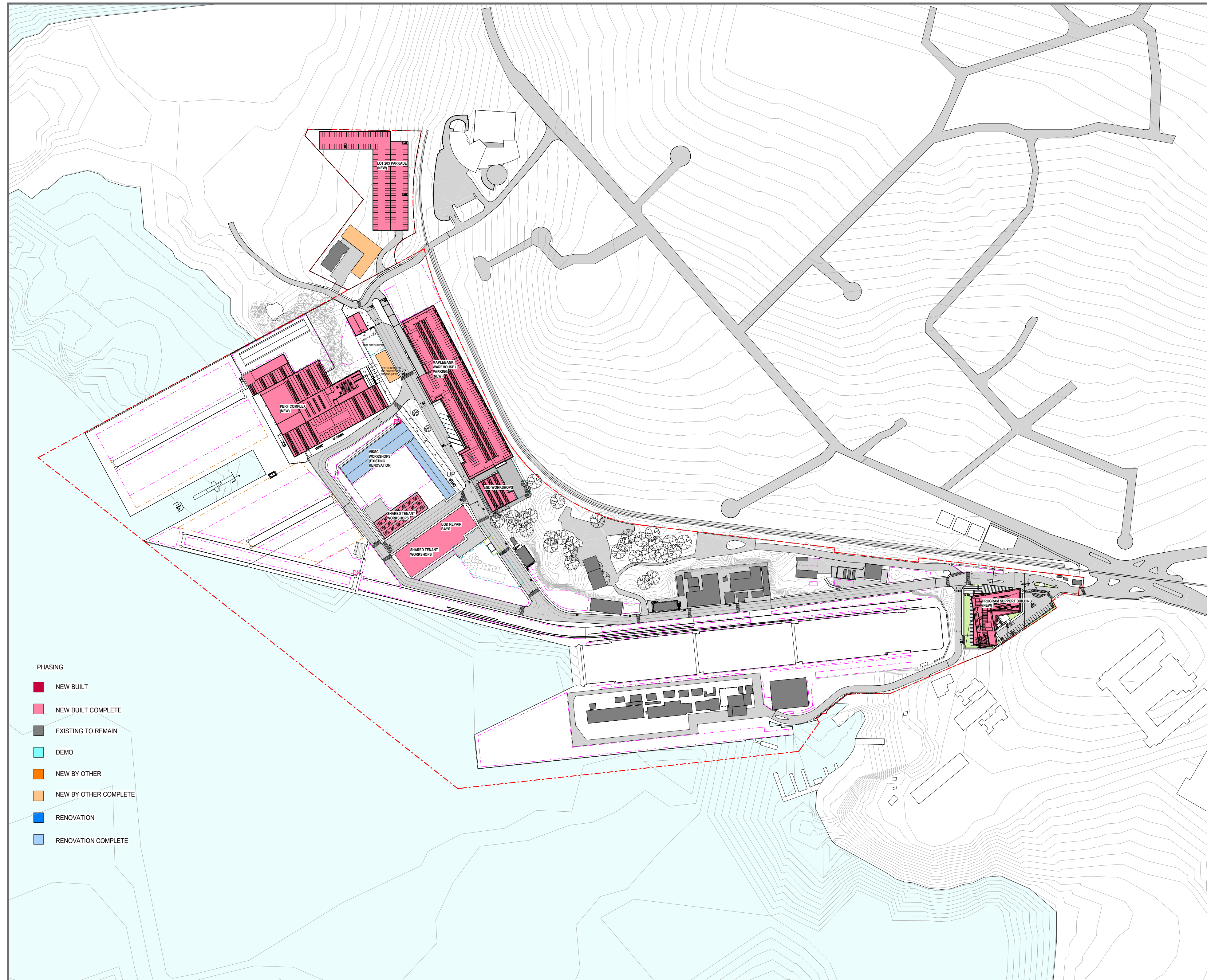


Figure 11.1 EGD Conceptual Plan, Implementation Strategy, Final-State

Figure 11.2 (opposite) Implementation Phasing Strategy, Construction Sequencing

EGD Conceptual Construction Sequencing

(Year 1 – Year 8, Q1–Q4 each)

Phase	TYPE	Project
1		
A	MAIN	West Gate: Maplebank Road realignment including adjustments to main circulation through site
A	MAIN	Dry Dock Extension
A	OUT	In-water remediation works
A	DEMO	Demolish Old Kiln Building at the beginning of this phase as building is at end of life.
A	OUT	Temporarily relocate PBRF storage and laydown areas from Lot 203 onto Songhees land
A	OUT	Temporarily locate Tenant 6 proximate to Tenant 8 (North corner of Maplebank Parking)
B	MAIN	East Gate: Relocate circulation at site entrance including connection to south jetty and north quad
B	MAIN	**Build parkade on Lot 203 with surface parking to relocate parking from Maple Bank**
B	MAIN	Build new West Sub-Station and Compressor Building
B	CIRC	Build new utilidor (new duct line) and road to west entrance/substation
B	MAIN	Build new West Gate Secondary Entry guardhouse / support building (optional kiosk). Adjacent Bike / golf cart parking.
B	FLEX	Build extension of Camosun Coastal Centre (Not included in PSPC Delivery Plan)
B	OUT	Create new Waste/Recycling compound
C	FLEX	**Build new Maplebank Warehouse with parking on rooftop**
C	DEMO	Demolish Old Gatehouse Buildings 1001/1002
C	OUT	North-west landing site prep and land infill
2		
	DEMO	Demolish the DND buildings on the CBSA (sailing club) site (North-West Gate) following land transfer
	OUT	Temporarily relocate Tenant 3 and 4 to south jetty
	MAIN	**Build new West Wharf with Ship Lift**
	CIRC	Build new access road between existing PBRF and new PBRF
	DEMO	Demolish Support Equipment/Raw Material Warehouse (Jenkins Building) at the end of the phase
	DEMO	Demolish 3 buildings on DND site at the East gate after land has been hand over to EGD
	MAIN	**Build new Program Support Building with parkade and east gate entry**
	FLEX	Tenant 1 admin relocate to Program Support Building / (Buildings 2001, 2002, 1036, 1037).
	FLEX	EGD Ops Management / PSPC relocates (Buildings 2025, 2024)
	FLEX	South jetty: Tenant Improvement, new SOB warehouse/office (in the same location as the existing one) Not shown.
3		
	FLEX	Tenant 8 and Tenant 6 locate to vacated building 2001
	MAIN	**Build and Relocate the PBRF secure compound on the new wharf including PBRF enclosed storage**
	DEMO	Demolish all smaller buildings in the old PBRF compound except for the Main Hangar and Workshop building
	DEMO	Demolish smaller buildings along north bedrock, including Tenant Building 1037, 1036, EGD Building 2024.
4		
	MAIN	**Repurpose the vacated PBRF hangar to workshops**
	MAIN	**Renovate VISCC**
	MAIN	Reconfigure wastewater treatment plant laboratory building and tanks (Tenant 5)
	DEMO	Demolish Tenant 1 workshops and warehouses
	OUT	Give temp. leased land adjacent to Lot 203 back to Songhees
5		
	MAIN	**Build new Shared Tenant Building (paint/sandblast workshop shown)**
	MAIN	**Build new EGD Operations (Repair Bays) / Shared Tenant Building**
	MAIN	**Build new EGD Operations (Workshops) Building**
	FLEX	EGD Ops relocates to new facilities.
	OUT	Move Tenant 3 and Tenant 4 to Share Tenant building
	OUT	Building 2025 available for tenants, including Tenant 12
	2ND	Build new road between the Shared Tenant Buildings
	2ND	Build new Fuel Storage
	FLEX	South Jetty (new washroom and lunch truck area)
	FLEX	North lunch truck area Café Vendor/Washrooms and Lunch Area

1 DND Lease handover April 2022

COLOR LEGEND

MAIN	Main Construction Project
2ND	Lower severity Construction Project
DEMO	Demolition Project
OUT	Outbuildings and Laydown Areas
FLEX	Projects that can be realised in any phase

IMPLEMENTATION PHASING STRATEGY, CONSTRUCTION SEQUENCING, PHASE 1A

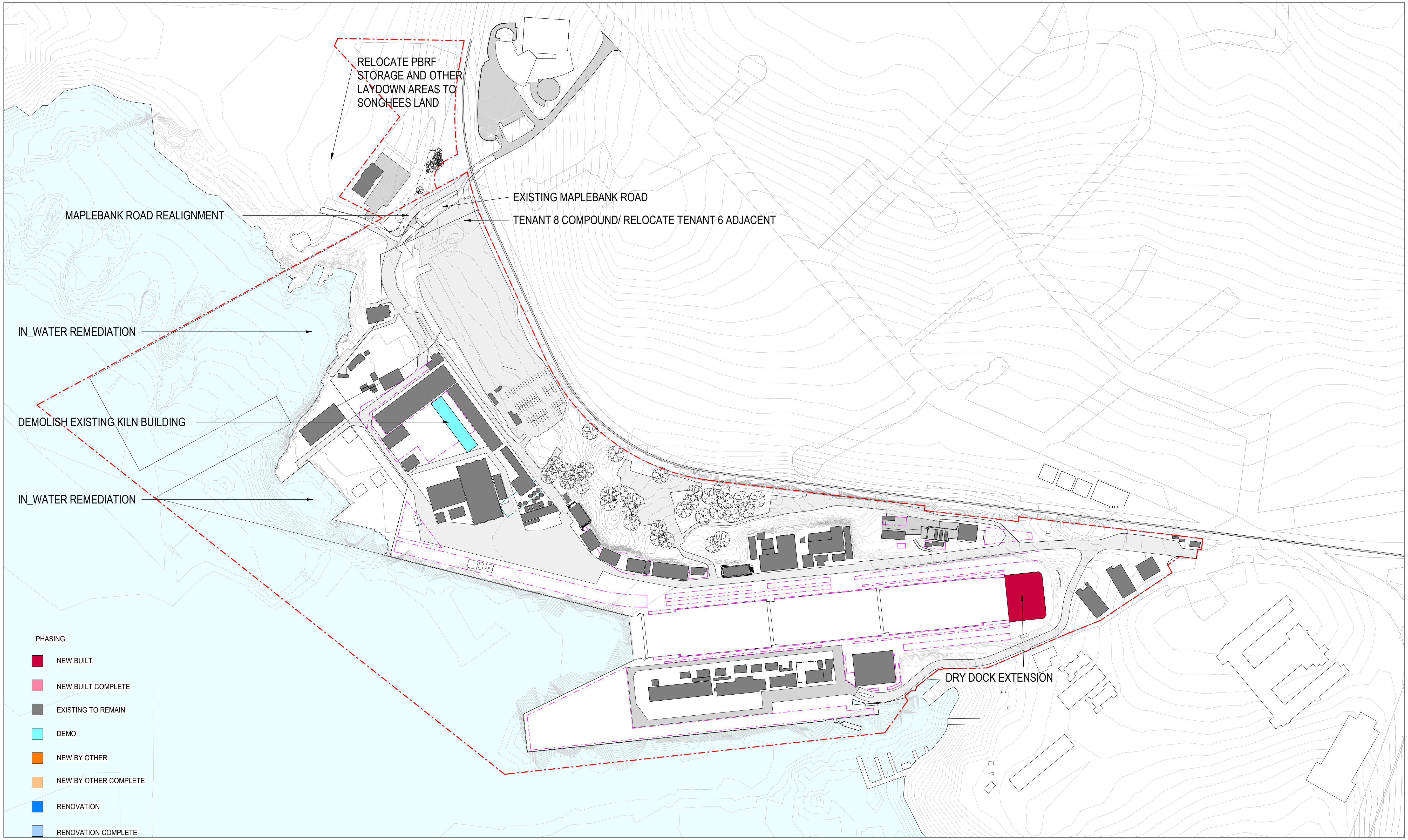


Figure 11.3 EGD Conceptual Plan, Construction Sequencing, Phase 1A

IMPLEMENTATION PHASING STRATEGY, CONSTRUCTION SEQUENCING, PHASE 1B

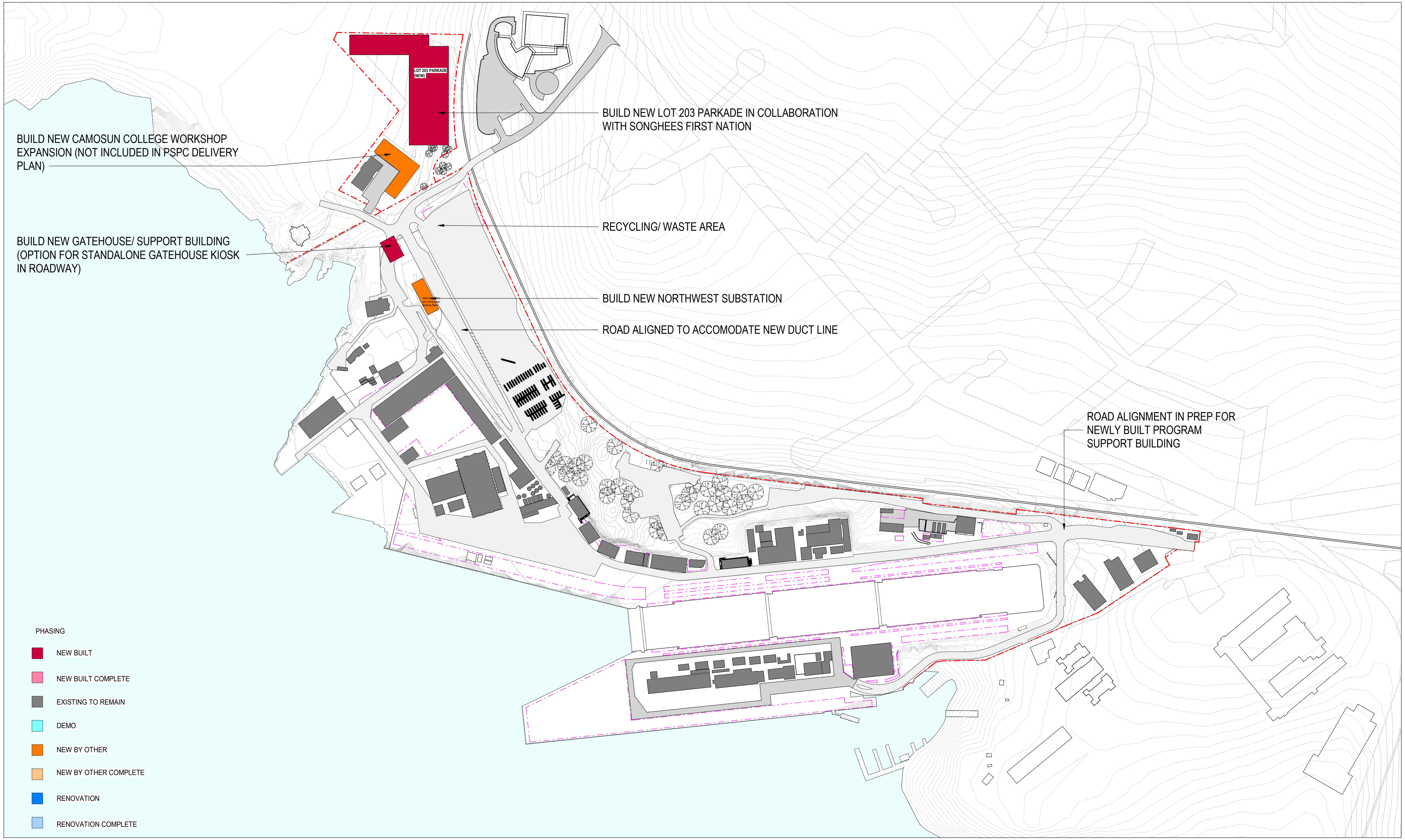


Figure 11.4 EGD Conceptual Plan, Construction Sequencing, Phase 1B

IMPLEMENTATION PHASING STRATEGY, CONSTRUCTION SEQUENCING, PHASE 1C

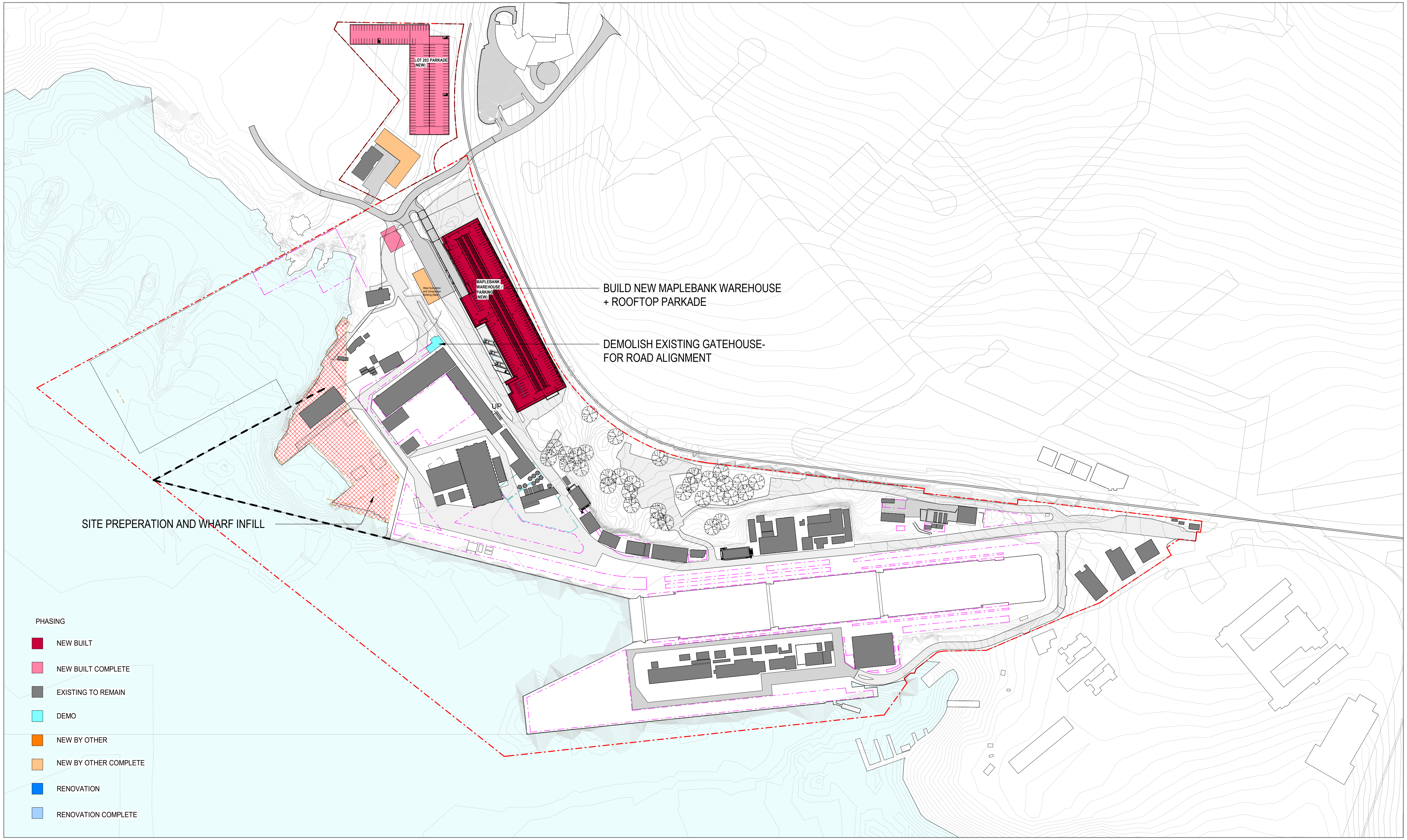


Figure 11.5 EGD Conceptual Plan, Construction Sequencing, Phase 1C

IMPLEMENTATION PHASING STRATEGY, CONSTRUCTION SEQUENCING, PHASE 2

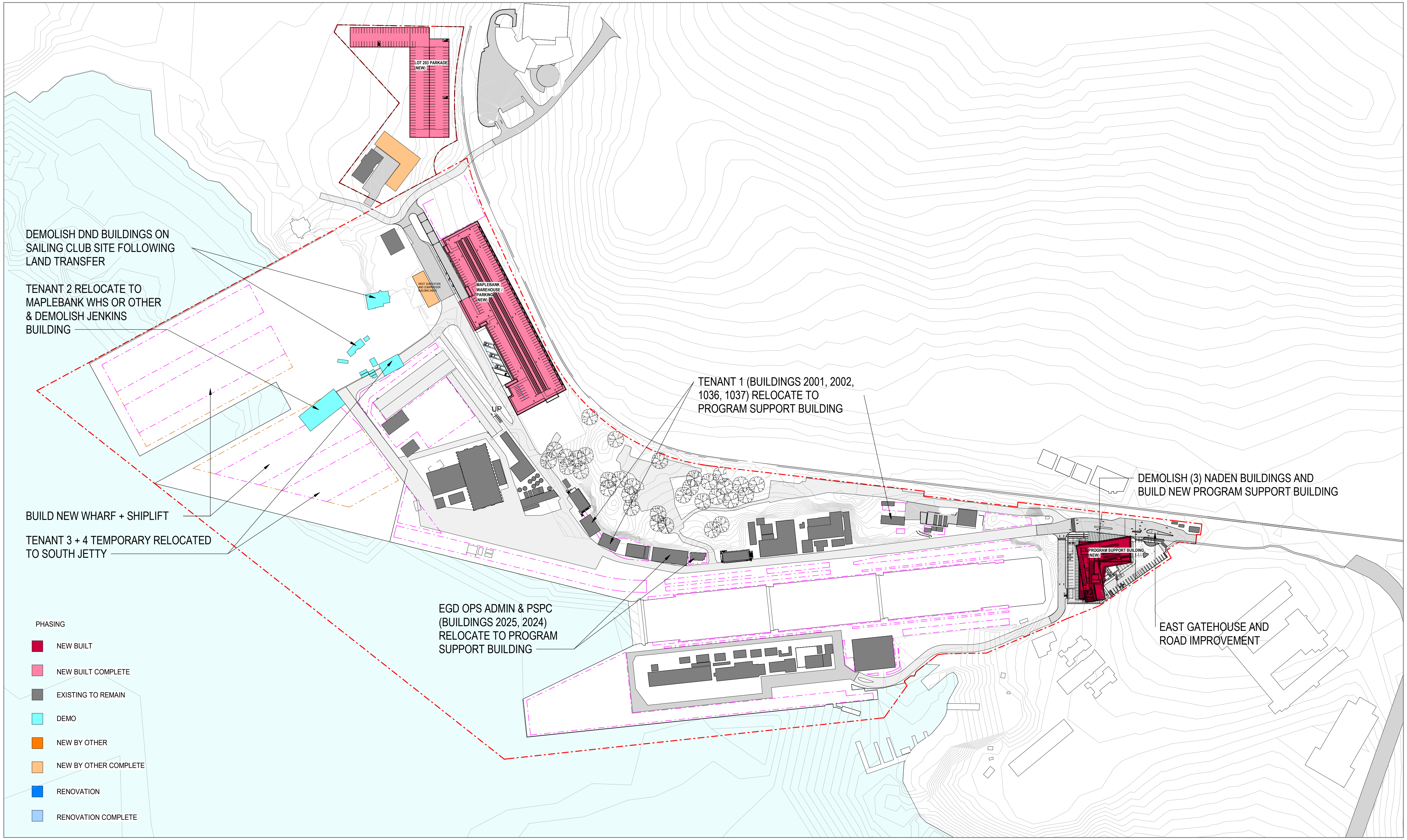


Figure 11.6 EGD Conceptual Plan, Construction Sequencing, Phase 2

IMPLEMENTATION PHASING STRATEGY, CONSTRUCTION SEQUENCING, PHASE 3

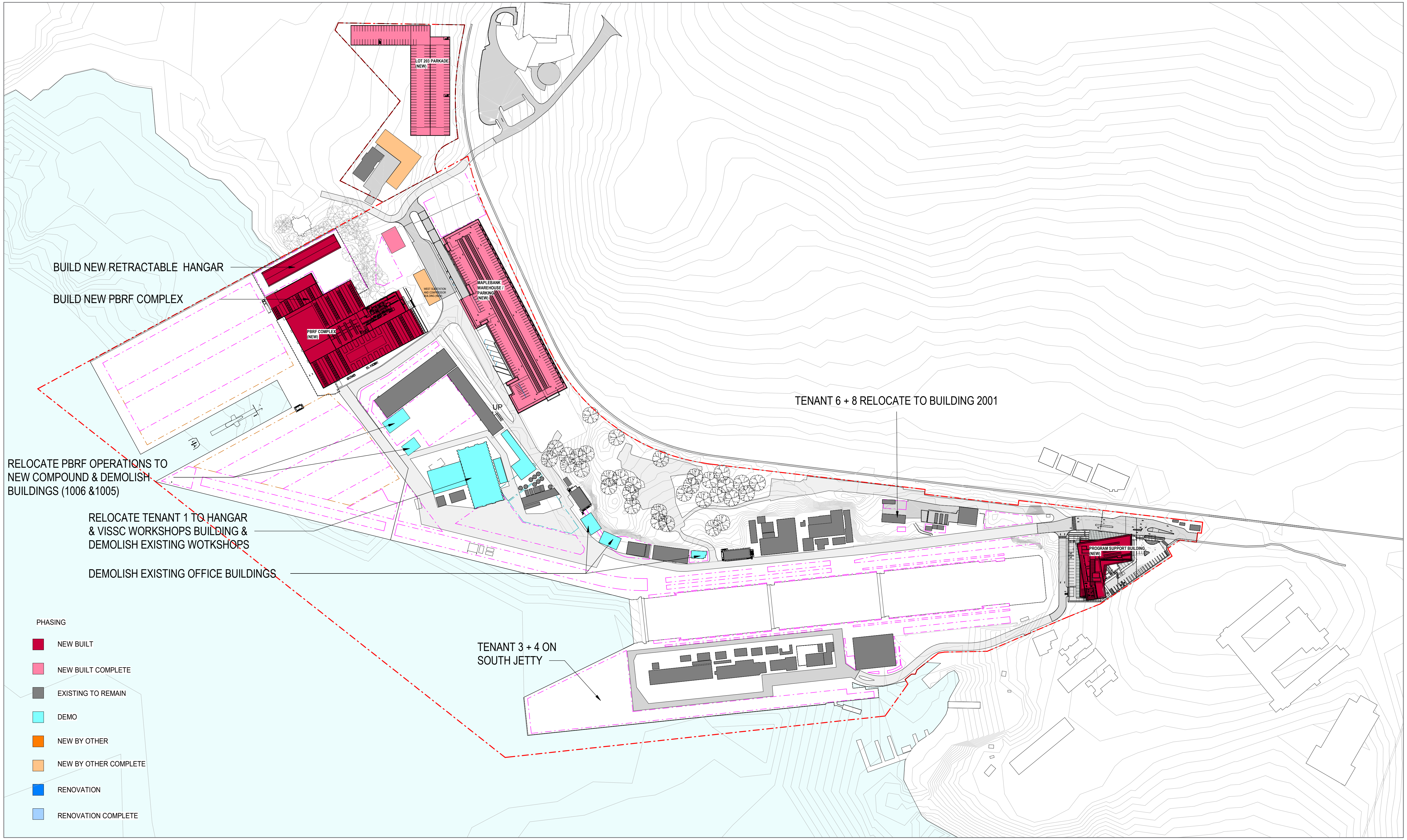


Figure 11.7 EGD Conceptual Plan, Construction Sequencing, Phase 3

IMPLEMENTATION PHASING STRATEGY, CONSTRUCTION SEQUENCING, PHASE 4

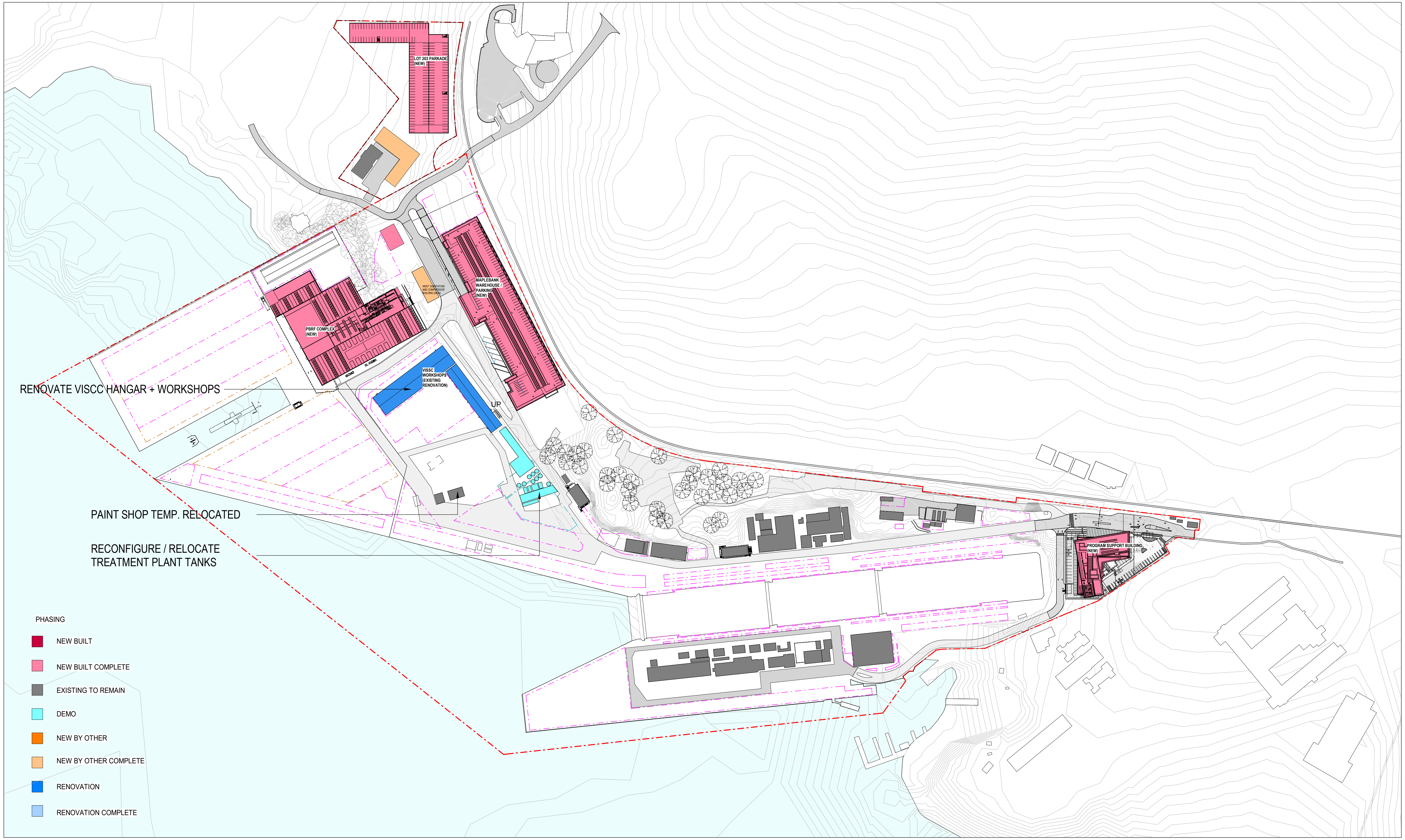


Figure 11.8 EGD Conceptual Plan, Construction Sequencing, Phase 4

IMPLEMENTATION PHASING STRATEGY, CONSTRUCTION SEQUENCING, PHASE 5

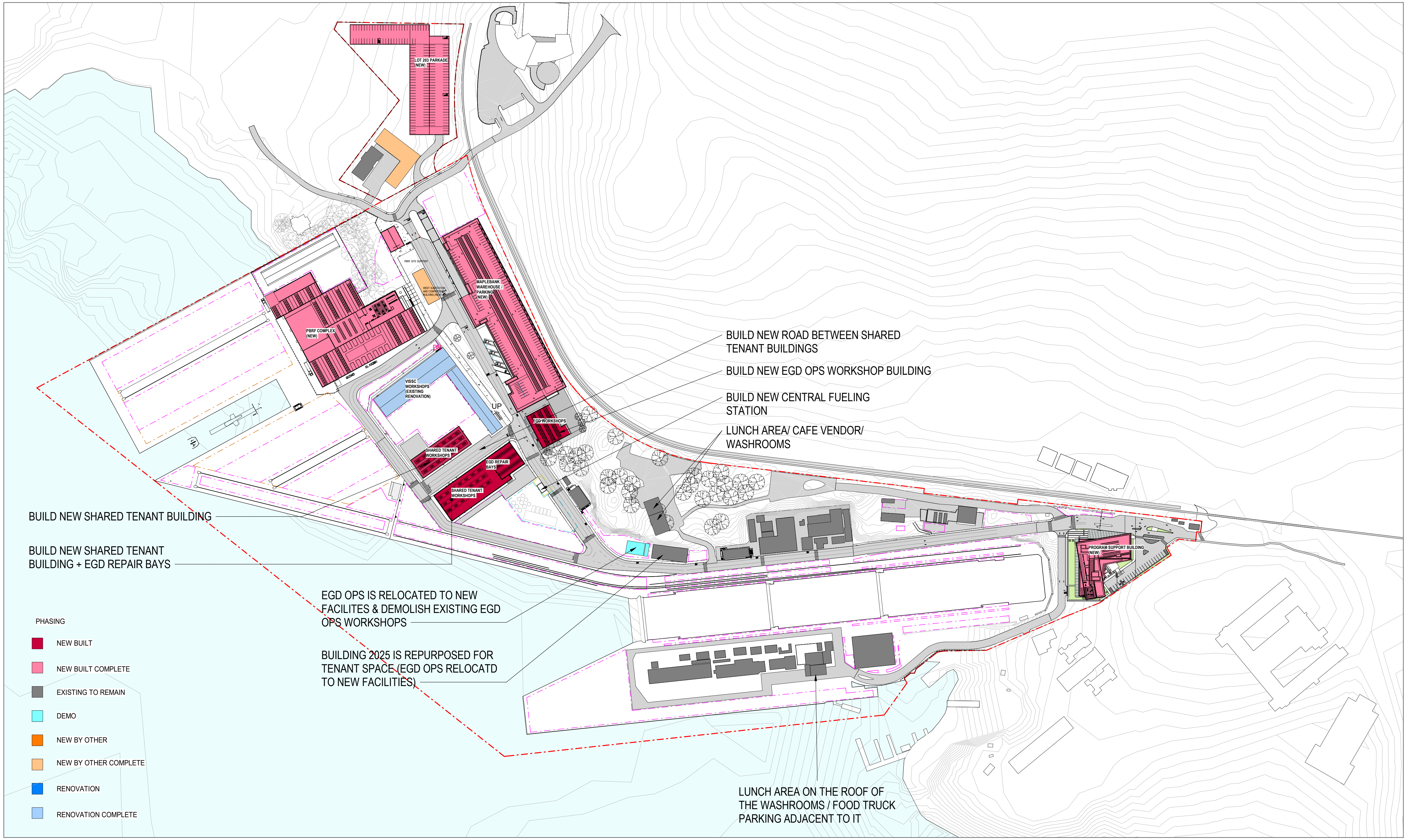


Figure 11.9 EGD Conceptual Plan, Construction Sequencing, Phase 5

IMPLEMENTATION PHASING STRATEGY, FINAL STATE

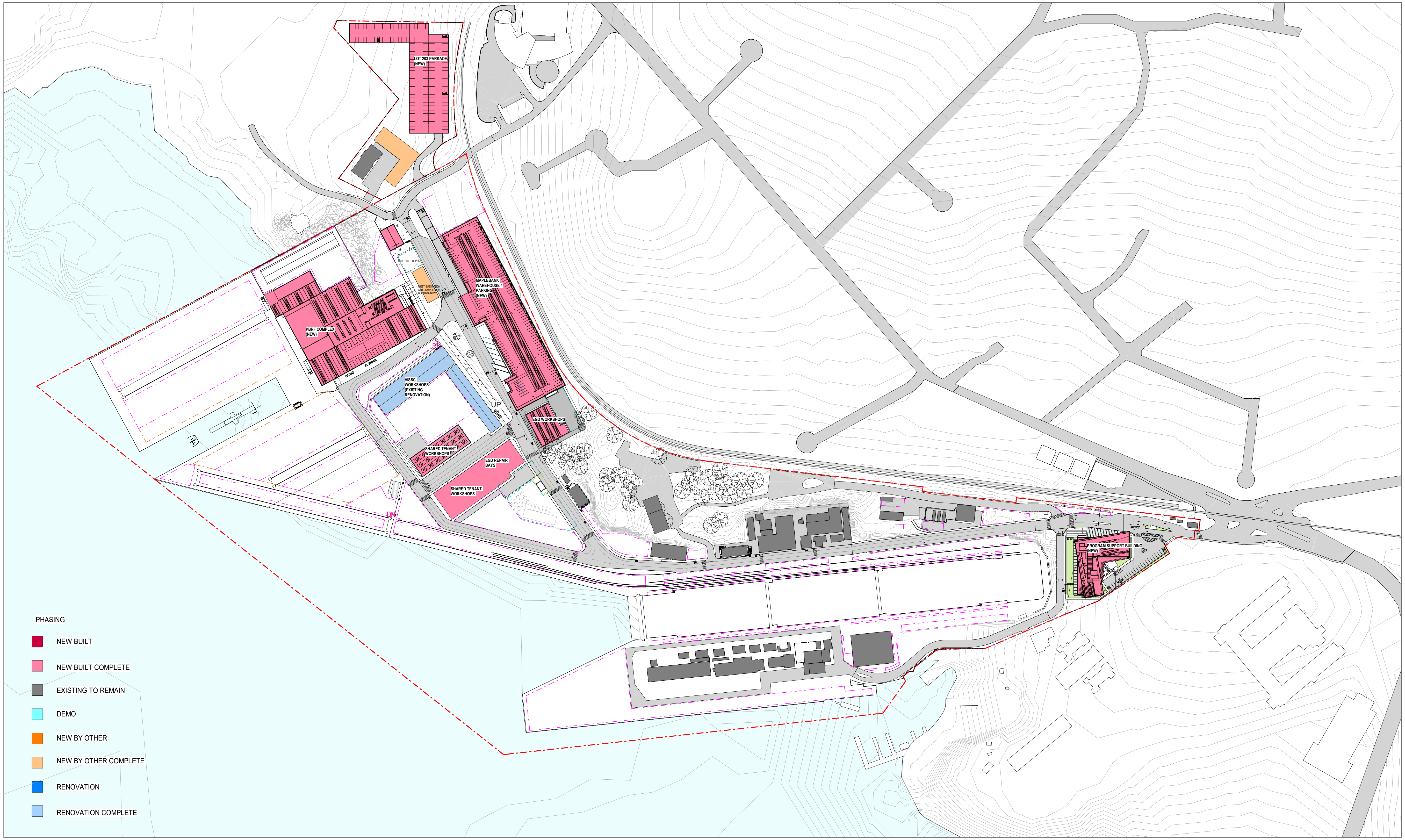
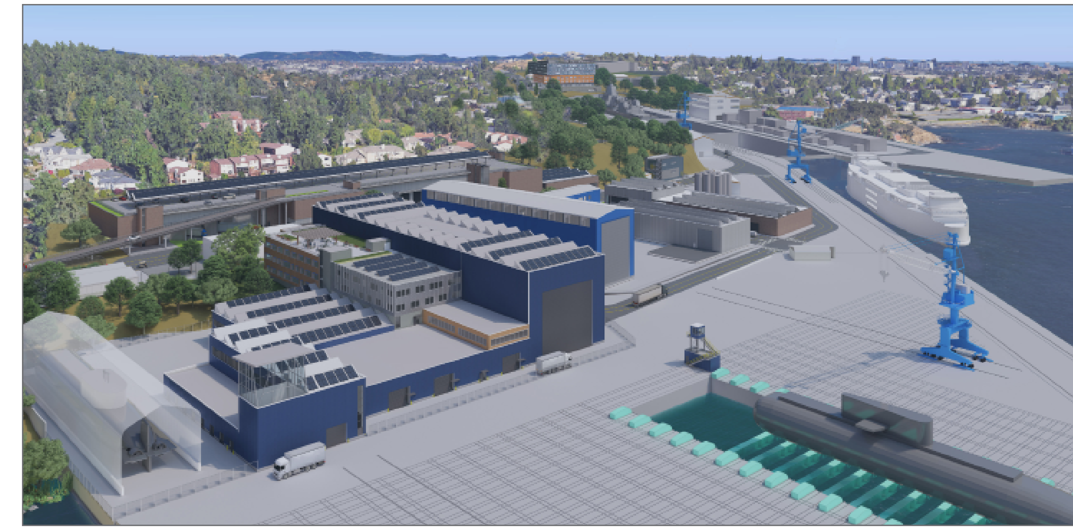


Figure 11.10 EGD Conceptual Plan, Implementation Strategy Final State



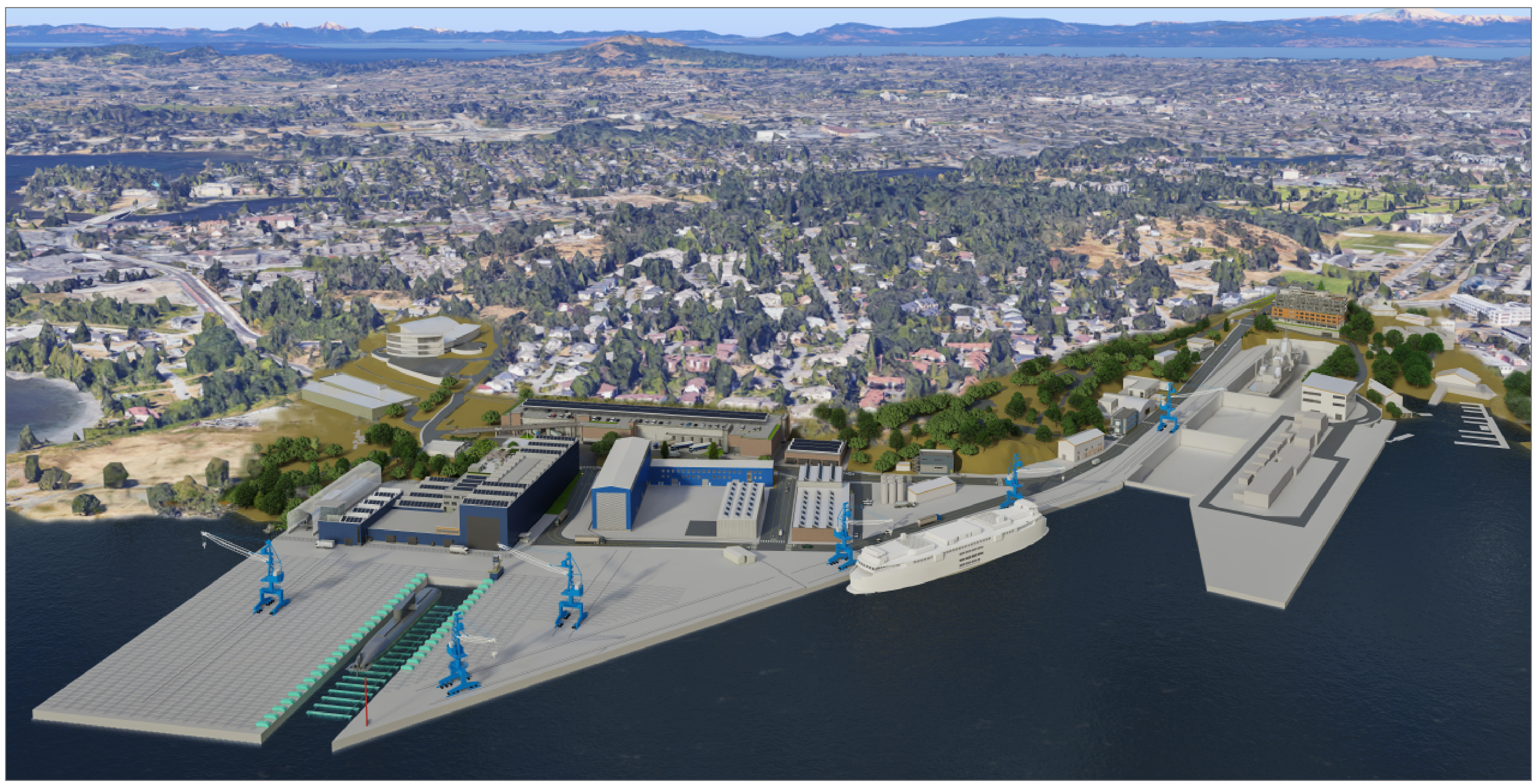


Figure 11.11 (top left) EGD Program Support Building

Figure 11.12 (top middle) PBRF Complex

Figure 11.13 (top right) North-West Landing Upland Facilities

Figure 11.14 (bottom left) EGD Conceptual Plan, Aerial View

Figure 11.15 (bottom right) PBRF Complex Rooftop Terrace

A

APPENDIX A:

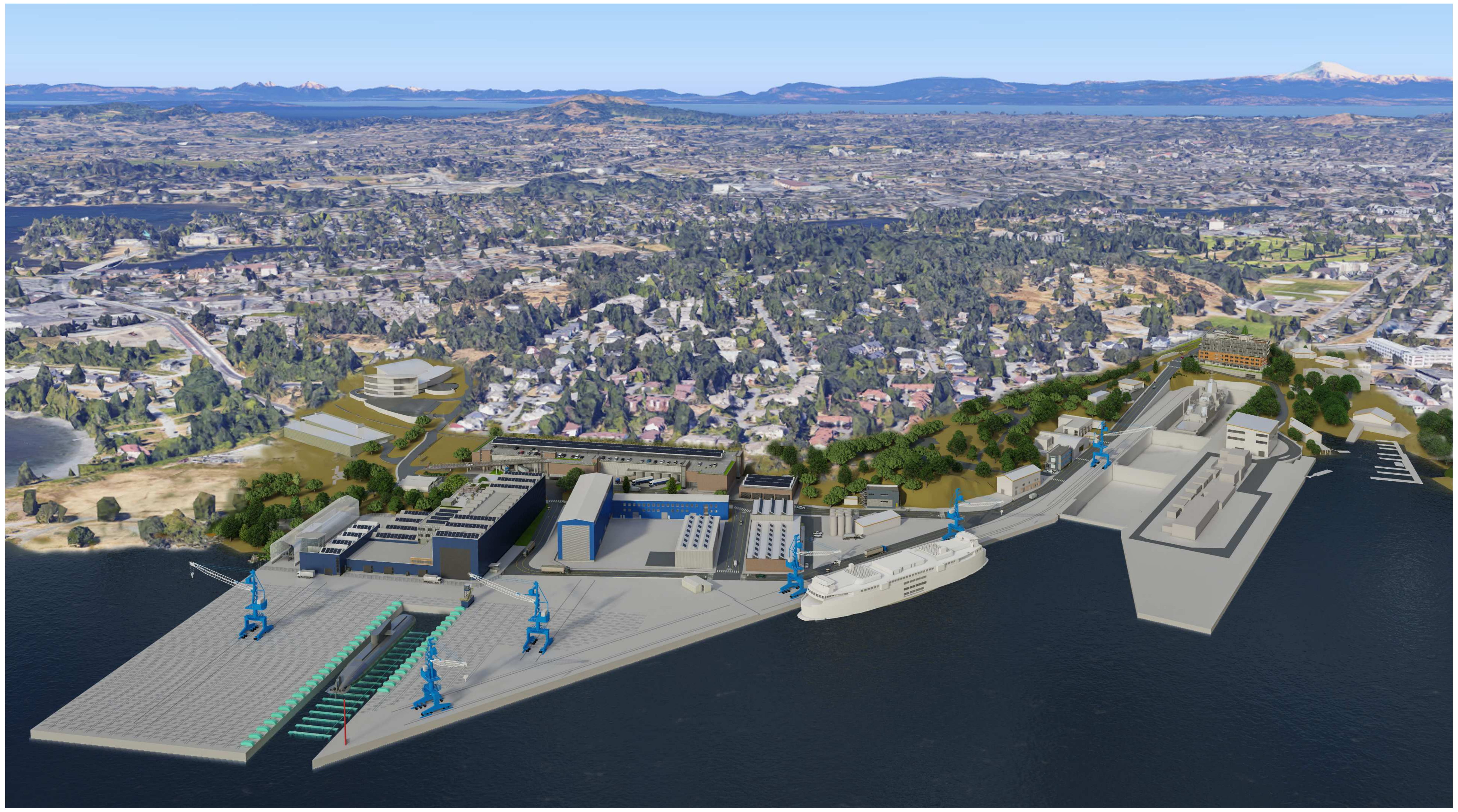
ARCHITECTURAL DRAWING PACKAGE

ESQUIMALT GRAVING DOCKS (EGD)

ESQUIMALT, BRITISH COLUMBIA, CANADA

100% CONCEPT DESIGN

JULY 26, 2021



DRAWING LIST

SITE

Sheet Number	Sheet Name
A02000	COVER SHEET
A02100	SITE PLAN - OVERALL
A02101	SITE PLAN -WEST
A02102	SITE PLAN - EAST
A02203A	SITE PLAN DETAIL WEST GATE
A02203B	SITE PLAN DETAIL NORTHWEST
A02203C	SITE PLAN DETAIL SOUTHWEST
A02203D	SITE PLAN DETAIL EAST GATE - PROGRAM SUPPORT BUILDING
A02204	PARKING
A02205	PEDESTRIAN
A02206	VEHICULAR
A02206 A	INTERSECTION
A02206 B	INTERSECTION
A02206 C	INTERSECTION
A02206 D	INTERSECTION
A02206 E	INTERSECTION
A02206 F	INTERSECTION
A02206 G	INTERSECTION
A02207	LAYDOWN AREAS
A02208	DUCT BANK PLAN
A02209	ENVIRONMENTAL
A02210	ARCHEOLOGICAL
A02401	TOPOGRAPHY/ELEVATIONS - WEST
A02402	TOPOGRAPHY/ELEVATIONS - EAST
A02403	SITE SECTIONS
A02404	LEVEL MATRIX

ACCESSORY BUILDING

Sheet Number	Sheet Name
A02501	EAST GATEHOUSE
A02502	WEST GATEHOUSE/AMENITY

PROGRAM SUPPORT BUILDING

Sheet Number	Sheet Name
A03000	COVER PAGE
A03100	SITE - EAST GATE
A03200	FLOOR PLAN - LEVEL - P3 PARKING
A03201	FLOOR PLAN - LEVEL - P2 PARKING
A03202	FLOOR PLAN - LEVEL - P1 PARKING
A03203	FLOOR PLAN - LEVEL 1
A03204	FLOOR PLAN - LEVEL 2
A03205	FLOOR PLAN - LEVEL 3
A03206	FLOOR PLAN - LEVEL 4
A03207	FLOOR PLAN - LEVEL 5
A03208	FLOOR PLAN - LEVEL 6
A03209	FLOOR PLAN - ROOF LEVEL
A03300	EXTERIOR ELEVATIONS NORTH AND EAST
A03301	EXTERIOR ELEVATIONS SOUTH AND WEST
A03310	BUILDING SECTIONS
A03900	RENDERED 3D VIEWS OF EXTERIOR
A03901	RENDERED 3D VIEWS OF EXTERIOR

EGD WORKSHOPS

Sheet Number	Sheet Name
A04100	COVER SHEET
A04101	GROUND FLOOR PLAN
A04102	MEZZANINE
A04103	ROOF PLAN
A04104	EXTERIOR ELEVATIONS
A04105	BUILDING SECTIONS
A04106	AXONOMETRICS

SHARED TENANT BUILDING / EGD BAYS

Sheet Number	Sheet Name
A05100	COVER PAGE / PROJECT DIRECTORY
A05101	MAIN FLOOR PLAN
A05102	MEZZANINE FLOOR PLAN
A05103	ROOF PLAN
A05104	EXTERIOR ELEVATIONS
A05105	BUILDING SECTIONS
A05106	AXONOMETRICS

VISSC RENOVATION

Sheet Number	Sheet Name
A06100	COVER SHEET
A06200	BUILDING 1004 PLANS
A06201	BUILDING 1003 PLANS
A06300	WAREHOUSE/VISSC ELEVATIONS
A06301	WAREHOUSE/VISSC ELEVATIONS
A06400	WAREHOUSE/VISSC SECTIONS

SHARED TENANT BUILDING

Sheet Number	Sheet Name
A07100	COVER SHEET
A07200	SHARED TENANT BUILDING PLANS
A07201	SHARED TENANT BUILDING PLANS
A07300	SHARED TENANT BUILDING ELEVATIONS
A07400	SHARED TENANT BUILDING SECTIONS
A07401	SHARED TENANT BUILDING AXONOMETRICS

MAPLEBANK WAREHOUSE

Sheet Number	Sheet Name
A08100	COVER PAGE
A08101	OVERALL FLOOR PLANS
A08102	OVERALL FLOOR PLANS
A08103	GROUND FLOOR PLAN GL1 TO GL9
A08104	GROUND FLOOR PLAN GL9 TO GL18
A08105	MEZZANINE LEVEL FLOOR PLAN GL1 TO GL9
A08106	MEZZANINE LEVEL FLOOR PLAN GL9 TO GL18
A08107	PARKING LEVEL FLOOR PLAN GL1 TO GL9
A08108	PARKING LEVEL FLOOR PLAN GL9 TO GL18
A08109	ROOF PLAN GL1 TO GL9
A08110	ROOF PLAN GL9 TO GL18
A08111	OVERALL EXTERIOR ELEVATIONS
A08112	EXTERIOR ELEVATIONS
A08113	EXTERIOR ELEVATIONS
A08114	BUILDING SECTIONS
A08115	BUILDING SECTIONS
A08116	AXONOMETRICS
A08117	AXONOMETRICS

PBRF

Sheet Number	Sheet Name
A09100	COVER PAGE
A09101	PBRF AREA PLAN
A09102	PBRF AREA PLAN
A09103	PBRF AREA PLAN
A09104	PBRF COMPLEX LEVEL 1
A09105	PBRF COMPLEX MEZZANINE
A09106	PBRF COMPLEX OFFICE LEVEL 1
A09107	PBRF COMPLEX OFFICE LEVEL 2
A09108	PBRF COMPLEX OFFICE LEVEL 3
A09109	PBRF COMPLEX ROOF LEVEL
A09110	ELEVATIONS
A09111	ELEVATIONS
A09112	ELEVATIONS
A09113	PBRF COMPLEX SECTIONS
A09114	PBRF COMPLEX SECTIONS
A09115	OVERALL PBRF WHARF VIEW
A09116	OVERALL PBRF COMPLEX VIEW
A09117	PERSPECTIVES VIEWS
A09118	PERSPECTIVE VIEWS
A09119	SIF/COMMS VIEW OF SIGHT STUDY

PARKADE

Sheet Number	Sheet Name
A10000	COVER PAGE
A10101	LOT 203 P1 - A
A10102	LOT 203 P2 - A
A10103	LOT 203 P3 - A
A10104	LOT 203 AXON & SECTIONS - A
A10302	LOT 203 P1 - B
A10303	LOT 203 P2 - B
A10304	LOT 203 P3 - B
A10305	LOT 203 AXON & SECTIONS - B

PHASING

Sheet Number	Sheet Name
A11000	PHASING _EXISTING
A11001	PHASING _PHASE 1
A11002	PHASING _PHASE 2
A11003	PHASING _PHASE 3
A11004	PHASING _PHASE 4
A11005	PHASING _PHASE 5
A11006	PHASING _PHASE 6
A11007	PHASING _FINAL STATE
A11008	Unnamed

Public Works and Government Services Canada
Travaux publics et Services gouvernementaux Canada

REAL PROPERTY SERVICES
Pacific Region
SERVICES IMMOBILIERS
Région de Pacifique

kasian

Project Title: 220064

Revision / Revision	Description / Description	Date / Date
3	Issued for 100% Concept Design	2021-07-26
2	Issued for Concept Design Review	2021-06-30
1	Issued for 60% Draft Concept Design Review	2021-03-31

Client / client

PSPC

Project title / Titre du project

825 ADMIRALS ROAD, VICTORIA, B.C.

EGD MP - SITE

Consultant Signature Only
Approver

Designed by / Concept par
Designer

Drawn by / Dessine par
Author

PWGSC, Project Manager / Administrateur de Projects , TPSGC
Approver

PWGSC, Reginal Manager, Architectural and Engineering services / Gestionnaire regionale, services d' architectural et de genie, TPSGC
Approver

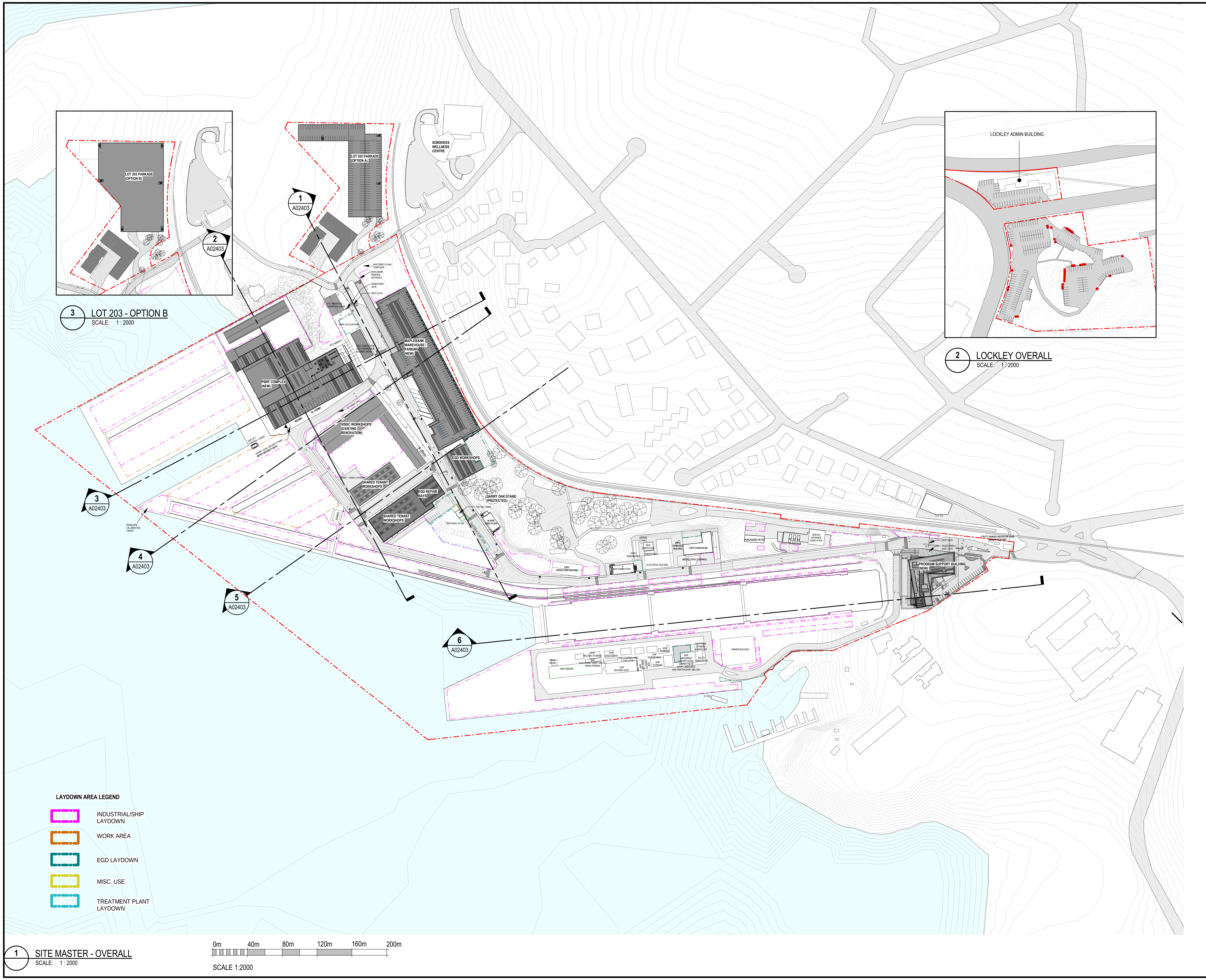
Drawing title / Titre du dessin

COVER SHEET

Project No. / No. du Project: R.108702.001

Sheet / Feuille: A02000 OF 0000

Revision no. / La Revision no.: 3



Public Works and Government Services Canada
Travaux publics et Services gouvernementaux Canada

REAL PROPERTY SERVICES
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Région de Pacifique

Kasian

Project Title: 220064

Revision / Revision	Description / Description	Date / Date
4	Issued for 100% Concept Design	2021-07-26
3	Issued for Concept Design Review	2021-06-30
2	Issued for 90% Draft Concept Design Review and Costing	2021-06-18
1	Issued for 60% Draft Concept Design Review	2021-03-31

Client / client

PSPC

Project title / Titre du project

825 ADMIRALS ROAD, VICTORIA, B.C.

EGD MP - SITE

Consultant Signature Only
Approver

Designed by / Concept par
Designer

Drawn by / Dessine par
Author

PWGSC, Project Manager / Administrateur de Projects , TPSGC
Approver

PWGSC, Reginal Manager, Architectural and Engineering services / Gestionnaire regionale, services d' architectural et de genie, TPSGC
Approver

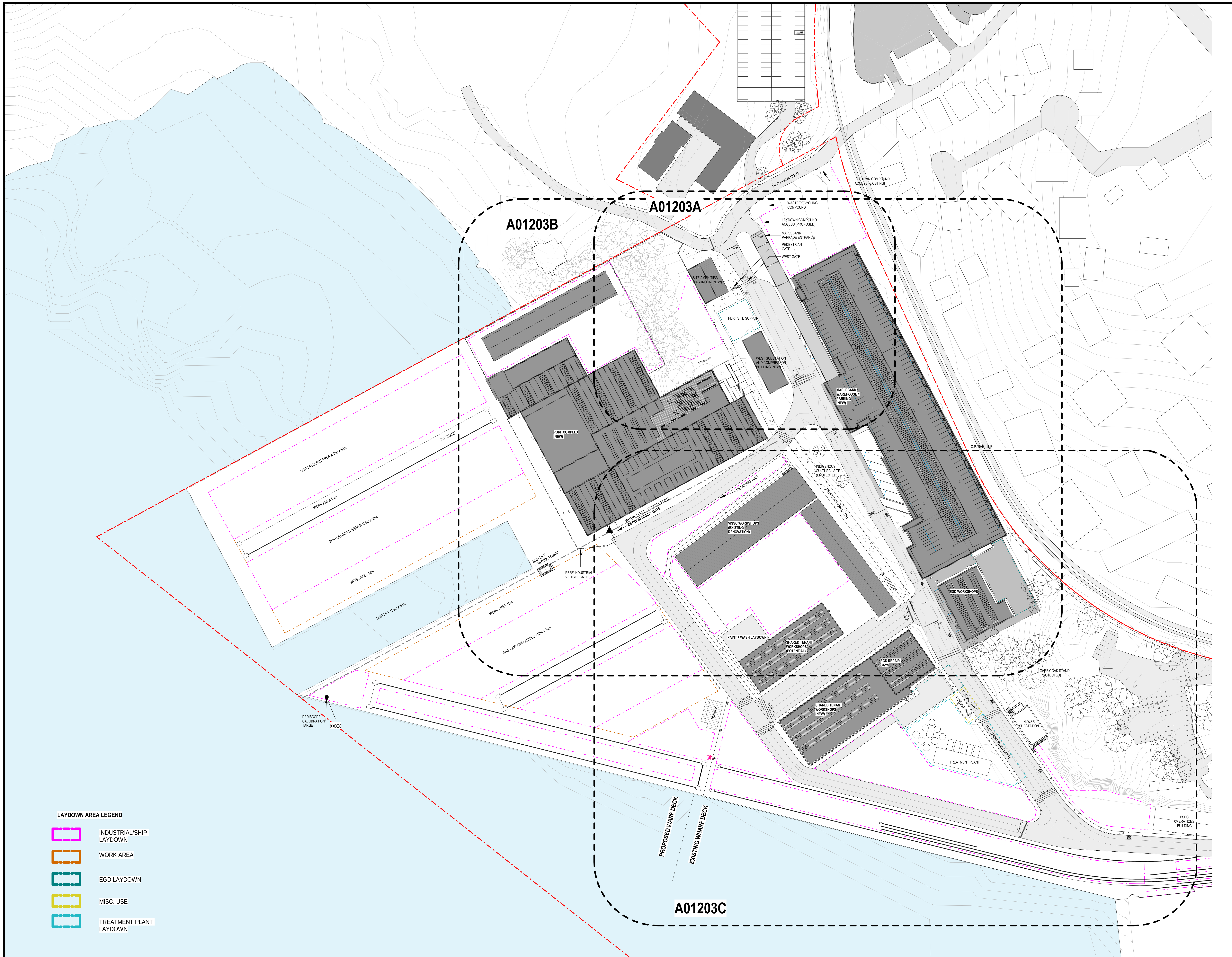
Drawing title / Titre du dessin

SITE PLAN - OVERALL

Project No. / No. du Project: R.108702.001

Sheet / Feuille: A02100 OF 0000

Revision no. / La Revision no.: 4



1 SITE PLAN - WEST SECTION
SCALE: 1 : 1000

Public Works and Government Services Canada
Travaux publics et Services gouvernementaux Canada

REAL PROPERTY SERVICES
Pacific Region
SERVICES IMMOBILIERS
Région de Pacifique

kasian

Project Title: 220064

Revision / Revision	Description / Description	Date / Date
4	Issued for 100% Concept Design	2021-07-26
3	Issued for Concept Design Review	2021-06-30
2	Issued for 90% Draft Concept Design Review and Costing	2021-06-18
1	Issued for 60% Draft Concept Design Review	2021-03-31

Client / client

PSPC

Project title / Titre du project

825 ADMIRALS ROAD, VICTORIA, B.C.

EGD MP - SITE

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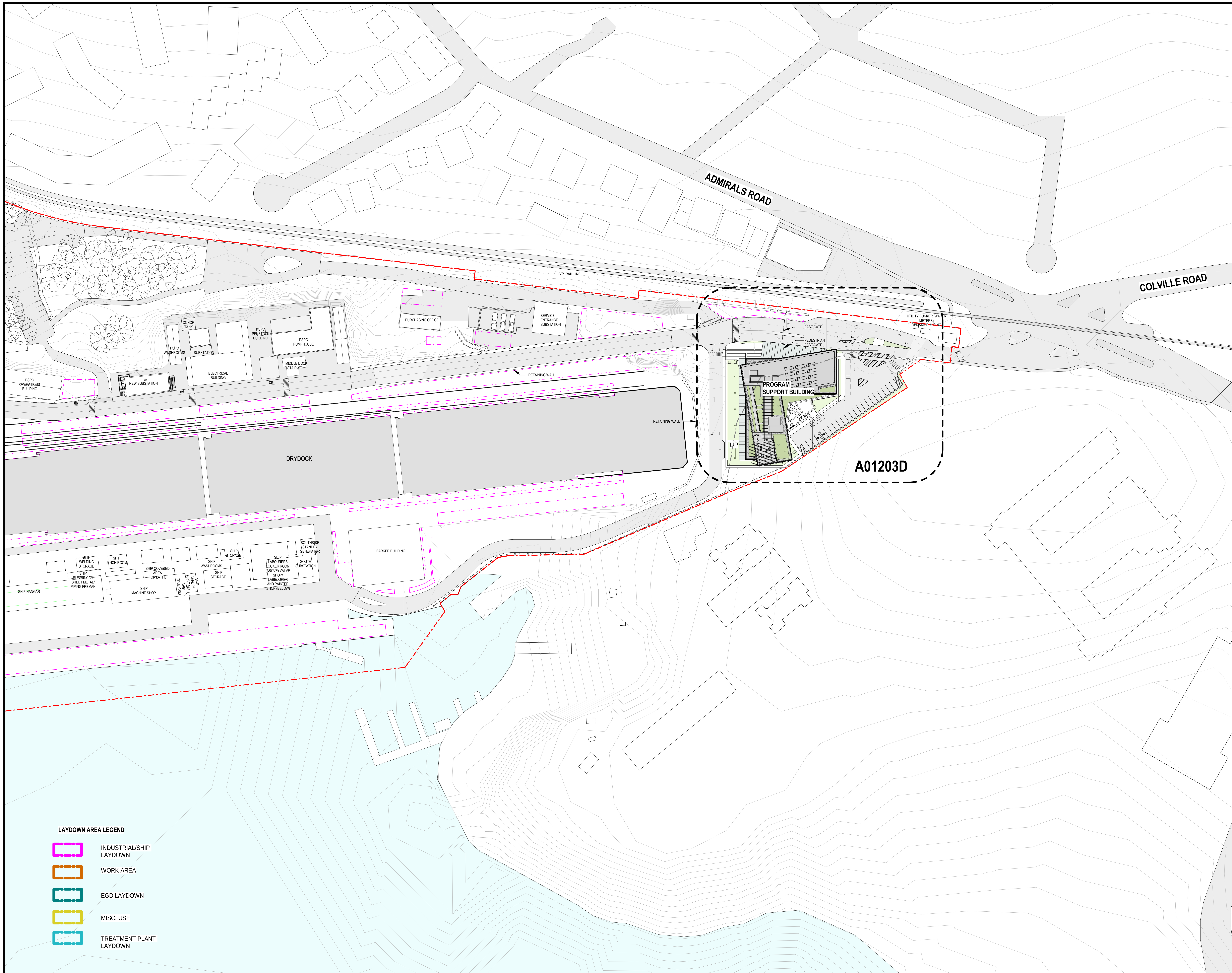
Approver

Drawing title / Titre du dessin

SITE PLAN -WEST

Project No. / No. du Project	Sheet / Feuille	Revision no. / La Revision no.
R.108702.001	A02101 OF 0000	4



1 SITE PLAN - EAST GATE
SCALE: 1 : 1000

0m 20m 40m 60m 80m 100m
SCALE 1:1000

Public Works and Government Services Canada
Travaux publics et Services gouvernementaux Canada

REAL PROPERTY SERVICES
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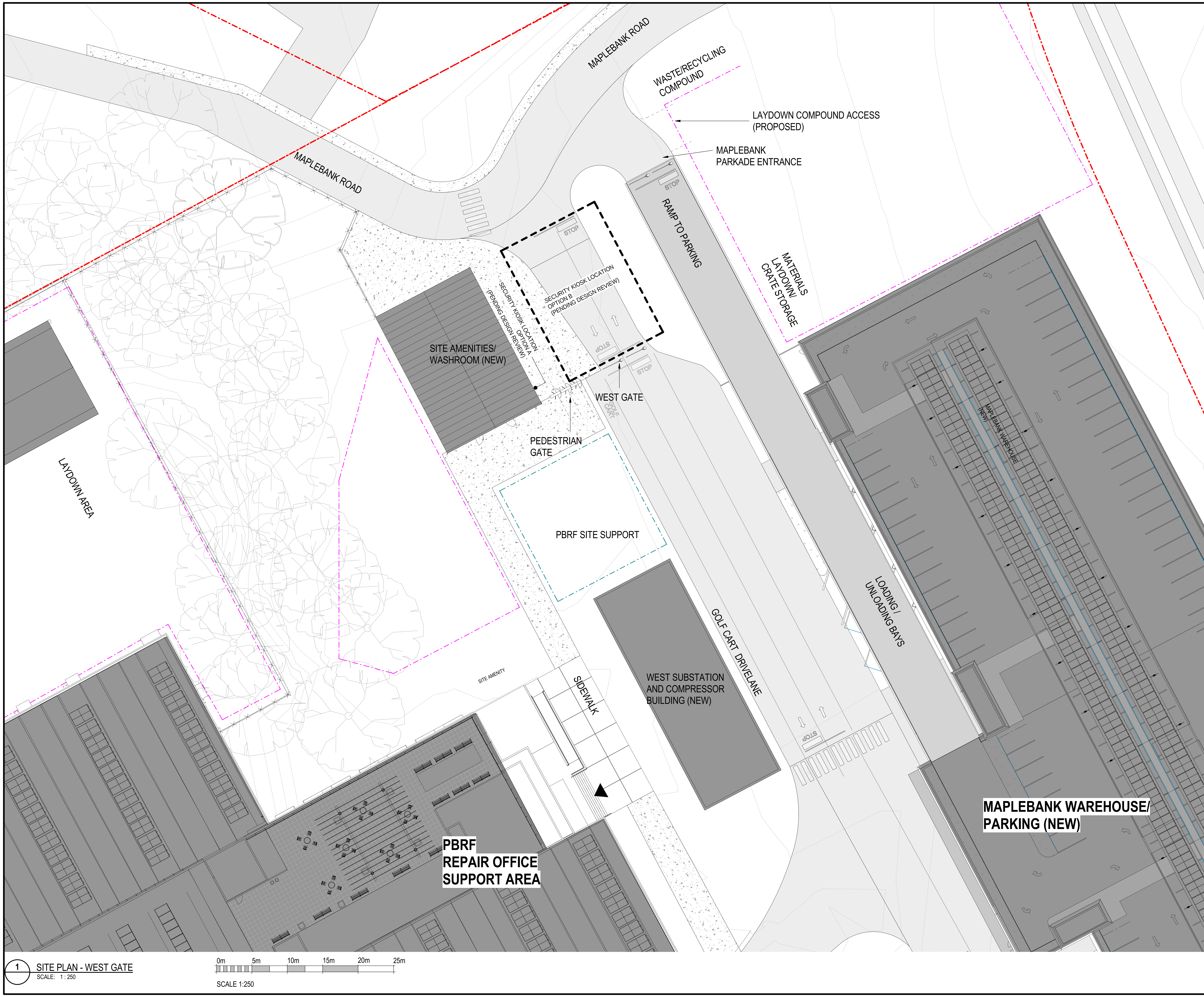
Drawing title / Titre du dessin

SITE PLAN - EAST

Project No. / No. du Project: R.108702.001
Sheet / Feuille: A02102 OF 0000
Revision no. / La Revision no.: 4



1 SITE PLAN - WEST GATE
SCALE: 1 : 250

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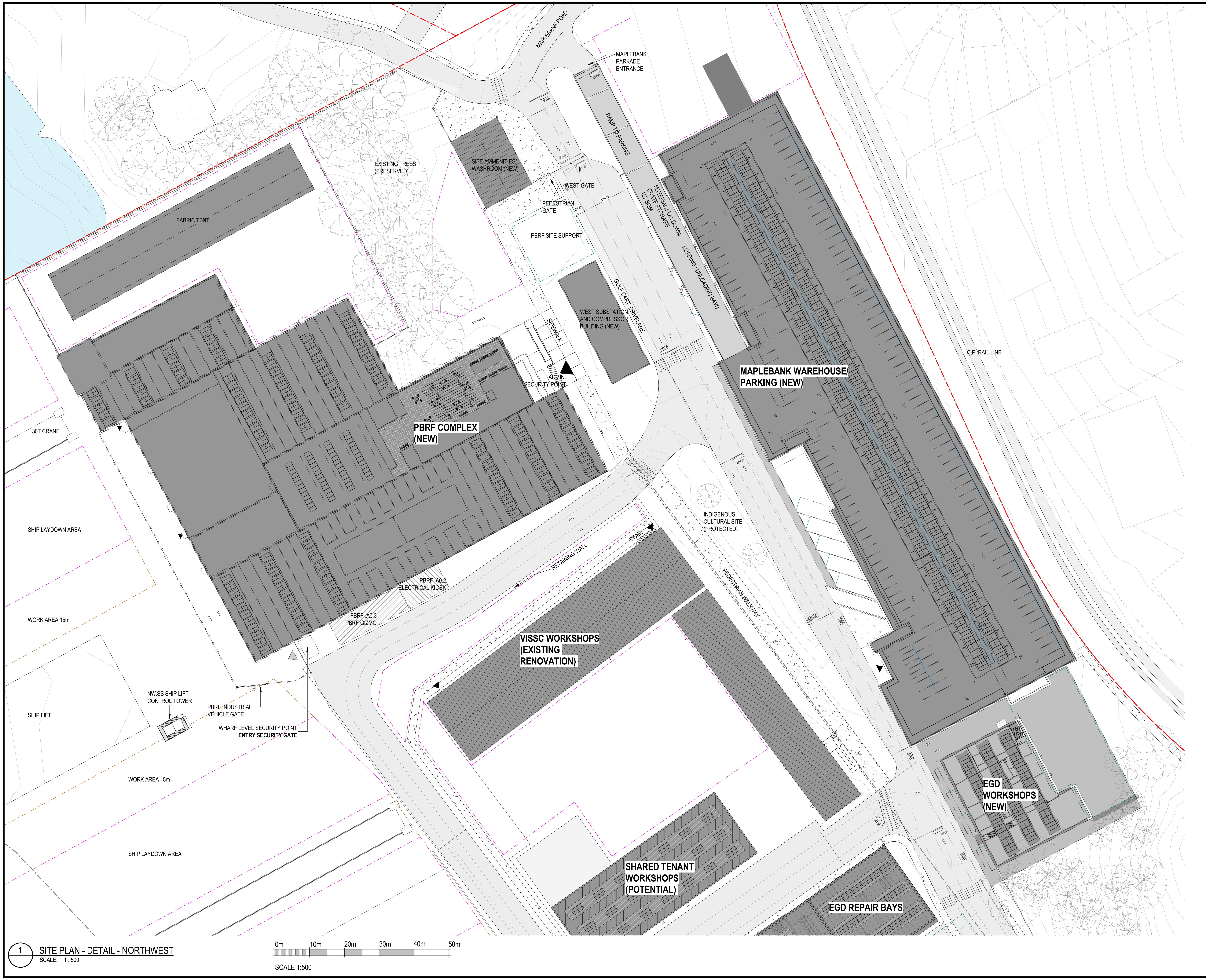
Drawing title / Titre du dessin

SITE PLAN DETAIL WEST GATE

Project No. / No. du Project: R.108702.001
Sheet / Feuille: A02203A OF 0000
Revision no. / La Revision no.: 4



1 SITE PLAN - DETAIL - NORTHWEST
SCALE: 1 : 500

Public Works and Government Services Canada / Travaux publics et Services gouvernementaux Canada

REAL PROPERTY SERVICES
Pacific Region
SERVICES IMMOBILIERS
Région de Pacifique

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Project Title: 220064

N

Revision / Revision	Description / Description	Date / Date
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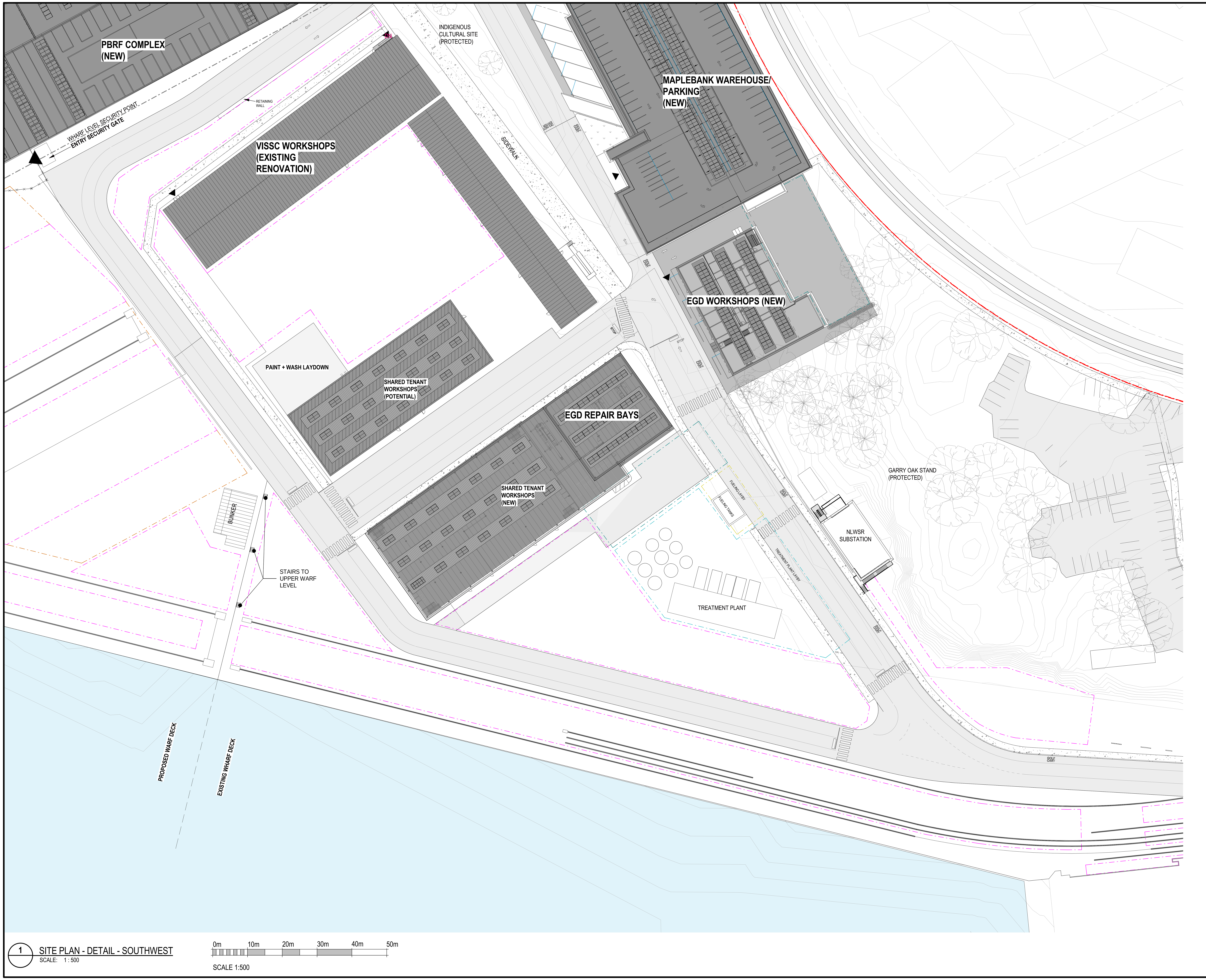
Drawing title / Titre du dessin

SITE PLAN DETAIL NORTHWEST

Project No. / No. du Project	Sheet / Feuille	Revision no. / La Revision no.
R.108702.001	A02203B OF 0000	4



1 SITE PLAN - DETAIL - SOUTHWEST

SCALE: 1 : 500

Public Works and Government Services Canada

Travaux publics et Services gouvernementaux Canada

REAL PROPERTY SERVICES

Pacific Region

SERVICES IMMOBILIERS

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Approver

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Approver

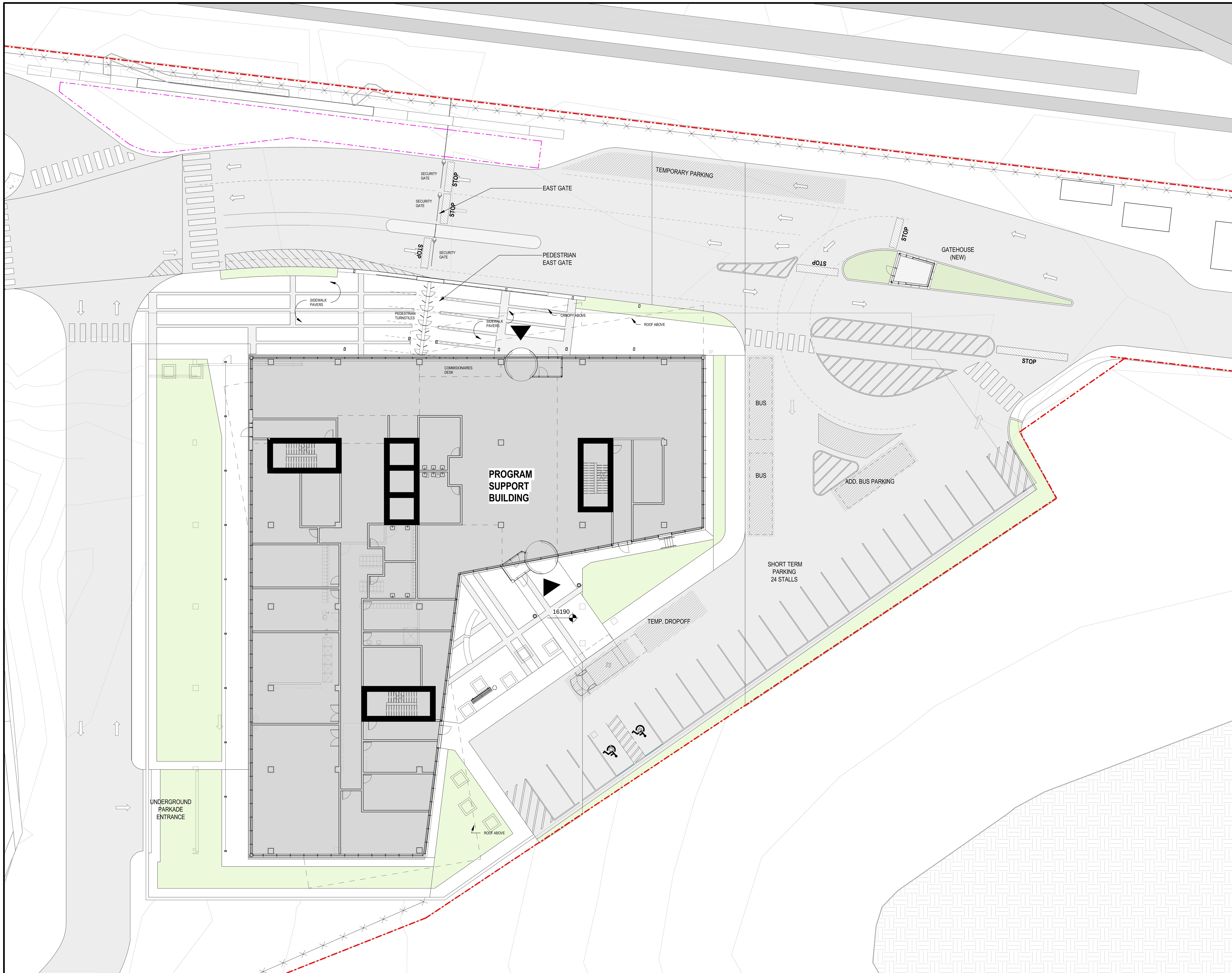
Drawing title / Titre du dessin

SITE PLAN DETAIL SOUTHWEST

Project No. / No. du Project: R.108702.001

Sheet / Feuille: A02203C OF 0000

Revision no. / La Revision no.: 4



1 SITE PLAN - EAST GATE
SCALE: 1 : 200

0m 4m 8m 12m 16m 20m
SCALE 1:200

Public Works and Government Services Canada
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REAL PROPERTY SERVICES
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Project title / Titre du project

825 ADMIRALS
ROAD, VICTORIA,
B.C.

EGD MP - SITE

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Approver

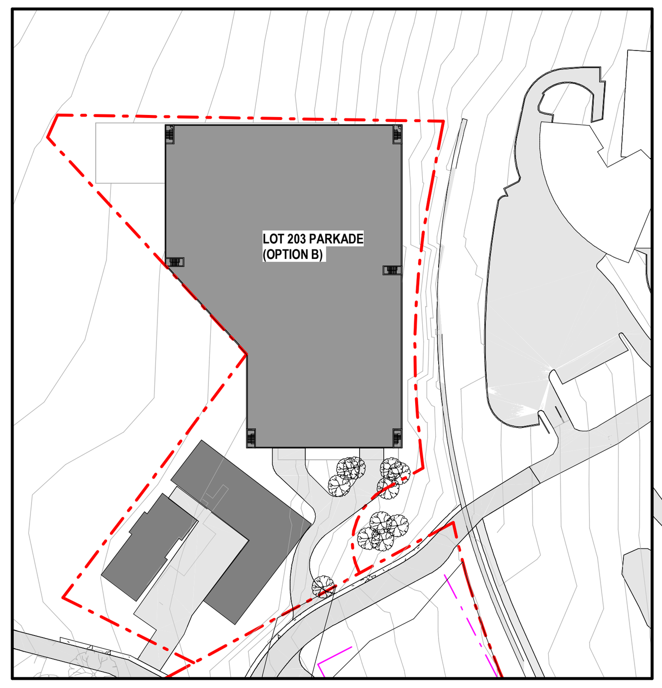
Drawing title / Titre du dessin

SITE PLAN DETAIL EAST GATE - PROGRAM SUPPORT BUILDING

Project No. / No. du Project: R.108702.001

Sheet / Feuille: A02203D
OF 0000

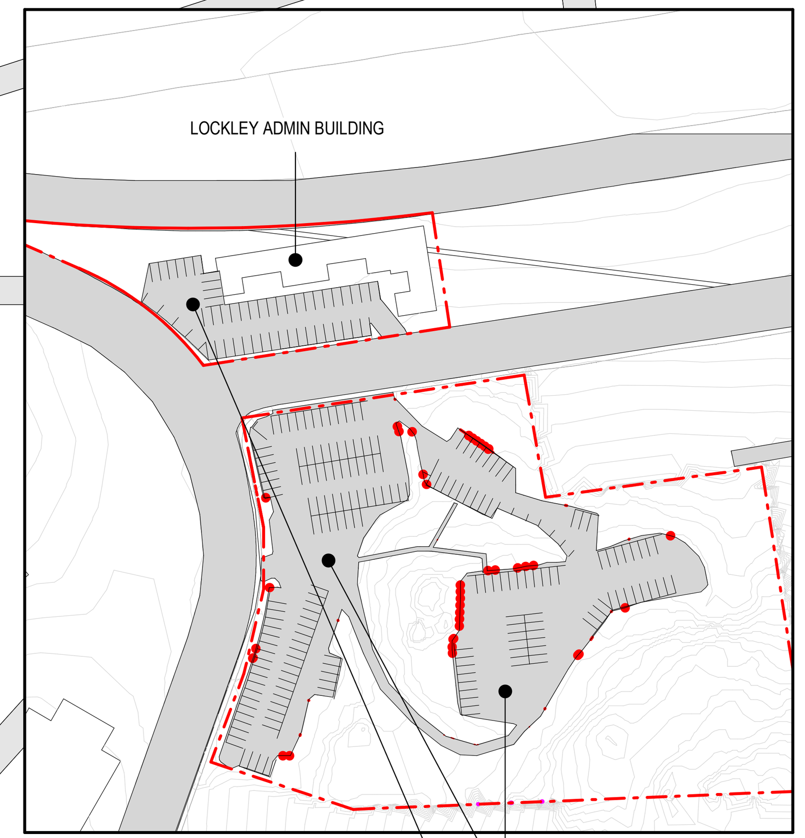
Revision no. / La Revision no.: 4



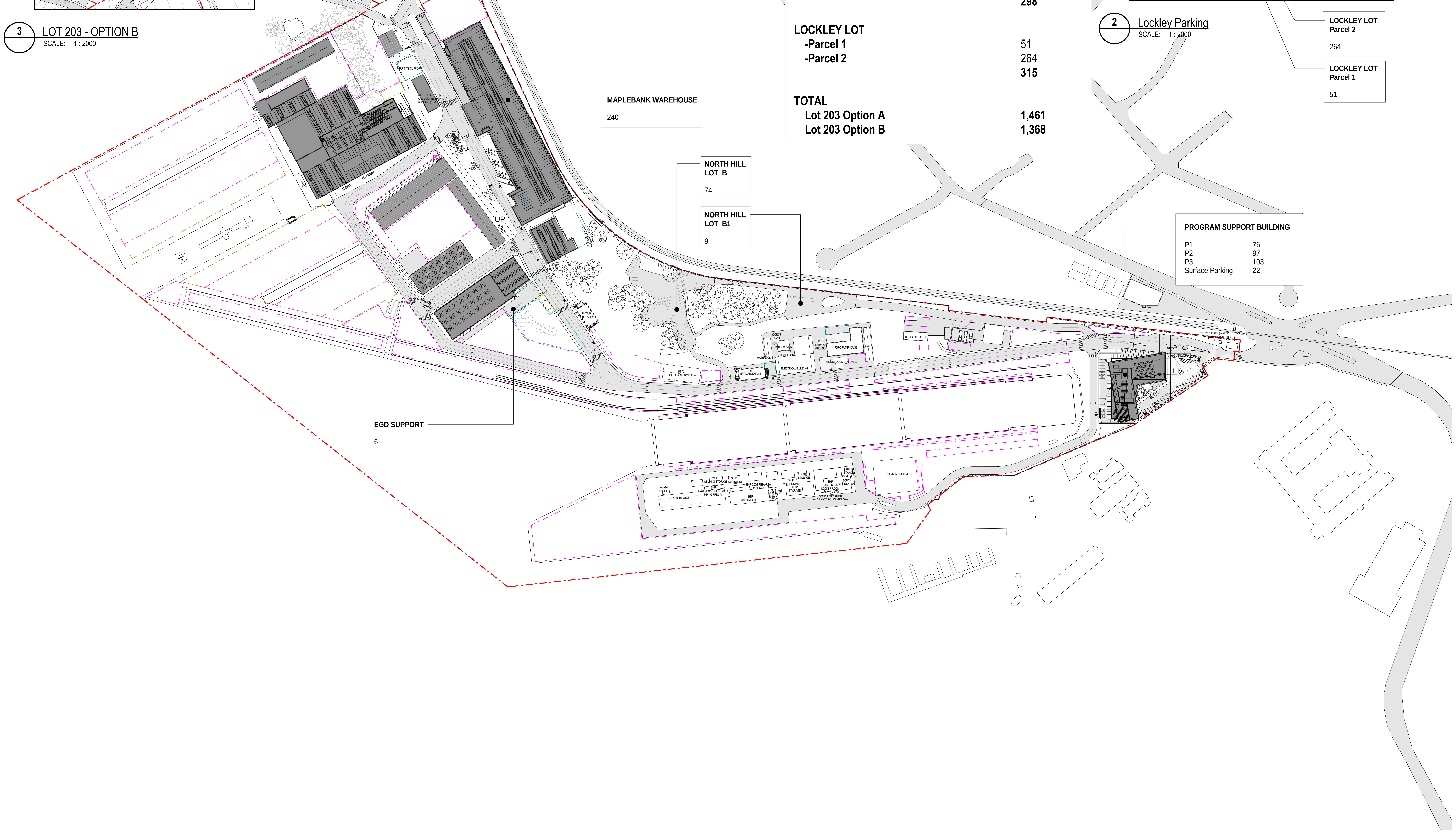
3 LOT 203 - OPTION B
SCALE: 1 : 2000

SITE PARKING COUNT

AREA	STALL COUNT
LOT 203 PARKADE	
-Option A	**519**
-Option B	**426**
MAPLEBANK WAREHOUSE	**240**
EGD SUPPORT	**6**
NORTH HILL	
-LOT B	74
-LOT B1	9
	83
PROGRAM SUPPORT BUILDING	
-P1	76
-P2	97
-P3	103
-Surface Parking	22
	298
LOCKLEY LOT	
-Parcel 1	51
-Parcel 2	264
	315
TOTAL	
Lot 203 Option A	**1,461**
Lot 203 Option B	**1,368**



2 Lockley Parking
SCALE: 1 : 2000



1 SITE PLAN - PARKING
SCALE: 1 : 2000

0m 40m 80m 120m 160m 200m
SCALE 1:2000

Public Works and Government Services Canada
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REAL PROPERTY SERVICES
Pacific Region
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kasian

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EGD MP - SITE

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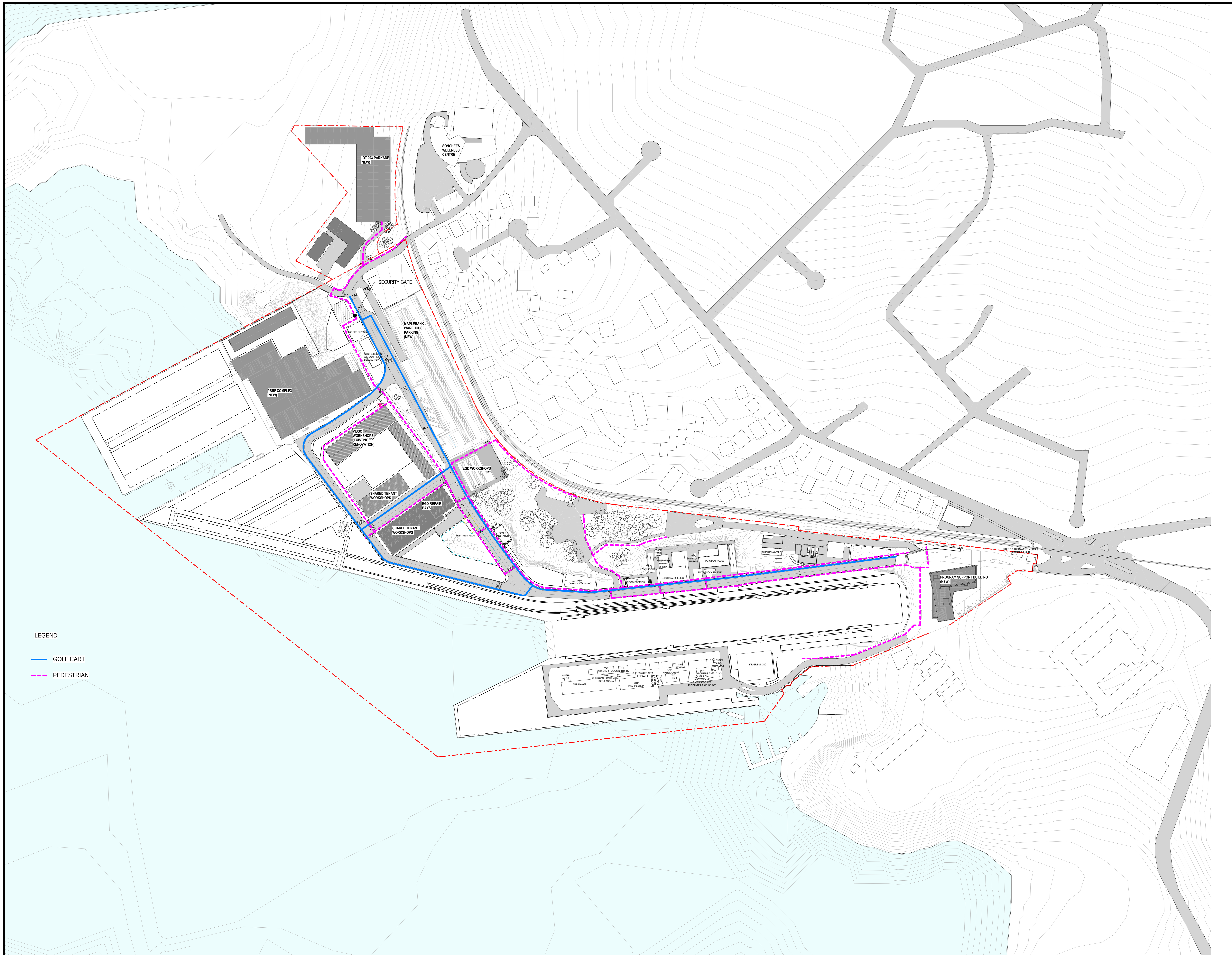
Approver

Drawing title / Titre du dessin

PARKING

Project No. / No. du Project	Sheet / Feuille	Revision no. / La Revision no.
R.108702.001	A02204 OF 0000	3



LEGEND

GOLF CART

PEDESTRIAN

1 SITE PLAN - PEDESTRIAN

SCALE: 1 : 2000

0m 40m 80m 120m 160m 200m

SCALE 1:2000

Public Works and Government Services Canada

Travaux publics et Services gouvernementaux Canada

REAL PROPERTY SERVICES

Pacific Region

SERVICES IMMOBILIERS

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825 ADMIRALS ROAD, VICTORIA, B.C.

EGD MP - SITE

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Approver

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Designer

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Author

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Approver

Drawing title / Titre du dessin

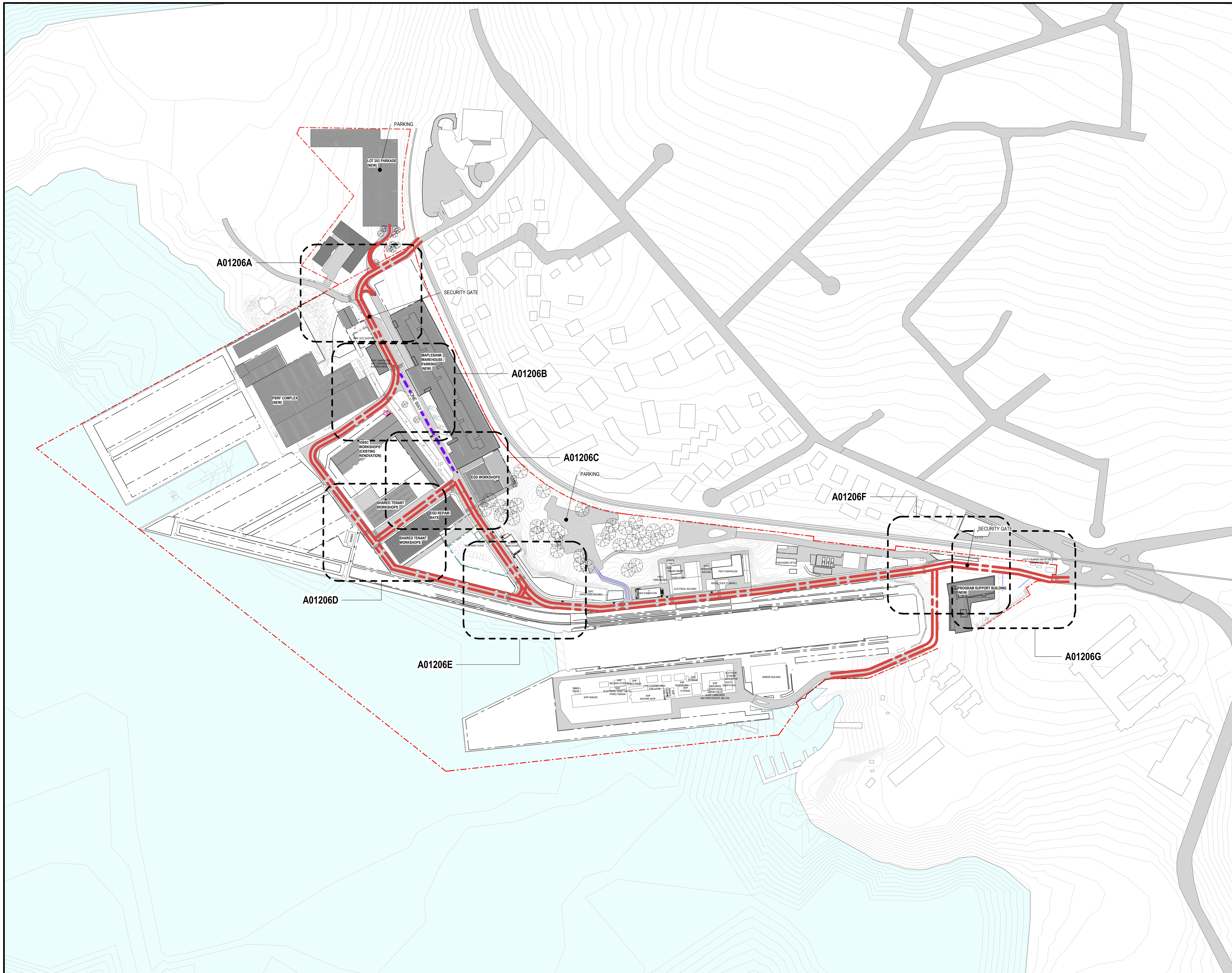
PEDESTRIAN

Project No. / No. du Project: R.108702.001

Sheet / Feuille: A02205

OF 0000

Revision no. / La Revision no.: 3



1 SITE PLAN - VEHICULAR
SCALE: 1 : 2000

0m 40m 80m 120m 160m 200m
SCALE 1:2000

Public Works and Government Services Canada
Travaux publics et Services gouvernementaux Canada

REAL PROPERTY SERVICES
Pacific Region
SERVICES IMMOBILIERS
Région de Pacifique

Kasian

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825 ADMIRALS ROAD, VICTORIA, B.C.

EGD MP - SITE

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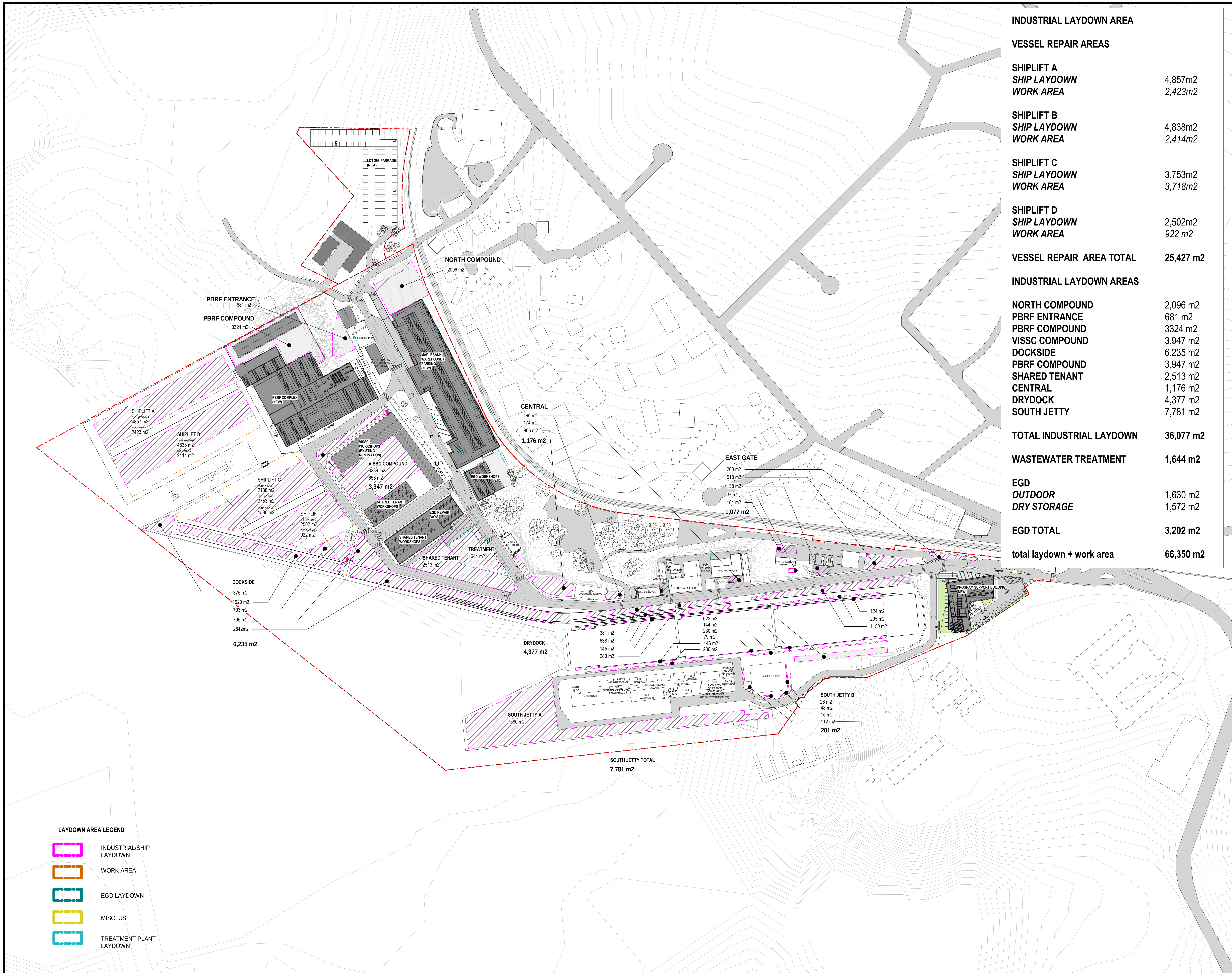
Approver

Drawing title / Titre du dessin

VEHICULAR

Project No. / No. du Project	Sheet / Feuille	Revision no. / La Revision no.
R.108702.001	A02206 OF 0000	3



INDUSTRIAL LAYDOWN AREA	
VESSEL REPAIR AREAS	
SHIPLIFT A	
SHIP LAYDOWN	4,857m2
WORK AREA	*2,423m2*
SHIPLIFT B	
SHIP LAYDOWN	4,838m2
WORK AREA	*2,414m2*
SHIPLIFT C	
SHIP LAYDOWN	3,753m2
WORK AREA	*3,718m2*
SHIPLIFT D	
SHIP LAYDOWN	2,502m2
WORK AREA	*922 m2*
VESSEL REPAIR AREA TOTAL	**25,427 m2**
INDUSTRIAL LAYDOWN AREAS	
NORTH COMPOUND	2,096 m2
PBRF ENTRANCE	681 m2
PBRF COMPOUND	3324 m2
VISSC COMPOUND	3,947 m2
DOCKSIDE	6,235 m2
PBRF COMPOUND	3,947 m2
SHARED TENANT	2,513 m2
CENTRAL	1,176 m2
DRYDOCK	4,377 m2
SOUTH JETTY	7,781 m2
TOTAL INDUSTRIAL LAYDOWN	**36,077 m2**
WASTEWATER TREATMENT	**1,644 m2**
EGD	
OUTDOOR	1,630 m2
DRY STORAGE	1,572 m2
EGD TOTAL	**3,202 m2**
total laydown + work area	**66,350 m2**

LAYDOWN AREA LEGEND

- INDUSTRIAL/SHIP LAYDOWN
- WORK AREA
- EGD LAYDOWN
- MISC. USE
- TREATMENT PLANT LAYDOWN

1 SITE PLAN - LAYDOWN
SCALE: 1 : 2000

0m 40m 80m 120m 160m 200m
SCALE 1:2000

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REAL PROPERTY SERVICES
Pacific Region
SERVICES IMMOBILIERS
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Client / client
PSPC

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825 ADMIRALS ROAD, VICTORIA, B.C.
EGD MP - SITE

Consultant Signature Only
Approver
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Designer
Drawn by / Dessine par
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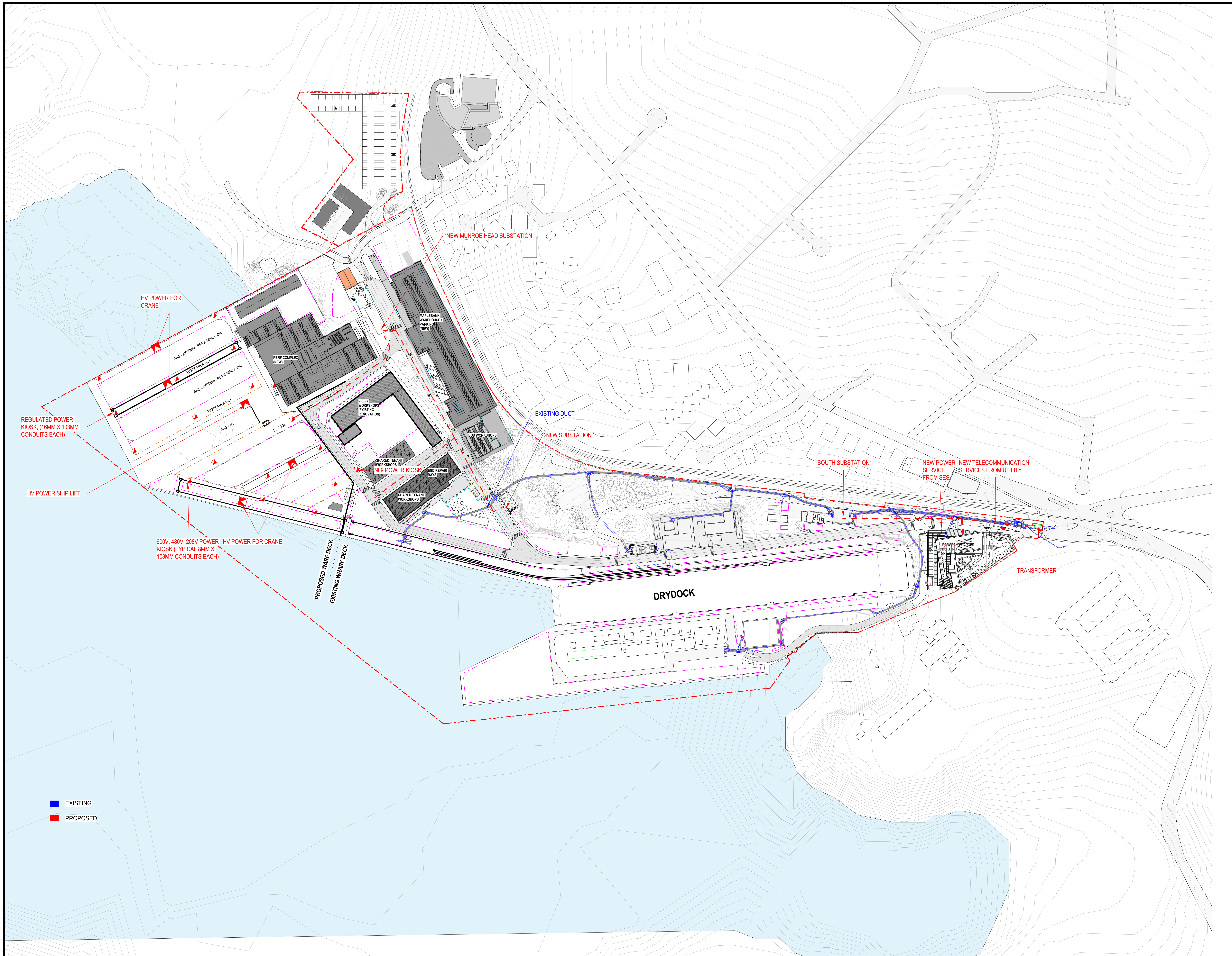
Approver
PWGSC, Regional Manager, Architectural and Engineering services / Gestionnaire regionale, services d' architectural et de genie, TPSGC
Approver

Drawing title / Titre du dessin
LAYDOWN AREAS

Project No. / No. du Project: R.108702.001
Sheet / Feuille: A02207 OF 0000
Revision no. / La Revision no.: 3



1 SITE PLAN - DUCT BANK
SCALE: 1 : 2000

0m 40m 80m 120m 160m 200m
SCALE 1:2000

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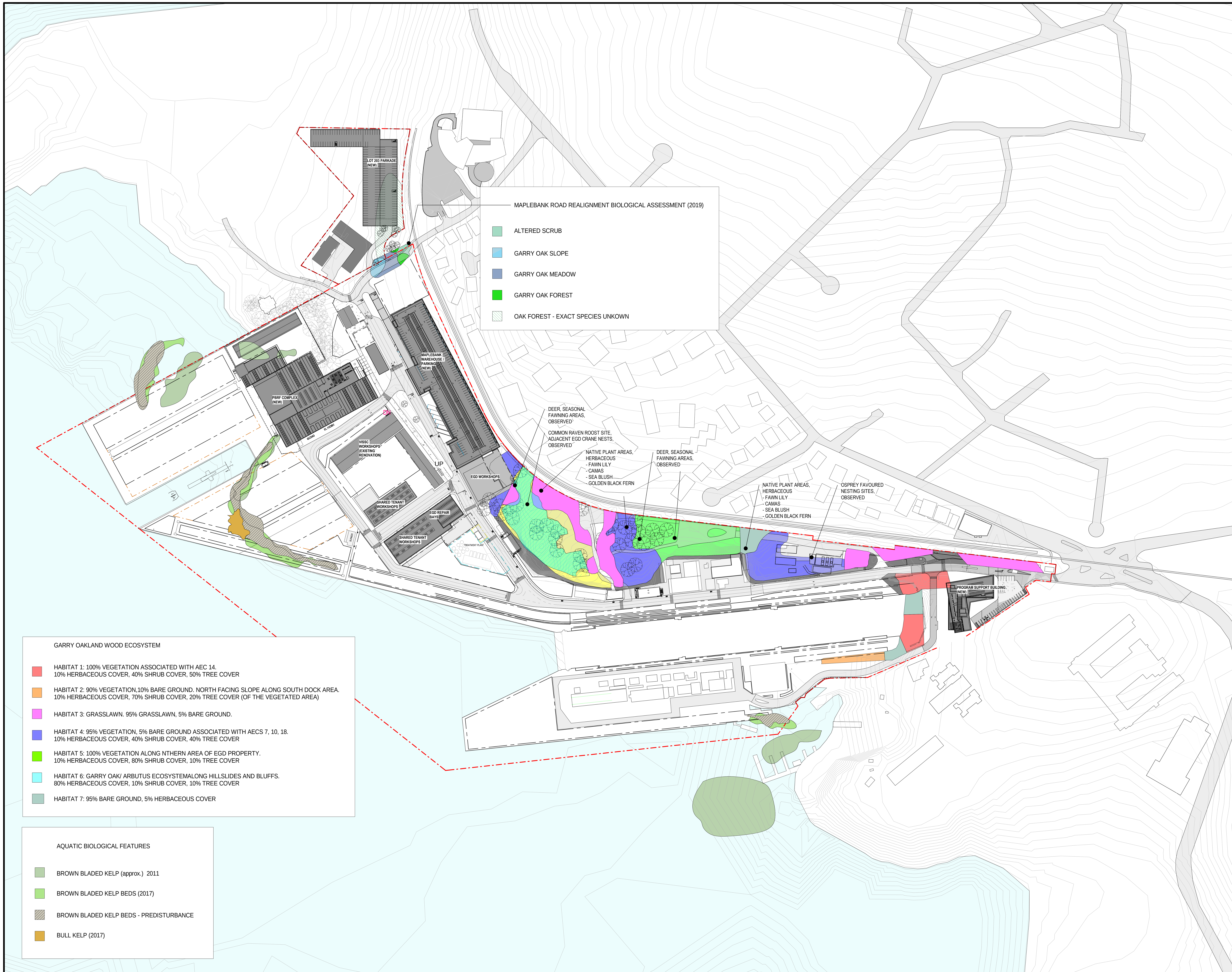
DUCT BANK PLAN

Project No. / No. du Project	Sheet / Feuille	Revision no. / La Revision no.
R.108702.001	A02208 OF 0000	4



GARRY OAKLAND WOOD ECOSYSTEM

- HABITAT 1: 100% VEGETATION ASSOCIATED WITH AEC 14. 10% HERBACEOUS COVER, 40% SHRUB COVER, 50% TREE COVER
- HABITAT 2: 90% VEGETATION,10% BARE GROUND. NORTH FACING SLOPE ALONG SOUTH DOCK AREA. 10% HERBACEOUS COVER, 70% SHRUB COVER, 20% TREE COVER (OF THE VEGETATED AREA)
- HABITAT 3: GRASSLAWN. 95% GRASSLAWN, 5% BARE GROUND.
- HABITAT 4: 95% VEGETATION, 5% BARE GROUND ASSOCIATED WITH AECS 7, 10, 18. 10% HERBACEOUS COVER, 40% SHRUB COVER, 40% TREE COVER
- HABITAT 5: 100% VEGETATION ALONG NTHERN AREA OF EGD PROPERTY. 10% HERBACEOUS COVER, 80% SHRUB COVER, 10% TREE COVER
- HABITAT 6: GARRY OAK/ ARBUTUS ECOSYSTEMALONG HILLSLIDES AND BLUFFS. 80% HERBACEOUS COVER, 10% SHRUB COVER, 10% TREE COVER
- HABITAT 7: 95% BARE GROUND, 5% HERBACEOUS COVER

AQUATIC BIOLOGICAL FEATURES

- BROWN BLADED KELP (approx.) 2011
- BROWN BLADED KELP BEDS (2017)
- BROWN BLADED KELP BEDS - PREDISTURBANCE
- BULL KELP (2017)

1 SITE PLAN - ENVIRONMENTAL
SCALE: 1 : 2000

0m 40m 80m 120m 160m 200m
SCALE 1:2000

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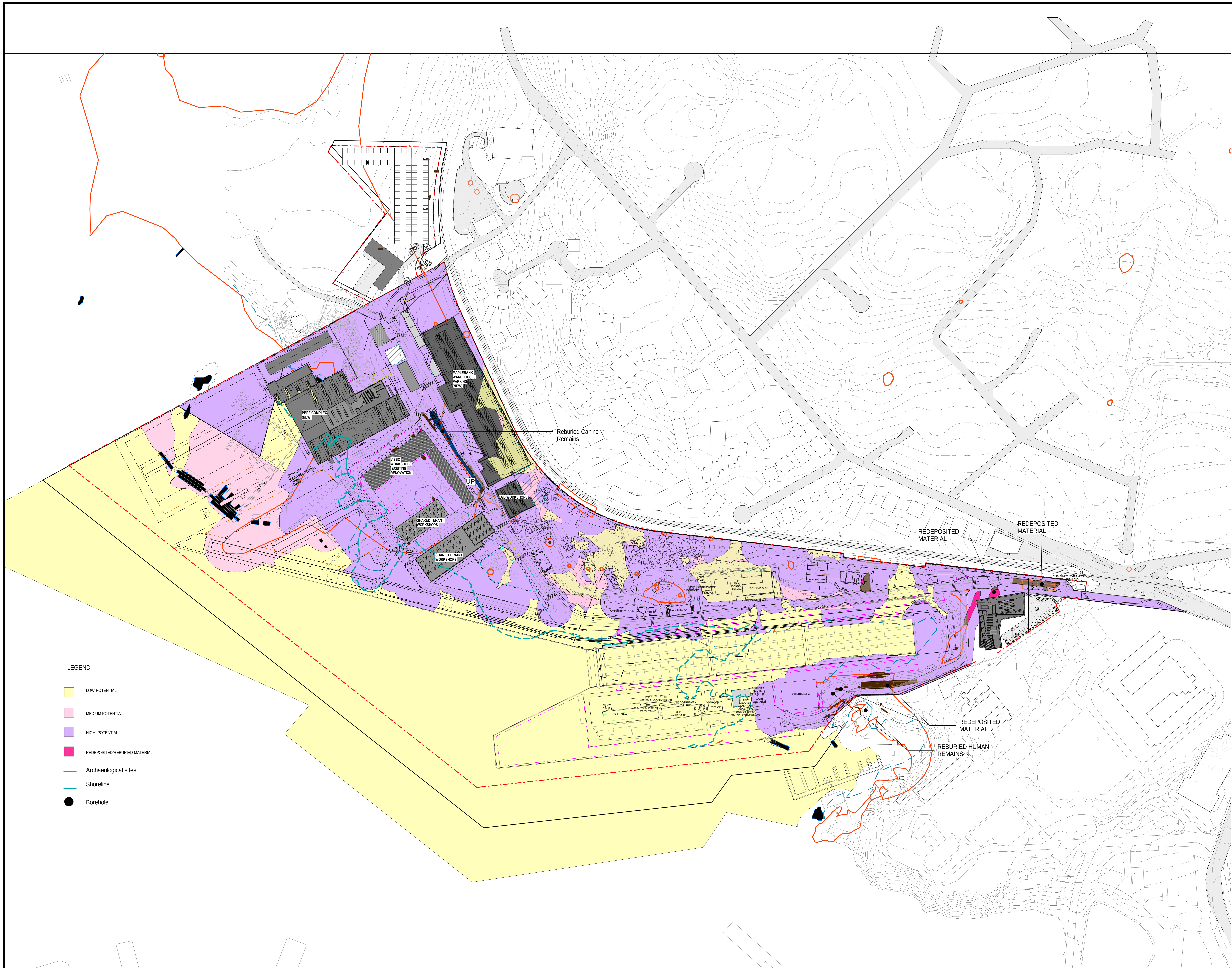
ENVIRONMENTAL

Project No. / No. du Project	Sheet / Feuille	Revision no. / La Revision no.
R.108702.001	A02209 OF 0000	2



1 SITE PLAN - ARCHEOLOGICAL

SCALE: 1 : 2000

0m 40m 80m 120m 160m 200m

SCALE 1:2000

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PSPC

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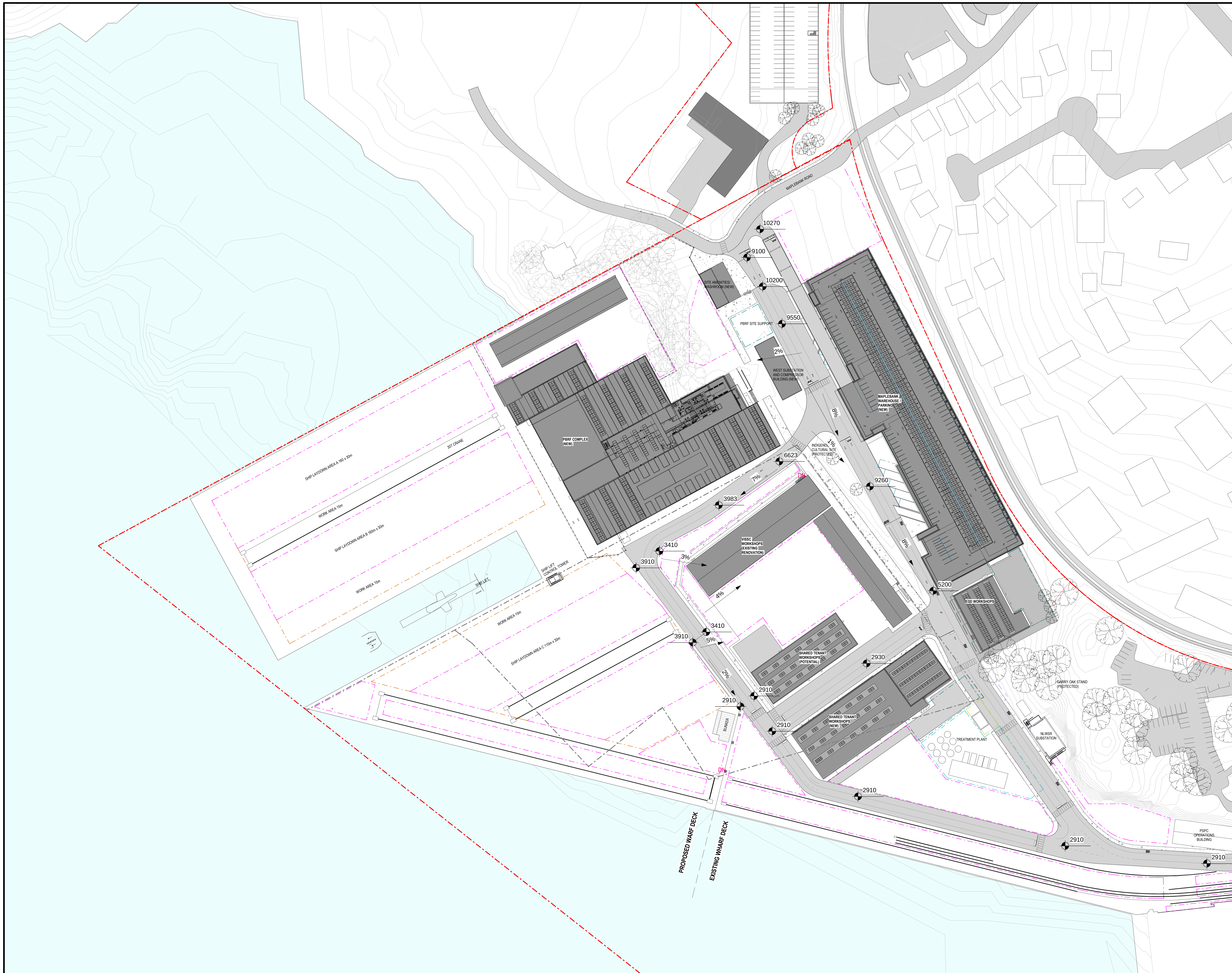
Drawing title / Titre du dessin

ARCHEOLOGICAL

Project No. / No. du Project	Sheet / Feuille	Revision no. / La Revision no.
R.108702.001	A02210 OF 0000	2



1 SITE PLAN - WEST SECTION TOPOGRAPHY

SCALE: 1 : 1000

0m 20m 40m 60m 80m 100m

SCALE 1:1000

Public Works and Government Services Canada

Travaux publics et Services gouvernementaux Canada

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Approver

Designed by / Concept par
Designer

Drawn by / Dessine par
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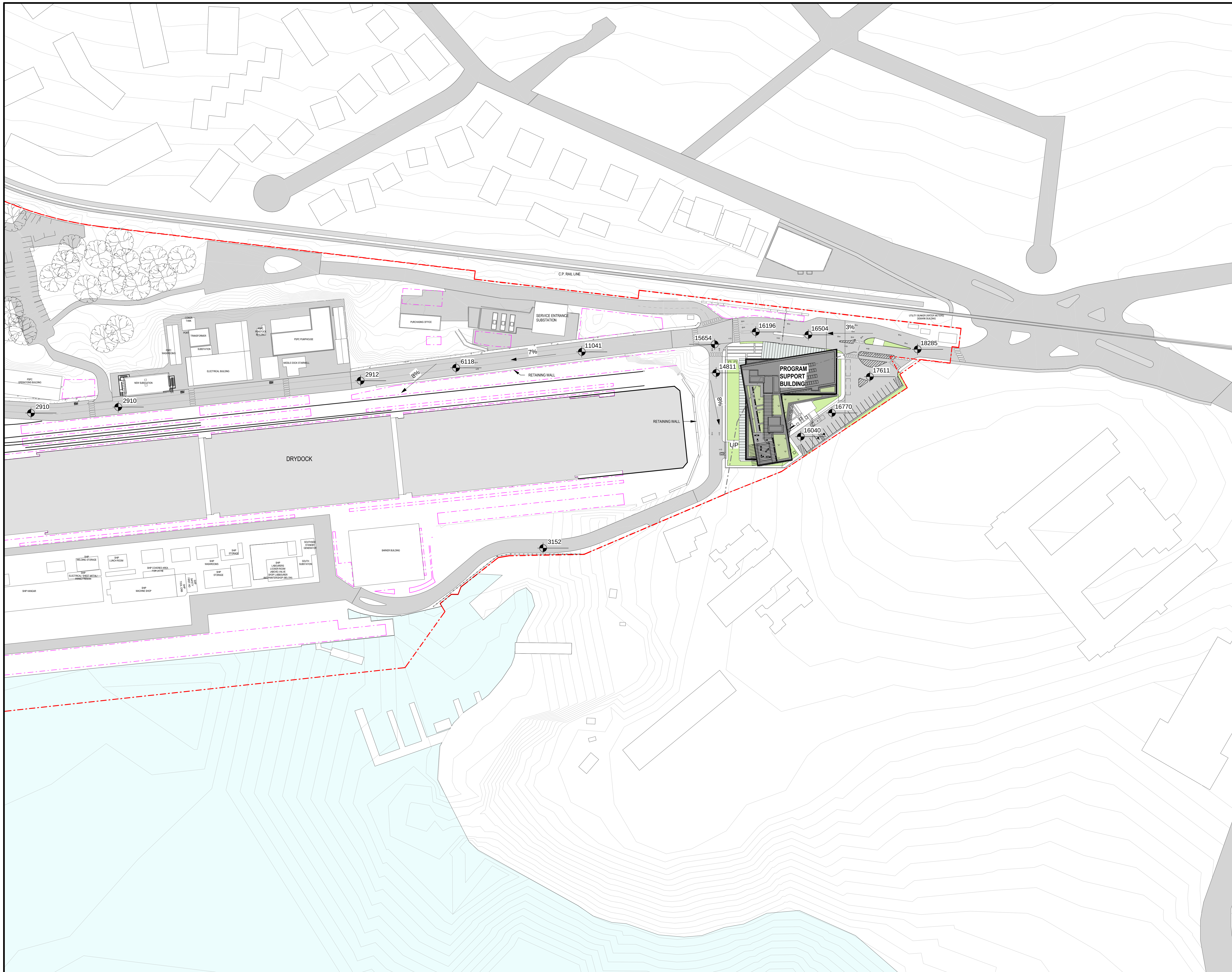
Approver

PWGSC, Reginal Manager, Architectural and Engineering services / Gestionnaire regionale, services d' architectural et de genie, TPSGC
Approver

Drawing title / Titre du dessin

TOPOGRAPHY/ELEVATIONS - WEST

Project No. / No. du Project	Sheet / Feuille	Revision no. / La Revision no.
R.108702.001	A02401 OF 0000	2



1 SITE PLAN - EAST GATE TOPOGRAPHY

SCALE: 1 : 1000

0m 20m 40m 60m 80m 100m

SCALE 1:1000

Public Works and Government Services Canada

Travaux publics et Services gouvernementaux Canada

REAL PROPERTY SERVICES
Pacific Region
SERVICES IMMOBILIERS
Région de Pacifique

kasian

Project Title: 220064

N

Revision / Revision	Description / Description	Date / Date
2	Issued for 100% Concept Design	2021-07-26
1	Issued for Concept Design Review	2021-06-30

Client / client

PSPC

Project title / Titre du project

825 ADMIRALS
ROAD, VICTORIA,
B.C.

EGD MP - SITE

Consultant Signature Only
Approver

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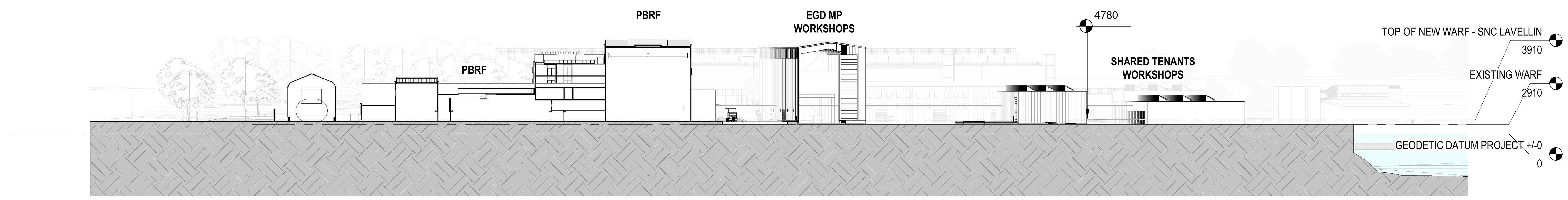
Drawing title / Titre du dessin

TOPOGRAPHY/ELEVATIONS - EAST

Project No. / No. du Project	Sheet / Feuille	Revision no. / La Revision no.
R.108702.001	A02402 OF 0000	2

1 A02100 Section 1
SCALE: 1 : 1000



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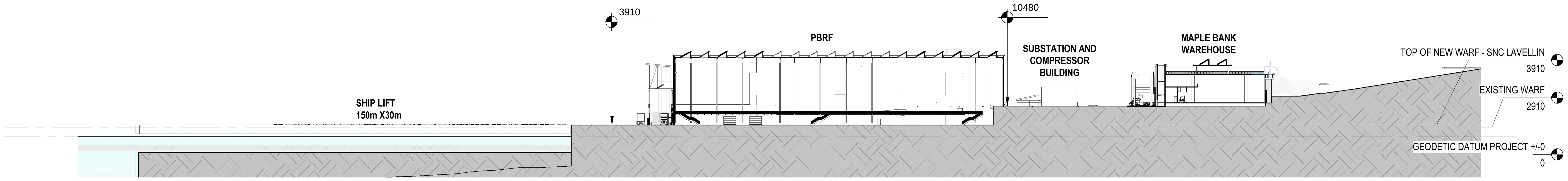

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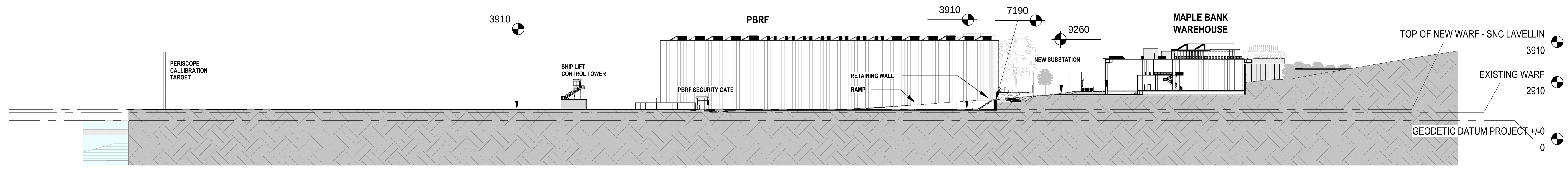

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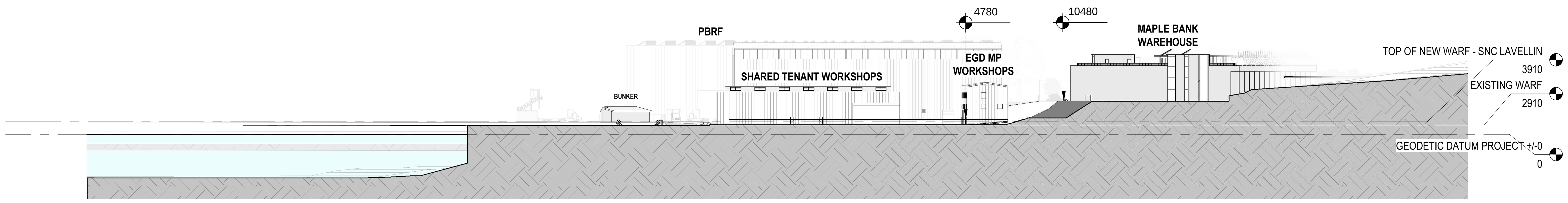

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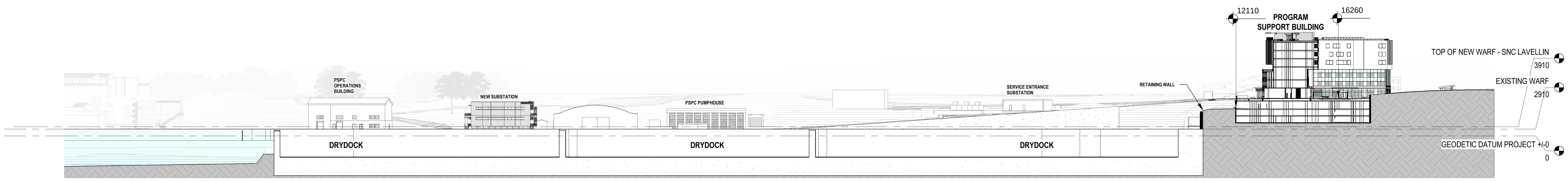

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SCALE: 1 : 1000

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SCALE 1:1000

Public Works and Government Services Canada
Travaux publics et Services gouvernementaux Canada

REAL PROPERTY SERVICES
Pacific Region
SERVICES IMMOBILIERS
Région de Pacifique

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Project Title: 220064

Revision / Revision	Description / Description	Date / Date
3	Issued for 100% Concept Design	2021-07-26
2	Issued for Concept Design Review	2021-06-30
1	Issued for 60% Draft Concept Design Review	2021-03-31

Client / client

PSPC

Project title / Titre du project

825 ADMIRALS ROAD, VICTORIA, B.C.

EGD MP - SITE

Consultant Signature Only
Approver

Designed by / Concept par
Designer

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PWGSC, Reginal Manager, Architectural and Engineering services / Gestionnaire regionale, services d' architectural et de genie, TPSGC
Approver

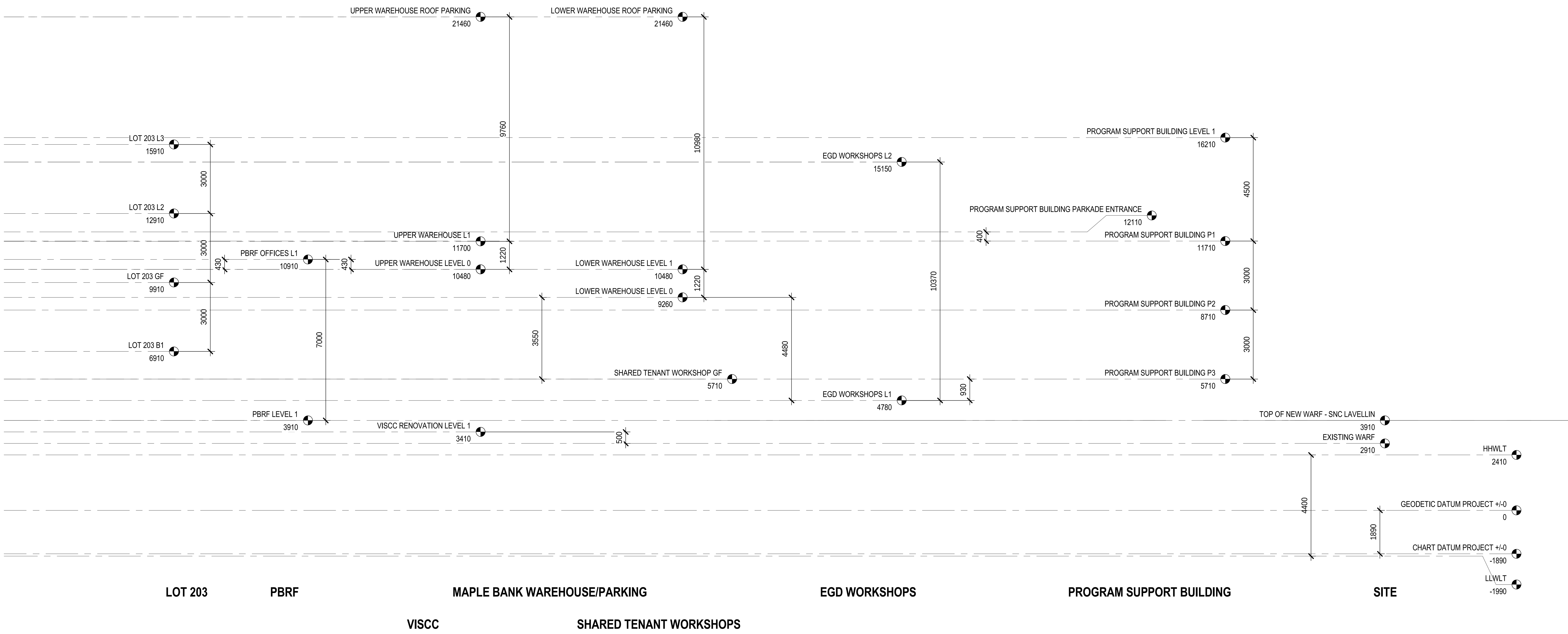
Drawing title / Titre du dessin

SITE SECTIONS

Project No. / No. du Project: R.108702.001

Sheet / Feuille: A02403 OF 0000

Revision no. / La Revision no.: 3



Public Works and Government Services Canada
Travaux publics et Services gouvernementaux Canada

REAL PROPERTY SERVICES
Pacific Region
SERVICES IMMOBILIERS
Région de Pacifique

Kasian

Project Title: 220064

Revision / Revision	Description / Description	Date / Date
2	Issued for 100% Concept Design	2021-07-26
1	Issued for Concept Design Review	2021-06-30

Client / client

PSPC

Project title / Titre du project

825 ADMIRALS ROAD, VICTORIA, B.C.

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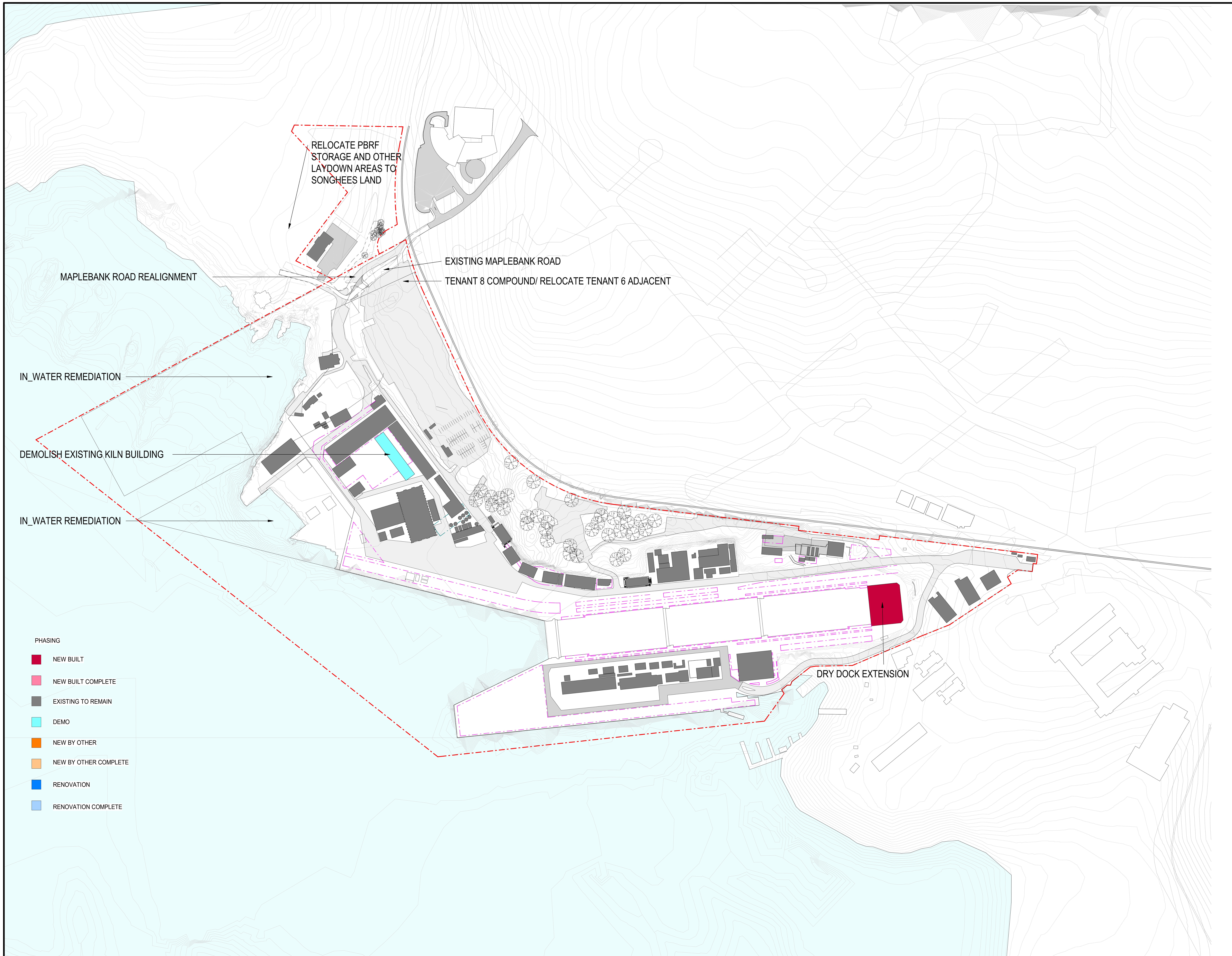
Drawing title / Titre du dessin

LEVEL MATRIX

Project No. / No. du Project	Sheet / Feuille	Revision no. / La Revision no.
R.108702.001	A02404 OF 0000	2



1 SITE MASTER - PHASING _1A
SCALE: 1 : 2000

0m 40m 80m 120m 160m 200m
SCALE 1:2000

Public Works and Government Services Canada
Travaux publics et Services gouvernementaux Canada

REAL PROPERTY SERVICES
Pacific Region
SERVICES IMMOBILIERS
Région de Pacifique

Project Title: 220064

N

Revision / Revision	Description / Description	Date / Date
3	Issued for 100% Concept Design	2021-07-26
2	Issued for Concept Design Review	2021-06-30
1	Issued for 90% Draft Concept Design Review and Costing	2021-06-18

Client / client

PSPC

Project title / Titre du project

825 ADMIRALS ROAD, VICTORIA, B.C.

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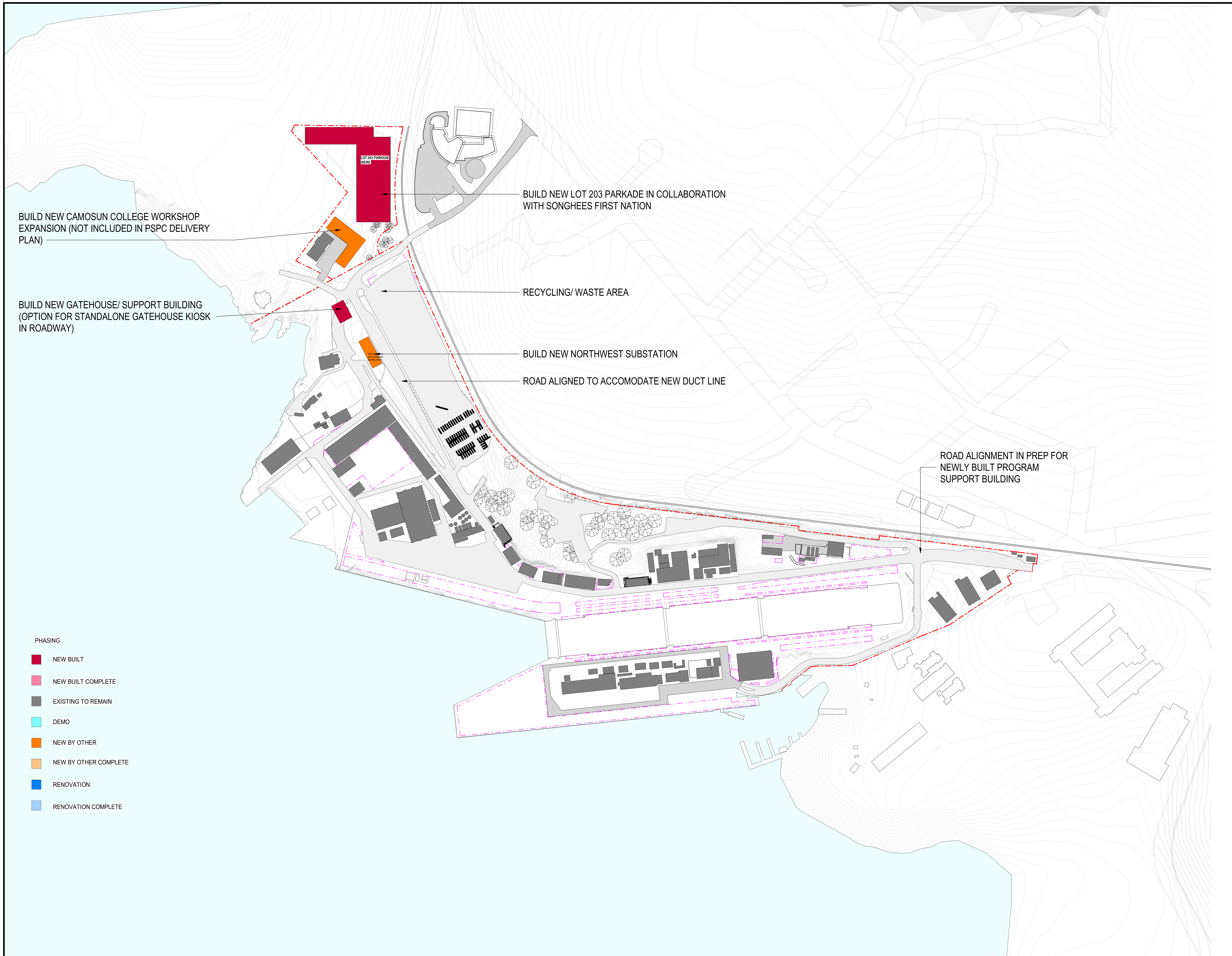
Approver

Drawing title / Titre du dessin

PHASING _PHASE 1A

Project No. / No. du Project: R.108702.001
Sheet / Feuille: A11000 OF 0000
Revision no. / La Revision no.: 3



1 SITE MASTER - PHASING _PHASE 1B
SCALE: 1 : 2000

0m 40m 80m 120m 160m 200m
SCALE 1:2000

Public Works and Government Services Canada
Travaux publics et Services gouvernementaux Canada

REAL PROPERTY SERVICES
Pacific Region
SERVICES IMMOBILIERS
Région de Pacifique

Project Title: 220064

N

Revision / Revision	Description / Description	Date / Date
3	Issued for 100% Concept Design	2021-07-26
2	Issued for Concept Design Review	2021-06-30
1	Issued for 90% Draft Concept Design Review and Costing	2021-06-18

Client / client

PSPC

Project title / Titre du project

825 ADMIRALS ROAD, VICTORIA, B.C.

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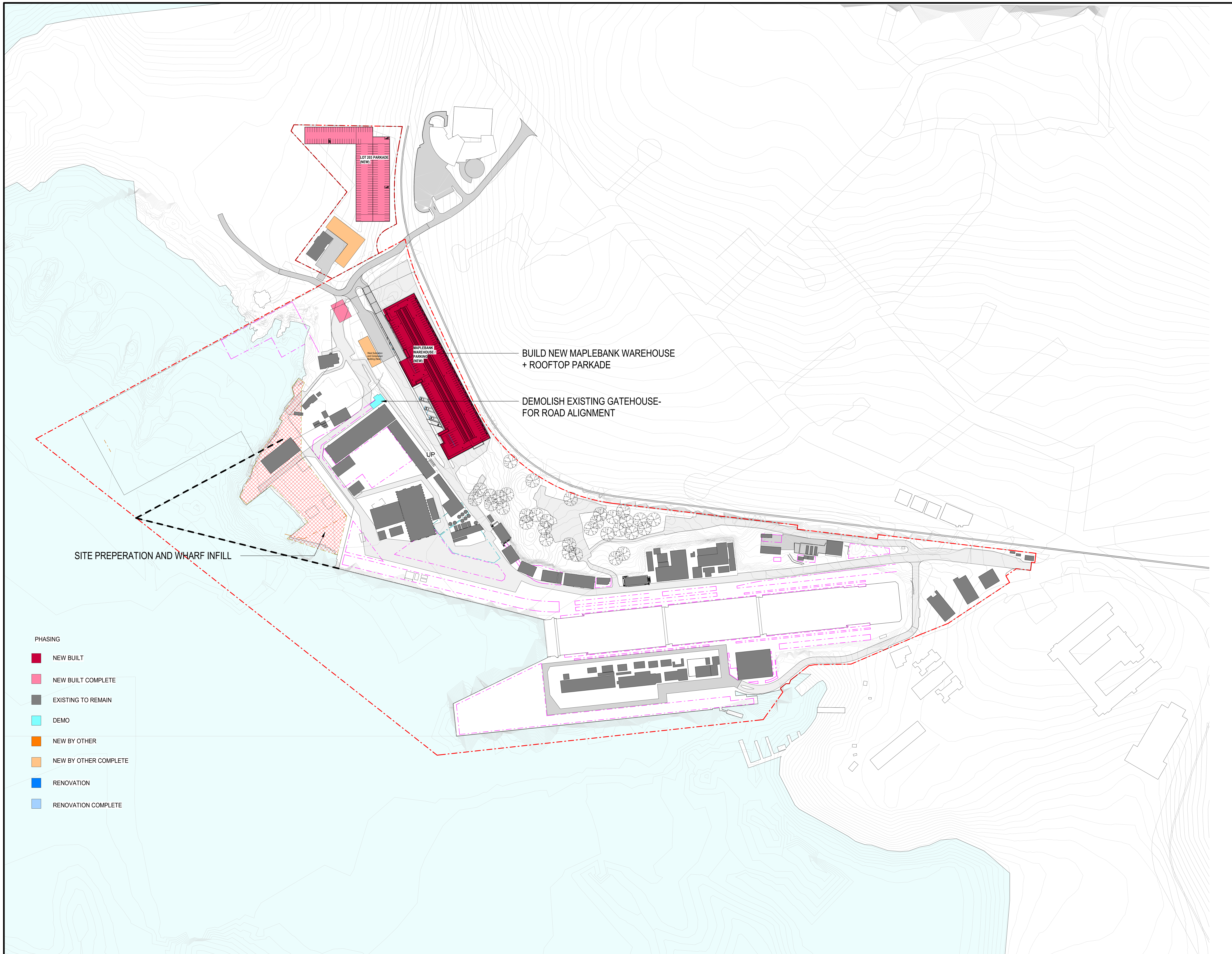
Drawing title / Titre du dessin

PHASING _PHASE 1B

Project No. / No. du Project	Sheet / Feuille	Revision no. / La Revision no.
R.108702.001	A11001 OF 0000	3



1 SITE MASTER - PHASING _PHASE 1C
SCALE: 1 : 2000

0m 40m 80m 120m 160m 200m
SCALE 1:2000

Public Works and Government Services Canada / Travaux publics et Services gouvernementaux Canada

REAL PROPERTY SERVICES
Pacific Region
SERVICES IMMOBILIERS
Région de Pacifique

kasian

Project Title: 220064

Revision / Revision	Description / Description	Date / Date
3	Issued for 100% Concept Design	2021-07-26
2	Issued for Concept Design Review	2021-06-30
1	Issued for 90% Draft Concept Design Review and Costing	2021-06-18

Client / client

PSPC

Project title / Titre du project

825 ADMIRALS ROAD, VICTORIA, B.C.

EGD MP - SITE

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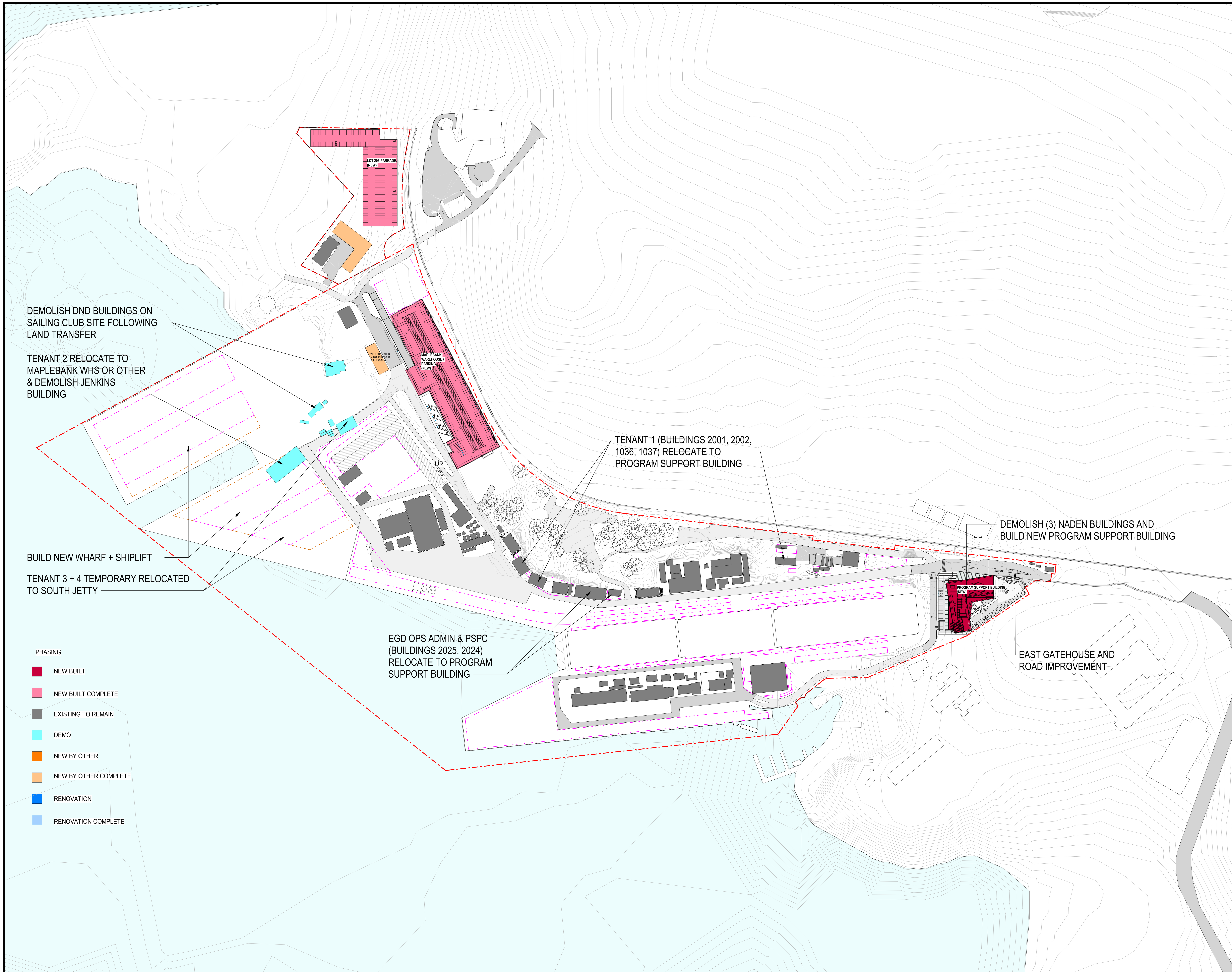
Drawing title / Titre du dessin

PHASING _PHASE 1C

Project No. / No. du Project: R.108702.001

Sheet / Feuille: A11002 OF 0000

Revision no. / La Revision no.: 3



1 SITE MASTER - PHASING _PHASE 2

SCALE: 1 : 2000

0m 40m 80m 120m 160m 200m

SCALE 1:2000

Public Works and Government Services Canada
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REAL PROPERTY SERVICES
Pacific Region
SERVICES IMMOBILIERS
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Project Title: 220064

N

Revision / Revision	Description / Description	Date / Date
3	Issued for 100% Concept Design	2021-07-26
2	Issued for Concept Design Review	2021-06-30
1	Issued for 90% Draft Concept Design Review and Costing	2021-06-18

Client / client

PSPC

Project title / Titre du project

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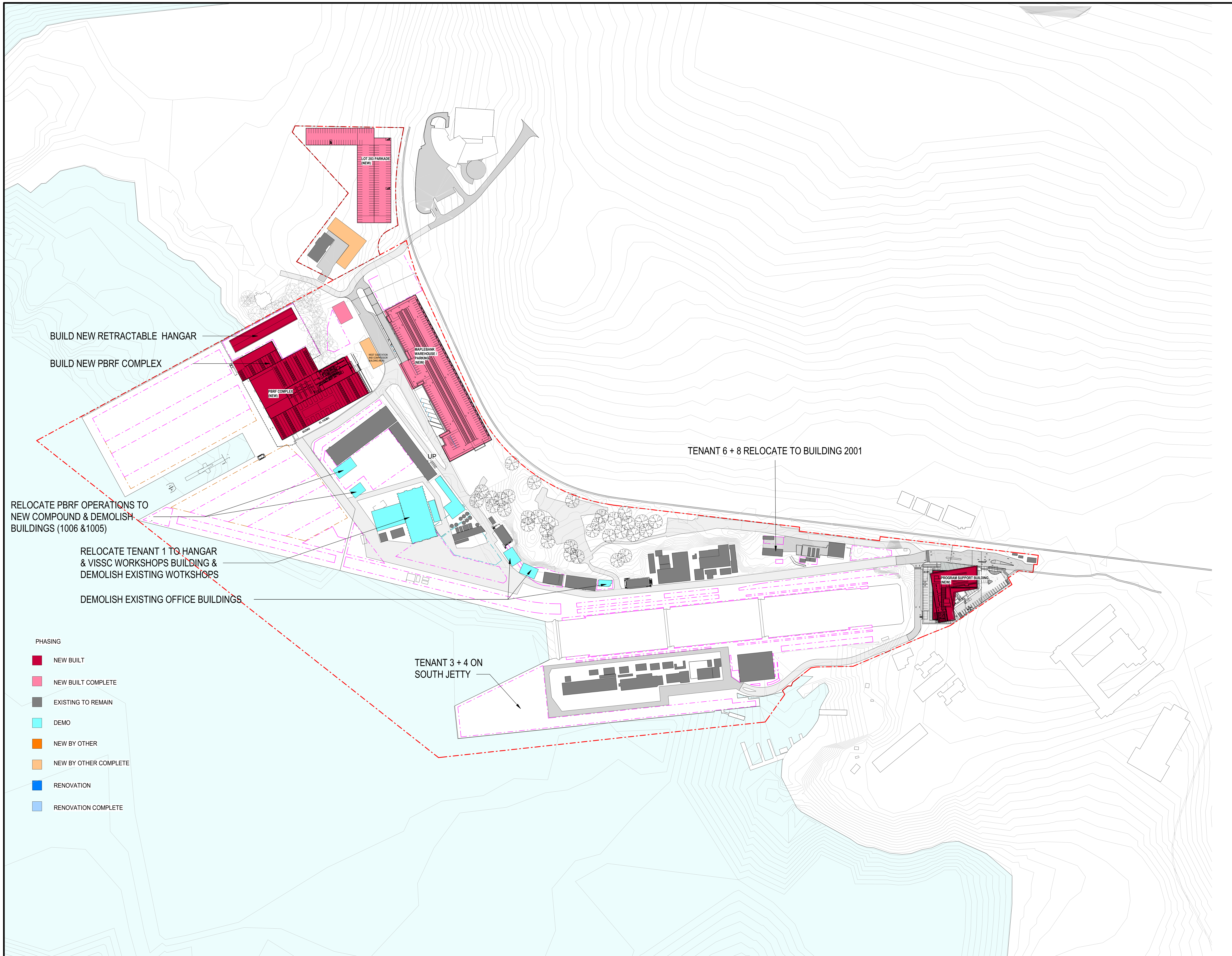
Drawing title / Titre du dessin

PHASING _PHASE 2

Project No. / No. du Project	Sheet / Feuille	Revision no. / La Revision no.
R.108702.001	A11003 OF 0000	3



2 SITE MASTER - PHASING _PHASE 3
SCALE: 1 : 2000

0m 40m 80m 120m 160m 200m
SCALE 1:2000

Public Works and Government Services Canada
Travaux publics et Services gouvernementaux Canada

REAL PROPERTY SERVICES
Pacific Region
SERVICES IMMOBILIERS
Région de Pacifique

Project Title: 220064

N

Revision / Revision	Description / Description	Date / Date
3	Issued for 100% Concept Design	2021-07-26
2	Issued for Concept Design Review	2021-06-30
1	Issued for 90% Draft Concept Design Review and Costing	2021-06-18

Client / client

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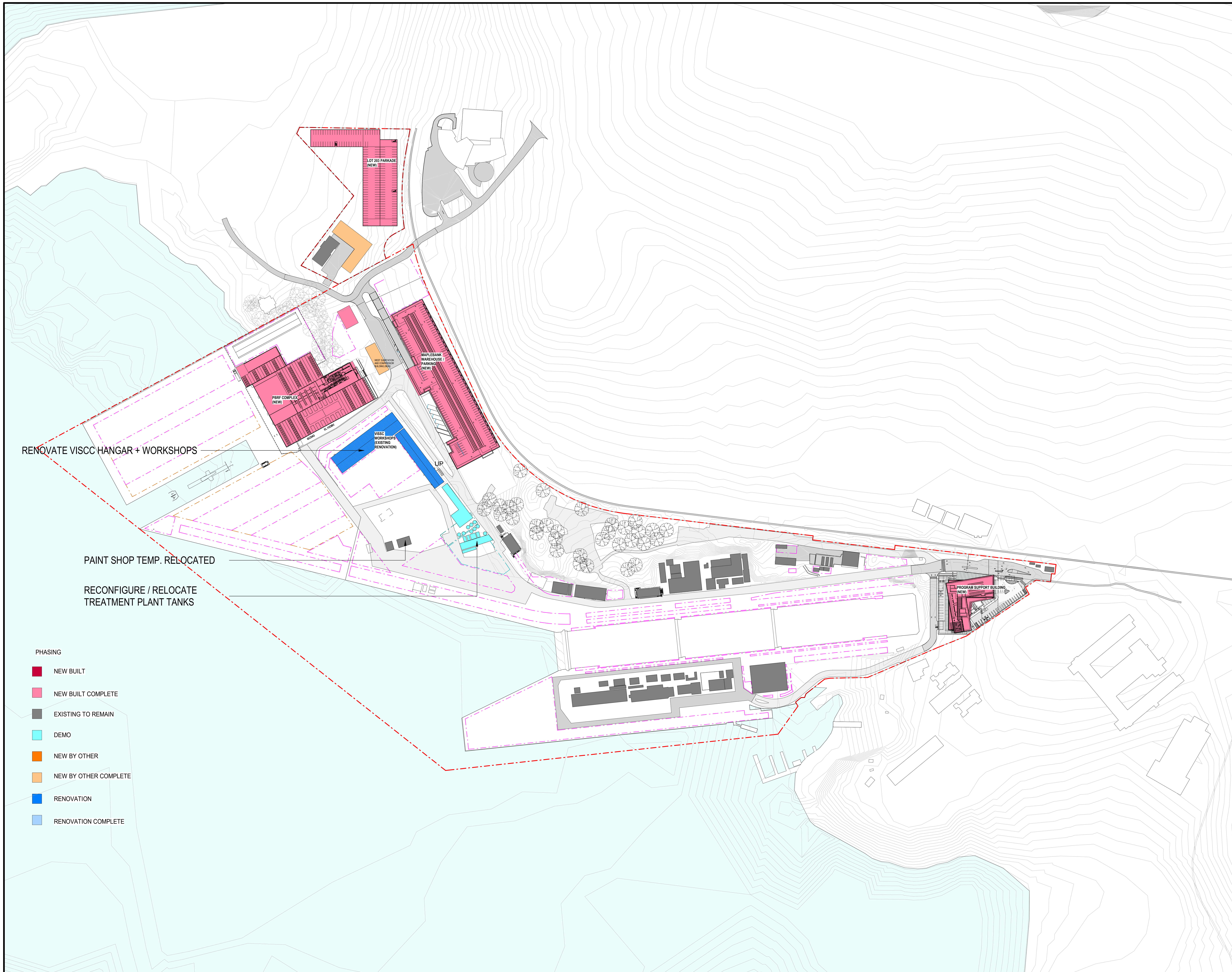
Drawing title / Titre du dessin

PHASING _PHASE 3

Project No. / No. du Project: R.108702.001

Sheet / Feuille: A11004 OF 0000

Revision no. / La Revision no.: 3



1 SITE MASTER - PHASING _PHASE 4
SCALE: 1 : 2000

0m 40m 80m 120m 160m 200m
SCALE 1:2000

Public Works and Government Services Canada
Travaux publics et Services gouvernementaux Canada

REAL PROPERTY SERVICES
Pacific Region
SERVICES IMMOBILIERS
Région de Pacifique

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Project Title: 220064

Revision / Revision	Description / Description	Date / Date
3	Issued for 100% Concept Design	2021-07-26
2	Issued for Concept Design Review	2021-06-30
1	Issued for 90% Draft Concept Design Review and Costing	2021-06-18

Client / client

PSPC

Project title / Titre du project

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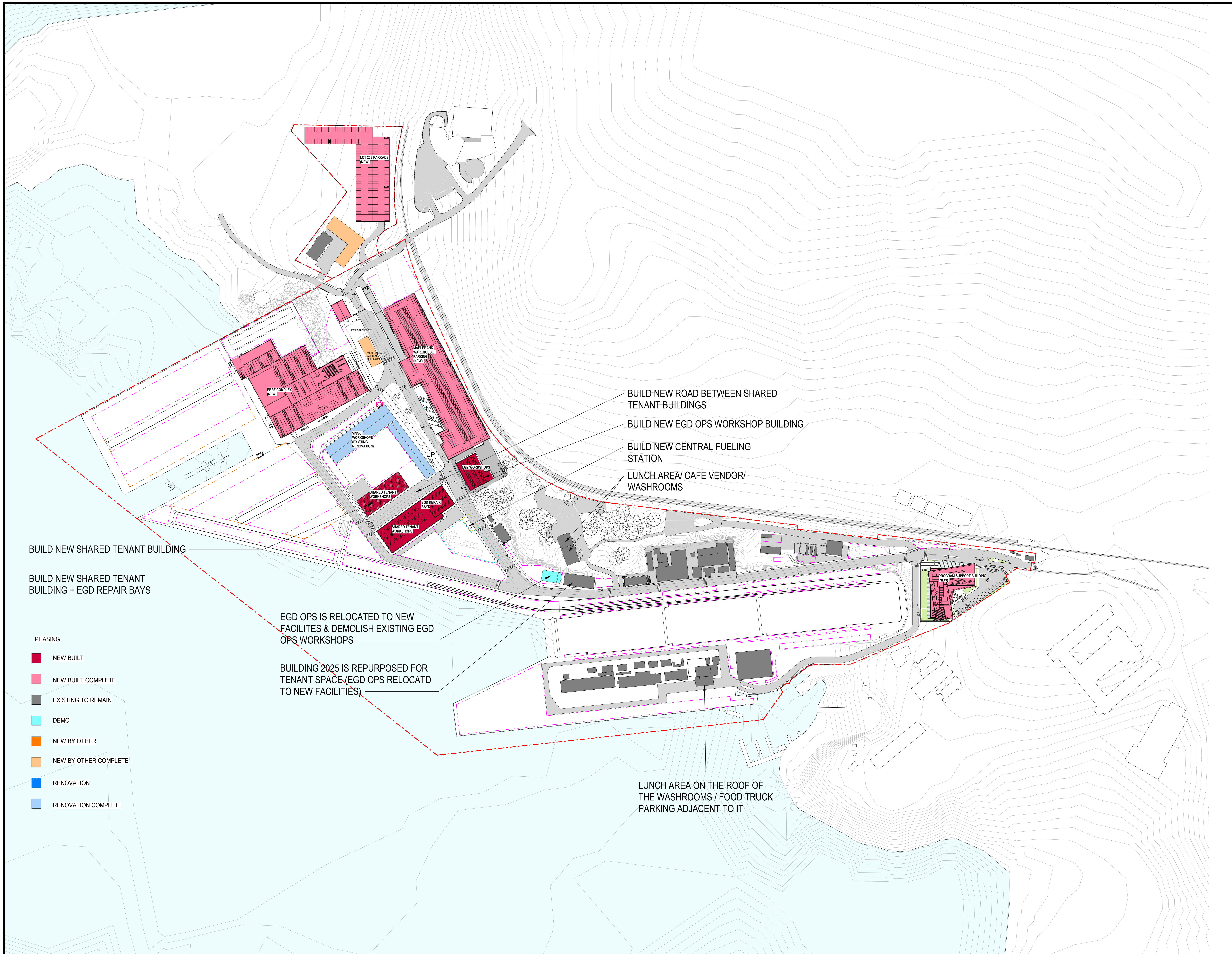
Drawing title / Titre du dessin

PHASING _PHASE 4

Project No. / No. du Project: R.108702.001
Sheet / Feuille: A11005 OF 0000
Revision no. / La Revision no.: 3



1 SITE MASTER - PHASING _PHASE 5
SCALE: 1 : 2000

0m 40m 80m 120m 160m 200m
SCALE 1:2000

Public Works and Government Services Canada
Travaux publics et Services gouvernementaux Canada

REAL PROPERTY SERVICES
Pacific Region
SERVICES IMMOBILIERS
Région de Pacifique

kasian

Project Title: 220064

N

Revision / Revision	Description / Description	Date / Date
2	Issued for 100% Concept Design	2021-07-26
1	Issued for Concept Design Review	2021-06-30

Client / client

PSPC

Project title / Titre du project

825 ADMIRALS ROAD, VICTORIA, B.C.

EGD MP - SITE

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Designer

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Approver

Drawing title / Titre du dessin

PHASING _PHASE 5

Project No. / No. du Project
R.108702.001

Sheet / Feuille
A11006
OF 0000

Revision no. / La Revision no.
2

1 SITE MASTER - PHASING _FINAL

SCALE: 1 : 2000

0m 40m 80m 120m 160m 200m

SCALE 1:2000

Public Works and Government Services Canada

Travaux publics et Services gouvernementaux Canada

REAL PROPERTY SERVICES

Pacific Region

SERVICES IMMOBILIERS

Région de Pacifique

Project Title: 220064

N

Revision / Revision	Description / Description	Date / Date
3	Issued for 100% Concept Design	2021-07-26
2	Issued for Concept Design Review	2021-06-30
1	Issued for 90% Draft Concept Design Review and Costing	2021-06-18

Client / client

PSPC

Project title / Titre du project

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EGD MP - SITE

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Designed by / Concept par

Designer

Drawn by / Dessine par

Author

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Approver

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Drawing title / Titre du dessin

PHASING _FINAL STATE

Project No. / No. du Project: R.108702.001

Sheet / Feuille: A11007 OF 0000

Revision no. / La Revision no.: 3