

# **Prideaux Satellite Parks Operations Yard** July 23, 2021





### SIGNATURES

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# **PROJECT OVERVIEW**

## 1.1 ASSIGNMENT / PLANNING PROCESS

#### 2021 Master Plan and Conceptual Design

The City underwent an Operational Space Needs Review / Redevelopment Options, prepared by Resource Planning Group Inc (RPG), in July 2019. To inform redevelopment options, Prideaux Site was designated as a Satellite Operations Works Yard due to its proximity to the downtown core.

The Prideaux Site comprises of several buildings and structures that all provide services for Parks Operations throughout the city of Nanaimo. The buildings include:

- Parks Administration Building
- Storage Equipment Building
- Shop Open Bay Building
- Green House

A preferred option was costed. Subsequently to reduce overall project costs the City's Steering Committee reviewed strategies to reduce program areas and re-use existing structures where possible.

Kasian Architecture, Interior Design and Planning Ltd (Kasian) was engaged by the City of Nanaimo (City) to renovate the Satellite Parks Operations Yard at 89 Prideaux Street. After site & life cycle analysis at 89 Prideaux and 91 Prideaux it was determine that both the Administration and Storage Buildings would be renovated as part of the expanded scope of the original 2019 Redevelopment Plan.

To inform the refinement the preferred Master Plan and phasing strategy, key planning sessions with the Project Steering Committee included:

- To inform planning, the design team underwent a site \_ walk-through of the existing accommodations to gain an understanding of operational workflows and deficiencies at the parks site.
- Develop of a Vision Statement and Planning Objectives for the future Nanaimo Operations Centre are outlined in Section 1.2.
- Site Overview. The design team reviewed the site from available background studies to understand the physical characteristics and constraints at the yard. Highlights of the existing site are detailed in Section 2.
- Review and refinement of the 2019 RPG Program and sketches prepared by the City. The future staff compliment and program are outlined in Section 3.
- Engineering strategies are detailed in Section 4.
- To identify the preferred Master Plan a number of discussions were held to capture ideal workflows, adjacencies, and building condition with the Steering Committee and departmental representatives.
- Development of an implementation phasing strategy and the Master Plan are outlined in Section 5.

Project Steering Committee includes:

- Bill Sims, General Manager of Engineering & Public Works
- John Elliot, Director of Public Works \_
- Poul Rosen, Director of Engineering \_
- Art Groot, Director of Facilities & Park Operations \_
- Jake Rudolph, Chief Administrative Officer

The Project Steering Committee was joined by:

- Michael Strain, Engineering Projects, Senior Project Manager \_ - Nanaimo Operations Center Project Manager
- Arshad Bastani, Capital Projects Project Advisor

With the development of the Parks Operations Yard, the design team moved forward with development of the Concept Plan for key buildings across the site.

Section 5 also includes preliminary floorplans based on program areas, workflows, critical adjacencies and BC Building Code

- Administration Building
- Storage Building

See Section 6 for preliminary structural, mechanical and electrical floor plans



### **1.2 PLANNING OBJECTIVES**

#### Nanaimo Operations Centre Vision

As part of the development of the Nanaimo Operations Center (NOC), the Prideaux site poses the opportunity to adjust the existing Parks Operations facilities. Post amalgamation, the Prideaux Yard became the Parks Operations Yard, and Parks has since outgrown the facility and now occupies both the Annex and the Prideaux Yard. The intent with the NOC would be to relocate all staff from the Annex to Labieux and some of the staff from Prideaux. The newly upgraded Prideaux yard would house a revised compliment of Parks Staff conveniently located within the downtown Nanaimo core, allowing the facilities to operate more effectively

and efficiently, while still retaining a welcoming public face.

This vision statement will guide the design process, providing the foundation for the Planning Objectives of upon which the Parks Operations yard will be renewed.

To guide the development of the site a series of Planning Objectives has been developed:

- Improved Resiliency
- Improved Safety
- Operational Efficiency
- Good Governance & Accountability
- Renewed and Right-Sized Facilities
- Environmental Sustainability.

These Planning Objectives will contribute to defining the ideal configuration and design for the Prideaux Parks Operations Work Yard.

### **1.2.1 IMPROVED RESILIENCY**

## Resiliency: Plan for seismic events and for durable material selection throughout design.

- Renovation and structural improvements allow for increased safety in case of seismic events i.e. re-roofing. See WSP report for more details, in Section 6.
- Renovation creates an opportunity to improve material durability through life cycle cost analysis

Adaptability: Plan to serve current and future needs. Consider future business transformational needs and trends such as population growth, automation and electric vehicles.

- The Master Plan should be based on a planning horizon of 25 years, with consideration of current building conditions.
- Provide flexible, adaptive space in administrative and warehousing facilities to allow for changes in requirements.



### **1.2.2 IMPROVED SAFETY**

## Improve security and safety for City staff and other users of the site.

- Safe and efficient movement of fleet is critical.
- Site design should reflect a comprehensive security plan focussed on functionality for all users at the Yard.
  - Taller & more robust fencing
  - Improvement of site lighting
  - Increased glazing so as to passively discourage theft or damage throughout the site. See section 5 for drawings.
  - Glazing throughout storage spaces will have a film added to remove visibility and mitigate theft issues.
- Improve the storage and handling processes for hazardous materials on site.

# Provide healthy work environments throughout the site

- Facilities should reflect best practices for modern, healthy work environments, including as access to natural light and views, improved mechanical systems and improved indoor air quality.
- Incorporate a variety of different spaces that support wellness across the site to support healthy movement throughout the day.
- Improve washroom and shower facilities to a healthy lifestyle in and out of office. (ex. Cycling to work, universal accessible washrooms)
- Use ergonomic principles to inform design solutions, such as furniture and equipment selections.

### 1.2.3 IMPROVED OPERATIONAL 1.2.4 GOOD GOVERNANCE & **EFFICIENCY**

#### Improve operational efficiency

- Identify key adjacencies between working groups and co-locate /consolidate their space to best support and streamline work flows and communications.
- Densify and optimize spaces across the site to use the full \_ site to its best capacity.
- Consider using alternative solutions, such as exterior \_ racking and new distribution models (i.e. single bin free issue materials or direct to project site) to reduce space requirements and allow the Yard to be agile and responsive to needs

# ACCOUNTABILITY

#### Balance cost effectiveness and efficiency with a flexible, adaptive work environment that allows for future facility changes or operational directives.

- Maintain continual operations and capacity with consideration for all ongoing project work.
- Parks strategies to focus on current and future needs, without impeding long-term future developments on the site.
- Seek out strategies for cost effective design solutions: utilitarian and practical in nature, future buildings are to be designed and specified to be basic and as cost effective as possible.

#### Contribute to a sustainable, liveable community.

- Implement a "good neighbour" approach to the organization of the site with respect to the surrounding area. Consider visual sight-lines into the site as well as noise.
- Provide opportunities for First Nations involvement and continue to strengthen the relationship between the City and the indigenous communities.
- Celebrate Nanaimo in the design of the facility and improve the welcoming public face to the Yard. For Example, the existing the mural on the Administration building.

### 1.2.5 RENEWED & RIGHT-SIZED **FACILITIES**

Flexibility: Facilities should be flexible and adaptable to the changing environment and service needs over time.

- Facilities should be designed to accommodate increased \_ service demands and projected staff growth.
- Use modular design principles to refine space types that can grow or compress as operational priorities shift over time.
- Strategically locate non-assigned or temporary uses adjacent to operations that have the highest potential for growth to allow for future expansion.

### Equity: Facilities should accommodate a changing workforce.

- Design all facilities to reflect the changing demographics of the workforce to attract and retain personnel.
- The design should be universal, considering such elements \_ as accessibility, cultural differences and gender neutral design to ensure inclusivity and provide future flexibility. (ex. Universal accessible washrooms to be provided within the administration building)
- Provide modern facilities and amenities that will attract and retain staff.



### 1.2.6 IMPROVED **ENVIRONMENTAL SUSTAINABILITY**

### The redeveloped site should demonstrate leadership in sustainable design.

- The Yard redevelopment must contribute to meeting the targets and objectives of the City's Green Building Strategy.
  - Energy Efficiency appropriate to the building scale.
  - Minimized Greenhouse gas emissions
  - Water efficiency throughout the site.
- Best Practices for sustainable design development will integrated into the design for any and all major building renovations funded by City capital funds. Should the renovation cost exceed 50% of the original building cost then Building Step Code will also be implemented.
- Develop Mandatory Design Criteria (applied to new builds or renovations) that outlines specific health and wellness / accessibility initiatives and ergonomic principles.
- Sustainable site assessment to be implemented should need arise.

### Water Efficiency

- Roof rainwater collection for grey water reuse has been considered, though due to site size limitations and rainwater data this option may be too costly.
- Any and all runnoff of water from the site must be captured and cleaned to protect the habitat of the local creeks, aguifers and Pacific Ocean.
- Reduction of the amount of impermeable surface across the site to replenish local aquifers.
- Implement an integrated efficient pluming and fixtures to minimize water waste throughout site.



#### Green Mobility

- Consider future space needs and preliminary strategies to accommodate the transition of Fleet Vehicles to renewable fuel stores such as electric.
  - Size electrical load and site weight bearing to be 30% \_ plus of future fleet could be EVs and heavy electric trucks. (2 spots provided onsite)
  - It is also important to assume a higher level of IT connectivity for fleet. Each major location should be served with fibre in conduit to allow for easy upgrades.
- Incorporate spaces, such as improved shower/changing facilities, outdoor bike rack, or optional outdoor bike cage to encourage the use of alternative transportation to the site.
- Provide easy access from the site to surrounding public transit. (Multiple Bus stations located nearby to site. See Section 2 for further information)
- Improve landscaping strip at the front of the building so as to transition nicely from ajoining park space to parks facility. (Comox Park)
- Provide safe pedestrian walkways across the site.
- Provide accommodations for carpooling, sharing and electrical vehicle charging for staff on site

#### Zero Waste

- Reuse of existing structures on site to modernize the structure and extend its usable life.
- Consider opportunities to reuse existing materials on site or materials generated through demolition of existing structures for new construction activities on site.
- Review existing yard processes to identify additional potential for synergies in using waste products generated by one branch for the activities of another branch, to reduce waste production on site.
- Incorporate spaces for educational outreach regarding Zero Waste planning and processes to the public and private sectors partners.
- The City of Nanaimo Green building Policy is scheduled for update and potential revision, upon this revision we will meet the change in requirements.



## **1.3 OUTCOMES & NEXT STEPS**

To inform subsequent design phases the following studies or strategies are recommended or anticipated. If funding is limited, the design team can prioritize these studies:

- Sustainability Site Assessment responding to Climate Change and Resiliency concerns.
- Geotechnical Site Assessment to respond to Seismic Safety Concerns
- Develop Mandatory Design Criteria (applied to new builds \_ or renovations) that outlines specific health and wellness / accessibility initiatives and ergonomic principles.

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## 2

## SITE OVERVIEW

To identify opportunities and challenges that might impact the project, the design team has carried out a high level overview of the site, leveraging findings from web-based research, available client background materials, as well as the information collected during the site visit.

### 2.1 CONTEXT LOCATION

The site is located on 89 and 91 Prideaux Street, on the North side of the City Centre The site is conveniently located near the Island Highway. The property is located between Comox Park on the East, Residential Buildings to the West and North, and a Parking lot to the South.

Looking in more detail at the surroundings of the site, the Eastern long side of the parcel is bordered by Prideaux Street, the only street with vehicular access to the site. The Northern portion of the site comprises of a Administrative Building, Workshops and Vehicle Storage. While the south end of the site hosts a Greenhouse, Wash Pit and Covered Storage. On the Western side, the length of the site abuts the Esquimalt and Nanaimo (E&N) Railway line and the E&N trail.





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Figure 2.1 (This page, left) Nanaimo Districts, Reimagine Nanaimo Phase 1 Public Engagement Summary (source: https://www.nanaimo.ca/docs/property-development/ reimagine-nanaimo/reimagine---phase-1-engagement-summary---2020-02-08.pdf) June 17. 2021

Figure 2. 2 (This page, above) Site Location (source: https://www.google.ca/maps) June 17, 2021

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#### SITE INFORMATION

Civic Address: 89 & 91 Prideaux Street 89 Prideaux St. PID: 008-803-137 Zone Code: DT8 Zone Description: Old City Mixed Use Approximate Area: 2,346.93 m² (0.58 acres)

91 Prideaux St.
PID: 008-814-228
Zone Code: DT8
Zone Description: Old City Mixed Use
Approximate Area: 1,078.40m<sup>2</sup> (0.27 acres)

### PARCEL AND PROJECT SITE

#### LEGEND

Parcel: 89 & 91 Prideaux Street Parcel includes:

Project Site



Figure 2. 3 Context - Parcel and Project Site (background image source: https://nanmap. nanaimo.ca/Html5Viewer/index.html?viewer=NanaimoMap) June 18, 2021



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### **EXISTING SITE COMPONENTS**

#### LEGEND

- 01 Shop Open Bay Building
- 02 Storage Equipment Building
- **03** Parks Administration Building
- 04 Greenhouse
- 05 Open Covered Storage Structures
- **06** Horticulture Outdoor Area
- 07 Wash Pit
- Project Site
- Property Line Separating both addresses. - -
- Main Access, 89 Prideaux St. >
- Main Access, 91 Prideaux St. >
- Main Internal Circulation
- Secondary Circulation
  - Staff Parking



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Figure 2. 4 Context - Existing Site Use (background image source: https://nanmap. nanaimo.ca/Html5Viewer/index.html?viewer=NanaimoMap) June 18, 2021





## 2.2 LAND USE

#### ZONING

The Site has been classified as DT8 which, according to the Zoning Bylaw No. 4500, corresponds to Downtown Eight. This zone provides for mixed commercial / residential buildings. Commercial uses are permitted at street level and multiple family residential uses on the second and third storeys. It is intended to provide for the adaptive reuse of character buildings.

Permitted Uses: [include] Assembly Hall, Commercial School, Daycare, Electric Vehicle Charge Station, Financial Institution, Internet Centre, Laundromat, Live/Work, Multiple Family Dwelling, Neighbourhood Pub, Office, Parking Lot/Parkade (Within the DT8 Zone, parking lots and parkades shall not be permitted on lots with an area greater than 1,800m<sup>2</sup>), Pawn Shop, Personal Care Facility, Personal Service Use, Pharmacy, Printing & Publishing Facility, Recreation Facility, Religious Institution. Restaurant, Retail, Rooming House, Single Residential Dwelling, Social Service Resource Centre. Vet Clinic.

Permitted Uses as an Accessory Use: [applicable to this site] One accessory dwelling unit.

Maximum Lot Density: 0.85 (+0.15 for Mixed Use)

- Lot Size and Dimensions:
- Minimum Lot Size: 800 m<sup>2</sup>
- Minimum Lot Frontage: 15 m
- Minimum Lot Depth: 30 m

#### Setbacks:

A principal building must be set back from the property lines as follows:

Minimum Front Yard Setback: 3 m

Maximum Front Yard Setback: 6 m

Side Yard Setback: 3 m

- Flanking Side Yard: 3 m
- Rear Yard Setback: 3 m

Figure 2. 5 Zoning diagram (source: https://nanmap.nanaimo.ca/Html5Viewer/index. html?viewer=NanaimoMap) April 26, 2021



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Where a lot abuts a residential zone, the side yard setback shall be 4.5m

The site is not abutting with a residential zone. However, residential building abuts the north side of the lot.

#### Size of Building:

The maximum lot coverage and height of a principal building shall be as follows:

Lot Coverage: 50%

Maximum Allowable Height: 10.5 m

Commercial uses are only permitted within the first storey of a building within the DT8 Zone. Within all downtown zones, except the DT8 Zone, no parking shall be permitted between the front property line and the front face of the building

NOTE: The current location of the buildings on site shows encroaching inside allowable setbacks. Any major modification of the renovated buildings may trigger some requirements to meet current Bylaw.





#### PARKING REGULATIONS

Based on the Off-street Parking Regulations Bylaw 2018 No. 7266, the following requirements apply to the project:

A maximum of 40% of the required off-street parking spaces may be reduced in size to accommodate small cars. Refer to Table 1 and 2 from the bylaw for parking dimensions.

#### LOADING SPACE REQUIREMENTS

On a lot used for industrial, warehouse or other similar use involving the movement of goods, materials or items by truck, the minimum number of off-street loading spaces shall be as follows:

Total Gross Floor Area of Building (s) and Structures	Spaces Required
Less than 465 m <sup>2</sup>	1
465 m <sup>2</sup> to 2,325 m <sup>2</sup>	2
2,325 m <sup>2</sup> to 4,650 m <sup>2</sup>	3
Each additional 4,650 m <sup>2</sup> or fraction thereof in excess of 2,325 m <sup>2</sup>	1 additional loading space

On a lot used for an office building, public utility, or other similar use involving the movement of goods, materials or items by truck, the minimum number of off-street loading spaces shall be as follows:

Total Gross Floor Area of	Spaces Required					
Building (s)						
Less than 2,800 m <sup>2</sup>	1					
2,800 m <sup>2</sup> to 5,600 m <sup>2</sup>	2					
Each additional 5,600 m <sup>2</sup> or	1 additional loading space					
fraction thereof in excess of						
2,800 m <sup>2</sup>						

#### REQUIRED NUMBER OF OFF-STREET PARKING SPACES

The required number and type of parking spaces for the project must be as follows:

Industri	al Uses				
Custom Workshop	1 space per 100 m <sup>2</sup> of gross floor area 1 space per 100 m <sup>2</sup> of gross floor area 1 space per 100 m <sup>2</sup> of gross				
	floor area				
Manufacturing and industrial	1 space per 100 m <sup>2</sup> of gross				
uses, including food and	floor area				
beverage processing					
Machinery and equipment sales	1 space per 100 m <sup>2</sup> of gross				
and service	floor area				
Service industry, repair	1 space per 100 m <sup>2</sup> of gross				
(excluding appliance and	floor area				
automotive) and similar uses					
Warehousing, storage, mini-	1 space per 200 m <sup>2</sup> of gross				
storage, wholesale and similar	floor area				
uses					

Commercial Uses								
Office	1 parking space per 22 m <sup>2</sup> net floor area for the first							
	1,000 $m^2$ of net floor area and 1 space per 25 $m^2$ of							
	net floor area for the remainder							

#### BICYCLE PARKING

The required number and type of bicycle parking spaces for the project must be as follows:

Use	Number of Short Term Bicycle Parking Spaces Required	Number of Long Term Bicycle Parking Spaces Required
Custom Workshop, Manufacturing and Industrial Uses	None required	0.1 per 100 m <sup>2</sup> of gross floor area
Office	0.1 spaces per 100 m <sup>2</sup> of gross floor area	0.35 spaces per 100 m <sup>2</sup> of gross floor area

Refer to the bylaw for size, location and access requirements.

SUMMARY: The replanned site design meets and exceeded these requirements for all city parking (bike and vehicle) and loading requirements.

#### ACCESSIBLE PARKING

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Parking spaces for the use of persons with physical disabilities shall be provided according to the following cumulative ratios:

No. of Required Parking Spaces	No. of Accessible Parking Spaces
1-10	0
11-20	+1
21-100	+2
101-1000	+2 per 100 required spaces or part thereof
1001+	+1 per 100 required spaces or part thereof



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### 2 | SITE OVERVIEW

#### LANDSCAPING REQUIREMENTS

As per the Zoning Bylaw No. 4500, the minimum level of landscaping required along streets to screen adjacent zones and to mask or separate outdoor storage, refuse sites and utility kiosks shall be as follows:

MINIMUM LANDSCAPE TREATMENT LEVELS

#### For DT8 sites:

Front Yard: Level 1

Side Yard: Level 1

Rear Yard: Level 1

Storage / Landfill / Refuse Receptacles: Level 2

#### CHARACTER OF LANDSCAPING

Character Area	Design Layout Type	Landscape Design Guidelines
Old Nanaimo	Formal	Make deciduous trees in formal
Historical city with		rows dominant. Consider flowering perennials, annuals, bulbs. Provide
iormai streetscapes.		emphasis on season colour and
		display. Protect plant materials
		from trampling. Consider heritage
		planting styles. Urban plazas are
		encouraged.

The required hedge, fence, shrub bed, ground cover or grass landscape shall be continuous along the affected property boundaries, broken only by public walkways and driveways.

All planted areas required by the bylaw shall be protected from intrusion by motor vehicles with a continuous concrete curb. The curb shall be a type which will not be damaged by normal vehicle impact.

When the vehicle area has parking perpendicular to the curb, the landscape must be protected from a car overhang by a concrete wheel stop placed in each parking stall a minimum of 1 meter from the landscape area.







On the street side, landscape buffers are to be protected from streets and shoulders by a continuous curb. If no curb exists on the City street, then a curb shall be provided along the property line.

All planted areas (trees, shrubs, ground cover, lawn) required by the bylaw shall be serviced by an underground automatic irrigation system.

SUMMARY: See Site Plan, in Appendix B, for suggested Landscape Improvements to the city boulevard. To continue with our "good neighbour" approach, we are using this opportunity to improve upon the public face of the site and compliment the existing mural.

Figure 2. 6 Minimum Landscape Treatment (source: Zoning Bylaw No. 4500)

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#### EASEMENTS / RIGHTS OF WAY

The 89 & 91 Prideaux parcels do not show easements nor rights of way within the property boundary.

However, due to the proximity of the power line to the property boundary the BC Hydro Power Line Regulations need to be considered in the planning process. The guidelines are as follows:

POTENTIAL COMPATIBLE USES OF BC HYDRO'S RIGHTS OF WAY

Any proposal within the right of way (ROW) should be designed to ensure it is a minimum of 10 metres away from BC Hydro structures (e.g. poles, towers, anchors). If a closer distance is desired, BC Hydro would need to review the proposal on an individual basis.

Some examples of compatible activities that may be approved:

- Multi-use trails, paths and walkways
- Non-permanent, non-metallic small sheds less than 3.6 metres in height and a floor space of not more than 36 m<sup>2</sup> with no wiring or plumbing
- Driveways and access roads
- Fencing
- Golf courses
- Farming
- Tree farms

Some examples that aren't compatible in ROWs, unless expressly authorized in writing by BC Hydro:

- Burning, blasting or log decking
- Stock piling of excavated, building or other material
- Storage or handling of flammable or explosive material
- Fueling of vehicles and equipment
- Deposit of any fill material
- Organized parking of vehicles
- Buildings or portions of buildings, including foundations and eaves

#### PLANTING AND LOGGING NEAR POWER LINES

When planting outside the ROW, BC Hydro recommends not planting anything that will grow to be very tall, or that has weak root systems that might be prone to falling on power lines or structures.



While BC Hydro restricts trees in their ROW, they do allow for some low-lying vegetation and other ecological enhancements, such as pollinator fields.

#### UNDERGROUND INSTALLATIONS

BC Hydro builds power lines both above ground and underground. It is vital to position anything that is built underground (e.g.: sewers, water lines, other utilities, or other conduits) to avoid the safety risk of fault transfer when electricity arcs from a power line/cable into the ground and/or surrounding equipment.

Any underground infrastructure proposals within BC Hydro's ROW must be reviewed and approved by BC Hydro. The proposed works should be designed:

To be a minimum 10 metres from power lines or • infrastructure, both overhead and underground, with the exception of metal/ductile iron pipe or gas installations, which require a 30 metre separation.

A written approval from BC Hydro is needed for all proposed installations within a ROW or within the required minimum separation distances, and a BC Hydro inspector may be required to be on site.

SUMMARY: The Proposed renovations do not require BC Hydro Infrastructure upgrades. Please see WSP Report in section 7, for further elaboration.







#### LEGEND

- Site Limits
- BC Hydro Power Line
- BC Hydro Power Line Post
- E & N Trail
- E & N Railway Line



Figure 2.7 (this page, right) Right of Ways and Power Line location (source: https://nanmap.nanaimo.ca/Html5Viewer/index. html?viewer=NanaimoMap) June 18, 2021

Figure 2.8 (This page, left) View of Power Line from Prideaux St. & the E&N Railway line from Campbell St.(Source: google maps) June 18, 2021

#### **RAILWAY SETBACKS**

The Esquimalt and Nanaimo (E&N) Railway line runs along the West border of the site. This is an active line with a speed allowance range of 8-40mph. The most recent assessment, prepared for the BC's Ministry of Transportation and Infrastructure (MoTI), titled 'Island Corridor Condition Assessment, Summary Report' dated March 2020, was prepared by WSP.

The WSP report along with previous 2010 and 2012 reports done by others can be sourced from the Ministry's website (https://www2. gov.bc.ca/gov/content/transportation/transportation-reports-andreference/reports-studies/vancouver-island/island-rail?keyword=Islan d&keyword=Rail&keyword=Corridor&keyword=Commuter&keyword= Rail&keyword=Assessment&keyword=Report).

#### GUIDELINES FOR NEW DEVELOPMENT IN PROXIMITY TO **RAILWAY OPERATIONS**

In May 2013, Dialog and J Coulter and Associates developed Guidelines for New Development in Proximity to Railway Operations, for the Federation of Canadian Municipalities and the Railway Association of Canada. The guidelines include a series of standard mitigation guidelines for developments along existing rail lines. While these guidelines were generally targeted at new residential developments, they could be considered for other development types. BUILDING SETBACKS: Suggested building setbacks are based on the classification of the rail line:

- Principal Main Line: 30m
- Secondary Main Line: 30m
- Principal Branch Line: 15m
- Secondary Branch Line: 15m
- Spur Line: 15m

Some reduction in the setback may be achieved through providing a vertical safety barrier.

NOISE MITIGATION: Noise from railway operations should be considered when locating buildings adjacent to rail line. The report recommends engaging an acoustic consultant to assess the sitespecific noise levels and their potential impact to inform the layout and design of buildings in proximity to the rail line. Noise Mitigation measures may include:

- Vertical Noise Barriers
- Increased setbacks
- Careful building layout design to locate noise sensitive areas



Figure 2. 9 (This page, right) Map of E&N Rail line (source: Island Rail Corridor Condition Assemet report by WSP)



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furthest from the rail corridor, and areas that are unaffected by noise closer to the corridor to act as a buffer.

- Minimizing doors and windows on the building face closest to the rail corridor.
- Use Wall, window and door construction methods with higher acoustic performance ratings.

VIBRATION MITIGATION: Vibration impact from rail operations is also site specific, dependant on such things as the geography and geology of the site and the rail corridor operations. Therefore the report recommends an acoustic or vibration consultant prepare a vibration impact study to inform the design of the site. The area of study should encompass the area within 75m of the rail corridor. Potential mitigation measures, which are specific to building types, are included in the report, however it is noted that any vibration mitigation measures are generally expensive and should be developed in partnership between an acoustic and structural engineers

SAFETY BARRIERS: The report provides a series of examples of safety barriers that can be constructed on site to reduce the risks to both people and properties on the site as the result of derailment. Examples include earthen berms and crash walls, with recommended heights based on the frequency of use of the rail corridor.

SECURITY BARRIERS: A minimum 1.83m high chain link fence along the mutual property line is recommended for safety and security.

STORMWATER AND DRAINAGE: Any proposed changes to drainage on the site that may affect the rail corridor must be reviewed and coordinated with the railway. Drainage from the site itself cannot be brought to the rail property.

The report recommends consultation with the affected railway early in the development process to

- Review the proposed site location and the nature of the . proposed development;
- Advise on the frequency and type of use within the corridor and any future rail capacity plans; and
- Advise on the applicability of the standard mitigation measures to the site and review of potential alternate mitigation measures.

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SUMMARY: Technical Safety BC is the regulatory body for rails; in accordance with Transport Canada. As indicated by this entity, the 30m setback mentioned in the Guidelines for New Development may not apply along this line, as structures such as houses are already within 15m, not 30m. However, should their be any future expansions to the site that are closer to the railway system, then the guidelines will be carefully followed. The renovations to the buildings on site do are not currently affected by the Railway line, however, should their be expansion to the scope of the renovation then these following quidelines would be applicable.



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#### OFFICIAL COMMUNITY PLAN

The Official Community Plan indicates the future land use designation of the site will be Neighbourhood. Currently the property sits amongst an existing Neighbourhood that consists of mainly residential areas.

The OCP describes the site designation as follows:

#### 'Neighbourhood

Mix of housing types including single family homes and groundoriented multiple family units.



#### 2.3 Neighbourhood

#### Objectives

- To maintain the character and livability of existing \_ neighbourhoods. Ensure that new development and redevelopment maintains and enhances the residential character of existing neighbourhoods.
- To maintain the viability of existing older neighbourhoods. Reinvest in older neighbourhoods through infrastructure upgrades, expansion of community and recreational services, and open space.
- To increase housing choice. Encourage developments that increase housing choice and complement existing neighbourhood character.
- To provide access to neighbourhood level services. Develop service centres in new neighbourhoods and support the development of neighbourhood commercial centres and local service centres in existing neighbourhoods to move Nanaimo's neighbourhoods towards more complete communities. The development and support of these centres will also reduce the consumption of fossil fuels and energy use if goods and services can be accessed within each neighbourhood.
- To provide access to basic community services.

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Build appropriate community uses into new developments, and allow these services to develop in existing neighbourhoods.

- To protect the environment. Environmental features such as watercourses or habitat areas within these neighbourhoods shall be protected through the development of policies that respect the environment and the integration of land uses, and new uses shall be considered against their impact on air, water, and land quality.
- To build community spirit and cohesion. Provide for neighbourhood planning and encourage community participation in civic activities.1

SUMMARY: So as to properly integrate within the neighbourhood context. The Prideaux site renovations will implement a "good neighbour" approach and consider visual sight-lines into the site as well as noise so as to retain a calm and relaxing neighbourhood for the local residents. The renovation also provides new opportunities to improve upon and showcase the mural alongside the administration building.

#### 1 Source: "City of Nanaimo - OFFICIAL COMMUNITY PLAN BYLAW 2008 NO.6500, consolidated 2019-JAN-21

Figure 2. 10 Future Land Use Designations (source: https://nanmap.nanaimo.ca/Html5Viewer/index. html?viewer=NanaimoMap) June 17, 2021





## 2.3 SITE **CHARACTERISTICS**

#### SITE ACCESS

The site is located between Prideaux St. and Milton St. The site is just south of Comox Rd, a major urban arterial road.

Along its east, the site has two (2) access points off Prideaux Street, which is classified as a "Minor Collector Road" by the City of Nanaimo. One entrance being the Main Access point to the Administrative Building and Workshops, and the second being an access point to the greenhouse and Wash Pit.

Across Prideaux Street, Comox Park runs along the northern half of the east frontage of the property, alongside its west the property is flanked by the E&N Railway and bicycle trail.



Prideaux Street, View to Admin Building Access



Prideaux Street, View to Greenhouse Access







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#### SITE CIRCULATION

The site circulation is limited to two (2) points of entry on Prideaux St. The first, at the northern point of the site has a separate exit and entrance for the admin building, and workshops. The second, toward the south is a shared exit/entrance that directs toward the greenhouse.

#### TRANSPORTATION

The site is located is the downtown of Nanaimo, allowing for several transportation options to and from the site. Comox Road is directly north of the site and connects to Terminal Avenue, a main urban artery throughout Nanaimo.

#### CYCLING NETWORK

The E&N trail provides a dedicated, safe bike route in immediate vicinity to the site along the E&N Railway. A second bike lane is located north of the site on Comox Road.

#### PUBLIC TRANSPORT

Public transport options are available within a 3 minute walk to the site. Bus lines 1, 20, 30 and 50 run through the four bus stations located near the site.

#### SITE TOPOGRAPHY

The site appears generally flat with a slight slope, however the southwest portion of the site has a small retaining wall allowing for a flat site.

#### GREENSCAPE

Due to its use, the majority of the site has a paved/compacted gravel surface, with the cities deciduous trees along Prideaux Street. The Western portion of the site comprises of the E&N Trail, which adds a fairly vegetated and tree filled area to the site. A few trees are located at the site edge with a green strip alongside. We will improve and maintaining the existing tree area as well as integrate a more lush landscape into the green strip so as to allow a nice transition from Comox Park to the Parks Operation Site.

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Figure 2. 11 (This page, top) Trails and Bike Lanes (source: https://nanmap.nanaimo.ca/Html5Viewer/index.html?viewer=NanaimoMap) June 18, 2021 Figure 2. 12 (This page, bottom left) Topography - Contours (source: https://nanmap.nanaimo.ca/Html5Viewer/index.html?viewer=NanaimoMap) June 18, 2021 Figure 2. 13 (This page, bottom right) BC Transit Map Nanaimo (source: https://bctransit.com/nanaimo/schedules-and-maps) June 18, 2021



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E&N Trail

Bike Lane

Bus Stop (Lines 1,20,30,50)



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#### EXISTING UTILITIES

The following diagrams obtained from the Nanaimo Maps tool provide an overview of the available utilities serving the 89 and 91 Prideaux Street.

#### LEGEND

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### Sanitary Infrastructure



### Stormwater Infrastructure



Figure 2. 14 (left to right) Utilities, Sanitary, Storm & Water (source: https://nanmap. nanaimo.ca/Html5Viewer/index.html?viewer=NanaimoMap) June 17, 2021



#### LEGEND

С	Сар	— Catch Basin Lead
	Cleanout	→ Culvert
	Curb Catchbasin	➤ Main
(	Inlet/Outlet	Perforated Drain
	Manhole	Service Lateral
$\oplus$	Non-Curb Catchbasi	Ditch
0	Other	Storm Detention Area

Prepared by: Kasian Architecture, Interior Design and Planning



Figure 2. 15 (left and right) Water and combined utilities (source: https://nanmap.nanaimo.ca/ Html5Viewer/index.html?viewer=NanaimoMap) May 10, 2021





#### CLIMATE

The Province of BC uses the Biogeoclimatic Ecosystem Classification to identify different zones in British Columbia based on their biological, geological and climatic characteristics.

The area of the site is within the Coastal Douglas Fir zone (CDF) which is one of the smallest zones in BC. The zone is limited to some lowland parts of the mainland coast, the Gulf Islands and along the southeastern coast of Vancouver Island.

As outlined by the University of British Columbia's Centre for Forest Conservation Genetics, "the climate of the CDF and the neighbouring CWH zone is strongly influenced by the Pacific ocean. Both have cool mesothermal climates with mild winters (mesothermal climates are distinguished from temperate climates by coldest month temperatures >-3°C; cool mesothermal climates have a mean warmest *month temperature <22°C and a growing season length* >4 months). The CDF zone lies in the rain shadow of Vancouver Island and the Olympic Islands and is much drier, warmer and sunnier that the neighbouring CWH

zone. The mean annual precipitation in the CDF is 1000 mm. Winters in the CDF are wet (800mm of precipitation) and the summers are long, sunny, warm (mean warmest month temperature of 16.9°C) and dry (200mm of precipitation"

The CDF is the least protected zone in BC with almost one third of its lands converted or altered by logging, agriculture, grazing, mining, and residential development.<sup>2</sup> Development activities, fire suppression efforts, invasive species and climate change have resulted in many of the ecosystems, plant and wildlife species being classified as threatened or endangered.<sup>3</sup>

2 Ibid Ibid 3





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Figure 2. 16 (This page, top right) Climograph for the city of Nanaimo, based on data from weather station Nanaimo A (source: https://climate.weather.gc.ca/  $climate\_normals/results\_1981\_2010\_e.html?searchType=stnName&txtStationName=nanaimo&searchMethod=contains&txtCentralLatMin=0&txtCentraLatMin=0&txtCentraLatMin=0&txtCentraLatMin=0&txtCentraLatMin=0&txtCentraLatMin=0&txtCentraLatMin=0&txtCent$ Sec=0&txtCentralLongMin=0&txtCentralLongSec=0&stnID=192&dispBack=0)

Figure 2. 17 (This page, bottom left) Wind Rose from nearby station (source: Autodesk Green Studio)

Figure 2. 18 (This page, bottom right) Biogeoclimatic Zones of British Columbia. Source: University of British Columbia Centre for Forest Conservation Genetics



### CITY OF NANAIMO | OPERATIONS CENTRE | 2021 MASTER PLAN





Coastal Western Hemlock Zone

<sup>1</sup> Source: https://cfcg.forestry.ubc.ca/resources/cataloguing-in-situ-genetic-resources/ cdf-zone/

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### CITY OF NANAIMO | OPERATIONS CENTRE | 2021 MASTER PLAN

#### SEA LEVEL RISE

Although Nanaimo is a costal city and would be impacted by sea level rise; based on the Sea Level Rise Impact report developed by Associated Engineering, it can be observed that the project site is located beyond the radius of building vulnerability to the 2100 Flood Construction Level (FCL) scenario.

> Figure 2. 19 (This page, top right) Seismic Hazard Map, Natural Resources Canada, 2015 Source: http://www.earthquakescanada.nrcan.gc.ca/hazardalea/simphaz-en.php

Figure 2. 20 (This page, bottom left) Heatmap showing concentration of building vulnerability to 2100 FCL scenario (source: Sea Level Rise Study by AE)



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#### SEISMIC HAZARD

To interpret the seismic hazard map for British Columbia and probability of damage, the Natural Resources Canada website states:

' Expected ground motion can be calculated on the basis of probability, and the expected ground motions are referred to as seismic hazard. The seismic hazard map layer indicates the relative seismic hazard across Canada. The map is a simplification of the National Building Code of Canada seismic hazard map for spectral acceleration at a 0.2 second period (5 cycles per second), and shows the ground motions that might damage one-to two-storey buildings.

The probability of strong shaking (strong enough to cause significant damage in a fraction of these buildings) is more than 30 times greater in the regions of highest hazard (at least a 30 per cent chance of significant damage within towns of these regions every 50 years) than in the regions of lowest hazard (less than 1 per cent chance in 50 years)."

#### FIRST NATIONS

The City of Nanaimo and the site, lie within the traditional Coastal Salish territory of the Snuneymuxw First Nation. Located in the Salish Sea, the traditional territory of the Snuneymuxw includes Nanaimo, as well as Gabriola, Mudge and the smaller islands within the Straight of Georgia. According to the BC Treaty Commission (website: http://www. bctreaty.ca/map):

' Snuneymuxw has overlapping and/or shared territory with its First Nation neighbours: Nanoose, Nuu-chah-nulth Tribal Council and Stz'uminus.'

Outlined by the Snuneymuxw First Nation (website: https:// www.snuneymuxw.ca/):

' Snuneymuxw territory encompasses one of the most productive and resource rich areas at the heart of the Salish Sea.

The responsibility of stewardship over such productive lands has raised up generations of hard working People. The Snuneymuxw are engaged politically, socially, and economically, as we seek to develop common pathways to prosperity in the region respectful of our enduring connection to our territories.

The Snuneymuxw First Nation is one of the largest Nations in B.C. with a population of over 1,700 people.'

The map depicted on the top left shows, that the project site is located within the boundary of the traditional territory of Snuneymuxw First Nation.

The map to the top right indicates the location of the closest Snuneymuxw Community today, identified as Nanaimo Town No.1.







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Figure 2. 24 (This page, top left) Boundary of the traditional territory described in the Snuneymuxw First Nation Statement of Intent. Produced by the BC Treaty Commission. Source: (website: http://www.bctreaty.ca/map)

Figure 2. 25 (This page, bottom right) Location of closest First Nation Settlement (source: https://www.snuneymuxw.ca/nation/territory)

## 3

## **FUTURE ACCOMMODATIONS**

### **3.1 STAFF COMPLEMENT**

Indoor and outdoor accommodations are programmed to reflect the future staff complement provided by the City of Nanaimo Parks Department. The summary table to the right has outlined staff by sector, position, and workspace assignment.

Section	Position	Workplace Assignment Current		Immediate - Right-Sized Growth	Long-Team Growth	
Parks & Facilities Operations	Manager, Parks Operations	Office w meeting for 2-3p	1	0	0	
Parks & Facilities Operations	Urban Forestry Coordinator	Office w meeting for 2-3p	1	0	0	
Parks & Facilities Operations	Horticulture Supervisor	Office w meeting for 2-3p	1	0	0	
Parks & Facilities Operations	Turf & Parks Supervisor	Office w meeting for 2-3p	1	0	0	



### 3.2 PROGRAM

Duilding	Component A	Component B		Succe Turne	Snoce Neme		01	Not	Net	Cross	Cross	
Building	Component A	Component B	Facility Type	Space Type	Space Name	Unit Area	Qty	Program	Net	Gross	Gross	Notes / Follow Up
			(Autinit, Muustital, Parking Materials)			(SIII)		Area (nem)	Aroa (NSE)	Area	Eactor	
			Farking, waterials)					Alea (lisili)	Alea (NSF)	(ghsm)	racion	
										(8,0011)		
Administration Building	Offices	Parks & Facilities Operations	Admin	Workspace	Manager, Parks Operations	11.1	1	11.1	119	17.8	1.6	Office w meeting for 2-3p
Administration Building	Offices	Parks & Facilities Operations	Admin	Workspace	Urban Forestry Coordinator	11.1	1	11.1	119	17.8	1.6	Office w meeting for 2-3p
Administration Building	Offices	Parks & Facilities Operations	Admin	Workspace	Horticulture Supervisor	11.1	1	11.1	119	17.8	1.6	Office w meeting for 2-3p
Administration Building	Offices	Parks & Facilities Operations	Admin	Workspace	Turf & Parks Supervisor	11.1	1	11.1	119	17.8	1.6	Office w meeting for 2-3p
Administration Building	Offices	Parks & Facilities Operations	Admin	Workspace	meeting room / hot desk	11.1	1	11.1	119	17.8	1.6	Office w meeting for 2-3p
Administration Building	Offices	Parks & Facilities Operations	Admin	Support	Multi purpose meeting / lunch room	50	1	50	538	80.0	1.6	kitchenette, 28 lockers, dryers
Administration Building	Offices	Parks & Facilities Operations	Admin	Support	Lobby	8	1	8	86	12.8	1.6	no reception desk required
Administration Building	Offices	Parks & Facilities Operations	Admin	Support	Men Washroom	8	1	8	86	12.8	1.6	minimum required is 1 water closet per gender
												or 2 universal washroom
Administration Building	Offices	Parks & Facilities Operations	Admin	Support	Women Washroom	8	1	8	86	12.8	1.6	minimum required is 1 water closet per gender
												or 2 universal washroom
Administration Building	Offices	Parks & Facilities Operations	Admin	Support	Universal Shower	5	1	5	54	8.0	1.6	minimum required is 1 universal shower
Administration Building	Offices	Parks & Facilities Operations	Admin	Support	Storage room	5	1	5	54	8.0	1.6	Janitor, storage
Storage building	Industrial	Parks & Facilities Operations	Industrial	Storage	Storage	165	1	165	1176	264.0	1.6	heated space, required access ramp for
				-								overhead doors
Storage building	Industrial	Parks & Facilities Operations	Industrial	Storage	By-law Impound	25	1	25	269	40.0	1.6	covered and enclosed space with security
						_						camera, required overhead door
Storage building	Industrial	Parks & Facilities Operations	Industrial	Storage	RCMP Exhibit Holding	25	1	25	269	40.0	1.6	covered and enclosed space with security
												camera, required overhead door
	La alcontata I		La du atatat	<b>C</b> 1		00		00	064			
wixed storage outdoor area	industrial	Parks & Facilities Operations	industrial	storage	ivilxed storage outdoor area	80	T	80	201			with visual obstruction



# **MASTER PLAN**

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## **4.1 PRIDEAUX SITE PLAN**

Along with Public Works Department located at 2020 Labieux road, some of the Parks Yard operation staff is currently located at 89 & 91 Prideaux street. The Workshop building and Storage building will remain as storage facilities and the administration building will accommodate Parks Yard operation administration functions. All outdoor areas on the south part of the site currently suits all functions required by the City of Nanaimo and so will remain as is.

Parking and loading on the site will be improved. This includes the addition of two electric car charging stations, an accessible parking stall, and new bikes racks.

Site security improvements will comprise of a fence upgrade for the mixed storage outdoor area with the inclusion of security cameras to reduce and avoid theft.

The two buildings will be renovated to meet all relevant codes and standards, including, but not limited to, the latest version of the BC Building Code and all municipal zoning requirements if required.





Existing Equipment Storage Building



Existing Greenhouse



Existing Covered Storage Structure











Existing Workshop Building



Existing Administrative Building

### CITY OF NANAIMO | OPERATIONS CENTRE | 2021 MASTER PLAN

## 5

## **CONCEPTUAL PLAN**

## 5.1 ADMINISTRATIVE BUILDING

### 5.1.1 DRAWINGS

The Administration Building is an existing 240 m<sup>2</sup> one storey building on Parks Prideaux Yard. The primary function of the Administration Building is to house the City's Parks operation offices: Manager Parks Operations, Urban Forestry Coordinator, Horticulture Supervisor, Turf & Parks Supervisor.

Refer to Appendix B for the Administration Building architectural drawing set.

Refer to Sections 6,7,8 & 9 for WSPs reports regarding Structural, Civil, Mechanical and Electrical upgrades.

CITY OF NANAIMO











Figure 5.1.1 (This page, middle) Site Photographs of Existing Administrative Building. Figure 5.1.2 (This page, top right) Proposed Site Plan, with Administrative Building Highlighted.

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### 5 | CONCEPTUAL PLAN ADMINISTRATIVE BUILDING DEMOLITION PLAN

EXISTING WALL TO REMAIN

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EXISTING WALL TO BE DEMOLISHED

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EXISTING WINDOWS TO REMAIN

EXISTING WINDOWS TO BE UPGRADED

## 5 | CONCEPTUAL PLAN ADMINISTRATIVE BUILDING PLAN









### CITY OF NANAIMO | OPERATIONS CENTRE | 2021 MASTER PLAN

### 5 | CONCEPTUAL PLAN ADMINISTRATIVE BUILDING ELEVATION







### **5.1.2 DESIGN SUMMARY**

The general architectural and building system strategies for the Administration Building are outlined below.

### **PROJECT DESCRIPTION**

To accommodate the new program, demolition work will be necessary. Most interior walls, interior finishes and lighting will be removed.

The renovated building's floor plan is simple and functional, primarily comprised of office and meeting functions. Flexibility is key in the floor plan layout, all offices have the same area; some flexible spaces are created like the hot desk area or the multipurpose meeting / lunchroom for city employees who normally work off site.

The building provides ample support spaces for staff. Lockers, dryers, shower and washroom facilities have been designed using gender neutral design principles to provide support to a changing workforce now and in the future.

The Administration Building is renovated to meet all relevant codes and standards, including, but not limited to, the latest version of the BC Building Code, municipal zoning requirements and step-code requirements if required.



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### CITY OF NANAIMO | OPERATIONS CENTRE | 2021 MASTER PLAN



### **ARCHITECTURAL**

The building is constructed of CMU exterior walls and wood roof structure, it will undergo renovations to the interior with some changes to the building envelope but will not include any additions or changes to the structure or type of construction. Some windows will be added to the South Façade as some new office spaces will be created. All windows and doors deemed obsolete will be upgraded to improve energy and comfort in the building and durability. Refer to building elevations for additional information.

The roof of the administration building is proposed to be upgraded. Refer to WSP report (Section 6) for additional information related to the roof.

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#### **APPLICATION OF BUILDING CODES - ADMINISTRATION** BUILDING

Per the City of Nanaimo Building Bylaw No. 7224, the current version of the BC Building Code (BCBC 2018). The BC Energy Step Code does not apply for existing buildings. BC Fire Code also applies to all existing buildings under renovation. Parts 3, 4, 5, and 6 of BCBC 2018 applies to alteration of this building. Refer to the table below for the Administrations Building's general code requirements for Fire Protection, Occupant Safety, and Accessibility described in Part 3 of BCBC 2018.

#### SPRINKLER SYSTEMS - EXISTING BUILDINGS (SECTION 28)

For construction/renovations to existing buildings within Fire Limit Areas, the Building Bylaw requires owner to install a sprinkler system throughout the building with a few exceptions. The renovations to the existing buildings on the Prideaux site are currently considered to require a new sprinkler system, however, one exception in the building bylaw may exempt some of the buildings from requiring a sprinkler system:

· Section 28.4.3 explains that a sprinkler system is not required if the cost of alterations is less than 50% of the current assessed value of the existing building. The value of the building is determined by the BC Assessment Authority or the BC Branch of Appraisal Institute of Canada

The cost of construction for each existing building is still to be determined, so the requirement for sprinklers per the building bylaw is unknown.

Feature	Code Requirement					
Zoning	DT8 - Old City Mixed Use					
Fire Limit Area	Sprinklers Required***					
Major Occupancy	Group D - Business					
Occupant Load	34 people Note: The city of Nanaimo will have a maximum of 10 occupants					
Building Height	Up to 2 Storeys					
Building Area	Max 1000 m <sup>2</sup> at 1 Storey, Facing 1 Street					
Sprinklers	Not Required, Required by Building Bylaw					
Construction Type	Combustible or Non-combustible					
Loadbearing Supports	45 min FRR, or non-combustible					
Wall Separations	1 hr FRR for Service & Electrical Rooms					
Spatial Separation and Exposure Protection	Face	LD	Openings	FRR	Cladding	
	West	>6 m	100 %	-	Combustible or Non-Comb.	
	East	>6 m	100 %	-	Combustible or Non-Comb.	
	North	>9 m	100 %	-	Combustible or Non-Comb.	
	South	6 m	52 %	1 hr	Combustible or Non-Comb.	
Fire Alarm	Required					
Exits	208 mm min. Cumulative Width (2 Exit Doors Required, Spaced 14m apart)					
Exit Spacing	At least 1/2 the Diagonal Length (m) of the Building					
Travel Distance (max)	40 m					
Exit Width (min)	At least 850 mm at Doors, 1100 mm for Corridors					
Water Closets	2 Water Closet at 34 people (1 per sex) + 1 Universal Washroom					
	34 – 10 (universal washroom) = 24					
	24 / 2 = 12 male/female = 1 water closet per sex					
	Based on the City of Nanaimo's expected occupancy of 10, the minimum					
	required is 1 water closet per gender or 2 universal washrooms.					

\*\*\* Sprinklers only required if value of construction exceeds 50% of the current assessed value of the building (28.4.3)



Code Reference					
Zoning Bylaw No. 4500 Schedule A					
Building Bylaw No. 7224 (28.2)					
3.1.2.1					
3.1.17.1					
3.2.2.62					
3.6.2.1					
3.2.3.1-D , 3.2.3.7					
3.2.4.1					
3.4.2.1					
3.2.4.3					
3.4.2.5					
3.4.3.2 , 3.8.3.6					
3.7.2.2 — В 3.8.3.12					

### CITY OF NANAIMO | OPERATIONS CENTRE | 2021 MASTER PLAN

## **5.2 STORAGE BUILDING**

### 5.2.1 DRAWINGS

The Storage Building is an existing 190 m<sup>2</sup> one storey building on Parks Prideaux Yard. The primary function of this building is to store a variety of equipment of the City's Parks operation as well as BY-Law impound and RCMP exhibit holding.

Refer to Appendix B for the Storage Building architectural drawing set.

Refer to Sections 6,7,8 & 9 for WSPs reports regarding Structural, Civil, Mechanical and Electrical upgrades













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Figure 5.2.1 (This page, middle) Site Photographs of Existing Storage Building. Figure 5.2.2 (This page, top right) Proposed Site Plan, with Storage Building Highlighted.

Prepared by: Kasian Architecture, Interior Design and Planning

### 5 | CONCEPTUAL PLAN STORAGE BUILDING DEMOLITION PLAN





### 5 | CONCEPTUAL PLAN **STORAGE BUILDING PLAN**














**STORAGE BUILDING ELEVATION** 

5 | CONCEPTUAL PLAN



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ROOF 0

LEVEL 1

-ROOF 3000

NOTE: REFER TO WSP REPORTS FOR CIVIL, STRUCTURAL, MECHANICAL, ELECTRICAL



### 5 | CONCEPTUAL PLAN



### **5.2.2 DESIGN SUMMARY**

The general architectural and building system strategies for the Storage Building are outlined below.

### **PROJECT DESCRIPTION**

To accommodate the new program, demolition work will be necessary. Some interior walls will be removed, as well as an access door and a window.

The storage building has a simple and functional floor plan, primarily comprised of storing a variety of equipment of the City's Parks operation but also BY-Law impound and RCMP exhibit holding.

All the storage rooms will be organized with new racks and workbenches. An access ramp for the existing overhead door as well as a second new overhead door is required to store a street sweeper and two lawn mowers.



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The BY-Law impound and RCMP exhibit holding spaces are accessible through two new overhead doors and those two spaces will be monitored with security camera.

The adjacent outdoor mixed storage is currently delimited by a fence that needs to be upgraded to an unclimbable micro mesh fence with visual obstruction in order to improve security in this area of the site. The area is also re-organized with new racks.

The Storage Building is renovated to meet all relevant codes and standards, including, but not limited to, the latest version of the BC Building Code, municipal zoning requirements and step-code requirements if required.

### ARCHITECTURAL

The building is constructed of CMU exterior walls and wood roof structure, it will undergo some changes to the building envelope but will not include any additions or changes to the structure or type of construction. Some Overhead doors will be added to meet the storage requirements. All windows and doors deemed obsolete will be upgraded to improve energy and comfort in the building and durability. Refer to building elevations for additional information.

#### APPLICATION OF BUILDING CODES - STORAGE BUILDING

Per the City of Nanaimo Building Bylaw No. 7224, the current version of the BC Building Code (BCBC 2018). The BC Energy Step Code does not apply for existing buildings. BC Fire Code also applies to all existing buildings under renovation. Parts 3, 4, 5, and 6 of BCBC 2018 applies to alteration of this building. Refer to the table below for the Administrations Building's general code requirements for Fire Protection, Occupant Safety, and Accessibility described in Part 3 of BCBC 2018.

#### SPRINKLER SYSTEMS – EXISTING BUILDINGS (SECTION 28)

For construction/renovations to existing buildings within Fire Limit Areas, the Building Bylaw requires owner to install a sprinkler system throughout the building with a few exceptions. The renovations to the existing buildings on the Prideaux site are currently considered to require a new sprinkler system, however, one exception in the building bylaw may exempt some of the buildings from requiring a sprinkler system:

· Section 28.4.3 explains that a sprinkler system is not required if the cost of alterations is less than 50% of the current assessed value of the existing building. The value of the building is determined by the BC Assessment Authority or the BC Branch of Appraisal Institute of Canada

The cost of construction for each existing building is still to be determined, so the requirement for sprinklers per the building bylaw is unknown.

Feature	Code Re	quiremer	nt			Code Reference
Zoning	DT8 - OI	d City Mix	ed Use			Zoning Bylaw No. 4500 Schedule A
Fire Area	Sprinkle	rs Require	ed***			Building Bylaw No. 7224 28.2
Major Occupancy	Group F	3 – Low H	azard (under	50kg/m <sup>2</sup> co	mbustible content)*	3.1.2.1
Occupant Load	8 people	2				3.1.17.1
Building Height	Up to 2	Storeys				
Building Area	Max 160	00m² at 1	Storey, Facin	g 1 Street		
Sprinklers	Not Req	uired, Red	quired by Buil	lding Bylaw		3.2.2.85
Construction Type	Combus	tible or N	on-Combustil	ble		
Loadbearing Supports	45 min f	RR or No	n-Combustibl	le		
Wall Separations	N/A					
	Face	LD	Openings	FRR	Cladding	
Creatical Comparations and	West	>8 m	100%	-	Combustible or Non-Comb.	
Spatial Separation and	East	>8 m	100 %	-	Combustible or Non-Comb.	3.2.3.1-E , 3.2.3.7
Exposure Protection	North	0.8 m	0%	1 hr	Non-Combustible	]
	South	>11 m	100 %	-	Combustible or Non-Comb.	
Fire Alarm	Require	d				3.2.4.1
Exits	50 mm ( 2 Exit D	min. Cum oors Requ	ulative Width uired, Spaced	13.5 m apa	rt)	3.4.2.1 , 3.4.3.2 ,
Travel Distance (max)	30 m					3.4.2.5
Exit Width (min)	850 mm 1100 mr	at Doors mat each	Corridor			3.8.3.12
Water Closets	Building basis. W Prideau	considere ashrooms site.	ed as out-buil s provided in	lding on the Administrati	site, occupied only on part-time ion Building on the same	2.3 (OH2.3, F71, F72)

\*Storage of combustible content is to be confirmed

\*\*\* Sprinklers only required if value of construction exceeds 50% of the current assessed value of the building (28.4.3)





# **6 STRUCTURAL ENGINEERING STRATEGIES**

CITY OF NANAIMO

NANAIMO PARKS OPERATIONS YARD REDEVELOPMENT 89 PRIDEAUX STREET, NANAIMO, BC









WSP Canada Inc.

## NANAIMO PARKS OPERATIONS YARD REDEVELOPMENT 89 PRIDEAUX STREET, NANAIMO, BC

**CITY OF NANAIMO** 

FINAL

PROJECT NO.: 211-05130-00 DATE: JULY 22, 2021

WSP SUITE 1000 840 HOWE ST VANCOUVER, BC, CANADA V6Z 2M1

T: +1 604-685-9381 WSP.COM



**kasia** 

# **1 STRUCTURAL DESIGN REPORT**

### **1.1 INTRODUCTION**

#### 1.1.1 PURPOSE

This Structural design concept report is intended to provide a general overview of selected existing buildings at the Nanaimo Parks Operations Yard facility located at 89 Prideaux Street, Nanaimo. The purpose of this document is to support the overall business case for the facility redevelopment.

#### 1.1.2 SITE VISIT

WSP-structural engineer Chelsea Paton, P.Eng visited the site on June 22, 2021 to visually observe the existing buildings. The structure was only partially exposed.

#### 1.1.3 CODES AND STANDARDS

The structural design and upgrade will be in accordance with the latest versions of all applicable codes, standards, and regulations adopted by the Authority Having Jurisdiction, including but not limited to the following:

- British Columbia Building Code 2018 (BCBC 2018)
- CSA A23.3 Design of Concrete Structures
- \_ CSA A21.1 Concrete Construction
- CSA S16 Design of Steel structures \_
- \_ CSA 304 Design of Masonry Structures CSA O86 Engineering Design in Wood

### **1.2 STRUCTURAL CONCEPT**

### 1.2.1 STORAGE BUILDING 1.2.1.1 EXISTING STRUCTURE

The existing storage building is a rectangular shaped one-storey building of size 25 m by 9.4 m (190 m<sup>2</sup>), located on the north side of the yard, oriented in the east-west direction. This building currently serves as a carpentry shop. Existing structural drawings are limited and only the upgrade from October 1980 is available.

The structure of the building consists of a wood frame roof; plywood on dimensional lumber joists (38x184 mm at 406 mm on center) on wood beams approximately 102x400 mm deep. The beams are supported by 114 mm diameter hollow structural steel or pipe columns, with a u-shaped steel bracket at the top.

The perimeter walls are (likely unreinforced) 190 mm thick hollow concrete block walls with unknown connections to the roof structure. The floor was built as a concrete slab on grade with unknown presence of reinforcing and unknown subbase. The existing foundations are of unknown shape, size and reinforcement. Based on our experience of similar types of structures, the existing columns are likely supported by conventional concrete pad footings, and the CMU walls by perimeter strip concrete footings. The footings are likely reinforced at the bottom face.

Some of the existing beams and columns were replaced in 1980 (Fig 1). There was also a new slab on grade added and raised to a higher elevation, but only in the west/central area (the carpentry shop) (Fig 2). The new 100mm slab was reinforced with welded-wire-mesh. New 140 thick unreinforced masonry walls were added along the south,

### 6 | STRUCTURAL ENGINEERING STRATEGIES

east, and interior west side. Based on our visual observations, the west interior wall was demolished at some point afterwards. The added masonry walls were dowelled with vertical bars into the new thickening of the slab on grade. The existing block walls do not show any signs of cracks.



Figure 1 - Replacement of existing beams/posts



Figure 2 - Adding SOG on top of existing



Figure 3 - Existing open storage at south end - east

#### 1.2.1.2 RENOVATION

The intention is to turn this space from the carpentry shop to storage, which is to remain classified as F2 occupancy. As per the Architectural recommendations, this change of use does not qualify as change of occupancy, and a seismic upgrade will not be required. Per architectural schematic drawings, interior partitions will remain as built.

One of the south existing windows will be replaced with overhead doors, which will require local masonry upgrades: reinforced grouted cores and steel channels anchored to masonry on 3 sides of the door.

The existing slab on grade and the compacted subbase will need to be assessed and potentially replaced with a new estimated 150 mm thick slab on grade, reinforced with 15M at 400 mm each way on moisture barrier on recompacted (or replaced 150 mm thick granular) subbase. The subbase will require assessment by a geotechnical engineer.

The presently open south wall at the east end of the building will be infilled with 152 mm deep steel studs and two new overhead doors with structural steel to support the door frames.





Although the building is not required to be seismically upgraded, from visual observations and time of construction the existing building likely does not satisfy the seismic requirements of the current BCBC 2018 code. Based on experience with similar buildings, the following is likely a list of seismic deficiencies:

- Insufficient strength of roof plywood diaphragm
- Lack of roof diaphragm chords
- Lack of roof-to-wall connections
- Weak in-plane and out-of-plane perimeter masonry walls
- Lack of dowels at the base of perimeter masonry walls

- Foundations under-designed for overturning and soil pressure capacity

The Owner could voluntarily choose to undertake some seismic upgrades to increase the safety of the building. Under relatively low cost, the following are potential voluntary upgrades that would increase seismic safety relatively significantly:

- structure
- (estimated 1200 mm on centre spacing)

The above upgrade options would not fully upgrade the building to meet the BCBC 2018, but would increase the building's performance in a seismic event. In order to meet the BCBC 2018, foundation upgrades are likely required, but will not be as economical as superstructure upgrades, and will require excavation, backfill, and slab replacement.

upgrade of the masonry walls.

### 1.2.2 ADMINISTRATION BUILDING

#### 1.2.2.1 EXISTING STRUCTURE

The existing administration building is an L-shaped one-storey building of size 25 m by 7.2 m (242 m<sup>2</sup>), located on the south side of the yard, oriented in the east-west direction. This building currently serves as an office building. Existing structural drawings have not been made available. The original date of construction is not known.

The structure of the building consists of a wood frame roof (not visible – covered by ceiling). The perimeter walls are (likely unreinforced) 190 mm thick hollow concrete block walls with unknown connections to the roof structure. The masonry walls show thin cracks along the head and bed joints, mostly on the south façade. The floor was built as a concrete slab on grade with unknown presence of reinforcing and an unknown subbase. The existing foundations are of unknown shape, size, and reinforcement. Based on our experience of similar types of structures, the existing columns are likely supported by conventional concrete pad footings, and the CMU walls by perimeter strip concrete footings. The footings are likely reinforced at the bottom face.

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#### 1.2.1.3 POTENTIAL SAFETY UPGRADES

- Re-nailing (or 12.5 mm plywood overlay, dependant on existing plywood pattern and state) of the existing roof plywood diaphragm and adding metal straps as diaphragm chords (could be done in near future at re-roofing) - Adding steel angle connections on the underside of the roof deck to connect the masonry walls to the roof

Adding vertical reinforcing in grouted cores, complete with dowels to the strip footings, in the existing masonry

The existing block wall likely contains vermiculite. It is recommended that hazardous abatement be done prior to the



Figure 4 - North façade of Administration building

#### 1.2.2.2 RENOVATION

The intention is to keep the use of the building as is: office space. Interior partitions will be removed, which does not create any additional cost as these are non-load bearing walls, except for one concrete wall at the north-east corner, at the transition between the large building and the low roof extension.

The south block wall will receive 2 new windows. The north wall door will be removed. Therefore, the following structural upgrades will be required:

- Reinforced grouted cores, each side of openings
- Steel angles bolted through grouted header, or overcut opening at the top and install new reinforced masonry \_ lintels
- Reinforce 5x3.8 m high portion of the south wall with vertical bars inserted into existing hollow block and grouted after, including dowels at the base and connections at the top.
- North door to be replaced with reinforced 190 mm thick masonry wall

#### 1.2.2.3 POTENTIAL SAFETY UPGRADES

Similar to the storage building, the following are potential voluntary upgrades that would increase seismic safety relatively significantly:

- Re-nailing (or 12.5mm plywood overlay, dependant on existing plywood pattern and state) of the existing roof plywood diaphragm and adding metal straps as diaphragm chords (could be done in near future at re-roofing)
- Adding steel angle connections on the underside of the roof deck to connect the masonry walls to the roof structure
- Adding vertical reinforcing in grouted cores, complete with dowels to the strip footings, in the existing masonry (estimated 1200 mm on centre spacing)

The above upgrade options would not fully upgrade the building to meet the BCBC 2018, but would increase the building's performance in a seismic event. In order to meet the BCBC 2018, foundation upgrades are likely required, but will not be as economical as superstructure upgrades, and will require excavation, backfill, and slab replacement.

The existing block wall likely contains vermiculite. It is recommended that hazardous abatement be done prior to the upgrade of the masonry walls.

End of structural report.



# **7 CIVIL ENGINEERING STRATEGIES**

**CITY OF NANAIMO** 

# NANAIMO PUBLIC WORKS 89 PRIDEAUX STREET NANAIMO, BC



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## NANAIMO PUBLIC WORKS 89 PRIDEAUX STREET NANAIMO, BC

**CITY OF NANAIMO** 

PROJECT NO.: 211-05130-00 DATE:

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July 13, 2021 Date

APPROVED<sup>1</sup> BY (must be reviewed for technical accuracy prior to approval)



Jeff Somerville, P.Eng. Senior Civil Review Engineer

Date

<u>July 13,</u> 2021

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NANAIMO PUBLIC WORKS 89 PRIDEAUX STREET Project No. 211-05130-00 CITY OF NANAIMO



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## **1 CIVIL DESIGN REPORT**

#### 1.1.1 STORM

The property at 89 Prideaux Street is well graded with one visible catch basin on the north-east corner of the property. The existing swale in front of the northern shop building serves to convey water into this existing catch basin.



The building leaders currently discharge directly onto the asphalt with the exception of the Administration building which has a perimeter drain and one leader discharging into a small grate. There are no reports of flooding or pooling on site.

#### 1.1.2 BUILDING ACCESS

Ramps have been requested for access to the northern shop building which sits approximately 12 inches or 300mm above grade. Future access for equipment like lawnmowers and the like will require a ramp type structure.

A 15% concrete ramp structure is proposed for access to the raised building. Bollards are recommended at each corner and between the two entrance doors for a total of 5 bollards. A new catch basin is proposed to pick up surface run-off on the west side of the proposed ramp with a new lead to tie into the existing circular catch basin to the east.



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Figure 1 - North-East Catch Basin

#### 1.1.3 GRADING

There is evidence disturbance in the asphalt surface behind the shop building in the northwest corner of the lot as pictured below. This area may benefit from root removal and paving to remove possible tripping hazards for the upgraded storage area.



Figure 3 - Asphalt Crack from Root Disturbance

Discussions with the yard caretakers indicates that the yard is adequately graded for positive drainage.

#### 1.1.4 SERVICES

The site is currently serviced with two storm, two sanitary, and four water services. The shop at the north end of the property does not have any water or sanitary and it is understood that there are no sprinklers servicing the shop or the administration building. If sprinklers are found to be required, then services will need to be added and/or upsized to support the fire suppression system.

There is one fire hydrant located at the north-east corner of the lot in the boulevard that appears to be in good condition.

It is understood that there is an old fuel tank buried underground on the east side of the northern shop building. A vent can be seen on the outside wall of the building and there is what appears to be a capped vent under a cone on the south-east corner of the building as well. This tank should not affect any potential civil work.



Figure 4 - Fuel Tank Ventilation



### CITY OF NANAIMO | OPERATIONS CENTRE | 2021 MASTER PLAN



# **8 MECHANICAL ENGINEERING STRATEGIES**

CITY OF NANAIMO

NANAIMO PUBLIC WORKS YARD REDEVELOPMENT (PRIDEAUX) NANAIMO, BC



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WSP Canada Inc.

## NANAIMO PUBLIC WORKS YARD REDEVELOPMENT NANAIMO, BC

CITY OF NANAIMO

MECHANICAL DESIGN CONCEPT REPORT

PROJECT NO.: 211-05130-00 DATE: JUNE 30, 2021

WSP SUITE 1000 840 HOWE STREET VANCOUVER, BRITISH COLUMBIAC, CANADA V6Z 2M1

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# **1 MECHANICAL** REPORT

### **1.1 INTRODUCTION**

This mechanical design concept repot is intended to provide a general overview of the mechanical system being proposed for the existing and new buildings in the updated Nanaimo Public Works Yard facility. This report includes the following new & existing buildings:

- Administration Building (Prideaux) – Renovation

- Storage building (Prideaux) - Renovation The purpose of this document is to support the overall business case for the facility redevelopment. Refer to architectural floor plans for the new and existing buildings for more information.

### **1.2 MECHANICAL**

#### 1.2.1 GENERAL

- Work Yard Facility.
- .2 Work in this section includes the following items within the buildings.
  - .1 Heating, ventilation and air conditioning systems
  - .2 Controls
  - .3 Sanitary plumbing and fixtures
  - .4 Domestic hot and cold-water systems
- .5 Building storm drainage and perimeter drainage system
- .6 Natural gas distribution system
- .7 Fire protection systems
- .8 Compressed air system
- proposed.
- .4 Civil is responsible for utilities one meter beyond outside of the building.

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### CITY OF NANAIMO | OPERATIONS CENTRE | 2021 MASTER PLAN

CON	DESIGN
. 001	DESIGN

.1 This section outlines the proposed mechanical requirements that will form the basis for the Nanaimo Public

.3 For major items of equipment some preferred suppliers have been noted to define the equipment quality

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### 8 | MECHANICAL ENGINEERING STRATEGIES

### 1.2.2 DESIGN CRITERIA

- .1 The preliminary mechanical design will be based on but not limited to the follow list of codes and standards:
  - .1 British Columbia Building Code 2018
  - .2 ASHRAE 90.1– Energy Efficient Design of New Buildings (Perspective path to be followed)
  - ASHRAE 62.1 Ventilation for Acceptable Indoor Air Quality .3
  - .4 NFPA 13 National Fire Protection Association
- .2 The HVAC systems proposed have been based on the following criteria:
  - .1 Design outdoor air
    - .1 Winter: -8°C (January 1%)
    - .2 Summer: 27°C, D.B./19°C W.B (July 2.5%)
  - .3 Shop space temperature:
    - .1 Winter: 16°C minimum
    - .2 Summer: 28°C maximum
  - .3 Air-conditioned office areas:
    - .1 Winter: 22°C minimum
    - .2 Summer: 25°C maximum
    - .3 Summer: 55% max R.H.
  - .4 Vehicle Bays space temperature:
    - .1 Winter: 16°C minimum
    - .2 Summer: No maximum
  - .3 Office outdoor air: 7.5 l/s/person
  - .4 Vehicle Bay:
    - a. Maintenance: 7.5 l/s/m2
    - b. Garage: 3.75 l/s/m2
    - c. CNG Truck Bay: 6 ACH
  - .5 Shop outdoor air: 3.75 l/s/m2
  - .6 Washroom exhaust: 10 l/s/m2
  - .7 HVAC Sounds Levels:
    - .1 Property line: 45dBA
    - .2 Office areas: NC 35
    - .3 Service bays/Shop: NC 40 to NC50
- .3 The minimum overall building envelope performance is based on the ASHRAE 90.1-2016 & BCBC 2018.
- .4 Domestic cold water and water suppression entering pressure will be specified by Civil Engineer.
- .5 Design data for storm drainage calculations to use rainfall rate of 10 mm per 15 min. rainfall as per BCPC 2018.

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- .1 Electricity will be the main source for cooling system.
- .2 Electricity will be the main source for mechanical heating energy source.
- .3 Natural gas will be the supplementary mechanical heating energy source for the administration building.
- .4 Natural gas will be the main source of fuel for the domestic hot water system.

### 1.4 ENERGY CONSERVATION

- The following energy conservation techniques have been considered in the preliminary mechanical design: .1 Use of condensing domestic hot water heaters.
- shedding.
- .3 Selection of equipment based upon efficiency ratings and life cycle costs.
- .4 Use of high-efficiency electric motors for all motors over 1 HP.
- .5 Room spaces thermostatically individually controlled for comfort and energy conservation.

- .8 Use of variable speed drives for main heating pumps and main chilled water pumps.
- .10 Demand controlled ventilation of shops.
- .11 Demand ventilation on air conditioning units.

### 1.5 HVAC SYSTEMS (PRIDEAUX)

### 1.5.1 ADMINISTRATION BUILDING (PRIDEAUX) - RENOVATION

- .1 Demolition Scope:
  - exhaust fans) shall be removed and demolished.

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- .2 Computerized DDC controls to allow intermittent operation, monitoring, programming, duty cycling, and load
- .6 Vehicle exhaust systems and make-up air systems controlled by gas detectors to reduce fan run times.
- .7 Use of active field polarized media air filters (Dynamic) on air handling units to reduce fan power consumption.
- .9 CO2 sensors will limit amount of fresh air according to CO2 levels.

.1 Existing HVAC system (Gas fired furnace c/w D/X cooling), condensing units, ductwork, washroom

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Figure 3: Existing Gas Fired Furnace



Figure 4: Existing Condensing Unit

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.2 Existing electric base board heaters around the perimeter to be replaced with new.

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- cooling to this building. Condensing unit to be mounted on the roof.
- (QMark, Ouellet).

#### 1.5.2 STORAGE BUILDING (PRIDEAUX) - RENOVATION

- .1 Demolition Scope:

.2 New Scope:

- electric heating coil, roof curb and variable speed drive.
- Ouellet).

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.1 New gas fired furnace c/w D/X cooling (6 Tons) located in the mechanical room will provide heating and

.2 New electric baseboard heaters will provide supplemental heating to spaces around perimeter spaces

.3 Cooling for electrical rooms will be provided by D/X split unit (Daikin or equal).

.4 Heating for washrooms and vestibules will be by electric force flow heaters (QMark, Ouellet).

.5 Heating for Mechanical room & janitor room will be by electric baseboard heaters (QMark, Ouellet).

.6 General exhaust for areas such as washrooms will be provided by exhaust fan located on the roof.

.1 Existing HVAC system (electric unit heaters, dust collection system) shall be removed and demolished.



Figure 5: Existing Dust Collection System

.1 Space ventilation for this building will be provided by roof mounted 100% outdoor heat recovery air handling units (Capacity: 650 l/s) c/w supply fan, return fan, heat recovery section, MERV 13 filters,

.2 Heating for storage, by-law impound & RCMP exhibit holding will be by electric unit heaters (QMark,

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### 1.6 PROPOSED PLUMBING SERVICES (PRIDEAUX)

#### 1.6.1 GENERAL

- .1 The plumbing and drainage systems include plumbing fixtures, sanitary drainage, storm drainage, and domestic hot and cold-water systems.
- .2 All distribution and service piping will generally be run above ground.

#### 1.6.2 DOMESTIC POTABLE WATER SUPPLY

- .1 Hot and cold water will be provided to all plumbing fixtures and outlets.
- .2 High efficiency gas fired domestic hot water tank will be located in mechanical rooms to supply potable hot water to washrooms, showers and sinks. Hot water piping will be provided with circulating pumps and piping for temperature maintenance.
- .3 All remote plumbing fixtures requiring hot water will be provided with dedicated electric water heaters. All eye / face washes and showers will be provided with tempered water, to meet Work Safe BC guidelines.
- .4 Potable water supply will be complete with meters, pressure regulators, backflow preventers, and other appurtenances required by the City. Premise isolation will be provided.
- .5 All potable water piping will be insulated.
- .6 Potable water piping will be type "K" copper.

#### 1.6.3 SERVICE WATER SUPPLY

- .1 A dedicated cold-water supply will be provided to serve the needs at all service bays. This system will be isolated from the domestic water supply by a reduced pressure backflow preventer.
- .2 All service water piping will be insulated.
- .3 Service water piping will be type "K" copper.

#### 1.6.4 SANITARY DRAINAGE

- .1 All waste from maintenance areas including hoist sumps will flow to the oil/water separator sump before release to the municipal sanitary system. For deep pits, sump pumps will pump the waste to the oil/water separator sump. Wastewater will be treated to meet local requirements for maximum permitted concentrations of pollutants.
- .2 Domestic sanitary waste will be discharged directly to the city sewer.
- .3 All sanitary drainage systems will flow by gravity. Drains will be sloped at a minimum of 2% to suit low flow plumbing fixture requirements.

#### 1.6.5 STORM DRAINAGE

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- .1 All roof drainage will flow via roof drains and interior rainwater leaders to the site storm drainage system.
- .2 A perimeter footing drainage will collect foundation drainage via perforated piping to a footing drain sump and storm sump with pumps to storm drain system.

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#### 1.6.6 PLUMBING FIXTURES

- conserving flush valves
- provided in the mechanics wash-up areas.
- .4 mixing valve to supply tempered water.

#### 1.6.7 FIRE PROTECTION

- requirements
- .4 Fire extinguishers will be provided to comply with the latest edition of NFPA 10.
- .5

#### 1.6.8 NATURAL GAS SYSTEM

- domestic water heaters, and any required service equipment.
- Safety Authority.
- .3 All gas piping will be black steel.
- .4
  - .5 Site work for natural gas piping to be done by Civil up to the building.

### 1.7 CONTROLS (PRIDEAUX)

The control system for the complete building will be a computerized direct digital control (DDC) system. (Johnson, Reliable, Energrated / Delta) The system will be utilized to control, monitor, alarm, and program the complete HVAC system including all fans, heat pumps, heaters, air conditioning units, boilers, etc. The operator interface will be through a workstation utilizing graphical operation and consists of a personal computer, keyboard, printer, and modem. DDC System will use not-proprietary software. An Energy Management System will be incorporated providing the following:

- .1 Ability to conform to peak load criteria for energy cost savings.
- .3 Utility usage patterns.
- .4 Temperature setbacks corresponding to occupancy and utilization patterns
- .5 Uniform and limited control of temperature settings.

NANAIMO PUBLIC WORKS YARD Project No. 211-05130-00 NANAIMO PUBLIC WORKS

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.1 Washrooms and locker rooms will be provided with vandal-proof plumbing fixtures and industrial grade trim. All urinals and water closets will be high efficiency sensor flush hard-wired flush valve type, with water

.3 Sinks will be provided where required. Janitor sinks will be floor mounted. "Trough" style sinks will be

Wash basins in washroom will be provided with commercial quality automatic infrared faucets and thermostatic

.1 Wet sprinkler systems will be provided throughout all heated areas to suit the hazard rating for each area. A Siamese connection will be provided on the outside of each building, adjacent to the main entrance.

.2 Exterior areas and canopies requiring fire protection will be provided with dry sprinkler systems.

.3 Automatic sprinkler systems will comply with the latest edition of NFPA 13 and the District of Saanich

Sprinkler system in storage areas will be designed for high storage without the use of in-rack sprinklers.

.1 The gas distribution piping system will be provided throughout the buildings to supply HVAC systems, boilers,

.2 All gas piping systems will comply with the requirements of CSA B149.1 and the requirements of the BC

Gas will be distributed at 35kPa with local regulator to suit equipment pressure requirements.

.2 Automated equipment maintenance scheduling resulting in lower anticipated equipment life cycle costs.

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### 8 | MECHANICAL ENGINEERING STRATEGIES

- .6 Ability to monitor and record indoor and outdoor conditions affecting HVAC systems, as well as alarms, failures, and abnormal operating conditions.
- .7 Ability to automatically control selected equipment such as air handlers, pumps, fans, boilers, heaters, valves, and automated dampers, as well as lighting in selected areas.
- .8 Monitoring of gas sensors to alarm and activate HVAC systems.
- .9 Demand ventilation of office air conditioning units.
- .10 Remote monitoring and control capability.
- .11 Control exterior and interior lighting.
- .12 Localized temperature control will be used for multiple zones.
- .13 CO2 sensors will be provided in areas to monitor carbon dioxide levels.

END OF REPORT

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# **9 ELECTRICAL ENGINEERING STRATEGIES**

CITY OF NANAIMO

## NANAIMO PARKS WORKS YARD REDEVELOPMENT NANAIMO, BC

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WSP Canada Inc.

## NANAIMO PARKS WORKS YARD REDEVELOPMENT NANAIMO, BC

**CITY OF NANAIMO** 

ELECTRICAL CONCEPT DESIGN REPORT

PROJECT NO.: 211-05130-00 DATE: JUNE 30, 2021

WSP **SUITE 1000** 840 HOWE STREET VANCOUVER, BRITISH COLUMBIA V6Z 2S9

WSP.COM

SIGNATURES	
REPARED BY	
Kenneth Taylor, Electrical Engineer, Buildings	Date
PPROVED <sup>1</sup> BY (must be reviewed for technical a	accuracy prior to approval)
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### **1.1 POWER DISTRIBUTION**

confirmed once the loads are known during detailed design.



and should be replaced.

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Figure 7 - Existing equipment past end of life.

Power will be provided to new and relocated equipment from both new and existing panels. Power will be provided from a new EV charger to provide charging for two of the parking spots.

### **1.2 STANBY POWER**

Currently there is no backup generator power at the site and there no backup power is expected for this project.

### 1.3 LIGHTING

It is expected that both the existing Admin and storage building will be provided with all new lighting and control. In general, all new fixtures will utilize energy-efficient LED lighting sources and the new lighting will be connected to new lighting control that will meet the needs of the spaces and ASHRAE requirements.

#### Office Areas

New 2'x4' LED, 120V fixtures will be provided in office areas which will be recessed into the T-Bar ceilings.

#### Storage, service rooms and work areas

New standard industrial type 1'x4'LED, 120V fixtures will be provide in the new stores which will be ceiling mounted or suspended.

In the existing buildings new life safety lighting and exit signage with battery backup will be provided as required to meet current codes. The buildings will require the existing exit signs to be upgraded to "Running Man" style to meet current building codes.

### 1.4 FIRE ALARM SYSTEM

Currently there is no fire alarm system in any of the buildings at the parks site. Per the code report a new fire alarm system will be required if the building is renovated. The new fire alarm system will be a single stage, zoned, addressable system with the main fire alarm control panel location to be determined, and a remote graphic annunciator located at the firefighter's entrance.

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### 1.5 COMMUNICATIONS/TELECOM

The telecom entry is in the main electrical closet in the Admin building. New data drops will be provided from the existing Comms closets as required to suite new layouts.

### **1.6 MECHANICAL SYSTEMS**

equipment size. Mechanical equipment in this location will need to be 120 or 240V.

Mechanical section.

### 1.7 PATHWAYS AND WIRING

utilized where available for routing of new telephone/data wiring.

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- Generally, new mechanical equipment will be connected to existing distribution panels or local electrical panels depending on
- For the electrical scope of work that is related to new mechanical equipment (HVAC, plumbing, etc.), the reader should refer to the
- All the buildings' new power and communication system wiring will be installed in new conduits and existing cable trays will be
- All lighting, power, and power feeder conduits will generally be electric metallic tubing (EMT). All power conductors will be copper.

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# **APPENDIX A /**

# **SITE PHOTOS**

EXISTING **ADMINISTRATION BUILDING EXTERIOR** 









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## A | SITE PHOTOS







## A | SITE PHOTOS

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# EXISTING **ADMINISTRATION BUILDING INTERIOR**















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## A | SITE PHOTOS











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# EXISTING **ADMINISTRATION BUILDING ELECTRICAL &** MECHANICAL ROOMS







# **EXISTING STORAGE BUILDING EXTERIOR**













# **EXISTING CARPENTER'S** SHOP INTERIOR















## A | SITE PHOTOS

















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# **EXISTING OUTDOOR** AREAS









































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# **APPENDIX B / Architectural Drawing Set**







BUILDING TO BE RENOVATED

SCOPE OF WORK

----- NEW COMPONENT



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## **APPENDIX C**

# PRELIMINARY FEEDBACK FROM THE CITY **OF NANAIMO**

# PRELIMINARY PLANNING COMMENTS:

Comments received on June 12th, 2021 during meeting with the City of Nanaimo

- The intention is to turn the carpentry shop to storage, which is to remain classified as F2 occupancy. As per architectural coordination, this change of use does not qualify as change of occupancy. More info and details will be required to confirm if the re purpose of the Carpentry Shop into a Storage building comply with zoning. A variance may be requested to deviate from current zoning requirements.
- The renovations to the existing buildings on the Prideaux site are currently considered to require a new sprinkler system, regardless of the Building Bylaw exception Section 28.4.3 explaining that a sprinkler system is not required if the cost of alterations is less than 50% of the current assessed value of the existing building.
- City of Nanaimo considers removing heating system from Storage building. This will be decided upon if required in Schematic Design phase.
- Also, note that during a "Budget Review & Enhancement Opportunity " meeting on July 14, 2021 with the City of Nanaimo, cost and schedule items were discussed.



### CITY OF NANAIMO | OPERATIONS CENTRE | 2021 MASTER PLAN

Prepared by: Kasian Architecture, Interior Design and Planning

## **APPENDIX D**

# **PRELIMINARY LIST OF BACKGROUND MATERIALS**

Preliminary list of background materials

Document Name	File Name	Туре	Scope	Discipline	Prepared by
Operationa Space Needs Review - Publich Works and Parks Operations -	1_Operational Space Needs Review_19jul11				
Redevelopment Options		Study	Site	PLANNING	Resource Planning Group Inc. (RPG)
Operationa Space Needs Review Part 2 - Publich Works and Parks	2_Phased Redevelopment Options_20feb04				
Operations - Phased Redevelopment Options		Study	Site	PLANNING	Resource Planning Group Inc. (RPG)



#### CITY OF NANAIMO | OPERATIONS CENTRE | 2021 MASTER PLAN

## **APPENDIX E**

# **HAZMAT REPORTS FINDINGS**

TSS Total Safety Services, Inc. (Total Safety) has completed a hazardous materials survey of the Parks Administration and Operations Building and Carpenter's Shop on June 2, 2021. The purpose of the survey was to identify hazardous materials such as asbestos containing materials, lead containing paints, PCBs, mercury, suspected mould growth, ozone depleting substances (ODS), silica, rodent/avian feces, radioactive sources and any stored chemicals for the purposes of gathering information to decide whether to renovate or demolish one or both buildings.

Table 1 below shows the asbestos containing building materials identified in this survey.

#### Table 1 – Summary of Asbestos Containing Materials

Sample Numbers	Location	Material	Asbestos Type (%)	Estimated Quantity
AO-A13	Administration & Operations Building –	Dravall Joint		
&	Women's Washroom, Spare Office,	Drywaii Joint	Chrysotile (1%)	500 ft <sup>2</sup>
AO-A15	and Mechanical Room	Compound		

Total Safety noted the following hazardous materials in Table 3 (Administration & Operations Building) and Table 4 (Carpenter's Shop) below:

#### Table 3 – Summary of Other Hazardous Materials – Administration & Operations Building

Hazard	Building Material	Location	Estimated Quantities
Marauri	Thermostats	None Observed	-
wiercury	Fluorescent Tubes/Bulbs	Throughout the building	64
PCBs	Ballasts in Light Fixtures	Throughout the building	32
Radioactive Sources	Smoke/Heat Detectors	None Observed	-
ODS	HVAC	None Observed	-
	Concrete	Building foundation	Present
Silica	Masonry Block	Building walls	Exterior & Interior
Rodent/Avian Feces	None observed	NA	-
Suspected Mould Growth	None observed	NA	-
Other	None observed	NA	-

Table 4 – Summary of Other Hazardous Materials – Carpenter's Shop Building

Hazard	Building Material	Location	Estimated Quantities
Morcup	Thermostats	None Observed	-
wiercury	Fluorescent Tubes/Bulbs	Throughout the building	40
PCBs	Ballasts in Light Fixtures	Throughout the building	20
Radioactive Sources	Smoke/Heat Detectors	None Observed	-
ODS	HVAC	None Observed	-
	Concrete	Building foundation	Present
Silica	Masonry Block	Building walls Throughout	Exterior & Interior
Rodent/Avian Feces	None observed	NA	-
Suspected Mould Growth	None observed	NA	-
Other	None observed	NA	-

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Note that these hazardous material surveys must be taken into account if any renovation work is undertaken in the future. Asbestos containing materials must be removed by a qualified asbestos abatement contractor prior to any renovation or demolition work being performed, using appropriate work procedures as determined by a Risk Assessment by a Qualified Person and in accordance with the BC Occupational Health and Safety Regulation (OH&S Reg).

Refer to the full reports Limited Hazardous Materials Survey, provided by Total Safety for each of the above buildings.





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