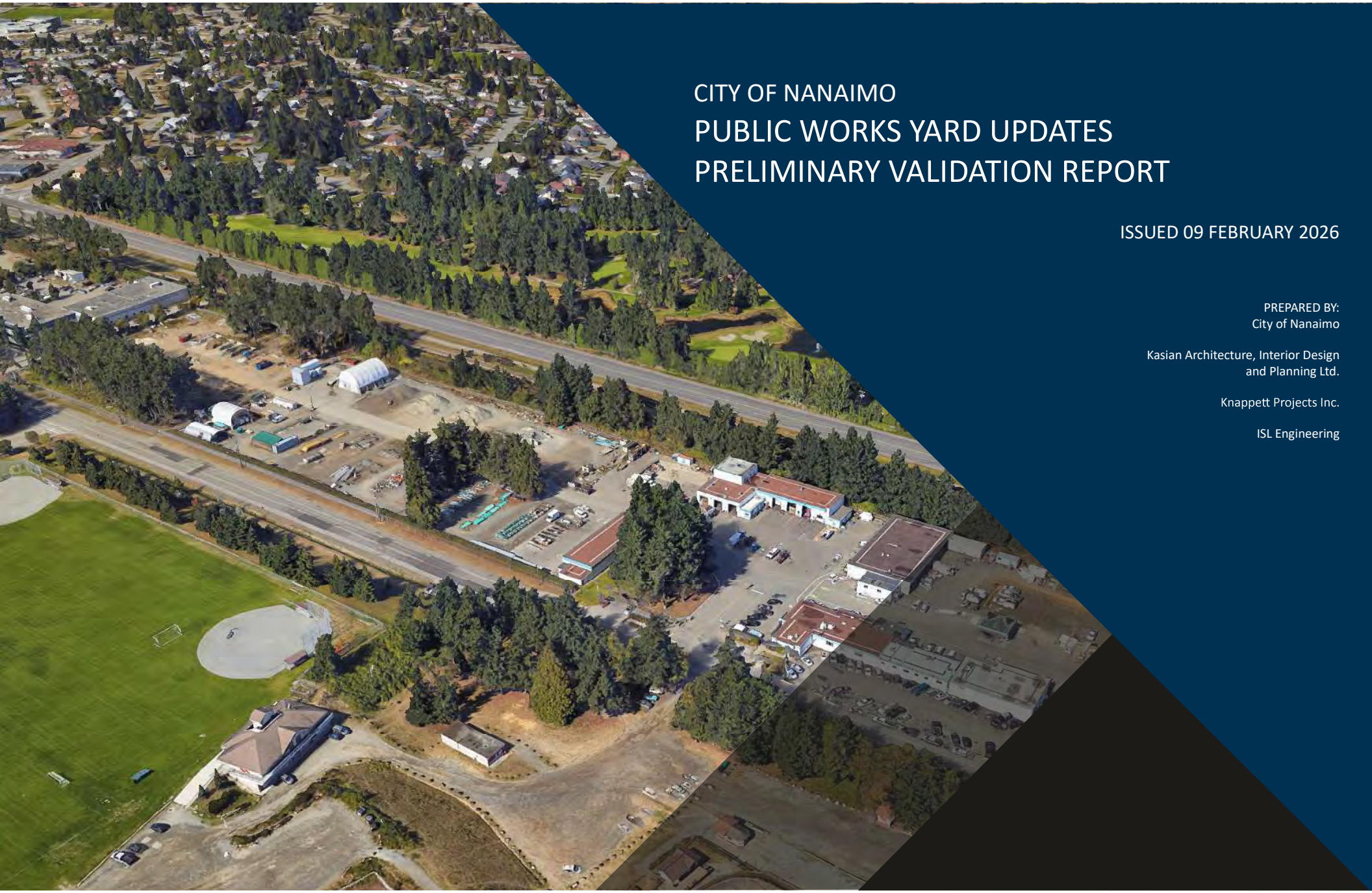
ATTACHMENT B



CITY OF NANAIMO

PUBLIC WORKS YARD UPDATES
PRELIMINARY VALIDATION REPORT

ISSUED 09 FEBRUARY 2026

PREPARED BY:
City of Nanaimo

Kasian Architecture, Interior Design and Planning Ltd.

Knappett Projects Inc.

ISL Engineering

We respectfully acknowledge that the city boundary lies within the Traditional Territory of Snuneymuxw First Nation.



Figure 1 (cover page) City of Nanaimo Public Works Yard Aerial View, Source: Google Earth

Figure text

Figure 2 (this page): Departure Bay Portal, Source: City of Nanaimo

EXECUTIVE SUMMARY

Project Context

The City of Nanaimo's (the City) Public Works Yard at 2020 Labieux Road is a critical municipal operations facility that supports daily service delivery and also functions as a Departmental Operations Centre (and back-up Emergency Operations Centre) during emergency events. The existing facilities, originally constructed in the mid-1960s and expanded incrementally, no longer meet operational needs, workforce demands, or current building code requirements. Previous assessments have confirmed that reinvestment is required to address safety, functionality, and long-term resilience.

Project Scope

The project includes construction of a new Crew and Administration Building, a new Fleet Maintenance Building, and associated site improvements to support ongoing Public Works operations.

The proposed Crew and Administration Building will support approximately 246 staff across Engineering & Public Works, Parks, Recreation & Culture, and Corporate Services, providing modern workspaces, meeting and training rooms, tailboard spaces, workshops, and essential operational support areas. The building has a programmed gross total building area of 4,332 m^2.

The proposed Fleet Maintenance Building will support 17 Fleet Operations staff and City-wide vehicle servicing, with approximately 60% of the net building area dedicated to maintenance bays, supported by administrative workspace and technical spaces, for a programmed gross total building area of 2,711 m^2.

Associated site updates include the reorganization and expansion of fleet and staff parking, new yard storage locations, relocation of salt and brine systems, demolition of obsolete buildings, and improved circulation and safety. The site plan has been developed to maintain uninterrupted Public Works operations throughout construction.

Design and Operational Considerations

The design approach prioritizes durability, safety, and long-term operational performance. Both major buildings are planned to achieve post-disaster operational performance, reflecting the essential role of Public Works during emergency events and simplifying construction and systems integration. Sustainability objectives are addressed through a practical, operations-focused strategy that includes high-efficiency building systems, EV-ready infrastructure, and solar installations. Updating the existing brownfield site limits environmental impacts while preserving undisturbed land.

Schedule Overview

A Preliminary Project Schedule has been developed to establish a clear and achievable path forward from Council approval through project completion. Key milestones include Council approval in February 2026, commencement of validation and design in March 2026, ground-breaking in September 2026, and progressive completion of the Crew and Administration Building and Fleet Maintenance Building between 2028 and early 2029. Overall project completion is anticipated in January 2029.

Preliminary Base Target Cost

The Preliminary Base Target Cost (BTC) establishes a current cost baseline based on the level of design and information available at this stage of the project. The BTC includes design costs, building construction, site works, identified project risks, and City-incurred costs. The preliminary BTC is summarized as follows:

- Design and Engineering: $6M
- Construction: $67.2M
- Risk Register and Contingency: $3.8M
- Utilities/Permitting: $2.4M,
- **Total Preliminary BTC: $79.4M**



Figure 3 City of Nanaimo Public Works Yard Aerial View, Source: Google Earth

Risk and Value Management

Key project risks related to site constraints, brownfield conditions, operational continuity, sustainability objectives, and market conditions have been identified and documented. In parallel, opportunities to improve value, efficiency, and constructability have been identified by the Project Team. These items form the basis for ongoing refinement of scope, cost, and schedule as the project advances.

Summary

The Preliminary Validation process confirms that renewal of the Public Works Yard is necessary and time-sensitive, and that the proposed scope is well aligned with the City's operational requirements. The work completed to date provides a solid foundation for continued refinement of scope, cost, and risk, and supports a structured transition into the next phase of design and validation to prepare the project for implementation.

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Figure 4 City of Nanaimo, Source: City of Nanaimo

1 PROJECT HISTORY

1.1 Project Overview

The City's Public Works Yard, located on a 6-hectare site at 2020 Labieux Road, was originally constructed in the mid 1960's. Since then, the City's boundary expanded to include the Improvement Districts of Harewood, Chase River, Northfield, Departure Bay, Wellington, and Protection Island and the population increased from 14,950 in 1971 to 40,340 in 1976 and is now over 110,000.

Over the years, the City's Public Works Yard has evolved on a piecemeal basis in response to the growth and changing needs of the City. In addition to supporting day-to-day operational activities, the Public Works Yard is a highly active Departmental Operations Centre, activated for flooding and heat events, windstorms, snow events, and other weather events that are becoming more prevalent with climate change. The Public Works Yard is also the backup Emergency Operations Centre to Fire Station 1.

The current facilities are no longer fit for purpose and do not meet operational needs. They are characterized by cramped temporary-use modular office buildings and other end-of-useful-life structures which are not up to current building code requirements and do not support the City's modern workforce composition.

The City began the work of better quantifying these issues and seeking out solutions to them in 2018, completing comprehensive building assessments and establishing the required operational space needs to support the present and projected future levels of service required by the community. In 2020, the City began to develop an architectural concept of how 2020 Labieux Road could be updated to better function as the City's primary operational space for delivery of community services and to better understand project risks which had not already been explored.

In 2021, a master plan for the Public Works Yard updates was presented to the Finance and Audit committee with an associated cost estimate of $125 million with an uncertainty of +30% to -20%. Given the inflationary pressures being felt at the time it was anticipated that the actual cost would be at the upper end of that estimate; $163 million. Following this presentation, and to spread out potential borrowing required to fund all of these updates over a greater period of time, a phased master plan was created and presented to Council in 2022.

In 2025 the City took a step back to review options to complete this work and opportunities to integrate feedback received from the community. The City initiated a new strategy to manage this project. In order to better define the scope of the project, generate more mature designs for that scope, and provide accurate costs to complete the work, the City decided to no longer pursue a Design-Bid-Build project delivery model in favour of using an Integrated Project Delivery (IPD) model. A core IPD team was brought together in 2025, consisting of the City, Kasian Architecture Interior Design and Planning Ltd. (Kasian) as design lead and project architect, and Knappett Projects Inc. (Knappett) as general contractor.

This IPD team has worked with City operations staff to establish plans which are fit for purpose and meet operational needs as well as pricing which is reflective of true and current market conditions. The results of those efforts are presented in this report.



Figure 1.1 City of Nanaimo Public Works Yard Open House, Source: City of Nanaimo



Figure 1.2 City of Nanaimo Sign, Source: City of Nanaimo



Figure 1.3 City of Nanaimo Public Works Yard Open House, Source: City of Nanaimo

2 PROGRAMMING AND PLANNING

2.1 Project Functional Space Program Summary

The Functional Space Program was originally developed in 2019 by Resource Planning Group. Kasian then re-validated the program through discussions with work groups in 2022 and 2025. The following is a summary of the operational and administrative needs for the Project as of Q4 2025.

2.1.1 Crew and Administration Building

2.1.1.1 Functional Program Summary

The Crew and Administration Building will house crew workspace, office space, and associated support space for staff and visitors to the site.

The net program area required is **2,749 net m²**. The net program area is the actual required footprint of each function/ space (ex: an 11.1 m² office), not including such space as general circulation. The net program area breaks down as follows:

- 41% Specialty Spaces (ex: Tailboard Space, Mudroom, Locker/Change Rooms)
- 35% Workstation/Office area
- 12% Meeting/Collaboration space (including a Department Operations Centre/back-up Emergency Operations Centre),
- 12% Office Support Spaces (ex: Copy/Print areas, File Storage)

With the addition of an allowance for general circulation, utility spaces (ex: Mechanical Rooms, Electrical Rooms), and wall thicknesses, the programmed gross total building area required is **4,332 gross m².** The gross-up factor used for administrative space is 1.6. This reflects the larger building circulation required for administrative space which is typically made up of multiple small rooms and workstations. The two industrial workshops in the program (Signs and Signal Workshops) receive a 1.2 gross-up factor reflecting the lower general circulation requirements of such spaces.

Refer to Appendix A for the detailed Functional Space Program.

2.1.1.2 Headcount

Table 2.1 identifies the work groups located in the Crew and Administration Building.

The Crew and Administration Building functional program accommodates 246 staff. Table 2.2 provides a breakdown, by department, identifying current and projected growth positions.

55% of the staff work primarily in the field and will have shared touchdown workspaces to use, as required, during the times that they are at the Public Works Yard.

The remaining staff spend the majority of their workday at the Public Works Yard and are provided with dedicated workspace.

Refer to Appendix A for a detailed headcount spreadsheet by position.

Table 2.1 Work groups programmed in the Crew and Administration Building

Department	Section
Engineering & Public Works	Public Works: – Administration – Roads & Traffic Services – Sanitation, Recycling & Cemeteries – Utilities – Water Resouces Engineering – Engineering Projects – Facility Asset Management*
Parks, Recreation & Culture	Administration* Facilities* Parks (Fields, Trails, Utilities)*
Corporate Services	Supply Chain Management Information Technology (IT)

*Denotes work groups currently working out of other locations which will be relocating to the Public Works Yard

Table 2.2 Headcount programmed in the Crew and Administration Building

Department	Current Staff	Growth Staff (Immediate or Long Term)	Total Staff
Engineering & Public Works	151	21	172
Parks, Recreation & Culture	56	6	62
Corporate Services	9	3	12
Grand Total	216	30	246

2.1.2 Fleet Maintenance Building

2.1.2.1 Functional Program Summary

The Fleet Maintenance Building primarily houses the Fleet Vehicle and Small Equipment Maintenance Bays and associated support spaces (ex: Parts Storage). There is also an office component for the Fleet Operations team which is part of the Public Works Department.

The net program area required is **2,356 net m²**. The net program area breaks down as follows:

- 60% Fleet and Equipment Maintenance Bays
- 28% Maintenance Support Spaces (ex: Parts Storage, Shipping & Receiving)
- 3% Workstation/Office area
- 3% Meeting/Collaboration space
- 2% Office Support Spaces (ex: Customer Service areas, Copy/Print areas, Administration Storage),
- 4% specialty space (ex: Lockers/Change Room, Coverall Storage, IT Comm Room)

With the addition of an allowance for circulation, utility spaces (ex: Mechanical Rooms, Electrical Rooms), and wall thicknesses, the programmed gross total building area required is **2,711 gross m².** Administrative-type spaces receive a 1.6 gross-up factor to reflect the larger building circulation required for administrative space with multiple small rooms and workstations. The large vehicle and equipment bays receive a smaller 1.1 gross-up factor as a large central circulation spine is included in the program as its own program line item. The remaining industrial spaces (ex: Parts Storage) receive the typical industrial 1.2 gross-up factor reflecting the lower building circulation requirements of such spaces.

Refer to Appendix A for the detailed Functional Space Program.

2.1.1.2 Headcount

The Fleet Maintenance Building program accommodates 17 staff. Table 2.3 provides a breakdown identifying current and projected growth positions.

Administrative staff in the building will have dedicated workspace. The trades staff (ex: Mechanics) will have shared touchdown workspaces as they are primarily working in the Fleet Vehicle and Small Equipment Maintenance Bays.

Refer to Appendix A for a detailed headcount spreadsheet by position.

2.1.3 Parking

The primary outdoor program associated with the Project is parking for fleet vehicles, staff, and visitors. Parking will be provided for 90% of staff on site, including current, seasonal, and projected growth staff. Fleet parking has been provided for all current vehicles as well as a provision for growth. Table 2.4 provides a breakdown of the quantity of parking by type.

Refer to Appendix A for a detailed parking breakdown.

Table 2.3 Headcount programmed in the Fleet Maintenance Building

Department	Current Staff	Growth Staff (Immediate or Long Term)	Total Staff
Engineering & Public Works	13	4	17

Table 2.4 Parking programmed in Phase 1

Parking Type	Quantity	Notes
Staff Parking	240	
Visitor Parking	11	
Fleet Parking	283	Includes broken + repaired vehicle parking for fleet maintenance, excludes plough blades
Grand Total	534	

3 DESIGN NARRATIVE AND SYSTEM VALIDATION

3.1 Site Plan

The proposed site plan was developed based on the Functional Space Program and work group workshops conducted between Q4 2025 and Q1 2026, and has been vetted by the IPD team. This included review and input from the City's Project Steering Committee and all affected City work groups, to capture key program and functional adjacencies of the Public Works Yard. Based on this input, the design team put together a site plan that prioritizes operational efficiency, maintainability, economic viability, and future adaptability.

3.1.1. Site Plan Design - The Project

The site plan design addresses the highest immediate needs that can be met within a single build-out and within the construction budget. It is comprised of the following:

- Construction of a new Crew and Administration Building (A) and a new Fleet Maintenance Building (B)
- Relocation of existing on-site yard storage and existing off-site Parks yard storage to the eastern portion of the site (C)
- Use of the City owned land on the western and northern portions of the site (D)
- Right-sizing and consolidation of most of the fleet vehicles to the western half of the property (E)
- Relocation of the existing Salt Shed and Brine Tanks (F)
- Demolition of the existing Administration Building but retaining the Casting Shed (G),
- Re-purposing the existing Fleet Maintenance Building and portions of the existing Truck Barn for indoor material and equipment storage (H).

Due to the narrowness of the site, the most efficient way to maintain operational maneuverability throughout the site is to split the administrative and fleet maintenance functions into two distinct buildings: the Crew and Administration Building and the Fleet Maintenance Building. Doing so allows the occupants of the Crew and Administration Building to maintain sight lines to the yard and have direct access to fleet vehicles. Meanwhile, the Fleet Maintenance Building is physically and acoustically separated from the Crew and Administration Building while still maintaining a desired adjacency between the two buildings. The separation allows for maximum flexibility for vehicle bay access around the perimeter of the Fleet Maintenance Building. Finally, separating the two buildings allows the Fleet Maintenance Building to be constructed as a pre-engineered structure, which is well-suited for this building's function and is more cost effective than on-site construction. The two buildings and their positioning then inform the rest of the program distribution across the site.

The two buildings are surrounded on the yard side with the light and heavy fleet parking, effectively the operational staff's "daily drivers", to ensure easy and safe access to these vehicles.

To account for the displaced yard storage where the new buildings will reside, the eastern and northern portion of the yard is being expanded to the property line and converted into interim yard storage and additional fleet parking.

The main drive aisle bisects the site longitudinally. This existing arrangement was purposely maintained in the Project site plan as it serves as an intuitive wayfinding strategy throughout the yard and maximizes sightlines for site safety.

Staff and visitor parking is located to the west of the Crew and Administration Building. This parking area is separated from the secure zone of the yard, ensuring large fleet traffic does not intersect with staff and public vehicle traffic.

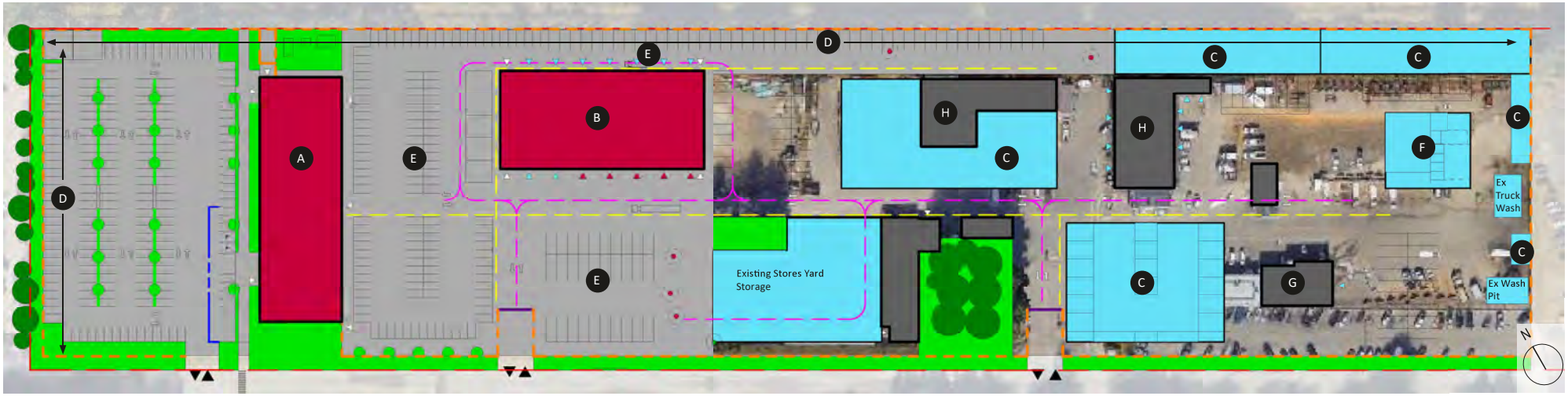


Figure 3.1 Project Site Plan

3.1.2 Site Plan Design - Future Adaptability

The Project site plan will address the urgent needs of the Public Works Yard while considering adaptability for future projects that the City may wish to undertake. This is critical to ensure what is being done as part of the project does not prohibit or limit the future use of the yard. Potential future projects may include:

- Removing remaining end-of-life assets such as the existing Fleet Maintenance Building (A), Casting Shed (B) and portable building (C)
- Maximizing the remainder of the site for yard storage (D)
- Constructing a Purpose-Built Storage Building to house weather-sensitive materials, equipment, and vehicles from various work groups (E)
- Relocating the fuel station, associated storage, and fleet vehicle wash areas (F) close to a site entry for easy access
- Adding a scale to weigh materials entering and leaving the site (G)
- Adding additional paved parking areas for parking displaced from the eastern side of the site (H),
- Potential renovations to the existing Stores Building and existing Truck Barn (I)

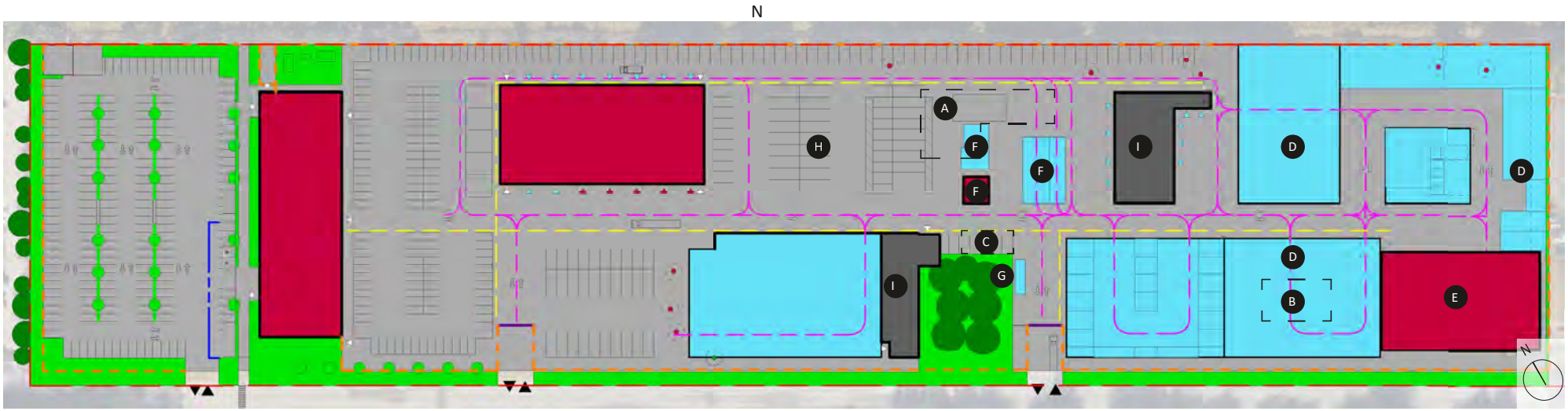


Figure 3.2 Future Potential Build-out Site Plan

3.2 Building Floor Plan Concepts

Validating the Functional Space Program was the first step to the design of the new Crew and Administration Building and the Fleet Maintenance Building. From there, a deep understanding of operations, adjacencies, and dependencies is required to inform the building shape and organization. Through several design meetings with the work groups, the design team gathered this data and cross referenced it with the program to develop the preliminary floor plan concepts.

The following is a description of the preliminary floor plan concepts by building. Note, building utility space and infrastructure has been considered at a high level, but engineering sub-consultants have not been engaged at this time.

3.2.1. Crew and Administration Building

The Crew and Administration Building is a two-story post-disaster building to house operational crews, administrative workspace, and associated support space for staff and visitors to the site. The gross floor area is **4,283m²** (not including the potential expansion space on the second floor), which is in alignment with the programmed gross area of **4,332m²**

The building will be designed to meet the accessibility requirements of the BC Building Code 2024 and will also include gender-inclusive spaces to reflect the City's accessibility priorities.

3.2.1.1. Ground Floor

The ground floor is primarily dedicated to crew operations space. This includes dispatch and crew support spaces such as Tailboard Rooms to support crew briefings and operational coordination, Locker/Changing Rooms, and Workshops. To support operations, the Tailboard Rooms need to be located on the ground floor with direct access to the exterior yard. Therefore, most Tailboard Rooms are clustered along the longest east facing elevation. This allows operational crews to move easily between their workspace, their vehicles, and the general yard. It also allows supervisors to have direct sightlines to the yard activity. The Locker/Changing Rooms, the Mudroom, and Coverall Storage are all located adjacent to the tailboard spaces for ease of access for operations crews at the start and end of the day.

The ground floor also includes the main public interaction spaces. As a civic building, members of the public may visit the building for a variety of reasons. Typically, user groups and individuals from the community come to meet with staff from Park Operations, Parks & Open Space Planning, and Facilities. Public-oriented amenities such as Reception, Meeting Rooms, and a Lobby used for program displays are included on the ground floor to allow the community to come in and engage with the City in a welcoming, barrier-free environment. At the core, however, the Crew and Administration Building will be a modern post-disaster facility that will serve the staff of the Public Works Yard and the City as they serve the community for many years to come.

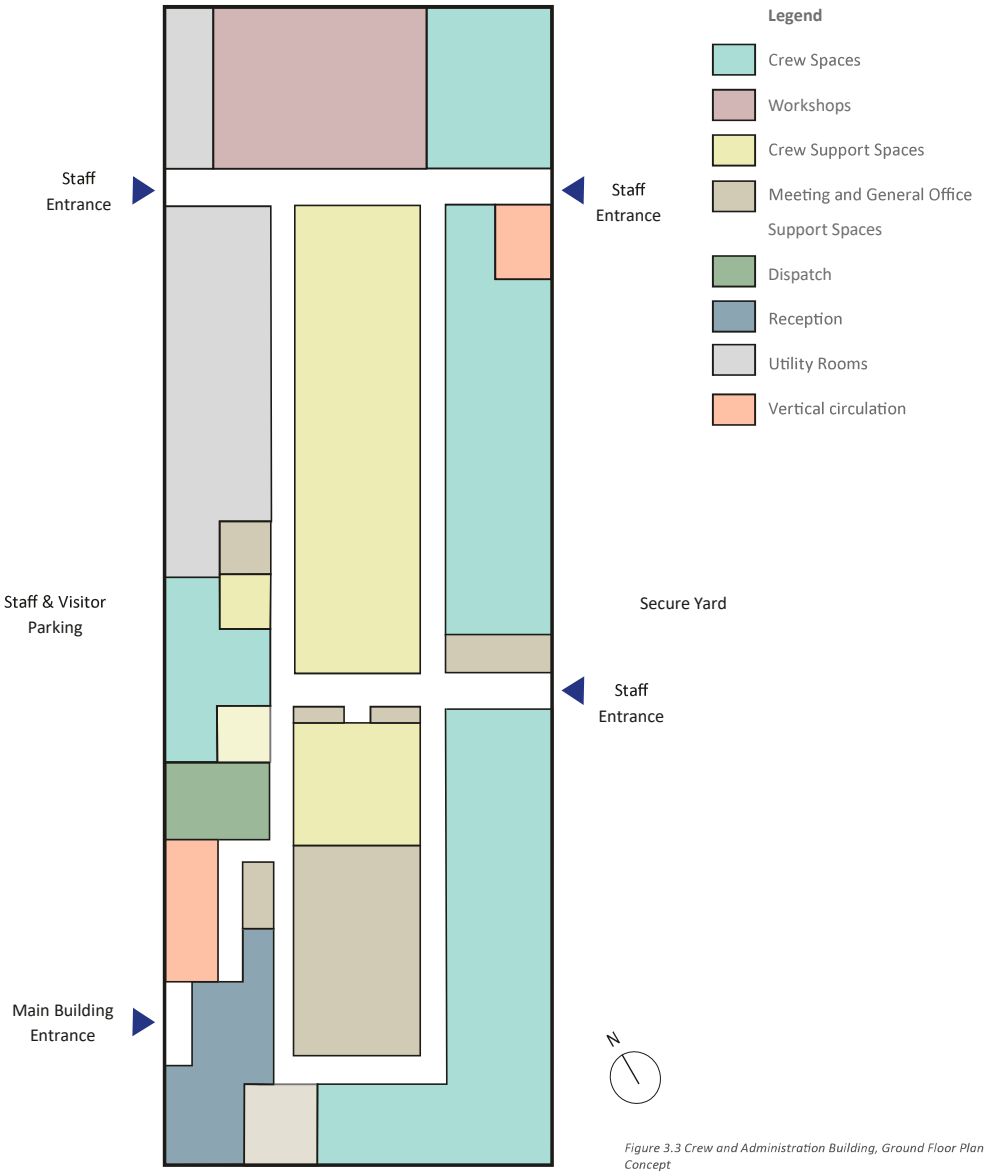


Figure 3.3 Crew and Administration Building, Ground Floor Plan Concept

3.2.1.2. Second Floor

The second floor houses the administrative spaces for those staff members that spend most of the workday at the Public Works Yard. The floor plan has been designed to maximize sightlines to the yard with workspaces lining the perimeter of the floor plate.

Common use spaces, such as Meeting Rooms, Copy/Print areas, and Storage Rooms are grouped in the centre of the floorplate, easily accessible to the perimeter workspace zone. This central area includes the Department Operations Centre which will allow for inter-departmental co-ordination during an event and will back-up the Emergency Operations Centre at Fire Station 1.

The team is continuing to collaborate with the various work groups to review the approach to workspace design to find further efficiencies.

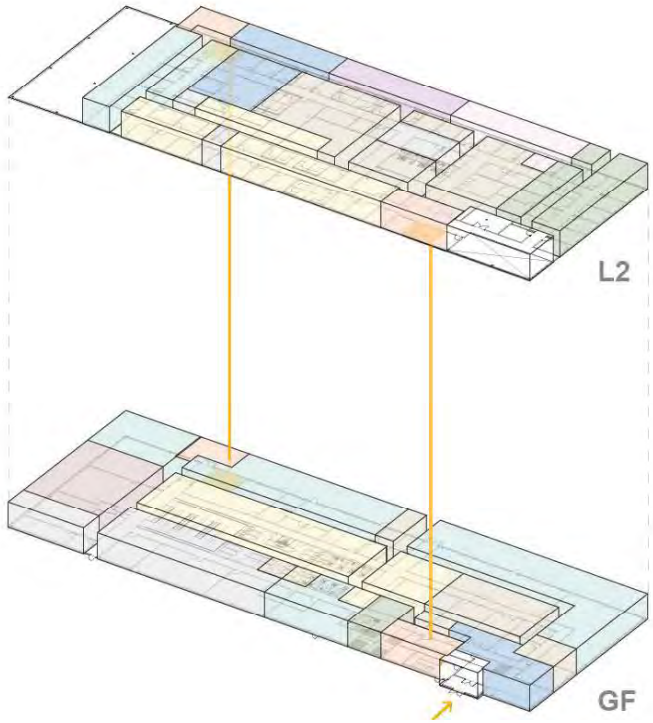


Figure 3.4 Crew and Administration Building, Axonometric



Figure 3.5 Crew and Administration Building, Second Floor Plan Concept

3.2.2. Fleet Maintenance Building

The existing Fleet Maintenance Building is one of the highest priority buildings for replacement to meet the current and future needs of the Public Works Yard. The existing building has aged beyond its useful life and there isn't enough space to house the current operations.

The Project proposes a new purpose-built Fleet Maintenance Building located nearby the Crew and Administration Building. The building will be a pre-engineered structure designed to post-disaster standards to ensure the Fleet Maintenance teams can continue to operate during an emergency. The gross floor area is **2,710m²**(including the mezzanine), which is in alignment with the programmed gross area of **2,711m².**

The Fleet Maintenance Building is designed with flexibility and growth in mind. The administrative functions are consolidated on the western side of the building while the rest of the building houses the Maintenance Bays and associated specialty support spaces (ex: Parts Storage) for fleet vehicle and small equipment maintenance. The plan includes modular, standardized sized bays: seven High-head Truck Bays and three Automotive Bays, open to each other for flexibility. An overhead crane runs across the seven High-head Truck Bays. Every effort was made to accommodate drive through functionality for the bays, providing a greater level of operational efficiency to the building and vehicular traffic control. Fleet vehicles can enter the building through the north or south elevations.

Finally, the building is also designed to meet current accessibility standards, incorporating barrier-free and gender-inclusive spaces.

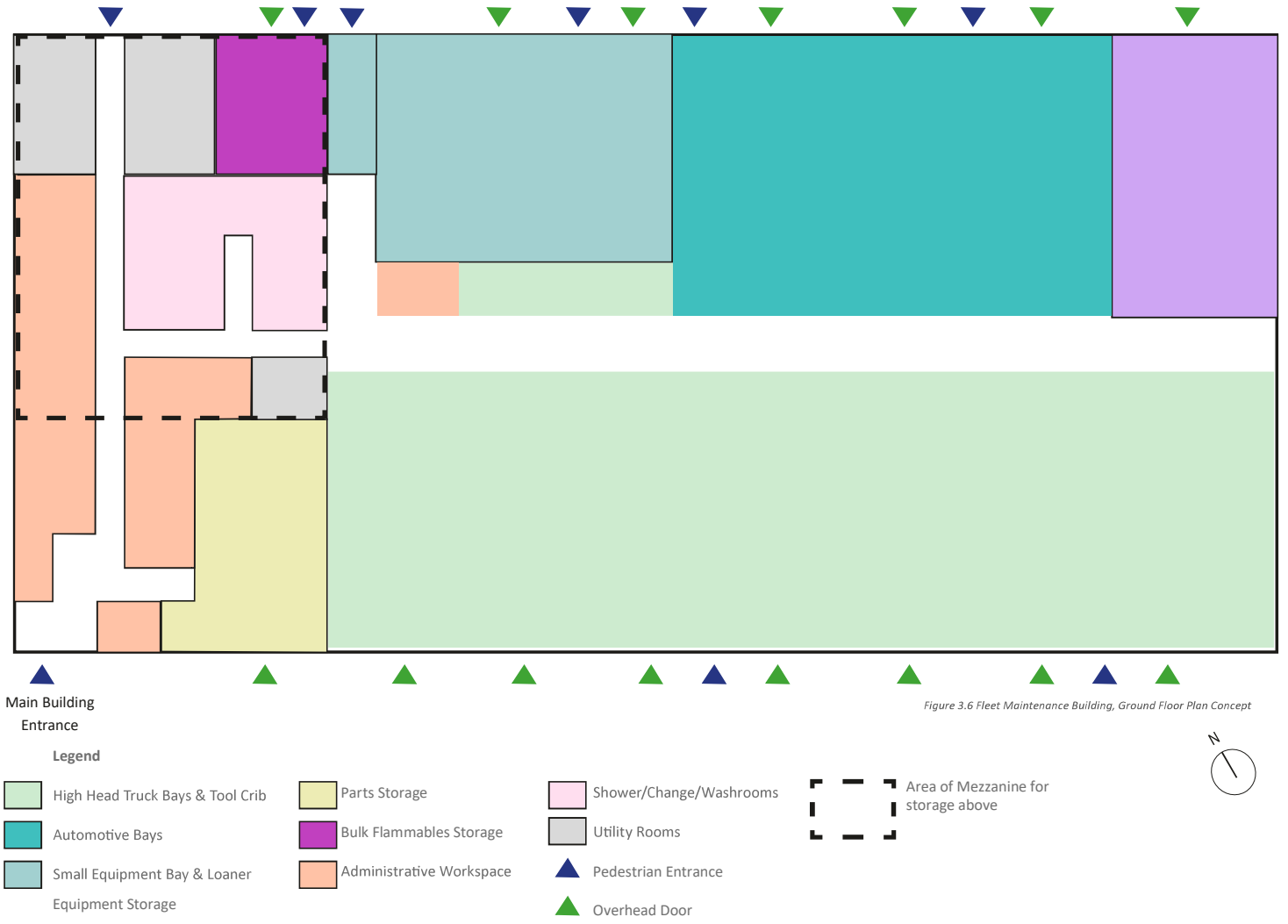


Figure 3.6 Fleet Maintenance Building, Ground Floor Plan Concept

3 DESIGN NARRATIVE AND SYSTEM VALIDATION

3.3 Building Massing Concepts

The building massing designs prioritize operational efficiency and a pragmatic design. The building massing designs are also a response to the overall site constraints, structural and post-disaster considerations, as well as maximizing the available land to fit the functional program. As such, both the Crew and Administration Building and the Fleet Maintenance Building are proposed to be rectangular masses. This is, from an architectural standpoint, the most efficient and cost-effective footprint.

3.3.1 Crew and Administration Building

The Crew and Administration Building serves as the main anchor to the site. Crew access and sightlines to the yard have driven the shape of the building. The long side of the building is oriented to face east towards the yard, allowing personnel from the ground floor direct adjacency to the fleet vehicles, and those on the second floor workspaces direct oversight to the yard. The program spaces are stacked across the two floors to minimize the building footprint, thereby maximizing site space available for other uses, and to provide optimized adjacencies according to work group needs.

3.3.2 Fleet Maintenance Building

The Fleet Maintenance Building is also rectangular in massing. The rectangular shape is the most efficient for a pre-engineered building. Massing irregularities would defeat the advantages gained from the modular nature of a pre-engineered structure and building envelope.

Both buildings are approximately 8.5m high. This height is designed to meet the functional requirements of the buildings while being respectful to and consistent with neighboring buildings, producing no shadows to adjacent properties or buildings.



Figure 3.7 Proposed Site Aerial

3.4 Sustainability & Greenhouse Gas Reduction Strategies

The Project will follow the City of Nanaimo's *Sustainable Building Policy*, ensuring that City facilities are built in an efficient, healthy, and ecologically responsible manner that enhances the well-being of the community in accordance with Council's strategic goals, the Official Community Plan, and community expectations. As a core civic operations facility, the Project adopts a pragmatic, operations-focused sustainability approach that emphasizes durability, energy efficiency, and lifecycle performance rather than certification-driven or short-term "showcase" measures. This is consistent with the policy's direction to pursue fit-for-purpose, value-oriented strategies over proprietary rating systems.

In accordance with the policy requirement for energy and carbon considerations, life cycle cost analyses, and climate responsiveness, the project will integrate building system strategies that support incremental greenhouse gas (GHG) reductions while maintaining operational reliability. Mechanical and electrical systems will be designed to meet or exceed current energy code requirements, with the Crew and Administration Building targeting BC Energy Step Code / National Energy Code of Canada for Buildings (NECB) Step 3. It is important to note that a Step Code 3 building is not relying on prescriptive requirements. Instead, it is performance-based, and compliance is demonstrated through energy modeling to achieve targets relative to a reference NECB building. As such, the design will initially focus on pragmatic designs to naturally achieve improved insulation values and airtightness.

Pursuing the same level of step code performance with the Fleet Maintenance Building would not be in keeping with the *Sustainable Building Policy* due to the inherent energy inefficiencies associated with the numerous large overhead doors which need to be opened and closed regularly. The BC Energy Step Code would also not apply to industrial buildings (Group F). Instead, the Fleet Maintenance Building design will target a 25% improvement over the baseline NECB 2020 Building as per the City of Nanaimo Building Bylaw amendment effective July 1, 2024.

Although not a requirement for the BC Energy Step Code, the yard and buildings will employ a fully electrified energy system, with back-up generators to balance near-term service resilience with long-term emissions reduction, while incorporating provisions for future decarbonization. The Project will include rooftop photovoltaic panels for onsite renewable energy generation, as well as electric vehicle charging stations for select fleet, staff, and community-use parking stalls. The Project will also allow for future expansion of charging infrastructure by pre-routing electrical systems, including underground duct banks and rough-ins. Integrating these provisions during the excavation and construction phase minimizes future operational disruptions and takes advantage of current site works.

Future implementation provisions have also been provided for additional elements are not part of the current Project scope. These include Level 3 EV charging infrastructure to support fleet electrification, space allocation for on-site battery storage, and additional electrical room capacity to accommodate future transformer upgrades. This future-ready approach enables the City to transition progressively toward lower-carbon operations in step with fleet conversion and grid decarbonization. It also supports the *City of Nanaimo's Guidance Document Supporting the Sustainability Policy for City-owned Buildings.*

Material selection and durability form a core component of the Project's sustainability strategy to address materials, resources, and waste management through a lifecycle lens. Architectural and structural systems prioritize robust assemblies, industrial-grade finishes, and low-maintenance envelopes to reduce repair cycles, replacement frequency, and associated embodied carbon over the facility's service life. As an example, the design team will prioritize local or Canadian products to reduce the transportation costs and embodied energy associated with the product's lifecycle. This approach considers the life cycle cost analysis, material longevity, and life cycle carbon reduction as key contributors to overall environmental performance. Through providing post-disaster rated facilities, the Project also supports long-term service continuity and climate resilience, consistent with the City's climate adaptation and hazard management objectives.

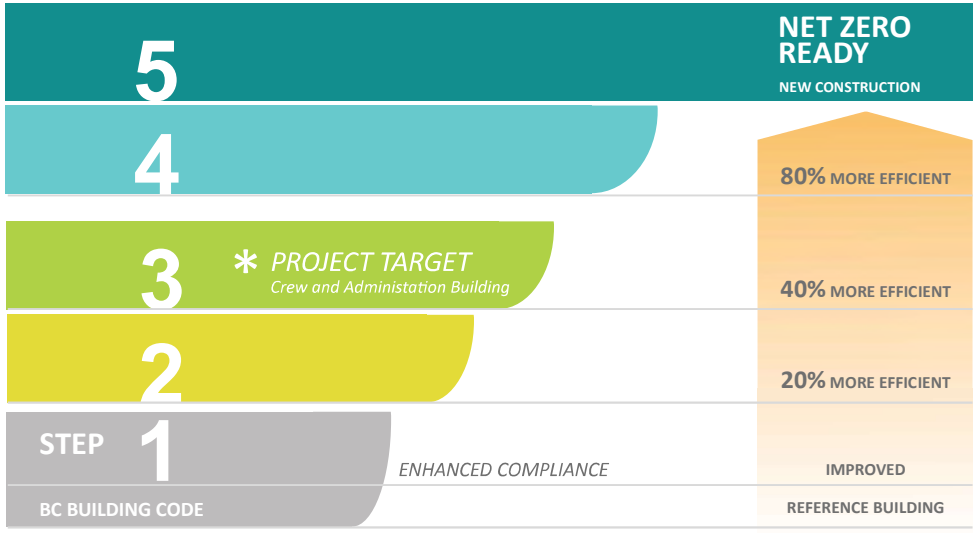


Figure 3.8 BC Step Code Diagram, Part 3 Buildings. Source: Community Energy Association

3.4.1 Brownfield Redevelopment and Sustainable Land Use

The redevelopment of the existing Public Works Yard represents a significant sustainability benefit through its classification as a brownfield and infill redevelopment. By reinvesting in an existing municipal site, the project leverages established land use, infrastructure, and servicing, thereby reducing the need for new road construction, utility extensions, and environmental disturbance. Maintaining the operational yard within its existing service area also improves fleet efficiency by reducing travel distances, fuel consumption, and associated transportation-related GHG emissions, supporting the City's broader GHG reduction objectives. Brownfield redevelopment also provides an opportunity to improve environmental performance on a previously impacted site through targeted remediation and modern construction practices. Measures such as upgraded environmental controls, salt-resistant concrete, and radon mitigation contribute to improved long-term environmental management.

3.5 Post Disaster Design Integration

During Preliminary Validation, the Project Team assessed post-disaster performance requirements, considering the essential role that Public Works has in emergency response, the key linkages between operations staff and fleet functions while fulfilling that emergency response role, and the potentially significant risks to the City's ability to fulfill its emergency response role due to facility downtime following a major event. The team determined that applying a post-disaster operational designation to both the Fleet Maintenance Building and the Crew and Administration Building provides the most reliable outcome and simplifies construction execution by avoiding mixed performance standards within an active operations campus.

The Public Works Yard is a critical operational hub during and after disruptive events such as earthquakes, severe weather, flooding, or large-scale utility failures. In these, and many other response circumstances, Public Works crews are relied upon to clear debris, restore transportation routes, support emergency responders, maintain water, wastewater, and storm systems, and undertake time sensitive repairs to critical community infrastructure. Ensuring that the facilities, such as the included Department Operations Centre/back-up Emergency Operations Centre, which are required to coordinate staff, to deploy equipment and other resources, and to service the City's fleet remain safe and fully functional immediately following a disaster is fundamental to maintaining essential services and supporting the community when it is most needed.

This post-disaster operational design requires higher performance standards related to structural design, building systems, and backup power. However, these elements are incorporated into the Preliminary Validation cost and scheduling models to reduce the risk of late-stage scope changes, unnecessary construction complexity, and operational disruption.

3.6 Building Envelope Design

The building envelope design for both the Fleet Maintenance Building and the Crew and Administration Building emphasizes robustness, durability, and direct support of operational requirements. Envelope composition, material selection, and assembly types are intentionally aligned with the industrial and functional nature of the facilities, prioritizing long-term performance, service life, and maintainability through a modest and rational architectural approach.

The Fleet Maintenance Building is proposed to be a pre-engineered building. It will adopt a utilitarian industrial aesthetic, using modular insulated metal panel wall assemblies and a standing-seam metal roof to ensure durability, ease of maintenance, and long-term performance. A concrete wall zone is provided at the lower 1–2 metres of the exterior walls to protect against vehicle impacts. Glazing is intentionally limited to that required for functional daylighting.

The Crew and Administration Building uses a conventional rainscreen wall assembly with robust insulation and thermal break paired with high performance window systems. Curtain wall or storefront glazing is restricted to the main public entrance to balance transparency with energy efficiency and cost control. Roofing consists of a two-ply waterproofing membrane, with limited skylights incorporated where operationally appropriate to support natural daylighting.

3.7 Materiality

Interior and exterior material selections prioritize durability, maintainability, and suitability for heavy City operations. Exterior materials reinforce an industrial and civic-service character, relying on robust metal cladding, concrete base protection, and restrained glazing to withstand long-term wear and exposure. For interior space, hard, resilient finishes are used for operational areas, including sealed concrete, resilient flooring (ex: rubber flooring), or other hard-wearing surface flooring systems suited to high-traffic and industrial use. Office and meeting spaces use carpet tile flooring for acoustic performance, comfort, and easy maintenance. Acoustic ceiling tiles are used generally throughout. Acoustic treatments will be selectively incorporated in Meeting Rooms and Tailboard Rooms to support functionality without decorative excess. These may include acoustic treatments for reduced sound reverberation to enhance speech clarity. Finishes are standardized and utilitarian, with no decorative millwork beyond functional requirements, reinforcing a consistent, cost-conscious material palette.



Figure 3.9 City of Nanaimo Public Works Yard Fleet Maintenance Building, Source: City of Nanaimo

3.8 Systems

During Preliminary Validation, the Project Team reviewed preliminary building system concepts to confirm feasibility, constructibility and alignment with operational needs, without finalizing specific system selections. Mechanical, electrical, and other major systems were assessed at a high level with input from construction and potential trade partners to understand cost, complexity, and execution implications of different options. This approach allows the project team to carry forward flexible, future-ready system strategies while deferring final system selection until design development, informed by validated cost, risk, and performance considerations. At a minimum, selected systems will address energy and heat recovery, building envelope airtightness, and air changes to meet ANSI/ASHRAE Standards for indoor air quality.

4 OPPORTUNITY AND RISK ANALYSES

The Opportunity and Risk Registers have been developed to identify, assess, and manage the key risks and value opportunities associated with the Project. The registers reflect the work completed to date by the project team during Preliminary Validation, including early review of scope definition, site and subsurface considerations, future capacity and future-proofing decisions, permitting and utility coordination, supply chain conditions, and the operational requirements of maintaining an active Public Works Yard.

The Opportunity Register captures practical strategies identified by the team to improve value and efficiency, including program and space optimization, standardization of building systems, right-sizing and phasing of infrastructure, prefabrication opportunities, early definition of sustainability targets, and operationally-driven site layout improvements.

As reflected in the Risk Register, the risks identified to date are typical of complex municipal infrastructure projects and are areas where early clarification and alignment can meaningfully reduce uncertainty as the project advances.

Together, these tools provide a structured and practical framework to support informed decision-making and guide continued refinement of scope, cost, and schedule as the project moves into full Validation.

4.1 Opportunity Register

The Opportunity Register (Table 4.1) is a proactive IPD tool used to intentionally create value throughout the project. Developed early and maintained through design and construction, it captures ideas that improve cost, schedule, constructibility, sustainability, and long-term performance.

Generated collaboratively by the full Project team, opportunities are assessed, tracked, and reviewed alongside the Risk Register and financial health metrics. Approved opportunities are integrated through Target Value Delivery or advanced as Added Value Incentive Items, ensuring alignment with Owner priorities and cost targets.

This approach enables informed, real-time decision-making and continuous optimization—focusing effort on value creation rather than late-stage cost corrections.

Table 4.1 Opportunity Register

Associated Risk	Date Added (yr/m/d)	Opportunity Description
1	2026-01-19	Space Efficiency/ Program Compression - Eliminate Overlapping & Redundant Space
2	2026-01-19	Private Offices - Reduce # of offices
3	2026-01-19	Standardizing Office and Cubicle Sizes
4	2026-01-19	Standard Wall and Floor Assemblies
5	2026-01-19	Standardizing Furniture - Offices, Tailboards, Meeting Rooms
6	2026-01-19	Strategic placement of glazing - Curtain Walls only at Lobby, improves building envelope performance
7	2026-01-19	Re-using Existing Equipment & Machinery
8	2026-01-19	Defining the Sustainability Requirements & Targets
9	2026-01-19	Pre-fabrication/ Offsite Assembly
10	2026-01-19	Site Layout & Circulation of Turning of Trucks (Design & Control Vehicle) - Reduce Area
11	2026-01-19	# of Fleet Parking Stalls - Reduce
12	2026-01-19	Government Grants - Sustainability, Gas, EV, PV, etc.
13	2026-01-19	Record Management Space (2nd Floor Crew and Administration Building) to be reduced
14	2026-01-19	Low Level of Finishes - Already Considered on ground floor; Second Floor to be standard office finishes in Crew and Administration Building
15	2026-01-19	Distribution of ground floor program to second floor to reduce overall building footprint of Crew and Administration Building
16	2026-01-19	Advanced Use of Building Information Modeling (BIM) - Next level (Revizto?)
17	2026-01-19	Salt & Brine Relocation by City
18	2026-01-19	Big Room moved on to site (utilize existing facilities)
19	2026-01-19	Reduce Civil Storm Scope of Work
20	2026-01-19	Utilize offsite storage for large, low risk, low turnover items (i.e.. Nanaimo Lakes, etc.)
21	2026-01-19	Alternative Mechanical & Electrical Systems
22	2026-01-19	Enhancing security through design decisions
23	2026-01-19	Strengthening local economy through partnerships and procurement

4 OPPORTUNITY AND RISK ANALYSES

4.2 Risk Register

Table 4.2 this page is the active Risk Register for the project.

Table 4.2 Risk Register

		Impact Potential				
Risk #	Risk Description	Projected Risk Cost ($)	Probability of Risk	Risk Factor (%)	Risk Cost ($)	Response Description
1	Unknown Requirements - Civil Scope - uncertain extent of stormwater servicing	$1,500,000	Low	20%	$300,000	Carry funding for the worst case scenario (minus contingency and escalation)
2	Environmental Ground Conditions	$150,000	Low	20%	$30,000	Assessment - Updated sampling (Dump Site)
3	Unknown Requirements - Sustainability Policy and Energy Targets (Step code 3/GHG Emissions Targets)	$200,000	Medium	50%	$100,000	Choosing by Advantages(CBA) and detailed report
4	Scope Creep - Driven by futureproofing (EV)					Risk mitigated, scope confirmed
5	Scope Creep - Driven by futureproofing (PV)					Risk mitigated, scope confirmed
6	Scope Creep - Driven by futureproofing (Energy Storage)					Risk mitigated, scope confirmed
7	Unknown Requirements - Storage Capacity - indoor and outdoor storage appurtenances (racking, etc. across work groups) (excludes structural/mechanical work from Truck Barn and Fleet)	$500,000	Medium-High	65%	$325,000	Conversations required + tour of existing off-site storage areas.
8	Unknown Requirements - IT Requirements	$250,000	Low	20%	$50,000	Possible Cash Allowance
9	Unknown Requirements - Outfitting DOC/EOC	$150,000	Low	20%	$30,000	
10	Scope Creep - Multiple Stakeholders (FF&E Unknowns)	$300,000	Medium-High	65%	$195,000	Avoid work triggering building permit for the Truck Barn, and limit expectations of stakeholder group
11	Abandoned Coal Mine (Under the Site)					Risk mitigated, Geotech with coal mine knowledge to be retained for project.
12	Futureproofing - Nanaimo Lakes/Prideaux					Risk mitigated, not in the base program/not part of this project.
13	Salt/Brine Move	$50,000	Very High	100%	$50,000	
14	Bulk Materials Move (out of project construction area)	$188,000	High	80%	$150,400	Public Works currently plans to tackle this, some support may be required from Project.
15	Escalation and Inflation (Until the end of project)	$1,500,000	Medium	50%	$750,000	
16	Tariffs	$500,000	Medium	50%	$250,000	Buy Local (Social Procurement)
17	Schedule - Permit Delays	$750,000	Low	20%	$150,000	Mitigate with a Certified Professional (CP)
18	Moving Strategy/Plan - Maintenance of 24/7 operation/IT plug and play	$200,000	Very Low	5%	$10,000	Develop a moving plan in tandem with IT
19	Operational Disruptions (during construction) - Unforeseen operational emergencies (Services in Yard)	$50,000	Medium	50%	$25,000	Increased Communication with City during operational emergencies
20	Protected Seasonal/ Perennial Nesting Birds	$25,000	Low	20%	$5,000	Engage experts early, confirm no perennial nesters (Eagles/Herons)Bird and conduct tree Survey
21	Supply Chain Disruptions	$150,000	Very Low	5%	$7,500	Coordination, expect long wait times and plan accordingly, get permission for early payment requirements - Procuring early + procuring often
22	BC Hydro Service Capacity					Risk mitigated, contained in base program.

Table 4.2 Risk Register

		Impact Potential				
Risk #	Risk Description	Projected Risk Cost ($)	Probability of Risk	Risk Factor (%)	Risk Cost ($)	Response Description
23	Third Party Utilities (Telus, Shaw, Fortis)- Schedule delays and updates to their estimates	$200,000	Medium	50%	$100,000	
24	Transmission Wires - Clearance requirement (Structural)					Risk mitigated, confirmed that the overhead wires are not transmission wires
25	Transmission Wires - Organized Parking Req.					Risk mitigated, confirmed that the overhead wires are not transmission wires
26	Unknown Wage Increase	$300,000	Low	20%	$60,000	Fair wage clause.
27	Design Rework Due to Refined Owner Requirements	$300,000	High	80%	$240,000	
28	Changing standards (Building Code etc.)	$500,000	Very Low	5%	$25,000	
29	Hazmat (Administrative Building)	$200,000	High	80%	$160,000	
30	Footprint of Project site not being available for start of construction	$500,000	Medium-High	65%	$325,000	Determine the monthly cost of impacts of not moving. Production and then procurement impacts
31	Barrier Free Office Requirements					Risk mitigated, contained in base program.
32	Unknown Requirements - Site Layout & Circulation/ Turning of Trucks (Design & Control Vehicles) related to storage relocation/design changes	$100,000	Low	20%	$20,000	
33	Unknown Requirements - Additional Design Costs for Unknown Elements	$300,000	High	80%	$240,000	
34	Crane - Pre-engineered Building Height Increase	$380,000	Medium	50%	$190,000	
TOTAL		$7,763,000			$3,787,900	

5 PRELIMINARY BASE TARGET COST

The Preliminary BTC has been developed as part of the Preliminary Validation work to establish a clear and well-supported cost baseline for the Public Works Yard Updates.

The BTC reflects the work completed to date by the Project Team, including refinement of program requirements, early consideration of site conditions, operational constraints associated with maintaining an active Public Works Yard, and review of key cost drivers such as civil scope, building systems, mechanical and electrical infrastructure, and future capacity needs. The BTC has been informed by the schedule strategy, early risk identification, and opportunity analysis completed during Preliminary Validation, and incorporates allowance-based approaches where further definition is anticipated.

The BTC is intended to provide a reliable starting point for full Validation, where continued collaboration among the City, consultants, and trade partners will be used to further refine scope, manage risk, and align cost and value prior to finalizing project commitments.

Refer to Appendix B for the detailed Preliminary BTCs for the Crew and Administration Building, the Fleet Maintenance Building and the Full Project Budget.

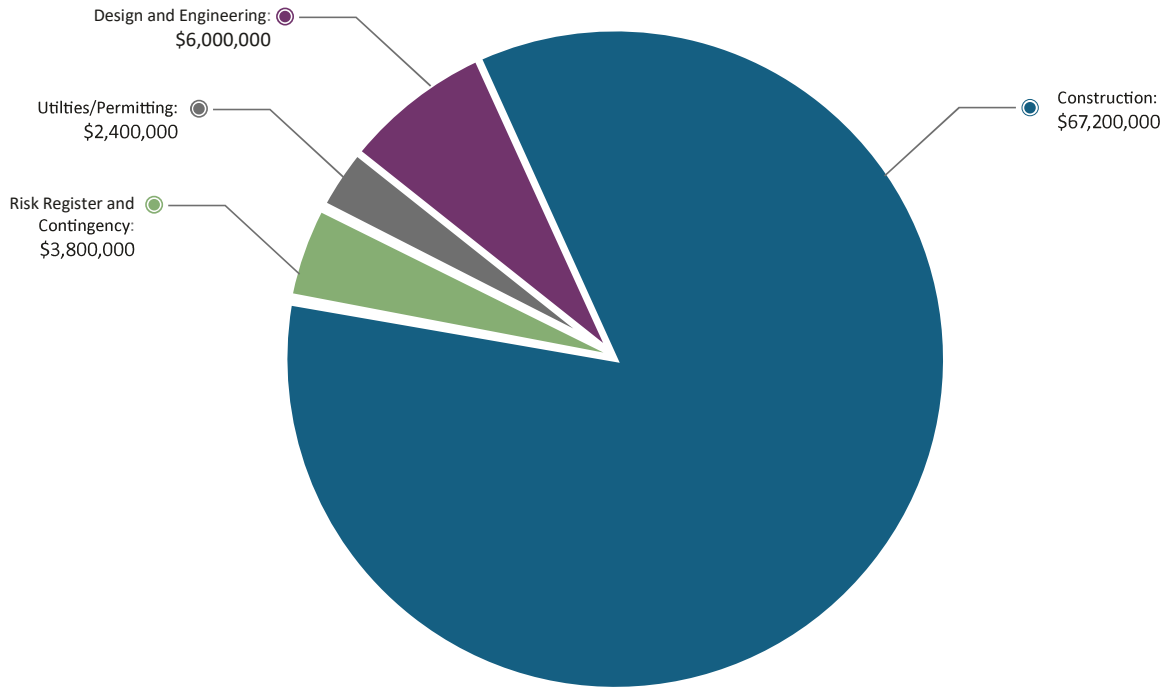


Figure 5.1: Preliminary Base Target Cost Summary Chart

6 SCHEDULE: DESIGN AND CONSTRUCTION

The Preliminary Project Schedule has been developed to reflect the work completed to date by the Project Team and to establish a realistic and achievable path forward for the Project. The schedule incorporates early planning and coordination undertaken during Preliminary Validation and demonstrates how key activities such as design development, procurement, permitting, and construction can be sequenced and, where appropriate, be overlapped to improve efficiency and reduce overall project duration. As illustrated, the schedule allows for early procurement of long-lead equipment, phased tendering of foundation and building packages, and advance site works to proceed in parallel with ongoing design refinement. The schedule also accounts for operational considerations specific to the project, including early site access, advance permitting, and the coordinated relocation of City materials and operations to minimize disruption. Collectively, these strategies reduce schedule risk, improve certainty, and support timely project delivery.

Refer to Appendix C for the detailed preliminary project schedule.

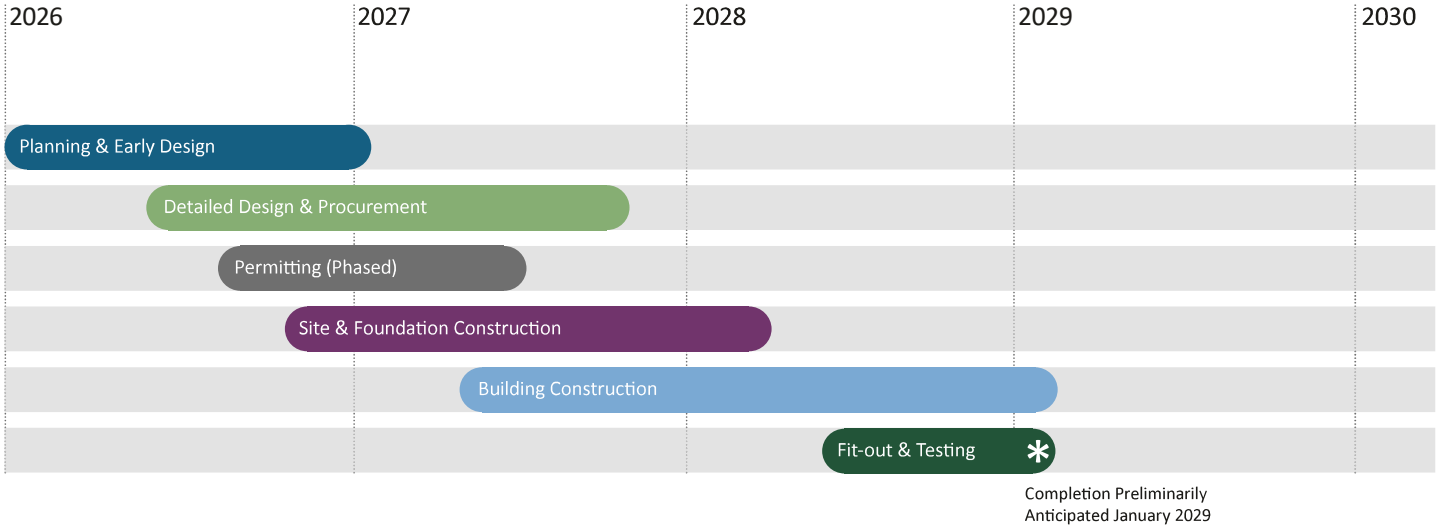


Figure 5.2: Preliminary Project Schedule Summary Graph

7 PROJECT EXECUTION PLAN

7.1 Integrated Project Delivery Approach

IPD is a collaborative approach where the client, designer, and contractor share risks and rewards under a single multiparty agreement. All participants work together from project inception to optimize outcomes.

IPD consistently produces stronger outcomes than traditional delivery models by aligning the commercial, technical, and behavioural aspects of a project from the outset. The Project Team is confident that IPD is particularly well suited to this update of the City's Public Works Yard, where long-term operational needs, future expansion, and complex stakeholder coordination must be addressed early and holistically. By bringing together stakeholders and coordinating with City staff and industry experts through facilitated Big Rooms and intentional Project Implementation Teams (PITs), we will capture the complete view of the Project's needs. IPD enables informed decisions that account for phasing, adaptability, and lifecycle performance, ensuring the facility can evolve over time without compromising safety, operational continuity, or efficiency.

The IPD model will support this project by establishing a clear, team-based governance structure that prioritizes shared objectives, early collaboration, and collective accountability. The team will leverage Lean tools such as the Last Planner ® system, transparent cost modeling, and Choosing-by-Advantages value-based decision making, to identify risk sooner, test options collaboratively, and make informed choices while change is still manageable. Equally important, this process intentionally creates psychological safety and trust, enabling open dialogue and respectful challenges across disciplines. Governance and leadership are exercised by the team as a whole through the Senior Management Team and Project Management Team and supported by PITs, reinforcing accountability and alignment with project goals. In consideration of all above factors, IPD will continue to be the project delivery method of choice for this project as it not only provides a structured framework and transparent forecasting of cost but also the necessary flexibility that this project will require.

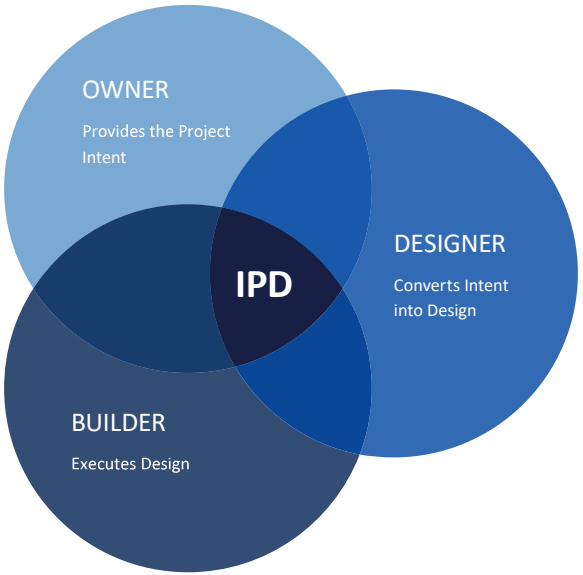




Figure 7.1 IPD Collaboration Session, Source: ISL Engineering

7.2 Design & Procurement

An IPD model establishes a highly collaborative framework that aligns the expertise of Kasian and Knappett with the needs of the City from the earliest stages of project development. By integrating architectural design and construction delivery under a shared contractual and operational structure, the project team can work together to collectively optimize outcomes related to design quality, constructibility, cost certainty, and schedule performance. This approach contrasts with traditional delivery models by replacing sequential handoffs with continuous collaboration, fostering shared ownership of both challenges and solutions.

From a design perspective, the close working relationship between Kasian and Knappett allows architectural concepts to be informed by real-time construction knowledge, market conditions, and procurement realities. Early contractor involvement ensures that design decisions are tested against constructibility, material availability, labour considerations, and sequencing implications as they are developed, rather than after design completion. This collaborative design process reduces redesign cycles, mitigates risk, and enables the team to converge more efficiently on solutions that balance performance, durability, and cost. The result is a design that is not only architecturally sound but also inherently buildable and aligned with the Project's budget and schedule constraints.

Procurement is similarly strengthened in the project team through early alignment between design intent and construction strategy. Knappett, a Vancouver Island based contractor, contributes valuable market experience related to trade capacity, material lead times, and cost trends, allowing Kasian to tailor specifications and assemblies to what can be procured most effectively. This collaboration supports early trade engagement, more accurate pricing, and strategic procurement planning, reducing exposure to market volatility, and minimizing late-stage substitutions. By integrating procurement considerations into the design process, the team achieves greater cost certainty and reduces the likelihood of scope compromises during construction. This integrated collaboration and communication structure supports faster resolution of design and construction challenges, reduces claims-oriented behaviour, and promotes a culture of trust and accountability.

A key advantage of the IPD approach is the reduction of communication pitfalls commonly associated with traditional project delivery methods. Rather than operating within siloed disciplines and contractual boundaries, Kasian and Knappett function as a unified team with shared goals and transparent information flow. Issues are identified and resolved collaboratively in real time, minimizing the risk of misinterpretation, adversarial exchanges, or delayed decision-making. This integrated communication structure supports faster resolution of design and construction challenges, reduces claims-oriented behaviour, and promotes a culture of trust and accountability.

Overall, the collaborative relationship between the City, Kasian, and Knappett has supported early identification of cost-saving opportunities, project risks, and schedule efficiencies. Through an iterative and feedback-driven design and planning process, the Project Team has been able to better align program requirements, construction methods, and procurement strategies, supporting informed decision-making and smoother execution. Early coordination has allowed risks to be identified and addressed sooner, opportunities for schedule acceleration to be explored, and cost drivers to be better understood and managed. Together, this approach supports improved predictability in cost and schedule outcomes while enhancing overall project value for the City of Nanaimo.

7 PROJECT EXECUTION PLAN

7.3 Construction Execution Plan

This Construction Execution Plan (CEP) describes how construction will be executed on this project and complements the design, sustainability, and procurement sections of this report. The CEP focuses exclusively on construction sequencing, logistics, risk management, and execution certainty.

IPD Value as Applied to Construction Execution

Under the IPD model, construction execution planning occurs concurrently with design development. Early trade engagement and open-book collaboration allow construction sequencing, logistics, temporary works, and commissioning strategies to be validated while change remains manageable. This approach reduces construction-stage change orders, improves schedule reliability, and supports responsible stewardship of public funds.

Construction Phasing and Operational Continuity

Construction will be delivered through phased execution that maintains uninterrupted Public Works operations. Sequencing is developed collaboratively with affected parties to balance safety, access, and productivity within an active works yard. The end goal is minimizing disruption to operational work groups and ensuring continuity of service to the community.

Site Logistics and Access Strategy

Execution planning prioritizes clear separation between construction and operational zones, controlled access points, and coordinated delivery timing. Limited laydown availability is addressed through just-in-time delivery and early procurement planning supported by trade input.

Execution Risk Reduction Through Validation

The Project Risk Register is actively used during Validation to identify construction-driven risks such as brownfield conditions, sustainability-related scope decisions, and post-disaster operational requirements. These risks inform construction sequencing, environmental controls, and procurement strategies prior to construction.

IPD in Action – Construction Execution Examples

Preliminary Validation activities have already influenced construction execution. Examples include: early confirmation of two post-disaster operational buildings enabling unified sequencing and commissioning strategies; early demolition scope definition allowing timely site access; early alignment on Furniture, Fixtures, and Equipment enabling integrated interior sequencing; real-time evaluation of HVAC zoning strategies to avoid excessive system complexity; and early integration of photovoltaic system to align with roof construction.

Continuous Execution Refinement

Construction execution planning will continue to evolve through ongoing project work. Sequencing, logistics, and risk mitigation strategies will be refined as design matures, ensuring that construction execution remains aligned with cost certainty, schedule confidence, and operational needs.



Figure 7.2, 7.3, 7.4: City of Nanaimo Public Works Yard Big Room Sessions, Source: ISL Engineering



Figure 7.5 City of Nanaimo Public Works Yard, Source: City of Nanaimo

Principle in Charge, Design Director

REGISTERED ARCHITECT DRAGANA PERUSINOVIC PROVINCE OF BRITISH COLUMBIA

Date: *February 9, 2026*

Dragana Perusinovic I Principle

SAA, AIBC, RAIC, BArch, MArch, LEED Green Associate