

Container Housing Development Outline

Objective

In order to efficiently plan and manage any project from concept to completion methodical planning and development of an effective delivery strategy and framework is vital. In the case of an inventive pilot project such as adapting shipping containers into quality affordable social housing units, the benefit of comprehensive and thorough assessment of all aspects of the development is central to the overall success of the project.

This document identifies the necessary components and critical path type activities that will need to be evaluated and considered when researching, designing and delivering the proposed 6 unit shipping container pilot housing project.

Project components and required tasks that have been identified are represented in a Table 1 - *Container Housing Development Outline*. Project elements and tasks in the table have been rationalised to simplify the main deliverables that will need to be undertaken and completed. The container development outline table will be used to plan and prioritize required project tasks and deliverables.

Project Concept

To create social housing utilizing shipping containers that will be modified to provide 320 sq.ft self-contained dwelling units. If successful from a technical, functional and cost perspective, this concept may have the potential to become a landmark affordable housing solution for both non-market and market housing sectors.

This is possibly the first attempt to use modified shipping containers in an incorporated municipality within Canada for the purpose of providing permanent social housing. The project will be rudimentary in its design and concept in an effort to manage technical constraints and to simplify municipal approvals such as zoning and building permitting.

Project Details

The project will consist of 6 self-contained dwelling units that will be built in a 2 units per floor, three storey building configuration. The proposed housing units will be partially constructed off-site and then installed and completed at Atira's site located at 120 Jackson Ave, Vancouver.

Project sponsors include BC Hydro and MC Quarters. Both sponsors have provided significant support by providing 4 of the proposed 6 units. BC Hydro has donated adapted shipping containers that will create 2 of the required housing units.

The BC Hydro unit was designed as a 'green' prototype residential dwelling unit. The unit was named The House of The Future due to its energy efficient attributes. The unit was exhibited to the general public during the 2010 Vancouver Winter Olympics.

The remaining 4 units will be supplied by MC Quarter, 2 units will be donated, and the remaining units will be purchased by Atira. Atira Development Society owns the subject site and will operate the building to provide affordable housing under a program umbrella to help women fleeing violence.

To accommodate the housing units, a portion of the existing building on the site will need to be demolished and the remaining buildings on the site upgraded to meet applicable and current building code provisions.

Municipal Approvals

The project will need to meet applicable City of Vancouver requirements which include;

- Zoning and Development Permit Approvals
- Building Permit (including mechanical & Electrical) Approvals

Project Requirements

The following regulative and physical type requirements will need to be evaluated and considered;

Regulative Approval Requirements

- Zoning & Planning
- Engineering Services
- Environmental
- Codes Approvals

Transport & Placement of Units

- Shipping & customs
- Overhead obstructions & adjacent buildings or laneway area restrictions

Unit Fabrication & Design

- Developing Manufacturing Standards
- Developing unit plans & fabrication shop drawings (off-site fabrication)
- Manufacturing quality control & inspections

Site Construction & Design

- Site preparation
- Developing construction plans & specifications
- Water, Hydro, Sewage and Storm

Zoning & Planning

The property falls within Sub-area 4 (Alexander / Powell) of the DEOD planning zone (Downtown Eastside / Oppenheimer). The DEOD is intended to be medium density, mixed industrial-residential. Residential use is permitted with an emphasis on self-contained use.

Zoning & Urban Design Guidelines

A development permit is required for this project. The following design guidelines are applicable;

- Where possible the new container housing complex should attempt to complete, improve and enhance, the heritage setting of individual buildings
- Open spaces should be designed to maximize sunlight and the building should be more engaging and be more contextual giving the building more permanent than temporary character

Engineering Services Requirements

In reference to a recent legal survey there are existing unregistered encroachments on the property. The City Surveyor will need to be informed regarding details of the encroachment.

A title search and charge summary prepared by a lawyer is required to be submitted to the City prior to the development permit application to determine if any charges on site will affect the proposed development.

Garbage and recycling storage facilities will be required on site. Existing and proposed garbage storage pick-up practices must be included in the development permit application.

Parking relaxations are being sought from the City of Vancouver. Given the proposed use of the site zero parking will be requested. A relaxation rationale must be provided.

Bicycle spaces and bicycle room must be provided to meet Parking By-law requirements regarding number, location, access and design.

Site servicing for storm/sanitary and water services will be included in the current renovation of the existing SRO hotel.

Crime Prevention Through Environmental Design (CPTED)

Design development is to take into consideration the principles of CPTED having particular regard to:

- reducing opportunities for mischief and vandalism such as graffiti;
- reducing all wall recessions and keeping niches to a minimum;
- avoiding dark hidden spaces; and
- providing good visibility and transparency in and around the site ("eyes on the street").

Landscaping

A legal survey must be provided showing the following information: Existing trees 20 cm calliper or greater on the development site, and the public realm (property Line to curb), including existing street trees, street utilities such as lamp posts, fire hydrants, pavement treatment, etc. adjacent to the development site.

A landscaping plan is required to a minimum scale of 1/8" = V-0" illustrating the proposed plant materials (common and botanical names), including sizes and quantities, paving, walls, fences, and other landscape elements. All existing street trees and public utilities such as lamp posts, hydro poles, fire hydrants, bike racks, benches and other street furnishings, etc.

Environmental Protection Branch Requirements

A site profile is required for the site. An erosion and sediment control plan is required for Environmental Protection review and approval at a Building Permit Application stage.

Codes Approvals

The site will consist of two existing buildings and the proposed container housing units. All buildings on the property will be governed under Part 9 of the Vancouver Building-By-law (VBBL)

On November 5th a meeting was held between senior representatives from the City's Building and Fire departments. The purpose of the meeting was to introduce and describe the project conceptually, and to then determine if the project was technically feasible from a codes and regulatory perspective.

The meeting established that the project and its technical components did not present any significant or insurmountable regulatory issues. However, due to the innovative aspect of using modified shipping containers and considering localized site specific constraints there will need to be additional design and code solutions developed to meet the intent of a number of identified regulatory code requirements.

Code compliance plans will need to be drafted, and alternative solutions developed to address applicable code items that have been deemed outside typical design and technical parameters. A summary of the additional design and code work is included in Table 1 - Container Development Outline.

Fabrication, Transport & Placement of Units

Shipping, Customs & Placement

Four of the proposed housing units will be partially fabricated in China and then shipped to Vancouver. Project partners, MC Quarters are a company that specialises in the supply of shipping containers. They have also developed and built a prototype housing unit to demonstrate how shipping containers can be adapted to provide cost efficient housing units.

MC Quarters will assist with the transportation of the containers from China and will be responsible for customs and placement on the Jackson Ave site in Vancouver.

Obstructions & Adjacent Building Restrictions.

The project team will coordinate with MC Quarters to determine the most efficient transport and placement methodology with respect to planning for any site restrictions or limitations.

Unit Fabrication & Quality Control

Manufacturing Standards and shop drawings will be required to ensure that the fabricating company in China are following Canadian Standards, regulations, and the Clients design and material preferences.

A process for monitoring manufacturing quality control and regulatory compliance will need to be developed and implemented to ensure that the units meet the Clients requirements.

Site Construction & Professional Design

Although this project is governed under Part 9 of the VBBL the City Building Codes Department has requested, due to the unique nature of the project, that letters of assurances are provided for Architectural & Structural.

A full set of architectural, structural and site servicing plans will be developed in addition to code compliance plans.

Container Housing Development Outline

Table 1 describes project development requirements and assigns individual task responsibilities.

Key: Atira Design / Consultants MC Quarters

Elements	Requirements	Process	Responsibilities
Zoning & Development	Obtain Development Permit	Submit DP Application & supporting documentation	Atira
		Develop DP Plans - (site, elevations, landscaping)	Design Consultants
	Public Notification	Consult with the community	Atira
Engineering Service	Title & Charge Summary	Submit a title search and charge summary prepared by a Lawyer	Atira
	Provide Garbage & Recycling Provisions	Include on site plans and written description of G&R provisions	Design Consultants
	Parking Provisions	Apply for zero parking relaxation and support with written rationale	Atira
	Bicycle Spaces	Review Parking-Bylaw requirements and include details on site plan	Design Consultants
Codes Approvals	Comply with VBBL & Other Applicable Regulations	Develop project documentation / plans and submit Building Permit	Design Consultants
Project Specific Code Issues	Fire Department Response Point	Locate response point on Jackson Ave as agreed with CoV Fire Chief Sziklai	Code Consultant
	Building located with 15m from a Street	Develop an alternative solution	Code Consultant
	Egress & Exiting –Shared Exit	Develop an alternative solution	Code Consultant
	Exit Exposures	Develop an alternative solution	Code Consultant
	Assembly Fire-Resistance Ratings	Refer to Appendix D or develop alternative solutions	Code Consultant
	Provide Accessibility	This is a voluntary upgrade to be discussed with the Client	Code Consultant
	Inspection of Buildings Services	Electrical and plumbing materials installed in China will meet Canadian standards. Once in Canada trades will take out permits for the work. They will test the systems and exposed sections will be left during fabrication to allow inspection by City of Vancouver Staff	Consultants & MC Quarters
	Letter of Assurance	Letters of Assurance will be provided for Architectural & Structural	Consultants
	Rain Screen Requirements	Draft Report detailing rain screen requirements	Envelope Consultant
Sound Ratings	Establish code compliant sound ratings and design criteria for construction assemblies.	Consultant / Sound Engineer	
Fabrication	Standards	Develop building standards and shop drawings	Consultants
	Quality Control / Coordination	Establish controls and review / inspection process	PM / MC Quarters
Transport & Placement	Ensure units can be transported, imported, positioned and lifted into place on site	Coordination with transportation and design / fabrication to confirm on site positioning and placement of off-site built components	MC Quarters