A Proposed Building Design for Independent Senior Co-Housing at Yew Park

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Abstract

Addressing senior housing issues in Kamloops, B.C. is necessary as there are not enough well-designed homes to support the aging population of seniors. This report involves incorporating co-housing design criteria into a proposed building design at Yew Park in North Kamloops aiming to suit the needs of seniors and people with physical disabilities. The Yew Park site and accessibility for all are key to the design of the Yew Park building and drive many aspects of the building design. The proposed conceptual floor plans produced are derived from the design criteria of three similar case studies involving local and global innovations in co-housing. Co-housing innovations are applied to the proposed building in the form of a conceptual building design modeled in Revit architectural design software by Autodesk. The building design complies with local zoning and building bylaws as well as the local official community plan guidelines. Analysis of the building design criteria results in well-designed, affordable senior housing that addresses some of the current and future senior housing issues in Kamloops.

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1. Introduction

1.1. Problem

Incorporating a plan for the elderly population in North Kamloops, B.C. is essential for the growth of the city. Currently, in the city of Kamloops, there are not enough well-designed homes for seniors and many of the single-family dwellings are occupied by people over the age of fifty-five [1]. The current housing crisis is directly related to the limited affordable and accessible housing options in Kamloops; with ten semi-affordable senior housing options [2] for approximately 30,000 local senior persons over age fifty-five.

Necessary building improvements in Kamloops need to offer a range of diverse housing options for all generations [3]. New senior building projects should be proposed inaccessible areas of the city to increase presence on the street and improve the reputation of North Kamloops [4]. Many areas of Kamloops have proven to be poor locations for independent and assisted senior housing as the facilities are too far away from amenities [5]. The three most affordable independent living facilities with poor accessibility to amenities are The Residence at Orchard Walk in East Kamloops, Chartwell Ridgepointe Retirement Residence, and Berwick On The Park in South Kamloops [2]. These areas chosen for senior residences are either too mountainous to safely travel to and from transit stations or are located too far away from amenities. Due to physical limitations, decreased reaction times, and the extra expense of operating vehicles; most seniors do not drive personal vehicles and tend to rely mainly on city transport systems [5].

1.2. Solution

Conversely, located along the north side of the Thompson River is the relatively flat North Kamloops which makes for easier walking or rolling for those with limited mobility. The green space at Yew Park in North Kamloops is a unique opportunity to present a building design influenced by co-housing to accommodate seniors in Kamloops affordably. Yew Park is notorious for vandalism and dumping from the homeless population and with the new proposed building for the park the neighborhood's reputation could initially be improved and rejuvenated. North Kamloops currently consists of mostly single and multi-family residential. This site is located a block away from the Tranquille Market Corridor which is prosperous with small businesses and shops [3]. The Yew Park is only 0.5 km from Mc-Donald Park which is at the heart of the North Shore zone, so modifying its use will not take away from the availability of the neighborhood's green spaces. The proximity to the Mc-Donald Park area also offers amenities such as a large open green space, a covered gazebo, a cricket ball court, a fully accessible paved walking path, a gated community garden, as well as a dog park as seen in figure 1.

Figure 1: Arial View of North Kamloops Zoning over Yew Park

Source: [6]

Figure 2 below is the illustration of a pre-conceptual site analysis of the land uses surrounding the proposed Yew Park site. Currently, the city of Kamloops considers Yew Park's land use as parks and green space but is zoned as an RT1C which suggests the city would like a building to be built on the proposed Yew Park site [6]. Figures 1 and 2 also illustrate that to the west of the Yew Park site consists mostly of low-density residential. Close by on the east side of the Yew Park site there is an effervescent Tranquille Market Corridor full of many local and affordable amenities. Across from the proposed Yew Park site is the completed two-phase building project of Colours On Spirit Square that consists of over 200 affordable and social housing options [7]. Though the two phases of construction at Colours On Spirit Square were intended to offer high-density affordable housing options: the two phases of construction only offer fifteen accessible suits in the most accessible area of Kamloops.

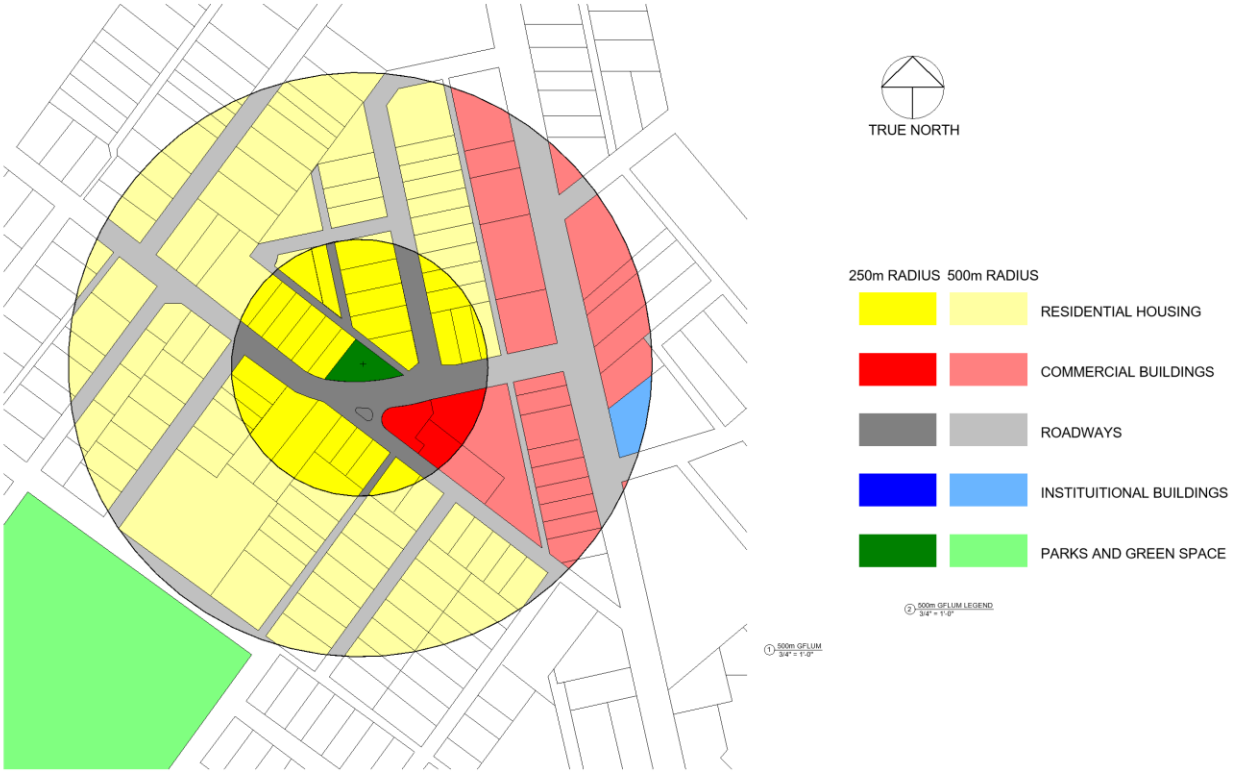


Figure 2: Focused 500m GFLUM of Proposed Yew Park Site

Source: Author Generated

2. Context

2.1. Senior Living

Options for independent senior housing are limited due to affordability and accessibility within the city of Kamloops. The city of Kamloops has a growing population of roughly 120,000 people and according to the Government of Canada, about 23% of the total population of Kamloops consists of an increasing senior population [9]. Within the city, there are 50.8% of approximately 30,000 local seniors reside in private dwellings single-family dwellings [1]. North Kamloops consists of many senior residents choosing to reside in their more affordable single-family dwellings which is unfortunate as the intent of the North Shore Neighbourhood Plan [3].

New developments in Kamloops must offer a range of diverse housing options for all generations [3]. Senior facilities need to be proposed inaccessible areas of the city to increase presence on the street and improve the reputation of North Kamloops [4]. Along with Kamloops being situated in a valley, few regions within Kamloops support senior housing as most regions are mountainous. When seniors feel anxious about travel it becomes harder to go out for walks and enjoy the community and often the thought of sustaining injuries affects seniors as it can take much longer to heal with age [9].

Unfortunately, as seniors grow older the requirements for health and social needs may change [8]. Through the changes and stages of senior living, there are different housing options available to best suit a senior's current housing needs. Listed below in Table 1 are some of the most common

levels of senior housing, each with varying capabilities of housing specific age groups depending on community location and building accessibility.

	The Senior Living Spectrum	
Least Care & Supervision	More Care and Supervision	Most Care & Supervision
Retirement Communities	Senior Co-operatives	Respite Care
Senior Apartments	Active Senior Housing	Personal Home Care
Adult Day Care	Congregational Housing	Assisted Living
In-Home Senior Care	Independent Living	Nursing Homes

Table 1: Senior Living Spectrum

Source: https://www.seniorliving.org/care/cost/

Consequently, with more provided supervision and care within senior housing options, the cost of housing goes up tremendously. The most expensive listed housing options above in table 1 are retirement communities, respite care centers, and, nursing homes [8] which are intended for elder seniors. These amenity-driven communities for seniors have proven to provide generous quality of life at a high cost resulting in less affordable housing options [2].

Although senior living can be costly, there are other ways to ensure that seniors have proper care by providing in-home caregivers [9]. The care-aid options allow for daily or weekly check-ins by nursing staff that assists with cooking, cleaning, bathing, and dressing. These services can cost as little as fifteen dollars an hour and will allow peace of mind to involved family members.

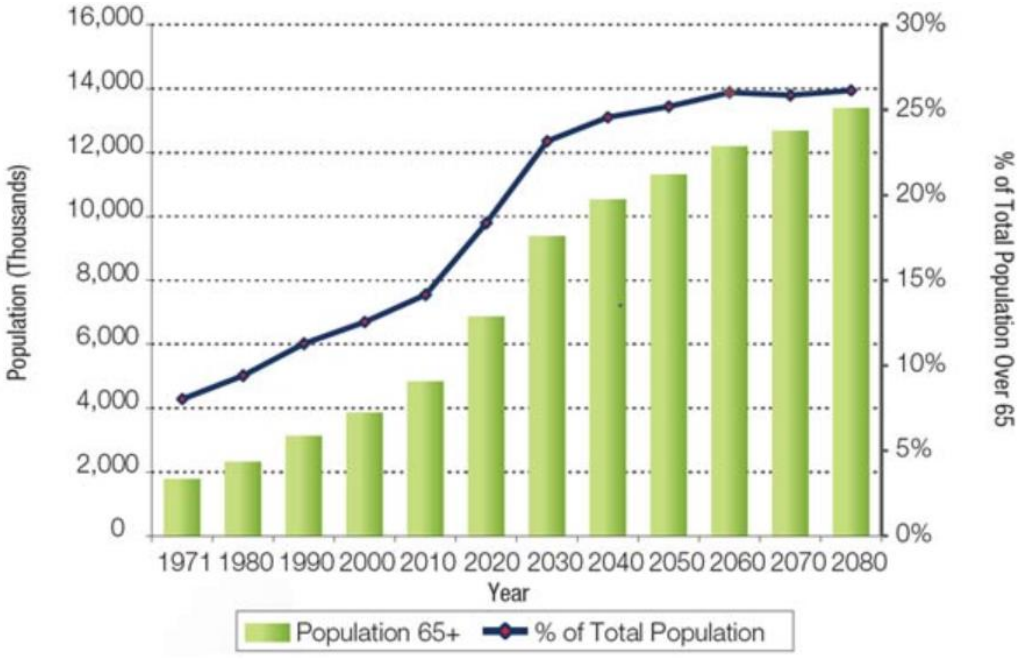


Figure 3: Graph Depicting Growth of Senior Populations Over the Decades

Source: [2]

Incorporating plans for seniors' housing into established communities is crucial as current senior generations are living longer and healthier lives than previous generations have [9]. The graph in figure 3 depicts that every decade senior populations' average life span is increasing by approximately two years more than in the previous decades. As a result of aging, mobility significantly decreases with increased age even though elder generations are living longer as shown above in figure 3. Also depicted in figure 3 is an increasing percentage senior population within the general population. Currently, the increase of 15% senior population from 1980 has raised to 25% with no potential of getting any lower.

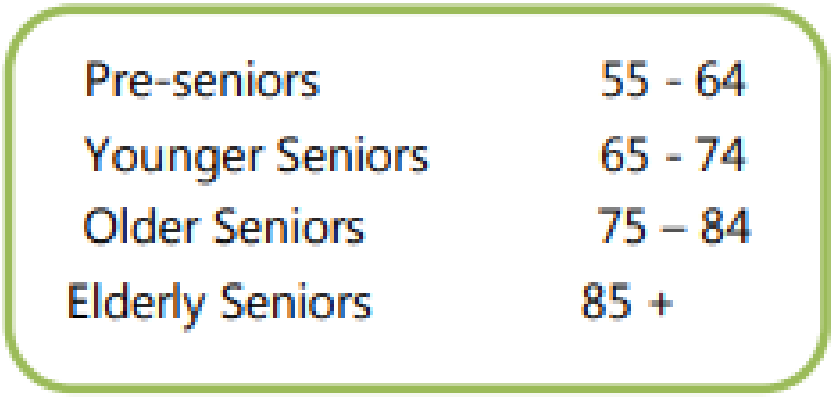


Figure 4: Aging Seniors Chart

Source: [2]

Currently in Canada 90% of seniors over the age of 65 struggle with chronic diseases or conditions affecting their quality of life [9]. As seniors age, decreasing mobility will significantly influence lifestyle and quality of life. Seniors of any age are most likely to have an accident or fall in the washroom of a residence [2]. Elderly seniors over the age of 85 experience drastic changes in mobility and health causing the need for more care and different levels of care facilities [6].

2.2. Building Accessibility

2.2.1. Storey Accessibility

The design of accessible buildings is significantly limited by the Accessibility Handbook [10] with specific building design specifications that can only be modified slightly to create more accessible and functional spaces. Below in figure 5 depicted are models of a first-floor accessible building and suite [10]. Although not all building areas require all floors and spaces to be accessible to everyone, it is more sought after, especially for seniors.

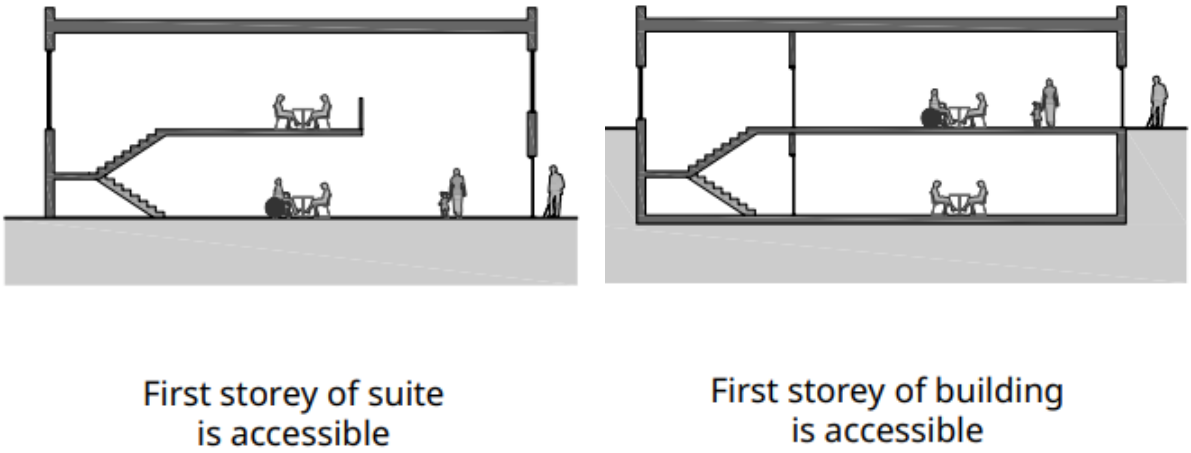


Figure 5: First Storey Accessibility in Section View

Source: [10]

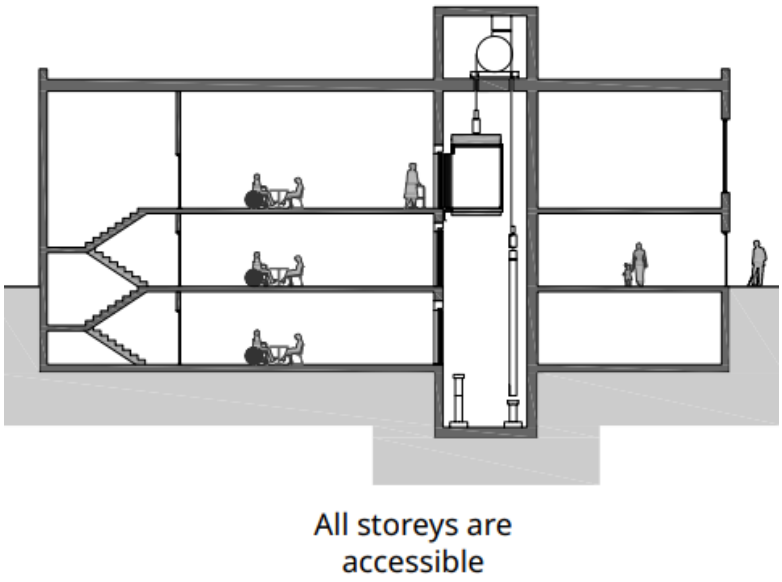
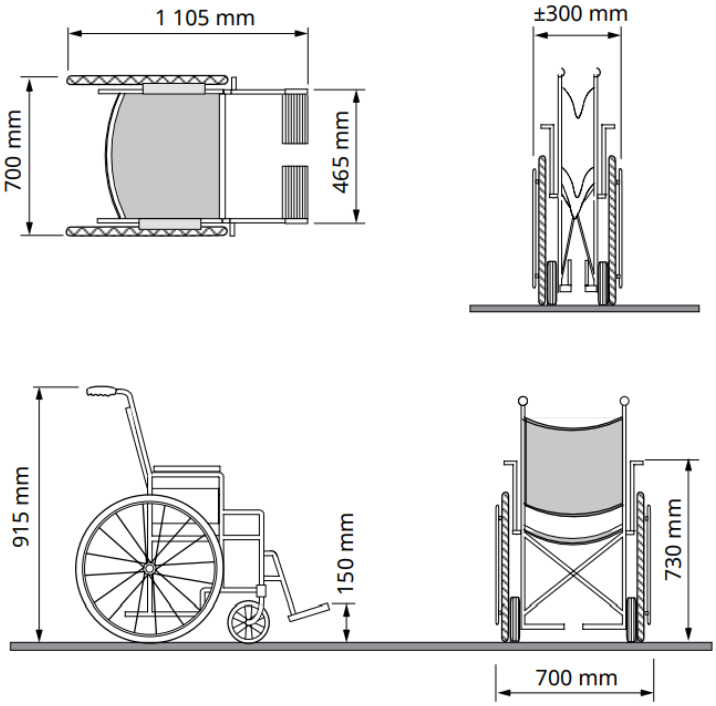


Figure 6: Fully Accessible Building Section View

Source: [10]

In figure 6 above a section view of a fully accessible building is illustrated which everyone on all floors can utilize with the addition of an elevator to a building design [10]. Elevators or lifts allow inaccessible designs to become accessible without designing complicated ramp systems that waste usable floor space. All spaces on all floors can be accessed safely with the central and functional placement of an elevator system.

2.2.2. Building Design Accessibility



In figure 7 wheelchair dimensions are shown to begin illustrating limitations of accessibility to create guidelines for accessible building design derived from mobility aids and user function. According to the Building Accessibility Handbook [10], the reach of a person in a wheelchair is decreased up to 75% vertically and horizontally. Below, figure 8 illustrates accessibility on floor plans by adding 1500mm diameter turning areas. Allowing for the 1500mm accessibility design circles to either side of a doorway and spaces of frequent use allows comfortable travel for those with limited mobility [10].

Figure 7: Wheelchair Dimensions for Accessible Design

Source: [10]

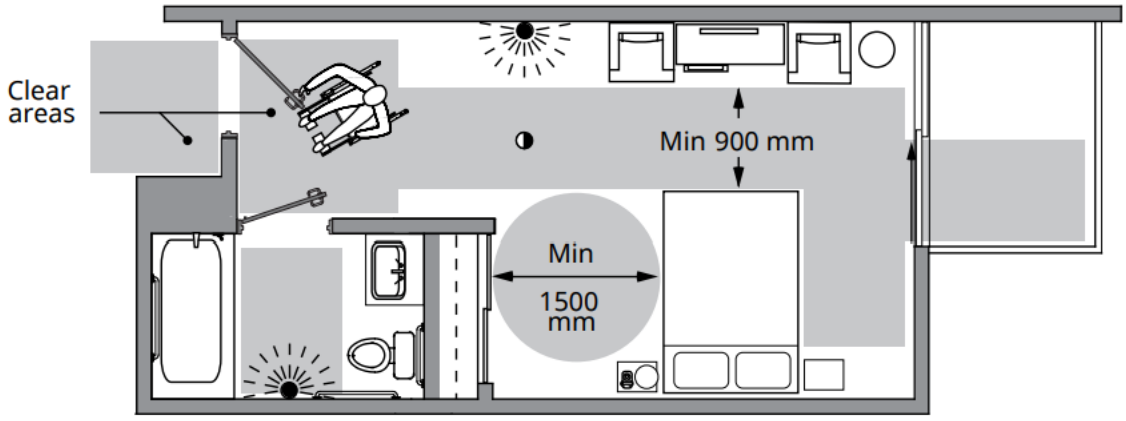


Figure 8:Accessible Suit Clearance in Plan View

Source: [10]

In figure 8, the small accessible suite illustrates the minimum required accessibility within a dwelling accommodating unobstructed 900 mm paths of travel and 1500 mm accessibility circles in highly used areas and at least one side of the bed [8]. By allowing for 900 mm of travel space it is less likely that one in a wheelchair would injure their hands or be obstructed from traveling through their dwelling improving the quality of life for seniors [9] [10]. At least one closet is required with an opening no less than 900 mm and a shelf lower than 1200 mm for accessible reach.

Figure 9 below is the illustration of an effectively accessible balcony although these are not required by the BCBC [11] for balcony conditions in suites. Although the guideline from figure 9 comes recommended from the Building Accessibility Handbook [10] for accessible suites but does not guarantee the safety of a user as there is greatly decreased mobility. Figure 9 shows the minimum recommended size for an accessible balcony for those with limited mobility, though the accessible balcony is only intended for temporary refuge in event of fire [10]. Size increases for seating are based on estimates complying with rules of accessibility illustrated in figure 8 and figure 9.

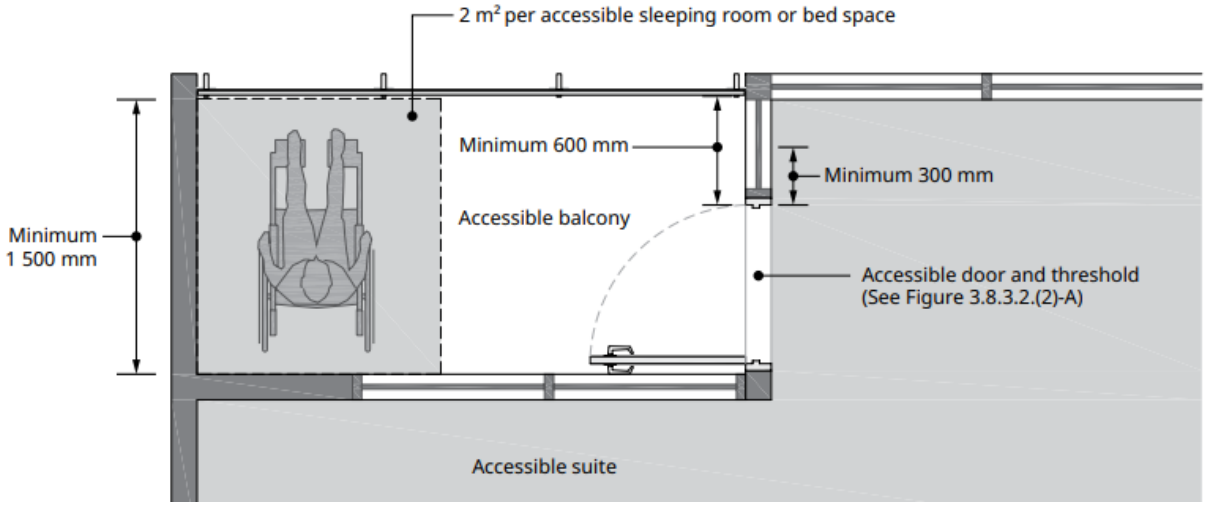
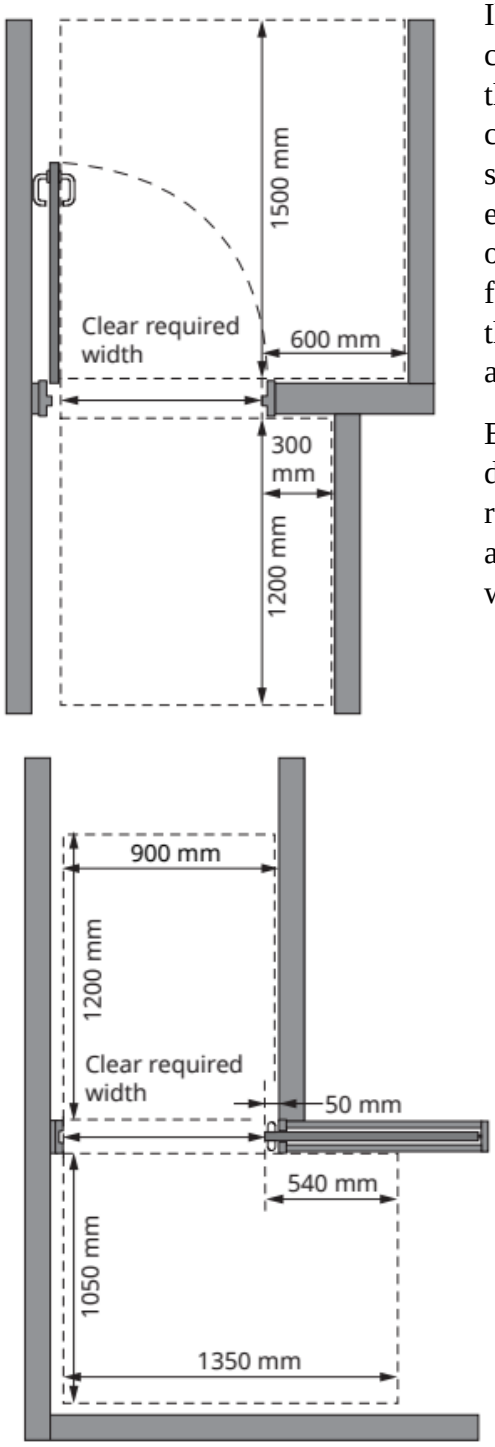


Figure 9: Accessible Balcony Detail

Source: [10]

Figure 10: Accessible Door Clearance in Plan View

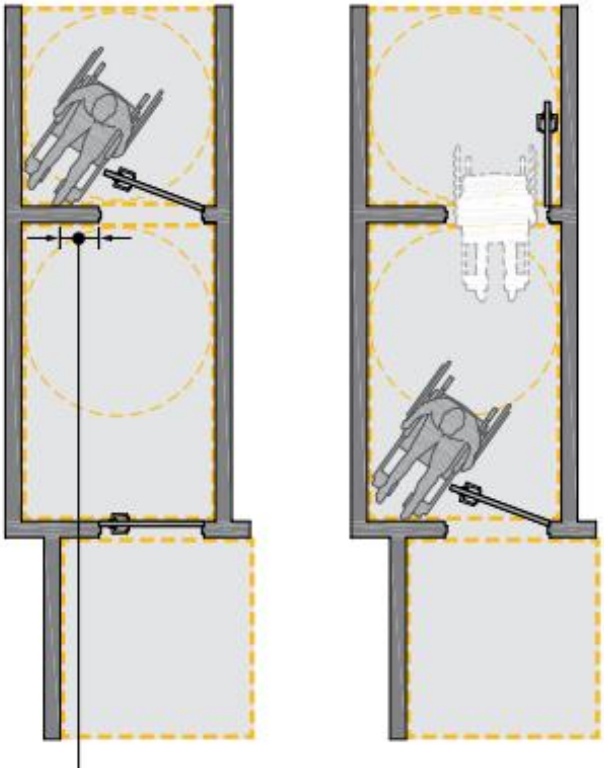


Source: [10]

Illustrated in figure 10 is the general building door clearance is depicted to ensure sufficient clearance for those with limited mobility for handicapped people to comfortably access a building [10]. The requirement of sufficient clearance is met when latches are provided on either side of the doors for a user to operate the door-opening mechanism and open the door without interference from a wheelchair. Particularly, it is important to consider these diagrams for the accessibility of the approach side of a door swing [10].

Below, figure 11 also illustrates a door swing in use in the direction of a person using a wheelchair. There is also a requirement for clear and level space on the latch side of any door to allow for the maneuvering of wheelchairs while operating the opening door [10].

Figure 11: Door Swing in the Direction of Travel



Source: [10]

2.2.3. Bathroom Design Accessibility

Accessible washrooms have unobstructed areas in front of the lavatory, water closet, and at least one side of the water closet [10]. The application of unobstructed areas creates the necessary maneuverability and function for a person in a wheelchair in an accessible washroom. In the design process, fixture choice and implementation are crucial to the design of accessible washrooms. The Building Accessibility Handbook's [10] intention is to increase the probability that people using wheelchairs will be able to use and access all fixtures within a designed accessible washroom.

The intent of the accessible features is so that persons with limited mobility will be able to use the water closet without the assistance of someone else. The tankless wall or floor-mounted water closets with recessed bases are recommended by The Accessibility Handbook [10] as they create the least amount of obstruction on the floor plan with the best accessibility. The bathrooms shown in figure 12 are not to be used by persons in a wheelchair unless assisted by someone as it is deemed unsafe otherwise by The Accessibility Handbook [10].

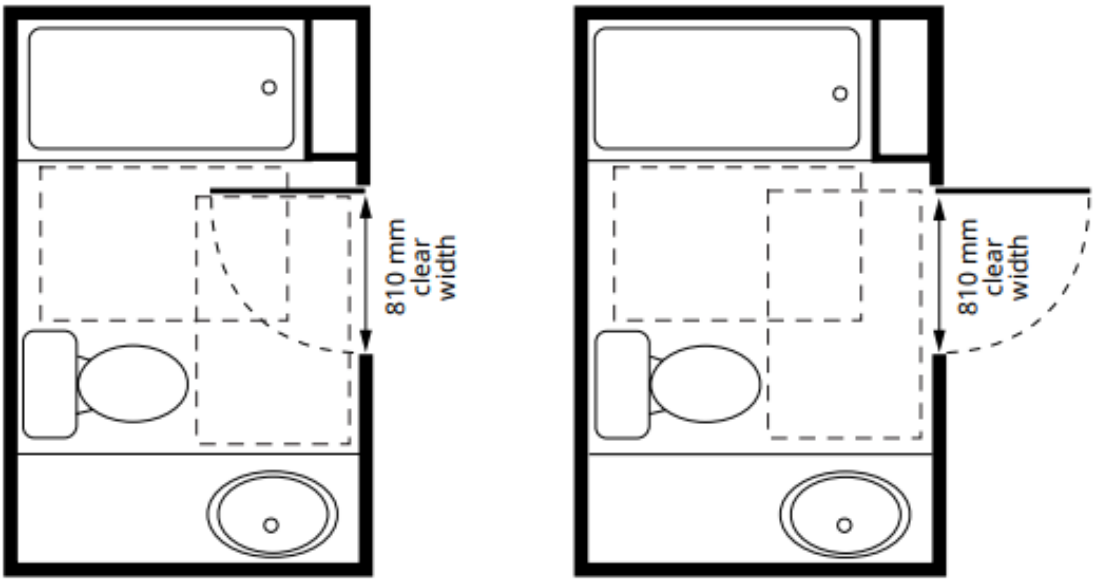


Figure 12: Typical Residential Occupancy Washrooms in Plan View

Source: [10]

Conversely, figure 13 and figure 14 below illustrate how simple it can be to create an accessible washroom with an area not much larger than a conventional washroom [10]. All the layouts in figure 13 and figure 14 can only be minimally altered to still be considered accessible washrooms for emergency access. In figure 14 the Building Accessibility Handbook [10] recommends the first and third washroom layout designs to allow unobstructed access to injured seniors in event of a slip or fall.

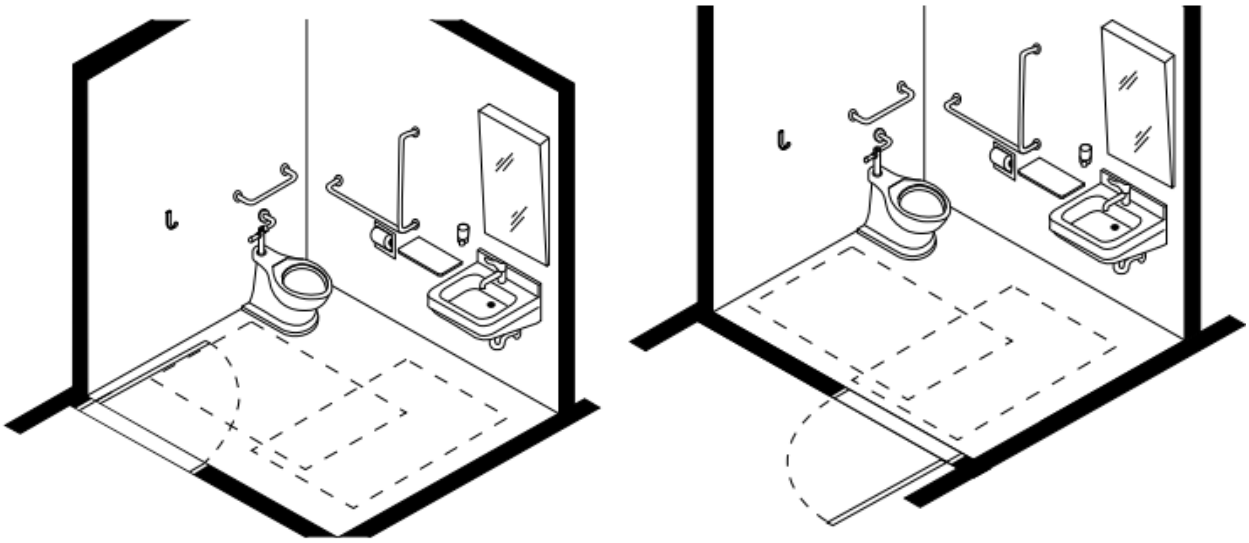


Figure 13: Accessible Washrooms in Perspective View

Source: [10]

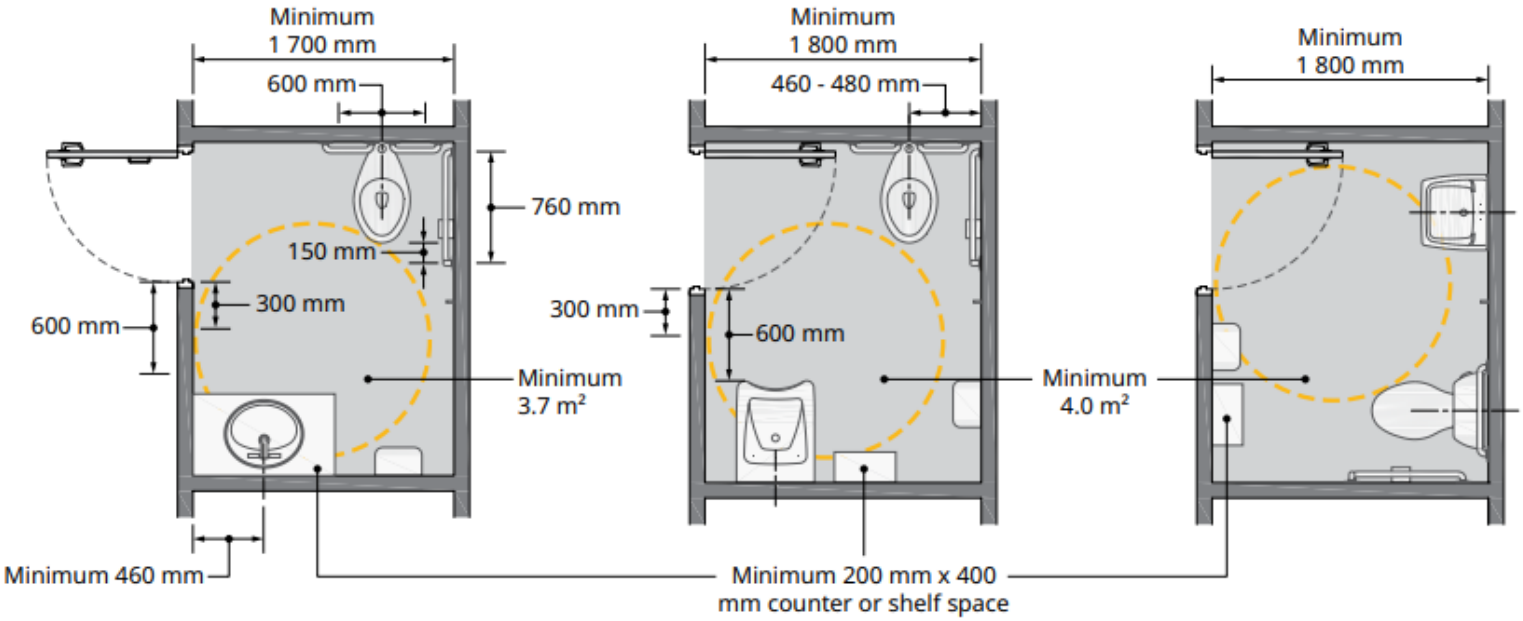


Figure 14: Accessible Washrooms in Plan View

Source: [10]

2.3. Co-Housing Design

Co-Housing Design Principles

All models of co-housing communities globally are built around a common belief system that affordable and functional housing can be created through [12]:

- Community collaboration, planning, and maintenance
- Sustainable design-driven of communities
- Shared common spaces with private accommodations for sleeping
- Designed spaces that support socialization and growth of the community
- Multigenerational design-driven to support diversity

These five co-housing fundamentals above have guided communal housing to diversify communities globally and can be modified to best suit the needs of any specific community [9][10]. Co-housing provides ample personal privacy combined with the benefits of communal living, creating interactions with familiar people that become everyday interactive neighbors. The levels of social interactions vary based on their resources and ideologies.

Traditional elder models of co-housing include individual housing for families built around a common house with the required amenities to live [13]. Some of these amenities in a common house may include a communal kitchen, workshop, home office space with laundry, guest, dining, and living rooms. Common houses were not always intended for use but often groups within the ten to thirty families in a co-housing community are formed to make cooking teams, so meals are enjoyed rather than labored over [12]. These concepts of co-housing were founded in the 1960s to be more affordable and to create more sustainable communities in Denmark. Co-housing beliefs came to North America in 1988 [13].

Generally, in North America, present-day models of co-housing communities are limited only to the imagination of the group creating the community [12]. Through collaboration and planning, 160 co-housing communities have been created in North America. There are also 100 new co-housing communities of various sizes currently under construction as they are a more affordable and sustainable model of housing [12]. In response to current issues with social, economic, and environmental issues, co-housing can be modified to accommodate more density within cities with increased attention to relationships and community involvement.

Current co-housing focuses greatly on multigenerational accommodations so housing can support anyone’s age and mobility [12]. This multigenerational push is greatly due to many seniors struggling with maintaining healthy contact with friends and family, resulting in less contact with loved ones. Co-housing has made right with these societal issues and addresses them by offering a variety of housing capable of housing up to four different generations under one roof.

2.4. Co-Housing Case Studies

Three specific buildings with affordable innovations in co-housing will inform the proposed building design at Yew Park. Innovations in co-housing from the Netherlands and Kamloops will help derive building criteria outlining improvements and issues with existing co-housing floor plans in terms of accessibility and affordability.

2.4.1. Ginko Co-Housing Project Case Study

The Ginko Project of Beekbergen, in the Netherlands, was constructed in 2012 and uses art, technology, and architectural design techniques to integrate a housing unit system into an existing green space [15]. The group of Architects at Casa Nova and Hernandez Architecture applies mixed uses influenced by Jane Jacobs's principles of diversity [4] and similar to the concepts of the North Shore Neighbourhood Plan [3]. Age diversity criteria are designed into the second floor of the building to accommodate multi-generations of families affordably. The building was built because most other small buildings in the area were not affordable and did not accommodate seniors in their designed spaces. The building is composed of two specific affordable uses, which are family and senior living.

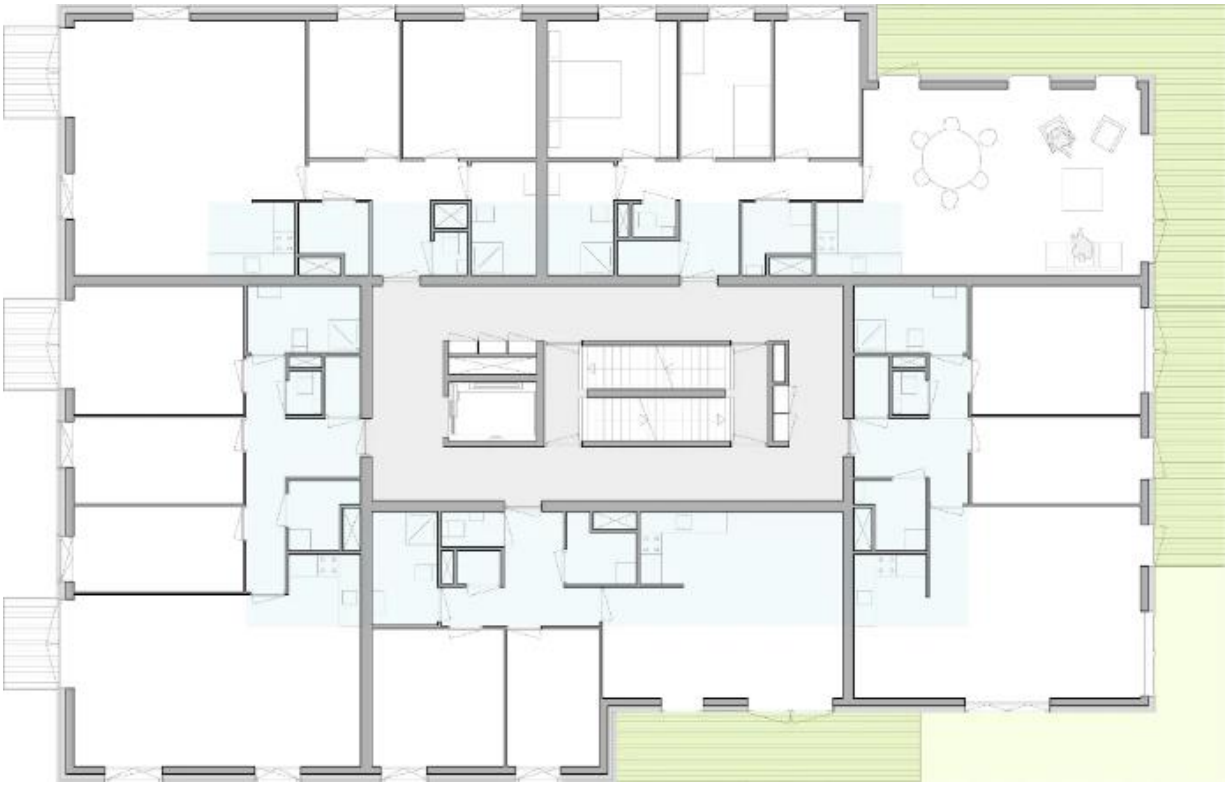


Figure 15: Innovational Floor Plans Involving Co-Housing

Source: [15]

Shown above in figure 15 is the innovative large-scale affordable twenty-nine units in the Ginko Project are created by blocking three or four rooms together to create co-housing situations within the building design which help residents create interpersonal relationships within dwellings [15]. This allows people to enjoy functional private spaces and share communal spaces and tasks

for a more sustainable community [9]. Suite sizes were not found but from the floor plan in figure 20, it can be estimated that suites vary from 83 sqm to 111 sqm for three or four co-housing members.

Behind the innovative façades and low heat loss walls as shown in figure 16 below are also many green and natural material selections. The Ginko Project utilizes materials that require low maintenance as well as recycled assemblies in window selection to reduce their carbon footprint [16]. This project also used locally prefabricated with innovative heat loss assemblies to increase the buildings operating efficiency.

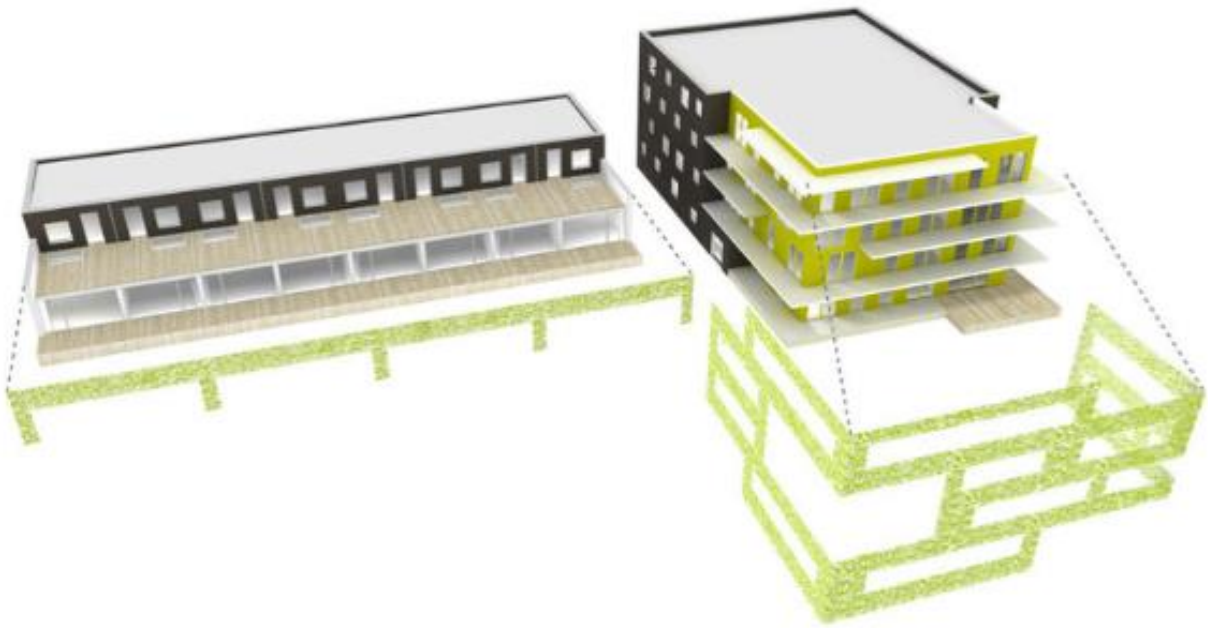


Figure 16:Innovation in Facade Design

Source: [15]

Ginko Co-Housing Case Study Design Criteria	
Desirable Design Criteria	Less Desirable Design Criteria

Good mix of two and three-bedroom dwellings sharing large open spaces.	Small showers are not large enough for wheelchair access.
Large laundry room within the common dwelling with storage area.	The number of washrooms and fixtures are not enough the designed number of beds
Stairs are blocked together at the core of the building near the elevator.	Dysfunctional washroom spaces due to the inaccessible placement of fixtures
The co-housing situation with high independence.	The personal storage area within the private living space is too small.

Figure 17: Ginko Co-Housing Case Study Design Criteria

Source: Author Generated

The criteria outlined in figure 17 are derived from accessible and co-housing principles and criteria aspiring to be applied to improve any proposed co-housing opportunity.

2.4.2. De Zeester Co-Housing Case Study

Figure 18: Innovational Brick and Circular Window Façade

Source: [17]

The architects at Marlines Rohmer Bureau have designed a unique senior co-housing residence that attempts to house those with mental illnesses or other handicaps all in one facility. This facility in Noordwijk, Netherlands, initially aimed to house any seniors whether affected by dementia, Alzheimer's, blindness, deafness, and most all illnesses and give them opportunities to gain confidence in different social situations. This shifted the care of seniors away from segregated units into a complex social network with interpersonal relationships; allowing for a non-institutional feel for buildings based around human care [17]. Integration within affordable housing is used to place seniors with other seniors in housing units of four or five people to create more shared and common spaces to encourage social relationships on a small scale. Well integrated into the community and well designed for accessibility to those visually and audibly disabled.

Da Zeester Case Study Design Criteria

Desirable Design Criteria	Less Desirable Design Details
Small scale interactions are created with a maximum of four seating at a table.	Limited accessibility due to one central stairwell without an elevator
Large laundry room within the common dwelling with storage area	Up to 8 beds per room are not safe
Accessible bathroom options on the first floor	Living rooms are not large enough to support the occupants
Inter-dependent living with a focus on storage throughout rooms and with large vertical lockers.	

Figure 19: Da Zeester Case Study Design Criteria

Source: Author Generated

The criteria outlined in figure 19 are derived from accessible and co-housing principles and criteria aspiring to be applied to improve any proposed co-housing opportunity. The floor plans below in figure 20 were used to generate the criteria in figure 19.

Figure 20: Innovative Co-Housing Floor Plans

Source: [17]

2.4.3. RareBirds Housing Co-operative Case Study

RareBirds Housing Co-operative [18] is an inclusive co-housing community in Kamloops, B.C. This case study is a 6000sq.ft, a sustainable co-housing residence constructed in February 2014 with four floors accessed by a stairwell. This community home was designed to lessen the environmental footprint by sharing living spaces, resources, and living costs. This new model for inter-dependent living balances functional sleeping spaces with large, shared living spaces. This project is unique in terms of design features as it allows the floor plans to have functional private and communal spaces.

Figure 21: Exterior of RareBirds Housing Co-Operative

Source: [18]

RareBirds Housing is designed around a sustainable community value but outlined in figure 22 are other design criteria observed from research, site visit, and floor plans that are considered desirable or less desirable in terms of accessible and affordable design criteria.

RareBirds Case Study Design Criteria	
Desirable Design Criteria	Less Desirable Design Criteria
Inter-dependent living with functional private living spaces.	Located in an area with poor transportation and accessibility due to the steep mountainside of Kamloops.
Co-housing is based around a large, shared kitchen, dining, and, living room.	Accessible on only one floor due to three of four floors due to stair mobility limitations.
Large storage areas in each unit.	Units are allotted private washrooms.
Guest rooms with guest amenities like private bathrooms.	One kitchen for ten community members is insufficient.
Gated communal Garden for residents.	

Figure 22: RareBirds Case Study Design Criteria

Source: Author Generated

3. Methodology

Using applied research on innovations in architecture, this project will define many aspects of the building design process aiming to outline and improve accessibility, affordability, and efficiency options that currently are insufficient or unavailable in the Kamloops area. Accessible elements will be informed by research from existing seniors housing and buildings with architectural innovations in co-housing. The process of the building design will include different presentation style schematic drawings in plan view. The schematic plans will aid in the visual representation of the building, including the washroom spaces. The project will also outline accessible features and design decisions for the site and building.

4. Site Design

4.1.1. Site Conditions

The initial building design must be based on defined site criteria. Many aspects of the site design will help guide the building design process with aspects such as landscaping, parking, and site access. The building zoning can generate definitions for site size and outline unique opportunities.

Below in figure 23 are proposed site conditions for the Yew Park building design [6]:

Neighborhood	-	North Kamloops
KAMPLAN Designation	-	Mc Donald Park
Current Zoning/ Use	-	RT1C (two-family residential)
Proposed Variance	-	CNS (North Shore Commercial)
Surrounding Uses	-	Commercial Retail (restaurants, printing service, medical center, and legal office)
Development Site Area	-	750.44 sqm
Proposed Building Area	-	280 sqm
Maximum Building Height	-	6 Storeys
Front Yard Setback	-	4.5 m
Side Yard Setback	-	1.5m
Rear Lane Setback	-	1.5 m
Parking Setback	-	1.0 m
Proposed Parking Requirement	-	0.5 parking per dwelling

Figure 23: Proposed Building Zoning and Setbacks

Source: Author Generated

4.1.2. Parking

The Parking for the proposed building will be located off on the north side lane of the Yew Park building. Parking must be 1.0 meters from the property line at the rear setback because the Kamloops Official Community Plan [3] states that the parking must not be located on the building frontage or side. The rear setback is 1.5 meters from the property line because doors are opening directly onto the rear lane. From the Kamloops Zoning Bylaw [12] the building's bike storage can reduce required parking spaces twelve bike storage are planned for eight residential units. The Yew Park site is small and only requires 0.5 parking spaces per unit of housing [8], but the proposed site plan offers 9 parking stalls as seen in figure 24 below.

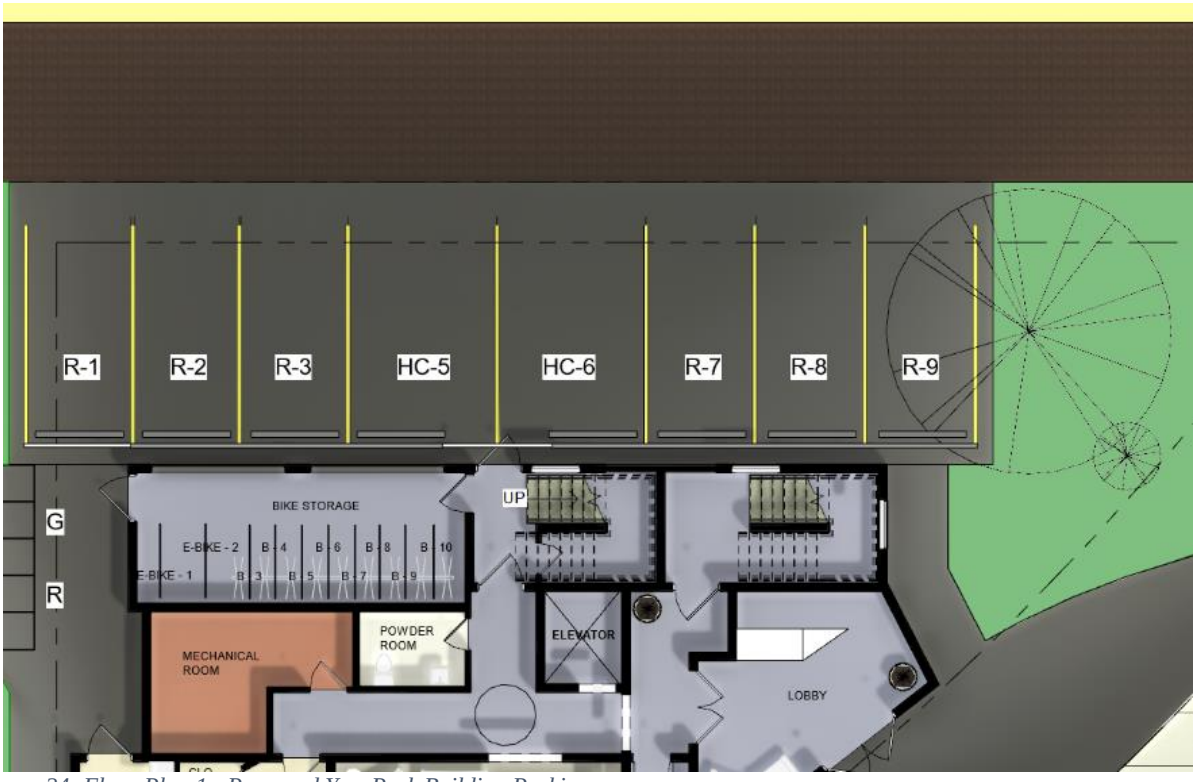


Figure 24: Floor Plan 1 - Proposed Yew Park Building Parking

Source: Author Generated

4.1.3. Landscaping

The proposed building design, included in the appendices, incorporates a detailed landscape concept plan that thoughtfully positions the building parking into the site with room for each dwelling to have at least one personal or visitor vehicle at any given time. The plan includes one large existing tree that factored into general building placement and parking placement. The large tree also provides a partial privacy screen for the proposed parking arrangement. The other five trees on the site must be removed for building footprint and site access. The proposed site plan is shown in the appendices also includes diverse selections of new coniferous and deciduous trees along the outside of the property and alongside the parking. All plants, other shrubs, and perennials will be completed with bark mulch and landscape edging to add texture to the site.

5. Building Design

5.1.1. Building Footprint

Figure 25 below summarises what can be thought of as the available building area based on surrounding setbacks. The Yew Park setbacks can be generated from the City of Kamloops Zoning Bylaw [18]. The large existing tree on the Yew Park Site will also significantly decrease the proposed buildable area on the site as generally a tree's roots can be damaged if there is excavation within their root line.

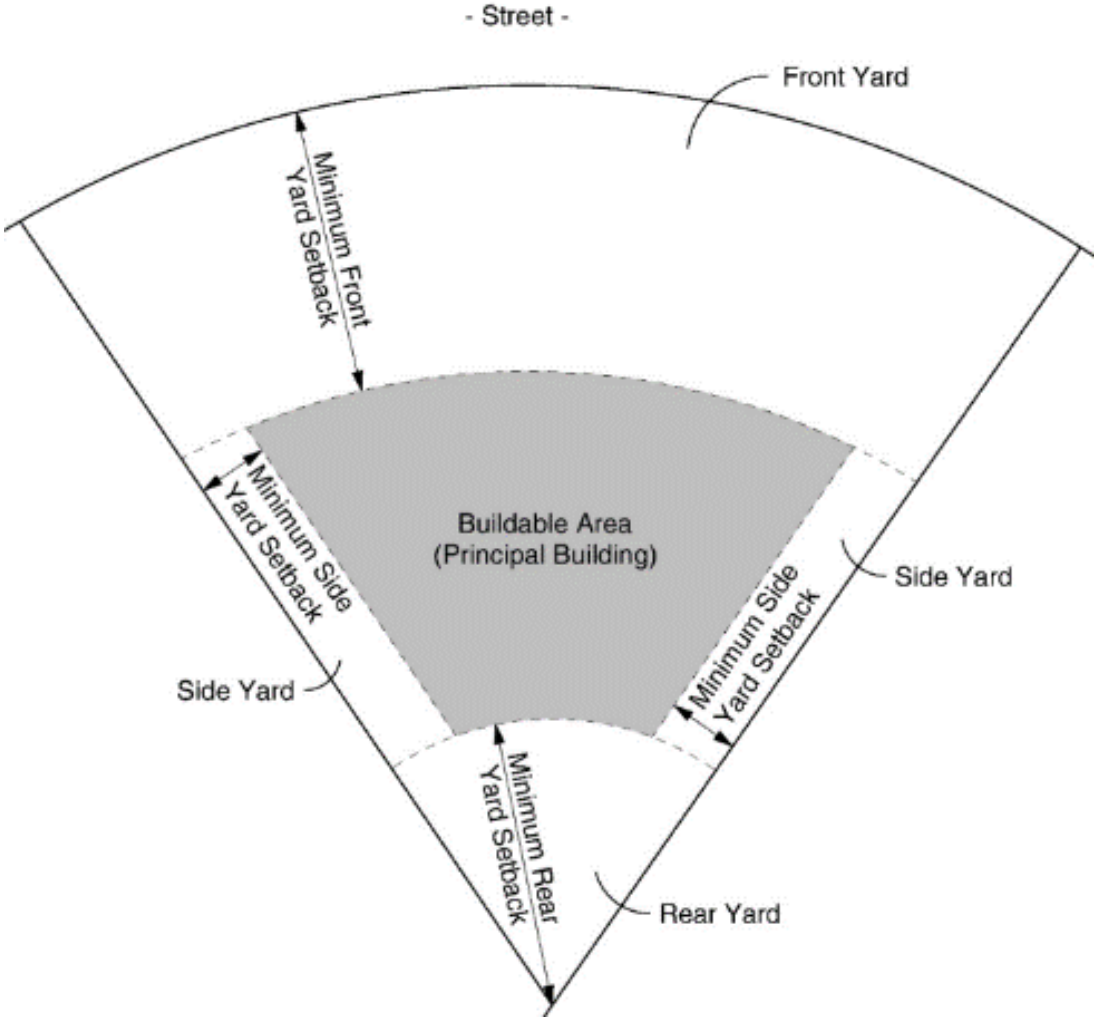


Figure 25: Yew Park Buildable Area Reference

Source: [7]

5.1.2. Building Massing

To reach the desired building density within four stories the aim of the proposed Yew Park building project is to meet the minimum goals laid out for density [14]. The Zoning Bylaw development regulations require the building to include multi-family residential dwellings on the second floor to allow for any more than three stories.

5.1.3. Applied Accessible Design Features

In the proposed building design, there will be an elevator located in the lobby to access all floors [10]. The case studies of the Netherlands and the RareBirds Housing Co-operative are applications of great co-housing designs; however, the Da Zeester building and the RareBirds have significant inaccessibility issues caused by stair only accessible plans. The proposed building design will be made accessible in a similar manner as the Ginko Project case study with a centralized lobby, stair, and elevator circulation systems to access the plate of the building efficiently.

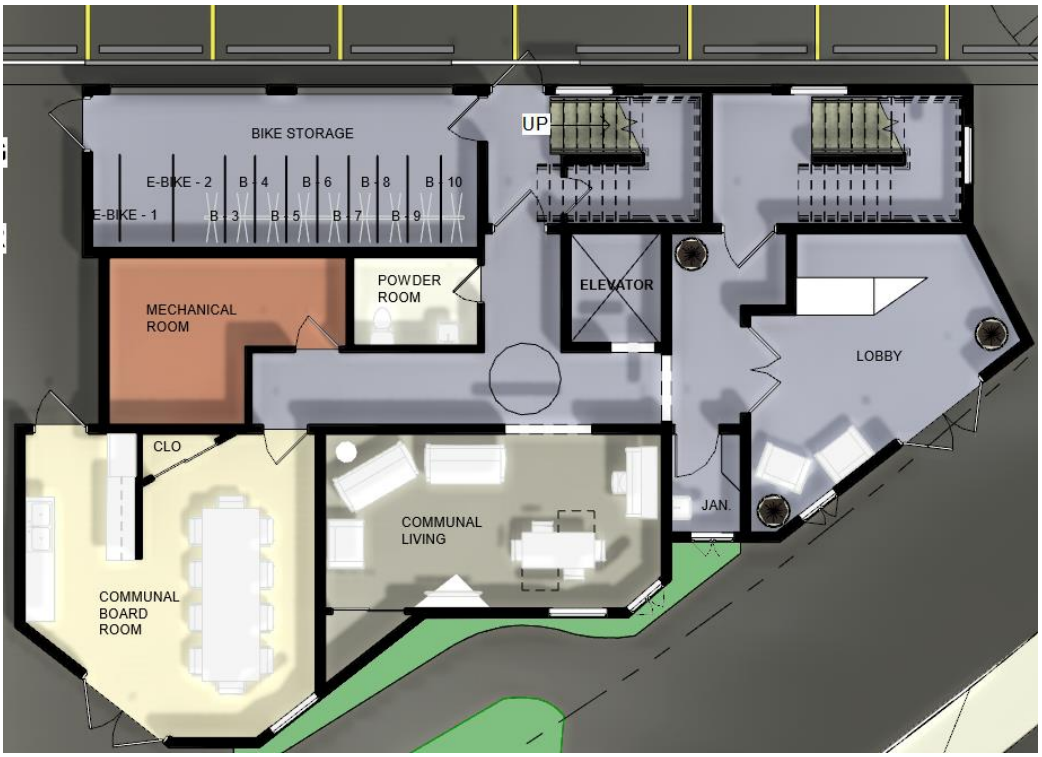


Figure 26: Proposed Yew Park Floor Plan 1

Source: Author Generated

From figure 26 above, the proposed Yew Park building design considers wheelchair accessibility which can be defined by circles of 1500 mm or 5'– 0" in diameter for access through circulation spaces such as the lobby, communal spaces, and hallways. The prominent proposed Yew Park entrance and large doors allow for easy building accessibility.

Figure 27: Proposed Yew Park Floor Plan 3

Source: Author Generated

The above in figure 27 shows the proposed third-floor plan which is almost identical to the proposed fourth-floor plan and both floor plans are intended for accessible senior co-housing. Within most private dwellings shown in figure 27 with light brown, there are two sides of the bed with 1500 mm clearance. This clearance allows people with limited mobility the best opportunity to use the bed safely. There has also been 1500 mm clearance provided in front closets and areas of high usage for an increased quality of life for seniors.

Following guidelines established in figure 9 with accessible balconies each of the proposed private dwellings has a patio which is a minimum of 1500 mm long by 900 mm wide intended for temporary fire refuge. Each balcony is also equipped with secondary fall protection with ½" thick, porous stainless-steel sheets similar to the Ginko case study [16]. The open end of the balconies has small evergreen trees to help offset the proposed tree removal.

Figure 28: Proposed Yew Park Accessible Washrooms

Source: Author Generated

Figure 28 above is the depiction of the proposed Yew Park washrooms on the third and fourth floors. These washrooms are derived from the accessibility handbook and similar case studies. The shower room is not included in the Accessibility Handbook although figure 8 and figure 13 greatly influenced the design of this washroom. The shower room allows someone with limited mobility to access the shower with ease with or without a caregiver present.

The bathroom located in the washroom unit correlates with the Accessibility Handbook [10] in that there is a 900 mm minimum clearance parallel to the bathtub. The Accessibility Handbook [10] also specifies that unassisted user operation of this type of bathtub should be avoided unless special entry tubs are present [10]. The accessible powder room was generated from figure 14 which depicts the minimum square footage and arrangement to allow for unassisted use of the washroom.

5.1.4. Applied Affordable Design Innovations

The building design incorporates a communal board-room that can be rented out for community meetings, parties, and meals which can be seen in figure 26. The intended users of the board-room will be from the Yew Park building or any community group looking to hold an event on the accessible first floor of the building. See Appendix A for a large floor plan view.

The proposed building is designed with a large communal living room on the ground floor. The ground floor plan can be found in the appendix and the shared communal living space is intended to be used by the senior occupants of the third and fourth floors. The large living room is similar

to the designs of the Ginko [16] and RareBirds [18] case studies and resembles research from co-housing design as there are functional private spaces based around a large, shared living rooms spaces.

Additionally, each floor plan of residential and senior housing has a large, shared dining room and kitchen. The second-floor plan consists of two multi-family units with innovations in co-housing applied by creating a large, shared kitchen with a dining room. The third and fourth-floor plan design consists of three accessible senior co-housing units. The senior housing units are similar to the second-floor plan of the multi-family designs of this proposed building and the second floor of the Ginko Project being that the units share a large kitchen and dining room.

In most units of the proposed building design, there are functional private balconies as well as a large, shared balcony on the fourth floor. These balcony designs are in line with the principles of the city of Kamloops as multi-unit buildings are encouraged to have outdoor amenity spaces for the residents. The Ginko Project [3] case study floor plans also included small, shared balconies for each co-housing section to allow for personal ventilation.

6. Conclusion

There are limited semi-affordable senior housing options in Kamloops, B.C due to a current housing crisis [1]. The proposed Yew Park building project could be important to the future growth of the city. This project is for the benefit of all people because planning to support present-day seniors is also planning for future generations as they become seniors.

The North Shore location in Kamloops offers amenities spread out in a manner suitable for anyone with limited mobility. The current senior housing in Kamloops is too far away from amenities as most seniors do not drive and mostly rely on public transport. The green space at the proposed Yew Park site is located near all the essential amenities for diverse lifestyles and mobility. The Yew Park site also struggles with homeless people and vandalism which is addressed in the KAPLAN [3] as a major issue in all green spaces on The North Shore. Innovative housing for seniors could allow the community to improve its reputation and initially address the Kamloops housing crisis.

Applying innovations of co-housing allows Kamloops to increase accessible and affordable diversity. Through the implementation of applying already well-established concepts of co-housing such as the RareBirds [18] and other case studies of the Netherlands, a more affordable and community-based senior housing design can be presented.

7. Recommendations

The primary recommendations that are necessary to improve the proposed Yew Park building design revolve around acquiring more research to improve the overall building accessibility. The specific design criteria for accessible kitchens and living rooms could benefit this proposed project greatly as these common spaces are in constant use. Other areas of building accessibility that need to be researched are the function, type, and affordability of elevators as they would also be a high traffic area in the building design.

The secondary recommendations pertain to researching other locations where co-housing communities could offer affordable solutions to Kamloops senior housing issues. There is also a need for accommodating different age groups of senior populations in new proposed senior facility designs in Kamloops. The proposed Yew Park building design is designed to suit the needs of pre-senior or highly independent social individuals but there are many other age groups of seniors. Kamloops has many other accessible building opportunities to offer but further research of the different age groups of seniors of all dependencies would allow for comfortable transitions through lifestyle changes that come with aging.

References

[1] CMHC. 2016. "Housing Market Information Portal." [online] Available at: <https://www03.cmhc-schl.gc.ca/hmip-pimh/en#Profile/4220/3/Kamloops> [Accessed 14 October 2021].

[2] Comfortlife.ca. n.d. “Kamloops retirement homes.” [online] Available at: <https://www.comfortlife.ca/retirement-communities/kamloops-retirement-homes> [Accessed 14 October 2021].

[3] Neighbourhood Plans. 2018. *The North Shore Neighborhood Plan*. [online] Available at: <https://www.kamloops.ca/sites/default/files/08-northshoreneighbourhoodplan_285831.pdf> [Accessed 15 October 2021].

[4] Schmitt, S. and Hartmann, T., 2016. “Clumsy City by Design—A Theory for Jane Jacobs' Imperfect Cities?” [online] ResearchGate. Available at: <https://www.researchgate.net/publication/311464524_Clumsy_City_by_Design-A_Theory_for_Jane_Jacobs'_Imperfect_Cities> [Accessed 14 October 2021].

[5] Comfortlife.ca, 2002. "The Residence at Orchards Walk | Kamloops" [online] Available: <https://www.comfortlife.ca/retirement-homes/the-residence-at-orchards-walk.> [Accessed: 14- Oct- 2021].

[6] Kamloops, C., 2021. 514 MACKENZIE AVE - Kamloops Property Report. [online] Maps.kamloops.ca. Available at: <https://maps.kamloops.ca/PropertyReports/htmlpages/P21806.html> [Accessed 31 October 2021].

[7] P. Carrol, "Rezoning Application No. REZ00660", 2021. [Online]. Available: https://www.kamloops.ca/sites/default/files/docs/ph_report_-_rez00660_dpm00660_-_mackenzie-yew_street.pdf. [Accessed: 06- Dec- 2021].

[8] J. Hoyt, "Types of Senior Living and Levels of Senior Care", *SeniorLiving.org*, 2021. [Online]. Available: <https://www.seniorliving.org/care/cost/.> [Accessed: 16- Oct- 2021].

[9] Canada, E., 2021. Government of Canada — Action for Seniors report - Canada.ca. [online] Canada.ca. Available at: <https://www.canada.ca/en/employment-social-development/programs/seniors-action-report.html> [Accessed 31 October 2021].

[10] 2020. *Building Accessibility Handbook*. [online] Available at: <https://www2.gov.bc.ca/assets/gov/farming-natural-resources-and-industry/construction-industry/building-codes-and-standards/guides/2020_building_accessibility_handbook.pdf> [Accessed 16 October 2021].

[11] BC Publications", *Free.bcpublications.ca*, 2021. [Online]. Available: https://free.bcpublications.ca/civix/content/public/bcbc2018/?xsl=/templates/browse.xsl&xsl=/templates/browse.xsl. [Accessed: 18- Oct- 2021].

[12] "What is Cohousing? - Canadian Cohousing Network", *Canadian Cohousing Network*, 2021. [Online]. Available: https://www.cohousing.ca/about-cohousing/what-is-cohousing/. [Accessed: 16- Oct- 2021].

[13] D. Clarke, "Deco Housing Denmark", *Decohousingdenmark.wixsite.com*, 2015. [Online]. Available: https://decohousingdenmark.wixsite.com/home/the-concept. [Accessed: 16- Oct- 2021].

[14] Kamloops.civicweb.net. 2021. *Zoning Bylaw No. 55, 2021*. [online] Available at: <https://kamloops.civicweb.net/document/135394/BL%20336915_BL%2055.pdf?handle=15EC5E8590D14B0EA0C478A792E7587F> [Accessed 13 November 2021].

[15] J. Casanova, "Gingko Project/ Casanova + Hernandez Architects", *ArchDaily*, 2012. [Online]. Available: https://www.archdaily.com/203792/gingko-project-casanova-hernandez-architects. [Accessed: 24- Oct- 2021].

[16] S. Singhal, "Gingko Project in Beekbergen, The Netherlands by Casanova + Hernandez Architects - ArchShowcase", *ArchShowcase*, 2021. [Online]. Available: https://www10.aeccafe.com/blogs/arch-showcase/2012/02/08/gingko-project-in-beekbergen-the-netherlands-by-casanova-hernandez-architects/. [Accessed: 25- Oct- 2012].

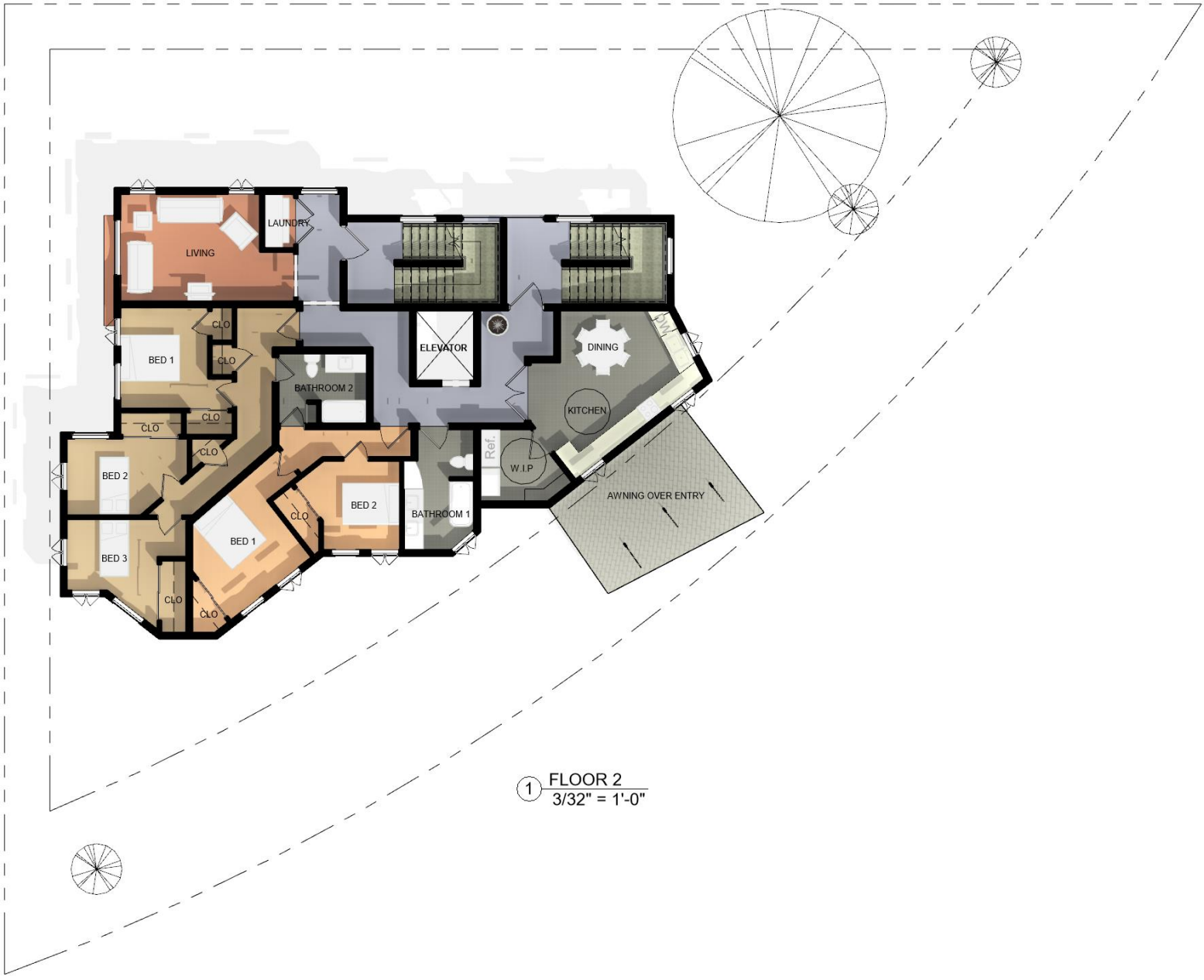
[17] D. Scagliola, "De Zeester by Architectenbureau Marlies Rohmer", *Architizer*, 2021. [Online]. Available: https://architizer.com/projects/de-zeester/. [Accessed: 25- Oct- 2021].

[18] "RareBirds Housing Co-operative", *RareBirds Housing Co-operative*. [Online]. Available: https://www.rarebirdshousing.ca/. [Accessed: 20- Oct- 2021].

Appendices

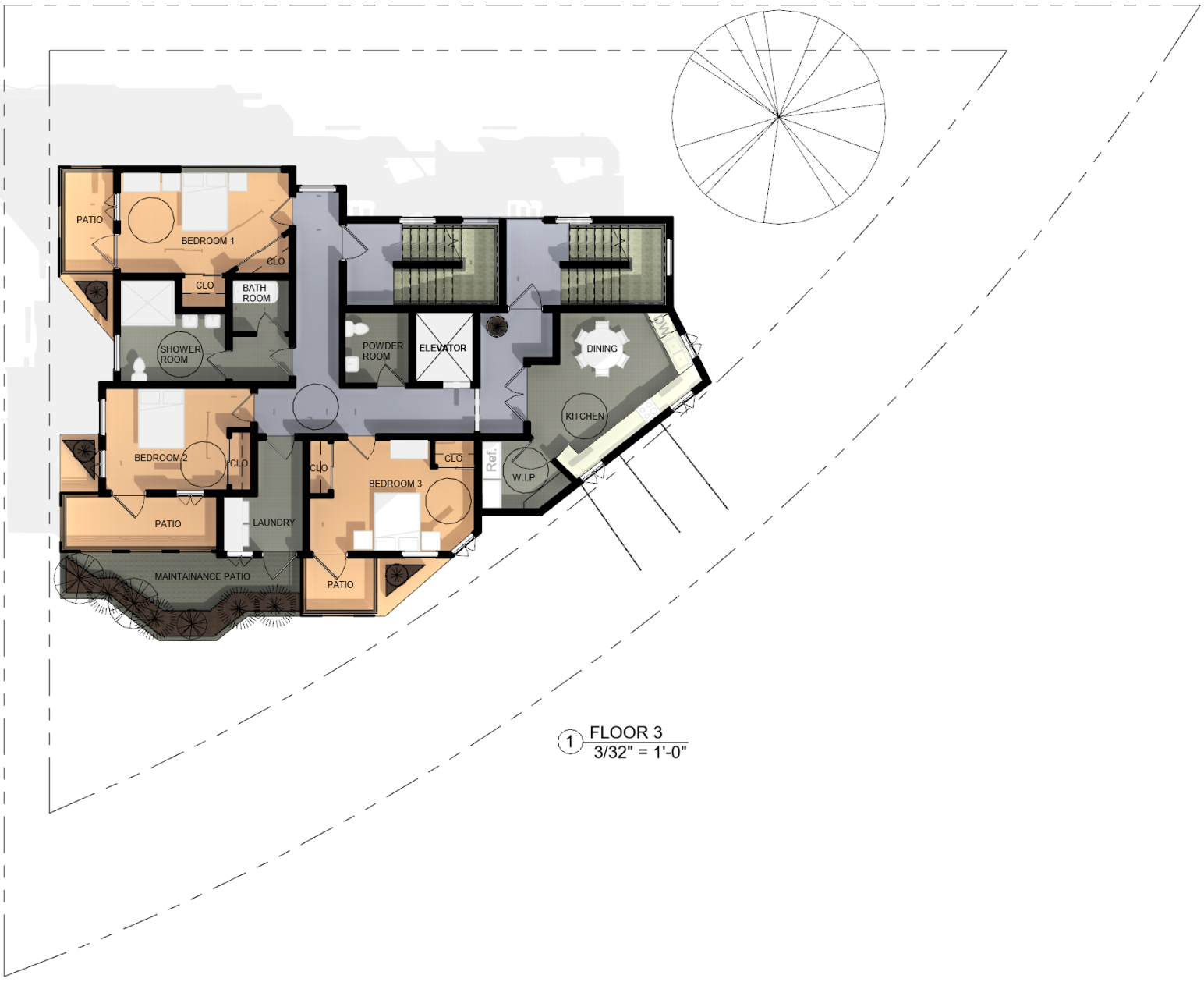
Appendix A – Floor 1

Appendix B – Floor 2



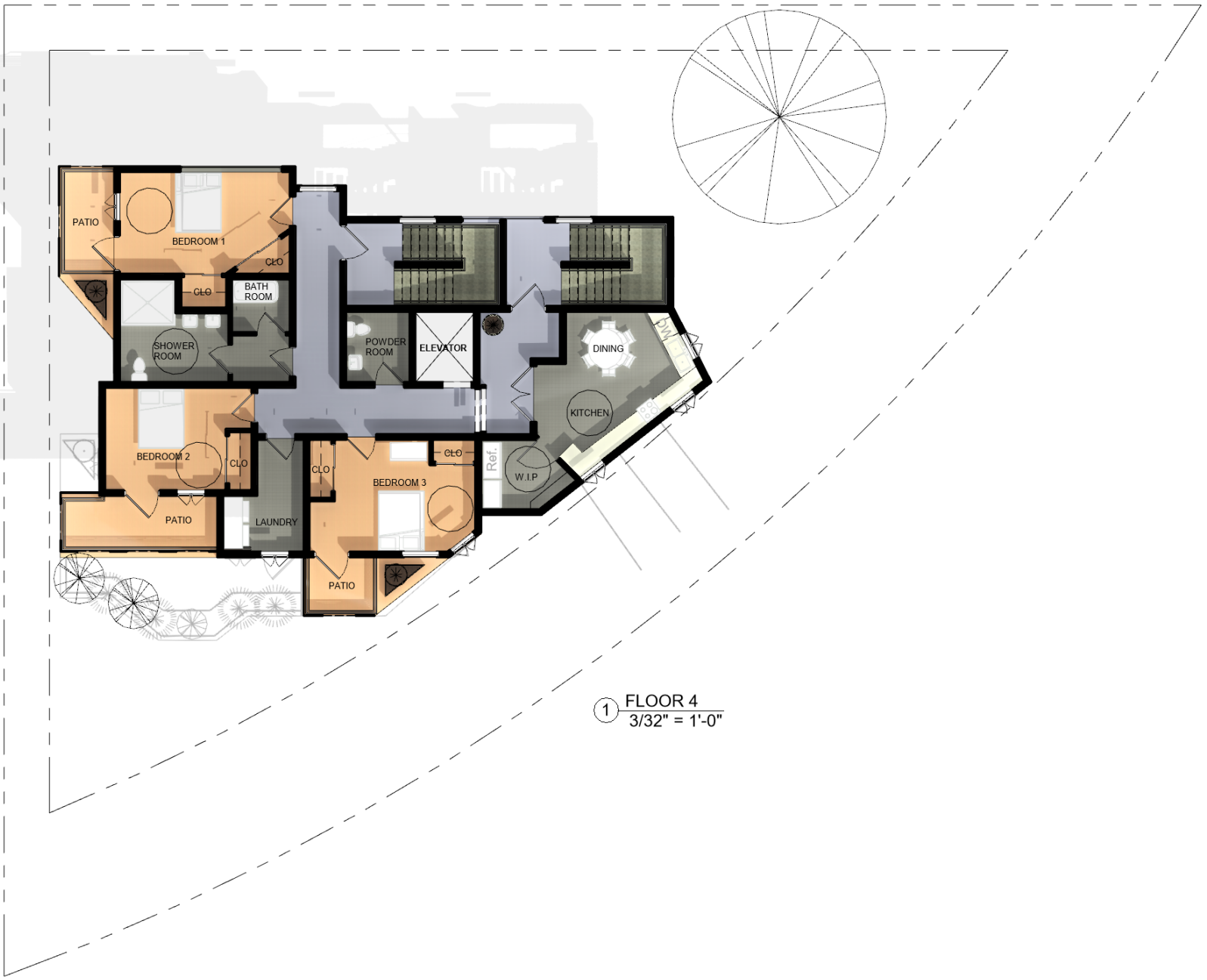
1 FLOOR 2
3/32" = 1'-0"

Appendix C - Floor 3



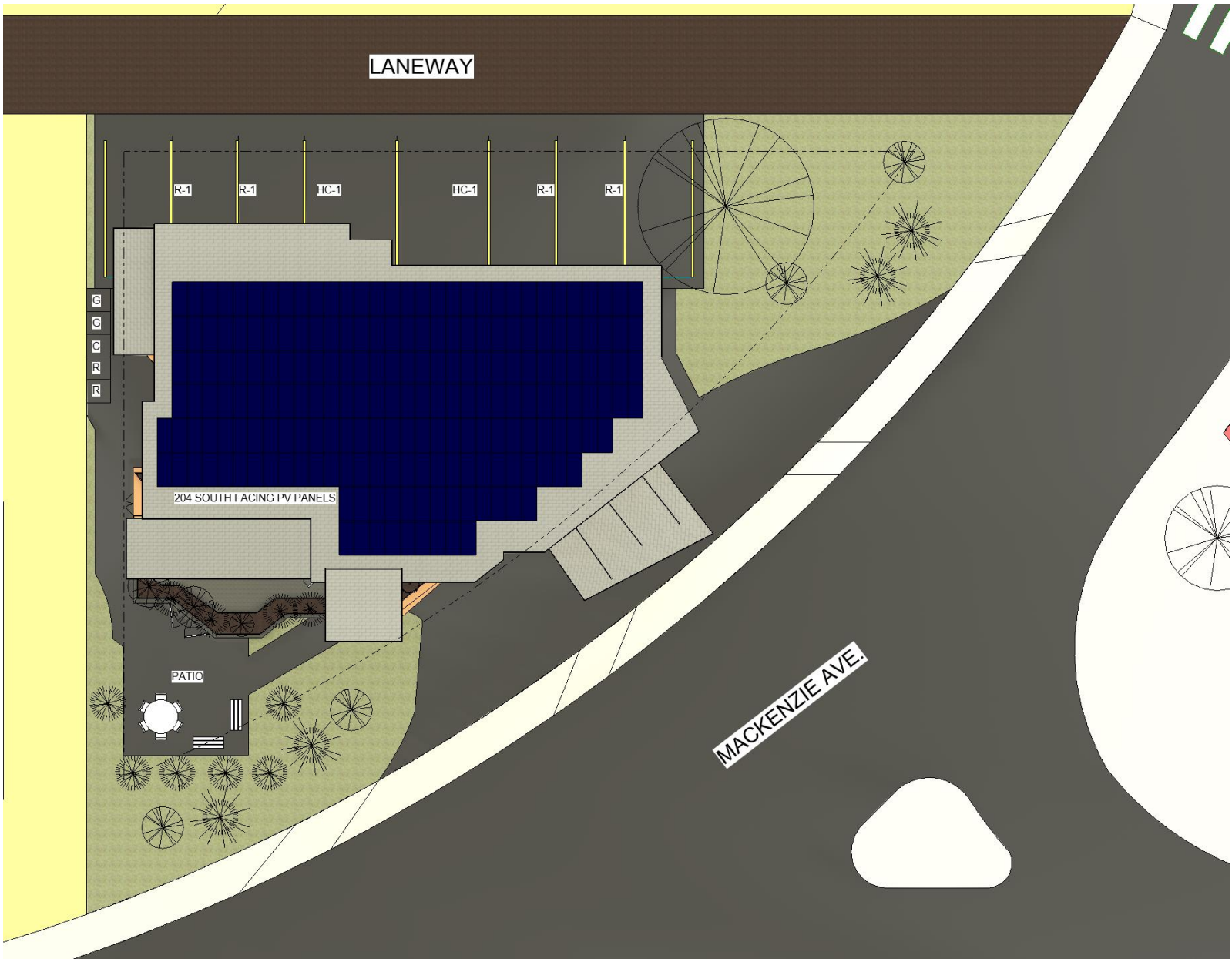
1 FLOOR 3
3/32" = 1'-0"

Appendix D – Floor 4

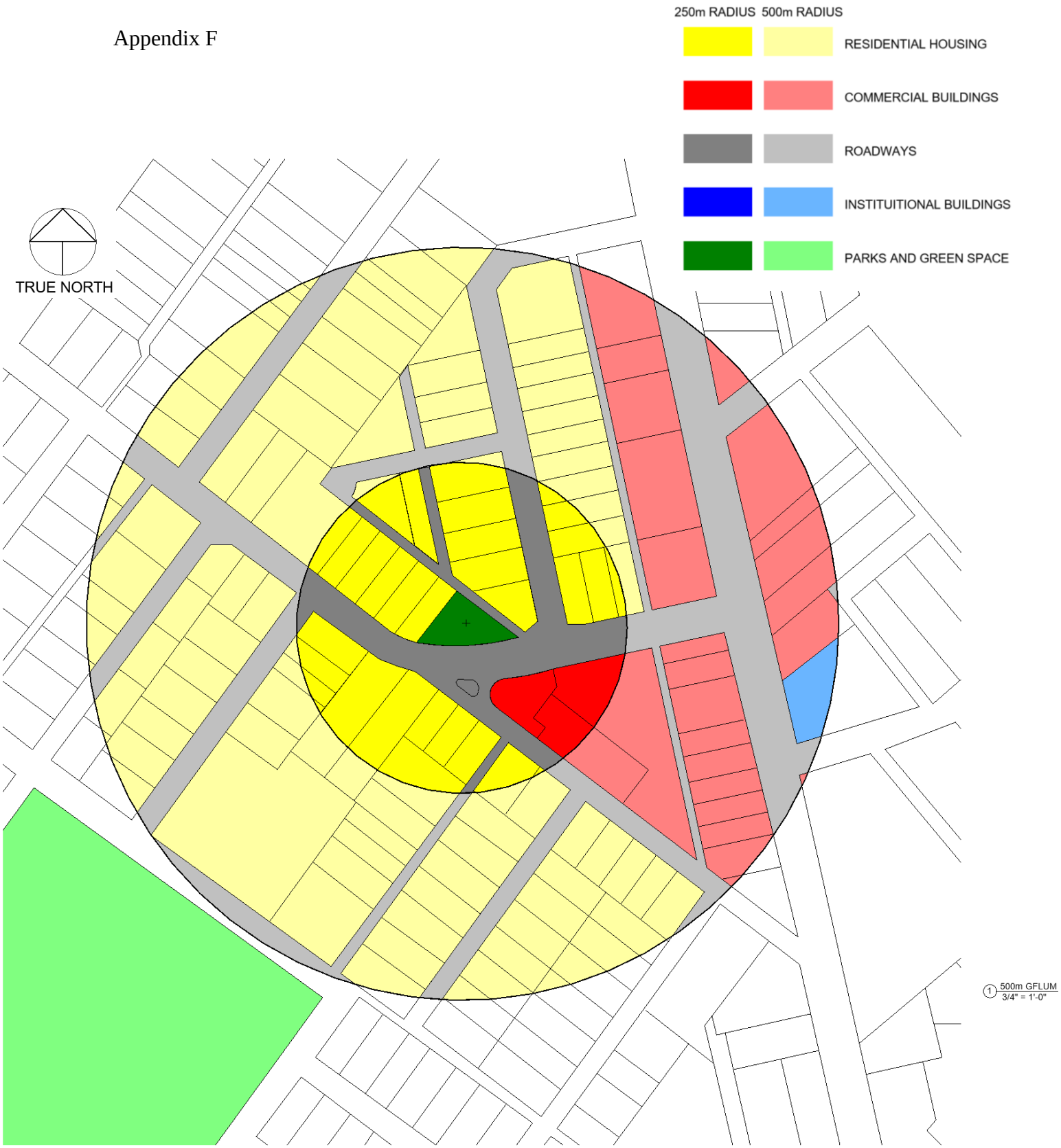


1 FLOOR 4
3/32" = 1'-0"

Appendix E – Site Plan



Appendix F


250m RADIUS
500m RADIUS
RESIDENTIAL HOUSING
COMMERCIAL BUILDINGS
ROADWAYS
INSTITUITIONAL BUILDINGS
PARKS AND GREEN SPACE
TRUE NORTH
1 500m GFLUM
3/4" = 1'-0"