

AFFORDABILITY AND CHOICE TODAY (A•C•T) DEMONSTRATION PROJECT

Small-Scale Infill: The Stacked Fourplex

**Capital Region Housing Corporation
Victoria, British Columbia**

Prepared for:

Federation of Canadian Municipalities

Canadian Home Builders' Association

Canadian Housing and Renewal Association

Canada Mortgage and Housing Corporation

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Ottawa, Ontario

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FOREWORD

The project documented in this case study received funding assistance under the Affordability and Choice Today (A•C•T) Program. A•C•T is a joint initiative, managed by the Federation of Canadian Municipalities, the Canadian Home Builders' Association, and the Canadian Housing and Renewal Association, together with the funding agency Canada Mortgage and Housing Corporation. The A•C•T Program is administered by the Federation of Canadian Municipalities.

A•C•T, which was launched in January 1990, was designed to foster changes to planning and building regulations and residential development approval procedures in order to improve housing affordability, choice and quality.

Through A•C•T, grants are awarded to municipalities, private and non-profit builders and developers, planners and architects to undertake innovative regulatory reform initiatives in municipalities across Canada. Three types of projects are awarded grants under the A•C•T Program: Demonstration Projects, Streamlined Approval Process Projects, and Case Studies (of existing initiatives).

- *Demonstration Projects* involve the construction of innovative housing that demonstrates how modifications to planning and construction regulations can improve affordability, choice and quality.

- *Streamlined Approval Process Projects* involve the development of a method or an approach that reduces the time and effort needed to obtain approvals for housing projects.
- *Case Study* grants are awarded for the documentation of existing regulatory reform initiatives.

Change and innovation require the participation of all the players in the housing sector. A•C•T provides a unique opportunity for groups at the local level to work together to identify housing concerns, reach consensus on potential solutions, and implement action. Consequently, a key component of A•C•T-sponsored projects is the participation and cooperation of various players in the housing sector in all phases of each project, from development to realization.

All projects awarded a grant under the A•C•T Program are documented as case studies in order to share information on the initiatives and the benefits of regulatory reform with other Canadian communities. Each case study discusses the regulatory reform initiative, its goals and the lessons learned. Where appropriate, the cost savings resulting from modifications in various planning, development, and construction regulations are calculated and reported.

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PROJECT OVERVIEW

Land intensification has become a development strategy of increasing necessity for many urban municipalities. Pressure to contain municipal boundaries, rather than continuing to grow outward, has focussed attention on small-scale, infill housing development as a means of providing affordable housing options and revitalizing vacant properties in established neighbourhoods.

Capital Region Housing Corporation of Victoria, British Columbia received an A•C•T grant in 1990 to develop an innovative small-scale residential concept that could be readily inserted into existing neighbourhoods. Specifically, the design would be a one- and two-bedroom, side-by-side, stacked fourplex. The size of the units, the single-lot land component, a fast-track approval process and prefabrication of components or entire units were key factors that would contribute to affordability.

The project team aimed to address the following:

- the development of a fourplex design concept, including variations

- new zoning requirements
- the development approval process
- market segments and rental options

Detailed design drawings were developed and modified in consultation with the City of Victoria Planning Department. Building specifications were defined, and budgets for development and construction costs were determined. In addition, a draft zoning by-law was produced that would permit the construction of the stacked fourplex.

A prototype was to be built, but unfortunately a site could not be obtained. This precluded developing a streamlined approval process for this type of housing and exploring rental options.

In 1991, a realtor assessed the potential market value of the units based on a review of the proposed design. The realtor concluded that the units could sell for \$79,000 to \$87,000. As virtually no other housing in the Victoria area was available for less than \$100,000, the project demonstrated that a fourplex design concept was indeed a viable option that could contribute to housing affordability.

1.0 PROJECT DESCRIPTION

1.1 Lack of Affordable Rental Housing

Renewed economic growth in the late 1980s in the Greater Victoria area resulted in a very tight rental situation. The Capital Regional District commissioned an intensive, four-month study in 1990 to develop a strategy to address the need for more rental housing. The study report noted that “there will be more ‘life-long’ renters for whom homeownership will never be an option.”¹ Several indicators of adverse rental market conditions were cited:

- low vacancy rates
- declining turnover
- expanded social housing waiting lists
- average rent increase of 12 percent from 1989 to 1990, which caused hardship for some renters
- rents outpaced the local Consumer Price Index for the preceding two years

An average of 470 rental units were built from from 1986 to 1991, which fell far short of the requirements forecast for the next 10 years. The study estimated that more than 1300 additional units would be required by 2001.

One of the two general goals arising from the study speaks specifically to affordability:

- To increase the supply of market and non-market rental housing,

particularly affordable rental housing, to meet the needs of low- and moderate-income households and people with “special needs”.

The study recommended, among other measures, that new zoning to facilitate construction of triplex, fourplex and sixplex dwellings would help to meet the need for affordable rental housing.

1.2 Project Objectives

Capital Region Housing Corporation (CRHC) of Victoria, British Columbia received an A•C•T grant in 1990 to develop an innovative small-scale residential concept that could be readily inserted into existing neighbourhoods. Specifically, the design would be a one- and two-bedroom, side-by-side, stacked fourplex. The size of the units, the single-lot land component, a fast-track approval process and prefabrication of components or entire units were key factors that would contribute to affordability.

The project team aimed to address the following:

- the development of a fourplex design concept, including variations
- new zoning requirements
- the development approval process
- market segments and rental options

1.3 Methodology

The project team included a representative from CRHC, an architect and two representatives from the building industry. The team developed a design concept and a draft zoning

¹ CitySpaces Consulting Ltd. and Clayton Research Associates, *Maintaining the Affordable Community: Rental Housing in the Capital Region—A Strategy for Action*, (Victoria: Capital Regional District, 1990), p. i.

by-law in consultation with the City of Victoria's Planning Department. Design drawings, prepared by the architect, and the draft by-law were presented on two occasions, one being to students in the University of British Columbia's course "Reforming Municipal Regulations and Approvals" (March 1991), and the other to the City of Victoria's Housing Committee (January 1992).

Several major changes were made to the design drawings and the draft zoning by-law, based on feedback from the Planning Department. The drawings were re-priced, and a construction cost estimate prepared. This information was presented in a workshop on the project, "Victoria Infill Innovation," at the June 1992 Innovative Infill Housing Conference held in Victoria. An architectural model of the final concept was prepared.

Considerable time and effort was spent on selecting a potential site. At an August 1990 meeting of the project team and the City of Victoria Planning Department,

City planners suggested that the register of City-owned lots be reviewed to identify a suitable site for the project. It was suggested also that parking issues might be addressed most effectively if a corner lot, or one with a back lane, was chosen. Corner and larger lots were eventually ruled out, however, as they were not the norm in the Victoria area.

The project team began pursuing the possibility of purchasing a City-owned lot in the fall of 1990. Despite continuing efforts over the next few years, a site was not obtained. With purchase of City-owned property no longer a possibility, the only alternative would be the private market. Market prices, however, were well beyond the project's budget. Private properties in the City of Victoria were selling at \$175,000, well beyond the means and goals of the project.

Since the stacked fourplex was not built, streamlining the development approval process and exploring rental options were not pursued.

2.0 THE STACKED FOURPLEX

2.1 Design Variations

The design proposed for development in this project was a one- and two-bedroom, side-by-side, stacked fourplex. The stacked fourplex concept, however, allows for variations on this theme:

- four one-bedroom units, two side-by-side and stacked
- two one-bedroom units, side-by-side on one level and one three- or four-bedroom unit on the other
- any of the variations above with a single basement suite or two side-by-side

Four front elevations showing alternative exterior design treatments are shown in figure 1.

Design drawings were developed for a lot 15 m x 36.5 m (50 ft. x 120 ft.). The average unit size initially proposed was 70 m² to 74 m² (750 ft² to 800 ft²). The final area for the one-bedroom units was 75 m² and 78 m² (810 ft² and 840 ft²) and for the two-bedroom units, 88 m² and 91 m² (945 ft² and 980 ft²).

An on-site parking space for each of the units was one of the more difficult design obstacles to overcome. It was thought that the dimensions of the building should not be reduced to increase exterior dimensions for parking and walkway areas. Four on-site parking spaces were incorporated into the design, but the City's Planning Department noted that this was below the requirement for townhouse projects of 1.5 spaces per

dwelling unit. Planning staff also pointed out a couple of objections that might arise in the event that an application was submitted. Street parking could be an issue, and two driveways close together might not be acceptable, depending on the street chosen.

Storage space in the units was considered satisfactory and well located with respect to the front entrance. Both B.C. Hydro and the City's Electrical Inspector gave permission for two duplex meters to be installed, which eliminated the need for an electrical room.

Lot and site plans are presented in figures 2 and 3. Figures 4 and 5 show the layouts of ground floor and second floor units.

2.2 Zoning Requirements

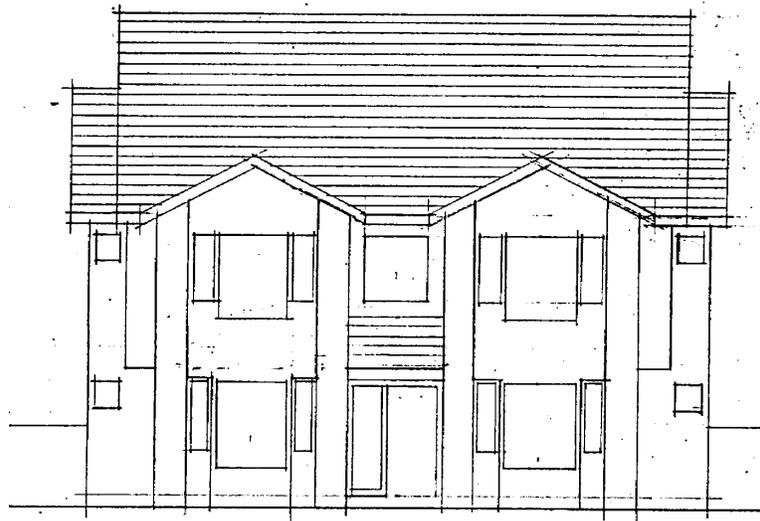
The project team wanted to ensure that new zoning requirements would be flexible enough to permit the type of design variations described above. In doing so, the stacked fourplex concept could be readily applied to meet a broad range of market needs, including rental and ownership options, various family sizes and different age groups.

The team reviewed applicable existing zoning by-laws and discussed zoning requirements with the City of Victoria Planning Department. A zoning by-law, "R—ACT Four Family Dwelling District," was drafted and submitted to the Planning Department for review and comment.

The revised final design drawings were incorporated into a rezoning application for a hypothetical inner city lot. This mock application, along with a proposed zoning by-law (please see Appendix A), was submitted in July 1992 to the Planning Department. The Department found the design plans to be laudable and

provided some general feedback. Before they could proceed with preparing a draft Advisory Planning Commission report, which would go back to the project team to assist them in preparing a genuine application, they indicated that they would need to review the application within the context of a specific site.

Figure 1. Front Elevation—Four Variations



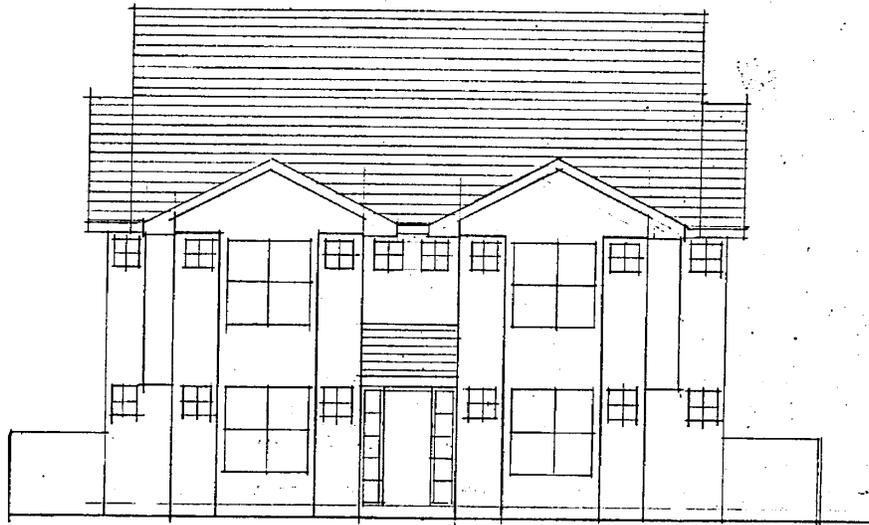
- FRONT: "A" - MAIN ROOF GABLED
- GABLED PROJECTIONS AT FRONT & SIDES
 - 6 IN 12 SLOPES
 - SQUARE BAY OVER 45° BAY



- FRONT: "B" - MAIN ROOF HIPPED
- HIPPED PROJECTIONS AT FRONT & SIDES
 - 6 IN 12 SLOPES
 - 45° BAY AT MAIN FLOOR ONLY C/W HIPPED ROOF

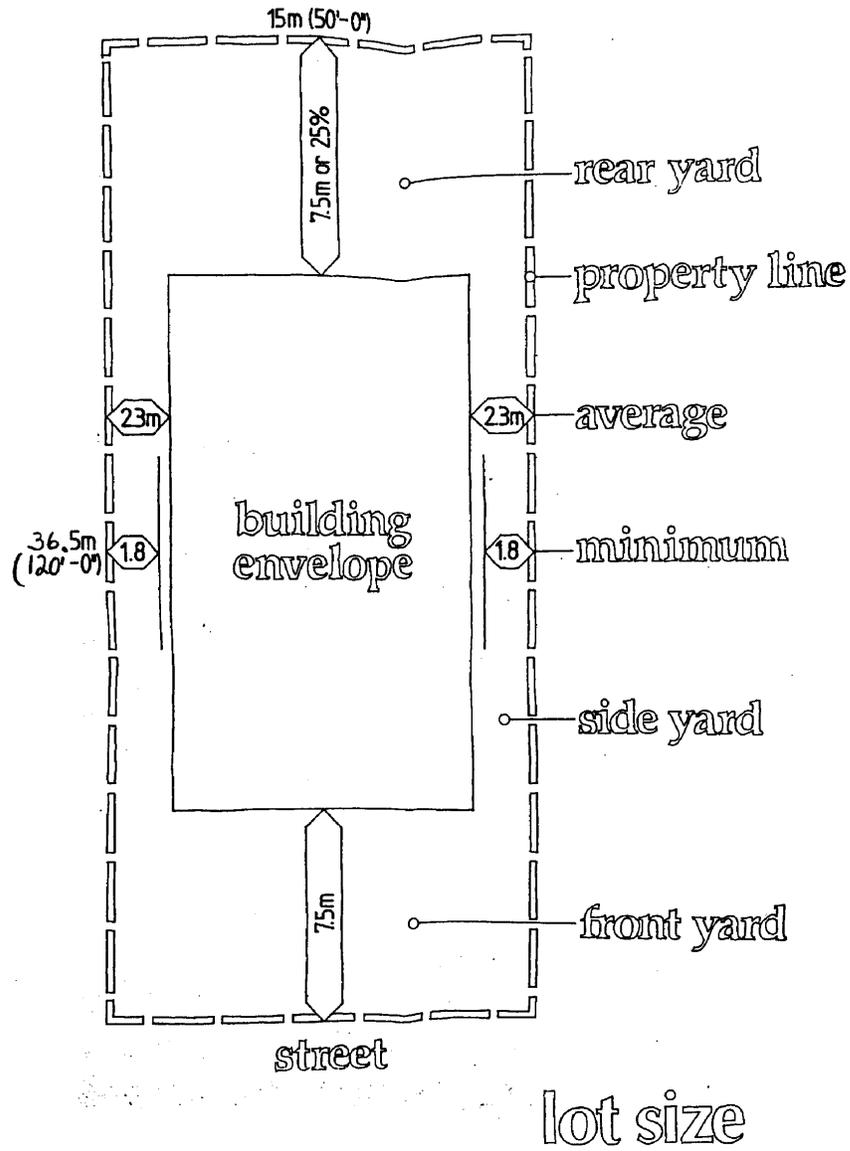


- FRONT: 'C' - MAIN ROOF HIPPED
 - GABLED PROJECTIONS AT FRONT & SIDES
 - 8 IN 12 SLOPES
 - SQUARE 2-STORY BAY C/W GABLES



- FRONT: 'D' - MAIN ROOF GABLED
 - GABLED PROJECTIONS AT FRONT & SIDES
 - 6 IN 12 SLOPES
 - SQUARE 2-STORY BAY + GABLE OVERHANG

Figure 2. Lot Plan



CRHC ACT Project

Figure 3. Site Plan

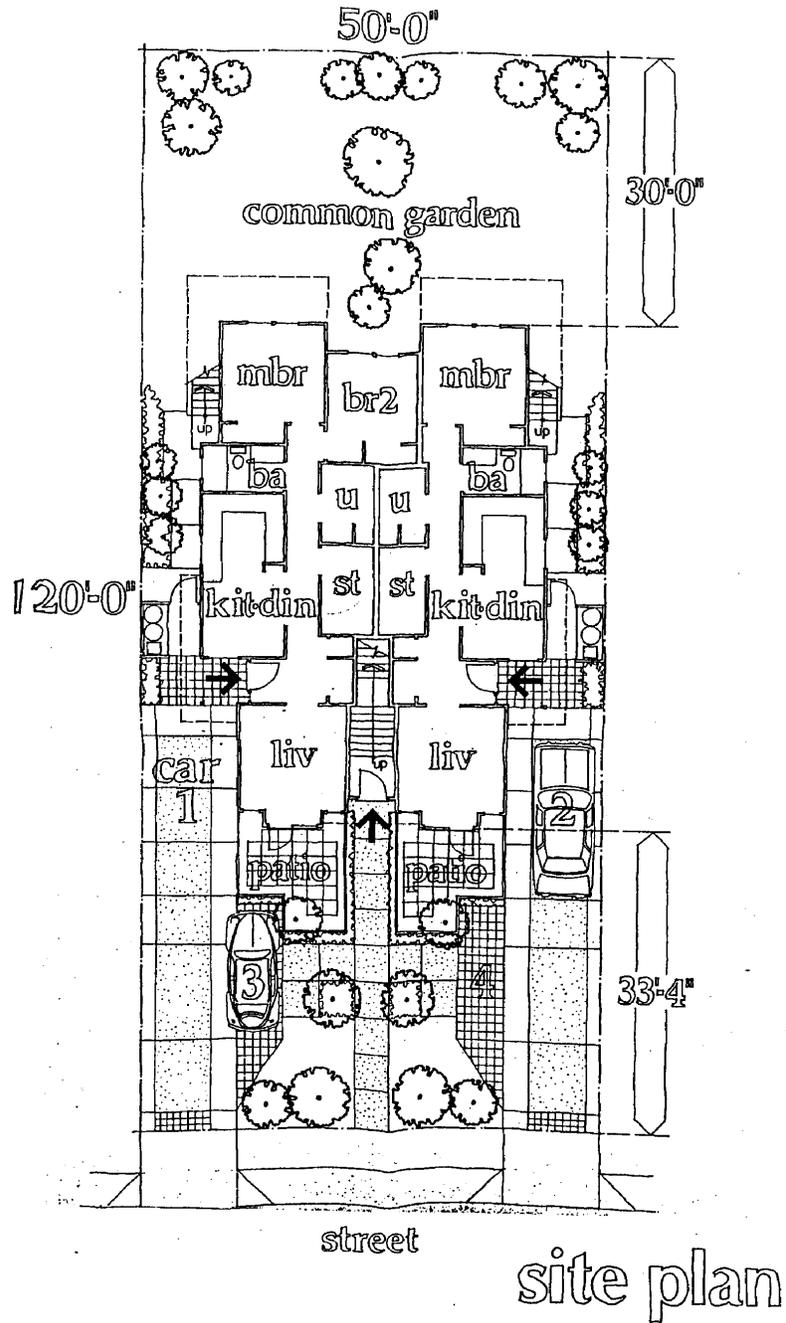
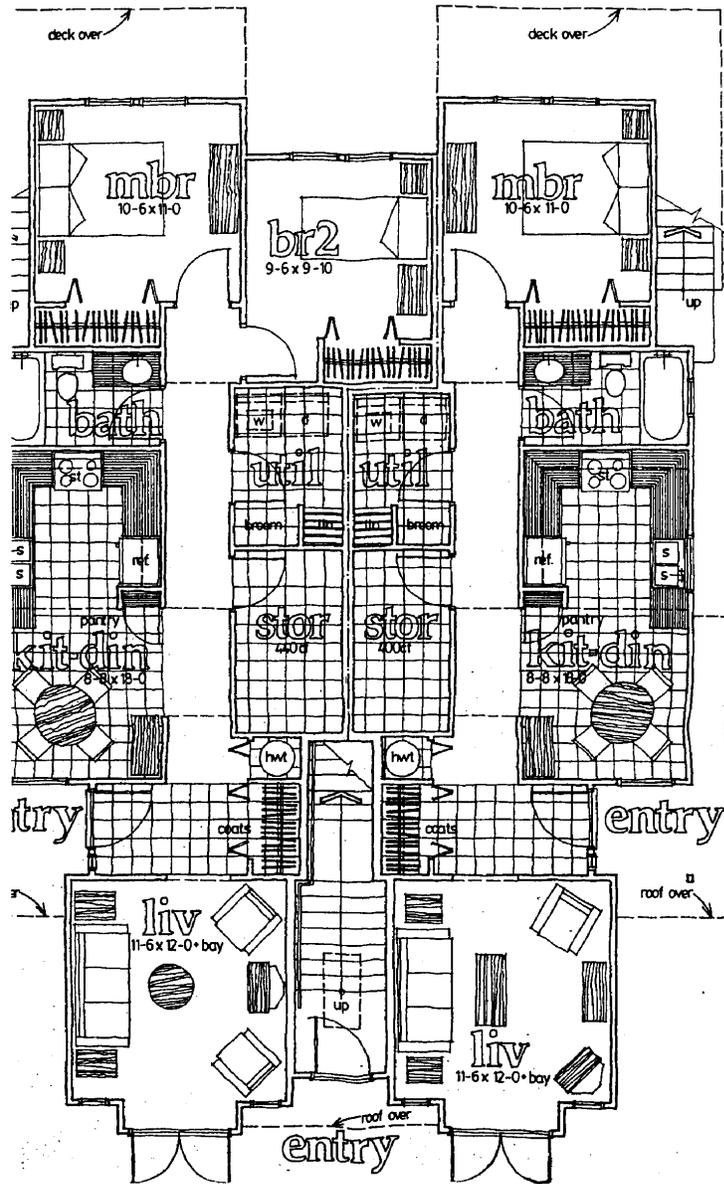
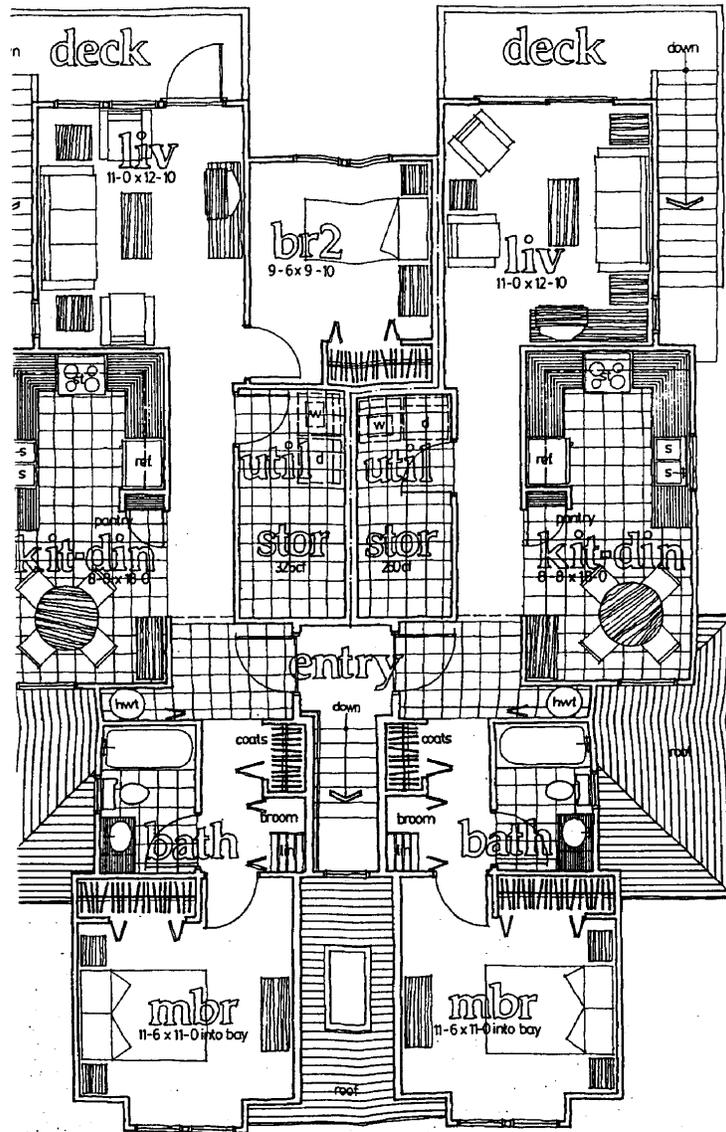


Figure 4. Layout—Ground Floor Units



unit types A & B
1845 sf

Figure 5. Layout—Second Floor Units



unit types C & D
1730 sf

2.3 Costs

The initial per-unit target cost, in 1991 dollars, was set at \$83,000. This figure was based on a lot price of \$120,000 and a unit size of 230 m² to 245 m² (750 ft² to 800 ft²). This unit price compared favourably with an average cost calculated by the project team for one-bedroom units at \$83,700.

A realtor's February 1991 assessment of the proposed fourplex and current market prices for other housing underscored the affordability of this housing concept. At that time, about 800 condominiums were available in the Greater Victoria area at a unit price of \$140,000 or higher. The realtor noted that there was virtually nothing in the single-family dwelling

category for sale in the Victoria area under \$100,000. None of the townhouses or condominiums currently listed were priced at less than \$100,000, and none of them were under 274 m² (900 ft²). The realtor proposed that the two-bedroom units in the fourplex could sell for \$87,000 and the one-bedroom units from \$79,000 to \$82,000.

Development and building costs were budgeted at \$423,904, as outlined in figure 6. Of that amount, construction costs were estimated at \$244,344. Construction costs are detailed in Appendix B. Building specifications are presented in Appendix C.

Figure 6. Development and Building Costs

Development and Building Costs	Estimate
Acquisition and Servicing Costs	
Purchase/Lease Value	\$ 125,000
Legal Fees	750
Property Purchase Tax	1,250
Sub-total	\$ 127,000
Development Fees and Charges	
Interest Pre I.A.D.	5,370
Taxes Pre I.A.D.	250
Insurance Pre I.A.D.	628
Consultants	8,000
Legal	2,500
Sub-total	\$ 16,748
Building	
Construction	\$ 244,344
Stoves/Fridges	5,000
Landscaping	6,000
New Home Warranty	740
Sub-total	\$ 256,084
Project Contingency	5,000
GST Contingency (Net)	19,072
TOTAL BUDGET	\$ 423,904

3.0 PROJECT BACKGROUND

Greater Victoria had a population of 276,540 in 1989, spread across 11 municipalities. This was expected to increase by 19 percent in 1990 to 328,400. The City of Victoria had already been experiencing record levels of inward migration by the late 1980s, stimulated by three factors:

- some area municipalities had adopted no-growth policies
- some were not extending their urban containment boundaries
- others did not have the infrastructure in place to accept growth

The predicted growth rate for the urban core from 1990 to 2110 is 53 percent. The City was facing a critical land shortage that would only become more severe over the next two decades, with prices escalating at a previously unheard of pace.

All factors indicated that availability of housing, especially single-family

dwelling, and affordability were problems requiring immediate attention. A review of existing community official plans for the area municipalities, and population projections, indicated that too much land had been allocated for multi-family units and not enough for single-family units. Only nine percent of new housing in Greater Victoria was priced below \$125,000 in 1989. An adequate supply of affordable housing was severely lacking.

Attitudinal Barriers to Affordable Housing

If our industry is to protect the environment and preserve open spaces and productive agricultural lands, we are going to have to accept higher densities. Everyone is concerned about livability and affordability and yet will fight to the death to prevent higher density zoning in their neighbourhoods.²

*—Wally Miller, 1990 President
Canadian Home Builders' Association of B.C.*

² Victoria Home Builders' Association and Greater Victoria Economic Development Commission, *Housing 20/20*, Conference Proceedings, (Victoria, 1990), p. 19.

4.0 REGULATORY REFORM INITIATIVES AND IMPACT ON HOUSING COST, CHOICE AND QUALITY

A small-scale fourplex that can be situated on a typical single-family lot measuring 15 m x 33.5 m (50 ft. x 110 ft.) or larger addresses many needs. It avoids the need for large-scale land assemblies, which have become more and more difficult to obtain. This type of fourplex is also generally acceptable to neighbours, who typically resent and resist large-scale projects being introduced into the neighbourhood.

A small-scale fourplex offers a strong potential for meeting a growing demand for affordable, infill housing in existing neighbourhoods. The concept can be used by either the public or private housing sector on a high-volume basis. The design of the units can provide an excellent option for young couples, families with one child, singles or seniors seeking smaller housing options in established neighbourhoods.

APPENDICES

APPENDIX A: DRAFT ZONING BY-LAW

R-ACT ZONE, FOUR FAMILY DWELLING DISTRICT

- Permitted Uses: 1. The following uses are permitted:
- (a) all uses permitted in the R1-B Zone, single family Dwelling District, subject to the regulations applicable to that Zone;
 - (b) all uses permitted in the R-2 Zone, Two Family Dwelling District , subject to the regulations applicable to that Zone,
 - (c) multiple dwellings, subject to the regulations contained in this Part;
 - (d) home occupations.
- Number of Buildings on a Lot 2. Subject to the restrictions hereafter mentioned, only one multiple dwelling building may be erected on one lot.
- No more than 4 Units per Dwelling: 3. No multiple dwelling building shall contain more than 4 dwelling units.
- Minimum Site Area: 4. The minimum surface area of a lot shall be 150 square metres per dwelling unit.
- Minimum Site Width: 5. The minimum width of a lot shall be 15 m.
- Site Coverage 6. The buildings on a lot, including accessory buildings, shall not occupy more than 40% of the surface area of the lot.
- Open Site Space 7. Not less than 40% of the area of a lot shall be open site space.
- Floorspace Ratio: 8. The maximum floorspace ratio shall be 0.8:1.
- Floor area: 9. The minimum floor area of any dwelling unit shall be 33 square metres measured from the interior wall surfaces and excluding balconies.

- Yard Setbacks:
10. (a) The minimum setback of a building from a street boundary shall be 7.5 m.
- (b) The minimum setback of a building from a rear lot line shall be the greater of 7.5 m or 25% of the depth of the lot.
- (c) The average side yard setback shall be 2.3 m, with a minimum width of 1.8 m, provided that all side walls are blank, or contain only side windows.
- Front Yard Coverage
11. Not more than 35% of the required front yard area shall be paved or used for the parking of motor vehicles.
- Projections:
12. Entrance porches, steps and balconies may project from the main wall into the front and rear setback areas, for a maximum distance of 1.5 m.
13. Steps may project from the main wall into the side setback area, for a maximum distance of 1 m.
- Separation Space:
14. The minimum separation space in front of the main window of a habitable room shall be 7.5 m, and in front of all other windows shall be a minimum of 2 m.
- Maximum Height:
15. The maximum height of a building shall be 7.6 m or 2 storeys.
- Off-Street Parking:
16. (a) Off-street parking spaces shall be provided at a ratio of 1 space per dwelling unit.
- (b) Up to 50% of the total number of parking spaces may be for small cars.
- Definitions:
17. In this Part, unless the context otherwise requires:
- "separation space" means the horizontal distance at right angles from a window measured from a point at grade on the outside surface of the wall in which the window is located.

APPENDIX B: DETAILED CONSTRUCTION COSTS

Survey	\$ 500	Drywall	\$16,000
Temporary power	1,000	Insulation	4,000
Temporary water	100	Painting	6,000
Site toilet	500	Cabinets	8,000
B.C. Hydro connection fees	160	Stucco	5,600
B.C. Tel connection fees	43	Tub surround	1,000
Cablevision fees	140	Floor coverings	11,000
Building Permits and connections	3,030	Roofing	4,000
Soils and concrete testing	400	Deck membranes	1,800
Heavy equipment rentals	4,000	Metal railings	1,000
Imported fill	5,000	Window coverings	3,000
Miscellaneous tool rental	800	Masonry	500
Forklift rentals	1,000	Soffits	3,000
Rubbish container/recycling	1,000	Window liners	1,000
General carpentry/labour own forces	6,000	Concrete	8,000
Cleanup	1,000	Concrete plumbing	1,000
Fencing labour	2,000	Damproofing	400
Drain tile	500	Cement finishings	2,000
Finish carpentry	2,000	Light fixtures	1,400
Final cleaning	500	Windows	5,500
Auto expenses and fuel	500	Doors/trim/hardware	8,000
Site office supplies	100	Building materials	30,000
Cedar siding application	500	Fencing materials	2,000
Electrical	14,000	Roof trusses	5,000
Plumbing	14,000	Misc. metals	500
Ventilation	3,000	Glue lams/Micro lams	1,500
On-site servicing	2,000	Small tools	1,000
Framing	12,000	Kerosene	500
Power nails and fasteners	1,000	Miscellaneous	3,000
		TOTAL CONSTRUCTION BUDGET	\$244,343

APPENDIX C: BUILDING SPECIFICATIONS

SPECIFICATION SHEET

FOUNDATION: Fully reinforced concrete foundation on concrete
footing. Slab insulated under entire area.

EXTERIOR FINISHES AND STRUCTURES: Predominantly cedar siding with
stucco accents, on 3/8" O.S.B. on 2 x 6 studs @ 16" o.c.
R20 Batt insulation, 6 mil poly, 1/2" painted drywall.

FLOOR SYSTEM: Main floor construction will be concrete slab on grade,
with 1" rigid insulation under the entire slab area.
All other floor assemblies will be 5/8" T & G plywood,
nailed and glued on wood joists, to minimize creaking
and improve rigidity. Intermediate floor of stacked
unit to be 1 1/2" concrete topping on 1" X 8" boards
laid diagonally on 2 x 10 joists with R12 Batt
insulation and 1/2" drywall on resilient channels.
Floor finishes will be 28 oz nylon carpet on 1/4" high
density 8lb underlay, and "Candide" 100 gauge sheet
vinyl.

ROOF SYSTEM: Pitched roofs will be finished with 235lb interlocking/
self-sealing asphalt shingles, with a fifteen year
manufacturer's warranty against material failure. This
will be supplemented by a 5-year letter of Warranty from
the developer covering the installation. Roof pitches
are generally 5 1/2 in 12 and 6 in 12 with asphalt

shingles installed over 1/2" plywood with H-clips between sheets. 2X4 engineered residential wood trusses at 2' - 0" o.c., blown insulation to R40, 6 mil poly vapour barrier and 1/2" drywall ceiling with paint or spray textured finish.

BALCONIES Projecting balconies with cedar siding and prefinished aluminum railings; balcony size approximately 50 sq. ft. with sheet vinyl deck finish; all balconies drained to tight drain system.

WINDOWS AND PATIO DOORS: Residential pre-finished baked enamel aluminum windows c/w wood liners and sills, and prefinished head trim. 1/2" double glazed sealed units. Prefinished insulated metal glazed unit entry/patio and balcony access doors. Prefinished residential patio doors to third floor balconies.

ELEVATORS: N/A

INTERIOR WALLS: Interior - 1/2" d/w on 2x4 studs at 16" o.c. Party - 5/8" d/w on 2x4 studs at 16" o.c. R12 insulation - 1" air space. Smoke stop at floor 1/2" sound board. 2x4 studs 16" o.c. R12 insulation, 5/8" d/w. Both walls set onto foam sill gaskets for improved sound insulation, STC Rating 58.

CABINETS: Benson Industries Ltd. - "Monaco Line"
Low pressure laminate over high density board
Blum 90 series hardware, plastic laminate counter tops.

APPLIANCES: Westinghouse 30" Easy-clean oven c/w window, clock and
timer. Westinghouse 30" Refrigerator 14.9 cu-ft frost-
free; all appliances Power Smart. Disabled units to have
side by side refrigerator/freezer, wall oven with side
hung door and four surface elements with front controls.
Dual speed range hood.

HEATING/AIR CONDITIONING: Electric baseboard heat. Untempered make up
air to each room. Air extractors to code; humidistat
controlled.

PLUMBING: Individual/Power Smart 40gal hot water tanks. Each unit
has a three piece main bathroom with shower; all
bathrooms & washrooms have economy toilets. 3 & 4
bedroom units also have a two piece washroom. Double
stainless steel sink to kitchen. Flow restrictors to
showers and lavatory faucets; laundry rough-in to each
unit.

ELECTRICAL: 600 amp single phase. 100 amps to each unit with
individual meters. Telephone and cable service.
Shielded sodium vapour site lighting or equivalent.
\$350.00 electrical fixture allowance for each unit.