

AFFORDABLE HOUSING DEVELOPMENT & DESIGN GUIDELINES



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2.0 Intent & Context

2.1 Intent

The Affordable Housing Development & Design Guidelines (hereinafter referred to as the Guidelines) is an educational resource providing guidance to non-profit and private sector advocates and developers of affordable housing in Calgary. The Guidelines offer practical advice and design suggestions for the successful creation of affordable housing. The Guidelines also present key principles that should be considered when developing an affordable housing project. The Guide is primarily intended for multi-residential rental developments, however the principles within the document could be applicable to affordable homeownership and town homes.

The Guidelines have been prepared to replace the existing Locational Guidelines for Non-market Housing and distinguish "affordable housing" from "special care housing". The Guidelines focus solely on the development of affordable housing and do not cover special care housing. The purpose of the Guidelines is to promote and positively influence the development of affordable housing as it is not a defined use under the Land Use Bylaw.

The Guidelines are not designed to be used as a check-list nor to restrict, limit or constrain the development of affordable housing. The Guidelines are intended as principles, to be regarded when developing affordable housing.

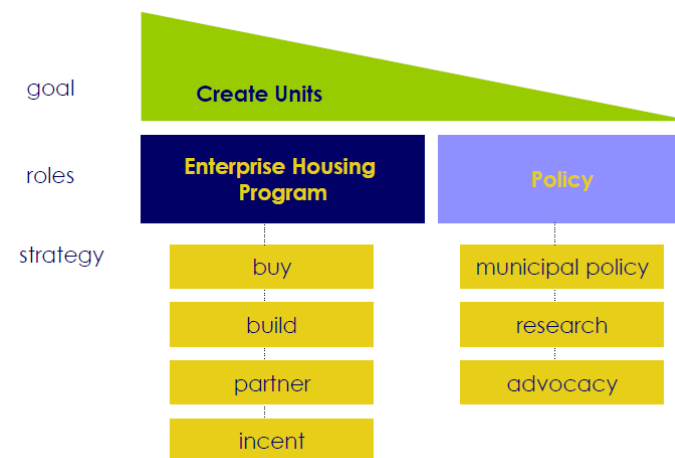
The Guidelines support:

- The City's comprehensive approach to developing affordable housing: buy, build, partner and incent;
- Council Priority CP1.3 (2009-2011) to work with our partners to foster a healthy physical and social environment;
- The City's response to the 10-Year Plan to End Homelessness.

The Guidelines have been developed by the Affordable Housing section of the Office of Land Servicing & Housing whose mandate is to deliver 200 units of affordable housing per year through the Enterprise Housing program and to facilitate a healthy environment for the creation of units through the development of policy, advocacy and research.

The following partners assisted with the creation of the Guidelines:

- Calgary Housing Company
- Calgary Homeless Foundation
- Federation of Calgary Communities
- Horizon Housing
- Kanas Corporation
- Norfolk Housing
- United Way
- Development & Building Approvals, City of Calgary
- Land Use Planning & Policy, City of Calgary



2.0 Intent & Context

2.2 Context

Affordable housing is an important component of the social and economic infrastructure of a healthy city. Over the past 4 census periods (1991-2006), the number of Calgary households (renters and homeowners combined) in need of affordable housing, has remained constant. Providing an appropriate supply of affordable housing is essential for attracting and maintaining a diverse workforce and is critical for economic growth and vitality.

The Guidelines describe key principles for developing affordable housing and align with Plan It, Calgary's Municipal Development Plan (MDP):

Complete communities are vibrant, green and safe places, where people of varying ages, incomes, interests and lifestyles feel comfortable and can choose between a variety of building types and locations in which to live, and where daily needs can be met. This strategy supports diversity to ensure a range of community retail and services, elementary schools, recreation facilities and community associations are more viable and accessible. The diversity within complete communities generates more choice, so that residents have the opportunity to live and remain in their own neighbourhood as their housing needs change over their lifetime.

Plan It, MDP, 2.2.4

The Guidelines encourage the development of well-designed and appropriate affordable housing. Ensuring that there is a range of housing forms, tenures and affordability for current and future Calgarians is a challenge. To assist with the challenge, the Guidelines offer key principles, practical advice and design suggestions.

The Guidelines promote a development team approach to creating affordable housing. The team will need to take a holistic approach by considering a number of key aspects including the prospective residents who will occupy the homes; site suitability & location; number of units; project financial viability; timescales; project management and project design (from conception to completion).

Strong urban design and affordable housing together can be a major contributor to the future landscape of the city. Good building design can create affordable housing that is indistinguishable in quality from private residential housing. Affordable Housing that is designed and developed in line with the principles set out in these Guidelines can contribute to the creation of complete communities and Calgary's MDP objectives.

Considerations & Lessons Learned:

The Guidelines represent current good practices, so as practices evolve, it is important to update them regularly to ensure that the content remains current and relevant. These updates could highlight new Calgary projects allowing developers to showcase their projects and to share their lessons learned with all stakeholders.

3.0 Principles

These key principles provide a positive framework for the development and design of affordable housing:



3.0 Principles

Development Team Approach

- Build and recruit team members based on the requisite project skill sets
- Seek external resources as required
- Continuously identify, evaluate and manage project risks

Financial Analyses

- Identify project capital costs, sources of funding & financing and operating costs
- Determine project viability through on-going financial modeling and analysis
- Ensure a positive cash flow

Mix + Demand & Supply

- Design the development to meet Calgary's current and future demand for Affordable Housing
- Provide a suitable mix including units that are accessible and barrier-free
- Affordable Housing works best where there is a mix of incomes
- Match building form and bedroom number with prospective residents and community

Communicate & Engage

- Communicate and Engage effectively with all stakeholders, including the community
- Provide good access to clear information early and repeatedly in process
- Identify when and where stakeholder views can be given

3.0 Principles

Location & Context

- Build developments in areas with good access to amenities and services
- Utilize sites that are appropriate for residential housing development
- Optimize the site context before designing the details
- Create developments that offer positive visual effects and relationships with the local community
- Provide a safe living environment
- Develop residential projects that complement adjacent buildings and offer open space
- Open Space enhances the residential environment
- Provide parking that is adequate, secure and cost-effective

Good Building Design

- Promote operational efficiencies and affordability by optimizing density
- Create affordable housing that is indistinguishable in quality from private residential housing
- Seek creative options for building form and alternatives to mainstream development
- Provide well-thought out and designed indoor amenity space
- Promote Universal Design and meet barrier-free / accessible requirements
- Design in flexibility/adaptability to accommodate changing needs of households over time
- Develop affordable housing that incorporates energy efficient measures & sustainability principles
- Use life-cycle costing when choosing materials.
- Create entrances that are distinct, welcoming and functional

4.0 Development Team Approach

Principles: Build and recruit team members based on the requisite project skill sets
Continuously identify, evaluate and manage project risks
Seek external resources as required

The Development Team approach can be an invaluable tool to minimize and/or mitigate risk by involving stakeholders at key decision making stages. The approach requires that the Development Team work collaboratively from project inception, through the construction phase until the building is commissioned and handed over to the operator. The Team should be comprised of members that have the necessary expertise, knowledge and resources to make the development successful. The Development Team should use a checks and balances approach to ensure that the design of the development meets the eventual clients needs, can be built efficiently (within site constraints, on time/on budget), maintains the architectural visions and promotes operational efficiencies over the long-term. The development team approach promotes accountability and provides robust information for use in subsequent financial analyses of the project. When the development team lacks expertise, knowledge or resources in a particular area, partnerships to acquire the necessary skills should be sought.

Roles and responsibilities of the Development Team's skill sets should cover the following areas:

- development of affordable housing units
- residential development
- design & architecture
- contracting & purchasing
- affordable housing management and operations
- financial management
- legal
- raising and managing government & private sector funding

Potential additional partners may include:

- non-profit organizations & housing providers
- private sector developers/builders
- municipalities
- funders
- educators
- philanthropists



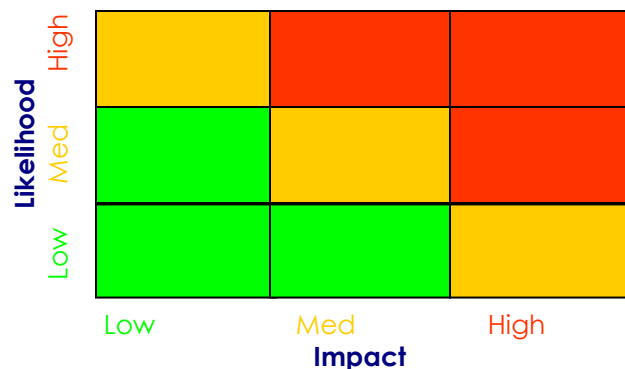
The principle behind this approach is to identify as many of the risks associated with the development as early as possible. The Development Team will apply more rigour as the project develops. Linking risks and mitigations to the financial modeling of the immediate and long term costs will assist in determining if the project is feasible. This approach helps the Development Team to determine, at the earliest possible stage, whether a project should be abandoned or more resources need to be committed to move it to the next stage. This approach also promotes creativity and innovation, which typically cannot be achieved in the middle of a project,

4.0 Development Team Approach

A Risk Management process should be used by the Project Manager / Development Team to manage risks throughout the key stages of the project. Some examples of project risk have been included in the adjacent table (left column) but they should be project specific.

Evaluation of Risks:

1. List and describe all of the likely risks that your project faces. Make the list as comprehensive as possible.
2. Assess the likelihood of each risk occurring, and assign it a rating; low, medium or high.
3. Estimate the impact on the project if the risk occurs; low, medium or high.
4. Use both these levels and the chart below to help determine the level of risk.
5. Develop a response to each risk, using the suggested management responses.



Risk levels should be re-evaluated throughout the project:

- site Identification
- prior to site purchase
- prior to development permit submission
- prior to Construction tendering
- approx 3 months prior to completion

Type of Risk	Description:	Likelihood: High Medium Low	Impact: High Medium Low	Total Risk Level: High Medium Low	Management: Avoid by... Transfer to... Reduce by... Monitor....
Client Group		High Medium Low	High Medium Low	High Medium Low	
Number of units		High Medium Low	High Medium Low	High Medium Low	
Site Constraints		High Medium Low	High Medium Low	High Medium Low	
Location Suitability		High Medium Low	High Medium Low	High Medium Low	
Planning risks		High Medium Low	High Medium Low	High Medium Low	
Timescales		High Medium Low	High Medium Low	High Medium Low	
Legal risks		High Medium Low	High Medium Low	High Medium Low	
Financial risks		High Medium Low	High Medium Low	High Medium Low	
Inspections		High Medium Low	High Medium Low	High Medium Low	

5.0 Financial Analyses

Principles: Identify project capital costs, sources of funding & financing and operating costs
Determine project viability through on-going financial modeling and analyses
Ensure a positive cash flow

It is important for the Development Team to demonstrate and prove the financial viability for both the construction and operation of the affordable housing project. A financial assessment must be conducted and the viability determined during the early stages of the development. Knowing how much it will cost to build the project (capital costs) and how much it will cost to run the building (operating costs) are critical aspects of housing development. Knowing where the money will come from to cover the costs is of equal importance.

5.1 Estimating Capital Costs

Development consultants, architects and cost consultants can assist with the determination of the capital cost for the project. Typical costs include: land, site services, construction, architect, development consultant fees, and municipal charges. Assessing the capital costs for the project should be

Considerations and Lessons Learned:

Step by Step Estimates

- **Step 1 estimate:** also called an order of magnitude, this is the first effort at determining how much a development will cost. *Step 1 estimates* may be based on typical costs e.g. \$ per sq ft or sq m. They are normally compiled with data received from industry averages or previous projects (see *Step 4 estimate* below) and can be used to choose between project options and give the Development Team a "ball park" idea of what the development may cost. Since they are based on average rates, care must be taken to add on costs associated with the project that would not be present on an average job.
- **Step 2 estimate:** is completed at the end of preliminary design work when material quantities have been established. This estimate is based on determining quantities for many key items and applying unit rates to them. *Step 2 estimates* are used to confirm the assumptions of the *Step 1 estimate*, and to seek approval for detailed design and to gain approval to move ahead with the next phase of the development. There may more than one *Step 2 estimate*.
- **Step 3 estimate:** completed just prior to tendering of the development, they are compiled using the same tools and techniques contractors employ in coming up with a price. *Step 3 estimates* will use cost information provided by suppliers and include overheads normally associated with a contracting business. It provides one more chance for the Development Team to review the expected cost of the development, before tendering begins. The Development Team has many options regarding changes to a project's scope, including cancellation of the project.
- **Step 4 estimate:** completed at project close, this estimate is based on actual costs expended on the development. The *Step 4 estimate* reflects the final completed cost of construction and is the most accurate, but least useful from the point of view of forecasting how the project will unfold. They are crucial however for feeding new costing information into the development of new *Step 1 estimates*, based on average project costs.

5.0 Financial Analyses

5.2 Financing & Funding

Adequate financing and/or funding must be secured to cover costs and to meet the timing requirements and cash-flows for the affordable housing project. Financing refers to loans or borrowed construction debt obtained from a financial institution, e.g. mortgage. Funding refers to grants, donations, contributions from governments, and/or private sector sources such as community foundations or fundraising. Sources of funding may include financial incentive programs to reduce fees associated with affordable housing or sustainable building (green) programs.

5.3 Identifying Operating Income & Expenditure

It is important to correctly identify income and expenditures in order to determine if the project is financially sustainable. Typical gross operating revenue could include rental income from:

- affordable housing unit rents
- parking (if there is a market, consider building more parking than required to provide revenue)
- laundry
- commercial space

Typical operating expenses could include:

- maintenance
- heat & utilities
- property management
- taxes
- replacement reserve

The difference between the gross operating income and the operating costs for the project is the net operating income. The net operating income identifies how much the project can afford to pay for the mortgage to secure the land or to finance construction capital. This is an early indicator of the financial viability of the project.

Considerations & Lessons Learned:

It is important to have an accurate assessment of property values, especially if the property is being used as an equity contribution, this should be determined by a land appraisal. Financial analysis is an ongoing process from project inception, design and construction through to occupancy. Decisions that result in changes to the initial budget impact financial modeling. Estimating the cost to operate the project and identifying if the proposed rents will be enough to carry the mortgage is a critical exercise. Once determined, adjustments can be made to balance revenues and expenditures e.g. adding more market units to increase rental revenue. Reductions in operating costs could be made through cost saving energy efficiency measures e.g. water reduction and electricity consumption. It is important to understand the impact that changing capital or operating costs may have on the other. Decreased operating costs can often result in increased capital costs. A cost-benefit or payback analysis is suggested.

6.0 Mix + Demand & Supply

Principle: Design the development to meet Calgary's current and future demand for Affordable Housing

Look at how the proposed type and mix of housing matches both the local community's and Calgary's demand for affordable housing. Conduct a needs analysis (formal or informal) to better determine how the proposed development will meet this need.

Housing Needs (demand) Sources include:

- wait list information from housing operators - identify applicants by type, bedroom size and length of wait
- research Briefs on Housing Need: Community & Neighbourhood Services, City of Calgary
- community profiles - most recent civic census and federal census data
- future projections of population and employment growth and housing demand (e.g. Statistics Canada, CMHC, Calgary Economic Dev.)

Housing Supply Sources include:

- local vacancy rates - 3% is considered healthy (CMHC)
- average market and median rents by building form and unit type (CMHC Rental market reports)
- typical market rents (local newspaper rental ads)
- average selling price (Calgary Real Estate Board)
- existing distribution of affordable housing
- number of housing starts and completions (CMHC)
- community Profiles (Community & Neighbourhood Services, Land-use Planning & Policy, Federation of Calgary Communities)

Identify the needs of future residents in relation to:

- level of independence
- security
- connectivity with community services
- accessible/adaptive units
- socialization
- privacy
- type of access e.g. individual and street level access
- access to indoor/outdoor amenity space

Considerations and Lessons Learned:

Reviewing the development plan to ensure that the project will meet the current and future needs of residents on a range of incomes is a valuable exercise.

The City of Calgary has Social Planning Review Committee that reviews outlines plans and provides comments with respect to the appropriateness for the residents and the community. The review highlights areas of concern such as: proximity to public transit, path connectivity, density of multi-residential developments, amenities etc.

6.0 Mix + Demand & Supply

Principle: Provide a suitable mix including units that are accessible and barrier-free

Encourage the inclusion of Universal Design features. The development should be flexible and adaptable to meet the future needs of residents. Consideration should be given to:

- Section 3.8 of the 2006 Alberta Building Code
- The City of Calgary Access Design Standards
- provincial Legislation in relation to barrier-free design (Barrier-Free Design Guide, Alberta Safety Codes Council)
- equitable use - the design must be useful and marketable to people with diverse abilities
- flexibility in use - the design will accommodate a wide range of individual preferences and abilities
- simple & intuitive to use - the design is easy to understand, regardless of the user's experience, knowledge, language skills or current concentration levels
- perceptible information - the design communicates necessary information effectively to the user, regardless of ambient conditions or the user's sensory abilities
- tolerance for error - the design minimizes hazards and the adverse consequences of accidental or unintended actions
- low physical effort - the design can be used efficiently and comfortably with a minimum of fatigue
- size & space for approach & use - appropriate size and space is provided for approach, reach, manipulation and use regardless of user's body size, posture or mobility

Considerations & Lessons Learned:

Including special design considerations can impact density, amenities and parking. Additionally, a building that is designed to be adaptable or flexible can meet the future needs of tenants over the longer term. A balance between the needs of future residents and the financial viability of the development should be achieved. Adaptable developments can contribute to complete communities allowing residents to age in place by offering increased affordable housing options. Increased options can allow existing residents to remain in their communities despite changes in their future economic or physical circumstances. The City's Municipal Development Plan, Plan It, encourages communities to include a wider variety of housing choices to avoid future population swings and to ensure long term stability.

6.0 Mix + Demand & Supply

Principle: Match building form and bedroom number with prospective residents and community

The choice of building form and bedroom number should correspond to the needs of future residents and the community so that the units will be easily marketable. A mix of bedroom types is advisable but the exact mix should be based on the demand information collected. Although the building form can dictate whether an elevator is required, residential mobility should also be considered. Occupancy standards should be consulted to determine the appropriate number of bedrooms required for families.

Building Form (This should be related to land-use bylaw definitions):

- low rise apartment
- townhouse/walkup
- medium rise apartment
- high rise apartment
- semi-detached house
- detached house

Bedroom Number:

- bachelor
- 1-bedroom
- 2-bedroom
- 3-bedroom
- 4 bedroom +

Considerations & Lessons Learned:

Housing mix is often determined on a site specific basis, due to the sites configuration or geographic location. When determining mix it is important to consider factors outside of the immediate site. For example, the range of housing diversity and choice that currently exists in the community. Some communities with limited housing options may support a development with a larger number of affordable housing units. Conversely, some sites may better suit limiting the number of affordable housing units due to the larger number of existing affordable housing units in the immediate neighbourhood.

The task of creating a development that meets the current and future demand for housing is a challenging task, it is helpful to remember that mixing incomes within the development or the community works best. The City of Calgary's Municipal Development Plan promotes housing diversity and choice through the creation of housing for all ages, income groups, family types and lifestyles. (Plan It, 2.3.1 b). This is a common approach as The City of Toronto through its Affordable Housing Action Plan (2010-2020) promotes creating housing opportunities in all neighbourhoods.

Where possible, different types of units should be dispersed throughout the building and/or site with the potential risks and impacts on the management of the units noted and considered by the future operator, e.g. being part of a condominium. Consideration should be given to creating mixed use communities by combining residential with commercial/retail. E.g. daycare in a multi-residential development for the surrounding neighbourhood.

Adequate supports are essential for ensuring housing is sustainable once it has been built or acquired. The Calgary Homeless Foundation has developed dimensions of practice for case managers working in housing and homelessness. They provide evidence for organizations who want to base their support efforts on good practices. They also have information on a Rehousing Triage Assessment Toll (RTAS) to determine who is in most need of immediate housing intervention and a Homelessness Asset & Risk Toll (HART) which is for organizations working with at risk individuals to intervene before homelessness occurs.

6.0 Mix + Demand & Supply

Principle - Affordable Housing works best where there is a mix of incomes within the development

The Development Team should determine which kind of tenure and income the development will target. Consideration should be given to the mix between ownership and rental, the mix of non-market, near-market, entry-level and market housing. The mix should be appropriate for the site and complementary to the community. There is often a range of incomes within each type of housing, (e.g. non-market rental housing is needed by a variety of households including individuals and families ranging from very low income to those who almost pay market housing prices).

The mix could include different tenure types:

- non-market rental including a mixed income approach (up to 10% below market)
- non-market homeownership
- entry-level market rental and/or ownership
- market rental and/or ownership
- mixed use (e.g. commercial & retail mixed with residential)
- cooperative rental
- cooperative ownership
- co-housing

Considerations & Lessons Learned:

It is important to identify if the development will be a mixed income project. Mixed income projects are preferable as they offer options for a range of incomes. Where possible, rental subsidy levels and the proposed income group should be identified, to assist in determining gross rental revenue. The geographical location of an affordable housing project is an important consideration. The proportion of residential housing that is considered affordable varies across Calgary. In certain areas, affordable housing represents just over 1% of all residential households, in other areas it represents just over 7% of households, with a city average of just over 3%. Pockets of affordable housing can exist within particular communities therefore, future developments should consider neighbourhood sensitivities.

7.0 Communicate & Engage

Principles: Communicate and Engage effectively with all stakeholders, including the community
Provide good access to clear information early and repeatedly in process
Identify when and where stakeholder views can be given

An appropriate communication & engagement strategy should be developed early on in the development process. Consideration should be given to the impact of the development on the community and other stakeholders even if specific planning approvals are not required. The City of Calgary's Engage Policy recognizes that decisions are improved by engaging citizens where appropriate.

Objections to affordable housing are sometimes characterized by a Not In My Back Yard (NIMBY) response but there can be valid concerns and objections that can be addressed if a proactive and open approach is taken. Dialogue with the local community is vital and it is important to understand and try to mitigate their concerns. The community (residents, neighbours, businesses) are often not aware of when and where they can give their respective views. Providing clear information early on in the process and allocating sufficient resources and time can enable effective engagement and communications. It is important that concerns are identified as individual and community opposition to affordable housing developments, can negatively impact timelines and financial budgets.

The *Human Rights Act* identifies objections based on the type of person who will live in your development as discrimination, however, valid objections or concerns may focus on:

- land use or planning principles
- level of public consultation and engagement

Considerations & Lessons Learned

Developers of affordable housing should consider whether links to other consultation processes that may be going on in the community, can be made, e.g. Area Redevelopment Plans (ARPs). The municipal planning approvals process may require statutory public engagement processes for additional individual and community engagement.

Effective communication and engagement should continue throughout the development process. Unexpected issues can sometimes arise during the construction process. It is important to start and maintain an open dialogue with stakeholders.

Consideration should also be given to developing a Communications Plan for the development after occupancy. The plan can identify key contact information for the operators of the development and can highlight practical supports to help residents successfully maintain their tenancies and enhance their quality of life. Examples of supports may include: Social Service Providers, e.g. Girls and Boys clubs, Meals on Wheels; Recreation Programs, e.g. Summer day camps; Financial Resources, e.g. budgeting, tax preparation; Health Services, e.g. healthy babies, family supports; Education, e.g. home maintenance.

8.0 Location & Context

Principle: Build development in areas with good access to amenities and services

8.1 Amenities & Services

The adjacent table provides suggested times for either transit or car to amenities/services. Sites within these times are considered favourable locations for affordable housing.

- When selecting land, look for sites near groups or corridors of amenities and services.
- Complete an analysis to identify the approximate time taken using transit and car from the proposed development to services and amenities.
- If amenities and services are located outside these times then consider putting some within the development.

	Time Taken (mins)
Transit	10 mins
Employment Centre	60 mins
Schools & Daycare	20 mins
Health Care	20 mins
Retail	15 mins
Play & Leisure	10 mins

Principle: Utilize sites that are appropriate for residential housing development

8.2 Development Feasibility

Creating healthy living environments is a primary consideration. An analysis should be conducted to determine the feasibility of developing residential housing on the site. Consideration must be given to land-use bylaws, density, massing, height and environmental impacts. The following analyses are essential:

- A cost-benefit analysis identifying site advantages and liabilities that could accrue, e.g. environmental contamination.
- An environmental assessment for sites that may require remediation. The nature of the adjacent lands should be known and the impacts on existing neighbourhoods, roadways, sidewalks, parks, open spaces and adjacent properties identified.
- A financial analysis to determine if it will be economical to develop affordable housing on greenfield/brown-field sites.
- High remediation and construction costs can seriously inflate the capital costs of a project.
- High costs coupled with lower projected rent revenues (affordable units) may make development on the site impossible. Limited rebate/grant programs may be available.
- Funding commitments must be secured for brown-field development projects.



Left: Image 1 – Developing a brownfield site for affordable housing.



Right: Image 2 - Carleton Lofts, potential for adaptive re-use

8.0 Location & Context

Principle: Optimize the site context before designing the details

8.3 Site Context

8.3.1 Selection Criteria

The nature of the development may depend on the following:

- Is the Site vacant?
- Is it an infill opportunity?
- Will it require the renovation, conversion or re-profiling of existing buildings (adaptive re-use projects)?
- Is it an acquisition?
- Physical site conditions for consideration:
 - topography, e.g. flat, hilly
 - wetland, wild life conservation area
 - drainage, flood plain considerations
 - previous site usage; contamination
 - existing site servicing
 - size/configuration
- Approved development and/or building permits
- Smart Growth considerations

8.3.2 Design Criteria

Strong urban design can act as a positive focal point in a community and should be considered as part of the community ensemble. Affordable housing can make positive contributions to a community by:

- creating a sense of comfort and security
- defining street edges and functions
- providing active building frontages e.g. retail, small offices
- integration of street design and/or redesign into a development
- providing permeability of the site through public walkways, bike paths and inviting entrances



Above: Image 3 - Optimizing the site context with low rise and medium rise housing over retail.



Above: Image 4 - Strong street frontage in an architectural rendering of a re-profiled mixed-income project.

8.0 Location & Context

Principle: Create developments that offer positive visual effects and relationships with the local community

8.3.3 Visual Impact

Calgary is a collection of communities or urban villages with shops, services, transportation links and housing forms. New developments should enhance the existing community. Existing and notable site elements / features (natural or man-made) should be protected.

External elements of the building should be coordinated, well-detailed and carefully located, e.g.

- lighting
- street furniture
- building
- street names

External elements associated with the units should be complementary, e.g.

- walls
- fences
- garages
- garbage
- drainpipes
- handrails

The site, scale and concept of the affordable housing project should fit well with the surrounding area, buildings & street patterns. Consideration should be given to:

- form
- mass
- details
- materials



Left: Image 5 - Good fit with existing area.



Right: Image 6 - Innovative design.

8.0 Location & Context

Principle: Develop residential projects that complement adjacent buildings and offer open space

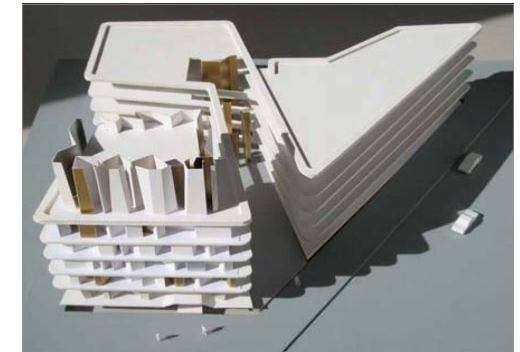
8.4 Site Layout & Access

8.4.1 Site Layout

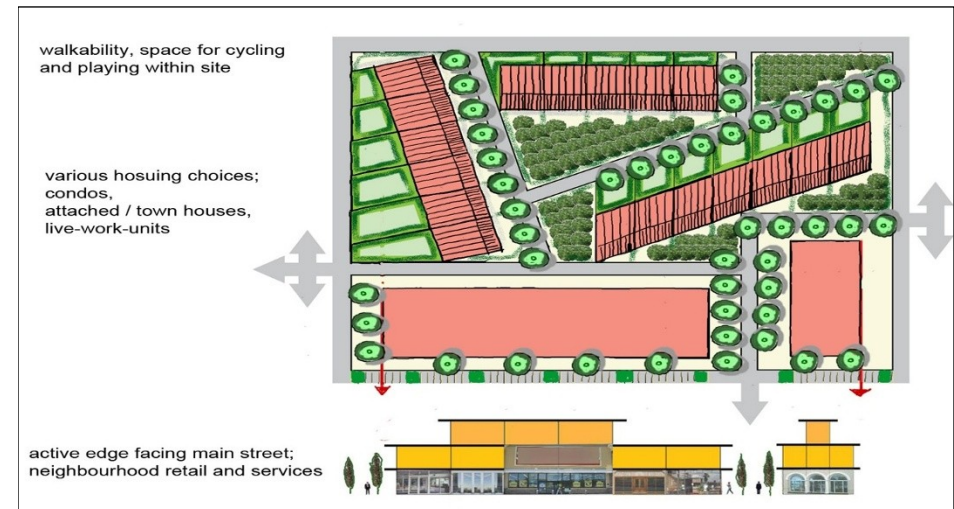
- Building placement should take advantage of site topography and should be arranged to avoid high traffic areas, noise and emissions. Design the built-form and open spaces to maximize the use of the site's configuration.
- Allow for social and community integration.
- Encourage positive urban environments by allowing for a variety of shapes.
- Break up large scale developments (>100 units) into smaller masses and open spaces.
- Consider including mixed-use such as convenience stores, employment centres and daycare centre to create active environments.
- Logical placement of garbage/recycling areas to allow for functionality and residential use.
- Unit lay-outs, within the building and common areas outside, should consider resident views and solar orientation.

8.4.2 Site Access

- It should be easy to understand how to enter the building and to move about the site.
- Walking and alternate forms of transportation such as bicycling should be promoted through the use of path networks.
- Effective signage and lighting should be used.
- Avoid complicated circulation patterns that create confusion.
- Limit the number of units that share the same access e.g. high rise buildings.



Above: Image 7 - Breaking up a larger development with circulation space.



Above: Image 8- Landscaping used to break up site, good site access and strong street frontage.

8.0 Location & Context

Principle - Provide safe living environments

8.5 Safe Living Environments

Minimize hazards and increase security for residents and visitors by:

- Incorporating adequate lighting for public and private spaces
- Utilizing "Crime Prevention Through Environmental Design" (CPTED) principles
- Creating natural surveillance by having units overlook public outdoor spaces
- Controlling building access through cameras and alarm signal devices
- Consider how the project contributes to a sense of a strong neighbourhood.



Left: Image 9 - Landscaping enclosed by garden bed as natural territorial reinforcement.



Above: Image 10 - Strong street frontage and effective street surveillance from retail at grade.

8.0 Location & Context

Principle: Open Space enhances the residential environment

8.6 Open Space

- Landscaping should be complementary to the building and the site, enhancing the image of the neighbourhood while offering practical solutions to wind protection, shading and buffering.
- Any open space provided should contribute to the sense of a strong neighbourhood and should be well-designed in shape, dimension, accessibility and location.
- Play areas for children should be strategically placed to maximize safety and to allow for parental supervision.
- Outdoor amenity spaces should complement the site's natural features and should allow for active and passive recreation to promote residential activity e.g. communal gardens.
- Adequate shared/public and private areas to meet the varying needs of residents.
- Well-defined distinction between shared/public & private open space. This can be achieved by maximizing and varying views from shared/public areas and giving areas distinct characteristics.
- Garbage/recyclables and storage areas should be sufficient, convenient and inconspicuous. Without identified and adequate storage facilities, residents may store items on entrances or balconies, compromising health and safety.
- Well-defined public spaces e.g. streets, gardens, parks and walkways.
- Adequate lighting and use of appropriate materials promotes accessibility and security.
- Consider landscaping maintenance requirements. Reducing regular maintenance and limiting irrigation through xeriscaping should be promoted.

Right: Image 11 - well designed open space,



Left: Image 12 - Play area.

8.0 Location & Context

Principle: Provide parking that is adequate, secure and cost-effective

8.7 Parking

Parking levels should be determined in consultation with the land-use by-law and the approving authority. If relaxations or changes are being requested then supporting documentation should be collected For example:

- car ownership levels
- proximity to frequent transit service
- reduced vehicle ownership rates for residents
- parking studies
- Smart Growth considerations

Parking considerations can dominate a development:

- Logical traffic circulation patterns should be determined to promote pedestrian and vehicular safety and efficiency.
- Parking areas should be secure, well-lit, ventilated and integrated into the public areas.
- Light pollution and site impacts should be minimized.
- Ground water absorption should be promoted for surface parking.
- Cross-functional usage of parking areas should also be explored to provide for additional outdoor amenity space.
- A secure bicycle storage area should also be considered during the design phase.

The costs of parking in relation to the project's capital budget should be considered., e.g.:

- If an underground facility is required to meet the parking requirements then the capital costs of the project must be carefully considered.
- The costs of this expense may prohibit development on the site.
- Alternatives to mitigate expenses such as parking relaxations, leasing out extra spaces for revenue or redesigning the site to accommodate surface parking should be explored.



Above: Image 13 - Parking that fits the urban fabric.



Above: Image 14 - Parking with thoughtful landscaping.

9.0 Building Design

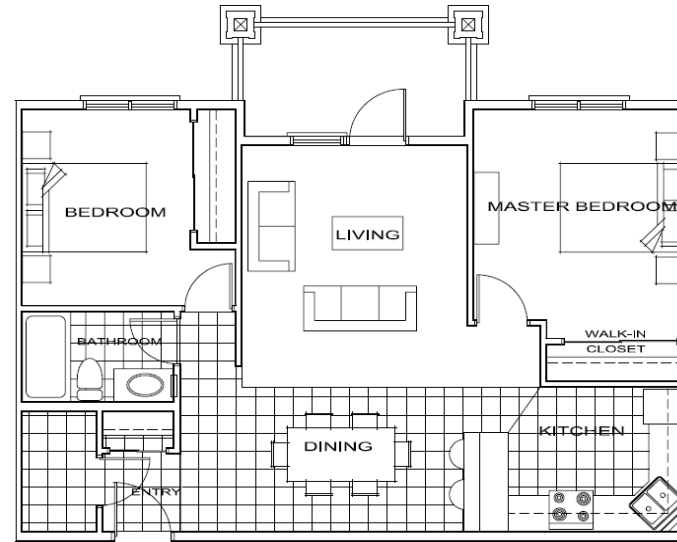
Principle: Promote operational efficiencies and affordability by optimizing density

9.1 Density

Municipal Land Use Planning & Policy and Development & Building Approval staff must be consulted to identify the appropriate number of units that the site can support.

The following should be considered when looking to promote operational efficiencies and affordability:

- Increasing the density—the number/ percentage of affordable housing units
- Creating units that are modest in size or square footage can reduce operating costs (i.e. heat and maintenance)
- The building should conform to the densities outlined in The City of Calgary's Land-use Bylaw, relevant Area Redevelopment Plans (ARP) & Area Structure Plans (ASP) and other statutory planning documents.
- Density bonus programs may be available in certain areas, along with voluntary inclusionary zoning and should be explored. Both concepts promote affordability and are desirable in urban settings.
- Density bonus programs generally allow increased floor area ratio (FAR) in exchange for providing additional non-market housing units within a project.



Left: Image 15 - Modest floor plan, average is 865 sq



Above: Image 16 - Building density aligns with ARP.

9.0 Building Design

Principle: Create affordable housing that is indistinguishable in quality from private residential housing

9.2 Quality & Integration

- The affordable housing project should be indistinguishable from other forms of residential housing, as housing is housing.
- The development should respect and enhance the existing character of residential areas while still allowing for innovative and creative designs.
- The scale should relate well to the surroundings supporting a sense of local pride, civic identity, culture and community building.



Left: Image 17 - Positively enhances site characteristics.



Right: Image 18 - Interesting in-fill.

Principle: Seek creative options for building form and alternatives to mainstream development

9.3 Building Size & Form

Small sized buildings (<20 units)

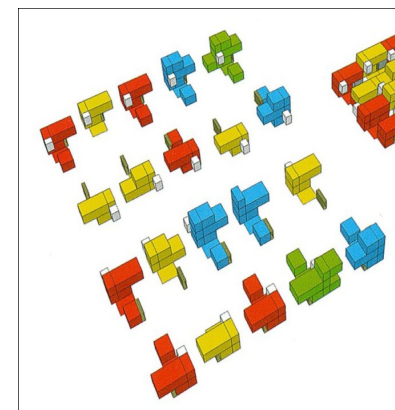
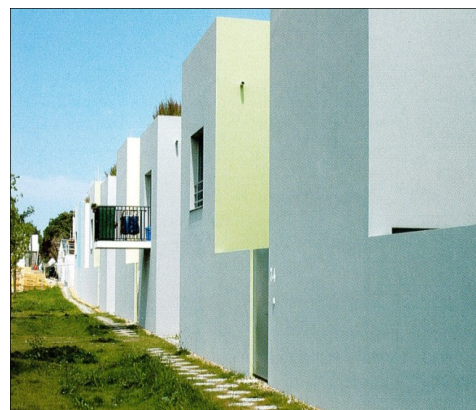
- Opportunities to be creative such as: infill on small lots, combinations with market housing, streetscape interface
- Incorporate slope, vegetation, commercial
- Integrate adjacent buildings through the reflection of building materials, shapes and uses

Medium sized buildings (40-100 units)

- When designing medium sized buildings consider being creative especially in constrained locations e.g. remnant parcels, in close proximity to traffic arteries, commercial, industrial areas.

Large sized buildings (>100 units)

- Consider providing increased density through low rise solutions by designing dense built urban forms. Forms could include prefabricated elements in clusters to include gardens, meeting and amenity areas.



Above: Image 19 - Dense low rise urban form.

9.0 Building Design

Principles: Promote Universal Design and meet barrier-free / accessible requirements.

Design in flexibility/adaptability to accommodate changing needs of households over time

9.4 Universal Design & Accessibility

- The building should be accessible to persons with disabilities.
- Accessibility requirements for the development should be identified during the design phase, meeting the Provincial Building Code requirements and The City of Calgary's Access Design Standards.



Left: Image 20 - Accessible suite, average is 946 sq ft for a 2 bed.



Right: Image 21 - Accessible kitchen.

9.5 Design in Flexibility/adaptability to accommodate changing needs of households over time.

- Consider Flexible Housing
- Design an open plan with moveable walls to accommodate a changing in function (e.g. study areas for homework)
- Place baseboards to enhance the room not restrict functionality
- Provide rough-ins where possible (e.g. in suite washer and dryer)
- Provide flexible bedroom spaces
- Design for future technology
- Provide adequate and suitable storage areas

Right & Below: Images 22 & 23 - Canuhome is an 850 sq ft residence. It is universal, accessible and adaptable to meet changing needs.



9.0 Building Design

Principle: Develop affordable housing that incorporates energy efficient measures and sustainability principles.

9.6 Energy Standards

The development should incorporate energy efficiency measures and sustainability principles. The Leadership in Energy and Environmental Design (LEED) Green Building Rating System™ and the Built Green Canada Programs encourage sustainable green building and development practices.

Consideration should be given to reducing energy consumption and capturing savings through the use of energy efficient materials and systems (integrated design process). This may also result in efficiencies in building operations and preventative maintenance.

A high standard of indoor air quality will enhance the liveability of the building for residents. Programs that provide rebates for incorporating energy efficiencies should be explored.

The following should be promoted during construction and operations:

- Recycle by establishing a formalized recycling program
- Waste reduction (diverting waste where possible)
- Consider grey water systems and other measures
- Look to reduce parking requirements
- Create bicycle storage
- Provide access to public transportation
- Low VOC and non-allergenic



Above: Image 25 - LEED™ platinum certified affordable housing project.



Below: Image 24 - The 39,000 sq. ft. project earned LEED™ Platinum certification from the Canada Green Building Council. All 20 townhouse units feature a south facing oriented private garden and a shared courtyard. It includes 2 non-market rental units..

9.0 Building Design

- **Principle: Use life-cycle costing when choosing materials.**

9.7 Materials

- Life cycle costing (LCC) is a technique to establish the total cost of ownership. It addresses all the elements of the cost of a product or service and produces a spend profile over its anticipated life-span. The results of an LCC analysis can be used to assist in the decision-making process where there is a choice of options.
- Materials should be chosen for attractiveness, performance, durability and ease of maintenance.
- Sustainable materials should be selected to reduce environmental impacts.
- The variety of materials should be carefully considered to avoid costly replacements.
- Local weather variations should be taken in account.
- **Window** design and placement should allow the maximum penetration of daylight into the dwelling units. Windows should be placed to provide architectural features. Window efficiencies should provide adequate levels of comfort and privacy.
- **Doors** should provide security, functionality and should be aesthetically complimentary. Entrances should establish a sense of arrival and should be personalized.
- **Balconies** should be practical, safe and maintenance free.



Above: Image 27 - Alberta's first Energuide rated building with an Energuide rating of 88 & it meets R-2000 criteria. Using insulated concrete forms (ICF) and triple pane windows to produce a superior building envelope. It has solar power, energy start rated appliances, water saving fixtures/toilets and a low maintenance exterior.

Below: Image 26 - Passive solar wall.



9.0 Building Design

Principle: Create entrances that are distinct, welcoming and functional.

9.8 Building Entrances

The main entrance to the building should be clear, intelligible and should create a focal point. The design should provide protection against the elements, be adequately lit, secure and accessible.

Entrances should:

- Be at grade for single family dwellings and multi-residential developments;
- Be functional (i.e. mail pick-up)
- Provide for social interactions through the use of foyers, gathering areas;
- Provide directions and identify the property manager's office and/or other key areas;
- Provide a security system such as buzzers or card readers to enhance resident safety.



Above: Image 28 - Welcoming entrance.



Above: Image 29 - Creating a focal point.

9.9 Principle: Provide well thought out and designed indoor amenity space

- For multi-residential developments, consider the provision of common rooms with a kitchenette, which could be available for resident functions (tenant meetings, birthdays, Christmas etc.)
- Consider the provision of common laundry facilities which should be on-site and at a reasonable cost.
- Including telecommunications (phone, cable, internet) in the design phase can greatly reduce future retro-fit costs.
- Consider the provision of office space for operators (property managers, administrators).
- Consider providing space (gymnasium, multi-purpose) for community groups to rent/use.



Above: Image 30 - Useable kitchen and meeting table.

Below: Image 31 - Informal comfy seating area.



10.0 Glossary

Affordable housing meets the needs of households earning 65 per cent or less of the median household income in Calgary that are spending 30 percent or more of their gross annual household income on shelter.

Aging in place is the ability to live in one's own home for as long as confidently and comfortably possible. Livability can be extended through the incorporation of universal design principles, telecare and other assistive technologies. These technologies also span categories of communication and engagement, health and wellness, home safety and security, and learning and contribution.

Amenity space Common or private, indoor or outdoor space provided on-site and designed for active or passive recreational use.

Area Redevelopment Plan (ARP) A statutory plan as defined by the Municipal Government Act, that directs the redevelopment, preservations or rehabilitation of existing lands and buildings, generally within existing areas of the city.

Area Structure Plan (ASP) A statutory plan as defined by the Municipal Government Act, that directs the future land use patterns, transportation and utility networks and sequence of development in new communities.

Brownfield site A site with the potential for redevelopment but which has been abandoned, vacant, derelict or underutilized property where past actions have resulted in real or perceived contamination. It includes parcels of all sizes from corner gas stations to large areas encompassing many properties.

Co-housing community is a type of intentional community composed of private homes with full kitchens, supplemented by extensive common facilities. A cohousing community is planned, owned and managed by the residents, groups of people who want more interaction with their neighbours. Common facilities vary but usually include a large kitchen and dining room where residents can take turns cooking for the community. Other facilities may include a laundry, pool, child care facilities, offices, internet access, guest rooms, game room, TV room, tool room or a gym. Through spatial design and shared social and management activities, cohousing facilitates intergenerational interaction among neighbors, for the social and practical benefits. There are also economic and environmental benefits to sharing resources, space and items.

Complete community A community that is fully developed and meets the needs of local residents through an entire lifetime. Complete communities include a full range of housing, commerce, recreational, institutional and public spaces. A complete community provides a physical and social environment where residents and visitors can live, learn, work and play.

Crime Prevention Through Environmental Design (CPTED) The proper design and effective use of the built environment, which may lead to a reduction in the fear and incidence of crime and an improvement in quality of life.

Density A measure of the number of dwelling units on a parcel of land, expressed in units per hectare or in units per parcel.

Flexible Housing can adapt to the changing needs of users. It includes the possibility of choosing different housing layouts prior to occupation as well as the ability to adjust one's housing over time. It also includes the potential to incorporate new technologies over time, to adjust to changing demographics, or even to completely change the use of the building from housing to something else.

10.0 Glossary

Floor Area Ratio (FAR) The quotient of the total gross floor area of a building on a parcel divided by the gross site area of the parcel. FAR is one of the measures to direct density on a site.

Housing cooperative is a legal entity, usually a corporation that owns real estate consisting of one or more residential buildings. Each shareholder in the legal entity is granted the right to occupy one housing unit, sometimes subject to an occupancy agreement, which is similar to a lease. The occupancy agreement specifies the co-op's rules. Cooperative is also used to describe a non-share capital co-op model in which fee-paying members obtain the right to occupy a bedroom and share the communal resources of a house that is owned by a cooperative organization. Such is the case with student cooperatives in some college neighborhoods in the United States.

Land Use Bylaw (LUB) The City of Calgary Land Use Bylaw 1P2007.

Mixed-use development The development of land, a building or a structure with two or more different uses, such as residential, office and retail. Mixed-use can occur vertically within a building, or horizontally on a site.

Net operating income (NOI): the difference between revenue and expenses and must be adequate to meet financing obligations (debt repayment).

NIMBY Not In My Back Yard. Refers to a position sometimes taken by individuals and communities who don't want to see certain types of development, e.g. multi-family, affordable housing in their immediate neighbourhood or community.

New Urbanism is an urban design movement, which promotes walkable neighborhoods that contain a range of housing and job types.

Smart Growth is an urban planning and transportation theory that concentrates growth in the centre of a city to avoid urban sprawl; and advocates compact, transit-oriented, walkable, bicycle-friendly land use, including neighborhood schools, complete streets, and mixed-use development with a range of housing choices.

Strong Neighbourhoods - It is generally agreed that strong neighbourhoods feature high levels of social cohesion and inclusion; good quality built and natural environments, including housing access, affordability and quality; accessible, affordable, and high quality amenities, programs and services; and positive community economic development.

Sustainability Meeting the needs of the present without compromising the ability of future generations to meet their own needs. It includes environmental, economic and social sustainability. Sustainability is defined by the 11 Sustainability Principles for and Use and Mobility, approved by Calgary City Council on Jan. 8, 2007.

10.0 Glossary

Type:

Non-Market Rental - Provides long-term, stable and affordable (subsidized) housing options for households unable to afford market housing in Calgary. The extent and focus of associated support services are matched to the needs of individual tenants.

Entry-Level Housing - Rental and homeownership housing options primarily provided by the market and provided at just below average market rents and median home sale prices. The municipality may also provide entry-level rental and homeownership housing when the need arises, and as part of a mixed-market portfolio where entry-level rents help support lower rents.

Market Housing - Rental and homeownership housing options provided by the market and provided at above average market rents and median home sale prices.

Transit Oriented Development (TOD) A compact, mixed-use community within walking distance of a transit stop, that mixes residential, retail, office, open space and public uses in a way that makes it convenient to travel on foot or by public transportation instead of by car.

Universal Design The design of products and environments to be usable by all people, to the greatest extent possible, without the need for adaptation or specialized design.

11.0 Resources & Links

Alberta Building Code, www.irc.nrc-cnrc.gc.ca/pubs/codes/abc_2006_e.html

Alberta Association of Architects: www.aaa.ab.ca/pages/public/about_assoc/pro_respons.aspx

Attainable Homes Calgary Corporation www.attainablehomescalgary.ca

Barrier-Free Design Guide (based on the Alberta Building Code, 2006), Alberta Safety Codes Council, 4th Edition July 2008

Built Green Society of Canada www.builtgreencanada.ca

BC Housing, www.bchousing.org/aboutus/publications/HPK

California Planning Roundtable, California Department of Housing & Community Development, Myths and Facts about High Density Affordable Housing, www.hcd.ca.gov/hpd/mythsnfacts.pdf

Canada Green Building Council (CaGBC) www.cagbc.org

Canada Lands Company, Community Consultation - The Benny Farm Experience, www.clc.ca/en/nr/speeches/pdf/2004/pres02182004.pdf

Canada Lands Company, Garrison Woods www.garrisonwoods.com

Canada Mortgage and Housing Corporation (CMHC) www.cmhc-schl.gc.ca

CMHC, Assessing Housing Need and Demand, www.cmhc-schl.gc.ca/en/inpr/afhoce/tore/lerc/lerc_003.cfm

CMHC, Building Your Team, www.cmhc-schl.gc.ca/en/inpr/afhoce/tore/lerc/lerc_003.cfm

CMHC, Building/Site Selection and Design, http://www.cmhc-schl.gc.ca/en/inpr/afhoce/tore/lerc/lerc_003.cfm

CMHC, Generating Community Support, www.cmhc-schl.gc.ca/en/inpr/afhoce/tore/lerc/upload/Generating-Community-Support.pdf

CMHC, Municipal Planning for Affordable Housing, www.cmhc-schl.gc.ca/publications/en/rh-pr/socio/socio063.pdf

CMHC, Need and Demand Checklist, www.cmhc-schl.gc.ca/en/inpr/afhoce/tore/lerc/lerc_003.cfm

CMHC, Project Costing and the Construction Process, www.cmhc-schl.gc.ca/en/inpr/afhoce/tore/lerc/lerc_003.cfm

CMHC, Sustainability <http://www.cmhc.ca/en/inpr/su/index.cfm>

Canadian Architect www.canadianarchitect.com

Calgary Homeless Foundation, www.endinghomeless.ca

11.0 Resources & Links

The City of Calgary, Affordable Housing, www.calgary.ca/affordablehousing

The City of Calgary, Civic Census, www.calgary.ca/portal/server.pt/gateway/PTARGS_0_2_570746_0_0_18/Civic+Census.htm

The City of Calgary, Community & Neighbourhood Services, (clicking on the right hand side of their page will take you to the community profiles and other relevant research), www..Calgary.ca/fcss

The City of Calgary, Beltline ARP, Density Bonus Program: www.calgary.ca/DocGallery/BU/planning/pdf/centre_city/beltline/beltline_plan_one.pdf

The City of Calgary, Green Building Website, www.calgary.ca/greenbuilding

The City of Calgary, Plan It: www.calgary.ca/planit

The City of Calgary, Sustainable Building Policy, www.calgary.ca/docgallery/bu/cityclerks/council_policies/amcw005.pdf

The City of Langford, British Columbia, www.housingaffordability.ca/documents/canadian/casestudies/Affordable_Housing_Program_Case_Study.pdf

Crime Prevention Through Environmental Design (CPTED) www.cptedontario.ca

Eco Density, Vancouver, British Columbia, www.vancouver-ecodensity.ca/content.php?id=15#three

Federation of Calgary Communities, www.calgarycommunities.com

Flexible Housing, www.flexiblehousing.org

Furman Institute for Real Estate and Urban Policy, New York University, www.homecomingcoalition.com/research/documents/FurmanCenterReleaseofSupportiveHousingResearch110608.pdf

Homecoming Coalition, www.homecomingcoalition.com/

Kanas Corporation www.kanas.ca

National Building Code, www.nationalcodes.ca/nbc/index_e.shtml

Norfolk Housing www.norfolkhousing.ca

Ontario Non-Profit Housing Association, www.onpha.on.ca//AM/Template.cfm?Section=Home

Ontario Non-Profit Housing Association, NIMBY Toolkit, www.onpha.on.ca/AM/Template.cfm?Section=NIMBY&Template=/CM/HTMLDisplay.cfm&ContentID=3671#kit

11.0 Resources & Links

Peel Region, Design Guidelines Affordable Housing,
www.peelregion.ca/housing/social/pdf/design-guidelines-apr-2007.pdf

Province of Alberta, A Housing Policy Framework for Alberta,
www.seniors.alberta.ca/housing/family_special/supportive_housing/PolicyFramework.pdf

Shared Learnings on Homelessness, www.sharedlearnings.org/index.cfm?fuseaction=News.FA_dsp_news&ym=2007-05

Smart Growth www.smartgrowth.org/

Smart Growth BC, Affordable Housing Policy, www.smartgrowth.bc.ca/Portals/0/Downloads/Affordable_Housing_Policy.pdf

Sothern California Association for Non-Profit Housing, Parking Requirements Guide for Affordable Housing Developers,
www.cacities.org/resource_files/24076.ParkingGuide.pdf

Statistics Canada, Community Profiles: www12.statcan.ca/census-recensement/2006/dp-pd/prof/92-591/index.cfm?Lang=E

UBC Design Centre for Sustainability, Smart Growth on the Ground, www.sgog.bc.ca/uplo/Sg5Parking.pdf

United Way, www.calgaryunitedway.org

Windmill Developments, www.windmilldevelopments.com

12.0 Images

- 1: Developing a brown-field site for affordable housing Abe Zakem House, Charlottetown, PEI
- 2: Potential for adaptive re-use. Carleton Place Lofts, St. Paul, Minnesota. BKV Group.
- 3: Optimizing the site context with low rise and medium rise housing over retail, De Citadel, City of Almere, NL
- 4 - Strong street frontage in an architectural rendering of a re-profiled mixed-income project, Don Mount Court, Toronto Community Housing Corporation.
- 5 - Good fit with existing area, Lomond, Kanas Corporation, Calgary.
- 6 - Innovative design, Mirror images, Terasse en Ville, Fantastic Stephane Maupin Architects (France)
- 7 - Breaking up a larger development with circulation space, social housing project "Dialogue", City of Rouen (France,) 2008 Frederic Borel Architect.
- 8- Landscaping used to break up site, good site access and strong street frontage. Urban Design & Heritage Group, The City of Calgary.
- 9 - Landscaping enclosed by garden bed as natural territorial reinforcement. Vida, The City of Calgary.
- 10 - Strong street frontage and effective street surveillance from retail at grade, Windmill Developments, The Bridges, Calgary.
- 11 - Well designed open space, Lothar Wiwjorra, social housing example from The City of Berlin (Germany)
- 12 - Play area, Crestwood, The City of Calgary.
- 13 - Parking that fits the urban fabric, Charles Hayden parkade, Toronto, Read Jones Christofferson , Consulting Engineers.
- 14 - Parking with thoughtful landscaping, The Natural Capital Centre Parking Lot, Portland, Oregon.
- 15 - Modest floor plan, average is 865 sq ft for 2 bed, Vista Grande, The City of Calgary.
- 16 - Building density aligns with ARP, Vida by Luxe, Calgary.
- 17 - Positively enhances site characteristics, Richmond Rd affordable housing in Ottawa, designed by James A. Colizza Architect Inc. Photographed by Martin Lipman.
- 18 - Interesting in-fill, Partage, City of Reims (France). Vers de nouveaux logements sociaux. 2009. Silvana Editoriale Spa.
- 19 - Dense low rise urban form: La Nantaise d'Abitation, City of Nantes (France).
- 20 - Accessible suite, average is 946 sq ft for a 2 bed. Vista Grande, The City of Calgary.
- 21 - Accessible kitchen in Manchester South, The City of Calgary.
- 22 & 23 - Canuhome is an 850 sq ft residence. It is universal, accessible and adaptable to meet changing needs. Designed by IWB.
- 24 - The 39,000 sq. ft. project earned LEED™ Platinum certification from the Canada Green Building Council. All 20 townhouse units feature a south facing oriented private garden and a shared courtyard. It includes 2 non-market rental units. Vento Residences, Windmill Developments, The Bridges, Calgary.
- 25 - LEED™ platinum certified affordable housing project, Chapelview, Brampton, Ontario.
- 26 - Passive solar wall, Manchester South, The City of Calgary.
- 27 - Alberta's first Energuide rated building with an Energuide rating of 88 & it meets R-2000 criteria. Using insulated concrete forms (ICF) and triple pane windows to produce a superior building envelope. It has solar power, energy start rated appliances, water saving fixtures/toilets and a low maintenance exterior. Parkhill Manor, Kanas Corporation, Calgary.
- 28 - Welcoming entrance, Social Housing , City of Waldkraiburg (Germany), 2008.
- 29 - Creating a focal point, City of Hamburg (Germany), 1920's.
- 30 - Usable kitchen and meeting table. Crestwood, The City of Calgary.
- 31 - Internal comfy seating area. Alice Bisset Place, Horizon Housing, Calgary.