Plateau Development Scheme

A Sustainable Arctic Subdivision
October 2004

Planning & Lands Department
City of Iqaluit
Nunavut

SLB Consulting
FoTenn Consultants
Marbek

CONTRIBUTORS

Funding Agencies

The City of Iqaluit would like to thank the funding agencies - Federation of Canadian Municipalities and the Canada Mortgage and Housing Corporation – for their invaluable support for their project.

Design Workshop Participants

The City of Iqaluit and the project consulting team would like to thank the following individuals, organizations and governmental agencies for their contribution to this project.

Federal departments/agencies /organizations

Grant Morrison	Canada Mortgage and Housing Corporation
Sandra Marshal	Canada Mortgage and Housing Corporation
Chris Ives	Canada Mortgage and Housing Corporation
Bill Semple	Canada Mortgage and Housing Corporation
Doug Pollard	Federation of Canadian Municipalities
John Purkis	Federation of Canadian Municipalities
Mary Anne Strong	Natural Resources Canada
Conrad Baumgartner	Natural Resources Canada
John VandeKleut	Natural Resources Canada
Ronald Alward	Natural Resources Canada
Josef Ayoub	Natural Resources Canada
Alex Taylor	Public Works and Government Services Canada

Territorial/Municipal departments/agencies

Jeanie Eseemailee	City of Iqaluit
Geoff Baker	City of Iqaluit
Rebecca Jerram	GN Department of Community and Government Services
Doug Sitland	GN Department of Community and Government Services
Peter Scott	Nunavut Housing Corporation
Lee Douglas	Nunavut Power Corporation
Jamal Shirley	Nunavut Research Institute
Jeff Wood	Nunavut Research Institute

Development community & Other organizations

Jim Little	Canada-Nunavut Geoscience Office
Michael Barton	Energy Solutions Centre
Robert Billard	Ferguson, Simek Clark
Keith Irving	Full Circle Architecture
Paul Mulak	Habitat for Humanity
Sheila Watt-Cloutier	Inuit Circumpolar Conference
Susan Spring	Iqaluit Housing Authority
Cathleen Knotsch	Inuit Tapiriit Kanatami
Stephane Gelinas	Kudlik Construction
John Laird	Laird & Associates
Glenda Zuker	Northern Properties Real Estate Investment Trust

Steve Cook	Nunastar Properties
Kim Makela	Trow Associates Inc.
Megan Torza	University of Toronto
Steve Sopinka	University of Toronto

Project Team

The project team consisted of the following individuals:

Michèle Bertol	City of Iqaluit
Steve Burden	SLB Consulting
Pamela Sweet	FoTenn Consultants Inc.
Michelle Armstrong	FoTenn Consultants Inc.
Christopher Straka	FoTenn Consultants Inc.
David Shipley	Marbek
Chrystal Fuller	CF Consulting
Debbie Nielsen	Environmental Management Services
Bill Waechter	RWDI

TABLE OF CONTENTS

INTRODUCTION

The City of Iqaluit wishes to increase the supply of land for development in the City and to apply sustainable development practices to this new development. A Development Scheme has been prepared for the development of the area known as The Plateau. The Plateau is an area identified as Future Development Area A in the General Plan (GP). The Plateau Development Scheme was approved by Council October 26th, 2004.

A Development Scheme is provided for in the *Planning Act* and is required by the GP for all Future Development Areas. This Development Scheme contains the following:

- Policy Framework
- Development Principles & Evaluation Criteria
- Development Concept Plan
- Servicing Plan
- Development and Servicing Policies
- Development Demonstration
- Implementation

The Development Concept Plan is attached as **Appendix A** and describes land uses, environmental protection areas, open space areas, watercourse setbacks, road and trail networks, and phasing of development. The Servicing Plan is attached as **Appendix B** and describes the water and sewer servicing and connection points. Road, Trail and Transit Network Plan are highlighted in **Appendix C**. Once approved, all new development must conform to the Development Scheme.

BACKGROUND

To address the growing demand for residential lots and to recognize the need for sustainable development practices, the City hosted a design charrette in May 2004 to explore different alternatives and ideas for development of the Plateau area. A *Background Report* (June 2004) was prepared by the consultant group (SLB Consulting, FoTenn Consultants, Marbek, RWDI, CF Consulting & Planning, and Debbie Nielson Environmental Management Services) to serve as an information base for the design charrette participants and the for the project in general.

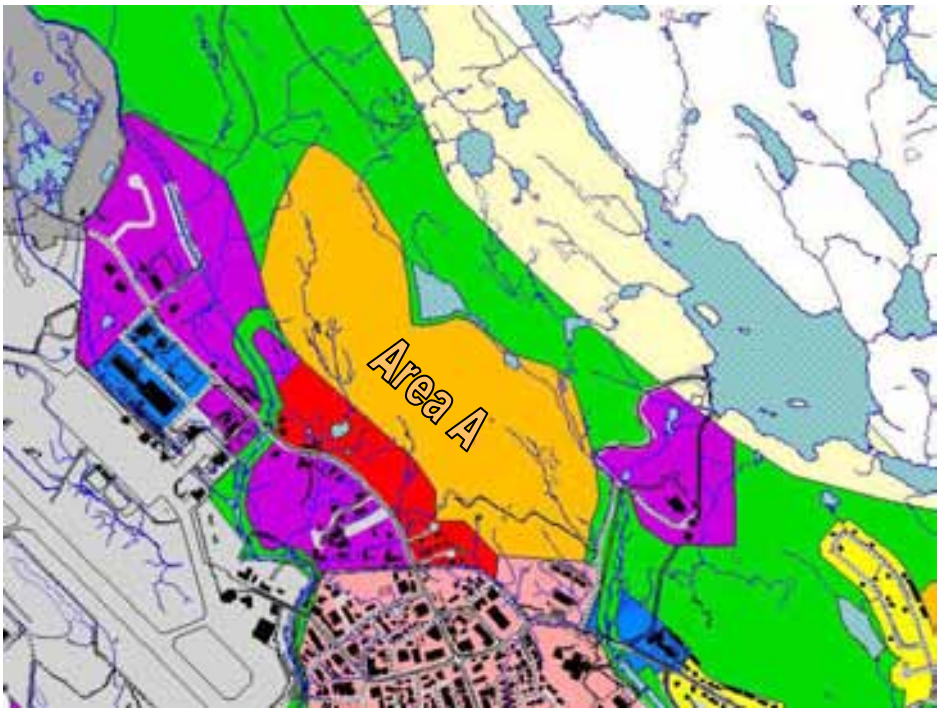
Two concepts were prepared and circulated to charrette participants, other key stakeholders, and the consulting team. Taking into account the feedback received on the two concept plans, a preferred Development Concept Plan was prepared along with development policies and recommendations to implement the Plan.

POLICY FRAMEWORK

Future Development Areas are designated on Figure B of the General Plan. A detail of Figure B is shown on the map below (Future Development Area A is shown in orange). These areas reserve land for housing, services, and employment opportunities for the future. Future Development Areas may only be developed by amendment to the General Plan, subject to the

justification of need for additional land for development and the adoption of a Development Scheme in accordance with the Development Guidelines in the General Plan (Section 8.6). A *Housing Needs Assessment* was completed in June 2004 as part of the Background Report for this project. The Assessment noted that the supply of remaining vacant lots and infill lots in the City will be fully developed by the end of the 2005 construction season. Since September 2002, over 80% of all units built, approved, or pending approval for construction are apartment units, primarily in Core Area redevelopment and residential intensification projects. The Assessment concluded therefore that new land is required to supply a greater amount of ground-oriented type housing, such as singles, semi-detached, duplex, row dwellings, and stacked row dwellings.

Section 8.6 of the General Plan contains Development Guidelines that provide design criteria and policies that must be considered in the preparation of Development Schemes. The proposed Development Concept Plan for The Plateau (Area A) responds to these guidelines.



Detail of Figure B of the General Plan No.571

DEVELOPMENT PRINCIPLES & EVALUATION CRITERIA

The City is applying sustainable development practices to the way Area A will be developed. Sustainable development integrates cultural, economic and social factors into environmental issues. Sustainable practices must therefore reflect the vision and resources of the community and consider factors such as climate, occupant use, and economics.

The development principles and evaluation criteria adopted for this project were used to guide and test the preparation of the Development Concept Plan. **Table 1** evaluates how the Plan responds to the 14 Development Principles:

Table 1: Performance of Development Concept Plan with respect to Development Principles

	Development Principle	Evaluation Criteria	Development Concept Plan
	Land Uses		
1	***Provide additional housing to meet the needs of a growing population.***	⊙ Target a build-out development potential of approximately 250 to 300 dwelling units.	✓ Development Potential is estimated at 300 units.
2	***Provide a choice of dwelling types to reflect Iqaluit's cultural diversity and socio-economic composition.***	⊙ Target 75% of the units to be ground-oriented (private entry access). ⊙ Target 15% of the units (ground-oriented) to be reserved for lower-income groups. ⊙ % of units with views to the sea.	✓ 87% of units are ground-oriented. ✓ Development Policies to support Affordable Housing are proposed and targeted at 15% of ground-oriented units, or approximately 40 units. ✓ 38% of lot area offer unobstructed views to the sea.
3	***Provide and seek opportunities for uses other than residential to be accommodated.***	⊙ Target a minimum of 10% of developable lot area for uses other than residential, such as commercial or institutional uses.	✓ 18% of developable lot area is reserved for non-residential uses.
	Environment		
4	***Protect significant environmental features both on and off site.***	⊙ Degree of protection of known or recorded environmental features.	✓ Berry-picking area, three significant rock outcroppings and the lake are fully preserved and protected.
5	***Design to respond to the local micro-climate and physical site conditions.***	⊙ % of linear roads laid out in the direction of prevailing winds. ⊙ % of lots oriented for maximum solar exposure. ⊙ Length of road where slopes greater than 10%.	✓ 75% of road length is oriented NW to SE. ✓ 41% of lot area is aligned directly N to S and the majority of remaining lots are oriented within 45 degrees of the N to S axis. ✓ Less than 300m of road exceeds a 10% slope, representing less than 9% of total

	Development Principle	Evaluation Criteria	Development Concept Plan
			road length.
6	***Reduce Greenhouse Gas emissions by reducing per capita consumption levels of key resources (water, diesel fuel, heating oil, gasoline)***	⊙ Target a 20% reduction in Greenhouse Gas emissions relative to emissions in other neighbourhoods in Iqaluit. ⊙ Target an overall 20% reduction in consumption level of key resources relative to current average consumption rates in the Iqaluit.	✓ Subdivision design and development policies that require a basic 'Lot Development Standard' for all buildings will achieve a 20% reduction in GHG emissions and a 20% reduction in water consumption.
7	***Reduce generation of wastes (wastewater, solid waste, construction waste)***	⊙ Target a 20% reduction in the generation of wastes.	✓ Wastewater will be reduced by reducing water use. Further strategies for reducing construction waste could be explored.
	Movement		
8	***Ensure safe movement systems within the neighbourhood.***	⊙ Degree of intermodal conflict mitigation measures.	✓ Clearly defined separate routes for snowmobiles, pedestrians and vehicles will result in low conflict. Cluster housing opportunities will help to centralize building services.
9	***Integrate neighbourhood movement systems with community-wide network to provide convenient access to key community destinations, the beachfront, and the land.***	⊙ Degree of accessibility to and overall efficiency of the Walking Trail network from all buildings in the development. ⊙ Degree of accessibility to and overall efficiency of the Snowmobile Trail network from all buildings in the development. ⊙ Degree of accessibility to and overall efficiency of the existing road network from all buildings in the development.	✓ 98% of lots adjoin either a Walking Trail or an Open Space area. ✓ No lot within the neighbourhood is further than 200m from a designated Snowmobile Trail. ✓ The road network provides alternate routes for emergency access and provides road access to all lots in the development.

	Development Principle	Evaluation Criteria	Development Concept Plan
	Neighbourhood Identity		
10	***Ensure a sense of identity in the neighbourhood while being socially integrated into the community as a whole.***	⊙ Number of unique features/focal points/characteristic elements in the neighbourhood.	✓ 6 features have been identified as significant features, 4 of which are natural features (lake and 3 rock outcroppings) and two community focal points (a public square and picnic area).
11	***Provide recreational opportunities for residents.***	⊙ Meet or exceed General Plan target of 100m2 of playground space per 30 to 50 households, with maximum 300 metre walking distance. ⊙ Number of other opportunities for recreation.	✓ There are three playground spaces identified (Phase 1 – 290m^2, Phase 2 – 4524m^2, Phase 3 – 330m^2) for a total of 5,054m^2, with a maximum 300-metre walking distance from each lot. ✓ Snowmobile and Walking Trails are provided throughout the subdivision. ✓ A majority of the land is designated Open Space providing informal or passive recreational opportunities.
	Economic		
12	***Provide a flexible, feasible and phased development concept that can spread sustainability improvements over the build-out period in order to reduce financial risk to City as the prime developer.***	⊙ Degree of phasing opportunities represented by the concept plan. ⊙ Degree of financial risk to the City represented by the concept plan. ⊙ Ease of implementation of the Concept Plan as measured by the potential obstacles to implementation.	✓ Upper Plateau and Lower Plateau development areas are phased separately providing 5 phases of development. ✓ The phasing of development and enhanced development requirements to support sustainability objectives are increasingly phased in over time to reduce financial risk to the City (20%, 33%, and 58% of residential lot area for Phase 1, 2, and 3 respectively). ✓ There are few major obstacles to development except for the requirement

	Development Principle	Evaluation Criteria	Development Concept Plan
			for relocation of the geomagnetic laboratories and land issues with Arctic College regarding Lower Plateau.
13	***For all infrastructure (eg. roads, water, sewer, power) decisions examine life cycle costing to operate the system for the expected lifetime.***	⊙ Degree to which total life cycle costs (initial purchase, transportation, installation, operation, maintenance) are reduced. ⊙ Linear length of developable frontage in relation to linear length of infrastructure.	✓ Infrastructure decisions have focused to a greater degree on life-cycle costing than conventional subdivision design in Iqaluit with the intent of reducing operating and maintenance costs to the City and future residents. ✓ For each linear metre of developable frontage, approximately 0.9 metres of linear infrastructure is required.
14	***City to develop industry/expertise in cold climate sustainable techniques.***	⊙ Extent to which existing knowledge and expertise is applied. Improved, promoted and marketed.	✓ The Plan supports the development of local expertise and knowledge. This will need to be monitored to understand and measure the long-term positive impacts.

DEVELOPMENT POLICIES

The following development policies will apply to the lands identified on the Development Concept Plan in **Appendix A**, the Servicing Plan in **Appendix B**, and the Road, Trails, and Transit Networks Plan in **Appendix C**.

Geomagnetic Laboratories

Natural Resources Canada currently operates two geomagnetic laboratories in the proposed development area, approximately 250m northwest of Arctic College. These laboratories require a minimum development buffer of 100m and direct line of sight with the Government of Canada building. The City is working in collaboration with NRCan to relocate these facilities. A new location has been confirmed and the facilities will be relocated prior to development of the subdivision. This Development Scheme assumes their satisfactory relocation so that their buffer requirements do not impact the development of this site.

Phasing of Development

The preferred Development Concept Plan provides the opportunity for approximately 300 housing units over all development phases. Approximately 260 of the housing units, or 87% of the total, are ground-oriented which provides private entry access to each unit. Two distinct development areas are identified on the Development Concept Plan – Upper Plateau and Lower Plateau – as shown on **Appendix A**. The Upper Plateau and Lower Plateau may be serviced separately and therefore the timing of development for each will be according to the City's needs.

The Upper Plateau is divided into three phases. The anticipated number of units for each of these phases reflect the General Plan targets for average annual supply of housing units needed to meet the City's 2022 population projection.

The Lower Plateau delivers a smaller developable area, however, has been divided into two phases given the uncertainty regarding the feasible development of Phase 2. Given the cost of lot development in this area, the development of Phase 2 would likely only proceed as part of a road infrastructure project in which it was determined that it is desirable to establish a road connection between Federal Road and the Upper Plateau development. The phasing therefore permits Phase 1 to be developed as a cul-de-sac independent of Phase 2 and a road connection to Federal Road.

Development Standards

Basic lot development standards are proposed for all development on the Upper and Lower Plateau. In addition, a number of lots on the Development Concept Plan (Appendix A) have been identified with an overlay which indicates 'Enhanced Development Requirements'. These

lots will need to achieve higher development standards than the other lots. The number of lots identified with enhanced requirements increases through the various phases of development, reflecting the anticipated increase in local builder capacity and expertise to achieve higher standards of development.

Table 2 outlines the basic development standards that will apply to all development on the Plateau – the 'Plateau Lot Development Standard'. This includes site layout considerations, building design, and building systems. A discussion of the proposed building system standards is described below. **Table 3** provides a summary of the standard and enhanced requirements for various designations through each phase of development. A description of the standards referred to in this table – R-2000, MNECB, and LEED – are all described below.

It should be noted that the City will review all development standards on Enhanced Development Requirement lots as phasing of development proceeds. Targets will be revised and set prior to development of each additional phase to reflect the availability of technologies and local expertise.

Building Systems Standard

There are a number of prescriptive measures described in the Plateau Lot Development Standard to reduce energy and water consumption.

- **ENERGY STAR ® qualified windows**: Windows can be a significant source of heat loss in a home or building. ENERGY STAR qualified windows will save money by reducing overall energy costs. They will also help keep the home or building more comfortable year-round, reduce outside noise and may have a lot less condensation in cold weather compared with a conventional product. These windows qualified by the Natural Resources Canada EnerGuide program. EnerGuide is the official Government of Canada mark associated with the labelling and rating of the energy consumption or energy efficiency of household appliances, heating and ventilation equipment, air conditioners, houses and vehicles.
- **Water saving devices:** Plumbing fixtures are required to meet the specific criteria outlined for toilet, showerhead, and faucet fixtures. This standard it intended to reduce the amount of water consumed on a daily basis in the building. The values chosen reflect both desired performance and market availability and are based on the R-2000 standard.
- **Oil-fired water heaters:** Oil-fired water heaters are specifically targeted over electric water heaters since fuel burned in the home is far more efficient than fuel burned at the diesel generating station and then transmitted to the home.
- **Heat Recovery Ventilators (HRV):** An HRV, air-to-air heat exchanger, is a mechanical ventilation device that helps make a home healthier, cleaner and more comfortable by continuously replacing stale indoor air with fresh outdoor air. HRVs are set apart from other mechanical ventilation devices by their ability to exchange heat between the supply and exhaust air streams, which in turn reduces the cost of heating or cooling the healthy fresh air that circulates through the home.

R-2000 Standard

The R-2000 energy standard, defined by Natural Resources Canada, is used as both a guideline and a required development standard throughout the various development phases. R-2000 is a prescriptive standard that specifies a set of construction measures that must be included in a home in order for it to qualify. Technical requirements of the R-2000 Standard

include measures for the efficient use of energy, improved indoor air quality and better environmental responsibility in the construction and operation of a house. The R-2000 Standard is not a substitute for the National Building Code or any other applicable building codes. Only licensed R-2000 builders can construct R-2000 certified homes. R-2000 trained builders are required to register, build and certify an R-2000 Demonstration Home before they can become licensed. The R-2000 standard is subject to revision and it is intended that updates to the R-2000 standard will be reviewed and adopted through the phases of development.

Model National Energy Code for Buildings (MNECB)

All *Mixed-Use* lots are required to meet the Model National Energy Code for Buildings (MNECB), which is a well-established standard for basic energy performance in buildings. This standard establishes minimum standards of construction for building components and features that affect energy performance. Specific requirements vary by building type (or purpose) and by region of the country. MNECB is designed to work well with the National Building Code. Programs to encourage greater energy efficiency in Canada's commercial buildings often take the MNECB as their basis. The Commercial Building Incentive Program (CBIP), for example, requires a building designer to show that a building will consume at least 25% less energy than a similar building constructed according to the MNECB. Experience has shown that this level of energy performance is readily attainable using well-established design techniques, and that the resulting improvements are financially attractive.

Leadership in Energy and Environmental Design (LEED®)

All *Community Use* and *Core Area Use* lots are required to achieve the Leadership in Energy and Environmental Design (LEED®) certification. In addition to energy efficiency, LEED takes into account siting issues, water use efficiency, materials and resources used in construction, and indoor environmental quality. LEED awards points for meeting specific performance criteria that outperform typical standard practice. These are confirmed by an independent review and audit. Depending on the number of points awarded, a building can attain basic LEED certification, or Silver, Gold, or Platinum levels. There is now a LEED standard specific to Canada (Canada Green Building Council), with energy requirements that are harmonized with those of CBIP.

Table 2: Plateau Lot Development Standard

PLATEAU LOT DEVELOPMENT STANDARD
Site layout
• Opportunities for passive solar heating of living spaces will be realized by requiring that the building façade with the most window area be **south facing ±30 degrees** (ie. 150º to 210º).
• **Building entrances** should avoid facing the northwest prevailing winds since these will have the highest potential for cold air infiltration into the building. Where an entrance must face NW, a wind screen will be constructed.
• All ground-level units in the medium density designation will be required to have an **enclosed storage** area on the lot. The storage area may be attached to the principal dwelling or may be in an accessory building on the lot.
• The use of **gravel fill** shall be minimized on all lots. Any area on the lot not being used for vehicular parking, access to parking or accessory building, shall not be filled and shall be retained as natural tundra.
• **Shared driveways and building services** (eg. garbage storage & oil delivery areas) shall be incorporated into site layout for residential lots containing 2 or more units, where feasible. Adjoining residential uses will be encouraged to share driveways and building service areas
Building Design
• **Wind exposed buildings** should be designed to allow wind to flow underneath the building to avoid snow drifting directly against building faces (i.e. no solid skirting or enclosed storage below buildings). Exceptions may be granted by the Development Officer where the applicant can demonstrate through a snow study that downwind effects are minimized through site layout and building design.
• A **wind study** shall be required for all buildings three or more storeys in height, or with a length greater than 25m, or with a gross floor area greater than 500m^2.
• **Buildings** shall be designed to respect and respond to the topography of the site. Stepping of the building to reduce massing and excessive pile height will be required.
• Residential units shall be encouraged to maximize solar exposure and views to the sea in **active areas** (such as the living room and kitchen). **Passive areas** in which light, views and heat are less important (such as storage areas, utility rooms, and bedrooms) should be located towards the building's northern facades. Avoid placement of **accessory buildings** in front of south-facing windows, where possible.
• All ground-oriented residential development shall incorporate **wind lock entries** (vestibules) into dwelling unit design to help

PLATEAU LOT DEVELOPMENT STANDARD

prevent energy loss and to provide storage space, particularly to support land-based economy activities.

- Multi-family buildings may not use an **interior corridor** to double load units on either side of the corridor to ensure there are no north facing units. Common stair accesses will be encouraged.

Building Systems

- All windows installed must be **ENERGY STAR® qualified windows** under the Natural Resources Canada (NRCan) EnerGuide Program.
- All buildings will use the following water saving devices:
  - All toilets to be water-saver or **ultra-low flush toilet** units using 6 litres/flush (1.3 imp. gal./flush) or less.
  - All showerheads to be **low-flow showerheads** using 9.8 litres/min. (2.2 imp. gal./min.) or less when tested at 551 kPa (80 psi).
  - All washroom and kitchen **faucets** to use 8.3 litres/min. (1.8 imp. gal./min.) or less when tested at 413 kPa (60 psi).
- All buildings will use **oil-fired water heaters** instead of electric water heaters.
- All buildings will use **Heat Recovery Ventilators** (HRV) as a ventilation standard.
- No buildings shall be permitted to have **electric baseboard heating** as the primary heating system.
- Development may consider **alternative servicing** arrangements where feasible and subject to the approval of the Director of Engineering.

Table 3: Phasing of Standard and Enhanced Requirements for Lot Development on the Plateau

PHASE	*STANDARD*	*ENHANCED REQUIREMENTS*
PHASE 1 ***(Upper Plateau & Lower Plateau)***	✓ 'Plateau Lot Development Standard' ✓ All lot development will encourage the use of the **R-2000 standard as a guideline**. ✓ All development on *Mixed Use* lots to achieve **Model National Energy Code for Buildings (MNECB) + 25%.**	✓ 'Plateau Lot Development Standard' ✓ Development to achieve **R-2000 certification**. ✓ All appliances installed must be **ENERGY STAR® qualified appliances** under the Natural Resources Canada (NRCan) EnerGuide Program.

PHASE	***STANDARD***	***ENHANCED REQUIREMENTS***
	✓ All development on *Community Use and Core Area Use (Capital District)* lots to achieve **LEED® certification**.	
PHASE 2	✓ 'Plateau Lot Development Standard' ✓ All lot development to achieve **R-2000 certification**. ✓ All development on *Community Use* to achieve **LEED® certification**.	✓ 'Plateau Lot Development Standard' ✓ Development to **exceed R-2000 certification** requirements (targets to be reviewed and revised at initiation of Phase 2 according to new standards). ✓ All appliances installed must be **ENERGY STAR® qualified appliances** under the Natural Resources Canada (NRCan) EnerGuide Program.
PHASE 3	✓ 'Plateau Lot Development Standard' ✓ All lot development to **exceed R-2000 certification** requirements (targets to be reviewed and revised at initiation of Phase 2 according to new standards). ✓ All development on *Community Use* lots to achieve **LEED® certification**.	✓ 'Plateau Lot Development Standard' ✓ Development to **exceed R-2000 certification** requirements (targets to be reviewed and revised at initiation of Phase 2 according to new standards). ✓ All appliances installed must be **ENERGY STAR® qualified models** under the Natural Resources Canada (NRCan) EnerGuide Program. ✓ Development to employ **alternate sewage** treatment facilities. ✓ Development to contain a **renewable energy** component to the building's annual energy requirements and will target a level of energy production based on the capacity of available technologies.

Land Uses

Land uses defined on Appendix A are conceptual and may be changed without amendment to this Plan, as long as the proposed use is consistent with the land use designation on Figure B of the General Plan. Changes in land use may require an amendment to the Zoning By-law.

Residential – Low Density

Residential – Low Density refers to single-detached, semi-detached, and duplex type dwellings. Buildings will be restricted to two storeys in height.

Residential – Cluster Development

All lots that are identified with a '**Cluster Development**' symbol provide an opportunity for clustered housing. Opportunities for cluster housing are provided in all phases of the Upper Plateau development. Cluster type developments will be governed by performance-based zoning as set out in the Zoning By-law. In this way, site-specific development will be evaluated on a set of performance criteria. Clustering results in lower land and servicing costs per unit, can reduce exposure to extreme weather conditions, and creates an enhanced sense of community. All cluster lots offer views of open space or the sea to provide opportunity to create a feeling of visual privacy. Development will be restricted to ground-oriented building forms. A cluster development is demonstrated in the Development Demonstration section.

Residential – Medium Density

Residential – Medium Density refers to ground-oriented multi-family housing forms such as fourplexes, sixplexes, row dwellings and stacked row dwellings, but do not include apartment type units.

Mixed-Use

Mixed-Use refers to buildings that include a mix of commercial and residential uses. The residential component would be considered apartment type units located above the ground floor of the building. The *Mixed-Use* lots are oriented to maximize solar exposure and to minimize impacts on development on their northern side. The *Mixed*-Use lots are situated in high activity areas at the main entrance to the Upper Plateau and close to activity areas in the Upper Plateau (Phase 1). *Mixed-Use* development is restricted to a maximum of four storeys in height, but may be restricted further in the Zoning By-law according to the location.

Community

Community refers to buildings that provide a community service. The range of uses would include educational, recreational, and other institutional type uses, government services, daycare, place of worship, arts studio. It is intended that these buildings could incorporate a residential component. *Community* lots are located in prime locations that offer good solar orientation, views to the sea, relatively flat building sites, and close proximity to primary roads or intersections. *Community* development is restricted to three storeys in height.

Special development conditions will apply to the *Community* designated lot closest to the Power Plant located in the Upper Plateau – Phase 1 area:

- Piped municipal servicing is not proposed to this lot, therefore alternative servicing will be needed, subject to the approval of the Director of Engineering.
- Design and use to address noise impacts from adjacent power plant.
- Design must consider opportunity for energy intensive use that can employ waste heat from the power plant.

Core Area Use

Core Area refers to uses permitted in the Core Area as defined in the General Plan No. 571. These uses include government office, cultural/community/arts centre and limited residential development.

Public Recreation Space

Three neighbourhood **playgrounds** are proposed. Two would be targeted to younger children with play equipment – that in Phase 1 (Upper Plateau) across from the community focal point and a second in Phase 3 (Upper Plateau). Both of the locations are centrally located with good visibility. The last park is intended as a playing field and would be targeted to youth. This park is less centrally located, but still has good visibility from the road.

Phase 1 of the Upper Plateau identifies a **public gathering space** at the tip of the triangular *Community* lot. It is intended that a sculpture or other type of landmark be commissioned by the City to define this public space as a gathering place within the neighbourhood. At the division between Upper Plateau Phase 2 and 3, a **picnic area** has been identified, which ties into the Walking Trail network.

Public Open Space

The majority of land in the Plateau Area is designated Open Space. The Open Space area includes the berry picking that was identified in the City's Cultural Resources Mapping exercise, significant natural features, the 30m setback from major watercourses, and areas where the slope is too steep to consider development. This area will thus remain undeveloped.

A necklace of **significant features** have been identified on the Development Concept Plan within the Open Space area and will be protected from development. The features include a ring of three significant rock outcroppings that provide excellent lookouts and the lake. Convenient walking access to these features has been preserved in the lot layout and it is intended that walking trails be constructed when funds are available.

Affordable Housing

The City intends to improve access for lower income groups to home ownership. Currently home ownership is largely limited to those able to buy, build and maintain a single-detached.

Approximately 15% of the proposed ground-oriented units, or approximately 40 units, will be targeted to lower-income groups.

Watercourse Setbacks & Drainage

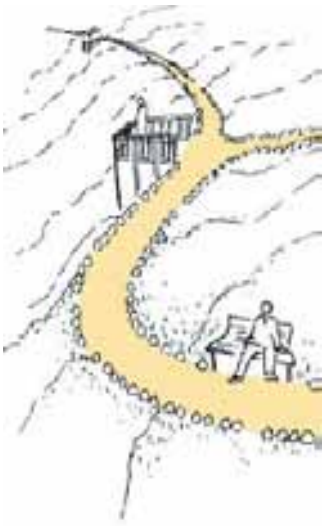
The General Plan prescribes watercourse setbacks for any lakes or streams within a development area. The Upper Plateau features a lake approximately 1.5 hectares in size. A 30 metre watercourse setback from the lake is reflected on the Development Concept Plan.

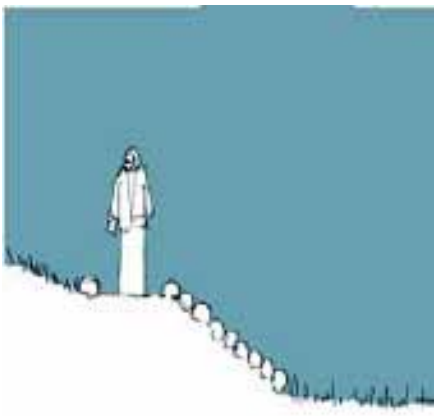
Existing spring run-off drainage courses have been integrated into road design and alignment where possible to avoid seepage on development lots. A drainage area in Phase 1 has been retained and incorporated as a design feature. It is recommended that drainage be identified on the subdivision plan to ensure proper drainage control measures are put in place at the time of lot development.

Walking Trails

A **Primary Walking Trail**, as shown in **Appendix C**, will serve residents of the neighbourhood on a daily basis as the primary pedestrian access route to Arctic College and the Core Area. The Primary Walking Trail will also provide visitors to the community with a recreation opportunity and draw visitors to the neighbourhood. The Primary Walking Trail links to the main road in the subdivision and to a neighbourhood public space where a bus shelter is also proposed. It is intended that the Primary Walking Trail link to the walking trail being constructed between the future Nunavut Justice Centre and the main Arctic College building. It is recommended that the City explore opportunities with the GN to link the trail providing access for the Plateau and for the College campus in general. The need for stairs (grades greater than 15%) would be minimized in the final trail design to reduce maintenance costs. Surface hardening and trail markers would establish the route and guide visitors. The Primary Walking Trail will be constructed in Phase 1 of the Upper Plateau development.

Secondary Walking Trails are also identified that will connect with the Primary Walking Trail. The Secondary Walking Trails include established pedestrian corridors which bisect neighbourhood blocks. All pedestrian trail design in the neighbourhood will incorporate measures to discourage snowmobile use and minimize intermodal conflict (i.e. tall bollards, boulders, trail markers). The trail network has been designed with trailheads at road ends to facilitate access.

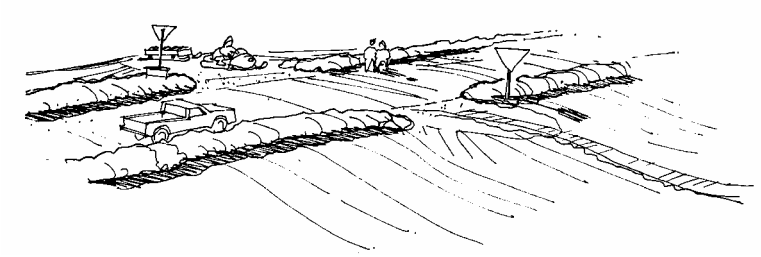




Source: Core Area & Capital District Plan, August 2004

Snowmobile Trails

North-south and east-west **Snowmobile Trail** links are provided as shown on **Appendix C**. It is intended that an east-west route traverse along the northern edge of the Upper Plateau and between Phase 1 and 2 of the Lower Plateau development to minimize pedestrian and snowmobile conflicts. Snowmobile crossings across key roads would need to be properly identified to improve their safety and to avoid piling snow in these areas.



source: Core Area Secondary Plan, 1998

Transit

Transit service is an essential component in providing transportation choice. A loop extension to the City's existing bus transit service is proposed. The extension would connect via Saputi Road from the existing service along Niaqunngusiaq Road, as shown in **Appendix C**. In Phase 1, it is proposed the bus will travel along the lower road and complete a loop before returning along the same road. A stop with bus shelter is proposed at the tip of the triangular *Community* lot intersection where a public space and trailhead are located. In Phase 2, the loop would be expanded with a stop and bus shelter at the edge of the Phase 2 development along the main road. Additional stops are recommended when and where demand emerges (e.g. playing field, mixed use intersection). Bus stop locations are to be reviewed with bus operators.

Roads

Road layout maximizes accessibility while considering prevailing winds, solar orientation and the topography of the site. None of the roads within the neighbourhood (after build out) will terminate in a cul-de-sac. This ensures ease of movement for citizens and maximizes access for service and emergency vehicles. The major roads are aligned with the prevailing wind patterns to minimize snowdrifiting and thus snow removal operations. The connecting roads are aligned to maximize solar orientation of the lots to improve passive solar heating. Roads respond as much as possible to topography to minimize the need for grade modification. Road layout also takes advantage of existing grade separation to present terraced building lots which maximizes solar exposure and provides desirable views.

The road network will be utilized by not only the automobile, but also by pedestrians and snowmobiles to a certain extent to access trailheads. Notwithstanding road allowance standards in the General Plan, most roads in the development will be designed with a road allowance width of 18 metres and a roadbed width of 8.5 metres. The roadbed width will allow sufficient space for automobiles, pedestrians and snowmobiles to coexist safely. Pedestrian

and snowmobile use of the roads, however, will be reduced by the walking and snowmobile trail networks. Access roads that do not have lots fronting on them will be designed with a road allowance width of 16 metres and a roadbed width of 7.0 metres as land adjacent to these roads will not generate the same degree of pedestrian or snowmobile traffic. The narrower road section will reduce the required quantity of aggregate by approximately 15%.

The standard road section in recent subdivisions has been approximately 1.5 metres high. This requirement is based on recommendations to promote permafrost in the native material below the road to provide a stable sub-base. In the study area, it is recommended that a geotechnical investigation be undertake to determine the stability of the native material. This will allow the road structure to be designed based on the stability of the soil, and will allow the road depth to be reduced in areas with a stable sub-base (i.e. rock). This will result in a net reduction in the quantity used, reducing the demand on the resource, the capital costs of the roads, and the impact of sand and gravel on the surrounding environment. In addition, the geotechnical investigation may identify areas of ice-rich terrain that are potentially vulnerable to thaw induced subsidence.

Asphalt treatment is proposed on Saputi Road between Niaqunngusiaq Road and the entrance to the Upper Plateau development to improve safety (10% grade on road), to eliminate the raising of dust, and reduce road maintenance costs for the City. The remaining roads will be gravel.

Servicing

The development will be serviced via utilidor, water mains and sanitary sewers, except for a portion of Phase 3 of the Upper Plateau which will only be serviced with water and one lot in Phase 1 of the Upper Plateau which will have no servicing. Servicing is illustrated on Appendix B. Utilidor servicing will provide fire protection throughout the development, avoids the need for trucked services, and allows additional time for alternate servicing technologies to be further investigated and proven in Iqaluit.

The area of Phase 3 which is outside of the limits which can be serviced by gravity sewers is to be serviced by alternate methods for sanitary sewage disposal. This may include grey water recycling or on-site treatment. As this area will not be developed for several years, these technologies will have been improved and proven, and their use will be better supported when the area is developed.

The use of low flow water fixtures required in the lot development standards will significantly reduce the water consumption rates and will therefore result in a reduced water bill for the consumers, and reduced subsidization by the City. The lower water consumption will also extend the life of some of the City's major infrastructure (i.e. the water treatment plant, water storage, and sewage treatment), thereby delaying the required capital expenditures to upgrade or replace this infrastructure.

It has been reported that there is a potential for the City to reduce their water reheating costs by approximately 25% by adjusting the operating temperature set points in the reheat stations. The design of the water distribution system for the proposed development will provide operating set points to minimize the reheating costs to ensure these saving are realized. It is also recommended that the City pursue the opportunity to utilize the waste heat from the Generating Station as the primary heating source for the proposed reheat station.

DEVELOPMENT DEMONSTRATION

The following 3 figures (Figures 1, 2 and 3) demonstrate conceptual site plans for lots within 3 areas typical of the subdivision as a whole. These site plans demonstrate the relationships between adjacent buildings, and highlight elements of site design that should be incorporated to ensure the achievement of this plan's principles.

A dot-hatch used in the Figures delineates the bounds of a service area that will accommodate vehicle parking and garbage storage. It is intended that gravel imported to the lots be limited where possible to this area, to minimize disturbance of the existing landscape.

A line-hatch used in the Figures delineates the location of entry and storage areas within each dwelling. It is intended that primary entrances, storage areas and utility areas be located along the north, north-eastern, or north-western facades of buildings within the development, to maximize views from, and solar penetration to living areas of dwellings. Where entrances must face NW, a wind screen would be constructed.

Building siting shown in the Figures maximizes solar exposure and views south to the sea. Wherever possible, buildings are offset so that side yards on one side of a roadway do not align with side yards on the opposing side of the roadway. Views and solar exposure are also enhanced by the grade change that occurs through most of the subdivision, as illustrated by the section in Figure 1. This section also serves to illustrate the extent of shadows cast by buildings at noon on the summer and winter solstice, as well as the shadow cast at noon on the spring and fall equinox.

Figure 1 illustrates hypothetical site plans for lots within Phase 2, designated for low and medium density residential development. The standard low density interior lot size of 20 metres by 25 metres allows for dwellings that will include both detached and semi-detached dwellings. The standard low density interior lot size of 30 metres by 25 metres allows for dwellings that will include both detached and semi-detached homes. The standard medium density interior lot size of 30 metres by 25 metres allows for a variety of dwellings including 4 unit row homes as illustrated.

Figure 2 illustrates a hypothetical site plan for a low density residential cluster lot within Phase 1. The intent of this large site is to encourage the construction of lower density residential building forms at a density higher than the norm in Iqaluit, by using shared service, parking and amenity areas (both indoor and outdoor).

Figure 3 illustrates hypothetical site plans for a row of lots in Phase 1 designated for low density residential development. Although the width of the lots is of standard size the depth of the lots is shallow relative to the convention in Iqaluit. Strips of lots on the periphery of the subdivision have are of a reduced depth to maximize development potential within the subdivision. Issues generally related to smaller lot sizes (such as cramping,) are negated in the case of the exterior lots by the fact that all of the smaller lots are located either at the crest of the slope separating the upper and lower phases, or along an open area such as a watercourse setback. Since the land adjoining the rear lot line of these smaller lots can not be developed, these lots will always offer expansive views to the sea or over the tundra that will create an enhanced sense of space around new development.

Figure 1

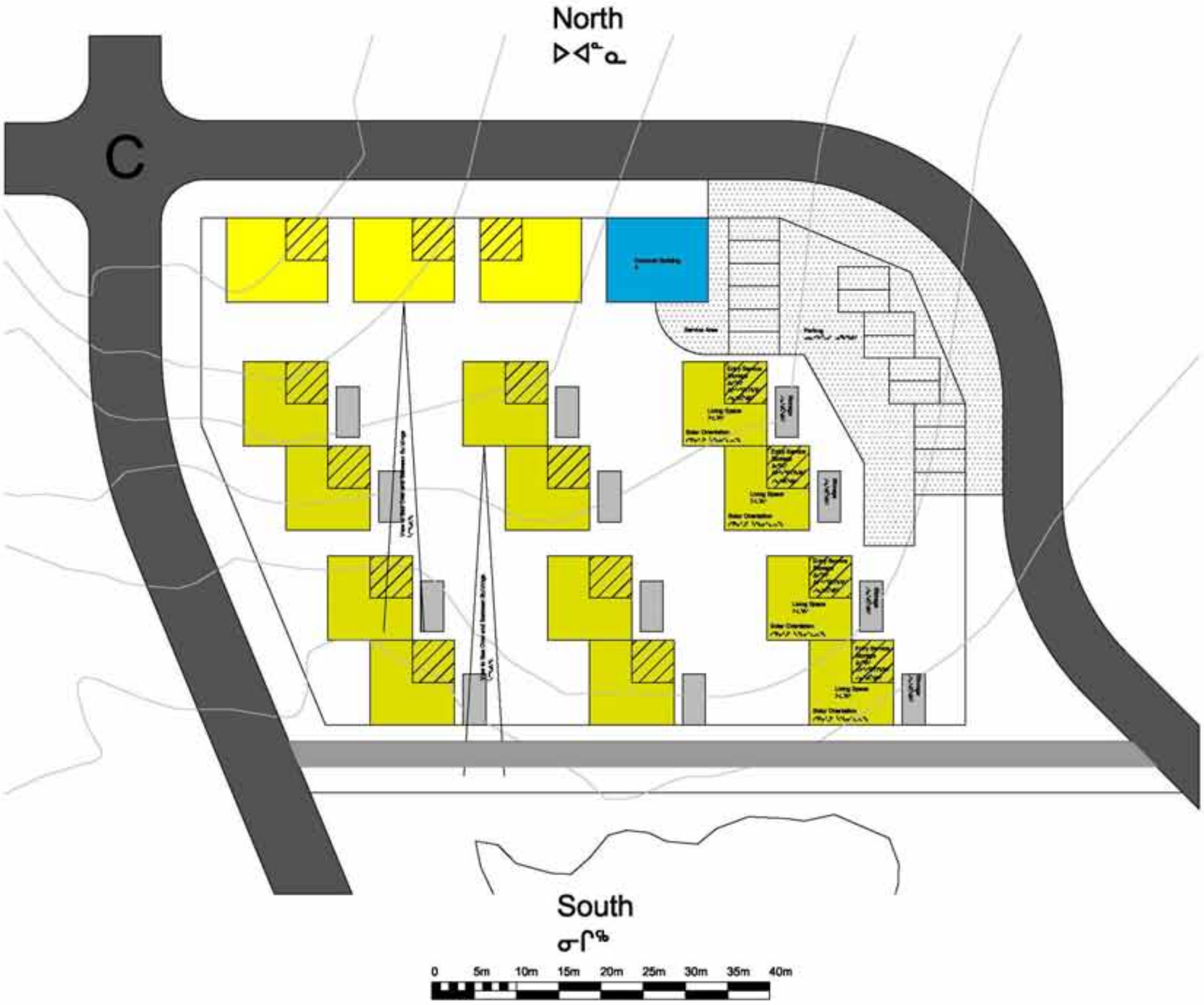
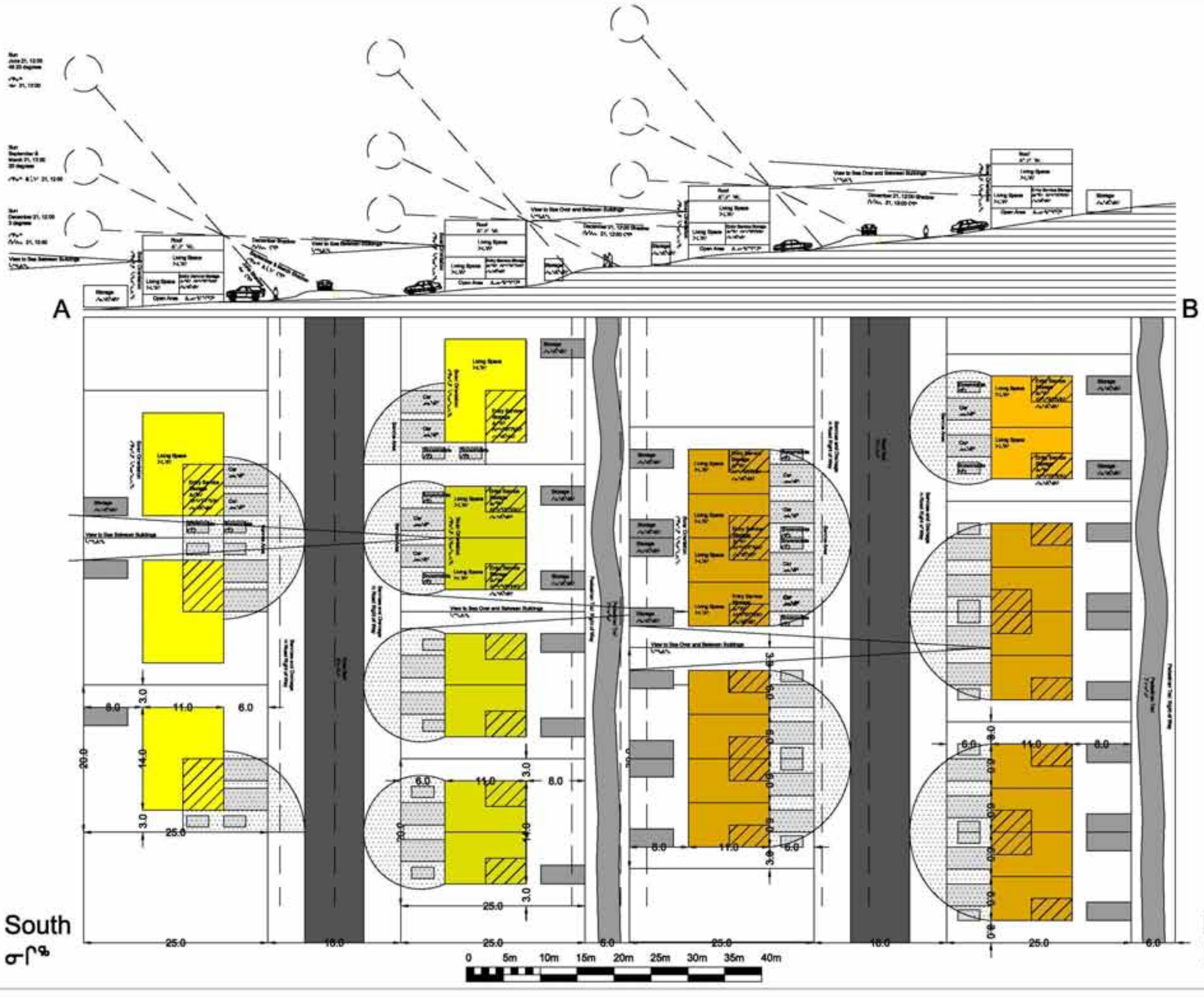


Figure 2

Figure 3



IMPLEMENTATION

Planning & Lands Administration

Lot pricing

The City currently prices lots by dividing the total land development costs by the developable lot area, which provides an average cost per square metre over the entire subdivision, and then calculates the lease amount for each lot based on the area of the lot. The City's Land Administration By-law permits land to be priced differentially by as much as 25% to account for Site Specific Factors such as site conditions, desirability of location, proposed land use and proposed land use. It is recommended that the City price lots differentially to reflect access to Open Space, views and development potential. For example, *Residential – Low Density* lots that back onto *Open Space* and have prime views (ie. are located on the Upper Plateau main ridge line) could be assigned a 10% price per square metre premium over the price of other lots within the same land use designation. *Residential – Low & Medium Density* lots that simply back onto *Open Space* would be assigned a 5% premium over the price of other lots. Similarly, lots with greater development potential have greater value than those with less development potential. Premiums would therefore be assigned to lots depending on the permitted density and uses on the lot.

Lot Leases

The City will retain fee simple title to all lands in the subdivision and will sign equity leases with successful applicants. It is recommended that the City include a restrictive covenant in all leases stating that any development on the lot shall be in keeping with the policies of the General Plan, as amended, and the Plateau Development Scheme, as amended.

Lot leasing process

Typically successful applicants for leases are awarded a lot by ballot draw or through a call for proposal process. Low density residential lots are awarded by ballot draw and all other lots are awarded by call for proposal. It is recommended that this process of leasing lots continue, however, with some adjustments.

- ***Ballot draw process:*** The current ballot draw process awards residential lots in a sequential order to successful applicants. In this way, the applicant does not have a choice of lots. Since it is recommended that lots be priced differentially and that they vary in size, thus impacting the range of permitted use on a given lot, it is desirable to introduce some level of choice in the ballot draw process. It is recommended that the City adopt a process whereby the applicant lists in priority order the lots that they would be interested in leasing should their name be drawn. As each name is drawn, the applicant is awarded the first lot that is still available as they go down the applicant's list. In this way, applicants can prioritize their choice according to the cost and location of the lot or permitted uses on the lot. It is recommended that the City continue its practice of preferential priority for first time homeowners.
- ***Call for proposal:*** All lots other than low density residential lots are awarded by call for proposal. It is recommended that evaluation criteria include sustainability criteria consistent with the development policies of the Plateau subdivision. For example, points should be awarded for any proposal that exceeds basic lot development standards. Call for proposals are also recommended for select medium density residential lots for the

development of freehold row housing units to improve access to affordable housing, as discussed below.

Affordable Housing

In order to improve affordable access to ground-oriented home ownership, it is recommended that the City reserve select medium density residential lots in each phase of development and award the lots based on a call for proposal to develop freehold row housing units. Criteria for the call for proposal will stipulate development and severance of lots within three years and will be evaluated based on life cycle costing of the units, flexibility and quality of design, adherence to the lot development standards, among other criteria as appropriate. Freehold townhomes provide ground-oriented housing that require less land per lot and are typically more energy efficient than single-detached homes. These characteristics reduce up-front capital costs and reduce on-going maintenance and operating costs and are thus considerably more affordable than single-detached housing forms. In each phase of development, the City should target that 15% of ground-oriented units be developed in this way.

Communication Strategy

Communicating and marketing the benefit of sustainable development practices is a key issue in their advancement. It is recommended the City consider preparing a kit for the builder/home owner that contains the following:

- A summary of the societal benefits resulting from small interventions by individuals that help make the whole community more self-reliant.
- Information sheets that demonstrate to builders and future homeowners the reduced operating costs resulting from the additional capital costs.
- Easy to use and understand information sheets that outline the Plateau Lot Development Standard with illustrative sketches for each development standard.
- List of suppliers with contact information where builders can purchase water saving devices, heat recovery ventilators, ENERGYSTAR windows and appliances, etc.

Permit Review Process

Through the development permit and building permit process, the City will be responsible for ensuring that development proposals meet the Plateau Lot Development Standard and any of the applicable enhanced development requirements.

Partnerships

Nunavut Power Corporation

City to work with Nunavut Power Corporation (NPC) to:

- Investigate the technical and economic feasibility of providing waste heat from the NPC Generating Station to buildings in the subdivision and/or for a municipal reheat station. Feasibility analysis will consider factors such as subdivision design, the size and scale of buildings, the heating demand of buildings, and availability of waste heat, among others.
- Investigate the technical and economic feasibility of undertaking the development of a distributed generation facility, for Upper Plateau Phase 3 development, or as appropriate.

Government of Nunavut

City to work with the Government of Nunavut to:

- Investigate opportunity to open existing private cul-de-sac road to College residences as a public road to provide access to the proposed Lower Plateau development.
- Explore technical feasibility and cost-sharing potential for extension of water and sewer services into the Arctic College lot to service Lower Plateau development and College Expansion.
- Explore feasibility and cost-sharing potential for linking the Primary Walking Trail (as shown on Appendix C) from the Upper Plateau Phase 1 through the Arctic College lot to the Nunavut Justice Centre and Core Area.
- Survey lot within Plateau subdivision identified as 'College Expansion Area' for transfer to the GN Department of Education to become part of the Arctic College lot (800-SK-027).
- Explore possible opportunity to approach Arctic College to request that they surplus a portion of their Reserve #032T (800-SK-027) to allow for the City to develop lot identified as 'Core Area Use' within Lower Plateau Phase 1. This lot will then be considered "untitled municipal land" according to the Nunavut Land Claim Agreement and will be available to be transferred to the City.
- Explore opportunity to connect service and parking access road shared by Arctic College and Nunavut Justice Centre to the Lower Plateau Phase 1 Road to provide an alternate emergency access route to this area (as shown on Appendix C) should the main road in the vicinity of the College residences be obstructed. This access route is envisioned as a right-of-way easement across the Arctic College lot.

Federal Agencies/Organizations (NRCan, CMHC, FCM, etc)

City to work with Federal agencies to explore opportunities to:

- Access funding programs for the development of the subdivision and to fund demonstration projects of sustainable building designs (eg. FCM Green Municipal Enabling Funds or Investment Funds).
- Provide the City and development community with technical expertise, training, and technical information (eg. R-2000 certification, EnerGuide Program, water-saving devices, heat recovery ventilators, etc.).
- Identify financial incentive programs that developers/home builders can apply for (eg. Commercial Building Incentive Program).
- Assist the City in communicating sustainability objectives and approaches being pursued in the City to a broader audience.

Amendments to General Plan & Zoning By-law

The following amendments to the General Plan will be required:

- Figure B to be amended to redesignate the Future Development Area A to Residential Community, Open Space and Core Area, all subject to the Plateau Development Scheme.
- Figure C to be amended to identify the relocated Walking and Snowmobile Trails.

- Figure D to be amended to identify the proposed road network.
- Section 5.9 (Future Development Area) be amended to reflect the development proposed in Area A.

The following key amendments to the Zoning By-law may be required:

- Schedule B to be rezoned from Municipal Reserve to the appropriate zones in the Zoning By-law.
- A new zone created that contains special provisions for cluster housing forms.
- Provisions that permit row housing units to be legally severed.
- Review of yard setback requirements in all zones with view to relaxing some requirements.

Further Studies

It is recommended that the City undertake a geotechnical investigation and an environmental assessment in the Upper and Lower Plateau development areas.

- ***Geotechnical investigation:*** The purpose of the geotechnical investigation is to determine the stability of the native material. This will allow the road structure to be designed based on the stability of the soil, thus resulting in a net reduction in the quantity of gravel fill used. This in turn will reduce the demand on the resource, the capital costs of the roads, and the impact of sand and gravel on the surrounding environment. In addition, the geotechnical investigation may identify areas of ice-rich terrain that are potentially vulnerable to thaw induced subsidence.
- ***Environmental Assessment:*** The purpose of the environmental assessment is to determine whether any contamination exists in the development areas. An environmental clearance letter is required by each mortgagee and the City can reduce the overall costs to individual builders by commissioning an assessment for the entire development area at one time.

Monitoring

In implementing the policies of this Development Scheme the following should be monitored and reviewed at the beginning of each phase of development:

- targeted and required lot development standards at each phase of development;
- housing demand and needs;
- demand for non-residential development lots;
- the success of call for proposals for development of freehold townhomes;
- the development of R-2000 expertise and certified R-2000 builders in the community;
- recurrent issues/challenges in the development review process that may need to be addressed with Zoning By-law amendments or other corrective measures.