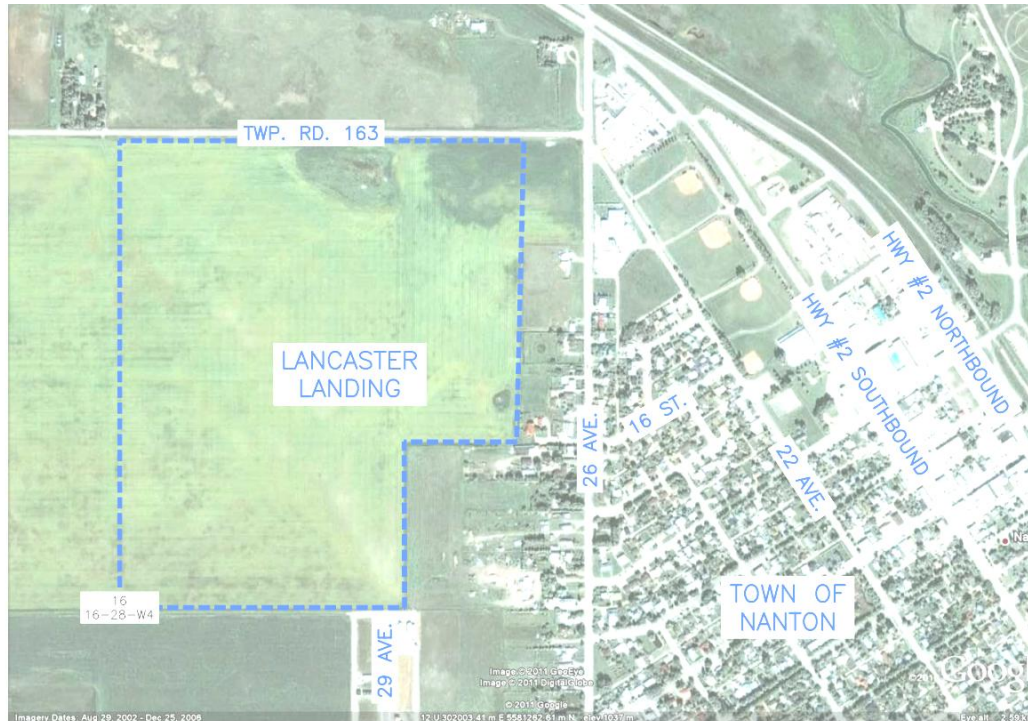


# LANCASTER LANDING

## AREA STRUCTURE PLAN

### NANTON, ALBERTA



October 17, 2011



D2S  
Farms  
Ltd.

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## 1. INTRODUCTION

D2S Farms Ltd. is the owner of approximately 124.91 acres (50.55 ha) of land within the Northeast ¼ of 16-16-28 - West of Meridian 4. D2S Farms is pursuing urbanization of these lands and has engaged a team of professionals to act on its behalf to prepare an Area Structure Plan according to the provisions of the Municipal Government Act. Preparation of an Area Structure Plan (ASP) for these undeveloped lands, herein after referred to as Lancaster Landing, has been underway since late 2006, shortly after the land was annexed into the Town.

The Lancaster Landing site was studied in considerable detail to identify physical aspects that influence how the land can be developed. A draft ASP was prepared and shared with both the public and the Town in June 2008. In response, the Town moved forward with a Municipal Development Plan rewrite, Infrastructure Master Plan update, Municipal Improvements Policy, and Off-site Levy Bylaw while D2S Farms completed a Traffic Impact Assessment study in support of their proposal. This resulted in an appropriate planning framework that was sensitive to the aspirations and opportunities for both parties.

D2S Farms is cognizant of market, environmental and societal influences that must be considered as it moves forward in unison with the Town to expand the community. Significant research, engineering and planning has been conducted to assess these influences and ascertain the potential of the property. Efforts are ongoing to resolve emerging issues as planning continues to take shape for Lancaster Landing.

Several factors affecting both the planning and development of these lands have occurred during the last four years. One of the most noteworthy changes has been a significant recession in the global economy in the later part of 2008 and throughout 2009. This recession negatively impacted Alberta in a major way subsequently impeding the housing market. The residential real estate market in Calgary was particularly hard hit and is just now beginning to rebound. This slowing of the Calgary real estate market has also had a direct impact on the D2S Farms development plans for Lancaster Landing.



## 2. AREA STRUCTURE PLAN PURPOSE AND CONTEXT

In the preparation of an Area Structure Plan, municipalities require information of sufficient detail to enable the municipality and its agents to ensure that the Area Structure Plan not only complies with statutory requirements but more importantly, those of the community.

Planning at the ASP level must be mindful of its natural and man-made surroundings. Plans must be cognizant of community and cultural values as well as interconnect with the physical infrastructure. With impending community growth, this level of planning must also address in considerable detail, the transportation, circulation and open space systems together with storm water management, sanitary sewer collection, water distribution systems to demonstrate how these systems will function and mesh with existing systems.

The Lancaster Landing Area Structure Plan has been prepared in accordance with Section 633 of the Municipal Government Act. It identifies and provides for a range of development opportunities on previously undeveloped agricultural land by creating a framework for the future subdivision and development of a new, viable Nanton neighbourhood.

In the preparation of the ASP, a comprehensive review of relevant Town documents and plans was undertaken. The ASP site has been studied to identify physical and cultural aspects that will influence how the land can be developed; recognizing that ultimate development of the property will only be successful if it meshes as seamlessly as possible with adjoining neighbourhoods and infrastructure, including roads and utilities.



### 3. PLAN LOCATION AND LAND AREA

Situated in the Town of Nanton and wholly located within the Northeast Quarter of Section 16, in Township 16, Range 28, West of the 4<sup>th</sup> Meridian. The Lancaster Landing development area contains 124.91 acres (50.55 ha.) (*Refer to Figure 1*).



#### 4. LAND OWNERSHIP

D2S Farms Ltd. is the registered land owner of the Lancaster Landing ASP lands. Land ownership of both land within and adjacent to Lancaster Landing is illustrated in *Appendix 1*. Appendix 1 also has a copy of title for lands of Lancaster Landing Area Structure Plan.



## 5. AREA STRUCTURE PLAN GOALS

In the preparation of the Lancaster Landing Area Structure Plan, market, environmental and societal influences have been taken in to account. Significant research, engineering and planning has been conducted to assess these influences to ascertain the potential of the property. Lancaster Landing ASP is intended to contribute to the process of community building as Nanton expands in the future. More specifically, the following represent the goals for the Area Structure Plan:

- a. to establish a land use and development concept that responds to community needs and adheres to Town requirements;
- b. to optimize expenditures for infrastructure extensions and upgrades;
- c. to partner with the Town of Nanton on mutually beneficial community projects to the extent practical where opportunities exist or arise;
- d. to address community growth impact issues that may directly or indirectly arise from the development of Lancaster Landing lands; and
- e. to build a quality neighbourhood that is diverse and sustainable.





## 6. AREA STRUCTURE PLAN OBJECTIVES

To facilitate neighbourhood integration and community formation, the Lancaster Landing Area Structure Plan will:

- a. guide the agricultural to urban development transition in an orderly and economical manner;
- b. create a development pattern and circulation system that meshes with existing development;
- c. create a neighbourhood identity compatible with Nanton's unique sense of community;
- d. create a residential neighbourhood which includes a mix of dwelling types at housing densities within the parameters of the Municipal Development Plan;
- e. provide for compatible non-residential land uses as required;
- f. establish the supporting internal transportation network and public utilities;
- g. introduce a storm water management system that addresses both public utility and amenity functions;
- h. provide and distribute open space, including a trail system that connects this neighbourhood, adjacent neighbourhoods, and which contributes to overall community walkability;
- i. propose a development phasing system;
- j. provide sufficient flexibility to accommodate design adjustments which respond to future market conditions, in keeping with community goals; and
- k. describe an implementation program that guides future land use classification and subdivision.



## 7. SITE EVALUATION

### a. Topography

The Lancaster Landing site is currently a slightly rolling cultivated field. A rural road bounds the site along the north and functions somewhat as a barrier holding back and directing drainage that naturally flows to the north east corner of the quarter section. Shallow depressions on the land intermittently accumulate snow melt and rain storm water from both off and on-site sources but are normally dry enough to farm over. These depressions were evaluated to determine if they should be considered for protection as wetlands.

### b. Environmental and Geotechnical Considerations

#### i) Environmental Site Assessment

DEAN Associates Ltd. was contracted to conduct a Phase I Environmental Site Assessment within the plan area in October, 2007 and to determine the existence of any environmental issues. DEAN reports that no obvious environmental concerns were detected in their desktop and document review nor were any concerns observed during their site visit (*refer to Appendix 2*).

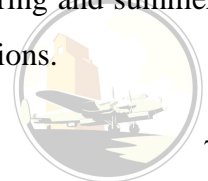
#### ii) Sub-surface Conditions

Lancaster Landing is underlain by bedrock that is close to the surface in various parts of the site. This will be a factor in several aspects of site development especially utility servicing and road construction as well as residential development insofar as footings and foundations are concerned (*refer to Appendix 3*)

#### iii) Groundwater Monitoring

Shallow groundwater conditions were encountered in a six month groundwater monitoring program conducted by McIntosh-Lalani Engineering Limited on the Lancaster Landing lands. Recommendations were made (*refer to Appendix 3*):

- (a) weeping tile will be required for below grade development, (basements);
- (b) Additional groundwater readings are recommended in spring and summer months to determine actual maximum groundwater elevations.



iv) Wetland Assessment

(a) According to a wetland analysis conducted by Worley-Parsons-Komex, Environmental & Water Resources consultants, there is an on-site area considered to be a Class III Wetland or seasonal marsh. This seasonal marsh is surface water fed, normally formed in the spring due to snow melt and precipitation and generally dries up by early to mid summer.

(b) This seasonal marsh will thus be taken into consideration in storm water management planning and engineering. It will be made into a wet pond, (*refer to Appendix 4*).

c. Climatic Influences

i) Wind and Sun

The Lancaster Landing site is completely exposed to both wind and sun. The prevailing southwesterly winds can be powerful in strength but often provide relief from the cold northerly winter winds and referred to as the “Chinook Effect”. Mitigation from prevailing winds can be attained through careful consideration of street orientation, doorways placement and a variety of other site and design features.

ii) Seasons

With no existing trees on site, design and siting of housing together with careful attention to landscaping will be necessary to alleviate the effects of long, hot summer days experienced in this area. The same principles apply to winter conditions where access to sun light is important.

d. Off-site Influences

i) Roads and Streets

Conditions exist on all four sides of the Lancaster Landing site that will influence both near and long term development. The existing road along the north edge of the site (Twp Rd 163) will facilitate site access but will eventually require upgrading to a suitable urban standard and may require a revised alignment to better intersect with 26<sup>th</sup> Avenue.



Three intersecting roads, 26<sup>th</sup> Avenue, 22<sup>nd</sup> Avenue and Twp Rd 163 intersect at extreme angles created from the original Town grid road layout near the northeast corner of the site. This condition will need to be rectified in order to resolve current traffic deficiencies as well as to create more suitable access to the Lancaster Landing property in the future. Resolution of the situation will require collaboration and cooperation between the Town and several landowners in order for an appropriate design to be employed.

Access to 26th Avenue, a major north-south town collector road, from the project site is non-existent. There are three potential connection locations, however; all are currently part of existing developed land holdings. Access to 26 Avenue will be provided by a minimum of two collector roads to 26 Avenue. The Township Road 163 will be retained.

Westview, the Town of Nanton subdivision directly south, affords three points of access into the Lancaster Landing site. These will need to be incorporated into the planning and design.

ii) Current Land Use

(a) Adjacent residential development

Existing homes and acreages situated along a good portion of the east edge of the project site will need to be considered in the subdivision design and layout of Lancaster Landing. This can be accomplished by “shadow-planning” and is considered necessary so that existing and new development will mesh from land use, traffic circulation and walkway extension perspectives. More efficient use of land will also result since currently under utilized property could be converted into suitable residential property. In some cases, buffering or screening of unsightly property may also be desirable.

(b) Westview Residential

Westview subdivision to the south is partially developed, including some directly adjacent lots. At “build-out” Westview will be a fully developed



residential neighbourhood with which the Lancaster Landing subdivision design and layout will also need to mesh.

(c) Farmland

Farmland adjoins the Lancaster Landing site along the west and north sides. Farming will continue on these lands and there will be occasions when farming practices will create dust or noise that may annoy residents in the new subdivision. However, this is a normal situation at the interface of rural and urban land use activity. The situation currently exists for those already living in town especially on the west side. New residents will need to be advised through a disclosure document that farming is the economic lifeblood of the local economy and some farming impact “comes with the territory”. Likewise, farmers may need to be reminded that new subdivision development is an integral component of community growth.

Provision for future access to these lands as part of the overall town circulation system and utility servicing will need to be accommodated so that the property does not become isolated.

iii) Other Factors

(a) Drainage

Natural overland drainage from adjacent lands needs to be considered in the design of the storm water management system. This includes the shadow plan in the south east shown in Figure 1, part of which naturally drains through Lancaster Landing.

(b) Views

Mountain views are currently enjoyed by those living on properties all along the west edge of town development. This west development edge does not have fixed boundaries and will continually move westward as development proceeds. Thus unobstructed views may also change in the future as development takes place.



## 8. NEIGHBORHOOD CHARACTER

### a. Overall effect

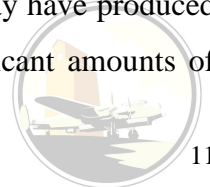
As community expansion takes place, it is important for developers to respect existing community values, one of which is harmony. The Lancaster Landing neighbourhood will have a distinctive character, which will be different from “Old Nanton”. It is therefore important that this new neighborhood blend with existing neighborhoods yet demonstrate unique character. Neighbourhood character will be evident in and attributable to several factors including:

- i) the newness;
- ii) the street layout and connections to existing streets;
- iii) the integration of different housing styles and other land uses;
- iv) the variety, distribution and linkage of open space;
- v) the architecture;
- vi) the landscaping.

### b. Major Features

Descriptions below provide a general overview of the major features that will significantly shape the new neighbourhood character. These features will be further elaborated upon in subsequent sections of the plan.

- i) The plan area will be primarily residential in nature but will include open space and provide two neighbourhood oriented commercial sites.
- ii) The open space network will be interconnected within the plan area and to adjoining features. It will be created to satisfy two principal purposes: firstly, a multitude of recreation opportunities that include parks, playgrounds, walkways and buffer strips; and secondly, a series of comprehensive storm-water management features including rain gardens, wetlands, bio-swales and overflow detention areas. Approval of detailed design of storm water management features would be required at development agreement or building permit stage.
- iii) Storm water management requirements and utility rights-of-way have produced further opportunities to create open spaces adjacent to significant amounts of



residential development. The cumulative effect of these open spaces will contribute to a more park-like character throughout the development area.



## 9. HOUSING DEMAND

### a. Historic Lot Creation and House Construction

Residential lot creation in Nanton has undergone dramatic fluctuations over the past 25 years. There have been several years when no new lots have been created while there have been years like 2007 where 93 lots were created. Lot creation and dwelling unit construction do not directly correlate as there is usually a time lag between subdivision, municipal servicing and ultimately construction. For example, housing construction ranged between 14 and 29 dwelling units per year between 2001 and 2005 while lot creation ranged between 0 and 71 during the same time frame.

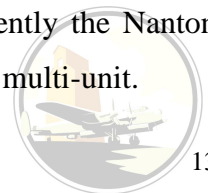
### b. Factors Influencing Demand and Supply

Within the Lancaster Landing Area Structure Plan area, there is a sufficient land base to help satisfy a growing housing demand in both Nanton and the Calgary commuter shed. Future new home construction will be subject to a variety of factors.

The 2008 - 2010 economic recession curbed a burgeoning demand for housing in the Calgary commuter shed. As the Calgary market recovers, it is anticipated that demand for housing within the commuter shed will once again increase. In addition, demographic change within Nanton and the Calgary region will continue to influence both the number of dwelling units and the number of persons per dwelling unit. For instance, the larger cohorts of the “baby-boomer” generation will swell the seniors’ population. If low interest rates continue and the mortgage market settles down, housing should continue to be affordable to more families. The aforementioned recession has affected the employment situation across Canada. However, communities which have more balanced economies are better suited to withstand recessionary pressures. For instance, a healthy agricultural sector in and around the community can be expected to continue to influence the residential market in Nanton.

### c. Responding to the Housing Market

Lancaster Landing Area Structure Plan will be designed to respond to both current and future housing needs of Nanton citizens. Single detached and multi-unit dwellings will reflect Nanton’s anticipated housing demand. Presently the Nanton housing mix ranges between 90%-95% single detached and 5%-10% multi-unit.





As the Westview subdivision to the south of Lancaster Landing is primarily comprised of single detached dwellings, a greater percentage of multi-unit dwellings is proposed for Lancaster Landing.

Within Lancaster Landing the proposed dwelling unit ratio is approximately one third single-detached, one third two-family dwelling, and one third multi-units.

The Town of Nanton, in an amendment to its Municipal Development Plan in 2008, approved overall densities which were set at 6.0 dwelling units per acre (du/ac) with an option to consider up to 8 dwelling units per acre. Based on potential subdivision layouts, Lancaster Landing Area Structure Plan would create approximately 650 dwelling units.



## 10. OVERVIEW OF PROPOSED LAND USES

Although land is not a scarce resource in Nanton, the manner by which it is converted from a large farmland holding in a rural jurisdiction to smaller developed lots in an urban municipality is becoming increasingly complex and expensive. It is therefore essential to balance the desires and needs of an expanding community with the fiscal requirements for this conversion process to happen.

Efficient use of land is a pre-requisite to orderly development and economical servicing so that housing remains attainable and taxes are not unduly increased. Based on current circumstances there does not appear to be a need for a dedicated school site within Lancaster Landing.

The following section describes the principal land use components including various housing types and styles (refer to Figure 1).

### a. Residential

Providing a wide variety of housing is a key facet of the Lancaster Landing Area Structure Plan. The objective is to establish an acceptable mix of attainable and market housing that will assist people living in Nanton and their families, as well as to attract new residents to the Town.

#### i) Single Family Dwellings

Single family housing will occupy approximately 32% of the land within the plan area. Lots will typically be around 6200 ft<sup>2</sup> (580 m<sup>2</sup>) in area. Housing styles should closely coincide to the economies of the market area. New housing should be contemporary yet respectful of the historic character of Nanton's existing housing.

#### ii) Multi-family Dwellings

This type of housing is intended to respond to those within the community who cannot afford or do not wish to reside in a single detached dwelling. It is anticipated that this type of housing would be provided primarily in two-family dwellings and townhouses.



iii) Seniors Housing

The growing demand for senior-oriented housing is intended to be provided at several locations within the plan area to correspond with development phasing and proximity to amenities.

b. Parks, Open Space & Walkways

i) Overview

The design and use of parks and open space will be a reflection of the community. The primary objective in the provision of open space for the Lancaster Landing Development is to create a balance of active, passive, aesthetic and utilitarian green space that is inter-woven and widely dispersed throughout this proposed expansion to Nanton. Efforts are being made to facilitate the needs of the overall community.

ii) System Components

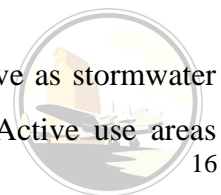
Parks and open space resources within the development area are interconnected. A larger, centrally located park site has been created to be used as a community gathering place or sports activity area.

The open space network will be pleasant and will incorporate stormwater management measures. These lands will combine to total approximately 14% of the subdivision development. These areas will provide a multitude of public functions that include:

- places for recreation, both passive and active
- stormwater management and water quality features
- promotion of public health and social activity
- multi-use pedestrian trails

The system of integrated community parks and open spaces will extend throughout the development and will be adjacent to or within a short walking distance of all land uses.

Recreation areas would include passive spaces that would serve as stormwater management facilities as well as hiking and biking trails. Active use areas



could include public gathering spaces, and multi-use fields for team sport and playground facilities.

Additional stormwater management and water quality areas could be designed into areas designated as boulevards, and greenbelts, in an effort to reduce the travel distance of water as well as limit excessive infrastructure, if the Town so desired.

iii) Design Approach

Parks and open spaces will help to shape the pattern and layout of this development, allowing for connections within the neighborhood and the larger community. Trails and parks encircle the proposed development, providing multiple opportunities to tie-in with existing development to the South and East, as well as to future areas for town expansion to the North and West. Walkways and multi-use pedestrian trails proposed for the community will insure safe, accessible travel through the proposed community including mid block crossings wherever possible and practical. Lancaster Landing aspires to create a walkable community which residents feel is safe, comfortable, and efficient for recreation utility and transportation.

c. Commercial

Two small areas in Lancaster Landing are proposed to be commercial. These commercial areas would provide neighborhood oriented commercial services. The larger of the two commercial areas is centralized to facilitate pedestrian traffic to the commercial facility. Residential accommodation in conjunction with commercial uses will be encouraged in the design of commercial development. The amount of such residential accommodation is not likely to result in too many dwelling units, however, density calculations may require a slight adjustment if and when development of this nature is imminent.



## 11. UNDERGROUND INFRASTRUCTURE

### a. Population Projection

To properly size pipes for water distribution and sanitary sewage collection, a population for Lancaster Landing must be projected. From the dwelling unit chart in Figure 1 – Proposed Land Use/Phasing, the population for Lancaster Landing is calculated below:

Type of Dwelling Unit	Number of Dwelling Units	People Per Dwelling Unit	Population
With Commercial	12	2.3	28
Multifamily	224	2.3	515
Two Family	164	2.3	377
Single Family	231	2.3	531
<b>Total</b>	<b>631</b>		<b>1451 People</b>

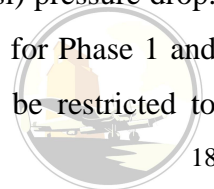
### b. Water System

The conceptual water system, (see Figure 2 - Water Distribution Concept), will be required to supply peak hour flows for the total projected population. Based on an average water consumption of 450 L/person/day and a peak hour factor of 4.5, the supply system should be capable of delivering 35.6L/sec (470 igpm)

The conceptual water distribution system with 200mm diameter mains and 300mm to 250mm diameter trunks will have no problem in delivering peak hour flows.

For ultimate fire flow of 8500 L/min (1880 igpm), \* buildings over 890m<sup>2</sup> (9600ft<sup>2</sup>) will require sprinkler systems. The projected fire flows are as required by FIRE UNDERWRITERS SURVEY. The conceptual water distribution system will be capable of accommodating the 8500L/min fire flow without experiencing more than a 140kPa (20psi) pressure drop.

Prior to the 300mm trunk line being placed in service, the capacity of the conceptual water system is rated at 5000L/min (1100igpm) with a 140kPa (20psi) pressure drop. This capacity will be more than sufficient to supply peak hour flow for Phase 1 and Phase 2 of the proposed development. However, fire flows will be restricted to



5000L/min (1100 igpm). This is sufficient for single family residential. For non-sprinklered buildings, their size will be limited to 500m<sup>2</sup> (5500ft<sup>2</sup>) and for sprinklered buildings they will be limited to 930m<sup>2</sup> (10,000ft<sup>2</sup>). Building sizes are determined by applying a 15% credit for low fire hazard occupancy, a 35% credit for sprinkler system, and a 25% debit for exposure to the Fire Underwriters Survey formula (1999).

As Lancaster Landing is being fed from the Nanton Water Plant via the water main trunks through Westview Subdivision, these Westview trunks will need to be in place prior to larger buildings being constructed.

It is noted that during static conditions, a pressure of 350kPa (50psi) at the SW corner of Lancaster Landing (elevation 1045), will provide a pressure of 490kPa (71psi) at the NE corner of Lancaster Landing, (elevation 1030), due to topography. This topographic feature is a bonus during high flows as system head loss will be negated by higher potential energy to the north east. A pressure of 50psi at the SW corner of the proposed subdivision would translate to a pressure of 590kPa (85psi) at the sewage treatment plant area during static (no flow) conditions.

The water distribution mains would be PVC C900 with a minimum cover of 2.6 meters. Hydrant spacing would be a maximum of 160m. All water mains would be 200mm diameter, except the 300mm and 250mm diameter trunk mains. All water mains would be installed to Alberta Environment Standards and the Town of Nanton standards.

It is proposed to have a 250mm and 300mm diameter tie to the existing 150mm diameter water main on 26<sup>th</sup> Avenue to improve existing flows. It is also proposed to have a 250mm diameter stub to the west for future tie in.

Based on the 2008 Infrastructure Master Plan, the Town of Nanton's existing water supply/treatment system will be able to accommodate only Phases 1 to 3 of the proposed development. Development of Phase 4 to Phase 7 will require expansion to the Town's present water supply/treatment system.



c. Sanitary Sewer

Utilizing Harmon's Peaking Factor Formula and an average flow of 400 L/person/day, the following peak flow for sewage is generated for the ultimate population of 1520.

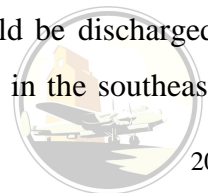
$$\begin{aligned} Q_{\text{peak}} &= 400 \text{ L/person/day} \times 1520 \text{ people} \times 3.68 &&= 2,237,440 \text{ L/day} \\ & &&= 25.9 \text{ L/second (342 igpm)} \\ &\text{Add 20\% infiltration} &&= 31.1 \text{ L/second (410 igpm)} \end{aligned}$$

A 250mm diameter pipe at 0.3% gradient, with an n value of 0.013 is capable of 1.2 ft<sup>3</sup>/sec or 34.0 L/sec flow. Therefore, the conceptual system, (see Figure 3 – Sanitary Sewer Collection Concept), with one 200mm diameter and one 250mm diameter main coming out of the subdivision dumping into a proposed 300mm diameter trunk at the NE corner will experience no capacity problems whatsoever.

The proposed 300mm diameter trunk sewer at 0.22%, (minimum gradient) will accommodate a flow of 1.7 ft<sup>3</sup>/sec or 48.1 L/sec. This is 1.5 times the total projected flow from Lancaster Landing. It is also noted that 11% of the sanitary sewage will flow south through Westview.

Although over 75% of the subdivision could be serviced by gravity into the sanitary sewer on 26<sup>th</sup> Avenue, the existing sanitary sewers from 26<sup>th</sup> Avenue to the Town's Sewage Treatment Plant do not have sufficient capacity to accommodate the proposed subdivision. It would be very expensive to upgrade and upsize the sanitary sewers through the existing developed areas of Town, not to mention the inconvenience to existing residents. Therefore, an alternate route to take the subdivision's sanitary sewage to the Town's Sewage Treatment Center is proposed; refer to Figure 4 – Offsite Sanitary Sewage Collection Concept. The proposed size of the sewer trunk, 300mm diameter, will allow for 1.5 times the projected population of Lancaster Landing to be serviced by the sewer trunk. It would be possible to modify the final route and the final size downstream of Lancaster Landing should it be more beneficial to the Town and to future development.

With the exception of 72 multi-family dwelling units in the south east corner of Lancaster Landing, all sanitary sewage from the development would be discharged into the proposed 300mm diameter trunk. These 72 dwelling units in the southeast



corner of the development would drain into the existing sanitary sewer at the north end of 29<sup>th</sup> Avenue in the Westview subdivision. All sanitary sewers would be gravity, with no lift stations proposed.

Based on the 2008 Infrastructure Master Plan, the Town of Nanton's Sewage Treatment facility has sufficient capacity to accommodate beyond Phases 1 to 3 of the proposed development. Expansion and upgrades to Nanton's present Sewage Treatment Center will be required when Phase 4 to 7 are developed.

All sanitary sewer mains onsite would be PVC DR35 and 200mm diameter, except where noted, (refer to Figure 3 – Sanitary Sewer Collection Concept). All sanitary sewer gradients would be at or above Alberta Environment's minimum gradients. All manhole spacing, minimum depth, and other features of the sanitary sewer system would be within Alberta Environment's guidelines and the Town of Nanton's standards.

The Town of Nanton may wish to have the developer upsize the offsite sanitary sewer trunk from 300mm to 375mm or greater diameter and have the proposed trunks that would service lands to the west increased from 250mm to 300mm diameter. Also, the Town may wish to have the offsite trunk service land to the north of what is shown on Figure 4 – Offsite Sanitary Sewage Concept.

d. Storm Sewer Management

The goal of the storm water management system for Lancaster Landing would be twofold:

- i) to attenuate a 1:100 year post development precipitation event to a 1:5 year pre development precipitation event at one hour into the storm by detention, thereby limiting the rate of runoff from the subdivision;
- ii) to lower the amount of runoff by a minimum of 40% of a 1 in 5 year post development storm event on individual sites by harvesting the storm water.

This would result in less flooding and erosion downstream of the subdivision after development than presently occurs. It would also result in lowering treated water demand for irrigation within the subdivision.





The development site slopes from the SW to the NE at an approximate gradient of 1%. Offsite drainage is poor to nonexistent as culverts across Township Road 163 to the north are buried. It is anticipated that the attenuated storm discharge from the development would be piped from the north east corner of the subdivision to the west ditch of Highway #2 which discharges into Nanton Creek or piped north eastward directly to Mosquito Creek.

Storm management design parameters are outlined below:

- City of Calgary Rainfall Intensity Curves adopted;
- 1:5 year storm with 20 minutes initial time of concentration;
- Rational Method, which is conservative, for flow calculations;
- Runoff coefficient of 0.6 post development and 0.2 pre-development;
- Maximum distance of surface drainage on roads prior to storm pond intercept 300 meters;
- Roughness coefficient for pipe of  $n = 0.013$  was adopted;
- 1:100 year post development storm will be attenuated to 1:5 year pre-development storm by using dry storm detention ponds at the upstream reaches of the development and a wet pond at the downstream north end of the development. The location of the wet pond would be where the seasonal wetland area has been identified (refer to Figure 5 – Storm Drainage Concept).
- Alberta Environment and Town of Nanton standards adhered to for both minor and major storm systems with emphasis on Best Management Practices.

### Harvesting

Harvesting of storm water on single family and two family lots would be achieved by utilizing an underground cistern to capture roof runoff and by constructing a bio swale between front property and back of concrete walk/curb (see Figure 6A – Roadway Sections). Both features will harvest the rain water for irrigation. For a normal  $560\text{m}^2$  ( $6000\text{ft}^2$ ) lot with a house of roof area  $140\text{m}^2$  ( $1500\text{ft}^2$ ) a  $6.4\text{m}^3$  ( $1400\text{ig}$ ) buried “rain barrel” will retain 40% of a 51mm (2 inch) rainfall, provided that it is empty when the storm starts. The “rain barrel” would be equipped with a small pump to surface irrigate plants on the lot. A 24 hour long 51mm rainfall has a



return period of 1 in 5 years. The bio swale would be shallow, 0.20m (8 inches), deep to promote seepage and evaporation and side slopes of 5:1 for ease of maintenance.

Harvesting of storm water on multi-family and commercial sites would be achieved by rain gardens and underground rain barrels. Retention of storm water would be in the form of depressed parking lots and underground storm water storage areas. Target percentage of harvesting and retention from multi-family and commercial sites is 83% of a 1:100 year storm post development condition.

Harvesting and retention, as outlined would reduce the amount of runoff from the lots by 57% of a 1 in 5 year event and by 38% of a 1:100 year event, both post development.

The retention would also 'clean' the runoff by settling and some filtration.

#### Detention

A series of smaller dry pond detention areas would be constructed throughout the development with a larger wet pond located at the north end of the development. The detention ponds would be connected to downstream ponds by small diameter piping to restrict the outflow of the higher ponds into the lower ponds. Prior to the storm water leaving the most downstream pond at the NE corner, it will pass through a hydrocarbon-grit remover. The detention ponds would also clean the storm water by virtue of settling.

#### Conveyance

As previously mentioned, the storm dry ponds would be interconnected with restrictive underground pipe. Storm water will be carried to the dry ponds via concrete gutters.

#### Other

If permission is granted by the Town, permeable concrete for sidewalks and permeable asphalt for roads would be utilized. These features would also lower the amount and the rate of runoff.



e. Franchise Utilities

It is proposed that power, telephone, cable and natural gas be installed in a 3.5m easement along the front of the lots. It is further proposed that four party trenching be utilized for the shallow franchise utilities.

Unless, prohibited by town engineering standards, street lights are only proposed at intersections to minimize light pollution thus lowering human stress levels and minimize electrical energy consumption. Intersections would not only be street to street but also street to pedestrian walkway.



## 12. ROADWAYS

### a. Roads

All roads are proposed with low profile concrete curb and gutter on both sides, (see Figure 6 – Roadway Concept and Figure 6A – Roadway Sections). Collector roads would have monolithic sidewalk on both sides and local roads would have monolithic sidewalks on one side only. The widths of the roads are as follows:

	R.O.W. Width	Paved Road Width
Collector	20m	12m
Local	18m	9.5m

As per Figure 6, the following roads within Lancaster Landing would be collector roads:

- North – South - 29 Avenue
- East – West - 15 Street
  - East portion of 12 Street (Local Collector)
  - West portion of Westview Drive (Local Collector)

The remaining roads in Lancaster Landing will be local.

It is important that the two proposed collectors are connected to 26 Avenue, an existing Town of Nanton collector. These connections will not only facilitate vehicular travel between existing town development and Lancaster Landing, but also pedestrian traffic between the two.

It is noted that Lancaster Landing proposes to have the road connections outlined as follows:

- two connections to the east to 26 Avenue which ultimately leads to downtown, Hwy #2, and Hwy #533;
- three connections to the south to the Westview Subdivision which ultimately leads to Hwy #533 which then connects to Hwy #2 and the MD of Willow Creek;



- one connection to the west for connection to possible future developments to the west, lands which are presently in the MD of Willow Creek; and
- two connections to the north to Twp. Rd. #163, which ultimately leads to 26 Avenue and to possible future developments to the north, which are lands presently in the MD of Willow Creek.

The effects of both these roadway connections and those of Lancaster Landing to the major roadways in Nanton, (including Hwy #2), have been analyzed in detail in the Traffic Impact Assessment (refer to Appendix 5)

Road structures would be according to Town of Nanton standards, with collector roads having a thicker structure than local roads.

b. Pathways and Sidewalks

Non-motorized access and the pedestrian system are components of the overall circulation system and will be provided through a series of pathways integrated with the open space system, (refer to Figure 7 – Pathway Concept).

Residential sidewalks will be located throughout Lancaster Landing on one side of all local streets and both sides of all collector streets.

Together they will provide the development with a high walkability factor by connecting open spaces, the central commercial and existing Town of Nanton. All pathways would be constructed to Town Standards.



### 13. ARCHITECTURAL CONTROL

Architectural controls are intended to supplement the requirements of the Land Use Bylaw by providing a set of rules that ensure consistent quality development will be attained in Lancaster Landing and to ensure that there will be an appropriate level of housing design compatibility. Architectural controls may vary to some extent depending on the location within the development area and will be registered on lot land titles by the developer. Architectural control will be administered by the developer or his designate.

Architectural control guidelines will be required from the Developer as part of the subdivision process. Where an architectural control which has not been approved through the Town, conflicts with provisions of the Land Use Bylaw, the Land Use Bylaw will prevail.

Typically the controls that may be in effect include the following:

- minimum dwelling unit area and site coverage (building footprint)
- diversity in home design
- incorporation of energy efficiency features
- roof pitch & materials
- exterior finishing materials
- fencing materials
- minimum landscaping requirements

In particular, the following architectural controls will be addressed in Lancaster Landing:

1. maximum fence height – suggested at 1.5m (5ft.);
2. two family dwellings will be constructed so each side appears unique (no mirror image buildings);
3. all two family dwellings to have rear vehicular access, (no front driveways to prevent vehicles from backing into traffic on collector roads);
4. all two family dwelling and single family lots will provide one 6.4cu.m. (1400ig) underground rain barrel per dwelling unit;
5. all multi-family (R-3) and commercial lots to provide harvesting of rainwater, rain gardens and barrels, and rainwater detention attenuating flow offsite back to 1 in 5 year predevelopment flows.



The developer may undertake construction of certain stretches of fencing or installation of certain aspects of landscaping to establish the character of the development.

a. Community Mailbox Locations

Community mailboxes will be distributed throughout the development area as required by and in consultation with Canada Post and the Town of Nanton.

b. Garbage Collection

Garbage pickup on collector streets would be via back alleys. All other streets would be front yard collection.



## 14. SUSTAINABLE COMMUNITY DEVELOPMENT

### a. Overview

Newer Area Structure Plans attempt to take a more holistic approach to neighbourhood planning by incorporating features that address sustainability. Responsibility for a “sustainable approach” to community development is shared among various levels of government, community planners, land developers, property owners and the general public. According to Steven Peck and Guy Dauncey, two sustainable community consultants who conducted research for Canada Mortgage and Housing Corporation (CMHC), there is an increasing recognition that the manner in which land is developed and redeveloped is a key determinant in the social and environmental health and economic well being of Canadians<sup>1</sup>. Peck and Dauncey have identified three major levels at which actions in support of sustainable community development or barriers to implementation occur:

- the planning and infrastructure level;
- the development site level; and
- the building level

Peck and Dauncey have identified 12 features of community sustainability which are incorporated within these three major levels.

### b. Community Sustainability Features in the Lancaster Landing

#### i) Ecological Protection

This feature pertains to the loss of farmland, habitat, forest cover and recreational green space which could be used for parks, nature reserves or trails. The Lancaster Landing Area Structure Plan will ultimately use a substantial amount of its development site for urban development. However, the land is intended to be kept in agricultural production as long as possible. Efforts will be made to utilize existing low lying area as part of the storm water management system that could be enhanced as a wetland providing opportunities for wildlife habitat. Landscape design should be based on native plants and those that support wildlife.

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<sup>1</sup> REFERENCE: New Urban Agenda - 12 Features of Sustainable Community Development: Social, Economic and Environmental Benefits; Steven Peck, Peck & Associates & Guy Dauncey, Sustainable Communities Consultancy <http://www.cardinalgroup.ca/nua/ip01.htm>





ii) Urban Design

- (a) The Lancaster Landing features a curvilinear, looped pattern of streets, sidewalks, appropriate building set-backs, some clustering of homes, provision of green space that may exceed mandated requirements, the use of urban design codes (architectural control), and steps to encourage pedestrian and bicycle travel, in addition to cars.
- (b) Streets within townhouse clusters will be narrower than normal yet will not hamper emergency or sanitation vehicles.
- (c) Significant amounts of green space are provided for active and passive recreation together with ponds and other features associated with the storm water management system.
- (d) Pathways have been designated for pedestrians and cyclists in and around the development area.

iii) Housing and Population Densities

The proposed new neighbourhood will be developed at slightly higher numbers of dwelling units and persons per hectare than the existing town.

- (a) On a site area of 50.55 hectares (124.91 acres), Lancaster Landing is proposing approximately 631 dwelling units. The gross housing density of the development area would thus be 12.5 units per hectare (5.0 units per acre).
- (b) Based on an average of 2.3 persons per dwelling unit, the population that could be accommodated in the development area would be approximately 1451. This represents a population density of approximately 28.7 persons per hectare (11.6 persons per acre).
- (c) Once roads, utility rights-of-way, open space and other land uses are factored-in, housing unit and population densities will increase.



iv) Urban Infill

Lancaster Landing is a recently annexed green field site thus urban infill criteria does not apply.

v) Neighborhood Commercial Site

The proposed neighbourhood commercial site will include some commercial uses within walking distance of most of the homes within the project area. This area will provide an opportunity for residents to acquire basic goods and services, congregate, socialize without having to depend on an automobile.

vi) Local Economy

Nanton is within the Calgary “commuter shed” and will appeal to Calgary workers by providing a range of affordable housing. Lancaster Landing should appeal to existing residents of Nanton and potential new residents alike. As the community grows, there should be more growth in the local economy and less reliance on the Calgary job market.

vii) Sustainable Transport

Public transit will not be practical in Nanton in the foreseeable future. However, Lancaster Landing is being designed as a walkable neighbourhood that will link with the existing community.

viii) Affordable Housing

Lancaster Landing intends on providing a range of affordable housing in various single and multi-family types.

ix) Livable Community

Lancaster Landing has incorporated numerous “livability features” suggested by CMHC including:

- (a) architectural controls
- (b) neighbourhood commercial site
- (c) garages at back or recessed/rear lanes
- (d) interconnected park system/walkways/bike trails
- (e) alternative crescent and looped roadways
- (f) streets connecting straight to neighbourhood commercial centre
- (g) mix of density and housing types



- (h) efficient energy/water use/waste systems
- (i) reduced infrastructure
- x) Sewage and Stormwater
  - Lancaster Landing will provide a conventional sewage collection system but has proposed ideas to minimize the need for piping and treatment of storm water including:
    - (a) rain gardens and bio-swale
    - (b) vegetated buffers
    - (c) open space and natural greenways
    - (d) naturalized detention
    - (e) native landscaping
- xi) Energy
  - Approximately 51% of the Lancaster Landing is designed along an east-west axis that will facilitate solar access. The combination of higher than average housing density and the presence of convenient walkways leading to a neighbourhood commercial site reduce automobile dependence in order to live in this neighbourhood.

c. Summary

Peck and Dauncey reach the following conclusions which are apropos to the Lancaster Landing project:

*“Sustainable community development requires new ways of thinking about the interrelationship between economy, environment and community and new ways of examining the full costs and benefits of alternatives to conventional approaches to development. There are many barriers to the implementation of sustainable communities that cut across the eleven major features described above.*

*The benefits of implementing sustainable communities can be significant in both the short and long term – for developers, residents and society in general. This framework should help those who are working to implement sustainable community development projects by bringing a more holistic, approach to development.”*



## 15. IMPLEMENTATION

- a. Adoption of this Area Structure Plan by bylaw will make it a statutory plan in accordance with Section 633 of the Municipal Government Act. Any deviation from the adopted plan will require amendment of this Area Structure Plan by bylaw.
- b. Upon adoption, application for redesignation by phase amending the Town of Nanton Land Use Bylaw will be made by the developer in accordance with *Figure 1*. It is recognized that phasing may not proceed exactly as numbered.
- c. All subdivision applications must be consistent with this Area Structure Plan and comply with the Land Use Bylaw.
- d. In accordance with Section 648 of the Municipal Government Act, off-site levies will be required to pay for the developer's share of:
  - i) new or expanded facilities for the storage, transmission, treatment or supplying of water;
  - ii) new or expanded facilities for the treatment, movement or disposal of sanitary sewage;
  - iii) new or expanded storm sewer drainage; and
  - iv) new or expanded roads required for or impacted by the subdivision.

The amount and manner of determination, payment and collection of these levies shall be in compliance with the Off-Site Levy Bylaw and with the Development Agreement.

- e. Subdivision of land will occur through the established provincial process set forth in the Municipal Government Act and Subdivision Regulation.
- f. In accordance with Sections 650 and 655 of the Municipal Government Act, the Developer will be required to enter into an agreement (referred to as a "Development Agreement") with the Town of Nanton for the provision of specified on-site services including:
  - i) the construction of roads to give access to the subdivision;
  - ii) the construction of a pedestrian walkway system to serve the subdivision;
  - iii) public utilities necessary to serve the subdivision;



- iv) payment of off-site levies; and
  - v) a “Development Agreement” may be registered against the certificate of title for the parcel of land that is the subject of the subdivision.
- g. Pursuant to sub-section f. above, a portion of these costs may be attributed to sub-development areas developers or builders to more equitably distribute costs coincident with the timing of actual development.
- h. Architectural Controls shall be submitted to the Town of Nanton for review prior to registration on title. The Town will look for conflicts with the Land Use Bylaw and may seek removal or clarification of any conflicting requirements.
- i. Development applications, within the boundaries of the plan area, must comply with the requirements of the respective land use districts for which they are proposed.
- j. Building permits must be reviewed through a safety codes process approved by the Town of Nanton.
- k. Lancaster Landing will request that the Town of Nanton check development applications, made within its project area, to ensure such applications have been certified by the developer’s architectural control reviewer. This is being requested so that any such non-compliant applications are not processed until certified compliant by the developer’s architectural control reviewer.
- l. Lancaster Landing Area Structure Plan contains conceptual engineering plans and practices including, but not limited to, project phasing and sequence, water and sewer system capacity, water and sewer oversizing, roadway layout, underground utilities, storm water management, and street lighting. When considering redesignation, subdivision, or development proposals, the Town may require further engineering study, reports, plans or documents to assess necessary infrastructure.

