



# TOWN POLICY

**POLICY NUMBER:** 3901

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**REFERENCE:**

Council 395.07.03

**ADOPTED BY:**

Town Council  
16 July 2003

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**PREPARED BY:** Planning & Development

**DATE:** 2 July 2003

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**TITLE: Design Standards & Procedures for Development & Subdivision  
Infrastructure Policy**

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**Policy Statement**

The Town of Strathmore will provide design standards and procedures for development and subdivision infrastructure as the basis for installing and constructing the necessary infrastructure to serve development and subdivision.

1. **Definitions**

- 1.1 Council means the Council of the Town of Strathmore, in the Province of Alberta.
- 1.2 Developer means a landowner, or his agent, who intends the new or revised development of land by subdivision.
- 1.3 Development means the change in use or intensity of use of land.
- 1.4 Development Agreement means an agreement between a Developer and the Town.

- 1.5 Infrastructure means the systems under the control of the Town necessary for water, sanitary sewer, storm sewer and motorized vehicle transportation and all appurtenances thereto.
- 1.6 Subdivision means the division of a title or lot into two or more titles or lots.
- 1.7 Town Manager shall mean the manager of the Town or his designate as employed or retained by the Town.

## 2. **Responsibilities**

### 2.1. Council

- 2.1.1 To review proposed design standards and procedures as required.
- 2.1.2 To make changes to the design standards and procedures as engineering practice and design criteria dictate.

### 2.2 Town Manager

- 2.2.1 To provide comment on all design standards or procedures to the Planning and Infrastructure Departments.
- 2.2.2 To be the signing authority for all Development Agreements where development or subdivision has been approved and includes as part of the agreement a schedule containing the design standards and procedures.

### 2.3 Infrastructure and Operations Department

- 2.3.1 To prepare amendments or revisions to the design standards and procedures as required.
- 2.3.2 To submit revisions to the design standards and procedures, with a recommendation to Council for their consideration.

### 2.4 Planning Department

- 2.4.1 To provide comment to the Town Manager and the Infrastructure and Operations Department on any provision within the standards or proposed changes.

3. **Basis for Discussion**

3.1 This Policy shall form the basis for discussion with a developer and any or all of the requirements of the Development Agreement, and shall be applied to any development or subdivision that has a condition of approval that requires the developer to provide infrastructure to a development or subdivision.

3.2 Where the Town considers that a development or subdivision is of a nature that requires special design or procedure modification to those contained with in the design standards and procedures, those extra requirements shall form part of the development agreement as a schedule outlining those special design or procedure modifications.

4. **Design Standards and Procedures**

4.1 The Design Standards and Procedures attached as Schedule "A", dated July 2, 2003 shall be the Design Standards and Procedures for development and subdivision for the Town.

5. **End of Policy**

## SCHEDULE "A"

### TOWN OF STRATHMORE "DESIGN STANDARDS AND PROCEDURES"

The "Design Guidelines for Subdivisions Servicing", "Standard Specifications", "Standard Block Profile Specifications" and "Storm Water Management Design Manual" all of the City of Calgary in force and effect as of the date of this agreement, (i.e., current edition), shall be the Standards to which subdivision and development will be designed and constructed except as modified as follows:

#### 1. GENERAL

The Developer shall notify the Municipality of award of construction contracts for the various municipal improvements and shall state the name of the Contractor, address, phone number and contact. The Developer shall ensure that the Contractor (s) are properly bonded for the performance of the work and that the Contractor carries Liability, Course of Construction and Equipment Insurance as required by the Municipality **and names the Municipality as an insured party.**

All local improvements constructed under this Agreement shall be extended to Subdivision Area boundaries, and through or along adjacent boundary roads, lanes or rights-of-way as necessary to accommodate a continuity of infrastructure with adjacent lands.

#### 2. SPECIAL CONSIDERATIONS

##### GENERAL

Utility appurtenances (valves, fittings, etc.), hydrants (including pumper connections and threads), and pipe shall conform to those currently accepted in the Town, subject always to the approval of the Town and all connections are to be supervised and inspected by the Town prior to back filling.

##### 2.1 WATERMAINS

- a) valves shall **open** counter-clockwise.
- b) hydrants shall be compression type, McAvity 67 or Mueller, ported to Town standards prior to installation and conform to the following:

- Placed on the right side of the street in the direction of travel from the entrance into the neighbourhood or street;
- Hose nozzle (A.M.A.) Alberta Mutual Aid;
- Fitted with a Stortz connector;
- Size 6.35 cm (2.5") inside diameter - 8 threads per inch;
- Square nut
- Painted florescent green.

## **2.2 GRAVITY MAINS**

- a) shall be concrete and/or polyvinyl chloride (PVC) and shall meet A.S.T.M. designations, subject to approval of the Town prior to construction.
- b) grades shall meet or exceed Alberta Environment Standards.
- c) separation of water and sewer lines shall conform to Alberta Environment Standards and Town alignments.
- d) the total infiltration of ground water into the whole sanitary sewer system shall not exceed 20 litres per day per mm of pipe diameter per km of sewer pipe installed. The infiltration into any section between adjacent manholes including that at the manholes shall not exceed twice that amount. All manholes shall be watertight.
- e) the Developer shall advise the Town in writing and receive written acknowledgement as to any and each proposed flushing operation.

## **2.3 SERVICE CONNECTIONS**

- a) The end of all services shall be marked with a suitable length of 2 x 4 extending 900 mm (3-feet) above the top of finished grade to the invert of the services, and a 4 x 4 post 1.8 m (6-feet) long extending 900 mm" (3-feet) above finished grade immediately adjacent to the service valve and painted red.
- b) for industrial and highway commercial lots only, the Developer shall:
  - i) install one 150 mm (6-inch) diameter sanitary sewer service and one 50 mm (2-inch) diameter water service to 3.6 metres

(twelve feet) inside the property line centered on each industrial or commercial lot less than 0.4 has (1 acre). The end of the sanitary service shall be capped. A plug and thrust block adequate to withstand the operating pressure in the distribution main shall be installed at the end of each water service.

- ii) water service shall not be filled until the service connection to a premises is complete.
- d) water service lines shall not be copper and shall meet the City of Calgary Standard for PEX pipe.
- e) storm and sanitary sewer service connections to the main shall be by a pre-installed inline tee or by Inserta-tee.
- f) connection to existing manholes shall be cored as required, fitted with Link Seal.
- g) new manholes shall be pre-cast complete with bench and bells and spigot to a minimum of 1.2 m. (4 ft.) in height or as otherwise approved by the Town.
- h) sewer connections from multi family dwellings shall be provided with a clean out complete with access cover, with multi service lines tied to the main sewer line with a manhole.
- i) lots for duplex or semi-detached shall be serviced with two separate services with a meter inside each unit. For lots of multi-family dwellings, apartments and multi- unit commercial or industrial buildings, if units not individually serviced, shall have a one meter installed inside a meter vault or multiple meters contained in a meter room with direct outside entrance to the room. Manufactured home parks shall be served with one meter housed inside a meter vault located within an easement on the said lot(s).
- i) all front serviced lots shall have the service connection located on the opposite side of proposed driveways and shall be 4.0 metres from the lot line or as otherwise approved by the Town.

## 2.4 CONCRETE CURBS, GUTTERS, SIDEWALKS & CARRIAGEWAYS

- a) curbs shall be low profile except adjacent to reserve and/or commercial areas where standard curb shall be constructed.
- b) sidewalks are required in the following instances:
  - i) one side of 15.0 m ROW residential street with 1.2 metre (4.0 feet) wide monolithic curb, gutter and sidewalk;
  - ii) both sides of 15.5 m ROW residential street with 1.2 metre (4.0 feet) wide monolithic curb, gutter and sidewalk;
  - iii) one side of a cul de sac with more than ten (10) residential or industrial lots 1.2 metre (4.0 feet) wide monolithic curb, gutter and sidewalk;
  - iv) both sides of collector street with 1.2 metre (4.0 feet) wide monolithic curb, gutter and sidewalk;
  - v) monolithic sidewalk adjacent to commercial area or school sites shall be 1.4 metre (4.5 feet) wide;
  - vi) separate 1.4 metre (4.5 feet) or monolithic 1.2 metre (4.0 feet) sidewalk on one side of an industrial street;
  - vii) separate 1.4 metre (4.5 feet) or mono 1.2 metre (4.0 feet) sidewalk for industrial collector streets;
  - viii) separate 1.4 metre (4.5 feet) or monolithic 1.2 metre (4.0 feet) sidewalk on one side of an arterial street with a 3 metre pathway on the opposite side.
- c) construct granular sub-base materials under curb and gutter and under monolithic sidewalk to 150 mm (6-inches) behind the concrete structure.

The minimum granular section shall consist of:

- extend the roadway pit-run section under the curb;

- provide 100 mm (4-inches) of crushed road gravel under the concrete walk, and;
  - provide 100 mm (4-inch) crushed road gravel under separate sidewalk.
- d) wheel chair ramps are required at all intersections, and at designated crosswalks.
- e) Class A concrete is required for all curbs, gutters and sidewalks.

## **2.5 EASEMENTS, UTILITY RIGHTS-OF-WAY (URW) AND WALKWAYS**

- a) easement or URW widths shall be consistent with requirements dictated by the number, depth and separation requirements for the deep utilities contained therein. In any event, a minimum width of 6 metres is required to accommodate one line and a minimum width of 9 metres is required for two lines and 11 metres where three or more lines.
- b) the minimum width of a walkway right-of-way shall be:
- i) 3 metres where no utilities are located within the right-of-way, or
  - ii) 6 metres where one utility line is located within the right-of-way, or
  - iii) 9 metres where two are located within the right-of-way.
  - iv) 11 metres where three or more utilities are within the right-of-way.

## **2.6 ROADWAYS/CARRIAGEWAYS**

The Developer shall construct roadways to the following standards. Road right of ways are illustrated in the attached figures:

- a) minimum acceptable widths are set out as follows:

Face to Face of  
Curb or Finished



Classification	Width	ROW Width
Driveways (SF Single)	3.0 m (10.0 feet)	3.0 m (10.0 feet)
Driveways (SF Double)	6.7 m (22 feet)	6.7 m (22 feet)
Driveways (Com)	7.5 m (25 feet)	7.2 m (23.6 feet)
Driveways (Apart, Lg. Commercial & Industrial.)	10.0 m (32.8 feet)	10 m (32.8 feet)
Lanes- unserviced Laned – serviced or 2 deep services and fire lane	7.6 m (24.9 feet)	7.6 m (24.9 feet)
Pathways/Walkways	9.0 m (30 feet)	9.0 m (30 feet)
Residential Local	2.45m (8 feet)	3.0 m (10 feet)
Sidewalk one side residential local	10 m (32.8 feet)	15.0 m (50 feet)
Sidewalk two sides major collector	10 m (32.8 feet)	15.5 m (51 feet)
Undivided & parking primary collector	12 m (20.5 feet)	22.0 m (72 feet)
Divided – no parking Industrial – local	3.25 m (10.6 feet) each lane	22.0 m (72 feet)
2 lanes no parking	10.5 m (34 feet)	17.0 m (55 feet)
Industrial – collector	14 m (20.5 feet)	22.0 m (72 feet)
4 lanes no parking	3.5 m each lane	
Major Arterial	14 m (46 feet)	30.0 m (100 feet)
4 lanes no parking	3.5 m each lane	
Primary Arterial feet)	7.5 m (24.6 feet)	36.0 m (118 feet)
Divided 4 lanes	3.75m each lane	

- i) Driveways shall be flared at roadways and shall have the following flare widths:

Residential SF & R2- Single and Double driveways: 1m (3 feet)  
Multi-Family, Commercial, and Industrial: 3m (10 feet)

- ii) Loading areas, and where lanes are used for access to the loading areas, shall be paved with a minimum of 110 mm of asphalt A-Mix and 40 mm of asphalt B-Mix or 300 mm of gravel and 88 mm of asphalt A-Mix.
- iii) Commercial and industrial parking and drive aisles including lane access to parking areas shall be paved with a minimum of 65 mm of asphaltic concrete on 50 mm crushed gravel over 250 mm of pit run gravel sub-base complete with a minimum 150 mm curb around the perimeter of the parking area. Wheel

stops to be incorporated as part of the landscaping. Handicap parking stall to be 4 metres in width.

iv) Two Family and Multi-family residential parking areas and drive aisles, including lanes used for access to parking areas, shall be paved with a minimum of 50 mm of asphaltic concrete on 50 mm crushed over 150 mm of pit complete with a minimum 150 mm curb around the perimeter of the parking area. Wheel stops to be incorporated as part of the landscaping. Handicap parking stall to be 4 metres in width.

b) in support of the proposed structural design sections for roadways, laneways and walkways, a report and recommendations from a registered Geotechnical Engineer are required for a fifteen (15) year design life.

c) Roadways shall be a minimum of:

(i) Residential Roadway:

- 65 mm (2½-inches) of asphaltic concrete; and
- 75 mm (3-inches) of crushed gravel
- 300 mm (12-inches) of pit-run gravel
- geotechnical fabric where required

(ii) Residential Collectors, Industrial and Commercial Roadways:

- 100 mm (4-inches) of asphaltic concrete;
- 75 mm (3-inches) of crushed gravel;
- 300 mm (12-inches) of pit run gravel; and
- geotechnical fabric where required;

(iii) Pathways:

- 65 mm (2½-inches) of mix “B” asphaltic concrete;
- 50 mm (2-inches) of crushed gravel;
- 250 mm (10-inches) of pit run gravel.

Or

The City of Calgary Standard.

(iv) Lanes:

Shall be designed and constructed with a granular section having due regard for normally imposed loads such as construction traffic (i.e., concrete trucks, dump trucks, etc.) and garbage pick-up trucks.

- d) temporary road turn-arounds where approved by the Municipality shall be oiled.

## **2.7 SIGNALIZATION**

The Developer shall design, construct and install traffic control signals at all arterial to arterial and collector to arterial intersections as required by the Municipality. In particular, major intersections on Secondary Highway 817, Brent Boulevard, Lakeside Boulevard and Boundary Road shall have traffic control signals.

## **2.8 STREET LIGHTING**

The Developer shall design, construct and install street lighting in accordance with the Engineering Society of North America (IESNA) publication RP-8.

## **2.9 EROSION AND SEDIMENTATION CONTROL**

The developer shall design, construct and install control mechanisms and features to mitigate against soil erosion in accordance with the City of Calgary "Erosion and Sediment Control Guidelines". The Developer shall submit an erosion and sedimentation report as per City of Calgary Guidelines with the engineering drawings.

## **2.10 LANDSCAPING**

The Developer must:

- a) grade and loam all boulevards, reserve, and public utility lands.
- b) make provision to have planted a minimum of two 50 mm (2-inch) calliper trees on the front yard of each residential lot.

- c) plant shrubs and/or trees (50 mm (2-inch) calliper for deciduous; 2m high for coniferous) in and for all parks, reserves, buffers, lots and other public lands. The minimum number required shall be calculated on the basis of one per 100 square metres (1000 square feet), but in any event not less than ten (10) per parcel.
- d) supply and install irrigation to all boulevards and municipal reserve lots less than 1 ha (2.5) acres in area, and provide water service connection(s) to all municipal reserve lots as agreed to by the Town.
- e) ensure that all work shall be in accordance with Calgary Parks/Recreation Department General Landscape Standards and Specification (current year), and all valves shall be electronically controlled as approved by the Town. Install a water meter for each irrigated area.

## **2.11 FENCING**

- a) Municipal and Environment Reserve Lots:
  - i) minimum of post and cable with minimum height of 0.6 metre to cable.
  - ii) adjacent to school and play ground areas shall be chain link, minimum height of 1.2 m (4 feet).
- b) Common Subdivision or Neighbourhood boundary fence:
  - i) Is required adjacent to an arterial street, service road and highway and must be uniform and of wood or screened construction throughout the subdivision or neighbourhood area;
  - ii) maximum height 2 m (6.5 feet) unless noise attenuation is a factor, then the noise attenuation design shall govern.

## **2.12 GRADE SLIPS AND GRADING PLAN**

The Developer shall provide the house builder of each lot with a grade plan or grade slip indicating by means of arrows (and elevations), the grading and drainage requirement for the said lot and any restrictions thereto which would influence the grading. The Developer shall provide all building

grades in the Development Area until the last Final Acceptance Certificate has been issued, and before the final release from liability is given by the Town to the Developer, all design building grade slips shall be turned over to the Town.

### **3. DESIGN INFORMATION & DRAWINGS**

Not so as to restrict the generality of information and drawings to be supplied for review, the Developer is required to provide the following as a minimum:

#### **3.1 DESIGN INFORMATION**

- alkalinity tests
- resistivity survey results
- storm sewer design calculations
- test hole data
- summary of water table readings

#### **3.2 ENGINEERING PLANS AND DRAWINGS**

- a) cover sheets for the following items shall contain, but not be limited to, the pertinent data indicated:
- Development area outline plan;
  - Oversize and boundary improvements clearly defined;
  - Proposed Land Use Classification map indicating the classification of all lots within the Development Area;
  - Location of all test holes with logs;
  
  - Location of all existing utilities, shallow utilities and other improvements within or immediately adjacent to the Development area;
  
  - Registered or non-registered legal plan, easements and utility right-of-way plan;
  
  - Existing Contour Plan;

- Watermain Layout - to show all lines, valves, fittings, line sizes, pump stations, pressure control facilities, pressure zone contours and park services;
- Pressure Reducing Facilities - pressure reducing facilities shall include upstream/downstream pressure gauges and an upstream Sensus strainer or approved equal. Show sizing calculations and set-points.
- Sanitary Sewer Layout - to show all lines, manholes, pump stations, lengths, slopes, invert and rim elevations, direction of flow.
- Storm Sewer Layout - as for sanitary, and show drainage area boundaries, areas, outfalls, catch basins, pump stations and erosion and sedimentation control;
- Sidewalks, Curb & Gutter, Roads & Walkways Layout - to show all curb, gutter and sidewalk proposed as to type and location, radii, catch basins, carriage way and right-of-way widths, proposed roadway design sections for asphalt (lifts), crushed gravel, pit-run gravel, proposed walkways;
- Building Grade Plan - to show all surface drainage swales and elevation, lot corner elevation, sanitary and storm invert elevations at property, minimum top of footing grades, landscaping building grades, terracing details, retaining wall locations, seasonally adjusted water table contours (0.5 m interval); by legend, lots which require bearing certificate, connection of weep tile to storm, setback variation from standard, test hole locations, restriction of housing type due to grades; lot number, 1:100 flood contour line; ice jam level;
- Landscaping Drawings or Plan - show proposed grades including surface features and drainage by way of contours for all credit reserves. Contour interval and scale to be approved by Town but tentatively 0.5 m and 1:500 respectively. Show proposed planting location and type for approval. Show proposed playground equipment and amenities for approval;

- Irrigation System - show proposed irrigation system complete with service ties, elevation, lines sizes, locations, turf heads, etc., for approval;
- Fencing Plan - show proposed fencing location and fence type and/or barrier locations.
- Sanitary and Storm Sewer Pumphouse - a design brief shall be submitted which describes the general scope, design and intended operation of the proposed lift station which covers the following:
  - i) Design Brief Outline
    - design flows
    - calculations
    - hydraulic calculations
    - system curves
    - pump pre-selection
    - system operation philosophy
    - staging considerations

Larger lift stations, or those likely to have critical issues associated with power failure, may have more detailed design requirements.

- 1.1 (ii) General
 

Complete operations and maintenance manuals shall be provided. This shall include a specific Preventative Maintenance Schedule. O & M plus PMS shall be presented in 3-ring binder format and on pdf files on CD. The PLC logic and related operational software shall also be presented in 3-ring binder (paper) and on pdf (digital), on CD.

  - The lift station design drawings shall be signed and stamped by an Engineer registered in the province of Alberta. Full electrical, mechanical,

architectural and structural design information shall be provided on the drawings.

1.2 (iii) Generator

- Koehler Genset Design.
- Generator standby for full load take-over, at ultimate lift station design capacity.
- Transfer switch-automatic (full phase protection).
- Radiators on generator (motor) rather than heat exchanger.
- Generator ventilation louvers to be modulated for temperature control.
- Battery charger (incorporate with the generator).
- Single-phase cut-outs for power failures (loss of power must engage generators).
- Natural gas for generator operation.
- Top oiler on generator motor.
- The generator exhaust shall be equipped with a critical silencer.
- Batteries mounted in secondary containment.
- Entire Genset to be mounted in secondary containment. Secondary containment must be sized accordingly to allow normal maintenance functions, such as oil changes, radiator flush, greasing, etc to be performed above it.



### 1.3 (iv) Pumps

- Roof hatches for pump and/or motor removal, with a track and chain hoist. Not necessary for small stations. Separate wet wells should be complete with lifting davit and hoist. Ensure that lifting of pumps can be safely performed without obstructions to ground level.
- Pump switchgear should have manual “HAND/ OFF/ AUTO” switches and properly labeled on control panel and within wet well.
- Pump rail, hardware and discharge converter must be Flygt compatible for sump pumps.
- Flygt pump electrical four pole 220 V plug shall be located above grade.
- Pumps to be Flygt Pumps (up to 30 l/s) complete with hour meters.
- Amp meters are required on all motors over 5 horsepower.
- Separate ball check valves and isolation plug valves shall be provided for each pump, easily accessible from catwalk.
- At least one of the pumps shall have a flusher valve.

### 1.4 (v) PLC Controls

- Pump controls should be sonic level with high/low electrical float balls (Flygt) as backup, larger lift stations will use bubbler backup.
- All pumps should alternate on starting sequence.
- An alarm system shall include Call-out capability for the following: generator failure, intrusion, power failure, pump failure, high and low liquid level, low temperature and communication failure, and shall be connected to the Town’s central reporting system i.e. WTP. A “test” lamp shall be provided for all alarm lights.
- PLC’s to be Modicon or Allan Bradley, complete with LCD interface.

- All alarm status indicators shall be mounted on the outside of the panel.
- PLC battery backup.
- Larger or critical lift stations shall provide a relay back-up to the PLC

vi) Building

- Building structure will be insulated to a minimum of R20. It must also be architectural compatible with the surrounding area.
- Pressure ventilation to all areas and exhaust ducts for all areas (exhaust should be separate from wet well) -per Provincial Regulations.
- Ventilation should be heated and thermostatically controlled.
- Water service two inches (for cleaning) complete with RPBA if the line is inside the building for large lift stations.
- Waterproof and explosion proof electric fixtures shall be provided within for wet wells. (Fixtures shall have access for maintenance by operators).
- Portable stations to have portable building (above ground). Security fence. Arch Controls. The fence shall be chain link, 2.0m in height. Access gate should be 4.5 metre minimum to allow service truck access.
- If building is over wet well, then gas & LEL monitoring is to be installed.
- Building design and placement shall be appropriate for the station design.
- A motion detection system shall be provided for outside lighting.
- 2 buildings- one for wet wells and one for emergency power (larger lift stations).
- Exterior alarm warning light.
- No windows for building.

- 1.5
  - Interior 120 V electrical outlet, explosion proof when necessary by code.
  
- 1.6
  - vii) Wetwell
    - Screens for catching debris. Mechanical baskets as per design (May be necessary).
    - Wet well cat walks hatches, ladders, etc. to be aluminum.
    - Intermediate floor with clear access to valves, screen, etc.
    - On larger or critically located sanitary stations a quick coupler system should be built in. This is a bypass line connected to the discharge header with an emergency quick coupler located at grade. The bypass shall have a gate valve and a backwater valve. A cover for the coupler is required.
  
- Access to all valves and equipment shall be provided by a platform within the wet well.
  - A continuous Inlet flow meter shall be provided on large or otherwise critical lift stations.
  - Lift chambers to be concrete or fiberglass. Concrete must be resistance to corrosive gases and liquids from raw sewage, EX. Hydrogen Sulphide.
  - Air scrubbers will be required for large lift stations.
  - Quick connect force main pressure gauge.

viii) Plans or Drawings to include:

- buoyancy calculations
- air exchange calculations
- hydraulic calculation for station and forcemain
- wet well volume calculations
- pump start and stop, and alarm levels
- electrical drawings including:
  - bill of materials
  - site plan complete with transformer and U/G cabling
  - breaker panel schedule
  - panel layout
  - control schematics
  - single line diagram
  - building electrical layout
  - trenching details on underground cabling
  - generator sizing calculations
  - mechanical drawings for heating and ventilation
- wet well drawings with piping layout and materials list
- structural drawings on building and wet well as necessary
- pipe supports in disturbed construction area
- 1:100 year storm events and ground water levels

ix) Submission for approval to include:

- 4 sets of plans
- specifications for
  - structural
  - process piping and equipment
  - heating and ventilation
  - electrical
- digital copy of tentative legal (AutoCad format) with Town of Strathmore layer standard.

- b) Plan Profile Sheets - shall conform to the current requirements of the City of Calgary, or A-1 size, unless otherwise approved by the Town.
- c) Upon final transfer of all drawings to the Town, each original shall contain the approved Town Logo.
- d) Where drawings are produced with a CADD system, in addition to the preceding mylar originals, the developer shall provide to the Town the CADD files on disk media and to the current AutoCAD Format (or such other format as may be approved by the Town) and with Town of Strathmore layer standard.

In the event that the City of Calgary does not publish design guidelines for subdivisions or the standards and specifications for subdivisions, or any other body or entity does not publish and other set of guidelines referred to in this Schedule "C" then the Town shall establish guidelines which shall be binding upon the Developer.

**4. GUARANTEE PERIODS**

**All periods are from the date of Construction Completion Certificates are issued unless otherwise specified.**

- a) Sanitary Sewers:.....One Year
- b) Storm Sewers:.....One Year
- c) Water Mains & Hydrants:..... One Year
- d) Sewer & Water Connections:

The minimum maintenance period for the subject connection (i.e., storm sewer (weep tile), sanitary sewer or water) shall be one (1) year.

The Developer's obligation of maintenance with respect to Water and Sewer Connections shall cease thirty (30) days after the granting of an Occupancy Permit by the Town for individual residences and buildings where the Developer has not been advised by the Town that a deficiency exists. Where such advice that a deficiency exists has been given by the Town, the Developer shall repair or correct the deficiency to the satisfaction of the

Town and maintenance for that specific connection will cease thirty (30) days after the Town's acceptance of said repair or correction.

e) Sidewalks, Curbs, Gutters and Catch Basins:.....Two Years

Provided the underground utilities have in the opinion of the Town been installed and compacted in other than winter conditions; or if installed in winter conditions, the backfilling has been properly compacted with granular material.

f) Paved Roads, Paved Lanes and Paved Walkways:..... Two Years

(Includes manhole frames and covers; water main and hydrant valves and valve operating mechanisms, cathodic protection test points, water service connection valves and valve operating mechanisms, and catch basin leads installed in paved roads, paved lanes or paved walkways.)

Provided the underground utilities have in the opinion of the Town been installed and compacted in other than winter conditions; or if installed in winter conditions, the backfilling has been properly compacted with granular material.

g) Gravelled Lanes: .....Two Years

(Includes manhole frames and covers; water main and hydrant valves and valve operating mechanisms; cathodic protection test points; water service connection valves and valve operating mechanisms installed in these lanes.) After the second spring thaw, the Developer shall reshape the lanes to design grades and slopes, gravel where considered necessary by the Town, repair and adjust manholes, hydrants and all valves, cathodic protection test points, catch basins and catch basin leads.

Provided:

- i) That at least 75% of the lots in the development area, that are lane serviced, have all the underground house services installed by the electric, natural gas, telecommunication systems.
- ii) No single lane has less than 50% of the house services installed.

h) Overland Drainage Control: ..... Two Years

- i) Sound Attenuation Fencing: ..... Two Years
- j) Landscaping for Reserve Parcels, Public Utility Lots and Underground Irrigation: ..... Two Growing Seasons

Provided all reserve parcels, buffers, ornamental parks, tot lots, linear parks and public utility lots have been properly graded, loamed and seeded and there is a satisfactory catch of grass and all necessary underground irrigation and fencing required by the Agreement have been completed to the satisfaction of the Town.

- k) Landscaping for Streets and Avenues

After all the medians, traffic islands and boulevards have been properly graded, loamed, seeded, and trees planted and there is a satisfactory catch of grass to the satisfaction of the Town, one (1) Final Acceptance Certificate will be issued, by the Town for the boulevards and medians.

- l) Pumping Stations and Pressure Control Facilities: .....One Year

**5. CONSTRUCTION COMPLETION QUALIFICATIONS**

- a) **Sanitary Sewers** - All proper size pipes are laid to approved grades, and all manholes are completed with properly formed inverts, and are free from obstructions and foreign matter such as rocks, silt, and gravel, and are undamaged, and:
  - i) The manhole rims and covers shall be finished to the approved design grade of the lane or road in which they are installed. The manhole rims and covers set in a surface where a subsequent lift of asphalt will be placed, must be protected to the satisfaction of the Town to preclude damage during snow removal operations;
  - ii) the Developer shall at no expense to the Municipality flush sanitary sewer lines and furnish a video Inspection Report by a firm skilled in such inspections by operators that are certified by the North American Association of Pipe Inspectors (NAPPI) for all sanitary sewers installed pursuant to this Agreement;
- b) **Storm Sewers** - Same as Sanitary Sewers.

- c) **Water** - The water mains have been installed to the approved grades, tested, inspected, backfilled and disinfected to the satisfaction of the Town, and are ready for the supply of water to the public, and:
- i) all the main and service connection valves and curb boxes, fire hydrants, pressure reducing valve chambers and other appurtenances are operable and undamaged and at elevations which are satisfactory to the Town.
  - ii) valve boxes set in asphalt surface where a subsequent lift of asphalt will be placed, must be protected to the satisfaction of the Town to preclude damage during snow removal operations;
- d) **Sewer and Water Service Connections** - The sewer and water service connections have been installed to the approved grades, tested, cleaned, inspected and backfilled and all appurtenances are operable and undamaged, all to the satisfaction of the Town, and the water mains and hydrants are deemed to be complete.
- e) **Sidewalks, Curbs, Gutters and Catch Basins** - All sidewalks, curbs, gutters, and catch basins and all hard surfaced medians, traffic islands and boulevards shall be fully constructed to the approved design grade and free of damage, except at lane crossings and easements wherein utilities are to be installed (not included as exceptions are underground wiring, service connections and sidewalks on fill), and all work shall be free from conditions deemed to be hazardous by the Town.

Those portions omitted shall be completed within one (1) year from the issuance of the Construction Completion Certificate for adjacent sidewalks, curbs and gutters, and this shall be a condition of the issuance of the Construction Completion Certificate. Should the omitted sections not be completed within one (1) year from the date of the issuance of the Construction Completion Certificate, the maintenance period shall be extended to one (1) year from the date of the completion of the omitted sections.

- f) **Paved Roads, Paved Lanes and Paved Walkways** - All catch basin leads, manhole frames and covers, water main valves and hydrant valves (and valve operating mechanisms), sewer and water service connections (and valve operating mechanisms), shall have been completed in the paved roads, paved lanes and paved walkways, prior to the Construction



Completion Certificate for paved roads, paved lanes and paved walkways being issued.

The paved road, paved lane and paved walkway surfaces shall be constructed except where

- i) the installation of the electric power, gas, telephone and cable T.V. utilities has caused the omission of construction of portions of the asphalt surface but the deep base is in place. In any event the total length of the omitted sections shall not exceed fifteen percent (15%) of the total length of the paved roads, paved lanes and paved walkways being constructed; or
- ii) when the Town deems it necessary to construct portions of any paved walkways at a later date to facilitate the landscaping with adjoining lots.

The construction of the said omitted sections of asphalt surface shall be constructed within one (1) year from the issuance of the Construction Completion Certificate for the adjacent paved roads, paved lanes and paved walkways. Should the omitted sections not be completed within one (1) year of the date from the issuance of the Construction Completion Certificate, the maintenance period shall be extended to one (1) year from the date of the completion of the omitted sections.

Notwithstanding the foregoing the placement of the final top lift asphalt may be omitted upon approval being given by the Town. The omitted final top lift asphalt must be placed at least thirty (30) days prior to the Developer submitting the Final Acceptance Certificates for paved roads, paved lanes and paved walkways.

- g) **Overland Drainage Control Facilities** - When all concrete drainage gutters and/or grassed swales, erosion and sedimentation control mechanisms and features and fences are constructed to the satisfaction of the Town.
- h) **Sound Attenuation Fencing** - When all the work has been completed to the satisfaction of the Town.
- i) **Landscaping for Reserve Parcels, Public Utility Lots and Underground Irrigation** - All underground irrigation and water services required for tot

lots, ornamental parks and linear parks and water services for other reserve parcels (other than environmental reserves) have been installed, tested and inspected and the "as-constructed" drawings, conforming to the Town requirements and showing the actual location of the underground irrigation as installed by the Developer have been submitted and approved by the Town and the tot lots, ornamental parks, linear parks, reserve parcels, buffers and public utility lots have been graded, loamed, and seeded.

j) **Landscaping for Streets and Avenues** - All the medians, traffic islands and boulevards have been graded, loamed and seeded and trees planted to the satisfaction of the Town.

k) **Pumping Stations and Pressure Control Facilities** - when the work is completed in accordance with the approved design, three sets of operating, maintenance and equipment manuals in a form acceptable to the Town have been provided, start-up reports have been completed certifying that performance meets design and the system is operating to the satisfaction of the Town.

l) **General**

i) Where applicable, the Developer shall submit with the Construction Completion Certificate:

- a separate certificate duly signed, and sealed, by a registered Professional Engineer of Alberta certifying that all the pre-grading, grading and back-filling operations, carried out by the Developer, have been carried out in accordance with the back-filling requirements.
- Standard Proctor and Density test results from an accredited testing company for, but not limited to the following: pre-grade, road and lane construction, all asphalt work and utility trenches. In addition, the Developer shall provide a summary form, concrete test data, asphalt test data including core data.
- samples of any materials proposed to be used or installed in any utility or improvement under this Agreement as reasonably requested by the Town. Certification for the respective improvements shall be submitted for that particular Construction Completion Certificate prior to application

by the Developer and shall be in a report or reports, complete with key plans showing and indexing test locations (provide test data), and shall be signed and sealed by a registered Professional Engineer of Alberta and have been carried out in accordance with and that the work meets the requirements of the Design Standards.

- video camera inspection tapes of sanitary and storm sewer lines.
- ii) The Developer, prior to the issuance of the Construction Completion Certificate for water mains and hydrants, shall provide certification of the pressure testing, chlorination and water sampling of the said water mains and confirmation in writing that the hydrants are operational for fire fighting.
  - iii) The Construction Completion Certificate may be issued if sanitary sewer, storm sewer, and water service connections are not completed to church sites, school sites and commercial areas where the final layout is not known.
  - iv) Immediately upon the completion of the construction and installation of the improvements, the Developer shall deliver to the Town for its approval, all inspection testing records and two complete sets of prints of all design and construction cover sheets setting out the improvements constructed pursuant to this Agreement and showing actual locations, descriptions and all "as-constructed" elevations referred to geodetic datum. All plans and information required by the Town to be amended or revised shall be corrected by the Developer and re-submitted for final acceptance by the Town. Prior to an application for FAC the Developer shall submit a check set of revised profiles. Upon final approval of "as-constructed", the Developer shall deliver the original plans, which shall be on mylar and digital form or such other material as approved by the Town, to the Town.
  - v) The Developer agrees that he will not make application for Final Acceptance Certificates on sidewalks, curbs & gutters or paved roads or lanes until he has been granted Final Acceptance Certificates for the underground utilities in those areas where

underground utilities and surface improvements are in the same right-of-way.

- vi) The Developer further agrees that he will make separate application for Final Acceptance Certificates on Parks, Boulevards, Buffers, Reserves, and Fencing. These requirements are in addition to any and all of the other pre-qualifications set out herein.

## **6. CERTIFICATES**

Application for Construction Completion and Final Acceptance shall be in the form as set out herein.

Applications for Construction Completion Certificates shall be accompanied by:

- Digital copy of Cover Sheets with record "as constructed" inverts, pipe sizes etc.
- Inspection and testing reports and record drawings.
- Video camera inspection tapes of sanitary and storm sewer lines.

Three (3) Months prior to applications being submitted for Final Acceptance Certificates the Developer shall submit to the Town copies of all "as built" Plans and profile record drawings in a form and to standards specified by the Town.

Notwithstanding the submission of a video camera inspection tape on sanitary or storm sewer lines, the Developer shall provide, if requested by the Town, a further video inspection of ten (10) percent of sanitary and storm sewer lines. If deficiencies are discovered the Town may require the Developer to video camera any remaining portion or the remainder of the sanitary or storm sewer lines.

**TOWN OF STRATHMORE  
CONSTRUCTION COMPLETION CERTIFICATE**

DATE OF ISSUANCE: \_\_\_\_\_

SUBDIVISION: \_\_\_\_\_ PHASE: \_\_\_\_\_  
\_\_\_\_\_

DEVELOPER: \_\_\_\_\_ AGREEMENT DATE: \_\_\_\_\_

UTILITY: \_\_\_\_\_

CONSULTING ENGINEER: \_\_\_\_\_ CONTRACTOR: \_\_\_\_\_  
\_\_\_\_\_

BOUNDARY OF AREA: See Map Attached.

**CONSULTING ENGINEER'S CERTIFICATE**

I, \_\_\_\_\_, Professional Engineer am employed by the Consulting Engineer who is engaged by the Developer to design and inspect the construction and installation of utilities and improvements. I do hereby certify that the utilities or improvements noted within the area shown on the attached plan have been constructed, installed and inspected in conformance in all respects to the Town's specifications and approved designs, or as otherwise required by the Town, and that all defects and deficiencies in work and materials have been reported to the Developer and the Town and have been remedied by the Developer.

I confirm that I have been empowered by the Developer to honor, comply with and perform all of the Consulting Engineer's obligations and to provide all of the Field Services as specified in the document entitled "Consulting Engineer's Field Services Guidelines", current year as issued by the Urban Development Institute/City of Calgary.

\_\_\_\_\_  
Signature of Engineer's Inspector

(permit to practice) (seal) \_\_\_\_\_ P.  
Eng.

\_\_\_\_\_  
Signature of Consulting Engineer

Acknowledgement of  
Receipt of Consulting  
Engineer's Certificate Date: \_\_\_\_\_

\_\_\_\_\_  
UMA Engineering Inc.

Acknowledgement of  
Receipt of Consulting  
Engineer's Certificate Date \_\_\_\_\_

\_\_\_\_\_  
Town of Strathmore

Projected Earliest Maintenance Period Expiry Date: \_\_\_\_\_  
\_\_\_\_\_

Rejection of Consulting \_\_\_\_\_  
Engineer's Certificate Date \_\_\_\_\_  
UMA Engineering Inc.

Cause for Rejection: \_\_\_\_\_

\_\_\_\_\_  
THEREBY CERTIFY THAT THE ITEMS LISTED  
AS CAUSES FOR REJECTION HAVE NOW BEEN CORRECTED.

\_\_\_\_\_  
P. Eng. \_\_\_\_\_  
Date Signature of Consulting Engineer  
ACKNOWLEDGEMENT OF RECEIPT OF CONSULTING ENGINEER'S CERTIFICATE

\_\_\_\_\_  
Date \_\_\_\_\_  
Town of Strathmore

Projected Earliest Maintenance Period Expiry Date: \_\_\_\_\_

**TOWN OF STRATHMORE  
FINAL ACCEPTANCE CERTIFICATE**

DATE OF ISSUANCE: \_\_\_\_\_  
SUBDIVISION: \_\_\_\_\_ PHASE: \_\_\_\_\_

DEVELOPER: \_\_\_\_\_ AGREEMENT DATE: \_\_\_\_\_  
UTILITY: \_\_\_\_\_  
CONSULTING ENGINEER: \_\_\_\_\_ CONTRACTOR: \_\_\_\_\_

BOUNDARY OF AREA: See Map Attached.  
**CONSULTING ENGINEER'S CERTIFICATE**

I, \_\_\_\_\_, Professional Engineer am employed by the Consulting Engineer who is engaged by the Developer to design and inspect the construction and installation of utilities and improvements. I do hereby certify that the utilities or improvements noted within the area shown on the attached plan have been constructed, installed and inspected in conformance in all respects to the Town's specifications and approved designs, or as otherwise required by the Town, and that all defects and deficiencies in work and materials have been reported to the Developer and the Town and have been remedied by the Developer.

I confirm that I have been empowered by the Developer to honor, comply with and perform all of the Consulting Engineer's obligations and to provide all of the Field Services as specified in the document entitled "Consulting Engineer's Field Services Guidelines", current year as issued by the Urban Development Institute/City of Calgary.

\_\_\_\_\_  
Signature of Engineer's Inspector

(permit to practice) (seal)  
Eng. \_\_\_\_\_ P.

\_\_\_\_\_  
Signature of Consulting Engineer

Acknowledgement of  
Receipt of Consulting  
Engineer's Certificate \_\_\_\_\_  
Date: \_\_\_\_\_

\_\_\_\_\_  
UMA Engineering Inc.

Acknowledgement of  
Receipt of Consulting  
Engineer's Certificate \_\_\_\_\_  
Date \_\_\_\_\_

\_\_\_\_\_  
Town of Strathmore

Projected Earliest Maintenance Period Expiry Date: \_\_\_\_\_  
\_\_\_\_\_

Rejection of Consulting \_\_\_\_\_  
Engineer's Certificate \_\_\_\_\_ Date \_\_\_\_\_ UMA \_\_\_\_\_

Cause for Rejection: \_\_\_\_\_

\_\_\_\_\_  
I HEREBY CERTIFY THAT THE ITEMS LISTED AS  
CAUSES FOR REJECTION HAVE NOW BEEN CORRECTED.

\_\_\_\_\_  
P. Eng. \_\_\_\_\_  
Date \_\_\_\_\_ Signature of Consulting Engineer

**ACKNOWLEDGEMENT OF RECEIPT OF CONSULTING ENGINEER'S CERTIFICATE**

\_\_\_\_\_  
Date \_\_\_\_\_ Town of Strathmore

Projected Earliest Maintenance Period Expiry Date: \_\_\_\_\_