



TOWN OF STRATHMORE ENGINEERING DESIGN AND CONSTRUCTION STANDARDS MANUAL

2022

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Foreword

This Engineering Design and Construction Standards Manual has been prepared by the Town of Strathmore to reflect subdivision and other site plan applications through the development processes. Collaborative efforts from experts in multiple Town Departments/Disciplines, were obtained to provide the most accurate and current information as possible.

It is recognized that this manual cannot consider or provide direction for all circumstances encountered. The Town reserves the right to apply discretion in the interpretation of these guidelines and that the use of other applicable guidelines and good engineering judgement will be required when reviewing each project.

Preamble

The Engineering and Landscaping Standards and Specifications provided in this document are considered to be the normal practice for the construction of civil and landscape elements. Their foundation is framed by the following Town policy documents *but not limited to*: Land Use Bylaw, Joint Use Agreements, Master Servicing Studies, and Wetland Policy and Bylaw. The Town of Strathmore Infrastructure, Operations, and Developments Services Department, at their discretion, may consider alternatives to or relaxations of the Standards and Specifications when the Developer or their agent, or the Contractor or their agent, provides a written submission identifying the reasons for special considerations.

PRIOR TO THE COMMENCEMENT OF ANY WORK IN THE TOWN OF STRATHMORE, ALL APPROVALS MUST BE IN PLACE. THIS INCLUDES BUT IS NOT LIMITED TO DEVELOPMENT AGREEMENTS, SECURITIES, AND DEVELOPMENT PERMITS.

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Alberta1Call	1.800.242.3447
Municipal Enforcement.....	403.361.2112

Emergency Numbers

Shaw Cable Locates (Emergency Requests).....	1.866.DIG SHAW (344.7429)
ATCO Gas.....	1.800.511.3447
Strathmore Operations (After Hours Emergency)	403.361-2137
EPCOR (Water or Sewer Emergencies)	403.934.9440
Fortis Alberta (Electrical Emergencies).....	310.WIRE (9473)
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REVISIONS

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1.0 Definitions

<i>Agreement</i>	shall mean the written contract agreement, subdivision servicing agreement, development agreement, or any other agreement or permit duly executed between the Developer and the Town which details the terms and conditions under which the Developer is to construct or install the Local Improvements.
<i>Assumed Subdivision</i>	shall mean when the municipality assumes responsibility for the maintenance of all municipal services regarding roads, sidewalks, grading, water and sewer services. This occurs at Final Acceptance Certification (FAC) for all components.
<i>Authority Having Jurisdiction</i>	shall mean the organization, office, or individual having statutory responsibility for enforcing the requirements of a standard and shall include but not be exclusive to Alberta Transportation, Western Irrigation District, and EPCOR Utilities.
<i>Canadian Standards Association (CSA)</i>	The CSA is a leader in standards, safety, research, and develops standards in 57 areas (i.e. electrical, playground equipment). Accredited as a certification body, the CSA publishes standards in print and electronic form, and provides training and advisory services.
<i>Certified Professional in Erosion and Sediment Control or equivalent</i>	A professional designer with experience in the design and implementation of erosion and sediment controls who holds a valid designation with experience in ESC as either a: <ul style="list-style-type: none"> • Certified Professional in Erosion and Sediment Control (CPESC) • Professional Engineer (P.Eng.) • Professional Licensee (P.L.Eng.) • Professional Agrologist (P.Ag.)
<i>Conservation Reserve (CR)</i>	see the Municipal Government Act, R.S.A. 2000; Chapter M-26; Part 17; Division 8, Section 664.2, as amended.
<i>Construction Completion Certificate (CCC)</i>	shall mean a document: <ul style="list-style-type: none"> • Signed and sealed by the Consulting Engineer and stamped with an Association of Professional Engineers and Geoscientists of Alberta (APEGA) permit to practice stamp, certifying that construction of the Local Improvement has been constructed, installed, and inspected in conformance with the Town of Strathmore's Standards, or in the case of Landscaping signed by the Landscape Architect certifying that construction of the Local Improvement has been constructed, installed, and inspected in conformance with the Town of Strathmore's Standards. • That is acknowledged and dated by the Infrastructure Manager and the Town's Director of Infrastructure, Operations & Development Services. • That contains the projected earliest warranty period expiry date for the Local Improvement as set by the Infrastructure Manager.
<i>Consulting Engineer</i>	shall mean <ul style="list-style-type: none"> • A professional engineer registered in the Province of Alberta who is a member in good standing of the Association of Professional Engineers and Geoscientists of Alberta (APEGA) and is employed or retained by the Developer at the Developer's expense for the design and inspection of the construction and installation of the Local Improvements pursuant to the Agreement. • For the purposes of landscaping, the word "Consulting Engineer" may be replaced with "Landscape Architect" who is a member in good standing of the Alberta Association of Landscape Architects (AALA)."

<i>Contractor</i>	shall mean the individual or corporation hired by the Developer or the Town to undertake the obligations contained in the Agreement on behalf of the Developer or the Town for the installation, construction, and maintenance of the Local Improvements or any part thereof.
<i>Crime Prevention Through Environmental Design (CPTED)</i>	is based on the premise that “the proper design and effective use of the built environment can lead to a reduction in the incidence and fear of crime, and an improvement in the quality of life.” https://cacpc.ca/cpted.html
<i>Developer</i>	shall mean the individual and/or corporation who propose to install and construct the Local Improvements as defined in the Development Agreement, as associated with permits, or as required by Town’s Bylaws.
<i>Development Area</i>	shall mean any portion of the lands that are the subject of a Subdivision Development Agreement or Development Permit approval, which the developer intends to immediately develop, and for which the Developer will be obligated to design, construct, and install the Local Improvements, which will be more particularly described in the Subdivision Development Agreement or Development Permit.
<i>Disturbed Zone</i>	an area of land that is not substantially in its natural and native condition and is cut off from the nearby natural system or vegetation community.
<i>Environmental Reserve (ER)</i>	see the Municipal Government Act, R.S.A. 2000; Chapter M-26; Part 17; Division 8, Section 664, as amended.
<i>Environmentally Significant Area (ESA)</i>	ESAs are important to the long-term maintenance of biological diversity, soil, water, or other natural processes, at multiple scales. They are areas that contain rare or unique elements or that include elements that may require special management consideration due to their conservation needs.
<i>Final Acceptance Certificate (FAC)</i>	shall mean a document: <ul style="list-style-type: none"> • Signed and sealed by the Consulting Engineer and stamped with an Association of Professional Engineers and Geoscientists of Alberta (APEGA) permit to practice stamp, certifying that the Municipal Improvement has been constructed, installed, inspected, and maintained in accordance with the Town of Strathmore’s Standards, or in the case of Landscaping, signed by the Landscape Architect who is a member in good standing of the Alberta Association of Landscape Architects (AALA) certifying that construction of the Local Improvement has been constructed, installed, inspected, and maintained in conformance with the Town of Strathmore’s Standards; and • Signed and dated by the Infrastructure Manager • That in most cases signals the end of when a Developer is responsible for maintaining a local improvement. Additional warranty periods may be added to newly installed infrastructure as determined by the Town.
<i>Garden Suite</i>	Shall mean a second Dwelling Unit on a parcel, to be used as a separate accommodation that is accessory to the primary dwelling and may be a standalone unit or may be located above a detached garage, with a minimum of one on-site parking stall and a minimum of 12m ² private amenity space.
<i>Historic / Archaeological</i>	refers to written/prewritten evidence/artifacts.
<i>Infrastructure Manager</i>	shall mean the Town of Strathmore Director of Infrastructure, Operations & Development Services (IODS), the Infrastructure Manager, their authorized representative, or such other engineer as may from time to time be duly authorized and appointed to act as the Town’s agent or representative in writing by the Town of Strathmore.

<i>Landscape Architect</i>	For the purposes of landscaping, the word "Consulting Engineer" may be replaced with "Landscape Architect" who is a member in good standing of the Alberta Association of Landscape Architects (AALA)." A Landscape Architect is required for the designs of all 'A', 'B', and 'D' Parks as detailed within this document.
<i>Local Improvements</i>	shall mean all of the installations and improvements to be constructed and installed in the Development Area in accordance with the Plans and including, but not limited to , the following: <ul style="list-style-type: none"> • Water mains, including all fittings, valves, and hydrants • Sanitary sewer mains, including all manholes, lift stations, and required appurtenances • Storm sewer mains, including all manholes, catch basins, catch basin leads, pump stations, and required appurtenances • Overland drainage control facilities, stormwater ponds, and related structures • Service connections from the storm sewer, sanitary sewer, and water mains to the required location at the property line • Streets with a stabilized base course and asphalt concrete surface course • Concrete curbs and gutters throughout the completed Subdivision • Concrete sidewalks and asphalt walkways • Paved lanes • Street lighting, underground and overhead power, telephone, gas, fibre optic cable, and cable TV services • Landscaping • Tree planting • Park, pathway, and walkway development on dedicated lands in accordance with Plans reviewed by the Town • Traffic signs and street signs • Traffic control signals and controlled pedestrian crossings where required • Fencing • Other improvements that are described in the Servicing and Construction or Development Agreement.
<i>Municipal Reserve/Municipal School Reserve</i>	see the Municipal Government Act, R.S.A. 2000; Chapter M-26; Part 17; Division 8, Section 666, as amended.
<i>Municipality</i>	shall mean the Town of Strathmore.
<i>Native Species</i>	of animal or plant that have not been introduced by people or their direct activity.
<i>Natural System</i>	a group of areas that are ecologically dependent.
<i>Naturalization</i>	the process of leaving a disturbed site to natural processes.
<i>Naturalized Stormwater System</i>	is a designed stormwater system that creates attractive and inviting places that support biodiversity, and enhance the living space of communities, connecting residents with nature.
<i>Non-Native Species</i>	any introduced species of animal or plant.
<i>Park Amenity</i>	a park development project, such as pathway, trail, bench, or viewing platform.
<i>Reclamation</i>	the efforts to improve a disturbed site's condition.
<i>Rehabilitation</i>	in reference to reclamation, and restoration, rehabilitation refers to i.e. the efforts to restore a site to near native condition, or the efforts to improve a disturbed site's condition.
<i>Resource Significance</i>	refers to the level of importance of the area in question to a future park area.

<i>Restoration</i>	implies intent to improve an area to near its natural and near native condition. Such an area plays a role in the nearby natural system or vegetation community.
<i>Sensitivity Measures</i>	the amount of un-mitigable damage that a particular vegetation community or species can withstand.
<i>Standards</i>	shall mean the Town of Strathmore's Engineering Design and Construction Standards set by the Town for the design, construction, and installation of the Local Improvements including any alterations to or amendments of such guidelines and standards which may be agreed upon in writing by the Town and the Developer, and as well shall include all the conditions imposed by the Town.
<i>Subdivision</i>	shall mean the division of a parcel of land by an instrument, which results in the reconfiguration of property lines.
<i>Town or Town of Strathmore</i>	shall mean the municipality of the Town of Strathmore and/or the land lying within the corporate limits of the Town, as the context requires.
<i>Town's Water and Wastewater Operator</i>	shall mean the corporation(s) hired by the Town of Strathmore to undertake on behalf of the Town the obligations contained in the Service Agreement for delivery, management, and operation of the water distribution and wastewater collection systems.
<i>Utility</i>	shall mean a system, works, plant, equipment, or service for the production, transmission, delivery, or furnishing of water, sewerage, heat, light, power, or waste management system.
<i>Vegetation Community</i>	a group of populations of plants in a given area.
<i>Warranty Period</i>	for each Local Improvement shall mean the minimum period of time commencing from the date of execution of the Construction Completion Certificate by the Infrastructure Manager pursuant to the provisions of the Development Agreement, to the date of execution of the Final Acceptance Certificate for the Local Improvement or Utility as described in this document.

SECTION 2.0

GENERAL INFORMATION

2.0 General Information

2.1 Introduction

The information contained herein comprises the Engineering and Construction Standards for the Town of Strathmore (Town). Included are design specifications and requirements, which are to be utilized for the design of works within the Town on municipally owned road allowances, municipally owned property and for municipally owned infrastructure on easements as well as projects subject to municipal approval or contributing to the municipal system. The design information contained in this manual is intended to provide guidance beyond legislative and standard design practices for use in the Town.

These Engineering Design and Construction Standards are intended to provide information to developers, engineering consultants, contractors, and the general public about the development approval process and standards governing the design and construction of infrastructure in the Town of Strathmore. All work performed in the Town shall be carried out in accordance with the latest issue of this document.

The Town reserves the right to vary these standards to meet any site-specific situation where the design will depart from these practices as it is not possible nor is it the intention of Town to anticipate every situation. As a result, specific site requirements may be applied where the Infrastructure Manager deems it necessary taking into account the protection of public interest. All other deviations from these standards and accepted construction drawings shall have the written approval of the Infrastructure Manager.

These specifications and drawings may be revised from time to time as considered necessary by the Town. It will be the responsibility of the professional engineer who is performing the design and contract administration for the work to verify that the design and installation of these systems will be in accordance with the latest revision of these Specifications.

All construction & maintenance activities shall conform to the Occupational Health and Safety Act.

We welcome feedback and/or enquiries on this document. Please direct enquiries to infrastructure@strathmore.ca

2.2 Submissions and Approvals by Government or Other Agencies

Depending on the nature and scope of the proposed development, approval may be required by other agencies, including provincial and federal regulators or other third parties. Once approval is received, a copy of the approval shall also be supplied to the Municipality. Approval by other agencies in no way removes the responsibility of the Developer to comply with the Engineering Design and Construction Standards and obtaining the Municipality's approval of the detailed plans and specifications.

This manual does not address submissions or approvals which may be required from other levels of government or other agencies. It is the Applicant's responsibility to identify approval requirements and apply for, and obtain, any necessary approvals from all Federal, Provincial, utility companies or other agencies or authorities as necessary.

Regulatory Compliance Considerations for Development may include ***but not limited to:***

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- | | |
|--|---|
| • Water Act (Alberta) | • Species At Risk Act (Alberta) |
| • Public Lands Act (Alberta) | • Migratory Birds Convention Act |
| • Historical Resources Act (Alberta) | • Wildlife Act (Alberta) |
| • Environmental Protection and Enhancement Act (EPEA)(Alberta) | • Alberta Environment & Parks Extension of Underground Facilities |
-

2.3 Municipal Planning Documents

This Manual applies to all new subdivisions, condominiums, site plans, and where deemed applicable by the Town, will apply to capital projects, and reconstruction projects. These specifications and drawings may be revised from time to time as considered necessary by the Town of Strathmore. It is the applicant's responsibility to obtain and check with the Town of Strathmore for new revisions. Copies are available from the Town of Strathmore or can be downloaded from the web site at: www.strathmore.ca/

Note, that all Town policies, procedures, master plans and bylaws are also applicable. This manual is to be read in conjunction with the following **current** Town of Strathmore Plans, Studies, Bylaws to provide guidance to the planning of municipal growth, and provide further requirement for public infrastructure:

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- | | |
|---|--|
| • Municipal Development Plan (MDP) | • Sanitary Master Servicing Study |
| • Area Structure Plans (ASP) and/or Outline Plans | • Stormwater Master Servicing Study |
| • Land Use Bylaw | • CSMI Regional Stormwater Guidelines & Policies |
| • Community Standards Bylaw | • Development Digital Submissions Requirements |
| • Municipal Strategic Plans | • Parks Classification and Maintenance Policy |
| • Strathmore Wetland Conservation Plan | • Eligible Shrubs for Strathmore |
| • Strathmore Wetland Conservation Policy | • Eligible Trees for Strathmore |
| • Transportation Master Plan | • Tree Protection Bylaw |
| • Water Master Servicing Study | |
-

2.4 Reference Materials

Reference will be made throughout the Standards to other regulatory agencies, standards, and documents. These include, **but are not limited to**:

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- | | |
|--|---|
| • City of Calgary; design standard documents (i.e., Water, SAN, Site Servicing, Roads) | • Crime Prevention through Environmental Design (CPTED) |
| • Transportation Association of Canada (TAC) | • Alberta Environmental and Parks |
| • Alberta Transportation | • Government of Canada |
| • Alberta Building Codes (ABC) | • Canadian Standards Association (CSA) |
-

2.5 Design

Notwithstanding anything contained in this document, all designs shall, as a minimum, meet the statutory requirements of the [Alberta Environmental Protection and Enhancement Act](#), all applicable legislation and regulations, as well as all policies adopted by the Municipal Council of the Town of Strathmore.

Exceptions to the City of Calgary specifications are outlined in this document. **However, in the case of a discrepancy** the Town Engineering Design & Construction Standards shall prevail. The Infrastructure Manager reserves the right not to accept any City of Calgary specification at his or her sole discretion.

This document provides the minimum acceptable standards. Where conditions dictate and good engineering practice requires, higher standards than those indicated in this document shall be observed and incorporated into the design. It shall be the Developer's responsibility to develop the Subdivision or property in accordance with standards that conform to good engineering and construction practices.

The Town encourages and will show flexibility to accommodate alternatives to promote conservation, sustainable best practice, and unique and innovative neighbourhood design as expressed in the context of the [Municipal Development Plan](#), provided sufficient evidence exists to demonstrate that the alternatives will work in the local context and climate.

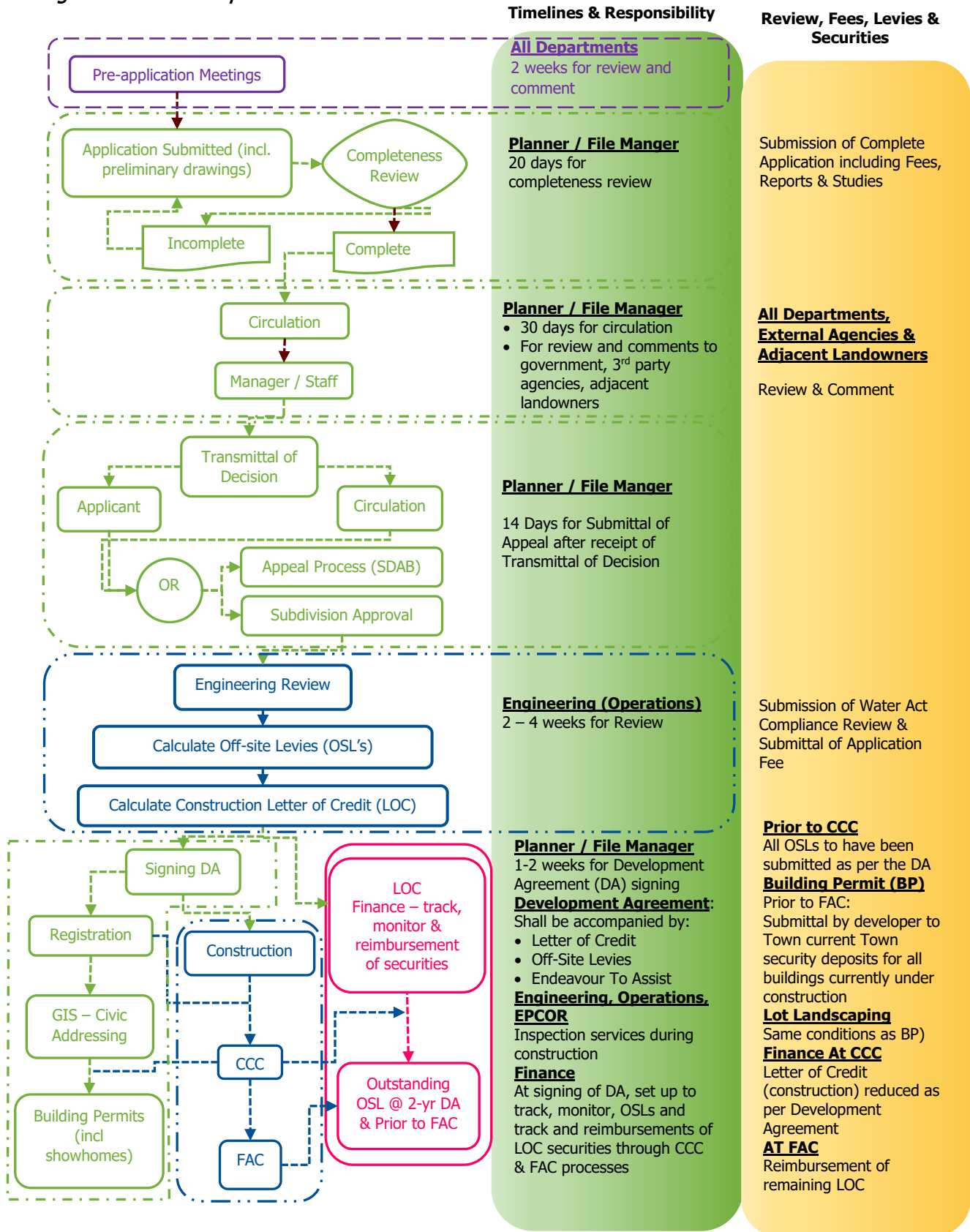
2.6 Procedure

An outline of the major steps and development procedures from subdivision approval to final acceptance is displayed in **Figure 2.1**. Some of the key steps are listed below:

1. A Pre-Application meeting is to assist the Applicant in clarifying the procedures of the Development process.
2. Submission of subdivision application which should include supporting documents such as
 - a. A design brief showing conformity to the Municipal Development Plan, Strategic Plan, current Land Use Bylaw, Area Structure Plan and other Municipal planning documents, and
 - b. Conceptual plans
3. Approval of subdivision application.
4. Development and finalization of easement and Municipal Reserve Agreements.
5. Preparation of detailed Engineering Drawings and Specifications and Landscape Plans and Specifications.
6. Approval of Engineering and Landscape drawings and specifications.
7. Notification and Approval from Alberta Government departments and other Third Parties as required.
8. Negotiation and finalization of a Development Agreement or Site Servicing Agreement.
9. Collect Financial Securities.
10. The Development Agreement shall include Permits as required:
 - a. Stripping and Grading Permit (Engineering)
 - b. Utility Line Assignment approval (Engineering)
 - c. Haul Route Permit (Planning and Engineering)
11. Complete construction activities in accordance with the Engineering Servicing Standards and the approved plans and specifications.
12. Joint inspection by Municipality and applicable Authority Having Jurisdiction for issuance of Construction Completion Certificate(s).
13. Preparation and registration of the Legal Plan of Subdivision.
14. Reduction of Financial Securities
15. Completion of appropriate warranty period(s).
16. Final overlays, correction of deficiencies.
17. Joint Inspection by the Municipality and applicable Authority Having Jurisdiction for issuance of Final Acceptance Certificate.
18. Eligibility for takeover by the Municipality of the current development phase occurs on the Final Acceptance Certification of both the surface concrete and road toplit components.
19. Release of Financial Security.

Note: Subdivision construction work including clearing and grading shall not be started before signing of the Development Agreement along with appropriate securities.

Figure 2.1 – Development Process Flowchart



2.7 Development Application Submission

When considering a development application, the supporting documentation necessary will be confirmed at a pre-consultation meeting with the Applicant conducted by the municipality's Development Services Department. While the following list is not exhaustive, such supporting documentation may include any or all of the following, depending on the nature and complexity of the application:

- a) Historical Clearance /Archaeological Report
- b) Phase I Environmental Site Assessment (ESA)
- c) Biophysical Impact Assessment
- d) Water and Wastewater Hydraulic Modelling
- e) Stormwater Management Report (Hydrogeological Assessment)
 - Functional Servicing Report
 - Detailed Design
- f) Functional Servicing Report addressing proposed sanitary servicing, water main distribution, storm drainage and stormwater management, and grading
- g) Wetland Impact Assessment
- h) Wetland Delineation Report
- i) Geotechnical Report
- j) Deep Fills Report
- k) Traffic Impact Assessment (TIA). TIA reports to be completed utilizing the data within the Town's current [Transportation Master Plan](#) and where applicable the current Alberta Transportation's [Traffic Impact Assessment Guideline](#).
- l) Traffic Noise Analysis and/or Sound Attenuation Report

Specifics of these report requirements are described in *Section 3* of this manual.

2.7.1 Site Developments

All site developments (i.e. private, commercial, industrial, and multi-family residential sites) must be designed in accordance with the current City of Calgary [Design Guidelines for Development Site Servicing Plans](#) and in conformity with the Town of Strathmore's current Land Use Bylaw as amended. Any work within the public right-of-way must ensure that it meets all applicable subdivision regulations and requirements.

2.8 Warranty Period (see Table 2.2)

All warranty periods for construction of Local Improvements begin at the date of execution of the Construction Completion Certificate(s) by the Town's Infrastructure Manager to the date of execution of the Final Acceptance Certificate(s) unless otherwise specified.

2.8.1 Landscaping

The Developer, at no expense to the Town, shall maintain over a continuous period: all classifications as identified by the Town's current [Parks Classification and Maintenance Policy](#) (see *Section 5 Landscape/Open Space Design* for detailed descriptions) for a period of **two (2)** growing seasons. Growing seasons shall be that period of time from the date that the Town's Infrastructure Manager signs the Construction Completion Certificate to June 30, or on the date when, in the sole opinion of the Town's Operations Department, the irrigation systems are operating and the vegetation is in full leaf, whichever event occurs last.

Note: *Where Landscaping is to receive a Construction Completion Certificate (CCC) after September 30th, the Town of Strathmore Infrastructure, Operations, and Development Services may extend the maintenance period to a maximum of September 30th in the following year from the CCC date. CCC inspections are subject to the seasonal limits identified in the CCC Construction Inspection Schedule.*

The Developer, at no expense to the Town, shall maintain stormwater management ponds, naturalized areas, and naturalized stormwater systems for **three (3)** growing seasons.

Table 2.2: Local Improvement Warranty Periods

Sanitary Sewers Storm Sewers Water Mains and Hydrants Overland Drainage Facilities Sewer and Water Connections**	One year or One full winter* (whichever is greater)
<p>* The term winter means the period from October 31 of any calendar year until May 1 of the following calendar year.</p> <p>** The Developer's obligations for maintenance in respect to water and sewer connections shall not terminate until 30 days after the completion of construction, pursuant to the Alberta Safety Codes Act Regulations, and 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 30 days after the Town's acceptance of said repair or correction.</p>	
Sidewalks, Curbs, Gutters and Catch Basins# Paved Roads, Lanes and Walkways (excluding Top Lift)## Overland Drainage Facilities Paved Lanes###	Two Years
<p># Provided the underground utilities have, in the opinion of the Infrastructure Manager, been installed and compacted in an environment other than winter conditions; or if installed in winter conditions, the backfilling must be properly compacted with granular material, free of ice and other frozen deleterious materials.</p> <p>## Paved Roads includes portions of underground utilities which protrude to the surface including sewer manholes, manhole frames and covers; water main and hydrant valves, valve operating mechanisms, cathodic protection test points, and catch basin leads installed in paved lanes, roads or walkways.</p> <p>### Provided all utilities planned within the lane are 100% complete.</p>	
Top Lift for Paved Roads, Lanes and Walkways^	One (1) Year
<p>^ FAC for Top Lift granted as long as all other requirements have been met. A warranty period will be imposed following FAC for a period of one (1) full year.</p>	
All Landscaping/Tree Planting Sound Attenuation Fencing Chain Link or Other Fencing	Two (2) Years (Two (2) Full Growing Seasons)
Storm Ponds	Three (3) Years
Constructed Wetlands	Three (3) Years or as noted in the <i>Wetlands Policy (whichever is greater) and Alberta Guide to Wetland Construction in Stormwater Management Facilities</i>

2.9 Inspections During Construction and Maintenance

2.9.1 Inspections by the Town

The Town must have free and immediate access to the Subdivision area and all other areas of development at all times during construction for the purpose of inspecting the site and sampling materials; however, the Town has no duty or obligation to discover or advise the Developer of any item of non-compliance during construction.

Failure to notify the appropriate inspection service may require all work to be exposed for an inspection at the Contractor's expense.

Note: *Inspectors are not required to review site development unless stamped approved drawings are available on site.*

Subdivision

Full-time inspection of the Subdivision by the Developer's Consulting Engineer must be provided during the construction and maintenance of the project, whenever contractors are on site. All backfill operations must be monitored on a full-time basis by a geotechnical consultant.

The latest edition of the City of Calgary's [Consulting Engineer's Field Services Guidelines](#) should be used as a guideline for field inspections.

Site Development

Full-time inspection of the development by the Developer's Consulting Engineer shall be provided during the construction and maintenance phases of the project within all municipal road Right-Of-Ways, utility easements and Right-Of-Ways, and any municipal lands. All backfill operations in public Right-Of-Ways must be monitored on a full-time basis by a geotechnical consultant.

The latest edition of the City of Calgary's [Consulting Engineer's Field Services Guidelines](#) should be used as a guideline for field inspections.

Landscaping

Inspections by the Town of Strathmore Operations Department are required at key times during project construction as outlined in each section of the Standard Specifications *for Landscape/Open Space Design (Section 5)*. Requests can be made by emailing operations@strathmore.ca

Satisfactory construction inspections will be recorded on a "Construction Inspection Checklist". It is the applicant's responsibility to keep a copy of the "Construction Inspection Checklist" on-site to verify previous site inspections. If a checklist is not available, the Inspectors are not required to review site development.

The Town of Strathmore's Operations Landscape Technician shall be given a minimum of 2 working days notice when requesting an inspection.

As per the Inspection Checklist tables, landscape and irrigation inspections for: interim development; Construction Completion Certificates; or Final Acceptance Certificates will only occur during regular business hours.

Note: *Operations Department personnel work a five-day week (Monday-Friday).*

Natural Areas/ER's restoration sites may receive regular inspections during their maintenance period to ensure that site restorations are on track. The Consultant can contact Town of Strathmore Operations Department at operations@strathmore.ca between May and September to arrange for a yearly inspection during the maintenance period.

2.10 Construction Phases

Construction phases consist of, but are not limited to, the following:

A. Underground Utilities

- Water mains and hydrants
- Sanitary sewers
- Storm sewers
- Service connections

B. Surface Improvements

- Paved Roads
- Paved and Graveled Lanes
- Sidewalks, curbs, gutters, and catchbasins
- Overland Drainage

C. Landscaping

- Parks & Municipal Reserve Improvements
- Boulevards, Medians, etc.
- Pathways
- Storm Ponds
- Attenuation Fencing
- Screen Fencing

D. Lift Stations

E. Storm Ponds & Constructed Wetlands

2.11 Construction Completion Certificates (CCCs)

2.11.1 Submissions

Following the completion of one (1) entire phase of local improvements (refer to *Section 2.6*), the Developer's Consultant may submit Construction Completion Certificates to the Town's Infrastructure Department at infrastructure@strathmore.ca. The Consultant should provide the following documentation, as applicable, along with the *CCC Checklists & Certificate* included in *Appendix A – CCC /FAC Application Required Documentation* for these items. Reports may be submitted prior to CCC Application.

- **An original Construction Completion Certificate** for each improvement.
- Submission of digital copies of the **CCC Checklist & Certificate**– The CCCs must be signed and stamped by the Developer's Consulting Engineer and an 8.5"x11" (letter size) cover sheet of the improvement must be attached with the construction boundary marked in red.
- **A flushing, disinfecting, and testing final report** as outlined in the Town's *Flushing, Testing, and Disinfection Manual for New Water and Sanitary Sewer Mains, Appendix B*. This report must include complete hydrostatic test results, water quality lab test results, CCTV footage of sanitary and storm mains, and a certification letter from the consulting engineer.
- Deflection (mandrel) testing shall be required at the discretion of the Town.
- An electronic copy of the **Hydrant certification letter** signed by the consulting engineer, confirming that each hydrant has been put into service and has been tested for proper operation and flow. The consulting engineer must provide information on the date and time of the test(s) and pressure (kPa) results.
- An electronic copy of **compaction reports** for underground utilities installation and surface improvements
- Electronic copies of the **Concrete and asphalt test results** for surface improvements from a certified geotechnical engineer
- One CAD and one electronic pdf set of the **As-built Construction Drawings** signed and stamped by the Developer's Consulting Engineer.

Note: The Town of Strathmore is willing to accept As-Built Construction Drawings following the CCC inspection however securities will not be released until the receipt of As-Built Drawings.

- One electronic copy of the completed **Unit Cost Worksheet**
- One electronic copy of all **Property Service Connection Reports** (see *Appendix A – CCC /FAC Application*)

Required Documentation).

- The applicable documents must be submitted as a complete package for each phase. Incomplete submissions will be returned without review.
- **Additional information may be required at the request of the Infrastructure Manager** (e.g., grade sheets, daily inspection reports, etc.).

2.11.2 Inspections

The consulting engineer may request a formal CCC inspection by the Town immediately upon construction completion of one complete phase of improvements (underground, surface, storm ponds, or landscaping) using the **Inspection Request Form** included in *Appendix A – CCC /FAC Application Required Documentation*. Prior to requesting a formal site inspection, the consulting engineer must inspect the site and identify and compile a list of deficiencies; this to be followed by a formal inspection by Town representatives and Consultant to verify and identify further deficiencies that may exist. Deficiencies do not need to be repaired until completion of the formal town inspection.

All inspections are subject to cancellation due to weather conditions. The Town requires 100% of all critical infrastructure (valves, manhole covers, catch basins, etc.) as well as 90% of all other installations to be completely visible, accessible, and clear of snow, ice, and debris at the time of CCC inspection.

The Town will complete a certain number of free inspections for each subdivision, as outlined in the current Town of Strathmore's [Consolidated Fees Schedule Bylaw](#). Should additional inspections be required, the cost of the inspection will be charged to the Developer at the Town's discretion.

2.11.3 CCC Issuance

CCCs will be issued after all essential deficiencies noted in the inspection are resolved, the subdivision has been registered, all fees have been paid, and all required documentation has been submitted to the satisfaction of the Infrastructure Manager.

2.11.4 CCC Landscaping

Municipal School Reserve (MSR) Sites

Class A and B Parks containing Municipal School Reserve (MSR) sites must be fully developed, where at least issuance of CCC has been accepted:

- a) No later than at least one (1) full year prior to occupancy of a school.
 - b) When two (2) sides of a development phase have been constructed adjacent to a park site, the park must be developed in its entirety prior to any further building development occurring.
1. Landscaping for Reserve Parcels (all classifications as identified by the Town's current [Parks Classification and Maintenance Policy](#)), public utility lots, ROW's, boulevards, medians, traffic islands and stormwater dry ponds shall be considered "complete" or "completed" when all underground irrigation and water services have been installed, tested and inspected and preliminary "as constructed" drawings have been submitted to the Town of Strathmore Infrastructure, Operations and Development Services Department and the Reserve Parcels, public utility lots, ROW's, boulevards, medians, traffic islands and stormwater dry ponds have been graded, loamed, seeded or sodded, the trees have been planted and, if applicable, the paved or interlocking stone walkways, fencing, play equipment and amenities have been constructed in accordance with the current City of Calgary [Development Guidelines and Standard Specifications for Landscape Construction](#).
 2. Park inspections will happen during the five critical stages (as per CCC Construction Inspections in *Appendix A – CCC /FAC Application Required Documentation*).
 - i. Inspection 1 – Construction Start-up
 - ii. Inspection 2 – Subgrade
 - iii. Inspection 3 – Tree and Shrub Planting

- iv. Inspection 4 – Irrigation
- v. Inspection 5 – Finish Grade
- 3. The Developer's Consultant, Contractor(s) and the Landscape Technician will be in attendance at each of the above critical stage inspections.

Note: Each inspection will be initiated by the Developer's Consultant or Contractor. The scope of work to be inspected shall be complete prior to the inspection.

- 4. Essential and non-essential deficiencies will be recorded during each inspection stage and both the Developer's Consultant and the Landscape Technician will sign off on each inspection stage.
- 5. At the end of the five stages, if all essential work has been completed, the Developer will apply to Infrastructure Department via email infrastructure@strathmore.ca for CCC. Along with that application, the Developer will submit:
 - i. A copy of the signed-off Construction Inspection Schedules and CCC Report noting the expiry date to complete all non-essential work.
 - ii. Submission of a proposed maintenance schedule for the duration of the warranty period.
 - iii. A complete set of As-Recorded drawings, only applicable where there are any deviations from the approved drawings.
 - iv. Structural engineering certification verifying that the built features have been constructed as per the approved drawings (if applicable).
 - v. All granular base and/or concrete cylinder testing to be submitted (if applicable).

Note: In order to effectively inventory sites once CCC is issued, Operations Department request that the Developer provide the following information on the CCC Application:

- Plan No. (registered or tentative), Block No., Lot No. and Park Classification Type, and
- Subdivision or Development Permit No.
- 6. Landscape components submitted for construction completion should be submitted in specific groupings by development phase to reduce the frequency of inspections and the volume of documentation by the Town of Strathmore Infrastructure and Operations Department and the Developer. Recommended groupings are:

<ul style="list-style-type: none"> i. All reserve parcels (including fencing) ii. All boulevards, medians, and traffic islands iii. All Environmental Reserves and Environmental Reserve Easements (including fencing) 	<ul style="list-style-type: none"> iv. All Municipal Reserves v. All dry and storm ponds vi. All fencing vii. All Public Utility Lots (PUL)
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Note: Where the Public Utility Lot (PUL) is dedicated for the purpose of a shallow utility cabinet or pedestal only, and embedded in a Municipal Reserve, the PUL may be included in the CCC application for the Municipal Reserve.

- 7. The Town upon receipt of an application for CCC shall within fourteen (14) days acknowledge the receipt of the said CCC and make arrangements for inspection.
- 8. Infrastructure, Operations and Development Services will sign the CCC and send a copy to the Developer. At this time the warranty period commences.
- 9. The Town of Strathmore will release up to **50%** of the landscaping securities, at the discretion of the Town of Strathmore staff.
- 10. No formal site inspection by the Landscape Technician will occur. The Developer must complete the non-essential work items before the expiry date and submit a letter to Town of Strathmore Infrastructure Department infrastructure@strathmore.ca confirming that all deficiencies have been completed. On receipt, the Landscape Technician will attend the site to confirm that all work has been carried out to industry standard.
- 11. As per the Residential Development Agreement, if the Developer does not complete the non-essential deficiencies within the expiry date period, the CCC will either be revoked, or the maintenance period

extended one year from the time the deficiencies are completed.

This process applies to Development Agreements from 2021 onwards and is not retroactive.

If FAC is not applied for or granted after the warranty period is complete, the developer will be responsible to provide additional warranty until granted.

2.12 Final Acceptance Completions (FACs)

2.12.1 Submission

Prior to the expiry of the Warranty Period as defined in *Table 1: Local Improvement Warranty Periods*, the Developer must submit to the Infrastructure Manager the following documents for review:

- **A digital Final Acceptance Certificate** for each improvement, in the form set out in *Appendix A – CCC /FAC Application Required Documentation*. The FACs must be signed and stamped by the Developer's Consulting Engineer and an 8.5"x11" (letter size) cover sheet of the improvement must be attached with the construction boundary marked in red.
- **Test results** are required for most **repair work** completed during the warranty period. Consulting engineers are encouraged to contact Infrastructure Department directly to determine what test results are required.
- One digital copy of water and sewer **acceptance testing** documentation. For water mains and sanitary sewers, acceptance testing shall be performed as per the latest edition of the Town's *Flushing, Testing and Disinfection Manual for New Water and Sanitary Sewer Mains (Appendix B)* and shall include visual inspection, CCTV video inspection and deflection (mandrel) testing, when requested, and must be successfully completed prior to submission of the FACs. Acceptance testing is also required for the top lift of asphalt.
- One digital CAD copy and one pdf copy of the **as-built drawings, if changed from the CCC submission**, signed and stamped by the Developer's Consulting Engineer. Drawings to be reviewed and any comments to be addressed and resubmitted.

With the exception of the as-built drawings, which may be submitted in advance, all the applicable documents must be submitted as a complete package for each phase. Incomplete submissions will be returned without review.

2.12.2 Inspections

Once the Town has verified that all the required FAC documentation has been submitted, and the consulting engineer has inspected the site to confirm that there are no outstanding deficiencies, the consulting engineer may request a formal FAC inspection using the form included in *Inspection Request Form Appendix A – CCC /FAC Application Required Documentation*.

All inspections are subject to cancellation due to weather conditions. The Town requires 100% of all infrastructure (valves, manhole covers, catch basins, etc.) to be completely visible, accessible, and clear of snow, ice, and debris at the time of FAC inspection.

The Town will complete a certain number of free inspections for each subdivision, as outlined in the current Town of Strathmore's [Consolidated Fees Schedule Bylaw](#). Should additional inspections be required, the cost of the inspection will be charged to the Developer at the Town's discretion.

2.12.3 Final Acceptance Certificate Issuance

FACs will be issued after all the required documentation has been submitted to the satisfaction of the Infrastructure Manager, the applicable performance deposits for undeveloped lots have been provided to the Town, and all fees have been paid.

Final Acceptance Certificates submitted after September 30 for sites with an irrigation system will require the area irrigation foreman, or designate, present during the winterization procedure. The areas will ensure staff will be available with 48 hours notice. As an alternate, the area staff will not be required on site during the winterization

procedure provided the Developer agrees, in writing, to start the system and perform any repairs that may be required the following spring.

2.12.4 Final Acceptance Certificate Landscaping

If FAC is not applied for or granted after the warranty period is complete, the developer will be responsible to provide additional warranty until granted.

A minimum of two (2) years after Interim Acceptance is granted, the landscape consultant shall submit the following items to the Town of Strathmore for review:

1. Submission of maintenance schedule records completed to date.
2. A revised bond set of As-Recorded drawings (bound and reverse rolled), only applicable where there are any deviations from the approved drawings.
3. Not less than three (3) months prior to the maintenance period expiry date, or earlier if weather conditions permit, the Consultant and the Contractor shall inspect the Reserve Parcels all classifications as identified by the Town's current [Parks Classification and Maintenance Policy](#), public utility lots, ROW's, boulevards, medians, traffic islands and stormwater dry ponds, and the Consultant shall ensure that the Contractor corrects all defects and deficiencies due to damage and other causes, except defects or deficiencies caused by the negligence of the Town or its agents, employees or servants in the performance of their duties on behalf of the Town. Subsequent to the correction of the said defects and deficiencies, the Consultant shall submit to the Town a digital copy of the Final Acceptance Certificate (FAC) duly signed and sealed by a signing officer of the Consultant.
4. Landscape components submitted for final acceptance should be submitted in specific groupings by development phase to reduce the frequency of inspections and the volume of documentation by the Town of Strathmore Parks Department and the Developer. Recommended groupings are:

<ol style="list-style-type: none">i. All reserve parcels (including fencing)ii. All boulevards, medians, and traffic islandsiii. All Environmental Reserves (ER) and Environmental Reserve Easements (including fencing)	<ol style="list-style-type: none">iv. All Municipal Reservesv. All Conservation Reservesvi. All storm pondsvii. All Public Utility Lots (PUL)
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Note: Where the PUL is dedicated for the purpose of a shallow utility cabinet or pedestal only, and embedded in a Municipal Reserve, the PUL may be included in the FAC application for the Municipal Reserve.

5. Once received, within 30 days of receipt of the FAC by the Town, the landscape consultant shall arrange a site meeting with the Town of Strathmore staff to verify the site conditions and determine if there are any discrepancies with the submitted documents. Final Acceptance Certification (FAC) inspections will be performed between **May 15th and October 15th**, while plant material is in full leaf. In order to meet the **October 15** inspection deadline, all site inspection requests shall be made prior to **September 15th**.
6. The Town of Strathmore Operations Department shall make an on-site inspection with the Consultant within thirty (30) days of receipt of the FAC by the Town, and if no advice of defects or deficiencies has been sent to the Developer within that time, the improvement shall be deemed by the Town to be completed.

Note: Prior to inspection with the Consultant, a representative of the Operations and Infrastructure Departments will inspect the site.

7. If the inspection shows to the satisfaction of the Town of Strathmore Operations Department that the improvement is completed, and any third-party damages are rectified the Infrastructure Manager shall sign the FAC.
8. If, however, defects or deficiencies are apparent, the Infrastructure Technologist will issue a "Final Acceptance Inspection Check List and Report" detailing the defects or deficiencies that exist and the Infrastructure Technologist shall retain the FAC for one (1) month from the date of notification. The consulting Landscape Architect shall update all applicable submission items and resubmit accordingly. Where the Town of Strathmore staff are required to complete more than two (2) site visits for FAC,

additional fees may be required in accordance with the current Town of Strathmore's [Consolidated Fees Schedule Bylaw](#).

9. Only one (1) Inspection Check List and Report will be issued during the inspection process. The Infrastructure Technologist will record the last day of the one (1) month period on the Inspection Check List and Report under "Application Expiration Date." In the event that the defects or deficiencies are not corrected by the Developer within the one (1) month period, the FAC shall be returned unsigned, and the Developer shall correct the defects and deficiencies and subsequently resubmit the FAC.
10. If weeds are identified in a Final Acceptance Inspection Check List and Report and an herbicide is applied to rectify the deficiency, a biocide application report must be submitted prior to the signing of the FAC.
11. All classifications of parks containing MSR sites shall be fully developed and have obtained CCC with the anticipated application for Final Acceptance to be submitted:
 - i. No later than at least one full year prior to occupancy of a school.
 - ii. By the time 30% of the lots or projected lots located within the catchment area, which is deemed to be all lands located within 1.2 km from the property line of the said parcel of land, are occupied.
 - iii. No later than September 30th of the year of application. FAC application inspections may be performed after September 30th subject to weather and ground conditions that allow for an effective assessment of the property and at the discretion of the Operations Department's Landscape Technician.
12. All development must be checked and approved on site by the Town's Infrastructure Technologist and Operations Landscape Technician prior to signing of the FAC by the Town's Infrastructure Manager. If defects or deficiencies are apparent, the process will be *as per Item 8 above*.

Once Final Acceptance Certification has been granted:

13. The warranty period ends, with the following exception:
 - i. Identified replacement trees required the same year as FAC granted.
 - ii. These trees are subject to an additional one (1) year warranty unless alternate arrangements are negotiated with Town of Strathmore's Infrastructure and Operations Department.

The Town may release the remaining overall landscaping securities but shall maintain the ability to withhold some securities if there are deficiencies outstanding.

2.12.5 Criteria for a Conditional FAC

1. Prior to FAC inspection, the Consultant must have reviewed the site; i.e., plant material and turf is healthy; irrigation system is complete, including required paperwork, and plans reflect final product. If this is not completed, no conditional FAC will be considered.
Note: Date of inspection by the Consultant shall be added to the FAC document.
2. FAC's are not to be submitted prior to site completion. Inspectors will not 'hold' document until site is ready.
3. Deficiencies indicated on the FAC inspection are to be corrected out as soon as possible, not at the end of the 30-day expiration date.
4. Revised construction inspection form is attached to the FAC document when submitted.
5. Conditional FAC will be considered if site was complete and third-party damage occurs where time restraints do not permit rehabilitation, or when there are exceptional circumstances.
6. Marketing signs and flags will not interfere with the FAC process providing the Developer submits a letter acknowledging responsibility for continued maintenance and repairs to the parcel as well as a map outlining where the signs and marketing items are. The Developer shall provide to the Town thirty (30) days notice of their intent to turn the parcel(s) over to the Town. Once the signs and/or marketing items have been removed the Developer shall initiate a re-inspection of the property as per the FAC procedure.

2.12.6 CCC and FAC Appeal Process

The intent is to provide a process by which an appeal can be initiated in the event the CCC or FAC applicant is refused a CCC or FAC. The process is intended to provide a review of the decision based on the contractual obligations associated with the development agreement, and the Town's standards.

Step One: In the event of a refusal by the Town's Infrastructure Technologist and Operation's Landscape Technician, a review will be conducted with the Operations and Infrastructure Managers along with the Developer, or their representative. Where agreement or consensus is not achieved, the process will go to Step Two below.

Step Two: In the event consensus is not reached, the refusal will be considered by the Director of Development, Operations and Infrastructure Services, and the Chief Administrative Officer (CAO). The decision at Step Two will be final.

2.13 Temporary Traffic Accommodation

Traffic control for construction must be in accordance with the current Town of Strathmore's *Temporary Traffic Control Guide (Appendix C)* and must meet the requirements of applicable Town of Strathmore traffic bylaws. In cases of highway use, the current [Alberta Transportation, Traffic Accommodation in Work Zones Manual](#). In no case shall construction traffic be allowed to use residential roads, unless no other route exists.

The Developer may be required to provide video or photographic documentation of the construction access route(s) prior to commencement of construction to determine the pre-existing state of roads, sidewalks, and related infrastructure. The Developer is responsible to repair any damages, outside of normal wear and tear, caused by construction traffic.

When construction on a proposed subdivision will have a direct impact on existing traffic and/or pedestrians, the applicant must submit a Traffic Accommodation Strategy (TAS) to the Infrastructure Manager in advance. If any construction work occurs on or near any Provincial Highway, the Developer should contact Alberta Transportation as well to obtain any necessary approvals.

The amount of time required to review the plan varies from **one (1) week to three (3) weeks** depending on the type of road affected (i.e., three weeks for a major collector, one week for a local road).

The Infrastructure Manager will circulate copies of the TAS to the Town's Operations Department and other departments as necessary for review. If, in the opinion of the Town, the interruption will cause excessive traffic delays, the Developer may be required to advertise the interruption as necessary or schedule the work for off-peak times.

The Developer shall provide at least two business days notice to the Town as well as any and all affected parties prior to implementing the TAS and after the streets are back in operation (more notice may be required for major routes at the discretion of the Town). Affected parties include, but are not limited to, school districts, emergency services, residents, and businesses affected by the interruption.

2.14 Service Interruptions

If existing services must be shut off for a period of time to accommodate construction activities, a written request must be submitted to the Infrastructure Manager for review at least **two (2) weeks** before the proposed interruption. The Developer will be required to notify all residents, businesses, schools, and emergency services affected by the interruption a minimum 72 hours prior, unless otherwise directed by the Town.

2.15 Road Crossings

When it is necessary to excavate an existing road or lane for the purpose of providing a crossing for water, sewer, gas, telephone, cable, or any other public utility or service, a TAS as described in *Section 2.13* must be provided to the Town for review prior to construction.

Upon completion of the installation, all associated infrastructure shall be returned to "as good or better condition". Excavations must be backfilled and compacted with suitable material to accommodate the pre-existing road structure. All concrete, asphalt, landscaping, and any other public or private assets that may have been disturbed

shall be replaced to the satisfaction of the Infrastructure Manager. Full-time inspections, geotechnical testing, monitoring, and reporting are required for any such work.

2.16 Erosion and Sediment Control (ESC)

The information provided in this document is intended to provide basic information on requirements, processes and practices in erosion and sediment control. Anyone involved in ESC activities in the Town of Strathmore is encouraged to consult the City of Calgary's current [Erosion and Sediment Control Guidelines](#) for specific details on erosion and sediment control processes and practices.

2.16.1 Erosion and Sediment Control Plan and Report

The Town requires an ESC Plan and accompanying report prepared by a Professional Engineer or a CPESC Professional be submitted to Infrastructure Manager for review and acceptance along with the Preliminary Engineering Drawings.

Drawings and reports for the following construction activities include:

- Stripping and Grading Plans
- Development Portion of the Phase/Development through to post development during buildout.

It is understood that should an ESC problem arise on-site prior to FAC, the issue shall be dealt with within a set time limit provided by the Town.

2.16.2 Ongoing Inspections and Maintenance

All ESC measures must be in place prior to commencing any stripping, grading, or construction. The Developer or consultant is required to confirm in writing that all necessary ESC measures are in place prior to construction. The Infrastructure Manager may also require an on-site meeting to confirm whether additional ESC measures are required.

The Developer must identify a Professional Engineer or CPESC Professional who will be responsible for ensuring that the site is monitored to ensure that all ESC measures are maintained, repaired, and revised as necessary for the duration of construction (from the stripping and grading phase until the last FAC has been issued).

Inspections and reports to be conducted:

- On a monthly or bi-monthly basis to be determined by the Town based on the size and anticipated construction duration of the development.
- Winter inspections can occur every 2-3 months or longer if no major weather events occur.
- Following any weather event which sees 15mm of rain or more over a 48 hour period.
- Following any melting event which sees melting occur for a period greater than two (2) consecutive days.

Copies of the Inspection Reports must be available to the Development Inspector or Infrastructure Manager upon request at any time during construction.

2.16.3 Dewatering

Any discharge of impounded water to the sanitary or storm system (including stormpond) or any off-site area requires a permit to be obtained from the Town's Infrastructure, Operations, and Development Services Department. The permit will detail the location of the utility which has been approved for discharge to. Town Representative to observe the turbidity testing prior to any release to any Town infrastructure. All approved permits include strict conditions on water quality and quantity which can be discharged.

2.16.4 Remediation

The Town will send any correspondence related to ESC to the professional identified by the Developer. Copies of all relevant documentation may be requested by the Town as evidence that the Developer has shown due diligence in addressing this issue. Should any erosion and sediment control measures fail, the Developer is responsible to ensure that any impacted areas are cleaned up within 24 hours.

If good housekeeping practices are not followed, or if erosion and sediment control measures are not adequately monitored and maintained, the Town or the Infrastructure Manager will provide to the Developer written notice to remedy the issue. If, after 72 hours, the Developer or the contractor has not responded to make the necessary repairs, the Town may place a stop-work order on the development until the repairs have been completed.

SECTION 3.0 ENGINEERING

3.0 Engineering

3.1 Design Submission Requirements for Subdivision in addition to the above listed Subdivision Development Site Servicing Plan (DSSP)

3.1.1 Overview

The following requirements cover submissions to be made to the Town of Strathmore's Infrastructure, Operations and Development Services. All submissions are to be coordinated by the Consulting Engineer, unless otherwise directed by the Town.

Prints of drawings for all subdivisions shall be in accordance with the Town engineering standards and each print shall be stamped with the submission number (Preliminary 1, 2, 3, etc., Final) and date of submission.

It is highly recommended that the Consulting Engineer arrange a pre-consultation meeting with the Town prior to the first submission to understand the submission procedure/expectations of the Town and to receive copies of checklists, templates etc. If a Landscape Architect has been engaged, it is recommended that he/she also attend the pre-consultation meeting.

3.1.2 Procedures for Applications Containing Roadway Structures (Bridge/Culvert)

When a new roadway structure (bridge, culvert, etc.) is required in a subdivision the engineering submission shall include one digital (pdf) copy and two (2) hardcopies or as determined by the Infrastructure Department. The following material shall be submitted for review:

1. General Arrangement drawing(s). This drawing is to be prepared in accordance with the current [Alberta Bridges and New Structures – New Design](#). It includes the roadway structure plan, profile, elevation, and cross sections.
2. Design Report. The design report includes but is not limited to, the description of the works, how the detail was arrived, different options and cost analysis/least expensive alternate to construct and maintain.
3. Design Criteria Sheet. General type/class of roadway, volume of traffic, geometric information, and cost estimate.
4. Foundation Report.
5. Hydrology Report (when applicable).
6. Letter from the Engineer who certifies that the design meets the current Alberta Transportation [Bridges and New Structures – New Design](#) requirements are met:
 - The bridge type, length and width are appropriate
 - The most economical life cycle cost solution has been selected for the site
 - The structural design drawings and details included as part of the Subdivision Agreement shall be stamped and signed by the two professional engineers who designed the roadway structure and by the professional engineer who checked the structural design drawings.
7. For road widenings and extensions crossing the Western Irrigation District's (WID) canal system, written acceptance of the design by the WID shall be part of the approval process.
8. Where the current Town's Transportation Master Plan details future expansion, the structure shall be constructed with expansion in mind.

3.1.3 First (Preliminary) Submission

Submissions shall include, as a minimum, all items listed under Engineering Submissions as well as Open Space Design / Landscaping Submissions (please refer to *Sections 4 and 5* for requirements).

Engineering Submission

The following documents shall be submitted in accordance with the current Town of Strathmore's [Consolidated Fees Schedule Bylaw](#). Only complete submissions will be accepted where applicable

The Consulting Engineer and Landscape Architect are required to meet with the Development & Infrastructure Services Department's review team to provide an overview of the development proposal and to show how they are

in keeping with the Department's Development Guidelines.

One (1) digital (pdf) and **two (2)** complete rolled sets **ANSI D** (558.8 x 863.6 mm) (22" x 34") or **ARCH D** (609.6 x 914.4 mm) (24" x 36"). of the following engineering drawings are required:

- | | |
|---|--|
| <ul style="list-style-type: none">• Proposed Plan for Registration• General Above Ground Services Plan(s)• Site Grading Plan(s) (including lot grading, parks and school block)• Erosion and Sediment Control Plan(s)• Miscellaneous Plans and Detail Drawings• Cover Sheet/Legend Sheet | <ul style="list-style-type: none">• General Below Ground Services Plan(s)• Storm Drainage Plan(s)• Detailed Drawings for Outlets and Watercourse improvements• Plan/Profile Drawings• Cut/Fill Drawings• Preliminary Landscape Drawings |
|---|--|
-

One (1) digital (pdf) and **one (1)** complete hard copy of the following documents are required:

- | | |
|---|---|
| <ul style="list-style-type: none">• Geotechnical Investigative Report• Storm Sewer Design Sheets• Environmental Site Assessment (Phase 1 & Record of Site Conditions)• Letter regarding the Conditions of Draft Approval• Traffic Impact Assessment (if required) | <ul style="list-style-type: none">• Stormwater Management Report• Acoustic Report (where appropriate)• Detailed Engineering and Landscaping Cost Estimates• Consulting Engineer's Letter regarding Drawing Submission requirements |
|---|---|
-

Drawing Submission Checklist. All engineering drawings and reports should be submitted as a complete package to the File Manager for the project. If the submission is deemed incomplete, the entire package will be returned without review.

Submissions will be circulated to the applicable Town departments, as well as the Town's Water and Wastewater Operators for their comments. The Infrastructure Manager will make every effort to provide comments within two (2) to four (4) weeks of receiving the complete submission, however, the Infrastructure Manager has the option to make application for an extension. An extension may be requested, for example, based on the extent of time required to review the drawings, the number of previously submitted review, and other applicable events. The Town reviews all applications in the order they are received.

The reviews and comments provided by the Town do not relieve the Consulting Engineer of responsibility for errors or omissions in the designs. The Consulting Engineer is professionally responsible for the proper design of the subdivision and/or site development.

3.1.4 Second and Subsequent Submissions

As with the first submission, the second and subsequent submissions are to include the *Engineering Submission as well the Open Space Design / Landscaping Submission* (see Sections 4 and 5).

Marked-Up Drawings from Review of First Submission - or copies of review comments from the Infrastructure Department indicating requested changes due to non-conformance or explanation where applicable for discussion.

One (1) digital (pdf) and **two (2)** complete rolled sets of the following drawings are required on **ANSI D** (558.8 x 863.6 mm) (22" x 34") or **ARCH D** (609.6 x 914.4 mm) (24" x 36"):

<ul style="list-style-type: none"> • Street Light Plan(s) and Photometrics • Shallow Utilities Plan(s) • Construction Management Plan 	<ul style="list-style-type: none"> • All Revised Drawings • Parking Plan (DSSP) • Detailed Landscape Drawings & Profiles
One (1) digital (pdf) and one (1) complete hardcopies of the following documents are required:	
<ul style="list-style-type: none"> • Acoustical Report (if required) • Revised Stormwater Management Report • Revised Storm Sewer Design Sheet • Revised Traffic Impact Study 	<ul style="list-style-type: none"> • Schedules to be included in the Subdivision Agreement: <ul style="list-style-type: none"> o Legal description of the property o List of all drawings and reports o List of lands to be deeded or conveyed (MR/ER)
The following letters in digital (pdf) are also to accompany the Second Submission:	
<ul style="list-style-type: none"> • Consulting Engineer's Letter regarding addressed comments 	<ul style="list-style-type: none"> • All other Agency and Environmental Compliance Approval/Comments (Alberta Transportation, Alberta Environment, etc.)

3.1.4.1 Environmental Compliance Approval

Where applicable, completed, signed, and dated, all provincial environmental compliance approvals (and any documents required by the form) are to be submitted. The engineering consultant is to provide complete digital signed copies of all documents (pdf) along with the Transfer Review payment (refer to the latest version of the Town of Strathmore's [Consolidated Fees Schedule Bylaw](#)).

Confirmation that the local Ministry District Office was sent a copy of the complete application package as per Environmental Protection and Enhancement Act, Revised Statutes of Alberta 2000 Chapter E-12 (current as of December 5, 2019).

3.1.5 Final Submission (Issued for Construction)

The following plans and documents are required for the final submission to the Town's File Manager (This shall include both Engineering and Open Space Design / Landscaping in one complete package):

- One (1) pdf and digital (CAD) package of the Final Revised Engineering Plans stamped and signed by Consulting Engineer (*see General Drawing Requirements, Section 3.1.6.1 and AutoCAD Development Drawing – General Submission Requirements (Appendix D)*).
- One (1) pdf and digital (CAD) package of the Final Landscape drawings stamped and signed by the Landscape Architect.
- Marked-Up Second or Subsequent Submission drawings (Engineering and Landscape) - or copies of covering letters from the File Manager indicating requested changes due to non-conformance.
- Consulting Engineer Letter regarding addressed comments
- Landscape Architect Letter regarding addressed comments
- One (1) hard copy, one (1) .pdf copy of all Final reports
- One (1) pdf complete copy of all drawings listed in Schedule 'C-1' of the Subdivision Development Agreement
- One (1) pdf of storm sewer design sheets labelled Issued for Construction (IFC). These are to be included in a Detail Drawing with the Final Submission.
- One (1) copy of the consultant's letter to Alberta Transportation confirming that the final set of drawings for a roadway structure have been sent for Alberta Transportation's files (if applicable).
- Copies of required approvals – i.e. Alberta Transportation, Alberta Environment and Parks, etc.
- Detailed cost breakdown spreadsheet of all proposed works
- Two (2) copies of the Insurance Certificate as per the Subdivision Agreement
- The Developer must submit in writing to the File Manager that they have made arrangements with FORTIS,

Bell, Shaw, TELUS, and ATCO, for the installation of their cables in a common trench in the prescribed locations on road allowances within the plan of subdivision.

- The Developer must submit evidence, in writing, to the File Manager that they have made satisfactory arrangements with Canada Post for the location of mailboxes
- Consulting Engineer Letter regarding conformance.

Notes:

1. *Submissions are to include the items listed above and are to be submitted in their entirety by one (1) agent of the Developer in one (1) complete package. Any incomplete submissions, delivered to the Town, shall be returned immediately.*
2. *All final drawings shall contain the following text in the title block for signing by the File Manager:*

Note: *Once the drawings have been signed by the File Manager, the original signed drawings as well as, one (1) complete digital set (CAD) of full-sized drawings, and one (pdf) are to be submitted to the Town, in accordance with the AutoCAD Development Drawing – General Submission Requirements (Appendix D). See Sections 4 and 5 Specifications for Engineering and Open Space Design / Landscaping Drawings for specific details on drawing requirements.*

**Town of Strathmore
Accepted for Construction**

The review is considered complete and is performed as a courtesy to the developer/consultant. Acceptance of the drawings provided by the developer/consultant does not relieve the developer/consultant of their responsibility to ensure that all work pursuant to the Development Permit or work to be completed by the developer is in accordance with current practice and is technically acceptable, nor does it relieve the developer/consultant of the responsibility and obligation to remedy subsequently discovered omissions and/or discrepancies

This acceptance is subject to further certification of the "as-constructed" works by a registered professional Landscape Architect of the Province of Alberta.

Date: _____

Accepted By: _____

Print Name: _____

Size:	Full sized drawings to be ANSI D (558.8 x 863.6 mm) (22" x 34") or ARCH D (609.6 x 914.4 mm) (24" x 36"). Reduced drawings are to be ANSI B (279.4mm x 431.8mm) (11" x 17").
Format:	Same as Town of Strathmore Finance and Infrastructure, Operations and Development Services Departments standard sheets unless otherwise approved.
CAD Standards:	Typical Plan Profile sheet complete with required Symbol and Layering in AutoCAD 2008 version or greater format.
Material for Preliminary and Second Submissions:	Bond – Black Ink (permanent)
Materials for Final Submission:	Bond – Black Ink (permanent) USB
Material for As-Recorded Drawings	USB containing all Digital Drawings and Full Set/Stamped – PDF Drawings All AutoCAD Dwg. 2008 version or greater. Refer to <i>AutoCAD Development Drawing – General Submission Requirements (Appendix D)</i>

3.1.6 Computer Assisted Drawings (CAD)

All Drawings shall be prepared using the Town of Strathmore Standard AutoCAD 2008 version or greater format and in accordance with the current Town of Strathmore's *AutoCAD Development Drawings – General Submission Requirements (Section 3.1.6.1) and Appendix D* for all drawings.

Electronic files shall be submitted for review and acceptance and all file names shall reflect the drawing numbers in the Engineered Drawing Set. The Final submission and "As-Built Recorded" submission shall also include an AutoCAD file that meets the Towns format; if layering, line type & thickness or format is not adhered to, the submission shall be deemed incomplete. Development drawing submissions specifically tailored to the digital submission requirements shall be in accordance with the current the Town of Strathmore's *AutoCAD Development Drawings – General Submission Requirements (Section 3.1.6.1) and Appendix D*.

3.1.6.1 General Drawing Requirements

The following basic information shall apply in preparation of the drawings:

- All plans, drawings, specifications, details, descriptions, notes, or any other terms included in the engineering drawings, are to use the Metric system of measurement and are to be prepared using a standard metric scale.
- All AutoCAD drawings must use the NAD83 3TM standard projection for Alberta. Projection with a Central Meridian of -114 degrees and Scale Factor of 0.9999 (NAD 83 3TM 114), with no rotation or shifting. Local Datum is not permissible.
- All plans shall include a north arrow in the mid to upper right-hand quadrant. All east-west streets shall generally be drawn with the north arrow pointing to the top, north-south streets with the north arrow generally pointing to the right, and all cul-de-sacs or other roads where this does not apply shall be drawn with the stations numbered from left to right.
- All drawings must have a Key Plan.
- Title block including the project name, date, municipal address and legal description (i.e. lot and concession number, Town site plan number and/or registered plan number with applicable lot/block number) shall be included.

- A legend including, ***but not limited to:***
Symbols for existing/proposed grades, major system/overland flow routes, drainage direction, underground services, above ground services, surface treatments, retaining walls, catch basins and manholes, and abbreviations shall be provided as required.
- Bearings and dimensions of the subject property shall be delineated.
- Private and Municipal easements, municipal ROWs, line of sight, 0.3m reserves, road widenings, or any other property limits or land dedications within or adjacent to the property shall be delineated and dimensioned as required
- Final engineering drawings are to include the signature and seal of the Professional Engineer responsible for the design. This may be Issued for Construction (IFC) drawings that must be submitted to the Town prior to start of construction.
- The location of adjacent watercourses including top of bank and floodline are to be delineated. (The layout of the site shall adhere to the appropriate setbacks dictated by the Town Planning Department).
- All existing and proposed buildings and structures within and adjacent to the subject property shall be delineated including existing and proposed building entrance locations.
- Landscaping drawings are to include the signature and seal of the Professional Landscape Architect responsible for the design. Engineer stamp and signature may be required when requested by the Town.
- Elevations are to be geodetic and related to the Town of Strathmore datum. The description of the benchmarks used shall be annotated on the drawings.
- All drawings must contain a revision submission name and date.

For a complete list refer to current City of Calgary drawing standards.

3.1.7 Landscape Plans

See Section 5.4.

3.1.8 Aboveground Plans

General plans showing aboveground services and appurtenances are to be drawn to a scale of 1 to 1,000 or larger and shall indicate ***but not be limited to*** the following:

- School signs
- Street signs
- Future land use signs
- Barricades
- Fencing (existing and proposed)
- Retaining walls
- Rear lot/block catch basins
- Screen planting
- Existing trees within 10 meters of the proposed development property boundary and trees to be preserved
- Any required easements including dimensions and descriptions
- Driveway locations (existing and proposed)
- Building envelopes for detached dwellings less than 12 meters, semi-detached dwellings, and townhouse dwellings
- A typical detail showing building envelopes, driveway location and widths
- Driveway curb cut and dimension for detached dwellings less than 12 meters, semi-detached dwellings, and townhouse dwellings
- Community mailbox
- Power Vaults, streetlights, streetlight pedestals, sidewalks
- Manholes (c/w numbers) and catch basins

- Existing structures adjacent to the proposed development limit

3.1.9 Below Ground Plans

General plans showing all below ground services and appurtenances are to be drawn to a scale of 1 to 1,000 or larger and are to include any required easements, as well as:

- Street names
- Water main and appurtenances
- Manholes (c/w numbers)
- Sewer size, slope, and material
- Directions of flow in the sewers
- Driveway locations

All service connection locations to lots or blocks

3.1.10 Composite Site Servicing Plan

To avoid conflicts, a Composite Utility Plan shall include all the requirements of the Aboveground Plans (surface works) including curb & gutter type, catch basins, shallow utility trench alignments, signage, streetlights, Canada Post facilities, all crossings and driveway locations. All locations must be established and resolved by the Developer's Engineer in conjunction with the utility companies and following the locations shown on the typical cross-section.

3.1.11 Storm Drainage Plans

Storm drainage plans are to be drawn to a scale of 1 to 1,000 or larger (a scale not exceeding 1 to 5,000 will be accepted for large external drainage areas) and using available grading information are to show the total area to be drained by the proposed storm sewers. The storm drainage plan is to be compatible with the grading plan and the Town's latest contour mapping. The storm drainage plan shall indicate **but not be limited to** the following:

- Proposed contours including elevations @ 0.5 m intervals
- Drainage patterns of adjacent lands (a minimum of 5.0 m into adjacent property) for commercial and infill lot development.
- Runoff coefficients and areas (ha) of tributary areas outside the development and for each section of the storm sewers within the development
- Direction of runoff
- Street names
- Manhole locations (c/w numbers)
- Catch basin locations
- Sewer sizes and slope
- Directions of flow in the sewers
- Any catch basins or swales, on the lots or blocks, required to pick-up the runoff
- Temporary or permanent quantity and quality stormwater management facilities
- Trap lows and calculations
- Overland drainage flow indicating direction and slopes, overland flow characteristics (flow, depth, velocity), and emergency spill locations.
- Culverts and other drainage appurtenances

3.1.12 Stripping and Grading Plan

General Information

Land is not allowed to be stripped or graded before either a Subdivision Development Agreement is signed, or a Development Permit is released by the Town. In addition, the following requirements must be met prior to stripping or grading of lands:

- A Stripping and Grading Application has been reviewed by the Town

- A Subdivision Development Agreement or Development Permit has been signed by the Town and the Developer
- The Developer has provided the appropriate securities in the form of an Irrevocable Letter of Credit for Stripping and Grading

Under no circumstances shall stripping and grading commence before a Development Agreement or Development Permit has been released by the Town, securities are in place, and erosion and sediment control on site is in place and has been confirmed by an ESC professional, to the satisfaction of the Town.

3.1.12.1 Stripping and Grading Application

The Developer must submit an application for stripping and grading to the Infrastructure Manager for review and acceptance. The Stripping and Grading Application must include the following:

- A copy of the current **Certificate(s) of Title** as well as current copies of any restrictive covenants, utility rights-of-way, easements, or caveats registered on title.
- **A letter of authorization** from the registered owner of the land.
- **A letter from the Developer's Consulting Engineer** confirming that all affected utility companies have been contacted regarding the relocation or disposition of their utilities. At a minimum, *Alberta1Call* must be contacted to locate all relative shallow utilities prior to construction.
- **Engineering Drawings** two (2) full sized hard copies – ANSI D (22" x 34") (558.8 x 863.6 mm) or ARCH D (609.6 x 914.4 mm) (24" x 36"), one CAD copy (final), and one pdf copy
 - o **Site Plan** showing the location of all existing and proposed utilities, site drainage, any intended stripping and grading on adjacent lands (including details of edge conditions, back sloping requirements, and areas to be re-loamed or seeded), existing trees and major vegetation on the parcel. Please note that written permission from adjacent landowners is required if their lands will be affected by stripping and grading operations.
 - o **Stripping and Grading Plan** clearly indicating the areas to be stripped and rough graded (outlined in red) as well as the proposed location of the stockpiles (outlined in green). Details of topsoil stockpiling should be provided including the planned height, width, length, and estimated volume. Please note that NO application will be considered for an area of more than **20 ha** per year, unless under special circumstances.
 - o **Cut and Fill Plan** with initial and final contours; any areas with cuts or fills greater than 2.0 m should be identified.
 - o **Phasing Plan** showing areas expected to be developed during the current year and the type of soil stabilization proposed for the areas not to be developed until following years.
 - o **Erosion and Sediment Control Plan(s) and Report** as discussed in *Section 3.1.18* of these Standards. The Erosion and Sediment Control report must show measures for control of erosion and sedimentation for the initial stripping and grading operation and after completion of grading and site rehabilitation.
- **Deep Fills Report** (two hard copies and one pdf copy) for areas with fills greater than 2.0 m. (Refer to *Section 4.1* (for more information))
- Details of **Best Management Practices** to be implemented.
- **Other information as required** – The Town may require additional plans, information, or studies, depending on the existing site conditions and the proposed land use. Applicants should contact the Infrastructure Manager to discuss what information is required.

3.1.13 Site Grading (DSSP only)

Grading plans for lots and blocks are to be drawn to a scale of 1 to 500 or larger, clearly showing existing contours with corresponding elevations established from field information. Contours 5 m from outside the property boundary shall be included to ensure proper drainage and grades have been established to not impact the adjacent properties (to include back-sloping agreements where applicable).

The grading plans shall indicate **but not limited to** the following:

- Existing contours (complete with elevations)

- Proposed elevations at the following locations:
 - o Along the center line of any existing or proposed roads (max. 20 m apart)
 - o Centre line or break point of each lot
 - o At the front and rear building line
 - o At the corners of each lot and block
 - o At frequent intervals along large block property lines
- Proposed elevation contours for grading within large blocks and parks.
- Any other points necessary to give proper picture of the proposed drainage scheme including tops of catch basins, bottoms of swales and top and bottom of retaining walls.
- Existing contours and elevations within the plan and at least 30 m externally. The external contours are to be extended far enough to determine the existing drainage pattern. In addition to the above, grading plans for parks are to indicate existing contours at 0.5 m intervals along with all existing trees, structures, watercourses, etc.
- Percent street grades for all roads within the development and the distance of the particular grade shall also be included.
- Overland flow routes.
- Easements/blocks including dimensions and descriptions.
- Retaining walls.
- Drainage types in accordance with typical details.
- Cut off swales and catch basins to intercept interim block drainage and external drainage.
- Areas of engineered cut and fills.
- Fencing both existing and proposed. A note is required on this drawing indicating that all proposed fencing is to be located on private property.

3.1.14 Site Servicing Plan (DSSP Only) – may be broken into 2 drawing submissions:

The **Servicing Plans 'A'** shall indicate *but not be limited* to the following:

- Existing and proposed spot elevations within the project site and on adjacent properties are to be indicated on the grading plan. Spot elevations are to be provided in sufficient detail so that drainage patterns can be readily identified (including: % grades, slope ratios and directional arrows). Include spot elevations and slopes for all berms, swales, and significant grade changes. Existing elevations at least 10m beyond limits of site are required. External elevations are to be extended far enough to determine the direction of existing drainage.
- Existing and proposed manhole and catch basin top of grate elevations are to be provided along with the existing centerline of road elevations.
- All existing and proposed underground servicing information shall be provided including, **but not limited to** water mains, storm and sanitary sewers including pipe size, slope, materials, invert elevation, and connection details. Pipe setbacks, spot elevations, and vertical and horizontal clearances shall be dimensioned as required. Wells, septic tanks, septic lines and tile beds, shall be included where required.
- Details of all stormwater management control features are to be provided including **but not limited to** roof top controls, on-site storage including ponding limits, orifice tubes or plates, curb cuts, SWM pond plans and details, and LID measures are to be provided.
- The location of existing and proposed site entrances shall be provided including **but not limited to** curb depressions, ditches, and culverts. Dimensions for the proposed entrances shall be indicated including driveway width, radius, and setbacks. Adjacent existing driveway entrances on both sides of the road shall be shown.
- All factors affecting on-site traffic movement shall be clearly defined on the plan and include **but not limited to** proposed access points, fire routes and turning radii around buildings, and any items that may impact vehicle access onto the site (i.e. traffic signals, turning lanes, center medians, sidewalks, etc.).
- Adequate snow storage areas are to be shown on the site plan. Snow storage locations shall have consideration for traffic sight lines both internal to the site and at site entrances.

The **Servicing Plans 'B'** shall indicate *but not be limited* to the following:

- Top of foundation wall (T.F.W.) and finished floor elevation (F.F.E.) of the ground floor for any proposed structures are to be shown.
- Retaining wall: Top of wall (T.W.) and bottom of wall (B.W.) elevations are to be provided on the grading plan where retaining walls are proposed.
- The location of existing or proposed retaining walls shall be shown including any required details. (Note: any retaining walls in excess of 1.0 meters must be accompanied by an Engineer's stamp taking ownership of the proposed retaining wall design).
- The location of all driveway entrances.
- The location of all existing and proposed utilities on the subject property, within the municipal ROW, and on adjacent properties shall be provided including, **but not limited to** fire hydrants, streetlight poles, hydro poles, transformer vaults, shall utility pedestals, guy wires, hydro lines, gas lines, valves, and street signs.
- The location and dimensions of all existing and proposed sidewalks, multi-use trails, and any other pedestrian walkways shall be provided. Extent of any sidewalk removal and replacement at entrances is to be delineated. Complete details of replacement or new sidewalk at entrances are required including all relevant Town standards.
- The location of existing or proposed fencing shall be shown. Details are to be provided for proposed fencing.

3.1.15 Additional Drawings

Additional drawings and reports may be required in support of certain applications. Applicants are encouraged to consult the Infrastructure Manager at early stages of the project to determine if additional information is required.

3.1.16 Plan – Profile Drawings (Plan of Subdivision)

Plan-profile drawings are to be drawn to a horizontal scale of 1 to 500 and vertical scale of 1 to 50 and are to conform to the following:

- Where two or more drawings are required for one street, match lines must be used and tied into the nearest full station and such station shall be indicated. Right-of-way, road and boulevard widths for all roads and partial legs must be indicated at the match line.
- Where intersecting streets are shown on a plan-profile, only the diameter of the pipe and direction of flow of the intersecting sewers are to be shown. This also applies to easements for which a separate plan-profile has been drawn.
- On plan-profile drawings the type of sewer (sanitary or storm), the diameter, length, grade and class of pipe are to be shown on the profile portion of the drawings only. Only the type and diameter are to be shown in the plan portion.
- Where possibility of conflict with other services exists, connections are to be plotted on the profile.
- Pavement/road base designs for the particular roadway are to be indicated on all plan-profile drawings.
- Gutter drainage details for temporary turning radii and cul-de-sacs.
- Storm sewers shall be shown as solid lines on both the plan and profile view. Directional arrows must be used throughout the plan drawings to show the direction of flow.
- Sumps of storm manholes are to be hatched to distinguish them from storm manholes.
- Centerline curve data information must be shown on the plan view.
- The profile view must show the bottom of granular road base/sub grade elevation.
- All manhole invert elevations shall be indicated below the profile view in the appropriate blocked space provided.

3.1.17 Erosion & Sediment Control Plans

The erosion and sediment control plans shall show at a minimum:

- Light duty and heavy-duty silt fencing
- Mud mats
- Rock check dams
- Topsoil stockpiles with appropriate protection measures

- Temporary sediment control ponds or basins
- Swales
- Staked straw bale
- Existing Trees (and protective root and canopy barriers where required)

Note: *Erosion and Sediment Control Plans are to be considered a living document which may require ongoing revisions/changes to the Plan throughout the duration of the construction.*

The City of Calgary's Water Resources – [Erosion and Sediment Control Guidelines may be used as a guide.](#)

3.1.18 As-Built Drawings

General

Upon completion of the construction of the services and prior to Completion Construction Certification, the Developer's Consultant shall obtain the 'As-Recorded' field information and revise the original drawings accordingly. Any changes to the approved drawings by the Consulting Engineer, Electrical Engineer or Landscape Architect are subject to approval by the Town.

Prior to Final Acceptance Certification of the subdivision by the Town, the Developer's Engineers' and Landscape Architect shall provide a complete set of revised drawings (engineering, streetlight and landscaping), if applicable, for the development to the Infrastructure Manager for review. Upon acceptance, the Developer's Engineer and Landscape Architect shall provide a complete – stamped set of AutoCAD digital drawings (Georeferenced) in accordance with Section 3.1.6.1 and the current Town of Strathmore's *AutoCAD Development Drawing – General Submission Requirements (Appendix D)* for all drawings. All digital and PDF drawings submitted to the Town, will be named and numbered to match the Title Page Drawing Index.

Note: *All drawings are to be accompanied by a Certification Letter from the Engineer (on company letterhead) bearing his/her stamp, signature and date, attesting that the drawings being submitted are "As-Recorded Drawings".*

In addition, in accordance with requirements in the current Town of Strathmore's *AutoCAD Development Drawing – General Submission Requirements (Appendix D)* a complete set of PDF drawings, shall be prepared from the 'As-Recorded' originals and supplied to the Town's Infrastructure, Operations and Development Department.

These drawings shall show the location both horizontally and vertically of everything, which is on, and under the lands to be accepted by the Town.

The Composite Utility Drawing is to show the final location of all utilities, service connections, as well as driveway locations.

The engineering drawings shall be sealed and signed by a Registered Professional Engineer and stamped 'As-Recorded' and dated in the revisions box.

The streetlight drawings shall be sealed and signed by the Electrical Engineer and stamped 'As-Recorded' and dated in the revisions box.

The Landscape drawings shall be sealed and signed by a Registered Professional Landscape Architect and stamped "As-Recorded" and dated in the revisions box.

The Town may perform a spot check of elevations and locations. If the Town finds major differences, the 'As-Recorded' drawings will be returned to the consultant to be corrected.

SECTION 4.0

DETAILED ENGINEERING DESIGN CRITERIA AND STANDARDS

4.0 Detailed Engineering Design Criteria and Standards

4.1 Design Reports

Preliminary drawing submissions should include one (1) hard copy and one electronic copy of all design reports. Reports that have been previously submitted to the Town and accepted (e.g., under Master Area Structure Plan, Area Structure Plan, or Outline Plan) need not be resubmitted, but should be referenced in the cover letter.

The following are typical design reports that are required for subdivisions in the Town of Strathmore. The Developer is encouraged to consult the Infrastructure Manager at the early stages of the project to determine specific design requirements for the development area, and to determine if revisions or updates to reports submitted at Area Structure Plan or Outline Plan stage are required.

Geotechnical Report

At the Area Structure Plan stage of the development a submission of a geotechnical report and investigation is required. For subsequent phases of development, further geotechnical investigations may be warranted, this would be on a case-by-case basis. The geotechnical report must be signed and sealed by a qualified Geotechnical engineer entitled to practice in Alberta.

The report should set out the details and specifications for the development including, at a minimum:

- Purpose, site description and methodology
- Subsurface soil conditions, subsurface drainage and groundwater levels
- Geotechnical evaluations and recommendations for site preparation, grading, excavations, compaction, road structure, foundation design, soil bearing capacity, frost protection, sulphate testing, etc.
- Slope stability analysis (for undisturbed condition and re-graded condition) if applicable
- Field test results, lab test results, and borehole log information
- Ground water readings must be conducted in areas where the estimated water table seasonal high is less than 1 m below the original ground level

Engineers are encouraged to consult the current City of Calgary's [Geotechnical Report Guidelines for Land Development Applications](#) for detailed information on geotechnical report requirements.

Deep Fills Report

A deep fills report must be submitted whenever more than 2.0 m of fill material will be placed on a site. The report must be prepared by a qualified geotechnical engineering consultant in accordance with industry standards and should identify all lots with fills in excess of 2.0 m above original elevations. The report should also state whether there are any restrictions on the deep fill areas. Deep Fills Reports are normally submitted as part of a Stripping and Grading Application.

Phase 1 Environmental Site Assessment/Biophysical Impact Assessment

Environmental and Biophysical Impact Assessments are normally completed at the Area Structure Plan stage of development. If further investigation is warranted, updated information can be provided at later stages of the development process. The report should follow the current [Alberta Environmental Site Assessment Standard](#).

Traffic Impact Assessment Report

Traffic Impact Assessments are normally submitted at the Area Structure Plan stage of development and should be prepared according to the current Alberta Infrastructure and Transportation's [Traffic Impact Assessment Guidelines](#) and the Town of Strathmore's current [Transportation Master Plan](#). If further investigation is warranted, updated information can be provided at later stages of the development process.

Traffic Noise Analysis and/or Sound Attenuation Report

All traffic noise and/or sound attenuation analysis reports, when required, should be prepared by a qualified professional engineer and are to comply with the latest edition of City of Calgary standards.

Stormwater Management Report

All stormwater management reports should be prepared by a qualified professional engineer and are to comply with the latest edition of CSMI Stormwater Guidelines (where applicable), Provincial, and City of Calgary standards. Storm facility designs shall consider future maintenance requirements and accesses shall have a minimum width of 5.0 meters. A Maintenance Report is required that meets the latest Alberta Environment and City of Calgary guidelines and shall outline maintenance and monitoring requirements. The Maintenance Report shall determine which method of cleaning the facility of accumulated materials is economically feasible, either in the wet or in the dry.

Typically, stormwater management planning and design occurs through a multi-phase process which is completed in concert with the land use planning process. The following preferred hierarchy of planning studies in the Town of Strathmore has been identified:

- Stormwater Management Plans:
 - o Functional Servicing Report
 - o Detailed Design

In some instances where there are limited numbers of landowners, and drainage areas are discrete, there may be an opportunity to combine the Subwatershed Impact Study with the Functional Stormwater Management Plan. Prior to initiating such a process, the proponent is required to review specifics with the Town and Alberta Environment and Parks or applicable Provincial Department.

Specifications/Terms of Reference

Watershed and Subwatershed Plans

The Town of Strathmore supports the implementation of Watershed and Subwatershed Planning Studies in concert with the land use planning process. Watershed and Subwatershed planning play an important role in the development of the Municipal Development Plan, Area Structure Plans, and Short-Term Planning.

Rationale and justification to undertake Watershed or Subwatershed Planning Studies must include consideration of:

- Type and extent of proposed land use changes
- Area of land use change with respect to the total watershed/subwatershed area
- Physical sensitivity/significance of the receiving watercourse
- Surface and subsurface flow paths
- Wildlife corridors and natural area linkages
- Existing downstream conditions and land use (i.e. flood and erosion hazards, water usage); and
- Location and characteristics of the development area with respect to the potential to provide integrated servicing and stormwater management which would minimize long term maintenance and operation cost incurred to the Town.

It is important to recognize that each Watershed or Subwatershed plan will have widely varying goals and objectives specific to the issues within each area. For these reasons, the study objectives, organization, and funding arrangements will necessarily differ for each study.

Subwatershed Impact Study

This intermediate level of study may be required in areas where multiple land ownership within the subwatershed occurs. This level of study would focus on integrating servicing and stormwater management of adjacent development to a greater level of detail than is normally achieved through the Subwatershed Plan. Typically, this study would be required if the Subwatershed Plan has been completed prior to the development of preferred land use and lot plans. The objectives of this level of study will be to determine:

- Preferred servicing plan
- Road layout
- Integration of stormwater management facilities

- Opportunities to integrate recreation opportunities with stormwater management
- Phasing and cost sharing in areas of multiple ownership.

There will be cases where a development will be allowed to proceed with a subwatershed plan. The decision as to whether a Subwatershed Impact Study is warranted would be determined through consultation between the various development proponents, the Town of Strathmore and Alberta Environment and Parks and would depend on, **but not limited to:**

- Level of planning information completed in the Area Structure and Outline Plan process such as road layout, facility locations and multiple servicing concept.
- The scale of the proposed development is small.
- An infill development.
- Number of development proposals/proponents involved in the study area and opportunity to integrate facilities and phase developments.

Note: *In the absence of watershed/subwatershed planning, subdivision/site planning must occur to ensure that the development is planned with due regard to the surrounding environment.*

Stormwater Management Plans (SWMP)

Stormwater Management Plans are prepared in support of individual development applications. The plans complement the planning process associated with Draft Plans of Subdivision or individual Site Plans. Stormwater management reporting associated with this planning stage would be the "Functional Design" plan. Subsequently, in support of final subdivision design a "Detailed Design" plan is required.

Functional Design

This level of design typically involves demonstrating the feasibility of providing stormwater management for a particular development. In areas where no Subwatershed Plan has been completed, the SWMP will be required to address additional issues such as environmental baseline conditions and screening of various stormwater management strategies and techniques.

Detailed Design

The detailed design submission shall demonstrate how the required information, outlined in Functional Design report, has been integrated as well as addressing details related to minor system design details, landscaping, safety and maintenance aspects of facility design, and monitoring requirements.

Low Impact Development (LID)

Low Impact Development (LID) technologies are to be incorporated into the stormwater management design. See the current City of Calgary's [Low Impact Development Initiative Modules](#). The Town will consider the use of technologies that utilize efficient design of features such as roof drain collectors, soak away pits, lot level controls, etc. wherever they are deemed appropriate and acceptable.

Stormwater Quantity, Quality and Erosion Control

Stormwater management is required to control increases in storm runoff due to development. Typical methods of quantity control are temporary storage of water on flat roof tops and parking lots, discharging rainwater leaders onto grassed areas or infiltration galleries, and downstream stormwater retention or detention ponds. Stormwater quantity controls are to be implemented on all applications in accordance with any applicable master drainage or subwatershed plan.

Flood Management Criteria

All newly developing or redeveloping areas must assess their potential impacts on local and regional flooding and mitigate accordingly.

Design

In areas where no Watershed or Subwatershed Planning or Subwatershed Impact Study has been completed, it is the policy of the Town of Strathmore to require that runoff peak flows are controlled to pre-development levels, unless the proponent can demonstrate through appropriate modelling and analysis that uncontrolled flow will not cause detrimental impacts on flood conditions on downstream properties and watercourse systems. Before the

Town will accept any increase in runoff rates, it must also receive endorsement from the agencies having jurisdiction.

Where the Subwatershed Plans or Subwatershed Impact Studies have been completed, the development proponent will be required to comply with the recommendations of the specific plan. Any variations will need to be appropriately supported by detailed analysis and be approved by any agencies having jurisdiction.

Erosion Control Criteria

Depending on the downstream water level and the nature of the soil strata affected, streambanks can be subject to increased erosion potential. In these cases, the proponent(s) will be required to provide appropriate protection in accordance with the Watershed or Subwatershed Plans or with the Subwatershed Impact Study, as well as policies of the appropriate Provincial Authority.

In areas where no Subwatershed Plan exists, it shall be the responsibility of the development proponent to provide adequate erosion protection in accordance with Provincial Guidelines, unless it can be demonstrated through appropriate modeling and/or analysis that erosion processes will not be adversely affected by the proposed development.

Design

Erosion Control and management involves:

1. Extended Detention storage for as per the current City of Calgary [Stormwater Management and Design Manual](#) and/or the Alberta Provincial [Stormwater Management Guidelines](#) in the absence of specific direction from a Subwatershed or Watershed Plan.
2. Assessment of downstream erosion susceptibility and critical flow values in conjunction with event modelling.
3. Assessment of downstream erosion critical velocity or shear forces in conjunction with continuous simulation techniques (duration analysis).

Storm sewer outfalls in natural channels should be provided with proper protection against erosion which includes appropriate bank scouring protection on either side of the outfall and creek. Where storm sewer outfalls outlet to steep and/or deep valleys, drop structures should be designed in such a manner as to provide integral bank stability. Such local erosion protection measures should be designed so as not to interfere with the natural channel forming processes of the receiving watercourse system.

Quality Control

Criteria

Water quality treatment will be required for all new development within the Town of Strathmore. Water quality treatment performance shall conform to City of Calgary and/or Provincial requirements.

In areas of existing development where re-development is proposed, provisions for water quality measures will be evaluated on a site-specific basis, based on the feasibility of implementation.

In areas where a Subwatershed Plan has been prepared and approved, the guidelines and criteria cited within the plan shall be adopted by the Development Proponent.

Design

As a general consideration, maintenance of the natural hydrologic cycle including infiltration is encouraged where soil conditions permit. Therefore, the use of stormwater management practices which enhance or maintain infiltration should be considered for each development. Generally active infiltration measures will be applicable in permeable soils areas only and their use will require supporting soils documentation. Passive measures such as disconnection of roof leaders have been historically utilized in many areas and should be implemented as a matter of course in all areas unless specific constraints preclude these measures.

In all cases, the potential for groundwater contamination shall be considered, particularly where infiltration of road runoff is contemplated.

In areas where hydrogeological concerns are identified and/or critical linkages to fisheries habitat are present, additional study and analysis may be required to determine the appropriate level of mitigation.

Wetland/Pond Report

All pond reports should be prepared by a qualified professional engineer and are to comply with the latest edition of [Principles for Stormwater Wetlands Management in the City of Calgary](#).

Erosion and Sediment Control Report

Erosion and sediment control measures shall be implemented as part of all proposed site works to prevent silt and sediment from leaving the site and entering waterways, wetlands, or environmentally significant features.

All erosion and sediment must be controlled in accordance with the latest requirements of the Town of Strathmore, *Section 2.16* and the current City of Calgary's Water Resources – [Erosion and Sediment Control Guidelines](#).

4.2 Engineering Design Drawings

4.2.1 Site Grading Design

The following grading and drainage criteria are applicable for site plan design:

- Site storm drainage to be self-contained and shall not adversely affect adjacent properties. Existing property line grades are to be matched. Where a subdivision grading plan exists, proposed site plan grades are to match the subdivision grading plan. Grading shall not extend onto adjacent properties without prior written consent from the adjacent property owner.
- Street line grades are to be set to ultimate road elevations. Landscape berms shall not encroach onto the municipal right of way.
- The consultant shall ensure that in the event of mechanical failure or during a major storm event that all structures are protected against flooding.
- A major system overland flow route shall be incorporated into the design to safely convey flows associated with the 100-year storm. The overland flow route must be clearly shown on the engineering plans and is to be directed to an acceptable outlet to be approved by the Town.
- Drainage shall not pass over retaining walls and a suitable outlet is to be provided for the retaining wall subdrain. Proposed elevations are to be given at both the top and bottom of the retaining wall. Additional design criteria can be found in the current City of Calgary [Stormwater Management and Design Manual](#).
- Roof leaders which discharge to grade shall not be directed on or near asphalt or pedestrian travelled areas.
- All parking areas shall be paved with asphalt, permeable pavers, or similar hard surface in accordance with the standards of the Town, unless otherwise prescribed by Town Staff.
- In situations where granular parking areas are permitted by the Town, the Construction Notes should include the following note:

The granular parking area shall be maintained with a stable surface which is treated so as to prevent the raising of dust or loose particles.

4.2.2 Servicing Design

The following site servicing criteria is applicable for site plan design:

- All external drainage should be considered and accounted for in the storm drainage design.
- All piping shall be clearly labelled with the pipe size, length, slope, flow direction, material, and invert elevations.
- Minimum lateral spacing is 2.5 m between potable water and sanitary sewer. The spacing requirement may be increased at the discretion of the Infrastructure Manager when the depth of bury is deemed to be excessive.
- Sanitary sewer mains shall be aligned at the centre of the roadway where possible. In roadways with inverted crowns or full cross fall, the sanitary sewer shall not be located near the lowest elevation in the cross section to minimize infiltration.
- Shallow utilities are normally located in a multiple-party trench on private property within a Utility Right-Of-Way (URW) (*see Section 4.2.9*).
- Line assignments should be submitted to the Town for approval at the start of a tentative subdivision application. In the case of alternate road designs, conceptual line assignments and road design cross

sections shall be submitted to the Town for approval at the Outline Plan stage, prior to starting the detailed design.

The availability and adequacy of the existing water supply and sanitary sewer system shall be determined by contacting the Town of Strathmore

The developer/consultant is to provide AEP with written notice of the developments intention to extend or replacement of water mains, sanitary sewers and/or storm sewers. A letter of written authorization to proceed from AEP must be submitted at Second or Final Submission of Drawings.

4.2.3 Alberta Environment & Parks (AEP) – Approval of Extended Underground Facilities

The developer/consultant is to provide AEP with written notice of the developments intention to extend or replacement of water mains, sanitary sewers and/or storm sewers. For projects that include new stormwater ponds and/or outfall(s) to a water body or drainage course, additional authorization or registration will be required by AEP and its associated regulations.

A letter of written authorization to proceed from AEP must be submitted to the Town in conjunction with Final Submission of Drawings.

4.2.4 Servicing – Water Distribution

General

This section outlines the minimum standards or requirements for water distribution systems required to be provided in a development. It is the Developer's responsibility to develop the land to meet or exceed the standards in accordance with good engineering practices, specific site condition requirements, and/or as may be required by the Town and Alberta Environment and Parks.

4.2.4.1 Design & Installation Criteria

General

All water distribution systems within the Town shall be designed and constructed in accordance with these standards and the latest edition of:

- Town of Strathmore's [Master Servicing Studies](#)
- Alberta Environment and Parks' [Standards and Guidelines for Municipal Waterworks, Wastewater, and Storm Drainage Systems](#)
- The City of Calgary's [Standard Specifications for Waterworks Construction](#)
- The City of Calgary's [Design Guidelines for Subdivision Servicing](#) and [Development Site Servicing Plans \(DSSP\)](#), as applicable

4.2.4.2 General Requirements

All water distribution systems shall be designed in accordance with the latest edition of the Town of Strathmore's current [Master Servicing Studies](#).

Sizes and layout of water mains must be in accordance with the most current approved Outline Plan. Distribution mains shall be continuous (looped).

Any water system must be designed to serve not only the area within the development boundary, but also any area that is a tributary to the system. The Town may request distribution main sizes to be increased as considered necessary to accommodate future development.

The Engineering Consultant will be required to submit all pertinent information to the Town for authorization to ISL to run the model on the Town's behalf. A cover letter is to be submitted with the preliminary engineering drawings and should provide relevant design information and assumptions governing the water design including pipe sizing, hydrant flows and pressures, including flow and pressure criteria when sprinkler systems are required.

4.2.4.3 Fire Flow

Fire flow requirements shall be determined in accordance with the latest edition of the Town of Strathmore's current [Master Servicing Studies](#).

4.2.4.4 Pressure

Pressure requirements shall be determined in accordance with the latest edition of the Town of Strathmore's current [Master Servicing Studies](#) as amended.

4.2.4.5 Valves

Valve placement should conform, at a minimum, to City of Calgary guidelines; however, the Town of Strathmore may ask for additional valves where they may provide an increased reliability of service or a specific operational benefit.

Please note the following requirements:

- Water valves must open **counter-clockwise** (country valve).
- All water valve stems should have keys.

4.2.4.6 Pipe Material

Materials used for water mains shall be in accordance with the City of Calgary specifications. The use of other materials is restricted to special applications and is subject to review and acceptance by the Infrastructure Manager.

4.2.4.7 Hydrants & Flushing Assemblies

Hydrants shall be compression type, break away design with square operating nuts. All new hydrants should be self-draining hydrants and shall be painted lime green with black caps and tops. All hydrants shall have two hose connections 57 mm in size at 180 degrees with Alberta Mutual Thread and a 114 mm pumper connection to match the City of Calgary standards. Examples of hydrant brands preferred by the Town include:

Clow Brigadier – McAvity

Mueller Modern & Super Centurion

All other brands will need to be submitted to Infrastructure for approval.

A permanent hydrant must be installed at the end of all water mains terminating in cul-de-sacs.

A temporary hydrant and valve must be installed at the end of all water mains that terminate in a roadway or easement where a future water main connection will be made by the Developer for future phases or by others. The hydrant would be removed, if required, when future phases are constructed or incorporated into the design of the future water main system.

4.2.4.8 Acceptance Testing

All new potable water distribution systems or portions thereof installed within the municipal boundaries of the Town shall comply with all procedures and methodologies for flushing, testing and disinfection of water mains as outlined in the current Town of Strathmore's *Flushing, Testing, and Disinfection Manual for New Water and Sanitary Sewer Mains (Appendix B)*. Deflection (mandrel) testing shall be required at the discretion of the Town. Acceptance testing shall be successfully completed prior to submission of the Construction Completion Certificate.

Each hydrant shall be tested for proper operation, pressure, and flow prior to CCC. Upon completion of the tests, results shall be forwarded to the Town for information. Any anomalies will be reviewed in conjunction with the Consulting Engineer and EPCOR.

4.2.5 Servicing – Sanitary Sewer System

General

This section outlines the minimum standards or requirements for sanitary sewer systems required to be provided in a development. It is the Developer's responsibility to develop the land to meet or exceed the standards in

accordance with good engineering practices, specific site condition requirements, and/or as may be required by the Town and Alberta Environment.

4.2.5.1 Design and Installation Criteria

All sanitary sewer systems within the Town shall be designed and constructed in accordance with these standards and the latest edition of:

- Alberta Environment's and Parks' [Standards and Guidelines for Municipal Waterworks, Wastewater, and Storm Drainage Systems](#)
- The Town of Strathmore's [Master Servicing Studies](#)
- The City of Calgary's [Standard Specifications for Sewer Construction](#)
- The City of Calgary's [Design Guidelines for Subdivision Servicing](#) and [Development Site Servicing Plans \(DSSP\)](#), as applicable

4.2.5.2 Pipe Design

Sanitary systems shall be designed in accordance with the latest edition of the Town of Strathmore's current [Master Servicing Studies](#).

The cover letter submitted with the preliminary engineering drawings should provide relevant design information and assumptions governing the sanitary sewer design including contributing areas, inflow and infiltration (I&I) allowances and all other relevant information.

Minimum and maximum pipe slopes and velocities must meet the requirements outlined in the Town of Strathmore's current [Master Servicing Studies](#) (Level of Service Criteria) and the City of Calgary's design guidelines, whichever is the more conservative requirement. The Infrastructure Manager may ask for verification that the design velocities meet these requirements.

All manhole covers to be Town of Strathmore specific as per design *Detail Drawing Sheets*.

Building foundation drain/weeping tiles and roof drains shall not be connected to the sanitary sewer system.

Lift Stations

Wastewater Lift Stations will be subject to review and acceptance by the Infrastructure Manager and shall be designed in accordance with the Town of Strathmore's current [Master Servicing Studies](#). It is the preference of the Town that Lift Stations be constructed in a manner similar to those already constructed in Town, when appropriate, to allow for the use of common materials and methods through maintenance.

4.2.5.3 Pipe Material

Materials used for sanitary sewers shall be in accordance with the latest City of Calgary [Standard Specifications for Sewer Construction](#) and the CSA/CAN standards.

4.2.5.4 Acceptance Testing

All new sanitary sewer systems or portions thereof installed within the municipal boundaries of the Town shall comply with all procedures and methodologies for flushing and inspection sewer mains as outlined in the current Town of Strathmore's *Flushing, Testing, and Disinfection Manual for New Water and Sanitary Sewer Mains (Appendix B)*. Acceptance testing shall be successfully completed prior to submission of the Construction Completion Certificate.

4.2.6 Servicing – Stormwater System

General

This section outlines the minimum standards or requirements for storm drainage systems required to be provided in a development. It is the Developer's responsibility to develop the land to meet or exceed the standards in

accordance with good engineering practices, specific site condition requirements, and/or as may be required by the Town and Alberta Environment and Parks.

4.2.6.1 Stormwater Management (SWM)

- As per the [Stormwater Management Guidelines for the Province of Alberta](#).
- As per the Co-operative Stormwater Management Initiative (CSMI) Stormwater Guidelines, where required.
- As per the City of Calgary Water Services [Stormwater Management & Design Manual](#).
- Specific sites may have higher inlet times which must be demonstrated with appropriate calculations.
- Site areas **less than five (5) hectares** may use the Rational Method to determine runoff quantities. For locations where a master environmental or drainage plans have been approved and where the runoff was previously calculated by some other means, it will be necessary to substantiate any deviation from the original plan by using the same model for comparison purposes.
- Parking areas where stormwater is proposed to be ponded are to be paved and not left as gravel surfaces which can be easily modified.
- Maximum stormwater flow velocities in ditches and swales should be checked and maintained below **1.5m/s** to protect against erosion.
- Oil Grit Separators (OGS) Criteria:
 - Town policy is to consider OGS units mandatory for sites storing fuels or chemicals.
 - Town policy is for OGS units to be installed as part of a treatment train approach in conjunction with other SWM options approved by the Town.
 - OGS units are to be installed on the downstream side of control MHs
 - Ensure OGS units are shown and properly detailed in plans. Specify the name of manufacturer and model number and manufacturer's calculations of the proposed OGS unit.
 - OGS design sheets are to be provided in the SWM report to confirm quality treatment.

4.2.6.2 Minor System

A design table of the storm sewer must be included on the stormwater cover sheet outlining the pipe sizes and capacities, velocity, contributing areas, and all other relevant information.

Minimum and maximum pipe slopes and velocities must meet the requirements outlined in the Town of Strathmore's current [Master Servicing Studies](#), the City of Calgary's design guidelines, whichever is the more conservative requirement. The Infrastructure Manager may ask for verification that the design velocities meet these requirements.

Catch basin inlet control devices shall be plate type and shall be installed as per the current City of Calgary Standard Specifications Sewer Construction (Sheet #43B). Interconnected catch basins are strongly discouraged.

Materials used for storm sewers shall be in accordance with the latest City of Calgary [Standard Specifications for Sewer Construction](#) and the CSA/CAN standards.

4.2.6.3 Major System

An overland flow analysis must be provided for all Subdivisions. the Town will require detailed computer modeling to be carried out to define the complete system, including depth of flow and velocity along the conveyance route.

The emergency escape route for overland drainage should be clearly indicated on all the relevant drawings. If emergency flow passes over private land an "emergency overland flow right-of-way" must be acquired.

For the safety of sidewalk users (pedestrian, bikers, wheelchair), and to avoid overtaxing maintenance operations, the Town is requesting that engineers find alternative methods of dealing with surface drainage from any public area to avoid direct water drainage/flow on to any sidewalk.

Developers shall refer to the Town of Strathmore's [Master Servicing Studies](#) to determine the allowable stormwater discharge rates and the area to which storm water shall be directed. For those areas which discharge to the CSMI system, the CSMI Stormwater Guidelines will apply.

Surface drainage that may be contaminated from industrial, agricultural, or commercial operations shall not be

discharged to the storm sewer.

4.2.6.4 Stormwater Management Facilities

Stormwater facilities should be designed in such a way that the water flows by gravity from the inlet to the outlet. The Town strongly discourages the use of stormwater pumping stations. Where there is no other alternative, stormwater pumping stations may be approved at the discretion of the Infrastructure Manager.

Evaporation stormwater facilities may not be used as the sole method for stormwater discharge. Evaporation may be approved in combination with other discharge methods at the discretion of the Infrastructure Manager.

All commercial/industrial/institutional developments prior to the release of flows to the adjacent stormwater system requires an on-site stormwater interceptor specifically designed by the manufacturer for the specific site.

At submission, detailed designs shall include ***but not limited to*** the following:

- Stormwater pond contours (proposed & final)
- Detailed forebay design to be constructed and other sediment protection methods during subdivision construction. Design to include submission of confirmed bottom elevations (through) GPS on construction of the forebay and pond itself. Additional elevations points are to be marked to indicate Normal and High Water Levels (NWL and HWL).
- Inlet, outlet, and bank protection
- Clearly marked freeboard contour
- Clearly marked flood pathways should they become necessary
- Prior to FAC, GPS readings are to be completed of the forebay and pond to compare to the original constructed elevations to determine requirements of cleaning prior to FAC being granted.
- Proposed maintenance methods and schedule for clean out of forebay and pond prior to FAC.

Upon completion of the site servicing work, building construction, and landscaping the storm sewer system, including catch-basins and leads shall be cleaned and flushed. Flushing operations shall comply with all applicable guidelines and regulations.

Acceptance testing for storm sewer systems shall be performed as per the latest edition of the City of Calgary [Standard Specifications for Sewer Construction](#) and shall include visual inspection and CCTV video inspection. Deflection (mandrel) testing shall be required at the discretion of the Town. Acceptance testing shall be successfully completed prior to submission of the Construction Completion Certificate.

After the Construction Completion Certificate for a stormwater facility is acknowledged by the Town, the Developer shall not be allowed to direct construction run-off into the stormwater facility.

4.2.6.5 Stormwater Maintenance Costs

The maintenance costs represent the costs to ensure the proper operation, longevity and aesthetic functioning of the stormwater control measures. The necessary tasks to achieve these objectives include sediment removal, trash removal, maintenance of the vegetation and inspections of the inlet and outlet. The Consulting Engineer shall provide a report to the Town detailing maintenance recommendations based on the approved stormwater management plan. The report shall include the following recommendations including the required maintenance interval and unit price for each of the required maintenance activities:

- Inspection of all structures and how frequently (minimum of once annually)
- Removal of all sediments and how frequently
- Method of re-stabilizing of all disturbed areas
- Sediments to be tested to determine method of disposal
- Effluent sampling protocol.

4.2.7 Service Connections

General

This section outlines the minimum standards or requirements for water and sanitary service connections in a development. It is the Developer's responsibility to develop the land to meet or exceed the standards in accordance with good engineering practices, specific site condition requirements, and/or as may be required by the Town and Alberta Environment and Parks.

4.2.7.1 Design and Installation Criteria

All service connections within the Town of Strathmore shall be designed and constructed in accordance with these standards and the latest edition of:

- The Town of Strathmore's [Master Servicing Studies](#)
- Alberta Environment and Parks Standards and [Guidelines for Municipal Waterworks, Wastewater and Storm Drainage Systems](#)
- The City of Calgary's [Design Guidelines for Subdivision Servicing](#) and [Development Site Servicing Plans \(DSSP\)](#), as applicable.
- The City of Calgary's [Standard Specifications for Sewer Construction](#)
- The City of Calgary's [Standard Specifications for Waterworks Construction](#)

4.2.7.2 General Requirements

All service lines crossing a shallow utility easement shall be installed 5.0 m inside property lines, otherwise, the services shall be installed 3.0 m inside property lines.

The developer is required to provide **Property Service Connection Reports** as outlined in *Appendix A – CCC /FAC Application Required Documentation*.

4.2.7.3 Water Services

The Town Water System and a Site Servicing Installation must be designed to prevent Cross-Connections and Backflow from a private service into the Town Water System. Criteria as per the current Town's [Water Utility Amendment Bylaw – Backflow Prevention & Cross Connection Bylaw](#).

Water service lines shall be blue "cross-linked polyethylene" PEX pipe.

Where service connections tie into a water main that is not PVC, an isolation full wrap clamp/saddle must be used for all service sizes.

Lots for all multi-plexes or semi-detached homes shall be individually serviced where individual titles can be created, other than condominium units. Exception is allowed for buildings with a common water room that is managed by a building and/or site manager.

For commercial and industrial lots, the Developer shall provide site specific plans for approval by the Infrastructure Manager.

4.2.7.4 Permission to Use Water for Construction

General

Water for construction and other purposes not related to fire-protection shall be obtained from the Bulk Water Station located in the Town. Where it is not feasible to obtain water from the Bulk Water Station, a customer may enter into an agreement with the Town to access a fire hydrant for a temporary water connection. For rental of a Hydrant Connection Unit and terms and conditions on its use contact the Town's Infrastructure Department directly at infrastructure@strathmore.ca to obtain a Rental Form.

Taking water from a hydrant without permission is unlawful and prohibited. Hydrants can only be operated by the Town's authorized representative (EPCOR). Any unauthorized use of fire hydrants will be enforced through the Town's By-law Officers.

Rentals are only available between April 1 and October 31 annually (weather permitting).

Hydrant water meter with backflow preventer must remain accessible to read and maintain.

4.2.7.5 Sanitary Services

Commercial and industrial developments may require a sanitary test manhole. The test manhole must meet all City of Calgary requirements.

As per the current Town of Strathmore's [Sanitary Sewer Fats Oils and Grease \(FOG\) Management Policy](#), all commercial and industrial establishments may be required to install, service and maintain an appropriately sized system of the type appropriate to the services being offered (i.e. restaurant (FOG), car wash (oil/grit separator), or dental office (dental amalgam interceptor).

Lots for duplexes or semi-detached homes shall be serviced with two separate services. For lots of higher density use, individual services shall be provided where individual titles can be created, other than condominium units.

For commercial and industrial lots, the Developer shall provide site specific plans for approval by the Infrastructure Manager.

4.2.7.6 Stormwater Services

The Town of Strathmore does not allow individual storm services to be tied into the municipal sanitary system.

4.2.8 Roadways

Note: *Winter construction of roads is not permitted by the Town.*

General

All roadways within the Town shall be designed and constructed in accordance with these Standards and the latest edition of:

- Town of Strathmore's [Municipal Development Plan](#)
- Town of Strathmore's [Master Transportation Plan](#)
- Transportation Association of Canada [Geometric Design Guide for Canadian Roads](#) or Alberta Transportation [Highway Geometric Design Guide](#)
- Transportation Association of Canada [Urban Supplement to the Geometric Design Guide for Canadian Roads](#)
- City of Calgary's [Design Guidelines for Subdivision Servicing](#)
- City of Calgary's [Roads Construction Standard Specifications](#)

Exceptions to the City of Calgary, Transportation Association of Canada and Alberta Transportation guidelines are noted in this document.

4.2.8.1 Design and Installation Criteria

When preparing the design, engineers are encouraged to use the current Town of Strathmore's [Master Transportation Plan](#) and the current City of Calgary's requirements in the [Design Guidelines for Subdivision Servicing](#) as a guideline for roadway design. However, road standards may be flexible if an appropriate design is proposed. Engineering drawings should provide a detailed design of the streets, including all applicable cross-sections for review.

Any road system or part of a system must be designed to serve not only the area within the development boundary, but also any area that is dependent on, adjacent to, or connected to the system.

Vertical Alignment

Maximum grade of all roadways shall be 8% unless otherwise approved by the Infrastructure Manager. The minimum grade of all roadways shall be 0.6%.

4.2.8.2 Rear Lanes

The function of rear lanes is to provide vehicular access to parking garages/areas located to the rear of a house/development that have frontages on another public street.

Rear lanes shall have 7.0 m Right-Of-Way (ROW) paved edge to edge.

Storm sewers shall be required along the length of the rear lanes which cannot reasonably drain to the street, but all other municipal infrastructure is prohibited along rear lanes. Catch basins shall be spaced a maximum of 100m apart.

Streetlight easements are required where streetlights are located on private property, for maintenance purposes.

4.2.8.3 Pavement Structure

Pavement designs must be submitted by the Developer to the Infrastructure Manager for review and acceptance. All pavement designs shall consist of two lifts, a base lift (at CCC) and a final lift (top lift) at the time of FAC. In no case shall FAC for the top lift of asphalt be constructed prior to the FAC being issued for the abutting sidewalks, curbs and gutters.

Please refer to the current City of Calgary [Standard Specifications for Road Construction](#) for detailed specifications.

4.2.8.4 Residential Driveways

The Developer shall coordinate the location of all wheelchair ramps, community mailboxes, hydrants, catch basins, light standards, service pedestals and transformers to eliminate any conflicts with driveway locations. Refer to the Town's current Land Use Bylaw, as amended for information on driveway regulations in the Town of Strathmore.

Location

Driveways must not have access to a Major Street or Primary Collector. All driveways shall intersect the Town's roadway at a perpendicular angle.

Materials

Driveways must be asphalt or concrete.

Grades

The **maximum grade** of a driveway shall be **8%** unless otherwise approved by the Infrastructure Manager. Driveways **grades shall not be less than 2%.**

Dimensions

Driveways shall have a minimum length of 6.0 m along the intended direction of travel measured from the back of the sidewalk or the edge of the pavement where there is no sidewalk.

The maximum length of a driveway shall be up to the front entrance of the main building. Exemptions may be made for Garden Suites.

The width of a driveway access shall not exceed 45% of lot width or 8 m, whichever is less.

Culverts

Where required, driveway culverts shall be a minimum of 450 mm diameter and must be constructed with either corrugated metal or reinforced concrete. The length of the culvert should be based on site conditions. Culverts shall be installed in such a manner that the existing drainage along the ditch is maintained. A larger diameter may be required when drainage conditions dictate. A minimum cover of 300 mm shall be provided over the driveway culverts.

4.2.8.5 Curbs, Gutters, and Sidewalks

In residential areas curb and gutter shall be low profile rolled section except adjacent to reserves where standard faced curbs shall be constructed. For local major and industrial roadways with no driveway accesses, standard curb and gutter shall be constructed.

As per the current City of Calgary's [Access Design Standards \(ADS\)](#), wheelchair ramps are required at all intersections and designated crosswalks. Wheelchair access should be provided to all MRs as well.

4.2.8.6 Temporary Turnarounds

A temporary turnaround and proper fencing must be installed at the end of all roadways where the road will be

continued in future phases by the Developer. The turnaround can be removed when future phases are constructed.

4.2.8.7 Materials

Asphalt

All asphalt mix designs should be designed according to the specifications outlined in the current City of Calgary [Standard Specifications for Road Construction](#) and must be submitted to the Town for review at least two weeks prior to the work.

Concrete

Concrete for all sidewalk and curb and gutter construction shall be Type 50 concrete unless geotechnical testing demonstrates that Type 50 is not required. If Type 50 is not required, Type 10 may be used, provided the Developer submits a letter signed and sealed by the professional geotechnical engineer along with documentation of the geotechnical testing for review prior to concrete placement.

4.2.8.8 Seasonal Requirements

Minimum placing temperatures for asphalt and concrete must meet City of Calgary specifications. The Town reserves the right to suspend or terminate concrete and asphalt placing operations should the ambient temperature fall below the requirements of the City of Calgary Roads Specifications or between September 30 and May 1.

Concrete poured after September 30 and before May 1 of any year must attain ultimate design strength in 7 days and will require lab certified test results to confirm.

4.2.8.9 Acceptance Testing

All roadway structures and appearances are subject to review at CCC and FAC inspection. The developer shall be required to make changes to surface areas (e.g., fog coat or tack coat) if required to ensure a smooth road surface to accommodate Town of Strathmore's Operations at CCC (*see Unassumed Road MOU – Section 4.3*).

Base Course

The Town will grant CCC to Road Base Course when all underground servicing, first stage curb, base asphalt, rough grading of the lots and all other essential infrastructure that the Town deems necessary is constructed to Standards as set out in the Subdivision Agreement. The Owner will be required to maintain this infrastructure in good condition, to Town Standards, to Manufacturers Specifications and to safe conditions for a period of not less than two (2) years, from the date of Construction Completion Certification (*see Unassumed Road MOU – Section 4.3*).

Toplift

The following must be completed and approved by the Town, before the placement of top course asphalt can commence:

- Complete all underground piping in roadbed.
- Complete all sidewalk works
- Complete driveway works
- Complete all curb works
- Complete boulevard works
- Grading Certifications submitted to the Town
- Flush and sweep surface and evenly apply tack coat
- Base course asphalt padding as required
- Town inspection and confirmation that all infrastructure deficiencies have been repaired to the Town's satisfaction.

If applicable:

- All manhole and catch basin frames and grates must be raised and the rims painted with orange, fluorescent paint to make them visible to drivers. Warning signs must be placed at all entrance points to the subdivision, indicating the raised manhole and catch basin frame covers ahead. Placement of the top course asphalt

must be completed within two weeks of raising the frames and grates.

- Install any delineation required for raised manholes and catch basins that are in excess of the 40mm top course asphalt lift. Delineation is required on any road with a posted speed limit of 60km/hr or greater.

The Engineer of Record is required to arrange an inspection of the top course asphalt once placed and all deficiencies identified must be addressed. The owner will be required to maintain this infrastructure in good condition, to Town Standards, to Manufacturer's Specifications and to safe conditions for a period of not less than one (1) year from the date of preliminary acceptance of Top Course Asphalt issuance.

FAC for Top Lift will be granted as long as all other requirements have been met (*see above*). A warranty period will be imposed following FAC for a period of one (1) full year.

Notes:

1. Under no circumstances will top course paving between October 15th and May 1st be accepted regardless of the weather conditions unless approved by the Director of Infrastructure, Operations, Development Services (IODS). Any paving done between these months without the approval of the Director, IODS, must be removed and replaced at the owner's expense.

Compaction Testing

In addition to the City of Calgary requirements, the Consulting Engineer must also contact the Town at least 24 hours prior to all proof rolls, so that the Town has the opportunity to witness these tests.

Asphalt Testing

In addition to the requirements set out in the City of Calgary standards, the following requirements must be met.

A minimum of two hot mix asphalt samples per day during asphalt placing operations are required. The following information must be submitted to the Town for each sample: time taken, type of mix of the sample, temperature of the sample, ambient temperature, and source of sample.

Core sample testing shall be provided for the base lift of all paving projects. The Consulting Engineer shall provide a minimum of one representative test sample per 1000 m² of a paved area or a minimum of two test samples per day of paving, whichever is greater. Core samples for top lift pavement shall be provided only when requested by the Infrastructure Manager. All test results shall be clearly summarized in a report stamped by a professional geotechnical engineer and submitted at CCC and FAC applications.

Concrete Testing

In addition to the requirements set out in the City of Calgary standards, the following requirements must be met.

Concrete tests are to be taken a minimum of one per 50 m³ of concrete poured (surface and underground). If concrete pours are less than 50 m³ per day, a minimum of one concrete test per day will be required. Concrete testing must include slump test, air entrainment test, and compressive strength testing. Test cylinders should remain on site to cure in the same conditions as the poured concrete. All test results shall be clearly summarized in a report stamped by a professional geotechnical engineer and submitted at CCC and FAC applications.

4.2.9 Erosion Sediment Control (ESC)

In all cases, with the exceptions listed below, it is required that sediment loading be design, controlled and constructed in accordance with the current City of Calgary [Standard Specifications - Erosion and Sediment Control Guidelines](#).

All Erosion and Sediment Control facilities shall be inspected and maintained until the site is stabilized to the satisfaction of the Town. must be submitted to the Town at time of CCC and FAC or when asked for by the Town.

Design

All activities on the site shall be conducted in a logical sequence to minimize the area of bare soil exposed at any one time.

As a minimum all Erosion and Sediment Control Plans should incorporate recommendations and protection measures pertaining to:

- Construction Scheduling/Development phasing
- Minimizing soil exposure and re-establishment of vegetative cover
- Minimizing unnecessary clearing
- On-site sediment and erosion techniques
- Site Supervision
- Monitoring and Maintenance
- Submission of Inspection Reports
- Site Restoration
- Special Considerations (i.e. in-stream construction/crossings, fisheries timing constraints)
- Additional ESC measures including **but not limited to** check dams, catch basin sediment traps, and temporary sedimentation ponds or basins will be required as needed on a site-specific basis, at the discretion of the Town.

Ground Disturbance

All disturbed ground left inactive shall be stabilized by seeding, sodding, or approved covering, or other equivalent control measure. The period of time of inactivity **shall not exceed 30 days**, unless otherwise authorized by the Town.

Vegetative Buffer Strips

Where possible, a minimum 3m wide vegetative buffer strip shall be provided along the limits of the development adjacent to existing road boulevards and existing residential properties. Where a sediment control fence is required, it shall be constructed in front of the buffer strip.

Topsoil Stockpile Protection

All topsoil stockpiles containing more than 100m³ of material shall be located a minimum of 10m away from the roadway, drainage channel or an occupied residential lot. The maximum side-slopes for topsoil stockpiles shall be 5:1 and the maximum height shall not exceed 5.0 meters. All stockpiles must have silt fencing installed around its perimeter to ensure no runoff can occur.

Location of Topsoil Stockpiles on lands to be dedicated to the public is prohibited. Topsoil Stockpiles should be located where possible on private lands between houses and on rear yards. If located on rear yards no material is to be stockpiled on a drainage swale if one is constructed.

Runoff from all topsoil stockpiles shall be controlled by a sediment control fence or other approved devices.

Roadside Catch Basin Sediment Protection

Under appropriate drainage circumstances, all non-low point roadside catch basins shall be provided with sediment protection by double wrapping the catch basin grate with a woven geotextile. All low point catch basins must utilize alternative sediment control measures so that the drainage outlet is not completely blocked. Regular weekly cleanings of the sump or the use of sediment bags shall be considered for these catch basins. All sediment controls must be inspected and maintained on a regular basis. All sediment control donuts must be removed for the winter months (October 30 and replaced the following spring). In areas under development, the developer will provide to the town, contact information on who will respond to address a flooding situation. If no response, within a suitable response time, the Town's Operations Department will attend and address the situation. The Town will charge back the developer for the call-out or draw on the Developer's Letter of Credit (LOC) for costs and/or lay additional charges.

Sediment Control Facilities/Basins

A warning sign shall be attached to posts surrounding the pond area that the area is off limits to the general public and advising that the pond/basin is used for sediment control purposes and that the enclosed area is subject to flash flooding.

Stone Pad Construction Entrance – Construction Access

In order to reduce the tracking of mud onto a paved street, a pad of crushed stone shall be constructed at the site entrance and exit leading onto any existing road. The stone pad shall be a minimum of 450mm thick, 30m long

and 5m wide. The first 15m from the entrance/exit shall be constructed with 50mm clear stone. The remaining 15m shall be constructed with 150mm rip rap.

This stone pad must be maintained as required given the site conditions to ensure mud tracking is kept to a minimum.

Mud and Dust Control

The Town requires all developers, owners, and builders be responsible for all mud and debris that is tracked onto the roadways from vehicles/equipment entering or leaving the construction site during the full period of construction.

Once any house has been occupied, the adjacent streets adversely affected by mud and dust build-up shall be cleaned on a regular or as needed basis.

Developers, Owners, or Builders are required to have all internal and external roads scraped/swept/flushed as deemed necessary. This work shall be required until all lots are sodded, or the development has been granted FAC.

Town staff will inspect on a periodic and on a complaint basis. The Developer, Owner and/or Builder shall, upon written request by the Town, immediately proceed with clean-up operations at their expense. Should the Developer fail to clean as directed, the Town will have the cleaning carried out, draw on the Developer's Letter of Credit (LOC) for costs and/or lay additional charges.

Weed Control

The Town requires all developers, owners, and builders be responsible for all weed control on unoccupied building and vacant lots (including noxious weeds) within the development until FAC has been granted. Following FAC, responsibility of weed control transfers from the developer to the builder or private landowners (which may continue to be the developer). Owners must ensure that weeds on their property are under control and do not spread to other properties.

In violation of not providing weed control, the Town may issue a Remedial Request. Failure to address the request will result in the Town's Operations Department taking corrective action and the developer shall be charged back for any corrective action and costs incurred in the removal of weeds from site.

Seeding or Other Treatment

All stripped and graded areas including road ROW, PULs, MRs, ERs, existing lots, and newly created lots shall be seeded or treated within 45 calendar days of completion of stripping and grading. Within 45 calendar days of stock piling of materials, if no substantial relevant work has been carried out, the Town reserves the right to treat and/or seed the stockpile and/or graded untreated areas utilizing the securities held by the Town.

Stockpile & Debris Control

Once homes have been occupied, neighbouring streets shall be kept clear of building materials and dirt or mounds of soil. Roadways may not be used for stockpiling materials once the road is open to public use. Stockpiling of material on overland concrete swales is at no time permitted. The Developer, Owner and/or Builder shall, upon written request by the Town, immediately proceed with the relocation of the stockpile from placement on the concrete swale. Should the Developer, Owner and/or Builder fail to relocate material, as directed, the Town will have the relocation carried out, charge back or draw on the Developer's Letter of Credit (LOC) for costs and/or additional charges as deemed appropriate.

A road to be blocked under five (5) minutes with construction equipment or materials must use flag persons and appropriate signage while blocked.

A road to be blocked for any duration (over five (5) minutes) with construction equipment or materials, then an alternative signed detour route must be established and approved by the Town for the public. All signing and detours must conform to the current Town of Strathmore's *Temporary Traffic Control Guide (Appendix C)*.

Inspections

All Erosion and Sediment Control Facilities are to be inspected by the Consulting Engineer once a week (at least

every seven (7) days during dry weather and at critical times when precipitation or snowmelt may be capable of causing erosion (inspection must occur during or within 24 hours of significant precipitation or snowmelt). A major precipitation event is defined as >12 mm rainfall over a 24-hour period. Daily inspections are required during extended rainfall or snow melt periods. These inspections are to ensure that the facilities are in proper working condition and all damaged ESC facilities are to be repaired and/or replaced within 48 hours of the inspection.

All erosion and sediment controls are temporary applications constructed prior to any land grading or disruption activities on the site. They are to be inspected and maintained by the Developer throughout the duration of the construction period, including building construction, until the site is stabilized.

Inspection reports are to be available for submittal on Town's request where required.

4.2.10 Shallow Utilities

The Developer shall provide Utility ROWs (URW) in each Subdivision or register easements in the name of the Town of Strathmore for the purpose of utility services of sufficient size and location to the satisfaction of the Town. The Developer shall arrange with the gas, power, telephone, cellular, internet, and cable TV providers to have the respective services installed. The services shall be installed underground, and the Developer shall pay any cost for these services charged by the respective utility companies.

The utilities shall be installed in a single trench wide enough to allow for all shallow utilities to remain in the same alignment within new developments.

The developer's consultant will arrange for the necessary design co-ordination with the various utility companies and receive acceptance/approval from each utility company.

The layout and design of shallow utility facilities shall be provided in accordance with engineering requirements of the respective service providers and will be subject to review by the Town. Utility service providers shall submit their layout and designs through the Developer's Consulting Engineer. It shall be the responsibility of the developer to follow up with the utility to ensure there is sufficient infrastructure in place to service the site.

Utility crossings for new roads shall be placed prior to placement of granular road base material and curbs. Utility crossings for existing roads shall have the asphalt surface saw cut and removed for the width of the trench plus a minimum of 0.5m out from each side of the trench walls.

Compaction of backfill for utility trenches shall be 95% Standard Proctor Density within boulevards and 100% for driveways and under travelled roads.

Requirements

1. Standard across all locations:
 - a. Electrical Servicing, as required by FORTIS
 - b. Gas Servicing, as required by ATCO
 - c. Communications Conduits
 - i. One (1) for each communication provider who wishes to participate
 - ii. One (1) spare conduit dedicated to the Town of Strathmore (See Requirement 2 Below)
 - d. Spacing and depth of cabling and conduits to be as per the attached standard diagram. Standard diagram is only a guideline. Contractor must follow all applicable regulations and requirements for utility installation in a joint use trench.
2. Town of Strathmore Conduit requirements:
 - a. Conduit Type – HDPE Conduit, SDR 11
 - b. Conduit Size – 100mm (4")
 - c. Conduit Colour
 - i. Town Service – Blue preferred
 - ii. All other communication conduits – Grey preferred
 - d. Conduit Requirements Internally:
 - i. Fish Rope – Must have a high tensile strength sufficient for pulling multiple types of communication cabling.
 - e. Termination:

- i. Town of Strathmore Conduit to be terminated in the Fibre Portion of a 4 Way Joint Use Underground Distribution Service Pedestal
- ii. Should Service Pedestals not have sufficient space, or not allowed due to other utility requirements, an access point (Channel Bulk 24" x 36" or approved alternate) shall be provided at regular intervals similar to Service Pedestal Spacing

Gas, electrical, the provision of telecommunications etc., shall be constructed underground and in accordance with the applicable utility company's requirements.

4.2.11 Signs, Signalization, and Streetlighting

4.2.11.1 Traffic Control and Street Identification Signs

The Developer is responsible for installing all permanent traffic control signs and street identification signs, based on information submitted by the Town's Planning and Operations Department. All traffic speed control signage must comply with the guidelines of the Transportation Association of Canada.

4.2.11.2 Traffic Signals

The Developer shall design, construct, and install traffic control signals at all arterial to arterial and collector to arterial intersections as required by the Town. Major intersections with Provincial Highways shall have traffic control signals.

The Developer shall pre-install conduits at major intersections for future traffic control and monitoring purposes (as per the Town's current [Master Transportation Plan](#)). Inserts shall be installed in islands/curbs as instructed by the Infrastructure Manager for traffic counters. If requested by the Infrastructure Manager, the Developer shall also install sensor loops and a receptacle for a traffic counter at important intersections.

4.2.11.3 Streetlighting

- Street lighting must meet Illuminating Engineering Society North America (IESNA) Standards.
- All street lighting and underground electrical power distributions systems are to be paid for by the Developer.
- The street lighting layout and line assignments shall be submitted to the Town for review prior to installation. Streetlight cables shall be installed underground.
- Upon request by the Town, streetlighting for arterial, primary, and collector roads shall have plug-ins and/or banner arms installed on pole standards.
- Luminaires shall be chosen to distribute the light away from residential buildings and onto roadways, pathways, or parking lots.
- No light for the site shall cast onto adjoining properties unless otherwise approved.
- All on-site exterior lighting is to be directed downward and internal to the site and shall in no way infringe on adjacent properties.
- Lighting shall be provided for each internal park area that is not adjacent to a lighted street.
- Light fixtures shall have plug-ins and banner arms for locations within Class A and B park areas.
- Streetlights shall be located at all points where pathways intersect roads.
- For multi-family residential developments, exterior lighting fixtures shall be located near the primary entrances.
- Luminaires and poles shall have an average life expectancy of 20 years and shall be vandal resistant.
- All lighting installations shall conform to the requirements of the current Canadian Standards Association, [Electrical Code of Alberta](#).
- All installations shall be subject to [The Electrical Safety Authority \(ESA\)](#) inspection.
- All wiring shall be underground.

Light Fixtures

All new streetlights must be LED and dark sky compliant, and all streetlight fixtures must be approved by Fortis Alberta and should comply with IESNA Standards. Davit type lighting shall be provided in all major roads. Flat lens

luminaries shall be used.

Cobra head light fixtures are acceptable for all major arterials and major collectors, at the discretion of the Infrastructure Manager. Cobra or decorative lighting shall be provided in all residential roads and municipal reserves. Banner arms and receptacles at the top of the pole for decorative lighting are acceptable at the discretion of the Infrastructure Manager.

The maximum height of all lighting fixtures is 9.0 m with Type II fixtures and a note shall appear on the drawings to this effect.

Exterior lighting at the main entrances and accessible parking spaces shall be at a lighting level not less than 35 lux.

4.2.12 Noise Attenuation

Town staff will confirm if a Noise Study is required in support of the site plan application based on review of the site plan proposal. The Noise Study is to be prepared by an engineering firm qualified in acoustical engineering. The study is to be prepared based on current City of Calgary's requirements in the [Design Guidelines for Subdivision Servicing](#) and [Development Site Servicing Plans \(DSSP\)](#), as applicable and in conjunction with current applicable Alberta Provincial Guidelines.

Noise Attenuation measures including noise barriers may be required in site specific situations to mitigate existing or anticipated noise levels. Town specific criteria for noise barriers are provided below:

- The maximum barrier wall height is 2.4m. Greater heights can be obtained using a combination of wall and berm.
- Barrier walls shall be constructed entirely outside of the Town ROW.
- The minimum density of the noise barrier wall shall be 20 kg/m²

4.2.13 Lot Grading and Drainage

General

Refer to Town of Strathmore *Bylaw No. 22-02 Lot Grading Bylaw*.

It is the Developer's responsibility to correct any drainage problems during the term of the Subdivision Agreement. The Developer is also responsible for certification of each lot's grading and sodding as required by the Town of Strathmore. Lot grading certificates are only valid for 1 year (*see Section 4.4.1.2*). The Developer is responsible to assure that all materials used (including materials used by the Builder) to alter the land and grading conforms to the Town's current Lot Grading Bylaw.

The Town will not accept a Lot Grading Certificate from a Consulting Engineer without the following having taken place:

- The Consulting Engineer has advised the Infrastructure and Development Services Department, in writing, that they have visited the site. The Consulting Engineer is assured that the lots which he proposes to certify have been graded and sodded in accordance with the grading plan and the house has been built and the ground elevation adjacent to the house are compatible with the lot grading which has been carried out.
- The Consulting Engineer will then arrange for themselves and/or their representative, the builder and/or his representative to visit the site and review each lot in the plan which is to be certified. Through a visual inspection it is to be determined which lot(s) require more surveying or work to determine how they can be certified. The Consulting Engineer will immediately certify all lots where the parties in the field have reached an agreement.
- The Consulting Engineer will re-survey those lots which cannot be certified by a visual inspection, or, if necessary, require the builder to do further work in order that such lots can be made certifiable. It should be noted that if the Builder will not correct the work as instructed by the Consulting Engineer, this responsibility will fall directly upon the Developer.
- Lots, which cannot be certified due to poor grading or due to changes in the type of house, which was built on the lot, will be brought to the attention of the Town, in writing, by the Consulting Engineer. The

Consulting Engineer, on behalf of the Developer, will prepare a new grading plan(s) for the lot(s), which have not been built according to plan and will submit the revised plan to the Town, to the Builder, and to the Homeowner (if applicable).

- The foregoing is an attempt to establish a system which will likely cover 98% of the lot grading problems presently being experienced; however, it is acknowledged that there are going to be problems that cannot be covered by this procedure. These problems will be dealt with as per the Town's current Lot Grading Bylaw and in consultation between with the Town's Development Services Department, the Consulting Engineer, the Developer, and the Builder, as they arise.
- Prior to FAC, if the residing Homeowner modifies grades within his own lot causing adverse effects to neighbouring lands, the Developer will be required to rectify the grading infraction to the satisfaction of the Town.

It is recommended that the Developer's Consultant file the actual grades being certified. This will allow a record to be kept for the duration of the Subdivision Agreement. This record will be available to resolve disputes involving changing or certified grades between certification and the Town's Final Acceptance Certification (FAC) of the subdivision.

Builders' site grading plans are to show underside of footing elevations and top of foundation wall elevations. Where multi-level footings and/or foundation walls are intended, all levels are to be shown. Engineered fill level is to be shown where applicable. Downspout locations are to be indicated on Builder's site plans.

The Developer is responsible for the correction of all drainage problems on the blocks during the term of the Subdivision Agreement and for sodding/seeding undeveloped blocks prior to FAC.

Two (2) certified copies of the proposed lot grading plan are to accompany all building permit applications.

The proposed and final grading certificates and drawings are to be certified by the Engineering Consultant responsible for the original design of the Subdivision and required prior to the certificate of assumption. The letter is required for the certification of building and lot grading and must include the date of the Town's approval of the variance.

The submission to the Infrastructure and Development Services Departments for preliminary lot grading certification will require the appropriate grading plan. The grading plan is to contain the following wording:

"I hereby certify that the proposed grading, building type and appurtenant drainage and stormwater management works comply with sound engineering design and that the proposed grading is in conformity with those of the adjacent lands for drainage and relative elevations".

The wording is to be followed by the Professional Engineers stamp and signature. Drawings are to be submitted in the following formats:

- a) A digital AutoCAD 2008 version or greater dwg file, and
- b) A digital (pdf) file.

The Developer shall provide the home builder of each lot with a grade plan or grade slip that matches the Building Grade Plan provided with the final engineering drawings. The Developer shall provide to the home builders and the Town all building grades in the Development Area until the last FAC for the area has been issued. Before FAC, all design building grade slips shall be turned over to the Town.

All lots are required to provide verification of the as-built grades through the Town of Strathmore's as-constructed grade certificate program through the current Town's Lot Grading Bylaw. For more information on the program, please contact the Town's Development Services Department.

4.2.13.1 Site Grading

All site grading must meet the requirements outlined in the accepted Geotechnical Report prepared for the area.

All lot drainage must meet the requirements of the Town of Strathmore's current [Land Use Bylaw](#) and/or the Lot Grading Bylaw.

Lot drainage systems shall be designed to the satisfaction of the Infrastructure Manager to:

- Provide for proper drainage of the land and the lots created by the proposed development

- Prevent the flow of drainage onto adjacent lands
- Prevent ponding on roadways, sidewalks, pathways, gutters, etc.
- Prevent erosion

In general, the minimum slope in the front yard from the grade at the house to the sidewalk shall not be less than 2%. The minimum slope in the back yard shall not be less than 2%. In rare cases where the slope falls towards the dwelling, provisions will be required to keep run off at least 1.2 m away from the dwelling.

4.2.13.2 Berms and Embankments

Where berms are constructed, the maximum side slope cannot exceed 4:1. Slopes should consist of a smooth gradual arc at the base and a smoothed crown on top, sufficient to prevent scalping of the turf during grass cutting. In areas where maintaining a slope of less than a 4:1 is impractical, the Town must review engineering alternatives submitted.

4.2.13.3 Retaining Walls

Retaining walls must comply with the requirements set out in the Town of Strathmore's [Land Use Bylaw](#). A retaining wall between two properties shall be less than 1.0 m in height, measured from the lower grade. Retaining walls up to 2.0 m in height may be accepted for a back yard, but any walls holding back greater than 1.2m of fill must be designed by a Professional Engineer accredited to work within the Province of Alberta.

4.3 Winterizing of Subdivision

Unassumed Roads

In new subdivisions, where public roads have been laid out as part of the registered plan of subdivision and are dedicated as public roads, the Town of Strathmore generally does not assume full responsibility of the physical maintenance of the roadway itself until full warranty periods (**Table 2.2**) have been completed and the issuance of FAC. This is based on the determination of the Town's Infrastructure, Operations, and Development Services Departments that the developer has fulfilled their obligations under the Development Agreement and the Town's engineering design and construction standards.

Limited authority by the Town occurs where a road has been dedicated under plan of subdivision and where the Town's Operational Department has begun to provide basic services (i.e. garbage pick-up) as residents move into the new subdivision. For safety reasons the Town has a mandate to take on such road services, for example, traffic regulations such as parking and stop control, and speed limited as approved by Town Council through Bylaw and are enforceable.

Services for these developments provided by the Town include ***but are not limited to:***

- Fire Protection
- Enforcement of parking restrictions
- Police protection and enforcement of Highway Traffic Act
- Garbage collection

Services for these developments ***not*** provided by the Town include ***but are not limited to:***

- Snow Removal
- Line Break Repair
- Storm or Sewage Blockages

Within the Town's Development Agreement, to provide the development community with operational flexibility, the Town allows the developer the following options to maintain the roads in their respective subdivision over the winter period. Exceptions to this are where there is a connecting link between assumed and unassumed parcels in which case the option would be at the sole discretion of the Town.

Option 1

The developer has the option to maintain the roads in their respective subdivisions at 100% their responsibility and cost. Should a developer fail to maintain roads, the Town will maintain and bill directly back to the developer for direct and indirect costs incurred including a 10% administrative fee. The Town will only take action following a notification to the developer in which that notification goes unanswered, or a commitment is not met.

Option 2

This billing model would be a contract with the developer that is negotiated using actual expenditures for the winter season between October to April from previous seasons for the entire road network, divided by the number of kilometers (km) of roadway. The result is a cost per km which is applied to the number of km's that the Town is asked to maintain on behalf of the developer.

In order to minimize repairs to new subdivision roads and snow plowing equipment, the Town requires the following works to be carried out prior to **October 15th** of each year:

- Manhole tops, catch basin frames and valves on roads with base asphalt shall be set at the level of the base course asphalt.
- Settlements in roadways shall be repaired, particularly adjacent to manhole tops and catch basin frames.
- Sidewalk bays which have settled and created a lip greater than 10mm shall be repaired.
- Asphalt roads shall be cleared of mud and debris and maintained in this manner throughout the maintenance period.
- Inlet manholes, catch basins, ditches or channel shall be cleared of debris to prevent blockages during winter and spring thaws.

The Town of Strathmore will **not** be responsible for damages to surface infrastructure from a road installed with only base course or within the one-year FAC warranty period.

4.4 Site Plan Process

4.4.1 Subdivision Development

Complete site plan application submission requirements including engineering requirements will be provided by Town's Infrastructure, Operations, and Development Services staff through the Site Plan Application process.

Subdivisions within the Town must be designed in accordance with an approved Area Structure Plan and/or Outline Plan for the Subdivision and shall be:

- In accordance with the latest edition of the Town's [Municipal Development Plan](#), [Master Servicing Studies](#), and Engineering Design & Constructions Standards.
- In accordance with the City of Calgary's current [Design Guidelines for Subdivision Servicing](#) (exceptions are noted in this document)
- In conformity with the Town of Strathmore's current [Land Use Bylaw](#).
- To be integrated with the Town's water, sanitary, storm, and transportation systems
- To suit the use for which it is intended
- To accommodate any possible future subdivision of adjacent lands
- Digital drawings to formatted following the *AutoCAD Development Drawing – General Submission Requirements* as outlined in *Section 3.1.6* and *Appendix D*.

This document provides the minimum acceptable standards. Where conditions dictate and good engineering practice requires, higher standards than those indicated in this document shall be observed and incorporated into the design. It shall be the Developer's responsibility to develop the Subdivision or property in accordance with standards that conform to good engineering and construction practices.

The Town encourages and will show flexibility to accommodate alternatives to promote conservation, sustainable best practice, and unique and innovative neighbourhood design as expressed in the context of the current [Municipal Development Plan](#) provided sufficient evidence exists to demonstrate that the alternatives will work in the local context and climate.

Notwithstanding anything contained in this document, all designs shall, as a minimum, meet the statutory requirements of the [Alberta Environmental Protection and Enhancement Act](#); applicable legislation and regulations, as well as all policies adopted by the Municipal Council of the Town of Strathmore.

4.4.1.1 Fees and Securities

The applicant and owner will be required to pay various fees and submit various securities and deposits to the Town of Strathmore as part of the Site Plan Application process.

Site Plan Fees will be consistent with the latest version of the current Town of Strathmore's [Consolidated Fees Schedule Bylaw](#) and will be confirmed by Town Staff during the Site Plan Application process.

Engineering Securities are required by the Town prior to signing of the Development Agreement. A cost of construction estimate, prepared by the contractor and bearing the stamp and signature of a Professional Engineer, is to accompany the final site plan drawings. The Engineering Cost Estimate is to include an estimate for all proposed site works internal to the subject property and a separate estimate for works in the municipal ROW. The required amount of Engineering Securities will be based on the Engineering Cost Estimate.

4.4.1.2 Review by Subdivision Consultant

When a building permit application is received within a subdivision that has not received Final Acceptance Certification, the consulting engineer for the subdivision developer is required to review and approve the site grading and servicing plans and the Stormwater Management Report in addition to the Town (*see Section 4.2.12*)

The subdivision engineer will be required to certify that the proposed site grading and servicing conforms to the approved subdivision plans, the site maintains the approved overland flow routes and the previously approved stormwater release rates are not exceeded. It is the responsibility of the applicant to submit any required materials to the subdivision consultant.

4.4.1.3 Utilities

The current City of Calgary's [Development Site Servicing Plans \(DSSP\)](#) can be used as a guide for line assignments, taking the following into consideration:

- Minimum lateral spacing is 2.5 m between potable water and sanitary sewer. The spacing requirement may be increased at the discretion of the Infrastructure Manager when the depth of bury is deemed to be excessive.
- Sanitary sewer mains shall be aligned at the centre of the roadway where possible. In roadways with inverted crowns or full cross fall, the sanitary sewer shall not be located near the lowest elevation in the cross section to minimize infiltration.
- Shallow utilities are normally located in a multiple-party trench on private property within a URW (*see Section 4.2.9*).
- Line assignments should be submitted to the Town for approval at the start of a tentative subdivision application. In the case of alternate road designs, conceptual line assignments and road design cross sections shall be submitted to the Town for approval at the Outline Plan stage, prior to starting the detailed design.
- Unless otherwise accepted by the Infrastructure Manager, right-of-way sizes for municipal utilities shall be a minimum of 6.0 m for a single, non-sleeved main. If the utility is to be sleeved, the minimum right of way is 3.0 m. For each additional utility in either a sleeved or non-sleeved right of way, an additional 3.0 m is required. Utilities that are excessively deep may require wider right of ways.

4.4.1.4 Municipal Right-Of-Way Excavation and Occupancy Permit

Pursuant to the current Town's [Municipal Right-Of-Way Works and Excavation Policy and Permit](#) a permit must be obtained from the Town's Infrastructure Department for all works to be completed within the Town's Right-Of-Way as part of the Site Plan works. The developer shall comply by all the requirements included in the Right-Of-Way permit application in addition to the requirements of the site plan application.

The Infrastructure and Operations Departments shall be notified 48 hours in advance of the commencement of any construction within the Town's Right-Of-Way.

The Owner/Applicant shall restore all disturbed areas within the Municipal Right-Of-Way to original or better

condition in accordance with the current [Municipal Right-Of-Way Works and Excavation Policy and Permit](#) or otherwise approved on the Site Plan and to the satisfaction of the Town of Strathmore. The security deposit will be held for the one-year warranty period following construction and returned on inspection and authorization by the Town's representative.

No planting, berming or landscaping will be permitted within the Town's Right-Of-Way unless otherwise approved through the Site Plan.

It is the Owners and Contractors responsibility to ensure that any mud or material tracked onto the road or left within the Municipal Right-Of-Way is removed immediately. If the Municipal Right-Of-Way is not kept free and clear of mud and debris the Town may draw from the securities held through the Right-Of-Way permit or Site Plan Agreement and perform the necessary, work at the owners' expense.

4.4.2 Site Plan Process for Private, Commercial, Industrial, Condominium/Multi-Family Standards

General

All site developments (private, commercial, industrial, and multi-family residential sites) must be designed in accordance with the current City of Calgary's [Development Site Servicing Plans \(DSSP\)](#) and in conformity with the Town of Strathmore's current [Land Use Bylaw](#) as amended. Any work within the public right-of-way must ensure that it meets all applicable subdivision regulations and requirements.

The following section outlines additional design criteria and requirements to address the development of private, commercial, industrial, condominiums, and multi-family type developments in the Town of Strathmore. The below condominium standards are in addition to any other relevant standards, policies, and guidelines provided in this manual or (see current City of Calgary's [Development Site Servicing Plans \(DSSP\)](#)) and in conformity with the Town of Strathmore's current [Land Use Bylaw](#) as amended. Any work within the public right-of-way must ensure that it meets all applicable subdivision regulations and requirements.

4.4.2.1 General Design Criteria

Engineering drawings shall be prepared to the satisfaction of the Town of Strathmore, to illustrate the locations of all underground services together with the locations of all roadways, sidewalks, boulevards, parking areas and driveways.

Designated areas for proper large bin waste collection areas must be provided throughout the development so that the waste haulers vehicles can enter the development and collect waste efficiently and safely.

Multi-family developments shall be signed to easily identify the location of all blocks.

4.4.2.2 Internal Private Roadways

1. Internal private roadways shall be designed in accordance with the latest version of the Town of Strathmore Standard Drawings for roads (including curbs, curb and gutters, subdrains and sidewalks).
2. Minimum width of the roadway shall be 6.0 m from edge-of-pavement to edge-of- pavement.
3. Designated fire access routes shall be provided throughout the development to the satisfaction of Strathmore Fire Department and Emergency Services and in accordance with sound engineering practice.
4. Lengths of driveways for condominium townhouse developments must be a minimum of 6.0 m measured from the back of the sidewalk, where a sidewalk exists or 6.0 m from the back of curb where no sidewalk exists.
5. Roadways shall not be considered to form any part of the required parking.
6. The minimum pavement structure for the internal condominium roads is per City of Calgary Standards.
Pavement and granulars are to conform to the applicable standards. The pavement structure may vary depending upon site soil conditions. For site conditions or any specific uses which require extra strength pavement, the pavement structure shall be substantiated by a report from the applicant's geotechnical consultant.
7. Parking lots shall be structurally designed to the equivalent of the internal road design.

8. The minimum pavement structure for driveways to individual, single, semi or townhouse units is as per City of Calgary Standards.
9. An 1.5 m wide sidewalk shall be installed at one or both sides of all internal roadways. Sidewalk construction is to conform to the applicable Town standards. Internal private roadways shall be designed in accordance with the latest version of the Town of Strathmore Standard Drawings for roads (including curbs, curb and gutters, subdrains and sidewalks)(must follow the approved road cross-sections in MTP)

4.4.2.3 Certificate Required to Registration

2. Prior to condominium registration, the Owner will be required to provide the following certifications:
 - Final Lot Grading Certification (including certification of retaining walls)
 - Pavement Certification for all roadways, driveways and parking areas
 - Site Servicing Certification (including storm and sewer flushing, water valve box adjustments, etc. (*See Flushing, Testing, and Disinfection Manual for New Water and Sanitary Sewer Mains, Appendix B*))
 - Acoustical Certification (as required)
3. Site inspection by Infrastructure, Operations and Development Services' staff will be required in conjunction with the review of the above-noted certifications.

SECTION 5.0

LANDSCAPE / OPEN SPACE DESIGN

5.0 Landscape / Open Space Design

The goal of this manual is to provide technical information for the design and implementation of open spaces within the Town of Strathmore.

5.1 General Overview of Landscape / Open Space Design

Open Spaces are an essential component of a successful community, integrating natural features and cultural heritage resources while facilitating a wide range of recreation experiences for the general public. Open Spaces typically include municipal boulevards and medians, stormwater management facilities, various classification of parks, naturalized areas, playgrounds (including tot lots) and athletic fields, linear parks, and pathways.

5.2 Park Classification

The location and programming of parks will be determined by Town Staff and will meet the needs of each unique park classification. The following is a list of key characteristics common to all park types:

- A pedestrian circulation system consisting of a paved walkway network connecting all points of entry to each proposed facility feature shall be provided.
- Where feasible, the park shall be linked to a greenway corridor or trail system.
- Seating and/or gathering areas shall be provided.
- Planting to provide shade and adequate buffers between adjacent land uses shall be provided.
- Provide a minimum of one (1) maintenance vehicular access point for ongoing park maintenance which may require a curb cut.
- Provide a minimum 50% lot frontage onto adjacent street(s) for maximum visibility and safety.
- Parks shall be proposed on table lands where the overall grade of the property does not exceed 6.6%. Parkland to be conveyed to the Town, shall not be in Environmental Reserve (ER) or Environmental Reserve Easement (ERE) lands.
- The shape and configuration of the park shall be in a useable form and centrally located within a residential neighbourhood.
- Park and school blocks, where deemed appropriate, should be close in proximity to maximize opportunities for facility sharing (i.e. parking, playfields etc.).

5.2.1 Class 'A'

Class 'A' park classification is a highly decorative showpiece park with numerous horticultural and landscaped features. It requires frequent, regular monitoring, and will have relatively intense maintenance activities. There is a high number of anticipated users for this park and will be highly visible to the public. They will usually contain seasonal plantings and will have a full or partial irrigation system. In areas that are irrigated, the turf will be healthy and green, with few weeds. The turf will be groomed to provide a neat and tidy appearance. This classification requires a skilled gardener for proper maintenance and execution of tasks to ensure high visual quality.

5.2.2 Class 'B'

Community orientated parks that are readily visible to the public and have a moderate level of use and contain playgrounds and picnic areas. This park classification requires regular, routine maintenance of moderate intensity. It will have a full or partial irrigation system and in areas where it is irrigated the turf will be healthy and green with few weeds. The turf will be groomed to provide a neat and tidy appearance.

5.2.3 Class 'C'

This park classification is considered to consist of low maintenance parks, greenspaces, and linear greenspaces that are usually non-irrigated and contain low maintenance landscape features. They are less visible to the public and have a low level of use and maintenance activities. Requires regular maintenance but at a lower rate of intervals

than an 'A' or 'B' Park Classification. Weeds are kept at acceptable levels within the limits of the regular visits. These spaces are transportation areas for pedestrians.

5.2.4 Class 'D'

This classification of park consists of Conservation Reserve, Environmental Reserve, or Environmental Reserve Easement designated lands whose primary role is the protection of environmentally significant features. They are maintained to encourage or preserve existing native vegetation or naturalized plantings which assist with filtering out pollutants. There will be a naturalized buffer zone and only the turf outside of the buffer zone will be mowed. Weeds are only removed from buffer zones if Noxious or Prohibited Noxious are identified within the Weed Act. Turf outside the buffer zone will have weeds kept at an acceptable level within the limits of the regular visits.

5.2.5 Class 'E'

Class 'E' parks consist of roads, thoroughfares, medians, and boulevards. Also include pathways and cut-throughs that do not have turf. These are low maintenance greenspaces and pathways that are non-irrigated and have no landscape features. They are less visible to the public and are used as transportation corridors, whether vehicular, pedestrian or a combination of both. Weeds will be kept to an acceptable level within the limits of the regular visits.

5.3 Accessibility and Safety

All public open space facilities shall be designed with accessibility and safety in mind. Every new park or trail shall comply with the technical requirements of the current City of Calgary's [Access Design Standards \(ADS\)](#) as well as applying current principles of [Crime Prevention Through Environmental Design \(CPTED\)](#).

All of Strathmore's new or significantly redeveloped existing public spaces are required to comply with ADS as of January 1, 2021. Areas covered by this standard include, but are not limited to:

- Recreational trails
- Outdoor public use eating areas
- Outdoor play spaces
- Exterior paths of travel (e.g., sidewalks, walkways)
- Accessible parking area
- Obtaining services (e.g., service counters)
- Maintenance of accessible elements

5.4 Drawing Submission Requirements

For specifications not covered in these guidelines, see current City of Calgary Parks [Development Guidelines and Standard Specifications for Landscape Construction](#).

Landscape Architects submitting technical drawings to the Town are expected to submit high quality landscape plans that conform to all Town of Strathmore standards and guidelines, as well as industry best practices. The consulting Landscape Architect will be responsible for the conceptual design, detailed design, construction drawings, cost estimates, certifications, and all other related documents to the satisfaction of the Town.

For all future Town owned park facilities, the consulting Landscape Architect will also be responsible for providing the Town with a tender ready construction package including a unit price schedule, specifications, and all associated construction drawings.

- When preparing the landscape drawings for submission, please note the following:
- All landscape plans for Class A, B and D are required to be designed and stamped by a full member of the Alberta Association of Landscape Architects (AALA) in good standing.
- All vegetation analysis reports, tree preservation plan(s) and inventory plan(s) are to be executed by a full registered member of the International Society of Arborists (ISA). All drawings and supplemental material(s) for irrigation systems that will be turned over to the Town, shall be stamped and signed by a Certified Irrigation Designer (CID). The certification must be issued by the Irrigation Association, Calgary, AB. The certified designer must be in good standing with the association.

- Landscape cost estimates will be required for Letter of Credit purposes.

All Drawings to include:

- Scale in metric (preferred scales: 1:200, 1:250, 1:500)
- North arrow
- Key plan oriented in same direction as site plan
- Legal description and zoning of site and property lines including bearings and dimensions. If the site has a municipal address, include it in the plan
- Land uses of surrounding parcels (i.e. residential, commercial, industrial, etc.)
- Utility locations and legal easements, Right-of-Ways, etc.
- Curb lines, sidewalk, utility poles, fences, and any other boundary condition.

Note: All park drawings shall be separated out into their own independent drawings set.

5.4.1 Concept Plan Requirements

A meeting with Town Departments to discuss the developer's concept plans prior to First Submission. **Concept Plan** should include *but not limited to*:

- Type of Park
- Locate and identify the major functions / spaces / constructed features with respect to the site
- Show the relationship of the functions / spaces / constructed features with respect to each other
- Show the relationship of the site to its surrounding land uses
- Indicate the location of the utility rights-of-way within the Parks and Open Space areas
- Indicate existing grades, proposed direction of drainage, slope percentage and adjacent land use information if the data is available
- Indicate Irrigated vs non-irrigated spaces
- Theme and Function

5.4.2 First Submission – Preliminary

Two (2) complete sets (reverse rolled) of the following drawings and documents are required for the first Town of Strathmore, Open Space/Parks Design submission:

- Landscape **Letter of Conformance**
- **Vegetation Analysis Report** (Arborist Report)
- **Demolition Plan**
- **Tree Preservation Plan** and Inventory List
- **Streetscape Buffer Details** (including Planting and Layout Plan(s))
- **Corridor Details** (including Planting and Layout Plan(s))
- Environmental Reserve/Environmental Reserve Easement (ER/ERE) **Restoration Plan** (if applicable)
- **Stormwater Management Pond Details** (including Planting and Layout Plan(s))
- Itemized Landscape **Cost Estimate**

5.4.3 Additional Submissions (Layout Plans)

Two (2) complete sets (reverse rolled) of the documents listed above in *Section 2.4.1 First Submission*, revised based on Town comments are required. The following drawings are also required, *but not limited to*:

- Letter from the consulting Landscape Architect outlining how previous submission comments/revisions were addressed
- **Landscape Letter of Conformance**
- Park **Grading Plan**
- Park **Grid Plan** for MSR Joint Use Sites Only
- Park Engineered **Fill Plan**
- Park **Planting & Layout Plan(s)**

- Park Details
- **Irrigation Plan**
- **Park Photometric and Electrical Plan(s)**
- Park Cost Estimate (separate from subdivision items)
- Stamped, structural engineering details and drawings (where applicable)

5.4.4 Final Submission – Subdivision and Site Plans

The final set of rolled drawings, letter of conformance and cost estimate(s) shall be submitted to the Town. Each drawing sheet is to be stamped, signed and dated by a full member of the Alberta Association of Landscape Architects (AALA) in good standing. Please note that an AALA digital stamp is acceptable, provided it is originally signed. For all subdivision drawings, the following signature box is required within the title bar of all landscape drawings and reports.

Town of Strathmore

Accepted for Construction

The review is considered complete and is performed as a courtesy to the developer/consultant. Acceptance of the drawings provided by the developer/consultant does not relieve the developer/consultant of their responsibility to ensure that all work pursuant to the Development Permit or work to be completed by the developer is in accordance with current practice and is technically acceptable, nor does it relieve the developer/consultant of the responsibility and obligation to remedy subsequently discovered omissions and/or discrepancies

This acceptance is subject to further certification of the "as-constructed" works by a registered professional Landscape Architect of the Province of Alberta.

Date: _____

Accepted By: _____

5.5 Landscape Design Requirements

See current City of Calgary Parks [Development Guidelines and Standard Specifications for Landscape Construction](#). The following chart outlines the *minimum* planting specifications:

<i>Type</i>	<i>Subdivision (Blvds/Medians)</i>	<i>Industrial & Commercial</i>	<i>Non- Industrial & Commercial</i>	<i>Stormwater Management Ponds</i>	<i>Corridors</i>
Deciduous Trees	50 mm cal.	50 mm cal.	50 mm cal.	60 mm cal.	50 mm cal.
Flowering Specimen Trees	50 mm cal.	50 mm cal.	50 mm cal.	60 mm cal.	50 mm cal.
Coniferous Trees	150 cm ht.	200 cm ht.	200 cm ht.	250 cm ht.	150 cm ht.
Shrubs	5-gallon pot	5-gallon pot	5-gallon pot	5-gallon pot	5-gallon pot
Whips	N/A	N/A	N/A	100 cm ht.	100 cm ht.

5.6 Streetscape (Boulevards)

- Please contact the Town of Strathmore Operations/Parks Department or download a copy of the current tree and shrub species list from the Town's official website, [Eligible Shrubs for Strathmore](#) and [Eligible Trees for Strathmore](#).
- All boulevards are required to have a minimum 300 mm depth of topsoil and sod. Boulevard seeding will not be accepted by the Town.
- To avoid a monoculture situation
 - A variety of tree species should be used and have no more than 4 – 8 of the same tree species grouped along a single street.
 - No more than 20% of any one tree species should be used within any given streetscape.
- Tree & shrub species, with an emphasis on native vegetative species, shall be diverse and hardy to withstand urban conditions.
- Tree root protection systems may be required at the discretion of the Town of Strathmore.

5.7 Streetscape (Road Extensions and Road Widening)

- For road widening and/or extensions, an arborist report from an ISA Certified arborist may be required at the discretion of the Town. Consult with Town of Strathmore Infrastructure, Operations and Development Services Department for clarification.
- Every effort should be made to maintain and protect all existing trees, fence lines and vegetation, utilizing arboricultural best practices. Refer to the current Town of Strathmore [Tree Protection Bylaw](#).
- Replacement and/or new deciduous trees shall be a minimum of 60mm caliper street trees spaced at 10-12m on center.
- Consult with Town of Strathmore Infrastructure, Operations and Development Services Department for appropriate tree and shrub species.
- For road widenings and extensions crossing hydrological and wetlands areas refer to the current Alberta Ministry of Environment and Parks best practices [Water Crossing Program](#).
- For road widenings and extensions crossing the Western Irrigation District's (WID) canal system written acceptance of the design by the WID will be required.

5.8 Buffers and Windrows

- a. Planting requirements in these areas will vary based on site specific conditions at the discretion of the Town.
- b. A mix of coniferous trees, deciduous trees and shrubs are required.
- c. All planting is to be in continuous mulched plant beds with weed barrier fabric.

5.9 Stormwater Ponds

- a. All planting plans shall follow the planting density and species requirements. Planting density charts shall be illustrated in a chart form on the planting plans as required by the Town. A minimum of 57% caliper trees shall be provided.
- b. Urban treatment features such as lookouts, seating areas, buffers and nodal planting may be required in addition based on site specific conditions and any applicable design guidelines at the discretion of the Town.
- c. Bio-swaes and Low Impact Development (LID) planting will be considered on a site-by-site basis.
- d. For trail requirements, refer to *Section 6.2* of the current City of Calgary Parks [Development Guidelines and Standard Specifications for Landscape Construction](#).
- e. For signage requirements, refer to current City of Calgary Parks [Development Guidelines and Standard Specifications for Landscape Construction](#).
- f. See Town of Strathmore's IODS Department staff for grading, lighting, and fencing requirements, if applicable.
- g. Chain link fencing is required wherever private property abuts public property such as storm pond blocks.

5.10 Greenway Corridors and Naturalized Areas

- a. Show all pathways within corridors as outlined in the current City of Calgary Parks [Development Guidelines and Standard Specifications for Landscape Construction](#).
- b. All soft landscape areas within the corridor shall be a minimum of 2% slope and a maximum of 25% slope.
- c. Corridors are required to have a minimum topsoil depth of 300mm.
- d. A minimum 2.0 m wide plateau may be required along the edge of the property line where the corridor or naturalization areas abut private lots, at the discretion of the Town. This area is to be finished with a low maintenance, naturalized seed mix.
- e. Half meter (0.5 m) contour intervals shall be shown on all grading plans.
- f. Spot elevations at critical areas including **but not limited to**, low points, high points, hard surface areas and catch basin rim elevations shall be provided.
- g. A 2.0 meter no planting zone for trees and shrubs is required from the edge of all pathways.
- h. Corridors shall be seeded with a native wildflower or grass seed mix with the exception of the following areas:
 - Trails require 1.0 m width of sod along all edges
 - Center points of swales shall be sodded and a minimum of 1.5 m wide
 - All catch basins shall be surrounded by a 1.5 m wide sodded strip
- i. Specialized entrance treatments at the Town's discretion may be required at pathway intersections including, **but not limited to**, accent paving, armour stone, site furniture, bollards, p-gates, shrubs and ornamental grasses.
- j. If required, all catch basins shall be installed in soft landscape areas.
- k. Bio-swaes and Low Impact Development (LID) planting will be considered on a site-by-site basis.
- l. Chain link fencing is required wherever private property abuts public property. All fencing to be installed entirely on private property unless otherwise directed by the Town.
- m. For signage requirements, see *Section 5.13.7*.

- n. Lighting within corridors is not typically required but will be determined at the discretion of the Town.
- o. Weeper drainage tiles may be required within the proposed swales at the discretion of the Town.
- p. See Town of Strathmore IODS staff for fencing requirements if applicable.

5.11 Natural Environment Parks

See current City of Calgary [Development Guidelines and Standard Specifications for Landscape Construction Pathways](#)

- a. All pathways are to be implemented according to the current Town of Strathmore's Pathways Master Plan within the [Transportation Master Plan](#). Pathways proposed on Town owned lands shall be a minimum of 3.0 meters wide and asphalt. The width and surface material may vary based on site specific conditions, at the discretion of the Town.
- b. Pathways require 1.0 m of sod along all edges.
- c. All pathways shall have a maximum side slope of 3% and a maximum run of 6.66% (1:15) where feasible
- d. All pathways must adhere to the most current City of Calgary [Development Guidelines and Standard Specifications for Landscape Construction](#) and International CPTED Association, www.cpted.net.
- e. Where organic soil is present after the proposed pathway has been excavated, additional excavation shall take place to below the organic layer at the developers cost. The proposed granular base depth shall be increased to compensate for the difference.
- f. No cross flow of water is permitted over any pathway.
- g. Soft surface areas shall not drain onto pathways or any other hard surfaces, a culvert with apron ends is required where there is no alternative design solution.
- h. For signage requirements, see *Section 5.13.7*.
- i. Chain link fencing is required wherever private property abuts public property such as satellite pathway. All fencing to be installed entirely on private property unless otherwise directed by the Town.

5.12 Parks

General

- Parks shall be designed in accordance with the Town of Strathmore Parks Master Plan, any Community Design Plans and Guidelines.
- All park designs shall meet or exceed the most recent technical requirements of the Integrated Accessibility Standards Regulation (IASR), the [Design of Public Spaces Standards](#) (IASR) and the current City of Calgary's [Access Design Standards \(ADS\)](#).
- Prior to draft plan approval, the Town may require a facility fit plan to be submitted for review and approval.
- Prior to any detailed design, a pre-consultation meeting shall be scheduled with the landscape consultant and the Town's Infrastructure, Operations, and Development Services Department staff to ensure that all necessary park components are included.
- A vegetation analysis report shall be provided and identify any existing vegetation that is suitable for preservation within park blocks.
- Any required tree protection measures shall be implemented prior to the commencement of rough grading and remain in place until advised by the Town.
- All parking lots shall be designed with two points of access from the adjacent street. In the event only one access point can be achieved, dead ends are not permitted. Where possible, the access points should line up with the center line of any adjacent T-intersections.
- Accessible parking spaces shall be included in the parking lot design as per the current Town of Strathmore's [Land Use Bylaw](#) and in keeping with the parking requirements of the City of Calgary's [Access Design Standards \(ADS\)](#).

- For signage requirements, see *Section 5.12.7* and refer to current City of Calgary Parks [Development Guidelines and Standard Specifications for Landscape Construction](#).

5.12.1 Parks – Hardscape

General

Refer to current City of Calgary [Development Guidelines and Standard Specifications for Landscape Construction](#) for standard details with the following exceptions, at the discretion of the Town:

- For all park access points no bollards are to be installed within the Town's park pathways. Should a bollard be required, a request will be made by the Town with an accompanying bollard and placement design.
- Where a 3.0 metre wide (maximum) walkway that doubles as a maintenance vehicle access route is required into the park from the main parking lot or road, a curb cut must be provided at the access/egress.
- Masonry columns or wooden features may be required and will be determined on a site-specific basis. Structural stamp and certificate shall be required at the discretion of the Town.
- In the event, the Town wishes to flood a hard surface play court to act as a skating rink during the winter months, the court surface shall be concrete or as directed by the Town. A centrally located catch basin with an approved cover shall be provided.
- Decorative metal fencing may be required along park frontage locations at the discretion of the Town.
- Chain link fencing is required wherever private property abuts public property such as park blocks.
- For site furniture and installation requirements, see *Section 5.12.8*.

5.12.2 Parks – Softscape

General

Refer to current City of Calgary [Development Guidelines and Standard Specifications for Landscape Construction](#) for standard details for specific technical planting requirements with the exceptions of:

- All soft surface slopes and swales are to be designed to a minimum of 2% and maximum 25% slope (1:4).
- Crossflow of water from soft to hard surfaces and play courts are to be avoided.
- Where hydro and/or terraseed is proposed adjacent hard landscape areas, trails and walkways, a minimum 1.0 m wide strip of sod is to be installed adjacent the hard surface.
- Site grading and catch basin locations are to be designed such that top of grate elevations allow water not to exceed 30 cm above the grate if obstructed, before the water is redirected to another catch basin.
- Swales shall be sodded to a minimum of 1.5 m wide, on either side of the center line of swale.
- All catch basins shall be surrounded by a minimum of 1.5 m wide sodded strip, from the outer edge of the catch basin.
- Where side or rear residential lots are adjacent to an organized or passive play field within a park block, a minimum 4.0 m wide planting buffer of predominately coniferous planting adjacent the residential lots shall be proposed within a continuous mulch bed.
- Some park entrances may contain upgraded landscape features such as grasses, shrubs, armour stone or structures at the discretion of the Town.
- An enhanced planting bed shall be included in all parks to accommodate a future address sign by the Town. The final locations will be confirmed by Town of Strathmore's, Infrastructure, Operations and Development Services Department.
- Best practices for design should be applied to all parks and open space.

5.12.3 Playgrounds

Layout of playground as per CSA guidelines, including non-encroachment zones. The design and installation of playground structures must comply with the current CAN-CSA Z614 standards for children's play spaces and equipment.

General

- *All playgrounds shall be accessible to people with mobility issues.*
- It is the responsibility of the consulting Landscape Architect to recommend the manufacturer and supplier of playground equipment for review and approval by the Town.
- All play pits shall contain a concrete curb border or alternative as directed by the Town, with concrete ramp(s) to allow access to the play area. Refer to the current Playground Edge Restraint (Concrete) in the current City of Calgary [Development Guidelines and Standard Specifications for Landscape Construction](#).
- The hard surface surrounding the perimeter of the play pit shall be of contrasting colour or include accessible markings such as a 200mm wide painted line to delineate the edge of the play area.
- All play pit surfaces shall be International Play Equipment Manufacturers Association (IPEMA) certified engineered wood fiber mulch, rubber surface or approved equal. The play pit base shall contain a weeping tile system out-letting to a local catch basin or soft surface at a lower elevation.
- All outdoor play spaces shall comply with the consultation and design requirements of the Design of Public Spaces of the City of Calgary's [Access Design Standards \(ADS\)](#).
- Play equipment and protective safety zone information shall be included on all appropriate landscape drawings.

5.12.4 Park Base Condition

Prior to the constructing of a park, the developer will be fully responsible for implementation of the park base conditions. The base conditions require general seed establishment and engineering certification prior to registration. Park base conditions include the following items:

- Installing and/or maintaining vegetation preservation fencing in accordance with the Town approved plans, and reports.
- Rough and fine grading of all proposed soft landscape areas with a minimum of 300mm (12") topsoil. The elevations should be 300mm below proposed finished, final approved grade. The entire park base condition is to be then seeded as per the approved seeding mix.
- Compacted engineered fill shall be installed under all proposed hard surfaced areas. The engineered fill is to be installed to bottom of granular sub-base elevation of the future hard surface. The remaining difference should be topsoil and seeded to 300mm (12") below proposed finished, final approved grade. Compaction testing shall be conducted at key locations as determined by the Town. All testing reports are to be submitted to the Town of Strathmore.
- All proposed culverts, catch basins, and pipe connections shall be installed.
- All catch basin top of grates shall be installed within 300mm below the proposed finished, final grade. All catch basin pipe connections shall be installed below frost level. Pipe connections shall be insulated where installation below frost level cannot be obtained within the design.
- All proposed perimeter chain link fencing shall be installed.
- All required Town of Strathmore approved site services (water, power, and sanitary) are to meet or exceed the most up to date Town or City of Calgary standards.
- All utilities shall be properly staked and labelled above ground for ease of location during construction. Where water services are required (e.g. splash pad, washroom, frost-free hydrant), a Town of Strathmore approved, appropriately sized meter chamber with shut off valve shall be installed within the park block as per the approved plan.
- A minimum of 5 core samples per site shall be conducted by the Developer, at their expense, and reports submitted to the Town of Strathmore to verify topsoil depths within park blocks. Additional core samples may be required at the discretion of the Town.
- The Developer shall provide at their expense, adequate record of topsoil testing to the Town for all topsoil

placed on park sites. If amendments are required of the topsoil, a pre- and post-test analysis report will be required.

- A stamped and signed certification letter from the consulting engineer shall be submitted to the Town verifying that the park base conditions have been implemented as per the approved park drawings.
- The Developer shall provide at their expense, an as-builts survey in electronic formats, one (1) AutoCAD 2008 version or greater (dwg) file and one (1) (pdf) file. Drawings shall include **but not limited to:**
 - o All finished (compacted sub-grades and finished (topsoil) grades. As-builts grading and servicing information overlayed on top of the proposed grading information.
 - o Top of grate elevations for all catch basins and manholes.
 - o 0.5m contour intervals and spot elevations at key points on site (e.g. catch basin rim elevations, high point swales and ridges).

Note: *In instances where severe grade changes are naturally occurring upon the proposed park site, if deemed necessary by the Town of Strathmore IODS Department, all non- decorative (structural) retaining wall systems shall be designed and installed as part of the park base conditions. Detailed construction drawings, certified and stamped by a licensed, registered professional engineer, are to be provided to the Town for review and acceptance prior to wall construction. The associated cost of all coordination, design and construction works shall be at the sole cost to the Developer.*

5.12.5 Grid Plan – For Municipal School Reserve (MSR) Joint Use Sites Only

See the current City of Calgary [Development Guidelines and Standard Specifications for Landscape Construction](#).

5.12.6 Lighting and Electrical

- Solar lighting and fixtures will be encouraged by the Town.
- All lighting is to be LED and controlled via photocell and digital timer to meet park hours of operation.
- “Dark sky” lighting will be required.
- All electrical and lighting drawings are to be designed and stamped by a certified Electrical Engineer.
- Lighting of parks will be at the discretion of the Town’s Infrastructure and Operations Departments. The Town shall confirm lighting requirements on a site-by-site basis when proposed for use as security for structures (CPTED), type of sports field, etc.
- If a shelter or gazebo structure is proposed, the consultant is to ensure that one of the posts is designed to internally carry an electrical supply to lights and/or GFIs at the discretion of the Town.
- Consult with Town of Strathmore’s Infrastructure and Operations Department for the latest park lighting requirements, prior to first submission from the electrical consultant.
- Shall be 6 Lux minimum (Fortis light summary sheet).
- All light fixtures shall have plug-ins and banner arms for locations within Class A and B park areas.

5.12.7 Signage

Park Signage Standards (Under Development). *Appropriate signage is to be installed within parking area and at all entry points within greenway corridors, park blocks, stormwater management blocks and where trail connections are proposed. Signage may include, **but not limited to:***

- Accessibility Trail Signage
- Storm Pond Signage
- No Winter Trail Maintenance Signage
- Accessible Parking Signage
- Dogs on Leash/Owners Pick Up After Dogs Bylaw Signage
- Naturalization Signage

In site specific instances, where historical, ecological, or educational features are present, additional signage may be required.

5.12.8 Site Furniture

General

- A hard surface (typically concrete) shall be provided under all proposed site furniture including, **but not limited to**, benches, garbage receptacles, recycling receptacles, bike racks, picnic tables, bleachers, and shade structures. Accessible seating options shall be required at the discretion of the Town.
- Consult with Town staff to verify manufacturer, model, colour, and additional specification that may be required.
- All site furnishings shall be installed as per manufacturer's specifications.
- All footings for shade structures, gazebos, etc. are to be reviewed, approved, and stamped by a structural engineer for coordination of future building permit(s).
- Metal fencing may be required entirely or partially along the frontage of the park block. Consult with Town staff for verification.

5.12.9 Entry Feature

General

- Entry features shall contain low maintenance or xeriscape plant material in continuous mulch beds with biodegradable weed barrier fabric. The proposed planting shall not obstruct signage on the wall. Coniferous and deciduous trees should be considered as a backdrop.
- The design shall consider local themes or heritage features. Wall features shall require structural stamp and certification at the discretion of the Town.
- Reclaimed heritage components are encouraged and may be included in the design and construction of the wall on consultation with Town's Infrastructure, Operations, and Development Services staff.

5.12.10 Permission to Use Water for Landscape Construction

General

Water for construction and other purposes not related to fire-protection shall be obtained from the Bulk Water Station located in the Town. Where it is not feasible to obtain water from the Bulk Water Station, a customer may enter into an agreement with the Town to access a fire hydrant for a temporary water connection. For rental of a Hydrant Connection Unit and terms and conditions on its use contact the Infrastructure Department directly at infrastructure@strathmore.ca to obtain a Water Meter with Backflow Preventer Rental Form (*see Section 4.2.6.4*).

5.13 Irrigation

General

- This section specifies the supply and installation of irrigation systems. Installers must have experience at this type of work and be willing to provide proof of experience.
- Contractors working on irrigation systems and supplemental components that will eventually be turned over to the Town shall be certified as a Certified Irrigation Contractor (CIC).

5.13.1 Design

- Irrigation Plans should be submitted as part of the landscaping approval package (*See Section 5.4*) and completed by a Certified Irrigations Designer (CID).
- Irrigation systems will be approved as one system in each landscape submission. Once FAC has been granted, a subsequent irrigation system will require a separate meter and submission
- All irrigation systems shall be connected to the potable water system with a meter (provided by the Town) installed. Systems connected to a storm pond or non-potable water source will be subject to special conditions not laid out in this document.

5.13.2 Materials

Materials detailed here are a guidance. Should a contractor or designer wish to use materials not specifically listed here, descriptive literature and samples shall be provided at the time of design or tender, whichever occurs first.

Piping

- Mainline pipes shall be of HDPE with a minimum dimension ratio (DR/SDR) of 17. Pipe diameters shall be determined by the designer based on the system size and pressures.
- Lateral pipes shall be of PVC with a minimum class (CL) of 160. Pipe diameters shall be determined by the designer based on the system size and pressures.

Sprinkler Heads

- Large Fields where large radius sprinklers are beneficial, the following heads may be used:
 - o Rain Bird Falcon 6504-SS
 - o Hunter I-25 (Stainless Steel)
- Small Fields and Parks where smaller radius sprinklers are beneficial, the following heads may be used:
 - o Rain Bird 3500
 - o Hunter PGJ
- Alternative heads from the same manufacturer may be used where specific circumstances require it for proper completion of the irrigation design.
- Flood Bubblers are not acceptable in any use.

Wiring

- Although Paige 2-Wire Cables are preferred, standard 14 Gauge wire rated for direct bury will be accepted.

Valves

- Zone control Valves shall be electrically operated and self cleaning with a make and model compatible with the system. Hand operated valves shall be installed on the upstream side of every electric valve.
- Gate valves shall be Bronze Body with solid wedge disk (Red & White 280 or equivalent)

Controller

- The Town is working to implement a central control system but does not have a standard at this time. Any controller chosen should minimize the required changes to the system to accommodate a future central control.
- At minimum, the controller for each irrigation project shall:
 - o Be programmable for each day independently
 - o Provide 20% expansion space from the designed system
 - o Accommodate rain and/or soil moisture sensors with override
 - o Be master valve programmable
 - o Be lockable if not contained within a larger lockable location
- All sports fields require at least one (1) soil moisture sensor.

Swing Joints

- Swing Joints shall be SJ or HSJ swing joints (or equivalent) which are appropriately sized for the system and do not restrict flow or downsize.

Irrigation Boxes

- All boxes shall be made of heavy-duty polyethylene and capable of withstanding the weight of a heavy-duty tractor on their surface and shall have a locking capability.
- Gravel beds shall consist of 19mm (3/4") washed gravel with an area 50% larger than the box it supports and to a depth no less than 200mm (8").

Sleeving

- Sleeves shall be used at all times when irrigation works crosses a hard surface such as concrete, asphalt, gravel, or the similar.

- Sleeves shall be at a depth of 300mm consisting of the following:
 - o 150mm (6") SDR35 PVC for irrigation piping and,
 - o 38mm (1.5") wire conduit adjacent for control wiring
 - o All sleeves shall extend 1.0m beyond the edge of the hard surface

5.13.3 Double Check Valve Assembly

Double Check Valve Assembly (DCVA) which is drainable and testable without removal shall be used on all irrigation installations. The DCVA shall be installed immediately following the meter and prior to any distribution piping or valves.

5.13.4 Secure Connection Point

A secure point of connection must be provided. This may reside in a room of an adjacent public building, a freestanding structure, or an underground concrete vault. The location must be lockable and secure. Items which must be housed within the Secure Connection Point are:

- Meter, provided by the Town of Strathmore upon request
- Double Check Valve Assembly (DCVA)
- Irrigation Controller
- Electrical Equipment necessary for the operation of the Irrigation system.

The secure connection point may be split between two locations as long as each meets the above requirements.

5.13.5 Inspection & Testing

All items noted below must be in place and operational at the time of inspection.

- Backfill complete and landscaping restored
- All valves & piping
- All boxes installed, levelled, and clear of debris
- Water pressure on and at full operational pressure
 - o A pressure gauge may be placed at any location on any point in the system at the inspector's discretion. The contractor shall be equipped and ready to install such a gauge upon request
- Irrigation heads adjusted and active
- Record drawings complete and available during the inspection. Record drawings shall be submitted as per *Section 3.1.20*.

5.13.6 Maintenance

Protection and Maintenance of the system is required until Final Acceptance (FAC) has been granted by the Town. Maintenance of the system shall include:

- System start-up including confirmation of proper operation and setting of the weekly schedule
- DCVA testing
- Monthly checks to verify controller schedule, proper valve operation, proper zone coverage, no leaks, and no damages

System shutdown including turning off the water supply, blow-out of the system, and winterizing any components to ensure no damage from freezing temperatures can occur.

APPENDICES

AMENDMENT 2023-001**ENGINEERING DESIGN AND CONSTRUCTION STANDARDS**

Revisions to Section 4.2.4.7 Hydrants & Flushing Assemblies:

To be added:

1. All main ports are to be installed with a 5" Storz connection.
2. All hydrants are to be installed to provide a minimum of 26" (660.4 mm) to a maximum of 36" (914.4 mm) clearance from finished grade to port key.

Please see the below diagram for more clarity

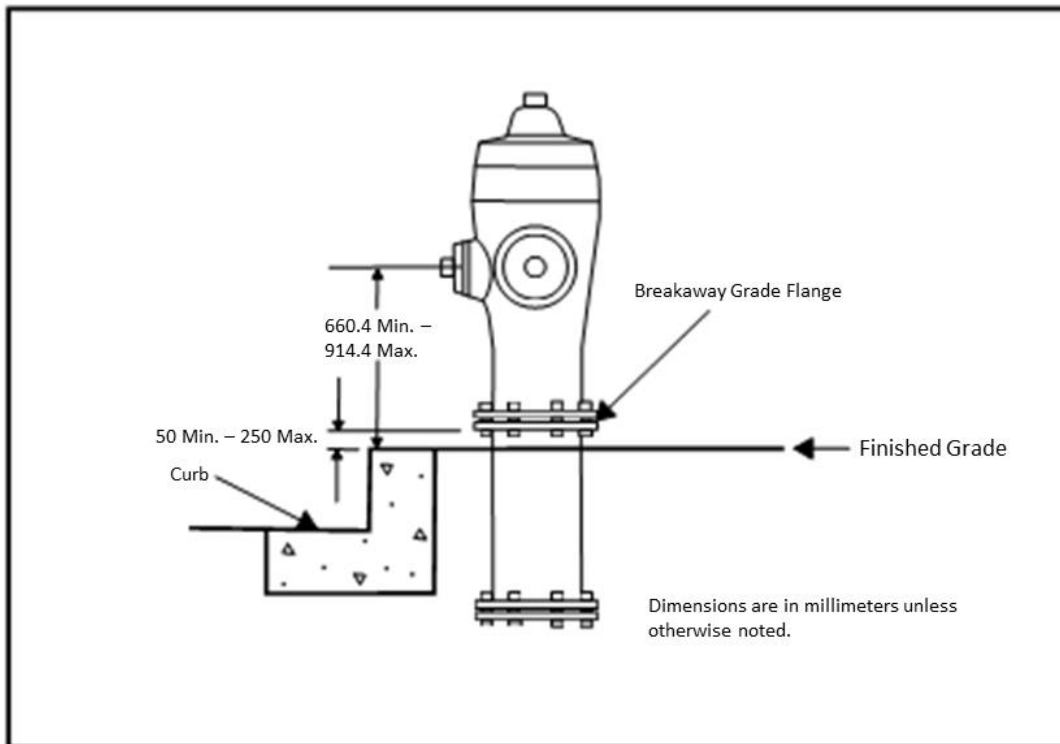


Figure 1 - Hydrant Clearance Requirements

AMENDMENT 2025-002

ENGINEERING DESIGN AND CONSTRUCTION STANDARDS

New Standard – Speciality Crosswalks

A 'speciality' crosswalk uses non-regulatory, non-standard colours, road markings (patterns, designs colours, and textures) on pavement to enhance the aesthetic appeal of a neighbourhood or local community. Speciality crosswalks may consist of artwork or geometric shapes that are painted between the white parallel lines found at most marked crosswalks (for example a rainbow crosswalk).

Criteria (applicant):

The applicant must have liability insurance and provide a copy of the policy to the Town.

Criteria (materials and road condition):

Speciality crosswalks can only be installed at existing marked crosswalks, on roads having a posted speed of 50 kph or lower. A speciality crosswalk may replace an existing zebra crossing on approval from the engineering department. To ensure road safety is not compromised all requests for speciality crosswalks will be reviewed by the ***Town's Infrastructure and Operations Departments***.

The applicant should note that the Town will not resurface the road or undertake any unscheduled repairs in preparation for the installation of a speciality crosswalk.

Proposed locations for decorative crosswalks must have current road surface at the intersection in good condition: free of rutting, alligator cracking, potholes, and raveling asphalt that is currently in acceptable condition which would inhibit the installation of a surface treatment.

Roadways utilizing unit pavers, stamped textures or any other mixed surface materials should **not** be considered for decorative crosswalks.

Any planned paving activities at the location of the crosswalk to be painted must be greater than 3 years in the future.

The Town will paint the white parallel crosswalk markings and will provide the traffic accommodation while the decorative paintwork is being painted. The applicant will be responsible for purchasing all the road paint required to paint the speciality crosswalk (only town approved road paints will be permitted). The applicant will be responsible for organizing all labour and supplies required to paint the decorative crosswalk. Applicants should note that crosswalk may need repainting every year.

Applicants should also note that decorative crosswalks can occasionally attract vandalism and that it will be the applicant's responsibility to remove or repaint any affected parts of the crosswalk and to undertake any necessary maintenance.

Design of Specialty Sidewalk:

1. Design to be centered in the intersection with sections of asphalt separating the colours to reduce friction and risk of slipping (no completely solid crosswalk area painting) (see Examples in Figure 1 & 2 below).
2. Decorative crosswalk designs should be kept simple. Detailed, intricate designs are difficult to maintain and can lose their meaning when worn.
3. For a decorative crosswalk marking request at a location where there is no existing crosswalk, the Town should consider whether the crosswalk is warranted using the Alberta Pedestrian Safety Guide.
4. Cannot contain colours or shapes that may be confused with regulatory traffic controls or be distracting to drivers (assessed by engineering staff).
5. Treatment must be contained within the two white standard crosswalk transverse (parallel) lines.
6. Treatment must be aligned with the gutter.
7. Decorative markings shall be anti-slip and should be made of durable markings unless otherwise specified (i.e. road paint, thermoplastic or methyl methacrylate). Decorative markings should be applied to the asphalt road surface (painted or stamped).
8. The application of the artwork must start approximately 1.0 metre away from the curb/edge of the roadway. The decorative crosswalk must not be applied to or extend onto median islands, curb gutters, curbs, sidewalks, manhole covers or other roadway features.

9. The artwork applied to the crosswalk should provide visual contrast and be reflective.
10. Durable skid resistant pavement markings, such as thermoplastic, should be utilized for artwork on decorative crosswalks.



Figure 1:
Example: City of Kelowna



Figure 2:
Example: City of Sacramento

Design of Specialty Crosswalk Will Not Be Accepted:

- Political or commercial in nature.
- Promotes children's activities in the non-standard crosswalk i.e. a hopscotch or checker-board design.
- Discriminatory or offensive, inflammatory, libelous, or obscene content.
- Shows images that are trademarked/copyrighted.
- Contains text or images that distract road users and/or
- Deemed unsuitable or that safety is negatively impacted by the Infrastructure or Operations Department.
- All of the above is at the discretion of council.

Types of Acceptable Paints/Thermoplastic:

1. All non-standard crosswalks must meet the Alberta Highway Pavement Markings Guide standards and have unpainted areas that allow tires to be directly in contact with road when wet (motorcycles and bicycles), no completely solid crosswalk area painting.
2. Lafrentz Painted Road Marking and Specialty Road Markings ([Lafrentz Road Marking | Lafrentz is Western Canada's leading road marking company, applying painted road markings, durable road markings and safety markings / surfaces.](#))
3. Cloverdale Paints ([Traffic Paint](#)) Example of colours per Progress Crosswalk, in City of St. Albert (below):

• SPD EN 76: SP, Bright Red – Pride Red	• SPD EN 76: SP, Deep Base 050A6865/050 Pride Pink (Pantone 218C)
• SPD EN 76: SP, Pumpkin Orange – Pride Orange	• SPD EN 76: SP, Clear Base 050A9872/050 Pride Purple
• SPD EN 76: SP, JD Yellow – Pride Yellow	• SPD EN 76: SP, Clear Base 050A6862/050 Pride Brown (Pantone 731C)
• SPD EN 76: SP, Black – Pride Black	• SPD EN 76: SP White 050A6866/050 Pride Light Blue
• SPD EN Blue – Pride Blue	• SPD EN 76: SP, Clear Base 050A6860/050 Pride Green
• SPD EN 76: SP White 641 – Pride White	
4. For structural integrity and providing excellent traction for motor vehicles and pedestrians, the colourful patented Traffic Patterns ([Road Pavement Markings in Canada – Traffic Patterns | HUBSS](#)) product which is outfitted with Corundum (Crushed Diamonds) or thermoplastic pavement marking materials, which are sheets of interconnect material for surface application and installed with a specialized infrared heating technology (for maximized high anti-skid elements and wear durability).

Costs:

Applicants are financially responsible for both the installation and maintenance (or unexpected damage/vandalism) of decorative crosswalk markings. Installation and maintenance costs of decorative crosswalk markings can be approximately six times higher than standard pavement markings due to their specialized design. Maintenance of decorative crosswalk markings using durable materials can be expected every 3 years, unless otherwise required due to wheel path wear, vandalism, or wear due to winter aggregate use.

Decorative crosswalks have a finite life and may require removal and/or possible replacement in the future. Depending on the terms of the agreement for their installation, crosswalks will either be renewed, replaced with different decorative artwork or replaced with a standard crosswalk.