CHESTERMERE

Engineering Design and Construction Standards

2025

2025 REVISIONS

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

DISCLAIMER

This document is intended to serve as a guideline only. All information provided is subject to addition, deletion, or modification after the date of printing. Although every effort has been made to ensure the accuracy of the contents of this document, no warranty whatsoever is made with respect to the contents. Users of this publication are advised to contact appropriate officials of the City of Chestermere to determine current standards. The City of Chestermere and its employees will not be held liable for any loss or damage incurred by any individual or company as a result of reliance on any of the information contained in this manual.

IMPORTANT NUMBERS

Community Growth and Infrastructure (previously Development Services) 403.207.7075
Community Operations (previously Public Works) 403.207.2807
Utility Safety Partners (previously Alberta1Call) 1.800.242.3447
EPCOR 403.207.4503
RCMP 403.204.8777
Fire Hall 403.272.9878
Community Peace Officers 403.207.7058
Shaw Cable Locates 1.866.344.7429

EMERGENCY NUMBERS

ATCO Gas 1.800.511.3447
Community Operations (previously Public Works) 403.207.2807
EPCOR (Water or Sewer Emergencies) 1.888.775.6677
Fortis Alberta (Electrical Emergencies) 403.310.9473

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1.0 DEFINITIONS

"**Agreement**" shall mean the written contract agreement, development agreement, or any other agreement or permit duly executed between the Developer and the City which details the terms and conditions under which the Developer is to construct or install the Local Improvements.

"**City**" or "**City of Chestermere**" or "Municipality" shall mean the corporation of the City of Chestermere and/or the land lying within the corporate limits of the City, as the context requires.

"**Construction Completion Certificate**" shall mean a document:

- Signed and sealed by the Consulting Engineer and stamped with an Association of Professional Engineers and Geoscientists of Alberta permit to practice stamp, certifying that construction of the Local Improvement has been constructed, installed, and inspected in conformance with the City of Chestermere'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 City of Chestermere's Standards.
- That is acknowledged and dated by the Municipal representative and the City's Chief Administrative Officer
- That contains the projected earliest warranty period expiry date for the Local Improvement as set by the Municipal representative.

"**Consulting Engineer**" shall mean 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 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."

"**Contractor**" shall mean the individual or corporation hired by the Developer or the City to undertake the obligations contained in the Agreement on behalf of the Developer or the City for the installation, construction, and maintenance of the Local Improvements or any part thereof.

"**Developer**" 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 City's Bylaws.

"**Development Area**" 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.

"**Final Acceptance Certificate**" shall mean a document:

- Signed and sealed by the Consulting Engineer and stamped with an Association of Professional Engineers and Geoscientists of Alberta permit to practice stamp, certifying that the Municipal Improvement has been constructed, installed, inspected, and maintained in accordance with the City of Chestermere's Standards, or in the case of Landscaping, signed by the Landscape Architect certifying that construction of the Local Improvement has been constructed, installed, inspected, and maintained in conformance with the City of Chestermere's Standards; and
- Signed and dated by the Municipal representative.

"**Landscape Architect**" shall mean an individual with membership in good standing with the Alberta Association of Landscape Architects.

"**Local Improvements**" 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:

- 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 facilities, stormwater management facilities, and related structures,
- Stormwater irrigation facilities and required appurtenances,

- 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 surface course,
- Concrete curbs and gutters throughout the completed Subdivision,
- Concrete sidewalks, cycle tracks and asphalt walkways,
- Paved lanes,
- Street lighting, underground and overhead power, telephone, gas, fibre optic cable, and cable TV services,
- Landscaping,
- Park, pathway, and walkway development on dedicated lands in accordance with Plans reviewed by the City,
- Traffic signs and street signs,
- Traffic control signals and controlled pedestrian crossings where required,
- Fencing and sound attenuation fencing,
- Other improvements that are described in the Servicing and Construction or Development Agreement.

"**Municipal representative**" shall mean the City of Chestermere Director of Community Growth and Infrastructure, the Infrastructure Manager, their authorized representative, or such other representative as may from time to time be duly authorized and appointed to act as the City's agent or representative in writing by the City of Chestermere.

"**Standards**" shall mean the City of Chestermere's Engineering Design and Construction Standards set by the City 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 City and the Developer, and as well shall include all the conditions imposed by the City.

"**Subdivision**" shall mean the division of a parcel of land by an instrument, which results in the reconfiguration of property lines.

"Stormwater Effluent" shall mean the treated stormwater released from a stormwater treatment facility. Stormwater treatment facilities include but are not limited to sedimentation,

filtration and infiltration practices for example stormwater ponds, oil and grit separators, bioretention, infiltration systems, etc.

"Stormwater Irrigation Facility" shall mean stormwater supply systems conveying non-potable water from City stormwater management facilities City of Chestermere Parks irrigation systems.

"**Stormwater Management Facility**" shall mean all storm water ponds, dry ponds and its related structures.

"**Trunk Sewer**" – shall mean sewers which collect and convey the wastewater or stormwater to central locations such as lift stations, treatment plants or other designated points. Sanitary trunks are generally larger than 375mm and collect sewer flows from multiple development areas with a service area greater than two quarter sections or 128ha.

"**Utility**" 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 supplied directly or indirectly to or for the public.

"Utility Co." shall mean 1538974 Alberta Ltd. an authorized representative of the City for delivery, management and operation of the water distribution, wastewater systems and stormwater systems.

"**Water and Wastewater Operator**" shall mean the entity(s) hired by the Utility Co. to undertake on behalf of the City the obligations contained in the Service Agreement for delivery, management, and operation of the water distribution, wastewater collection systems and stormwater systems.

"**Warranty Period**" for each Local Improvement shall mean the period from the date of execution of the Construction Completion Certificate by the Municipal representative and the Chief Administrative Officer 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.

2.0 GENERAL INFORMATION

2.1 INTRODUCTION

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

The City reserves the right to vary these standards to meet any specific site issue that may arise in order to sustain the City's development standards and protect public interest. As a result, specific site requirements may be applied where the Municipal representative deems it necessary. All other deviations from these standards and accepted construction drawings shall have the written approval of the Municipal representative.

2.2 DESIGN

The current adopted City of Calgary Subdivision Design Guidelines and Waterworks, Sewer and Roads Construction Specifications must be followed unless otherwise accepted or required by the Municipal representative. Exceptions to the City of Calgary specifications are outlined in this document.

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 City encourages Developers to provide innovative alternatives to promote conservation, sustainable best practice, and unique and innovative neighbourhood design as expressed in the context of the *Municipal Development Plan (MDP)*, 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*, all applicable legislation and regulations, as well as all policies adopted by the Municipal Council of the City of Chestermere.

2.2.1 SUBDIVISIONS

Subdivisions within the City must be designed:

- In accordance with the latest edition of the City's Municipal Development Plan (MDP), Area structure Plan (ASP), Land Use/Outline Plan, Utility Master Plan (UMP), Transportation Master Plan (TMP), Stormwater Master Plan, Existing Stormwater System Analysis, these Standards, and any other master plan as updated by the Municipality from time to time.
- In accordance with the City of Calgary's current *Design Guidelines for Subdivision Servicing* (exceptions are noted in this document)
- To be integrated with the City's water, sanitary, storm, and transportation systems
- To reference the North American Datum 3TM, NAD83 grid coordinates (the combined scale factor must be supplied on each drawing)
- To suit the use for which it is intended
- To accommodate any possible future subdivision of adjacent lands
- In conformity with the current City of Chestermere's *Land Use Bylaw*, as amended.

2.2.2 SITE DEVELOPMENTS

All site developments (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 current City of Chestermere's *Land Use Bylaw* as amended. Any work within the public right-of-way must ensure that it meets all applicable subdivision regulations and requirements.

As per the Water Bylaw 025-13 and Wastewater Bylaw 027-13, the customer is responsible for all costs associated with relocating water and wastewater facilities. These costs include engineering drawings, approvals, construction, and an administration fee of 13%, to be paid by the responsible owner.

2.3 UTILITY LINE ASSIGNMENT

The current adopted City of Calgary *Design Guidelines for Subdivision Servicing* can be used as a guide for line assignments, taking the following into consideration:

- **The Developer's Consulting Engineer is responsible for coordination and submission of the utility line assignments (ULA), including all applicable shallow utilities and checking for conflicts with other deep and shallow utilities. Refer to Appendix J - ULA (Shallow) Application Requirement Checklist.**
- **The Developer's Consulting Engineer is to serve as the primary contact for all ULA applications and change requests.**
- **Minimum lateral spacing is 2.5 m between potable water and sanitary sewer.**
- 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 four-party trench on private property within a 3.5 m utility right-of-way (U.R.W).
- The irrigation supply lines shall be installed on the same alignment and directly above the storm sewer. Where a storm system does not exist, the irrigation supply lines shall be installed in the same line assignment as if the storm sewer existed based on the typical road cross sections.
- Line assignments shall be submitted to the City 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 City for approval at the Outline Plan stage, prior to starting the detailed design.
- Unless otherwise accepted by the Municipal representative, right-of-way sizes for municipal utilities shall be a minimum of 9 m for a single, non-sleeved main. If the utility is to be sleeved, the minimum right of way is 6 m. For each additional utility in either a sleeved or non-sleeved right of way, an additional 3 m is required. Utilities that are excessively deep (greater than 5 m) may require wider rights-of-way.

2.4 WARRANTY PERIOD

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

TABLE 1: LOCAL IMPROVEMENT WARRANTY PERIODS

Sanitary Sewers **Storm Sewers** **Water Mains and Hydrants** **Sewer and Water Connections**** **Overland Drainage Facilities**	**One year** or **One full winter*** (whichever is greater)
*The term winter means the period from October 31 of any calendar year until May 1 of the following calendar year. **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, for buildings on 75% of the lots created by the Subdivision, and where the Developer has not been advised by the City that a deficiency exists. Where such advice that a deficiency exists has been given by the City, the Developer shall repair or correct the deficiency to the satisfaction of the City, and maintenance for that specific connection will cease 30 days after the City's acceptance of said repair or correction.	
Sidewalks, Curbs, Gutters and Catch Basins* **Paved Roads, Lanes and Walkways (excluding Top Lift)**** **Paved Lanes*****	**Two winters***
*Provided the underground utilities have, in the opinion of the Municipal representative, 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. **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. ***Provided at least 75% of the lots in the development area that are lane serviced, have all underground house services installed by the electric, natural gas, telecommunication systems, and no single lane has less than 50% of the house services installed.	
Top Lift for Paved Roads, Lanes and Walkways	**Three months**
Sound Attenuation Fencing **Chain Link or Other Fencing**	**One year**
Stormwater Irrigation Facility	**Four Years***
Stormwater Management Facility	**Three Years***
Wetlands	Refer to *Wetlands Policy*
*The City reserves the right to require extended warranty times if the entire contributing area is not developed, if the design is novel or represents a pilot project, or as may be determined by the Municipal Representative.	

2.5 INSPECTIONS DURING CONSTRUCTION AND MAINTENANCE

2.5.1 SUBDIVISIONS

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 Developer's Consultant Engineer must provide the City with sufficient notice for construction inspections complete with the **Inspection Request Form**. Inspections may be deferred, at the City's discretion when they fall outside of standard working hours as defined by the development agreement or when the inspection schedule is fully booked, preventing timely inspection, and weather conditions.

The City will need to be present to complete the following inspections that are expected to normally occur during the City's regular working hours:

- Utility concrete thrust blocks and collars: Minimum of 24 hours notice from the time concrete was poured. The concrete material must be visible and not covered for inspection.
- Hydrostatic Testing (pressure test): Minimum of 48 hours notice. If the test fails, then a minimum of 24 hours notice to reschedule.
- Subgrade Proof Roll: Minimum of 24 hours notice. An allowance of up to six subgrade proof rolls is provided. For additional inspections the financial remedies shall be as per the City's Fee Schedule, unless otherwise noted.

In the event inspections are required outside of regular working hours or on weekends, the financial remedies shall be as per the City's Fee Schedule.

In the event that the City is unable to attend an inspection, and the inspection cannot be deferred, the Developer shall, at their sole risk, submit daily reports, photos, and geotechnical reports for the City's review and acceptance. At the City's discretion, should the submitted information be found not acceptable, the Developer is responsible for all costs to demonstrate the work was performed in compliance with the requirement such as, but not limited to, uncovering work for inspection or reperforming tests witnessed by the City.

The latest edition of the City of Calgary's ***Consulting Engineer's Field Services Guidelines*** shall be used as a guideline for field inspections.

2.5.2 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 rights-of-way, utility easements and rights-of-way, and any municipal lands. All backfill operations in public rights-of-way must be monitored on a full-time basis by a geotechnical consultant engaged by the developer.

The latest edition of the City of Calgary's ***Consulting Engineer's Field Services Guidelines*** shall be used as a guideline for field inspections.

2.5.3 ACCESS FOR INSPECTIONS BY THE CITY

As outlined in the **Development Agreement**, the City must have free and immediate access to the Subdivision area at all times during construction for the purpose of inspecting the site and sampling materials.

2.6 CONSTRUCTION PHASES

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

- **Underground utilities**:
    - Water mains and hydrants
    - Sanitary sewers
    - Storm sewers
    - Service connections
    - Irrigation pipes
- **Surface improvements:**
    - Paved roads
    - Paved lanes
    - Sidewalks, curbs, gutters and catch basins
    - Overland drainage
    - Signage and signals

- **Stormwater Management Facility**
    - Stormwater/Irrigation Facilities (if applicable)
- **Fixed Municipal Assets**
    - Lift stations
    - Booster/pump stations
    - Sound attenuation fences
- **Landscaping**
    - Municipal reserve improvements
    - Screen fencing
    - Pathways

2.7 CONSTRUCTION COMPLETION CERTIFICATES (CCCS)

2.7.1 SUBMISSIONS

Following the completion of one entire phase of local improvements (refer to Section 2.6), the Developer's Consultant may submit Construction Completion Certificates to the City's Engineering Department. The Consultant should provide the following documentation, as applicable, along with the CCCs.

- CCC Inspection Request Form
- All documents as outlined in **Appendix E - Appendix E - CCC Checklist, Submission Structure & Certificate,** including the checklist. The submission should be submitted following the structure shown in the CCC Submission Structure.
- **One PDF original Construction Completion Certificate** for each improvement, in the form set out in **Appendix E - CCC Checklist, Submission Structure & Certificate** –The CCCs must be signed and stamped by the Developer's Consulting Engineer and an **8.5"x11"** cover sheet of the improvement must be attached with the construction boundary marked in red.

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 Municipal representative (e.g., grade sheets, daily inspection reports, etc.).

2.7.2 INSPECTIONS

The consulting engineer may request a formal CCC inspection by the City immediately upon construction completion of one complete phase of improvements (underground, surface, stormwater retention facilities, or landscaping) using the form included in **Appendix G – Inspection Request Form**. Prior to requesting a formal site inspection, the consulting engineer must inspect the site to verify that there are no outstanding deficiencies prior to requesting a formal site inspection.

All inspections are subject to cancellation due to weather conditions. The City requires 100% of all critical infrastructure (see **Appendix E - CCC Checklist, Submission Structure & Certificate**) 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 City will complete **TWO (2)** free inspections for each subdivision, as outlined **in the City of Chestermere Policy 643 – Service Fee Schedule**. Should additional inspections be required, the cost of the inspection will be charged to the Developer.

2.7.3 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 Municipal representative.

2.8 FINAL ACCEPTANCE CERTIFICATES (FACS)

2.8.1 SUBMISSIONS

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

- **One original PDF Final Acceptance Certificate** for each improvement, in the form set out in **Appendix F - FAC Checklist, Submission Structure & Certificate** - The FACs must be signed and stamped by the Developer's Consulting Engineer and an 8.5"x11" cover

sheet of the improvement must be attached with the construction boundary marked in red. The submission should be submitted following the structure shown in the FAC Submission Structure.

- One CAD copy and one PDF copy of the **Record drawings**, signed and stamped by the Developer's Consulting Engineer. After these final Record drawings have been reviewed and revised as necessary, **two full-sized hard copies** of the final drawings must be submitted.

With the exception of the Record 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.

2.8.2 INSPECTIONS

Once the City 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 **Appendix G – Inspection Request Form.**

All inspections are subject to cancellation due to weather conditions. The City requires 100% of all infrastructure (see **Appendix F - FAC Checklist, Submission Structure & Certificate**) to be completely visible, accessible, and clear of snow, ice, and debris at the time of FAC inspection.

The City will complete two (2) free inspections for each subdivision, as outlined **in the City of Chestermere Policy 643 – Service Fee Schedule**. Should additional inspections be required, the cost of the inspection will be charged to the Developer.

2.8.3 FAC ISSUANCE

FACs will be issued after all the required documentation has been submitted to the satisfaction of the Municipal representative, the applicable hold-back lot deposits for undeveloped lots have been provided to the City, and all fees have been paid.

2.9 TRAFFIC ACCOMMODATION STRATEGY

Traffic control for construction must be in accordance with the current *Alberta Transportation, Traffic Accommodation in Work Zones* manual or the current City of Calgary *Temporary Traffic Control Manual* and must meet the requirements of applicable City of Chestermere traffic bylaws. In no case shall construction traffic be allowed to use residential roads.

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 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 Municipal representative 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 week** to **three weeks** depending on the type of road affected (see section **2.10 Road Closures and Interruptions**).

The Municipal representative will circulate copies of the TAS to all the departments as necessary for review. If, in the opinion of the City, 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.

Haul operations of fill material on/off site may require a Road Use agreement between the City and the Developer/contractor at the discretion of the Municipal representative. This agreement requires, but not limited to the following:

- **Haul route map**
- **TAS report**
- **Pre/Post Haul Inspections**
- **Securities in the form of Letter of Credit**

If utilizing a road with a road restriction, utilizing overweight equipment, or carrying hazardous materials, a haul truck permit is required. Please search "truck permits" on the City of Chestermere's website for more information.

2.10 ROAD CLOSURES AND INTERRUPTIONS

The Developer/contractor shall provide the City 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 City). The TAS must include physical signage or variable message board signage that details the project and closure dates. The amount of time

required for the notice prior to implementation of the TAS depends on the type of road affected. The notification times for different road types are as follows:

Notification Times for Partial & Full Road Closures	
Major Roads	At least ten full days
Transit Route	At least seven full days
Residential Roads	At least seven full days

Peak times in the city are typically from 7 a.m. to 9 a.m., and 4 p.m. to 6 p.m. Monday to Friday. During these times, construction is not allowed on major roads except in cases of emergency or with prior approval from the City and public notification.

Affected parties include, but are not limited to, school districts, emergency services, residents, and businesses affected by the interruption.

2.11 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 Municipal representative for review at least **seven full days** before the proposed interruption. The Developer may be required to notify all residents, businesses, schools, and emergency services affected by the interruption, unless otherwise directed by the City.

2.12 MASTER FACILITY CROSSING AGREEMENT (RIGHT-OF-WAY)

A crossing proximity agreement will be required for any work within the City's right-of-way. Agreement must be in place prior to any work proceeding. The standard conditions are included in **Appendix I** - **Master Facility Crossing Agreement** (Right-of-Way). Other conditions may be required for specific sites at the discretion of the Municipal representative.

Consultants seeking information on where existing infrastructure locations will need to complete a Freedom of Information request with the City. For more information, see the City of Chestermere's website: https://thecityofchestermere.ca/cityhall/foip-records/

2.13 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 City of Chestermere is encouraged to consult the Development Agreement and Standards for detailed information on the Developer's responsibilities for erosion control, and the City of Calgary's current *Guidelines for Erosion and Sediment Control* for detailed information on erosion and sediment control processes and practices.

2.13.1 EROSION AND SEDIMENT CONTROL PLAN AND REPORT

The City requires an ESC Plan and Report for all construction activities. This plan and accompanying report must be prepared by a Professional Engineer or a CPESC Professional, in accordance with the City of Calgary's *Guidelines for Erosion and Sediment Control* and must be submitted to the Municipal representative for review and acceptance along with the Preliminary Engineering Drawings.

2.13.2 ONGOING INSPECTIONS AND MAINTENANCE

All ESC measures must be in place prior to commencing any stripping, grading, or construction. The Developer is required to submit a report signed by a Professional Engineer or CPESC professional, confirming that all necessary ESC measures are in place prior to construction. The Municipal representative 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 on a weekly basis 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). Documentation of the weekly inspections will be submitted along with CCCs and FACs, but must be available to the Municipal representative upon request at any time.

2.13.3 DEWATERING

In addition to the requirements outlined in the City of Calgary's *Guidelines for Erosion and Sediment Control*, any discharge of impounded water to the sanitary system or any off-site areas requires the approval of Development Services, and any discharge of impounded water to any existing storm infrastructure requires approval from the City. All approvals include strict conditions on water quality and quantity that can be discharged.

2.13.4 REMEDIATION

The City will send any correspondence related to ESC to the professional identified by the Developer. Copies of all relevant documentation may be requested by the City 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 City or the Municipal representative 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 City may place a stop-work order on the development until the repairs have been completed.

2.14 CONSTRUCTION IN PROXIMITY TO CRITICAL INFRASTRUCTURE

The current adopted City of Calgary Close Proximity Guidelines must be followed unless otherwise accepted or required by the Municipal representative. The consultant should apply for a Master Facility Crossing Agreement. See section 2.12 and **Appendix I – Master Facility Crossing Agreement** for more information.

A work plan describing the construction activities and scope of work must be submitted to the City for approval two (2) weeks prior to commencement of work.

A work plan shall include the following:

- List of parties involved in the project (Owner, Consulting Engineer(s), Contractor)
- Legal land description of the work site
- Equipment being use
- Steps to locate and protect City's Infrastructure
- Installation and Backfilling procedure

Construction drawings approved by the Professional Engineer or P. Tech (Eng.) detailing the following:

- Location of City infrastructure
- Location of proposed work
- Vertical and Horizontal distances from the City's infrastructure
- Changes to grade

- Equipment crossing details indicating method to protect (rig mats, berms, etc.) the City's Infrastructure

Any additional information requested by the Municipal representative.

3.0 DRAWING & REPORT SUBMISSIONS

3.1 SUBDIVISION OR DEVELOPMENT PERMIT APPLICATION

At the time of Subdivision or Development Permit application, the applicant must submit preliminary design drawings that clearly outline the engineering concept for the site. This includes, at a minimum, the following three drawings:

Composite Site Servicing Plan (For Commercial and Multi-family Developments only)

A composite site servicing plan should be included in the set, showing all proposed roads, lots and lot numbers; all sanitary and storm sewers including pipe diameter and direction of flow; all water mains, hydrants and valves; all manholes and catch basins; private and public servicing information, as well as any existing streets and services surrounding the development. Proposed and existing shallow utilities and easements should also be included.

Site Grading Plan

Site grading plan should show general grading information including the existing and proposed elevations along property lines, driveway locations, sidewalks, walkways, storm and surface water drainage directions, major overland and emergency overland flow routes, trap low extents and calculations, retaining walls, etc.

Overland Drainage Plan

Overland drainage cover sheet should indicate trap lows and calculations, overland drainage flow direction and slopes, overland flow characteristics (flow, depth, velocity), and emergency spill locations.

Note: additional drawings and reports may be required in support of certain applications. Applicants are encouraged to consult the Municipal representative at early stages of the project to determine if additional information is required.

3.2 ENGINEERING REVIEW PROCESS

The detailed engineering review takes place after the subdivision application or development permit has received tentative approval or as authorized by the Director of Community Growth and Infrastructure.

A complete set of drawings should be submitted for each stage of engineering review:

1. Preliminary Engineering Review
2. Final Engineering Review
3. Record Drawing Review

A submission checklist as well as the required number of copies for each submission is listed in **Appendix B – Engineering Drawing Completeness Review 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 City departments for review and comments. The City will endeavor to provide completeness review comments within 14 days of receiving the complete submission. An additional 30 days is required for a detailed engineering/submission review; and any subsequent submissions require additional reviewing time. However, the length of time required for the review depends on the number of submissions the City is currently processing. All applications are reviewed in the order they are received.

Please refer to the City's website for the Subdivision Process Flow (Vacant Land) for additional information. https://thecityofchestermere.ca/cityservices/subdivision-application/

The reviews and comments provided by the City 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.

3.3 SUBDIVISION SUBMISSION REQUIREMENTS

All subdivision engineering drawings should be submitted as a complete package. If the submission is deemed incomplete, the entire package will be returned to the Applicant without review.

3.3.1 COVER LETTER

All engineering drawing and report submissions must include a cover letter and the City's of Chestermere Engineering Drawing Completeness Review Checklist (refer to **Appendix B – Engineering Drawing Completeness Review Checklist**) outlining the type of submission. The cover letter for the preliminary drawing submission should outline the intent of the project and include an engineering design brief outlining the key design assumptions and refer to all

supporting studies for the project (e.g., Master and Staged Master Drainage Plans, Traffic Impact Assessment, etc.). Subsequent submissions should include a copy of the comments provided by the City and a written response to those comments.

3.3.2 SCHEDULE

All final engineering drawing submissions should include a preliminary construction schedule or notice of construction dates.

3.3.3 DESIGN REPORTS

Preliminary drawing submissions should include two bound hard copies and one electronic copy of all design reports. Reports that have been previously submitted to the City 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 City of Chestermere. The Developer is encouraged to consult the Municipal representative 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

A geotechnical report and investigation are required for every subdivision phase of development within the City of Chestermere. 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
- A hydrogeological study 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 City of Calgary's *Guidelines for Geotechnical Reports* 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.

Erosion and Sediment Control Report

An ESC report should be prepared by a professional engineer according to the City of Calgary's *Guidelines for Erosion and Sediment Control.*

Fire Flow Letter/Report

For private sites a Fire Flow Letter/Report should be prepared by a professional engineer according to the City of Calgary's *Design Guidelines for Development Site Servicing Plans*. Refer to sections 4.2 (Fire Flow Requirements) and 5.11 (Fire Protection & Hydrants) of the City of Calgary guideline. Design fire flow rates for the City of Chestermere are found under Section 5.2.2 Potable Water Design Factors. Buildings requiring other fire flows require for a FUS study to be completed and submitted.

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 Guidelines*.

Traffic Impact Assessment

Traffic Impact Assessments (TIA) are normally submitted at the Area Structure Plan and Outline Plan stages of development and should be prepared according to Alberta Infrastructure and Transportation's *Traffic Impact Assessment Guideline* and the City of Chestermere's *Transportation Master Plan*. If further investigation is warranted, updated TIA technical memo 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 City of Calgary standards.

Stormwater Irrigation Report

All stormwater irrigation 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/Pond Report

All pond reports should be prepared by a qualified professional engineer and are to comply with the latest edition of City of Calgary standards.

Sanitary Report

A sanitary report must be submitted for all area contribution in volume within the outline plan area applicable to the subdivision. All reports should be prepared by a qualified professional engineer and are to comply with the latest edition of City of Calgary standards.

3.3.4 ENGINEERING DRAWINGS

All engineering drawing submissions must be signed and sealed by a Professional Engineer or P. Tech (Eng.) registered in the Province of Alberta to ensure a detailed review has been undertaken by the responsible engineer of record prior to submission. Revisions to drawings that are currently in circulation will not be accepted.

The following are general requirements for engineering drawings to be submitted to the City:

- Electronic submissions must conform to the City of Chestermere's drawing requirements, included in **Appendix C - AutoCAD Drawing Submission Requirement**.
- One PDF, full size (22 x 34) copy of the drawings
- One printed, full-size (22 x 34) copy of the drawings
- One printed, 11 x 17 copy of the drawings
- Drawings shall be drawn on standard A1 (841 x 594 mm) sheets.
- Only metric dimensions will be accepted.
- The drawings shall clearly distinguish between existing, proposed, and future features.

Each drawing set must include the following drawings and should be presented in the same order.

Cover Sheet

- The cover sheet should include all applicable information including the name of the development or project; name and address of the owner and consulting engineer; the City of Chestermere subdivision file number or development permit number; a legal description of the lands involved; the issue/revision number and date of issue; and a list of drawings in the set.
- A key plan showing the location of the site within the City of Chestermere should also be shown on the cover sheet.

Outline Plan, Tentative Plan, and Phasing Plan

- A copy of each of the above drawings should be included, as applicable. Subdivision and lot layout design must conform to the approved Tentative Plan.

Composite Site Servicing Plan (For Commercial and Multi-family Developments only)

- A composite site servicing plan should be included in the set, showing all proposed roads, lots and lot numbers; all sanitary and storm sewers including pipe diameter and direction of flow; all water mains, hydrants and valves; all manholes and catch basins; as well as any existing streets and services surrounding the development.

Streets and Sidewalks Plan

- Streets and sidewalks layout should show all curb, gutter, and sidewalks including transition points and curb types; catch basins including ICD information; carriage way and right-of-way widths; radii; location of Canada Post Community Mail Boxes; swales, fences, gates; and any other information as required.
- Proposed roadway cross-sections must be included on this sheet or a separate details sheet. All sections should include roadway, sidewalks, utility line assignment, and lighting, complete with dimensions and materials.
- Proposed fence cross-sections must be included on this sheet or a separate details sheet.

Pavement Markings and Signage Plan

- Proposed signage location layout complete with pavement markings and included sign details.

Storm, Sanitary, and Water Cover Sheets

- Water main layout should show all hydrants, lines, valves, fittings, line sizes, pressure control facilities, pressure zone contours, PRV requirements, and park services.
- Sanitary sewer layout to show all proposed sanitary lines, manholes, and appurtenances. Grade, size, type of pipe, length of each section, invert and rim elevations, and direction of flow should be indicated on the drawings. Manhole plugs should be shown in trap lows. Must include design calculations for sewer sizing, capacity, and sewer catchments.
- Storm sewer layout to show all proposed storm lines, manholes, and catch basins. Lengths, grades, invert and rim elevations, and direction of flow should be indicated on the drawing. Ditches, culverts, and ponds should be indicated as well. A storm sewer design table should be included on the cover sheet.

Building Grade Plan

- Building grade plan should show all lot corner elevations and at least two side yard elevations (dimensioned from the front or rear property line), high points, drainage arrows, minimum top of footing grades, suggested front and rear grades, sanitary and storm invert elevations, size of water service, location of services, servicing details,

insulation for services (if required) driveway locations, mailbox locations, hydrant locations, street light locations, water table contours (1.0 m interval), traplows, shallow utility furniture, bearing certificate requirements, PRV requirements, restrictions of housing type due to grades, and lot numbers.

- Where extremes in elevation of abutting lots require the construction of a retaining wall, it shall be indicated on the plan and must meet all requirements of the current City of Chestermere *Land Use Bylaw*, as amended.

Overland Drainage Plan

- Overland drainage cover sheet should indicate trap lows and calculations, overland drainage flow direction and slopes, overland flow characteristics (flow, depth, velocity), and emergency spill locations.

Stormwater Management Plan

- The Stormwater Management Plan should show all catchment areas, flow arrow, trap low locations, storage infrastructure and facilities, conveyance infrastructure, and associated calculations.

Plan Profiles

- Plan profile drawings should be submitted at a horizontal scale of 1:500 and vertical scale of 1:50 for water mains, sanitary sewers, storm sewers, services, and roads. The geometric layout and dimensions of all above noted utilities including lanes, walkways, and lots should be shown clearly on the plan portion of the drawing. The profile section should show the existing ground profile and the proposed design street grades, and the proposed design of all underground utilities.

- All existing infrastructure elevations must be shown in grey for clarity of proposed elements.

- The current City of Calgary *Block Profile Specifications* should be used as a guideline for these drawings. The current City of Chestermere logo should appear on all drawings.

Storm Pond Drawings

- Refer to City of Calgary standards for details on pond drawings.

Landscaping Drawings

- Please refer to the current City of Chestermere's *Landscape Guidelines and Specifications* for detailed information on landscaping drawing requirements.

Erosion and Sediment Control Plan(s)

- Erosion and Sediment Control drawings should meet the requirements specified in the City of Calgary's *Guidelines for Erosion and Sediment Control.*

3.4 DEVELOPMENT PERMIT SUBMISSIONS

All site developments (private, commercial, industrial, and multi-family residential) must submit site servicing drawings as part of the DP application. Because the set of required drawings varies according to the complexity of the project, applicants are encouraged to request a pre-application meeting with the Planning team to discuss the required submissions for each individual project.

Please refer to Section 3.3.4 above for a list of general requirements for engineering drawings.

3.4.1 COVER LETTER

All site servicing drawing submissions must include a cover letter outlining the type of submission (i.e., preliminary, final, or Record). The cover letter for the preliminary drawing submission should include an engineering design brief outlining the key design assumptions and refer to all supporting studies for the project (e.g., traffic impact assessment; traffic noise analysis, staged master drainage plan, geotechnical evaluation, etc.). Subsequent submissions should include a copy of the comments provided by the City and a written response to those comments.

3.4.2 SCHEDULE

All final engineering drawing submissions must include a preliminary construction schedule.

3.4.3 DESIGN REPORTS

One electronic copy of all required design reports not previously submitted must be included with the submission. Refer to Section 3.3.3 above for information on design reports.

3.4.4 ENGINEERING DRAWINGS

All engineering drawing submissions for grading and site servicing must be signed and sealed by a Professional Engineer or P. Tech (Eng.) registered in the Province of Alberta to ensure a detailed review has been undertaken by the responsible engineer of record prior to submission. Revisions to drawings that are currently under review will not be accepted without prior approval.

Composite Site Servicing Plan

A composite site servicing plan should be included in the set, showing all proposed roads, lots and lot numbers; all sanitary and storm sewers including pipe diameter and direction of flow; all water mains, hydrants and valves; all manholes and catch basins; private and public servicing information, as well as any existing streets and services surrounding the development. Proposed and existing shallow utilities and easements should also be included.

Site Grading Plan

Site grading plan should show general grading information including the existing and proposed elevations along property lines, driveway locations, construction signs and locations, sidewalks, walkways, storm and surface water drainage directions, egress routes with dimensions, major overland and emergency overland flow routes, trap low extents, retaining walls, etc.

Overland Drainage Plan

Overland drainage cover sheet should indicate trap lows and calculations, overland drainage flow direction and slopes, overland flow characteristics (flow, depth, velocity), and emergency spill locations.

Stormwater Management Plan

The Stormwater Management Plan should show all catchment areas, flow arrow, trap low locations, storage infrastructure and facilities, conveyance infrastructure, and associated calculations.

Erosion and Sediment Control Plans

Erosion and Sediment Control drawings and report should meet the requirements specified in the City of Calgary's *Guidelines for Erosion and Sediment Control.*

Additional Drawings as Required

Depending on the complexity of the project, additional drawings may be required, including separate cover sheets for underground utilities, TAS, as well as plan/profile sheets for assets in the public right-of-way.

3.5 SHALLOW UTILITY SUBMISSIONS

All shallow utility drawing submissions must be signed and sealed by a Professional Engineer or P. Tech (Eng.) registered in the Province of Alberta to ensure a detailed review has been undertaken by the responsible engineer of record prior to submission. Revisions to drawings that are currently in circulation will not be accepted.

Utility service providers shall submit their layout and designs through the Developer's Consulting Engineer. 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 and acceptance by the City.

4.0 STRIPPING AND GRADING

4.1 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 City. In addition, the following requirements must be met prior to stripping or grading of lands:

- An Outline Plan for the subject land must be approved by City Council
- A Stripping and Grading Application has been reviewed by the City
- A Subdivision Development Agreement or Development Permit has been signed by the City and the Developer
- The Developer has provided the appropriate securities in the form of an Irrevocable Letter of Credit for Striping and Grading

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

4.2 STRIPPING AND GRADING APPLICATION

The Developer may submit an application for stripping and grading to the Municipal representative for review and acceptance.

A stripping and grading application is not required for development under 2000m^2

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** (one half-sized 11x17 hard copy, one CAD copy, and one pdf copy)
    - **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.
    - **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 40 ha per year.
    - **Cut and Fill Plan** with initial and final contours; any areas with cuts or fills greater than 2.0 m should be identified.
    - **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.
    - **Erosion and Sediment Control Plan(s) and Report** as discussed in Section 2.12 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** (one pdf copy) for areas with fills greater than 2.0 m. (Refer to Section 3.3.3 for more information)
- **Other information as required –** The City may require additional plans, information, or studies, depending on the existing site conditions and the proposed land use. Applicants should contact the Municipal representative to discuss what information is required.

4.3 STRIPPING AND GRADING OPERATIONS

4.3.1 GENERAL REQUIREMENTS

Prior to construction, developers must provide appropriate signage and/or fencing to protect the site and identify it as a construction zone. It is the developer's responsibility to maintain all fencing and signage for the duration of construction.

The Developer must contact the City and/or the Water and Wastewater Operator to make arrangements for water supply during stripping and grading activities. A bulk water meter with a backflow preventer is required. Contact utilities@chestermere.ca to arrange bulk water meter rental.

Written authorization from the appropriate utility agencies must be obtained prior to grading, filling, or excavation within utility and road right-of-ways, under any overhead utility lines, or over any underground utilities.

Where applicable, erect fencing and provide other measures satisfactory to the City to ensure the stripping and grading does not encroach into any land designated as Environmental Reserve or Wetlands.

A stripping and grading report shall be prepared by the Consulting Engineer upon completion of stripping and grading operations and submitted to Municipal representative as per the City of Calgary's current *Consulting Engineers Field Services Guidelines.*

Haul operations of fill material on/off site may require a Road Use agreement between the City and the Developer/contractor at the discretion of the Municipal representative. This agreement requires, but not limited to the following:

- **Haul route map**
- **TAS report**
- **Pre/Post Haul Inspections**
- **Securities in the form of Letter of Credit**

4.3.2 EROSION AND SEDIMENT CONTROL

The Developer must also provide a letter signed by the Developer's Erosion and Sediment Control professional certifying that all Erosion and Sediment Control Features are in place prior to construction. The developer must also contact the Municipal representative to arrange a

site meeting with the Developer's Consulting Engineer to confirm that all necessary ESC measures are in place prior to construction.

The Developer shall submit a letter under corporate seal indemnifying and saving harmless the City and owners of adjacent properties or such other affected parties from any losses or damages which the City, owners of adjacent properties, or other affected parties may sustain as a result of stormwater runoff, soil erosion, soil instability, sedimentation, topsoil stockpiling, dust, differential settlements, and any other problem which may arise from the stripping and rough grading of the lands. In addition, the Developer, at its own expense, shall take any necessary corrective actions to rectify the problems and shall do so promptly and in a manner satisfactory to the Municipal representative.

The Developer must identify a Professional Engineer or a CPESC Professional who will be responsible for ensuring that the site is monitored on a weekly basis 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). Documentation of the weekly inspections must be submitted to the Municipal representative upon request and/or after stripping and grading has been completed.

The Developer shall implement satisfactory drainage control guidelines on site for the duration of the stripping and grading operations. The guidelines must provide for control and drainage of stormwater in and from the land, and stormwater which may be cut off from its natural drainage route by the development (e.g., inlet protection to any adjacent stormwater sewer system). These drainage control guidelines must be approved by the Municipal representative prior to being implemented in the development area.

4.3.3 DUST CONTROL

The Developer shall employ appropriate measures to control any dust, particularly in the vicinity of any roadway or occupied dwelling. Dust control measures must also be employed to:

- Ensure traffic safety
- Minimize and manage dust nuisance complaints from the public
- Minimize drainage, soil erosion, and soil instability problems
- Address any other problems arising from stripping, rough grading, topsoil, stockpiling, and any related operations or development activities

Internal haul roads and working surface areas in and around the lands must be watered as necessary to ensure dust control.

4.3.4 STOCKPILES

Stripped topsoil shall be stockpiled in the location outlined on the approved plan and the stockpile should be neat in appearance, free from any hazardous condition, and treated to prevent soil erosion arising from wind and/or precipitation. Appropriate signage should be posted adjacent to the topsoil pile to prevent illegal dumping and promote safety on site.

The topsoil stockpile shall be removed from the site by the date set in the Stripping and Grading Agreement, unless the Municipal representative grants an extension of time. Extension applications must be requested in writing at least one month before the pre-arranged date of removal or the request may be denied, and removal procedures may be initiated by the City at the Developer's sole expense.

4.3.5 SOIL SCREENING

Soil screening operations of any topsoil stockpile must have prior approval from the Municipal representative and all of the screening operations will remain the responsibility of the Developer. Topsoil screening activities may only be conducted under the following conditions:

- Only topsoil removed from the Land and stockpiled in accordance with the approved plan may be screened. No offsite material is to be brought on to the stripping and grading area unless a valid Development Permit allowing for an enhanced soil screening operation is in place.
- No topsoil screening operations may take place in adverse weather conditions (e.g., strong winds).
- No topsoil may be removed from within the City limits unless authorized by the Municipal representative.

4.3.6 CONTAMINATED LANDS

If during construction of the development the Developer, the owner of the development site, or any of their agents or contractors becomes aware of any type of contamination within the Lands, they must do the following:

- The contamination shall be immediately reported to both Alberta Environment and the City

- The Developer shall, prior to the approval of a Development Completion Permit, submit a Phase II Environmental Site Assessment, prepared by a qualified professional, to Alberta Environment and provide a copy of the report to the Municipal representative
- If required to do so by Alberta Environment, the Developer shall submit to Alberta Environment a remediation plan or risk management plan (Phase III Environmental Site Assessment) prepared by a qualified professional, and acceptable to Alberta Environment and provide a copy to the Municipal representative
- If the submission of a Phase III Environmental Site Assessment has been required at any time, a Development Completion Permit shall not be approved until a qualified professional has submitted a letter to the Municipal representative in a form satisfactory to the Municipal representative, certifying that the physical components identified in the Phase III ESA have been implemented
- If no contamination is discovered during construction of the development, the Developer shall submit a letter to the Municipal representative certifying that no contaminants were discovered at the time of request for letter of credit reduction.

In the event that contamination originated from the land, the Developer, at its own expense, shall rehabilitate adjacent lands to the satisfaction of the affected owners immediately after completion of the stripping and grading of the development lands.

4.3.7 REMEDIAL MEASURES

The Municipal representative may give the Developer notice at any point during stripping and grading operations to remedy deficiencies that emerge on site, including dust, sedimentation, or other nuisance and/or hazard conditions; soil instability problems; and drainage and/or soil erosion issues. It is the Developer's responsibility to ensure these deficiencies are remediated promptly.

In the event of an emergency, the City shall have the right, but not the obligation, to enter upon the lands and rectify any dust, stormwater runoff, soil instability, soil erosion, sedimentation, grading, nuisance, or hazard conditions at the Developer's own cost.

5.0 WATER DISTRIBUTION SYSTEM

5.1 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 City and Alberta Environment.

5.2 DESIGN & INSTALLATION CRITERIA

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

- The City of Chestermere's *Utilities Master Plan*
- The City of Calgary's *Standard Specifications for Waterworks Construction*
- The City of Calgary's *Design Guidelines for Subdivision Servicing* or *Design Guidelines for Development Site Servicing Plans*, as applicable.
- Alberta Environment's *Standards and Guidelines for Municipal Waterworks, Wastewater and Storm Drainage Systems*

5.2.1 GENERAL REQUIREMENTS

Refer to the "City of Calgary *Standard Specifications Waterworks Construction*" for detailed specifications. The following are City of Chestermere requirements that may differ from the City of Calgary:

Sizes and layout of water mains must be in accordance with the most current approved Outline Plan.

Distribution mains shall be continuous (looped). **The City may authorize up to a maximum of 45 single dwelling units (R1 or R2) on a permanent basis and 100 single dwelling units (R1 or R2) on temporary basis in a closed system (dead end).**

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 City may request distribution main sizes to be increased as considered necessary to accommodate future development.

The cover letter and/or supporting documents submitted with the preliminary engineering drawings 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.

5.2.2 POTABLE WATER DESIGN FACTORS

Potable Water Design Factors	
Water Average Daily Demand (ADD) (l/c/d)	250
Water Maximum Daily Demand (MDD) (l/c/d)	ADD x 2.0
Peak Hour Demand (PHD)	ADD x 3.7
Fire Flow – Residential without Multi -family dwellings (L/s)	83 for 2.0 hours + MDD
Fire Flow – Residential with Multi-family dwellings (L/s)*	120 for 2.5 hours + MDD
Fire Flow – Industrial Commercial & Institutional (ICI) (L/s)*	200 for 2.5 hours + MDD
Minimum Residual Pressure MDD + Fire	140 kPa (20 psi)
Minimum Residual Pressure PHD	276 kPa (40 psi)
Maximum Pressure	550 kPa (80 psi)
Maximum Velocity in System	3.0 m/s

*If the available fire flow provided by the City is found to be inadequate after an FUS assessment, then additional mitigation measures will have to be proposed during the development process.

5.2.3 VALVES

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

Please note the following additional requirements:

- Water valves must open **clockwise** (same as City of Calgary).
- All water valve stems should have 38mm (1½") keys.
- No valves shall be installed on City of Chestermere owned sidewalks (full or partial)
- Valves on the distribution mains are to be located at the extension of the street property line at street intersections.

5.2.4 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 Municipal representative.

5.2.5 HYDRANTS & FLUSHING ASSEMBLIES

Hydrants shall be compression type, break away design with square operating nuts. All new hydrants shall be self-draining hydrants and shall be painted lime green with black caps and tops. Existing non-draining hydrants are to be painted red 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.

A flushing hydrant or 50 mm Type B or C flushing assembly must be installed at the end of all water mains terminating in cul–de–sacs.

The hydrant should be located no more than 2m from the curb or access area. A 2 m clearance is required on the port sides of the hydrants with a 1 m clearance on the back or blank side as per City's of Calgary Bylaw 40M2006. Distance coverage between hydrants shall be measured along the roadway complete with dimensions. The City's will not be accepting radius circles. Watermains terminating in cul-de-sacs shall not exceed a maximum length of 100m from the tee of the cul-de-sac.

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 may be removed, if required, when future phases are constructed or incorporated into the design of the future water main system.

5.3 ACCEPTANCE TESTING

All new potable water distribution systems or portions thereof installed within the municipal boundaries of the City shall comply with all procedures and methodologies for flushing, testing and disinfection of water mains as outlined in the current City of Calgary Standard Specifications for Waterworks Construction. Acceptance testing shall be successfully completed prior to submission of the Construction Completion Certificate.

Each hydrant shall be tested for proper operation and flow prior to CCC. Upon completion of the tests, the Consulting Engineer should provide written verification that the hydrant meets the minimum requirements of the City of Chestermere and is now in operation.

5.3.1 HYDROSTATIC TESTING

The City of Calgary Hydrostatic Pressure Testing and Disinfecting Procedures shall be followed for all main installations. The City shall be given at least given 2 full working days notice prior to the testing being undertaken complete with a Hydrostatic Testing Requirements form as per Appendix L. The Developer shall not operate any existing water valves. Should any test disclose leakage greater than the allowable, the Contractor at his own expense, locate and repair the defect. Any failed test attempt must be rescheduled with at least 24 hours notice. The contractor is responsible for collecting the clean water sample(s) and arranging for analysis. The main shall not be put into service until the water sample results have been forwarded to and accepted by the City.

6.0 SANITARY SEWER SYSTEM

6.1 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 City and Alberta Environment.

6.2 DESIGN AND INSTALLATION CRITERIA

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

- The City of Chestermere's *Utilities Master Plan*
- The City of Calgary's *Wastewater Lift Station Design Guidelines*
- The City of Calgary's *Standard Specifications for Sewer Construction*
- The City of Calgary's *Design Guidelines for Subdivision Servicing* or *Design Guidelines for Development Site Servicing Plans*, as applicable.
- Alberta Environment's *Standards and Guidelines for Municipal Waterworks, Wastewater and Storm Drainage Systems*

6.2.1 PIPE DESIGN

Refer to the "City of Calgary Standard Specifications Sewer Construction" for detailed specifications. The following are City of Chestermere requirements that may differ from the City of Calgary:

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 *Utilities Master Plan* (Level of Service Criteria) and the Alberta Environmental Protection (AEP) Standards and Guidelines, whichever is the more conservative requirement. The

Municipal representative may ask for verification that the design velocities meet these requirements.

All manholes located in trap lows are to be sealed watertight.

All manhole covers to be City of Chestermere specific as per design detail drawing Sheet 1. Where sanitary manhole base has a "dead end invert" the dead end shall be benched to prevent buildup of solid material. If the dead end is temporary and will be used for future development, benching is not required.

Plugs must be installed at the end of all sewer mains that terminate in a roadway or easement where a future sewer main connection will be made by the Developer for future phases or by others. Concrete sewer mains must terminate with appropriate size concrete plugs. Wooden planks shall not be used as a substitute for plugs.

A temporary plug at the tie-in point to the City's sanitary system is required since the tie-in cannot occur until the Construction Completion Certificate (CCC) or Schedule H is issued. The location of the temporary plug must be included in the submitted drawings. Authorization to connect to the City's sanitary system or the removal of the temporary plug is attained through the submission of a Plug Removal Letter. The Plug Removal Letter must be submitted to the City's Engineering Department via email at engineeringinfo@chestermere.ca at least 2 full business days prior to the requested removal date. The City's Engineering Department will review the submitted Plug Removal Letter within 2 full business days. The temporary plug can be removed only after the Developer provides a signed Plug Removal Letter to the City for review and approval. Building foundation drains/weeping tiles and roof drains shall not be connected to the sanitary sewer system.

6.2.2 WASTEWATER DESIGN FACTORS AND REQUIREMENTS

Wastewater Design Factors	
Sanitary ADWF (L/c/d)	240
Sanitary Peaking Factor (PF) for Subdivisions	Harmon's formula
General Inflow/Infiltration Allowance (L/s/ha) for Subdivisions	0.28

Minimum Velocity at Half Full Pipe Flow (m/s)	0.6
Maximum Velocity at Peak Design Flow (m/s)	3.0
Peak Flow Rate at Roadway Sags or Other Low Areas (L/s)	0.4
Sanitary trunks will be designed as per City's wastewater model and requirements of the current UMP. Trunks by definition connect multiple development areas and are larger than 375mm.	

6.2.3 MINIMUM PIPE SLOPES

Minimum pipe slopes shall be designed to meet 0.6 m/s self cleaning velocity of a half full pipe at full build out of the subdivision or sewer catchment. The top leg of sewer systems and/ or rider sewers shall be designed with 2 times the minimum slope due to City of Chestermere operational requirements. The minimum slopes for curved sewers shall be 50 percent greater than the minimum slopes required for straight runs.

The minimum pipe slopes for sanitary sewer conveyance in subdivisions will be as follows:

- 200 mm – 0.40%
- 250 mm – 0.28%
- 300 mm – 0.22%
- 375 mm – 0.15%
- 450 mm – 0.12%
- 525 mm – 0.10%
- 600 mm – 0.08%
- 675 mm – 0.07%
- 750 mm – 0.06%
- 900 mm – 0.05%
- 1050 mm – 0.04%
- 1200 mm – 0.03%
- 1500 mm – 0.02%
- 1650 mm and greater – 0.02%

6.2.4 LIFT STATIONS

Wastewater Lift Stations will be subject to review and acceptance by the Municipal representative and shall be designed in accordance with the *Utilities Master Plan* and the City of Calgary's *Wastewater Lift Station Design Guidelines.*

Lift Stations are to follow approved Outline Plan architectural standards.

6.2.5 MATERIALS

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

6.3 ACCEPTANCE TESTING

All new sanitary sewer systems or portions thereof installed within the municipal boundaries of the City shall comply with all procedures and methodologies for flushing and inspection sewer mains as outlined in the City of Calgary *Specifications for Sewer Construction***.** Acceptance testing shall be successfully completed prior to submission of the Construction Completion Certificate.

6.3.1 DEFLECTION TESTING FOR SANITARY AND STORM SEWERS

Refer to the "City of Calgary *Standard for Sewer Construction*" for detailed specifications. The following are City of Chestermere requirements that may differ from the City of Calgary:

CCTV inspection for CCC shall occur no sooner than thirty (30) days after complete backfill. A detailed report of the CCTV inspection certified by a NASSCO certified professional must be submitted along with CCC submission.

Short term deflection testing (by mandrels) is not required for CCC submission.

CCTV inspection for FAC shall not occur no sooner than one (1) year after complete backfill. A detailed report of the CCTV inspection certified by a NASSCO certified professional must be submitted along with FAC submission.

Prior to undertaking any underground utility repairs at either the Construction Completion Certificate (CCC) or Final Acceptance Certificate (FAC) stage, the developer or contractor is required to submit a notice seven days in advance. This notice must include, but not be limited to, the following:

- Notifications to the City for construction schedule and duration
- Distribution of door knockers to residents and all stakeholders affected by the construction activities
- Submission of Traffic Accommodation Strategy (TAS) documents

The contractor must completely flush the sewer segment before commencing CCTV inspections. At the start of the run, the contractor must establish a baseflow.

At FAC, the operational tolerance for sags acceptance is done by means of a monetary penalty agreement limited to sags between 10% to 20%. The percentage depth of sags is to be noted at 5% increments. Any identified sag equal to or greater than 20% requires re-installation.

The monetary penalty calculation will be based on the Utility operators' estimated flushing frequency, subject to the number and length of sags within a sewer segment between manholes. The monetary penalty table is as follows:

SAG (%)	SAG ≤ 5m length in total length	SAGS >5m length in total length
10% ≤ Sag <15%	**6 Year Frequency**	**3 Year Frequency**
15% ≤ Sag <20%	**5 Year Frequency**	**2 Year Frequency**
≥20%	**Dig and Repair**	**Dig and Repair**

7.0 STORM DRAINAGE SYSTEM

7.1 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 City and Alberta Environment.

7.2 DESIGN AND INSTALLATION CRITERIA

All storm drainage systems and facilities (including dry ponds, wet ponds, wetlands, or a combination of these) within the City of Chestermere shall be designed and constructed in accordance with these standards and the latest edition of:

- The City of Chestermere's *Stormwater Master Plan*
- The City of Chestermere's *Utilities Master Plan*
- The City of Calgary's *Stormwater Management Design Manual*
- The City of Calgary's *Standard Specifications of Sewer Construction.*
- The City of Calgary's *Design Guidelines for Subdivision Servicing* or *Design Guidelines for Development Site Servicing Plans*, as applicable.
- Alberta Environmental Protection *Standards and Guidelines for Municipal Waterworks, Wastewater and Storm Drainage Systems*.

7.2.1 GENERAL REQUIREMENTS

The following stormwater management reports (complete with modeling output) should be submitted along with the preliminary design drawings for a general compliance authorization, as applicable:

- Staged Master Drainage Plan
- Stormwater Management Report
- Storm Pond Design Report

Storm drainage systems shall be designed on the basis of minor and major systems. The minor system (storm sewer piped system) shall be designed to carry the peak flow from a 1:5-year storm event. The major system (overland drainage system) shall be designed to safely carry the peak flow from a 1:100-year storm event, which cannot be carried by the minor system.

The minor and major systems should be designed to discharge stormwater by gravity. The City strongly discourages the use of stormwater pumping stations. Stormwater pumping stations shall be subject to approval by the Municipal representative.

All manhole covers to be City of Chestermere specific as per design detail drawing Sheet 1. Where storm manhole base has a "dead end invert" the dead end shall be benched to prevent buildup of solid material. If the dead end is temporary and will be used for future development, benching is not required.

Plugs must be installed at the end of all sewer mains that terminate in a roadway or easement where a future sewer main connection will be made by the Developer for future phases or by others. Concrete sewer mains must terminate with appropriate size concrete plugs. Wooden planks shall not be used as a substitute for plugs.

7.2.2 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 *Utilities Master Plan* or the City of Calgary's design guidelines. The Municipal representative 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 Sheet # 43B of the *City of Calgary Standard Specifications Sewer Construction*. **Type C catch basins shall be located at property line extensions so as not to conflict with driveways.**

Materials used for storm sewers shall be in accordance with the latest City of Calgary Standard Specifications Sewer Construction and the CCSA/CAN B1800 standard.

7.2.3 MAJOR SYSTEM

An overland flow analysis must be provided for all Subdivisions. The City 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.

Surface drainage from any public area shall not flow over any sidewalk unless authorized by the Director of Community Growth & Infrastructure. Discharge from swales should not flow over sidewalks.

Developers shall refer to the City of Chestermere *Utilities Master Plan*, *Stormwater Master Plan and Existing Stormwater System Analysis* to determine the allowable stormwater discharge rates and the area to which storm water shall be directed.

Surface drainage that may be contaminated from industrial, agricultural, or commercial operations shall not be discharged to the storm sewer.

Concrete swales are to be constructed with continuous grade lines with a minimum 0.5% slope, up to maximum of 10% unless other wise approved by the City.

Maximum allowable trap low depth is 0.3m unless otherwise approved by the City.

7.2.4 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 City 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 Municipal representative.

Evaporation stormwater facilities may not be used as the sole method for stormwater discharge. Evaporation may be accepted in combination with other discharge methods at the discretion of the Municipal representative.

All commercial/industrial/institutional development requires an on-site stormwater interceptor (such as a stormceptor) prior to release of flows to the adjacent stormwater system.

Storm pond fountains are strongly discouraged and will be reviewed on a case-by-case basis.

7.2.5 PHOSPHORUS DISCHARGE LIMITS

A theoretical/design effluent stormwater quality (WQ) target of 0.1mg/or less must be met at the connection to the City's stormwater effluent system. The connection point to the City's stormwater effluent system will be confirmed by the City. A treatment train approach should be adopted to achieve these WQ targets. Stormwater effluent is defined as stormwater than has undergone treatment via a stormwater treatment facility or infrastructure such as an OGS.

The intent is not for every stormwater facility to meet the 0.1mg/L, however all drainage areas/catchments in any portion of or overall new development area submitted for City review must meet an overall combined/weighted target of 0.1mg/L.

The theoretical design method used to achieve the design water quality targets must meet industry standards or best practices. And must also be clearly defined for any portion of or overall development area submitted for City review.

7.3 ACCEPTANCE TESTING

All new storm sewer systems or portions thereof installed within the municipal boundaries of the City shall comply with all procedures and methodologies for flushing and inspection sewer mains as outlined in the City of Calgary **Specifications for sewer construction.** 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 City, the Developer shall not be allowed to direct construction run-off into the stormwater facility.

Storm sewer acceptance testing requirements shall be in accordance with "Deflection Testing for Sanitary and Storm Sewers" Section 6.3.1.

8.0 STORMWATER IRRIGATION INFRASTRUCTURE

8.1 GENERAL

The current adopted City of Airdrie *General Design Standard and Construction Specifications (Section 5. Irrigation – Stormwater for Use)* specifications must be followed unless otherwise accepted or required by the Municipal representative.

The following City of Chestermere requirements may differ from the City of Airdrie specifications:

8.1.1 VALVES

Please note the following additional requirements:

- Water valves must open clockwise (same as City of Calgary).
- All water valve stems should have 38mm (1½") keys.
- No valves shall be installed on City of Chestermere owned sidewalks (full or partial)
- Valves on the distribution mains are to be located at the extension of the street property line at street intersections.

8.2 ACCEPTANCE TESTING

All new irrigation systems or portions thereof installed within the municipal boundaries of the City shall comply with all procedures and methodologies for flushing and inspection sewer mains as outlined here. Acceptance testing shall be successfully completed prior to submission of the Construction Completion Certificate.

8.2.1 HYDROSTATIC TESTING

The Developer must submit the Hydrostatic Test Request form, and the City shall be given at least given two full working days notice prior to the testing being undertaken. The Developer shall not operate any existing water valves. Should any test disclose leakage greater than the allowable, the Contractor at his own expense, locate and repair the defect. Any failed test attempt must be rescheduled with at least 24 hours notice. The contractor is responsible for

collecting the clean water sample(s) and arranging for analysis. The main shall not be put into service until the water sample results have been forwarded to and accepted by the City.

8.2.2 IRRIGATION PUMP STATIONS

Irrigation Pump Stations are to follow approved Outline Plan architectural standards.

9.0 SERVICE CONNECTIONS

9.1 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 City and Alberta Environment.

9.2 DESIGN AND INSTALLATION CRITERIA

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

- The City of Chestermere's *Utilities Master Plan*
- *The City of Chestermere Engineering Design and Construction Standards*
- The City of Calgary's *Design Guidelines for Subdivision Servicing* or *Design Guidelines for Development Site Servicing Plans*, as applicable.
- The City of Calgary's *Standard Specifications for Sewer Construction*
- The City of Calgary's *Standard Specifications for Waterworks Construction* Alberta Environmental Protection *Standards and Guidelines for Municipal Waterworks, Wastewater and Storm Drainage Systems*.

9.2.1 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 records in the Property Service Connections Record form or as an Excel spreadsheet as outlined in **Appendix D – Property Service Connection Report**.

The following are City of Chestermere requirements that may differ from the City of Calgary:

9.2.2 WATER SERVICES

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 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 review for general compliance by the Municipal representative.

Abandonment of service connections shall adhere to City of Calgary Standard Specifications for Waterworks Construction. Tapping the main for temporary construction use (such as chlorine injection) shall not be permitted unless otherwise approved by the Municipal representative.

All PEX services that are not perpendicular from main to curb stop must be installed complete with tracer wire from curb stop to main stop.

All service connections shall be installed via HotTap unless otherwise approved by the Municipal representative.

9.2.3 SANITARY SERVICES

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

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 review for compliance by the Municipal representative.

Abandonment of sewer service connections shall adhere to the City of Calgary Specifications for Sewer Construction.

9.2.4 STORM SEWER SERVICES

The City of Chestermere does not allow individual storm services to be tied into the municipal storm system, unless authorized by the Director of Community Growth & Infrastructure.

10.0 ROADWAYS

10.1 GENERAL

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

- The City of Chestermere's *Municipal Development Plan*
- *The City of Chestermere Engineering Design and Construction Standards*
- The City of Chestermere's *Transportation Master Plan*
- The City of Calgary's *Design Guidelines for Subdivision Servicing*
- The City of Calgary's *Roads Construction Standard Specifications*
- 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*

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

10.2 DESIGN AND INSTALLATION CRITERIA

When preparing the design, engineers are encouraged to use the City of Calgary's *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. The City of Chestermere will not pay for any additional costs associated with road construction that benefits an additional developer but may enter into an Endeavor to Assist for future cost recovery.

10.2.1 VERTICAL ALIGNMENTS

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

10.2.2 PAVEMENT STRUCTURE

Pavement designs must be submitted by the Developer to the Municipal representative for review and acceptance. All pavement designs shall consist of two lifts, a base lift and a final lift (top lift) at the time of FAC. In no case shall 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.

10.2.3 ALL WEATHER ACCESS ROADS

All weather access roads are required prior to the release of Building permits. All weather access includes the following minimum requirements:

- A stamped and signed letter from Professional Engineer or P. Tech (Eng.) confirming adequate construction of road base.
- Approved access points and turn around room for emergency vehicles
- An inspection by a Municipal representative
- Roadway maintenance to the City's satisfaction.

Refer to the City of Calgary *Standard Specifications for Road Construction* for detailed specifications.

10.2.4 RESIDENTIAL DRIVEWAYS

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

Location

Driveways must not have access to a Major Street or Primary Collector. All driveways shall intersect the City's roadway at a perpendicular angle. **Side yard garages are strongly discouraged and will be reviewed on a case-by-case basis.**

Materials

Driveways must be asphalt or concrete.

Grades

The maximum grade of a driveway shall be **10%** unless otherwise approved by the Municipal Representative. 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. In no case shall the driveway be extended from the front to the back yard.

The width of a driveway must not exceed:

- 7.0 m where the parcel frontage width is 9.0 m to 15.0 m;
- 8.0 m where the parcel frontage width is greater than 15.0 m; or
- The width of the garage.

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.

10.2.5 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.

Wheelchair ramps are required at all intersections and designated crosswalks. Wheelchair access should be provided to all MRs as well. Tactile walking surface indicators (TWSIs) are required based on the City of Calgary's Specification.

10.2.6 CATCH BASINS

All catch basins shall be constructed such that the entire bearing surface of all joints are watertight by use of butyl, waterproof sealant or waterproof mortar as approved by Municipal representative.

10.2.7 SUBDRAINS

Subdrains are required at the Lip of Gutter (LOG) from catch basin to the outer limits of the trap low.

10.2.8 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.

10.2.9 MATERIALS

Asphalt

All asphalt mix designs should be designed according to the specifications outlined in the current City of Calgary *Roads Construction Standard Specifications* and must be submitted to the City for review at least two weeks prior to the work.

Concrete

The current City of Calgary *Roads Construction Specifications* apply, with the following exceptions.

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.

Sidewalk concrete thickness shall be 100mm.

A minimum of 100mm of 25mm crushed gravel shall be placed under all separate sidewalks, concrete curb and gutters, and monolithic sidewalks.

10.2.10 SEASONAL REQUIREMENT

Minimum placing temperatures for asphalt and concrete must meet City of Calgary specifications. The City 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 test results to confirm.

Cold weather pavement design must be submitted by a professional engineer and approved by the City at least one (1) week prior to material placement.

10.3 ACCEPTANCE TESTING

All roadway structures and appearances are subject to review at CCC and FAC inspection.

10.3.1 COMPACTION TESTING

In addition to the City of Calgary requirements, the Consulting Engineer must also contact the City at least 24 hours prior to all proof rolls, so that the City has the opportunity to witness these tests. Which will include six proof roll inspections. For additional inspections the financial remedies shall be as per the City's Fee Schedule, unless otherwise noted.

10.3.2 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 City 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 m^2 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 Municipal representative. All test results shall be clearly summarized in a report stamped by a professional geotechnical engineer and submitted at CCC and FAC applications.

10.3.3 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 m^3 of concrete poured (surface and underground). If concrete pours are less than 50 m^3 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.

11.0 SHALLOW UTILITIES

11.1 GENERAL INFORMATION

The Developer shall provide rights-of-way in each Subdivision or register easements in the name of the City of Chestermere for the purpose of utility services of sufficient size and location to the satisfaction of the City. The Developer shall arrange with the gas, power, fiber optics, telephone and cable TV companies 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 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 City. Utility service providers shall submit their layout and designs through the Developer's Consulting Engineer.

The Developer's Consulting Engineer is responsible for coordination of utilities and checking for conflicts with other deep and shallow utilities.

All shallow utility crossing shall be minimum 3.0m away from the curb stop unless otherwise approved by the Municipal representative.

Installation of shallow utilities are not permitted without curbs and gutters unless otherwise approved by the Municipal representative.

All work completed within public rights-of-ways shall be in accordance with **"Master Facility Crossing and Proximity Agreement" Section 2.12.**

12.0 SIGNS, SIGNALIZATION, AND STREET LIGHTING

12.1 TRAFFIC CONTROL AND STREET IDENTIFICATION SIGNS

The Developer shall be responsible for installing all permanent traffic control and street identification signs. All street signs must follow City of Chestermere Street name sign standards (see Appendix H – Streetname Sign Standards).

All traffic speed control signage must comply with the guidelines of the Transportation Association of Canada. A 40 km/hr speed signage is required on collector and primary roadways unless otherwise noted.

All street signs must be installed prior to the approval of CCC for paved roads and boulevards and prior to issuance to building permits.

12.2 TRAFFIC SIGNALS

The Developer shall design, construct, and install traffic control signals if intersections are signal warranted. This can be determined following the procedure outlined in TAC's Traffic Signal Warrant Handbook. If a signal is warranted, the guidelines provided in the City of Chestermere's *Traffic Signal Guidelines* shall be followed. The Developer shall pre-install conduits at major intersections for future traffic control and monitoring purposes. Inserts shall be installed in islands/curbs as instructed by the Municipal representative for traffic counters. If requested by the Municipal representative, the Developer shall also install sensor loops and a receptacle for a traffic counter at important intersections.

12.3 STREET LIGHTING

All street lighting and underground electrical power distributions systems are to be paid for by the Developer.

12.3.1 DESIGN

A Fortis approved street lighting layout and line assignments shall be submitted to the City for review prior to installation. Street light cables shall be installed underground.

Streetlights shall be placed at locations not interfering with proposed driveways or road ways and in general shall be located in line with the extension of common property lines between two lots. Lighting shall be provided for each internal park area that is not adjacent to a lighted street. Streetlights shall be located at all points where pathways intersect roads.

12.3.2 FIXTURES

All new streetlights must be LED, and all street light fixtures must be approved by Fortis Alberta and should comply with Illuminating Engineering Society guidelines. 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 Municipal representative. **Decorative lighting installations are prohibited without prior authorization from the City and Fortis, and must be previously approved within the outline plan**

13.0 LOT GRADING

13.1 LANDSCAPING

All landscaping shall comply with the latest edition of the City of Chestermere *Development Guidelines* and *Landscape Guidelines and Landscape Specifications*.

13.2 SITE GRADING

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

13.2.1 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 City must review alternatives.

13.2.2 RETAINING WALLS

Retaining walls must comply with the requirements set out in the City of Chestemere's current *Land Use Bylaw*, as amended. 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.

13.3 LOT DRAINAGE

All lot drainage must meet the requirements of The City of Chestermere's current *Land Use Bylaw*, as amended.

Lot drainage systems shall be designed to the satisfaction of the Municipal representative 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

All detached residential building roof drains are to be discharged to grassed or other pervious areas. Discharge flows must pass over a minimum of 2.0 m of pervious area prior to release to adjacent and/or public properties, as per the City of Chestermere's current *Land Use Bylaw*, as amended.

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.

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 City 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 City. Table 2: Lot Grading Guidelines below shows the tolerances and minimum grades that apply to all construction in Chestermere (single-detached, semi-detached, duplex dwellings, multi-family housing developments, and construction on commercial and industrial sites).

TABLE 2: LOT GRADING GUIDELINES

Item	Acceptable Grade Tolerances Between Grade Slip & As Constructed	Over-Riding Minimum Grades	Other
Top of Footing Verification	±0.15 m	Top of footing must not be lower than the recommended LTF on grade slip	If house or building constructed with minimum entrance grade below minimum grade (MG) or Registered Minimum Grade (RMG) specified, maximum is 0.08 m
As constructed grades for landscape after loaming	±0.15 m	2% grade	Maximum grade ratio of 3:1 without a retaining wall

Areas within 1.2 m of house or building foundation wall under decks and cantilevers		4% grade	
Concrete driveways, sidewalks, and patios		2% grade from garage entrance or house or building foundation wall	Not applicable to driveways in cases where below-grade garages are approved pursuant to a development permit
Multi-family Housing Developments and Commercial or Industrial Sites			Trap-low areas must have volume capacity set out in Storm Water Management Report (Drainage Plan)

All lots are required to provide verification of the Record grades through the City of Chestermere's as-constructed grade certificate program. For more information on the program, please contact Development Services.

14.0 SOUND ATTENUATION FENCE

Sound fence shall be constructed as per the City of Calgary Standard Specifications with the following exceptions:

- Sound fence is to be constructed entirely on public property.
- Screen fence shall be located on Private property.

An electronic copy of Traffic Noise/Sound Attenuation report prepared by a qualified Profession Engineer or P. Tech (Eng.) must be submitted to the City for compliance review. All reports must comply with the latest City of Calgary standards and specifications.

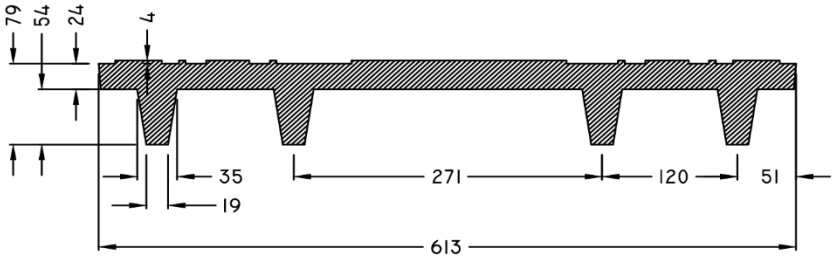
14.1 ACCEPTANCE TESTING

All sound fence structures are subject to review at CCC and FAC.

15.0 DETAIL DRAWINGS

15.1 DRAWING INDEX

CHESTERMERE MANHOLE COVER



SECTION A-A

SPECIFICATIONS:

- GREY CAST IRON TO CONFORM TO CLASS 20 ASTM A48 (LATEST EDITION).

- NOMINAL MASS = 72 KILOGRAMS. +/- 5%

NOTES:

-FOR SANITARY SEWER MANHOLE COVERS LOCATED IN TRAPPED LOWS, EITHER A SINGLE VENT HOLE IS REQUIRED OR 1 OF THE 2 HOLES MUST BE PLUGGED.

-PLUGS ARE SUBJECT TO ENGINEER APPROVAL.

- ALL DIMENSIONS IN mm UNLESS OTHERWISE NOTED.

ALL DIMENSIONS IN MM NLESS OTHERWISE NOTED

No	DATE	REVISION

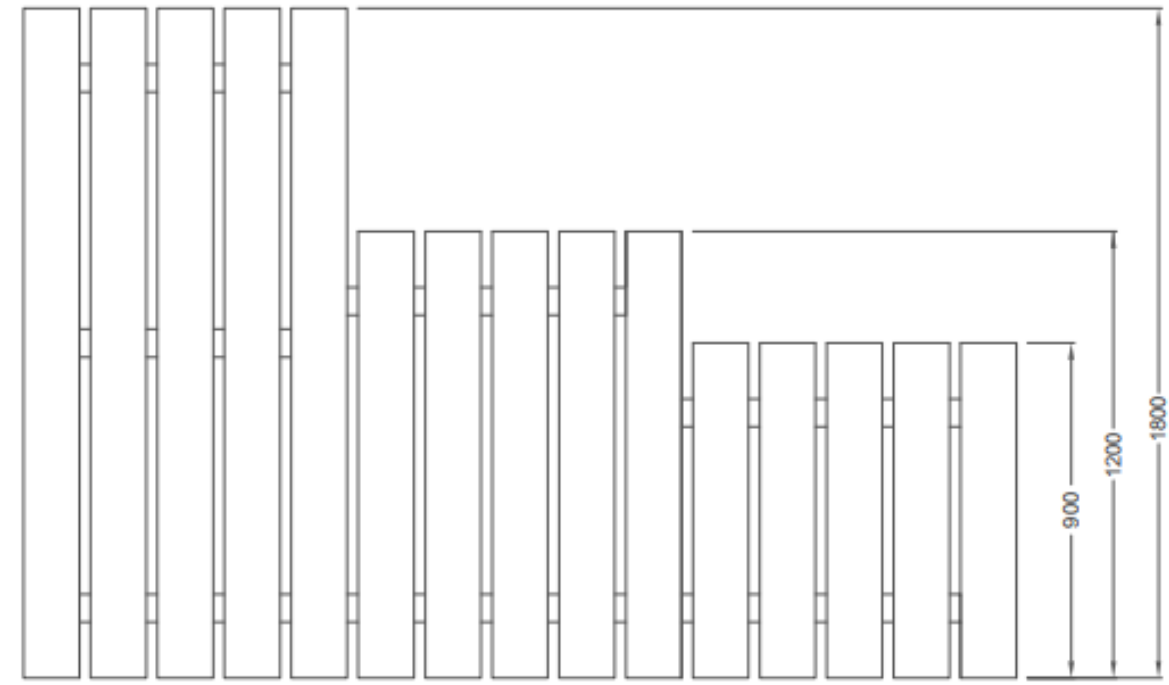
DRAWN BY: PS
DATE: 9/6/2016
SCALE: N.T.S.
APPROVED BY: EW

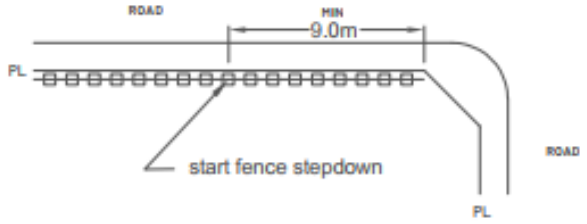
CHESTERMERE
DEVELOPMENT & INFRASTRUCTURE SERVICES

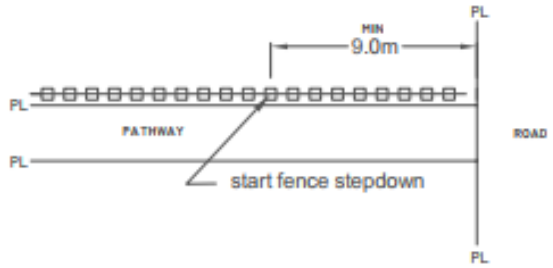
SHEET: 1
FILE NUMBER:

CHESTERMERE STORMWATER STORAGE SITE SIGN

CHESTERMERE FENCE STEPDOWN







NOTES:

- FENCE SECTIONS OF 1.2M AND 0.9M TO BE EQUAL LENGTH.
- FENCE STEPDOWNS SHALL START AT EQUAL DISTANCE FROM THE FRONT PROPERTY LINE.
- ALTERNATE STEPDOWN DETAIL MAY BE USED IF OUTLINED IN ARCHITECTURAL GUIDELINES.

ALL DIMENSIONS IN MM UNLESS OTHERWISE NOTED.

NO.	DATE	REVISION		
			PS	7/19/2017
			N.T.S.	
			EW	

CHESTERMERE
COMMUNITY GROWTH AND INFRASTRUCTURE

3

APPENDIX A

STRIPPING AND GRADING CHECKLIST

CHESTERMERE

STRIPPING AND GRADING APPLICATION CHECKLIST

Project (Subdivision, Site Development): _____

Engineering consultant: _____

Date: _____

REQUIRED DOCUMENTATION:

- ☐ Copy of current **Certificate of Title**
- ☐ **Letter of Authorization** from registered owner of land
- ☐ **Confirmation** of utility locates
- ☐ **Engineering Drawings** (two full-sized hard copies, one CAD, and one pdf)**:**
    - Site Plan
    - Stripping and Grading Plan
    - Cut and Fill Plan
    - Phasing Plan
    - Erosion and Sediment Control Plan and Report
- ☐ **Deep Fills Report**
- ☐ **Other information** as required

_____

_____

- ☐ Proof of decommissioning of existing wells

- Refer to City of Chestermere's *Engineering Design and Construction Standards* and Pregrade Agreement for detailed information on each requirement.
- All drawings and reports submitted to the City of Chestermere are to be signed and sealed to ensure a detailed review has been completed by the responsible engineer of record prior to submission.
- All drawings must include the issue/revision number and date of submission.
- Revisions to drawings that are currently under review will not be accepted.
- Allow 30 days **for each review of engineering drawings.**

APPENDIX B

ENGINEERING DRAWING COMPLETENESS REVIEW CHECKLIST

CHESTERMERE

Engineering Drawing Completeness Review Checklist

Subdivision and Phase: _____

City File Number: _____

Developer / Consulting Engineer: _____

Date: _____

If documents from the list below are not included in the submission, please comment why they were exempt .

DOCUMENT	PROVIDED IN SUBMISSION?		COMMENTS
	YES	NO	
Cover Letter			
Preliminary Construction Schedule			
Approved Outline Plan			
DESIGN REPORT:			
Geotechnical Report			
Deep Fills Report			
Slope Stability Assessment			
Stormwater Management Report			
Pond Report			
Traffic Impact Assessment Update (*confirm the TIA originally submitted is still valid and what, if any, improvements are triggered by proposed phase*)			
Traffic Noise Analysis and/or Sound Attenuation Report			
Erosion and Sediment Control Report			
Existing Hydrant Test Report & Fire Flow Analysis Report based on the latest Underwriters Survey (FUS) data			

CHESTERMERE

ENGINEERING DRAWINGS:			
Cover Sheet			
Outline Plan			
Tentative Plan			
Index of Drawings			
Surface Improvements Cover Sheet			
Surface Details Cover Sheet with Cross Sections			
Turning Templates Cover Sheet			
Pavement Markings & Signage Drawings			
Sanitary Cover Sheet			
Storm Cover Sheet			
Water Cover Sheet			
Irrigation Cover Sheet			
Building Grade Plan			
Overland Drainage			
Stormwater Management Plan			
Storm Pond Drawings			
Erosion & Sediment Control Plan			
Landscape Drawings			
Cut/Fills Plan			
Plan & Profiles			
ADDITIONAL DRAWINGS OR REPORTS SUBMITTED:			

APPENDIX C

AUTOCAD DRAWING SUBMISSION REQUIREMENT

AUTOCAD DEVELOPMENT DRAWING SUBMISSION REQUIREMENT

1.0 TOC DIGITAL DRAWING SUBMISSION STANDARDS

The standards described in this manual are to assist applicants in providing the required digital computer Aided Drafting (CAD) information in the correct format and appearance for acceptance by the City of Chestermere. These standards apply to coversheets only. Block profiles are to remain consistent with the current version of the City of Calgary's "Standard Block Profile Specifications for CAD and Manual Formats".

1.1 DRAWING FORMAT

All AutoCAD files submitted to the City are to be in AutoCAD 2018. All other formats will not be accepted.

1.2 DRAWING SUBMISSION

Digital AutoCAD drawings are required at the Preliminary Design, IFC, and at FAC (Record Drawings). The AutoCAD files (.dwg) will be placed on an USB drive with the associated PDF files for the current submission. All information needed to reproduce the final accepted drawings (PDF's) is required to be included on the disc. The disk will be clearly labeled with the subdivision/development name, phase number (if applicable), Consultant information, date submitted, and the reason of submission (CCC, FAC, etc.)

1.3 DRAWING PRESENTATION

Drawings submitted must adhere to the following rules:

1. All drawing objects and text associated with those objects must be located in model space.

2. All drawing objects to be shown at actual length and in ground coordinates based on NAD83 3TM projection, central meridian -114 with no scaling, rotating, or shifting required. Local Datum is not permissible.

3. Drawing must be purged of all definitions that are not used such as: layers, layer filters, text styles, dimension styles, blocks, etc.

4. All objects must be on its correct layer. (i.e. water mains on a separate

layer from Water valves, hydrants etc.)

5. Duplicate objects, and text are to be removed.

6. External and Data References are to be bound within the drawing

1.4 DIGITAL DATA STRUCTURE

- Line
- Point Feature
- Text
- Dimension

1.4.1 LINE

All linear features within the drawing are to be on its correct layer. Linear features are created by the AutoCAD commands, line, circle, arc and polyline. Lines representing a segment of any utility are to be one segment from point feature to point feature. For example, a water main is drawn as a polyline or line from each valve, reducer, etc. to the next point feature. The lines representing utilities are not to be broken at curves; they

are to be one polyline until the next point feature. The exceptions to this rule are water mains that have a 45° or greater bend; the bend is treated as a point feature without requiring symbolic representation.

1.4.2 POINT FEATURE

Point features within the drawing are to be represented by a point or a block. Points or Blocks shall be 'snapped' to linear features. For a complete list of features to be represented by points or blocks, and how they are to appear, refer to the template that is distributed with this manual and shown in Figure 1. All blocks are to be inserted on the layer that corresponds with the feature. Point Features are not to be exploded.

1.4.3 TEXT

All text within the CAD file is to be in model space.

1.4.4 DIMENSIONS

All dimensions within the CAD file are to be in model space.

APPENDIX D

PROPERTY SERVICE CONNECTION RECORD

CHESTERMERE

PROPERTY SERVICE CONNECTIONS RECORD

Provide property service connection records in the Property Service Connections Record form or as an Excel spreadsheet, including the following information as per below (excluding Servicing Diagram):

Note: Fill all applicable fields.

PROPERTY SERVICE CONNECTIONS RECORD

HOUSE NO. STREET NAME

SUBDIVISION

PLAN BLOCK LOT

Notes:

SERVICING DIAGRAM (Provide North Arrow)

SCALE DATE

DRAWN CHECKED

WATER		SANITARY SEWER		STORM SEWER	
DATE OF INSTALLATION		DATE OF INSTALLATION		DATE OF INSTALLATION	
SERVICE SIZE		SERVICE SIZE		SERVICE SIZE	
SERVICE TYPE		SERVICE TYPE		SERVICE TYPE	
DIST. FROM PL TO MAIN		DIST. FROM PL TO MAIN		DIST. FROM PL TO MAIN	
DIST. FROM PL		DIST. FROM PL		DIST. FROM PL	
TYPE OF CURB STOP		FITTING AT MAIN		FITTING AT MAIN	

CHESTERMERE

DEPTH AT PL		DEPTH AT PL		DEPTH AT PL	
DIST FROM PL TO CURB STOP		RISER HEIGHT		RISER HEIGHT	
TYPE OF SADDLE		DIST. FROM DOWNSTR. MH TO FITTING ON MAIN		DIST. FROM DOWNSTR. MH TO FITTING ON MAIN	
MAIN SIZE		MAIN SIZE		MAIN SIZE	
MAIN TYPE		MAIN TYPE		MAIN TYPE	
LENGTH OF STUB INSIDE PL		LENGTH OF STUB INSIDE PL		LENGTH OF STUB INSIDE PL	
NORTHING COORDINATE					
EASTING COORDINATE					
ELEVATION					

APPENDIX E

CCC CHECKLIST, SUBMISSION STRUCTURE, & CERTIFICATE

CHESTERMERE

CCC SUBMISSION CHECKLIST

Subdivision and Phase: _____

Developer: _____

Consulting Engineer: _____

Sanitary Sewer:

- ☐ 1 CCC copies with reduced coversheets showing boundary, deficiency markup and comprehensive plan/list
- ☐ Geotechnical results (sieve, compaction, cylinder)
- ☐ CCTV reports
- ☐ Unit Cost Worksheet
- ☐ Hydrostatic test results (force main only)

Water:

- ☐ 1 CCC copies with reduced coversheets showing boundary, deficiency markup and comprehensive plan/list
- ☐ Geotechnical results (sieve, compaction)
- ☐ Hydrostatic test results
- ☐ Hydrant flow test results
- ☐ Hydrant certification letter
- ☐ Lab test results
- ☐ Letter to Fire Chief
- ☐ Unit Cost Worksheet
- ☐ 1 Electronic Copy of all Property Service Connection Reports

Overland Drainage:

- ☐ 1 CCC copies with reduced coversheets showing boundary, deficiency markup and comprehensive plan/list
- ☐ Geotechnical results (sieve, compaction)
- ☐ Unit Cost Worksheet
- ☐ Electronic copies of all weekly erosion and sediment control inspection reports

Storm Sewer:

- ☐ 1 CCC copies with reduced coversheets showing boundary, deficiency markup and comprehensive plan/list
- ☐ Geotechnical results (sieve, compaction, cylinder)
- ☐ CCTV reports
- ☐ Unit Cost Worksheet
- ☐ Hydrostatic test results (force main only)

Service Connections:

- ☐ 1 CCC copies with reduced coversheets showing boundary, deficiency markup and comprehensive plan/list
- ☐ Curb box Record data (N, E) in excel format
- ☐ Geotechnical results (sieve, compaction)
- ☐ Unit Cost Worksheet
- ☐ Property Service Connections record in excel format

Sound Attenuation Fences:

- ☐ 1 CCC copies with reduced coversheets showing boundary, deficiency markup and comprehensive plan/list
- ☐ Unit Cost Worksheet

Paved Roads:

- ☐ 1 CCC copies with reduced coversheets showing boundary, deficiency markup and comprehensive plan/list
- ☐ Geotechnical results (compaction, cores, Marshall)
- ☐ Unit Cost Worksheet

CHESTERMERE

Concrete Curbs, Gutters and Sidewalk:

- ☐ 1 CCC copies with reduced coversheets showing boundary, deficiency markup and comprehensive plan/list
- ☐ Geotechnical results (compaction, cylinder, air voids)
- ☐ Unit Cost Worksheet

Stormwater Management Facilities:

- ☐ 1 CCC copies with reduced coversheets showing boundary, deficiency markup and comprehensive plan/list
- ☐ Geotechnical liner report

Stormwater Irrigation Facilities and Pump Stations:

- ☐ 1 CCC copies with reduced coversheets showing boundary, deficiency markup and comprehensive plan/list
- ☐ Geotechnical results (compaction, sieve)
- ☐ Hydrostatic Test results
- ☐ Operations and Maintenance manuals
- ☐ Inspectors installation reports
- ☐ Electrical Schematic(s)

Financials and DA Requirements

- ☐ Development Agreement Special Clauses Addressed
- ☐ Fees. Levies, and endeavors paid
- ☐ Proof Roll reduced markup

Paved Lanes

- ☐ 1 CCC copies with reduced coversheets showing boundary, deficiency markup and comprehensive plan/list
- ☐ Geotechnical results (compaction, cores, Marshall)
- ☐ Unit Cost Worksheet
- ☐ Proof Roll reduced markup
- ☐ Shallow Utility Plans

Drawings

- ☐ 1 CAD and 1 PDF set of the Issued for Construction Drawings

Pavement Markings and Signage

- ☐ 1 FAC copies with reduced coversheets showing boundary, deficiency markup and comprehensive plan/list

Comments: _____
_____
_____
_____

CCC SUBMISSION FILE STRUCTURE

- Subdivision Name and Phase Number
- 1 - Checklist
- 2 - Inspection Request Form
- 3 - Unit Cost Worksheets
- 4 - Offsite Levy Payment (OSL) Confirmation
- 5 – ESC Reports
- 6 - CCC Submission
    - 6.1 – Underground
        - 6.1.1 - CCC's with Coversheets
        - 6.1.2 - Geotechnical Results
        - 6.1.3 – Sanitary Sewer
            - Hydrostatic Test Results (force main only)
            - Videos
                - Data
                - Pictures
                - Program
                - Reports
                - Video
                - CCTV Declaration Letter
                - Report Summary and Review
            - Deficiency markups and comprehensive plan/list
        - 6.1.4 – Storm Sewer
            - Hydrostatic Test Results (force main only)
            - Videos
                - Data
                - Pictures
                - Program
                - Reports
                - Video
                - CCTV Declaration Letter
                - Report Summary and Review
            - Deficiency markups and comprehensive plan/list
        - 6.1.5 – Water
            - Hydrostatic Test Results
            - Hydrant Flow Test Results
            - Hydrant Certification Letter
            - Lab Test Results

Letter to Fire Chief
Deficiency markups and a comprehensive plan/list
Copy of all Property Service Connection Reports

6.1.6 - Service Connections
Property Service Connections Record Sheets in excel format
Curb box Record data (N, E) in excel format
Deficiency markups and comprehensive plan/list

6.2 - Surface
6.2.1 - CCC's with Coversheets
6.2.2 - Geotechnical Results
6.2.3 - Paved Roads
Proof Roll Reduced Markup
Deficiency markups and comprehensive plan/list
6.2.4 - Paved Lanes
Proof Roll Reduced Markup
Shallow Utility Plans
Deficiency markups and comprehensive plan/list
6.2.5 - Concrete Curbs, Gutters and Sidewalks
Deficiency markups and a comprehensive plan/list
6.2.6 - Overland Drainage
Deficiency markups and comprehensive plan/list
6.3 - Sound Attenuation Fence
6.3.1 - CCC's with Coversheets
6.3.2 - Deficiency markups and comprehensive plan/list
6.4 - Pavement Markings and Signage
6.4.1 - CCC's with Coversheets
6.4.2 - Deficiency markups and a comprehensive plan/list
6.5 - Stormwater Management Facilities
6.5.1 - CCC's with Coversheets
6.5.2 - Geotechnical Liner Report
6.5.3 - Deficiency markups and a comprehensive plan/list
6.6 - Stormwater Irrigation Facilities and Pump Stations
6.6.1 - CCC's with Coversheets
6.6.2 - Hydrostatic Test Results
6.6.3 - Operations and Maintenance Manuals
6.6.4 - Inspector Installation Reports
6.6.5 - Electrical Schematics
6.6.6 - Deficiency markups and a comprehensive plan/list

CHESTERMERE

CONSTRUCTION COMPLETION CERTIFICATE

Subdivision:		**Phase:**	
Developer:		**Date:**	
Contractor:		**Improvement:**	
Consulting Engineer:		**Boundary of Area:**	See Attached Map

CONSULTING ENGINEER'S CERTIFICATE

I, _____, Professional Engineer of the firm of _____ , Consulting Engineers, who are engaged by the Developer to design and inspect the construction and installation of roadways, utilities and other improvements, do hereby certify that the utilities and improvements within the area shown on the attached plan have been constructed, installed and inspected in conformance with the Municipality's specifications and approved designs, or as otherwise required by the Municipality, and that all defects and deficiencies in work and materials have been reported to the Developer and the Municipality and have been remedied by the Developer, and that the roadway, utility or other improvement noted herein meets all the requirements for acceptance. I confirm that I have been empowered by the Developer to honour, comply with and perform all of the Consulting Engineer's obligations and to provide all of the Field Services as specified in the current *Consulting Engineer's Field Services Guidelines,* as issued by the Urban Development Institute/City of Calgary

_____
Consulting Engineer's Inspector

Consulting Engineer's Stamp,
Signature and Permit to Practice

Acknowledgement of Receipt of Consulting Engineer's Certificate:

_____ _____
Municipal Representative Date

_____ _____
City of Chestermere Date

Rejection of Consulting Engineer's Certificate:

_____ _____
Municipal Representative Date

_____
Cause of Rejection

I hereby certify that the items listed as reason for rejection have now been corrected.

_____
Consulting Engineer's Inspector

Acknowledgement of Receipt of Consulting Engineer's Certificate:

_____ _____
Municipal Representative Date

Projected earliest maintenance expiry date:	

APPENDIX F

FAC CHECKLIST, SUBMISSION STRUCTURE, & CERTIFICATE

CHESTERMERE

FAC SUBMISSION CHECKLIST

Subdivision and Phase: _____

Developer: _____

Consulting Engineer: _____

Sanitary Sewer:

- ☐ 1 FAC copy with reduced coversheets showing boundary, deficiency markup and comprehensive plan/list
- ☐ CCTV and Mandrel reports
- ☐ Record drawings (CAD, PDF, full size hard copies)
- ☐ Oversize calculations (if applicable)

Water:

- ☐ 1 FAC copy with reduced coversheets showing boundary, deficiency markup and comprehensive plan/list
- ☐ Record drawings (CAD, PDF, full size hard copies)
- ☐ Oversize calculations (if applicable)

Overland Drainage:

- ☐ 1 FAC copy with reduced coversheets showing boundary, deficiency markup and comprehensive plan/list
- ☐ Record drawings (CAD, PDF, full size hard copies)
- ☐ Electronic copies of all weekly erosion and sediment control inspection reports

Concrete Curbs, Gutters and Sidewalk:

- ☐ 1 FAC copy with reduced coversheets showing boundary, deficiency markup and comprehensive plan/list
- ☐ Geotechnical results (compaction, cylinder, air voids)
- ☐ Weekly ESC reports
- ☐ Unit Cost Worksheet
- ☐ Record drawings (CAD, PDF, full size hard copies)

Storm Sewer:

- ☐ 1 FAC copy with reduced coversheets showing boundary, deficiency markup and comprehensive plan/list
- ☐ CCTV and Mandrel reports
- ☐ Record drawings (CAD, PDF, full size hard copies)
- ☐ Oversize calculations (if applicable)

Service Connections:

- ☐ 1 FAC copy with reduced coversheets showing boundary, deficiency markup and comprehensive plan/list

Sound Attenuation Fences:

- ☐ 1 FAC copies with reduced coversheets showing boundary, deficiency markup and comprehensive plan/list

Paved Roads:

- ☐ 1 FAC copy with reduced coversheets showing boundary, deficiency markup and comprehensive plan/list
- ☐ Geotechnical results (compaction, cores, Marshall)
- ☐ Unit Cost Worksheet
- ☐ Weekly ESC reports
- ☐ Record drawings (CAD, PDF, full size hard copies)

Paved Lanes

- ☐ 1 FAC copy with reduced coversheets showing boundary, deficiency markup and comprehensive plan/list

CHESTERMERE

Stormwater Management Facilities:

- ☐ 1 FAC copy with reduced coversheets showing boundary, deficiency markup and comprehensive plan/list
- ☐ Record drawings (CAD, PDF, full size hard copies)
- ☐ Pond record drawings with volume calculations

Stormwater Irrigation Facilities and Pump Stations:

- ☐ 1 FAC copy with reduced coversheets showing boundary, deficiency markup and comprehensive plan/list
- ☐ Record drawings (CAD, PDF, full size hard copies)
- ☐ Water quality performance Data for irrigation

Financials and DA Requirements

- ☐ Development Agreement Special Clauses Addressed
- ☐ Fees. Levies, and endeavors paid
- ☐ Geotechnical results (compaction, cores, Marshall)
- ☐ Record drawings (CAD, PDF, full size hard copies)

Pavement Markings and Signage

- ☐ 1 FAC copy with reduced coversheets showing boundary, deficiency markup and comprehensive plan/list
- ☐ Record drawings (CAD, PDF, full size hard copies)

Comments: _____

_____

CHESTERMERE

FAC SUBMISSION FILE STRUCTURE

- Subdivision Name and Phase Number
  - 1 – Checklist
  - 2 - Inspection Request Form
  - 3 - Unit Cost Worksheets
  - 4 - Offsite Levy (OSL) Payment Confirmation
  - 5 – ESC Reports
  - 6 - Record Drawings (CAD, PDF)
  - 7 - FAC Submission
    - 7.1 Underground
      - 7.1.1 FAC's with Coversheets
      - 7.1.2 Record Drawings (CAD, PDF)
      - 7.1.3 Sanitary
        - Videos
          - Data
          - Pictures
          - Program
          - Reports
          - Video
          - CCTV Declaration Letter
          - Report Summary and Review
        - Oversized Calculations (if applicable)
        - Deficiency markups and a comprehensive plan/list
      - 7.1.4 Storm Sewer
        - Videos
          - Data
          - Pictures
          - Program
          - Reports
          - Video
          - CCTV Declaration Letter
          - Report Summary and Review
        - Oversized Calculations (if applicable)
        - Deficiency markups and a comprehensive plan/list
      - 7.1.5 Water
        - Oversized Calculations (if applicable)
        - Deficiency markups and a comprehensive plan/list
      - 7.1.6 - Service Connections
        - Deficiency markups and comprehensive plan/list

CHESTERMERE

FINAL ACCEPTANCE CERTIFICATE

Subdivision:		**Phase:**	
Developer:		**Date:**	
Contractor:		**Improvement:**	
Consulting Engineer:		**Boundary of Area:**	See Attached Map

CONSULTING ENGINEER'S CERTIFICATE

I, _____, Professional Engineer of the firm of _____ , Consulting Engineers, who are engaged by the Developer to design and inspect the construction and installation of roadways, utilities and other improvements, do hereby certify that as of the expiry date listed below, the said improvements meet all the requirements for acceptance as specified in the Development Agreement and Engineering Design and Construction Guidelines and hereby recommend the infrastructure for final acceptance by the City of Chestermere. All defects and deficiencies in work and materials have been reported to the Developer and the Municipality and have been remedied by the Developer, and the said improvements meet all the requirements for final acceptance. I confirm that I have been empowered by the Developer to honour, comply with and perform all of the Consulting Engineer's obligations and to provide all of the Field Services as specified in the current Consulting Engineer's Field Services Guidelines, as issued by the Urban Development Institute/City of Calgary.

_____
Consulting Engineer's Inspector

Consulting Engineer's Stamp,
Signature and Permit to Practice

Acknowledgement of Receipt of Consulting Engineer's Certificate:

_____ _____
Municipal Representative Date

_____ _____
City of Chestermere Date

Rejection of Consulting Engineer's Certificate:

_____ _____
Municipal Representative Date

_____
Cause of Rejection

I hereby certify that the items listed as reason for rejection have now been corrected.

_____
Consulting Engineer's Inspector

Acknowledgement of Receipt of Consulting Engineer's Certificate:

_____ _____
Municipal Representative Date

Maintenance expiry date:	

APPENDIX G

INSPECTION REQUEST FORM

CHESTERMERE

INSPECTION REQUEST FORM

Subdivision (including phase): _____

Engineering Consultant: _____

Date: _____

INSPECTION TYPE

- ☐ Thrust Block
- ☐ Concrete Collars
- ☐ Subgrade Proof Roll
- ☐ CCC
- ☐ FAC

INSPECTIONS REQUESTED

- ☐ Sewers
- ☐ Storm Sewer
- ☐ Water
- ☐ Service Connections
- ☐ Concrete Curbs. Gutters, and Sidewalks
- ☐ Paved Roads
- ☐ Pavement Markings and Signage
- ☐ Stormwater Retention Facility
- ☐ Stormwater Irrigation Facility
- ☐ Overland Drainage
- ☐ Sound Attenuation Fencing
- ☐ Other _____

CONSULTING ENGINEER CERTIFICATION

I hereby confirm that the utility has been inspected and found to be acceptable for certification, according to the City of Chestermere's *Engineering Design and Construction Standards.*

CHESTERMERE

For CCC Inspection Requests: I confirm that 100% of all critical assets* and 90% of all other assets* are visible and accessible for inspection. I confirm that a pre-inspection has been conducted between the developer consultant and the contractor. All deficiencies have been noted and identified.

_____

Consulting Engineer

Refer to the current edition of the City of Chestermere Development Services Department Fee Schedule for information on cost of inspections.

Critical assets include all infrastructure that is normally visible from the surface and critical to the day-to-day operation of the water, sewer, or sanitary systems (e.g., all catch basins, storm outfalls, and culverts; all valves, hydrants, and flushing assemblies; all sanitary and storm manholes; all sanitary inspection chambers and water services). Other assets include any other improvements that are normally visible from the surface (e.g., paved roads, paved lanes, pathways, sidewalks, curb and gutter, etc.).

APPENDIX H

STREETNAME SIGN STANDARDS

STREETNAME SIGNS FOR COLLECTORS / ARTERIALS / RESIDENTIAL WITH POSTED SPEED OF 60 KM/H OR LOWER

Substrate: Extruded Aluminum

Reflective Rating: ASTM Type IV / Diamond Grade

Sheeting Colour: **Pantone Blue 302C**

Print & Cut Options:

Font Style	Clearview 2W Text
Font Color	White
City Logo Color	Pantone Blue 646C
City Logo Height	1 – Line Sign: 200mm
	2 – Line Sign: 150mm

Sign & Font Design Details:

	1-Line Streetname Sign	**2-Line Streetname Sign**
Lettering (Font) Height:	200mm or 7.9 in (can use 8 in)	150mm or 5.9 in (can use 6 in)
Streetname Sign Height:	300mm or 11.8 in (can use 12 in)	500mm or 19.7 in (can use 20 in)
Streetname Spelling:	Abbreviated Spelling (e.g. ST, AVE)	
Use of Arrow:	No	Yes for 2-Line Signs Yes for T-Intersection
Use of Direction (e.g. N, S):	No	No

APPENDIX I

MASTER FACILITY CROSSING AGREEMENT

MASTER FACILITY CROSSING AGREEMENT

Please see the Master Facility Crossing Agreement on the City of Chestermere's website at www.chestermere.ca.

APPENDIX J

ULA (SHALLOW) APPLICATION REQUIREMENT CHECKLIST

ULA (SHALLOW) APPLICATION REQUIREMENTS

PRIMARY APPLICATION CONTACT:

Name: _____

Phone number: _____

Email Address: _____

For existing property, please provide the following:

Address: _____

Lot: _____ Block: _____

Please submit your application to *engineeringinfo@chestermere.ca*

Refer to the link for the updated *Engineering Design and Construction Standards*

PLEASE CHECK ALL THAT APPLY:

ROGERS: Project Number _____ Subdivision: _____
Phase: _____
Initial Submission Date: _____ Re-submission Date: _____

TELUS: Project Number _____ Subdivision: _____ Phase: _____
Initial Submission Date: _____ Re-submission Date: _____

ATCO: Project Number _____ Subdivision: _____ Phase: _____
Initial Submission Date: _____ Re-submission Date: _____

FORTIS: Project Number _____ Subdivision: _____ Phase: _____
Initial Submission Date: _____ Re-submission Date: _____
(UEDS Form is not required when the lighting will be contained within a privately-owned site)

BELL: Project Number _____ Subdivision: _____ Phase: _____
Initial Submission Date: _____ Re-submission Date: _____
(Please See Additional Requirements Below)

CLARIFY/CONFIRM THE FOLLOWING:

- The proposed schedule of construction. _____
- The remediation plan of restoration for the existing ROW/road structures.
  _____
  _____
- If traffic will be affected during construction, please provide a Traffic Accommodation Strategy (TAS) for review.
  _____
  _____
- Have all shallow utilities been identified and will proper locates be in place prior to excavation?
  Yes No
- Have all deep utilities been identified and will proper locates be in place prior to excavation?
  Yes No
- Confirm that the appropriate horizontal and vertical clearances are maintained.
  Yes No
- Confirm the proposed method of construction.
  _____
  _____
- Please provide locations of all entry and exit pits.
  _____
  _____
- For existing property, please confirm that all adjacent stakeholders will be notified about the proposed work.
  _____
- Please contact the City of Chestermere at 403-207-7075 seven (7) days before construction commences.
- Additional Comments:
  _____
  _____

ADDITIONAL REQUIREMENTS FOR BELL CANADA APPLICATIONS:

- Confirm that all existing utilities are to be located and identified;

    1. Water mains, valves and service connections.
       Yes No

    2. Sanitary inspection chambers and service connections.
       Yes No

    3. Sanitary and Storm sewer lines, manholes, and catch basins
       Yes No

    4. Other shallow utilities to avoid service disruption to local residents.
       Yes No

    5. Any other residents are to be notified of scope of work and duration prior to construction.
       Yes No

- Bell Canada will be responsible for their safety and the safety of the public, and will have an emergency response plan in place prior to starting the work.
- Bell Canada will be responsible for damages to the City and public infrastructure, and will be responsible for all the associated repairs, replacement costs, incidental costs, and fees.
- Bell Canada is to notify EPCOR about the proposed work and ensure all their requirements are met during the project.

Signature of Developer's Consulting Engineer:

Date:

APPENDIX K

TRAFFIC SIGNALS GUIDELINES

December 22, 2023

Traffic Signal Guidelines

CITY OF CHESTERMERE –

CHESTERMERE

December 22, 2023

RE: Traffic Signal Guidelines

Introduction

This document provides an overview of the suggested Traffic Signal Guidelines for the City of Chestermere including Synchro parameters and traffic signal infrastructure. These guidelines are consistent with the surrounding guidelines provided by the City of Calgary, Rocky View County, and the City of Red Deer.

In addition, the following are recommended when conducting a traffic modelling and analysis exercises for the City:

1. When completed by external consultants, a report / memo summarizing the analysis including development description, assumptions used in the analysis, traffic volumes, micro-simulation results, etc. is to be provided and must be stamped & signed by a Professional Engineer.
    - Summaries in the report should include volume to capacity (V/C) ratios, Level of Service (LOS) values and queue lengths.
    - An electronic copy of the Synchro files and a PDF or hard copy of the Synchro printouts is to be included with the report.
2. Depending on the context, location of the project and at the discretion of City staff, pedestrian/bicyclist volumes are to be assigned to each of the approach of the intersection.

Table 1: Pedestrian/Bicyclist Volumes

Synchro Parameters	
Very low impact locations	10 pedestrians/hour
	5 bikes/hour
Low impact locations	25 pedestrians/hour
	10 bikes/hour
Moderate impact locations	50 pedestrians/hour
	20 bikes/hour

3. Existing traffic volumes must of current volumes (not older than three years). If the current traffic volumes are not available, then independent traffic count should be undertaken.
4. Demand volume imbalances greater than 10% should be identified.
5. For developments that are predominantly urban in nature, the accepted performance thresholds are a maximum V/C ratio of 1.0 with a LOS of E or better. For developments that are predominantly rural in nature, the accepted performance thresholds are a maximum V/C ratio of 0.90 with a LOS of D or better.

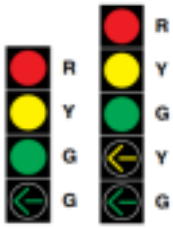
Table 2: Recommended Synchro Input Parameters

Synchro Parameters	
Ideal Saturated Flow Rate	1,850
Leading Detector	8 m for left 4 m for through
Trailing Detector	2 m
Peak Hour Factor	0.94 AM 0.95 PM
Heavy Vehicles	Enter existing if known. Otherwise: - 5% main street - 2% minor street - 10% industrial areas
Minimum Initial Main Street	20 seconds or pedestrian time (sum of walk and pedestrian clearance), whichever is greater
Minimum Initial Side Street	10 seconds or pedestrian time, whichever is greater
Minimum Initial Arrows	7 seconds
Recall	Pedestrian / minimum recall should be placed on main street unless signal operates in a fixed time (pre-timed) mode. Recall should not be placed on minor streets or turns.
Pedestrian Walk Time	Minimum 8 seconds
Pedestrian Clearance Time	Based on the actual crossing distance and a walking speed of 1.0 m/s (0.8 m/s in areas with high senior citizens).
Yellow Time	Through movements – calculated in accordance with the Manual of Uniform Traffic Control Devices for Canada (MUTCDC) • Recommended minimum – 3.0 seconds • Recommended maximum – 5.0 seconds Fully protected Left-Turns – 3.0 seconds Protected/Permissive Left Turns – 3.0 seconds T-intersection – 3.0 seconds
All-Red Time	Through movements – calculated in accordance with the Manual of Uniform Traffic Control Devices for Canada (MUTCDC) • Recommended minimum – 2.0 seconds Fully protected Left-Turns – 2.0 seconds Protected/Permissive Left Turns – 1.0 second T-intersection – 2.0 seconds For mixed traffic phases with high proportion of bicycles, the vehicular all-red interval may be increased by up to 1.0 seconds to accommodate bicycle traffic.

General Comments:

- Dual left-turn lanes are typically modelled using a fully-protected phase. If one movement has dual left-turn lanes but the opposite movement has a single lane, then the opposing left-turn should either be modelled as fully-protected or permissive (but not a protected-permissive phase).
- For left-turns across 3 or more lanes of traffic, the turn must be a protected phase.

Table 3: Recommended Signal Infrastructure Standards

Signal Infrastructure Standards		
Traffic Signal Head Position		Primary Signal Head (Type B): - Horizontally aligned overhead on far side of intersection and centered over the receiving lane(s). Where there are two signal heads for one direction, one should be centered over the curb lane and the other over the remaining receiving lane(s).
		Secondary Signal Head (Type D): - Vertically aligned on the median or far left side of all intersection approaches that do not display left turn phasing. - Vertically aligned to far right of all intersection approaches that do not display right turn phasing.
C –		Left Turn Signal Head (Types C, F, H, L): - Horizontally aligned overhead on the far side of the intersection and is located closest to the intended left turn lane.
F –		
H –		
L –		
E (left) – **G (right) –**		Left Turn Signal Head (Type E, G, J, M): - Vertically aligned on the median and located closest to the intended left turn lane.
J (left) – **M (right) –**		
		Right Turn Signal Head (Type N): - Vertically aligned on far right of intersection and located closest to intended right turn lane.

Signal Infrastructure Standards		
Traffic Signal Locations		Traffic signal heads shall be placed on the far side of an intersection and located: - Within the range of 15 – 45 m from the nearest stop line; and - Within 20° from either side of a line originating at the near side stop line and centered on the approaching lanes excluding any parking lane(s). Traffic signal structures shall be placed at a distance of 2 m or close to 2 m from face of curb with a minimum clearance of 0.6 m from signal structure to the face of curb. Signal structures shall not be placed on islands with areas less than 6 sq. m and shall be placed in the corner of the island, closest to the centre of the intersection. Signal posts shall not be placed on medians with a width less than 1.2 m (minimum 1.5m wide medians are preferred) and shall be placed 3 m back from the bull-nose.
Pedestrian Control		Pedestrian signal heads shall be installed at each leg of the intersection where pedestrians are permitted to cross and "pedestrian prohibited" signs shall be placed where pedestrian crossing is prohibited. Pedestrian pushbuttons shall be installed only where actuation is required. The pushbuttons shall be located 1.25 m above the sidewalk and are to be mounted parallel to the direction of pedestrian traffic, on the sidewalk side of the signal structure. Audible pedestrian signals, if used, shall be installed in accordance with the Operational Details outlined in the Manual of Uniform Traffic Control Devices for Canada.

Note: Standard signal heads shall be used for different intersection configurations as outlined in the following table:

Median ≥ 1.5m?		No	Yes
Left Turn Phasing	No Left Turn Phase	D, B, D	D, B, D
	Protected-Permissive	D, B, F	D, B, G
	Protected-Permissive	D, B, L	D, B, M
	Protected-Prohibited	D, B, H	D, B, J
	Separate Protected	D, B, C	D, B, E

SPECIFICATION FOR IR & GPS/RF OPTICOM SYSTEM – INTERSECTION:

1. 722 detectors mounted at end of 2 cantilevers for E/W & N/S detection.
2. 711 detector mounted to cantilever for single approach, in case of a T-intersection
3. 138 IR cable from traffic cabinet to each 700 series detector
4. 3100 GPS/RF radio transceiver mounted on closest pole to traffic cabinet.
5. 1070 GPS/RF cable from traffic cabinet to 3100 transceiver.
6. 764 Multimode phase selector card installed in Pre-emption card rack.
7. 768 Auxiliary Interface panel or other interface panel wired into Pre-emption card rack to enable communication with 764 card.

APPENDIX L

HYDROSTATIC TESTING REQUEST FORM

HYDROSTATIC TESTING REQUEST FORM

Date: _____

Subdivision (including phase): _____

Developer: _____

Engineering Consultant: _____

Contractor: _____

PROVIDE THE FOLLOWING:

- ☐ Testing locations: _____

_____

- ☐ Gauge placements: _____

_____

- ☐ Injection point(s): _____

_____

- ☐ Pressure at the lowest elevation in the system: _____

_____

- ☐ Lengths and joint counts for leakage allowance calculations: _____

_____

- ☐ Confirmation of expected volumes: _____

_____

- ☐ Discharge Locations: _____

_____

- ☐ Commissioning process as Per City of Calgary Specifications:

_____

****** NOTE: PLEASE ATTACH THE DETAILED MARKUPS AND NOTES TO THE APPROVED PLAN DRAWING ALONG WITH THIS FORM.***

CONSULTING ENGINEER CERTIFICATION

I hereby confirm that the utility has been inspected and found to be acceptable for certification, according to the City of Chestermere's *Engineering Design and Construction Standards.*

For Hydrostatic Testing Inspection Requests: I confirm that 100% of all critical assets* and 90% of all other assets* are visible and accessible for inspection. I confirm that a pre-inspection has been conducted between the developer consultant and the contractor. All deficiencies have been noted and identified.

_____

Consulting Engineer

Refer to the current edition of the City of Chestermere Development Services Department Fee Schedule for information on cost of inspections.

Critical assets include all infrastructure that is normally visible from the surface and critical to the day-to-day operation of the water, sewer, or sanitary systems (e.g., all catch basins, storm outfalls, and culverts; all valves, hydrants, and flushing assemblies; all sanitary and storm manholes; all sanitary inspection chambers and water services). Other assets include any other improvements that are normally visible from the surface (e.g., paved roads, paved lanes, pathways, sidewalks, curb and gutter, etc.).