



# **Design Guidelines for Development Site Servicing Plans**



**Foreword:**

The “Design Guidelines for Development Site Servicing Plans” is intended to provide information to architects, engineers, contractors and developers who require knowledge of the design requirements for Development Site Servicing Plans (DSSPs).

It is important to recognize that DSSP approval does not constitute development approval. Clearance by the City of Calgary reviewers is only one requirement within the overall Development Permit (DP) and as such the approval of the DSSP must **not** be construed as a clearance to commence work on a project. Final Approval and Building Permit (BP) issuance will be given by Development & Building Approvals (DBA).

The manual does not attempt to set rigid solutions to particular design problems but rather provides a guide to the City of Calgary’s design requirements by indicating the business unit standards which will apply. Where questionable or complicated design situations arise, engineering judgement should prevail and it is the responsibility of the applicant to confirm the applicability of any or all the business unit conditions with the appropriate City staff. The manual should be used in conjunction with the various Engineering and City of Calgary Standards and Specifications for roads, water, sanitary, and storm infrastructure construction.

The manual incorporates metric standards. When designing in metric the following point must be remembered:

- All elevations in metric are **GEODETIC DATUM**. When an elevation is converted from imperial datum to metric datum **35.56 feet** must be added to the imperial elevation (City Datum) prior to multiplying by 0.3048 to convert to the metric elevation (Geodetic Datum).

Where reference is made to City By-laws, policies, standards, specifications, etc. the most current version, during the development process, is to be used.

It is our hope that this manual will become a useful tool for the construction industry.



**Preface:**

Reference is made to various divisions of the Utilities & Environmental Protection and Development & Building Approvals departments throughout the “Design Guidelines for Development Site Servicing Plans”. To familiarize the developer with the various Divisions, a list of these departments with typical contacts is provided below.

**Utilities & Environmental Protection****Estimators****Roads****Environmental & Safety Management****Waste & Recycling Services*****Infrastructure & Asset Management***

Team Leader

(403) 268-8491

**Water Services**

Inspections

(403) 268-5006

**Water Resources**

Reception

(403) 268-5721

Cross Connection Control

(403) 268-2706

***Development Approvals***

Team Leader

(403) 268-4636

**Development & Building Approvals****Planning****Building Regulations**

Plumbing &amp; Gas

(403) 268-2138

**Urban Development**

Development Site Servicing

[DevelopmentServicing2@calgary.ca](mailto:DevelopmentServicing2@calgary.ca)**Community Services & Protective Services****Fire Prevention Bureau**

Technical Services Officer

(403) 863-6876



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# 1 General

The Building Permit approval system within the City of Calgary requires a review of a DSSP for all proposed developments where the existing water service, metering, or on-site sewers will be changed. It is also required in situations where the proposed development will increase the stormwater release from site or where there are significant changes to the site grading. These changes must be reviewed by the Utility and Environment Protection Department. The prime reason is to ensure that any new or altered utility service systems are designed and installed to meet the requirements of all applicable codes and design standards. As the locations and elevations of both the buildings and utilities are critical to the success and function of the project, it is imperative that approval from Water Resources be obtained prior to the release of any permits.

Water Resources, Development Approvals Department provides quality assurance for the design of the Water, Sanitary and Storm systems, ensuring developments of all kinds meet or exceed the City's design requirements. This process involves working with Urban Development to review DP applications and Development Site Servicing Plan (DSSP) Circulations. Development Approvals also reviews stormwater management reports that support these developments to ensure that the design of the overland flow system will meet current standards.

For links to various bylaws, standards, and guidelines see Appendix 'C'. Please note that the most up-to-date regulations shall prevail.

Please note that approval of the project's Development Site Servicing Plan is only one element of the Building Permit approval process. This approval must not be construed as a clearance to commence work on a project. The final approval and Building Permit is issued by the Development & Building Approvals Department.

## 1.1 DSSP Requirements

DSSP are to be submitted to the City of Calgary, Development Servicing Section. Prior to submission of the DSSP the Developer must have an approved Development Permit (DP). Some DP's will also request a stamped Fire Prevention plan and/or an approved Storm Water Management Report prior to DSSP submission.

A high level of quality assurance by the consultant is important to the plan circulation process to ensure submission acceptance and help minimize review times.

The Development Servicing Section will review all legal information and service connection inverts within the public r/w. The plans are then circulated to specialists in Water Resources for their review and comment on the plans, approving or rejecting the application. The specialist may at their discretion, request any additional information to be supplied which may be necessary to check the proposed work. The amount of information required will depend on the complexity of the project and the area topography. All plans should be legible and drawn to a suitable scale to qualify for circulation.

The Development Servicing Technician is not responsible for grades or inverts for connections being made in subdivisions which are not under City control (subdivisions for which Final

Acceptance Certificates have not been issued). This information must be obtained from the consultant responsible for the subdivision design.

Grade slips will be issued from the Development Servicing section shortly after plans have completed the Engineering Circulation and have been stamped "Approved". In no case shall City Surveyors set grades for a project until approval has been granted and the Grade Fee has been paid (where applicable).

All DSSP's must comply with these guidelines and also any other relevant City of Calgary Bylaws, Guidelines, and Specifications, as well as any relevant Provincial safety regulations.

## 1.2 DSSP Complete Application Requirement List (CARL)

The DSSP CARL outlines all of the information necessary to evaluate and provide a timely decision on your application.

Only applications that are complete will be accepted. Applications and materials submitted must be clear, legible and precise. Plans submitted should be to a professional drafting standard. We are currently unable to accept digital applications.

The following summary of the CARL list outlines all of the information necessary to evaluate and provide a timely decision on your application.

Required Items:

- A Development Permit
- An approved stamped site plan by the Fire Prevention Bureau (When required by Development Permit Conditions of Approval)
- An approved Storm Water Management Report (If a report is required, provide the name of the report and a copy of the approval letter)
- Fee (See Utility Site Servicing Bylaw for review fees and inspection fees and procedures)
- Three (3) copies of Site Plans with a title block showing:
  - plans to metric scale, minimum 1:100, all elevations shall be given in metres (Geodetic)
  - north arrow, pointing to top or left of page
  - size of parcel (ha)
  - label all elements of plan as existing or proposed
  - municipal address (i.e.: street address) and legal description (i.e.: plan/block/lot)
  - uses, project name, applicant name and contact information
  - name of consultant and an original signed professional engineer's stamp and legible permit to practice number
  - they are clear of any previous approval stamps and/or notations
  - relevant DP number and any previous DSSP numbers for the site

All plans must be sorted into sets and be;

- Rolled, not folded
- Stapled together, NOT bound by tape

- On the same sized paper
- Clear and legible
- No larger than the maximum drawing size of 0.600m x 0.900m

Ensure the information required for the following is provided on all plans:

- Dimensioned property lines:
  - Indicate elevations at back of sidewalk – at property line corners and VPIs
  - Indicate lane grade design elevations – at property line corners and VPIs
- Adjacent to parcel:
  - city streets, label street names
  - sidewalks, City and public paths (Regional Pathway System)
  - curb cuts, medians and breaks in medians
  - road widening setbacks and corner cuts, dimensioned and labelled
- Easements, Utility Rights-of-Way, etc:
  - dimension (width and location)
  - label type of easement and registration number

Show all utilities on and adjoining the parcel (deep, shallow and overhead):

- Water, storm and sanitary sewer
  - locations and full dimensions for mains, services, manholes, catch basins, hydrants and valves to property lines, buildings, and other utilities
  - show pipe size, type, class, material, length, slope, and bedding material
  - pipe inverts and rim elevations at all manholes and catch basins
  - proposed sanitary/storm inverts at property lines and buildings
  - horizontal and vertical clearances at all utility crossings
  - locations of sanitary test manholes with details of easement if located on private property, if applicable
  - pipe capacity for large developments
- Gas
- Electrical (poles, fixtures, guy wires/pole anchors, transformer boxes, etc.)
- Cable, telephone

Location of all:

- Retaining walls and fences
- Landscaping, berms, swales, slopes and other physical features which could affect utility servicing both on the site and adjoining boulevards

If trees are existing on public lands adjacent to the site:

- Specify species and diameter of each tree
- Location of the centre point of the trunk of each tree
- Is tree is to be retained or removed? (At owner's expense)

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Water servicing:

- Location of on-site water meter (indicated by M)
- Total residential unit count
- Complete water meter details including all internal pipes at the meter, pressure reducing valves, backflow prevention devices, valves, and anchor details for master control valve (if applicable)
- Irrigation meter details
- Pipe support details

Surface Drainage:

- Plot existing and proposed surface grades along property lines and on site
- Drainage pattern indicated by boundary lines and arrows
- Storm drainage calculations including discharge to minor systems, ponding, and catchment boundaries
- Location and elevation of emergency escape routes
- ICD and HYDROVEX details (include all HYDROVEX details with application)
- Stormwater features such as storm ponds, trap lows, ICDs, oil/grit separators, BMPs, or Low Impact Development Practices

Floodway, Flood Fringe and Overflow:

- Show Floodway/Flood Fringe/Overland Flow Zone lines on the plans complete with all step elevations and labels
- Dimension distance to buildings and structures

Outline and dimension buildings:

- Detached buildings and structures (sheds, garages, etc.)
- Main floor elevations
- Principal entrance to building

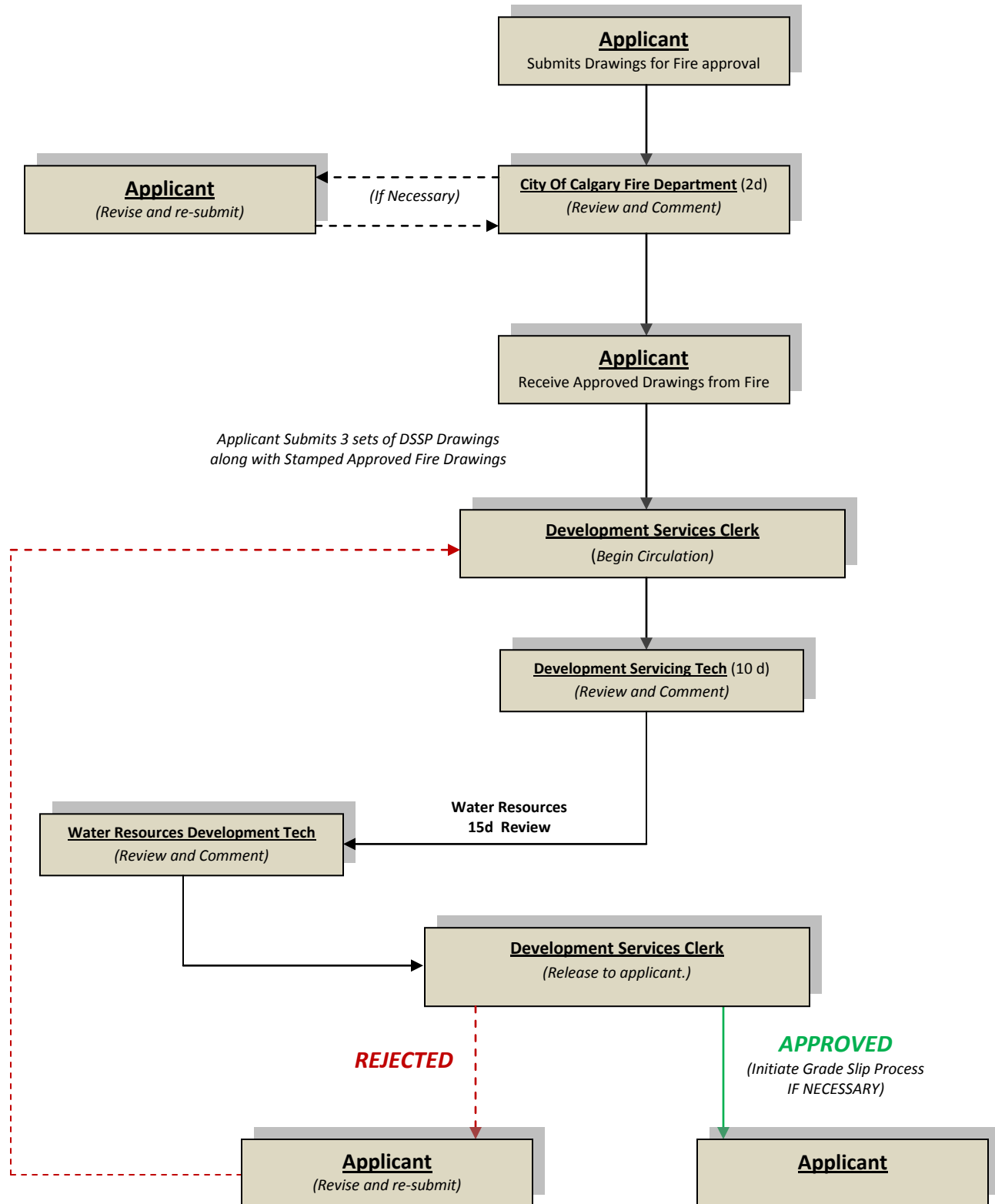
Driveways & parking areas:

- Label surface material
- Label curb cuts to be removed and rehabilitated
- Major grade changes and ramps

On the DSSP CARL that you submit with your applications, please identify and provide justification for items that do not comply with Council approved policies, bylaw standards, or technical guidelines. Attach a separate sheet, if necessary to explain.

See Appendix 'A' of these guidelines for a complete DSSP CARL list that can be printed and used for DSSP submissions.

### 1.3 DSSP Mechanical Drawings – Circulation Chart



### 1.4 Circulation Block

As of January 1, 2013 every submission will require the Circulation Block to be included on the front sheet of all DSSP submissions. The City has designed the layout and produced a block, which available on the Urban Development website for download.

<b>CITY OF CALGARY</b> DEVELOPMENT SITE SERVICING PLAN			
Date Received _____			
CIRCULATION TO:		INITIAL	DATE
DEVELOPMENT SERVICING			
WATER RESOURCES			
<p>IT IS THE RESPONSIBILITY OF THE CONSULTANT TO LOCATE AND IDENTIFY ANY CONFLICTS INTERFERING WITH SERVICE CONNECTIONS. THE CITY OF CALGARY IS NOT RESPONSIBLE FOR DELAYS OR COSTS INCURRED AS A RESULT OF ANY UNIDENTIFIED OBSTRUCTIONS.</p> <p>ALL INFORMATION MARKED ON THE SITE SERVICING PLANS MUST BE INCLUDED ON ANY RESUBMISSIONS OR THE PLANS WILL BE REJECTED</p> <p>IT IS THE OWNER'S RESPONSIBILITY TO CHECK PERIMETER GRADES TO INSURE COMPATIBILITY OF ADJACENT PROPERTIES</p>			

## 1.5 Small Format Review

After acceptance of a DSSP and during deep service installation a stop in construction may occur due to field conditions generating a change in the design. In such a circumstance submission of a Small Format Review may be considered. This process allows construction to continue on the site simultaneous to the review of the proposed design change.

The Small Format Review must be initiated by the applicant if both of the following conditions have been met:

- a) Inspection fees for the parcel have been paid for
- b) An initial inspection appointment has been booked through a development servicing technician.

In either case, the change in design must then be pre-discussed with the Water Resources file manager. Only at this stage will the small format submission be allowed.

A Small Format Review must meet ALL of the criteria stated below:

- Be scaled and readable on 8 ½ x 11" sized paper
- Show previously approved design as well as proposed changes
- Able to be scaled
- Be stamped by a Professional Engineer
- Show the Municipal Address
- Show the legal information including the section number
- Show the DSSP circulation number

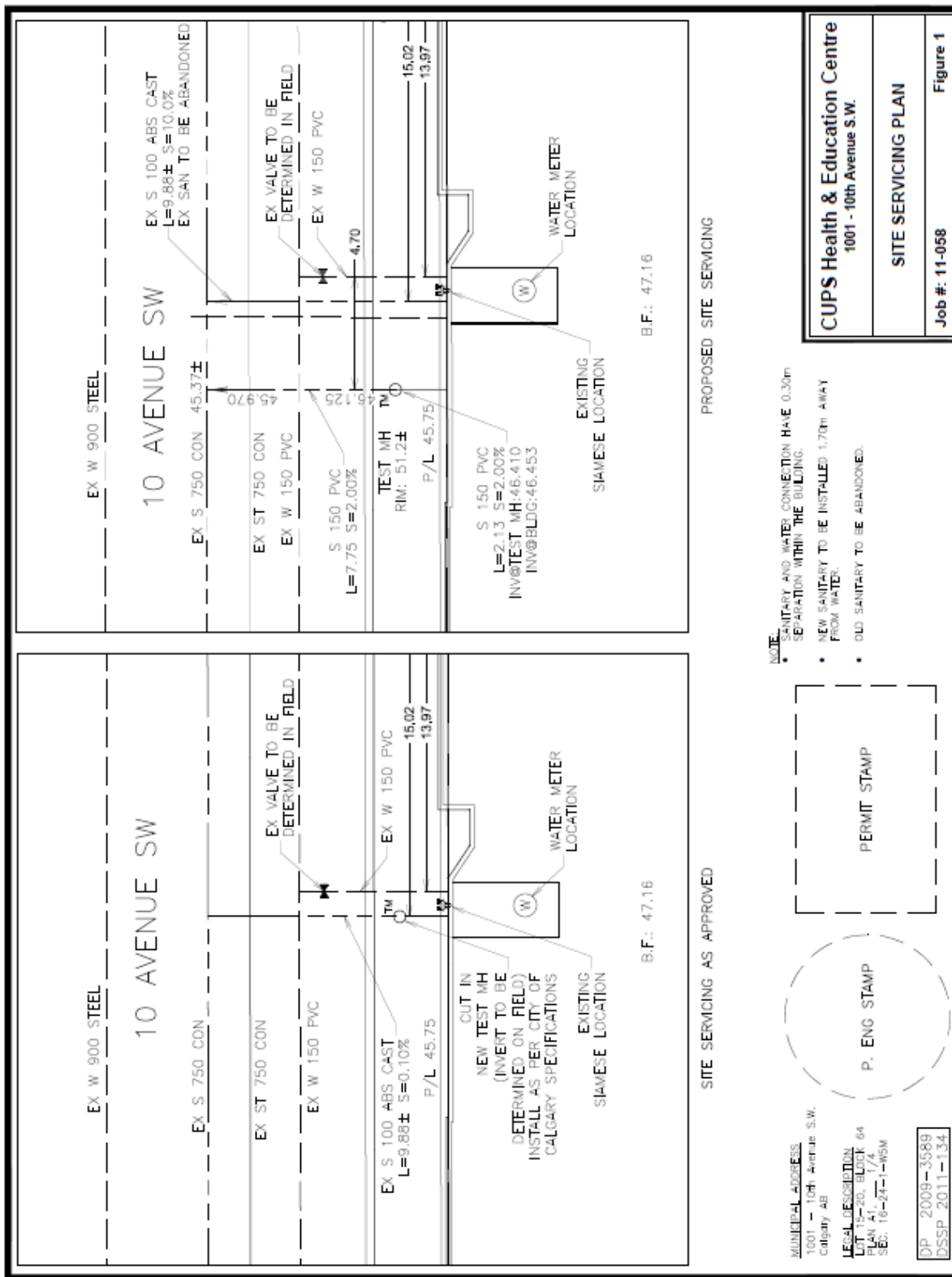
The change must be submitted in person complete with all relevant information to the DSSP counter. Small Formats are considered a full review and subject to the appropriate fees. A maximum of 3 consecutive small reviews will be allowed. After which time a complete submission showing all previous changes must occur.

No further reviews are allowed once inspections on a site are complete and the file has been closed. Any revisions to a site after this time must be completed as a new DSSP submission.

Refer to the Figure 1 on the next page for an example of a typical small format revision drawing.



Figure 1: Typical Small Format Revision Drawing



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## 2 Servicing

### 2.1 Approvals

A contractor must be issued a copy of an engineer-stamped drawing, which has been authenticated and approved by The City prior to installation of any sewer or water service pipes or construction of any drainage features.

### 2.2 Regulatory Documents

- a) Installation of sewer and water pipes shall, in all cases, follow the requirements and guidelines as contained in this manual and in:
- o Current City of Calgary Bylaws,
  - o The current National Plumbing Code of Canada,
  - o Standard Specifications: Waterworks Construction,
  - o Standard Specifications: Sewer Construction,
  - o Design Guidelines for Subdivision Servicing,
  - o Stormwater Management & Design Manual, and
  - o Any relevant Provincial regulations.

Links are provided in Appendix 'B' for these regulatory documents and other relevant reference materials.

### 2.3 Developer and Representatives' Responsibilities

The developer or his representative is responsible to ensure that the location for the service pipes do not conflict with power poles, pole anchors, transformers, trees, catch basins, underground chambers or other facilities which may exist within the public right-of-way. No service connections shall be granted where such obstructions exist

### 2.4 Developer Controlled Subdivision

Contact the Area Developer for all sewer and water service pipe installations in the public rights-of-way, which are in a developer controlled subdivision, for which Final Acceptance Certificates have not been granted. Installations shall be done in full accordance with current City of Calgary "Standard Specifications Waterworks Construction", "Standard Specifications Sewer Construction", and the "Stormwater Management Design Manual". Any such installations shall be carried out only under the supervision of a City Inspector.

### 2.5 New Service Quotation

Service connection quotations are prepared from approved Development Site Servicing Plans (DSSP) by an Indemnified Contractor for all projects. A copy of the most recently Approved Indemnified Contractors can be found by contacting Inspection Services at (403) 268-1203.

### 2.6 Service Rates

- a) All new service connections are at developer's expense.

- b) The rates for a service quotation are based on the seasonal period, which are assessed on an ongoing basis.
- o Summer rates are in effect from April 15 to October 15.
  - o Winter rates are in effect from October 16 to April 14.

Note: Service quotations that are not paid prior to October 16 may be required to be re-done.

## 2.7 City Portion of Service Connection

Once payment has been received (prior to the expiry date) and the private service pipe has been installed to the property line in accordance with the approved Development Site Servicing Plan and Building Grade Slip (and all other requirements), the developer or a contractor must contact the City of Calgary Construction Services or an Indemnified Contractor to request the installation of the City portion of the service pipe.

## 2.8 Setting Service Inverts at Property Line

When setting the service connection inverts at the property line;

- Determine invert elevation of the main
- Match crowns of pipe or add 0.06m whichever is greater
- Determine the distance from the main to property line and calculate the rise in elevation required from the minimum slope table
- Add slope of pipe
- Add 0.15m to grade at property line to allow for 'construction and datum error'
- Allow more grade if there is a possible conflict with other utilities.
- Some sanitary sewers require a test manhole. These are usually noted on the Development Site Servicing Plan circulation by the architect or by Water Resources technicians. A minimum 150 millimetres drop is required through a test manhole. Because the test manhole is usually set outside of the property line, an additional 150 millimetres to a maximum of 600 millimetres must be added onto an invert at the property line

## 2.9 Service Disconnection

- a) The developer must make a payment to The City to disconnect the service pipe from the public water or sewer mains prior to receiving a building permit. Contact Construction Services.
- b) The cost of a service pipe disconnect varies according to the location. They are adjusted annually.
- c) For infill residential lots where the developer is approved to use the existing water and/or sewer service pipes payment for the service pipe disconnect will be refunded only after the developer complies with the conditions under Clause 5.0 in this Section.

### 3 Water Infrastructure

#### 3.1 General

- a) Valves, fire hydrants, and all other appurtenances shall conform to and be designed as per the current version of the City of Calgary "Standard Specifications Waterworks Construction"
- b) Information and requirements for fire protection systems contained in codes other than this manual can be obtained by contacting the Building Services Section of Regulations Division and the Fire Prevention Bureau.
- c) Provide block profiles for all existing utility rights-of-way showing the existing and proposed grades.
- d) Backflow protection shall be provided in accordance with the following codes and manuals:
  - o National Plumbing Code of Canada
  - o CAN/CSA - B64.10 "Manual of the Selection and Installation of Backflow Prevention Devices" published by:

Canadian Standards Association (CSA)  
Suite 100  
5060 Spectrum Way  
Mississauga, ON L4W 5N6  
Tel: (416) 747-4000  
Toll Free: 1-800-463-6727 or (416) 747-2661  
Fax: (416) 747-2473  
Web Address: <http://www.csa-international.org>

- o Cross Connection Control Manual published by:

Western Canada Section AWWA  
P.O. Box 1708  
Cochrane, AB T4E 1 B6  
Phone: 1-877-283-2003 Fax: 1-877-283-2007  
Web Address: <http://www.wcsawwa.net/>

- e) Where approved, non-potable water (reclaimed water) systems shall comply with the "Standard Specifications Waterworks Construction" (Section 504.04.01 & 503.02.07).

#### 3.2 Crossing Water Feedermain

To ensure the safety of the public and to protect the feedermain (500mm and larger) any construction within 3.0m of these mains must be reviewed and approved by Water Resources, Infrastructure Delivery. Hydrovacating is required to determine the alignment, elevation, pipe diameter, pipe support, backfill and clearances. A detail of this information is required on the

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Development Site Servicing Plan with respect to working in the proximity of this feeder main. Contact the Capital Inspections Group at 268-5752 for approval, notification shut down periods, and tunnelling and augering options

### 3.3 Extension of Water Mains

- a) Where extensions of City water mains form part of the development proposal, drawings will be required on a standard block profile format for approval by The City.
- b) Where there is no public water main adjacent to the proposed development and it is the opinion of Water Resources that it is required, the Developer, at their expense, shall:
  - o install all required water mains and appurtenances
  - o extend the water main along the total frontage and/or flankage of the proposed development on the approved line assignment for watermains
  - o arrange for an Indemnification Agreement through Urban Development
- c) Where there is no public water main adjacent to the proposed development and it is the opinion of Water Resources that a private potable water supply system may be used, a Deferred Services Agreement must be signed by the Developer. The permit is required from Alberta Environment at 403-297-7166 and testing of water quality is required by the Alberta Health Services at 403-943-1111.
- d) All work done by a Contractor in the City rights-of-way, must be made in writing and requires either a Subdivision Development Agreement or an Indemnification Agreement with The City prior to commencement of work.

### 3.4 Service Connections

- a) Water service pipes must connect to the public water main at right angles.
- b) A single separate service connection to a public water main is permitted for each lot with distinct certificates of title.
- c) Water service pipes are not permitted to cross one property and enter into another or reside on any other premises as per the National Plumbing Code of Canada 2005 Section #2.1.2.4.
- d) Pipes are not permitted to extend from building to building on the same property except for an ancillary building. Refer to the National Plumbing Code of Canada 2005 Section #2.1.2.4.
- e) Each condominium building shall have separate service connections to the public watermain. Condominium units are serviced from a private water main within the building, similar to the servicing within an apartment building.
- f) In the case of a Bareland Condominium, separate service connections are made to a private water main. The private water main shall have a single connection to the public watermain, except where looping is required.

- g) A strata subdivision is used to subdivide the commercial portion of a mixed use building from the residential portion. A strata is not the equivalent of a condominium. It is the description of volumetric space under section 86 of the Land Titles Act. The Commercial space and residential space shall each have a separate water and sewer from the main and may share a common meter room where city access is permitted. A strata requires a detailed and restrictive covenant agreement - each subdivided parcel must be individually serviced directly to the public water main. The water service pipe shall enter an exterior wall, directly into a mechanical room. Each subdivided parcel shall have their own separate valves and meter assemblies.
- h) Pre-servicing is not permitted unless there is a certainty of location of building (meter room), fire protection requirements, and service size. (Approved with DP Plans)

### 3.5 Service Marking

Private water services shall be installed to the property line and the location marked with a 2X4 vertically placed to the pipe invert and showing one (1) metre above ground level. The letters "WI" shall be painted on the 2X4 to specify water.

### 3.6 Piping Material

- a) Water service pipes 20 mm, 25 mm, 40 mm, and 50 mm in diameter are to be copper or PEX pipe (Cross-linked Polyethylene Pipe). See Standard Specification Waterworks Construction Section 503.02.18.
- b) Water service pipes 100 mm, 150 mm, 200 mm, 250 mm, 300 mm, and 400 mm in diameter are to be ductile iron or PVC DR 18 AWWA C 900. See "Standard Specifications Waterworks Construction" (Sections 503.01.00.1, 503.02.03 and 503.02.04) For PVC pipes installed in industrial areas, NBR gaskets shall be supplied as per 504.04.01.
- c) All 100 mm and larger diameter service pipes passing through the exterior foundation wall or floor slab up to the master control valve shall be approved ductile iron pipe. Refer to "Standard Specifications Waterworks Construction" (Drawing 453.1009.009 part 2)
- d) Metallic water pipes and fittings c/w NBR (nitrile) gaskets are to be used on-site in areas contaminated or potentially contaminated with organic compounds (organic solvents or petroleum products). See Standard Specifications Waterworks Construction, Sections 504.05.01 and 503.02.12

### 3.7 Arrangement of Piping

- a) Two (2) or more water service pipe connections are required to be looped on-site for multi-family sites (i.e. townhouses) with more than 60 units and for 80 or more high rise apartment-style residences. See Standard Specifications Waterworks Construction Drawing 453.1026.001.

- b) All dual water service pipes installed in a common trench shall have a separation of 1.3 metres.
- c) Water service pipes must cross public easements at right angles or as otherwise approved, but are not permitted to extend lengthways within the easement
- d) A water service pipe, located between two buildings, must have a minimum distance of 6.0m from the exterior walls.
- e) The minimum horizontal separation between a water service pipe and other utilities and infrastructure shall be as follows:

	≤ 50 mm diameter water service pipe	≥100 mm diameter water service pipe
Foundation wall or piles which support a building	3.0 m	3.0 m
Foundation wall or piles extending vertically a minimum of 2 meters below the invert of the water pipe.	2.0 m	2.0 m
Property line	2.0 m	3.0 m
Storm pipe	2.0 m	2.0 m
Sanitary pipe	0.3 m (same trench)	
Shallow utility pipe	2.0 m	2.0 m
TELUS Cable pedestal, power pole, or streetlight standard	2.5 m	2.5 m
Edge of transformer or pull box/junction terminal	3.0 m	3.0 m
Catch basin	3.0 m	3.0 m

- f) Service valves shall be located on the approved line assignment as specified in "Appendix 11-B" in the "Design Guidelines for Subdivision Servicing".
- g) On-site distribution systems shall have the appropriate number and location of valves to provide a separation between fire hydrants and to limit the number of dwelling units affected by a shutdown to a maximum of 60 units.
- h) Water services 50 mm and smaller are to be installed in the same trench as the sanitary sewer, except where prohibited by code (hospitals, chemical plants, etc.) and are to be shown in the same trench.
- i) It is the responsibility of the developer to ensure that the location for the water service pipe within the public right-of-way does not conflict with power poles, pole anchors, transformers, trees, catch basins, underground chambers or other facilities which may

exist within the public right-of way. The City will not provide services where such obstructions exist.

- j) Location of piles in relation to the water service pipe must be shown on the Development Site Servicing Plan.
- k) Water service pipes shall be provided with a master control valve immediately where the pipe enters the building. All branched water supply shall be downstream of this valve. Refer to the “Standard Specifications Waterworks Construction” (Drawing 453.1009.008 and 453.1009.009 part 2)

### **3.8 Piping Support**

- a) For buildings with deep foundation walls or adjacent to the property line (exceeding the depth of the water invert), the developer shall provide adequate pipe support from the building to undisturbed soil within the public right-of-way. The details of this pipe support shall be shown on the Development Site Servicing Plan and approved by a Professional Engineer.
- b) The developer shall install the service pipe in conjunction with the support grade beam through the wall to a point 250 mm beyond the end of the support beam. The pipe may be supported with lean concrete placed between the pipe and the original undisturbed soil.

### **3.9 Size and Capacity**

- a) Water service pipes with private fire hydrants shall not be less than 150 mm in diameter, and no leg shall be greater than 180 meters in length to the fire hydrant otherwise it is required to be looped.
- b) A water service pipe shall be sized according to the peak demand flow and shall not be less than 20mm size. See the “National Plumbing Code of Canada 2005” (Section 2.6.3.4).
- c) Where static pressure exceeds 550 kpa, a pressure reducing valve must be installed as per the “Standard Specifications: Waterworks Construction” (Sheets 30A, 31, and 32a). In addition, see the “National Plumbing Code of Canada 2005” (Section 2.6.3.3) and the Design Guidelines for Subdivision Servicing” (Appendix II-A) for pressure zone maps and details.
- d) Where installations are required in the top of the pressure zone a 25mm service is required. See the “Design Guidelines for Subdivision Servicing” (Appendix III-A) for pressure zone maps and details.
- e) No new water service pipes shall be larger in diameter than the water main in which it connects.



### **3.10 Protection of Service Pipes and Public Water Mains**

- a) On-site water service pipes shall be installed with a minimum cover of 2.7 metres below final grade in clay, and 3.3 metres when the strata is gravel. Refer to the Specifications Waterworks Construction – Section 504.04.13.
- b) It is the responsibility of the developer to repair, at their expense, any damage to public water mains adjacent to their site during their construction. All repairs will be congruent with the current "Standard Waterworks Construction" manual.

### **3.11 Fire Protection & Hydrants**

- a) All codes and regulations of the Fire Prevention Bureau and the Insurance Underwriters Organization must be complied with in designing the private water supply system.
- b) All piping and private fire hydrants must be shown on the Development Site Servicing Plan.
- c) A separate service connection is not permitted for private fire hydrants. Hydrants must be connected to a service pipe where there is a constant draw of water.
- d) Public hydrants are not permitted to be connected to private service lines.
- e) Hydrant pumper ports shall face the carriageway and set to grade as per the Standard Specifications Waterworks Construction Drawing 453.1002.001.
- f) Hydrants shall be located a maximum distance of 2.0 meters from the curb or edge of asphalt carriageway as per the Fire Prevention Bureau requirements.
- g) The minimum separation between a hydrant and a Telus and cable pedestal, power pole, or street light standard shall be 2.5 meters. The minimum separation between a hydrant and the edge of a transformer or pullbox/junction terminal shall be 3.0 meters.
- h) The Developer must receive approval from the Fire Prevention Bureau for on-site hydrant requirements as per Alberta Building Code 1997, Section 3.2.5.5, and submit the approved plan to Water Resources with the Development Site Servicing Plan submission.
- i) The Developer shall request quotation and remit payment to Construction Services for replacement of old public fire hydrants to pumper-type.
- j) Two hydrants are not permitted on a dead-end main. A looped connection will be required.

### **3.12 Public Water Mains on Private Property**

- a) All grade changes within a public water main right-of-way must be approved. The developer must provide a profile showing the existing and proposed grades prior to approval of the Development Site Servicing Plan.
- b) Buildings are not permitted over existing public water mains which have registered easements.

### **3.13 Cross Connection Control**

- a) No private water supply system shall be interconnected with the public water supply system. See National Plumbing Code of Canada 2005 Section 2.6.2.5.
- b) Multi-family Residential, Industrial, Commercial and Institutional facilities are required to have a cross connection control device installed on their incoming water service pipe immediately after the water meter outlet valve. See "Standard Specifications Waterworks Construction" for further design details.
- c) The cross connection control device must be shown as a detail on the Development Site Servicing Plan with the meter assembly.

### **3.14 Metering**

- a) All consumers must make provisions for the installation of water meters in accordance with the "Standard Specifications Waterworks Construction" manual.
- b) Each unit must be individually metered.
- c) Water meters shall be installed at the point of entry into the building and shall be installed in accordance with the applicable City of Calgary Meter Standard.
- d) Water meters shall be installed in mechanical rooms or meter rooms with a floor drain. In no case shall a meter be installed in a bathroom, bedroom, or under a stairwell.
- e) A water meter room is required adjacent to an exterior wall where water service pipes 100 mm and larger enter the building. This applies to buildings that have levels below ground. A service pipe may enter the building under the slab for a single level underground parkade, otherwise the service must enter the building through an exterior wall.
- f) A water meter room is required to be located where water service pipes 50 mm and smaller enter a building. The water service pipe may enter through an exterior wall or from under the slab of the building. The water pipe must be joint-free when entering the building from under the slab.

- g) All water meters which are used exclusively for irrigation water shall be shown and noted on the Development Site Servicing Plan and shall be labelled on the meter piping as "Irrigation Meter". A City Parks irrigation meter cannot be used for a private site.
- h) All water service pipes shall be metered except those pipes dedicated for fire protection.
- i) A minimum of 2.0 metres of headroom is required at the meter location.
- j) When a meter cannot be installed in a building, the owner must provide a meter building or a meter vault located 2 metres inside the property line in accordance with the "Standard Specifications Waterworks Construction" manual. Remote readouts shall be installed where meter vaults are used.
- k) Pressure reducing valves are required to be installed downstream of the meter or meter assembly on all domestic supplies when the static pressure exceeds 80 psi. The valves shall be shown and identified on the Development Site Servicing Plan.
- l) The City shall supply and install all water meters. Contact the Water Services Meter Section to make arrangements.

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## 4 Sewer Infrastructure

### 4.1 General

- a) Sewer infrastructure includes sanitary & storm sewer pipes as well as the drainage or stormwater management system. Sewer design should be based on the “Standards and Guidelines for Municipal WaterWorks, Wastewater, and Storm Drainage System” published by Alberta Environment. For information on storm sewer and drainage (major system) design refer to City of Calgary “Stormwater Management & Design Manual” (Sections 3.0 and 4.0). Refer to the current edition of the following additional City of Calgary manuals for further information on pipe materials, design criterion and installation standards (See appendix ‘C’ for links to current editions):
  - o Standard Specifications - Sewer Construction
  - o Standard Block Profile Specifications
  - o Guidelines for Erosion & Sediment Control
  - o Design Guidelines for Subdivision Servicing
- b) Manholes, catch basins, and any other appurtenances shall conform to and be constructed as per The City of Calgary "Standard Specifications Sewer Construction".
- c) Where sanitary or storm sewer extensions are required to service the proposed development it will be at the applicant's expense. Drawings shall be required on a standard block profile for approval by the City with the DSSP circulation. Block profile submissions must be done as per the current edition of the “Standard block profile specifications for CAD and manual formats”.
- d) Provide block profiles with the DSSP submission for all existing utility rights-of-way showing the existing and proposed grades.
- e) Where outfalls to waterways or drainage courses are required, the consultant will supply an outfall design on a standard City of Calgary block profile to Water Resources for submission to the Provincial Government for approval and permits.
- f) Where storm ponds are required, the consultant will supply design drawings to Water Resources and complete the required check sheet(s). Contact Water Resources for more information.
- g) No portions of private sewer systems are permitted in bylaw setback areas except for service connections.
- h) Extensive and/or complicated external sewer systems shall be installed with the surveyor's grade sheets and batter boards. For inspection purposes Development Site Servicing Plans (DSSPs) will be stamped as such whenever this applies.

## 4.2 Peak Flows

Since peak sewage flows vary greatly with type and density of development, each case must be considered on an individual basis. Contact Water Resources/Development Approvals for more information.

When calculating sanitary peak flows, use table 5.1(2) of the most recent version of the "Standards and Guidelines for Municipal Waterworks, Wastewater and Storm Drainage Systems" by Alberta Environment to estimate the average volume of sanitary sewer flow per day for a specific type of development/land use.

## 4.3 Pipe Sizes

The following minimum pipe sizes will be considered provided they have adequate capacities as verified by the applicants' engineer:

- a) Minimum size of sanitary sewer for the site is 100 millimetres diameter.
- b) Minimum size of area drain leads is 250mm diameter with the following exceptions:
  - o Where the pipe is directly involved in a storm water retention system or is upstream of the ICD (Inlet Control Device) a minimum size of 150 millimetres diameter is acceptable.
  - o Where the public mains are less than 525 millimetres in diameter, pipe sizes 150 millimetres to 250 millimetres in diameter are considered for connection.

The capacity and the size of the service leaving the building shall meet the National Plumbing Code of Canada requirements. Sanitary service sizing is the responsibility of the developer.

## 4.4 Cover

- a) Sanitary
  - o The minimum cover for sanitary sewers shall be 2.5 meters from pipe crown to finished grade. Check that adequate depth of cover is provided to obtain frost protection. Insulation is required if depth to top of pipe is less than 2.5 meters. Insulation shall be installed as per current "Standard Specification Sewer Construction"
- b) Storm
  - o The minimum cover for storm sewers shall be 1.2 meters from pipe crown to finish grade. Insulation is required for frost protection if the depth to top of pipe is less than 1.2 meters. Installation shall be installed as per current "Standard Specification Sewer Construction" (Section 403.05.08)

Note: If cover is less than minimum then concrete encasement and frost protection may be required at the discretion of Water Resources. Concrete encasement is to be the entire length of pipe, from manhole to manhole. See Stormwater Management & Design Manual (Section 3.0)

## 4.5 Slopes

Minimum slopes for small diameter sewer lines see latest edition of the City of Calgary "Design Guidelines for Subdivision Servicing":

Diameter of Service	Sanitary Sewers Minimum Design Slope (%)		Storm Sewers Minimum Design Slope (%)	
	Concrete (n = 0.013)	PVC (n = 0.013)	Concrete (n = 0.013)	PVC (n = 0.011)
75mm Weeping Tile	-	-	2.00	2.00
100mm Weeping Tile	-	-	1.00	1.00
150mm Weeping Tile	-	-	0.48	.035
200mm Weeping Tile	-	-	0.32	0.24
250mm Weeping Tile	-	-	0.24	0.18
100mm	2.00	2.00	2.00	2.00
150mm	1.00	1.00	1.00	1.00
200mm	0.80	0.60	0.80	0.60
250mm	0.40	0.30	0.56	0.40
300mm	0.32	0.24	0.44	0.32
375mm	0.24	0.18	0.32	0.24
450mm	0.18	0.14	0.26	0.18
525mm	0.16	0.12	0.22	0.16
600mm	0.12	0.10	0.18	0.12
675mm	0.10	0.10	0.15	0.11
750mm	0.10	0.10	0.13	0.10
900mm and Greater	0.10	0.10	0.10	0.10

All concrete pipe, manholes and appurtenances shall be manufactured using type HS (type 50) sulphate resistant cement. Anchoring is required when pipe slope is greater than 33% or where velocities exceed 3.0 m/s

## 4.6 Service Connections

For storm sewer service connections to public mains please refer to the City of Calgary "Stormwater Management & Design Manual" (Section 4.0) for information on:

- Servicing,
- Location, and
- Grades.

A manhole is required on a main for a sewer connection when:

- The diameter of the connection line is greater than one half the diameter of the main, or
- The length of the service connection from the building to the main is greater than 30m.

When tying to an existing manhole, indicate the size and type of the manhole.

Service connections shall not be installed to sewer mains deeper than 6m. A secondary sewer may have to be installed to allow for servicing.

#### **4.7 Setting Service Inverts at Property Line**

When setting the service connection inverts at the property line;

- Determine invert elevation of the main
- Match crowns of pipe or add 0.06m whichever is greater
- Determine the distance from the main to property line and calculate the rise in elevation required from the minimum slope table
- Add slope of pipe
- Add 0.15m to grade at property line to allow for 'construction and datum error'
- Allow more grade if there is a possible conflict with other utilities.
- Some sanitary sewers require a test manhole. These are usually noted on the Development Site Servicing Plan circulation by the architect or by Water Resources technicians. A minimum 150 millimetres drop is required through a test manhole. Because the test manhole is usually set outside of the property line, an additional 150 millimetres to a maximum of 600 millimetres must be added onto an invert at the property line.

## 5 Sanitary Sewer Design

### 5.1 Servicing

Sanitary servicing from building to building is not permitted except for auxiliary buildings that are required and form an integral part of the development. Show the invert elevation at building and site elevation at or near the location where the sanitary sewer enters the building.

### 5.2 Manholes

#### a) Test Manhole

- A Sanitary Sewer Test Manhole is required to service proposed industrial and commercial developments, as per Section 7 of the Sewer Service Bylaw 24M96, unless it falls into an exempt use. In general, this typically includes: restaurants, grocery stores and wholesalers (with meat or deli departments), commercial bakeries, rendering and meat by-product processing, beverages manufacturing, fluid milk manufacturing, beer and liquor manufacturing, laboratories, industrial parcels, car washes, service stations (with a car wash), and, laundries). Contact Water Resources for more information or to determine if an exemption is applicable.
- On sites encompassing more than one business, a separate sanitary test manhole is required on those businesses that require one.
- The sanitary test manhole is to be located outside the property line on public property (off driveways and streets) and must be accessible to City staff, otherwise an easement access is required. The easement access is to be a minimum 5m x 5m surrounding the test manhole and include a standard access right of way for City forces to legally access the manhole. Contact Corporate Properties for an easement access.
- Provide a minimum of 150 millimetres to a maximum of 600 millimetres fall through a test manhole. (See current edition of "Standard Specifications Sewer Construction").

#### b) Interior/Exterior Drop Manhole

- Where the difference in elevation between the incoming pipe invert and the outgoing pipe centreline is greater than 760 millimetres an interior/exterior drop manhole must be provided. No interior drop manholes will be allowed when the incoming pipe exceeds 300 millimetres in diameter. current edition of "Standard Specifications Sewer Construction"

Note: Sanitary manholes should be located outside of trap lows. For any sanitary sewer manholes located in trap lows, sanitary seals are required to reduce infiltration. Sanitary manholes within stormwater ponds are not permitted.





## 6 Storm Sewer Design

All designs are to be in accordance with the City of Calgary "Stormwater Management & Design Manual" (latest edition). See Sections 3.0 and 4.0.

### 6.1 Catch Basins

- a) City standards recognize four types of inlet structures for private use.
  - o type "C" catch basin with storm back
  - o type "K2" catch basin
  - o type "K3" catch basin
  - o Grated top (GT) manhole

Note: See current edition of "Standard Specifications Sewer Construction" and "Stormwater Management & Design Manual" for further information.

- b) Use grated top manholes instead of catch basins when:
  - o depth from the rim to pipe invert exceeds 2.5 meters,
  - o 3 or 4 way junction occurs, or
  - o the total sum of incoming pipe diameters is > 600 mm
  - o when the CB lead is longer than 30m

The use of a manhole is required instead of a catch basin barrel in this situation

### 6.2 Weeping Tile

- a) Refer to City of Calgary "Stormwater Management & Design Manual"
- b) Surface drainage is not permitted to drain to a weeping tile system by any means other than infiltration from the surface. Window wells and area drains must not have a direct connection to the weeping tile system.
- c) Weeping tile drain is NOT permitted to tie to the sanitary sewer.



## 7 Stormwater Management

Stormwater retention and management requirements must be designed in accordance with the current edition of the City of Calgary "Stormwater Management & Design Manual". See Sections 3.0 and 4.0 for technical requirements. All sites must adhere to City of Calgary "Guidelines for Erosion & Sediment Control"

### 7.1 Stormwater Retention

On-site stormwater retention is generally required on all sites (normally indicated at the time of the Development Permit circulation). When stormwater retention is required, the DSSP submission should indicate the method of retention, along with drainage area plans and stormwater retention design calculations. Plans should delineate drainage boundaries and ponding areas. Provide all calculations for stormwater storage including trap lows, stormwater ponds, and roof control flow data. Design for the storm system must include the total site area and account for future development

### 7.2 Stormwater Retention Calculations

- a) Sites over 2 ha will require a Stormwater Management Report (SWMR) be submitted to Water Resources (2 copies). Approval of the SWMR is required prior to submitting the DSSP. Other conditions may trigger the requirement as indicated in section 1.2.5 above.
- b) Sites using the Unit Release Rate Method (L/s/ha) should use Figure 4.1, from the current edition of the "Stormwater Management & Design Manual", for storage calculations.
- c) Sites using the Rational Method for storage calculations should refer to Appendix B, Storm Retention Calculations Based on Rational Method Design, of the current edition of the "Stormwater Management & Design Manual" as guidance.
- d) Surcharging of the weeping tile system is not permitted.
- e) Trap Lows are to be clearly outlined with the 1 :100 year elevation and the spill elevation clearly labelled on the drawing.
- f) Emergency escape routes for trap lows are to be directed away from buildings and towards public roadways with grading clearly shown to demonstrate such.

### 7.3 Western Headworks Canal Catchment

Areas located in the Western Headworks (WH) Canal Catchment fall under the 1980 Moratorium of Stormwater Discharges into the WH Canal. Any development that could result in an increase in imperviousness is required to implement BMPS to yield, at a minimum, a net-zero increase in run-off rate, runoff volume and pollutant loading to the WH Canal. Refer to section 4.7.3 of the "Stormwater Management and Design Manual" for guidance.

#### **7.4 Precautionary Measures that must be taken**

- a) Ensure elevations of building slab and/or any building openings are 0.3m minimum above trap low spill elevations or the 100 year elevation, whichever is higher.
- b) Ensure the hydraulic slope is taken into account.
- c) Ensure pipe sizes are not less than 150 millimetres in diameter for area drains.
- d) Ensure building structural design accounts for water loading where roof retention is used.

#### **7.5 Drainage and Grading Requirements**

- a) All on-site grading and drainage must be in accordance with Lot Grading Bylaw 32M2004 and the "Stormwater Management & Design Manual".
- b) All open areas shall drain to the storm sewer. When storm sewers are not available, a temporary drywell system may be required. (See current edition of "Standard Specifications Sewer Construction" and "Stormwater Management & Design Manual").
- c) The minimum number of drywells required is determined by the flow from the site in relation to the intake capacities of the inlet structures. A geotechnical report may be required to determine efficiency and actual number of drywells required.
- d) Drainage from roof areas shall be contained on-site. Control flow roof drain specifications (Us) as well as location of roof drains shall be shown. Drainage boundaries for roof shall be shown where the roof encompasses a large area.
- e) A summary table for roof drains should also be included showing:
  - o number of roof drains,
  - o flow per roof drain, and
  - o total flow from roof.
- f) On-site grading must be shown with spot elevations and grade arrows with % grade shown (adhering to minimum grades for surface materials used as per City design guidelines). All building and parking lot corners must have design spot elevations shown. Contours are not acceptable for site grading.
- g) For commercial and Industrial sites where storm sewers are not available an evaporation pond is required. (Refer to Storm Water Management and Design Guidelines)

#### **7.6 Water Quality**

Water Quality is to be in accordance with the most recent edition of the City of Calgary "Stormwater Management & Design Manual".

## **7.7 Oil I Grit Separators**

Oil/Grit Separators are required for the following:

- Sites over 2 ha (As per the most recent edition of the City of Calgary "Stormwater Management & Design Manual")
- No capabilities in the downstream storm sewer system prior to outfall to the river
- Sites with petroleum products on-site
- Heavy industrial and manufacturing sites
- Sites discharging runoff to City owned ditches

## **7.8 Stormwater Ponds**

Where stormwater ponds are required (dry ponds, wet ponds, wetlands, and evaporation ponds), they are to be designed in accordance with the City of Calgary "Stormwater Management & Design Manual" and a Stormwater Management Report will be required.

## **7.9 Best Management Practices**

Refer to the City of Calgary "Stormwater Management & Design Manual" for more information.

As-built information for grading must be submitted as per Lot Grading Bylaw 32M2004.



## 8 Floodway, Flood Fringe and Overland Flow Zones

Developments in the Floodway, Flood Fringe and Overland Flow Zone areas are subject to the regulations described in City of Calgary Land Use Bylaw 2P80 Section 19.1 which was amended by Bylaw 5P85. Refer to Bylaws 2P80 and 5P85, and the "Stormwater Management & Design Manual" (Section 3.5) for more information.

Please note that the most up-to-date regulations shall prevail.

- a) Flood Regulations or Advisory Guidelines shall be followed by all landowners or developers proposing construction within the Floodway, Flood Fringe, or Overland Flow Zone of the Bow and Elbow Rivers, and Nose Creek drainage basins.
- b) Copies of the Floodway, Flood Fringe, and Overland Flow Zone maps approved by Council are available at online at [www.calgary.ca](http://www.calgary.ca) through a search for "flood maps".
- c) Under the land use bylaw, rules on building design and alterations shall apply to all buildings except for single-detached, semi-detached or duplex dwellings that are infill development or are existing buildings, either being redeveloped to one of those three uses, or are being altered or added to. Special provisions apply to Roxboro Road SW, Erlton, Quarry Park, and Inglewood.
- d) The following rules shall be followed by the appropriate landowners or developers:

### 8.1 Flood Fringe

If the subject property is within the 1:100 year Flood Fringe it is mandatory that the following Special Regulations be adhered to:

- The minimum first floor elevation shall be constructed at or above the designated flood elevation. All electrical and mechanical equipment shall be located at or above this elevation as well.
- The building shall be designed so as to prevent structural damage by floodwaters (this may include elevated groundwater).
- Onsite access roads shall be constructed at or above the designated flood level.
- For the development or redevelopment of single detached, semi-detached or duplex dwellings in the Flood Fringe that are infill or existing, Council has approved advisory guidelines. These were approved under the "Calgary River Valleys Plan (1984)" and must be followed.
- Proposed drive down garages must indicate a gravity connection to the storm sewer system complete with a backflow prevention valve located in a separate manhole on public property. Note that no sump pumps are allowed (drainage should be by gravity) and it is recommended that the first two feet in front of the garage slopes at 2.0% away from the garage door towards the drainage swale.  
*Note: Roads should be contacted to ensure that existing and future road grades are compatible with on-site grades.*
- Minimum building openings should be above the designated 1:20 year flood elevation.
- Foundation dewatering should be discharged to ground above the designated 1:100 year flood elevation. The system should account for high groundwater that may accompany floods.



## 8.2 Floodway

If the subject property is within the 1:100 year Floodway it is mandatory that the following Special Regulations be adhered to:

- No alterations shall be made and no structures including, but not limited to, rip-rap, berms, fences, walls, gates, patios, docks, decks shall be constructed on, in or under a Floodway unless in the opinion of the Approving Authority there will be no obstruction to floodwaters and no detrimental effect on the hydrological system or water quality, including the natural interface of the riparian and aquatic habitats.
- No replacement of, external alterations or additions to existing buildings that might increase the obstruction to flood waters on that site, or have a detrimental effect on the hydrological system or water quality, shall be allowed.
- No new building or other new structures shall be allowed except for the replacement of existing single family, semi-detached, duplex dwellings and accessory buildings on the same location.
- No outside storage is permitted.

## 8.3 Overland Flow Zone

If the subject property is within the 1:100 year Overland Flow Zone it is mandatory that the following Special Regulations be adhered to:

- The first floor elevation and all electrical and mechanical equipment shall be 0.3m minimum above the highest adjacent street centre line grade for all buildings.
- Indicate that the access to the underground parkade is 0.3m above the highest adjacent street centre line grade or the critical downstream spill elevation, whichever is higher.

## 8.4 Calgary River Valleys Plan (July 1984)

The following advisory guidelines from the “Calgary River Valleys Plan” will be provided to all landowners or developers proposing construction in the Flood Fringe areas in the City of Calgary.

### 8.4.1 General

- Where it is desirable to have a single detached, semi-detached or duplex family dwelling with a basement below the designated flood level, this floor should not contain any bedrooms.
- Basements should not be utilized for storage of immovable or hazardous materials that are flammable, explosive or toxic.
- Footings and foundation walls should be cast-in-place concrete.
- The top of the basement walls should be a minimum of 0.3m above the designated flood level.
- Basement walls should be provided with at least two open-able windows located on opposite sides of the building. The windows should be at least 0.15m above the designated flood level.

- Where applicable, stable fill material may be used to raise the lowest portion of the building above the designated flood level, provided the building is not raised to a height which is not in keeping with surrounding buildings or conflict with the current Land Use Bylaw.
- Where possible, buildings should be constructed with the longitudinal axis paralleled to the direction of flow.

#### **8.4.2 Anchorage**

In order to resist floatation and lateral movement, the basement floor joists should either have the ends embedded in the basement concrete wall or the header joist mechanically fastened to the required anchor bolts for the sill plate, or any other system providing similar protection.

#### **8.4.3 Basement Drainage System**

- A sump pump must be provided in the basement.
- The outflow pipe should be looped and discharge above the designated flood level.
- A separate electrical circuit should be provided for the sump pump with the operating switch located above the designated flood level.
- Basement walls should be made water tight through the use of paints, membranes and mortars to minimize seepage.
- Installation of cut-off valves on sewer lines or the elimination of gravity flow basement drains.



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## 9 Grade Calculations

### 9.1 Building Grades or Lot Grades

- a) If a curb or sidewalk exists in front of lot, then the 'building' or 'lot' grade is the elevation of curb or back of walk, plus a 2% slope rise to the property line. The existing curb or sidewalk elevation should be within 25 to 50 millimetres of the design elevation shown on block or sidewalk profiles.
- b) If the curb or sidewalk does not exist, then the design elevation of future curb must be calculated from block, Sidewalk, or paper profiles, usually opposite the corners of a small lot or every 15.0 metres in the case of a large lot. To this top of curb elevation a figure must be added, calculated at 2% up, to arrive at property line elevation. Therefore, the proposed distance from face of curb to property line must be known.
- c) In some cases, a setback grade is required. These are given where street widening is proposed. It is important to know whether the curb and walk remains on its existing line assignment or if it will be moved back. If the curb and walk are to be moved, it is usually back from existing and at the same elevation (except for major roads) The setback grade is given on the setback line 2% up from the design on profiles or, in some cases, from existing.

### 9.2 Lane Grades

- a) Dished Lanes: From the lane or block profile, the centre line elevation is calculated. The property line elevation is higher depending on the width and cross section on the lane in a specific area. Dished lanes rise from centre line to edge at 2% for concrete and paved lanes and 4%, 6% and 8% for gravel lanes (depending on the area).(1975 standard 3.5%)
- b) Flat Lanes: Centre Line elevation is calculated, and to this, add 75 millimetres for property line elevation on a 6.1 metre wide lane and 150 millimetres for property line elevation on a 9.0 metre wide lane. Variations may arise where an odd width lane is encountered.
- c) Some existing flat lanes which are to be paved or poured concrete, will require the addition of 61 mm to the centre line elevation to obtain property line elevation for a 6.1 metre wide lane and 91 mm in the case of a 9.1 meter wide lane.

Ensure lanes conform to City of Calgary "Standard Specifications Roads Construction"



## 10 Erosion & Sediment Control

If Erosion and Sediment Control (ESC) drawings or a report are requested for review and acceptance by Water Resources, the developer or project manager, and their site designates, shall ensure a timely and complete implementation, inspection and maintenance of all practices specified in erosion and sediment control report and/or drawings. Any amendments to the ESC documents must be reviewed and approved by Water Resources in advance by contacting the ESC inspector that reviewed the documents or by contacting the Water Resources Erosion Control Coordinator at 403-268-2655. Documents submitted shall conform to the requirements detailed in the current edition of The City of Calgary Guidelines for Erosion and Sediment Control and shall be prepared, signed and stamped by a qualified consultant specializing in erosion and sediment control, and holding current professional accreditation as a Professional Engineer (P. Eng.), Professional Agrologist (P. Ag.) or Certified Professional in Erosion and Sediment Control (CPESC).

For each stage of work where soil is disturbed or exposed, documents must clearly specify the location, installation, inspection and maintenance details and requirements for all temporary and permanent controls and practices.

For other projects where an erosion and sediment control report and/or drawings have not been required at the Prior to Release stage, the developer, or their designates, shall, as a minimum, develop an erosion and sediment control drawing and implement good housekeeping practices to protect onsite and offsite storm drains, and to prevent or mitigate the offsite transport of sediment by the forces of water, wind and construction traffic (mud-tracking) in accordance with the current edition of The City of Calgary Guidelines for Erosion and Sediment Control ([www.calgary.ca/waterservices/esc](http://www.calgary.ca/waterservices/esc)). Some examples of good housekeeping include stabilization of stockpiles, stabilized and designated construction entrances and exits, lot logs and perimeter controls, suitable storm inlet protection and dust control.

For all soil disturbing projects, the developer, or their representative, shall designate a person to inspect all erosion and sediment control practices a minimum of every seven (7) days and during, or within 24 hours of, the onset of significant precipitation (> 12 mm of rain in 24 hours, or rain on wet or thawing soils) or snowmelt events. Note that some practices may require daily or more frequent inspection. Erosion and sediment control practices shall be adjusted to meet changing site and winter conditions.

Refer to Appendix 'B' below for links to the Erosion & Sediment Control guidelines and other relevant documentation.



## 11 Encroachments

All expenses, costs, liabilities, or other risk associated with an authorized Encroachment shall be borne by the owner. Furthermore, an authorized encroachment agreement does not release an applicant from the responsibility to comply with other Provincial or Federal requirements or municipal bylaws.

The Encroachment Guidelines can be found on:

<http://www.calgary.ca/CS/CPB/Pages/Real-Estate/Encroachments/Encroachments.aspx>





## 12 Waste & Recycling Requirements

Waste & Recycling Requirements are looked at under the Development Permit Submission. To obtain all the detailed specifications as set out by Development Building Approvals or review the Complete Applications Requirement List (CARL) for Waste & Recycling go to:

<http://www.calgary.ca/UEP/WRS/Pages/Development-permit-review-and-requirements/Development-Permit-Review-and-Requirements.aspx>



**Appendix 'A' – DSSP CARL**  
**Development Site Servicing Plan Complete Application Requirement List (CARL)**

**DSSP CARL:**

Last Modified 2012 July 30

DSC _____
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The following **Development Site Servicing Plan Complete Application Requirement List** outlines all of the information necessary to evaluate and provide a timely decision on your application.

For design guidelines and standards please refer to the “*Design Guidelines for Development Permits; Development Site Servicing Plans and Waste & Recycling Services for Commercial/Industrial Applications*” available on the [Urban Development Publications](#) webpage.

**Only applications that are complete will be accepted.** Applications and materials submitted must be clear, legible and precise. Plans submitted should be to a professional drafting standard. We are currently unable to accept digital applications. Thank you for your co-operation.

**All plans submitted must:**

- contain a title block with information such as:**
  - address and legal description (section number; plan; block; lot)
  - uses, project name, applicant name and contact information
  - Name of consultant and an original signed professional engineer’s stamp and legible permit to practice number
- be sorted into sets:**
  - sets should be rolled, not folded
  - each set must be stapled together, NOT bound by tape
- paper size:**
  - all plans submitted must be on the same sized paper
  - drawings are clear and legible
  - maximum size of drawing not to exceed 0.600m x 0.900m
- be clear of any previous approval stamps and/or notations:**

completed by applicant	office use only	Required Items
<input type="radio"/>	<input type="radio"/>	1. <b>A Development Permit</b>
<input type="radio"/>	<input type="radio"/>	2. <b>An approved stamped site plan by the Fire Prevention Bureau (When required by Development Permit Conditions of Approval)</b>
<input type="radio"/>	<input type="radio"/>	3. <b>An approved Storm Water Management Report (If a report is required, provide the name of the report and a copy of the approval letter)</b>
<input type="radio"/>	<input type="radio"/>	4. <b>Fee (See <a href="#">Utility Site Servicing Bylaw</a> for review fees and inspection fees and procedures)</b>

<input type="radio"/>	<input type="radio"/>	<b>5. <u>Three (3) copies of Site Plans showing:</u></b>
<input type="checkbox"/>	<input type="checkbox"/>	plans to metric scale, minimum 1:100, all elevations in metric are Geodetic Datum
<input type="checkbox"/>	<input type="checkbox"/>	north arrow, pointing to top or left of page
<input type="checkbox"/>	<input type="checkbox"/>	municipal address (ie, street address) and legal address (ie, plan/block/lot)
<input type="checkbox"/>	<input type="checkbox"/>	size of parcel (ha)
<input type="checkbox"/>	<input type="checkbox"/>	label all elements of plan as <b><u>existing</u></b> or <b><u>proposed</u></b>
<input type="checkbox"/>	<input type="checkbox"/>	<b>Plot and dimension property lines</b>
<input type="checkbox"/>	<input type="checkbox"/>	Indicate elevations at back of sidewalk – at property line corners and VPIs
<input type="checkbox"/>	<input type="checkbox"/>	Indicate lane grade design elevations – at property line corners and VPIs
<input type="checkbox"/>	<input type="checkbox"/>	<b>Adjacent to parcel:</b>
<input type="checkbox"/>	<input type="checkbox"/>	City streets, label street names
<input type="checkbox"/>	<input type="checkbox"/>	sidewalks, City and public paths (Regional Pathway System)
<input type="checkbox"/>	<input type="checkbox"/>	curb cuts, medians and breaks in medians
<input type="checkbox"/>	<input type="checkbox"/>	road widening setbacks and corner cuts, dimensioned and labelled
<input type="checkbox"/>	<input type="checkbox"/>	<b>Easements, Utility Rights-of-Way, etc:</b>
<input type="checkbox"/>	<input type="checkbox"/>	dimension (width and location)
<input type="checkbox"/>	<input type="checkbox"/>	label type of easement and registration number
<input type="checkbox"/>	<input type="checkbox"/>	<b>Utilities on and adjoining the parcel (deep, shallow and overhead):</b>
<input type="checkbox"/>	<input type="checkbox"/>	<b><u>water, storm and sanitary sewer</u></b>
<input type="checkbox"/>	<input type="checkbox"/>	▪ Locations and full dimensions for mains, services, manholes, hydrants and valves to property lines, buildings, and other utilities
<input type="checkbox"/>	<input type="checkbox"/>	▪ show pipe size, type, class material, length, slope, and bedding material
<input type="checkbox"/>	<input type="checkbox"/>	▪ location of all manholes and catch basins complete with pipe inverts and rim elevations
<input type="checkbox"/>	<input type="checkbox"/>	▪ proposed sanitary/storm inverts at property lines and buildings
<input type="checkbox"/>	<input type="checkbox"/>	▪ horizontal and vertical clearances at all utility crossings
<input type="checkbox"/>	<input type="checkbox"/>	▪ locations of sanitary test manholes with details of easement if located on private property, if applicable
<input type="checkbox"/>	<input type="checkbox"/>	▪ pipe capacity for large developments
<input type="checkbox"/>	<input type="checkbox"/>	gas
<input type="checkbox"/>	<input type="checkbox"/>	electrical (poles, fixtures, guy wires/pole anchors, transformer boxes, etc.)
<input type="checkbox"/>	<input type="checkbox"/>	cable, telephone
<input type="checkbox"/>	<input type="checkbox"/>	<b>Location of all:</b>
<input type="checkbox"/>	<input type="checkbox"/>	retaining walls, fences
<input type="checkbox"/>	<input type="checkbox"/>	landscaping, berms, swales, slopes and other physical features which could affect utility servicing both on the site and adjoining boulevards
<input type="checkbox"/>	<input type="checkbox"/>	<b>If trees are existing on public lands adjacent to the site:</b>
<input type="checkbox"/>	<input type="checkbox"/>	specify species and diameter of each tree
<input type="checkbox"/>	<input type="checkbox"/>	location of the centre point of the trunk of each tree
<input type="checkbox"/>	<input type="checkbox"/>	Is tree is to be retained or removed? (At owner's expense).
<input type="checkbox"/>	<input type="checkbox"/>	<b>Water</b>
<input type="checkbox"/>	<input type="checkbox"/>	location of on-site water meter (indicated by M)
<input type="checkbox"/>	<input type="checkbox"/>	total residential unit count
<input type="checkbox"/>	<input type="checkbox"/>	complete water meter details including all internal pipes at the meter, pressure reducing valves, backflow prevention devices, valves, and anchor details for master control valve (if applicable)

<input type="checkbox"/>	<input type="checkbox"/>	irrigation meter details
<input type="checkbox"/>	<input type="checkbox"/>	pipe support details
<input type="checkbox"/>	<input type="checkbox"/>	<b>Surface Drainage:</b>
<input type="checkbox"/>	<input type="checkbox"/>	plot existing and proposed surface grades along property lines and on site
<input type="checkbox"/>	<input type="checkbox"/>	drainage pattern indicated by boundary lines and arrows
<input type="checkbox"/>	<input type="checkbox"/>	storm drainage calculations including discharge to minor systems, ponding, and catchment boundaries
<input type="checkbox"/>	<input type="checkbox"/>	location and elevation of emergency escape routes
<input type="checkbox"/>	<input type="checkbox"/>	ICD's and HYDROVEX details (include all HYDROVEX details with application)
<input type="checkbox"/>	<input type="checkbox"/>	stormwater features such as storm ponds, trap lows, ICDs, oil/grit separators, BMPs, or Low Impact Development Practices (complete with LID checklists)
<input type="checkbox"/>	<input type="checkbox"/>	<b>Floodway, Flood Fringe and Overflow:</b>
<input type="checkbox"/>	<input type="checkbox"/>	Show floodway/flood fringe/overland flow lines on the plans complete with all step elevations and labels
<input type="checkbox"/>	<input type="checkbox"/>	dimension distance to buildings and structures
<input type="checkbox"/>	<input type="checkbox"/>	<b>Outline and dimension buildings:</b>
<input type="checkbox"/>	<input type="checkbox"/>	detached buildings and structures (sheds, garages)
<input type="checkbox"/>	<input type="checkbox"/>	main floor elevations
<input type="checkbox"/>	<input type="checkbox"/>	principal entrance to building
<input type="checkbox"/>	<input type="checkbox"/>	<b>Driveways &amp; parking areas:</b>
<input type="checkbox"/>	<input type="checkbox"/>	label surface material
<input type="checkbox"/>	<input type="checkbox"/>	label curb cuts to be removed and rehabilitated
<input type="checkbox"/>	<input type="checkbox"/>	major grade changes and ramps

Please identify and provide justification for items that do not comply with Council approved policies, bylaw standards, or technical guidelines. Attach a separate sheet, if necessary.

**Applicant's Signature**

**Date**

(Confirming that all required information has been provided and is correct)

**Screened by**

**Date**

For Further Information:

**The City of Calgary**

Development Servicing, Urban Development

Development & Building Approvals (#8032)

5<sup>th</sup> floor, Calgary Municipal Building

800 Macleod Trail SE, Calgary, Alberta T2P 2M5

8:00 a.m. to 4:00 p.m. Monday – Friday (Closed from 12-1)

**Email [development servicing2@calgary.ca](mailto:development servicing2@calgary.ca) or visit our website - [www.calgary.ca/ud](http://www.calgary.ca/ud)**

Checklists are updated periodically. Please ensure you have the most recent edition.



## Appendix 'B' – References & Links

Refer to the following links for more information and reference material.

### Relevant Bylaws:

Calgary Land Use Bylaw 1P2007

<http://www.calgary.ca/PDA/DBA/Pages/Calgary-Land-Use-bylaw-1P2007/Calgary-Land-Use-Bylaw-1P2007.aspx>

Calgary Land Use Bylaw 2P80

<http://www.calgary.ca/PDA/LUPP/Documents/Publications/bylaw.pdf>

Utility Site Servicing Bylaw 33M2005

[http://www.calgary.ca/\\_layouts/cocis/DirectDownload.aspx?target=http://www.calgary.ca/CA/city-clerks/Documents/Legislative-services/Bylaws/33m2005-UtilitySiteServicing.pdf&noredirect=1&sf=1](http://www.calgary.ca/_layouts/cocis/DirectDownload.aspx?target=http://www.calgary.ca/CA/city-clerks/Documents/Legislative-services/Bylaws/33m2005-UtilitySiteServicing.pdf&noredirect=1&sf=1)

Water Utility Bylaw 40M2006

<http://www.calgary.ca/CA/city-clerks/Documents/Legislative-services/Bylaws/40M2006-WaterUtility.pdf>

Wastewater Bylaw 14M2012

<http://www.calgary.ca/CA/city-clerks/Documents/Legislative-services/Bylaws/14M2012-Wastewater.pdf>

Drainage Bylaw 37M2005

<http://www.calgary.ca/CA/city-clerks/Documents/Legislative-services/Bylaws/37m2005-Drainage.pdf>

Lot Grading Bylaw 32M2004

<http://www.calgary.ca/CA/city-clerks/Documents/Legislative-services/Bylaws/32m2004-LotGradingBylaw.pdf>

Waste and Recycling Bylaw 20M2001

[http://www.calgary.ca/\\_layouts/cocis/DirectDownload.aspx?target=http%3a%2f%2fwww.calgary.ca%2fCA%2fcity-clerks%2fDocuments%2fLegislative-services%2fBylaws%2f20M2001-WasteAndRecycling.pdf&noredirect=1&sf=1](http://www.calgary.ca/_layouts/cocis/DirectDownload.aspx?target=http%3a%2f%2fwww.calgary.ca%2fCA%2fcity-clerks%2fDocuments%2fLegislative-services%2fBylaws%2f20M2001-WasteAndRecycling.pdf&noredirect=1&sf=1)

### Water Resources Links:

Development Site Servicing Plan (DSSP) Complete Applications Requirement List (CARL)

<http://www.calgary.ca/PDA/DBA/Documents/carls/DSSP-CARL.pdf>

Stormwater Management and Design Manual

[http://www.calgary.ca/PDA/DBA/Documents/urban\\_development/bulletins/2011-stormwater-management-and-Design.pdf](http://www.calgary.ca/PDA/DBA/Documents/urban_development/bulletins/2011-stormwater-management-and-Design.pdf)



Standard Specifications for Waterworks Constructions

[http://www.calgary.ca/PDA/DBA/Documents/urban\\_development/publications/Waterworks2012.pdf](http://www.calgary.ca/PDA/DBA/Documents/urban_development/publications/Waterworks2012.pdf)

Standard Specifications for Sewer Construction

[http://www.calgary.ca/PDA/DBA/Documents/urban\\_development/publications/Waterworks2012.pdf](http://www.calgary.ca/PDA/DBA/Documents/urban_development/publications/Waterworks2012.pdf)

Design Guidelines for Subdivision Servicing

[http://www.calgary.ca/PDA/DBA/Documents/urban\\_development/publications/design-guidelines-for-subdivision-servicing-2012.pdf](http://www.calgary.ca/PDA/DBA/Documents/urban_development/publications/design-guidelines-for-subdivision-servicing-2012.pdf)

Development Approval Submissions (Stormwater Reports, Construction Drawings, & Ponds)

<http://www.calgary.ca/UEP/Water/Pages/Specifications/Submission-for-approval-/Submission-for-Approval.aspx>

Floodway, Flood Fringe and Overland Flow Zone Maps

<http://www.calgary.ca/PDA/DBA/Pages/Calgary-Land-Use-bylaw-1P2007/Maps/Floodway-Flood-Fringe-Maps.aspx>

National Plumbing Code of Canada (Can be purchased at the following link)

<http://www.nrc-cnrc.gc.ca/eng/ibp/irc/codes/2010-national-plumbing-code.html>

Calgary River Valleys Plan – July 1984 (Can be purchased at the following link)

<http://www.calgary.ca/PDA/DBA/Pages/Planning-policy-information/Printed-documents/Environment.aspx>

Water Services Information Page

<http://www.calgary.ca/UEP/Water/Pages/Water-Services.aspx>

PVC Main Break Study – Cause Analysis

[http://www.calgary.ca/UEP/Water/Documents/Water-Documents/PVC\\_Failure\\_Presentation\\_Sept\\_-202010.pdf](http://www.calgary.ca/UEP/Water/Documents/Water-Documents/PVC_Failure_Presentation_Sept_-202010.pdf)

Design and Construction of Flexible Thermoplastic Pipe

[http://www.calgary.ca/PDA/DBA/Documents/urban\\_development/publications/standard-practice-for-design-and-construction-flexible-pipe.pdf](http://www.calgary.ca/PDA/DBA/Documents/urban_development/publications/standard-practice-for-design-and-construction-flexible-pipe.pdf)

### **Erosion and Sediment Control:**

Guidelines for Erosion and Sediment Control

<http://www.calgary.ca/UEP/Water/Pages/Specifications/Submission-for-approval-/Submission-for-Approval.aspx>

Field Manual for Erosion and Sediment Control

[http://www.calgary.ca/PDA/DBA/Documents/urban\\_development/publications/ESC-field-manual-2011.pdf](http://www.calgary.ca/PDA/DBA/Documents/urban_development/publications/ESC-field-manual-2011.pdf)

Environmental Regulatory Review and Responsibilities: Calgary Construction Sites

[http://www.calgary.ca/UEP/Water/Documents/Water-Documents/esc\\_regulatory\\_review\\_responsibilities.pdf](http://www.calgary.ca/UEP/Water/Documents/Water-Documents/esc_regulatory_review_responsibilities.pdf)

**General Links:**

Servicing Guidelines for new Single Family/Semi-detached/Duplex dwellings in the Developed Area

<http://www.calgary.ca/PDA/DBA/Documents/carls/residential-grades.pdf>

Standard Specification for Roads Construction

<http://www.calgary.ca/Transportation/Roads/Documents/Contractors-and-Consultants/Roads-Construction-2012-Standard-Specifications.pdf>

Standard Specifications for Landscape Construction

[http://www.calgary.ca/PDA/DBA/Documents/urban\\_development/publications/Landscape2012.pdf](http://www.calgary.ca/PDA/DBA/Documents/urban_development/publications/Landscape2012.pdf)

Standard Block Profile Specifications for CAD and manual formats

[http://www.calgary.ca/PDA/DBA/Documents/urban\\_development/publications/BlockProfile2008.pdf](http://www.calgary.ca/PDA/DBA/Documents/urban_development/publications/BlockProfile2008.pdf)

Consulting Engineers Field Services Guidelines

[http://www.calgary.ca/PDA/DBA/Documents/urban\\_development/CEFSG/Consulting-Engineers-Field-Services-Guidelines-6th-edition.pdf](http://www.calgary.ca/PDA/DBA/Documents/urban_development/CEFSG/Consulting-Engineers-Field-Services-Guidelines-6th-edition.pdf)

Standard Specifications for Street Lighting Construction

[http://www.calgary.ca/PDA/DBA/Documents/urban\\_development/publications/Streetlighting2006.pdf](http://www.calgary.ca/PDA/DBA/Documents/urban_development/publications/Streetlighting2006.pdf)

