## Cross Reference for Changes

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<td>VI.2.3.k</td>
<td>Add 110 volt wire location to the irrigation as built drawing.</td>
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<td>Add requirement for HDPE fusion inspection to the open trench inspection.</td>
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<td>VI.6.5.g</td>
<td>Add reference to irrigation wiring details.</td>
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<td>VI.6.5.j</td>
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<td>Sheet # 50a</td>
<td>100mm to 50mm HDPE Valve Connection - New</td>
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<td>Detail</td>
<td>Sheet # 50b</td>
<td>150mm to 50mm HDPE Valve Connection</td>
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<td>Detail</td>
<td>Sheet # 50c</td>
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INTRODUCTION

The purpose of the Development Guidelines and Standard Specifications – Landscape Construction is to provide:

- A list of appropriate development activities for each park type;
- Concept Planning Requirements at the Land Use / Outline Plan stage;
- Construction approval requirements;
- Construction plan requirements;
- Requirements for inspections during construction;
- Construction Completion Certificate requirements;
- Final Acceptance Certificate requirements; and
- Detail specifications for landscape construction.

Concept plans and construction plans shall reflect the policies and conditions approved at the Community Planning and Land Use / Outline Planning stages. Community Plans and Land Use / Outline Plans shall conform to Council approved policies and Federal/Provincial legislation. The following table illustrates these relationships:

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<th>Municipality Government Act &amp; Other Provincial and Federal Legislation</th>
<th>Inter-municipal Development Plans</th>
<th>The Calgary Plan and other Council-approved policies (e.g. Go Plan)</th>
<th>Joint Use Agreement</th>
</tr>
</thead>
<tbody>
<tr>
<td>City wide / larger in scope; multiple functions; partnerships</td>
<td>Inter-municipal Development Plans</td>
<td>The Calgary Plan and other Council-approved policies (e.g. Go Plan)</td>
<td>Joint Use Agreement</td>
</tr>
<tr>
<td>City wide; all open space</td>
<td>Inter-municipal Development Plans</td>
<td>The Calgary Plan and other Council-approved policies (e.g. Go Plan)</td>
<td>Joint Use Agreement</td>
</tr>
<tr>
<td>City wide; specific to an issue or aspect of open space. Examples include:</td>
<td>Open Space Plan</td>
<td>Open Space Plan</td>
<td>Open Space Plan</td>
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<tr>
<td>Urban Park Master Plan</td>
<td>Natural Areas Mgmt Plan</td>
<td>Stormwater Mgmt Plan</td>
<td>Bikeways/Pathways Plan</td>
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<tr>
<td>River Valleys Plan</td>
<td>Wetland Conservation Plan</td>
<td>Water Mgmt Strategic Plan</td>
<td>Sports Fields Mgmt Plan</td>
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<tr>
<td>Policy for a broad geographic area</td>
<td>Area Redevelopment Plans</td>
<td>Community Plans Area Structure Plans</td>
<td>Special Studies (e.g. Bow Valley Centre, CFB)</td>
</tr>
<tr>
<td>Plans for location / configuration of open space in a specific area (Implementation)</td>
<td>Land Use Amendments, Outline Plans and Tentative (Subdivision) Plans</td>
<td>Development Permits Review of Developer-built/Partnership projects</td>
<td>Design Development Plans for City park projects</td>
</tr>
<tr>
<td>Implementation of policy through development of a specific site or project</td>
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ACKNOWLEDGMENTS

In September 1993, The City of Calgary Parks committed to a full-scale review of their Development Guidelines and Standard Specifications for Landscape Construction. The approved process for conducting the review was to facilitate a series of workshops that would include participants from:

• the Urban Development Institute - Calgary;
• the Alberta Association of Landscape Architects;
• the Landscape Alberta Nursery Trades Association;
• the Alberta Irrigation Association; and
• The City of Calgary Parks

The resulting workshop series involved six different workshop groups, with members from each of the above organizations that were assigned to review and update, by consensus, specific sections of the 1993 Guidelines and Specifications. The series ran over a total of 6.5 days in the month of January 1994. The City of Calgary Parks would like to take this opportunity to cordially thank those 65 individuals who donated their time and effort toward the workshop series.

A further full-scale review of the Development Guidelines and Standard Specifications for Landscape Construction was conducted during 2004. It involved a series of negotiations between representatives of the Urban Development Institute and The City of Calgary Parks to obtain a collaboratively developed set of guidelines and standards for the construction of the City’s Open Space system. The dedication and effective communication skills of the members of the negotiation teams are what made this manual possible. Our sincere thanks go out to the following:

Urban Development Institute - Calgary’s Urban Landscape Committee and The City of Calgary Parks’ Negotiating Team
The Development Guidelines and Standard Specifications provided in the following sections are considered to be the normal practice for the construction of landscape elements. Their foundation is framed by the following policy documents: The Calgary Plan, Joint Use Agreement, Open Space Plan, Urban Parks Master Plan, Natural Areas Management Plan, Wetlands Conservation Plan, Storm-water Management Plan, Pathways/Bikeways Plan and Sports Fields Management Plan. The City of Calgary Parks, at their discretion, may consider alternatives to or relaxations of the Guidelines and Specifications when the Developer or their agent, or the Contractor or their agent, provides a written submission identifying the reasons for special considerations.
DEVELOPMENT ACTIVITIES
I. **PARKS**

1. **Development Activities and Responsibilities**

Table 1 illustrates responsibility for park development activities based on negotiations with the Urban Development Institute (UDI) and on The City of Calgary's Supply and Development Standards for parks and open space. The intent of the table is to provide the reader with a summary of the various types of parks and their appropriate level of development.

**TABLE 1: Responsibility for Park Development Activities**

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<th>Appropriate Development Activities</th>
<th>1 Sub-Neighbourhood Parks MSR</th>
<th>2 Neighbourhood Parks MR</th>
<th>3 Community Parks MR</th>
<th>4 District Parks MR</th>
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<td>NR</td>
<td>NR</td>
<td>NR</td>
<td>NR</td>
<td>NR</td>
</tr>
<tr>
<td>Exercise Equipment</td>
<td>NR</td>
<td>NR</td>
<td>NR</td>
<td>NR</td>
<td>NR</td>
</tr>
<tr>
<td>Game Tables</td>
<td>NR</td>
<td>NR</td>
<td>NR</td>
<td>N/A</td>
<td>NR</td>
</tr>
<tr>
<td>Picnic Tables</td>
<td>NR</td>
<td>NR</td>
<td>NR</td>
<td>N/A</td>
<td>N/A</td>
</tr>
<tr>
<td>Basketball/Volleyball</td>
<td>NR</td>
<td>NR</td>
<td>NR</td>
<td>NR</td>
<td>NR</td>
</tr>
<tr>
<td>Ball Diamond</td>
<td>NR</td>
<td>D</td>
<td>NR</td>
<td>D</td>
<td>N/A</td>
</tr>
<tr>
<td>Soccer Field</td>
<td>NR</td>
<td>D</td>
<td>D</td>
<td>D</td>
<td>D</td>
</tr>
</tbody>
</table>

*Current Development Responsibility*
### *Current Development Responsibility*

<table>
<thead>
<tr>
<th>Appropriate Development Activities</th>
<th>1 Sub-Neighbourhood Parks MSR</th>
<th>2 Neighbourhood Parks MR</th>
<th>3 Community Parks MR MSR</th>
<th>4 District Parks MR MSR</th>
<th>5 Linear Parks</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ice Rinks</td>
<td>N/A</td>
<td>N/A</td>
<td>C</td>
<td>C</td>
<td>NR</td>
</tr>
<tr>
<td>Tennis Courts</td>
<td>N/A</td>
<td>NR</td>
<td>C</td>
<td>C</td>
<td>NR</td>
</tr>
<tr>
<td>Bleachers</td>
<td>N/A</td>
<td>N/A</td>
<td>NR</td>
<td>C</td>
<td>C</td>
</tr>
<tr>
<td>Portable Washrooms</td>
<td>N/A</td>
<td>N/A</td>
<td>NR</td>
<td>C</td>
<td>C</td>
</tr>
<tr>
<td>Parking</td>
<td>N/A</td>
<td>N/A</td>
<td>NR</td>
<td>D</td>
<td>D</td>
</tr>
<tr>
<td>Football field</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
<td>C</td>
</tr>
<tr>
<td>400m Track</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
<td>C</td>
</tr>
<tr>
<td>Lighting</td>
<td>NR</td>
<td>NR</td>
<td>NR</td>
<td>NR</td>
<td>D</td>
</tr>
<tr>
<td>2m Asphalt or Non-asphalt Pathway</td>
<td>NR</td>
<td>NR</td>
<td>NR</td>
<td>NR</td>
<td>NR</td>
</tr>
</tbody>
</table>

*Current Development Responsibility*

D: Developer is responsible for appropriate development activity.

C: City/Community is responsible for appropriate development activity.

N/A: Development activity is not appropriate for the park type.

NR: Development activity is not required for the park type, however the Developer, City or community association may apply for its implementation.

### Definitions of Park Types Noted in Table 1

#### 1. Sub-Neighbourhood Parks

Municipal Reserves (MR), i.e. Tot lots, decorative parks or ornamental parks that are +/- 0.2 hectares (+/- 0.5 acres). These parks are part of the 10% reserve dedication.

#### 2. Neighbourhood Parks

Municipal Reserves (MR), i.e. Tot lots, decorative parks or ornamental parks that are 0.4 to 3.6 hectares (1.0 to 8.9 acres). These parks are part of the 10% reserve dedication.

#### 3. Community Parks

MR and/or Municipal School Reserves (MSR), i.e. Tot lots, school grounds, recreation grounds or community lease sites that are 3.6 to 8.8 hectares (8.9 to 22 acres). These parks are part of the 10% reserve dedication. The following types of school sites, with or without a community lease site, are defined as community parks:

- Public Elementary School (4 ha. / 10 acres)
- Public Junior High School (4.9 ha. / 12 acres)
- Public Elementary and Junior High Schools (6.9 ha. / 17 acres)
- Separate Elementary School (3.6 ha. / 9 acres)
Separate Elementary and Junior High school (4.9 ha. / 12 acres)

.4 District Parks

MR and/or MSR, i.e. School grounds, recreation grounds or community lease sites that are greater than or equal to 9.2 hectares (23 acres). These parks are not part of the 10% reserve dedication. The following type of school site, with or without a community lease site, is defined as a district park:

Public/Separate High School (9.2 ha. / 23 acres)

.5 Linear Parks

MR that has a minimum width of ten (10) metres and a maximum width of twenty (20) metres, and that accommodates a regional pathway or performs a linear recreation function by providing local or regional pathway links to educational, recreational, and open space features (e.g. natural environment parks) within and between communities. These parks are part of the 10% reserve dedication.

2. Minimum and Maximum Landscape Development Activities

A Developer is responsible to construct in accordance with the minimum and maximum landscape development standards indicated in Tables 2.1 to 2.4 and to the satisfaction of the Manager of The City of Calgary Parks for all local parks. Local parks are defined to be sub-neighbourhood parks, neighbourhood parks, community parks and district parks.

If a Developer or homeowners'/residents'/community association wishes to develop parks beyond the “maximum” standards, they must follow the corporate policy and procedures as approved by Council for “Enhanced Landscape Maintenance & Infrastructure” (also see “Irrigation of Boulevard and Medians” page 11 and “Optional Amenities” page 130). Contact the Parks Maintenance Agreement Coordinator (268-4734) for further details.
## .1 Sub-Neighbourhood Parks – MR

<table>
<thead>
<tr>
<th>Item</th>
<th>Quantity</th>
<th>Type/Comment</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Minimum</td>
<td>Maximum</td>
</tr>
<tr>
<td>Grading/Loaming</td>
<td>Entire site</td>
<td>Entire site</td>
</tr>
<tr>
<td>Turf</td>
<td>Entire site</td>
<td>Entire site</td>
</tr>
<tr>
<td>Trees</td>
<td>20 trees/.405 ha (1 acre)</td>
<td>40 trees/.405 ha (1 acre)</td>
</tr>
<tr>
<td>Irrigation</td>
<td>Entire site</td>
<td>Entire site</td>
</tr>
<tr>
<td>Benches</td>
<td>1 per site</td>
<td>5 per site</td>
</tr>
<tr>
<td>Dog bylaw sign</td>
<td>1 per play equipment area</td>
<td>1 per play equipment area</td>
</tr>
<tr>
<td>Walkways</td>
<td>As required</td>
<td>2.0m wide</td>
</tr>
<tr>
<td>Fencing</td>
<td>As required</td>
<td>3 sides of site if requested</td>
</tr>
<tr>
<td>Play equipment or other recreation equipment</td>
<td>If suited</td>
<td>If suited</td>
</tr>
<tr>
<td>Game tables</td>
<td>0 per site</td>
<td>2 per site</td>
</tr>
<tr>
<td>Picnic tables</td>
<td>0 per site</td>
<td>1 per site</td>
</tr>
<tr>
<td>Sports fields/Parking</td>
<td>Not suitable</td>
<td>Not suitable</td>
</tr>
<tr>
<td>Basketball/Volleyball</td>
<td>If suitable</td>
<td>If suitable</td>
</tr>
<tr>
<td>Garbage Receptacles</td>
<td>1 per site</td>
<td>1 per site</td>
</tr>
<tr>
<td>Shrubs</td>
<td>50 m²/ha</td>
<td>150 m²/ha</td>
</tr>
<tr>
<td>Retaining Walls</td>
<td>As required</td>
<td>As required</td>
</tr>
</tbody>
</table>
## .2 Neighbourhood Parks – MR

<table>
<thead>
<tr>
<th>Item</th>
<th>Quantity</th>
<th>Type/Comment</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Minimum</td>
<td>Maximum</td>
</tr>
<tr>
<td>Grading/Loaming</td>
<td>Entire site</td>
<td>Entire site</td>
</tr>
<tr>
<td>Turf</td>
<td>Entire site</td>
<td>Entire site</td>
</tr>
<tr>
<td>Trees</td>
<td>15 trees/.405 ha (1 acre)</td>
<td>30 trees/.405 ha (1 acre)</td>
</tr>
<tr>
<td>Irrigation</td>
<td>Entire manicured area except for</td>
<td>Entire site</td>
</tr>
<tr>
<td></td>
<td>community centre site.</td>
<td></td>
</tr>
<tr>
<td>Benches</td>
<td>2 per site</td>
<td>5 per site</td>
</tr>
<tr>
<td>Dog bylaw sign</td>
<td>1 per play equipment area</td>
<td>1 per play equipment area</td>
</tr>
<tr>
<td>Walkways</td>
<td>As required</td>
<td>2.0m wide</td>
</tr>
<tr>
<td>Fencing</td>
<td>As required</td>
<td>3 sides of site if requested</td>
</tr>
<tr>
<td>Play equipment or</td>
<td>If suited</td>
<td>1 per site</td>
</tr>
<tr>
<td>other recreation</td>
<td></td>
<td></td>
</tr>
<tr>
<td>equipment</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sport fields/Parking</td>
<td>Softball or soccer, as appropriate</td>
<td>-1-76m softball</td>
</tr>
<tr>
<td></td>
<td></td>
<td>-1 major soccer (minor overlap)</td>
</tr>
<tr>
<td>Game tables</td>
<td>0 per site</td>
<td>3 per site</td>
</tr>
<tr>
<td>Picnic tables</td>
<td>0 per site</td>
<td>3 per site</td>
</tr>
<tr>
<td>Basketball/Volleyball</td>
<td>0 per site</td>
<td>1 per site</td>
</tr>
<tr>
<td>Garbage Receptacles</td>
<td>1 per site</td>
<td>As per Trash Receptacles, page 120</td>
</tr>
<tr>
<td>Shrubs</td>
<td>0</td>
<td>100 m²/ha</td>
</tr>
<tr>
<td>Retaining Walls</td>
<td>As required</td>
<td>As required</td>
</tr>
</tbody>
</table>

Standard Specifications for Landscape Construction 2011
.3  **Community Parks – MSR, SR and MR**

<table>
<thead>
<tr>
<th>Item</th>
<th>Quantity</th>
<th>Type/Comment</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Grading/Loaming</strong></td>
<td>Entire site</td>
<td>As per spec</td>
</tr>
<tr>
<td>Turf</td>
<td>Entire site</td>
<td>As per spec</td>
</tr>
<tr>
<td>Trees</td>
<td>10 trees/.405 ha (1 acre)</td>
<td>Approved species</td>
</tr>
<tr>
<td>Irrigation</td>
<td>Entire manicured area except for SR &amp; community centre site.</td>
<td>Automatic, as per spec</td>
</tr>
<tr>
<td>Dog bylaw sign</td>
<td>1 per play equipment area</td>
<td>As per spec</td>
</tr>
<tr>
<td>Walkways</td>
<td>As required</td>
<td>Regional pathway 2.5m wide</td>
</tr>
<tr>
<td>Fencing</td>
<td>As required</td>
<td>Only post and cable and chain link</td>
</tr>
<tr>
<td>Play equipment or other recreation equipment</td>
<td>The provision of space only as per Site Planning Team Guidelines (Page 53)</td>
<td>To School needs or preference if desired</td>
</tr>
<tr>
<td>Ball Diamonds/Parking</td>
<td>As per Site Planning Team Guidelines (page 53)</td>
<td>-15 stalls per 76m softball -As per spec</td>
</tr>
<tr>
<td>Benches</td>
<td>2/ball diamond</td>
<td>Players benches</td>
</tr>
<tr>
<td>Portable Washrooms</td>
<td>0/ball diamond</td>
<td></td>
</tr>
<tr>
<td>Bleachers</td>
<td>0/ball diamond</td>
<td>2/ball diamond</td>
</tr>
<tr>
<td>Soccer Fields/Parking</td>
<td>As per Site Planning Team Guidelines (Page 53)</td>
<td>-20 stalls per Major/minor soccer -As per spec</td>
</tr>
<tr>
<td>Ice Rink</td>
<td>The provision of space only for one rink within community lease</td>
<td>1 per community lease site</td>
</tr>
<tr>
<td>Tennis Courts</td>
<td>The provision of space only for two courts within community lease</td>
<td>4 per community lease site (boards, lights, hard surfaced, nets)</td>
</tr>
<tr>
<td>Field Event Area</td>
<td>The provision of space only as per Site Planning Team Guidelines (Page 53)</td>
<td>The provision of space only as per Site Planning Team Guidelines (Page 53)</td>
</tr>
<tr>
<td>Garbage Receptacles</td>
<td>1 per site</td>
<td>2 Haul All per site</td>
</tr>
<tr>
<td>Shrubs</td>
<td>50 m$^2$/ha</td>
<td>70 m$^2$/ha</td>
</tr>
<tr>
<td>Retaining Walls</td>
<td>As required</td>
<td>As required 1.5m height with mowing strip when abutting turf areas</td>
</tr>
</tbody>
</table>
### District Parks – MSR, SR and MR

<table>
<thead>
<tr>
<th>Item</th>
<th>Quantity</th>
<th>Minimum</th>
<th>Maximum</th>
<th>Type/Comment</th>
</tr>
</thead>
<tbody>
<tr>
<td>Grading/Loaming</td>
<td>Entire site</td>
<td>Entire site</td>
<td>Entire site</td>
<td>As per spec</td>
</tr>
<tr>
<td>Turf</td>
<td>Entire site</td>
<td>Entire site</td>
<td>Entire site</td>
<td>As per spec</td>
</tr>
<tr>
<td>Trees</td>
<td>10 trees/.405 ha (1 acre)</td>
<td>15 trees/.405 ha (1 acre)</td>
<td>Approved species</td>
<td></td>
</tr>
<tr>
<td>Irrigation</td>
<td>Entire manicured area except for SR and community centre site.</td>
<td>Entire manicured area except for SR site.</td>
<td>Automatic, as per spec</td>
<td></td>
</tr>
<tr>
<td>Walkways</td>
<td>As required</td>
<td>Regional pathway 2.5m wide</td>
<td>As per spec</td>
<td></td>
</tr>
<tr>
<td>Fencing</td>
<td>As required</td>
<td>2 sides of site if requested</td>
<td>Only post and cable and chain link</td>
<td></td>
</tr>
<tr>
<td>Play equipment or other recreation equipment</td>
<td>The provision of space only as per Site Planning Team Guidelines (Page 53)</td>
<td>1 per site</td>
<td>To community needs or preference if desired</td>
<td></td>
</tr>
<tr>
<td>Dog Bylaw Sign</td>
<td>1 per play equipment area</td>
<td>1 per play equipment area as required</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ball Diamonds/Parking</td>
<td>As per Site Planning Team Guidelines (Page 53)</td>
<td>As per Site Planning Team Guidelines (Page 53)</td>
<td>-15 stalls per 76m softball -As per spec</td>
<td></td>
</tr>
<tr>
<td>Benches</td>
<td>2/ball diamond</td>
<td>2/ball diamond</td>
<td>Players benches</td>
<td></td>
</tr>
<tr>
<td>Portable Washrooms</td>
<td>0/ ball diamond</td>
<td>1/ ball diamond</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Bleachers</td>
<td>0/ ball diamond</td>
<td>2/ ball diamond</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Soccer Fields/Parking</td>
<td>As per Site Planning Team Guidelines (Page 53)</td>
<td>As per Site Planning Team Guidelines (Page 53)</td>
<td>-20 stalls per Major/minor soccer -As per spec</td>
<td></td>
</tr>
<tr>
<td>Foot ball Field</td>
<td>As per Site Planning Team Guidelines (Page 53)</td>
<td>As per Site Planning Team Guidelines (Page 53)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ice Rink</td>
<td>The provision of space only for one rink within community lease</td>
<td>1 per community lease site</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Tennis Courts</td>
<td>The provision of space only for two courts within community lease</td>
<td>4 per community lease site (boards, lights, hard surfaced, nets)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Field Event Area</td>
<td>The provision of space only as per Site Planning Team Guidelines (Page 53)</td>
<td>1, 400 metre track per athletic field.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Garbage Receptacles</td>
<td>1 per site</td>
<td>2 Haul All per site</td>
<td>Near walkway</td>
<td></td>
</tr>
<tr>
<td>Shrubs</td>
<td>50 m²/ha</td>
<td>70 m²/ha</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Retaining Walls</td>
<td>As required</td>
<td>As required</td>
<td>1.5m height with mowing strip when abutting turf areas</td>
<td></td>
</tr>
</tbody>
</table>
3. Local Parks Development Charge

The Urban Development Institute and The City of Calgary agreed to the implementation of a development charge for local parks subject to the following conditions:

.1 All sub-neighbourhood and neighbourhood parks will be dedicated and developed at the expense of the dedicating Developer with no recovery.

.2 All pathways, whether regional, local or a connection to the carriageway of a major adjacent road, will be provided at the sole expense of the dedicating Developer with no recovery.

.3 All community and district parks are to be dedicated and developed by the dedicating Developer and may be subject to cost recovery as provided for below.

a. If one Developer owns the entire community and is also responsible for the dedication and development of the community and district parks, there will be no acreage assessment for community and district parks in the said community. The Developer will make arrangements, at the Outline Plan stage, for the dedication and development of the community and district park, according to the timing as determined by the Director of The City of Calgary Parks.

b. If there is, however, more than one Developer within the community, then all lands within the community shall pay acreage assessments to The City. These community and district park development charges shall be recovered by the dedicating Developers of community and district parks in accordance with the ratio of the ownership of the joint use sites on a proportionate share basis.

c. If there is more than one Developer within a community and all of the community and district parks are to be provided at the expense of a single Developer, then all lands within the community other than the lands Owned or controlled by the district and community park dedicating Developer shall pay development charges to The City.
II. BOULEVARDS, MEDIANS and TRAFFIC ISLANDS

1. Boulevard
   Grade, loam and seed or sod to grass. All trees planted in a boulevard must be approved by The City of Calgary Parks and Transportation Roads.

2. Median
   Grade, loam and seed or sod to grass. All trees planted in grassed median must be approved by The City of Calgary Parks and Transportation Roads.

3. Traffic Island

   If less than five hundred (500) square metres in area:
   
   a. hard surface low maintenance material as approved by The City of Calgary Parks and Transportation Roads.

   If greater than five hundred (500) square metres in area:
   
   a. grade, loam and seed or sod to grass;
   
   b. 50mm P.W.S. and automatic pop-up irrigation system;

   All trees planted in a traffic island must be approved by The City of Calgary Parks and Transportation Roads.

   All traffic islands will have a 0.50m concrete maintenance strip installed directly behind the curb.

   Boulders, signs and other obstacles must be:
   
   a. at least 0.75m back from the curb;
   
   b. a minimum of 4.5m from the bullnose or back of walk extended through the island, whichever is greater, adjacent to the primary streets;
   
   c. a minimum of 4.5m from 'any' bullnose adjacent to primary streets on irregular shaped islands; and
   
   d. a minimum of 3.0m from the bullnose inside the cul-de-sac.

   The minimum width of traffic islands containing coniferous trees shall be 7.0m.
4. Irrigation of Boulevards and Medians

The following is The City of Calgary’s criteria for private irrigation systems proposed within boulevards and medians. Note that irrigating boulevards and medians is a non-standard practice; one not encouraged by The City of Calgary for safety and water conservation reasons.

1. If a Developer or homeowners'/residents/community association wishes to irrigate boulevards or medians within a community, they must receive approval from The City of Calgary Roads and enter into a Landscape Maintenance Agreement with The City as per the corporate policy and procedures as approved by Council for “Enhanced Landscape Maintenance & Infrastructure.” Contact the Parks Business Strategist 403-221-3960 for further details.
   NOTE: The intent to enter into a Landscape Maintenance Agreement must be identified at the Tentative Plan Stage via a letter of intent or other suitable mechanism.


3. Private Water Service – This service must be independent of any other park irrigation. It must be for irrigation in the road Right-of-Way only. Supply of double check valve and meter must be to City Standard (Parks and Water Services). Irrigation Controller must not be tied to The City’s Centralized Irrigation Control System or that of any park.

4. Sleeving shall be either C900 PVC (bell and spigot) pipe bedded as per backfill material specification (Pg. 156, 6.12a and 6.12b), installed below the bed for a pathway, sidewalk, driveways or PVC SDR 35 (bell and spigot) pipe to City of Calgary Standard specifications for Sewer Construction Sec. 402.02.02 or approved equal.
   NOTE: Sleeving to be bedded in accordance to The City of Calgary Standard Specifications for Sewer Construction.

5. An amenity removal and landscape rehabilitation fund, in an amount determined by The City of Calgary Parks, shall be provided for the removal and landscape rehabilitation of any irrigation component visible at the surface of the landscape (e.g. valve boxes, irrigation heads, etc.), and for the killing of the Parks Water Service to the mainline.
III. PUBLIC UTILITY LOTS (PUL) and RIGHTS-of-WAY (RoW)

Grade, loam and seed or sod to grass; chain link, wood screen or other type of fencing as approved by The City of Calgary Parks on the flankage and rear of lots that abut RoW.; post and cable barrier where PUL or RoW. abuts lane.

IV. DRY PONDS

The dual use of MR and MSR lands for dry ponds should be supported, provided their location, size and recreation, education and/or conservation functions are not prejudiced in an effort to accommodate the ponds. The following are appropriate development guidelines and activities for MR and MSR sites containing dry ponds.

1. Development Guidelines

.1 Dry ponds shall not be located within MR lands that are classified as environmentally significant, Special Protection Natural Environment Parks or Major Natural Environment Parks.

.2 Storm-water dry pond facilities should be designed and operated so as to be fully integrated into the neighbourhood setting.

.3 Storm-water dry pond facilities may receive 100 percent credit where located on reserve lands, provided that the reserve lands meet all City planning criteria for location, size and purpose and the reserve function is not prejudiced.

.4 In the event that the location of a storm-water dry pond facility on reserve land results in an over-dedication of reserve, compensation for said over-dedication will be deemed to be one dollar. Storm-water dry ponds will be limited to 1/3 of approved reserve land.

.5 In the event that a storm-water dry pond facility is located on a Public Utility Lot (PUL) and results in the 30 percent road/utility dedication being surpassed, compensation for the dry pond PUL will be deemed to be one dollar. Site development shall be similar to standards for reserve lands as noted herein.

.6 All overland storm routes and dry pond areas shall be signed, at the Developer's expense, as dual function areas to the satisfaction of The City Engineer and the Director of The City of Calgary Parks.

.7 Storm-water dry pond facilities and overland drainage routes to dry ponds are not to be located on school or community building envelopes. However, in retrofit situations, this restriction may be reviewed on a site-
by-site basis.

.8 Where dry ponds are included in MR or MSR sites, it is intended that these sites (including the school building envelope of the MSR site) shall be developed as a "turn key" operation and that all sodding, seeding, landscaping, and user amenities be installed as soon as possible.

.9 The Developer, at his expense, will be required to excavate and grade the dry pond areas in accordance with The City of Calgary Water Services Storm-water Management & Design Manual. The area of inundation must be sodded to establish grass cover for erosion control and water quality. Areas above the level of inundation may be seeded. These seeded and sodded areas shall be maintained for three (3) years.

.10 Notwithstanding Item .9, the Developer shall maintain MSR or MR sites less than four acres in area for three years. On sites larger than four acres, the limits of the three year maintenance period will be determined through negotiations between the Developer and the Director of The City of Calgary Parks. The maintenance cost during the negotiated maintenance period of the MSR or MR sites shall be at the sole expense of the Developer.

.11 The Developer will be encouraged to develop the lots adjacent to the dry pond areas and to establish grass in the rear yards at the earliest possible date.

2. Development Activities

.1 The Developer at their cost shall install service connections (sanitary, storm, water) from the mains to the property line of affected S.R. sites unless otherwise directed by the City Engineer.

.2 The Developer at their cost shall install pathways as required in accordance with the Open Space Plan on all parks that have storm-water retention ponds.

.3 Irrigation shall be provided as required under the terms of the Standard Development Agreement. In active sport areas irrigation is required.

.4 Benches will be provided at the Developer's cost as follows:

a. four benches per kilometre of lineal pathway, and
b. two benches per play structure.
.5 **Trash receptacles** will be provided at the Developer’s cost as follows:

- a. two per ball diamond or soccer pitch,
- b. one per playground structure, and
- c. two per kilometer of lineal pathway.

.6 **Playground equipment** – Dry ponds should not be located within areas designed to accommodate playground equipment.

.7 **Goal posts and backstops** shall be provided and installed at the Developer’s cost where deemed appropriate by The City of Calgary Parks.

.8 **Shrubs** provided should be in accordance with the "Minimum and Maximum Landscape Development Activities" tables on pages 4 through 8.

.9 **Trees** shall be provided on public lands in accordance with the Urban Forest Management Policy as negotiated in the Standard Development Agreement.

.10 **Subsurface drainage systems** are required for all sports field areas within a dry pond.

.11 **A hard surface 3.0m ramp** to all levels of a dry pond is to be provided.

.12 **Soccer fields and ball diamonds** located within dry ponds shall meet the performance criteria specified in Item I.3.6b on page 55.

.13 **Hockey Rinks, Lacrosse Fields and Tennis Courts**, located within dry ponds, shall be placed above the 1:50 year flood level.

.14 **Dry Pond walls** should undulate in order to provide visual relief.

V. **WATER MANAGEMENT STRATEGIC PLAN (WMSP) POLICY**

In June of 2000, City Council approved the Parks Water Management Strategic Plan (CSPS 041). This document outlines policies, strategies and practices that guide the maintenance, growth and development of The City’s landscape water delivery systems.

The purpose of the Water Management Strategic Plan is to provide a framework for City staff, community partners and the development industry to move towards an overall management system that balances water conservation and financial sustainability while supporting healthy plant material.

The Water Management Strategic Plan uses two terms in the identification of the policy statements contained within the document. These terms are “Policy”, new
or existing, and “Practice”, new or existing. Through the use of these terms The City differentiates how the policy statement is to be implemented. A policy statement that has the term “Policy” in its heading is considered to be implemented without exception unless, previously defined within the policy statement. A policy statement that has the term “Practice” in its heading allows the development industry to evaluate the practicality and cost benefit on a project-by-project basis, prior to implementing the policy. “Practices” may also relate to policy statements that refer to educational and partnership opportunities, which may not require mandatory participation from the development industry or the community partners.

The Water Management Strategic Plan is available on The City of Calgary website.

VI. ENVIRONMENTAL RESERVES and ENVIRONMENTALLY SIGNIFICANT AREAS

The following zone system has been developed by The City of Calgary Parks with the intent of providing quantifiable rational for the appropriate development or protection in Environmental Reserves (ER) or those Municipal Reserves (MR) that are allocated for the protection of Environmentally Significant Areas (ESA’s).

1. Environmental Reserve Setback Guidelines

In accordance with section 664(1)(c) of the Municipal Government Act, Environmental Reserve setback zones will be determined with the following factors:

1. Water body Type

A site-specific variable setback width shall be applied to water bodies qualifying as Environmental Reserve based on the following water body types:

A. Stream Order

1st order: 6m setback
*typically a vegetated ‘draw’ that conveys flow primarily during periods of moderate to heavy rainfall and may not convey flow during other periods.*

2nd order: 30m setback
_Formed when two first order streams meet, e.g. West Nose Creek_

3rd order: 50m setback
_trIBUTARY OF TWO 2ND ORDER STREAMS (E.G. NOSE CREEK)_

4th order: 50m setback
_trIBUTARY OF TWO 3RD ORDER STREAMS (E.G. BOW RIVER, ELBOW RIVER)_

B. Wetland Class

Stewart and Kantrud Class 3-6 wetlands, considered to be Environmental
Reserve Wetlands under the *Wetland Conservation Plan* will have a 30m base setback applied to them. Wetlands that are engineered to serve as storm-water management facilities (‘storm-water wetlands’), may, at the discretion of the Administration have an ER setback width of less than 30m applied to them if the primary function of the wetland is for the provision of storm-water treatment rather than functioning as a natural wetland. Appropriate design elements (such as buffer strips, treatment swales or site grading) would be required to demonstrate that the water body would not be subject to surface or subsurface pollutant loading.

Setback widths should be determined as early as possible in the planning process. An initial review of water bodies and recommended setback widths should be done by the Area Structure Plan stage of planning and confirmed later in the development approvals process.

### 2. Setback modifiers

The base setback width will modified on a site-specific basis according to the following factors:

**A. Slope**

The setback distance will increase on sloped lands adjacent to a water body by a factor of one point five (1.5) metres for every percentage of slope increase above 5%. There will be no adjustment factor for slopes between 0 and 5%

**B. Cover type**

Where the lands adjacent to the water body are disturbed, or have a non-native riparian zone that is determined to have lower ability to prevent non-point pollutants from entering the water body, the base setback width should be doubled, or, the base setback zone should be restored to a condition that will allow it to effectively buffer the water body from pollutants.

**C. Hydraulic connectivity**

Applies to areas of land adjacent to a water body with shallow groundwater deemed to be ‘under the influence of a surface water’, namely there is hydraulic connectivity between groundwater and surface water, such as the alluvial aquifer of streams. If it is demonstrated that pollution of shallow groundwater would reasonably lead to the pollution of a directly adjacent surface water body, then that land should be included within the ER setback zone.
### Summary Table

<table>
<thead>
<tr>
<th>Setback type</th>
<th>Base setback</th>
<th>Adjustment Factors</th>
<th>Cover type</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Slope adjustment</td>
<td>Hydraulic connectivity to groundwater*</td>
</tr>
<tr>
<td>1\textsuperscript{st} order stream</td>
<td>6m</td>
<td>+1.5m/% slope over 5%</td>
<td>n/a</td>
</tr>
<tr>
<td>2\textsuperscript{nd} order stream</td>
<td>30m</td>
<td>“</td>
<td>Areas of land adjacent to water bodies that have shallow groundwater connectivity to surface water are taken as ER.</td>
</tr>
<tr>
<td>3\textsuperscript{rd}–4\textsuperscript{th} order stream</td>
<td>50m</td>
<td>“</td>
<td>“</td>
</tr>
<tr>
<td>Class 3-6 wetlands *</td>
<td>30m</td>
<td>“</td>
<td>“</td>
</tr>
</tbody>
</table>

* This process is intended for use after the ER boundaries are identified and not as a method of determining ER definition. “See Glossary of Terms, page 17, item 3.1 for ER definition.
### 2. Criteria for ER/Natural Environment Parks (MR)

<table>
<thead>
<tr>
<th>Criteria</th>
<th>Preservation</th>
<th>Restoration</th>
<th>Disturbed</th>
</tr>
</thead>
<tbody>
<tr>
<td><em>Native Condition</em> (evaluated by % of expected native plant communities)</td>
<td>Near Native</td>
<td>Portion of Habitat Area that is disturbed in a natural area</td>
<td>Area that is in introduced condition and will likely harm nearby natural area</td>
</tr>
<tr>
<td><em>Sensitivity</em> (Refers to the potential for unmitigated damage)</td>
<td>High Sensitivity</td>
<td>Moderate Sensitivity</td>
<td>Low Sensitivity</td>
</tr>
<tr>
<td><em>Resource Significance</em> (Refers to the zone’s significance to the future park)</td>
<td>Resource significant to future park in existing condition</td>
<td>Resource significance to future park area to warrant enhancement</td>
<td>Will require improvement to not have a negative impact on future park area</td>
</tr>
<tr>
<td><em>Habitat Type/Vegetation Community</em> (Viable condition)</td>
<td>Aspen Forest, Balsam Poplar, White Spruce, Upland Tall Shrub, Riverine Tall Shrub, Low Shrub, Native Grassland, Wetland</td>
<td>Non Native Grassland, Disturbed vegetation communities</td>
<td>Non Native Grassland, Disturbed vegetation communities</td>
</tr>
<tr>
<td><em>Archaeological/Historical</em></td>
<td>Present/No Evidence</td>
<td>Present/No Evidence</td>
<td>No Evidence</td>
</tr>
<tr>
<td><em>Natural System</em></td>
<td>Part</td>
<td>Part</td>
<td>Not significantly</td>
</tr>
</tbody>
</table>
3. Development Activities for ER/Natural Environment Parks (MR)

<table>
<thead>
<tr>
<th>Development Activities</th>
<th>Preservation</th>
<th>Restoration</th>
<th>Disturbed</th>
</tr>
</thead>
<tbody>
<tr>
<td>Development Encroachment</td>
<td>None</td>
<td>Agreement between parties (site by site basis)</td>
<td>Agreement between parties (site by site basis)</td>
</tr>
<tr>
<td>Utilities Encroachment</td>
<td>None</td>
<td>Agreement between parties (site by site basis)</td>
<td>Where required</td>
</tr>
<tr>
<td>Park Amenity Construction</td>
<td>For preservation purposes only</td>
<td>Where required</td>
<td>Where required</td>
</tr>
<tr>
<td>Fencing</td>
<td>Always</td>
<td>Always</td>
<td>Optional</td>
</tr>
<tr>
<td>Native Seed/Sod Planting (Species to be submitted and approved)</td>
<td>N/A</td>
<td>Always</td>
<td>Optional (Type)</td>
</tr>
<tr>
<td>Non-Native Seed/Sod Planting (Species to be submitted and approved)</td>
<td>N/A</td>
<td>No</td>
<td>Optional (Type)</td>
</tr>
<tr>
<td>Restoration/Reclamation Signage</td>
<td>N/A</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Irrigation</td>
<td>N/A</td>
<td>Overland</td>
<td>Overland</td>
</tr>
<tr>
<td>Maintenance Period</td>
<td>None</td>
<td>until established to the satisfaction of The City of Calgary Parks</td>
<td>until established to the satisfaction of The City of Calgary Parks</td>
</tr>
<tr>
<td>Restoration Plans (see page 29)</td>
<td>N/A</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Weed/Pest Management/Control</td>
<td>Yes for maintenance time period</td>
<td>Yes for Maintenance time period</td>
<td>Yes for maintenance time period</td>
</tr>
<tr>
<td>Departmental Checks</td>
<td>Regular</td>
<td>Yearly</td>
<td>Regular</td>
</tr>
<tr>
<td>Native Tree/Shrub Planting (Species to be submitted and approved)</td>
<td>N/A</td>
<td>As Required</td>
<td>Optional (Type)</td>
</tr>
<tr>
<td>Non-Native Tree/Shrub Planting (Species to be submitted and approved)</td>
<td>N/A</td>
<td>No</td>
<td>Optional (Type)</td>
</tr>
</tbody>
</table>
4. Glossary of Terms

1. Environmental Reserve

   See the Municipal Government Amendment Act, 1995; Chapter 24; Part 17; page 37; section 616(e).

2. Municipal Reserve

   See the Municipal Government Amendment Act, 1995; Chapter 24; Part 17; page 37; section 616(o).

3. Environmentally Significant Area

   A natural area site that has been inventoried prior to potential development and which because of its features or characteristics is significant from an environmental perspective to Calgary and has the potential to remain viable in an urban environment. A site is listed as an Environmentally Significant Area on the basis of meeting one or all of the criteria listed in Appendix C of The City of Calgary Parks Open Space Plan.

4. Preservation Zone

   Implies intent to maintain a natural environment in its present condition. See The City of Calgary Parks Natural Area Management Plan (NAMP).

5. Restoration Zone

   Implies intent to improve an area to near its natural and native condition. Such an area plays a role in the nearby natural system or vegetation community.
6. **Disturbed Zone**

   An ER or Natural Environment Park (MR) that is not substantially in its natural and native condition, and is cut off from the nearby natural system or vegetation community.

7. **Native**

   Species of animal or plant that have not been introduced by people or their direct activity.

8. **Near Native Condition**

   A vegetation community is not dominated by introduced species or seriously affected by damage.

9. **Sensitivity**

   Measures the amount of un-mitigable damage that a particular vegetation community or species can withstand.

10. **Resource Significance**

    Refers to the level of importance of the area in question to a future park area.

11. **Vegetation Community**

    A group of populations of plants in a given area.

12. **Historic/Archaeological**

    Refers to written/prewritten evidence/artifacts.

13. **Natural System**

    A group of areas that are ecologically dependent.

14. **Development Encroachment**

    A non-legal or non-judgmental term which refers to development activities in an ER.

15. **Utility Encroachment**

    Implies a non-legal or non-judgmental term which refers to utility development (i.e. natural gas, sewer, electrical, etc.) in an ER.
16. **Park Amenity**

A park development project, such as pathway, trail, bench, or viewing platform.

17. **Non Native**

Any introduced species of animal or plant.

18. **Restoration**

The efforts to restore a site to near native condition.

19. **Reclamation**

The efforts to improve a disturbed site’s condition.

20. **Naturalization**

The process of leaving a disturbed site to natural processes.

21. **Rehabilitation**

The above three terms – i.e. the efforts to restore a site to near native condition, or the efforts to improve a disturbed site’s condition, or the process of leaving a disturbed site to natural processes.

22. **Natural Environment Park**

See The City of Calgary Parks Open Space Plan, page 103.

VII. **DIRECT CONTROL SITES (DC)**

As DC sites are not property under the ownership of The City of Calgary they should not share an irrigation water service with a park property. The City of Calgary Parks will not inspect CCC or FAC DC sites as they are private property.
GENERAL GUIDELINES
I. CONCEPT PLAN REQUIREMENTS

Concurrent with the submission of the Outline Plan, the Developer is responsible for the submission and receipt of approval of Concept Plans prior to Outline Plan approval for all Municipal Park and Open Space areas.

A Concept Plan is intended to be a simple, written and drawn representation of the intended function of the MR and Open Space areas within an Outline Plan. Only freehand bubbles and other abstract symbols are expected within the representation, although computer generated drawings will also be accepted.

Since Concept Plans are precursors to the development of Layout Plans (page 27) and Grading Plans (page 30), detailed information will be presented as appropriate. Further, it is understood by both the Developer and The City of Calgary Parks that not all technical, grading and utility details, among others, are known at the time of submission of Concept Plan, but that best efforts will be made to represent the future intended use of the MR and Open Spaces by use of the Concept Plan.

The Concept Plan should:

- Locate and identify the major functions / spaces / constructed features with respect to the site;
- Show the relationship of the functions / spaces / constructed features with respect to each other;
- Show the relationship of the site to its surrounding land uses;
- Determine a preliminary resolution of technical requirements;
- Indicate the location of the utility rights-of-way within the Parks and Open Space areas; and
- Indicate existing grades, proposed direction of drainage, slope percentage and adjacent land use information if the data is available.

Each Concept Plan should contain the following information:

1. Theme and Function

Indicate the type of Municipal Park and Open Space area and its associated theme/function. The following are a few examples:

<table>
<thead>
<tr>
<th>Park Type</th>
<th>Park Theme and Function</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sub-Neighbourhood Park</td>
<td>Child oriented, active recreation area</td>
</tr>
<tr>
<td>Linear Park</td>
<td>Pathway linkage within a natural area</td>
</tr>
</tbody>
</table>
Appropriate types of Municipal Park and Open Space areas are:

1. Sub-Neighbourhood Park
2. Neighbourhood Park
3. Community Park
4. District Park
5. Linear Park
6. Storm Water Pond
7. Storm Water Wetland
8. Storm Water Dry Pond
9. Environmental Reserve
10. Environmentally Significant Area

Notes:

a. Definitions and/or appropriate levels of development for each of the above can be found in the “Open Space Development Activities” section (page 9).

b. If Environmental Reserves and Environmentally Significant Areas are not developed or disturbed through the development of the subdivision a concept plan simply stating so will be acceptable.

II. CONSTRUCTION APPROVAL REQUIREMENTS

Prior to commencing landscape work on any park or public land within the city boundaries, the Contractor may confirm the appropriate approval process with the Parks Coordinator – Development for north areas tel. 403-268-1334 or central and south areas tel. 403-268-1376 (see Parks Inspection Boundaries map page 36). Parks will copy the Developer on all correspondence resulting from landscape construction drawing submissions. To facilitate this, all submissions for the approval by Parks of landscape construction drawings shall include the Developer's name, company and address, and the appropriate contact information for the Developer's Project Manager.

The following requirements generally apply to the various forms of development as undertaken:

<table>
<thead>
<tr>
<th>Construction Type</th>
<th>Requirements for Approval</th>
<th>Time for Review and Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Utility and Roadwork</td>
<td>2 sets of drawings folded and collated into sets.</td>
<td>10 working days</td>
</tr>
<tr>
<td>2. Landscape Construction</td>
<td>7 sets of drawings folded and collated into sets, to Parks for new subdivisions.</td>
<td>15 working days</td>
</tr>
<tr>
<td>(Grading, loaming, seeding, irrigation, planting, hard surface treatments, play structures, site structures, etc.)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
### III. CONSTRUCTION PLAN REQUIREMENTS

The following information will be provided with any drawings submitted to The City of Calgary Parks Planning and Development Services for construction approval. Landscape construction drawings are to be submitted only by Registered Landscape Architects.

**NOTE:** The title block for landscape drawing layout, as made available by Parks, accommodates the Landscape Architect's stamp and a Parks approval stamp. All plans are to be prepared in ink using an accepted drafting standard.

#### 1. General Requirements

1. All landscape construction **plans** shall be sealed and signed by a Registered Landscape Architect with current membership in the Canadian Society of Landscape Architects.

   **NOTE:** Time for Review and Comment is assuming all submissions are complete.

   Submit two (2) copies of reproducible Mylars® drawings for approval within 30 days of the review date on the construction drawings. One (1) Mylars® drawing set will be sent back to the Consultant for their records.

   All construction plans should provide the development agreement phase boundary on the key plans. This will be used by the Parks Development Inspector to ensure that all components within the phase are complete as per the specific groupings identified in item .2; page 37.

   **NOTE:** For information on Utility Line Assignment submissions contact The City business unit Infrastructure Information Services – Access Solutions, tel. 403-268-5807.
Irrigation Association, Falls Church, VA. The certified designer must be in good standing with the association.

3. All drawings are to be submitted on The City of Calgary Parks' title block. The title block template is available from The City of Calgary Parks Planning and Development Service, contact the Park Coordinator – Development, for north areas tel. 403-268-1334 or central and south areas tel. 403-268-1376 (see Parks Inspection Boundaries map page 36).


5. North arrow.

6. Key plan oriented in same direction as site plan.

7. Legal description and zoning of site and property lines including bearings and dimensions. If the site has a municipal address, include it in the plan.

8. Land uses of surrounding parcels (i.e. residential, commercial, industrial, etc.).

9. Utility locations and legal easements, Right-of-Ways, etc.

10. Curb lines, sidewalk, utility poles, fences and any other boundary condition.

The following information shall apply to specific plans in conjunction with the information noted above.

2. Demolition Plan

1. Labeled as "Demolition."

2. Existing above & below grade features to be protected & to be removed.

3. Existing vegetation.

4. Existing irrigation.

3. Layout Plan

1. Labeled as "Layout."

2. Existing features to be saved.

3. Location of proposed structures and features.
4. Layout of playground as per CSA guidelines, including non-encroachment zones.

5. Location of dog bylaw signs, restoration/reclamation signs, pathway signs (item n. ‘Signage’, page 100), and trail signs (item m. ‘Signage’ page 105).

6. Identify and label the following park areas:

   a. **Preservation Zones**
   Preservation areas are portions of parks, which are to remain in their natural condition. The layout plan should identify the significance of the preservation areas, such as their habitat types and the grouping of vegetative communities that may support their ecological systems. The plan should also indicate how controlled human use is to be accommodated within the preservation areas.

   b. **Naturalized Zones**
   Naturalized areas are portions of parks, which are proposed for reclamation to as natural a state as possible. They include manicured areas and/or disturbed or partially disturbed natural areas. Vegetative cover shall include native grasses and/or trees and shrubs that may support the ecological system. Once established, maintenance is to be limited to fire and weed control as well as garbage removal. The plan should also indicate how controlled human use is to be accommodated within the naturalized area.

   c. **Manicured Zones**
   Manicured areas are portions of parks that have defined 'special use areas'. They imply some development as identified in the minimum standards and maintenance that is relatively intense compared to preservation and naturalized areas. Manicured areas include areas where larger numbers of park users are anticipated; i.e. sports fields, playgrounds, community uses.

4. **Planting Plan**

   1. Labeled as "Planting."

   2. Major items associated with "Layout" but not including dimensions, i.e. walkways, roads, curbs, hard surface areas, fountains, other structures, natural areas.

   3. Plant material shown with crowns at 2/3 maximum size as noted in "Alberta Horticultural Guide" (Alberta Agriculture, AGDEX No. 200/01).
4. Outline of planting beds.

5. Proposed contours at half (½) metre intervals.

6. Utilities/ROW

7. Plant list identifying species (botanical and common name), quantities, sizes, habit, spacing and specific remarks as required.

8. Details as required but which are not included in Standard Specifications.

5. ER/Natural Environment Park (MR) Restoration Plan for Approved Encroachments

.1 Labeled as "Restoration Plan."

.2 Pre-development biophysical inventory of the site. At a minimum, the inventory will include:

- An inventory of plant species composition and an assessment of relative abundance.
- Soils described using the Canadian system of Soil Classification – classified to Soil Group. Provide texture and horizon depths.
- Site description sufficient to establish the ecological characteristics of the site including:
  - Exposure (i.e. south facing, dry and exposed);
  - Slope position (i.e. mid-slope, slope crest, level); and
  - Topography (i.e. rolling with micro-topographic variation of approximately 5.0m – hummocky).
- Sufficient detail must be provided so that the current condition of the site can be assessed and used to determine the desired objectives of the restoration.

.3 Site preparation methods, i.e. a season of weed control prior to reseeding.

.4 Seed mix(es) and application rate(s) specific to the site conditions.

.5 Seeding method (hydroseeding, brillion, etc.)

.6 Plant material shown with crowns at 2/3 maximum size as noted in "Alberta Horticultural Guide."

.7 Proposed contours at half (½) metre intervals.

.8 Utilities/ROW
.9 Planting list identifying species (botanical and common name), quantities, sizes, habit, spacing densities and specific remarks as required.

NOTE: Plant cultivars are only acceptable if approved by Parks; and the spacing and densities of plantings are to replicate the biophysical inventory.

.10 An achievable set of criteria that constitutes a successful restoration of the site to be prepared in consultation with the Developer.

.11 Depth of predevelopment topsoil and location of proposed stockpile.

.12 Proposed maintenance schedule

6. Grading Plan

1. Labeled as "Grading."

2. Major items associated with layout but not including dimensions, i.e. walkways, play fields, roads, curbs, other structures, and natural areas.

3. Existing and proposed contours at half (½) metre contour intervals (existing to be done in a lighter pen width or pencil and solid; suggested pen widths: existing - 000, proposed – 0).

4. All grades shall be Geodetic measure and tied to the nearest A.S.C.M. benchmark; A.S.C.M. benchmark number to be indicated on plan.

5. Elevations to be shown at each break point (top and toe of slope).

6. Label property lines and show spot elevations.

7. Catch basin rim and invert elevations where required.

8. Manhole rim elevations.

9. Top of wall, top of curb, finished floor elevations as required.

10. Surrounding grade information affecting site development.

11. Label all concrete gutters.

NOTE: Where possible, concrete gutters are to be located on private property.

12. Show all trap lows showing their 1:100 inundation area and emergency spill routes.
If site grades are significantly different from the approved grading plan and there appears to be a drainage problem as identified by the Park Development Inspector, as-built grading plans on an acceptable grid and tied to legal boundaries are to be provided and approved by The City of Calgary Parks prior to the signing of the CCC.

7. Grid Plan - For MSR Joint Use Sites Only

1. Labeled as “Grid.”

2. Existing and proposed spot elevations on a fifteen (15) metre grid and tied to legal boundaries are required.

3. All grades shall be Geodetic measure and tied to the nearest A.S.C.M. benchmark; A.S.C.M. benchmark number to be indicated on plan.

4. Label property lines.

5. Catch basin rim and invert elevations where required.

6. Surrounding grade information affecting site development.

7. School building envelope to have same grade as sportsfield envelope (i.e. 2%).

8. School building envelopes and adjacent road grades must be at the same elevation.

9. For every one (1) metre in elevation in excess of 2% slope, a minimum increase of three (3) metres will be required on site.

10. Refer to section “Recreation Facilities” for all sports field design and grading specifications.

8. Irrigation Plan

1. Labeled as "Irrigation."

2. Major items associated with "Layout" but not including dimensions, i.e. walkways, structures, fences, play fields, roads, curbs, and natural areas.

3. Screened back major items of “Planting” and “Grading” plans.

4. Proposed contours at half (½) metre interval.

5. Locations of all lines, sprinkler heads, valves, drains, sleeves, electrical drop-offs, 100 volt wire, 110 volt conduit, electrical controllers, dimensional
6. Design the irrigation system so that sprinkler heads do not spray into playgrounds.

7. Indicate whether the system will be trenched or "plowed in" and whether the system will be gravity drained, blown out or a combination.

8. Set back park water services a minimum of 2.5m from pathways, hard surfaces and trees, and set back lateral irrigation lines a maximum of 0.5m from property lines.

9. Schedule of materials/products describing sizes, manufactures and model numbers, pipe fitting method, performance standards and sources of said materials/products. Approval of the list of materials/products is required prior to the placing of formal orders for them.

10. Water window is justified by vandalism problems and horticultural requirements. The park water service maximum site sizes are:

<table>
<thead>
<tr>
<th>Park Water Service</th>
<th>Maximum Size of Site</th>
</tr>
</thead>
<tbody>
<tr>
<td>50mm</td>
<td>0.83 ha</td>
</tr>
<tr>
<td>100mm</td>
<td>3.02 ha</td>
</tr>
<tr>
<td>150mm</td>
<td>6.79 ha</td>
</tr>
<tr>
<td>200mm</td>
<td>11.17ha</td>
</tr>
</tbody>
</table>

11. All pertinent construction details not included in Standard Specifications.

12. Design the irrigation system to the minimum static water pressure of the applicable pressure zone. Contact the Development Section of Wastewater Division (268-2701) to obtain the Static Water Pressure, and indicate the pressure on the plan.

13. Where the design conflicts with the Development Guidelines and Standard Specifications, and the designer wishes approval for an override, identify conflicts and provide an explanation, i.e. “This design overrides specification item 7.4 of ‘Layout’ for the following reasons…”

14. In order to ensure that the irrigation design will function effectively within the practical water window, completion of the following scheduling chart is required. The following are the water requirements and limitation for Calgary as per current data. The maximum ET measured during the last couple of weeks in July and the first two in August is 0.183 inches per day or 1.281 inches per week (Based on Environment Canada 30-year data). The daily watering window is from 1:00 AM till 6:00 AM. For the health of the plants

from adjacent property lines.

**NOTE:** The irrigation system as shown on the plan is approximate and shall be adjusted to suit site conditions.
and to promote good root growth, each zone cannot operate more than once every second day.

<table>
<thead>
<tr>
<th>Station / Zone</th>
<th>Head Type</th>
<th>Nozzle #</th>
<th>PSI</th>
<th>Flow (GPM)</th>
<th>Precipitation Rate</th>
<th>Slope</th>
<th>Aspect</th>
<th>Soil</th>
<th>Days of the week</th>
<th>No. of cycles</th>
<th>Cycle Time</th>
<th>Soak Time</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>I-25</td>
<td>5@#13</td>
<td>56</td>
<td>58</td>
<td>1.575 in/hr</td>
<td>3:1</td>
<td>South</td>
<td>Clay loam</td>
<td>M-W-F</td>
<td>3</td>
<td>10min</td>
<td>45min</td>
</tr>
<tr>
<td>2</td>
<td>Toro 570</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

IV. UTILITY and PIPELINE LOCATION CONTACT NUMBERS

Prior to the commencement of any work, the Contractor is responsible to contact the appropriate agencies as required including those not listed in the list below to locate existing underground utilities and pipelines in or adjacent to the construction work site. The utility or pipeline agencies must be contacted two (2) working days in advance of commencement of work.

1. Field Location Service Calls

   ATCO  
   ENMAX  
   Telus  
   Wastewater  
   Wastewater  
   Petrogas Processing Ltd.  
   Rogers Cable TV/FM (South) 261-7075  
   Calgary Cable TV/FM (North) 250-5935  
   Gulf Canada Ltd.  
   - Alberta Products Pipeline 259-9060  
   - Valley Pipeline 933-4711  
   Home Oil Company Ltd. 232-5054

2. Excavation Permits

Prior to any excavation in public Rights-of-Way, excavation permits must be
obtained from The City of Calgary Transportation Roads at the
Traffic Permits Counter, Main Floor Building E, Manchester Centre, 2808
Spiller Road SE, Calgary.

3. Emergency Service

If you accidentally damage the coating or scrape, sever or rupture any underground line, please call the appropriate service immediately.

Watch for aboveground structures such as utility pedestals, power lines and hydrants that are located in roadways, lanes and private property. If they are damaged please report the incident immediately.

**Emergency Calls - 24 HR. Service**

<table>
<thead>
<tr>
<th>Service</th>
<th>Phone Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>ATCO</td>
<td>245-7222</td>
</tr>
<tr>
<td>ENMAX</td>
<td>514-6100</td>
</tr>
<tr>
<td>Sewer, Wastewater, Roads</td>
<td>268-1155</td>
</tr>
<tr>
<td>Telus</td>
<td>611</td>
</tr>
<tr>
<td>Rogers Cable TV/FM (South)</td>
<td>261-7075</td>
</tr>
<tr>
<td>Calgary Cable TV/FM (North)</td>
<td>250-5935 (07:00 - 23:30 hrs.)</td>
</tr>
<tr>
<td>250-8989 (23:30 - 07:00 hrs.)</td>
<td></td>
</tr>
<tr>
<td>Gulf Canada Ltd.</td>
<td></td>
</tr>
<tr>
<td>- Alberta Products Pipeline Edmonton</td>
<td>1-800-661-5642</td>
</tr>
<tr>
<td>- Valley Pipeline Stettler</td>
<td>1-800-661-5642</td>
</tr>
<tr>
<td>Home Oil Co. Ltd.</td>
<td>232-5000</td>
</tr>
<tr>
<td>Petrogas Processing</td>
<td>226-0023</td>
</tr>
</tbody>
</table>

V. PERMISSION TO USE WATER FOR CONSTRUCTION

Refer to the current edition of Water Resources Standard Specifications
Waterworks Construction, Section 504.13.00.

VI. INSPECTIONS

Inspections by The City of Calgary Parks are required at key times during project construction as outlined in each section of the Standard Specifications for Landscape Construction. In 1989 a centralized inspection service was instituted to respond to inspection requests. To determine which inspector to call, see enclosed map (page 36). These requests can now be met by calling the following telephone numbers for the Parks Development Inspectors:

<table>
<thead>
<tr>
<th>Inspector</th>
<th>Cell. No.</th>
</tr>
</thead>
<tbody>
<tr>
<td>North</td>
<td>403-804-9397</td>
</tr>
</tbody>
</table>

Standard Specifications for Landscape Construction 2011
Satisfactory construction inspections will be recorded on a "Construction Inspection Checklist". It is the applicant's responsibility to keep a copy of the "Construction Inspection Checklist" on site to verify previous site inspections. If a checklist is not available the Inspectors are not required to review site development.

The City of Calgary Parks shall be given a minimum of 24 hours notice when requesting an inspection.

As per the tables beginning on page 39, landscape and irrigation inspections for: interim development; Construction Completion Certificates; or Final Acceptance Certificates will only occur during regular business hours.

NOTE: Parks Development Inspectors work a five-day week (Monday-Friday).

Final Acceptance Certificates submitted after September 30 for sites with an irrigation system will require the area irrigation foreman, or designate, present during the winterization procedure. The areas will ensure staff will be available with 48 hours notice. As an alternate, the area staff will not be required on site during the winterization procedure provided the Developer agrees, in writing, to start the system and perform any repairs that may be required the following spring.

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

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

Natural Areas/ER’s restoration sites may receive regular inspections during their maintenance period (see page 42) to ensure that site restorations are on track. The Consultant can contact Parks Planning and Development Services, call 3-1-1 between May and September to arrange for a yearly inspection during the maintenance period.
Parks Inspection Boundaries Map
VII. CONSTRUCTION COMPLETION CERTIFICATES (CCC)

1. Landscaping for Reserve Parcels (i.e. sub-neighbourhood parks, linear parks and those portions of neighbourhood, community and district parks designated as decorative parks, ornamental parks and tot lots), public utility lots, RoW, boulevards, medians, traffic islands and storm-water dry ponds shall be considered "complete" or "completed" when all underground irrigation and water services have been installed, tested and inspected and preliminary "as constructed" drawings have been submitted to The City of Calgary Parks and the Reserve Parcels, public utility lots, RoW., boulevards, medians, traffic islands and storm-water dry ponds have been graded, loamed, seeded or sodded, the trees have been planted and, if applicable, the paved or interlocking stone walkways, fencing, play equipment and amenities have been constructed in accordance with The City of Calgary Parks' Development Guidelines and Standard Specifications, Landscape Construction.

2. Park inspections will happen during the five critical stages (as per CCC Construction Inspection Schedules on pages 39 and 41).

   a. Inspection 1 – Construction Start-up
   b. Inspection 2 – Subgrade
   c. Inspection 3 – Tree and Shrub Planting
   d. Inspection 4 – Irrigation
   e. Inspection 5 – Finish Grade

3. The Developer’s Consultant, Contractor(s) and the Parks Development Inspector will be in attendance at each of the above critical stage inspections.  
   NOTE: Each inspection will be initiated by the Developer’s Consultant or Contractor. The scope of work to be inspected shall be complete prior to the inspection.

4. Essential and non-essential deficiencies will be recorded during each inspection stage and both the Developer’s Consultant and the Parks’ Development Inspector will sign off on each inspection stage.

5. At the end of the five stages, if all essential work has been completed, the Developer will apply to Urban Development for CCC. Along with that application, the Developer will submit a copy of the signed-off Construction Inspection and CCC Report noting the expiry date to complete all non-essential work. 
   NOTE: In order to effectively inventory sites once CCC is issued, Parks request that the Developer provide the following information on the CCC Application:

   • Plan No. (registered or tentative), Block No., Lot No. and Type; and
   • Development Agreement No.

6. Landscape components submitted for construction completion should be submitted in specific groupings by development phase to reduce the frequency of inspections and the volume of documentation by The City of Calgary Parks, Urban Development and the Developer. Recommended groupings are:
.1 all reserve parcels;

.2 all boulevards, medians and traffic islands;

.3 all Environmental Reserves;

.4 all storm-water dry ponds;
   **NOTE:** This CCC and FAC should be held at the same time of the CCC and FAC for Water Resources.

.5 all Public Utility Lots
   **NOTE:** Where the PUL is dedicated for the purpose of a shallow utility cabinet or pedestal only, and embedded in a Municipal Reserve, the PUL may be included in the CCC application for the Municipal Reserve.

7. The Developer, upon the completion of a reserve parcel, public utility lots, RoW, boulevards, medians, traffic islands or storm-water dry pond shall cause to be prepared and issued four (4) copies of a Construction Completion Certificate (CCC) that is duly signed, sealed and certified by the signing officer of the Consultant. The CCC shall also include the projected earliest maintenance expiry date.
   **NOTE:** An application form is available online at [www.calgary.ca/parks](http://www.calgary.ca/parks) (click on Parks, Parks under Construction, Park Development guidelines, and the form is available under downloads).

8. The Developer, within thirty (30) days of the issuance of the said CCC shall forward the four (4) copies of the said CCC to The City of Calgary Urban Development Division (268-5782) for acknowledgment of receipt of same.

9. The City upon receipt of the said CCC shall within fourteen (14) days acknowledge the receipt of the said CCC.

10. Urban Development will sign the CCC and send a copy to Calgary Parks.

11. No other site inspection by the Parks’ Development Inspector will occur. The Developer must complete the non-essential work items before the expiry date and submit a letter to Calgary Parks (cc. Urban Development) confirming that all deficiencies have been completed.

12. As per the Residential Development Agreement, if the Developer does not complete the non-essential deficiencies within the expiry date period, the CCC will either be revoked or the maintenance period extended one year from the time the deficiencies are completed.

13. This process applies to Development Agreements from 2002 onwards and is not retroactive.
CCC CONSTRUCTION INSPECTION SCHEDULE

Sub-neighbourhood, Neighbourhood, Community, and Linear Parks; Employment Centre Open Space; Community Squares; Commercial Plazas; Dry Ponds; RoW

**NOTE:** Approved plans required prior to work.

<table>
<thead>
<tr>
<th>Work Inspected</th>
<th>Seasonal Limits</th>
<th>Timing</th>
<th>% Essential Prior to CCC</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Site Layout, Grades, Topsoil and Turf</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Layout P.L. Stakes</td>
<td>6” frost and/or no snow</td>
<td>Inspection 1</td>
<td>100</td>
</tr>
<tr>
<td>Erosion/Sediment Controls</td>
<td>None</td>
<td>Inspection 1</td>
<td>100</td>
</tr>
<tr>
<td>Survey Stakes - Grades</td>
<td>6” frost and/or no snow</td>
<td>Inspection 1</td>
<td>100</td>
</tr>
<tr>
<td>Sub-grade Preparation</td>
<td>6” frost and/or no snow</td>
<td>Inspection 2</td>
<td>100</td>
</tr>
<tr>
<td>Site Layout (e.g. pathways, trees, amenities, sportsfields, playgrounds etc.)</td>
<td>6” frost and/or no snow</td>
<td>Inspection 2</td>
<td>100</td>
</tr>
<tr>
<td>Topsoil Test</td>
<td>None</td>
<td>Inspection 3</td>
<td>100</td>
</tr>
<tr>
<td>Finished Grade to Plan and Spec.</td>
<td>Frost Free</td>
<td>Inspection 5</td>
<td>100</td>
</tr>
<tr>
<td>Seeding</td>
<td>Frost Free</td>
<td>Inspection 5</td>
<td>100</td>
</tr>
<tr>
<td>Sodding</td>
<td>Frost Free</td>
<td>Inspection 5</td>
<td>100</td>
</tr>
<tr>
<td>Compaction Reports</td>
<td>None</td>
<td>Inspection 5</td>
<td>Within 60 days of inspection</td>
</tr>
<tr>
<td><strong>Trees/Shrubs</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Line Assignment</td>
<td>None</td>
<td>Inspection 1</td>
<td>100</td>
</tr>
<tr>
<td>Tree/Shrubs Pits/Beds</td>
<td>None</td>
<td>Inspection 3</td>
<td>100</td>
</tr>
<tr>
<td>Correct Number and Species</td>
<td>None</td>
<td>Inspection 4</td>
<td>100</td>
</tr>
<tr>
<td>Rootball/Caliper Standards Met</td>
<td>Frost Free</td>
<td>Inspection 4</td>
<td>100</td>
</tr>
<tr>
<td>Trees Planted at Specified Grade</td>
<td>Frost Free</td>
<td>Inspection 4</td>
<td>100</td>
</tr>
<tr>
<td>CNLA Specifications Met</td>
<td>Frost Free</td>
<td>Inspection 4</td>
<td>100</td>
</tr>
<tr>
<td>Insect/Disease/Damage Free</td>
<td>Active Growth</td>
<td>Inspection 4</td>
<td>100</td>
</tr>
<tr>
<td>Set back Spacing</td>
<td>No Snow</td>
<td>Inspection 4</td>
<td>100</td>
</tr>
<tr>
<td>Burlap Strapping/Wires Removed or Rolled Back</td>
<td>Frost Free</td>
<td>Inspection 5</td>
<td>100</td>
</tr>
<tr>
<td><strong>Irrigation</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Plumbing Permit</td>
<td>At irrigation layout</td>
<td>Inspection 2</td>
<td>100</td>
</tr>
<tr>
<td>Irrigation Layout</td>
<td>6” frost &amp;/or no snow</td>
<td>Inspection 2</td>
<td>100</td>
</tr>
<tr>
<td>Meter Received by Contractor and Meter information sheet is submitted</td>
<td>Sept. 30th or permission from Wastewater</td>
<td>Inspection 4</td>
<td>100</td>
</tr>
<tr>
<td>Open Trench Inspection</td>
<td>Frost Free</td>
<td>Inspection 4</td>
<td>100</td>
</tr>
<tr>
<td>Two Copies Irrigation As-Builts</td>
<td>None</td>
<td>Inspection 5</td>
<td>Within 60 days of inspection</td>
</tr>
<tr>
<td>Annual DCV Report</td>
<td>Within 30 days of start-up</td>
<td>Inspection 5</td>
<td>100</td>
</tr>
<tr>
<td>Work Inspected</td>
<td>Seasonal Limits</td>
<td>Timing</td>
<td>% Essential Prior to CCC</td>
</tr>
<tr>
<td>--------------------------------------</td>
<td>--------------------------------------</td>
<td>--------------</td>
<td>--------------------------</td>
</tr>
<tr>
<td><strong>Pathways</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pathway Alignment</td>
<td>6” frost and/or no snow</td>
<td>Inspection 2</td>
<td>100</td>
</tr>
<tr>
<td>To Approved Plan and Specification</td>
<td>No snow</td>
<td>Inspection 5</td>
<td>100</td>
</tr>
<tr>
<td><strong>Playgrounds</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>To Approved Plan and Specification</td>
<td>No snow</td>
<td>Inspection 5</td>
<td>100</td>
</tr>
<tr>
<td>Certificate of Compliance Letter</td>
<td>Prior to CCC</td>
<td>Inspection 5</td>
<td>100</td>
</tr>
<tr>
<td><strong>Amenities</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>To Approved Plan and Specification</td>
<td>No snow</td>
<td>Inspection 5</td>
<td>Prior to FAC</td>
</tr>
<tr>
<td>***Executed Maintenance Agree.</td>
<td>Prior to FAC</td>
<td>Inspection 5</td>
<td>Prior to FAC</td>
</tr>
</tbody>
</table>
## CCC CONSTRUCTION INSPECTION SCHEDULE

**Natural Environment Parks & Engineered Storm Water Wetlands**

**NOTE:** Approved biophysical impact assessment, environmental significance assessment, wetland development assessment, and construction & restoration plans required prior to work.

<table>
<thead>
<tr>
<th>Work Inspected</th>
<th>Seasonal Limits</th>
<th>Timing</th>
<th>% Essential Prior to CCC</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Site Layout, Grades, Topsoil and Native Seed/Sod</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Layout P.L. and Approved Utility/ROW Encroachments</td>
<td>6″ frost and/or no snow</td>
<td>Inspection 1</td>
<td>100</td>
</tr>
<tr>
<td>Erosion/Sediment Controls</td>
<td>None</td>
<td>Inspection 1</td>
<td>100</td>
</tr>
<tr>
<td>Survey Stakes - Grades</td>
<td>6″ frost and/or no snow</td>
<td>Inspection 2</td>
<td>100</td>
</tr>
<tr>
<td>Sub-grade Preparation</td>
<td>6″ frost and/or no snow</td>
<td>Inspection 2</td>
<td>100</td>
</tr>
<tr>
<td>Site Layout (e.g. trees, pathways, amenities, etc.)</td>
<td>6″ frost and/or no snow</td>
<td>Inspection 2</td>
<td>100</td>
</tr>
<tr>
<td>Predevelopment Topsoil Stored</td>
<td>Frost Free</td>
<td>Inspection 2</td>
<td>100</td>
</tr>
<tr>
<td>Topsoil Depth &amp; Finished Grade to Pre-existing Native Profile &amp; Pre-Development Drainage Patterns &amp; Rates</td>
<td>Frost Free</td>
<td>Inspection 5</td>
<td>100</td>
</tr>
<tr>
<td>Seeding</td>
<td>Frost Free</td>
<td>Inspection 5</td>
<td>100</td>
</tr>
<tr>
<td>Sodding</td>
<td>Frost Free</td>
<td>Inspection 5</td>
<td>100</td>
</tr>
<tr>
<td>Compaction Reports</td>
<td>None</td>
<td>Inspection 5</td>
<td>Within 60 days</td>
</tr>
</tbody>
</table>

| **Native Trees/Shrubs** | | | |
| Tree/Shrubs Pits/Beds | None | Inspection 3 | 100 |
| Correct Number and Species | None | Inspection 4 | 100 |
| Rootball/Caliper Standards Met | Frost Free | Inspection 4 | 100 |
| Trees Planted at Specified Grade | Frost Free | Inspection 4 | 100 |
| CNLA Specifications Met | Frost Free | Inspection 4 | 100 |
| Insect/Disease/Damage Free | Active Growth | Inspection 4 | 100 |
| Set back Spacing | No Snow | Inspection 4 | 100 |
| Burlap Strapping/Wires Removed or Rolled Back | Frost Free | Inspection 5 | 100 |

| **Pathways** | | | |
| Pathway Alignment | 6″ frost and/or no snow | Inspection 2 | 100 |
| To Approved Plan & Specification | No snow | Inspection 5 | 100 |

| **Amenities/Fencing** | | | |
| Restoration/Reclamation Signage | No snow | Inspection 1 | 100 |
| To Approved Plan & Specification | Prior to CCC | Inspection 5 | Prior to FAC |
VIII. MAINTENANCE PERIOD

1. The Developer, at no expense to The City, shall maintain over a continuous period: sub-neighbourhood parks; linear parks; those portions of neighbourhood, community and district parks designated as decorative parks, ornamental parks and tot lots; boulevards; medians; traffic islands and public utility lots, RoW for one (1) growing season. One (1) growing season shall be that period of time between the date that the Park Development Inspector signs the Construction Completion Certificate to June 30 of the following year, or on the date when, in the sole opinion of The City of Calgary Parks, the irrigation systems are operating and the vegetation is in full leaf, whichever event occurs last.

   NOTE: Where Landscaping is to receive a Construction Completion Certificate (CCC) after September 30th, The City of Calgary Parks may extend the maintenance period to a maximum of September 30th in the following year from the CCC date. CCC inspections are subject to the seasonal limits identified in the CCC Construction Inspection Schedule on pages 39, 40 and 41.

2. The Developer, at no expense to The City, shall maintain storm-water dry ponds on SR, MSR, or MR sites less than four (4) acres in area for three years. On sites larger than four (4) acres, the limits of the three (3) year maintenance will be determined through negotiations between the Developer and The City of Calgary Parks.

3. The Developer, at no expense to The City, shall maintain engineered storm-water wetlands for three (3) years.
# Construction Inspection Checklist

## A. Inspection #1
- Approved Plans, Letter
- Line Assignment
- Layout P.L. Values
- Erosion/Sediment Controls

## B. Inspection #2
- Approved Plans & Letter
- Survey Stakes - Grade
- Subgrade Preparation
- Irrigation System
- Plumbing Permit
- Layout, pathways, trees, furniture
- Sports Fields, Playgrounds etc.

## C. Inspection #3
- Approved Plans & Letter
- Topsoil Test as per specification
- Tree/Shrub Plots

## D. Inspection #4
- Approved Plans & Letter
- Trees & Shrubs as per Drawing
- Mater Received By Contractor
- Tag #
- Serial #
- Open Drain Inspection
- Trees Planted at Specified Grade
- Rainfall, Caliper Standards Met
- C.N.I.A. Specifications Met
- Root Damage/Drainage Tree
- Tree Setback Spacing

## E. Inspection #5
- Approved Plans & Letter
- Finish Grade to Plan & Spec.
- Topsoil & Finish Grade to Pre-existing
- Native Profile & Pre-Development
- Drainage Patterns & Edges
- Seeding/Sodding
- Basalt Strips-Wires Removed/Rolled Back
- Amenities to Plan & Spec.
- Improvements to Plan & Spec.
- Certificate of Compliance Letter
- Asphalt Pathway to Plan & Spec.
- Asphalt Compaction Density Reports
- Two Copies Irrigation As Built
- Annual DCV Report

## General Comments & Prior to F.A.C. Conditions
- Is there non-engineered fill on this site? Yes No If yes, are attached Non-Engineered Fill Drawing

## Report Distribution
- No Deficiencies Noted
- Report Distribution
- Developers Representative
- Park Inspector
- Design & Development File

---

<table>
<thead>
<tr>
<th>Print Name</th>
<th>Signature</th>
</tr>
</thead>
</table>

---

Report Date: XXXX MM DD
CONSTRUCTION COMPLETION CERTIFICATE

Subdivision ________________ Phase ________ Developer ________________

Agreement No. ________________ Description ______________________________________

Municipal Address ______________________________________ Plan/Block/Lot _____________

Consultant __________________________ Contractor _______________________________

BOUNDARY AREA: Map Attached.

Acting on behalf of the Developer, we wish to make application for a Construction Completion Certificate according to the terms outlined in the above noted The City of Calgary Residential Subdivision Agreement.

Attached are the appropriate Parks inspection report(s)/correspondence and a copy of the map showing the development boundary.

We hereby certify that the remaining landscaping noted within the area shown on the attached boundary map were constructed, installed, completed and inspected in conformance with all respects to The City of Calgary’s specifications and approved designs, or as otherwise required by Parks, and that all defects and deficiencies in work and materials were reported to the Developer and were remedied by the Developer.

Date ____________________ Signature of Applicant

---------------------------------------------------------------

Approved on

Date ____________________ Manager Urban Development

Projected Earliest Maintenance Period Expiry Date: __________________________

---------------------------------------------------------------

Rejected on

Date ____________________ Manager Urban Development

Cause for Rejection:

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---------------------------------------------------------------

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Standard Specifications for Landscape Construction 2011
IX. FINAL ACCEPTANCE CERTIFICATES

1. Not less than three (3) months prior to the maintenance period expiry date, or earlier if weather conditions permit, the Consultant and the Contractor shall inspect the Reserve Parcels (i.e. sub-neighbourhood parks; linear parks; and those portions of neighbourhood, community and district parks designated as decorative parks, ornamental parks and tot lots), public utility lots, RoW, boulevards, medians, traffic islands or storm-water dry ponds, and the Consultant shall ensure that the Contractor corrects all defects and deficiencies due to damage and other causes, except defects or deficiencies caused by the negligence of The City or its agents, employees or servants in the performance of their duties on behalf of The City. Subsequent to the correction of the said defects and deficiencies, the Consultant shall submit to The City of Calgary Urban Development Division (268-5782) four (4) copies of the Final Acceptance Certificate (FAC) duly signed and sealed by a signing officer of the Consultant.  

NOTE: An application form is available online at http://www.calgary.ca/parks (click on Parks, Parks under construction; Park development guidelines and the form is under downloads.)

2. Landscape components submitted for final acceptance should be submitted in specific groupings by development phase to reduce the frequency of inspections and the volume of documentation by The City of Calgary Parks, Urban Development and the Developer. Recommended groupings are:

1. all reserve parcels;
2. all boulevards, medians and traffic islands;
3. all Environmental Reserves;
4. all storm-water dry ponds.  

NOTE: This CCC and FAC should be held at the same time of the CCC and FAC for Water Resources.

5. All Public Utility Lots.  

NOTE: Where the PUL is dedicated for the purpose of a shallow utility cabinet or pedestal only, and embedded in a Municipal Reserve, the PUL may be included in the FAC application for the Municipal Reserve.

3. The City of Calgary Parks shall make an on-site inspection with the Consultant within thirty (30) days of receipt of the FAC by The City, and if no advice of defects or deficiencies has been sent to the Developer within that time, the improvement shall be deemed by The City to be completed.  

NOTE: Prior to inspection with the Consultant, the Parks Development Inspector will inspect the site with a representative of the Parks Division.

4. If the inspection shows to the satisfaction of The City of Calgary Parks that the improvement is completed and any third party damages are rectified the Area
Parks Superintendent shall sign the FAC.

5. If, however, defects or deficiencies are apparent, the Parks Development Inspector will issue a "Final Acceptance Inspection Check List and Report" (page 48) detailing the defects or deficiencies that exist and the Inspector shall retain the FAC for one (1) month from the date of notification. Only one Inspection Check List and Report will be issued during the inspection process. The Inspector will record the last day of the one (1) month period on the Inspection Check List and Report under "Application Expiration Date." In the event that the defects or deficiencies are not corrected by the Developer within the one (1) month period, the FAC shall be returned unsigned and the Developer shall correct the defects and deficiencies and subsequently resubmit the FAC.

6. If weeds are identified in a Final Acceptance Inspection Check List and Report and a herbicide is applied to rectify the deficiency, a biocide application report must be submitted prior to the signing of the FAC.

7. Community and District parks containing MSR sites shall be fully developed and an application for Final Acceptance shall be submitted:

1. no later than at least one full year prior to occupancy of a school;

2. by the time thirty (30) percent of the lots or projected lots located within the catchment area, which is deemed to be all lands located within 1.2 kilometres from the property line of the said parcel of land, are occupied;

3. no later than September 30th of the year of application. FAC application inspections may be performed after September 30th subject to weather and ground conditions that allow for an effective assessment of the property and at the discretion of the Manager Parks Planning and Development Services.

All development has to be checked and approved on site by Park Development Inspectors prior to signing of the FAC by the Manager Parks Operations Division. If defects or deficiencies are apparent, the process will be as per item 5 above.

8. Criteria for Conditional FAC

1. Prior to FAC inspection, the Consultant has reviewed the site; i.e., plant material and turf is healthy; irrigation system is complete, including required paperwork, and plans reflect final product. If this is not completed, no conditional FAC will be considered.

   **NOTE:** Date of inspection by the Consultant shall be added to the FAC document.

2. FAC’s are not to be submitted prior to site completion. Inspectors will not ‘hold’ document until site is ready.
3. Deficiencies indicated on the FAC inspection are to be carried out as soon as possible, not at the end of the 30 day expiration date.

4. Revised construction inspection form is attached to the FAC document when submitted.

5. Conditional FAC will be considered if site was complete and third party damage occurs where time restraints do not permit rehabilitation, or when there are exceptional circumstances (i.e., drought).

6. Marketing signs and flags will not interfere with the FAC process providing the Developer submits a letter acknowledging responsibility for continued maintenance and repairs to the parcel as well as a map outlining where the signs and marketing items are. The Developer shall provide to The City 30 days notice of their intent to turn the parcel(s) over to The City. Once the signs and/or marketing items have been removed the Developer shall initiate a re-inspection of the property as per the FAC procedure.
### Final Acceptance Inspection Check List & Report

<table>
<thead>
<tr>
<th>Category</th>
<th>Description</th>
<th>Surface Condition</th>
<th>Turf</th>
<th>Trees</th>
<th>Benches</th>
<th>Play Equipment</th>
<th>Pathways/Sidewalk Surface</th>
<th>Amenities</th>
<th>General Comments</th>
<th>Irrigation System</th>
<th>Extending Warranty Required</th>
<th>Maintenance Log Submitted</th>
<th>Landscape &amp; Irrigation</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### Notes:
- No deficiencies noted
- application expiration date
- report distribution
- industry rep.
- area superintendent

Parks Area Rep.: 
Industry Rep.: 
Park Inspector: 
Design & Development File: 
Inspection Date: 

---

Standard Specifications for Landscape Construction 2011

48
FINAL ACCEPTANCE CERTIFICATE

Subdivision __________________ Phase ________ Developer ________________
Agreement No. _______________ Description __________________________________
Municipal Address _________________________________ Plan/Block/Lot _____________
Consultant __________________________ Contractor _______________________________

BOUNDARY AREA: Map Attached.

Acting on behalf on the Developer, we wish to make application for a Final Acceptance Certificate according to the terms outlined in the above noted The City of Calgary Residential Subdivision Agreement.

Attached is a copy of the map showing the development boundary.

We hereby certify that the remaining landscaping noted within the area shown on the attached boundary map were constructed, installed, completed and inspected in conformance with all respects to The City of Calgary’s specifications and approved designs, or as otherwise required by Parks, and that all defects and deficiencies in work and materials, including any prior to FAC conditions noted on the Construction Inspection Checklist were reported to the Developer and were remedied by the Developer.

Date _______________ Signature of Applicant __________________________

Approved on __________________________
Date ___________ Parks Representative __________________________

Approved on __________________________
Date ___________ Manager Urban Development __________________________

Rejected on __________________________
Date ___________ Parks Representative __________________________

Rejected on __________________________
Date ___________ Manager Urban Development __________________________

Cause for Rejection: __________________________________________________
___________________________________________________________________
___________________________________________________________________
___________________________________________________________________
___________________________________________________________________
___________________________________________________________________

Standard Specifications for Landscape Construction 2011

49
X. CCC and FAC APPEAL PROCESS

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

**Step One:** In the event of a refusal by the Parks Development Inspector, a review will be conducted with the Manager Parks Operations Division, the Developer or their representative, and the Parks Coordinator – Development. Where agreement or consensus is not achieved, the process will go to Step Two below.

**Step Two:** In the event consensus is not reached, the refusal will be considered by the Manager (North or South) Parks Planning and Development Services, and the Manager Urban Development or designate. The decision at Step Two will be final.
STANDARD SPECIFICATIONS FOR LANDSCAPE CONSTRUCTION
RECREATION FACILITIES
I. RECREATION FACILITIES

1. Site Planning Team’s Joint Use Site Guidelines

<table>
<thead>
<tr>
<th>Type of School</th>
<th>Joint Use Site Area</th>
<th>School Building Envelope</th>
<th>Sports field Envelope</th>
<th>Educational Sports field Requirements</th>
<th>Recreational Sports field Requirements</th>
</tr>
</thead>
<tbody>
<tr>
<td>Public Elementary School</td>
<td>4 hectares (10 acres)</td>
<td>1.6 hectares (4 acres)</td>
<td>2.4 hectares (6 acres)</td>
<td>- 2 Minor/1 Major overlapping soccer fields - Creative Playground</td>
<td>- 1 x 76m ball diamond</td>
</tr>
<tr>
<td>Public Junior High School</td>
<td>4.9 hectares (12 acres)</td>
<td>1.6 hectares (4 acres)</td>
<td>3.2 hectares (8 acres)</td>
<td>- 2 Minor/1 Major overlapping soccer fields - Field event area</td>
<td>- 2 x 76m ball diamond</td>
</tr>
<tr>
<td>Public Elementary &amp; Junior High Schools</td>
<td>6.9 hectares (17 acres)</td>
<td>3.2 hectares (8 acres)</td>
<td>3.6 hectares (9 acres)</td>
<td>- 2 Minor/1 Major overlapping soccer fields - Creative Playground</td>
<td>- 2 x 76m ball diamond</td>
</tr>
<tr>
<td>Separate Elementary School</td>
<td>3.6 hectares (9 acres)</td>
<td>1.4 hectares (3.5 acres)</td>
<td>2.2 hectares (5.5 acres)</td>
<td>- 2 Minor/1 Major overlapping soccer fields - Creative Playground</td>
<td>- 1 x 76m ball diamond</td>
</tr>
<tr>
<td>Separate Elementary &amp; Junior High School</td>
<td>4.9 hectares (12 acres)</td>
<td>1.9 hectares (4.75 acres)</td>
<td>2.9 hectares (7.25 acres)</td>
<td>- 2 Minor/1 Major overlapping soccer fields - Field event area - Creative Playground</td>
<td>- 1 x 76m ball diamond</td>
</tr>
<tr>
<td>Public/ Separate High School</td>
<td>9.2 hectares (23 acres)</td>
<td>4 hectares (10 acres)</td>
<td>5.3 hectares (13 acres)</td>
<td>- 2 Minor/1 Major overlapping soccer fields - 1 Football field - Track &amp; field area</td>
<td>- 2 x 76m ball diamond</td>
</tr>
<tr>
<td>Community Association Facility</td>
<td>1.2 - 1.6 ha. (3 - 4 acres)</td>
<td></td>
<td></td>
<td></td>
<td>- 1 Outdoor Rink - 2 Tennis Courts</td>
</tr>
</tbody>
</table>

Notes:

a. Public Elementary and Junior High School sites will accommodate 2 school buildings.

b. All site sizes and building envelopes are minimum requirements. Additional land may be required where physical constraints exist.

c. For joint use sites with Recreation Facilities within storm-water detention ponds see below: Hockey Rink and Lacrosse Field - Item 2.4; Soccer fields and Ball Diamonds - Item 3.6; and Tennis Courts - Item 4.2.g.
d. Field Event areas include long jump, shot put, discus, etc.

2. Hockey Rink and Lacrosse Field

1. Refer to Detail Sheet #1 for rink dimensions.

2. Rink surface must be graded flat for water retention.

3. Hockey Rinks and Lacrosse Fields located within dry ponds shall be placed above the 1:50 year flood level.

3. Soccer Fields and Ball Diamonds

1. Refer to Detail Sheets #3, 4 & 5 for soccer field and goalpost dimensions.

2. Subject to approval by The City, portable goalposts may be installed. If portable goalposts are to be installed they must be securely anchored to the ground.

3. Refer to Detail Sheets #6 to 12 for ball diamond & backstop dimensions.

4. All sports fields, and a buffer zone of 3m, are to be graded to achieve a level, playable surface without ponding areas. The fields are to be graded to a maximum of 2% in all directions with a preference towards the “Optimal Drainage Patterns for Sports fields” as per Detail Sheet #2. The Parks Development Coordinators will consider solutions other than the preferred sports field grading options if site conditions do not permit their execution. Goal end to goal end grading will only be permitted subject to demonstration that no other alternate is available. Only the 3m adjacent to the sports field of the total 10m buffer is required to be graded level and free of obstacles. The 7m balance of the buffer may include plant material, amenities and back-sloping.

5. Ball diamonds and soccer fields shall be devoid of all obstacles including catch basins, and they shall be set back a minimum of:

- 10m from all Property Lines
- Tree and shrub setbacks as per Table in item 1.2 on page 61;
- 20m from playgrounds;
- 10m behind soccer goal posts; and
- 3m around the perimeter of ball diamonds and along the sides of soccer fields.

6. Soccer fields and ball diamonds located within dry ponds shall meet the following performance criteria:

a. Soccer fields, ball diamonds and their buffer zones are to be located
outside of the 1:5 year inundation level.

b. Inundation of soccer fields, ball diamonds and their buffer zones must:
   i. not be more than 48 hours in any month of the year;
   ii. not exceed 6 times per month; and
   iii. leave fields suitable for play within 48 hours after the flood event has receded.

7. Backstop canopies are required when the back of the backstop faces roadways; residences; other backstops; playgrounds; pathways; and other sports fields.

4. Tennis Courts

1. Tennis Courts will be permitted if developed minimally as double courts.

2. The following guidelines and specifications should be used in conjunction with Detail Sheets #13 to 21:
   a. A geotechnical analysis on a maximum ten (10) metre grid and to a two (2) metre depth shall be conducted.
   
   b. Any organic or otherwise unsuitable material as determined by the geotechnical analysis, shall be removed to a minimum depth of one (1) metre below existing grade and replaced with one (1) metre of 75mm minus pit run base gravel conforming to the current Standard Specifications Roads Construction. If no organic or otherwise unsuitable material is present, then the subgrade shall be excavated to a minimum depth of 500mm and back filled with 500mm of 75mm minus pit run base gravel conforming to the current Standard Specifications Roads Construction. The subgrade and base gravel shall be compacted to a minimum average of 98% with no single test showing less than 95% of standard Proctor.
   
   c. 100mm of 20mm crushed gravel conforming to the current Standard Specifications Roads Construction shall be placed and compacted to a minimum average of 98% with no single test showing less than 95% of standard Proctor.
   
   d. A 60mm lift of Mix 'B' asphaltic concrete conforming to the current standard Specifications Roads Construction shall be placed and compacted to a minimum average of 98% with no single test showing less than 95% of standard Proctor.
   
   e. A 40mm lift of mix 'M' asphaltic concrete conforming to the current Standard Specifications Roads Construction shall be placed and compacted to a minimum average of 98% with no single test showing less than 95% of standard Proctor.
f. The entire court surface area will be power washed with a minimum 3000 P.S.I. Power washer to ensure the surface is clean and free of all dirt, oil, and deteriorated coatings. The contractor is required to remove all debris from the site prior to the commencement of court patching and surfacing.

g. Prior to the application of the “Asphalt Resurfacer” (Asphalt Emulsion Filler Coarse), the contractor shall flood the court surface area with clean potable water in the presence of the Development Inspector or designated representative. Any depressions thereupon holding water deeper than 1.25 mm after 45 minutes shall be marked out. These depressions shall then be filled with “Court Patch Binder” (High Strength Acrylic Bonding Liquid Patching Mixture). After appropriate curing time the court surface area will again be flooded as described above to ensure that all reasonable depressions have been filled. If it is determined that more filling is required, filling will be done as described above. The use of asphaltic type emulsions or hot sand mix asphalt to fill depressions is prohibited. Note: It is expected on new construction that no depressions will be evident after the final lift of asphalt is laid. On new construction, the asphalt must cure for a minimum of 14 days prior to the application of any surface coating.

h. Upon completion of all depression patching, the contractor shall fill in all surface divots and cracks with “Plexipave Tennis Court Crack Filler” or approved equivalent (highly flexible filler and/or a high strength acrylic bonding liquid patching mixture) as per manufacturers specifications. The entire surface will then be scraped and/or ground to remove all ridges and then be blown clean to remove all loose debris.

i. The contractor shall apply one coat of SS1 Asphaltic binder to the entire court surface immediately prior to the first application of asphaltic emulsion filler. (Note: This step is not required for new construction)

j. The contractor shall apply two coats of “Asphalt Resurfacer” (Asphalt Emulsion Filler Course) to the entire court surface as per manufacturers’ specifications. The second coat will be applied at a 90 degree angle to the first coat. When the second coat has cured, the surface will be scraped to remove any ridges and then the entire surface will be blown clean to remove all debris. The surface will then be rolled with a double drum mechanical roller.

k. The contractor shall apply two coats of “Coloured Fortified Plexipave” or approved equivalent (Fortified Acrylic Coloured Filler Emulsion – utilizing 80-100 mesh rounded sand) – as per manufacturer’s specifications. The surface will be scraped and blown between coats as previously described. A final coat of Coloured Plexichrome (Fortified Acrylic Coloured Finish Emulsion) or approved equivalent – as per manufacturer’s specifications shall be applied to the entire surface. Colour scheme is to be Green playing pads and Red
perimeter – unless otherwise agreed by The City. For multi-use court, colour will be green.

l. For multi-use courts, in lieu of “Coloured Fortified Plexipave”, the contractor shall apply two coats of “Acrylotex” (Specialized Fortified Acrylic Coloured Filler Emulsion) or approved equivalent, as per manufacturer’s specifications. Note: this step only to multi-use surface installations (i.e. basketball/inline hockey surfaces).

m. The contractor will layout, mask and roll court lines as per official dimensions. Two coats of “Plexicolor Textured White Line Paint” or approved equivalent (100% Acrylic Emulsion Line Paint) will be brush applied. All lines shall be straight and true and provide sharp edges. The use of traffic oil, alkyd, or solvent vehicle type paints is prohibited.

n. The contractor will paint the tennis posts with two coats of black epoxy enamel paint (Tremclad or equivalent). New posts will be treated with a light acid wash (acetone, vinegar, etc.) Previously painted posts will have old flaking paint removed prior to painting.

o. Tennis Courts located within dry ponds shall be placed above the 1:50 year flood level.

NOTE: The resulting surface shall be completely true (flat) with water ponding to a maximum depth of 1.25mm. Any deviation shall be corrected by the Contractor at no expense to The City of Calgary.

FENCING: A 3.66m high chain link fence (38mm mesh - No. 9 gauge steel) is required and shall be constructed as per standard The City of Calgary Parks Standard Specifications - Landscape Construction.

5. Football Fields/Track & Field Areas

1. Football fields/track & field areas and their buffer zones must be graded to eliminate ponding areas and have an optimum gradient of 2% in all directions with a variance of plus or minus 0.5%.

2. Grading plans for football field/track & field areas shall illustrate drainage patterns in a minimum of three directions.

3. Football field/track & field areas are not to be located within dry ponds.

4. Football fields/track & field areas form part of a District Park and are not part of the 10% Municipal Reserve Dedication. The School Boards will be responsible for the development of these facilities.

5. Goal post and field dimensions are on Detail Sheets 69 and 70.

6. The layout for the field events may be varied to suit particular local requirements. Design specifications can be obtained by contacting the Park Development Coordinator.
6. Basketball Courts

1. **Detail Sheets 71, 72 and 73** are to be used in conjunction with the following specifications:

   a. Prior to construction of the surfacing a pavement design shall be submitted to Calgary Parks. The pavement design shall be prepared by a qualified geo-technical professional Engineer. The design should be gravel based and shall include a review of existing subsoils and subgrade drainage conditions. Subgrade preparation along with placing and compaction of gravel and asphaltic concrete is to be carried out in accordance with the current City of Calgary Roads specifications unless otherwise specified in the design.

   b. A final asphalt emulsion of two coats should be applied. The application shall include a filling, sealing and texturing process. Then the colouring and lining of courts shall occur with an acrylic emulsion coating. This coating shall be highly pigmented with prime colour and reinforcing pigments that will provide a long and lasting finish for basketball courts.

   c. Basketball Courts located within dry ponds shall be placed above the 1:50 year flood level.

   **NOTE:** The resulting surface shall be completely true (flat) with water ponding to a maximum depth of 2.50mm. Any deviation shall be corrected by the Contractor at no expense to The City of Calgary.
TREES, SHRUBS and GROUNDCOVERS
II. TREES, SHRUBS and GROUNDCOVERS

1. Development Guidelines

1. Tree Planting Quantities
   The Developer, at its sole cost and expense shall:
   
a. plant all trees within the Development Area in conformity with the Tree Planting Guidelines and the Urban Forest Management Policy using the one tree per two lot formula and giving first priority to the planting of trees on public lands, and
   
b. plant all trees on public land within the Development Area in conformity with Park Specifications, the Tree Planting Guidelines and the Urban Forest Management Policy.

2. Setback/Spacing Guidelines

   The edge of beds or clusters are to be located 2.5 m away from each other and other vertical elements.
   The following table shows the set back and spacing guidelines for all tree plantings in parks, public utility lots, RoW and storm-water dry ponds:

<table>
<thead>
<tr>
<th>A. Setback Situation</th>
<th>Poplar and Willow Trees and Shrubs</th>
<th>Other Deciduous Trees</th>
<th>Coniferous Trees</th>
</tr>
</thead>
<tbody>
<tr>
<td>Vertical Elements and Hard Surfaces</td>
<td>5m</td>
<td>2m</td>
<td>½ maximum spread</td>
</tr>
<tr>
<td>Private Property</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>• chain link fence</td>
<td>10m</td>
<td>2m</td>
<td>½ maximum spread</td>
</tr>
<tr>
<td>• post &amp; cable fence</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>• wood screening fence</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sport Fields</td>
<td>10m</td>
<td>½ maximum spread from 3m buffer</td>
<td>½ maximum spread from 3m buffer</td>
</tr>
<tr>
<td>B. Tree Spacing</td>
<td>½ maximum spread or 5m (whichever is less)</td>
<td>½ maximum spread</td>
<td></td>
</tr>
</tbody>
</table>

NOTES:

a. Poplar trees
   i. all poplars except for trembling aspen and Swedish Columnar aspen.
   ii. the minimum set backs for poplars may be reviewed upon request.

b. If other deciduous trees and coniferous trees are less than 3.5m from vertical elements and hard surfaces or private property lines the trees must be placed in mulched beds.

c. Maximum tree spread as per Alberta Horticultural Guide.

d. No more than 50% of any one species planted in a park will be poplar as per the Poplar Tree Policy.
NOTE: Deciduous trees that are 100mm caliper or larger and coniferous trees that are 4.0m high or taller will require a warranty and a five (5) year maintenance period. The five (5) year maintenance period is calculated from the date of issuance of CCC.

3. Line Assignment (i.e. Setback) Requirements

a. For setback requirements of trees planted along roadways see “Design Guidelines for Subdivision Servicing” available from The City of Calgary Roads. “Regional Pathways on Residential Boulevards”. Also see Park’s Detail Sheet No.37b.

b. The following table shows setback requirements for trees planted adjacent to utilities.

<table>
<thead>
<tr>
<th>UTILITIES</th>
<th>POPLAR</th>
<th>DECIDUOUS</th>
<th>CONIFEROUS</th>
</tr>
</thead>
<tbody>
<tr>
<td>DEEP</td>
<td>SERVICES MAINS</td>
<td>SERVICES MAINS</td>
<td>SERVICES MAINS</td>
</tr>
<tr>
<td>Sanitary</td>
<td>3.0m</td>
<td>4.0m</td>
<td>0m** 2.5m</td>
</tr>
<tr>
<td>Storm (&lt;4.5m deep)</td>
<td>3.0m</td>
<td>4.0m</td>
<td>0m** 2.5m</td>
</tr>
<tr>
<td>Water</td>
<td>3.0m</td>
<td>4.0m</td>
<td>0m** 2.5m</td>
</tr>
<tr>
<td>Hydrants</td>
<td>3.0m</td>
<td>4.0m</td>
<td>N/A 2.5m</td>
</tr>
</tbody>
</table>

SHALLOW

| ATCO TELUS | 2.0m* | 2.0m* | 2.0m | 2.0m |
| CTV ENMAX  | 2.0m* | 2.0m* | 1.5m | 1.5m |
| ENMAX      | 2.0m* | 2.0m* | 1.5m | 1.5m |

ENMAX

| Transformer (within Utility Rights-of-Way) | N/A | N/A | N/A |
| Street Light Poles | 5.0m | 4.0m - 5.0m | Min. 4.0m |

NOTES:

* A 3.0m separation may be required at the discretion of the utilities.

** Pipe joints are not permitted on water or sewer services located under medians.

*** Trees on residential (15.0m RoW) boulevards, with no sidewalks, can be planted 1.0m from driveways. Driveway crossings are to be aligned, where possible, to allow space for tree planting.
4. **Traffic Islands**

The following are setback requirements for trees and shrubs planted on traffic islands:

i. All trees and shrubs must be a minimum of 7.5m from the bullnose or back of walk extended through the island, whichever is greater, adjacent to primary streets.

ii. All trees and shrubs must be a minimum of 4.5m from 'any' bullnose adjacent to primary streets on irregular shaped islands.

iii. All trees and shrubs must be a minimum of 3.0m from the bullnose inside the cul-de-sac.

iv. All shrubs and deciduous trees (excluding poplars) must be planted 1.5m from back of curb.

v. All Poplar trees, except for Trembling Aspen and Swedish Columnar Aspen, must be planted 6.0m from back of curb, except when the director of Parks and director of Roads give conditional approval.

vi. All coniferous trees must be planted 3.0m from back of curb.

*NOTE:* To obtain line assignment and construction approvals for plantings, please submit seven (7) sets of folded drawings to Parks Planning and Development Services for new subdivisions, or seven (7) sets of folded drawings to Infrastructure Information Services, Access Solutions for non-standard tree planting proposals existing areas and where utility lines are involved.

5. **Play Structure Plantings**

a. Shrub beds should be set back from areas designed for play structures as follows:

   i. 3.5m from the outside edge of the play area; or
   ii. The width of a local pathway where the pathway abuts a play area.
   iii. Type and spacing of plantings shall ensure clear sight-lines into the play structure area.

6. **Tree Protection Guidelines**

The Street Bylaw (20M88) and the Tree Protection Bylaw (23M2002) contain clauses intended to protect trees growing on Public Land.

As part of the Tree Protection Bylaw, a Tree Protection Plan will be required when a development or construction activity or a disturbance occurring on The City boulevard is within 6 meters of a boulevard Tree. The intent of a Protection Plan is to maintain Public Trees as long-term
assets to the community and to the City in general. Tree protection requires forethought and planning well before construction activities commence. Tree Protection Plans and protection measures are only required on City of Calgary owned land.

Permits issued by The City of Calgary Roads are required if construction activities use or cross any portion of the road Right-of-Way (including boulevards). Permits are obtained at Traffic Assessment 2808 Spiller Rd SE. For further permit information call 403-268-3658 or consult The City of Calgary Roads’ website at www.calgary.ca/roads and follow the “permit” link.

A condition of the issuance of permits by The City of Calgary Roads may be the requirement for a Tree Protection Plan when construction activities are within six (6) metres of a tree on Public land. The intent of a Tree Protection Plan is to help ensure that The City’s Urban Forestry assets remain long term assets to the community. Requirements and specifications for a Tree Protection Plan may be obtained by telephoning Urban Forestry, call 3-1-1 or consult The City of Calgary Parks’ web site at www.calgary.ca/parks, click on Parks Management, Trees

a. Tree Protection Plan elements, measures and conditions are only required on The City of Calgary owned land. However, applicants are encouraged to apply tree protection measures on private land. Effective tree protection places limits on damage and disturbance to tree branches, trucks, and root systems.

b. If plans call for Public Trees to be removed, an application for the removal of Public Trees can be found online at www.calgary.ca/parks Public Tree Removals will not be approved without an approved Tree Protection Plan. Completed Tree Protection Plans referencing Development Permit number, site address and billing information are to be submitted for approval.

Via email to: Tree.Protection@calgary.ca
Or by mail to:

Tree Protection
City of Calgary Parks Urban Forestry
P.O. Box 2100, Stn M #75
Calgary, AB T2P2M5
Or by fax to:
403-537-7505

c. A tree protection plan is a drawing and/or report, installation of physical barriers or other materials and specification of construction techniques. A Tree Protection Report is to:

• Inventory and locate all trees and shrubs on The City of Calgary owned land within six (6) metres of all property lines of the site
under redevelopment.

- Identify species, diameter at 1.4m off the ground, height, condition and existing flaws or damage, significant pests and diseases.
- Identify whether tree(s) or shrubs are to be moved, removed or protected.
- Identify whether tree pruning is required to provide clearance.
- Identify a Tree Protection Zone in which activities are restricted. Minimally, this zone is limited to The City of Calgary owned land, four (4) metres distance from the trunk and to a depth of 1.2m. The canopy of the tree is protected to the dripline.
- Locate staging, hoarding, and storage areas of construction.
- Locate limits of land disturbance, excavation, trenching and grade changes, routing of utilities, and irrigation systems, sidewalks, driveways, construction access roads, changes to street lighting, fire hydrants, utilities boxes.
- Identify construction methods and equipment to be used on The City of Calgary owned lands.
- Identify measures to ensure tree branches, trunk and roots are protected during construction. Measures may include effective barrier fencing, branch and or root pruning, protective mulch, supplementary water, soil aeration, informational signage.
- Identify pre and post construction tree care measures.
- Provide contact information for a designated individual that will be responsible for ensuring all work adheres to the approved Tree Protection Plan.

d. The City of Calgary Parks prohibits:

- Work on The City of Calgary owned land within six (6) metres of a Public Tree without a Tree Protection Plan.
- Construction activities requiring use of or on the road right of way without a permit issued by Calgary Roads, Traffic Assessment.
- Unauthorized soil disturbance on The City of Calgary owned land within six (6) metres of a City Tree.
- Unauthorized deviation from a Tree Protection Plan approved by The City of Calgary Parks.
- Unauthorized entry into a Tree Protection Zone or interference with tree protection barriers.
- The attachment of objects to the trunk or branches.
- The use of equipment for which there is insufficient canopy clearance.

e. The City of Calgary Parks requires:

- Work on The City of Calgary owned lands to be performed by The City of Calgary forces or by Contractors that have entered into an indemnity agreement with The City of Calgary.
• Compensation for trees removed or damaged as per appraisal methodologies accepted by the International Society of Arboriculture and as determined to be fair and reasonable by The City of Calgary Parks, Urban Forestry Coordinator.

f. Failure to comply with public tree protection measures may result in fines ranging from $100 to $10,000, in accordance with The City of Calgary’s Tree Protection Bylaw 23M2002. Other compliance measures may be required by a duly appointed Enforcement Officer.

g. The applicant will be required to provide compensation to The City of Calgary for any Public Trees that are removed or damaged. Individual Public Trees can have values ranging in the thousands of dollars depending on size and species. You may wish to consider this cost during the design and development phase of your project. Applicants that are unfamiliar with tree protection or tree appraisal are advised to consult an arborist. Arborists are found in the telephone directory under “Tree Service”.

h. The applicant shall provide compensation of The City for trees removed as per the approved Tree Protection Plan. Payment to be made to:

The City of Calgary Parks  
c/o Urban Forestry Coordinator  
Location #75, P.O. Box 2100 Station M  
Calgary, AB T2P 2M5

All trees and landscaping on public land shall be established and receive construction inspections in accordance with the current edition of the Park Development & Operations Development Guidelines and Standard Specifications Landscape Construction'. Contact the Park Development Inspector at North 804-9397, South 804-9417, or Central 620-3216.

7. Tree Replacement/Compensation Guidelines

a. If anyone receives approval from The City of Calgary Parks to remove trees from public lands and they plant replacement trees, they may apply for a credit of $380.00 per tree planted on public land. The replacement tree must be 60-85 mm and over and above any requirements under the Land Use Bylaw, or any other City requirement. Application for reimbursement may be made after the issuance of the FAC. Application for reimbursement should be directed to The City of Calgary Parks, Urban Forestry section call 3-1-1.

b. If anyone receives approval from The City of Calgary Parks to remove trees from public lands and there are plans for replacement, they shall pay to The City the difference (if applicable) between the cost of the
replacements and the value of the trees to be removed as determined by the Urban Forestry Specialist, call 3-1-1, using the International Society of Arboriculture’s formula.

c. If anyone, or other City business units, remove or damage trees on public lands, without approval of The City of Calgary Parks, while performing a City public works project, they shall replace the trees in accordance with the two trees for every one tree removed or destroyed formula.

d. If anyone removes or damages Native Vegetation in any of the above three scenarios, the replacement of the vegetation will be evaluated on a site-by-site basis to ensure that the integrity of the site’s vegetation is reasonably maintained.

8. Shrub Planting Guidelines

a. Parks

Up to 1% of total area of park. Plantings to be approved on a site by site basis.

b. Boulevards

No shrub planting permitted except at interchanges where gradients exceed 3H: 1V.

NOTE: Special projects to be looked upon on a site by site basis for larger boulevards as long as the shrubs:

i. are utilitarian;

ii. do not cause excess maintenance requirements;

iii. do not restrict the visibility between pedestrians and vehicles;

iv. are not in conflict with utilities; and

v. are of a suitable species and growth habit.

c. Medians & Traffic Islands

No shrub planting permitted.

NOTE: Special projects to be looked upon on a site by site basis.

d. Utility Easements & Right-of-Ways

No shrub planting permitted unless otherwise approved by Infrastructure Information Services, Access Solutions.
2. Standard Specifications

1. Description/Quality Assurance

a. This section specifies the supply and planting of trees, shrubs and ground covers.

b. Planting work is to be carried out by experienced personnel under the direction of a skilled horticultural foreman.

2. Product Delivery, Storage and Handling

a. Supply manufactured items such as fertilizer, bone meal, mulch, etc. in standard containers, clearly indicating contents, weight, component analysis, and the name of the manufacturer. Include WHMIS codes as required.

b. Store manufactured materials, subject to deterioration, in a weatherproof place on site and in such a manner that their effectiveness is not impaired.

c. Provide root balls of the following minimum sizes to meet the corresponding tree size:

i. Hand Planting

   Deciduous Trees

   **Caliper** | **Root Ball Diameter**
   --- | ---
   #40mm (1.5") | 600mm (2'0")

   Coniferous Trees

   **Height** | **Root Ball Diameter**
   --- | ---
   1.0m (3.28') - | 600mm (2'.0")
   1.5m (4.92') |

   Root ball sizes for naturalized plantings will be approved by The City of Calgary Parks on a site-by-site basis.

   Provide root ball depth as follows:

   - Root Ball Diameter | Root Ball Depth
   - 600mm (2'0") or less | minimum 450mm

   Wrap root balls according to the following schedule:

   - Root Ball Diameter | Wrapping Schedule
   - up to 600mm (2'0") | 142g (5oz.) hessian burlap, single wrap

   Bare root stock to not exceed 40mm (1.5") caliper. Root Ball diameter will be 300mm (12") for every 25mm (1") caliper.
ii. For trees dug by tree spade (machine method):

Minimum Root Ball Size For Deciduous Trees (CNLA Standard)

<table>
<thead>
<tr>
<th>Caliper</th>
<th>Ball Diameter</th>
<th>Ball Depth</th>
</tr>
</thead>
<tbody>
<tr>
<td>40 mm</td>
<td>60 cm</td>
<td>40 cm</td>
</tr>
<tr>
<td>50-60 mm</td>
<td>70 cm</td>
<td>40 cm</td>
</tr>
<tr>
<td>70 mm</td>
<td>80 cm</td>
<td>50 cm</td>
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<tr>
<td>80 mm</td>
<td>90 cm</td>
<td>50 cm</td>
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<td>90 mm</td>
<td>90 cm</td>
<td>50 cm</td>
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<tr>
<td>100 mm</td>
<td>100 cm</td>
<td>50 cm</td>
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<tr>
<td>125 mm</td>
<td>120 cm</td>
<td>80 cm</td>
</tr>
<tr>
<td>150 mm</td>
<td>150 cm</td>
<td>80 cm</td>
</tr>
<tr>
<td>175 mm</td>
<td>175 cm</td>
<td>80 cm</td>
</tr>
<tr>
<td>200 mm</td>
<td>200 cm</td>
<td>80 cm</td>
</tr>
</tbody>
</table>

- These root ball sizes are considered minimum and will only be used for trees grown under proper nursery conditions (i.e. transplanted or root pruned at least once within previous four years).
- Multi-stem trees will require a root ball at least one size larger.

Minimum Rootball Size For Coniferous Trees (CNLA Standard)

<table>
<thead>
<tr>
<th>Height</th>
<th>Root Ball Size</th>
<th>Height</th>
<th>Root Ball Size</th>
</tr>
</thead>
<tbody>
<tr>
<td>50 cm</td>
<td>30 cm</td>
<td>200 cm</td>
<td>80 cm</td>
</tr>
<tr>
<td>60 cm</td>
<td>35 cm</td>
<td>225 cm</td>
<td>90 cm</td>
</tr>
<tr>
<td>80 cm</td>
<td>40 cm</td>
<td>250 cm</td>
<td>90 cm</td>
</tr>
<tr>
<td>100 cm</td>
<td>45 cm</td>
<td>275 cm</td>
<td>100 cm</td>
</tr>
<tr>
<td>125 cm</td>
<td>50 cm</td>
<td>300 cm</td>
<td>122 cm</td>
</tr>
<tr>
<td>150 cm</td>
<td>60 cm</td>
<td>350 cm</td>
<td>127 cm</td>
</tr>
<tr>
<td>175 cm</td>
<td>70 cm</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

- These root ball sizes are considered minimum and will only be used for trees grown under proper nursery conditions (i.e. transplanted or root pruned at least once within previous four years).
- Root ball shall be burlapped and wire basketed. Wire basket shall be laced at the top and of sufficient strength to withstand lifting the tree by the top loops of the basket at a minimum of two points.

d. Cut all roots cleanly when digging plants. Roots should be cut even with the edges of the root ball.

e. Protect plant material from damage and breakage. Protect all parts of plant material from drying out and maintain adequate moisture levels.

f. Ensure that during transport, plant material is adequately protected.
g. Carefully tie in all branches before transporting.

h. Pad all points of contact between plant material, equipment and basket.

i. Heel in with soil or other suitable material and water any plant material that cannot be planted during the current day's operations. All plant material should be planted within 24 hours of delivery to site. The City of Calgary Parks reserves the right to reject any material not installed within this timeframe, weather permitting.

j. Keep all roots and root balls watered prior to planting.

k. Nursery grown deciduous trees that are 100mm caliper or larger and coniferous trees that are 4.0m high or taller will require a warranty and a five (5) year maintenance period. The five (5) year maintenance period is calculated from the date of issuance of CCC.

l. Avoid purchasing material with encircling roots.

m. Root ball sizes for naturalized and natural area plantings will be approved by The City of Calgary Parks on a site-by-site basis.

3. Job Conditions/Substitutions

   a. Proceed with planting operations during suitable weather conditions or at the discretion of The City of Calgary Parks.

   b. Supply and install plant material as specified on the plant list. Substitution with other plant material will be allowed only with the written approval of The City of Calgary Parks.

4. Inspections

   a. The Contractor shall have an approved set of drawings and specifications and an approved line assignment available on site prior to calling The City of Calgary Parks for an inspection.

   b. Make plant material available for inspection at source by The City of Calgary Parks.

   c. Approval of plant material at source will not impair the right of The City of Calgary Parks to inspect plants upon arrival on the site or during the course of construction and to reject plants which have been damaged, or which in any way do not conform to the specifications.

   d. Give timely notice (see Inspections page 34) to The City of Calgary Parks when inspection and acceptance are required. Inspections shall be requested:
i. when holes or wells have been excavated;

ii. when all work is complete.

e. Plant material at CCC and FAC: true to name and type; structurally sound; well branched; healthy and vigorous and free from disease, insect infestations, rodent damage, sun scald, frost cracks, and other untreated abrasions to the bark; and densely foliated with a healthy, well developed root system. Pruning wounds must show vigorous callus growth on all edges and all parts must show live and green cambium tissue when cut. Final inspection of all plant material will be made at the end of the specified guarantee period.

5. Plant Material

a. Trees should comply with the Canadian Nursery Certification Institute’s Phytosanitary Certification Program standards (DPCP) whenever possible. (Currently this is a guideline but will become a mandatory requirement in 2012.)

b. As a minimum, all plant material must be nursery grown and meet the specifications set out in the latest Guide Specifications for Nursery Stock prepared by the Canadian Nursery Trade Association (C.N.T.A.) and the International Society of Arboriculture (I.S.A.) for size, height, spread, grading, quality and method of cultivation.


d. Any plant material not conforming to CNLA standards and specifications and/or not grown according to good nursery practices will be designated as "collected plants".

e. "Collected plants" may only be used when approved in writing by The City of Calgary Parks. “Collected plants” must be of good health and free of pests and diseases.

f. All material must conform to the sizes shown on the plant list. Larger material may be used only when approved by The City of Calgary Parks. Use of larger plants will not increase the contract price.

6. Mulch

1. All the planting beds, vaults, and wells shall be mulched.

2. Materials:

   a. Type: Any wood type is acceptable except that which is chemically treated or is salvaged from construction lumber, building demolition, or shipping waste.
b. Size: Coarsely ground mulch is preferred; otherwise use an even mixture in a range of sizes from 10mm x 10mm x 5mm to 40mm x 60mm x 35mm.

c. Consistency: Material should have no more than 5% by volume of soil, sawdust, peat moss, or needles.

d. The best material is pulled out of piles that have composted for a year.

e. Sanitation: No mulch from diseased or infested plant material is allowed unless it can be shown the material presents no risk to tree health.

f. Substitutions: All non-wood types of mulch require the approval of The City of Calgary Parks. Approval criteria will include: Safety, Aesthetics, Durability, Rate of Decomposition, Ease of Renewal and Replacement, Breakdown products, Resistance to salts and solvents, Recyclability, Permeability, Impact on water retention, soil structure, biology, and how unfavorable impacts will be mitigated.

g. Application: 75mm deep. Keep material 50mm away from trunks and stems to prevent rotting of bark. Any time of year.

7. Preparation

a. Obtain the approval of The City of Calgary Parks for all planting excavations prior to commencing planting operations. Parks Development Inspector approval does not preclude the applicant obtaining his or her approvals as may be required by other City Business Units, Utility providers, or regulators.

b. All necessary permits, approvals and plants must be available on site including but not limited to utility locates, line assignments, street use and excavation permits, and Parks’ approved construction plans.

c. Tree hole excavations exposing utilities including irrigation must be inspected by the utility owner. Utility inspection contacts can be found on Alberta One-Call locate sheet. Inspections of City owned irrigation can be arranged; call 3-1-1.

d. If using a nitrogen fertilizer, it shall be a slow or controlled release product. Synthetic or natural organic fertilizers are preferred.

e. Supply plant material as specified on the plant list or substitutions as approved by The City of Calgary Parks.
f. Dig material, specified "B.R." (bare root) on the plant list, while in a dormant state and with the root system extending a minimum of 300mm (12") diameter per 25mm (1") of tree caliper. Immediately after digging, wrap the roots in wet burlap and keep burlap wet during transport and storage.

g. Provide material, specified "W.B." (wire basketed and burlapped) to Canadian Nursery Landscape Association (CNLA) specifications. 

NOTE: Section 2.2.c.ii (page 69) for root ball size.

h. Do not use plant material on which the root ball has been cracked or broken preparatory to or during the planting process.

i. Container stock to be Canadian Nursery Landscape Association (CNLA) specifications.

8. Installation

The following specifications are to be referred to with Detail Sheets #22 to 27a.

a. Dig out by tree spade, backhoe or hand shovel, the tree holes and shrub beds and remove excess soil off site.

b. Ensure width of all planting excavations is 450mm greater on all sides than the width of the root ball or as per site conditions to maintain soil volume. Scarify subgrade to a depth of 75mm under all tree pits and shrub beds.

c. Depth of planting beds are as follows:
   • 450mm for flower beds
   • 600mm for shrub beds

d. Place plant plumb in the centre of the planting pit with a firm base under the root ball. Face the plant to give the best appearance or relationship to adjacent structures. Grafted trees should be planted at root crown depth. The graft shall be above soil grade. Trees are to be planted with root crown at grade or above.

e. Place bare root plants so that the roots lie in a natural position. Container grown trees are to have the root crown exposed from excess potting soil. Encircling roots are to be separated or cut and laid out radially from the root crown.

f. At the time of planting, cut away the strappings and remove the top 1/3 of the wire and burlap. Leave two wire handles intact during the maintenance period. Remove these wire handles to the
first wire ring prior to final acceptance.

g. Backfill with topsoil or other material as specified by The City of Calgary Parks and firmly compact the soil to ensure the plant retains its orientation. Ensure no air pockets remain around the roots.

h. Thoroughly water within the same working day of planting trees. Water probing is not acceptable.

i. Ensure that the trees remain at grade surrounded by a tree well to a depth of 100mm after planting and watering. All trees to be mulched starting 50mm from the root flare (trunk) and extending the length of the hole.

9. Maintenance/Pruning/Clean-up

a. Maintain all plant material from the time of planting until the date of issue of Final Acceptance Certificate.

b. Maintenance shall include all measures necessary to establish and maintain all plants in a vigorous and healthy growing condition, as specified in Landscape Maintenance, page 169.

c. At the time of acceptance, all material must be in a healthy, vigorous growing condition. Unmulched beds and tree pits must be freshly cultivated and free of weeds, rubbish, and debris. Mulched beds should be free of weeds, rubbish and debris.

d. Remove all dead branches. If there is a double leader, shorten one by about ½, back to a live branch that points away from the trees that is about 1/3 the diameter of the leader cut. Prune broken portions of branches back to live lateral. Retain the rest of the spec.

e. Ensure that all damage to surrounding work is repaired before leaving site.

f. Each day ensure that all debris is cleaned up and disposed off site and that the project site is left in a tidy, organized condition.

10. Transplanting Existing Trees

As per Sections .6, .7, .8 and .9 above.

11. Pruning

The Parks Urban Forest Strategic Plan outlines the acceptable reasons for pruning trees as well as prohibited reasons:
a. Acceptable reasons for tree pruning
   i. Overhead utility clearance
   ii. Public Safety
   iii. Tree health
   iv. Tree structure

b. Prohibited reasons for tree pruning
   i. Mitigation of minor nuisances such as fruit, seeds, fluff, pollen, sticky bud caps, leaves, minor pest infestation, etc.
   ii. Mitigation of landscape damage
   iii. Creation of views and clearance of advertising signs.

c. Tree pruning is to be in accordance with the best practices as published by the International Society of Arboriculture.

d. Branch removal should be limited to necessary clearance pruning for public and electrical safety, the removal of dead, diseased and defective wood to improve tree health and/or structure.

e. Trees are to be pruned and maintained in accordance with Illuminating Engineering Society of North America standards for Roadway Lighting.

f. Public trees interfering with overhead power lines will be pruned or removed as appropriate.
SUBGRADE, TOPSOIL, SODDING, SEEDING
III. SUBGRADE, TOPSOIL, SODDING and SEEDING

1. Subgrade and Topsoil

1. Design Guidelines

a. Provide a minimum 2% gradient across all reserve parcels, medians, traffic islands, boulevards, public utility lots/ROW’s and storm-water dry ponds.

b. Excessive fill that compromises the site design will not be acceptable.

c. Geotechnical testing may be required where questionable subgrade exist.

d. Joint Use Site Guidelines:
   - School building envelope to have same grade as sports field envelope (i.e. 2%);
   - School building envelopes and adjacent road grades must be at the same elevation;
   - School building envelope is to have topsoil applied to a maximum depth of 150mm.
   - For every one (1) metre in elevation in excess of 2% slope, a minimum increase of three (3) metres will be required on site.
   - If non-engineered fill is to be incorporated in an MSR site, the non-engineered fill drawing (see detail Sheet No. 28a), documenting the limit and depth of the fill area and confirming the fill area is outside the building envelope, shall be provided at CCC.

2. Drainage Guidelines

a. Where possible drainage is to be picked up within the reserve parcels, public utility lots/ROW’s and storm-water dry ponds in grass swales.

b. Grass swales are to drain at a minimum 2% gradient.

c. Grass swales exceeding sixty (60) metre runs are to have a minimum gradient of 4.0%. If the swale is to drain at less than 4.0%, it shall have weeping tile along the entire length of the swale tied into a catch basin or water drainage along a concrete swale or an approved equal.

d. The City of Calgary Parks reserves the right to limit the amount of off-site drainage onto a reserve parcel and public utility lot/ROW when, in their opinion, such drainage will compromise the integrity of the site.

e. All trap lows must be approved by The City of Calgary Parks prior to construction. Trap lows must not compromise the use of the site and must be an integral part of the design.
f. All drainage swales that empty onto reserve parcels, boulevards, public utility lots, RoW’s, environmental reserves, and storm-water dry ponds shall have concrete splash pads (Detail Sheet #46). Concrete splash pads shall be installed at a 10% pitch or erosion fabric will be required at their end.

3. Description and Quality Assurance

This section specifies the preparation of subgrade and supply and spreading of topsoil. The Contractor must have experience at performing this type and scale of work and be willing to provide proof of this experience.

4. Submittals

Submit required sample of topsoil to the testing laboratory and indicate intended use, type of mulches to be applied, type of sub-soil and quality of drainage.

5. Product Delivery, Storage and Handling

   a. Stockpile topsoil in locations designated by The City of Calgary Parks.

   b. Do not spread topsoil in a muddy condition.

6. Job Conditions and Protection

   a. Report in writing to The City of Calgary Parks, prior to commencing work, any conditions or defects encountered on site upon which the work of this section depends, and which may adversely affect the performance of the work.

   b. Do not commence work until such conditions or defects have been investigated and corrected.

   c. Commencement of work implies acceptance of surface conditions and no claims for damages or extra work will be accepted, except where such conditions cannot be determined prior to construction.

   d. Protect all existing trees and planting areas in accordance to the Tree Protection Guidelines (see page 63).

7. Inspections and Topsoil Test

   a. The Contractor shall have an approved set of drawings and specifications available prior to calling The City of Calgary Parks for inspection.

   b. Obtain approval of the topsoil in writing from The City of Calgary Parks. Topsoil testing shall be done on the source of topsoil. Four
samples shall be taken (i.e., one within every 25% vertical increment of the stockpile) at a depth of one foot. The location of the samples within each vertical increment shall be determined by the Park Development Inspector.

c. Submit for approval from The City of Calgary Parks the name of the testing company who will conduct the soil analysis.

d. Submit two (2) copies of the soil analysis report, including the location of the topsoil stockpile or source and recommendations for correction to The City of Calgary Parks. Test the topsoil for NPK, a particle size analysis, soluble salt content, organic matter and pH. Recommendations should clearly state the type, quantity and application procedure for amendment.

e. Should the source of topsoil be exhausted, test topsoil from new source, submit soil analysis report and recommendations for correction and obtain the approval of The City of Calgary Parks before using.

f. The City of Calgary Parks shall approve both rough grade prior to placing of topsoil and finished grade at appropriate times before the Contractor proceeds with next phase of work. For all joint use sites and community parks, as well as dry ponds containing sports fields in MR and MSR sites, the Contractor shall:

i. **At Subgrade Inspection:**
   - supply grade stakes at all corners of sports fields as well as along their centre line;
   - supply grade stakes at the toe and heel of all slopes and swales. Spacing of the stakes is to be determined by The City of Calgary Parks prior to their installation;
   - be available for a joint site inspection with The City of Calgary Parks and have on site a survey crew fully equipped to provide any additional elevations as may be requested.

ii. **At Finished Grade Inspection:**
   - supply grade stakes at the corners, centre and quarter points of sports field, break of slopes and along drainage channels.

*NOTE: The information to be provided by the Developer on the grade stakes, if so requested by The City of Calgary, shall include but not be limited to:*

- Offset distance (if applicable)
- Actual Elevations
- Grid Point (if applicable)
- Cuts/Fills

*The Developer of any adjacent undeveloped lands shall be responsible to match these final design elevations to the satisfaction of The City of Calgary.*
8. **Materials (Detail Sheet #28)**

a. "Topsoil": A fertile, friable, natural loam, containing not less than 4% organic matter for clay loams and not less than 2% organic matter for sandy loams to a maximum of 15%; and capable of sustaining vigorous plant growth, free of rocks of 50mm in diameter and over, subsoil contamination, roots and weeds (as determined by The City of Calgary Parks) and having a pH ranging from 7.0 to 8.5.

b. Volume of rock in topsoil not to exceed 20%.

c. Native soils should be used where restoration is required of natural areas and environmental reserves. The organic layer (A horizon) should be stripped and stockpiled. Imported loam should only be used at the discretion of The City of Calgary Parks.

9. **Subgrade Preparation (Detail Sheet #28)**

a. Fine grade subgrade to even running and given levels with a tolerance of plus or minus 75mm. Remove all debris from the subgrade and ensure it is not contaminated and free of all deleterious materials.

b. Compact finished subgrade and all fill material to 85% standard proctor Dry Density for areas under turf or planting.

c. Scarify subgrade to a depth of 75mm in all areas except where considered impractical by The City. Whenever compaction is greater than or equal to 95% standard proctor dry density scarification will be required to 200mm.

10. **Spreading of Topsoil**

a. Spread dry topsoil during dry weather over approved subgrade.

b. Apply topsoil to the following minimum depths measured at right angles to the subgrade after leveling with a tolerance of 25mm over a distance of 2.4m:

- 150mm for seeded areas
- 125mm for sodded areas
- 450mm for flower beds
- 600mm for shrub beds

c. Fine grade topsoil eliminating rough and low areas and to ensure positive drainage.

d. Ensure that finished grade meets flush at surface structures, project boundaries and property lines.
e. Rake topsoil to obtain even running and given levels and remove surface rock. (Detail Sheet #28).

f. Make good any damage caused by topsoil spreading activities.

g. Control dust so as to have no impact on surrounding land uses.

h. Clean all adjacent walks, streets and properties as a result of work done under this section at the end of each working day or as directed.

11. Spreading of Topsoil – Natural Areas, ER’s

a. See above “Spreading of Topsoil,” subsections a, d, f, g and h.

b. In restoration the depth and finish grade of the topsoil should be tied to the depths and finish of the pre-existing native profile. This should be specified in the restoration plan and approved by The City of Calgary Parks.

c. Rough grade topsoil to ensure positive drainage and to emulate the pre-development drainage patterns and rates.

2. Sodding

1. Description and Quality Assurance

   This section specifies the supply and placing of cultivated sod. The Contractor must have experience at performing this type and scale of work and be willing to provide proof of this experience.

2. Product Delivery, Storage and Handling

   a. Cut sod by approved methods in accordance with recommendations of the Canadian Nursery Landscape Association (CNLA).

   b. Roll or fold sod prior to lifting, in such a manner as to prevent tearing or breaking.

   c. Protect sod during transportation to prevent drying out and ensure its arrival at the site in a fresh and healthy condition.

   d. Sod should be installed upon arrival. If there is a delay in installation due to weather, keep the sod moist and cool and protected from direct exposure to the sun until installation. The City of Calgary Parks will reject sod that has dried out.

   e. Provide fertilizer in standard manufacturer's containers, clearly marked with the name of the manufacturer, weight and analysis.
3. **Inspections**

   a. The Contractor shall have an approved set of drawings and specifications available prior to calling The City of Calgary Parks for an inspection.

   b. Make all materials, including sod, available for inspection upon arrival on the site, or at source of supply when requested. Also, verify names of suppliers when requested.

   c. Give timely notice (see Inspections page 34) when materials are available for inspection.

   d. Obtain approval of finished topsoil surface by The City of Calgary Parks before proceeding with sodding.

   e. The City of Calgary Parks reserves the right to reject sod after it has been installed if: the sod does not conform to the specification and/or drawings; each grass species within the sod does not show signs of survival; the root system is not strong and fibrous; the sod is not free of stones; or if the sod shows signs of burned or bare spots.

   f. Remove all rejected materials immediately from the site.

4. **Materials**

   a. **Number One Kentucky Bluegrass-Fescue Sod**: Good quality blue grass and fescue mix suitable for the Alberta climate.

   b. **Fertilizer**: Type and application rate to be determined by soil test.

   c. **Wooden pegs or approved equal**: ensure pegs are long enough to securely anchor sod.

5. **Preparation and Installation (Detail Sheet #29)**

   a. Proceed with sodding operation only during favourable weather conditions and in accordance with good horticultural practice.

   b. Apply slow release fertilizer (NPK 2-4-1) i.e. 12-25-10 at a rate of 3.5lb of phosphorous per 1000 ft². Desired nitrogen makeup shall be 50% water-soluble and 50% polymer coated urea (slow release). This is subject to adjustment upon time of year and receipt of the topsoil analysis report and the Contractor's recommendation as outlined in Section III.1.7, Inspections/Topsoil Test (page 78).

   c. Provide a finished topsoil surface that is smooth and firm with a fine, loose texture, free of rocks, weeds and debris over 50mm in diameter, before sod is placed *(See Detail Sheet #28).*
d. Lay sod with tight butt joints. Do not leave any open joints or overlap adjacent pieces of sod. Ensure that adjacent rows are laid in a staggered sequence.

e. Big Roll Sod. Where big roll sod is to be installed, remove any and all shipping or packaging materials prior to or at the time of installation of big roll sod. Remove nylon mesh nettings or any similar materials from rolls of sod prior to or at the time of installation.

f. Ensure finished sod surface is flush with adjoining grass areas, pavement or top surface structures such as curbs, manholes, sidewalks, irrigation boxes, etc.

g. On slopes steeper than 3H:1V lay sod across the face of the slope and peg each row at intervals of not more than 600mm. Secure in an approved fashion.

h. Lay sod to a width of 3m in swales and place perpendicular to direction of swale, unless otherwise noted on drawings.

i. Immediately after installation of sod, water area with sufficient amounts to saturate sod and underlying topsoil to a minimum depth of 100mm.

j. After the sod and soil have dried sufficiently to prevent damage, roll the areas, if required, to ensure good bond between sod and soil and to remove minor irregularities. Clean up and remove off site all waste and extra sod at the end of each day or as directed.

k. Protect all newly sodded areas as required.

l. Remedy all damages, washouts and eroded areas resulting from weather, improper protection or other causes.

6. Maintenance and Acceptance

a. Maintain sodded areas according to the Landscape Maintenance Section (Page 169) from the time of installation until Final Acceptance Certificate is issued by The City of Calgary Parks.

b. Prior to acceptance, sod and water all bare spots larger than 15cm². Acceptance will be given upon establishment of sodded area.

3. Seeding

1. Description and Quality Assurance

This section specifies the supply and placing of grass seed. The Contractor must have experience at performing this type and scale of work and must be willing to provide proof of this experience.
2. **Product Delivery, Storage and Handling**

Deliver grass seed, fertilizer, mulch and other materials in standard containers, clearly marked with contents, weight, analysis and name of supplier or manufacturer. Ensure that the quantities of each seed species within seed mixtures are clearly marked.

3. **Inspections**

   a. The Contractor shall have an approved set of drawings and specifications available prior to calling The City of Calgary Parks for an inspection.

   b. Make all materials, including seed, available for inspection, upon arrival on the site, or at source of supply when requested. Also verify names of suppliers when requested.

   c. Give timely notice (see Inspections page 34) in writing, when materials are available for inspection.

   d. Obtain the approval of The City of Calgary Parks of the finished topsoil preparation before proceeding with seeding. (Detail Sheet #28).

   e. Where a hydro-seeding method is used, notify The City of Calgary Parks 24 hours before loading seeder and allow for an inspection at location of loading operation. Also, provide all identification labels from materials placed in hydro-seeder. Failure to notify The City of Calgary Parks before loading occurs could result in rejection of the seeding operation.

   f. Installation of seed prior to inspection is the Contractor's responsibility. During an inspection, The City of Calgary Parks reserves the right to reject seed if seed does not conform to specifications.

   g. Remove all rejected materials from site immediately.

4. **Materials**

   i. **Grass Seed**: certified Canada No. 1 seed, free of disease, weed seeds or other foreign materials, meeting the requirements of the Seeds Act. All cultivars listed below must be rated in the top 25\textsuperscript{th} percentile of the National Turfgrass Evaluation Plots (NTEP) located in Alberta.

   The following are grass seed mixes approved by The City of Calgary Parks and their appropriate application for use:

   i. **Urban A**: for slopes up to 3H:IV, highway boulevards, interface areas and other areas where irrigation is not available; a coarse grass mixture composed of:
Kentucky Blue Grass 20%
Creeping Red Fescue 35%
Annual Rye 30%
Perennial Rye Grass 15%

**NOTE:** The annual rye grass may be replaced with crested wheat when, in the opinion of Calgary Parks, the crested wheat grass will not be invasive to a natural area.

ii. **Urban B:** for play fields, joint use sites, residential boulevards and other non-irrigated but high use areas; a medium grass mixture composed of:

Kentucky Blue Grass 40%
Creeping Red Fescue 45%
Perennial Rye Grass 15%

iii. **Urban C:** for irrigated tot lots, decorative and athletic parks; a fine grass mixture composed of:

3 varieties of Kentucky Blue Grass 75%
Creeping Red Fescue 15%
Perennial Ryegrass 10%

Urban A, B and C grass mixtures are applied at a rate of not less than 30g/m² or 300kg/ha.

iv. **Urban D:** a native grass seed for reclamation of Environmental Reserves and Natural Areas where maintenance and irrigation are not available. A proposed grass seed mix that makes every attempt to use seed that is native (locally indigenous) to the Calgary region must be submitted. The mix should be based primarily on wheat grasses and will be approved on a site-specific basis. Substituting due to lack of availability of native seed must be approved in advance by The City of Calgary Parks. Submissions must indicate seed suppliers for verification of source. Upon approval of the proposed grass seed mix, a seed analysis certificate shall be submitted for approval by The City of Calgary Parks prior to application. Application rates to be determined on a site-specific basis.

v. **Urban E:** a wildflower seed mixture for use as an option to Urban D in reclamation of Environmental Reserves and Natural Areas where irrigation and maintenance will not be available. It should be composed of a minimum of 10 perennial wildflower species applied at a rate of not less than 1gm/m² or 10kg/ha with an approved bunchgrass at 2.5gm/m² or 25kg/ha. A proposed wildflower mix must be submitted to The City of Calgary Parks for approval.
vi. **Urban F**: a slow growing, low maintenance mix for medium use park areas where a more natural grassland appearance is desired on a non-irrigated site; a grass mixture composed of:

- 3 varieties of Kentucky Blue Grass: 20%
- Creeping Red Fescue: 40%
- Lowgrow Perennial Ryegrass: 15%
- Hard Fescue: 25%

Urban F grass mixture is to be applied at a rate of not less than 20g/m² or 200kg/ha.

Where practical, Urban A, B, C and F grass mixtures can be used adjacent to natural areas only if a suitable barrier can be provided (such as a pathway) to prevent the Urban mix from encroaching into the native community.

vii. **Fertilizer**: type and application to be determined by soil test.

viii. **Hydromulching**: (as per Public Works Canada specifications)

   i. **Mulch**: Approved wood fibre mulch manufactured from whole wood chips and containing no growth or germination inhibiting factors. The following specifications shall apply: Percent moisture content - 10%; percent organic matter - 99.2%; percent ash content - 8%; pH - 4.8%; water holding capacity - 1000gms/100gms of fibre. Percent moisture content is determined in accordance with the Canadian Pulp and Paper Association, Technical Section, Standard A.2.

The area of coverage for a hydroteeder is based on the water carrying capacity of a mulch and the volume of water that a seeder carries. The following is the water carrying capacity for various mulches. It is quoted as the number of kg's of mulch necessary to hold 1000 litres of water.

<table>
<thead>
<tr>
<th>Manufacturer</th>
<th>Kg/1000 L</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fibramulch</td>
<td>46.84</td>
</tr>
<tr>
<td>Silva-Fiber</td>
<td>50.00</td>
</tr>
<tr>
<td>Verdyol Standard</td>
<td>37.9</td>
</tr>
</tbody>
</table>

The following is an **example for calculating the amount of mulch necessary per hydroteeder** if Fibramulch is being used:

- Hydroteeder volume is 3300 US gallons
- 3.785 is the conversion factor for US gallons to Liters
- 1000 is the water carrying capacity constant

Hydroteeder Volume × 3.785 × Water Carrying Capacity

1000
3300 \times 3.785 \times 46.84 = 585 \text{ kg}

Therefore, each hydroseeder load requires 585 kg of mulch. Since Fibramulch comes in 50 lb. or 22.7 kg bags, each tank load would require 25.77 bags.

The following are the rates for the application of mulch:

<table>
<thead>
<tr>
<th>Slope and/or Wind Conditions</th>
<th>Rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt;6:1 (H:V) Light Wind</td>
<td>1400 kg/ha</td>
</tr>
<tr>
<td>6:1 to 3:1 Medium Wind</td>
<td>1700 kg/ha</td>
</tr>
<tr>
<td>&gt;3:1 High Wind</td>
<td>2000 kg/ha</td>
</tr>
</tbody>
</table>

The following is an example of calculating the area of coverage per hydroseeder load on a >3:1 slope:

- Application Rate is 2000 kg/ha (see above table)
- 10000 is the conversion factor from ha to m²
- Area covered is in m²
- Mulch per tank is 585 kg from previous calculation

\[
\text{Mulch Per Tank} \times 10000 = \frac{\text{Area Covered}}{\text{Application Rate}}
\]

\[
585 \times 10000 = \frac{2925 \text{ m}^2}{2000}
\]

Therefore, the area of coverage per hydroseeder load is 2925 m² whether it is doing seeding, fertilizing or erosion control.

ii. Tackifier: Acceptable colloidal polysaccharide tackifier, adhering to mulch during manufacturing, non-toxic and without growth or germination inhibiting factors. Apply as per labeled manufacturer’s specifications for slopes 4:1 and greater.

The following are the recommended rates for the application of TA200 tackifier:

<table>
<thead>
<tr>
<th>Slope and/or Wind Conditions</th>
<th>Rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt;6:1 (H:V) Light Wind</td>
<td>50 lbs./acre</td>
</tr>
<tr>
<td>6:1 to 3:1 Medium Wind</td>
<td>75 lbs./acre</td>
</tr>
<tr>
<td>&gt;3:1 High Wind</td>
<td>100 lbs./acre</td>
</tr>
</tbody>
</table>

The following is an example of converting the application rate from lbs./acre to kg/ha:

- 0.4047 is the conversion factor for acres to ha
- 0.4536 is the conversion factor for lbs. to kg
- Application rate is 100 lbs./acre (see above table)

\[
\text{Application Rate} \times 0.4536 = \text{Metric Rate} \\
\frac{0.4047}{0.4047}
\]

\[
100 \times 0.4536 = 112
\]

Therefore, the metric application rate is 112 kg/ha.

**The quantity of tackifier per tank load is calculated as follows:**

- Area of coverage (as previously calculated) = 2925 m²
- Application Rate (kg/ha) = 112
- Conversion factor from ha to m² = 10000

\[
\text{Seeder Coverage} \times \text{Application Rate} \\
\frac{10000}{10000}
\]

\[
2925 \times 112 = 33.6
\]

Therefore, 33.6 kg of tackifier is required per hydroseeder load. The following is packaging information on TA200 Tackifier:

1 Pail = 50 lbs. = 22.68 kg ~ 20 litres

The following calculates the number of containers of Tackifier:

\[
\frac{\text{Weight per Tank Load}}{\text{Weight per Container}} = \text{Number of Containers}
\]

\[
\frac{33.6}{22.68} = 1.48
\]

Therefore, each hydroseeder load will have 1.48 pails of tackifier.

**iii. Quantities of Seed in a Hydroseeder**

The quantity of seed in a hydroseeder is calculated as follows:

\[
\text{Seeder Coverage} \times \text{Seed Application Rate} \\
\frac{10000}{10000}
\]

The following are seed application rates as per the Development Guidelines and Standard Specifications:

<table>
<thead>
<tr>
<th>Seed Mix</th>
<th>Application Rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>Urban A, B &amp; C</td>
<td>300 kg/ha</td>
</tr>
<tr>
<td>Urban D</td>
<td>Site Specific</td>
</tr>
<tr>
<td>Urban E</td>
<td>25 kg/ha</td>
</tr>
<tr>
<td>---------</td>
<td>----------</td>
</tr>
<tr>
<td>Urban F</td>
<td>200 kg/ha</td>
</tr>
</tbody>
</table>

If the project calls for Urban F on the job site then the quantity of seed is calculated as follows:

\[
\frac{2925 \times 200}{10000} = 58.5
\]

Therefore, each hydroseeder tank load will require 58.5 kg of seed. Based on 25 kg per bag of seed, each hydroseeder load will require 2.34 bags.

iv. **Quantity of Fertilizer in a Hydroseeder**

Fertilizer rates are variable and they depend on the results of a soil analysis and the type of fertilizer applied. For this example it is assumed that 16-20-0 fertilizer is being applied at 400 kg/ha. The result would be the following calculation:

\[
\frac{Seeder \, Coverage \times \text{Fertilizer Application Rate}}{10000}
\]

\[
\frac{2925 \times 400}{10000} = 117
\]

Therefore, each tank load will require 117 kg of fertilizer. Based on 20 kg per bag of fertilizer, each hydroseeder load will require 5.85 bags.

5. **Preparation and Installation**

a. Provide a finished topsoil surface prior to seeding that is: conducive to seed growth; even running and to finish grades; free of rocks over 25mm in diameter; and free of weeds and debris (Detail Sheet #28).

b. Ensure that finish grade meets flush and smooth with adjacent grades and surface structures such as curbs, manholes, sidewalks, irrigation boxes, etc.

c. On slopes exceeding 3H:1V and where hydro-seeding is the application technique to be used, track packing is an acceptable form of preparation subject to meeting conditions in items a. and b. above. The long ridges of the tread are to run across the face of the slope.

d. Apply 91kg/ha of 16-20-0 fertilizer at the time of seeding and then, two months into the growing season apply 32kg/ha of 32-4-8 fertilizer. This rate is subject to adjustment upon receipt of the topsoil analysis report and the Contractor’s recommendation as outlined in Section III.1.7, Inspections/Topsoil Test (page 78).
e. Do all seeding in accordance with good horticultural practice during
the period from May 1 until September 30, or as weather permits and
when wind speeds are minimal and site conditions are approved by
The City of Calgary Parks.

f. Two means of applying seed are acceptable to The City of Calgary
Parks:
   i. hydraulically-seeding, and
   ii. mechanical or "Brillion" type seeding.

   Hand broadcasting of seed is unacceptable under any conditions
   except for isolated repair work.

g. Protect all newly seeded areas as required.

h. Remedy all damaged areas and maintain until turf has properly
   established.

6. Maintenance and Acceptance

   a. Maintain seeded areas according to the Landscape Maintenance
      Section (page 169) from the time of installation until Final Acceptance
      Certificate is issued by The City of Calgary Parks.

   b. Prior to acceptance, top dress, seed and water all bare spots larger
      than 15cm². Acceptance will be given upon germination of seeded
      areas.
PATHWAYS, TRAILS and PAVING STONES
IV. PATHWAYS, TRAILS and PAVING STONES

1. Pathways

1. Planning Guidelines

The following list of guidelines is intended to assist in the development of a high-quality and fully integrated pathway system. It includes legal requirements, official policies, established standards and practices and desirable standards and is a local supplement to the existing standards in "Guidelines for Design of Bikeways" by the Roads and Transportation Association of Canada.

The objective of the planning guidelines is to lay out a pathway network which links together residential area parks, natural areas, riverbanks and public recreational facilities.

a. Pathway Classification

i. Regional Pathway System:

The regional pathway system is a city-wide linear network that facilitates non-motorized movements for recreation and transportation purposes. The regional pathway is hard-surfaced, typically asphalt and located off-street. It is a multi-use facility and no one user or type of user is to be given preference. The spine of the system parallels the major physical features of the river valleys park system, including waterways, escarpments and ravines. It should be designed as a continuous facility that connects individual communities to:

- City-wide and Regional Parks and recreation facilities;
- Natural features, including water courses, escarpments, ravines, river valley parks and associated open space;
- Regional joint use sites, commercial districts, employment centres, adjacent communities and key cultural attractions;
- Local pathways, bikeways and trail systems; and
- LRT stations and transit routes.

ii. Local Pathways:

A local pathway is a pathway that provides secondary routes within communities, linking residential areas to facilities such as neighbourhood parks, schools and other local community designations. Local pathways may also serve as links to the regional pathway system.
b. Alignments

Pathways shall be shown schematically in an Area Structure Plan; and have their alignment confirmed at the Outline Plan and Construction Plan stages in accordance to the Council approved Calgary Pathway & Bikeway Plan.

i. Pathways, where desirable, should be routed along the edges of environmentally significant areas or into locations with less sensitivity in natural environment parks in order to minimize the impact on the park and reduce future damage and desire lines.

c. Linear Parks

i. Linear parks provide open space connections within and between communities through a formal pathway network. They should accommodate a regional pathway or perform a linear recreation function for the community as a whole by providing local or regional pathway links to educational, recreational, and open space features (e.g. natural environment parks).

ii. Overland drainage features should be contained in linear parks only when they do not diminish the primary recreational and aesthetic function of the park, and do not occupy more than one-quarter of the park’s width. Otherwise, the overland drainage feature should be contained in a Public Utility Lot.

iii. Utility rights-of-way should not interfere with the recreational, environmental and urban design functions of a linear park.

iv. Linear parks should have a minimum width of ten (10) metres and a maximum width of twenty (20) metres.

d. Boulevards

i. Avoid routing pathways along boulevards in front of residential properties.

ii. Avoid routing pathways along boulevards where spacing of driveways and cross-streets is less than 200m.

iii. Provide either an asphalt multi-use pathway or parallel asphalt bicycle pathway and concrete sidewalk.

e. Pathway Easement

Where an easement has been required for a pathway, ensure it is of an adequate width to facilitate the design and safe function of the pathway.
f. Street Crossings
   i. Route pathways to street intersections where possible.
   
   ii. Mid-block crossings are discouraged and permitted on local streets only. If mid-block crossings occur appropriate signage is to be installed by The City of Calgary.
   
   iii. Avoid necessity for building mid-block pedestrian overpasses on major streets.
   
   iv. Adjust subdivision layout to minimize quantity of crossings.
   
   v. Line up pathway entrances to ensure visual continuity.

g. Play Equipment Sites
   i. Regional pathways should not be within a minimum of 5.0m from play area surfaces.
   
   ii. Provide a minimum 2.0m wide asphalt link from the play equipment site to a local or regional pathway.

h. Parking Lots
   i. Route pathways around; avoid through.
   
   ii. Provide asphalt links from parking lots to pathways.
   
   iii. Locate pathway entrance at street.

i. Natural Areas
   i. Encourage back sloping gradient to 2:1 to minimize disturbance.

2. Design Guidelines

The objective of the design guidelines is to produce a safe and enjoyable pathway incorporating the needs of multiple users (i.e. walkers, children's strollers, runners/joggers, people with disabilities, cyclists, in-line skaters and skateboarders), and therefore, stringent attention must be given to design details. Where location and design considerations prevent transportation and recreation functions from being accommodated together, the recreation function should be given a higher priority. In addition to the following guidelines, section 2.7, Pathway Design Guidelines, of the Council approved Pathway & Bikeway Plan Report should be applied.
a. **Surface Materials**

i. Regional pathways are hard-surfaces typically of asphalt pavement to accommodate multiple users.

ii. Local pathways and pathways oriented to pedestrian traffic can be made up of a variety of materials depending on use.

b. **Width**

i. 2.0m minimum for local pathways.

ii. 2.5m minimum for regional pathways.

iii. 3.5m minimum for river pathways.

iv. 2.5m minimum pedestrian pathways and 2.5m minimum bicycle pathway for twinned pathways.

c. **Safety Clearance and Setback requirements**

i. Provide 1.0m clear of all obstacles on both sides.

ii. Provide 3.0m clear of all obstacles overhead.

iii. Avoid locating pathways over manholes.

iv. Ensure a 2.5m minimum clearance from park water services.

v. Set back pathways a minimum of 1.0m from face of curb.

d. **Pathway Handrail**

i. Pathway handrails shall be installed when a pathway is within two (2) metres of the top of a 2:1 slope or steeper, and the slope is greater than or equal to one (1) metre in depth.

ii. Under exceptional circumstances and subject to approval by Parks after an appropriate risk assessment, a safety railing may not be required. If a risk assessment is required it shall be provided by The City at no cost to the Developer.

iii. Minimum railing height and design to be as per Detail Sheet #30 or to be an equivalent as approved by The City of Calgary Parks.

iv. Chain-link fence is only acceptable when the fabric is attached to, but not protruding above, the top rail. **NOTE:** Attachment will be with a knuckle finish.

v. Wooden fences are not desired.
e.  **Pathway Junctions**

   i.  Where possible, ensure pathways join at right angles.

   ii. Provide widening of pathways with radius of 4.0m where pathways join other pathways. *(Detail Sheets #32)*

f.  **Pathway Entrances/Wheel Chair Ramps**

   i.  Extend pathway to street curb in all cases.

   ii. Ensure pathway joins street at right angles.

   iii. Provide a standard steel bollard *(Detail Sheets #31 & 32)* where the entrance to a pathway is on a street.

   iv.  Provide a **concrete wheelchair ramp** *(Detail Sheet #33)*, as required, where the entrance to a pathway is on a street and there is an existing concrete sidewalk.

   v.  Provide an **asphalt wheelchair ramp complete with depressed concrete curb** *(Detail Sheet #34)* as required, where the entrance to a pathway is on a street and there is no existing concrete sidewalk.

   vi. Line up entrances for visual continuity where pathway route crosses street.

   vii. Ensure no catch basins are located at the entrance.

g.  **Sight-lines**

   Where possible, ensure no obstructions to visibility within 5.0m of junction with other pathways and streets (trees, shrubs, utility boxes, fences, etc.).

h.  **Criteria for Bicycles**

   i.  Maximum grades:

      - over 8%: re-route or provide stairs.
      - 5% to 8%: not longer than 50m (keep bicycles and pedestrians separate and avoid curves and constrictions).
      - 3% to 5%: not longer than 200m.
      - under 3%: acceptable.

   ii. Design Speed - flat terrain: do not exceed 35km/hr; downgrades: do not exceed 50km/hr.

   iii. Super-elevation - on curves: 2%; maximum 5%.
iv. Stopping Sight Distances - stopping sight distance is described below:

\[ \text{Minimum SSD} = \frac{v^2}{[255 \ (f+g)]} + 0.695v \]

Where: SSD = stopping sight distance  
\( v \) = bicycle design speed (typically 30km/hr)  
\( f \) = coefficient of friction = 0.25  
\( g \) = grade m/m (rise or descent/run)

The following table may also be used to obtain appropriate stopping sight distances.

**NOTE:** A stopping site distance of 35.0m is considered a standard guideline:

<table>
<thead>
<tr>
<th>Gradient</th>
<th>Level</th>
<th>Ascending</th>
<th>Descending</th>
</tr>
</thead>
<tbody>
<tr>
<td>SSD</td>
<td>35m</td>
<td>33.5m</td>
<td>32.5m</td>
</tr>
</tbody>
</table>

v. Minimum Design Curve Radii - the minimum design curve radii is as follows:

\[ \text{Minimum } r = \frac{v^2}{[127 \ (e+f)]} \]

Where: \( r \) = minimum radius  
\( f \) = coefficient of friction = 0.25  
\( e \) = super elevation  
\( v \) = bicycle design speed (typically 30km/hr)

The following Table may also be used to obtain the appropriate minimum radius for asphalt pathways with 2% banking.

**NOTE:** A minimum design curve radii of 5.0m is considered a standard guideline:

<table>
<thead>
<tr>
<th>Speed</th>
<th>10 km/hr</th>
<th>15 km/hr</th>
<th>20 km/hr</th>
</tr>
</thead>
<tbody>
<tr>
<td>Radius</td>
<td>2m</td>
<td>5m</td>
<td>9.5m</td>
</tr>
</tbody>
</table>

vi. Stairs

i. Where possible, avoid use within a pathway network.

ii. Install bicycle ramp along one side where stairs are unavoidable.
i. **Lighting**

   i. Provide on local and regional pathways as required by the Transportation Department and the Linear Park Policy.

   ii. Provide on river pathways in the downtown part of the city consistent with the boundaries defined in the Center city Plan.

j. **Pedestrian Bridges and Overpasses**

   i. Railing height as per building code.

   ii. Minimum deck width 3.0m (between railings).

   iii. Submit concept drawings to The City of Calgary Parks, however, final approval will come from the Bridges Section of the Roads Business Unit. Ensure all drawings are stamped by a professional Engineer.

k. **Vehicular Bridges and Overpasses**

   i. In general, ensure sidewalks for pedestrians and widened shoulder lanes for cyclists are provided along both sides of structure.

   ii. Where bridge is part of pathway system, ensure combined pathway and sidewalk is provided along both sides of structure.

   iii. Railing height as per building code.

   iv. Minimum pathway width to be 3.0m.

   v. Submit concept drawings to The City of Calgary Parks, however final approval will come from The City of Calgary Transportation Infrastructure Structural Design business unit. Ensure a Professional Engineer stamps all drawings. The Developer is to ensure that the proposed structure conforms to all applicable City Bylaws and provincial Building Code

l. **Pedestrian Underpasses**

   i. Minimum height 3.0m and minimum width 3.0m.

   ii. Ensure drainage is kept in concrete swale along one side.

   iii. Ensure well lighted.

   iv. Desirable maximum length 50m; provide break in underpass within median of divided roadways.
m. Signage

i. Provide standard identification signs with pathway name (Traffic Operations #14-700 series) at pathway entrances.

ii. Provide standard hazard warning signs (see Traffic Operations Sign Manual) where appropriate.

iii. Provide centre line pavement marking on regional and river pathways and on separated bicycle pathways (75mm wide, yellow paint).

iv. Provide double centre line pavement marking at hazardous locations (50+ 50mm wide, yellow paint).

n. Design Drawings References

i. Submit to The City of Calgary Parks for approval for all local and regional paths as outlined in Construction Plan Requirements (page 26).


o. Root Barriers

To protect pathway sections in the vicinity of aggressive rooting species, install root barriers (Detail Sheet #37) along sections of pathways that run through Environmental Reserves, Environmentally Significant Areas or Municipal Reserves where natural vegetation is being preserved and that have species of the Poplar family (except Aspen) or Willow family located within a five (5) metre set back of the edge of pathway. Root barriers will not necessarily run continuously through the Environmental Reserves, Environmentally Significant Areas or Municipal Reserves. They will only be installed where there are encroaching species as per Detail Sheet #37a.
3. Standard Specifications

a. Description and Quality Assurance

This section specifies the construction of functional and cost effective pathways. The Contractor must have experience at performing this type and scale of work and be willing to provide proof of this experience.

b. Inspections

i. The Contractor shall have an approved set of drawings and specifications available prior to calling The City of Calgary Parks for an inspection.

ii. The Contractor shall obtain approval for the pathway alignment and sub-base (i.e. compaction and depth of gravel) prior to surfacing with asphalt.

iii. All Regional pathways, shall be inspected and maintained by The City of Calgary Parks.

c. Materials

i. Sub-base: 25mm crushed gravel.

ii. Surface: Mix “B-50” asphalitic concrete.

iii. Bollard (Detail Sheets #31 & 32): schedule 20 steel pipe minimum 140mm outside diameter; 1m height with 0.75m in ground in concrete; steel cap welded on. Bollard to be painted white with 2 strips of reflective tape. All paint is to be powder-coated polyester. The bollard will be permanent unless a service vehicle cannot maneuver around it. In this case, it shall be removable.

iv. Root Barriers: 40mil.* thickness HDPE (high-density polyethylene) product or approved equal (Detail Sheets #37 & 37a). NOTE: * mil. Unit of measurement used for plastic thickness; 40mil. = 1mm.

d. Installation (Detail Sheets #35 & 36)

i. Compact subgrade to 98% S.P.D.

ii. Compact sub-base to 98% S.P.D. The sub-base shall be 100mm thick of 25mm crushed gravel.

iii. Surface with 75mm thick asphalt to ensure:

• Density values shall be established by Marshall Method – 50
blows with mechanical compaction. Minimum density of 96% of its maximum design density. Densities less than 96% shall be paid for as shown in the “Standard Specifications Streets Construction” item 308.05.02

- central crown with 2% cross fall except where super elevation required on a curve; and

- no trapped low areas on pathway surface.

iv. Ensure pathways are not used as drainage swales. Use swales and culverts (Detail Sheet #38) to ensure there is positive drainage away from the pathway surface. Culverts are to be sized according to adequately handle the anticipated flow.

v. Place good quality (raked and rolled) topsoil and sod, unless otherwise specified, on turf areas damaged by construction.

vi. Ensure that the sod surface is flush with the pathway edge.

e. Maintenance

i. Maintain pathways according to the Landscape Maintenance Section (page 169) from the time of installation until Final Acceptance Certificate is issued by The City of Calgary Parks.

2. Trails

Trails are constructed linear paths with a granular surface generally located in natural areas. As a management tool they identify intended public routing and can formalize desire lines to minimize impact on the natural environment.

1. Planning Guidelines

a. Alignments

i. Use trails to give low impact and low cost pedestrian access to parks, natural areas, riverbanks, and sensitive or steep areas where pathways are not appropriate.

ii. Use trails as a secondary system to pathways.

iii. Ensure trail alignments correspond to Natural Areas Management Policy, Area Structure Plans, Outline Plans and other Council-approved policy documents.

iv. Locate crossings of major roads at overpasses or signalized intersections.

v. Send proposed route plans for all natural areas and
2. Design Guidelines

The objective of these design guidelines is to produce safe and enjoyable trails incorporating the needs of pedestrians, skiers and the disabled where possible, while respecting the surrounding environment.

a. Natural Areas

i. Align trails around significant areas and sites; never through.

ii. Avoid damage to natural features, vegetation and wildlife habitat.

iii. Increase back sloping gradient to 2:1 to minimize fill coverage.

iv. Send proposed design plans for all natural areas and Environmental Reserve parcels to The City of Calgary Parks for approval.

b. Surface Materials

i. Dirt for informal trails.

ii. Wooden chips, red shale, or crushed gravel (crusher fines) for formal, designed trails.

c. Width

i. 0.3m to 0.5m for informal trails.

ii. 0.5m to 1.5m for formal designed trails.

d. Slope Grades

i. Less than 3% is required if to be wheelchair accessible.

ii. Less than 5% is ideal.

iii. 5% to 10% is acceptable.

iv. More than 10%: provide switchbacks or stairs.

e. Safety Clearance

i. Provide minimum 0.5m clear of all obstacles on both sides (i.e. trees, signs, light poles etc.).
ii. Provide minimum 2.1m clear of all obstacles overhead (i.e. tree branches, bridges, etc.).

f. Pathway Handrail

i. Minimum railing height and design to be as per Detail Sheet #30 or to be an equivalent as approved by The City of Calgary Parks.

ii. Usually of galvanized steel or wood.

iii. Install where a trail is within 1m of the top of a 2:1 slope or steeper, and the slope is greater than or equal to 1m in depth.

iv. Under exceptional circumstances and subject to approval by Parks after an appropriate risk assessment, a pathway handrail may not be required. If a risk assessment is required it shall be provided by The City at no cost to the Developer.

v. Chain link fence is less desirable and is only acceptable when the fabric is attached to but not protruding above, the top rail. **NOTE:** Attachment will be with a knuckle finish.

g. Stairs

i. Avoid if the trail is to be accessible to skiers and wheelchairs.

ii. 1m to 2m wide; of wood or rock; handrails as required for safety.

h. Amenities

i. In general, provide one trail entrance every 150m or as needed.

ii. One park bench every 250m; one picnic table every 500m. Environmentally sensitive areas should be assessed on a site by site basis.

i. Bridges

i. Railing height as per building code.

ii. Minimum deck width: 1.5m between railings.

iii. Material examples: log stringers, laminated wooden beams, prefabricated steel and pre-cast concrete.

iv. Submit concept drawings to The City of Calgary Parks, however, final approval will come from the Bridges Section of the Roads Business Unit. Ensure all drawings are stamped by a Professional Engineer.
j. Pedestrian Underpasses
   i. Minimum height 3.0m and minimum width 3.0m.
   ii. Ensure drainage is kept in a swale along one side.
   iii. Ensure the underpass is adequately lighted.
   iv. Desirable maximum length 50m; provide opening in underpass within median of divided roadways.

k. Accessible Use
   i. Primarily includes people in wheelchairs or without sight.
   ii. The needs of these users are more stringent than for other walkers.
   iii. To fully accommodate all users in trail design, consult Section "O" - "Recommended References," page 105.

l. Cross Country Skiing
   i. The needs of skiers are more stringent than for walkers.
   ii. To fully accommodate skiers in trail design, see Section "o" - "Recommended References," page 105.

m. Signage
   i. Provide standard signs with trail name (see Parks and Pathways Sign Manual) at trail entrances and important junctions to ensure continuity and legibility of trail routes where appropriate.
   ii. Provide standard hazard warning signs (see Parks and Pathways Sign Manual) where appropriate.

n. Design Drawings
   i. Submit design drawings to The City of Calgary Parks for approval for all trail proposals in Environmental Reserves and naturally vegetated areas.
   ii. Ensure plans are at minimum 1:500 scale and include proposed trail details, gradients, and signage, plus adjacent park and land uses and roadways.

o. Recommended References


3. Standard Specifications

a. Description/Quality Assurance

This section specifies the construction of safe, functional and cost effective trails. The Contractor will have experience at performing this type and scale of work and be willing to provide proof of this experience.

b. Inspections

i. The Contractor shall have an approved set of drawings and specifications available prior to calling The City of Calgary Parks for an inspection.

ii. The Contractor shall obtain approval for the trail alignment prior to surfacing.

c. Materials

i. Compacted dirt, wooden chips, granular trail mix, red shale, fine gravel-clay mix or crushed gravel depending on use and as approved by The City of Calgary Parks.

ii. Parks Gravel Trail Mix

This product has been customized for pedestrian and bicycle oriented trails; it is not suitable for extensive vehicle use. Moisture content and timely compaction are important when placing this material. Contractors can inquire to purchase directly from The City of Calgary Roads Materials Plant.

Contact:
City of Calgary Materials Plant Engineer, Ph: (403) 268-4928
**Description:** Gravelly sand, some silt, trace of clay

**Optimum Moisture Content:** 7.5%

**Grain Size Distribution:**

<table>
<thead>
<tr>
<th>Material</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gravel</td>
<td>21.8%</td>
</tr>
<tr>
<td>Sand</td>
<td>61.5%</td>
</tr>
<tr>
<td>Silt</td>
<td>12.8%</td>
</tr>
<tr>
<td>Clay</td>
<td>3.9%</td>
</tr>
</tbody>
</table>

The combined aggregates meet the following gradation:

<table>
<thead>
<tr>
<th>Sieve Size (mm)</th>
<th>% Passing</th>
</tr>
</thead>
<tbody>
<tr>
<td>16</td>
<td>100</td>
</tr>
<tr>
<td>12.5</td>
<td>98 – 100</td>
</tr>
<tr>
<td>10</td>
<td>80 – 98</td>
</tr>
<tr>
<td>5</td>
<td>55 – 80</td>
</tr>
<tr>
<td>2.5</td>
<td>40 – 60</td>
</tr>
<tr>
<td>1.25</td>
<td>35 – 50</td>
</tr>
<tr>
<td>0.63</td>
<td>28 – 43</td>
</tr>
<tr>
<td>0.315</td>
<td>23 – 36</td>
</tr>
<tr>
<td>0.160</td>
<td>15 – 25</td>
</tr>
<tr>
<td>0.80</td>
<td>8 - 18</td>
</tr>
</tbody>
</table>

**Gravel Trail Mix:**
The gravel trail mix must be laid upon a dry firm sub-grade, true to grade and cross-section and free from all screening or other loose or foreign material. No gravel trail mix to be installed when the sub-grade is wet or when other conditions prevent proper spreading, finishing or compaction of the gravel trail mix.

Trail mix stockpiles stored on site greater than 30 days will be subject to inspection to ensure mix has retained correct properties (i.e. proportion of fine materials). After 30 days, contractor may be required to re-mix trail mix to ensure correct distribution of materials.

All supply and installation of granular trails shall be as per Standard Specifications, Streets Construction and, Standard Specifications, Landscape Construction. Adherence to the desired mix will enhance life of the product reducing materials from being washed way, broken down and/or the creation of potholes.

iii. Asphalt or other alternatives only in cases of heavy usage or extreme erosion problems.

d. **Installation**

   i. Strip existing surface material to allow for a 150mm compacted depth of approved material (see “Materials” section “c” above).
ii. Haul and place trail mix to allow for crowning and compaction. Material to be placed and compacted on the same day.

iii. Top of compacted trail mix should be 25 mm higher than adjacent vegetation and existing conditions.

iv. Provide 3 - 5% cross-fall or central crown as determined by site conditions. Final surface to be level and true with minimal undulations. Ensure that there are no trapped low areas on trail surface. Provide positive drainage away from the surface with diagonal water bars, ditches, swales and culverts.

v. Finished trail compacted to 95% maximum dry density. Multiple passes by a vibrating roller with the application of water may be required to achieve the specified level of compaction. Ensure no loose fine materials are left on the surface.

vi. The finished gravel trail surface will be at the same elevation as any connecting existing trails or pathways. All grading will be free draining and is not to impede existing drainage.

vii. Place topsoil (raked and rolled) and grass seed mix, as approved by The City of Calgary Parks, on areas damaged by construction.

e. Maintenance

Maintain trails according to the Landscape Maintenance Section (page 169) from the time of installation until Final Acceptance Certificate is issued by The City of Calgary Parks.

3. Concrete Paving Stones

1. Description/Quality Assurance

This Specification shall indicate the manufacturer, delivering, and placing of concrete pavers of various types. The Contractor must have experience at performing this type and scale of work and must be willing to provide proof of this experience.

2. Materials

a. Cement - Shall be Portland Cement conforming to the requirements of CAN3-A5-M77.

b. Aggregates - Shall conform to the requirements of CAB3-A23-M77.

c. Admixtures - Shall conform to the requirements of CAN-A23.1-M77.
d. **Concrete Compressive Strength** - Prior to delivery to site

   Average Strength 55 MPa  
   Minimum Strength 50 MPa

e. **Absorption** - Maximum individual sample 5% ASTM C140.

f. **Resistance to Freezing and Thawing** - The manufacturer shall satisfy the purchaser either by proven field performance or a laboratory freezing-and-thawing test that the paving units have adequate resistance to freezing and thawing. If a laboratory test is used, when tested in accordance with Section 8 of Method C67, specimens shall have no breakage and not greater than 1.0 percent loss in dry weight, of any individual unit when subjected to 50 cycles of freezing and thawing. This test shall be conducted not more than 12 months prior to delivery.

g. **Abrasion Resistance** - When tested in accordance with Method C418, specimens shall not have a greater volume loss than 15cm³ per 50cm². The average thickness loss shall not exceed 3mm.

h. **Mix Design and Concrete Testing** - The supplier shall, immediately after award of Tender and prior to any casting of interlocking stone, submit to The City of Calgary Parks for approval, the proposed mix design including source of proposed aggregates.

   The supplier shall notify The City of Calgary Parks of casting items in order that arrangements for concrete testing and/or inspection can be made as desired, at the expense of The City. The supplier shall allow the Engineer free access to those portions of his plant where the pavers are being produced and stored, for this purpose.

3. **Workmanship and Procedures**

   a. **Forms** - Shall be true to shape, lines and dimension called for on the drawings. They shall be substantial and tight to prevent leakage of moisture. Maximum tolerance for final dimensions shall be ±2mm.

   b. **Concrete Compaction** - During casting, sufficient vibratory or other mechanical effort shall be applied to thoroughly compact the concrete.

   c. **Moist Curing** - The surfaces of fresh concrete shall be kept continuously moist for a period of at least seven days and shall be protected against the harmful effects of sunshine, drying winds, cold running water, surface water, and mechanical shock. The temperature of the concrete shall be kept at 20° Celsius for not less than seven days.

   d. **Steam Curing** - If steam curing is used to maintain a daily cycle of casting, the following criteria for curing shall be adhered to:
i. There shall be a minimum of four hours delay after final placing of the concrete prior to the application of steam.

ii. The maximum rate of temperature rise of the concrete shall be 20° Celsius per hour.

iii. The maximum temperature to which the concrete shall be raised shall be 70° Celsius.

iv. The maximum rate of cooling shall be 20° Celsius per hour.

Immediately after stripping of forms, the members shall be moist or steam cured for an additional five days at a temperature of not less than 65° Celsius.

e. **Handling, Storage and Delivery** - Care shall be taken in the handling, storage and delivery of completed interlocking stone to avoid damage. Damage to units prior to acceptance by The City at the point of delivery shall be rectified by the supplier at no extra cost to The City.

The concrete pavers shall be delivered to the site of work as directed by The City of Calgary Parks, and shall be unloaded and stacked at a specified location.

f. **Visual Inspection** - All units shall be sound and free of defects that would interfere with the proper placing of the unit or impair the strength of permanence of the construction. Minor cracks incidental to the usual methods of manufacture or minor chipping resulting from customary methods of handling in shipment and delivery shall not be deemed grounds for rejection.

g. **Sampling and Testing** - The purchaser, or his authorized representative, shall be accorded the proper facilities to inspect and sample the units at the place of manufacture from lots ready for delivery. Sample and test units in accordance with method C140.

h. **Rejection** - In case the shipment fails to conform to the specified requirements, the manufacturer may sort it, and new specimens shall be selected by the purchaser from the retained lot and tested at the expense of the manufacturer. In case the second set of specimens fail to conform to the test requirements, the entire lot shall be rejected.
4. The Base (Detail Sheet #39)

<table>
<thead>
<tr>
<th>Sieve mm</th>
<th>% Passing</th>
</tr>
</thead>
<tbody>
<tr>
<td>9.50mm</td>
<td>100</td>
</tr>
<tr>
<td>4.75mm</td>
<td>95 to 100</td>
</tr>
<tr>
<td>2.36mm</td>
<td>80 to 100</td>
</tr>
<tr>
<td>1.18mm</td>
<td>50 to 85</td>
</tr>
<tr>
<td>600μm</td>
<td>25 to 60</td>
</tr>
<tr>
<td>300μm</td>
<td>10 to 30</td>
</tr>
<tr>
<td>150μm</td>
<td>2 to 10</td>
</tr>
</tbody>
</table>

This sand plus six (6) percent Bentonite shall be used for surface leveling and crack filling.

5. Sand Bedding Course (Detail Sheet #39)

a. The sand-bedding course shall be spread evenly over the area to a level that will produce the required 50mm thickness when the paving stones have been placed and vibrated.

b. Once leveled, this sand-bedding course shall not be disturbed in any way.

6. Installation (Detail Sheet #39)

a. Where service vehicles will be traveling on concrete paving stones, the pavers shall be set on a concrete base. The pavers shall be seated on a latex or polymer modified mortar. All joints shall be mortar filled.

b. Where service vehicles will not be traveling on concrete paving stones, a subgrade and gravel base each compacted to 95% S.P.D. will be acceptable.

c. **Edge Restraint** - All edges of the pavers installation shall be restrained. There shall be positive edge restraint and the type of restraint used shall be subject to the approval of The City of Calgary Parks.

d. Laying of Concrete Pavers

   i. The concrete pavers shall be laid in a pattern approved by The City of Calgary Parks.

   ii. The concrete pavers shall be laid in such a manner that the desired pattern can be maintained and the joints between the stones do not exceed 3mm.

   iii. The gaps at the edge of the paved surface shall be filled with
standard edge pieces or with stones cut to fit. The stones shall be cut to a straight even surface without cracks or chips.

iv. The concrete pavers shall be vibrated to their final level.

v. After vibration, sand shall be brushed over the surface and vibrated to completely fill the joints. Sands worked between the paving stones shall be thoroughly mixed with six (6) percent by weight of bentonite clay.

vi. Surplus material shall then be swept from the surface and the entire site left clean.

vii. After final vibrating, the surface shall be true to line and grade and shall not vary by more than 8mm when tested with a 3m board at any location on the surface.

7. Maintenance

Maintain concrete paving stones from the time of installation until Final Acceptance Certificate is issued by The City of Calgary Parks.
AMENITIES
V. **AMENITIES**

1. **Development Guideline**

The new Land Use Bylaw 1P2007 provides requirements for a Development Permit (DP). Under this bylaw certain amenity structures may require a Development Permit (DP) prior to construction. The Alberta Building Code as provincial legislation also requires the approval of a Building Permit (BP) for certain works. It is the Developer's responsibility to ensure that the proposed development complies with all applicable City Bylaws and provincial Building Codes. Parks approval of the landscape construction drawings does not supersede this requirement.

2. **Material and Installation Standards**

The following list is a list of all standards and regulations referred to within the Amenities Section of this manual.

All standard specifications are the latest issue, except when a year is mentioned.

**A.S.T.M.**

A-36-81a Specification for structural steel

A-325-71a Specification for high strength bolts for structural steel

D-693-70 Test for moisture-density relations of soils and soil aggregate mixtures

**C.S.A.**

0121- M1978 Douglas Fir plywood

0141- 1970 Softwood lumber

0151- M1978 Canadian softwood plywood

G40.21 - 1976 & 2 Structural quality steels supplements

Can 3-G4021 MB1 Structural quality steels

G164- M1981 Hot dip galvanizing for irregularly shaped articles

W47.1 - 1983 Certification of companies for fusion welding of steel structures

W59 - M1984 Welded steel construction (metal arc welding)
C.G.S.B.

1-GP-40C   Primer, structural steel OI, Alkyd type

CAN 2 - 138.1 - .4-M80 Chain link fence fabric, framework, installation and gates

85-GP-1M   Painting Exterior Wood Surfaces

NOTE: The preceding standards can be obtained from the following:

A.S.T.M.  American Society for Testing and Materials
          1916 Race St
          Philadelphia, Pennsylvania 19103

C.S.A.    Canadian Standards Association
          5060 Spectrum way Suite 100
          Mississauga, ON L4W 5N6
          1-800-463-6727
          www.csa.ca

C.G.S.B.  Canadian Government Publishing Centre
          Supply and Services Canada
          Ottawa, ON K1A 0S9
3. Play Structures

1. Description and Quality Assurance

This section specifies the supply and installation of Play Structures. The Contractor must have experience in performing this type and scale of work and must be willing to provide proof of their experience.

2. Inspections

a. The Contractor shall have an approved set of drawings and specifications available prior to calling The City of Calgary Parks for an inspection.

b. The design and installation of playground structures must comply with C.S.A. guidelines on children's play spaces and equipment. **NOTE:** A letter of compliance to C.S.A. guidelines will be required prior to signing a construction completion certificate.

   Canadian Standards Association
   5060 Spectrum way Suite 100
   Mississauga, ON L4W 5N6
   1-800-463-6727
   www.csa.ca

   c. Give timely notice (see Inspections page 34) to The City of Calgary Parks when Construction Completion Certificate for work is required.

3. Materials

a. Wooden playground structures and surrounding wooden borders shall not be used in construction.

b. Use nylon locking nuts only.

c. Playground Edge Restraints (Detail Sheets #40, 40a & 41) shall be constructed of plastic timbers or concrete. **NOTE:** Plastic edge restraints will be of a minimum of 1.5m in length.

   Provide pea gravel or gyrostone base to the following depths:

<table>
<thead>
<tr>
<th>Height of Platform</th>
<th>Depth</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt;2.1m</td>
<td>200mm</td>
</tr>
<tr>
<td>2.1 to 2.99m</td>
<td>225mm</td>
</tr>
<tr>
<td>3.0m or greater</td>
<td>300mm</td>
</tr>
</tbody>
</table>
4. Equipment Design and Layout

a. Hardware

   i. All suspended elements, such as trapeze bars, rings, tight rope cables and swing seats, shall be fastened at top and bottom by means of a **positive locking system** such as hammer locks or clevis hooks (no quick links). These hooks should have lock tight attachments to prevent removal by equipment users.

   ii. All chains shall be at least ¼" or larger, zinc plated or galvanized.

   iii. Swing Seats and chains shall be connected by means of a **positive locking system** such as hammer locks or clevis hooks (no quick links).

   iv. Eye bolts must be forged or welded.

   v. Bearing hangers shall be complete with oil impregnated bronze bushing and shall be wrap free in design.

b. Slides

   i. The sitting section of all slides shall have protective side enclosures that diminish from guardrail height (i.e., 600mm) to side wall height (i.e., 100mm) in a smooth curve. They shall be designed so that the user's flow of hand movement is unhampered and smooth.

   ii. All sliding surfaces shall have sidewalls to control and guide descent and prevent the lateral discharge of the child during descent. A minimum height of 100mm of sidewall shall be provided and may be reduced to zero at the exiting section.

   iii. All slides shall be oriented north or east (i.e., not south or west).

   iv. Plastics are not to be used in the construction of slides. They shall be constructed out of metals that are not subject to structural degradation such as rust or corrosion.

c. Tube Structures

   Tube structures and any other apparatus that restricts visibility into the structure will not be permitted.

d. Swings

   The distance between individual swings and the distance between a swing and the swing structure shall be at least 750mm (30in.).
e. Posts

   i. All support post shall be a minimum of 3” square 11 – gauge galvanized tubing, or 3.5” round 11 – gauge galvanized tubing c/w polyester powder coat finish. For structures designed for 5-12 year old children, there is a preference for posts of at least 5” diameter or 5” square.

   ii. Post caps shall be secured by means of electronic weld, rivets or interference fit rib.

   iii. A settlement block, such as 2X6 pressure treated spf, larger than the footprint of the post must be placed at the bottom of the hole prior to installation of posts.

f. Teeter Totters

   Teeter totters shall not have inclines more than 25° from the ground and the teeter totter beam shall be of such a length that children are no more than 1.524m (5 feet) from the ground.

g. Bridges

   Suspended bridges must have positive locking system such as hammer locks.

h. Concrete Anchors

   All concrete anchors shall be installed at a minimum depth of 300mm below the surface of the play area.

i. Coatings

   All metal surfaces must be galvanized, plated, stainless steel, baked on paint etc. to resist corrosion. All paint must be lead free and conform to industry standard.

j. Signs

   If a playground is in a park, the Developer will install “No Dogs within 20 metres of Play Apparatus” signs. Signs and posts to be provided by The City.

k. Benches

   Subject to providing a universally accessible surface for access, benches may be installed inside the children’s play space border. All related CSA Guidelines must be adhered to.
5. **Installation (Detail Sheets #40 to 43)**

   a. In parks where play equipment is an appropriate development activity and a play structure is not to be installed by the Developer, a level turf area of 25m² must be made available by the Developer for future installation. Ensure that the future location is clearly labeled on the Layout Plan.

   b. Prior to installation, the Contractor shall submit to The City of Calgary Parks for approval the construction plans as well as the product name and model type or number of the play structure.

   Ensure that the base of the play area is constructed to provide adequate surface drainage *(Detail Sheets #42 and 43)*.

6. **Maintenance**

   Maintain play structures according to the Landscape Maintenance Section (page 169) from the time of installation until Final Acceptance Certificate is issued by The City of Calgary Parks.

4. **Site Furnishings**

   1. **Description and Quality Assurance**

      This section specifies the supply and installation of site furnishings. The Contractor must have experience in performing this type and scale of work and must be willing to provide proof of this experience.

   2. **Inspections**

      Give timely notice (see Inspections page 34) to The City of Calgary Parks when Construction Completion Certificate for work is required.

   3. **Design, Materials and Installation**

      a. **General Guidelines**

         i. All site furnishings design and specifications must be reviewed and approved by The City of Calgary Parks prior to installation.

         ii. Site furnishings design and finishes should be consistent with site furnishings in adjacent parkland, if applicable.

         iii. All site furnishings should be of a consistent style and type within the community and or development phase.
b. Trash Receptacles

i. Design

- Haul-all containers or equivalent are encouraged but are not mandatory (see item 3.3a above).

- The following applies to non-bear proof containers:
  - metal cladding encouraged, however, if wood is used, it must be a minimum of 2"x4."
  - vandal resistant construction.
  - the container should accommodate a standard 75 litre receptacle that will hold a 66x91cm (26"x36") garbage bag.

ii. Materials

- **Timber Component**
  - kiln dried and nominal size.
  - fir/spruce/pine/cedar species.
  - chamfered on all sides and ends.
  - smooth finish.

- **Metal Component**
  - no special cast pieces.
  - welded joints ground smooth.
  - metal finish to be electrostatically applied or polyester powder coating.
  - vandal resistant zinc coated metal fasteners.
  - galvanized steel is an acceptable option.

iii. Installation

- Provide concrete, asphalt or compacted granular base.

- Ground model types must be bolted to a concrete pad using vandal resistant fasteners as per the manufacturer’s requirements.
• Pedestal type must be set in concrete to a minimum depth of 300mm below finish grade.

• Set back trash receptacles at least ten (10) metres from all park benches where possible.

c. Bench (Detail Sheet #44)

i. Design

• length about 1.8m with back.

• pedestals must be of a schedule 40 metal.

• metal mesh or wooden seat/back.

ii. Materials

• **Timber Component**
  
  - kiln dried and nominal size.

  - fir/spruce/pine/cedar species.

  - smooth finish.

• **Metal Component**

  - no special cast pieces.

  - seats and backs to be fabricated from 5 gauge welded wire.

  - cap ends appropriately with metal.

  - welded joints ground smooth.

  - metal finish to be: electrostatically applied; polyester powder coating; hot dip vinyl; or galvanized.

  - field repair of metal finish will be accepted if performed in accordance with manufacture’s specifications.

iii. Installation

• provide concrete, asphalt pad or compacted granular base.

• seating surface to be 410-440mm above finished grade.

• pedestals must be set in concrete to a minimum depth of 600mm below finished grade.
• ground model types must be bolted to a concrete pad using vandal resistant fasteners as per the manufacturer's requirements.

4. Maintenance

Maintain site furnishings according to the Landscape Maintenance Section (page 169) from the time of installation until Final Acceptance Certificate is issued by The City of Calgary Parks.

5. Metal Work

1. Description and Quality Assurance

a. This section specifies the fabrication, supply and installation of miscellaneous metal items and fasteners.

b. All work shall conform to The City of Calgary Roads Standard Specifications Roads Construction where applicable.

c. The Contractor must have experience at performing this type and scale of work and be willing to provide proof of this experience.

d. The Contractor, where applicable, must be fully approved by the Canadian Welding Bureau under the requirements of C.S.A. W.-47.1. Welding is to be done in accordance with C.S.A. W-59.

2. Shop Drawings and Submittals

a. Submit shop drawings for The City of Calgary Parks' review of items as noted.

b. Indicate materials, connections, attachments, anchorage and location.

c. Submit samples of any or all specified materials if requested by The City of Calgary Parks.

3. Product Delivery, Storage and Handling

a. Store fabricated metal products and fasteners on racks or skids. Protect from the elements and damage by other materials. Maintain steel in its fabricated form.

4. Job Conditions

a. Report in writing to The City of Calgary Parks, prior to commencing work, of any conditions or defects encountered on the site upon which work of this section may depend, and which may adversely affect the performance of the work.
b. Do not commence work until such conditions or defects have been investigated and corrected.

c. Commencement of work implies acceptance of surface and conditions and no claim for damages or resulting extra work will be accepted, except where such conditions cannot be determined prior to construction.

d. Protect all metal products from damage or harmful effects of weather, water, mechanical shock or trespassers until properly installed.

5. Inspections

a. The Contractor shall have an approved set of drawings and specifications available prior to calling The City of Calgary Parks for an inspection.

b. Obtain The City of Calgary Parks approval of the layout before proceeding with subsequent work.

c. Give timely notice (see Inspections page 34) to The City of Calgary Parks when Construction Completion Certificate for work is required.

6. Materials

a. General Purpose Steel C.S.A. G400-21

b. Bolts and Nuts A.S.T. A325-71A

c. Galvanizing CGSB G164 650u zinc per m²

d. Primer CGSB 1-GP-40, oil alkyd type

e. Welding Materials C.S.A. 516

f. Structural Steel C.S.A. G40-21

g. Paint Ready mixed non-metal products as detailed and applied according to manufacturer's recommendations

7. Fabrication

a. Verify site dimensions before proceeding with shop fabrication and to suit field conditions.

b. Fabricate all items in shop to approved Shop Drawings.

b. Fabricate work complete with components for anchoring. After fabrication, radius all edges, welds and corners.
d. Welds to be continuous fillet type, ground and filled in exposed locations.

e. Drill all holes countersinking where required.

f. Fill open joints, depressions and seams with metallic paste filler or by continuous brazing or welding and grind smooth to true form.

g. After fabrication, de-scale steel, remove roughness and irregularities, clean oil and grease from surface and prepare for priming and galvanizing.

h. Where galvanizing is called for, fabricate out of galvanized material and paint all welds with a silver zinc rich paint. Where galvanizing is not called for, the entire structure must be hot-dipped galvanized.

i. Where priming is called for, apply one full coat of primer.

j. Paint, where called for, with polyester coat finish or electrostatic. Obtain approval from The City of Calgary Parks on colour and type before proceeding.

k. Bolts, nuts, washers, screws, nails and all fasteners shall be heavy duty galvanized or stainless steel. Supply all anchorages for attachment to structure as detailed.

8. Installation

a. Lay out all work according to drawings and obtain approval from The City of Calgary Parks before proceeding.

b. Provide temporary supports and bracing as required to steady metal work until installation is complete.

c. Protect metal work from damage during installation. Touch-up primer and/or paint chipped during installation.

d. When excavating, ensure that all utility lines are property staked. Hand excavation shall take place as per standard utility requirements.

e. Make all pipe bends with approved bending tools. Bends are to be smooth transition, without kinks, crimps, bulges or other deformations.

f. Where anchors, fastenings or sleeves have to be built-in by other trades, supply necessary templates, instructions and inspection to ensure satisfactory installation.

g. All broken welds shall be completely separated, ground down, joints cleaned and re-welded as specified earlier. Re-galvanize, or prime and paint entire unit as required.

h. Clean up and remove off site all debris at the end of each working day,
or as required.

9. **Maintenance**

Maintain all metal work from the time of installation until Final Acceptance Certificate is issued by The City of Calgary Parks.

6. **Timber and Woodwork**

1. **Description and Quality Assurance**

   a. This section specifies the supply and installation of timber and wood elements.

   b. All work must be executed by skilled tradesmen having experience at performing this type and scale of work and willing to provide proof of this experience.

   c. All wood must comply with the grade specified.

2. **Shop Drawings**

   a. Submit shop drawings for The City of Calgary Parks' review on items as noted.

   b. Clearly show materials, connections, attachments, reinforcements, anchorage and location.

3. **Product Delivery, Storage and Handling**

   a. Protect all materials from harmful exposure during transportation to site.

   b. On delivery, store all materials off the ground and protect from adverse conditions to prevent deterioration, damage, or impairment of structural or other essential properties.

4. **Job Conditions**

   a. Prior to commencing work, report in writing to The City of Calgary Parks any conditions or defects encountered on the site which may adversely affect the performance of the work.

   b. Do not commence work until such conditions or defects have been investigated and corrected.

   c. Commencement of work implies acceptance of surfaces and conditions and no claim for damages or resulting extra work will be accepted, except where such conditions cannot be determined prior to construction.
d. Protect all existing trees, structures and adjacent areas from damage due to construction work. Make good all damage at no extra cost to the contract.

e. Check and verify all site dimensions governing the fabrication of shop made items and report any discrepancies immediately to The City of Calgary Parks.

5. Inspections

a. The Contractor shall have an approved set of drawings and specifications available prior to contacting The City of Calgary Parks for an inspection.

b. All materials are subject to inspection by The City of Calgary Parks on arrival on the site. Any materials not meeting the specifications will be rejected and must be removed from the site immediately.

c. Give timely notice (see Inspections, page 34) to The City of Calgary Parks when Construction Completion Certificate is required.

6. Materials

a. Timber and Lumber: All lumber shall be #1 Construction Grade Spruce, Western Pine or Douglas Fir dressed, conforming to C.S.A. 0141 - 1970 for nominal size. All timber and lumber must be straight, sound and free of splits, warps, checks, large knots or other defects. Rough sawn lumber will be used only where detailed and shall be sawn straight, square and true.

b. Plywood: Exterior type, free of all checks, splits, open joints, cracks, knot holes or loose knots and other defects, conforming to C.S.A. 0151-M1978 and 0121-M1978 for thickness and grade

c. Nails, Spikes, Bolts, Lagscrews etc.: Hot dipped galvanized in accordance with C.S.A. G164-M1981 and of the size and/or weight specified.

d. Connecting Steel: Medium structural steel, conforming to C.S.A. G40-4 latest edition and hot dipped galvanized as specified in section "d" above.

e. Steel Cable: Multi-strand 10mm diameter galvanized with galvanized clamps as detailed and specified in section "d" above.
7. **Prefabricated Units**
   
a. Manufacture all prefabricated units in strict accordance with approved shop drawings.

b. Items brought on to a site which does not conform to the shop drawings and specifications will be rejected.

c. Apply shop coat of zinc primer conforming to C.G.S.B. 1-GP-40C to metal fasteners where specified.

8. **Installation**
   
a. Lay out all work true to line, level and spacing, plumb on true. Accurately place structural supports and members in position and brace securely to remain plumb and true until permanently fixed.

b. Ensure structural supports and members are capable of safely supporting imposed loads. Report any discrepancies immediately to The City of Calgary Parks.

c. Execute all fastening with nails, spikes, bolts or framing anchors as detailed. Counter sink all exposed bolts and nuts where required. Drill bolt hole 2mm larger than diameter of bolt, and after final installation, pean all bolts over to prevent removal of nuts.

d. Ensure that all debris is cleaned up and removed off site at the end of each working day or as required.

e. Ensure that all drilled, sawn or routed edges are free of splinters or burrs. Sand smooth if required.

f. All woodwork is to be finished with an approved exterior paint or stain as detailed.

9. **Maintenance**

   Protect and maintain all timberwork, woodwork and finishes from the time of installation until Final Acceptance Certificate is issued by The City of Calgary Parks.

7. **Fencing (Chain Link & Post and Cable)**

   1. **Description and Quality Assurance**

   This section specifies the supply and installation of chain link and post and cable fencing. The Contractor must have experience at performing this type and scale of work and be willing to provide proof of this experience.
2. Job Conditions

a. Verify all job conditions on site. Report any conditions at variance with the drawings and specifications in writing to The City of Calgary Parks before proceeding.

b. Do not begin work until any such conditions have been investigated and corrected.

c. Commencement of work implies acceptance of conditions and no claims for extra work will be allowed except where such conditions cannot be determined prior to construction.

d. Protect all plant material and structures from damage. Make good all damage at no extra cost (see Tree Replacement/Compensation Guidelines, page 66).

e. The Contractor is responsible for contacting the appropriate Parks Operations Division office for irrigation locations:

   Northwest Division call 3-1-1
   Northeast Division call 3-1-1
   West Division call 3-1-1
   Centre Division call 3-1-1
   South Division call 3-1-1

3. Inspections

a. The Contractor shall have an approved set of drawings and specifications available prior to contacting The City of Calgary Parks for inspection.

b. Prior to construction, the Park Development Inspector will verify the installation of fencing to protect Environmental Reserves and Natural Areas (see section 7.c, page 129).

c. Give timely notice (see Inspections, page 34) to The City of Calgary Parks when Construction Completion Certificate for work is required.

4. Materials (Chain Link)

See The City of Calgary Transportation’s “Standard Specifications Roads Construction.”

5. Materials (Post and Cable) Detail Sheet #45

a. Lumber: All lumber shall be rough-cut, No. 2 Construction Grade, and kiln dried.
b. **Steel Cables and Clamps:** All steel cables and clamps shall be hot-dipped galvanized to C.S.A. G164 or as specified. The steel cables shall have a 10mm (3/8”) diameter.

6. **Fabrication (Chain Link)**


7. **Location and Type**

   a. **Flankage and rear of lots adjacent to parks and utility lots/ROW:** Chain link, wood screen or other type of fencing as approved by The City of Calgary Parks is to be installed.

   b. **Where parks and utility lots/ROW's abut lanes:** Post and cable fencing is to be installed.

   c. **Environmental Reserves and Natural Areas:** Area to be fenced off with snow fencing or equivalent by the Developer prior to construction. The Developer will contact the Park Development Inspector and the Subdivision Inspector for a meeting to verify the location of this temporary fencing prior to installation.

8. **Installation (Chain Link)**

   See The City of Calgary Transportation’s “Standard Specifications Roads Construction.”

9. **Installation (Post and Cable) (Detail Sheet #45)**

   a. Provide all new material unless directed otherwise.

   b. Post spacing to be as detailed or as specified by The City of Calgary Parks.

   c. Orient the face cuts of the posts as directed by the Park Development Inspector on a site-specific basis.

   d. Provide sufficient tension on steel cable to eliminate sag.

   e. Install the first cable clamp over-top the end of the cable to eliminate frayed ends.

10. **Maintenance**

    Maintain all fence installations from the time of installation until Final Acceptance Certificate is issued by The City of Calgary Parks.
8. Lighting

1. Lighting will be permitted on park land provided:
   
   a. it is identified by The City as part of the transportation system; or
   
   b. it is used as security for structures; or
   
   c. in accordance with the "Linear Park Policy".

2. Lighting standards shall be 6 Lux minimum.

9. Optional Amenities

1. Optional amenities are non-standard infrastructure development (i.e. ornamental fencing, water features, gazebos, sculptures, entrance features/signs, decorative fixtures, etc.) in a public park or road Right-of-Ways.

2. If a Developer or homeowners'/residents/community association wishes to construct an optional amenity, they must receive approval from The City of Calgary Parks for optional amenities within a public park and from The City of Calgary Roads for optional amenities within a road Right-of-Way.

3. The intent to construct optional amenities must be identified at the Tentative Plan Stage via a letter of intent or other suitable mechanism.

4. If a Developer or homeowners'/residents/community association wishes to construct an optional amenity, they must either enter into an Optional Amenities Agreement and/or a Landscape Maintenance Agreement with The City, or they must provide an Endowment Fund as per the corporate policy and procedures as approved by Council for “Enhanced Landscape Maintenance & Infrastructure.” Contact the Parks Maintenance Agreement Coordinator 403-268-5204 for further details.

5. A firm indication of whether an Optional Amenities Agreement, Landscape Maintenance Agreement or Endowment Fund will apply shall be given at the Construction Plan Approval Stage.

6. An Optional Amenity Agreement, Landscape Maintenance Agreement or payment of an Endowment Fund must be executed prior to FAC approval.

7. Maintenance manuals are to be submitted to The City prior to FAC approval for all optional amenities associated with irrigation and/or water systems (i.e. water features, fountains, spray pools etc.).

8. Under the Municipal Government Act, Community Entrance Features that contain the name, logo, address of the community, or the Developer's identification, cannot be placed on Municipal Reserves. Community
Entrance Features with this type of information must be placed on private lands or within wider road Right-of-Ways upon approval of The City of Calgary Roads. All Community Entrance Features are to be in compliance with Land Use Bylaw 1P2007, Division 5, Signs.

If Community Entrance Features are placed on road Right-of-Ways, an Optional Amenities Agreement is required.

10. Landscape Boulders and Rocks

1. Landscape boulders/rocks placed in turf areas must have a 150 mm X 150 mm concrete mowing strip placed around their base and flush to final grade. All other landscape Boulders/Rocks must be placed in planting beds.

2. Landscape boulders/rocks near playgrounds must meet the safety set backs as specified in the CSA guidelines.

**NOTE:** Landscape boulders and rocks are not allowed within a playground area.

11. Pedestrian Bridges

Submit concept drawings to The City of Calgary Parks, however final approval will come from The City of Calgary Transportation Infrastructure Structural Design business unit. Ensure a Professional Engineer stamps all drawings. The Developer is to ensure that the proposed structure conforms to all applicable City Bylaws and provincial Building Codes.

12. Retaining Walls

Submit concept drawings for approval to The City of Calgary Parks. If the retaining wall is to be made from sandstone, it shall be constructed as per **Detail Sheet #74**. Ensure a Professional Engineer stamps all drawings of retaining walls that exceed one (1) metre in height. The Developer is to ensure that the proposed structure retaining wall conforms to all applicable City Bylaws and provincial Building Codes.
IRRIGATION
VI. IRRIGATION

1. Description and Quality Assurance

   a. This section specifies the supply and installation of irrigation systems. Installers must have experience at this type and scale of work and be willing to provide proof of experience.

   b. “As of June 30, 2011, contractors working on irrigation systems and supplemental components that will eventually be turned over to The City, shall be certified as a Certified Irrigation Contractor (CIC). The contractor must ensure the project superintendent, or authorized designate, responsible for the daily delivery of the project be certified as a CIC.”

2. As-Built Drawings (Detail Sheet #47)

   1. Verify all conditions on the site and immediately report all discrepancies and variations from the drawings to The City of Calgary Parks.

   2. Submit a reproducible Mylar® drawing which has been drafted in a professional manner and is to scale on legal base plan, which shows the exact "as-built" location of the system relative to property line, including the locations of all lines, sprinkler heads, valves (drain and zone control), boxes, double check valves, parks water service, curb stops, underground pipe fitting not adjacent to surface fixtures (tee, elbows, etc.) saddles for poly pigtails and other irrigation materials prior to the issuance of a Final Acceptance Certificate. All of the above items must be tied in at two points each from site property lines or other permanent on-site features.

   3. Requirements for acceptable submission of 'as-built' drawings will include, but not be limited to, the following:

      a. sheet size to be 594mm x 841mm laid out on The City of Calgary Parks title block.

      b. labeled as "As-built Irrigation System".

      c. key plan showing location of site, including street names.

      d. labeling to be a minimum of a 12 pt. font.

      e. plan of site showing property lines, bearings, surrounding site uses, north location, on-site structures, utilities, fences, buildings, walkways, etc., all to a suitable metric scale.

      f. municipal address and legal description of said property including a registered plan number. If more than one address, refer to location of parks water service.

      g. largest scale (1:250) with a minimum letter size of 12 pt. font.
h. Legend: Do not include Detail Sheets in as-built drawings. Instead, refer to the year of specification and the Detail Sheet name and number (i.e. 1998, Drain Pit for PVC Pipe, Detail Sheet #68). Clarify type of irrigation system (gravity drain, blow out or main line gravity drain with lateral line that has to be blown out).

i. Number all irrigation zones starting from DCVA and turning to the right at a mainline junction. Return to last turn and continue as before until all zones are numbered.

j. Name, address and 24 hour phone number of installer as well as owner/Developer and Consultant, where applicable.

k. All 110 volt electrical wire and 110 volt electrical conduit

l. Serial number, installation date and confirmation of up to date inspection of double check valve in accordance with The City of Calgary Water Resources business unit procedures.

m. Provide zone flow rates and a precipitation table.

3. Product Delivery, Handling and Storage

   1. Store all materials off the ground and under protection until ready to use. Support as required to prevent excessive strain on piping.

   2. Remove off site all material that is damaged or rejected. No material that has been damaged shall be installed. The City of Calgary Parks reserves the right to reject any material that does not meet specifications.

4. Job Conditions

   1. Proceed with irrigation installation only during suitable weather conditions.

   2. Report to The City of Calgary Parks, prior to commencing work, of any conditions or defects encountered on the site upon which work of this section may depend and which may adversely affect the performance of the work.

   3. Do not commence work until such conditions or defects have been investigated and corrected.

   4. Protect the system from being contaminated during construction by blocking all open pipe ends.
5. Inspections and Testing

1. Drawings

The Contractor shall have an approved set of drawings and specifications available prior to calling The City of Calgary Parks for an inspection. All installations require inspection acceptance from The City.

2. Open Trench Inspections and Testing

a. The City of Calgary Parks shall be given a minimum of 24 hours notice when an open trench inspection is required.

b. Items which must be in place and complete for the open trench inspection include:
   i. trench depth and alignment.
   ii. bedding material.
   iii. pipe alignment joints and expansion couplers, valves.
   iv. Hydro fusion or electro fusion joints.
   v. drains with gravel sumps.
   vi. swing joints and head locations.
   vii. thrust blocking and conduit under paving.
   viii. pressure test without heads (static water pressure).
   ix. electrical wiring and electrical conduit
   x. meter as supplied by The City of Calgary.
   xi. other items.

c. Items b.iii through b.x above shall be inspected in the event that the system is "plowed-in."

d. Receive in writing from The City of Calgary Parks acceptance and approval of the irrigation system as viewed during the open trench inspection before back filling.

e. The City of Calgary Parks Development Inspector shall be given a minimum of 24 hours notice of when the HDPE welding process will begin.
f. All butt fusion and electro fusion welds must meet the applicable specification. Any butt fusion or electro fusion welds not meeting the specification may require the following additional tests, at the discretion of the Parks Development Inspector:

i. Bend Back Test
   - A strap or section shall be cut out of a fused section of pipe; the strap shall extend a minimum of 150mm on either side of the fusion and shall be a minimum of 25mm wide.
   - The strap is then bent back so that the ends of the strap are touching.
   - Any disbondment or voids at the fusion will indicate a poor fusion.
   - If failure occurs, all fusion joints exhibiting similar deviations from the bead melt specifications will be rejected.
   - The bend back must be completed successfully before proceeding.

ii. Pressure/Leak Test if required shall be performed consistent with the ASTM F2164 - 02(2007) Standard Practice for Field Leak Testing of Polyethylene (PE) Pressure Piping Systems Using Hydrostatic Pressure.

3. Construction Completion Inspection and Pressure Test

   a. The City of Calgary Parks shall be given a minimum of 24 hours notice when a construction completion inspection and pressure test is required.

   b. The inspection and pressure test shall not be done unless written proof of the open trench inspection is available.

   c. Items which must be in place and complete for the inspection and pressure test include:

      i. back filling and landscaping.

      ii. drain and valve boxes installed as per specifications and clear of debris.

      iii. water pressure on and flowing freely through the system.

      iv. irrigation head adjustment and all heads activated and throwing water to provide adequate coverage as per manufacturer's recommendations and the plan.
d. At The City of Calgary Parks’ discretion, a pressure gauge shall be placed on any point in the system and a reading shall be taken to confirm operating pressure in system. Pressure gauges shall be minimum 50mm face, 0-1000kPa, Peacock or equal, complete with pet cock.

e. Annually test the backflow prevention device in accordance with Wastewater By-law 40M2006. A copy of the Testing and Inspection Report for Double Check Valve Assemblies shall be submitted to Parks Development Inspector for forwarding to the Wastewater Division. The municipal address of the site shall be indicated on the Testing and Inspection Report.

f. Submit a completed Parks Meter Record form (see page 165).

g. Supply a copy of the Plumbing Permit.

h. Submit two paper copies of preliminary as-built drawings for verification. These drawings will state the municipal address of the site. As-built drawings received at CCC will be verified by Parks prior to Fac. Discrepancies, if any, noted on the as-builts will be corrected on the Mylar® copy

i. Receive in writing from The City of Calgary Parks acceptance and approval of the construction completion inspection and pressure test.

4. Final Acceptance Certificate Inspections

a. Irrigation items to be approved at a FAC inspection include:

   i. All valves, valve boxes, sprinkler heads or other irrigation sprinkler system components are undamaged and in good working condition;

   ii. All valve boxes are flush and set to the approved final grade;

   iii. All valve boxes are free of debris with the valve assemblies exposed as per specification;

   iv. Provide a copy of the double check valve assembly test, by a licensed tester, showing the assembly is operating properly, done yearly, or as required by The City of Calgary Water Resources business unit. **NOTE: The municipal address of the site shall be indicated on the testing and inspection report.**

   v. All zone control valves and drain valves are functioning properly with no leakage through the valve.

   vi. All heads are in a vertical position and installed at a depth recommended by the manufacturer.
vii. All heads must be activated and operating to provide necessary coverage with the arc set as designed and with minimum overspray outside of the park property.

viii. Maintenance manuals are to be submitted to The City prior to FAC approval for all optional amenities associated with irrigation and/or water systems (i.e. water features, fountains, pumps, booster pumps, spray pools, etc.).

ix. Temporary irrigation systems shall be removed and their water services shall be "killed" (i.e. removed to the water main). Provide certification from Wastewater that this has been completed to their satisfaction.

x. The Developer must submit a reproducible Mylar® drawing which shows the exact "as-built" location of the irrigation system prior to the issuance of a Final Acceptance Certificate (see As-Built Drawings page 134).

xi. Submit a completed Parks Meter Record form (page 165), and Irrigation Information Sheet (page 161, 162).

**NOTE:** The irrigation information sheet must contain actual calculated values, not the standard numbers out of the catalogues.

b. FAC's submitted after September 30th for sites with an irrigation system will require the area irrigation foreman, or designate, present during the winterizing procedure. The areas will ensure staff will be available with 48 hours notice. As an alternative, the area staff will not be required on site during the winterization procedure provided the Developer agrees, in writing, to start the system and perform any repairs that may be required the following spring.

c. Pressure and Leak test for HDPE if required shall be performed consistent with the ASTM F2164-02(2007) Standard Practice for Field Leak Testing for Polyethylene (PE) Pressure Piping Systems Using Hydrostatic Pressure.

6. Materials

1. Testing

Materials shall be new and without flaws or defects of any type. All irrigation items must meet current specification and go through a testing period of the duration and under conditions determined by the type of product, but not less than one year.
2. **Substitutions**

For substitutions, supply material with descriptive literature and samples, at least three weeks before commencement of work. Any substitutions must meet or exceed specifications and performance standards of proposed system, and be approved by the Water Management Coordinator, without any additional cost to The City of Calgary Parks.

3. **Piping and Fittings**

   a. All piping on downstream side of parks water service shall be: NSF or CSA B137.3 certified series 160 PVC with schedule 40 fittings and schedule 80 nipples; or high density polyethylene pipe using butt fusion or electro fusion according to manufacturer's recommendations and CGSB 41-GP-25 M. Medium density polyethylene pipe series 100 will be acceptable as laterals under extensive hard landscaping, shrub beds and as "pigtails" (Detail Sheets #48 to 54, and 56).

   All polyethylene pipe, tubing, and fittings furnished under this specification shall conform to all applicable provisions and requirements of the latest revision of AWWA C901, C906, or CSA B137.1 and, by inclusion, all appropriate standards referenced therein.

   Where High Density Polyethylene is used on main lines the pipe shall be Standard Dimension Ratio (SDR) 11 and shall be listed by the Plastic Pipe Institute (PPI) as a PE 4710 resin with a hydrostatic design basis (HDB) of 1600 psi for water at 23°C. The material shall comply with ASTM D1248 as a Type III Class C, Category 5, Grade P34 material and with ASTM D3350 - 08 as a 345434C cell material. The material shall have a design factor of 0.63 for water service at 23°C.

   b. Expansion couplers of appropriate size shall be used at a minimum spacing of every thirty (30) metres or as required.

   c. All fittings, valves and double check valve assemblies will be sized to fit the downstream pipe diameter as illustrated in the irrigation (Detail Sheets #48 to 59 and 63 to 68).

   d. For PVC pipe with a diameter greater than 38mm, bell and spigot type pipe and fittings with rubber gaskets shall be used. Solvent weld PVC joints will be permitted based on previous written approval from The City of Calgary Parks.

   e. For medium density installations, all fittings shall be double clamped with galvanized or plastic inserts as per section 4.a.i below.

      Fittings for HDPE pipe shall be butt fusion type or electro fusion type.

      Fittings shall be molded or fabricated by the pipe manufacturer.
f. The Contractor shall provide a Certificate of Training confirming the person or persons performing the butt fusion welds or electro fusion have received the appropriate industry certification.

g. The Contractor shall provide the welding procedures to be used for the specific project.

h. Bead melts shall conform to the following guideline:

<table>
<thead>
<tr>
<th>Pipe Size (inches)</th>
<th>Approx. Melt Bead Size (inches)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 1/4</td>
<td>1/32 – 1/16</td>
</tr>
<tr>
<td>1 ¼ to 3</td>
<td>about 1/16</td>
</tr>
<tr>
<td>3 to 8</td>
<td>1/8 to 3/16</td>
</tr>
<tr>
<td>8 to 12</td>
<td>3/16 to 1/4</td>
</tr>
<tr>
<td>12 to 24</td>
<td>1/4 to 7/16</td>
</tr>
</tbody>
</table>

See Bead Melt Detail Sheet #50-l

i. Only CSA Series 100 medium-density poly pipe may be used as laterals in extensive shrub bed installations. 25mm poly pipe may be used in shrub beds if the approved drawing shows the changes in pipe size. Use 25mm, triple swing assemblies and reduce to the appropriate size at the last elbow. ½ inch triple swing assemblies are only acceptable on MDPE shrub bed laterals with spray heads using ½ inlets. Swing joints are to be installed to lateral using saddles or insert “T’s” and elbows.

4. Swing Joints and Risers/Sprinkler and Shrub Heads (Detail Sheet #54 to 57)

a. Swing Joints/Risers

i. Swing joints shall be three 25 mm elbows using galvanized steel or PVC. elbows and nipples and brass saddles.

ii. All risers for shrub beds shall be galvanized or Schedule 80 PVC and bushed down after the final elbow. A tee bar stake will be used and will be double clamped.

b. Spray Heads

i. The following pressure compensating spray heads or an approved equal shall be used. Toro 570ZPR-4p; Toro 570Z PR-12p; Hunter Institutional 04, 06 & 12 heads; Rain Bird 1812 PRS & 1804 PRS.

**NOTE:** TORO 570Z-PRX is not approved.
ii. The sprinkler heads shall be described on the drawings, and conform to manufacturer's performance standards for durability and operation, i.e. operating pressure, gallonage, nozzle size.

iii. Where quick couple valve systems are used, supply one sprinkler head and one valve key for every four quick coupler valves installed.

iv. The sprinkler shall be a fixed spray type, capable of covering a 2 to 5.5 metre radius at 30 psi with a full circle discharge rate of approximately 5gpm.

v. The sprinkler shall have radius adjustment capabilities from top of the nozzle.

vi. The sprinkler shall be available in 4", 6" and 12" pop up.

vii. The sprinkler shall have heavy-duty riser seal to eliminate excess flow-by.

viii. The sprinkler shall have optional drain check valve.

ix. If the static water pressure in a lateral zone or the entire system exceeds the maximum listed operating pressure in an irrigation manufacturers performance chart (i.e. Hunter SRS = 40 psi), then a pressure reducing device must be installed in the head, on the lateral line or after the meter

x. The sprinkler shall have ratcheting riser features on all bodies for easy adjustment.

xi. The sprinkler shall have 1/2" NPT female thread.

xii. The sprinkler shall have a five (5) year, over-the-counter warranty (not pro-rated).

c. Sprinkler (For Areas Less than 12m in Width)

i. The following sprinklers or an approved equal shall be used: Hunter I-20 ADS; Hunter I-20 36S; Rain Bird 5004 Plus SS; Rain Bird 5006 Plus SS and MP Rotator Nozzles 1000, 2000, 3000, MPCorner, MPPstrip. MP Rotator nozzles shall be installed on approved pressure compensating spray head bodies (Item 6.4.b.i).

ii. The sprinkler shall be of the gear driven rotary type, capable of covering a 5-15 metres radius at 50psi. with a discharge rate of 3-10 gpm. The sprinkler shall be available with interchangeable nozzles. The sprinkler shall have radius adjustment capabilities by means of a stainless steel adjustment screw.
iii. The sprinkler shall be commercial duty available in both full circle and adjustable part circle configurations. The adjustable unit shall have the capability of adjustment in all phases of installation, i.e. before installation and after installation static and while in operation. Pop-up versions of the sprinkler shall have a ratcheting type riser assembly for final arc orientation.

iv. The sprinkler shall have a minimum of 3" pop up. The sprinkler shall have a rubber cover.

v. The sprinkler shall be equipped with a drain check valve to prevent low head drainage and be capable of checking up to 8 feet (2.40m) in elevation changes. The sprinkler shall be equipped with a stainless steel set screw for locking the threaded cap to the body.

vi. The sprinkler unit shall have a 3/4" NPT female thread inlet. The sprinkler shall be serviceable after installation in the field by unscrewing the body cap, removing the riser assembly and cleaning the inlet filter screen.

vii. The body of the sprinkler shall be constructed of non-corrosive heavy duty ABS and the pop-up riser assembly shall be encased in stainless steel. The sprinklers carry a five-year over the counter exchange warranty (not pro-rated).

viii. If the static water pressure in a lateral zone or the entire system exceeds the maximum listed operating pressure in an irrigation manufacturers performance chart (i.e. Hunter I-20 with #4 nozzle = 60 psi), then a pressure reducing device must be installed in the head on the lateral line or after the meter.

ix. Sprinklers should be supplied by a local distributor to allow for product availability within 2-3 weeks.

d. Sprinkler (Standard for Public Landscape Areas)

i. The following sprinklers or an approved equal shall be used; Hunter I-25 ADS; Hunter I-25 36S; Hunter I-60; Toro 640, Toro S2001; Nelson 7005, Rain Bird Falcon 6504 and Rain Bird 8005-SS.

ii. The sprinkler shall be of the gear driven rotary type, capable of covering a 12-18 metre radius at 50psi with a discharge rate of 7-10gpm. The sprinkler shall be available with interchangeable nozzles. The sprinkler shall have radius adjustment capabilities by a stainless steel adjustment screw. Arc adjustment should be accessed at the top of the sprinkler without having to take the sprinkler apart.
iii. If the static water pressure in a lateral zone or the entire system exceeds the maximum listed operating pressure in an irrigation manufacturers performance chart (i.e. Hunter I-25 with #7 nozzle = 70 psi), then a pressure reducing device must be installed in the head on the lateral line or after the meter.

iv. See section c. "Sprinkler (for Areas Less than 12m in Width"), subsections iii. - viii. (page 142).

e. Flood Bubblers

i. The following flood bubblers or an approved equal shall be used: Toro S00C; Rainbird I-300A-F; and Nelson 7300.

ii. The flood bubblers will have an adjustment from 0gpm. to 3.5gpm.

iii. The flood bubblers will have a screw adjustment.

iv. The flood bubblers will have a serviceable filter screen.

v. The flood bubblers will have a 1/2" NPT female thread inlet.

5. Controllers (Detail Sheet #60, 60b, 60c, 60d) and Valves (Detail Sheets #48 to 53)

a. All irrigation controllers/cabinets are to be setup as non-metered sites.

Exceptions where metering is required

1. Sites that involve heavy usage – storm ponds with pumps and/or valve operations

2. Sites where services have been added from the cabinet to operate lighting, etc.

3. If a third party is actually the major user of energy and The City of Calgary Parks is the site owner.

b. All irrigated sites will include the installation of an irrigation central control controller compatible with The City of Calgary Parks water management system. Currently The City of Calgary Parks uses the Motorola IRRInet Control Center (ICC) system. In general the following guidelines shall be followed:

- Sites with three (3) zones or less may utilize Motorola Piccolo-XRs;
- Sites with between 4 & 23 zones may utilize Motorola IRRInet-Ms in either 12 or 24 station configuration and either AC or DC/Solar configuration;
- Sites requiring 24 or more zones may utilize IRRInet-ACE controllers in the appropriate configuration.

The communication system will depend on the location of the site and may include 450 MHz radio, 800 MHz radio, GPRS or combinations of the preceding.

Designers are required to communicate with the Parks Water Management Lead prior to formal submission of the designs plans for approval by Parks to fine tune the selection of controllers and communication hardware.

If the site utilizes a Piccolo-XR for control the developer will be responsible for the installation of a Piccolo Interface Unit (PIU) at the nearest IRRInet to complete the communication network.

**NOTE:** The location and type of park site will dictate which of the Motorola controller products to use. The Developer or their agent should contact the Park Coordinator – Development for north areas tel. 403-268-1334 or central and south areas tel. 268-1376 (see Parks Inspection Boundaries map page 36) to determine the appropriate controller type.

c. For outdoor installation the controller shall be mounted in an approved cabinet, fixed to a concrete base, as per Detail Sheet No. 60a-d.

d. Zone control valves shall be CSA certified as Class II power limiting circuit low voltage (i.e. 24 volt) operated only. Closing time for valves shall not be less than 5 seconds.

e. Zone control valves shall be electrically operated and self cleaning with a **bronze body** and of a make and model compatible with the designed system. Hand operated valves shall be installed on the upstream side of every electric valve.

f. Wiring to and from the controller and valves shall conform to the Canadian Electric Code and any other regulatory conditions which govern this type of installation.

g. All wire shall follow irrigation lines where appropriate. **(See detail sheets #48a, 48b, 48c & 48d)**

h. Where wiring leaves pipe alignment, place in conduit. Below ground - PVC is acceptable, above ground - galvanized conduit must be used.

i. Splices shall be made waterproof with the use of an acceptable outdoor waterproof wire connector (refer to Pg. 152, 6.11.d.iii). Field splices will be identified, looped and located in a 250mm diameter lockable irrigation box.

j. 110 volt wiring shall be colour coordinated to be different from 24 volt wire where used. Install all 110 volt wire in accordance with Canadian
Electrical Code. Install all 110 volt wire in grey PVC electrical conduit. Electrical conduit shall be trenched, not ploughed. All 110 volt electrical conduits shall be marked with a continuous yellow caution tape, placed directly over the conduit, 300mm from the top of the conduit. Where satellite controllers are installed, colour code all wiring according to the satellite.

**NOTE:** Temporarily locate the 110 volt wire drop-off with a 4X4 stake until a controller is installed.

**k. Valve Signal Wires and Common Wires (See detail sheets #48a, 48b, 48c & 48d)**

- Use continuous wire runs wherever manufacturers wire roll sizes allow.

- Calculate the voltage drop on zone signal wires and common based on the furthest distance run and the maximum number of valves that can simultaneously be activated on that leg. The value will be based on the abilities of the controller specified. Size wires accordingly and indicate calculations and designed wire sizes on design plans and as-built.

- When making field splices or valve wire connections, the length of wire for all signal wires or common wires is to extend at least 12” out of the box before making the watertight connector.

- Common to be sized one size larger than signal wire (i.e. If signal 14ga then common to be 12). One common wire per hectare of zone valves or one common wire per 10 signal wires.

**l. Spare Wires**

- Provide one (1) spare wire per wire run for each group of five (5) valves or less. The spare wire shall be looped in each valve box to extend 300mm above the valve box and be terminated in the fifth or last valve box.

- Provide one (1) spare 12 gauge common wire for each leg of the mainline, terminating at the end of the mainline.

- Use continuous wire runs wherever wire roll sizes allow.

- Have a loop of 0.5m of spare wire coiled into each valve box that the spare wires run through.

- Allowable voltage drop over distance (to be calculated and inserted).

- For redundancy, provide two spares per Ha or less of park size and a minimum of two spares per multiple of 5 valves per mainline run.
• For future expected expansion, there will be 10 additional wires per Ha of expansion, plus an over sized common.

6. **Wiring** requirement Motorola Central Control DC Scorpio or DC IRRIcom Controllers.

**Motorola DC Scorpio controller:**
- The total valve operating capacity of the controller ordered must include an extra valve circuit for the Master Valve.
- The controller circuits have one common wire connection for each group of four valve wires. The field wire gauges are as per other wire specification, i.e. 12 ga for common & 14 ga for valves. The valves grouped together on the one common connection should follow the valve box numbering order, i.e. follow the flow of water from the point of supply and follow any change of direction to the right. If the four valves in a group are in opposite directions at a tee in the main line, use a second common wire to the other valves but plan wiring so there are groups of four, e.g. for one four valve group: if one valve is to the right of the tee, this would have a combination of one common with one valve, leaving the three valves to the left to be connected to a second common.
- Follow the groupings of four, and when the total valve count is not a combination of four, have only the last grouping of valves wired at less than four valves.
- This standard must be followed to ensure that the Controller's valve operation potential is maximized.

**Motorola DC IRRIcom controller:**
- The total valve operating capacity of the controller ordered must include an extra valve circuit for the Master Valve.
- The controller circuits have one common wire connection for each group of six valve wires. The field wire gauges are as per other wire specification, i.e. 12 ga for common & 14 ga for valves. The valves grouped together on the one common connection should follow the valve box numbering order, i.e. follow the flow of water from the point of supply and follow any change of direction to the right. If the six valves in a group are in opposite directions at a tee in the main line, use a second common wire to the other valves but plan wiring so there are groups of six, e.g. for one six valve group: if two valves are to the right of the tee, these would have a combination of one common with two valves, leaving the four valves to the left to be connected to a second common.
- Follow the groupings of six, and when the total valve count is not a combination of six, have only the last grouping of valves wired at less than six valves.
- This standard must be followed to ensure that the Controller's valve operation potential is maximized.
7. Electric Valves (Detail Sheet #48 to 50)

a. A Griswold GP or Rain Bird GB series electric valve or an approved equal shall be used.

b. Performance Features

i. Continually cleans itself without screens or filter to clean or replace.
   - Sand
   - Silt
   - Algae

ii. Works dependably in effluent or dirty water containing:

iii. Closes slowly without a hammer or chatter.

iv. Works under extremely low flow and low pressure conditions.

v. Has a flow control stem.

vi. Has a manual open/close control.

c. Technical Features

i. Available sizes – 3/4:" to 2."

ii. Body configuration - globe.

iii. Pressure rating - 200psi.

iv. Flow range - 1.0 to 180gpm.

v. Power requirements - 7.2 VA holding; 10.8 VA in rush

vi. Operating voltage range 17-40.

vii. Maximum wire run #14 wire - 1,460m.

viii. Warranty - 5 years.

8. Gate Valves (Detail Sheet #51)

a. Gate valves for drainage and flow control shall be bronze body with solid wedge disk, non-rising stem, removable handle and a resilient rubber ring seal with a minimum pressure rating of 10kg/cm². All gate valves shall be installed in an upright position for accessibility.

b. Valves – 1/4" to 3": A Red & White 280A must be used or an approved equivalent that meets the following criteria:
### i. Materials

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<td>Bonnet</td>
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<td>3 Cast bronze</td>
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NOTE:

- End threads conform to the female international standard pipe threads.
- These valves conform to the requirements of MSS SP-80.

c. Valves 100 mm or larger to be resilient seat flanged valve, a Watts 405RW or approved equal with a 15 MM test cock.

9. Double Check Valve Assembly (Detail Sheets #58, 59, 59a, 59b & 59c)

a. The term "double check valve assembly" (DCVA) shall mean an assembly composed of two independently acting, approved check valves, including tightly closing shut-off valves with resilient seats located at each end of the assembly and fitted with properly located test cocks as per CSA B64 series-1976. All DCVA's must conform to The City of Calgary Water Resources Standard Specifications, latest edition, and capable of being installed in field locations with a drainage function.

In addition, the device must be drainable, in place, without any dismantling, adjustments or movement of the assembly, through the use of a test cock or drain valve, as approved and certified by CSA.

b. The 150mm DCVA shall be a WATTS – 757N (drawings 59b & 59c) or approved device of equal dimension to allow the assembly to fit into a standard box.

10. Brass Saddles, Tees or Crosses (Detail Sheet #50, 54 and 55)

a. Cambridge 800 series hinged saddles, or AY MacDonald 3802 & 3892 service saddles, tees and crosses or approved equals must be used.

b. 3/4" to 4" pipe size.

c. 1/2" to 1" female threaded outlet (FIPT).

d. Casting of saddle must be:
   - 85% copper
   - 5% zinc
   - 5% tin
   - 5% lead

e. Bolts are of 18-8 non-corrosive stainless steel.

f. To be used on series 160 PVC. or series 100 polyethylene pipe.
11. Irrigation Boxes

a. Where manufactured irrigation boxes are used, they shall be of heavy duty weight polyethylene and capable of being extended, withstanding the weight of a heavy tractor on their surface, and shall have a locking capability (clearances noted on details).

b. Gravel beds in boxes shall consist of clean, washed 19mm gravel with an area marginally larger than box opening. See Detail Sheets #48-53, 58, 59, and 66-68 for the depth of gravel and the distance the gravel shall be kept from the lowest point of the irrigation system.

c. The double check valve assembly box and zone control valve boxes shall be designed into a location site where the final grade of the surrounding ground does not carry overland water drainage into the valve boxes.

d. Wire Splices Box

i. Body (Carson 910-10-4 or an approved equal)
- top inside diameter 9 1/4”.
- top outside diameter 10”.
- bottom inside diameter 11 3/4”.
- bottom outside diameter 13”.
- body of the box to be heavy duty polyethylene weighing 3 lbs.
- depth 10 1/4”.
- colour green.

ii. Lid (Carson 910-4 or an approved equal)
- lid of the box to be heavy duty polyethylene weighing 1 1/2 lbs.
- twist lock lid.
- come with 3/8 x 1 3/4" lock bolt for slot screwdriver.
- marking on lid to be "Irrigation Wire Splice Box".
- must have cover lift holes.
• must be 2" in depth.

• colour green.

iii. **Wire Splice Connectors:** 3M DBY/DBR’s or equivalent.

e. **Drain Boxes**

   i. **Box** (Carson 1419 or an approved equal)

   • body of the box to be heavy duty polyethylene weighing 7 lbs.

   • depth 12".

   • outside top width 11 3/4".

   • outside top length 17".

   • outside bottom width 15 7/8".

   • outside bottom length 21 1/8".

   • inside bottom width 14 1/8".

   • inside bottom length 19 1/4".

ii. **Lid** (Carson 1419-4L or an approved equal)

   • lid of the box to be heavy duty polyethylene weighing 3 1/2 lbs.

   • lid must be over the rim cover or T-lid.

   • must have locking 3/8" L-bolt with 9/16" head, non-corrosive, metal detector sensitive ball.

   • marking on the lid to be "Irrigation Drain Box."

   • lift slot.

   • outside top width 12 1/2".

   • outside top length 18".

   • outside insert width 10 1/8".

   • outside insert length 5 3/8".
• must be 2 1/8" in depth.

• lid must be interchangeable with box and extensions.

• colour green.

g. Control Valve Box, Isolation Valve Box, Meter Valve Box and Gate Valve Outlet Box

i. Boxes (For valves 50 mm or smaller Carson 1220-12 or an approved equal and for valves larger than 50 mm Carson 1324-12 or 1324-15 or an approved equal)

• body of the box must be made of heavy duty polyethylene weighing 8 lbs.

• depth 12".

• outside top width 14 3/4".

• outside top length 21 1/2".

• outside bottom width 19".

• outside bottom length 25 3/4".
• inside bottom width 17 1/4”.
• inside bottom length 24”.
• colour green.

ii. **Lid** (Carson 1220-3L or 1220-5L or 1324-3L or an approved equal)

• lid of the box to be non-hinged made of heavy duty polyethylene weighing 5 lbs.
• must have locking 3/8" L-bolt with 9/16" head, non-corrosive, metal detector sensitive bolt.
• lift slot.
• outside width 13 1/4”.
• outside length 19 3/4”.
• must be 1 3/4” in depth.
• marking on the lid will change depending on the use of the lid; i.e.:
  - Irrigation Control Valve Box.
  - Irrigation Isolation Valve Box.
  - Irrigation Meter Valve.
• lid must be inter-changeable with box and extensions.
• colour green.

h. **Control Valve Box, Isolation Valve Box, Meter Valve Box and Gate Valve Outlet Box Extensions**

i. **Box** (Carson 1220-6X or an approved equal)

• body of the box must be made of heavy duty polyethylene - weighing 4 lbs.
• depth 6 3/4”.
• outside top width 14 3/4”.

Standard Specifications for Landscape Construction 2011
• outside top length 21 1/2”.
• outside bottom width 17 5/8”.
• outside bottom length 24 3/8”.
• inside bottom width 15 3/8”.
• inside bottom length 22 1/8”.
• colour green.

i. Double Check Valve Assembly Box

i. Box (Carson 1730-18-3L or an approved equal)
• body of the box must be made of heavy duty polyethylene weighing 25 lbs.
• depth 18”.
• top outside width 19 1/2”.
• top outside length 32 1/2”.
• bottom outside width 27 1/4”.
• bottom outside length 40 1/2”.
• bottom inside width 24 1/4”.
• bottom inside length 37 1/2”.
• colour green.

ii. Lids (Carson 1730-3L or an approved equal)
• lid of the box to be non-hinged made of heavy duty polyethylene weighing 10 lbs.
• must have locking 3/8" L-bolt, with 9/16" head, non-corrosive, metal detector sensitive bolts.
• lift slot.
• outside width 17 1/2”.
• outside length 30 1/2”.
• must be 2” in depth.
• marking on the lid to be "Double Check Valve Assembly Box."

• colour green.

iii. See Detail Sheets #61, 62 and 62a for 100mm DCV box and lid assembly complete with access door for meter reading.

12. Backfill Material

a. Backfill material for pipe trenches within 150mm of pipe shall be clean approved sand fill or gravel less than 12mm diameter in size, free of stones and sharp objects capable of damaging pipe.

b. Excavated material may be used for backfilling only when approved by The City of Calgary Parks.

13. Sleeving (Detail Sheet #63)

a. Sleeving shall be PVC SDR 35 or PVC C-900 (bell and spigot) pipe to The City of Calgary Water Resources Standard specifications for Sewer Construction Sec. 402.02.02 or approved equal.

NOTE: PVC SDR 35 shall be backfilled in accordance to The City of Calgary Standard Specifications for Sewer Construction. PVC C-900 may be backfilled with native material free of organics and shall be compacted to 98% SPD.

b. Diameter of conduit shall be twice the diameter of the irrigation pipe. The size of the conduit shall be measured in 50mm increments or as noted on the drawings.

c. Extend sleeving a minimum of one (1) metre beyond edge of pavement of amenity area. Tape ends to prevent debris filling.

d. All wire for automatic systems will not go in the same sleeve as the irrigation pipe; wire will have its own sleeving. Amount of wires will determine the size of the sleeve as follows:

i. 2 to 14, #14 gauge wires: 2 inch (50mm) sleeve;

ii. 14 to 40, #14 gauge wires: 4 inch (100mm) sleeve.

iii. 40 to 70, #14 gauge wires: 4 inch (10mm) to 6 inch (150mm) sleeve.

Existing Irrigation Systems: DO NOT CUT wires or pipe. Use one sleeve as per above and cut sleeve down its length to create two half shells; excavate under pipe and wires; place one half of sleeve under wire and pipe, place other half above pipe and wire, then clamp two halves
together with two broken pipe repair clamps.

14. Miscellaneous Components

All miscellaneous components, such as air relief valves (Detail Sheet #53a), concrete vaults or meter boxes, valve markers and caps, etc., shall be of the type and size as indicated on the drawings or details. Install according to approved manufacturer's directions or at the direction of The City of Calgary Parks.

15. Thrust Blocks

a. Local conditions will determine the type and extent of thrust blocking to be used. Obtain approval from The City of Calgary Parks on the base method (i.e. concrete, rock, rebar or a combination of the former) before proceeding.

b. All lines 100mm and over will require concrete thrust blocks. Concrete will be Class B as per 310.00.00. Street Specifications.
## 16. Irrigation Products Currently Being Tested

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<td>Spray Head Nozzle</td>
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<td>EvapoTranspiration-based weather reporting and automatic irrigation adjustment system</td>
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<td>Rain Bird</td>
<td>VB-STD</td>
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<th>Manufacturer</th>
<th>Model No.</th>
<th>Description</th>
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<td></td>
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<tr>
<td>CLA-VAL</td>
<td>690G-01YBKCX 150mm PRV</td>
<td>Pressure Reducing Valve</td>
<td>2007</td>
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<tr>
<td>Carson Industries</td>
<td>H3660-36” Series</td>
<td>Valve Box</td>
<td>2007</td>
</tr>
<tr>
<td>Custom Fabrication</td>
<td>36” X 60”</td>
<td>Valve Box Lid</td>
<td>2007</td>
</tr>
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<td>N/A</td>
<td>Above Ground DCVA &amp; Master Valve</td>
<td>2009</td>
</tr>
<tr>
<td>N/A</td>
<td>N/A</td>
<td>HDPE Partial Gravity Drain Mainline</td>
<td>2008</td>
</tr>
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</table>
7. **Layout**

1. Stake out entire system, including locations of sprinkler heads and/or quick coupler valves, double check valve, zone control valves and tees and elbows for the pipe as well as the layout of all the piping, park water service, and the electrical drop. Confirm that layout is within project boundaries and property lines and ensure all surface hardware, excluding sprinklers, is installed outside of sports fields and the three meter buffer zones. Under exceptional circumstances and subject to the approval of Parks limited encroachment of surface hardware into the buffer zone may be acceptable. Heads shall be spaced to ensure head to head coverage. Where deviation from the design drawing is anticipated, submit in writing, as required, change requests to The City of Calgary Parks for approval.

2. Verify on site, the location of all sleeving under paving and adjust to suit.

3. Verify the location of all underground utilities and use standard precautions when working near such. Make good all damages at Contractor's cost.

4. Set back park water services (Detail Sheets #64 and 65) a minimum of 2.5m from pathways, hard surfaces and trees, and set back lateral irrigation lines a maximum of .50m from property lines.

5. Have layout inspected and approved by The City of Calgary Parks before commencement of work.

6. Due to changes in landscape elements, it may be necessary to adjust the spacing of the sprinklers in the field. Such changes that do not require extra materials or labour shall be done at no extra cost to The City of Calgary Parks. If such changes result in extra cost, all such changes shall be approved in writing by The City of Calgary Parks before proceeding with work.

8. **Coordination**

   Fully coordinate work with other trades, so as not to delay work progress. If the water or electric service exists from a building, coordinate work with the building owner to ensure proper connections to services.

9. **Trenching**

   1. Ensure that the grade has been set and approved by The City of Calgary Parks before commencing trench operations.
2. Width of trench shall be a minimum of three times the diameter of the pipe. Main line pipe depth shall be in accordance with the following table to ensure adequate coverage:

<table>
<thead>
<tr>
<th>Pipe Size</th>
<th>Min. Depth to Top of Pipe</th>
<th>Max. Depth of Bottom of Pipe</th>
<th>Imp. Depths</th>
</tr>
</thead>
<tbody>
<tr>
<td>2” (50mm)</td>
<td>350mm</td>
<td>600mm</td>
<td>14” – 24”</td>
</tr>
<tr>
<td>4” (100mm)</td>
<td>350mm</td>
<td>650mm</td>
<td>14” – 26”</td>
</tr>
<tr>
<td>6” (150mm)</td>
<td>400mm</td>
<td>750mm</td>
<td>16” – 30”</td>
</tr>
<tr>
<td>8” (200mm)</td>
<td>400mm</td>
<td>800mm</td>
<td>16” – 32”</td>
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</table>

<table>
<thead>
<tr>
<th>Lateral Zone Piping Depth</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pipe Size</td>
</tr>
<tr>
<td>------------</td>
</tr>
<tr>
<td>2” (50mm) zone lines depth</td>
</tr>
</tbody>
</table>

3. Bed with suitable material (See Backfill Material page 156) to the proper depth and compact to meet the approval of The City of Calgary Parks.

4. The Contractor shall repair any settlement of the trenches by bringing them to grade with topsoil and sodding.

5. Place sleeving as required to enclose piping under paved areas. Depth of sleeving shall match table for depth of pipe, 1000mm under roadways or as approved by Roads/Land Information & Mapping Services.

10. Installation

1. Submit a schedule as required for the proper installation of the system. Coordinate irrigation installation with other aspects of site development to ensure proper construction and reduce the possibility of damage to and by other trades. All work shall conform to approved design drawings.

2. Install all piping so it is not bent from a straight line in excess of the manufacturer’s recommendation for local conditions and with a minimum fall of .5% to drain boxes.

3. Make all joints and connections tight and in accordance with manufacturer’s recommendations.

4. Ensure the glue adhesive is appropriate for the ambient temperature at the time of installation and is used in accordance with manufacturer’s specifications.

5. Install risers with saddle tees (Detail Sheet #54-57) firmly connected and plumbed.
6. All sprinklers are to be adjusted and set flush with final grade using the three elbow swing joint (Detail Sheet #54 and 55). Ensure the horizontal nipple is no more than 45 degrees out of level when setting sprinklers. Where utility easements or property lines preclude the standard assembly, a "pig tail" swing joint shall be used (Detail Sheet #56).

**NOTE:** Pig tails shall be excluded in utility easements that contain concrete drainage swales. However, the Developer is responsible for repairs to the irrigation system during the maintenance period if remedial work is performed by The City within the drainage easement.

7. All backflow prevention assemblies (Detail Sheet #58 and 59) must be installed in accordance with the Wastewater By-law 40M2006 and the Alberta Plumbing and Drainage Act Regulations. Backflow prevention assemblies must be tested and tagged upon installation and annually thereafter prior to activating the system that year.

8. Ensure that such items as shrub heads are set at the proper height to obtain adequate coverage.

9. For automatic systems:

   a. Lay the wire in the trench with sufficient slack to accommodate backfilling and then backfill with suitable material (see Backfill Material page 156) prior to installation of the piping. *(See detail sheet #48a)*

   b. Ensure a green 14 gauge tracer wire is installed for lateral lines.

   c. Provide a minimum of 600mm coiled loops of wire at all control valves and changes in direction.

   d. Wiring necessary to activate the controller and valves must be located in a conduit (see Sleeving page 156) when located in buildings or under all paving.

   e. If a controller is located in a building, mount within approved cabinet *(Detail Sheet #60, center cabinet 1650 mm above floor)* capable of locking and securing controller and waterproof if necessary.

   **NOTE:** The installation of a temporary controller will be acceptable at CCC, however a permanent automatic controller shall be installed by the Developer one month prior to application for FAC.

   f. IRRInet-XM and IRRInet-ACE controller cabinet AC *(Detail Sheet #60 or #60b)*.

   g. Scorpio, IRRIcom and IRRInet-M cabinet AC *(Detail Sheet #60 or #60c)).

   h. Scorpio, IRRIcom and IRRInet –M cabinet DC *(Detail Sheet #60d)*.
10. Block all changes of direction and pipe endings (tee, elbows 45° and 90°, plugs). If concrete thrust blocks are used, (see Page 157 Item V1.15) protect pipe from spillover.

11. Ensure that the last sprinkler head tee is not set closer than 150mm from the pipe end.

12. Install drain valves and boxes (Detail Sheet #67 and 68) at appropriate locations to accommodate the slope of the land and the size of the irrigation system. Ensure that all heads, valves and drains are not set closer than one (1) metre from each other. If the mainline is less than ten (10) metres in length drain pits will not be required.

13. Install one 25mm curb stop drain valve (Detail Sheet #66) at each end of a conduit under a roadway to ensure adequate drainage.

14. Install Park Water Services as per Detail Sheet #64 and 65.

15. Where provided for by The City of Calgary, install a combination 50mm Master Valve with a Water Meter as per Detail Sheet #53.

11. Backfilling

1. After an open trench inspection and receipt of written approval by The City of Calgary Parks, backfill with an approved fill (see Backfill Material page 156).

2. Place backfill in 150mm lifts, placing and compacting all lifts to 85% S.P.D. until 150mm below finished grade. Place topsoil, seed and/or sod as specified.

3. Adjust sprinkler heads to the correct spray angle to provide adequate coverage without excessive overspray.

4. All irrigation systems shall be flushed out in a satisfactory manner to remove accumulation of dirt and other deleterious matter. Flush all laterals in a manner approved by the manufacturer to prevent clogging of sprinkler screens or nozzles.

5. In the event that finished landscape grades are changed more than 150mm, either lower or higher, and thereby compromise the initial intent of the irrigation specifications, at the direction of The City of Calgary Parks, the irrigation piping and fixtures may have to be adjusted to meet the specifications. Drain valve assemblies may require a change to the standard 25mm curb stop size.

6. Repair as required upon final testing by The City of Calgary Parks.
12. **Clean Up**

   Remove off site all debris and excess material left over from installation at the end of each working day or as required.

13. **Maintenance**

   1. Protect and maintain the entire irrigation system from the time of installation until Final Acceptance Certificate is issued by The City of Calgary Parks.

   2. **Maintenance of the irrigation system shall include:**

      a. **System Turn On**

         i. operational by May 15.

         ii. includes: Spray painting water services and keeping them clear and exposed from overgrowth (locator markings).

         iii. follow all maintenance and repair procedures to ensure a completely functional system with head to head coverage according to original intent of design.

         iv. submit and implement a weekly watering schedule for the season, which shall provide moisture to the turf and plant material as site conditions dictate.

         v. double-check valve test: Complete and submit.

         **NOTE:** The municipal address of the site shall be indicated on the Testing and Inspection Report.

      b. **Monthly Checks**

         The following items will be checked on a monthly basis for proper operation:

         i. controller (clock).

         ii. automatic valves.

         iii. double-check valve.

         iv. water services.

         v. piping.

         vi. manual valves.
vii. sprinkler heads (arcs).

viii. boxes.

ix. general settling and grading problems.

c. System Turn Off

i. Turn off the water supply to the irrigation system. You will have two choices:
   
   • stop and drain (or seal), 1/4 turn clockwise to close.
   
   • Service valve and drain rod - service valve counter-clockwise to close and drain rod is 1/4 turn counter-clockwise to open.

ii. Open all drain valves on main line of irrigation system and all test cocks and drains on double check valve assembly and allow sufficient time for the water to drain out.

iii. Close all drain valves.

iv. Connect an air compressor (600cfm) to a quick coupler using a 25mm hose (Detail Sheet #54) or to a 50mm gate valve outlet assembly using a 50 mm hose (Detail Sheet #51) downstream of the double check valve assembly or water meter.

v. Activate all electric valves from the controller. Ensure that each zone blows "clean" of any water before proceeding to the next. After this procedure is completed, go to each electric valve and manually activate each zone to make sure you have not missed a zone. Repeat the procedure from controller to dispel any remaining water.

vi. Turn the air compressor off and drain the main line of air, through the drain valve. Check all drain valves to make sure no water is coming out. Disconnect the air compressor. **DO NOT** leave drain valves and test cocks open for the winter.
# Parks Irrigation Meter Sheet

<table>
<thead>
<tr>
<th>MFRM000</th>
<th>Quality Management Document Parks Irrigation Meter Report</th>
<th>ISO Elem: 4.0</th>
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<tbody>
<tr>
<td>Owner:</td>
<td>Approved by:</td>
<td>Issue Date:</td>
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## Irrigated Site Information

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<tr>
<th>Address:</th>
<th>Legal Description:</th>
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<tbody>
<tr>
<td>Reference Address:</td>
<td>Community:</td>
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<td>Developer:</td>
<td>Steward:</td>
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<table>
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## Meter Information

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<tr>
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<td>Serial #</td>
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<tbody>
<tr>
<td>COMPUTER HOOK UP:</td>
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## Development Inspection Information

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<table>
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<tbody>
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<td>Development Status:</td>
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| CCC | FAC: | DATE: |

## Developer & Consultant Information

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<thead>
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<th>Name Of Consultant:</th>
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</thead>
<tbody>
<tr>
<td>Contact Person:</td>
<td>Phone:</td>
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</table>

## Meter Location Diagram

 REF:    Revision Date:    Revision #:    Page:  
Copy 1: Parks Inventory # 54  Copy 2: Waterworks: 334  Copy 3: Inspector  Copy 4: Consultant
# Irrigation Information Sheet

<table>
<thead>
<tr>
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<th>Page of</th>
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<tr>
<td>Municipal Address</td>
<td>P.M.M.S. Number</td>
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<tr>
<td>Service Address</td>
<td>PROSIS Number</td>
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<tr>
<td>Systems</td>
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<td></td>
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</table>

- Automatic
- Manual Pop Up
- Manual

- Parks Water Service Type
- Service Number
- Corresponding Back Up Valve
- #1
- #2
- Stop & Drain Service
- Service Valve & Service Drain
- Other
- Water Service size in Millimeters
- Water Service depth in Metres

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<tr>
<th>Corresponding Backflow Unit</th>
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<tr>
<td>2</td>
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<th>Corresponding Water Meter</th>
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<tr>
<td>1</td>
</tr>
<tr>
<td>2</td>
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</tbody>
</table>

### Field Drains

- Total No.
- Gate Valves
- Drain Rod
- Drains Located
  - D.C.V.
  - Main Line
  - Laterals

### Components

- Description (Make, Model, Etc.)
- Arc Size, No. of Stations
- Number, Length
- Nozzle Size

- Box
- Controller
- Pipe
- Sprinkler Head
- Valve

- Washroom
- Drinking Fountain
- Display Fountain
- Winter Service

- Fill Up Site

---

Standard Specifications for Landscape Construction 2011
<table>
<thead>
<tr>
<th>Key Plan</th>
<th>Water Services Location: Sketch / Written</th>
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<th>MM</th>
<th>DD</th>
<th>Last Updated</th>
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Winterizing Procedures:
- [ ] Gravity Drain
- [ ] Compression
- [ ] Drain Main / Blow Laterals

Precipitation Rate per Zone (in/hr)

Additional Comments

To Be Filled Out By Calgary Parks

163
LANDSCAPE MAINTENANCE
VII. LANDSCAPE MAINTENANCE

1. Preamble

Parks Operations Divisions have developed these maintenance standards as a benchmark for minimum level of performance. The Development Industry at its discretion may desire to perform an increased level of maintenance. Sections within these standards may be specific to Parks Operations and not apply to the Development Industry.

2. Mowing

Class A, B, C, R, N, Parks

Desired Results:

All turf has been cut evenly at designated height, in a safe and efficient manner.

A – 5 – 7 cm
B – 5 – 10 cm
C – 5 – 15 cm
R – 5 – 15 cm
N – 10 – 20 cm (fire cut only)

- No excessive equipment "down time".
- No damage to turf.
- No damage to trees, shrubs or other park features such as scraped bark on trees and shrubs, bent or scraped park furniture.
- No areas have been missed.
- Prior to and after mowing, no highly visible debris, paper, etc. have been left on turf.
- No more than 5% scalped turf
- Prior to and after mowing, no more than 1 piece of highly visible litter per 100 m2 on turf.
- No lubricant or fuel spills on turf or non-turf areas.
3. **Small Mowing / Power Trim**

Class A, B, C, R, N, Parks

Desired Results:

All turf has been cut evenly at designated heights and to standard.

A – 5 – 7 cm  
B – 5 – 10 cm  
C – 5 – 15 cm  
R – 5 – 15 cm  
N – 5 – 20 cm (firecut)

- No areas have been missed  
- No scalped turf  
- Prior to and after mowing, no visible litter on “A” Class Parks and no more than:
  - 1 piece of litter per 100 m² – Class “B” Parks  
  - 2 pieces of litter per 100 m² – Class “C” Parks  
- No damage to trees, shrubs or other park features such as scraped bark on trees and shrubs, bent or scraped park furniture
- No highly visible grass clippings on class A or B turf areas. Clippings should not accumulate to the point of creating an appearance problem or inhibit lawn growth on class C or R turf areas.
- Grass clippings should not be present on sidewalks, pathways or any hard surfaces for any class of park
- No lubricant or fuel spills on turf or non turf areas.

4. **Litter Control**

Class A, B, C, R, N Parks

Desired Results:

- Removal of all “Ad Hoc” structures in the park (tree forts, etc.)
- Fence lines cleaned of highly visible accumulated litter
- Lack of highly visible litter per 100 m² on turf

A – not to exceed 0 pieces per 100 m²  
B – not to exceed 1 pieces per 100 m²  
C – not to exceed 2 pieces per 100 m²  
R – not to exceed 2 pieces per 100 m²  
N – not to exceed 2 pieces per 100 m²
5. Garbage Receptacle Emptying

- All bags 75% full or over shall be replaced

Class A, B, C, R, N, Parks

Desired Results:

- All garbage cans must have a plastic garbage bag inside
- All garbage containers shall remain free of crusted garbage build-up, objectionable odors, wasps or other insects from being attracted to the garbage can.
- Area around garbage container shall be litter free. All garbage bags, hazardous material, bio-hazardous waste is to be safely disposed of according to applicable safety procedures

6. Curb Sweeping, Spring and Fall Cleanup

Class A, B, C, R, Parks

Desired Results:

- All possible areas within the site swept in a safe and efficient manner
- No litter or visible debris left on the turf
- Proper disposal of all hazardous material including bio-hazardous waste, in compliance to applicable policy
- All debris piles removed from the site in a safe and efficient manner without damage to trees, shrubs or other park features
- No damage to parks buildings or amenities
- No lubricant or fuel spills on turf or non-turf areas

7. Fertilize

Class A, B, C, Parks
- Public Notice prior to application.

Desired Results:

- Application is even and uniform throughout
- No spillage of fertilizer
- No burning of turf grass
- No discolouring (streaking) of turf
- No damage to trees, shrubs or other features such as scraped bark or trees and shrubs, bent or scraped park furniture
- No lubricant or fuel spills on turf or non-turf areas
8. **Aerate**

Class A, B, C Parks

Desired Results:

- Aerator holes / cores should be 3 inches deep, 3 inches or less apart and about \( \frac{3}{4} \) inch in diameter
- No damage to trees, shrubs or other park features such as scraped bark on trees and bent or scraped park furniture, or damages to irrigation system.
- No ripping or tearing turf (caused by sharp turns)
- No missed areas
- No lubricant or fuel spills on turf or non-turf areas

9. **Top Dressing**

Class A, B, C, Parks

Desired Results:

- Park site to be prepared for top dressing as required (ie. Removal of rocks and litter. Mowing, sweeping, aerating)
- No damage to trees, shrubs, turf or other park features such as scraped bark on trees, bent or scraped park furniture
- Accurate topsoil requirement calculations
- Appropriate soil mixture piling
- Loam spread and matted evenly throughout designated area
- No areas missed with top dressing material
- No remaining piles
- No damage to turf caused by loam piles
- No top dressing material on sidewalks or roadways
- No tools are to be left at the work site after completion of task
- No lubricant or fuel spills on turf or non-turf areas

10. **Chemical Weed Control**

Class A, B, C, R, Parks
- Public Notice prior to application.

Desired Results:

- No lubricant, chemical or fuel spills on turfed or non-turfed areas
- Threshold of 5 weeds per m\(^2\) attained on all classes (spot spraying see biocide report)
- No damage to trees, shrubs or other park features as a result of spraying operations
- No spray (herbicide) damage to non targeted vegetation
• No spray (herbicide) damage within 10 meters of the edge of tot lots
• All signage removed

11. Renovation of Park Site

Class A, B, C, R, N Parks

As required based on condition of site and specifics of those conditions

• Could involve total renovation of park including but not limited to – reseeding, resodding, change of type of park from tot lot to leisure site or athletic site, upgrade of site from class C to class B or renovation of playground area to meet new standards or safety requirements (i.e. change of equipment from wooden structures to new metal/plastic structures, change of structure due to health and safety issue like lead paint situation)

12. Tree Well Maintenance

Class A, B, C, R

Desired Results

• Tree well to be either cultivated or mulched
• If well is cultivated, well should be free of weeds and of a standard size, approximately one (1) metre in diameter
• Tree well should be intact and able to hold water
• If well is mulched, mulch should be spread evenly to a depth of 4 inches and not piled against or touching trunk of tree as this can rot the wood causing decay or even death of the tree
• All visible litter shall be removed

13. Shrub Bed Maintenance

Class A, B, C, R, Parks

Desired Results:

**Cultivated Beds:**

• No damage such as broken branches or scraped bark
• Shrub bed area is cultivated and free of weeds
• No more than 5% of shrubs dead, missing or diseased
• No more than 5% of broken, dead or diseased shrub branches remaining in bed
• Shrub bed 90% free of weeds
• All visible litter removed
Mulched Beds:

- Shrub bed to be weeded and cultivated before mulch is applied
- Mulch to be spread evenly to a depth of 4 inches
- Mulch should not be piled against the base of trees or shrubs as this can rot the wood, causing decay or even death of the plant
- No more than 5% of shrubs dead, missing or diseased
- No more than 5% of broken, dead or diseased shrub branches remaining in bed
- Shrub beds 90% free of weeds
- All visible litter removed

14. Flower Bed Fertilizing

Class A, B, Parks

Desired Results:

- Fertilization of the flower displays in a safe and efficient manner, using the correct rates and frequencies as recommended by the manufacturer
- Healthy, vigorous and colourful flower displays in part as a result of an ongoing effective fertilizer program
- Even coverage of target plants, without significant spillage
- No symptoms of toxicity as a result of over fertilization
- No significant salt accumulations
- No fertilizer concentrate spilled on flower bed or surrounding area
- All immediate hazards removed
- All tools and equipment removed from site following completion of fertilizing activities

15. Irrigation Maintenance

Class A, B, Parks

Desired Results:

Successful completion of irrigation activities including:

- Service initiation
- DCV Testing
- System Turn-on
- All repairs required in order that system operate effectively
- All systems workable
- No water leaking from system
- No debris or parts left on site
- No irrigation boxes that have lids missing or in poor state of repair. Box lids are safe and locked
- Parks water value and drain rod are visible, to grade and painted red after FAC
16. **Street Sidewalks (Snow Removal)**

Class A, B, C Parks

Snow and ice cleared in accordance with Bylaw 20M88.

Desired Results:

- Free of hazards and obstructions
- 98% clear of snow
- Sand placed on 90% of slippery areas
- No damage to trees, fences, turf or other features such as scraped bark on trees, bent or scraped park furniture or fence
- No snow piled onto shrub/planting beds
- No lubricant or fuel spills on turf or non-turf areas
- No snow pushed onto private property
- No snow sprayed onto vehicles parked along pathway or sidewalk

17. **Pathways, Roads and Parking Lot Maintenance**

Class A, B, C, R, N Parks

Desired Results:

- To be maintained in order that they can be used for their intended purpose
- To be inspected and repaired / renovated on a regular basis either as required or as scheduled
- To be maintained in a manner that meets all legislated requirement including safety requirements
- Free of hazards and obstructions
- No damage to trees, fences, turf or other park features such as scraped bark on trees, bent or scraped park furniture or fences
- No lubricant or fuel spills on turf or non-turf areas
- No piles of debris or excess material left on site as a result of maintenance completed

18. **Park Features**

Class A, B, C, R, N Parks

Parks Features: including but not limited to park furniture signs, sculptures, garbage receptacles, lights, bollards, stairway/platforms.

Desired Results:
- All parks features shall be fully functional, as designed, at all times
- All parks features shall be installed as to specifications and standards
- All parks features shall be maintained in safe operating condition
- All parks features shall meet or exceed all legislated requirements
- All park features shall be inspected and maintained on a regular basis as scheduled or as required

19. Building and Janitorial Maintenance

Class A, B, C, N Parks

Desired Results:

**Building Maintenance:**

- All vandalism reported according to procedure
- All breaches of security reported according to procedure
- All buildings safe and secure
- All fans, pumps, filters, furnaces, valves must be checked on a regular scheduled basis and be in working order
- All lights and other electrical devices in working order

**Building Janitorial:**

- Accumulations of water, mud and dirt must not be present on more than 5% of the floor surface (after cleaning)
- Broken glass or obvious litter must not be present
- Adherence to spill cleanup procedures and WHMIS policy
- Smudges, spots, stains, watermarks etc must not be present on more than 5% of any wall surface or mirrors
- Waste and sanitary receptacles must not be more than 75% full. Overflowing conditions and piles of litter around receptacles are not acceptable
- All dispensers (toilet paper, paper towels, etc) shall not be less than 25% full
- All toilets and sinks shall be operable. No plugged, leaking or overflowing toilets or sinks

20. Playground Inspection and Maintenance

Class A, B, C, R, N Parks

Desired Results:

- Inspections completed as per established inspection schedule
- All formal (inspection report) documentation completed
- All minor repairs completed
- Any major repairs scheduled as per inspection report
21. **Tree Pruning**

Class A, B, C, R Parks

Desired Results:

- Tree is cleaned of all dead, diseased and broken branches
- All clearance, both vertical and visual (for safety reasons) are maintained
- No low hanging branches that will interfere with vehicles, equipment, pedestrians or signs.
- An obvious, prominent central leader is evident (if species and growth habit of tree allows)
- Structural defects are mitigated (e.g. Hazards, dead branches removed)
- The habit of growth for the species is maintained
- No stubs, flush cuts or stumps and tearing. Final cuts should result in a flat surface with adjacent bark firmly attached
- No more than 20% of the total live canopy and 20% of living wood on any branch removed in one season
- No debris from pruning operations on roadway sidewalk or private property

22. **Water Features (Ponds and Lagoons)**

Class A, B Parks

Desired Results:

**Summer Operation:**

- All areas/structures related to water feature shall be safe and secure
- All fans, pumps, filters, valves or other water volume regulatory devices must be checked on a regular scheduled basis and must be in proper working order
- All lights and/or other electrical devices must be in proper working order
- All vandalism and/or security breaches must be reported according to procedure
- All legislated requirements must be adhered to, such as WHMIS, ISO14001, OH&S, etc.

**Winter Operation:**

- Snow cleared and piled safely in a non-obstructive manner
- No snow sprayed on parked vehicles
- All areas / structures related to water feature shall be safe secure and maintained as required
- All maintenance activities shall be carried out according to procedure in a safe manner (i.e. sweeping ice, flooding, heavy snow removal, litter control, etc)
• Adherence to all legislated requirements (i.e. WHMIS, OH and S, Working Alone Policy, etc)
• All areas must be free of obstacles and hazards
• All standard procedures shall be followed (i.e. use of fire hydrant for flooding etc)
• Ice groomed and fit for skating by Christmas (weather permitting)
• Smooth ice (weather permitting)
• No holes or cracks in ice that would constitute a hazard
• No buried rocks, pop cans, etc within the ice surface that would constitute a hazard
• No damage to trees, fences, turf or other park features
• No lubricant or fuel spills on turf or non-turf areas

23. Fence Maintenance

Class A, B, C, N Parks

Desired Results:

• No damage to trees, shrubs or other park features such as scraped bark on trees and shrubs, bent or scraped park furniture
• No lubricant or fuel spills on turf or non-turf areas
• No fill piled up around posts
• No debris (i.e. rocks, pieces of wood, cable, pieces of fabric, tie wires, etc) left laying around repaired fence
• No broken or bent posts
• Cable and/or fabric must be tightened as required
• Fence must be straight and at same consistent height throughout
• All gates must be installed according to standard procedures and fully operational

24. Tennis Courts

Class A, B Parks

Desired Results:

• Nets neat and straight and at the correct height
• No surface dirt, gravel or other debris on court
• No graffiti on practice board
• All fencing, furniture and signs are repaired

25. Playfields

Class A, B Parks
Desired Results:

- Ensure that in all fields where shale is used, that all edges where shale meets the grass are straight
- Shale should be loosened regularly, to a depth of 1 inch
- Areas adjacent to the grass to be level
- Ball diamond infield and soccer fields should be weed free
- No holes in playing fields
- No glass or other hazardous materials on the playing surface
- Level, non-protruding surface
- Ensure that all fixtures and amenities on or around play fields are inspected regularly and maintained in order to provide a safe playfield area (i.e. goal posts, backstops, players benches, dugouts, bleachers, etc)
- Ensure that all irrigation sprinkler heads and/or box lids are set to grade, so as to not create a tripping hazard
- Ensure that all irrigation box lids fitted properly to boxes and locked
- Ensure that all lighting and electrical amenities are maintained properly and in good working condition.

26. The City of Calgary Parks - Park Classifications

Class A Park:

These are highly decorative show piece parks usually with numerous horticultural and landscape features.
These parks will have a full or partial irrigation system capable of complete coverage of the turf area of park.

Class B Park:

These parks could be neighborhood, regional, community or major thoroughfare orientated. Horticultural and landscape features will be based on activities and usage.
Programs are generally limited to tennis, soccer, baseball, playgrounds and can include areas designated for picnics.
These parks will have a full or partial irrigation system capable of complete coverage of the turf area of park.

Class C Park

These parks are considerably different than a Class B park in that they may have limited or no horticultural features (i.e. flowers, trees, shrub beds).
Parks will be categorized as district, regional, community, citywide and major thoroughfare orientated and could have limited programs for major outings (i.e. picnicking, playgrounds, cycling). Turf is also generally of a more coarse texture.
Growth and colour of turf is mainly determined by natural conditions. Limited weed infestation may be evident.
These parks are non-irrigated.

**Class R Park**

Parks in this category could be identified as major thoroughfares (i.e. boulevards and medians) and buffer zones. The grass will be coarse and sparse with quality determined by natural conditions. Higher weed infestation usually present than in a Class C park.

Usually no irrigation system present.

**Class N Park**

These are natural areas and will include riverbanks, escarpments, gullies, coulees, natural parks and environmental reserves with plant material of native species only.

Irrigation systems not present.
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NOTE: All dimensions are in metres unless otherwise noted.

Ice Rink Envelope: 3.0m Buffer, optimum 2% grade in all directions.
(Total Area = 1953 square metres)
OPTIMAL DRAINAGE PATTERNS FOR SPORTS FIELDS

LEGEND

- Sports Field
- Direction of Surface Drainage
- Graphic Representation of Contour Line – (no scale)
NOTE: All dimensions are in metres unless otherwise noted.

Soccer Envelope: 3.0m Buffer; optimum 2% grade in all directions. (Total Area = 9116 Square Metres)

Goal Post locations to be staked by Calgary Parks & Recreation Staff.

PROJECT TITLE
SPECIFICATIONS

SHEET TITLE
COMBINATION
MAJOR - MINOR
SOCCER FIELD
NOTE: All dimensions are in metres unless otherwise noted. Dimensions in yards are in brackets.

Typical buffers around fields are 10m behind goal posts and 3m along sidelines.

U6 fields are 27.43 x 18.29m (30 x 20yd) and lay out in the same locations as the U8 fields.
3.0m Buffer; optimum 2% grade in all directions. (Total Area = 8064 Square Metres)

NOTE: All dimensions are in metres unless otherwise noted.
Goal Post in Concrete Base. (Typ.)
Painted White (Typ.)
Finished Grade
89mm O.D., Schedule 20 (Typ.)

Welded Joints (Typ.)
Capped End (Typ.)
Set Screw (Typ.)

89mm Inside Dia. (Typ.)

Goal Post in Concrete Base. (Typ.)
Finished Grade

89mm O.D., Schedule 20 (Typ.)

Major: 2.440m (8'-0")
Minor: 1.830m (6'-0")

300 (Typ.)
1200 (Typ.)

NOTES:
All dimensions are in millimetres unless otherwise noted.

Subject to approval by The City, portable goalposts may be installed.

If portable goalposts are to be installed they must be securely anchored to ground.

OPTIONAL INSTALLATION *

* OPTIONAL - TO ALLOW REMOVAL
To be used when located near toboggan hills or as required by Calgary Parks.

---

PROJECT TITLE
SPECIFICATIONS

SHEET TITLE
MAJOR / MINOR SOCCER GOAL POST DETAIL

DRAWN BY
W.B.
DATE 2009-10-27

DESIGN BY
D.Laf.
DATE 1997-07

SCALE
N.T.S.

SHEET NO.
5

FILE NO.
Side stand 48mm O.D. pipe

Ground frame 102mm x 50mm rectangular tube
Main uprights and crossbar - 89mm O.D. Pipe

Location of the pin to be 500mm from the back of the goalpost frame, centred on the bottom rail

Galvanized steel pin centred on the bottom rail

20mm Diameter x 725mm long hot dip galvanized steel pin, c/w a 38mm round head

NOTES:
1. All dimensions are in millimetres unless otherwise noted.
2. All goal pipe shall be powder coated steel.
Softball Envelope:
- 3.0m Buffer,
- optimum 2% grade in all directions.
- Total area including buffer equals 7406 square metres

NOTE: All dimensions are in metres unless otherwise noted.
Limit of Red Shale Area
(1558 Sq. m., min. 150mm depth)

Baseline Layout by Others

Typical Players' Bench (4.57m, 15ft)

Backstop see Detail Drawing

Pitchers' Mound, see detail

NOTE: Backstop & Red Shale corner locations to be staked by Calgary Parks.

All Dimensions are in metres unless otherwise noted.
Limit of Red Shale Area (2449 Sq. m., min. 150mm depth)

Baseline Layout by Others

Typical Players' Bench

Pitchers' Mound, see detail

Backstop see Detail Drawing

Plan View

Section A - A

Pitchers' Mound Detail (N.T.S.)

NOTE: Backstop & Red Shale corner locations to be staked by Calgary parks & Recreation Staff.

All Dimensions are in metres unless otherwise noted.
Baseball Envelope: 3.0m Buffer, optimum 2% grade in all directions.
(Total area = 10,394 square metres)

91.4m
Little League
Baseball Diamond

NOTE: All dimensions are in metres unless otherwise noted.
CANOPY DETAIL
N.T.S.

NOTE: NO.6 OR NO.9 GAUGE WIRE MESH FOR CANOPY

3.05m O.D. GALV. PIPE (CORNER POST)
41.3mm O.D. GALV. PIPE (RAIL)
41.3mm O.D. GALV. PIPE (LINE POST)

BACKSTOP PLAN

BACKSTOP ELEVATION

SEE DETAIL A
SEE DETAIL B
SEE DETAIL C
SEE DETAIL D
SEE DETAIL E

GROUND LEVEL
WIRE MESH FABRIC
300mm DIA. x 1300mm DEEP CONCRETE ANCHOR

THE CITY OF PARKS CALGARY

SPECIFICATIONS

PROJECT TITLE

DRAWN BY MK
DATE 2006 05 25
DESIGN BY

SCALE N.T.S.

SHEET NO. 11

FILE NO.

DATE
**Detail A**

- Post Top
- Tension Bend
- Tension Bar
- Corner Post

**Detail B**

- Corner Post
- Welded Junction
- Top Rail
- Wire Tie

**Detail C**

- Top Rail
- Welded Junction
- Tension Bar
- Tension Band

**Detail D**

- Top Rail
- Welded Junction
- Wire Tie
- Corner Post

**Detail E**

- Wire Tie
- Tension Bar
- Tension Band
- Top Rail

**Material List**

<table>
<thead>
<tr>
<th>QTY</th>
<th>SIZE</th>
<th>DESCRIPTION</th>
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<tbody>
<tr>
<td>49m</td>
<td>3.05m x 50mm</td>
<td>No. 6 Gage Wire Mesh</td>
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<td>1477m</td>
<td>41.3mm O.D.</td>
<td>Top Rail</td>
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<td>4</td>
<td>88.9mm O.D. x 7.32m</td>
<td>Corner Post</td>
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<td>5</td>
<td>60.3mm O.D. x 7.32m</td>
<td>Line Post</td>
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<td>56.9mm I.D.</td>
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<td>2</td>
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<tr>
<td>9.07kg</td>
<td>No.16 Gauge</td>
<td>Lacing Wire</td>
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<tr>
<td>72</td>
<td>34mm x 7.9m</td>
<td>Bolts c/w Locks &amp; Nuts</td>
</tr>
<tr>
<td>72</td>
<td>88.9 I.D.</td>
<td>Tension (offset) Bonds</td>
</tr>
</tbody>
</table>

**Backstop Materials**

- (38 Welded Juncions
- Canopy Not Included)
**Net Post &/or Transom located .9144m from edge of court.**

All dimensions are in metres unless otherwise noted.

**NOTE:** Where there is an irrigation mainline within 25lm of a pedestrian entrance, an irrigation turf valve shall be placed at that entrance.
- Practice Board to be mounted on 89mm (3 1/2") O.D., schedule 40 Posts.
- Practice Board to be mounted 100mm above court surface for drainage purposes. Provide 100 x 100 x 200 pressure treated wood blocking @ 1220mm O.C.
- Practice Board to receive one coat of primer paint & two coats of "Forest Green" or as otherwise approved.
- A 75mm wide White Sighting Line shall be painted on the Practice Board. This Line shall be 1080mm above & horizontal to the playing surface.

* Practice Board to be mounted on 89mm (3 1/2") O.D., schedule 40 Posts.
* Practice Board to be mounted 100mm above court surface for drainage purposes. Provide 100 x 100 x 200 pressure treated wood blocking & 1220mm O.C.
* Practice Board to receive one coat of primer paint & two coats of "Forest Green" or as otherwise approved.
* A 75mm wide White Sighting Line shall be painted on the Practice Board. This Line shall be 1080mm above & horizontal to the playing surface.

* All dimensions are in millimetres unless otherwise noted.
Turf (Existing Grade) to be lower than asphalt apron to allow positive drainage off of courts.

NOTE: All dimensions are in metres unless otherwise noted. See design information for Tennis Courts.
NOTES:
- 400mm - 600mm square of asphalt to be removed prior to augering post holes. Repair using asphalt and grade level with surrounding surface.
- All Pipe to be Galvanized Schedule 40.
- All dimensions are in millimetres unless otherwise noted.
NOTES:
- 400mm - 600mm square of asphalt to be removed prior to augering post holes. Repair using asphalt and grade level with surrounding surface.
- All Pipe to be Galvanized Schedule 40.
- All dimensions are in millimetres unless otherwise noted.
PERMANENT TENNIS NET POST

NOTE: System includes Post Top Caps as approved by Calgary Parks.

REMOVABLE TENNIS NET POST

NOTE: System includes Post Top Caps & Covers required to seal sleeves when posts are removed as approved by Calgary Parks.

NOTES:
- 400mm - 600mm square of asphalt to be removed prior to augering post holes. Repair using asphalt and grade level with surrounding surface.
- All Pipe to be Galvanized Schedule 40.
- All dimensions are in millimetres unless otherwise noted.
COLOUR FAILURE ANYWHERE ON SIDE COURT SPACE OR BETWEEN COURT SPACE, RECOLOUR THE ENTIRE AFFECTED AREA.

SIDE COURT SPACE OR BETWEEN COURT SPACE SHOWN THUS:

3.66m High Chainlink Fence
0.30m Edge
1.00m Apron

COLOUR FAILURE ANYWHERE ON SIDE COURT SPACE OR BETWEEN COURT SPACE, RECOLOUR THE ENTIRE AFFECTED AREA.
COLOUR FAILURE ON ANY COURT, RECOLOUR & RELINE THE ENTIRE AFFECTED COURT.

COURTS SHOWN THUS —

NOTE: All dimensions are in metres unless otherwise noted.

3.66m High Chainlink Fence

COLOUR FAILURE ON ANY COURT, RECOLOUR & RELINE THE ENTIRE AFFECTED COURT.

COURTS SHOWN THUS —

NOTE: All dimensions are in metres unless otherwise noted.
TREE PLANTING DETAIL

The following Tree Planting Detail will be used for Bare Root Trees up to 35mm Caliper.

NOTES:
- Spread out roots in hole (hole shall be twice the diameter of the root spread).
- Flush out broken or frayed root ends with secateurs
- Hold trunk vertical, backfill around roots with shredded loam mix, continuously packing the soil until firm.
- Tree should be planted in a 75mm - 100mm tree well at the same original growing depth as in nursery.
- Bars should be hammered down into solid footing (at least 400mm into sub-soil base).
- Use rubber straps at end of all guy wires to protect the tree at point of contact. (Guying & Staking is optional)
- Prune dead branches to maintain natural form of tree.
TREE PLANTING DETAIL

The following Tree Planting Detail will be used for Backhoe Dug, 40mm - 100mm caliper, either coniferous or deciduous, irrigated sites, basketed, or balled and burlap trees.

On non-irrigated sites an increase in topsoil depth to increase water holding capacity may be desired.

NOTES:
- Do not allow air pockets to form when back filling.
- Trees to be planted at grade with trunk flare visible - no more than 25mm above grade
- If staking, stake beyond edge of root ball. Bars should be hammered down into solid footing (at least 400mm into sub-soil base).
- Use 2mm (1/2") braided nylon strap to protect the tree at point of contact.
- If tree is in wire basket, cut and remove strapping and the horizontal / vertical wires of the upper 1/3 as a minimum. Pull back burlap to the same minimum.
- Prune dead branches to maintain natural form of tree. Do not prune heavily at planting.
- On sites of extreme compaction scarifying is recommended.
- 50mm - 75mm tree well depth option for non-irrigated sites. Refer to Landscape Construction Specifications, Trees Shrubs Groundcovers, Standard Specifications, 8 (i) installation.

Existing Grade

Topsoil, refer to Topsoil Specifications.
Compact clay below rootball (typ.)
Place rootball on compacted or undisturbed subgrade.

Min.450mm or 2xWidth /Dia. of Rootball, Whichever is greater.

40mm to 100mm Caliper Tree or Coniferous Tree

Single Leader, (unless multistem species is specified)

2mm (1/2") Braided Nylon Strap
Use three 1800mm painted T-Bars. (staking optional)

Prevailing Wind

Plan for Tree Staking
( optional)
TREE PLANTING DETAIL

The following Tree Planting Detail will be used for Spade Hole Preparation, 40mm - 100mm Caliper, either Coniferous or Deciduous, Basket or Ball & Burlap Trees

NOTES:
- Do not allow air pockets to form when back filling.
- Stake beyond edge of root ball.
- Tree should be planted 75mm - 100mm below ground level.
- Bars should be hammered down into solid footing (at least 400mm into sub-soil base).
- If tree is in wire basket, cut and remove strapping and the horizontal/vertical wires of the wire basket to a minimum depth of 200mm from the top of the root ball. Pull back burlap to this same minimum depth.
- Use rubber straps at end of all guy wires to protect the tree at point of contact.
- Prune dead branches to maintain natural form of tree.

PLAN FOR TREE STAKING
(optional)

40mm to 100mm Caliper Tree.

Use three 1800mm painted T-Bars. (staking optional)

Mulch, starting 50mm from Root Flare (trunk) & extending the hole.

Slope Top Soil from Root Ball to edge of hole to form well.

Sub-soil.

400 mm

Root Flare at grade.

Compacted Clay below Root Ball.

Top Soil, refer to Top Soil Specs.

Use rubber straps at end of all guy wires to protect the tree at point of contact.

- Prune dead branches to maintain natural form of tree.

THE CITY OF PARKS CALGARY
The following shrub planting detail will be used for all potted deciduous or coniferous shrubs:

- **Shrub Pit**
  - Prune dead and broken branches while retaining normal plant shape.
  - Saucer shaped basin for water containment.
  - Grade:
    - 50mm min. mulch layer.
    - 200mm depth.
  - Scarify pit bottom.
  - Compacted subgrade.
  - Topsoil, firmly packed, refer to Topsoil Specs.

- **Shrub Bed**
  - Grade:
    - 50mm min. mulch layer.
    - 200mm depth.
  - Scarify pit bottom.
  - Compacted subgrade.
  - Topsoil, firmly packed, refer to Topsoil Specs.
  - 1/2 spacing (as per plant list) spacing (as per plant list) 1/2 spacing.
  - Saucer shaped basin for water containment.
  - Prune dead and broken branches while retaining normal plant shape.

*The specifications include:* 200mm Topsoil, firmly packed, refer to Topsoil Specs.
TREE PLANTING DETAIL
This detail may be used for group tree planting on sites where drainage patterns allow a raised bed. Consider species selection & site selection for this detail.

NOTES:
- Edge of bed to be staked and approved by Landscape Architect.
- Do not allow air pockets to form when back filling.
- If staking, stake beyond edge of root ball. Bars should be hammered down into solid footing (at least 400mm into sub-soil base). Use 2mm (1/2") braided nylon strap to protect the tree at point of contact.
- If tree is in wire basket, cut and remove strapping and the horizontal / vertical wires of the upper 1/3 as a minimum. Pull back burlap to the same minimum.
- Prune dead branches to maintain natural form of tree. Do not prune heavily at planting.
- Option to raise bed 150mm - 300mm

*50mm - 75mm depth, starting 50mm from root flare (trunk). Extend to the edge of drip line or 1000mm.

Compact clay below rootball (typ.)
Place rootball on compacted or undisturbed subgrade.

Topsoil, refer to Topsoil Specifications.

**50mm - 75mm depth, starting 50mm from root flare (trunk). Extend to the edge of drip line or 1000mm.

2mm (1/2") Braided Nylon Strap
Use three 1800mm painted T-Bars, (staking optional)

Existing Grade

600mm

Existing Grade

600mm

Topsoil, refer to Topsoil Specifications.

Prevailing Wind

PLAN FOR TREE STAKING
(optional)
NOTES:
- Do not allow air pockets to form when back filling.
- Stake beyond edge of root ball.
- Tree should be planted 75mm - 100mm below ground level.
- Bars should be hammered down into solid footing (at least 400mm into sub-soil base).
- If tree is in wire basket, cut and remove strapping and the horizontal/vertical wires of the wire basket to a minimum depth of 200mm from the top of the root ball. Pull back burlap to this same minimum depth.
- Use rubber straps at end of all guy wires to protect the tree at point of contact.
- Prune dead branches to maintain natural form of tree.

TREE PLANTING DETAIL

- Mulch, starting 50mm from Root Flare (trunk) & extending the hole.
- 100mm Slope Top Soil from Root Ball to edge of hole to form well.
- Root Flare at grade.
- Sub-soil.
- 450mm Compacted Clay below Root Ball.
- Rubber Strap. Wire does not go around tree.
- 11 Gauge Guy Wire. Use three 1800mm painted T-Bars. (staking optional)
- Top Soil, refer to Top Soil Specs.
- Prevailing Wind

THE CITY OF PARKS
CALGARY

PLAN FOR TREE STAKING
(optional)
**TREE PLANTING DETAIL**

The following Tree Planting Detail will be used for all trees planted in the Boulevard and Median.

**NOTES:**
- Depth of loam min 150mm to optimum of 300mm. Tree spade option if depth is 300mm.
- Do not allow air pockets to form when back filling.
- Trees to be planted at grade with trunk flare visible - no more than 25mm above grade.
- Staking, if required - refer to Tree Planting Detail #23. remove staking one year after installation.
- If tree is in wire basket, cut and remove strapping and the horizontal / vertical wires of the upper 1/3 as a minimum. Pull back burlap to the same minimum.
- Prune dead branches to maintain natural form of tree. Do not prune heavily at planting.
- Crown median to ensure positive drainage.

**SECTION VIEW A - A**

50 - 75mm depth of mulch, starting 50mm from root flare (trunk). Extend to the edge of drip line or 1000mm.

**SECTION VIEW B - B**

- Depth of loam min 150mm to optimum of 300mm. Tree spade option if depth is 300mm.
- Compact clay below rootball. (typ.)
- Min. 450mm or 2 x Width/Dia. of Rootball. *Which ever is greater.
- Place rootball on compacted or undisturbed subgrade.
- Tree Pit depth equals Rootball depth.
- 150mm - 300mm Minimum.
- Crown median to ensure positive drainage.

**PLAN VIEW**

- Boulevard Tree (typical)
- Root Flare at grade.
- Curb
- Roadway
- Median Planting Zone

**TOPSOIL, REFER TO TOPSOIL SPECIFICATIONS.**
Surface Rock greater than 50mm must be removed

Visual Rock greater than 50mm must be removed

Embedded Rock greater than 50mm must be removed

Volume of rock in topsoil not to exceed 20%

Embedded Rock may remain

Surface Rock greater than 50mm must be removed

Visual Rock with greater than 50% embedded and not rising more than 50mm above surface may remain

Visual Rock with greater than 50% above surface and greater than 50mm must be removed

NOTE: Surface, visual or embedded rock that is greater than 25mm must be removed for all sportsfields.
Flush with curbs (if applicable)

Flush with paved area (if applicable)

130mm Topsoil min.

Sod to be laid lengthwise across face of slope

Section Through Sod

Each uphill end of sod to be pegged with two 25 x 25 x 230mm wooden pegs, driven in below lawn level

Full row of sod to be used on perimeter of sodded area

CROSS-SECTION OF 3H:1V SLOPE

Sod to be laid closely packed together, joints in adjacent rows shall be staggered

Planting area or walkway

Plan View of Sod Layout and Edging

Sod

Compacted Subgrade

THE CITY OF CALGARY PARKS

PROJECT TITLE

SPECIFICATIONS

SHEET TITLE

SOD DETAIL

DRAWN BY

DATE 2006 01 09

DESIGN BY

SCALE

N.T.S.

SHEET NO.

29

FILE NO.
Elevation

NOTE: - All dimensions are in millimetres unless otherwise noted.
- Posts - Schedule 40, 48mm OD
- Rails - .083 to .100 wall thickness, 48mm OD
- Post and Rails to be steel pipe, continuous weld, all joints.
- * Total railing height increases to 1400mm when required on a bridge.
Welded Cap
2 - 50.8mm Strips of Reflective Tape
White Powdercoat
100mm O.D. I88 Wall Steel Pipe

See Detail
Gravel/Asphalt Path
Concrete
Drainage Sump
(40mm Clean, Washed, Crushed Gravel)

NOTE: Steel pipe capped by welding steel plate & grinding smooth.

ELEVATION
N.T.S.

NOTE: Install Pin parallel to direction of Path

Hole Duted For Padlock
8mm Dia. Pin 65mm Long
Heavy Washer Welded To Pin
10mm Chain w/ end links welded to pin & bollard

Notch For Alignment Dowel
86.9mm O.D. 250mm Long Sleeve Welded To Base
15mm Dowel Welded Into Place

DETAiL
N.T.S.

NOTE: See Bollard in Pathways, Trails & Paving Stones section, Pg.93 Sec. 1.2.11
All dimensions are in millimetres unless otherwise noted.
Welded Cap
2 - 50.8mm Strips of Reflective Tape
White Powdercoat
100mm O.D. 188 Wall Steel Pipe

Gravel/Asphalt Path
14 Mpa Concrete

255

NOTE: Steel pipe capped by welding steel plate & grinding smooth.

ELEVATION /SECTION

Street
Curb

Provide a widening of Pathways with a radius of 4m where Pathways join other Pathways

Path Width (varies)

Bollard located 1000mm back from Curb (unless otherwise noted)

PLAN VIEW OF FLARE

NOTE: See Bollard in Pathways, Trails & Paving Stones section. Pg.94 Sec. 1.2.F.iii
All dimensions are in millimetres unless otherwise noted.
NOTE: Maximum slope of ramp 8.0% (12.5:1)
Ramp surface to be textured concrete
All dimensions are in millimetres unless otherwise noted.
Provide widening of Pathway with a radius of 4.0m where Pathways join other Pathways

PLAN VIEW

SECTION VIEW A–A

NOTE: Maximum slope of ramp 8.0%
All dimensions are in millimetres unless otherwise noted.
LEVEL GROUND

1) Remove Organic Soils, recompact exposed soil to 98% min. (If necessary, add granular fill to bring base to appropriate grade compacted to 98% min.)

2) Install Root Barrier (Poly spun 300 or approved equivalent) on recompacted exposed soil. (See Root Barriers in Pathways, Trails & Paving Stones section of Specifications)

3) Add 100mm of 25mm Crushed Gravel, compacted to 98%.

4) Pave with 75mm of City Mix "B", Roll / Tamp asphalt edges minimum density 96%

5) Backfill with loam and seed. (Typ.)

SIDE SLOPES

1) Remove Organic Soils, recompact exposed soil to 98% min. (If necessary, add granular fill to bring base to appropriate grade compacted to 98% min.)

2) Install Root Barrier (Poly spun 300 or approved equivalent) on recompacted exposed soil. (See Root Barriers in Pathways, Trails & Paving Stones section of Specifications)

3) Add 100mm of 25mm Crushed Gravel, compacted to 98%.

4) Pave with 75mm of City Mix "B", Roll / Tamp asphalt edges minimum density 96%

5) Backfill with loam and seed. (Typ.)

NOTES:
Asphalt type "B" mix. Refer to the current edition City of Calgary Standard Specifications, Roads Construction.

All dimensions are in metres unless otherwise noted.
1) Remove Organic Soils, recompact exposed soil to 98% min. (If necessary, add granular fill to bring base to appropriate grade compacted to 98% min.)

2) Install Root Barrier (Polyspun 300 or approved equivalent) on recompacted exposed soil. (See Root Barriers in Pathways, Trails & Paving Stones section of Specifications)

3) Add 100mm of 25mm Crushed Gravel, compacted to 98%.

4) Pave with 75mm of Mix "B-50" Asphaltic Concrete. Roll / Tamp asphalt edges minimum density 96%.

5) Backfill with loam and seed. (Typ.)

6) Install 75mm wide Yellow Centre Line

- Where the Regional Pathway replaces a city sidewalk or is installed in a road right of way the Desirable Clearance Zones will not apply.
- Safety railings, if required, may be installed within the Desirable Clearance Zones.
- All dimensions are in Metres unless otherwise noted.
NOTES:

Within Streets Right-of-way, compaction of 100mm of 25mm Crushed Gravel shall be 100% in accordance with Section 305.02.01 of the City of Calgary Standard Specifications Roads Construction.

All dimensions are in metres unless otherwise noted.
Root Barriers not required

Drip Line

Vertical Root Barrier required on side of path where trees exist. Horizontal Root Barrier required for entire span

Drip Line

Root Barriers not required

Drip Line

Vertical Root Barrier required on side of path where trees exist. Horizontal Root Barrier required for entire span

Root Barriers not required

Drip Line

PATHWAY
OPTION "A"

NOTE:
- All dimensions are in meters unless otherwise noted.

OPTION "B"
PLAN VIEW

CROSS SECTION

END VIEW

* OR Approved Equivalent

NOTE: All dimensions are in millimetres unless otherwise noted.
NOTE: All dimensions are in millimetres unless otherwise noted.
Notes: Perforated PVC Weeping Tile to maintain a minimum 1% slope to catch basin barrel.
Core hole in catch basin slightly larger than the weeping tile diameter.
Insert perforated PVC into catch basin and caulk.
Weeping tile to be installed along the entire length of the swale.
Alternate design for a weeping tile system will be considered.
The applicant shall cite the source for the manufacturer’s performance specification.
Min. 200mm of 5mm Gyrostone or Pea Gravel. Remove all organics.

150mm x 150mm Plastic Timbers or eased edge 140mm x 140mm.

150mm Compacted Topsoil

Undisturbed Subgrade, sloped to drain.

Hot dipped galvanized steel pin with a 38mm round head 20mm Dia. x 725mm long.

NOTES:
1500mm O.C. and 300mm from both sides of every joint.
Min. 200mm of 5mm Gyrostone or Pea Gravel. Remove all organics.

Undisturbed Subgrade, sloped to drain

150mm x 150mm Plastic Timbers (2).

Blocking- Min.150mm x 150mm x 300mm spaced every 1200mm

Grade

75mm

Hot dipped galvanized steel pin with a 38mm round head 20mm Dia. x 1050mm long.

Backfill with Loam & Seed, 3:1 (max.) slope from top of plastic timbers to grade.

NOTES:
1500mm O.C. and 300mm from both sides of every joint.
NOTES:
Contraction Joints shall be cut at every 1.5 metres by means of a marking tool or other approved method. Joints shall not be less than 30mm in depth and 6mm in width. The edges of the joint shall be rounded off with an edger having a radius of 6mm.

All dimensions are in millimeters unless otherwise noted.
**PLAYGROUND DRAINAGE**

**PLASTIC TIMBER CURB**

- **PLAY AREA**
- **DIRECTION OF SURFACE DRAINAGE** (to not cross pathways)
- **MIN. 2% GRADE**
- **LAG BOLT(S)**
- **GYROSTONE OR PEA GRAVEL LINE**
- **150mm TOPSOIL**
- **UNDISTURBED SUBGRADE**
- **SECTION A**
  - **FRONT VIEW - STEEL PLATE AND OPEN MESH**
  - **600mm x 150mm x 750mm LONG STEEL PLATE**
  - **150mm TOPSOIL**
  - **UNDISTURBED SUBGRADE**
  - **MESH WELDED TO STEEL PLATE**
    - **ON PLAY AREA SIDE**
  - **FILTER FABRIC ON PLAY AREA SIDE OF MESH**
  - **MINIMUM 200mm OF 5mm GYROSTONE OR PEA GRAVEL**
  - **MIN. 2.0% GRADE**
  - **75mm INTO SUBGRADE**
  - **TOP VIEW - STEEL PLATE**
    - **25mm X 25mm OPEN MESH**
    - **750mm LONG X MINIMUM 500mm DEEP**

**PLASTIC TIMBER CURB**

- **PLASTIC TIMBER CURB**
- **6mm x 150mm x 750mm LONG STEEL PLATE RECESSED INTO PLASTIC TIMBER (TOP TO BE FLUSH WITH PLASTIC TIMBER)**
- **300mm OPENING IN PLASTIC TIMBER**
- **PLASTIC TIMBER CURB**
- **300mm OPENING IN PLASTIC TIMBER**
- **PLASTIC TIMBER CURB**
- **PLASTIC TIMBER CURB**

**SECTION A**

- **PLASTIC TIMBER CURB**
- **150mm TOPSOIL**
- **UNDISTURBED SUBGRADE**
- **MIN. 2.0% GRADE**
- **75mm INTO SUBGRADE**
- **FILTER FABRIC ON PLAY AREA SIDE OF MESH**
- **MINIMUM 200mm OF 5mm GYROSTONE OR PEA GRAVEL**
- **MIN. 2.0% GRADE**
- **75mm INTO SUBGRADE**

**PLAYGROUND DRAINAGE**

**PLASTIC TIMBER EDGE DETAIL**

**DATE**

**2009 03 26**

**THE CITY OF PARKS CALGARY**

**DESIGN BY**

**DRAWN BY**

**SCALE**

**N.T.S.**

**FILE NO.**

**SHEET NO.**

**43**
NOTE: All dimensions are in millimetres unless otherwise noted.
NOTE:
- All lumber shall be rough cut. No. 2 construction grade and kiln dried.
- The direction of the face cut will be specified on site when the posts are installed.
- All steel cables and clamps shall be hot-dipped galvanized to C.S.A. G 164 or as specified. Provide sufficient tension on steel cable to eliminate sag.
- The first cable clamps will be located at the end of the cable to eliminate frayed ends.
- Alternate Material: Where specified in contract. Wood Posts may be substituted with Grey Recycled Plastic Posts. All dimensions to remain the same.
CONCRETE SPLASH PAD ON PUBLIC EASEMENTS

NOTES:
- 25MPa Concrete
- Reinforcing all 10m Bar
- Total Weight = 1207kg
- All dimensions are in millimeters unless otherwise noted.
- Concrete Splash Pads shall be installed at a 10% pitch, or erosion control fabric will be required at their end.
- Industry may use variable concrete splash pad sizes subject to the velocity not exceeding 0.9m/sec.
- Subject to approval by Parks other ECP/energy dispersion products may be used.
- Rip Rap may be used in Natural Areas.

3 Threaded inserts @ 150mm to accept threaded 10M Bar

3 Threaded inserts @ 150mm to accept threaded 10M Bar

PLAN VIEW

SECTION A - A

Precast Concrete Splash Pad

Concrete Drainage Swale

Centre Lines Of Energy Dispersion Bumps @ 300mm O.C.
50mm PVC Series 160 Pipe

Valve Box

50mm Male Adapter
50mm Schedule 80 Union (Threading)

50mm x 75mm Sch 80 Nipple
50mm x 50mm Sch 80 Nipple

Swing Joint:
2-50mm x 90 degree Elbows
2-50mm x 90mm Nipples
All fittings to be Schedule 80 PVC
Schedule 80 PVC Nipples

80mm x 75mm Sch 80 Nipple
When electrical valve body is less than
500mm (typical Grinnald @ 125mm)
or
50mm x 75mm Sch 80 Nipple
When electrical valve body is greater than
1300mm (typical Rainbird @ 145mm)

ELEVATION

Hand Valve
Electric Valve

Swing Joint

300mm Drainage Gravel

NOTES:
- Box Specifications:
  - Bottom........... 402mm x 634mm
  - Top.............. 374mm x 546mm
  - Height........... 304mm
- If Electric Valve not installed, centre Hand Valve in centre of box.
- Use premanufactured extensions when obtaining proper height of boxes.
- All threaded PVC fittings are to be Schedule 80
- All dimensions are in mm, unless otherwise noted.

PROJECT TITLE
SPECIFICATIONS
VALVE HOOK-UP (PVC)
50mm TO 50mm

DRAWN BY W.B.
DATE 2006 08 17
DESIGN BY

SCALE N.T.S.
SHEET NO. 48
FILE NO.
SECTION

NOTES:
- All dimensions are in millimeters unless otherwise specified.

GREEN COLOUR
14 GA TRACE WIRE
MAINLINE / LATERAL PIPE
PROVIDE 25mm CLEARANCE BETWEEN WIRE AND PIPE

SPECIFIED 24VAC VALVE WIRE BUNDLE incl:
- 2 SPARE WIRE / 6 ZONES w/ 300mm SPARE LOOP @ VALVE BOX
- POSITIONED 4:30-8:00 Beneath Pipe

SPECIFIED COMMUNICATION WIRE:
- FOR IRRIGATION SENSORS + CONTROLLERS
- SHIELDED POLYETHYLENE SLEEVE

SNAKE WIRE TO ALLOW CONTRACTION

PLAN

AS SPECIFIED

T.O.G.
NOTE:
INSTALL ONE (1) SIGNAL WIRE PER VALVE

LEGEND

- - - - - - - - MAINLINE
- - - - - - - - SIGNAL WIRE
- - - - - - - - ELECTRIC CONTROL VALVE
RIGHT HAND VALVE WIRING RULE

P.O.C. (POINT OF CONNECTION)
NOTES:
- For Box Specifications refer to Detail Sheet #48.
- Use premanufactured extensions when obtaining proper height of boxes
- All threaded PVC fittings are to be Schedule 80.
- All dimensions are in metres, unless otherwise noted.
50mm x 50mm X 50mm HDPE BUTT FUSED TEE

150mm HDPE MAINLINE

50mm x 75mm SCH 80 PVC/BRASS/STAINLESS STEEL NIPPLE (SAME AS UNION)
* 50mm x 75mm NIPPLE IF ELECTRICAL VALVE BODY LENGTH IS LESS THAN 130mm (TYPICAL GRISWOLD @ 114mm)
OR
50mm x 50mm NIPPLE IF ELECTRICAL VALVE BODY LENGTH IS GREATER THAN 130mm (TYPICAL RAIN BIRD @ 140mm)

PLAN

50mm x 300mm SCH 80 PVC NIPPLE
SWING JOINT:
(2) 50mm x 90° SCH 80 PVC THREAD ELBOWS
(1) 50mm x 300mm SCH 80 PVC NIPPLE
50mm HDPE MALE TRANSITION FITTING
50mm HDPE MAINLINE

SECTION

NOTES:
1. USE PRE-MANUFACTURED EXTENSIONS WHEN OBTAINING PROPER HEIGHT OF BOXES.
2. ALL HIGH DENSITY FITTINGS ARE TO BE BUTT FUSED OR ELECTRO-FUSION.
3. IF ELECTRIC VALVE NOT INSTALLED, CENTRE HAND VALVE IN CENTRE OF BOX.
4. FOR BOX SPECIFICATIONS REFER TO DETAIL SHEET #48.
5. ALL DIMENSIONS ARE IN MILLIMETRES UNLESS OTHERWISE SPECIFIED.
6. SCH 80 PVC UNIONS SHALL HAVE UNION COLLARS INSTALLED TOWARDS VALVE.
7. ELECTRO-FUSED SADDLES & BUTT-FUSED TEES ARE ACCEPTABLE FOR USE ON MAINLINES.
1. Use pre-manufactured extensions when obtaining proper height of boxes.
2. All high density fittings are to be butt fused or electro-fused.
3. If electric valve not installed, centre hand valve in centre of box.
4. For box specifications refer to detail sheet #48.
5. All dimensions are in millimetres unless otherwise specified.
6. SCH 80 PVC unions shall have union collars installed towards valve.
7. Electro-fused saddles & butt-fused tees are acceptable for use on mainlines.
50mm x 300mm SCH 80 PVC NIPPLE
SWING JOINT:
(2) 50mm x 90° SCH 80 PVC THREAD ELBOWS
(1) 50mm x 300mm SCH 80 PVC NIPPLE
50mm HDPE MALE TRANSITION FITTING
150mm HDPE MAINLINE

50mm x 150mm HDPE x 50mm BUTT FUSED REDUCING TEE
50mm x 75mm SCH 80 PVC/BRASS/STAINLESS STEEL NIPPLE (SAME AS UNION)
* 50mm x 75mm NIPPLE IF ELECTRICAL VALVE BODY LENGTH IS LESS THAN 130mm (TYPICAL GRISWOLD @ 114mm)
OR 50mm x 50mm NIPPLE IF ELECTRICAL VALVE BODY LENGTH IS GREATER THAN 130mm (TYPICAL RAIN BIRD @ 140mm)

50mm BRASS MANUAL CONTROL VALVE
50mm x 75mm BRASS/STAINLESS STEEL NIPPLE
600mm EXTRA WIRE
3M DBY/DBR WIRE CONNECTOR
50mm BRASS 24VAC ELECTRIC CONTROL VALVE
VALVE BOX EXTENSION WITH LOCKING COVER
50mm x 50mm SCH 80 PVC MALE ADAPTER
50mm PVC LATERAL
VALVE BOX
50mm SCH 80 PVC UNION
PWF WOOD, BRICK OR CONCRETE BLOCKING REQUIRED (TYP.)
300mm DEPTH 19mm @ WASHED GRAVEL

NOTES:
1. USE PRE-MANUFACTURED EXTENSIONS WHEN OBTAINING PROPER HEIGHT OF BOXES.
2. ALL HIGH DENSITY FITTINGS ARE TO BE BUTT FUSED OR ELECTRO-FUSION.
3. IF ELECTRIC VALVE NOT INSTALLED, CENTRE HAND VALVE IN CENTRE OF BOX.
4. FOR BOX SPECIFICATIONS REFER TO DETAIL SHEET #48.
5. ALL DIMENSIONS ARE IN MILLIMETRES UNLESS OTHERWISE SPECIFIED.
6. SCH 80 PVC UNIONS SHALL HAVE UNION COLLARS INSTALLED TOWARDS VALVE.
7. ELECTRO-FUSED SADDLES & BUTT-FUSED TEES ARE ACCEPTABLE FOR USE ON MAINLINES.
200mm x 200mm HDPE x 50mm BUTT FUSED REDUCING TEE

50mm x 75mm SCH 80 PVC/BRASS/STAINLESS STEEL NIPPLE (SAME AS UNION)
* 50mm x 75mm NIPPLE IF ELECTRICAL VALVE BODY LENGTH IS LESS THAN 130mm (TYPICAL GRISWOLD @ 114mm)
OR
50mm x 50mm NIPPLE IF ELECTRICAL VALVE BODY LENGTH IS GREATER THAN 130mm (TYPICAL RAIN BIRD @ 140mm)

50mm x 300mm SCH 80 PVC NIPPLE
SWING JOINT:
(2) 50mm x 90° SCH 80 PVC THREAD ELBOWS
(1) 50mm x 300mm SCH 80 PVC NIPPLE
50mm HDPE MALE TRANSITION FITTING

200mm HDPE MAINLINE

50mm BRASS MANUAL CONTROL VALVE
50mm x 75mm BRASS/STAINLESS STEEL NIPPLE
600mm EXTRA WIRE
3M DBY/DBR WIRE CONNECTOR
50mm BRASS 24VAC ELECTRIC CONTROL VALVE VALVE BOX EXTENSION WITH LOCKING COVER
50mm x 50mm SCH 80 PVC MALE ADAPTER
50mm PVC LATERAL
VALVE BOX
50mm SCH 80 PVC UNION

PWF WOOD, BRICK OR CONCRETE BLOCKING REQUIRED (TYP.)
300mm DEPTH 19mm @ WASHED GRAVEL

NOTES:
1. USE PRE-MANUFACTURED EXTENSIONS WHEN OBTAINING PROPER HEIGHT OF BOXES.
2. ALL HIGH DENSITY FITTINGS ARE TO BE BUTT FUSED OR ELECTRO-FUSION.
3. IF ELECTRIC VALVE NOT INSTALLED, CENTRE HAND VALVE IN CENTRE OF BOX.
4. FOR BOX SPECIFICATIONS REFER TO DETAIL SHEET #48.
5. ALL DIMENSIONS ARE IN MILLIMETRES UNLESS OTHERWISE SPECIFIED.
6. SCH 80 PVC UNIONS SHALL HAVE UNION COLLARS INSTALLED TOWARDS VALVE.
7. ELECTRO-FUSED SADDLES & BUTT-FUSED TEES ARE ACCEPTABLE FOR USE ON MAINLINES.
50mm ISOLATION VALVE
MAIN CONTROL VALVE (HDPE)

VALVE BOX EXTENSION WITH LOCKING COVER

50mm HDPE BUTT FUSED FLANGE ADAPTER, EPOXY COATED BACK-UP RING & GASKET

50mm BRASS MANUAL CONTROL VALVE

50mm HDPE MAINLINE VALVE BOX

PWF WOOD, BRICK OR CONCRETE BLOCKING REQUIRED (TYP.)

50mm x 75mm BRASS/EPOXY COATED STAINLESS STEEL NIPPLE

300mm DEPTH 19mm Ø WASHED GRAVEL

NOTES:
1. ALL DIMENSIONS ARE IN MILLIMETERS UNLESS OTHERWISE SPECIFIED.
2. ALL BOLT HEADS ON FLANGES SHALL BE FACING TOWARDS VALVE.
NOTES:
1. ALL DIMENSIONS ARE IN MILLIMETERS UNLESS OTHERWISE SPECIFIED.
2. ALL BOLT HEADS ON FLANGES SHALL BE FACING TOWARDS VALVE.
200mm ISOLATION VALVE
MAIN CONTROL VALVE (HDPE)

NOTES:
1. ALL DIMENSIONS ARE IN MILLIMETERS UNLESS OTHERWISE SPECIFIED.
2. ALL BOLT HEADS ON FLANGES SHALL BE FACING TOWARDS VALVE.
ELEVATION

50mm PVC MAINLINE
50mm SCH. 80 PVC MALE ADAPTER
50mm SCH. 80 PVC UNION
50mm X 75mm SCH. 80 PVC / BRASS / STAINLESS STEEL NIPPLE
50mm BRASS MANUAL CONTROL VALVE
50mm PVC MAINLINE
50mm SCH. 80 PVC MALE ADAPTER
50mm SCH. 80 PVC UNION
50mm X 75mm SCH. 80 PVC / BRASS / STAINLESS STEEL NIPPLE
BRICK
300mm DEPTH 25mm WASHED GRAVEL

PLAN

374 TOP / 654 BOTTOM

546 TOP / 654 BOTTOM

NOTES:
- ALL DIMENSIONS ARE IN MILLIMETERS UNLESS OTHERWISE SPECIFIED.
- SCH. 80 PVC UNIONS SHALL HAVE UNION COLLARS INSTALLED TOWARDS VALVE.
100mm SERIES 160 PVC c/w FLANGE
100mm FLANGED MANUAL CONTROL VALVE
100mm SERIES 160 PVC c/w FLANGE
BRICK
300mm DEPTH 25mm WASHED GRAVEL

ELEVATION

374 TOP / 654 BOTTOM

PLAN

546 TOP / 654 BOTTOM

NOTES:
- ALL DIMENSIONS ARE IN MILLIMETERS UNLESS OTHERWISE SPECIFIED.
- ALL BOLT HEADS ON FLANGES SHALL BE FACING AWAY FROM VALVE.
150mm SERIES 160 PVC c/w FLANGE
150mm FLANGED MANUAL CONTROL VALVE
150mm SERIES 160 PVC c/w FLANGE
BRICK
300mm DEPTH 25mm WASHED GRAVEL

ELEVATION

NOTE:
- ALL DIMENSIONS ARE IN MILLIMETERS UNLESS OTHERWISE SPECIFIED.
- ALL BOLT HEADS ON FLANGES SHALL BE FACING AWAY FROM VALVE.

PLAN

PROJECT TITLE
SPECIFICATIONS

SHEET TITLE
150mm ISOLATION VALVE MANUAL CONTROL VALVE (PVC)

DRAWN BY
WYC

DATE 2008 12 05

SCALE
N.T.S.

FILE NO.
50j
200mm SERIES 160 PVC c/w FLANGE
200mm FLANGED MANUAL CONTROL VALVE
200mm SERIES 160 PVC c/w FLANGE

BRICK
300mm DEPTH 25mm WASHED GRAVEL

ELEVATION

374 TOP / 654 BOTTOM

546 TOP / 654 BOTTOM

PLAN

NOTES:
- ALL DIMENSIONS ARE IN MILLIMETERS UNLESS OTHERWISE SPECIFIED
- ALL BOLT HEADS ON FLANGES SHALL BE FACING AWAY FROM VALVE.
## HDPE BEAD MELT DETAIL

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<td>Millimeters</td>
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<td>4.5 to 6.25</td>
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**Diagram:**

- 2H
- 2 1/2 H
- 1/2 H
- H

- UNIFORM BEAD SIZE AND SHAPE
- BEAD ROLLED TO PIPE SURFACE

- PE PIPE (CROSS SECTION VIEW)
100mm HDPE MAINLINE
100mm X 100mm X 50mm HDPE TEE
50mm HDPE MAIN c/w FUSED ANSI FLANGE

SWING JOINT
(2) 50mm X 90° GALV. MPT X FPT STREET ELLS

PLAN

50mm X 63mm BRASS HYDRANT ADAPTER
50mm BRASS GATE VALVE
50mm X 75mm GALV. NIPPLE c/w STEEL FLANGE

ELEVATION

NOTES:
- INCREASE ANGLE AT ELBOW TO ALLOW FOR EASIER HOSE CONNECTION TO ADAPTER
- FOR BOX SPECIFICATIONS REFER TO DETAIL SHEET #48
- ALL DIMENSIONS ARE IN MILLIMETRES UNLESS OTHERWISE NOTED.
NOTES:
- INCREASE ANGLE AT ELBOW TO ALLOW FOR EASIER HOSE CONNECTION TO ADAPTER
- FOR BOX SPECIFICATIONS REFER TO DETAIL SHEET #48
- IF VALVE ASSEMBLY MAY BE USED AS FUTURE ZONE VALVE, LEAVE ELECTRICAL WIRES FOR FUTURE ELECTRICAL VALVE.
- USE PREMANUFACTURED EXTENSIONS WHEN OBTAINING PROPER HEIGHT OF BOXES.
- ALL DIMENSIONS ARE IN MILLIMETRES UNLESS OTHERWISE NOTED.
NOTE:

- Box Specifications: (all outside measurements)
  - Bottom: 482mm x 654mm
  - Top: 374mm x 546mm
  - Height: 304mm

- All dimensions are in metres unless otherwise noted.
Use premanufactured extensions when obtaining proper height of boxes.

ELEVATION

NOTES:
- Eight, 14 gauge direct burial wires to run from Water Meter to Controller Box.
- Box Specifications:
  Bottom........... 482mm x 654mm
  (all outside measurements)
  Top................ 374mm x 546mm
  Height........... 304mm
- Install "Quick Coupler Valve" (Detail Sheet #55) 0.5m downstream from the Water Meter Box.
- Install above Master Valve & Meter Assembly downstream of 50mm Double Check Valve Assembly. (Detail Sheet #58)
- Locate 1.5m (Center to Center) downstream of Double Check Valve Box.
- All dimensions are in metres, unless otherwise noted.
- All fittings on the pressure side are to be Schedule 80.
AIR RELIEF VALVE (HDPE)

CARSON #1419-12 VALVE BOX c/w EXTENSION
INSTALL VENT TUBE IN ATMOSPHERIC VENT AND POINT OPEN END OF VENT TUBE DOWN
AIR RELIEF VALVE
50mm LENGTH 25mm Ø GALV. NIPPLE
25mm BRASS GATE VALVE
50mm LENGTH 25mm Ø GALV. NIPPLE
50mm x 25mm MIPT x FIPT SCH.80 REDUCING ADAPTER
HDPE BUTT FUSION REDUCING TEE
HDPE MAINLINE
300mm DEPTH 25mm Ø WASHED GRAVEL SUMP
BRICK

AIR RELIEF VALVE (PVC)

CARSON #1419-12 VALVE BOX c/w EXTENSION
INSTALL VENT TUBE IN ATMOSPHERIC VENT AND POINT OPEN END OF VENT TUBE DOWN
AIR RELIEF VALVE
50mm LENGTH 25mm Ø GALV. NIPPLE
25mm BRASS GATE VALVE
50mm LENGTH 25mm Ø GALV. NIPPLE
50mm x 25mm MIPT x FIPT SCH.80 REDUCING ADAPTER
GASKET PVC TEE
PVC MAINLINE
300mm DEPTH 25mm Ø WASHED GRAVEL SUMP
BRICK

NOTE:
- ENSURE MAINLINE DEPTH FROM TOP OF PIPE TO FINISHED GRADE IS AT MINIMUM 450mm.
NOTE:
- Install Swing Joint so that all water drains back into pipe.
- Use galvanized fittings when installing Quick Coupling Valves or Metal Sprinkler Heads. Use Teflon Tape at all connections as per proper trade practice.
- Use Schedule 40 PVC Fittings and Schedule 80 PVC Nipples when installing Plastic Sprinkler Heads.
- All dimensions are in metres unless otherwise noted.
NOTE:
- Install Swing Joint so that all water drains back into pipe.
- Use galvanized fittings when installing Turf Valves or Metal Sprinkler Heads. Use Teflon Tape at all connections as per proper trade practice.
- Use Schedule 40 PVC Fittings and Schedule 80 PVC Nipples when installing Plastic Sprinkler Heads.
- All dimensions are in metres unless otherwise noted.
NOTE:

- 25mm x 90° (Typ.) MDPE shall be used as a pigtail for obstructions such as property easements, utility right of ways, tree roots, etc.
- Poly pigtail shall be CSA Series 100 medium density polyethylene
- Distance from irrigation pipe to sprinkler head shall be indicated on as built drawings
- Swing joint and poly pigtail shall be min. 350mm depth and shall have 14 ga. green trace wire from pipe connection to base of swing joint.
(2) OPPOSITE FACING STAINLESS STEEL CLAMPS
25mm SCH. 80 PVC FNPT x BARB FITTING
50mm COMPRESSION x 50mm COMPRESSION x 25mm FIPT TEE
50mm TYPE 3 SERIES 160 HDPE LATERAL

NOTE:
- 25mm X 900mm (TYP.) MDPE SHALL BE USED AS A PIGTAIL FOR OBSTRUCTIONS SUCH AS PROPERTY EASEMENTS, UTILITY RIGHT OF WAYS.
- POLY 'PIGTAIL' SHALL BE CSA SERIES 100 MEDIUM DENSITY POLYETHYLENE
- DISTANCE FROM IRRIGATION PIPE TO SPRINKLER HEAD SHALL BE INDICATED ON AS BUILT DRAWINGS
- SWING JOINT AND POLY PIGTAIL SHALL BE MIN. 350mm DEPTH AND SHALL HAVE 14 GA. GREEN TRACE WIRE FROM PIPE CONNECTION TO BASE OF SWING JOINT
PLASTIC SHRUB SPRAY
PLASTIC SHRUB
SPRAY ADAPTER
12.5mm X 900mm
SCH. 80 PVC NIPPLE
1000mm LENGTH
TEE BAR STAKE
(2) STAINLESS STEEL GEAR
CLAMPS @ TOP + BOTTOM OF RISER
FINISHED GRADE
REDUCER FITTING
(IF REQUIRED)
(2) 25mm 90° SCH. 40 / BRASS / STAINLESS
ELBOWS

NOTES:
- USE GALVANIZED FITTINGS WHEN INSTALLING TURF VALVES OR METAL
SPRINKLERS HEADS.
- USE SCH. 40 PVC FITTINGS AND SCH. 80 PVC NIPPLES WHEN INSTALLING
PLASTIC SPRINKLER HEADS.
- BRASS SADDLE SHALL NOT BE CLOSER THAN 150mm FROM PIPE END.
- ALL DIMENSIONS ARE IN MILLIMETERS UNLESS OTHERWISE SPECIFIED.
- DOUBLE CHECK VALVE ASSEMBLY SHALL CONFORM TO CITY OF CALGARY WATERWORKS STANDARD SPECIFICATIONS, LATEST EDITION, AND BE CAPABLE OF BEING DRAINED OF WATER.
- EIGHT, 14 GAUGE, DIRECT BURIAL WIRES TO RUN FROM WATER METER TO CONTROLLER BOX.
- STRAP AND THRUST BLOCK 90° HDPE ELBOW.
- PAINT ALL FABRICATED STEEL WITH 2 COATS EPOXY PAINT, BLUE COLOUR.
- ALL DIMENSIONS ARE IN MILLIMETERS UNLESS OTHERWISE NOTED.
NOTES:
- All dimensions are in millimetres unless otherwise noted.
- All 25mm Hand Valve Fittings are to be Sch 80 PVC, Brass or Stainless Steel
- Length of 100mm Spool from flange to flange is 185mm.
- Length of 150mm Spool from flange to flange is 200mm.
WEATHERPROOF METAL CONTROLLER CABINET AS MANUFACTURED BY ACE MFG. COMPANY LTD. NEMA 3 OR EQUIVALENT, EUROBECC 1300GC CEMA 3R (DOUBLE DOOR)
LOCKABLE DOORS, HANDLES WITH INTERNAL ROLLER MECHANISM.

*** ALL IRRIGATION CONTROLLERS / CABINETS ARE TO BE SET UP AS NON-METERED SITES.
EXCEPTIONS WHERE METERING IS REQUIRED:
1. SITES THAT INVOLVE HEAVY USAGE - STORM PONDS WITH PUMPS AND / OR VALVE OPERATIONS
2. SITES WHERE SERVICES HAVE BEEN ADDED FROM THE CABINET TO OPERATE LIGHTING ETC.
3. IF A THIRD PARTY IS ACTUALLY THE MAJOR USER OF ENERGY AND THE CITY OF CALGARY IS THE SITE OWNER.

ELEVATION

PLAN

NOTE:
- CONTROLLER CABINET SHALL HAVE ELECTRICAL SURGE PROTECTION AND GROUNDED TO 5 ohms OR LESS
- CABINET SHALL BE:
  ≤ 15 ZONES 750mm X 750mm X 250mm
  ≥ 15 ZONES 900mm X 900mm X 300mm
- ALL DIMENSIONS ARE IN MILLIMETERS UNLESS OTHERWISE NOTED.
PLAN

SECTION

NOTE:
- CONTRACTOR SHALL CONFIRM ALL BOLT TEMPLATES w/ CONTROL BOX MANUFACTURER
- CONDUIT SHALL BE SIZED SO AS WIRES DO NOT EXCEED 40% * OF PIPE DIAMETER
- VERIFY ANCHOR BOLT PLACEMENTS w/ BOLT TEMPLATE SUPPLIED BY PEDESTAL MANUFACTURER

PROJECT TITLE
SPECIFICATIONS
CONCRETE PAD FOR IRRINET / IRRICOM / SCORPIO CONTROLLER CABINETS

DRAWN BY
MRM
DATE 2006 05 24
DESIGN BY

SCALE
N.T.S.

SHEET NO.
60a

FILE NO.
ALL IRRIGATIONS CONTROLLERS / CABINETS ARE TO BE SET UP AS NON-METERED SITES. EXCEPTION WHERE METERING IS REQUIRED:
1. SITES THAT INVOLVE HEAVY USAGE - STORM PONDS WITH PUMPS AND / OR VALVE OPERATIONS.
2. SITES WHERE SERVICES HAVE BEEN ADDED FROM THE CABINET TO OPERATE LIGHTING ETC.
3. IF A THIRD PARTY IS ACTUALLY THE MAJOR USER OF ENERGY AND THE CITY OF CALGARY IS THE SITE OWNER.

PLAN

CSA3 WEATHERPROOF 12 GA. STAINLESS STEEL ENCLOSURE
LOCKABLE HINGED DOUBLE DOORS c/w DOCUMENT POCKET
EMKA 3 POINT LOCK c/w PADLOCK SECURITY LATCH
PRE-PUNCHED 60/40 SPLIT MOUNTING PANEL FOR AC MOTOROLA MOSCAD, IRRInet XM, or (2+) IRRInet XL
100 CONNECTOR TERMINAL STRIP c/w DIN RAIL + GROUND BAR
200mm x 200mm x 600mm PEDESTAL c/w TOP + BOTTOM MOUNTING FLANGES
INJECT CABINET LEG WITH EXPANDING INSULATING FOAM
CONCRETE PAD

ELEVATION

240/120VAC 100 AMP LOAD CENTRE c/w MAIN BREAKER
(c/w (2) 15 AMP SINGLE-POLE GFI BREAKER
(2) QUADRAPLEX OUTLETS IN DUPLEX BOXES c/w COVERS
NORTHERN TECHNOLOGIES TCS-HWR SURGE PROTECTOR

NOTE:
- CONTRACTOR SHALL CONFIRM ALL PEDESTAL BOLT TEMPLATES w/ CONTROL BOX MANUFACTURER PRIOR TO INSTALLATION
- ALL DIMENSIONS IN MILLIMETERS UNLESS OTHERWISE SPECIFIED
- CABINET SHALL BE POWDER COATED w/ PFS-600-S8
  ALMOND FINISH OR EQUIVALENT
- ALL COMPONENTS SHALL BE CSA APPROVED AND SUBJECT TO APPLICABLE NATIONAL, PROVINCIAL AND MUNICIPAL CODES / BYLAWS
- CONFORMS TO CARLYLE & CO. MODEL NO CCA15202

PROJECT TITLE
SPECIFICATIONS

SHEET TITLE
AC MOSCAD [AC IRRInet XM]
AC IRRInet XL CONTROL CABINET AND PEDESTAL

DRAWN BY
CWM
DATE 2008 12 05

DESIGN BY
JM
DATE

SCALE
N.T.S.

SHEET NO.
60b

FILE NO.
ALL IRRIGATIONS CONTROLLERS / CABINETS ARE TO BE SET UP AS NON-METERED SITES.

EXCEPTION WHERE METERING IS REQUIRED:
1. SITES THAT INVOLVE HEAVY USAGE - STORM PONDS WITH PUMPS AND / OR VALVE OPERATIONS.
2. SITES WHERE SERVICES HAVE BEEN ADDED FROM THE CABINET TO OPERATE LIGHTING ETC.
3. IF A THIRD PARTY IS ACTUALLY THE MAJOR USER OF ENERGY AND THE CITY OF CALGARY IS THE SITE OWNER.

PLAN

LOCKABLE HINGED DOUBLE DOORS c/w DOCUMENT POCKET + EMKA 3 POINT LOCK c/w PADLOCK SECURITY LATCH

CSA3 WEATHERPROOF 12 GA. STAINLESS STEEL ENCLOSURE

MOTOROLA AC SCORPIO | IRRicom | IRRInets CONTROLLERS

PRE-PUNCED 60/40 SPLIT MOUNTING PANEL FOR SINGLE (1) MOTOROLA IRRIstem XL, SCORPIO OR IRRicom CONTROLLERS

50 CONNECTOR TERMINAL STRIP c/w DIN RAIL + GROUND BAR

200mm x 200mm x 600mm 8 GA. STEEL PEDESTAL c/w TOP + BOTTOM MOUNTING FLANGES

INJECT CABINET LEG WITH EXPANDING INSULATING FOAM

CONCRETE PAD

ELEVATION

240/120VAC 100 AMP LOAD CENTRE c/w MAIN BREAKER c/w (2) 15 AMP SINGLE-POLE GFI BREAKER

(2) QUADRAPLEX OUTLETS IN DUPLEX BOXES c/w COVERS

NORTHERN TECHNOLOGIES TCS-HWR SURGE PROTECTOR

NOTE:
- CONTRACTOR SHALL CONFIRM ALL PEDESTAL BOLT TEMPLATES w/ CONTROL BOX MANUFACTURER PRIOR TO INSTALLATION
- ALL DIMENSIONS IN MILLIMETERS UNLESS OTHERWISE SPECIFIED
- CABINET SHALL BE POWDER COATED w/ PFT-500-S8 ALMOND FINISH OR EQUIVALENT
- ALL COMPONENTS SHALL BE CSA APPROVED AND SUBJECT TO APPLICABLE NATIONAL, PROVINCIAL AND MUNICIPAL CODES / BYLAWS
- CONFORMS TO CARLYLE & CO. MODEL NO CCAL/MCD03AC

PROJECT TITLE
SPECIFICATIONS

AC SCORPIO [AC IRRicom]
AC IRRicom CONTROL CABINET AND PEDESTAL

DRAWN BY
CWM

DATE 2008 12 05

DESIGN BY
DG

SCALE N.T.S.

60c

FILE NO.
ALL IRRIGATION CONTROLLERS / CABINETS ARE TO BE SET UP AS NON-METERED SITES. EXCEPTIONS WHERE METERING IS REQUIRED:
1. SITES THAT INVOLVE HEAVY USAGE - STORM PONDS WITH PUMPS AND / OR VALVE OPERATIONS.
2. SITES WHERE SERVICES HAVE BEEN ADDED FROM THE CABINET TO OPERATE LIGHTING, ETC.
3. IF A THIRD PARTY IS ACTUALLY THE MAJOR USER OF ENERGY AND THE CITY OF CALGARY IS THE SITE OWNER.

ELEVATION

NOTE:
- CONTRACTOR SHALL CONFIRM ALL PEDESTAL BOLT TEMPLATES w/ CONTROL BOX MANUFACTURER PRIOR TO INSTALLATION
- ALL DIMENSIONS IN MILLIMETERS UNLESS OTHERWISE SPECIFIED
- CABINET SHALL BE POWDER COATED w/ PFT-500-58 ALMOND FINISH OR EQUIVALENT
- ALL COMPONENTS SHALL BE CSA APPROVED AND SUBJECT TO APPLICABLE NATIONAL, PROVINCIAL AND MUNICIPAL CODES / BYLAWS
- CONFORMS TO CARLYLE & CO. MODEL NO CCA-1MCD03DC

PROJECT TITLE
SPECIFICATIONS

SHEET TITLE
DC IRRICOMS / DC SCORPIO CONTROL CABINET + PEDESTAL

DRAWN BY
MRM
DATE 2008.01.29
DESIGN BY
DATE

SCALE
N.T.S.

SHEET NO.
60d

FILE NO.
COPPER GROUND PLATE
(100mm x 2400mm x 1.50mm)

#6 AWG SOLID BARE COPPER WIRE
2400mm

GROUND PLATE
(100mm x 2400mm x 1.50mm)

ELECTRODE SPHERE OF INFLUENCE
BOUNDARIES

#6 AWG SOLID BARE COPPER WIRES TO BE CONNECTED TO GROUND BAR IN CONTROLLER CABINET

DO NOT INSTALL ANY OTHER WIRES OR CABLE WITHIN THE SPHERE OF INFLUENCE

SIDE VIEW

CONTROLLER

CONCRETE PAD

PVC SWEEP ELL
(1 1/2" OR LARGER)

#6 AWG SOLID BARE COPPER WIRES TO BE CONNECTED TO GROUND BAR IN CONTROLLER CABINET

GROUND PLATE

GROUND ROD

CADWELD CONNECTION

EARTH CONTACT MATERIAL

750mm MIN.
COPPER GROUND PLATE
(100mm X 2400mm X 1.50mm)

#6 AWG SOLID BARE COPPER WIRES TO BE CONNECTED TO GROUND BAR IN CONTROLLER CABINET

DO NOT INSTALL ANY OTHER WIRES OR CABLE WITHIN THE SPHERE OF INFLUENCE

SIDE VIEW

CONTROLLER
CONCRETE PAD

PVC SWEEP ELL
(1 1/2" OR LARGER)

#6 AWG SOLID BARE COPPER WIRES TO BE CONNECTED TO GROUND BAR IN CONTROLLER CABINET

GROUND PLATE

EARTH CONTACT MATERIAL

GROUND ROD

300mm

750mm MIN.
COPPER GROUND PLATE
(100mm X 2400mm X 1.50mm)

ELECTRODE SPHERE OF INFLUENCE BOUNDARIES

DO NOT INSTALL ANY OTHER WIRES OR CABLE WITHIN THE SPHERE OF INFLUENCE

SIDE VIEW

CONTROLLER

CONCRETE PAD

PVC SWEEP ELL (1 1/2" OR LARGER)

#6 AWG SOLID BARE COPPER WIRES TO BE CONNECTED TO GROUND BAR IN CONTROLLER CABINET

GROUND PLATE

EARTH CONTACT MATERIAL

750mm MIN.
#6 AWG SOLID BARE COPPER WIRES,
18000mm & 22500mm LONG,
300mm TO 450mm BELOW GROUND LEVEL

**EARTH CONTACT MATERIAL**

**GROUND PLATES**

**CONCRETE PAD**

**PVC SWEEP ELL**
(1 1/2" OR LARGER)

**2400mm**

**300mm**

**900mm**

**ELECTRODE SPHERE OF INFLUENCE BOUNDARIES**

**#6 AWG SOLID BARE COPPER WIRE (TYP.)**

DO NOT INSTALL ANY OTHER WIRES OR CABLE
WITHIN THE SPHERE OF INFLUENCE

* FOR SITES WITH MORE STATIONS CONTACT THE CITY OF CALGARY
WATER MANAGEMENT COORDINATOR FOR DESIGN INFORMATION

**TOP VIEW**

**SIDE VIEW**

* #6 AWG SOLID BARE COPPER WIRES TO BE CONNECTED TO GROUND BAR IN CONTROLLER CABINET

* #6 AWG SOLID BARE COPPER WIRES, 18000mm & 22500mm LONG, 300mm TO 450mm BELOW GROUND LEVEL

**THE CITY OF PARKS CALGARY**

**SPECIFICATIONS**

**UP TO 96 STATIONS, ROCKY SOILS**

**DRAWN BY**

**WYC**

**DATE**

**2008 12 05**

**DESIGN BY**

**AS PER ASIC**

**FILE NO.**

**SCALE N.T.S.**

**60h**
CUTTING LIST
SIDE BOARDS - 18 PCS. - 2" x 6" x 8'
END BOARDS - 18 PCS. - 2" x 6" x 45"
BOTTOM PLATES - 2 PCS. - 4" x 4" x 93"
  - 2 PCS. - 4" x 4" x 38"
VERTICAL BRACING - 12 PCS. - 4" x 4" x 43 1/8"
TOP PLATES - 2 PCS. - 4" x 4" x 93" - MITRED
  - 2 PCS. - 4" x 4" x 45" - MITRED
CENTRE BRACES - 4 PCS. - 4" x 4" x 45" - NOTCHED.
WOOD - PRESSURE TREATED PINE

BOLT IN PLACE
AS APPROVED
BY CALGARY PARKS
& RECREATION

PLAN VIEW
(TOP)

PLAN VIEW
(BOTTOM)

3 1/2"

2x6

12"

8'

4'

50 1/4"
PLAN VIEW

NOTES:
- Finish to be Red Oxide Primer
- Meter Viewing Port location is schematic and is anticipated to be above the meter.
- All dimensions are in millimetres unless otherwise noted.

SECTION A - A

For Box Detail, See Sheet # 61

PROJECT TITLE
SPECIFICATIONS

SHEET TITLE
100mm DOUBLE CHECK VALVE BOX LTD WITH METER VIEWING LTD

DRAWN BY

DATE
2006 05 19

DESIGN BY

SCALE
N.T.S.

SHEET NO.
62

FILE NO.
**DETAIL A - METER VIEWING LID**

- 5mm Checkerplate Steel
- L 51 x 76 x 5 Steel Frame. Flange In. Mitre All Corners
- L 51 x 51 x 5 Brace

**NOTE:** Meter Viewing Lid to be located directly above anticipated location for meter.

**DETAIL B - FRAME**

- 19mm diameter hole
- 13mm diameter CR x 343mm long. Formed Handle
- 11mm plain flat weld

**DETAIL C - DOOR HANDLE**

**DETAIL D - DOOR LATCH**

- 6 x 38 x 25 long F.B. with 13mm diameter hole
- 178 x 178 x 3 M.S.
- 6 x 38 x 260 long F.B. with 13mm diameter hole at one end and 45 degree mitre at other end
- 3 x 38 x 508 Formed F.B.

**DETAIL E - DOOR HINGE**

- 13mm diameter CR x 165 long. Stainless Steel
- 10mm Standard Pipe x 51mm long. Drill I.D. to 13mm (3 per hinge)
PLAN VIEW

PLAN VIEW BOTTOM

SIDE VIEW

MATFRIW: WOOD - PRF5SURF TREATED PINE

CUTTING LIST:
- SIDE BOARDS: (18) PCS - 2 x 6 x 96
- END BOARDS: (18) PCS - 2 x 6 x 45
- BOTTOM MEMBERS: (2) PCS - 4 x 4 x 93
  (2) PCS - 4 x 4 x 38
- VERTICAL MEMBERS: (14) PCS - 4 x 4 x 43 1/8
- TOP MEMBERS: (2) PCS - 4 x 4 x 93 MITRED
  (2) PCS - 4 x 4 x 45 MITRED
- BOTTOM BRACES: (2) PCS - 4 x 4 x 45 NOTCHED

DETAIL AA

4x4x45 BOTTOM BRACES (NOTCHED)

3 DIMENSIONAL VIEW

PROJECT TITLE
SPECIFICATIONS

SHEET TITLE
VALVE BOX DETAILS FOR 100mm DOUBLE CHECK VALVE ASSEMBLY

DRAWN BY
WYC
DATE 2008 12 05

DESIGN BY
JM
DATE 2008 12 05

SCALE
N.T.S.

SHEET NO.
62b

FILE NO.
GENERAL ARRANGEMENT

MAIN ANGULAR FRAME

DIA 3/4, (8) HOLES TO HIDE HINGE SCREW NUTS; CONFIRM HOLE LOCATIONS PRIOR TO PUNCHING OR DRILLING

WELD (4) O-RINGS TO SIDES OF FRAME SO IT CAN BE LIFTED (PART No. 09111 BY "ERICKSON")

Dia 5/8, (4) HOLES

304SS ANGLE FRAME 3 x 3 x 1/4

SHORT END OF EACH HINGE TO BE WELDED TO THE ANGULAR FRAME; SS STRAP HINGE HTD-120 FAUCHER

FOR MAIN WOODEN BOX c/w CROSSBEAM. SEE SHEET #2

SECTION A-A

PROJECT TITLE
SPECIFICATIONS

FRAME DETAIL FOR 100mm DOUBLE CHECK VALVE BOX ALUMINUM LID

DRAWN BY
WYC

DATE 2008 12 05

DESIGN BY
JM

DATE 2008 12 05

SCALE N.T.S.

SHEET NO. 62c

FILE NO.
CROSSBEAM DETAIL

USE 1/2NC x 5 LG BOLTS C/W HEX NUTS TO FASTEN CROSSBEAM SUPPORT BRACKETS TO CENTER VERTICAL MEMBERS OF THE WOODEN BOX BOLTS & NUTS TO BE MIN GRADE 5, PLATED

CROSSBEAM

6061-T6 ALUMINUM H-BEAM 4 x 4 x 1/4

DIA 9/16, (2) HOLES

36

37 5/8
CROSSBEAM SUPPORTS

SIDE PLATES: LEFT & RIGHT

304SS PLATE 3/16

PIN
304SS ROUND BAR DIA 1/2

SHELF
304SS PLATE 3/16

BACK PLATE
304SS SHEET 12ga

DIA 1/8, HOLE

RAD 3/8, TYPICAL
DIA 9/16, (3) HOLES

3/16

1/4

2 1/4

135°

4 1/4

3 1/4

9 1/2

7 1/2

6 3 1/2

3 1/4

1 1/2

1 1/2

5

4 1/8

1 7/8
HANDLE DETAIL

WELD 1/2 SS WASHER TO THE END OF SHAFT
304SS ROUND BAR, DIA 1/2
USE 1/4 NC x 1/2 LG
304SS FLAT HEAD SCREW

DIA 9/32, HOLE COUNTERSINK
5052-H32 ALUMINUM PLATE 1/4

PROJECT TITLE
SPECIFICATIONS

SHEET TITLE
DETAILS FOR 100mm DOUBLE CHECK VALVE BOX ALUMINUM LID

DRAWN BY
WYC
DATE 2008 12 05

DESIGN BY
JM
DATE 2008 12 05

SCALE N.T.S.

SHEET NO. 62f
FILE NO.
COVER PLATES DETAIL

MARK LOCATION OF THE METER ON TOP COVER; WELD-ON "M" IN THE CENTER OF COVER

ATTACH HINGES TO THE COVER PLATES WITH 1/4 NC x 3/4 LG 304SS FLAT HEAD SCREWS c/w SS HEX NUTS; COUNTERSINK HOLES IN THE COVER PLATES

COVER SUPPORT FRAME WITH ALUMINUM SHEET 125 x 36 x 10 1/2

WELDING PATTERN BOTTOM VIEW OF COVER

BRAKE EDGES OF EACH COVER PLATE 1/4 ALUMINUM CHECKER PLATE
Note - All dimensions are in metres unless otherwise noted.
NOTES:
1. Parks Water Service shall be installed in accordance to the City Of Calgary Standard Specifications Waterworks Construction.
2. For irrigation system design, consult latest City Of Calgary, Park Development & Operations, Development Guidelines And Standard Specifications Landscape Construction.
4. Drainage Membrane, see Sec. 320 Standard Specification Streets Construction.
5. All dimensions are in millimeters unless otherwise noted.
NOTES:
1. Parks Water Service shall be installed in accordance to the City Of Calgary Standard Specifications Waterworks Construction.
2. For irrigation system design, consult latest City Of Calgary, Park Development & Operations, Development Guidelines And Standard Specifications Landscape Construction.
4. Drainage Membrane, see Sec. 320 Standard Specification Streets Construction.
5. All dimensions are in millimeters unless otherwise noted.
NOTE:
1. Locate Drain Pits at lowest relative grade to ensure positive gravity drainage.
   Number and location of Drain Pits will depend on topographic conditions and extent of system.
2. Size of Drainage Pit shall vary with pit conditions and pipe size
3. For Medium Density Polyethylene Pipe installation, use Double Clamped Insert Fittings in lieu of Brass Tapping Saddle.

-Box Measurements: (all outside measurements)
  Bottom.............. 391mm x 536mm
  Top.................. 298mm x 431mm
  Height............... 304mm
NOTE:
1. Locate Drain Pits at lowest relative grade to ensure positive gravity drainage. Number and location of Drain Pits will depend on topographic conditions and extent of system.
2. Size of Drainage Pit shall vary with pit conditions and pipe size.
3. For Medium Density Polyethylene Pipe installation, use Double Clamped Insert Fittings in lieu of Brass Tapping Saddle.
NOTE:
1. Locate Drain Pits at lowest relative grade to ensure positive gravity drainage. Number and location of Drain Pits will depend on topographic conditions and extent of system.
2. Size of Drainage Pit shall vary with pit conditions and pipe size.
3. For Medium Density Polyethylene Pipe installation, use Double Clamped Insert Fittings in lieu of Brass Tapping Saddle.

-Box Measurements: (all outside measurements)
  Bottom............. 391mm x 536mm
  Top................. 298mm x 431mm
  Height............. 304mm
FOOTBALL GOAL POSTS

SPECIFICATIONS

NOTE: All dimensions are in metres unless otherwise noted.
Notes:
Dimensions are in metres unless otherwise noted.
2m minimum buffer around asphalt edge.
All lines to be masked and striped with
100% acrylic latex paint only.
Fan-shaped 6mm cast aluminum backboard with reinforcing ribs and 12mm thick goal mounting area. Powder coated white, mounted with tamper-proof hardware. Includes orange-painted shooter's square.

Goal: 2 - 16mm high strength cold rolled C104 steel rim and 5mm thick x 25mm wide flat bar brace to individually accommodate net ties for nylon and chain nets. 5mm one-piece formed full-back/side plate, powder-coated orange. All components front mounted.

Note:
All dimensions are in metres unless otherwise noted.
Post, Goal and Backboard are all mounted together with the same hardware.
Turf (Existing Grade) to be 25 mm below edge of asphalt

NOTE: All dimensions are in metres unless otherwise noted.
Wall Batter shall not exceed 1:1 without slope stability report from geotechnical consultant.

Average size Sandstone Retaining Rock: 750mm ht. x 500mm w. x 1000mm l.

Swale (as necessary)

600mm

33% Maximum Slope

150mm

45%

475mm typ.

950mm max.

Finished Grade

150mm of 20mm diameter clear crush aggregate (continuous) c/w 100mm diameter perforated weeping tile (as necessary), and dependant upon surcharge behind and above wall.

Filter Fabric (continuous)

Compacted subgrade to 98% SPD

NOTES

All dimensions are in metres unless otherwise noted.
All void spaces to be filled with clear crushed aggregate and consolidated to prevent migration of fill materials.
All rocks to be structurally sound, free of any spalling, crooks, crevices or splinters. Mud stone is not acceptable.
All rocks to be buried 1/3 depth into ground. Place rocks to facilitate slope stability. Wall shall conform to all current applicable legislation.
Filter fabric to be Amoco 4535 non-woven or equivalent. (unit weight 139 g/m2)