

THE CITY OF
CALGARY

PARKS

DEVELOPMENT GUIDELINES
AND STANDARD SPECIFICATIONS:
LANDSCAPE CONSTRUCTION

2013

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June 5, 2013

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MANUAL REVISION NOTICE

The 2013 *Development Guidelines and Standard Specifications for Landscape Construction* has been substantially re-written to remove redundancies and grammatical errors, to re-number clauses, and to generally restructure the document for ease of use. Navigating through this new version of the document is greatly simplified from previous versions:

- Clicking a **black hyper-linked reference** takes you to the specified section.
- Clicking a **blue hyper-linked reference** takes you to the specified document on the internet (or opens a web page on which you can find the specified document).
- Clicking a **green hyper-linked reference** takes you to the Glossary of Terms (Appendix A), where the specified word, phrase, or acronym is defined.
- Clicking a **brown hyper-linked reference** takes you to the Contacts (Appendix C), where the specified department or staff position’s contact information is listed.
- Clicking the logo at the bottom left of any page takes you to the Table of Contents.

The formatting changes listed above do not affect the purpose or intent of any part of this document. Only the technical changes listed below are considered to be substantive changes to the actual specifications. Within the text of this document, revisions are noted with a “New” or “Revised” arrow and are shaded for additional clarification. Detail Sheet revisions are noted with a “New” or “Revised” arrow only.

SECTION	STARTING ON PAGE	CONTENT REVISION
<u>1.6.1 Habitat Restoration Framework</u>	<u>35</u>	New section.
<u>1.6.2 Biophysical Impact Assessment (BIA) Framework</u>	<u>35</u>	New section.
<u>2.8 MAINTENANCE PERIOD</u>	<u>56</u>	Item 2 removed.
<u>2.9 FINAL ACCEPTANCE CERTIFICATE (FAC)</u>	<u>57</u>	Item 10 revised.
<u>4.2.2 Product Delivery, Storage and Handling</u>	<u>75</u>	Item 13 removed.
<u>6.2.2.2 Surface Materials</u>	<u>108</u>	New section.
<u>6.2.2.3 Width</u>	<u>109</u>	New section.
<u>6.2.2.12 Cross-Country Skiing</u>	<u>110</u>	Item 2 revised.
<u>7.10 Landscape Boulders and Rocks</u>	<u>136</u>	Items 2 and 3 added.
<u>8.6.16 Irrigation Products Currently Being Tested</u>	<u>161</u>	Table removed. No products currently being tested.
<u>CHAPTER 9: LANDSCAPE MAINTENANCE STANDARDS</u>	<u>171</u>	<ul style="list-style-type: none"> • All park classifications (A, B, C, R, N) changed to Turf classifications (A, B, T, and S) or “all park types” where applicable. • Desired results modified to suit new classifications, where applicable.

ACKNOWLEDGEMENTS

In September 1993, The City of Calgary Parks committed to a full-scale review of their *Development Guidelines and Standard Specifications for Landscape Construction*. In January 1994, a workshop series was conducted that included participants from:

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

Workshop participants reviewed and updated, by consensus, specific sections of the 1993 Guidelines and Specifications.

In 2004, a second full-scale review was conducted. 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 City of Calgary Parks would like to take this opportunity to cordially thank the 65 individuals who donated their time and effort toward the 1993 workshop series. As well, our sincere thanks go out to the representatives of the **Urban Development Institute - Calgary's Urban Landscape Committee** and the members of **The City of Calgary Parks' Negotiating Team who devoted their time in 2004**. The dedication and effective communication skills of the members of the negotiation teams are what made this manual possible.

INTRODUCTION

The *Development Guidelines and Standard Specifications for Landscape Construction* (hereafter referred to as “this manual”) was created by The City of Calgary Parks to provide the following:

- 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.
- Detailed specifications for landscape construction.

Concept plans and construction plans must reflect the policies and conditions approved at the Community Planning and Land Use/Outline Planning stages. Community Plans and Land Use/Outline Plans must conform to Federal/Provincial legislation and Council-approved policies, such as *The Calgary Plan*, the [Open Space Plan](#), the [Calgary Urban Park Master Plan](#), the [Natural Area Management Plan](#), the [Calgary Wetlands Conservation Plan](#), the [Stormwater Management Plan](#), and the [Calgary Pathway & Bikeway Plan Report](#). The following table illustrates these relationships:

	Municipal Government Act and other Provincial and Federal legislation.					
<i>City wide/larger in scope; multiple functions; partnerships</i>	Inter-Municipal Development Plans.		The Calgary Plan Other Council-approved policies (i.e. Go Plan).		Joint Use Agreements	
	Open Space Plan.					
<i>City wide; all open space</i>	Urban Park Master Plan.	Natural Areas Mgmt. Plan.	Stormwater Mgmt. Plan.	Bikeways/ Pathways Plan.	Sports Fields Mgmt. Plan.	Urban Forestry Mgmt. Plan.
	River Valleys Plan.	Wetland Conservation Plan.	Water Mgmt. Strategic Plan.		Urban Forestry Mgmt. Plan.	
<i>Policy for a broad geographic area</i>	Area redevelopment plans.		Community Plans. Area structure Plans.		Special Studies (i.e. Bow Valley Centre, CFB).	
<i>Plans for location/ configuration of open space in a specific area (Implementation)</i>	Land Use Amendments. Outline Plans. Tentative (Subdivision) Plans.					
<i>Implementation of policy through development of a specific site or project</i>	Development Permits.				Design Development Plans for City park projects.	
	Review of Developer-built/Partnership projects.				Business Plans.	
	Development Agreements.					

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**SECTION I:
DEVELOPMENT ACTIVITIES
AND GENERAL GUIDELINES**

CHAPTER 1: DEVELOPMENT ACTIVITIES

1.1 PARKS

1.1.1 Development Activities and Responsibilities

Table 1-1 illustrates responsibility for park development activities for parks and open space. It summarizes the various types of parks (refer to **APPENDIX A: GLOSSARY OF TERMS** for definitions) and their appropriate level of development.

Table 1-1: Current Responsibility for Park Development Activities

Legend:

MR Municipal Reserve

MSR Municipal School Reserve.

SR School Reserve.

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, The City, or a community association may apply for its implementation.

Appropriate Development Activities	<u>Sub-Neighbourhood Park</u>	<u>Neighbourhood Park</u>	<u>Community Park</u>		<u>District Park</u>		<u>Linear Park</u>
	MR	MR	MR	MSR	MR	MSR	
Grade	D	D	D	D	D	D	D
Loam	D	D	D	D	D	D	D
Seed to Grass	D	D	D	D	D	D	D
Fully-Automatic Irrigation (50 mm P.W.S.)	D	N/A	N/A	N/A	N/A	N/A	D
Fully-Automatic Irrigation (150 mm P.W.S.)	N/A	D	D	D	D	D	D
1.2 m Chain Link Fence	D	D	D	D	D	D	D
Post and Cable Fence	D	D	D	D	D	D	D
Optional Amenities	NR	NR	NR	NR	NR	NR	NR
Local Pathway	D	D	D	D	D	D	D
Trees	D	D	D	D	D	D	D
Regional Pathway	NR	NR	NR	D	NR	D	D
Shrubs	D	D	D	D	D	D	D
Benches	D	D	D	D	D	D	D
Garbage Receptacles	D	D	D	D	D	D	D
Supply Dog By-law Signs	C	C	C	C	C	C	C
Install Dog By-law Signs	D	D	D	D	D	D	D

Appropriate Development Activities	<u>Sub-Neighbourhood Park</u>	<u>Neighbourhood Park</u>	<u>Community Park</u>		<u>District Park</u>		<u>Linear Park</u>
	MR	MR	MR	MSR	MR	MSR	
Play Equipment	NR	NR	NR	NR	NR	NR	NR
Exercise Equipment	NR	NR	NR	NR	NR	NR	NR
Game Tables	NR	NR	NR	NR	NR	NR	NR
Picnic Tables	NR	NR	NR	NR	NR	NR	NR
Basketball/Volleyball	NR	NR	NR	NR	NR	NR	NR
Ball Diamond	N/A	D	NR	D	NR	D	N/A
Soccer Field	N/A	D	D	D	D	D	N/A
Ice Rinks	N/A	N/A	C	C	NR	NR	N/A
Tennis Courts	N/A	NR	C	C	NR	NR	N/A
Bleachers	N/A	N/A	NR	C	NR	C	N/A
Portable Washrooms	N/A	N/A	NR	C	NR	C	N/A
Parking	N/A	N/A	NR	D	NR	D	N/A
Football Field	N/A	N/A	N/A	N/A	N/A	C	N/A
400 m Track	N/A	N/A	N/A	N/A	N/A	C	N/A
Lighting	NR	NR	NR	NR	NR	NR	D
2 m Asphalt or Non-asphalt Pathway	NR	NR	NR	NR	NR	NR	NR

1.1.2 Minimum and Maximum Landscape Development Activities

A Developer is responsible to construct in accordance with the minimum and maximum landscape development standards indicated for all Local Parks in Table 1-2, Table 1-3, Table 1-3, and Table 1-4, and to the satisfaction of the Manager of The City of Calgary 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 Maintenance Agreement and Infrastructure Agreements (also refer to 1.2.4 Irrigation of Boulevards and Medians and 7.9 Optional Amenities for additional information).

Table 1-2: Sub-Neighbourhood Parks - MR

Item	Quantity		Type/Comment
	Minimum	Maximum	
Grading/Loaming	Entire site	Entire site	As per spec
Turf	Entire site	Entire site	As per spec
Trees	20 trees/.405 ha (1 acre)	40 trees/.405 ha (1 acre)	Approved species
Irrigation	Entire site	Entire site	Automatic as per spec
Benches	1 per site	5 per site	

Item	Quantity		Type/Comment
	Minimum	Maximum	
Dog By-law Sign	1 per play equipment area	1 per play equipment area	As per spec
Walkways	As required	2.0 m wide	Specifications as per approved policy
Fencing	As required	3 sides of site if requested	Only post cable and chain link
Play Equipment or Other Recreational Equipment	If suited	If suited	To community needs or preference if desired
Game Tables	0 per site	2 per site	
Picnic Tables	0 per site	1 per site	
Sports Fields/Parking	Not suitable	Not suitable	
Basketball/Volleyball	If suitable	If suitable	
Garbage Receptacles	1 per site	1 per site	Near walkways not benches
Shrubs	50 m ² /ha	150 m ² /ha	
Retaining Walls	As required	As required	1.5 m height with mowing strip when abutting turf areas

Table 1-3: Neighbourhood Parks - MR

Item	Quantity		Type/Comment
	Minimum	Maximum	
Grading/Loaming	Entire site	Entire site	As per spec
Turf	Entire site	Entire site	As per spec
Trees	20 trees/.405 ha (1 acre)	40 trees/.405 ha (1 acre)	Approved species
Irrigation	Entire site	Entire site	Automatic as per spec
Benches	1 per site	5 per site	
Dog By-law Sign	1 per play equipment area	1 per play equipment area	As per spec
Walkways	As required	2.0 m wide	Specifications as per approved policy
Fencing	As required	3 sides of site if requested	Only post cable and chain link
Play Equipment or Other Recreational Equipment	If suited	If suited	To community needs or preference if desired
Game Tables	0 per site	2 per site	
Picnic Tables	0 per site	1 per site	
Sports Fields/Parking	Not suitable	Not suitable	
Basketball/Volleyball	If suitable	If suitable	
Garbage Receptacles	1 per site	1 per site	Near walkways not benches
Shrubs	50 m ² /ha	150 m ² /ha	
Retaining Walls	As required	As required	1.5 m height with mowing strip when abutting turf areas

Table 1-4: Community Parks - MSR, SR, and MR

Item	Quantity		Type/Comment
	Minimum	Maximum	
Grading/Loaming	Entire site	Entire site	As per spec
Turf	Entire site	Entire site	As per spec
Trees	10 trees/.405 ha (1 acre)	15 trees/.405 ha (1 acre)	Approved species
Irrigation	Entire manicured area except for SR and com- munity centre site	Entire manicured area except for SR site	Automatic, as per spec
Dog By-law Sign	1 per play equipment area	1 per play equipment area as required by school	As per spec
Walkways	As required	Regional pathway 2.5 m wide	As per spec
Fencing	As required	2 sides of site if requested	Only post cable and chain link
Play Equipment or Other Recreational Equipment	The provision of space only as per <u>3.1 SITE PLANNING TEAM'S JOINT USE SITE GUIDELINES</u>	1 per school	To school needs or preference if desired
Ball Diamonds/ Parking	As per <u>3.1 SITE PLANNING TEAM'S JOINT USE SITE GUIDELINES</u>	As per <u>3.1 SITE PLANNING TEAM'S JOINT USE SITE GUIDELINES</u>	-15 parking stalls/76 m softball - As per spec
Benches	2 per ball diamond	2 per ball diamond	Players benches
Portable Washrooms	0 per ball diamond	1 per ball diamond	
Bleachers	0 per ball diamond	2 per ball diamond	
Soccer Fields/Parking	As per <u>3.1 SITE PLANNING TEAM'S JOINT USE SITE GUIDELINES</u>	As per <u>3.1 SITE PLANNING TEAM'S JOINT USE SITE GUIDELINES</u>	- 20 parking stalls per major/minor soccer - As per spec
Ice Rink	The provision of space only for one rink within community lease	1 per community lease site	
Tennis Courts	The provision of space only for two courts within community lease	4 per community lease site (boards, lights, hard surfaced, nets)	
Field Event Area	The provision of space only as per <u>3.1 SITE PLANNING TEAM'S JOINT USE SITE GUIDELINES</u>	The provision of space only as per <u>3.1 SITE PLANNING TEAM'S JOINT USE SITE GUIDELINES</u>	
Garbage Receptacles	1 per site	2 Haul All per site	Near walkway
Shrubs	50 m ² /ha	70 m ² /ha	
Retaining Walls	As required	As required	1.5 m height with mowing strip when abutting turf areas

Table 1-5: District Parks - MSR, SR, and MR

Item	Quantity		Type/Comment
	Minimum	Maximum	
Grading/Loaming	Entire site	Entire site	As per spec
Turf	Entire site	Entire site	As per spec
Trees	10 trees/.405 ha (1 acre)	15 trees/.405 ha (1 acre)	Approved species
Irrigation	Entire manicured area except for SR and community centre site	Entire manicured area except for SR site	Automatic, as per spec
Dog By-law Sign	1 per play equipment area	1 per play equipment area as required	
Walkways	As required	Regional pathway 2.5 m wide	As per spec
Fencing	As required	2 sides of site if requested	Only post cable and chain link
Play Equipment or Other Recreational Equip- ment	The provision of space only as per <u>3.1 SITE PLANNING TEAM'S JOINT USE SITE GUIDELINES</u>	1 per site	To community needs or preference if desired
Ball Diamonds/Park- ing	As per <u>3.1 SITE PLANNING TEAM'S JOINT USE SITE GUIDELINES</u>	As per <u>3.1 SITE PLANNING TEAM'S JOINT USE SITE GUIDELINES</u>	-15 parking stalls/76 m softball - As per spec
Benches	2 per ball diamond	2 per ball diamond	Players benches
Portable Washrooms	0 per ball diamond	1 per ball diamond	
Bleachers	0 per ball diamond	2 per ball diamond	
Soccer Fields/Parking	As per <u>3.1 SITE PLANNING TEAM'S JOINT USE SITE GUIDELINES</u>	As per <u>3.1 SITE PLANNING TEAM'S JOINT USE SITE GUIDELINES</u>	- 20 parking stalls per major/minor soccer - As per spec
Football Field	As per <u>3.1 SITE PLANNING TEAM'S JOINT USE SITE GUIDELINES</u>	As per <u>3.1 SITE PLANNING TEAM'S JOINT USE SITE GUIDELINES</u>	
Ice Rink	The provision of space only for one rink within community lease	1 per community lease site	
Tennis Courts	The provision of space only for two courts within community lease	4 per community lease site (boards, lights, hard surfaced, nets)	
Field Event Area	The provision of space only as per <u>3.1 SITE PLANNING TEAM'S JOINT USE SITE GUIDELINES</u>	1400 m track per ath- letic field	
Garbage Receptacles	1 per site	2 Haul All per site	Near walkway
Shrubs	50 m ² /ha	70 m ² /ha	
Retaining Walls	As required	As required	1.5 m height with mowing strip when abutting turf areas

1.1.3 Local Parks Development Charge

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

- 1) All Sub-Neighbourhood Parks 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 Parks 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 determined by the Director of The City of Calgary Parks.
 - b) If there is 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) must be used to calculate the development charges owing to The City.

1.2 BOULEVARDS, MEDIANS and TRAFFIC ISLANDS

1.2.1 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 The City of Calgary Roads.

1.2.2 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 Roads.

1.2.3 Traffic Island

- 1) If the traffic island is:
 - a) Less than 500 m² in area, then hard surface low maintenance material must be used as approved by The City of Calgary Parks and Roads.
 - b) Greater than 500 m² in area, then grade, loam and seed or sod to grass and use a 50 mm P.W.S. and automatic pop-up irrigation system.
- 2) All trees planted in a traffic island must be approved by The City of Calgary Parks and The City of Calgary Roads.
- 3) All traffic islands will have a 0.50 m concrete maintenance strip installed directly behind the curb.
- 4) Boulders, signs and other obstacles must be:
 - a) At least 0.75 m back from the curb.
 - b) A minimum of 4.5 m from the bullnose or back of walk extended through the island, whichever is greater, adjacent to the primary streets.
 - c) A minimum of 4.5 m from 'any' bullnose adjacent to primary streets on irregular shaped islands.
 - d) A minimum of 3.0 m from the bullnose inside the cul-de-sac.
- 5) The minimum width of traffic islands containing coniferous trees shall be 7.0 m.

1.2.4 Irrigation of Boulevards and Medians

The following is The City of Calgary's criteria for private irrigation systems proposed within boulevards and medians.

Note: Irrigating boulevards and medians is a non-standard practice, and is 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 corporate policy and procedures as approved by Council for [Enhanced Maintenance Agreement and Infrastructure Agreements](#).

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.

- 2) Design and construction of irrigation systems within boulevards and medians shall be in accordance this manual, The City of Calgary's [Land Use Bylaw](#), [Standard Specifications Roads Construction](#), and [Parks Water Management Strategic Plan](#).
- 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. Double check valve and meter must be to City standard (both 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 **8.6.12 Backfill Material**, and installed below the bed for a pathway, sidewalk, driveways.
 - PVC SDR 35 (bell and spigot) pipe installed to The City of Calgary's [Standard Specifications: Sewer Construction](#), section 402.02.02 (or approved equal).

Note: Sleeving to be bedded in accordance to The City of Calgary's *Standard Specifications: 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 (e.g. valve boxes, irrigation heads, etc.), and for the killing of the Parks Water Service from the mainline.

1.3 PUBLIC UTILITY LOTS and RIGHTS-OF-WAY

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 [Right-of-Way \(RoW\)](#). Post and cable barrier where [Public Utility Lot \(PUL\)](#) or RoW abuts lane.

1.4 DRY PONDS

The dual use of Municipal Reserve (MR) and Municipal and School Reserve (MSR) lands for dry ponds should be supported, provided that 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.

1.4.1 Development Guidelines

- 1) Dry ponds must not be located within MR lands that are classified as environmentally significant, Special Protection Natural Environment Parks, or Major Natural Environment Parks.
- 2) Stormwater dry pond facilities should be designed and operated so as to be fully integrated into the neighbourhood setting.
- 3) Stormwater 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 stormwater 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 (\$1.00). Stormwater dry ponds will be limited to 1/3 of approved reserve land.
- 5) In the event that a stormwater 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) Stormwater 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 their expense) will be required to excavate and grade the dry pond areas in accordance with The City of Calgary's Stormwater 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 (3) 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.

1.4.2 Development Activities

- 1) The Developer (at their cost) shall install service connections (sanitary, storm, water) from the mains to the property line of affected SR 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 stormwater 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) The following benches will be provided (at the Developer's cost):
 - a) 4 benches per km of lineal pathway.
 - b) 2 benches per play structure.
- 5) The following trash receptacles will be provided (at the Developer's cost):
 - a) 2 per ball diamond or soccer pitch,
 - b) 1 per playground structure, and
 - c) 2 per kilometer of lineal pathway.
- 6) 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 ([Table 1-2](#), [Table 1-3](#), [Table 1-4](#), and [Table 1-5](#))
- 9) Trees shall be provided on public lands in accordance with the City of Calgary's [Parks Urban Forest Strategic Plan](#) 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 3.0 m ramp to all levels of a dry pond must be provided.
- 12) Soccer fields and ball diamonds located within dry ponds shall meet the performance criteria specified in item 6 of **3.3 SOCCER FIELDS AND BALL DIAMONDS**.
- 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.

1.5 WATER MANAGEMENT STRATEGIC PLAN (WMSP)

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

The purpose of the Water Management Strategic Plan (WMSP) 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 WMSP 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 statement that has the term "Policy" in its heading is expected to be implemented without exception unless previously defined within the policy statement. A 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" might also relate to statements that refer to educational and partnership opportunities, which may not require mandatory participation from the development industry or the community partners.

1.6 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 rationale for the appropriate development or protection in Environmental Reserves ([ERs](#)) or those Municipal Reserves ([MRs](#)) that are allocated for the protection of [Environmentally Significant Areas](#).

NEW

1.6.1 Habitat Restoration Framework

The purpose of The City of Calgary Parks' [Habitat Restoration Framework](#) (the Framework) is to provide guidance on the preparation of restoration reports and restoration landscape plans. The Framework will guide the development of measurable project goals and the performance-based criteria that will help meet the Final Acceptance Certificate (FAC) requirements.

1.6.2 Biophysical Impact Assessment (BIA) Framework

The purpose of The City of Calgary Parks' [Biophysical Impact Assessment Framework](#) is to provide a consistent process for review and approval of BIA reports, ensuring equability and transparency throughout Parks planning regions and other regulatory procedures. In addition, the BIA Framework is established as a straightforward decision-making process to assist project proponents and environmental consultants in determining the appropriate level of BIA required, with triggers/mechanisms for assessing the appropriate level of BIAs required.

1.6.3 Environmental Reserve Setback Guidelines

In accordance with the [Municipal Government Amendment Act](#), Part 17, section 664(1)(c), Environmental Reserve setback zones will be determined using the following factors:

1.6.3.1 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:

1) **Stream Order**

- a) 1st order: 6 m setback - typically a vegetated 'draw' that conveys flow primarily during periods of moderate to heavy rainfall and may not convey flow during other periods.
- b) 2nd order: 30 m setback - Formed when two first order streams meet.
- c) 3rd order: 50 m setback - Tributary of two 2nd order streams.
- d) 4th order: 50 m setback - Tributary of two 3rd order streams.

2) **Wetland Class**

Stewart and Kantrud Class 3-6 wetlands, considered to be Environmental Reserve Wetlands under the Wetland Conservation Plan, will have a 30 m base setback applied to them.

Wetlands that are engineered to serve as stormwater management facilities ('stormwater wetlands'), may (at the discretion of the Administration) have an ER setback width of less than 30 m applied to them if the primary function of the wetland is for the provision of stormwater treatment rather than functioning as a natural wetland.

Appropriate design elements (such as buffer strips, treatment swales or site grading) are 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.

1.6.3.2 Setback Modifiers

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

1) **Slope**

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

2) **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.

3) **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.

Table 1-6: Setback Summary Table

Setback Type	Base Setback	Adjustment Factors		
		Slope Adjustment	Hydraulic Connectivity to Groundwater*	Cover Type
1st order stream	6 m	+1.5 m/ % slope over 5%	N/A	N/A
2nd order stream	30 m		Areas of land adjacent to water bodies that have shallow groundwater connectivity to surface water are taken as ER.	Double base setback width to provide for better buffering of water body or restoration of riparian lands to provide for proper riparian function.
3rd-4th order stream	50 m			
1st order stream	30 m			

Note: This process is intended for use after the ER boundaries are identified and not as a method of determining ER definition. See **APPENDIX A: GLOSSARY OF TERMS** for ER definition.

1.6.4 Criteria for ER/Natural Environment Parks (MR)

Table 1-7: Criteria for ER/Natural Environment Parks (MR)

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

1.6.5 Development Activities for ER/Natural Environment Parks (MR)

Table 1-8: Development Activities for ER/Natural Environment Parks (MR)

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

1.7 DIRECT CONTROL SITES

Since Direct Control (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 because they are private property.

CHAPTER 2: GENERAL GUIDELINES

2.1 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 for all Municipal Reserve (MR) parks and Open Space areas.

A Concept Plan is intended to be a simple, written and visual 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 (refer to 2.3.3 Layout Plan) and Grading Plans (refer to 2.3.6 Grading Plan), detailed information will be presented as deemed appropriate. Further, it is understood by both the Developer and The City of Calgary Parks that not all details (including technical, grading, and utility) 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.

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.
- Indicate existing grades, proposed direction of drainage, slope percentage and adjacent land use information if the data is available.

2.1.1 Theme and Function

The Concept Plan should indicate the type of Municipal Park and Open Space area and its associated theme/function. For example, a Sub-Neighborhood park's theme/function might be a child-oriented, active recreation area, while a Linear park's theme/function might be pathway linkage within a natural area.

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) *Wet Pond*
- 7) *Wetland*
- 8) *Dry Pond*
- 9) *Environmental Reserve (ER)*
- 10) *Environmentally Significant Area*

Notes: a) Definitions and/or appropriate levels of development for each of the above can be found in **1.1.1 Development Activities and Responsibilities**.

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

2.2 CONSTRUCTION APPROVAL REQUIREMENTS

Prior to commencing landscape work on any park or public land within City boundaries, the Developer's representative can confirm the appropriate approval process with The City of Calgary Parks' [Development Coordinator](#) appropriate for the development area (refer to [Figure 2-1](#)).

Parks' Planning & Development Services will copy the Developer on all correspondence resulting from landscape construction drawing submissions. To facilitate this, all landscape construction drawings submitted for the Parks' approval must include the Developer's company name and address, as well as the appropriate contact information for the Developer's Project Manager.

All construction drawings must be submitted to Parks Planning & Development Services for review and approval. The following requirements generally apply to the various forms of development:

Table 2-1: Construction Approval Requirements

Construction Type	Requirements for Approval	Time for Review and Comments
Utility and Road Work	Submit 2 sets of drawings (folded and collated into sets) to Parks' <u>Planning & Development Services</u> .	10 working days
Landscape Construction (Grading, loaming, seeding, irrigation, planting, hard surface treatments, play structures, site structures, etc.)	For new Subdivisions, submit 7 sets of drawings (folded and collated into sets) to The City of Calgary Parks' <u>Planning & Development Services</u> .	15 working days
Landscape Construction on Roadways, Public Utility Lots, and Easements.	For new Subdivisions, submit 7 sets of drawings (folded and collated into sets) to The City of Calgary Parks' <u>Planning & Development Services</u> .	15 working days
	For non-standard tree planting proposals in existing areas, or where utility lines are involved, submit 7 sets of drawings (folded and collated into sets) to The City of Calgary Infrastructure & Information Services' <u>Access Solutions</u> .	15 working days
Note: Time quoted for review and comment is assuming that all submissions are complete.		

Within 30 days of the date stamped on the review set of drawings, submit two (2) sets of rolled final drawings to Parks Planning & Development Services for approval. Rolled final drawings must be un-stapled paper copies, unless the Consultant desires a Mylar® copy. One (1) set will be returned to the Consultant for their records.

All construction plans should show 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 [2.7 CONSTRUCTION COMPLETION CERTIFICATE \(CCC\)](#) (Item 2).

Note: For information on Utility Line Assignment submissions, contact The City of Calgary Infrastructure & Information Services' [Access Solutions](#).

2.3 CONSTRUCTION PLAN REQUIREMENTS

The following information must be provided with any drawings submitted to The City of Calgary Parks' *Planning & 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.

2.3.1 General Requirements

- 1) All landscape construction plans must be sealed and signed by a Registered Landscape Architect with current membership in the Canadian Society of Landscape Architects.
- 2) All drawings and supplemental material(s) for irrigation systems that will be turned over to The City, must be stamped and signed by a Certified Irrigation Designer (CID) - Commercial. This certification must be issued by the 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 Services. Contact The City of Calgary Parks' *Development Coordinator* appropriate for the development area (refer to **Figure 2-1**).
- 4) Scale must be in metric (preferred scales: 1:200, 1:250, 1:500).
- 5) North arrow must be included.
- 6) Key plan must be oriented in same direction as site plan.
- 7) Include the legal description and site and property line zoning, including bearings and dimensions. If the site has a municipal address, include it in the plan.
- 8) Include the proposed land uses of surrounding parcels (i.e. residential, commercial, industrial, etc.) and school building envelope for MSR sites.
- 9) Include utility locations, legal easements, Rights-of-Way, etc.
- 10) Include curb lines, sidewalks, utility poles, fences, and any other boundary conditions.

2.3.2 Demolition Plan

In addition to **2.3.1 General Requirements**, Demolition Plans must:

- 1) Be labeled as “Demolition.”
- 2) Show existing above & below grade features to be protected & to be removed.
- 3) Show existing vegetation.
- 4) Show existing irrigation.

2.3.3 Layout Plan

In addition to **2.3.1 General Requirements**, Layout Plans must:

- 1) Be labeled as “Layout.”
- 2) Show the existing features to be saved.
- 3) Show the location of proposed structures and features.
- 4) Show the layout of playground as per CSA guidelines, including non-encroachment zones.
- 5) Show the location of dog bylaw signs, restoration/reclamation signs, pathway signs (refer to **6.1.2.12 Signage**), and trail signs (refer to **6.2.2.13 Signage**).
- 6) Identify and label the following park areas:
 - **Preservation Zone** - identify the significance of the preservation areas, such as their habitat types and the grouping of vegetative communities that may support their ecological systems. Also, indicate how controlled human use is to be accommodated within the preservation areas.
 - **Naturalized Zone** - indicate how controlled human use is to be accommodated within the naturalized area.
 - **Manicured Zone**

2.3.4 Planting Plan

In addition to **2.3.1 General Requirements**, Planting Plans must:

- 1) Be labeled as “Planting.”
- 2) Show major items associated with “Layout” but not including dimensions, i.e. walkways, roads, curbs, hard surface areas, fountains, other structures, natural areas.
- 3) Show plant material with crowns at 2/3 maximum size as noted in *Alberta Yards & Gardens: What to Grow*.
- 4) Show the outline of planting beds.
- 5) Show proposed contours at 0.5 m intervals.
- 6) Show utilities and Rights-of-Way.
- 7) Include a plant list identifying species (botanical and common name), quantities, sizes, habit, spacing, and specific remarks as required.
- 8) Include details of items that are not included in **SECTION II: STANDARD SPECIFICATIONS FOR LANDSCAPE CONSTRUCTION** (as required).

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

In addition to **2.3.1 General Requirements**, Restoration Plans must:

- 1) Be labeled as “Restoration Plan”.
- 2) Include a 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 5.0 m - 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) Include site preparation methods (i.e. a season of weed control prior to reseeded).
- 4) Include seed mix(es) and application rate(s) specific to the site conditions.
- 5) Include seeding method (hydroseeding, billion, etc.)
- 6) Show plant material with crowns at 2/3 maximum size as noted in *Alberta Yards & Gardens: What to Grow*.
- 7) Show proposed contours at 0.5 m intervals.
- 8) Show utilities and Rights-of-Way.
- 9) Include a plant list identifying species (botanical and common name), quantities, sizes, habit, spacing, and specific remarks as required.

Note: Plant cultivars are only acceptable if approved by Parks. The spacing and densities of plantings are to replicate the biophysical inventory.
- 10) Include an achievable set of criteria that constitutes a successful restoration of the site to be prepared in consultation with the Developer.
- 11) Show depth of pre-development topsoil and location of proposed stockpile.
- 12) Include the proposed maintenance schedule

2.3.6 Grading Plan

In addition to **2.3.1 General Requirements**, Grading Plans must:

- 1) Be labeled as “Grading.”
- 2) Show major items associated with layout but not including dimensions, i.e. walkways, play fields, roads, curbs, other structures, and natural areas.
- 3) Show existing and proposed contours at 0.5 m contour intervals.
- 4) Show all grades in Geodetic measure and tied to the nearest A.S.C.M. benchmark. A.S.C.M. benchmark number to be indicated on plan.
- 5) Show elevations at each break point (top and toe of slope).
- 6) Label property lines and show spot elevations.
- 7) Show catch basin rim and invert elevations where required.
- 8) Show manhole rim elevations.
- 9) Show top of wall, top of curb, and finished floor elevations as required.
- 10) Show surrounding grade information affecting site development.
- 11) Label all concrete gutters.

Note: Wherever possible, concrete gutters should be located on private property.

- 12) Show all trap lows with 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.

2.3.7 Grid Plan - For MSR Joint Use Sites Only

In addition to **2.3.1 General Requirements**, Grid Plans must:

- 1) Be labeled as “Grid”.
- 2) Show existing and proposed spot elevations on a 15 m grid and tied to legal boundaries.
- 3) Show all grades in 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) Show catch basin rim and invert elevations where required.
- 6) Show surrounding grade information affecting site development.
- 7) Ensure that the school building envelope has the same grade as the sportsfield envelope (i.e. 2%).
- 8) Ensure that the school building envelopes and adjacent road grades are at the same elevation.

- 9) Ensure that for every 1 m in elevation in excess of 2% slope, a minimum increase of 3 m has been included on site.

Note: Refer to **CHAPTER 3: RECREATION FACILITIES** for all sports field design and grading specifications.

2.3.8 Irrigation Plan

In addition to **2.3.1 General Requirements**, Irrigation Plans must:

- 1) Be labeled as “Irrigation.”
- 2) Show major items associated with “Layout” (but not including dimensions), such as walkways, structures, fences, play fields, roads, curbs, and natural areas.
- 3) Show screened back major items of “Planting” and “Grading” plans.
- 4) Show proposed contours at 0.5 m intervals.
- 5) Show locations of all lines, sprinkler heads, valves, drains, sleeves, electrical drop-offs, 100 volt wire, 110 volt conduit, and electrical controllers, dimensional from adjacent property lines.

Note: The irrigation system as shown on the plan is approximate and must be adjusted to suit site conditions.

- 6) Ensure that the irrigation system is designed 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) Ensure that park water services are set back a minimum of 2.5 m from pathways, hard surfaces and trees, and lateral irrigation lines are set back a maximum of 0.5 m from property lines.
- 9) Include a schedule of materials/products describing sizes, manufacturers 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) Ensure that the water window is justified by vandalism problems and horticultural requirements. The park water service maximum site sizes are:

Table 2-2: Park Water Service Maximum Site Sizes

Park Water Service	Maximum Size of Site
50 mm	0.83 ha
100 mm	3.02 ha
150 mm	6.79 ha
200 mm	11.17 ha

- 11) Include details of items that are not included in **SECTION II: STANDARD SPECIFICATIONS FOR LANDSCAPE CONSTRUCTION** (as required).

- 12) Ensure that the irrigation system is designed to the minimum static water pressure of the applicable pressure zone. Contact The City of Calgary Water Services' *Distribution Control* to obtain the Static Water Pressure, and then indicate the pressure on the plan.
- 13) Where the design conflicts with the guidelines and specifications in this manual, and the designer wishes approval for an override, identify conflicts and provide an explanation, i.e. "This design overrides specification 8.7 Layout, Item 4, for the following reasons..."
- 14) Complete an Irrigation Scheduling Chart to ensure that the irrigation design will function effectively within the practical water window.

Table 2-3: Irrigation Scheduling Chart Example

Station/ Zone	Head Type	Nozzle#	PSI	Flow (GPM)	Precipitation Rate	Slope	Aspect	Soil	Days of the Week	# of Cycles	Cycle Time	Soak Time
1	I-25	5@#13	56	58	1.575"/hr	3:1	South	Clay loam	M-W-F	3	10 min.	45 min.
2	Toro 570											
3												

The following are the water requirements and limitations 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" per day or 1.281" 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 and to promote good root growth, each zone cannot operate more than once every second day

2.4 FIELD LOCATION SERVICE CALLS AND EMERGENCY SERVICE CALLS

2.4.1 Field Location Service Calls

Prior to the commencement of any work, the Contractor is responsible to contact the appropriate agencies for field locations as required to locate existing underground utilities and pipelines in or adjacent to the construction work site. A list of commonly used contacts is provided in **APPENDIX B: CONTACTS**. The utility or pipeline agencies must be contacted two (2) working days in advance of commencement of work.

2.4.2 Excavation Permits

Prior to any excavation in public Rights-of-Way, excavation permits must be obtained from The City of Calgary Roads' **Traffic Permits**.

2.4.3 Emergency Service

If you accidentally damage the coating or scrape, sever or rupture any underground line, please call the appropriate service immediately. A list of commonly used emergency contacts is provided in **APPENDIX B: CONTACTS**.

Watch for above ground 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.

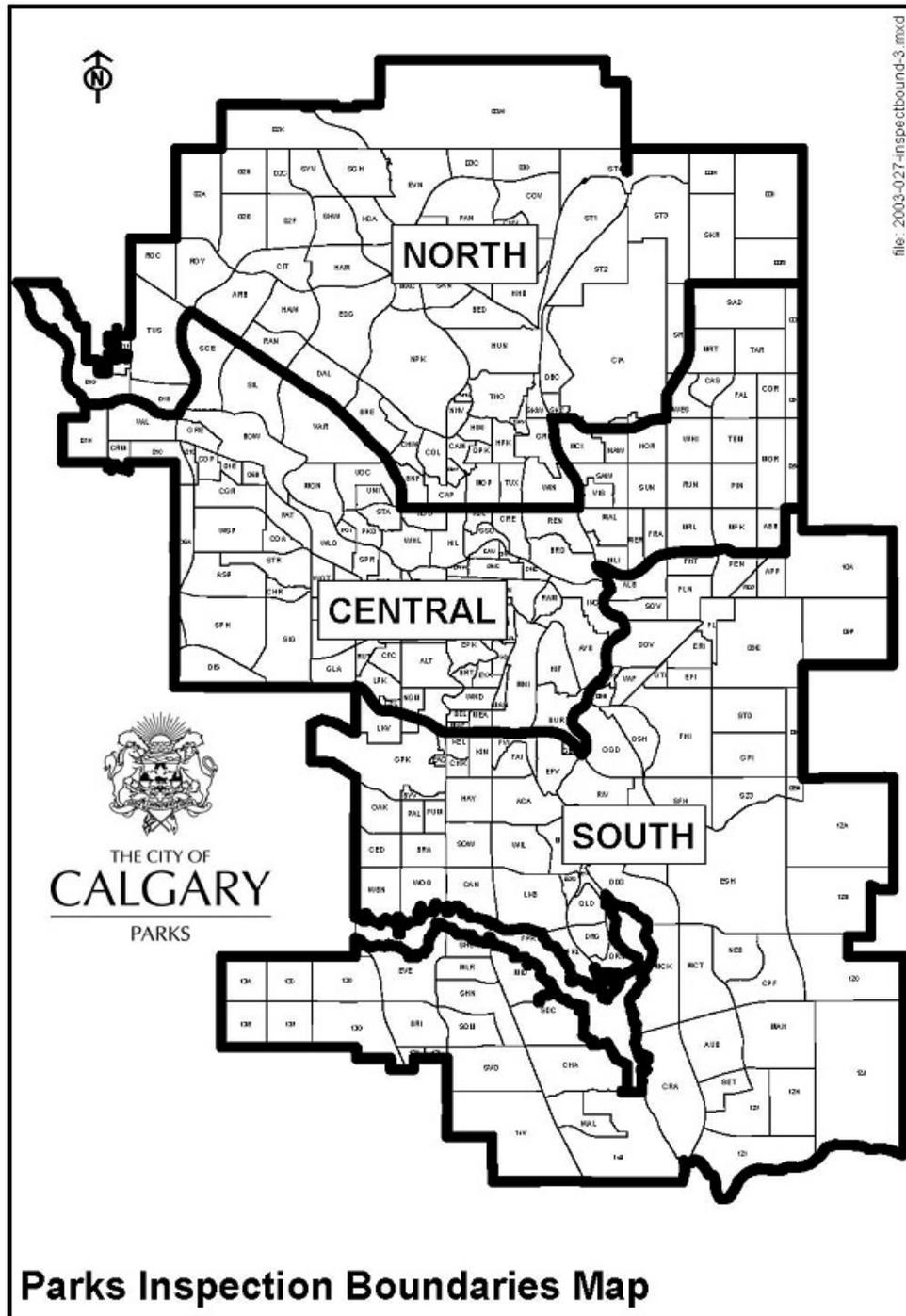
2.5 PERMISSION TO USE WATER FOR CONSTRUCTION

Refer to the current edition of The City of Calgary's **Standard Specifications Waterworks Construction**, Section 504.13.00.

2.6 INSPECTIONS

- 1) Inspections by The City of Calgary Parks are required at key times during project construction as outlined in **SECTION II: STANDARD SPECIFICATIONS FOR LANDSCAPE CONSTRUCTION**. Contact the **Development Inspector** for the area under construction as shown in **Figure 2-1**.

Figure 2-1: Park Inspection Boundaries Map



- 2) Satisfactory construction inspections will be recorded on a *Construction Inspection Checklist and CCC Report* (refer to ***Figure 2-2***). It is the applicant's responsibility to keep a copy of the *Construction Inspection Checklist and CCC Report* on site to verify previous site inspections. If a checklist is not available, the Inspectors are not required to review site development.
- 3) The City of Calgary Parks must be given a minimum of 24 hours notice when requesting an inspection. As per ***2.7.2 CCC Construction Inspection Schedules***, landscape and irrigation inspections for interim development, Construction Completion Certificates (CCCs), or Final Acceptance Certificates (FACs) will only occur during regular business hours.
Note: Parks Development Inspectors work Monday to Friday each week, excluding holidays.
- 4) FACs submitted after September 30 for sites with an irrigation system will require the area's Parks Irrigation Foreman (or designate) present during the winterization procedure. Parks Operations will ensure that staff will be available upon 48 hours notice. Alternatively, Parks Operations 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.
- 5) Natural Area/ER restoration sites should receive regular inspections during their maintenance period (refer to ***2.8 MAINTENANCE PERIOD***) to ensure that restorations are on track. The Consultant can contact The City of Calgary Parks' ***Planning & Development Services*** between May and September to arrange for an annual inspection during the maintenance period.

2.7 CONSTRUCTION COMPLETION CERTIFICATE (CCC)

2.7.1 CCC Application Requirements

Note: This process applies to Development Agreements from 2002 onwards and is not retroactive.

- 1) Landscaping for Reserve Parcels, Public Utility Lots (PULs), Rights-of Way (RoWs), boulevards, medians, traffic islands, and Stormwater Ponds will be considered complete when:
 - All underground irrigation and water services have been installed, tested, and inspected.
 - Preliminary “as constructed” drawings have been submitted to The City of Calgary Parks
 - The area has been graded, loamed, seeded or sodded.
 - The trees have been planted.
 - The paved or interlocking stone walkways, fencing, play equipment, and/or amenities have been constructed in accordance with this manual.
- 2) Park inspections must occur during the five critical stages (as identified in the *Construction Inspection Checklist and CCC Report* (refer to **Figure 2-2**).
- 3) The Developer's Consultant, Contractor(s) and the Parks Development Inspector will be in attendance at each of the critical stage inspections.

Note: Each inspection will be initialed on the *Construction Inspection Checklist and CCC Report* by the Developer's Consultant or Contractor. The scope of work to be inspected must 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 is complete, the Developer can apply to The City of Calgary Urban Development's Coordinator Subdivision Development for a CCC. Along with the application, the Developer must submit a copy of the signed-off *Construction Inspection Checklist & CCC Report* (refer to **Figure 2-2**), noting the expiry date (before which all non-essential work must be complete).

Note: In order to effectively inventory sites once CCC is issued, Parks requests that the Developer provide the Plan # (registered or tentative), Block #, Lot # and Type, and Development Agreement # on the CCC Application.

- 6) Landscape components submitted for construction completion should be submitted in specific groupings by development phase to reduce both the frequency of inspections and the volume of documentation required by The City of Calgary Urban Development, Parks, and the Developer. Recommended groupings are:
 - a) All Reserve Parcels.
 - b) All boulevards, medians, and traffic islands.

c) All *Environmental Reserve (ER)s*.

d) All *Dry Ponds*.

Note: The CCC for Parks should be held at the same time as the CCC for Water Resources.

e) All *PULs*.

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 must prepare and issue four (4) copies of a *Construction Completion Certificate (CCC)* form (available on the City of Calgary's website) that is duly signed, sealed, and certified by the signing officer of the Consultant. The CCC must include the projected earliest maintenance expiry date.
- 8) Within thirty (30) days of the Development Inspector signing the *Construction Inspection Checklist & CCC Report*, the developer must forward four (4) copies of the *Construction Completion Certificate (CCC)* form and the *Construction Inspection Checklist & CCC Report* to The City of Calgary Urban Development.
- 9) Urban Development will acknowledge receipt of the four (4) copies of the *Construction Inspection Checklist & CCC Report* and *Construction Completion Certificate (CCC)* form within fourteen (14) days.
- 10) Urban Development will sign the four (4) copies of the Construction Completion Certificate and forward one copy to Parks.
- 11) No other site inspection by the Parks' Development Inspector will occur. The developer must complete all non-essential work items as per **2.7.2 CCC Construction Inspection Schedules**.
- 12) As per the Residential Development Agreement, if the Developer does not complete the non-essential deficiencies before the expiry date, the CCC will either be revoked or the maintenance period will be extended one year from the time the deficiencies are completed.

2.7.2 CCC Construction Inspection Schedules

The five critical stages of construction are as follows:

- 1) Inspection 1 - Construction Start-up
- 2) Inspection 2 - Subgrade
- 3) Inspection 3 - Tree and Shrub Planting
- 4) Inspection 4 - Irrigation
- 5) Inspection 5 - Finish Grade

Table 2-4: CCC Construction Inspection Schedule 1

This schedule is applicable to:

- Sub-neighbourhood, Neighbourhood, Community, and Linear Parks
- Employment Centre Open Space
- Community Squares
- Commercial Plazas
- Stormwater Ponds
- RoWs.

Note: Approved plans required prior to work commencement.

Work Inspected	Seasonal Limits	Timing	% Essential Prior to CCC Approval
Site Layout, Grades, Topsoil, and Turf			
Layout P.L. Stakes	6" frost and/or no snow	Inspection 1	100
Erosion/Sediment Controls	None	Inspection 1	100
Survey Stakes - Grades	6" frost and/or no snow	Inspection 2	100
Sub-grade Preparation	6" frost and/or no snow	Inspection 2	100
Site Layout (i.e. pathways, trees, amenities, sports fields, playgrounds etc.)	6" frost and/or no snow	Inspection 2	100
Topsoil Test	None	Inspection 3	100
Finished Grade to Plan and Spec.	Frost Free	Inspection 5	100
Seeding	Frost Free	Inspection 5	100
Sodding	Frost Free	Inspection 5	100
Compaction Reports	None	Inspection 5	Within 60 days of date on <i>Construction Inspection Checklist & CCC Report</i>
Trees/Shrubs			
Line Assignment	None	Inspection 1	100
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

Work Inspected	Seasonal Limits	Timing	% Essential Prior to CCC
Irrigation			
Plumbing Permit	At irrigation layout	Inspection 2	100
Irrigation Layout	6" frost and/or no snow	Inspection 2	100
Meter Received by Contractor and Meter information sheet is submitted	Sept. 30th or permission from Wastewater	Inspection 4	100
Open Trench Inspection	Frost Free	Inspection 4	100
Two Copies Irrigation As-Builts	None	Inspection 5	Within 60 days of date on <i>Construction Inspection Checklist & CCC Report</i>
Annual DCV Report	Within 30 days of start-up	Inspection 5	100
Pathways			
Pathway Alignment	6" frost and/or no snow	Inspection 2	100
To Approved Plan and Specification	No snow	Inspection 5	100
Playgrounds			
To Approved Plan and Specification	No snow	Inspection 5	100
Certificate of Compliance Letter	Prior to CCC	Inspection 5	100
Amenities			
To Approved Plan and Specification	No snow	Inspection 5	Prior to FAC
Executed Maintenance Agreement	Prior to FAC	Inspection 5	Prior to FAC

Table 2-5: CCC Construction Inspection Schedule 2

This schedule is applicable to natural environment parks and engineered stormwater wetlands.

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

Work Inspected	Seasonal Limits	Timing	% Essential Prior to CCC Approval
Site Layout, Grades, Topsoil, and Native Seed/Sod			
Layout P.L. and Approved Utility/ROW Encroachments	6" frost and/or no snow	Inspection 1	100
Erosion/Sediment Controls	None	Inspection 1	100
Survey Stakes - Grades	6" frost and/or no snow	Inspection 2	100
Sub-grade Preparation	6" frost and/or no snow	Inspection 2	100
Site Layout (i.e., trees, pathways, amenities, etc.)	6" frost and/or no snow	Inspection 2	100
Pre-development Topsoil Stored	Frost Free	Inspection 2	100
Topsoil Depth & Finished Grade to Pre-existing Native Profile & Pre-Development Drainage Patterns & Rates	Frost Free	Inspection 5	100
Seeding	Frost Free	Inspection 5	100
Sodding	Frost Free	Inspection 5	100
Compaction Reports	None	Inspection 5	Within 60 days of date on <i>Construction Inspection Checklist & CCC Report</i>

Work Inspected	Seasonal Limits	Timing	% Essential Prior to CCC
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 and Specification	No snow	Inspection 5	100
Amenities			
Restoration/Reclamation Signage	No snow	Inspection 1	100
To Approved Plan and Specification	Prior to CCC	Inspection 5	Prior to FAC

2.8 MAINTENANCE PERIOD

The Developer, at no expense to The City, must maintain the following over a continuous period for one (1) growing season:

- [Reserve Parcels](#) and [Stormwater Ponds](#).
- Boulevards, medians, and traffic islands.
- Public Utility Lots ([PULs](#)).
- Rights-of Way ([RoWs](#)).

One (1) growing season is defined as the period of time between the date that the Park Development Inspector signs the CCC to June 30 of the following year, or, in the sole opinion of The City of Calgary Parks, on the date when the irrigation systems are operating and the vegetation is in full leaf, whichever event occurs **last**.

Note: Where Landscaping is to receive a CCC after September 30th, The City of Calgary Parks may extend the maintenance period to (at the latest) September 30th of the following year. CCC inspections are subject to the seasonal limits identified in [2.7.2 CCC Construction Inspection Schedules](#).

2.9 FINAL ACCEPTANCE CERTIFICATE (FAC)

- 1) Not less than three (3) months prior to the maintenance period expiry date, or earlier if weather conditions permit, the Developer and the Contractor must inspect Reserve Parcels, Public Utility Lots (PULs), Stormwater Ponds, Rights-of Way (RoWs), boulevards, medians, and traffic islands, and the Developer must 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.

During the site review, the Developer should ensure that plant material and turf is healthy, that the irrigation system is complete (including required paperwork), and that all plans reflect the final product. If this is not completed, no conditional FAC will be considered.

Note: The date of inspection by the Consultant must be recorded on the FAC Application.

- 2) Subsequent to the correction of all defects and deficiencies noted in item 1, the Developer must submit to The City of Calgary Urban Development's Coordinator Subdivision Development four (4) copies of an FAC Application Form that is duly signed and sealed by a signing officer of the Consultant.

Note: FAC Applications are not to be submitted prior to site completion. Inspectors will not 'hold' document until site is ready.

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

- a) All Reserve Parcels.
- b) All boulevards, medians and traffic islands.
- c) All Environmental Reserve (ER)s.
- d) All Stormwater Ponds.
- e) All PULs.

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.

- 4) Community Parks and District Parks containing MSR sites must be fully developed, and an FAC Application must be submitted:
 - a) No later than at least one (1) full year prior to occupancy of a school.
 - b) By the time thirty percent (30%) of the lots or projected lots located within the catchment area, which is deemed to be all lands located within 1.2 km from the property line of the said parcel of land, are occupied.
 - c) 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 Parks Development Inspectors prior to signing of the FAC by the Manager Parks Operations. If defects or deficiencies are apparent, the process will be as per item 5, below.

- 4) The City of Calgary Parks will schedule an on-site inspection with the Developer within thirty (30) days of receipt of the FAC by Urban Development, and if no advice of defects or deficiencies has been sent to the Developer within that time, the improvement must be deemed by The City to be complete.

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

- 5) If the inspection:

- a) Shows to the satisfaction of the Parks Development Inspector that the improvement is completed and any third party damages are rectified, the Parks *Development Inspector* will sign the FAC Application.
- b) Shows defects or deficiencies, the Parks Development Inspector will issue a *Final Acceptance Inspection Check List & Report* (refer to **Figure 2-3**) detailing the defects or deficiencies that exist, and will record the last day of the one (1) month period on the Inspection Check List and Report under "Application Expiration Date."

The Parks *Development Inspector* will retain the FAC for one (1) month (until the "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 will be returned unsigned. Deficiencies indicated on the FAC inspection are to be corrected as soon as possible (not at the end of the 30 day expiration period). The Developer can resubmit the FAC once the defects and deficiencies are corrected.

Note: Only one (1) *Final Acceptance Inspection Check List & Report* (refer to **Figure 2-3**) will be issued during the inspection process.

- 6) If weeds are identified in a *Final Acceptance Inspection Checklist & Report* (refer to **Figure 2-3**) and a herbicide is applied to rectify the deficiency, a biocide application report must be submitted prior to the signing of the FAC.
- 9) 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).

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- 10) 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 located. It will be the Developer's responsibility to ensure that all the marking signs and flags are compliant with all Municipal, Provincial, and Federal regulations that may apply. The Developer shall provide to The City thirty (30) days notice of their intent to turn the parcel(s)

2.10 CCC and FAC APPEAL PROCESS

In the event that a CCC or FAC Application is rejected by the Parks Development Inspector, it will be returned to the Developer. The Developer can appeal the decision by mailing the application with a cover letter explaining the reason(s) for the appeal to the Manager, Parks Planning and Development Services for the appropriate area (North or South).

When an appeal is received, a review will be conducted based on the contractual obligations associated with the development agreement and this manual. The review will include the Manager, Parks Operations, the Developer or their representative, and the Parks Development Coordinator.

Where agreement or consensus is not achieved during the review, the appeal will be considered by the Manager Parks Planning and Development Services (North or South, as applicable), and the Manager Urban Development (or designate). The decision made at this point will be final.

**SECTION II:
STANDARD SPECIFICATIONS FOR
LANDSCAPE CONSTRUCTION**

CHAPTER 3: RECREATION FACILITIES

3.1 SITE PLANNING TEAM'S JOINT USE SITE GUIDELINES

Table 3-1: Site Planning Team's Joint Use Site Guidelines

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

- Notes:**
- a) Public Elementary & 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 [Dry Ponds](#) see [3.2 HOCKEY RINKS AND LACROSSE FIELDS](#), [3.3 SOCCER FIELDS AND BALL DIAMONDS](#), and [3.4 TENNIS COURTS](#).
 - d) Field Event areas include long jump, shot put, discus, etc.

3.2 HOCKEY RINKS AND LACROSSE FIELDS

- 1) Refer to **Detail Sheet 1: Ice Hockey Rink** for rink dimensions.
- 2) Rink surface must be graded flat for water retention.
- 3) Hockey Rinks and Lacrosse Fields located within **Dry Ponds** must be placed above the 1:50 year flood level.

3.3 SOCCER FIELDS AND BALL DIAMONDS

- 1) Refer to the following detail sheets for soccer field and goalpost dimensions:
 - **Detail Sheet 3: Soccer Fields and Goal Posts**
 - **Detail Sheet 4: Soccer Fields and Goal Posts**
 - **Detail Sheet 5: Soccer Fields and Goal Posts**
- 2) Subject to The City of Calgary Parks' approval, portable goalposts may be installed if they are securely anchored to the ground.
- 3) Refer to the following detail sheets for ball diamond & backstop dimensions:
 - **Detail Sheet 6: Ball Diamonds and Backstops**
 - **Detail Sheet 7: Ball Diamonds and Backstops**
 - **Detail Sheet 8: Ball Diamonds and Backstops**
 - **Detail Sheet 9: Ball Diamonds and Backstops**
 - **Detail Sheet 10: Ball Diamonds and Backstops**
 - **Detail Sheet 11: Ball Diamonds and Backstops**
 - **Detail Sheet 12: Ball Diamonds and Backstops**
- 4) All sports fields, and a buffer zone of 3 m, 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 toward the "Optimal Drainage Patterns for Sports Fields" as per **Detail Sheet 2: Soccer Fields and Goal Posts**. 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 alternative is available. Only the 3 m adjacent to the sports field of the total 10 m buffer must be graded level and free of obstacles. The remaining 7 m of the buffer may include plant material, amenities and back-sloping.
- 5) Ball diamonds and soccer fields must be devoid of all obstacles, including catch basins, and they must be set back a minimum of:
 - 10 m from all property lines.
 - 20 m from playgrounds.
 - 10 m behind soccer goal posts. 3 m around the perimeter of ball diamonds and along the sides of soccer fields.

Note: Setback trees and shrubs as per **Table 4-1**.

- 6) Soccer fields and ball diamonds located within Dry Ponds must 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 for more than 48 hours in any month of the year.
 - ii) Not exceed six times per month
 - 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.

3.4 TENNIS COURTS

- 1) Tennis Courts will be permitted if developed minimally as double courts.
- 2) The guidelines and specifications in this section should be used in conjunction with the following detail sheets:
 - **Detail Sheet 13: Tennis Courts - Construction (Plan & Section View)**
 - **Detail Sheet 14: Tennis Courts**
 - **Detail Sheet 15: Tennis Courts - Construction Apron**
 - **Detail Sheet 16: Tennis Courts - Construction (Permanent Transom)**
 - **Detail Sheet 17: Tennis Courts - Construction (Removable Transom)**
 - **Detail Sheet 18: Tennis Courts - Construction Net Post Details**
 - **Detail Sheet 19: Tennis Courts**
 - **Detail Sheet 20: Tennis Courts**
 - **Detail Sheet 21: Tennis Courts**
- a) A geotechnical analysis on a maximum 10 m grid must be conducted to a 2 m depth.
- b) Any organic or otherwise unsuitable material (as determined by the geotechnical analysis) must be removed to a minimum depth of 1 m below the existing grade, and replaced with 1 m of 75 mm 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 must be excavated to a minimum depth of 500 mm and back filled with 500 mm of 75 mm minus pit run base gravel conforming to the current Standard Specifications Roads Construction. The subgrade and base gravel must be compacted to a minimum average of 98%, with no single test showing less than 95% of standard Proctor.

- c) 100 mm of 20 mm crushed gravel (conforming to the current [Standard Specifications Roads Construction](#)) must be placed and compacted to a minimum average of 98%, with no single test showing less than 95% of standard Proctor.
- d) A 60 mm lift of Mix 'B' asphaltic concrete (conforming to the current [Standard Specifications Roads Construction](#)) must be placed and compacted to a minimum average of 98%, with no single test showing less than 95% of standard Proctor.
- e) A 40 mm lift of mix 'M' asphaltic concrete (conforming to the current [Standard Specifications Roads Construction](#)) must 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 must be power washed with a minimum 3000 P.S.I. power washer to ensure that 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 commencing court patching and surfacing.
- g) Prior to the application of the “Asphalt Resurfacer” (Asphalt Emulsion Filler Coarse), the court surface area must be flooded with clean, potable water in the presence of the Development Inspector or a designated representative. After 45 minutes, any depressions holding water deeper than 1.25 mm must be marked out and filled with “Court Patch Binder” (High Strength Acrylic Bonding Liquid Patching Mixture). The use of asphaltic type emulsions or hot sand mix asphalt to fill depressions is prohibited.

After an appropriate curing time, the court surface area must again be flooded (as described above) to ensure that all reasonable depressions have been filled. If it is determined that more filling is required, conduct additional filling as described above.

Note: On new construction, it is expected that:

- No depressions will be evident after the final lift of asphalt is laid.
 - The asphalt will cure for a minimum of 14 days prior to the application of any surface coating.
- h) Upon completion of all depression patching, all surface divots and cracks must be filled in with “Plexipave Tennis Court Crack Filler” or an approved equivalent (highly flexible filler and/or a high strength acrylic bonding liquid patching mixture) as per the manufacturer’s specifications. The entire surface must then be scraped and/or ground to remove all ridges, and then be blown clean to remove all loose debris.
 - i) One coat of “SS1 Asphaltic Binder” must be applied to the entire court surface immediately prior to the first application of asphaltic emulsion filler (item j).

Note: This step is not required for new construction.

- j) Two coats of “Asphalt Resurfacer” (Asphalt Emulsion Filler Course) must be applied to the entire court surface as per the manufacturer’s specifications. The second coat must be applied at a 90 degree angle to the first coat. Once the second coat has cured, the surface must be scraped to remove any ridges, blown clean to remove all debris, and then rolled with a double drum mechanical roller.
- k) Two coats of “Coloured Fortified Plexipave” or an approved equivalent (Fortified Acrylic Coloured Filler Emulsion utilizing 80-100 mesh rounded sand) must be applied as per the manufacturer’s specifications. The surface must be scraped and blown between coats (as described in item j). A final coat of “Coloured Plexichrome” (Fortified Acrylic Coloured Finish Emulsion) or an approved equivalent can then be applied to the entire surface as per the manufacturer’s specifications. The colour scheme must be green for playing pads and red for the perimeter, unless otherwise agreed to by Parks. For multi-use courts, the colour must be green.
- l) For multi-use courts, in lieu of “Coloured Fortified Plexipave”, two coats of “Acrylotex” (Specialized Fortified Acrylic Coloured Filler Emulsion) or an approved equivalent must be applied as per the manufacturer’s specifications.

Note: This step only applies to multi-use surface installations (i.e. basketball/inline hockey surfaces).

- m) Court lines must be laid-out, masked, and rolled as per official dimensions. Two coats of “Plexicolor Textured White Line Paint” or an approved equivalent (100% Acrylic Emulsion Line Paint) must be brush applied. All lines must be straight and true, with sharp edges. The use of traffic oil, alkyd, or solvent vehicle type paints is prohibited.
- n) Tennis posts must be painted with two coats of black epoxy enamel paint (Tremclad or an equivalent). Prior to painting, treat new posts with a light acid wash (acetone, vinegar, etc.) and remove old flaking paint from previously painted posts.
- o) Place tennis courts located within *Dry Ponds* above the 1:50 year flood level.

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

- 3) A 3.66 m high chain link fence (38 mm mesh - No. 9 gauge steel) is required around the perimeter. It must be constructed as per the standards in this manual. Refer to *Detail Sheet 14a: Tennis Courts - Fencing* for more information.

3.5 FOOTBALL FIELDS/TRACK & FIELD AREAS

Detail Sheet 69: Football Fields and Goal Posts and **Detail Sheet 70: Football Fields and Goal Posts - Football Goalpost** are to be used in conjunction with the specifications in this section.

- 1) Football fields/track & field areas and their buffer zones must be graded to eliminate ponding areas, and must have an optimum gradient of 2% in all directions with a variance of +/- 0.5%.
- 2) Grading plans for football field/track & field areas must illustrate drainage patterns in a minimum of three directions.
- 3) Football field/track & field areas must not 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 appropriate School Board will be responsible for the development of these facilities.
- 5) The layout for field events may be varied to suit particular local requirements. Design specifications can be obtained by contacting the Parks **Development Coordinator**.

3.6 BASKETBALL COURTS

The following detail sheets are to be used in conjunction with the specifications in this section:

- **Detail Sheet 71: Basketball - Court**
- **Detail Sheet 72: Basketball - Goal Post**
- **Detail Sheet 73: Basketball - Court Surface Construction**

- 1) Prior to construction of the surface, a pavement design that has been prepared by a qualified geotechnical Engineer must be submitted to Calgary Parks. The design should be gravel based, and must include a review of existing subsoils and subgrade drainage conditions. Subgrade preparation, along with placing and compaction of gravel and asphaltic concrete, must be carried out in accordance with **Standard Specifications Roads Construction** unless otherwise specified in the design.
- 2) A final asphalt emulsion of two coats must be applied. The application must include a filling, sealing, and texturing process. Once the asphalt emulsion has been applied, the courts can be coloured and lined. This coating must be highly pigmented with prime colour and contain reinforcing pigments, which will provide a long and lasting finish.
- 3) Basketball courts located within **Dry Ponds** must be placed above the 1:50 year flood level.

Note: The resulting surface must be completely true (flat) with water ponding to a maximum depth of 2.50 mm. Any deviations must be corrected by the Contractor at no expense to The City of Calgary.

CHAPTER 4: TREES, SHRUBS, AND GROUNDCOVER

4.1 DEVELOPMENT GUIDELINES

4.1.1 Tree Planting Quantities

The Developer, at its sole cost and expense must:

- 1) Plant all trees within the Development Area in conformity with the [Parks Urban Forest Strategic Plan](#) using the “One Tree per Two Lot” formula and giving first priority to the planting of trees on public lands.
- 2) Plant all trees on public land within the Development Area in conformity with these specifications and the *Parks Urban Forest Strategic Plan*.

4.1.2 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 setback and spacing guidelines for all tree plantings in parks, Public Utility Lots ([PULs](#)), Rights-of Way ([RoWs](#)), and [Stormwater Ponds](#).

Table 4-1: Tree Planting Setback and Spacing Guidelines

		Poplar Trees, Willow Trees, and Shrubs	Other Deciduous Trees	Coniferous Trees
Setback Situation	Vertical Elements and Hard Surfaces	5 m	2 m	½ maximum spread
	Private Property: <ul style="list-style-type: none"> • chain link fence • post & cable fence • wood screening fence 	10 m	2 m	½ maximum spread
	Sport Fields	10 m	½ maximum spread from 3 m buffer	½ maximum spread from 3 m buffer
Tree Spacing		½ maximum spread or 5 m (whichever is less)	½ maximum spread	

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 3.5 m 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 Yards & Gardens: What to Grow - Agdex 200/32-1*.

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 100 mm caliper or larger and coniferous trees that are 4.0 m 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.

4.1.3 Line Assignment (i.e. Setback) Requirements

- 1) For setback requirements of trees planted along roadways, refer to The City of Calgary's *Design Guidelines for Subdivision Servicing* and **Detail Sheet 37b:**

Regional Pathways, Residential Boulevards.

- 2) The following table shows setback requirements for trees planted adjacent to utilities.

Table 4-2: Tree Separations To Utilities

Deep Utilities	Poplar		Deciduous		Coniferous			
	Services	Mains Parallel to tree line	Services Medians	Mains Blvds	Mains Parallel to tree line	Services Medians	Blvds	Mains Parallel to tree line
Sanitary	3.0 m	4.0 m	0 m ^b	2.5 m	3.0 m	0 m ^b	3.0 m	4.0 m
Storm (<4.5 m deep)	3.0 m	4.0 m	0 m ^b	2.5 m	3.0 m	0 m ^b	3.0 m	4.0 m
Water	3.0 m	4.0 m	0 m ^b	2.5 m	3.0 m	0 m ^b	3.0 m	4.0 m
Hydrants	3.0 m	4.0 m	N/A	2.5 m	2.5 m	N/A	3.0 m	4.0 m
Shallow Utilities	Poplar		Deciduous		Coniferous			
	Services	Mains Parallel to tree line	Services	Mains Parallel to tree line	Services	Mains Parallel to tree line	Mains Parallel to tree line	
ATCO	2.0 m ^a	2.0 m ^a	2.0 m	2.0 m	2.0 m ^a		2.0 m ^a	
TELUS	2.0 m ^a	2.0 m ^a	1.5 m	1.5 m	2.0 m ^a		2.0 m ^a	
CTV	2.0 m ^a	2.0 m ^a	1.5 m	1.5 m	2.0 m ^a		2.0 m ^a	
ENMAX	2.0 m ^a	2.0 m ^a	1.5 m	1.5 m	2.0 m ^a		2.0 m ^a	
Enmax	Poplar		Deciduous		Coniferous			
Overhead (to outside conductor)	9.0 m		7.0 m - 9.0 m		7.0 m - 9.0 m			
Transformers (within Utility Rights of Way)	N/A (Tree planting not permitted within Utility Rights-of-Way)							
Street Light Poles	Poplar		Deciduous		Coniferous			
	5.0 m		4.0 m - 5.0 m		Min. 4.0 m			

- Notes:** a) A 3.0 m separation may be required at the discretion of the utilities.
b) Pipe joints are not permitted on water or sewer services located under medians.
c) Trees on residential (15.0 m RoW) boulevards, with no sidewalks, can be planted 1.0 m from driveways. Driveway crossings are to be aligned, wherever possible, to allow space for tree planting.

4.1.4 Traffic Islands

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

- 1) All trees and shrubs adjacent to primary streets must be a minimum of 7.5 m from the bullnose or the back of the walk extended through the island, whichever is greater.
- 2) For irregular-shaped traffic islands adjacent to primary streets, all trees and shrubs must be a minimum of 4.5 m from the bullnose curb.
- 3) All trees and shrubs must be a minimum of 3.0 m from the bullnose inside the cul-de-sac.

- 4) All shrubs and deciduous trees (excluding poplars) must be planted 1.5 m from the back of the curb.
- 5) All Poplar trees, except for Trembling Aspen and Swedish Columnar Aspen, must be planted 6.0 m from back of curb, except when the Director of Parks and the Director of Roads give conditional approval.
- 6) All coniferous trees must be planted 3.0 m from the back of the curb.

Note: To obtain line assignment and construction approvals for plantings, please; submit seven (7) sets of folded drawings to The City of Calgary Parks' [Planning & Development Services](#) for new subdivisions, or seven (7) sets of folded drawings to [The City of Calgary - Infrastructure and Information Services](#) for non-standard tree planting proposals existing areas and where utility lines are involved.

4.1.5 Play Structure Plantings

Shrub beds should be set back from areas designed for play structures in one of the following ways:

- 3.5 m from the outside edge of the play area.
- The width of a local pathway where the pathway abuts a play area.

Type and spacing of plantings must ensure clear sight-lines into the play structure area.

4.1.6 Tree Protection Guidelines

The [Street Bylaw \(20M88\)](#) and the [Tree Protection Bylaw \(23M2002\)](#) contain clauses intended to protect trees growing on Public Land. The intent of these clauses is to maintain public trees as long-term assets to the community and to The City of Calgary in general.

Tree protection requires forethought and planning well before construction activities commence. A Tree Protection Plan and other protection measures are only required on City-owned land, however applicants are encouraged to apply tree protection measures on private land, as well. Effective tree protection places limits on damage and disturbance to tree branches, trucks, and root systems.

- 1) 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 a City boulevard is within 6 m of a boulevard tree. Tree Protection Plans can be submitted for approval to [Urban Forestry - Tree Protection](#).

A Tree Protection Plan is a drawing and/or report that outlines the installation of physical barriers or other materials and specifies of construction techniques. A Tree Protection Plan should:

- Inventory and locate all trees and shrubs on City-owned land within 6 m of all property lines of the site under redevelopment.
- Identify species, diameter at 1.4 m 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 City-owned land, 4 m distance from the trunk and to a depth of 1.2 m. 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 City-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, and/or 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.

For more information about Tree Protection Plan requirements and specifications, refer to the [Tree Protection Plan Guide](#), contact the City of Calgary Parks' [Urban Forestry Technician](#) or consult The City of Calgary Parks' [website](#).

- 2) The City of Calgary Parks prohibits:
 - a) Work on City-owned land within 6 m of a public tree without a Tree Protection Plan.
 - b) Construction activities requiring use of or cross any portion of the road Right of Way (including boulevards) without a permit issued by The City of Calgary. Permits must be obtained from The City of Calgary Roads' [Traffic Permits](#). For further information call 3-1-1 or consult The City of Calgary Roads' [website](#).
 - c) Unauthorized soil disturbance on City-owned land within 6 m of a City Tree.
 - d) Unauthorized deviation from a Tree Protection Plan approved by The City of Calgary Parks.
 - e) Unauthorized entry into a Tree Protection Zone or interference with tree protection barriers.
 - f) The attachment of objects to the trunk or branches.
 - g) The use of equipment for which there is insufficient canopy clearance.

- 3) The City of Calgary Parks requires:
 - a) Work on City-owned lands to be performed by The City of Calgary's forces or by Contractors that have entered into an indemnity agreement with The City of Calgary.
 - b) All trees and landscaping on public land to be established and receive construction inspections in accordance with this manual. Contact the Parks ***Business Strategy and Contracts Lead*** for more information.
 - c) A completed ***Public Tree and Stump Removal Application for Development Sites*** to be included with the Tree Protection Plan if the plan calls for Public Trees to be removed. Public tree removals will not be approved if the form is submitted on its own - it must be part of a Tree Protection Plan.
 - d) Compensation for trees removed or damaged as per appraisal methodologies accepted by the ***International Society of Arboriculture (ISA)*** and as determined to be fair and reasonable by The City of Calgary Parks' ***Urban Forestry Coordinator***. Individual Public Trees can have values ranging in the thousands of dollars depending on size and species. Applicants are urged to consider this cost during the design and development phase of a project. Applicants that are unfamiliar with tree protection or tree appraisal are advised to consult an arborist (found in the telephone directory under "Tree Service").
- 4) Failure to comply with public tree protection measures may result in fines ranging from \$100 to \$10000, in accordance with The City of Calgary's ***Tree Protection Bylaw***. Other compliance measures may be required by a duly appointed Enforcement Officer.

4.1.7 Tree Replacement/Compensation Guidelines

- 1) If approval is received from The City of Calgary Parks to remove trees from public lands and replacement trees are planted, a credit of \$380.00 per tree planted on public land can be applied for. The replacement tree must be 60-85 mm, and be over and above all requirements in the ***Land Use Bylaw*** and any other City of Calgary requirements. Application for reimbursement can be made after the issuance of the FAC and be submitted to The City of Calgary Parks' ***Urban Forestry***.
- 2) If approval is received from The City of Calgary Parks to remove trees from public lands and there are plans for replacement, The City of Calgary must be paid the difference (if applicable) between the cost of the replacement trees and the value of the trees to be removed as determined by a City of Calgary Parks' ***Urban Forestry Technician*** using the ***International Society of Arboriculture (ISA)*** formula.
- 3) If trees are removed or damaged on public lands (by Contractors, Developers, or even other City business units) while performing a City public works project without approval of The City of Calgary Parks, they must replace the trees (without compensation) in accordance with the "Two Trees for every One Tree Removed or Destroyed" formula.

- 4) If Native Vegetation is removed or damaged 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. For further information, contact 3-1-1 and place a service request for a Parks' Urban Forestry Technician.

4.1.8 Shrub Planting Guidelines

4.1.8.1 Parks

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

4.1.8.2 Boulevards

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

Note: Special projects to be reviewed 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.
- v) Are of a suitable species and growth habit.

4.1.8.3 Medians & Traffic Islands

No shrub planting is permitted on medians and traffic islands.

Note: Special projects to be reviewed on a site-by-site basis.

4.1.8.4 Utility Easements & Right-of-Ways

No shrub planting is permitted on Utility Easements and Right-of-Ways unless otherwise approved by The City of Calgary Infrastructure & Information Services' Access Solutions.

4.2 STANDARD SPECIFICATIONS

4.2.1 Description/Quality Assurance

- 1) This section specifies the supply and planting of trees, shrubs and ground covers.
- 2) Planting work is to be carried out by experienced personnel under the direction of a skilled horticultural foreman.

4.2.2 Product Delivery, Storage and Handling

- 1) Supply manufactured items (such as fertilizer, bone meal, mulch, etc.) in standard containers, with the contents, weight, component analysis, the name of the manufacturer, and WHMIS code (if required) clearly indicated.
- 2) Store manufactured materials subject to deterioration in a weatherproof place on site, and in such a manner that their effectiveness is not impaired.
- 3) Root balls of the following minimum sizes must be provided to meet the corresponding tree size:
 - a) Hand Planting

Table 4-3: Hand Planting - Minimum Root Ball Size

	Caliper	Root Ball Diameter
Deciduous Trees	#40 mm (1.5")	600 mm (2'0")
Coniferous Trees	1.0 m (3.28') - 1.5 m (4.92')	600 mm (2'.0")

REVISED!

Root ball sizes for naturalized and natural area plantings will be approved by The City of Calgary Parks on a site-by-site basis. Root balls will be a minimum of 450 mm diameter, up to a maximum of 600 mm diameter.

Wrap root balls up to 600 mm (2' 0") diameter with 142 g (5 oz.) hessian burlap, single wrap.

Bare root stock to not exceed 40 mm (1.5") caliper. Root Ball diameter will be 300 mm (12") for every 25 mm (1") caliper.

- b) Machine Method (Trees Dug by Spade)

Table 4-4: Minimum Root Ball Size For Deciduous Trees (CNLA Standard)

Caliper	Ball Diameter	Ball Depth
40 mm	60 cm	40 cm
50-60 mm	70 cm	40 cm
70 mm	80 cm	50 cm
80 mm	90 cm	50 cm
90 mm	90 cm	50 cm
100 mm	100 cm	50 cm
125 mm	120 cm	80 cm
150 mm	150 cm	80 cm

Caliper	Ball Diameter	Ball Depth
175 mm	175 cm	80 cm
200 mm	200 cm	80 cm

- Notes:** a) 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).
- b) Multi-stem trees will require a root ball at least one size larger.

Table 4-5: Minimum Root Ball Size For Coniferous Trees (CNLA Standard)

Caliper	Root Ball Size	Caliper	Root Ball Size
50 cm	30 cm	200 cm	80 cm
60 cm	35 cm	225 cm	90 cm
80 cm	40 cm	250 cm	90 cm
100 cm	45 cm	275 cm	100 cm
125 cm	50 cm	300 cm	122 cm
150 cm	60 cm	350 cm	127 cm
175 cm	70 cm		

- Notes:** a) 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).
- b) Root ball must be burlapped and wire basketed. Wire basket must 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.

- 4) Cut all roots cleanly when digging plants. Roots should be cut even with the edges of the root ball.
- 5) Protect plant material from damage and breakage. Protect all parts of plant material from drying out and maintain adequate moisture levels.
- 6) Ensure that during transport, plant material is adequately protected.
- 7) Carefully tie in all branches before transporting.
- 8) Pad all points of contact between plant material, equipment, and basket.
- 9) 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 time frame, weather permitting.
- 10) Keep all roots and root balls watered prior to planting.
- 11) Nursery grown deciduous trees that are 100 mm caliper or larger and coniferous trees that are 4.0 m 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.
- 12) Avoid purchasing material with encircling roots.

4.2.3 Job Conditions/Substitutions

- 1) Proceed with planting operations during suitable weather conditions or at the discretion of The City of Calgary Parks.
- 2) 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.

4.2.4 Inspections

- 1) An approved set of drawings and specifications and an approved line assignment must be available on site prior to calling The City of Calgary Parks for an inspection.
- 2) Make plant material available for inspection at the source by The City of Calgary Parks.
- 3) 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, or to reject plants that have been damaged or that in any way do not conform to the specifications in this manual.
- 4) Give timely notice (refer to **2.6 INSPECTIONS**) to The City of Calgary Parks when inspection and acceptance are required. Inspections must be requested when holes or wells have been excavated and when all work is complete.
- 5) Plant material at CCC and FAC must be:
 - True to name and type.
 - Structurally sound.
 - Well branched.
 - Healthy, vigorous.
 - Free from disease, insect infestations, rodent damage, sun scald, frost cracks, and other untreated abrasions to the bark.
 - 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.

4.2.5 Plant Material

- 1) Trees should comply with the Canadian Nursery Certification Institute (CNCI)'s Domestic Phytosanitary Certification Program (DPCP) standards whenever possible.
- 2) As a minimum, all plant material must be nursery grown and meet the specifications set out in the latest Canadian Standards for Nursery Stock prepared by the Canadian Nursery Landscape Association (CNLA) and the International Society of Arboriculture (ISA) for size, height, spread, grading, quality and method of cultivation.

- 3) Nomenclature of specified plants must conform to the *International Code of Nomenclature for Cultivated Plants* and the latest edition of *Standardized Plant Names*.
- 4) Any plant material not conforming to Canadian Nursery Landscape Association (CNLA) standards and specifications and/or not grown according to good nursery practices will be designated as “collected plants”.
- 5) “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.
- 6) 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.

4.2.6 Mulch

- 1) All the planting beds, vaults, and wells must be mulched.
- 2) Materials:
 - a) Type: Any wood type is acceptable, except those that are chemically treated or 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 10x10x5 mm to 40x60x35 mm.
 - c) Consistency: Material should have no more than 5% (by volume) of soil, sawdust, peat moss, or needles.

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

 - d) Sanitation: No mulch from diseased or infested plant material is allowed, unless it can be shown that the material presents no risk to tree health.
 - e) 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, and biology.
 - How unfavorable impacts will be mitigated.
 - f) Application: 75 mm deep. Keep material 50 mm away from trunks and stems to prevent rotting of bark. Any time of year.

4.2.7 Preparation

- 1) 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 appropriate approvals that might be required by other City Business Units, Utility providers, or regulators.
- 2) 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.
- 3) Tree hole excavations exposing utilities including irrigation must be inspected by the utility owner. A list of commonly used contacts is provided in **APPENDIX B: CONTACTS**. Inspections of City owned irrigation can be arranged by calling 3-1-1.
- 4) If using a nitrogen fertilizer, it must be a slow or controlled release product. Synthetic or natural organic fertilizers are preferred.
- 5) Supply plant material as specified on the plant list, or make substitutions as approved by The City of Calgary Parks.
- 6) Provide 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 300 mm (12") diameter per 25 mm (1") of tree caliper. Immediately after digging, wrap the roots in wet burlap and keep the burlap wet during transport and storage.
- 7) Provide material, specified "W.B." (wire basketed and burlapped) to **Canadian Nursery Landscape Association (CNLA)** specifications.
Note: Refer to **Table 4-4** and **Table 4-5** for root ball size.
- 8) Do not use plant material on which the root ball has been cracked or broken prior to or during the planting process.
- 9) Container stock to be as per **Canadian Nursery Landscape Association (CNLA)** specifications.

4.2.8 Installation

The guidelines and specifications in this section should be used in conjunction with the following detail sheets:

- **Detail Sheet 22: Tree/Shrub Planting**
 - **Detail Sheet 23: Tree/Shrub Planting**
 - **Detail Sheet 24: Tree/Shrub Planting**
 - **Detail Sheet 25: Tree/Shrub Planting**
 - **Detail Sheet 26: Tree/Shrub Planting**
 - **Detail Sheet 27: Tree/Shrub Planting**
 - **Detail Sheet 27a: Tree/Shrub Planting**
- 1) Dig out the tree holes and shrub beds by tree spade, backhoe, or hand shovel, and remove excess soil off site.

- 2) Ensure width of all planting excavations is 450 mm 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 75 mm under all tree pits and shrub beds.
- 3) Depth of planting beds are as follows:
 - 450 mm for flower beds
 - 600 mm for shrub beds
- 4) 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 must be above soil grade. Trees are to be planted with root crown at grade or above.
- 5) Place bare root plants so that the roots lie in a natural position. Container grown trees are to have the root crown exposed (remove excess potting soil). Encircling roots are to be separated or cut and laid out radially from the root crown.
- 6) 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 FAC.
- 7) Backfill with topsoil or other material as specified by The City of Calgary Parks and firmly compact the soil to ensure that the plant retains its orientation. Ensure that no air pockets remain around the roots.
- 8) Thoroughly water trees on the same working day they are planted. Water probing is not acceptable.
- 9) Ensure that the trees remain at grade, surrounded by a tree well to a depth of 100 mm, after planting and watering. All trees must be mulched, starting 50 mm from the root flare (trunk) and extending the length of the hole.

4.2.9 Maintenance/Pruning/Clean-up

- 1) Maintain all plant material from the time of planting until the date of FAC issue.
- 2) Maintenance must include all measures necessary to establish and maintain all plants in a vigorous and healthy growing condition, as specified in **CHAPTER 9: LANDSCAPE MAINTENANCE STANDARDS**.
- 3) 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.
- 4) Remove all dead branches. If there is a double leader, shorten the non-dominant leader to approximately half its original length, back to a live branch that points away from the trees that is about one-third the diameter of the leader cut. Prune broken portions of branches back to live lateral.
- 5) Ensure that all damage to surrounding work is repaired before leaving the site.
- 6) Each day, ensure that all debris is cleaned up and disposed of offsite, and that the project site is left in a tidy, organized condition.

4.2.10 Transplanting Existing Trees

Transplant existing trees as per [4.2.6 Mulch](#), [4.2.7 Preparation](#), [4.2.8 Installation](#), and [4.2.9 Maintenance/Pruning/Clean-up](#).

4.2.11 Pruning

The [Parks Urban Forest Strategic Plan](#) outlines both acceptable and prohibited reasons for pruning trees.

- 1) Acceptable reasons for tree pruning:
 - Overhead utility clearance.
 - Public safety.
 - Tree health.
 - Tree structure.
- 2) Prohibited reasons for tree pruning:
 - Mitigation of minor nuisances such as fruit, seeds, fluff, pollen, sticky bud caps, leaves, minor pest infestation, etc.
 - Mitigation of landscape damage.
 - Creation of views and clearance of advertising signs.
- 3) Tree pruning is to be in accordance with the best practices published on the [International Society of Arboriculture \(ISA\)](#)'s [website](#).
- 4) Branch removal should be limited to necessary clearance pruning for public and electrical safety and the removal of dead, diseased, and/or defective wood to improve tree health and/or structure.
- 5) Trees are to be pruned and maintained in accordance with [Illuminating Engineering Society of North America \(IES\)](#) standards for Roadway Lighting.
- 6) Public trees interfering with overhead power lines can be pruned or removed as appropriate.

CHAPTER 5: SUBGRADE, TOPSOIL, SODDING, AND SEEDING

5.1 SUBGRADE AND TOPSOIL

5.1.1 Description and Quality Assurance

This section specifies the preparation of subgrade and the 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.

5.1.2 Design Guidelines

The Developer, at its sole cost and expense must:

- 1) Provide a minimum 2% gradient across all *Reserve Parcels*, medians, traffic islands, boulevards, Public Utility Lots (*PULs*), Rights-of-Way (*RoWs*), and *Stormwater Ponds*.
- 2) Excessive fill that compromises the site design will not be acceptable.
- 3) Geotechnical testing may be required where questionable subgrades exist.
- 4) 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 150 mm.
 - For every 1 m in elevation in excess of 2% slope, a minimum increase of 3 m will be required on site.
 - If non-engineered fill is to be incorporated in an *MSR* site, the non-engineered fill drawing, documenting the limit and depth of the fill area and confirming that the fill area is outside the building envelope, must be provided at CCC. Refer to **Detail Sheet 28a: Non-Engineered Fill Drawing** for more information.

5.1.3 Drainage Guidelines

- 1) Wherever possible, drainage is to be picked up within *Reserve Parcels*, *PULs*, *RoWs*, and *Stormwater Ponds* in grass swales.
- 2) Grass swales are to drain at a minimum 2% gradient.
- 3) Grass swales exceeding 60 m runs are to have a minimum gradient of 4%. If the swale is to drain at less than 4%, it must 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.

- 4) The City of Calgary Parks reserves the right to limit the amount of off-site drainage onto a Reserve Parcel, PUL, or RoW when, in their opinion, such drainage will compromise the integrity of the site.
- 5) 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.
- 6) All drainage swales that empty onto Reserve Parcels, boulevards, PULs, RoWs, Environmental Reserve (ER)s, and Stormwater Ponds must have concrete splash pads (refer to Detail Sheet 46: Concrete Splash Pad). Concrete splash pads must be installed at a 10% pitch or are to have erosion control fabric installed around the perimeter lip of the pad.

5.1.4 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.

5.1.5 Product Delivery, Storage and Handling

- 1) Stockpile topsoil in locations designated by The City of Calgary Parks.
- 2) Do not spread topsoil in a muddy condition.

5.1.6 Job Conditions and Protection

- 1) Report in writing to The City of Calgary Parks, prior to commencing work, any conditions or defects that are encountered on site and that might adversely affect the performance of the work.
- 2) Do not commence work until all conditions or defects noted in item 1 have been investigated and corrected.
- 3) Commencement of work implies acceptance of surface conditions. After commencement of work, no claims for damages or extra work will be accepted, except where such conditions cannot be determined prior to construction.
- 4) Protect all existing trees and planting areas in accordance to 4.1.6 Tree Protection Guidelines.

5.1.7 Inspections and Topsoil Test

- 1) The Contractor must have an approved set of drawings and specifications available prior to calling The City of Calgary Parks for inspection.
- 2) Obtain approval of the topsoil in writing from The City of Calgary Parks. Topsoil testing must be done on the source of topsoil. Four samples must 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 must be determined by The City of Calgary's Parks Development Inspector.

- 3) Submit the name of the testing company who will conduct the soil analysis to the Development Inspector for approval.
- 4) Submit two (2) copies of the soil analysis report, including the location of the topsoil stockpile or source and recommendations for correction to the Development Inspector. Test the topsoil for NPK, particle size, soluble salt content, organic matter, and pH. Recommendations should clearly state the type, quantity, and application procedure for amendment.
- 5) Should the source of topsoil be exhausted, test topsoil from the new source before using. Submit a soil analysis report and recommendations for correction to obtain the approval of the Development Inspector.
- 6) The City of Calgary Parks must approve both rough grade (prior to placing of topsoil) and finished grade (at appropriate times) before the Contractor proceeds with the next phase of work. For all joint-use sites and Community Parks, as well as Stormwater Ponds containing sports fields in MR and MSR sites, the Contractor must:
 - a) 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 that may be requested.
 - b) 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, must 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 is responsible for matching these final design elevations to the satisfaction of The City of Calgary.

5.1.8 Materials

Refer to **Detail Sheet 28: Topsoil/Subgrade Preparation** for more information on items in this section.

- 1) “Topsoil” is defined as 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% capable of sustaining vigorous plant growth. It is free of rocks of 50 mm in diameter and over, subsoil contamination, roots, and weeds (as determined by The City of Calgary Parks), and has a pH ranging from 7.0 to 8.5.
- 2) Volume of rock in topsoil (50mm in diameter and under) not to exceed 20%.
- 3) Native soils should be used where restoration is required of **Natural Environment Park** natural areas and **Environmental Reserve (ER)s**. 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.

5.1.9 Subgrade Preparation

Refer to **Detail Sheet 28: Topsoil/Subgrade Preparation** for more information on items in this section.

- 1) Fine grade the subgrade to even running levels with a tolerance of +/- 75 mm. Remove all debris from the subgrade and ensure it is not contaminated and free of all deleterious materials.
- 2) Compact the finished subgrade and all fill material to 85% standard proctor Dry Density for areas under turf or planting.
- 3) Scarify the subgrade to a depth of 75 mm 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 200 mm.

5.1.10 Spreading of Topsoil

- 1) Spread dry topsoil during dry weather over approved subgrade.
- 2) Apply topsoil to the following minimum depths, measured at right angles to the subgrade after leveling with a tolerance of 25 mm over a distance of 2.4 m:
 - 150 mm for seeded areas
 - 125 mm for sodded areas
 - 450 mm for flower beds
 - 600 mm for shrub beds
- 3) Fine grade the topsoil to eliminate rough and low areas and to ensure positive drainage.
- 4) Ensure that the finished grade is flush to surface structures, project boundaries, and property lines.

- 5) Rake the topsoil to obtain even running levels and remove surface rock (refer to **Detail Sheet 28: Topsoil/Subgrade Preparation** for more information).
- 6) Make good any damage caused by topsoil spreading activities.
- 7) Control dust so as to have no impact on surrounding land uses.
- 8) 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.

5.1.11 Spreading of Topsoil - Natural Areas and Environmental Reserves

In addition to items 1, 4, 6, 7, and 8 of **5.1.10 Spreading of Topsoil**, the following items apply to **Natural Environment Park** natural areas and **Environmental Reserve (ER)s**:

- 1) 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.
- 2) Rough grade topsoil must ensure positive drainage and emulate the pre-development drainage patterns and rates.

5.2 SODDING

5.2.1 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.

5.2.2 Product Delivery, Storage and Handling

- 1) Cut sod by approved methods in accordance with recommendations of the *Canadian Nursery Landscape Association (CNLA)*.
- 2) Roll or fold sod prior to lifting to prevent tearing or breaking.
- 3) Protect sod during transportation to prevent drying out and to ensure its arrival at the site in a fresh and healthy condition.
- 4) Sod should be installed upon arrival. If there is a delay in installation due to weather, keep the sod moist, cool, and protected from direct exposure to the sun until installation. The City of Calgary Parks will reject sod that has dried out.
- 5) Provide fertilizer in standard manufacturer's containers, clearly marked with the name of the manufacturer, weight, and analysis.

5.2.3 Inspections

- 1) The Contractor must have an approved set of drawings and specifications available prior to calling The City of Calgary Parks for an inspection.
- 2) Make all materials, including sod, available for inspection upon their arrival on the site, or at the source of supply when requested. Also, verify names of suppliers when requested.
- 3) Give timely notice (as per **2.6 INSPECTIONS**) when materials are available for inspection.
- 4) Obtain approval of finished topsoil surface by The City of Calgary Parks before proceeding with sodding.
- 5) 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.
- 6) Remove all rejected materials immediately from the site.

5.2.4 Materials

- 1) **Number One Kentucky Bluegrass-Fescue Sod:** Good quality blue grass and fescue mix suitable for the Alberta climate.
- 2) **Fertilizer:** Type and application rate to be determined by soil test.
- 3) **Wooden pegs or approved equal:** Ensure pegs are long enough to securely anchor sod.

5.2.5 Preparation and Installation

Refer to **Detail Sheet 29: Sod Detail** for more information on items in this section.

- 1) Proceed with sodding operation only during favourable weather conditions and in accordance with good horticultural practice.
- 2) Apply slow release fertilizer (NPK 2-4-1), (i.e. 12-25-10 at a rate of 1.5 kg of phosphorous per 100 m²). Desired nitrogen makeup must be 50% water-soluble and 50% polymer coated urea (slow release). This is subject to adjustment upon time of year, receipt of the topsoil analysis report, and the Contractor's recommendation as outlined in **5.1.7 Inspections and Topsoil Test**.
- 3) Provide a finished topsoil surface (smooth and firm with a fine, loose texture, free of rocks, weeds, and debris over 50 mm in diameter) before sod is placed (refer to **Detail Sheet 28: Topsoil/Subgrade Preparation** for more information).
- 4) 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.
- 5) Where big roll sod is to be installed, remove any and all shipping or packaging materials prior to installation. Remove nylon mesh nettings or any similar materials from rolls of sod prior to installation.
- 6) Ensure that finished sod surface is flush with adjoining grass areas, pavement, or top surface structures (such as curbs, manholes, sidewalks, irrigation boxes, etc.).
- 7) On slopes steeper than 3H:1V, lay sod across the face of the slope and peg each row at intervals of not more than 600 mm. Secure in an approved fashion.
- 8) Lay sod to a width of 3 m in swales. Place perpendicular to direction of swale unless otherwise noted on drawings.
- 9) Immediately after installation of sod, water the area with sufficient amounts to saturate the sod and underlying topsoil to a minimum depth of 100 mm.
- 10) After the sod and soil have dried sufficiently to prevent damage, roll the areas (if required) to ensure a 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.
- 11) Protect all newly sodded areas as required.

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

5.2.6 Maintenance and Acceptance

- 1) Maintain sodded areas as per **CHAPTER 9: LANDSCAPE MAINTENANCE STANDARDS** from the time of installation until the FAC is issued by The City of Calgary Parks (refer to **2.9 FINAL ACCEPTANCE CERTIFICATE (FAC)** for more information).
- 2) Prior to acceptance, sod and water all bare spots larger than 15 cm². Acceptance will be given upon the establishment of the sodded area.

5.3 Seeding

5.3.1 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.

5.3.2 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 the seed mixtures are clearly marked.

5.3.3 Inspections

- 1) The Contractor must have an approved set of drawings and specifications available prior to calling The City of Calgary Parks for an inspection.
- 2) Make all materials, including seed, available for inspection upon their arrival on the site, or at the source of supply when requested. Also, verify names of suppliers when requested.
- 3) Give timely notice (as per **2.6 INSPECTIONS**) in writing, when materials are available for inspection.
- 4) Obtain the approval of The City of Calgary Parks of the finished topsoil preparation before proceeding with seeding (refer to **Detail Sheet 28: Topsoil/ Subgrade Preparation** for more information).
- 5) 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 the hydro-seeder. Failure to notify The City of Calgary Parks before loading occurs could result in a rejection of the seeding operation.
- 6) 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.
- 7) Remove all rejected materials from site immediately.

5.3.4 Materials

5.3.4.1 Grass Seed

Certified Canada No. 1 seed must be free of disease, weed seeds, or other foreign materials and must meet the requirements of the [Seeds Act](#). All cultivars listed below must be rated in the top 25th percentile of the [National Turfgrass Evaluation Program \(NTEP\)](#) located in Alberta.

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

- 1) **Urban A:** A coarse grass mixture for slopes up to 3H:IV, highway boulevards, interface areas, and other areas where irrigation is not available.

Urban A is composed of:

Kentucky Blue Grass	20%
Creeping Red Fescue	35%
Annual Rye	30%
Perennial Rye Grass	15%

Urban A is applied at a rate of not less than 30g/m² or 300kg/ha.

- 2) **Urban B:** A medium grass mixture for play fields, joint use sites, residential boulevards, and other non-irrigated but high use areas.

Urban B is composed of:

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

Urban B is applied at a rate of not less than 30g/m² or 300kg/ha.

- 3) **Urban C:** A fine grass mixture for irrigated tot lots, decorative parks, and athletic parks.

Urban C is a fine grass mixture composed of:

3 Varieties of Kentucky Blue Grass	75%
Creeping Red Fescue	15%
Perennial Rye Grass	10%

Urban C is applied at a rate of not less than 30g/m² or 300kg/ha.

- 4) **Urban D:** A native grass seed used for reclamation of Environmental Reserve (ER)s and Natural Environment Park natural areas where maintenance and irrigation are not available. Use of Urban D must be approved by the City of Calgary Parks.

Proposals must be submitted to the Parks Development Coordinator, and will be approved on a site-by-site basis. The mix should be based primarily on wheat grasses, and make every attempt to use seeds native (locally indigenous) to the Calgary region. 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 must be submitted for approval by The City of Calgary Parks prior to application. Application rates to be determined on a site-specific basis.

- 5) **Urban E:** a wildflower seed mixture for use as an alternative to Urban D in reclamation of *Environmental Reserve (ER)s* and *Natural Environment Park* 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.
- 6) **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 Rye Grass | 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.

5.3.4.2 Fertilizer

Type and application of fertilizer to be determined by soil test.

5.3.4.3 Hydromulching

Hydromulching must be completed as per *Public Works Canada* specifications.

- 1) **Mulch:** Approved wood fibre mulch manufactured from whole wood chips and containing no growth or germination inhibiting factors.
- a) The following specifications apply to mulch:

Table 5-1: Mulch Specifications

Item	Accepted Measure
Moisture Content	10%
Organic Matter	99.2%
Ash Content	8%
pH	4.8%
Water Holding Capacity	1000 gms/100gms of fibre

Note: Percent moisture content is determined in accordance with *The Pulp and Paper Technical Association of Canada (PAPTAC)* standards.

- b) **Area of Coverage:** The area of coverage for a hydroseeder is based on the hydroseeder's carrying capacity and the application rate.

The hydroseeder's carrying capacity is based on the water carrying capacity of the mulch and the volume of water that the hydroseeder can carry.

Equation 5-1: Mulch Required Per Hydroseeder Load

$$\frac{\text{Hydroseeder Volume} \times 3.785}{1000} \times \text{Water Carrying Capacity} = \text{Mulch Required Per Hydroseeder Load}$$

The water carrying capacity is quoted as the number of kg's of mulch necessary to hold 1000 litres of water.

Table 5-2: Mulch Water-Carrying Capacity

Manufacturer	kg/1000 L
Fibramulch	46.84
Siva-Fiber	50.00
Verdyol Standard	37.90

The area of coverage is then calculated based on the application rate and the mulch per load:

Equation 5-2: Area of Coverage Per Hydroseeder Load

$$\frac{\text{Mulch Per Load} \times 10000}{\text{Application Rate}} = \text{Area Covered}$$

The Mulch Application Rate is based on the slope and/or wind conditions.

Table 5-3: Mulch Application Rate

Slope and/or Wind Conditions	Application Rate
<6:1 (H:V) Light Wind	1400 kg/ha
6:1 to 3:1 Medium Wind	1700 kg/ha
>3:1 High Wind	2000 kg/ha

The following is an example for calculating the area of coverage, assuming:

- Fibramulch is used.
- there is a high wind.
- Area covered is in m².
- 10000 is the conversion factor from ha to m².

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

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

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

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

- 2) **Tackifier:** TA200 is an 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.
- a) The recommended rates for the application of TA200 tackifier are based on slope and/or wind conditions:

Table 5-4: TA200 Tackifier Application Rate

Slope and/or Wind Conditions	Application Rate
<6:1 (H:V) Light Wind	50 lbs/acre
6:1 to 3:1 Medium Wind	75 lbs/acre
>3:1 High Wind	100 lbs/acre

The metric conversion for the Application Rate is as follows:

Equation 5-3: Tackifier Application Rate - Metric Conversion

$$\frac{\text{Application Rate} \times 0.4536}{0.4047} = \text{Metric rate (kg/ha)}$$

The following is an example for converting the application rate from lbs/acre to kg/ha for High Wind conditions:

- 0.4047 is the conversion factor for acres to ha
- 0.4536 is the conversion factor for lbs to kg.

$$\frac{100 \times .4536}{.4047} = 112 \text{ kg/ha}$$

Therefore, the metric application rate is 112 kg/ha in High Wind conditions.

- b) The quantity of tackifier per hydroseeder tank load is calculated as follows:

Equation 5-4: Quantity of Tackifier per Tank Load

$$\frac{\text{Seeder Coverage} \times \text{Application Rate}}{10000} = \text{Quantity (kg)}$$

The following is an example for calculating the amount of tackifier required per hydroseeder tank load:

- Area of coverage (as previously calculated in **5.3.4.3 Hydromulching**) = 2925 m²
- Application Rate (as calculated above) = 112 kg/ha
- Conversion factor from ha to m² = 10000

$$\frac{2925 \times 112}{10000} = 33.6 \text{ kg}$$

Therefore, 33.6 kg of tackifier is required per hydroseeder load.

- c) The number of containers of Tackifier required per load is calculated as follows:

Equation 5-5: Number of Tackifier Containers per Load

$$\frac{\text{Weight Per Tank Load}}{\text{Weight Per Container}} = \# \text{ of containers}$$

The following is an example for calculating the number of tackifier containers required per hydroseeder tank load:

- Packaging information on TA200 Tackifier - **1 Pail** (container) = **50 lbs = 22.68 kg** (~ 20 litres)
- Amount of tackifier required per hydroseeder load (as calculated above) = 33.6 kg

$$\frac{33.6}{22.68} = 1.48$$

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

3) Quantities of Seed in a Hydroseeder

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

Equation 5-6: Quantity of Seed in a Hydroseeder

$$\frac{\text{Seeder Coverage} \times \text{Seed Application Rate}}{10000} = \text{kg}$$

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

Table 5-5: Seed Application Rates

Seed Mix	Application Rate
Urban A, B, and C	300 kg/ha
Urban D	Site Specific
Urban E	25 kg/ha
Urban F	200 kg/ha

The following is an example for calculating the quantity of seed in a hydroseeder, assuming:

- The project calls for Urban F on the jobsite.
- The area of coverage (as previously calculated in **5.3.4.3 Hydromulching**) is 2925 m².

$$\frac{2925 \times 200}{10000} = 58.5 \text{ kg}$$

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.

4) Quantity of Fertilizer in a Hydroseeder

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

Equation 5-7: Quantity of Seed in a Hydroseeder

$$\frac{\text{Seeder Coverage} \times \text{Fertilizer Application Rate}}{10000} = \text{kg}$$

Fertilizer application rates are variable, depending on the results of a soil analysis and the type of fertilizer applied. For the example below, it is assumed that:

- 16-20-0 fertilizer is being applied at 400 kg/ha.
- The area of coverage (as previously calculated in **5.3.4.3 Hydromulching**) is 2925 m².

$$\frac{2925 \times 400}{10000} = 117 \text{ kg}$$

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.

5.3.5 Preparation and Installation

- 1) Provide a finished topsoil surface prior to seeding that is:
 - Conducive to seed growth.
 - Even running and to finish grades.
 - Free of rocks over 25 mm in diameter.
 - Free of weeds and debris (refer to **Detail Sheet 28: Topsoil/Subgrade Preparation** for more information).
- 2) Ensure that finish grade meets flush and smooth with adjacent grades and surface structures such as curbs, manholes, sidewalks, irrigation boxes, etc.
- 3) 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 the conditions in items 1 and 2 above. The long ridges of the tread are to run across the face of the slope.
- 4) 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 per **5.1.7 Inspections and Topsoil Test**.
- 5) Do all seeding in accordance with good horticultural practice during the period from May 1 to September 30 (or as weather permits), when wind speeds are minimal, and when site conditions are approved by The City of Calgary Parks.
- 6) Two means of applying seed are acceptable to The City of Calgary Parks:
 - a) Hydraulic-seeding.
 - b) Mechanical or "Brillion" type seeding.Hand broadcasting of seed is unacceptable under any conditions, except for isolated repair work.
- 7) Protect all newly seeded areas as required.
- 8) Remedy all damaged areas and maintain until turf has properly established.

5.3.6 Maintenance and Acceptance

- 1) Maintain seeded areas as per **CHAPTER 9: LANDSCAPE MAINTENANCE STANDARDS** from the time of installation until the FAC is issued by The City of Calgary Parks (refer to **2.9 FINAL ACCEPTANCE CERTIFICATE (FAC)** for more information).
- 2) Prior to acceptance, top dress, seed, and water all bare spots larger than 15 cm². Acceptance will be given upon germination of seeded areas.

CHAPTER 6: PATHWAYS, TRAILS, AND PAVING STONES

6.1 Pathways

6.1.1 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 *Geometric Design Guide for Canadian Roads* by the *Transportation Association of Canada (TAC)*.

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.

6.1.1.1 Pathway Classifications

1) **Regional Pathway System:**

The regional pathway system is a city-wide linear network that facilitates non-motorized movements for recreational and transportation purposes. The regional pathway is hard-surfaced, typically asphalt, and located off-street. It is a multi-use amenity, 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 amenity 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.
- LRT stations and transit routes.

2) **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.

6.1.1.2 Alignments

- 1) Pathways must 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 Report](#).

- 2) 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.

6.1.1.3 Linear Parks

- 1) **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 (i.e. **Natural Environment Parks**).
- 2) 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 (PUL)**.
- 3) Utility Rights-of-Way (**RoWs**) should not interfere with the recreational, environmental, and urban design functions of a linear park.
- 4) Linear parks should have a minimum width of 10 m and a maximum width of 20 m.

6.1.1.4 Boulevards

- 1) Avoid routing pathways along boulevards in front of residential properties.
- 2) Avoid routing pathways along boulevards where spacing of driveways and cross-streets is less than 200 m.
- 3) Design either an asphalt multi-use pathway or a parallel asphalt bicycle pathway and concrete sidewalk.

6.1.1.5 Pathway Easement

Where an easement has been required for a pathway, ensure that it is of an adequate width to facilitate the design and safe function of the pathway.

6.1.1.6 Street Crossings

- 1) Route pathways to street intersections wherever possible.
- 2) Mid-block crossings are discouraged, and permitted on local streets only. If mid-block crossings occur, then appropriate signage will be installed by The City of Calgary.
- 3) Avoid designs that make building mid-block pedestrian overpasses on major streets a necessity.
- 4) Adjust the subdivision layout to minimize the quantity of crossings.
- 5) Line up pathway entrances to ensure visual continuity.

6.1.1.7 Play Equipment Sites

- 1) Regional pathways should not be within 5.0 m of play area surfaces.
- 2) Provide a 2.0 m wide (minimum) asphalt link from the play equipment site to a local or regional pathway.

6.1.1.8 Parking Lots

- 1) Route pathways around parking lots; avoid going through.
- 2) Provide asphalt links from parking lots to pathways.
- 3) Locate pathway entrance at the street.

6.1.1.9 Natural Areas

Encourage back sloping gradient of 2:1 to minimize disturbance.

6.1.2 Design Guidelines

The objective of the design guidelines is to produce safe and enjoyable pathways incorporating the needs of multiple users (i.e. walkers, children's strollers, runners/joggers, people with disabilities, cyclists, in-line skaters, and skateboarders). 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, the pathway design guidelines in section 2.7 of the Council-approved [Calgary Pathway & Bikeway Plan Report](#) should be applied.

6.1.2.1 Surface Materials

- 1) Regional pathways are hard-surfaced, typically of asphalt pavement, to accommodate multiple users.
- 2) Local pathways and pathways oriented to pedestrian traffic can be made up of a variety of materials, depending on use.

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- 3) Width
 - a) 2.5m minimum for local pathways.
 - b) 2.5m minimum for regional pathways with 3.0m provided where possible.
 - c) 3.5m minimum for river pathways with 4.0m provided where possible.
 - d) 2.5m minimum pedestrian pathways and 2.5m minimum bicycle pathway for twinned pathways with 3.0m provided where possible.
- 4) At Time of Lifecycle
 - a) 3.0m minimum for regional pathways
 - b) 4.0m minimum for river pathways, where possible.
 - c) 3.0m minimum pedestrian pathways and 3.0m minimum bicycle pathways for twinned pathways.

6.1.2.2 Safety Clearance and Setback Requirements

- 1) Provide 1.0 m clear of all obstacles on both sides.
- 2) Provide 3.0 m clear of all obstacles overhead.
- 3) Avoid locating pathways over manholes.
- 4) Ensure a 2.5 m minimum clearance from park water services.
- 5) Set back pathways a minimum of 1.0 m from face of curb.

6.1.2.3 Pathway Handrail

- 1) Pathway handrails must be installed when a pathway is within 2 m of the top of a 2:1 slope or steeper, and the slope is greater than or equal to 1 m in depth.
- 2) 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 must be provided by The City of Calgary at no cost to the Developer.
- 3) Minimum railing height and design must be as per **Detail Sheet 30: Pathway Handrail** or an equivalent as approved by Parks.
- 4) 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.

- 5) Wooden fences are not acceptable unless specifically requested and approved of for use.

6.1.2.4 Pathway Junctions

- 1) Wherever possible, ensure that pathways join at right angles.
- 2) Provide widening of pathways with a radius of 4.0 m where pathways join other pathways (refer to **Detail Sheet 32: Bollards** for more information).

6.1.2.5 Pathway Entrances/Wheel Chair Ramps

- 1) Extend pathway to street curb in all cases.
- 2) Ensure that the pathway joins the street at right angles.
- 3) Provide a standard steel bollard (refer to **Detail Sheet 31: Bollards** and **Detail Sheet 32: Bollards**) where the entrance to a pathway is on a street.
- 4) Provide a concrete wheelchair ramp (refer to **Detail Sheet 33: Wheel Chair Ramp**), as required, where the entrance to a pathway is on a street and there is an existing concrete sidewalk.
- 5) Provide an asphalt wheelchair ramp complete with depressed concrete curb (refer to **Detail Sheet 34: Wheel Chair Ramp**) as required, where the entrance to a pathway is on a street and there is no existing concrete sidewalk.
- 6) Line up entrances for visual continuity where the pathway route crosses the street.
- 7) Ensure that no catch basins are located at the entrance.

6.1.2.6 Sight-lines

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

6.1.2.7 Criteria for Bicycles

1) Maximum Grades:

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

2) Design Speed:

- Flat terrain: Do not exceed 35 km/hr.
- Downgrades: Do not exceed 50km/hr.

3) Super-elevation:

- On curves: 2%.
- Maximum: 5%.

4) Stopping Sight Distances (SSDs):

A SSD of 35.0 m is considered to be a standard guideline, but SSDs can be calculated as follows:

Equation 6-1: Stopping Sight Distance

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

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.

Table 6-1: Stopping Sight Distance

	Level	Ascending		Descending	
Gradient	0%	2.5%	5.0%	2.5%	5%
SSD	35 m	33.5 m	32.5 m	36.5 m	38 m

5) Minimum Design Curve Radii (r):

A minimum design curve radii of 5.0 m is considered to be a standard guideline, but the minimum design curve radii is calculated as follows:

Equation 6-2: Minimum Design Curve Radii

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

- where: r = design curve radius
 v = bicycle design speed (typically 30km/hr)
 f = coefficient of friction = 0.25
 e = super elevation

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

Table 6-2: Stopping Sight Distance

Speed	10 km/hr	15 km/hr	20 km/hr
Radius	2 m	5 m	9.5 m

- 6) **Stairs:**
- Wherever possible, avoid use of stairs within a pathway network.
 - Install a bicycle ramp along one side where stairs are unavoidable.

6.1.2.8 Lighting

- Provide lighting on local and regional pathways as required by The City of Calgary's *Transportation Infrastructure* and the *Linear Park Policy*.
- Provide lighting on river pathways in the downtown part of the city consistent with the boundaries defined in the Center city Plan.

6.1.2.9 Pedestrian Bridges and Overpasses

- Railing height as per provincial building codes.
- Minimum deck width of 3.0 m (between railings).
- Submit concept drawings to Parks' *Development Coordinator*, however, final approval will come from the The City of Calgary's *Transportation Infrastructure*. Ensure that all drawings are stamped by a professional Engineer.

6.1.2.10 Vehicular Bridges and Overpasses

- In general, ensure that sidewalks for pedestrians and widened shoulder lanes for cyclists are provided along both sides of the structure.
- Where a bridge is part of the pathway system, ensure that a combined pathway and sidewalk is provided along both sides of the structure.
- Railing height as per provincial building codes.
- Minimum pathway width of 3.0 m.

- 5) Submit concept drawings to Parks' *Development Coordinator*, however, final approval will come from the The City of Calgary's *Transportation Infrastructure*. The Developer must ensure that the proposed structure conforms to all applicable City Bylaws and to provincial building codes, and must ensure that all drawings are stamped by a Professional Engineer.

6.1.2.11 Pedestrian Underpasses

- 1) Minimum height of 3.0 m and minimum width of 3.0 m.
- 2) Ensure that drainage is kept in concrete swale along one side.
- 3) Ensure that they are well lit.
- 4) Preferable maximum length of 50 m.
- 5) Provide a skylight break in the underpass ceiling that corresponds with the median of a divided roadway on the surface above.

6.1.2.12 Signage

- 1) Provide standard identification signs with pathway name (Traffic Operations #14-700 series) at pathway entrances.
- 2) Provide standard hazard warning signs (refer to the *Parks and Pathways Sign Manual*) where appropriate.
- 3) Provide a centre line pavement marking on regional and river pathways and on separated bicycle pathways (75 mm wide, yellow paint).
- 4) Provide a double centre line pavement marking at hazardous locations (each line 50mm wide, yellow paint).

6.1.2.13 Design Drawings and References

- 1) Submit drawings to the Parks' *Development Coordinator* for approval for all local and regional paths as outlined in **2.3 CONSTRUCTION PLAN REQUIREMENTS**.
- 2) Follow guidelines as outlined in the following documents (refer to **APPENDIX C: REFERENCES** for source information):
 - *Geometric Design Guide for Canadian Roads* by the *Transportation Association of Canada (TAC)*.
 - *Pathway Network for Canada's Capital Region: 2006 Strategic Plan* by the National Capital Commission.
 - *Technical Handbook of Bikeway Design* by Vélo, Québec.
 - *Planning and Design for Pedestrian and Cyclists* by Vélo, Québec

6.1.2.14 Root Barriers

To protect pathway sections in the vicinity of aggressive rooting species, install root barriers (refer to **Detail Sheet 37: Root Barriers**) along sections of pathways that run through Environmental Reserves (**ERs**), **Environmentally Significant Areas**, or

Municipal Reserves (**MRs**) where natural vegetation is being preserved and that have species of the Poplar family (except Aspen) or Willow family located within a 5 m set back of the edge of pathway. Root barriers do not need to necessarily run continuously through ERs, Environmentally Significant Areas or MRs; they will only be installed where there are encroaching species as per **Detail Sheet 37a: Root Barriers**.

6.1.3 Standard Specifications

6.1.3.1 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.

6.1.3.2 Inspections

- 1) The Contractor must have an approved set of drawings and specifications available prior to calling The City of Calgary Parks for an inspection.
- 2) The Contractor must obtain approval for the pathway alignment and sub-base (i.e. compaction and depth of gravel) prior to surfacing with asphalt.
- 3) All Regional pathways, must be inspected and maintained by The City of Calgary Parks.

6.1.3.3 Materials

- 1) **Sub-base:** 25 mm crushed gravel.
- 2) **Surface:** Mix “B-50” asphaltic concrete.
- 3) **Bollard** (refer to **Detail Sheet 31: Bollards** and **Detail Sheet 32: Bollards**):
 - Schedule 20 steel pipe, minimum 140 mm outside diameter.
 - 1 m height with 0.75 m in ground in concrete.
 - Steel cap welded on.
 - Painted white with 2 strips of reflective tape. All paint is to be powder-coated polyester.
 - Permanent unless a service vehicle cannot maneuver around it. In this case, it must be removable.
- 4) **Root Barriers:** 40 mil. thickness HDPE (high-density polyethylene) product or approved equal (refer to **Detail Sheet 37: Root Barriers** and **Detail Sheet 37a: Root Barriers**).

Note: mil. is a unit of measurement used for plastic thickness; 40 mil. = 1 mm.

6.1.3.4 Installation

Refer to **Detail Sheet 35: Pathways** and **Detail Sheet 36: Pathways - Typical Regional Pathway Cross Sections** for more information on items in this section.

- 1) Compact subgrade to 98% S.P.D.
- 2) Compact sub-base to 98% S.P.D. The sub-base must be 100 mm thick of 25 mm crushed gravel.
- 3) Surface with 75 mm thick asphalt to ensure:
 - Minimum density of 96% of its maximum design density. Density values must be established by Marshall Method (50 blows with mechanical compaction). Densities less than 96% must be paid for as described in **Standard Specifications Roads Construction**, section 308.05.02
 - Central crown with 2% cross fall, except where super-elevation is required on a curve.
 - No trapped low areas on pathway surface.
- 4) Ensure that pathways are not used as drainage swales. Use swales and culverts (refer to **Detail Sheet 38: Pathway Culvert and Edge Detail**) to ensure that there is positive drainage away from the pathway surface. Culverts are to be sized accordingly to adequately handle the anticipated flow.
- 5) Place good quality (raked and rolled) topsoil and sod, unless otherwise specified, on any turf areas damaged by construction.
- 6) Ensure that the sod surface is flush with the pathway edge.

6.1.3.5 Maintenance

Maintain pathways as per **CHAPTER 9: LANDSCAPE MAINTENANCE STANDARDS** from the time of installation until the FAC is issued by The City of Calgary Parks (refer to **2.9 FINAL ACCEPTANCE CERTIFICATE (FAC)** for more information.

6.2 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 pedestrian shortcut desire lines to minimize impact on the natural environment.

6.2.1 Planning Guidelines (Alignments)

- 1) 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.
- 2) Use trails as a secondary system to pathways.
- 3) Ensure trail alignments correspond to the [Natural Area Management Plan](#), Area Structure Plans, Outline Plans, and other Council-approved policy documents.
- 4) Locate crossings of major roads at overpasses or signalized intersections.
- 5) Submit proposed route plans for all natural areas and [Environmental Reserve \(ER\)](#) parcels to The City of Calgary Parks' [Planning & Development Services](#) for approval.

6.2.2 Design Guidelines

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

6.2.2.1 Natural Areas

- 1) Align trails around significant areas and sites; never go through.
- 2) Avoid damage to natural features, vegetation, and wildlife habitat.
- 3) Increase back sloping gradient to 2:1 to minimize fill coverage.
- 4) Submit proposed design plans for all natural areas and [Environmental Reserve \(ER\)](#) parcels to City of Calgary Parks' [Planning & Development Services](#) for approval as described in [2.3 CONSTRUCTION PLAN REQUIREMENTS](#).

6.2.2.2 Surface Materials

- 1) Use dirt for informal trails.
- 2) Use wooden chips, red shale, or crushed gravel (crusher fines) for formal, designed trails.

6.2.2.3 Width

- 1) 0.3 m to 0.5 m for informal trails.
- 2) 0.5 m to 1.5 m for formal designed trails.

6.2.2.4 Slope Grades

- 1) Less than 3% is required if the trail is to be wheelchair accessible.
- 2) Less than 5% is ideal.
- 3) 5% to 10% is acceptable.
- 4) More than 10%: provide switchbacks or stairs.

6.2.2.5 Safety Clearance

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

6.2.2.6 Pathway Handrail

- 1) Minimum railing height and design to be as per **Detail Sheet 30: Pathway Handrail** or to be an equivalent as approved by The City of Calgary Parks.
- 2) Usually made of galvanized steel or wood.
- 3) Install where a trail is within 1 m of the top of a 2:1 slope or steeper, and the slope is greater than or equal to 1 m in depth.
- 4) Under exceptional circumstances, and subject to approval by the City of Calgary Parks after an appropriate risk assessment, a pathway handrail might not be required. If a risk assessment is required, it must be provided by The City at no cost to the Developer.
- 5) Chain link fence is less desirable than galvanized steel or wood, 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.

6.2.2.7 Stairs

- 1) Avoid stairs if the trail is to be accessible to skiers and wheelchairs.
- 2) Stairs must be 1 m to 2 m wide and made of wood or rock.
- 3) Handrails as required for safety.

6.2.2.8 Amenities

- 1) In general, provide one trail entrance every 150 m, or as needed.
- 2) Provide one park bench every 250 m and one picnic table every 500 m. Environmentally sensitive areas should be assessed on a site-by-site basis.

6.2.2.9 Bridges

- 1) Railing height as per provincial building codes.
- 2) Minimum deck width: 1.5 m between railings.
- 3) Material examples: log stringers, laminated wooden beams, prefabricated steel and pre-cast concrete.
- 4) Submit concept drawings to The City of Calgary Parks' *Planning & Development Services* for approval as described in **2.3 CONSTRUCTION PLAN REQUIREMENTS**, however, final approval will come from the The City of Calgary Roads' Bridges section. Ensure that all drawings are stamped by a Professional Engineer.

6.2.2.10 Pedestrian Underpasses

- 1) Minimum height 3.0 m and minimum width 3.0 m.
- 2) Ensure that drainage is kept in a swale along one side.
- 3) Ensure that the underpass is adequately lit.
- 4) Preferable maximum length of 50 m.
- 5) Provide a skylight break in the underpass ceiling that corresponds with the median of a divided roadway on the surface above.

6.2.2.11 Accessible Use

- 1) Accessible Use is primarily required by people in wheelchairs or those without sight. The needs of these users are more stringent than for other walkers.
- 2) To fully accommodate all users in trail design, refer to **6.2.2.15 Recommended References**.

6.2.2.12 Cross-Country Skiing

- 1) The needs of skiers are more stringent than for walkers.
- 2) To fully accommodate all users in trail design, refer to **6.2.2.15 Recommended References**.

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6.2.2.13 Signage

- 1) Provide standard signs with trail name (see the City of Calgary's *Parks and Pathways Sign Manual*) at trail entrances and important junctions to ensure continuity and legibility of trail routes.
- 2) Provide standard hazard warning signs (see the City of Calgary's *Parks and Pathways Sign Manual*) where appropriate.

6.2.2.14 Design Drawings

- 1) Submit design drawings to The City of Calgary Parks' *Planning & Development Services* for approval as described in **2.3 CONSTRUCTION PLAN REQUIREMENTS** for all trail proposals in Environmental Reserves (*ERs*) and naturally vegetated areas.

- 2) Ensure that plans are at minimum 1:500 scale and include proposed trail details, gradients, and signage, plus adjacent park and land uses and roadways.

6.2.2.15 Recommended References

Refer to **APPENDIX C: REFERENCES** for source information.

- *AMC's Complete Guide to Trail Building & Maintenance* by the Appalachian Mountain Club.
- *Sentiers Quebec* by Comite Quebecois des Sentiers de Randonnee.
- *Access Design Standards* by The City of Calgary.
- *Trail Builder's Resources* by Alberta Trailnet.

6.2.3 Standard Specifications

6.2.3.1 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.

6.2.3.2 Inspections

- 1) The Contractor must have an approved set of drawings and specifications available prior to calling The City of Calgary Parks for an inspection.
- 2) The Contractor must obtain approval for the trail alignment prior to surfacing.

6.2.3.3 Materials

- 1) 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.
- 2) **Parks Gravel Trail Mix** - This product has been customized for pedestrian and bicycle oriented trails. It is not suitable for extensive vehicle use.

Description:

- Gravelly sand, some silt, trace of clay
- Optimum Moisture Content: 7.5%
- Grain Size Distribution:

Gravel	21.8%
Sand	61.5%
Silt	12.8%
Clay	3.9%

Moisture content and timely compaction are important when placing this material. Contractors can inquire about purchasing this material directly from The City of Calgary Roads' Materials Plant by contacting the [The City of Calgary Roads Construction](#).

The combined aggregates must meet the following gradation:

Table 6-3: Gradation Requirements

Sieve Size (mm)	% Passing
16	100
12.5	98 - 100
10	80 - 98
5	55 - 80
2.5	40 - 60
1.25	35 - 50
0.63	28 - 43
0.315	23 - 36
0.160	15 - 25
0.80	8 - 18

Gravel Trail Mix:

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 should be installed when the sub-grade is wet or when other conditions prevent proper spreading, finishing, or compaction.

Trail mix stockpiles stored on site greater than 30 days will be subject to inspection to ensure that the 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 the correct distribution of materials.

All supply and installation of granular trails must be as per [Standard Specifications Roads Construction](#), and this manual. Adherence to the desired mix will enhance the life of the product, which in turn will reduce the amount of materials washed away or broken down, and /or prevent/reduce potholes.

- 3) Asphalt or other alternatives should only be used in cases of heavy usage or extreme erosion problems.

6.2.3.4 Installation

- 1) Strip existing surface material to allow for a 150 mm compacted depth of approved material (refer to [6.1.3.3 Materials](#) for more information).
- 2) Haul and place trail mix to allow for crowning and compaction. Material must be placed and compacted on the same day.
- 3) Top of compacted trail mix should be 25 mm higher than the adjacent vegetation and existing ground level.
- 4) Provide 3% - 5% cross-fall or central crown as determined by site conditions. Final surface must be level and true with minimal undulations. Ensure that

there are no trapped low areas on the trail surface. Provide positive drainage away from the surface with diagonal water bars, ditches, swales, and culverts.

- 5) Finished trail compacted to 95% maximum dry density. Multiple passes by a vibrating roller with the application of water might be required to achieve the specified level of compaction. Ensure that no loose fine materials are left on the surface.
- 6) The finished gravel trail surface must be at the same elevation as any connecting existing trails or pathways. All grading must be free draining, and must not to impede existing drainage.
- 7) Place topsoil (raked and rolled) and grass seed mix, as approved by The City of Calgary Parks, on areas damaged by construction.

6.2.3.5 Maintenance

Maintain trails as per **CHAPTER 9: LANDSCAPE MAINTENANCE STANDARDS** from the time of installation until the FAC is issued by The City of Calgary Parks (refer to **2.9 FINAL ACCEPTANCE CERTIFICATE (FAC)** for more information.

6.3 Concrete Paving Stones

6.3.1 Description and Quality Assurance

The Contractor must have experience at performing this type and scale of work and must be willing to provide proof of this experience.

6.3.2 Materials

6.3.2.1 Cement

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

6.3.2.2 Aggregates

Must conform to the requirements of CAB3-A23-M77.

6.3.2.3 Admixtures

Must conform to the requirements of CAN-A23.1-M77.

6.3.2.4 Concrete Compressive Strength

Prior to delivery to site:

- Average Strength: 55 MPa
- Minimum Strength: 50 MPa

6.3.2.5 Absorption

Maximum individual sample: 5% in accordance with *ASTM C140 Standard Test Methods for Sampling and Testing Concrete Masonry Units and Related Units (Standard Specification for Solid Concrete Interlocking Paving Units)*.

6.3.2.6 Resistance to Freezing and Thawing

The manufacturer must 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 *ASTM C67 Method for Sampling and Testing Brick and Structural Clay Tile (Standard Specification for Solid Concrete Interlocking Paving Units)*, specimens must have no breakage and not greater than a 1% loss in dry weight of any individual unit when subjected to 50 cycles of freezing and thawing. This test must be conducted not more than 12 months prior to delivery.

6.3.2.7 Abrasion Resistance

When tested in accordance with *ASTM C418 Standard Test Method for Abrasion Resistance of Concrete by Sandblasting (Standard Specification for Solid Concrete Interlocking Paving Units)*, specimens must not have a volume loss greater than 15 cm³ per 50 cm². The average thickness loss must not exceed 3 mm.

6.3.2.8 Mix Design and Concrete Testing

The supplier must, immediately after the award of Tender and prior to any casting of interlocking stone, submit the proposed mix design (including source of proposed aggregates) to Parks' *Planning & Development Services* for approval.

The supplier must notify Parks' *Planning & Development Services* of casting items in order that arrangements for concrete testing and/or inspection can be made as required at the expense of The City of Calgary. The supplier must allow the Engineer free access to those portions of their plant where the pavers are being produced and stored for the purpose of that inspection.

6.3.3 Workmanship and Procedures

6.3.3.1 Forms

Forms must be true to the shape, lines, and dimensions called for on the drawings. They must be substantial and tight to prevent leakage of moisture. Maximum tolerance for final dimensions must be +/- 2 mm.

6.3.3.2 Concrete Compaction

During casting, sufficient vibratory or other mechanical effort must be applied to thoroughly compact the concrete.

6.3.3.3 Moist Curing

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

6.3.3.4 Steam Curing

If steam curing is used to maintain a daily cycle of casting, the following criteria for curing must be adhered to:

- 1) There must be a minimum of four hours delay after final placing of the concrete before steam is applied.
- 2) The maximum rate of concrete temperature rise is 20° Celsius per hour.
- 3) The maximum temperature to which the concrete must be raised is 70° Celsius.
- 4) The maximum rate of cooling is 20° Celsius per hour.

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

6.3.3.5 Handling, Storage and Delivery

Care must be taken in the handling, storage, and delivery of completed interlocking stone to avoid damage. Damage to units prior to acceptance by The City of Calgary at the point of delivery must be rectified by the supplier at no extra cost to The City of Calgary.

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

6.3.3.6 Visual Inspection

All units must be sound and free of defects that would interfere with the proper placing of the unit or impair the strength or 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) are not deemed grounds for rejection.

6.3.3.7 Sampling and Testing

The purchaser, or his authorized representative, must 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 *ASTM C140 Standard Test Methods for Sampling and Testing Concrete Masonry Units and Related Units (Standard Specification for Solid Concrete Interlocking Paving Units)*.

6.3.3.8 Rejection

In case the shipment fails to conform to the specified requirements, the manufacturer may retain the lot, and new specimens can 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 will be rejected.

6.3.4 The Base

Refer to **Detail Sheet 39: Concrete Paving Stones/Weeping Tile** for more information on items in this section.

Table 6-4: The Base

Sieve Size (mm)	% Passing
9.50 mm	100
4.75 mm	95 - 100
2.36 mm	80 - 100
1.18 mm	50 - 85
600 µm	25 - 60
300 µm	10 - 30
150 µm	2 - 10

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

6.3.5 Sand Bedding Course

Refer to **Detail Sheet 39: Concrete Paving Stones/Weeping Tile** for more information on items in this section.

- 1) The sand-bedding course must be spread evenly over the area to a level that will produce the required 50 mm thickness when the paving stones have been placed and vibrated.
- 2) Once leveled, this sand-bedding course must not be disturbed in any way.

6.3.6 Installation

Refer to **Detail Sheet 39: Concrete Paving Stones/Weeping Tile** for more information on items in this section.

6.3.6.1 Base

- 1) Where service vehicles will be traveling on concrete paving stones, the pavers must be set on a concrete base and seated on a latex or polymer modified mortar. All joints must be mortar filled.
- 2) 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.

6.3.6.2 Edge Restraint

All edges of the pavers installation must be restrained. There must be positive edge restraint and the type of restraint used must be subject to the approval of The City of Calgary Parks.

6.3.6.3 Laying of Concrete Pavers

- 1) The concrete pavers must be laid in a pattern approved by The City of Calgary Parks.
- 2) The concrete pavers must be laid in such a manner that the desired pattern can be maintained, and the joints between the stones do not exceed 3 mm.
- 3) The gaps at the edge of the paved surface must be filled with standard edge pieces or with stones cut to fit. The stones must be cut to a straight, even surface without cracks or chips.
- 4) The concrete pavers must be vibrated to their final level.
- 5) After vibration, sand must be brushed over the surface and vibrated to completely fill the joints. Sand worked between the paving stones must be thoroughly mixed with 6% by weight of bentonite clay.
- 6) After final vibrating, the surface must be true to line and grade and must not vary by more than 8 mm when tested with a 3 m board at any location on the surface.
- 7) When installation is complete, surplus material must be swept from the surface and the entire site left clean.

6.3.7 Maintenance

Maintain concrete paving stones from the time of installation until the FAC is issued by The City of Calgary Parks (refer to **2.9 FINAL ACCEPTANCE CERTIFICATE (FAC)** for more information.

CHAPTER 7: AMENITIES

7.1 Development Guidelines

The [Land Use Bylaw](#) provides requirements for a Development Permit (DP). Under this bylaw certain amenity structures may require a 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.

7.2 Material and Installation Standards

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

All standard specifications are the latest issue, except when a year is mentioned. For standard organization contact information, refer to [APPENDIX B: CONTACTS](#).

7.2.1 American Society for Testing and Materials (ASTM)

- 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

7.2.2 Canadian Standards Association (CSA)

- | | | |
|--------------|----------|---|
| 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 | M 1984 | Welded steel construction (metal arc welding) |

7.2.3 Canadian General Standards Board (CGSB)

- | | |
|----------------------|--|
| 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 |

7.3 Play Structures

7.3.1 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.

7.3.2 Inspections

- 1) The Contractor must have an approved set of drawings and specifications available prior to calling The City of Calgary Parks for an inspection.
- 2) The design and installation of playground structures must comply with CSA standards on children's play spaces and equipment.

Note: A letter of compliance to CSA standards will be required prior to signing a construction completion certificate. Contact the [Canadian Standards Association \(CSA\)](#) for more information.

- 3) Give timely notice (refer to **2.6 INSPECTIONS**) to The City of Calgary Parks when Construction Completion Certificate for work is required.

7.3.3 Materials

- 1) Wooden playground structures and surrounding wooden borders must not be used in construction.
- 2) Use nylon locking nuts only.
- 3) Playground edge restraints (refer to **Detail Sheet 40: Playground Edge Restraints (Plastic Timber)**, **Detail Sheet 40a: Playground Edge Restraints (Plastic Timber Above Ground)**, and **Detail Sheet 41: Playground Edge Restraints**) must be constructed of plastic timbers or concrete.

Note: Plastic edge restraints will be of a minimum of 1.5 m in length.

- 4) Provide pea gravel or gyrostone base to the following depths:

Table 7-1: Base Depth

Structure Fall Height	Depth
<2.1 m	200 mm
2.1 m to 2.99 m	225 mm
3.0 m or greater	300 mm

7.3.4 Equipment Design and Layout

7.3.4.1 Hardware

- 1) All suspended elements, such as trapeze bars, rings, tight rope cables and swing seats, must be fastened at the top and the 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.

- 2) All chains must be at least ¼" or larger, zinc plated or galvanized.
- 3) Swing seats and chains must be connected by means of a positive locking system, such as hammer locks or clevis hooks (no quick links).
- 4) Eye bolts must be forged or welded.
- 5) Bearing hangers must be complete with oil-impregnated bronze bushing and must be wrap-free in design.

7.3.4.2 Slides

- 1) The sitting section of all slides must have protective side enclosures that diminish from guardrail height (i.e. 600 mm) to side wall height (i.e. 100 mm) in a smooth curve. They must be designed so that the user's flow of hand movement is unhampered and smooth.
- 2) All sliding surfaces must have sidewalls to control and guide descent, and to prevent the lateral discharge of the child during descent. A minimum height of 100 mm of sidewall must be provided, and may be reduced to zero at the exiting section.
- 3) All slides must be oriented north or east (i.e. not south or west).
- 4) Plastics are not to be used in the construction of slides. They must be constructed out of metals that are not subject to structural degradation such as rust or corrosion.

7.3.4.3 Tube Structures

Tube structures, and any other apparatus that restricts visibility into the structure, will not be permitted.

7.3.4.4 Swings

The distance between individual swings and the distance between a swing and the swing structure must be at least 750 mm (30").

7.3.4.5 Posts

- 1) All support post must 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.
- 2) Post caps must be secured by means of electronic weld, rivets or interference fit rib.
- 3) 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.

7.3.4.6 Teeter Totters

Teeter totters must not have inclines more than 25° from the ground and the teeter totter beam must be of such a length that children are no more than 1.524 m (5 feet) from the ground.

7.3.4.7 Bridges

Suspended bridges must have a positive locking system, such as hammer locks.

7.3.4.8 Concrete Anchors

All concrete anchors must be installed at a minimum depth of 300 mm below the surface of the play area.

7.3.4.9 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.

7.3.4.10 Signs

If the playground is in a park, the Developer must install “No Dogs within 20 m of Play Apparatus” signs. Signs and posts to be provided by The City of Calgary.

7.3.4.11 Benches

Subject to providing a universally accessible surface for access, benches may be installed inside the children's play space border. All related CSA standards must be adhered to.

7.3.5 Installation

Refer to the following detail sheets for more information on items in this section:

- ***Detail Sheet 40: Playground Edge Restraints (Plastic Timber)***
- ***Detail Sheet 40a: Playground Edge Restraints (Plastic Timber Above Ground)***
- ***Detail Sheet 41: Playground Edge Restraints***
- ***Detail Sheet 42: Playground Edge Restraints***
- ***Detail Sheet 43: Playground Edge Restraints***

- 1) In parks where play equipment is an appropriate development activity and a play structure will not be installed by the Developer, a level turf area of 25 m² must be made available by the Developer for future installation. Ensure that the future location is clearly labeled on the Layout Plan.
- 2) Prior to installation, the Contractor must submit the construction plans (including the product name and model type or number of the play structure) to The City of Calgary Parks' ***Planning & Development Services*** for approval as described in **2.3 CONSTRUCTION PLAN REQUIREMENTS**.
- 3) Ensure that the base of the play area is constructed to provide adequate surface drainage (refer to ***Detail Sheet 42: Playground Edge Restraints*** and

Detail Sheet 43: Playground Edge Restraints).

7.3.6 Maintenance

Maintain play structures as per **CHAPTER 9: LANDSCAPE MAINTENANCE STANDARDS** from the time of installation until the FAC is issued by The City of Calgary Parks (refer to **2.9 FINAL ACCEPTANCE CERTIFICATE (FAC)** for more information.

7.4 Site Furnishings

7.4.1 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.

7.4.2 Inspections

Give timely notice as per **2.6 INSPECTIONS** to The City of Calgary Parks when the CCC is required (refer to **2.7 CONSTRUCTION COMPLETION CERTIFICATE (CCC)** for more information.

7.4.3 Design, Materials and Installation

7.4.3.1 General Guidelines

- 1) All site furnishing designs and specifications must be reviewed and approved by The City of Calgary Parks prior to installation.
- 2) Site furnishings design and finishes should be consistent with site furnishings in adjacent parkland, if applicable.
- 3) All site furnishings should be of a consistent style and type within the community and or development phase.

7.4.3.2 Trash Receptacles

- 1) **Design**
 - a) Haul-all containers or equivalent are encouraged but are not mandatory (refer to **7.4.3.1 General Guidelines**).
 - b) 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 66 x 91 cm (26"x36") garbage bag.
- 2) **Materials**
 - a) Timber Component
 - Kiln dried and of nominal size.
 - Fir/spruce/pine/cedar species.
 - Chamfered on all sides and ends.
 - Smooth finish.

- b) 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.

3) Installation

- a) Provide concrete, asphalt, or compacted granular base.
- b) Ground model types must be bolted to a concrete pad using vandal-resistant fasteners as per the manufacturer's requirements.
- c) Pedestal type must be set in concrete to a minimum depth of 300 mm below finish grade.
- d) Set back trash receptacles at least 10 m from all park benches wherever possible.

7.4.3.3 Bench

1) Design

- a) Bench must have a back.
- b) Length about 1.8 m.
- c) Pedestals must be of a Schedule 40 metal.
- d) Metal mesh or wooden seat/back.

2) Materials

- a) Timber Component
 - Kiln dried and nominal size.
 - Fir/spruce/pine/cedar species.
 - Smooth finish.
- b) 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 manufacturer's specifications.

3) **Installation**

- a) Provide a concrete or asphalt pad, or a compacted granular base.
- b) Seating surface to be 410-440 mm above finished grade.
- c) Pedestals must be set in concrete to a minimum depth of 600 mm below finished grade.
- d) Ground model types must be bolted to a concrete pad using vandal-resistant fasteners as per the manufacturer's requirements.

7.4.3.4 Maintenance

Maintain site furnishings as per **CHAPTER 9: LANDSCAPE MAINTENANCE STANDARDS** from the time of installation until the FAC is issued by The City of Calgary Parks (refer to **2.9 FINAL ACCEPTANCE CERTIFICATE (FAC)** for more information.

7.5 Metal Work

7.5.1 Description and Quality Assurance

- 1) This section specifies the fabrication, supply and installation of miscellaneous metal items and fasteners.
- 2) Work must conform to The City of Calgary Roads' [Standard Specifications Roads Construction](#) where applicable.
- 3) The Contractor must have experience at performing this type and scale of work and be willing to provide proof of this experience.
- 4) 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.

7.5.2 Shop Drawings and Submittals

- 1) Submit shop drawings for review by The City of Calgary Parks' [Planning & Development Services](#) as described in **2.3 CONSTRUCTION PLAN REQUIREMENTS**.
- 2) Indicate materials, connections, attachments, anchorage, and location.
- 3) Submit samples of any or all specified materials, if requested, to The City of Calgary Parks' [Planning & Development Services](#) for approval as described in **2.3 CONSTRUCTION PLAN REQUIREMENTS**.

7.5.3 Product Delivery, Storage and Handling

Store fabricated metal products and fasteners on racks or skids. Protect items from the elements and damage by other materials. Maintain steel in its fabricated form.

7.5.4 Job Conditions

- 1) Prior to commencing work, report (in writing) to The City of Calgary Parks any conditions and/or defects encountered on the site upon which work of this section may depend, and which might adversely effect the performance of that work.
- 2) Do not commence work until such conditions and/or defects have been investigated and corrected.
- 3) 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.
- 4) Protect all metal products from damage, trespassers, and the harmful effects of weather, water or mechanical shock until properly installed.

7.5.5 Inspections

- 1) The Contractor must have an approved set of drawings and specifications available prior to calling The City of Calgary Parks for an inspection.
- 2) Obtain The City of Calgary Parks approval of the layout before proceeding with work.
- 3) Give timely notice as per **2.6 INSPECTIONS** to The City of Calgary Parks when the CCC is required (refer to **2.7 CONSTRUCTION COMPLETION CERTIFICATE (CCC)** for more information.

7.5.6 Materials

- 1) General Purpose Steel - C.S.A. G400-21.
- 2) Bolts and Nuts - A.S.T. A325-71A.
- 3) Galvanizing CGSB G164 - 650 u zinc per m².
- 4) Primer - CGSB 1-GP-40 - oil alkyd type.
- 5) Welding Materials - C.S.A. 516.
- 6) Structural Steel - C.S.A. G40-21.
- 7) Paint - Ready mixed non-metal products as detailed and applied according to manufacturer's recommendations.

7.5.7 Fabrication

- 1) Verify site dimensions and conditions before proceeding with shop fabrication.
- 2) Fabricate all items in the shop to approved Shop Drawings.
- 3) Fabricate items complete with components for anchoring. After fabrication, radius all edges, welds, and corners.
- 4) Welds must be continuous fillet type, finished by grinding and filling for all amenities that are exterior installations.
- 5) Drill all holes, countersinking where required.
- 6) Fill open joints, depressions, and seams with metallic paste filler (or by continuous brazing or welding) and grind smooth to true form.
- 7) After fabrication, de-scale steel, remove roughness and irregularities, clean oil and grease from surface, and prepare for priming and galvanizing.
- 8) 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.
- 9) Where priming is called for, apply one full coat of primer.
- 10) Paint, where called for, with polyester coat finish or electrostatic. Obtain approval from The City of Calgary Parks' **Planning & Development Services** on colour and type before painting.
- 11) Bolts, nuts, washers, screws, nails, and all fasteners must be heavy duty galvanized or stainless steel. Supply all anchorages for attachment to structure as detailed.

7.5.8 Installation

- 1) Layout all work on-site according to drawings and obtain approval from The City of Calgary Parks' *Planning & Development Services* before proceeding.
- 2) Provide temporary supports and bracing as required to steady metal work until installation is complete.
- 3) Protect metal work from damage during installation. Touch-up primer and/or paint that was chipped during installation.
- 4) When excavating, ensure that all utility lines are properly staked. Hand excavation must take place as per standard utility requirements.
- 5) Make all pipe bends with approved bending tools. Bends are to be smooth transition, without kinks, crimps, bulges, or other deformations.
- 6) Where anchors, fastenings, or sleeves have to be built-in by other trades, supply necessary templates, instructions, and inspection to ensure satisfactory installation.
- 7) All broken welds must be completely separated and ground down, and the joints cleaned and re-welded as specified. Re-galvanize, or prime and paint entire unit, as required.
- 8) Clean up and remove off site all debris at the end of each working day, or as required.

7.5.9 Maintenance

Maintain all metal work from the time of installation until the FAC is issued by The City of Calgary Parks (refer to *2.9 FINAL ACCEPTANCE CERTIFICATE (FAC)* for more information.

7.6 Timber and Woodwork

7.6.1 Description and Quality Assurance

- 1) This section specifies the supply and installation of timber and wood elements.
- 2) All work must be executed by skilled tradesmen having experience at performing this type and scale of work, and who must be willing to provide proof of this experience.
- 3) All wood must comply with the grade specified.

7.6.2 Shop Drawings

- 1) Submit shop drawings for review to The City of Calgary Parks' The City of Calgary Parks' Planning & Development Services.
- 2) Clearly show materials, connections, attachments, reinforcements, anchorage, and location.

7.6.3 Product Delivery, Storage and Handling

- 1) Protect all materials from harmful exposure during transportation to site.
- 2) On delivery, store all materials off the ground and protect from adverse conditions to prevent deterioration, damage, and/or impairment of structural or other essential properties

7.6.4 Job Conditions

- 1) Prior to commencing work, report (in writing) to The City of Calgary Parks' Planning & Development Services any conditions or defects encountered on the site which might adversely affect the performance of the work.
- 2) Do not commence work until such conditions and/or defects have been investigated and corrected.
- 3) 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.
- 4) 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.
- 5) Check and verify all site dimensions governing the fabrication of shop made items, and report any discrepancies immediately to The City of Calgary Parks' Planning & Development Services.

7.6.5 Inspections

- 1) The Contractor must have an approved set of drawings and specifications available prior to contacting The City of Calgary Parks for an inspection.

- 2) 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.
- 3) Give timely notice as per **2.6 INSPECTIONS** to The City of Calgary Parks when the CCC is required (refer to **2.7 CONSTRUCTION COMPLETION CERTIFICATE (CCC)** for more information.

7.6.6 Materials

7.6.6.1 Timber and Lumber

All lumber must be #1 Construction Grade, dressed (S4S surface planed); Spruce, Western Pine or Douglas Fir, 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 must be sawn straight, square and true.

7.6.6.2 Plywood

Exterior type plywood, free of all checks, splits, open joints, cracks, knot holes, loose knots, and/or other defects, conforming to C.S.A. 0151-M1978 and 0121-M1978 for thickness and grade

7.6.6.3 Nails, Spikes, Bolts, Lagscrews, etc.

Hot dipped galvanized in accordance with C.S.A. G164-M1981 and of the size and/or weight specified.

7.6.6.4 Connecting Steel

Medium structural steel, conforming to C.S.A. G40-4 latest edition, and hot dipped galvanized as specified in **7.5 Metal Work**.

7.6.6.5 Steel Cable

Multi-strand 10 mm diameter galvanized steel cable with galvanized clamps as detailed and specified in **7.5 Metal Work**.

7.6.7 Prefabricated Units

- 1) Manufacture all prefabricated units in strict accordance with approved shop drawings.
- 2) Items brought onto a site which does not conform to the shop drawings and specifications will be rejected.
- 3) Apply a shop coat of zinc primer conforming to C.G.S.B. 1-GP-40C to metal fasteners where specified.

7.6.8 Installation

- 1) 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 keep them plumb and true until permanently fixed.
- 2) Ensure that structural supports and members are capable of safely supporting imposed loads. Report any discrepancies immediately to The City of Calgary Parks' *Planning & Development Services*.
- 3) Execute all fastening with nails, spikes, bolts, or framing anchors as detailed. Counter sink all exposed bolts and nuts where required. Drill the bolt hole 2 mm larger than the diameter of the bolt, and after final installation pean all bolts over to prevent removal of nuts.
- 4) Ensure that all debris is cleaned up and removed off site at the end of each working day or as required.
- 5) Ensure that all drilled, sawn, or routed edges are free of splinters or burrs. Sand smooth if required.
- 6) All woodwork is to be finished with an approved exterior paint or stain as detailed.

7.6.9 Maintenance

Protect and maintain all timberwork, woodwork and finishes from the time of installation until the FAC is issued by The City of Calgary Parks (refer to **2.9 FINAL ACCEPTANCE CERTIFICATE (FAC)** for more information.

7.7 Fencing (Chain Link & Post-and-Cable)

7.7.1 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.

7.7.2 Job Conditions

- 1) Prior to commencing work, verify all job conditions on site. Report (in writing) to The City of Calgary Parks' Planning & Development Services any conditions at variance with the drawings and specifications.
- 2) Do not begin work until any such conditions have been investigated and corrected.
- 3) 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.
- 4) Protect all plant material and structures from damage. Make good all damage at no extra cost (refer to 4.1.7 Tree Replacement/Compensation Guidelines for more information).
- 5) The Contractor is responsible for contacting the appropriate City of Calgary Parks' Operations office for irrigation locations.

7.7.3 Inspections

- 1) The Contractor must have an approved set of drawings and specifications available prior to contacting The City of Calgary Parks for inspection.
- 2) Prior to construction, the Park Development Inspector will verify the installation of fencing to protect Environmental Reserve (ER)s and Natural Areas (refer to 7.7.7 Location and Type for more information).
- 3) Give timely notice as per 2.6 INSPECTIONS to The City of Calgary Parks when the CCC is required (refer to 2.7 CONSTRUCTION COMPLETION CERTIFICATE (CCC) for more information).

7.7.4 Materials - Chain Link

See The City of Calgary's Standard Specifications Roads Construction.

7.7.5 Materials - Post-and-Cable

Refer to Detail Sheet 45: Fence - Post-and-Cable for more information on items in this section.

- 1) **Lumber:** All lumber must be rough-cut, No. 2 Construction Grade, and kiln dried.

- 2) **Steel Cables and Clamps:** All steel cables and clamps must be hot-dipped galvanized to C.S.A. G164 or as specified. The steel cables must have a 10 mm (3/8") diameter.

7.7.6 Fabrication - Chain Link

See The City of Calgary's [Standard Specifications Roads Construction](#).

7.7.7 Location and Type

- 1) Flankage and rear of lots adjacent to parks, public utility lots (**PULs**), and rights-of-way (**RoWs**) must have chain link, wood screen, or other type of fencing as approved by The City of Calgary Parks.
- 2) Where parks, public utility lots (**PULs**), and rights-of-way (**RoWs**) abut lanes, post-and-cable fencing must be installed.
- 3) Environmental Reserves (**ERs**), and Natural Areas must be fenced off with snow fencing or equivalent by the Developer prior to construction. The Developer will contact the appropriate City of Calgary Parks' **Development Inspector** for a meeting to verify the location of this temporary fencing prior to installation.

7.7.8 Installation - Chain Link

See The City of Calgary's [Standard Specifications Roads Construction](#).

7.7.9 Installation - Post-and-Cable

Refer to **Detail Sheet 45: Fence - Post-and-Cable** for more information on items in this section.

- 1) Provide all new material unless directed otherwise.
- 2) Post spacing to be as detailed in approved drawings and specifications or as specified by The City of Calgary Parks.
- 3) Orient the face cuts of the posts as directed by The City of Calgary Parks' **Development Inspector** on a site-specific basis.
- 4) Provide sufficient tension on steel cable to eliminate sag.
- 5) Install the first cable clamp over the end of the cable to eliminate frayed ends.

7.7.10 Maintenance

Maintain all fence installations from the time of installation until the FAC is issued by The City of Calgary Parks (refer to **2.9 FINAL ACCEPTANCE CERTIFICATE (FAC)** for more information.

7.8 Lighting

- 1) Lighting will be permitted in parks in one (or more) of the following situations:
 - a) It is identified by The City of Calgary as part of the transportation system.
 - b) It is used as security for structures.
 - c) In accordance with The City of Calgary's *Linear Park Policy*.
- 2) Lighting standards must be 6 Lux minimum.

7.9 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-way (**RoW**).
- 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 **RoW**.
- 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 enter into an Optional Amenities Agreement and/or a Landscape Maintenance Agreement with The City of Calgary, or they must provide an Endowment Fund as per the corporate policy and procedures as approved by Council for [Enhanced Maintenance Agreement and Infrastructure Agreements](#). Contact the [Business Strategy and Contracts Lead](#) for further details.
- 5) A firm indication of whether an Optional Amenities Agreement, Landscape Maintenance Agreement, or Endowment Fund will apply must 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 Final Acceptance Certificate (FAC) approval.
- 7) Maintenance manuals are to be submitted to The City of Calgary Parks' [Planning & Development Services](#) 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, and address of the community, or the Developer's identification, cannot be placed on Municipal Reserves (**MRs**). Community entrance features with this type of information must be placed on private lands, or within wider road **RoWs** upon approval by The City of Calgary Roads. All community entrance features are to be in compliance with the [Land Use Bylaw](#), (Part 3: Rules Governing All Districts; Division 5: Signs).
If Community entrance features are placed on road **RoWs**, an Optional Amenities Agreement is required.

7.10 Landscape Boulders and Rocks

1) Landscape boulders/rocks placed in turf areas must have a 150x150 mm concrete mowing strip placed around their base, flush to final grade. All other landscape boulders/rocks must be placed in planting beds.

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2) All boulders must be buried a minimum one third below finished grade.

3) All sandstone boulders must be structurally sound and free of any spalling, cracks, crevices, or splinters. Mud stone is not acceptable. Refer to **Detail Sheet 74: Dry Pack Rock Retaining Wall** for more information.

4) Landscape boulders/rocks near playgrounds must meet the safety setbacks as specified in the CSA standards.

Note: Landscape boulders and rocks are not allowed within a playground area.

7.11 Pedestrian Bridges

Submit concept drawings to The City of Calgary Parks' **Planning & Development Services**, however final approval will come from The City of Calgary's **Transportation Infrastructure**. Ensure that a Professional Engineer stamps all drawings. The Developer must ensure that the proposed structure conforms to all applicable City Bylaws and provincial building codes.

7.12 Retaining Walls

Submit concept drawings for approval to The City of Calgary Parks' **Planning & Development Services**. If the retaining wall is to be made from sandstone, it must be constructed as per **Detail Sheet 74: Dry Pack Rock Retaining Wall**. Ensure a Professional Engineer stamps all drawings of retaining walls that exceed 1 m in height. The Developer must ensure that the proposed structure retaining wall conforms to all applicable City Bylaws and provincial building codes.

CHAPTER 8: IRRIGATION

8.1 Description and Quality Assurance

- 1) 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.
- 2) As of June 30, 2011, contractors working on irrigation systems and supplemental components that will eventually be turned over to The City, must be certified as a Certified Irrigation Contractor (CIC). The certification must be issued by the Irrigation Association, Falls Church, VA. The contractor must ensure the project superintendent, or authorized designate, responsible for the daily delivery of the project be certified as a CIC.

8.2 As-Built Drawings

Refer to **Detail Sheet 47: Irrigation - As-Built** for more information on items in this section.

- 1) Verify all conditions on the site and immediately report all discrepancies and variations from the drawings to The City of Calgary Parks' **Planning & Development Services**.
- 2) Submit a reproducible Mylar® drawing, which has been drafted in a professional manner, is to scale on legal base plan, and which shows the exact "as-built" location of the system relative to the property line. 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 pigtailed, and other irrigation materials must be included prior to the issuance of a Final Acceptance Certificate (FAC). 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) Ensure that sheet size is 594x841 mm, laid out on The City of Calgary Parks' title block.
 - b) Label as "As-built Irrigation System".
 - c) Include key plan showing location of site, including street names.
 - d) Ensure that labeling is a minimum of a 12 pt. font.
 - e) Include a plan of the 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) Include a municipal address and legal description of the property, including a registered plan number. If more than one address applies, refer to the location of the park's water service.
- g) Ensure the largest scale (1:250) with a minimum letter size of 12 pt. font.
- h) Drawing 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 the 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 the last turn and continue as before until all zones are numbered.
- j) Include the name, address and 24-hour phone number of the installer, owner/Developer, and Consultant (where applicable).
- k) Show all 110 volt electrical wire and 110 volt electrical conduit.
- l) Include the serial number, installation date, and confirmation of up-to-date inspection of double check valve, in accordance with The City of Calgary Water Resources' procedure.
- m) Provide zone flow rates and a precipitation table.

8.3 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 can be installed. The City of Calgary Parks reserves the right to reject any material that does not meet specifications.

8.4 Job Conditions

- 1) Proceed with irrigation installation only during suitable weather conditions.
- 2) Prior to commencing work, report (in writing) to The City of Calgary Parks' Planning & Development Services any conditions or defects encountered on the site which might adversely affect the performance of the work.
- 3) Do not commence work until such conditions and/or defects have been investigated and corrected.
- 4) Protect the system from being contaminated during construction by blocking all open pipe ends.

8.5 Inspections and Testing

8.5.1 Drawings

The Contractor must 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.

8.5.2 Open Trench Inspections and Testing

- 1) The City of Calgary Parks must be given a minimum of 24 hours notice when an open trench inspection is required.
- 2) Items which must be in place and complete for the open trench inspection include:
 - a) Trench depth and alignment.
 - b) Bedding material.
 - c) Pipe alignment joints and expansion couplers, and valves.
 - d) Hydro fusion or electro fusion joints.
 - e) Drains with gravel sumps.
 - f) Swing joints and head locations.
 - g) Thrust blocking and conduit under paving.
 - h) Pressure test without heads (static water pressure).
 - i) Electrical wiring and electrical conduit.
 - j) Meter as supplied by The City of Calgary.
 - k) Other items as deemed appropriate by the Parks *Development Inspector*.
- 3) Items 2c through 2j must be inspected in the event that the system is “plowed-in.”
- 4) Before backfilling, ensure that acceptance and approval of the irrigation system as viewed during the open trench inspection has been received (in writing) from The City of Calgary Parks.
- 5) The Parks *Development Inspector* must be given a minimum of 24 hours notice of when the HDPE welding process is ready to begin.
- 6) All butt fusion and electro fusion welds must meet applicable specifications. Any butt fusion or electro fusion welds not meeting the specifications may require the following additional tests, at the discretion of the Parks Development Inspector:
 - a) Bend Back Test
 - A strap or section must be cut out of a fused section of pipe; the strap must extend a minimum of 150 mm on either side of the fusion and must be a minimum of 25 mm 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
- b) Pressure/Leak Test
Must be performed consistent with the *ASTM F2164 - 02(2007) Standard Practice for Field Leak Testing of Polyethylene (PE) Pressure Piping Systems Using Hydrostatic Pressure.*

8.5.3 Construction Completion Inspection and Pressure Test

- 1) The City of Calgary Parks must be given a minimum of 24 hours notice when a construction completion inspection and pressure test is required.
- 2) The inspection and pressure test must not be done unless written proof of the open trench inspection is available.
- 3) Items that must be in place and complete for the inspection and pressure test include:
 - a) Back filling and landscaping.
 - b) Drain and valve boxes installed as per specifications and clear of debris.
 - c) Water pressure on and flowing freely through the system.
 - d) Irrigation head adjustment, and all heads activated and throwing water, to provide adequate coverage as per the manufacturer's recommendations and the approved irrigation drawing.
- 4) At The City of Calgary Parks' discretion, a pressure gauge must be placed on any point in the system and a reading must be taken to confirm operating pressure in system. Pressure gauges must be minimum 50 mm face, 0-1000 kPa, Peacock or equal, complete with pet cock.
- 5) Annually test the backflow prevention device in accordance with [Wastewater Bylaw 40M2006](#). A copy of the *Testing and Inspection Report for Double Check Valve Assemblies* must be submitted to the Parks Development Inspector for forwarding to The City of Calgary Water Services' Wastewater. The municipal address of the site must be indicated on the Report.
- 6) Submit a completed *Parks Irrigation Meter Sheet* (refer to **Figure 8-1**).
- 7) Supply a copy of the Plumbing Permit. 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 The City of Calgary Parks' **Planning & Development Services** prior to FAC. Discrepancies (if any) noted on the as-builts will be corrected on the Mylar® copy.
- 8) The City of Calgary Parks will issue (in writing) acceptance and approval of the construction completion inspection and pressure test.

8.5.4 Final Acceptance Certificate Inspections

- 1) Irrigation items to be approved at a FAC inspection include:
 - a) All valves, valve boxes, sprinkler heads, or other irrigation sprinkler system components, which must be undamaged and in good working condition.
 - b) All valve boxes, which must be flush and set to the approved final grade.
 - c) All valve boxes, which must be free of debris with the valve assemblies exposed as per specification.
 - d) All zone control valves and drain valves, which must be functioning properly with no leakage through the valve.
 - e) All heads, which must be in a vertical position and installed at a depth recommended by the manufacturer. As well, 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.
- 2) 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.

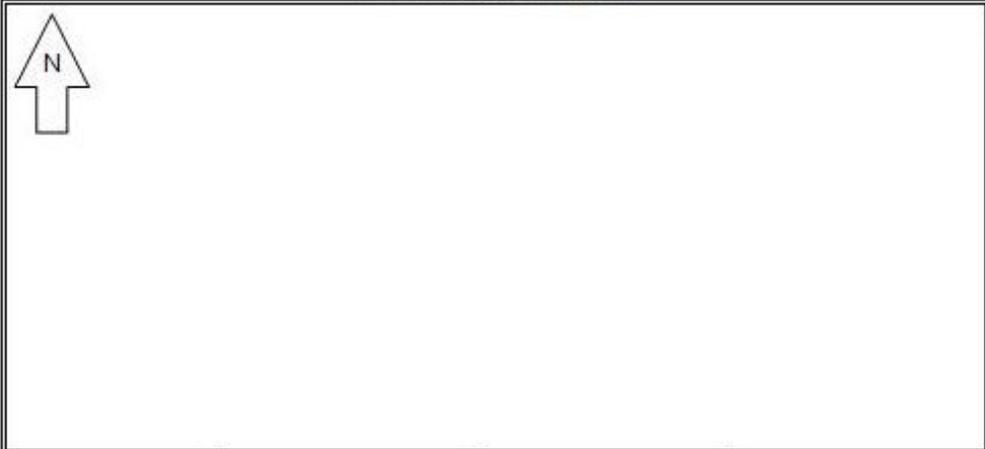
Note: The municipal address of the site must be indicated on the testing and inspection report.
- 3) Maintenance manuals are to be submitted to The City of Calgary Parks' Planning & Development Services prior to FAC approval for all optional amenities associated with irrigation and/or water systems (i.e. water features, fountains, pumps, booster pumps, spray pools, etc.).
- 4) Temporary irrigation systems must be removed and their water services must be "killed" (i.e. removed to the water main). Provide certification from The City of Calgary Water Services' Wastewater that this has been completed to their satisfaction.

Note: Submit a reproducible Mylar® drawing which shows the exact "as-built" location of the irrigation system
- 5) Maintenance manuals are to be submitted to The City of Calgary Parks' Planning & Development Services prior to the issuance of the FAC (refer to 8.2 As-Built Drawings for more information).
- 6) Submit a completed *Parks Irrigation Meter Sheet form* (refer to Figure 8-1), and a completed *Irrigation Information Sheet* (refer to Figure 8-2).

Note: The *Irrigation Information Sheet* must contain actual calculated values, not the standard numbers out of the catalogues.
- 7) FACs submitted after September 30th for sites with an irrigation system will require the Parks' Water Management Lead (or designate) present during the winterizing procedure. The City of Calgary Parks' Operations will ensure that staff will be available upon 48 hours notice. As an alternative, Parks' Operations 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 might be required the following spring.

- 8) A pressure and leak test for HDPE (if required) must be performed consistent with the ASTM F2164-02(2007) Standard Practice for Field Leak Testing for Polyethylene (PE) Pressure Piping Systems Using Hydrostatic Pressure.

Figure 8-1: Sample Parks Irrigation Meter Sheet

Parks Irrigation Meter Sheet			
MFRM000	Quality Management Document Parks Irrigation Meter Report		ISO Elem: 4.0
Owner:	Approved by:	Issue Date:	Controlled Document
Irrigated Site Information			
Address:		Legal Description:	
Reference Address:		Community:	Phase:
Developer:		Steward:	MGMT_NUM:
Meter Information			
Meter Pit Location:		Meter Size:	50 mm 100 mm 150 mm
Tag #:		Serial #	
Install Date:		Install Reading:	
Power Source:	SOLAR ELECTRIC	Computer Hook up:	NO YES
Electric Meter:	NO <input type="checkbox"/> YES NUMBER:	Outlet Tested:	NO YES
Development Inspection Information			
Irrigation Contractor:		Development Inspector:	
Phone :		As-Built: <input type="checkbox"/> NO <input type="checkbox"/> YES	
Day Agreement #:		Development Status: (CCC) (FAC): DATE:	
Developer & Consultant Information			
Name of Developer:		Name Of Consultant:	
Contact Person:		Phone:	
Meter Location Diagram			
			
REF:	Revision Date:	Revision #:	Page:
Copy 1: Parks Inventory # 54	Copy 2: Waterworks: 334	Copy 3: Inspector	Copy 4: Consultant

8.6 Materials

8.6.1 Testing

Materials must be new and without flaws or defects of any type. All irrigation items must meet current specifications and go through a testing period of the duration specified and under the conditions determined by the type of product, but not less than one year.

8.6.2 Substitutions

For substitutions, supply material with descriptive literature and samples at least three weeks before commencement of work. All substitutions must meet or exceed the specifications and performance standards of proposed system, and be approved by the Parks' **Water Management Lead**, without any additional cost to The City of Calgary Parks.

8.6.3 Piping and Fittings

- 1) All piping on the downstream side of the park's water service must 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 "pigtailed". Refer to **Detail Sheet 48: Irrigation - Valve Hook-Ups, Field Wire Alignment**, **Detail Sheet 54: Irrigation - Three Elbow Swing Joint for Metal Sprinkler Head**, and **Detail Sheet 56: Irrigation - Pigtail Swing Joint** for more information.

All polyethylene pipe, tubing, and fittings furnished under this specification must 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 must be Standard Dimension Ratio (SDR) 11 and must 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 must 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 must have a design factor of 0.63 for water service at 23°C.

- 2) Expansion couplers of appropriate size must be used at a minimum spacing of every 30 m.
- 3) All fittings, valves, and double check valve assemblies will be sized to fit the downstream pipe diameter as illustrated in the following Detail Sheets:
 - **Detail Sheet 48: Irrigation - Valve Hook-Ups, Field Wire Alignment** through **Detail Sheet 59: Irrigation - Double Check Valve**.
 - **Detail Sheet 63: Irrigation - Road Crossing High Density Poly** through **Detail Sheet 68: Irrigation - Drain Pit**.

- 4) For PVC pipe with a diameter greater than 38 mm, bell and spigot type pipe and fittings with rubber gaskets must be used. Solvent weld PVC joints will be permitted based on previous written approval from The City of Calgary Parks.
- 5) For medium density installations, all fittings must be double clamped with galvanized or plastic inserts as per **8.6.4.1 Swing Joints/Risers**. Fittings for HDPE pipe must be butt fusion type or electro fusion type. Fittings must be molded or fabricated by the pipe manufacturer.
- 6) The Contractor must provide a *Certificate of Training* confirming the person or persons performing the butt fusion welds or electro fusion have received the appropriate industry certification.
- 7) The Contractor must provide the welding procedures to be used for the specific project.
- 8) Bead melts must conform to the following guidelines:

Table 8-1: Bead Melt Sizes

Pipe Size	Approximate Bead Melt Size
1 1/4"	1/32" to 1/16"
1 1/4" to 3"	about 1/16"
3" to 8"	1/8" to 3/16"
8" to 12"	3/16 "to 1/4"
12" to 24"	1/4" to 7/16"

Note: See *Detail Sheet 50: Irrigation - HDPE Bead Melt*.

- 9) Only CSA Series 100 medium-density poly pipe may be used as laterals in extensive shrub bed installations. 25 mm poly pipe may be used in shrub beds if the approved drawing shows the changes in pipe size. Use 25 mm, triple swing assemblies and reduce to the appropriate size at the last elbow. 1/2" triple swing assemblies are only acceptable on MDPE shrub bed laterals with spray heads using 1/2 inlets. Swing joints are to be installed to lateral using saddles or insert "T's" and elbows.

8.6.4 Swing Joints and Risers/Sprinkler and Shrub Heads

Refer to the following detail sheets for more information about items in this section:

- ***Detail Sheet 54: Irrigation - Three Elbow Swing Joint for Metal Sprinkler Head***
- ***Detail Sheet 55: Irrigation - Three Elbow Swing Joints***
- ***Detail Sheet 56: Irrigation - Pigtail Swing Joint***
- ***Detail Sheet 57: Irrigation - Pigtail Swing Joint***

8.6.4.1 Swing Joints/Risers

- 1) Swing joints must be three 25 mm elbows using galvanized steel or PVC elbows and nipples, as well as brass saddles.
- 2) All risers for shrub beds must 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.

8.6.4.2 Spray Heads

- 1) The following pressure compensating spray heads or an approved equal must be used:
 - Toro 570ZPR-4p.
 - Toro 570Z PR-12p.
 - Hunter Institutional 04, 06, and 12 heads.
 - Rain Bird 1812 PRS & 1804 PRS.

Note: TORO 570Z-PRX is not approved.
- 2) The sprinkler heads must be described on the drawings and conform to manufacturer's performance standards for durability and operation (i.e. operating pressure, gallonage, and nozzle size).
- 3) Where quick couple valve systems are used, supply one sprinkler head and one valve key for every four quick coupler valves installed.
- 4) The sprinkler must:
 - a) Be a fixed spray type, capable of covering a 2 m to 5.5 m radius at 30 psi with a full circle discharge rate of approximately 5 gpm.
 - b) Have radius adjustment capabilities from top of the nozzle.
 - c) Be available in 4", 6", and 12" pop up.
 - d) Have heavy-duty riser seal to eliminate excess flow-by.
 - e) Have optional drain check valve.
 - f) Have ratcheting riser features on all bodies for easy adjustment.
 - g) Have 1/2" NPT female thread.
 - h) Have a five (5) year, over-the-counter warranty (not pro-rated). If the static water pressure in a lateral zone or the entire system exceeds the maximum listed operating pressure in an irrigation manufacturer's 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.

8.6.4.3 Sprinkler (For Areas Less than 12 m in Width)

- 1) The following sprinklers or an approved equal must be used:
 - Hunter I-20 ADS.
 - Hunter I-20 36S.
 - Rain Bird 5004 Plus SS.
 - Rain Bird 5006 Plus SS.
 - MP Rotator Nozzles 1000, 2000, 3000.
 - MPCorner.
 - MPStrip.

Note: MP Rotator nozzles must be installed on approved pressure compensating spray head bodies (refer to **8.6.4.2 Spray Heads** (item 1) for more information).

- 2) The sprinkler must:
 - a) Be of the gear driven rotary type, capable of covering a 5 m to 15 m radius at 50psi. with a discharge rate of 3-10 gpm.
 - b) Be available with interchangeable nozzles.
 - c) Have radius adjustment capabilities by means of a stainless steel adjustment screw.
 - d) Be commercial duty available in both full circle and adjustable part circle configurations. The adjustable unit must 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 must have a ratcheting type riser assembly for final arc orientation.
 - e) Have a minimum of 3" pop up.
 - f) Have a rubber cover.
 - g) Be equipped with a drain check valve to prevent low head drainage and be capable of checking up to 8 feet (2.40 m) in elevation changes.
 - h) Be equipped with a stainless steel set screw for locking the threaded cap to the body.
 - i) Have a 3/4" NPT female thread inlet.
 - j) Be serviceable after installation in the field by unscrewing the body cap, removing the riser assembly and cleaning the inlet filter screen.
 - k) Have a body constructed of non-corrosive heavy duty ABS and the pop-up riser assembly must be encased in stainless steel. The sprinklers carry a five-year over the counter exchange warranty (not pro-rated).
- 3) 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.
- 4) Sprinklers should be supplied by a local distributor to allow for product availability within 2-3 weeks.

8.6.4.4 Sprinkler (Standard for Public Landscape Areas)

- 1) The following sprinklers or an approved equal must be used:
 - Hunter I-25 ADS.
 - Hunter I-25 36S.
 - Hunter I-60.
 - Toro 640.
 - Toro S2001.
 - Nelson 7005.
 - Rain Bird Falcon 6504.
 - Rain Bird 8005-SS.

- 2) The sprinkler must
 - a) Be of the gear driven rotary type, capable of covering a 12 m to 18 m radius at 50psi with a discharge rate of 7-10gpm.
 - b) Be available with interchangeable nozzles.
 - c) 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.
 - d) Be commercial duty available in both full circle and adjustable part circle configurations. The adjustable unit must 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 must have a ratcheting type riser assembly for final arc orientation.
 - e) Have a minimum of 3" pop up.
 - f) Have a rubber cover.
 - g) Be equipped with a drain check valve to prevent low head drainage and be capable of checking up to 8 feet (2.40 m) in elevation changes.
 - h) Be equipped with a stainless steel set screw for locking the threaded cap to the body.
 - i) Have a 3/4" NPT female thread inlet.
 - j) Be serviceable after installation in the field by unscrewing the body cap, removing the riser assembly and cleaning the inlet filter screen.
 - k) Have a body constructed of non-corrosive heavy duty ABS and the pop-up riser assembly must be encased in stainless steel. The sprinklers carry a five-year over the counter exchange warranty (not pro-rated).
- 3) 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.

8.6.4.5 Flood Bubblers

- 1) The following flood bubblers or an approved equal must be used:
 - Toro S00C.
 - Rainbird I-300A-F
 - Nelson 7300.
- 2) The flood bubblers must:
 - a) Have an adjustment from 0gpm. to 3.5gpm.
 - b) Have a screw adjustment.
 - c) Have a serviceable filter screen.
 - d) Have a 1/2" NPT female thread inlet.

8.6.5 Controllers and Valves

Refer to the following Detail Sheets for more information about items in this section:

- **Detail Sheet 48: Irrigation - Valve Hook-Ups, Field Wire Alignment** through **Detail Sheet 53: Irrigation - Master Valve with Water Meter**.
- **Detail Sheet 60: Irrigation - Irrigation Controller** through **Detail Sheet 60d: Irrigation - Irrigation Controller**.

- 1) All irrigation controllers/cabinets are to be set up as non-metered sites, with only the following exceptions where metering is required:
 - a) Sites that involve heavy usage - **Stormwater Ponds** with pumps and/or valve operations.
 - b) Sites where services have been added from the cabinet to operate non-irrigation related electrical components.
 - c) If a third party is actually the major user of energy and The City of Calgary Parks is the site owner.
- 2) All irrigated sites will include the installation of an irrigation central 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 must be followed:
 - Sites with three (3) zones or less may utilize Motorola Piccolo-XRs.
 - Sites with between 4 and 23 zones may utilize Motorola IRRInet-Ms in either 12 or 24 station configuration and in 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 a 450 MHz radio, a 800 MHz radio, GPRS, or any combination of the three.

Designers are required to communicate with the Parks' **Water Management Lead** to fine tune the selection of controllers and communication hardware prior to formal submission of the design plans for approval by The City of Calgary Parks.

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 appropriate City of Calgary Parks **Development Coordinator** (refer to **Figure 2-1**) to determine the appropriate controller type.

- 3) For outdoor installation, the controller must be mounted in an approved cabinet that is fixed to a concrete base as per **Detail Sheet 60a: Irrigation - Irrigation Controller** through **Detail Sheet 60d: Irrigation - Irrigation Controller**.

- 4) Zone control valves must be CSA certified as Class II power limiting circuit low voltage (i.e. 24 volt) operated only. Closing time for valves must not be less than 5 seconds.
- 5) Zone control valves must be electrically operated and self cleaning with a bronze body and of a make and model compatible with the designed system. Hand operated valves must be installed on the upstream side of every electric valve.
- 6) Wiring to and from the controller and valves must conform to the [Canadian Electric Code](#) and any other regulatory conditions which govern this type of installation.
- 7) All wire must follow irrigation lines where appropriate (refer to **Detail Sheet 48a: Irrigation - Valve Hook-Ups, Field Wire Alignment** through **Detail Sheet 48d: Irrigation - Valve Hook-Ups, Field Wire Alignment**).
- 8) Where wiring leaves pipe alignment, place it in a conduit. Below ground, PVC is acceptable, but above ground galvanized conduit must be used.
- 9) Splices must be made waterproof with the use of an acceptable outdoor waterproof wire connector (refer to **8.6.11.4 Wire Splices Box** (item 2) for more information). Field splices must be identified, looped and located in a 250 mm diameter lockable irrigation box.
- 10) 110 volt wiring must be colour coordinated to be different from the 24 volt wiring. Install all 110 volt wire in accordance with the [Canadian Electric Code](#). Install all 110 volt wire in grey PVC electrical conduit. Electrical conduit must be trenched, not ploughed. All 110 volt electrical conduits must be marked with continuous yellow caution tape and placed directly over the conduit 300 mm 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.
- 11) Valve Signal Wires and Common Wires (refer to **Detail Sheet 48a: Irrigation - Valve Hook-Ups, Field Wire Alignment** through **Detail Sheet 48d: Irrigation - Valve Hook-Ups, Field Wire Alignment**):
 - Use continuous wire runs wherever manufacturer's wire roll sizes allow.
 - Calculate the voltage drop on zone signal wires and common wires 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-builts.
 - 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 meeting the watertight connector.
 - Common wires to be sized one size larger than signal wires (i.e. If signal is 14 gauge then common must be 12 gauge). Allow one (1) common wire per hectare (ha) of zone valves or one (1) common wire per 10 signal wires.

12) Spare Wires

- Provide one (1) spare wire per wire run for each group of five (5) valves or less. The spare wire must be looped in each valve box to extend 300 mm above the valve boxes 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 0.5 m 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 must be 10 additional wires per ha of expansion, plus an over sized common.

8.6.6 Wiring

Requirements for Motorola Central Control DC Scorpio and DC IRRicom Controllers.

1) 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 gauge for common and 14 gauge 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 (i.e. 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.

2) 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 gauge for common and 14 gauge 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 (i.e. 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.

8.6.7 Electric Valves

Refer to refer to ***Detail Sheet 48: Irrigation - Valve Hook-Ups, Field Wire Alignment*** through ***Detail Sheet 50: Irrigation - 50 mm to 50 mm HDPE Valve Connection*** for more information about items in this section.

8.6.7.1 Products

A Griswold GP or Rain Bird GB series electric valve or an approved equal must be used.

8.6.7.2 Performance Features

- 1) Continually cleans itself without screens or filter to clean or replace sand, silt, and algae.
- 2) Works dependably in effluent or dirty water.
- 3) Closes slowly without a hammer or chatter.
- 4) Works under extremely low flow and low pressure conditions.
- 5) Has a flow control stem.
- 6) Has a manual open/close control.

8.6.7.3 Technical Features

- 1) Available sizes - 3/4" to 2".
- 2) Body configuration - globe.
- 3) Pressure rating - 200 psi.
- 4) Flow range - 1 gpm to 180 gpm.
- 5) Power requirements - 7.2 VA holding, and 10.8 VA in rush.
- 6) Operating voltage range 17-40.
- 7) Maximum wire run #14 wire - 1460 m.
- 8) Warranty - 5 years.

8.6.8 Gate Valves

Refer to **Detail Sheet 51: Irrigation - Compressor Connection and Meter Test Outlet Assembly** for more information about items in this section.

- 1) Gate valves for drainage and flow control must be bronze body with solid wedge disk, non-rising stem, removable handle, and a resilient rubber ring seal with a minimum pressure rating of 10 kg/cm². All gate valves must be installed in an upright position for accessibility.
- 2) Valves - 1/4" to 3": A Red & White 280A must be used (or an approved equivalent) that meets the following criteria:

a) Materials

Table 8-2: Gate Valve 1/4"-3" Materials Specifications

Name of Parts		ASTM Specifications	
Body		Cast Bronze	B62-C83600
Bonnet		Cast Bronze	B62-C83600
Stem		Copper Alloy Rod or Cast Bronze	B21-C47940 or B505-C83600
Disc		Cast Bronze	B62-C83600
Stuffing Box	1/4 - 2 1/2"	Brass Rod	B16-C36000
	3"	Cast Bronze	B62-C83600
Packing Nut	1/4 - 2 1/2 "	Forged Brass	B283-C37700
	3"	Cast Bronze	B62-C83600
Gland		Forged Brass	B124-C37700
Gland Packing		Non-asbestos Packings	T#2996-NA
Hand-wheel	1/4 - 1/2"	Zinc Alloy Die Casting	B86-Z33520
	3/4 - 3"	Aluminum Alloy Die Casting	B85-A03840
Wheel Nut		Steel (Zinc plated)	A563-Gr.A
Name Plate		Aluminum Plate	B209-1100

b) Dimensions

Table 8-3: Gate Valve 1/4"-3" Dimensions

Mark	Size	1/4	3/8	1/2	3/4	1	1 1/4	1 1/2	2	2 1/2	3
L	inches	1.69	1.77	1.97	2.20	2.56	2.83	3.11	3.35	4.21	4.57
	mm	43	45	50	56	65	72	79	85	107	116
H	in	3.58	3.58	3.78	4.33	4.88	5.63	6.46	7.60	9.29	10.71
	mm	91	91	96	110	124	143	164	193	236	272
D	in.	1.89	1.89	2.17	2.48	2.76	3.15	3.54	3.94	4.33	4.92
	mm	48	48	55	63	70	80	90	100	110	125
Weight											
lb.		0.71	0.66	0.88	1.17	1.76	2.45	3.53	5.36	8.36	11.91
kg		0.32	0.30	0.40	0.53	0.80	1.11	1.60	2.43	3.72	5.62

c) Working pressures

Table 8-4: Gate Valve 1/4”-3” Working Pressures

	Working Pressure Non-Shock		Test Pressure	
	Saturated Steam	Cold Water, Oil, Gas	Shell (Water)	Seat (Air)
Psi	125	200	300	80
Bar	8.6	13.8	20.7	5.5

Notes: a) End threads conform to the female international standard pipe threads.

b) These valves conform to the requirements of MSS SP-80.

- 3) Valves 100 mm or larger must be resilient seat flanged valve, a Watts 405RW, or an approved equal with a 15 mm test cock.

8.6.9 Double Check Valve Assembly

Refer to the following Detail Sheets for more information about items in this section:

- **[Detail Sheet 58: Irrigation - Double Check Valve](#)**
- **[Detail Sheet 59: Irrigation - Double Check Valve](#)**
- **[Detail Sheet 59a: Irrigation - Double Check Valve](#)**
- **[Detail Sheet 59b: Irrigation - Double Check Valve](#)**
- **[Detail Sheet 59c: Irrigation - Double Check Valve](#)**

- 1) The term “double check valve assembly” (DCVA) means 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 DCVAs must conform to The City of Calgary’s [Standard Specifications Waterworks Construction](#), 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.

- 2) The 150 mm DCVA must be a WATTS - 757N (refer to **[Detail Sheet 59b: Irrigation - Double Check Valve](#)** and **[Detail Sheet 59c: Irrigation - Double Check Valve](#)**) or an approved device of equal dimension to allow the assembly to fit into a standard box.

8.6.10 Brass Saddles, Tees, or Crosses

Refer to the following Detail Sheets for more information about items in this section:

- **[Detail Sheet 50: Irrigation - 50 mm to 50 mm HDPE Valve Connection](#)**
- **[Detail Sheet 54: Irrigation - Three Elbow Swing Joint for Metal Sprinkler Head](#)**
- **[Detail Sheet 55: Irrigation - Three Elbow Swing Joints](#)**

- 1) Cambridge 800 series hinged saddles, or AY MacDonald 3802 & 3892 service saddles, tees, and crosses (or approved equals) must be used.
- 2) 3/4" to 4" pipe size.
- 3) 1/2" to 1" female threaded outlet (FIPT).
- 4) Casting of saddle must be:
 - 85% copper
 - 5% zinc
 - 5% tin
 - 5% lead
- 5) Bolts must be of 18-8 non-corrosive stainless steel.
- 6) To be used on series 160 PVC or series 100 polyethylene pipe.

8.6.11 Irrigation Boxes

8.6.11.1 Manufactured irrigation Boxes

Where manufactured irrigation boxes are used, they must:

- a) Be of heavy duty weight polyethylene,.
- b) Be capable of being extended.
- c) Be capable of withstanding the weight of a heavy tractor on their surface.
- d) Have a locking capability (clearances noted on details).

8.6.11.2 Gravel Beds in Boxes

Gravel beds in boxes must consist of clean, washed, 19 mm gravel with an area marginally larger than the box opening. Refer to the following Detail Sheets for the depth of gravel and the distance the gravel must be kept from the lowest point of the irrigation system:

- **Detail Sheet 48: Irrigation - Valve Hook-Ups, Field Wire Alignment** through **Detail Sheet 53: Irrigation - Master Valve with Water Meter**.
- **Detail Sheet 58: Irrigation - Double Check Valve** and **Detail Sheet 59: Irrigation - Double Check Valve**.
- **Detail Sheet 66: Irrigation - Curb Stop Assembly** through **Detail Sheet 68: Irrigation - Drain Pit**.

8.6.11.3 Drainage

The double check valve assembly box and zone control valve boxes must be designed into a location where the final grade of the surrounding ground does not carry overland water drainage into the valve boxes.

8.6.11.4 Wire Splices Box

1) **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 - heavy duty polyethylene weighing 3 lbs.
- Depth - 10 1/4".
- Colour - green.

2) **Lid**

- Lid of the box to be heavy duty polyethylene weighing 1 1/2 lbs.
- Twist lock lid.
- Must 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.

3) **Wire Splice Connectors**

3M DBY/DBRs or equivalent.

8.6.11.5 Drain Boxes

1) **Box**

Carson 1419 or an approved equal:

- Body of the box - 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".

2) **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 must be "Irrigation Drain Box".
- Must have lift slot.
- Outside top width - 12 1/2".

- Outside top length - 18".
- Outside insert width - 10 1/8".
- Outside insert length - 5 3/8".
- Depth - 2 1/8".
- Lid must be interchangeable with box and extensions.
- Colour - green.

8.6.11.6 Drain Box Extensions

Carson 1419-6X or an approved equal:

- Body of box must be made of heavy duty polyethylene weighing 5 lbs.
- Depth - 6 3/4".
- Outside top width - 12".
- Outside top length - 17".
- Outside bottom width - 14".
- Outside bottom length - 19".
- Inside bottom width - 12 1/8".
- Inside bottom length - 17 1/4".
- Colour - green.

8.6.11.7 Control Valve Box, Isolation Valve Box, Meter Valve Box, and Gate Valve Outlet Box

1) Boxes

For valves 50 mm or smaller - Carson 1220-12 or an approved equal. 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.

2) 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.
- Must have lift slot.
- Outside width - 13 1/4".

- Outside length - 19 3/4".
- Depth - 1 3/4".
- Marking on the lid will change depending on the use of the lid (i.e. Irrigation Control Valve Box, Irrigation Isolation Valve Box, or Irrigation Meter Valve).
- Lid must be inter-changeable with box and extensions.
- Colour - green.

8.6.11.8 Control Valve Box, Isolation Valve Box, Meter Valve Box and Gate Valve Outlet Box Extensions

Carson 1419-6X or an approved equal:

- Body of box must be made of heavy duty polyethylene weighing 5 lbs.
- Depth - 6 3/4".
- Outside top width - 12".
- Outside top length - 17".
- Outside bottom width - 14".
- Outside bottom length - 19".
- Inside bottom width - 12 1/8".
- Inside bottom length - 17 1/4".
- Colour - green.

8.6.11.9 Double Check Valve Assembly Box

1) 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.

2) Lids

Carson 1730-3L or an approved equal:

- Lid of the box to be non-hinged and made of heavy duty polyethylene weighing 10 lbs.
- Must have locking 3/8" L-bolt, with 9/16" head, and non-corrosive, metal detector sensitive bolts.
- Must have lift slot.
- Outside width - 17 1/2".
- Outside length - 30 1/2".
- Depth - 2".

- Marking on the lid to be “Double Check Valve Assembly Box”.
 - Colour - green.
- 3) Refer to **Detail Sheet 61: Irrigation - Double Check Valve Box**, **Detail Sheet 62: Irrigation - Double Check Valve Box**, and **Detail Sheet 62a: Irrigation - Details for 100 mm Double Check Valve Box Lid with Meter Viewing Lid** for 100 mm DCV box and lid assembly, complete with access door for meter reading.

8.6.12 Backfill Material

- 1) Backfill material for pipe trenches within 150 mm of pipe must be clean, approved sand fill or gravel less than 12 mm diameter in size, free of stones and sharp objects that could damage pipe.
- 2) Excavated material may be used for backfilling only when approved by The City of Calgary Parks.

8.6.13 Sleeving

Refer to **Detail Sheet 63: Irrigation - Road Crossing High Density Poly** for more information about items in this section.

- 1) Sleeving must be PVC SDR 35 or PVC C-900 (bell and spigot) pipe to The City of Calgary’s **Standard Specifications: Sewer Construction**, section 402.02.02 (or approved equal).

Note: PVC SDR 35 must be backfilled in accordance with The City of Calgary’s **Standard Specifications: Sewer Construction**. PVC C-900 may be backfilled with native material free of organics and must be compacted to 98% SPD.

- 2) Diameter of the conduit must be twice the diameter of the irrigation pipe. The size of the conduit must be measured in 50 mm increments or as noted on the drawings.
- 3) Extend sleeving a minimum of 1 m beyond the edge of the pavement of the amenity area. Tape ends to prevent debris filling.
- 4) Wire for automatic systems must not go in the same sleeve as the irrigation pipe. Wire must have its own sleeving. the number of wires will determine the size of the sleeve as follows:

Table 8-5: Wire Sleeving Requirements

Number of #14 Gauge Wires	Sleeve Size
2 to 14	2" (50 mm) sleeve
14 to 40	4" (100 mm) sleeve
40 to 70	4" to 6" (100 mm to 150 mm) sleeve

Note: Existing Irrigation Systems - DO NOT CUT wires or pipe. Use one sleeve as per above and cut the sleeve down its length to create two half shells. Excavate under pipe and wires, then place one half of sleeve under wire and pipe, place the other half above pipe and wire, and then clamp the two halves together with two broken pipe repair clamps.

8.6.14 Miscellaneous Components

All miscellaneous components, such as air relief valves (refer to [**Detail Sheet 53a: Irrigation - Air Relief Valve**](#)), concrete vaults or meter boxes, valve markers and caps, etc., must be of the type and size indicated on the drawings or details. Install according to approved manufacturer's directions or at the direction of The City of Calgary Parks.

8.6.15 Thrust Blocks

- 1) Local conditions will determine the type and extent of thrust blocking to be used. Obtain approval from The City of Calgary Parks' [**Development Inspector**](#) for the base method (i.e. concrete, rock, rebar or a combination of the former) before proceeding.
- 2) All lines 100 mm and over will require concrete thrust blocks. Concrete will be Class B as per 310.00.00 of The City of Calgary Roads' [**Standard Specifications Roads Construction**](#).

8.6.16 Irrigation Products Currently Being Tested

NEW

Currently, there are no irrigation products being tested.s

8.7 Layout

- 1) Stake out the 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 must be spaced to ensure head-to-head coverage. Where deviation from the design drawing is anticipated, submit change requests (in writing) to The City of Calgary Parks' *Planning & Development Services* 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 them. Make good all damages at the Contractor's cost.
- 4) Set back park water services (refer to <Xrefs>*Detail Sheet 64: Irrigation - Park Water Service* and *Detail Sheet 65: Irrigation - Park Water Service*) a minimum of 2.5 m from pathways, hard surfaces, and trees, and set back lateral irrigation lines a maximum of 0.5 m from property lines.
- 5) Have the layout inspected and approved by The City of Calgary Parks before commencement of work.
- 6) Due to changes in landscape elements, it might be necessary to adjust the spacing of the sprinklers in the field. Changes that do not require extra materials or labour must be done at no extra cost to The City of Calgary Parks. If the changes result in an extra cost, all such changes must be approved (in writing) by The City of Calgary Parks before proceeding with work.

8.8 Coordination

Fully coordinate work with other trades so as not to delay work progress. If the water or electric service extends from a building, coordinate work with the building owner to ensure proper connections to services.

8.9 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 must be a minimum of three times the diameter of the pipe. Main line pipe depth must be in accordance with the following table to ensure adequate coverage:

Table 8-6: Pipe Depth

MAIN LINE PIPE DEPTH			
Pipe Size	Min. Depth to Top of Pipe	Max. Depth of Bottom of Pipe	Imp. Depths
2" (50 mm)	350 mm	600 mm	14" - 24"
4" (100 mm)	350 mm	650 mm	14" - 26"
6" (150 mm)	400 mm	750 mm	16" - 30"
8" (200 mm)	400 mm	800 mm	16" - 32"
LATERAL ZONE PIPING DEPTH			
Pipe Size	Min. Depth to Top of Pipe	Max. Depth of Bottom of Pipe	Imp. Depths
2" (50 mm) zone lines depth	300 mm	450 mm	14" - 16"

- 3) Bed with suitable material (refer to **8.6.12 Backfill Material**) to the proper depth and compact to meet the approval of The City of Calgary Parks.
- 4) The Contractor must repair any settlement of the trenches by bringing them to grade with topsoil and sodding.
- 5) Install sleeving as required to enclose piping under paved areas. Depth of sleeving must match **Table 8-6**, 1000 mm under roadways, or as approved by The City of Calgary Roads and the City of Calgary Land Information & Mapping.

8.10 Installation

- 1) Submit a schedule to the Parks **Development Inspector**, 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 must conform to approved design drawings.
- 2) Install all piping so that it is not bent from a straight line in excess of the manufacturer's recommendation for local conditions, and with a minimum fall of 0.5% to drain boxes.
- 3) Make all joints and connections tight and in accordance with manufacturer's recommendations.
- 4) Ensure that 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 firmly connected and plumbed. Refer to the following Detail Sheets for more information:
 - **Detail Sheet 54: Irrigation - Three Elbow Swing Joint for Metal Sprinkler Head**
 - **Detail Sheet 55: Irrigation - Three Elbow Swing Joints**
 - **Detail Sheet 56: Irrigation - Pigtail Swing Joint**
 - **Detail Sheet 57: Irrigation - Pigtail Swing Joint**

- 6) All sprinklers must be adjusted and set flush with final grade using a three elbow swing joint (refer to **Detail Sheet 54: Irrigation - Three Elbow Swing Joint for Metal Sprinkler Head** and **Detail Sheet 55: Irrigation - Three Elbow Swing Joints**). Ensure that 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 must be used (refer to **Detail Sheet 56: Irrigation - Pigtail Swing Joint**).

Note: Pig tails must 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 of Calgary within the drainage easement.

- 7) All backflow prevention assemblies (refer to **Detail Sheet 58: Irrigation - Double Check Valve** and **Detail Sheet 59: Irrigation - Double Check Valve**) must be installed in accordance with [Wastewater Bylaw 40M2006](#) and [Alberta Regulation 119/2007: Alberta Safety Codes Act Plumbing Code Regulation](#). Backflow prevention assemblies must be tested and tagged upon installation and annually thereafter prior to activating the system that year.
- 8) Ensure that items such as shrub heads are set at the proper height to obtain adequate coverage.
- 9) For automatic systems:
- Lay the wire in the trench with sufficient slack to accommodate backfilling and then backfill with suitable material (refer to **8.6.12 Backfill Material**) prior to installation of the piping (refer to **Detail Sheet 48a: Irrigation - Valve Hook-Ups, Field Wire Alignment**).
 - Ensure that a green 14 gauge tracer wire is installed for lateral lines.
 - Provide a minimum of 600 mm coiled loops of wire at all control valves and changes in direction.
 - Wiring necessary to activate the controller and valves must be located in a conduit (refer to **8.6.13 Sleeving**) when located in buildings or under all paving.
 - If a controller is located in a building, mount it within an approved cabinet (refer to **Detail Sheet 60: Irrigation - Irrigation Controller**). The cabinet must be centred 1650 mm above floor, be capable of locking and securing the controller, and be waterproof (if necessary).

Note: The installation of a temporary controller will be acceptable at CCC, however a permanent automatic controller must be installed by the Developer one month prior to application for the FAC.

- f) Approved Controller Cabinets:
- IRRInet-XM and IRRInet-ACE controller cabinet AC (refer to **Detail Sheet 60: Irrigation - Irrigation Controller** or **Detail Sheet 60b: Irrigation - Irrigation Controller**).
 - Scorpio IRRIcom and IRRInet-M cabinet AC (refer to **Detail Sheet 60: Irrigation - Irrigation Controller** or **Detail Sheet 60c: Irrigation - Irrigation Controller**).

- Scorpio IRRlcom and IRRlnet -M cabinet DC (refer to **Detail Sheet 60d: Irrigation - Irrigation Controller**).
- 10) Block all changes of direction and pipe endings (tee, elbows 45° and 90°, and plugs). If concrete thrust blocks are used (refer to **8.6.15 Thrust Blocks**), protect pipe from spillover.
 - 11) Ensure that the last sprinkler head tee is set no closer to the pipe end than 150 mm.
 - 12) Install drain valves and boxes (refer to **Detail Sheet 67: Irrigation - Drain Pit** and **Detail Sheet 68: Irrigation - Drain Pit**) 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 1 m from each other. If the mainline is less than 10 m in length, drain pits will not be required
 - 13) Install one 25 mm curb stop drain valve (refer to **Detail Sheet 66: Irrigation - Curb Stop Assembly**) at each end of a conduit under a roadway to ensure adequate drainage.
 - 14) Install Park Water Services as per **Detail Sheet 64: Irrigation - Park Water Service** and **Detail Sheet 65: Irrigation - Park Water Service**.
 - 15) Where provided for by The City of Calgary, install a 50 mm Master Valve with a Water Meter as per **Detail Sheet 65: Irrigation - Park Water Service**.

8.11 Backfilling

- 1) After an open trench inspection and the receipt of written approval from The City of Calgary Parks, backfill with an approved fill (refer to **8.6.12 Backfill Material**).
- 2) Place backfill in 150 mm lifts, placing and compacting all lifts to 85% S.P.D., until 150 mm 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 must 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 150 mm, (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 might have to be adjusted to meet the specifications and drain valve assemblies might require a change to the standard 25 mm curb stop size.
- 6) Repair as required upon final testing by The City of Calgary Parks.

8.12 Clean Up

Remove off site all debris and excess material left over from installation at the end of each working day or as required.

8.13 Maintenance

Protect and maintain the entire irrigation system from the time of installation until the FAC is issued by The City of Calgary Parks (refer to **2.9 FINAL ACCEPTANCE CERTIFICATE (FAC)** for more information.

Maintenance of the irrigation system must include:

1) System Turn On

- Must be operational by May 15.
- Spray paint water services and keep them clear and exposed from overgrowth (locator markings).
- Follow all maintenance and repair procedures to ensure a completely functional system, with head to head coverage, according to original intent of design.
- Implement and submit to the Parks *Development Inspector* a weekly watering schedule for the season, which must provide moisture to the turf and plant material as site conditions dictate.
- Complete and submit to the Parks *Development Inspector* a double-check valve test.

Note: The municipal address of the site must be indicated on the *Testing and Inspection Report*.

2) Monthly Checks

The following items must be checked on a monthly basis for proper operation:

- Controller (clock).
- Automatic valves.
- Double-check valve.
- Water services.
- Piping.
- Manual valves.
- Sprinkler heads (arcs).
- Boxes.
- General settling and grading problems.

3) System Turn Off

a) Turn off the water supply to the irrigation system in one of the following ways:

- Stop and drain (or seal), 1/4 turn clockwise to close.
- Turn service valve counter-clockwise to close, and turn drain rod 1/4 turn counter-clockwise to open.

- b) Open all drain valves on the main line of the irrigation system and on all test cocks and drains on the double check valve assembly. Allow sufficient time for the water to drain out.
- c) Close all drain valves.
- d) Connect an air compressor (600 cfm) to a quick coupler using a 25 mm hose (refer to **Detail Sheet 54: Irrigation - Three Elbow Swing Joint for Metal Sprinkler Head**) or to a 50 mm gate valve outlet assembly using a 50 mm hose (refer to **Detail Sheet 51: Irrigation - Compressor Connection and Meter Test Outlet Assembly**) downstream of the double check valve assembly or water meter.
- e) Activate all electric valves from the controller. Ensure that each zone blows “clean” of any water before proceeding to the next zone. After this is complete, go to each electric valve and manually activate each zone to make sure you have not missed a zone. Return to the controller and repeat the procedure for each zone to dispel any remaining water.
- f) Turn the air compressor off, and then 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.

**SECTION III:
LANDSCAPE MAINTENANCE**

CHAPTER 9: LANDSCAPE MAINTENANCE STANDARDS

9.1 Introduction

Parks Operations Divisions have developed these maintenance standards as a benchmark for minimum level of performance. The Development Industry, at its discretion, may perform an increased level of maintenance. Sections within these standards are be specific to Parks Operations, and might not apply to the Development Industry.

9.2 Mowing

REVISED!

- 1) Applies to turf classifications A, B, and T.
- 2) Desired Results: All turf has been cut evenly at the height designated below in a safe and efficient manner.
 - A - 5 - 7 cm
 - B - 5 - 10 cm
 - T - 10 - 20 cm.
- 3) Additional standards:
 - No excessive equipment “downtime”.
 - No areas have been missed.
 - No scalped turf.
 - No damage to trees, shrubs or other park features such as scraped bark on trees and shrubs, bent or scraped park furniture.
 - Prior to and after mowing, no visible litter on turf classification A areas and no more than one (1) piece of litter per 100m² on turf classification B areas.
 - No highly visible grass clippings on turf classification A or B areas. Clippings should not accumulate to the point of creating an appearance problem or inhibit lawn growth on turf classification S or T areas.
 - Grass clippings should not be present on sidewalks, pathways, or any hard surfaces for any turf classification.
 - No lubricant or fuel spills on turf or non turf areas.

9.3 Small Mowing/Power Trim

REVISED!

- 1) Applies to turf classifications A and B.
- 2) Desired Results: All turf has been cut evenly at the appropriate height (as designated below).
 - A - 5 - 7 cm
 - B - 5 - 10 cm
- 3) Additional standards:
 - No excessive equipment “downtime”.
 - No areas have been missed.
 - No scalped turf.
 - No damage to trees, shrubs or other park features such as scraped bark on trees and shrubs, bent or scraped park furniture.
 - Prior to and after mowing, no visible litter on turf classification A areas and no more than one (1) piece of litter per 100m² on turf classification B areas.
 - No highly visible grass clippings on turf classification A or B areas. Clippings should not accumulate to the point of creating an appearance problem or inhibit lawn growth on turf classification S or T areas.
 - Grass clippings should not be present on sidewalks, pathways, or any hard surfaces for any turf classification.
 - No lubricant or fuel spills on turf or non turf areas.

9.4 Litter Control

REVISED!

- 1) Applies to all park sites.
- 2) Desired Results:
 - a) All “Ad Hoc” structures in the park (tree forts, etc.) must be removed.
 - b) Fence lines must be cleaned of highly visible accumulated litter
 - c) Visible litter must not exceed 2 pieces per 100 m² on turf classification A areas.

9.5 Garbage Receptacle Emptying

REVISED!

- 1) Applies to all park sites.
- 2) Desired Results:
 - All bags 75% full or over must be replaced.
 - All garbage cans must have a plastic garbage bag inside.
 - All garbage containers must be free of crusted garbage build-up and objectionable odors to prevent wasps or other insects from being attracted to the garbage can.
 - Area around garbage container must be litter free. All garbage bags, hazardous material, bio-hazardous waste must be safely disposed of according to applicable safety procedures.

9.6 Curb Sweeping, Spring and Fall Cleanup

REVISED!

- 1) Applies to all park sites.
- 2) 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.

9.7 Fertilize

Note: Public Notice must be given prior to application.

REVISED!

- 1) Applies to turf classifications **A** and **B**.
- 2) Desired Results:
 - Fertilizer 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 on trees and shrubs and bent or scraped park furniture.
 - No lubricant or fuel spills on turf or non-turf areas.

9.8 Aerate

REVISED!

- 1) Applies to turf classifications A and B.
- 2) Desired Results:
 - Aerator holes/cores should be 3” deep, 3” or less apart, and about ¾“ 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.

9.9 Top Dressing

REVISED!

- 1) Applies to turf classifications A and B.
- 2) Desired Results:
 - Park site to be prepared for top dressing as required (i.e. removal of rocks and litter, mowing, sweeping, and aerating).
 - No damage to trees, shrubs, turf or other park features, such as scraped bark on trees and 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.

9.10 Chemical Weed Control

Note: Public Notice must be given prior to application.

REVISED!

1) Applies to all turf classifications, as well as all planting beds.

2) Desired Results:

- No lubricant, chemical or fuel spills on turfed or non-turfed areas.

REVISED!

• Threshold of 5 weeds per 1 m² attained on all turf classifications (for 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.

9.11 Renovation of Park Site

REVISED!

1) Applies to all park sites.

2) Desired Results: Renovations as required based on condition of site and specifics of those conditions. This could involve total renovation of park including (but not limited to):

• Reseeding.

• Resodding.

• Change site's turf classification.

• Renovation of playground area to meet new standards or safety.

requirements (i.e. change of equipment from wooden structures to new metal/plastic structures or a change of structure due to a health and safety issue like lead paint situation).

9.12 Tree Well Maintenance

1) Applies to all park sites.

REVISED!

2) Desired Results:

• Tree well to be either cultivated or mulched.

• If the well is cultivated, it should be free of weeds and of a standard size (approximately 1 m in diameter).

• Tree well should be intact and able to hold water.

• If the well is mulched, mulch should be spread evenly to a depth of 4" and not piled against or touching the trunk of the tree (as this can rot the wood, causing decay or even death of the tree).

• All visible litter has been removed.

9.13 Shrub Bed Maintenance

REVISED!

- 1) Applies to all park sites.
- 2) Desired Results:
 - a) 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 are dead, missing or diseased.
 - No more than 5% of broken, dead, or diseased shrub branches remain in the bed.
 - Shrub bed is 90% free of weeds.
 - All visible litter has been removed.
 - b) Mulched Beds:
 - Shrub bed has been weeded and cultivated before mulch is applied.
 - Mulch is spread evenly to a depth of 4”.
 - 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 are dead, missing or diseased.
 - No more than 5% of broken, dead, or diseased shrub branches remain in the bed.
 - Shrub beds is 90% free of weeds.
 - All visible litter has been removed.

9.14 Flower Bed Fertilizing

REVISED!

- 1) Applies to all park sites.
- 2) Desired Results:
 - Flower displays are fertilized in a safe and efficient manner, using the correct rates and frequencies as recommended by the manufacturer.
 - Flower displays are healthy, vigorous, and colourful, in part due to an ongoing effective fertilizer program.
 - Even fertilizer 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 have been removed.
 - All tools and equipment have been removed from site following completion of fertilizing activities.

9.15 Irrigation Maintenance

REVISED!

- 1) Applies to all irrigated park sites.
- 2) Desired Results: Successful completion of irrigation activities, including:
 - Service initiation.
 - DCV testing.
 - System turn-on.
 - All repairs (as required) must be completed so that the system operates effectively.
 - All systems are operational.
 - 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. All box lids are safe and locked.
 - The park's water value and drain rod are visible, to grade, and painted red after FAC.
 - All sprinkler heads/turf valves are to grade, so as not to be a tripping hazard.

9.16 Street Sidewalks (Snow Removal)

REVISED!

- 1) Applies to all park sites.
- 2) Desired Results:
 - Free of hazards and obstructions.
 - 98% clear of snow (snow and ice cleared in accordance with The City of Calgary [Streets Bylaw 20M88](#)).
 - Sand placed on 90% of slippery areas.
 - No damage to trees, fences, turf, or other features, such as scraped bark on trees and bent or scraped park furniture or fences.
 - 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 the pathway or sidewalk.

9.17 Pathways, Roads and Parking Lot Maintenance

REVISED!

- 1) Applies to all park sites.
- 2) Desired Results:
 - Must be maintained in order that they can be used for their intended purpose.
 - Must be inspected and repaired/renovated on a regular basis, either as required or as scheduled,
 - Must be maintained in a manner that meets all legislated requirements, including safety requirements.
 - Must be free of hazards and obstructions.
 - No damage to trees, fences, turf, or other park features, such as scraped bark on trees and 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 completed maintenance.

9.18 Park Features

REVISED!

- 1) Applies to all park sites.

Note: Park features include (but are not limited to) park furniture signs, sculptures, garbage receptacles, lights, bollards, and stairway/platforms.
- 2) Desired Results:
 - All park features must be fully functional, as designed, at all times.
 - All park features must be installed as per **SECTION II: STANDARD SPECIFICATIONS FOR LANDSCAPE CONSTRUCTION**.
 - All park features must be maintained to ensure safe operating conditions.
 - All park features must meet or exceed all legislated requirements.
 - All park features must be inspected and maintained on a regular basis, either as scheduled or as required.

9.19 Building and Janitorial Maintenance

REVISED!

- 1) Applies to all park sites.
- 2) Desired Results:
 - a) Building Maintenance:
 - All vandalism must be reported according to procedure.
 - All breaches of security must be reported according to procedure.
 - All buildings must be safe and secure.
 - All fans, pumps, filters, furnaces, valves must be in working order and checked on a regular scheduled basis.
 - All lights and other electrical devices must be in working order.
 - b) 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,
 - Spill cleanup procedures and WHMIS policy must be adhered to.
 - 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.
 - Dispensers (toilet paper, paper towels, etc.) must not be less than 25% full.
 - Toilets and sinks must be operable. Plugged, leaking, or overflowing toilets or sinks are not acceptable.

9.20 Playground Inspection and Maintenance

REVISED!

- 1) Applies to all park sites.
- 2) Desired Results:
 - Inspections must be completed as per established inspection schedule.
 - All formal (inspection report) documentation must be completed.
 - All minor repairs must be completed.
 - Any major repairs must be scheduled as per the inspection report.
 - Playground must be safe for public use.

9.21 Tree Pruning

REVISED!

- 1) Applies to all park sites.
- 2) Desired Results:
 - Tree is cleaned of all dead, diseased, and broken branches.
 - Vertical clearance and visual clearance (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 (.i.e. hazards and dead branches have been 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 can be removed in one season.
 - No debris from pruning operations on roadway, sidewalk, or private property.

9.22 Water Features

REVISED!

- 1) Applies to all park sites.
Note: Ponds and lagoons are considered to be water features.
- 2) Desired Results:
 - a) Summer Operation:
 - All areas/structures related to the water feature are safe and secure.
 - All fans, pumps, filters, valves, or other water volume regulatory devices are checked on a regular scheduled basis and are in proper working order.
 - All lights and/or other electrical devices are in proper working order.
 - All vandalism and/or security breaches are reported according to procedure.
 - All legislated requirements are adhered to, such as WHMIS, ISO14001, OH&S, etc.
 - b) Winter Operation:
 - Snow is cleared and piled safely in a non-obstructive manner
 - No snow is sprayed on parked vehicles
 - All areas/structures related to the water feature must be safe and secure, and maintained as required.

- All maintenance activities must be carried out in a safe manner (i.e. sweeping ice, flooding, heavy snow removal, litter control, etc).
- All legislated requirements must be adhered to (i.e. WHMIS, OH and S, Working Alone Policy, etc).
- All areas must be free of obstacles and hazards.
- All standard manufacturer's operational procedures must be followed (i.e. use of fire hydrant for flooding, etc).
- Ice must be groomed, smooth, and fit for skating by Christmas (weather permitting).
- Ice must be free of anything that might constitute a hazard, such as holes, cracks, or rocks,/pop cans/etc imbedded in the surface.
- No damage to trees, fences, turf, or other park features.
- No lubricant or fuel spills on turf or non-turf areas.

9.23 Fence Maintenance

REVISED!

- 1) Applies to all park sites.
- 2) Desired Results:
 - No damage to trees, shrubs, or other park features, such as scraped bark on trees and shrubs, and 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 fences.
 - No broken or bent posts.
 - Cable and/or fabric must be tightened as required.
 - Fence must be straight and at the same consistent height throughout.
 - Gates must be installed according to manufacturer specifications and all City of Calgary standard specifications, and must be fully operational.

9.24 Tennis Courts

REVISED!

- 1) Applies to all park sites.
- 2) Desired Results:
 - Nets must be neat and straight and at the correct height.
 - No surface dirt, gravel or other debris on the court.
 - No graffiti on the practice board.
 - All fencing, furniture, and signs are repaired as required.

9.25 Play Fields

REVISED!

- 1) Applies to all park sites.
- 2) Desired Results:
 - In all fields where shale is used, all edges where the shale meets the grass are straight.
 - Shale should be loosened regularly, to a depth of 1”.
 - Areas adjacent to the grass must be level.
 - Ball diamond infield and soccer fields must be weed free.
 - No holes in playing fields.
 - No glass or other hazardous materials on the playing surface.
 - Level, non-protruding surface.
 - All fixtures and amenities on or around play fields are inspected regularly and maintained in order to provide a safe playing area (i.e. goal posts, backstops, players benches, dugouts, bleachers, etc).
 - All irrigation sprinkler heads and/or box lids are set to grade, so as to not create a tripping hazard.
 - All irrigation box lids are fitted properly to boxes and locked.
 - All lighting and electrical amenities are maintained properly and in good working condition.

SECTION IV: APPENDICES

APPENDIX A: GLOSSARY OF TERMS

Amenity

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

Boulevard

The unpaved portion of the road's shoulder from the back of the concrete curb up to the common property line. This boulevard area is usually sodded, and includes a concrete sidewalk or paved pathway and street trees.

Community Park

Community parks (i.e. tot lots, school grounds, recreation grounds, or community lease sites) are **MRs** and/or **MSRs** that are 3.6 to 9.2 hectares (8.9 to 23 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)

District Park

District parks (i.e. school grounds, recreation grounds, or community lease sites) are **MRs** and/or **MSRs** that are greater than or equal to 9.2 hectares (23 acres). These parks are not part of the 10% reserve dedication. Only Public/Separate High School sites (9.2 ha./23 acres) are defined as district parks.

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.

Dry Pond

A **Stormwater Pond** used to temporarily store stormwater runoff in order to restrict downstream discharge to predetermined rates, and to reduce downstream flooding and erosion potential. Most dry ponds have no permanent pool of water.

Environmental Reserve (ER)

As defined in the [Municipal Government Act](#), Part 17, section 616.

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 deemed to be an Environmentally Significant Area if it meets one or more of the criteria listed in Appendix C of The City of Calgary Parks' [Open Space Plan](#).

Historical/Archaeological

Refers to written/pre-written evidence and/or artifacts.

Linear Park

Linear Parks are [MRs](#) that have a minimum width of 10 m and a maximum width of 20 m, and that accommodate a regional pathway or perform a linear recreation function by providing local or regional pathway links to educational, recreational, and open space features (i.e., natural environment parks) within and between communities. These parks are part of the 10% reserve dedication.

Local Park

Local parks include [Community Parks](#), [Neighbourhood Parks](#), and [District Parks](#).

Manicured Zone

Manicured zones are portions of a park that have been developed consistent with [Minimum and Maximum Landscape Development Activities](#) and require maintenance that is relatively intense compared to preservation and naturalized areas. Manicured areas include areas where large numbers of park users are anticipated; such as sports fields, playgrounds, and community uses.

Median

A road median is a raised central reserve area in a roadway that segregates the driving lanes of opposite directions of traffic flow.

Municipal Reserve (MR)

As defined in the [Municipal Government Act](#), Part 17, section 616.

Municipal and School Reserve (MSR)

As defined in the [Municipal Government Act](#), Part 17, section 616.

Native

A species of animal or plant that has not been introduced by people or their direct activity.

Naturalization

The process of leaving a disturbed site to natural processes.

Naturalized Zone

Naturalized zones are portions of parks that have been (or will be) returned to as natural a state as possible. They include manicured areas and/or disturbed or partially-disturbed natural areas. Vegetative cover includes native grasses and/or trees and shrubs that may support the ecological system. Once established, maintenance must be limited to fire control, weed control, and garbage removal.

Natural System

A group of areas that are ecologically dependent.

Natural Environment Park

Refer to page 103 of The City of Calgary Parks' [Open Space Plan](#) for more information.

Near-Native Condition

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

Neighbourhood Park

Neighbourhood parks (i.e. tot lots, decorative parks, or ornamental parks) are [MRs](#) that are 0.4 to 3.6 hectares (1.0 to 8.9 acres). These parks are part of the 10% reserve dedication.

Non-Native

Any species of animal or plant that has been introduced by people or their direct activity.

Preservation Zone

Preservation zones are portions of parks that will remain in their present (natural) condition. Refer to The City of Calgary Parks' [Natural Area Management Plan](#) for more information.

Public Utility Lot (PUL)

PULs are titled lots intended to provide for infrastructure and utility facilities, maintenance facilities, and public transportation uses. They can be operated (individually or jointly) by the Federal, Provincial, and Municipal levels of government.

Reclamation

The process of improving a disturbed site's condition.

Rehabilitation

A combination of restoration, reclamation, and naturalization processes.,

Reserve Parcel

Reserve Parcels are sub-neighbourhood parks or linear parks. As well, they can be portions of neighbourhood, community, and district parks that have been designated as decorative parks, ornamental parks, and tot lots.

Resource Significance

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

Restoration

The process of restoring a site to [Near-Native Condition](#).

Restoration Zone

Restoration zones are portions of parks that have been returned (or will be improved) to near their natural and native condition. Such areas play a role in the nearby natural system or vegetation community.

Right-of-Way (RoW)

An Easement, or a privilege for one party to pass over a portion of property belonging to another; however, the property owner retains the benefits and privileges of ownership. Also, an RoW preserves the rights for accommodating upon a portion of property a specific utility function such as a roadway, railway or utility pipeline.

School Reserve (SR)

As defined in the [Municipal Government Act](#), Part 17, section 616.

Sensitivity

Measures the amount of unmitigatable damage that a particular vegetation community or species can withstand.

Sub-Neighbourhood Park

Sub-neighborhood parks (i.e. tot lots, decorative parks, or ornamental parks) are [MRs](#) that are +/- 0.2 hectares (+/- 0.5 acres). These parks are part of the 10% reserve dedication.

Stormwater Pond

Stormwater ponds include dry ponds, wet ponds, wetlands, and any combinations thereof (hybrid ponds). An integral part of a major storm drainage system, they receive stormwater runoff from conveyance systems (ditches, drainage swales, roads and gutters, and storm sewers) and discharge to receiving waters such as wetlands, lakes, ponds, and streams, and/or to downstream conveyance systems.

Traffic Island

A road traffic island is an irregular-shaped, raised reserve area within a roadway that segregates the driving lanes and directs the flow of traffic in a roadway system.

Turf Classification A

Highly decorative show-piece parks, usually with numerous horticultural and landscape features.

These parks have a full or partial irrigation system capable of partial coverage of the turf area of the park.

Turf Classification B

Neighborhood, regional, community or major thoroughfare orientated parks. Horticultural and landscape features are based on activities and usage. Programs are generally limited to tennis, soccer, baseball, and/of playgrounds, and can include areas designated for picnics.

These parks have a full or partial irrigation system capable of partial coverage of the turf area of the park.

Turf Classification S

Typically steep slopes, such as riverbanks, escarpments, gullies, coulees, natural parks, and environmental reserves, with plant material comprised of predominately native or indigenous species.

These parks are non-irrigated.

Turf Classification T

Tall grass areas, such as public open spaces, major thoroughfares (i.e. boulevards and medians), and buffer zones. The grass will be coarse and sparse, with quality determined by natural conditions. There is usually a higher weed infestation present than in turf classifications A or B.

These parks do not usually have an Irrigation system present.

Utility Encroachment

A non-legal and non-judgmental term that refers to utility development (i.e. natural gas, sewer, electrical, etc.) in an Environmental Reserve (ER).

Vegetation Community

A group of populations of plants in a given area.

Wet Pond

A Stormwater Pond that is similar to a lake in that there is always a permanent body of water. During rainstorms, additional temporary storage is provided above the normal water level (NWL); afterward, the water level gradually recedes back to its original level. Wet ponds are very similar to Wetlands, but have a greater number of deep water zones, and aquatic vegetation is concentrated along the perimeter of the pond.

Wetland

A Stormwater Pond that always has a permanent body of water, like a Wet Pond; however, they differ from wet ponds in that they are dominated by shallow water zones (less than 0.50 m), and aquatic vegetation is found throughout the pond. During rainstorms, additional temporary storage is provided above the normal water level (NWL); afterward, the water level gradually recedes back to its original level.

APPENDIX B: CONTACTS

The City of Calgary - Parks

Operations

General Information

Phone: 3-1-1

<http://www.calgary.ca/CSPS/Parks/Pages/Contact-Parks.aspx>

Note: Refer to **Figure 2-1** to determine the appropriate Operations division for the development area (Northwest, Northeast, Central, Southwest, or Southeast).

Business Strategy and Contracts Lead

Phone: 403-268-8483

Urban Forestry

Phone: 3-1-1

Mail: The City of Calgary Parks Urban Forestry
P.O. Box 2100 Station M, Mail Code #75
Calgary, AB T2P 2M5

Urban Forestry Coordinator

Phone: 3-1-1

Mail: Urban Forestry Coordinator
The City of Calgary Parks Urban Forestry
P.O. Box 2100, Station M, Mail Code #75
Calgary, AB T2P 2M5

Urban Forestry Technician

Phone: 3-1-1

Urban Forestry - Tree Protection

Phone: 3-1-1

E-mail: tree.protection@calgary.ca

Mail: Tree Protection
The City of Calgary Parks Urban Forestry
P.O. Box 2100, Station M, Mail Code #75
Calgary, AB T2P 2M5

Fax: 403-537-7505

Water Management Lead

Phone: 403-268-4531

Water Management Irrigation Supervisor

Phone: 3-1-1

Planning & Development Services

Phone: 3-1-1

<http://www.calgary.ca/CSPS/Parks/Pages/Contact-Parks.aspx>

Note: Refer to **Figure 2-1** to determine the appropriate Planning and Development Services Division for the development area (North or South).

Development Inspector

Phone: North - 403-804-9397

South - 403-804-9417

Central - 403-620-1326

Note: Refer to **Figure 2-1** to determine the appropriate inspector for the development area.

Development Coordinator

Phone: North - 403-268-1334

Central and South - 403-268-1376

Note: Refer to **Figure 2-1** to determine the appropriate coordinator for the development area.

The City of Calgary - Infrastructure and Information Services

Access Solutions

Phone: 403-268-5807

Mail: Access Solutions

The City of Calgary Corporate Services

P.O. Box 2100, Station M, Mail Code #8026

Calgary, AB T2P 2M5

The City of Calgary - Roads

The City of Calgary Roads Construction

P.O. Box 2100, Station M, Mail Code #4010

Calgary, AB T2P 2M5

<http://www.calgary.ca/Transportation/Roads/Pages/Contact-Roads/Contact-Roads.aspx>

Plant Coordinator

Phone: 403-268-1264

Traffic Permits

Phone: 3-1-1

In Person: Traffic Permits Counter, Main Floor Building E

Manchester Centre, 2808 Spiller Road SE, Calgary

The City of Calgary - Transportation Infrastructure

General Information

Phone: 3-1-1

The City of Calgary - Transportation Planning

General Information

Phone: 3-1-1

The City of Calgary - Urban Development

Coordinator Subdivision Development

Phone: 403-268-6739

Mail: The City of Calgary Urban Development
P.O. Box 2100, Station M, Mail Code #8032
Calgary, AB T2P 2M5

The City of Calgary - Water Services

Leader - Development Approvals

Phone: 403-268-4636

Mail: The City of Calgary Urban Development
P.O. Box 2100, Station M, Mail Code #409
Calgary, AB T2P 2M5

Distribution Control

Phone: 3-1-1

Standards and Organizations

American Society for Testing and Materials (ASTM)

1916 Race St.
Philadelphia, Pennsylvania 19103

www.astm.org

Canadian General Standards Board (CGSB)

Canadian Government Publishing Centre
Supply and Services Canada
Ottawa, ON K1A 0S9

www.gc.ca

Canadian Nursery Certification Institute (CNCI)

<http://cleanplants.ca>

Canadian Nursery Landscape Association (CNLA)

7856 Fifth Line South
Milton, ON L9T 2X8
1-888-446-3499

<http://www.canadanursery.com/>

Canadian Standards Association (CSA)

5060 Spectrum way Suite 100T
Mississauga, ON L4W 5N6
1-800-463-6727

www.csa.ca

Canadian Welding Bureau

Head Office
8260 Parkhill Drive
Milton, ON L9T 5V7
1-800-844-6790

<http://eng.cwbgroup.org/Pages/default.aspx>

Illuminating Engineering Society of North America (IES)

120 Wall Street, Floor 17
New York, NY 10005-4001
212-248-5000

<http://www.iesna.org/>

International Society of Arboriculture (ISA)

P.O. Box 3129
Champaign, IL 61826-3129
1-888-472-8733

<http://www.isa-arbor.com/>

National Capital Commission

Client Services — Contact Centre

National Capital Commission

202–40 Elgin Street

Ottawa ON K1P 1C7

1-800-465-1867

[http://www.canadacapital.gc.ca/bins/
ncc_web_content_page.asp?cid=16296&lang=1](http://www.canadacapital.gc.ca/bins/ncc_web_content_page.asp?cid=16296&lang=1)

National Turfgrass Evaluation Program (NTEP)

10300 Baltimore Ave. Bldg. 005, Rm. 307

Beltsville Agricultural Research Center-West

Beltsville, Maryland

U.S.A. 20705

Phone: 301-504-5125

Fax: 301-504-5167

<http://www.ntep.org/>

The Pulp and Paper Technical Association of Canada (PAPTAC)

740 Notre-Dame St. W., suite 1070

Montreal, Quebec H3C 3X6

Phone: (514) 392-0265

Fax: (514) 392-0369

<http://www.paptac.ca/>

Transportation Association of Canada (TAC)

2323 St. Laurent Blvd.

Ottawa ON K1G 4J8

613-736-1350

<http://www.tac-atc.ca/>

Service Calls

Field Location Service Calls

ATCO	
Enmax		Alberta One-Call
Telus	1-800-242-3447
Wastewater		www.alberta1call.com
Petrogas	

Emergency Service Calls

ATCO	780-245-7222 or 1-800-511-3447
Enmax	403-514-6100
Sewer/Wastewater/Roads	3-1-1
Telus	611
Shaw Cable	403-716-6000

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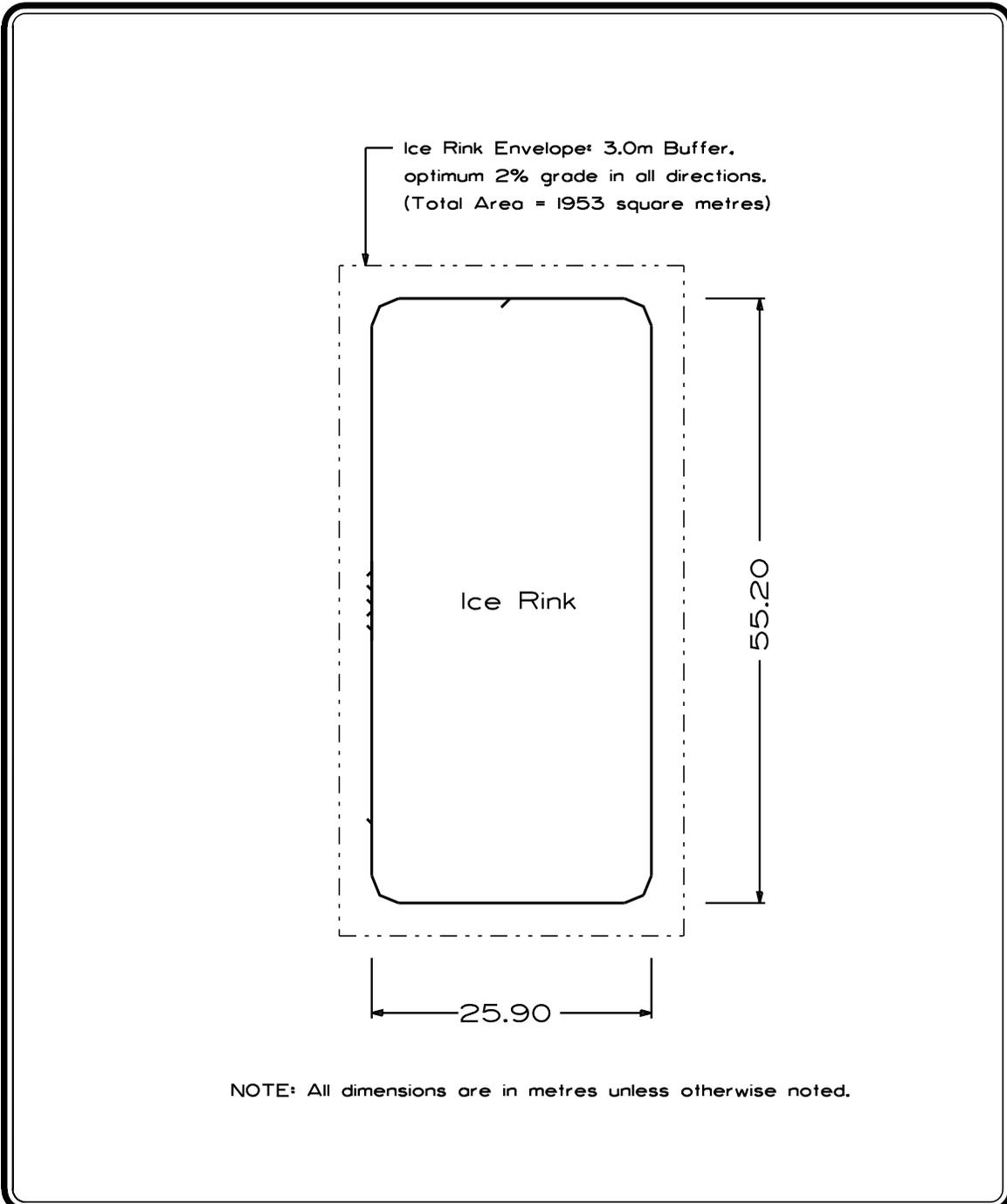
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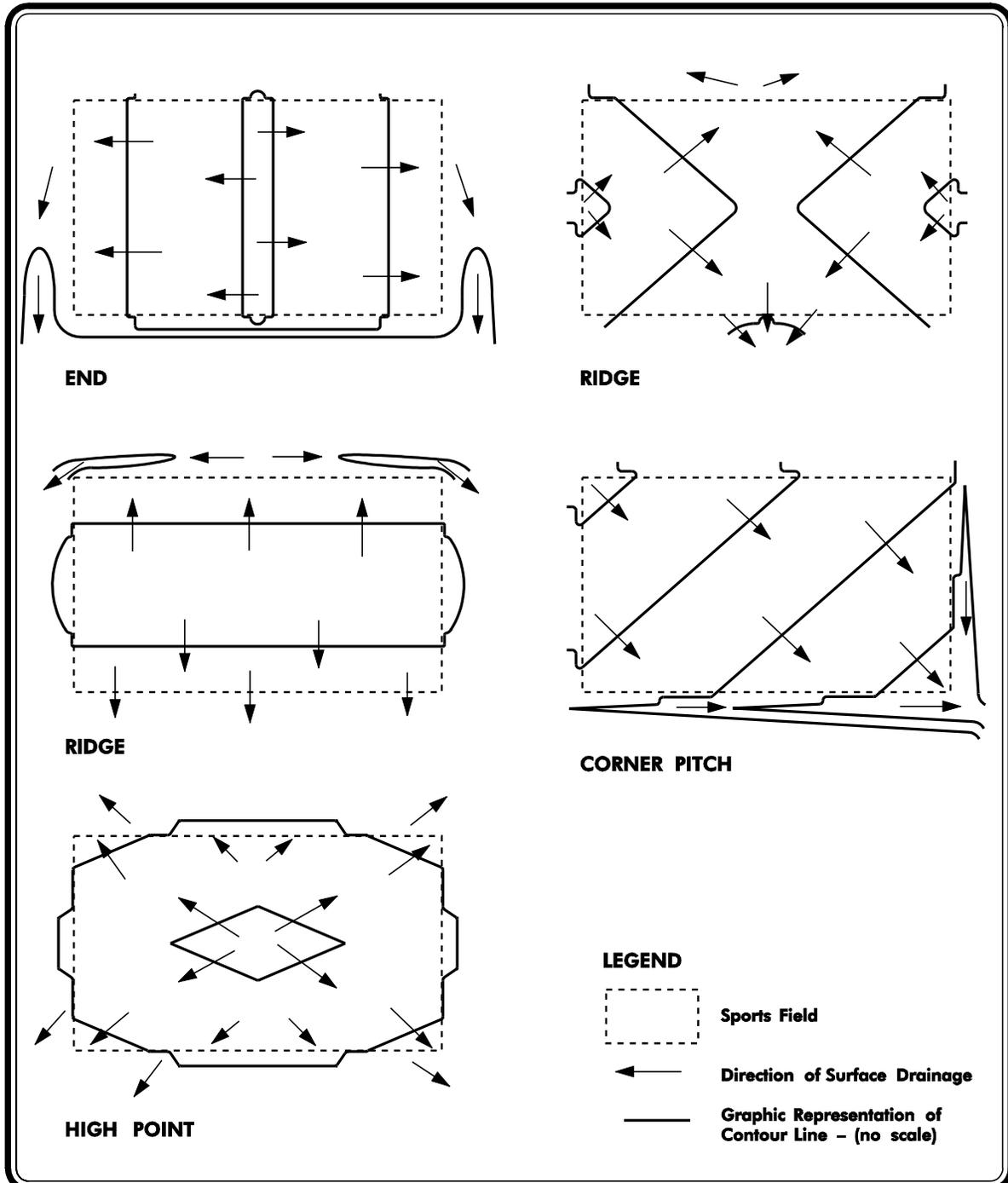
APPENDIX D: DETAIL SHEETS

Detail Sheet 1: Ice Hockey Rink



	PROJECT TITLE	DRAWN BY	SCALE
	SPECIFICATIONS	WB /MM	N.T.S.
	SHEET TITLE	DATE 2006 02 03	SHEET NO.
	COMMUNITY ICE HOCKEY RINK & LACROSSE FIELD	DESIGN BY	1
		D.LaF.	FILE NO.
		DATE 1995 02 25	

Detail Sheet 2: Soccer Fields and Goal Posts



PROJECT TITLE
SPECIFICATIONS

SHEET TITLE
**OPTIMAL DRAINAGE
PATTERNS FOR SPORTS FIELDS**

DRAWN BY
MM

DATE **2005 01 25**

DESIGN BY
DK

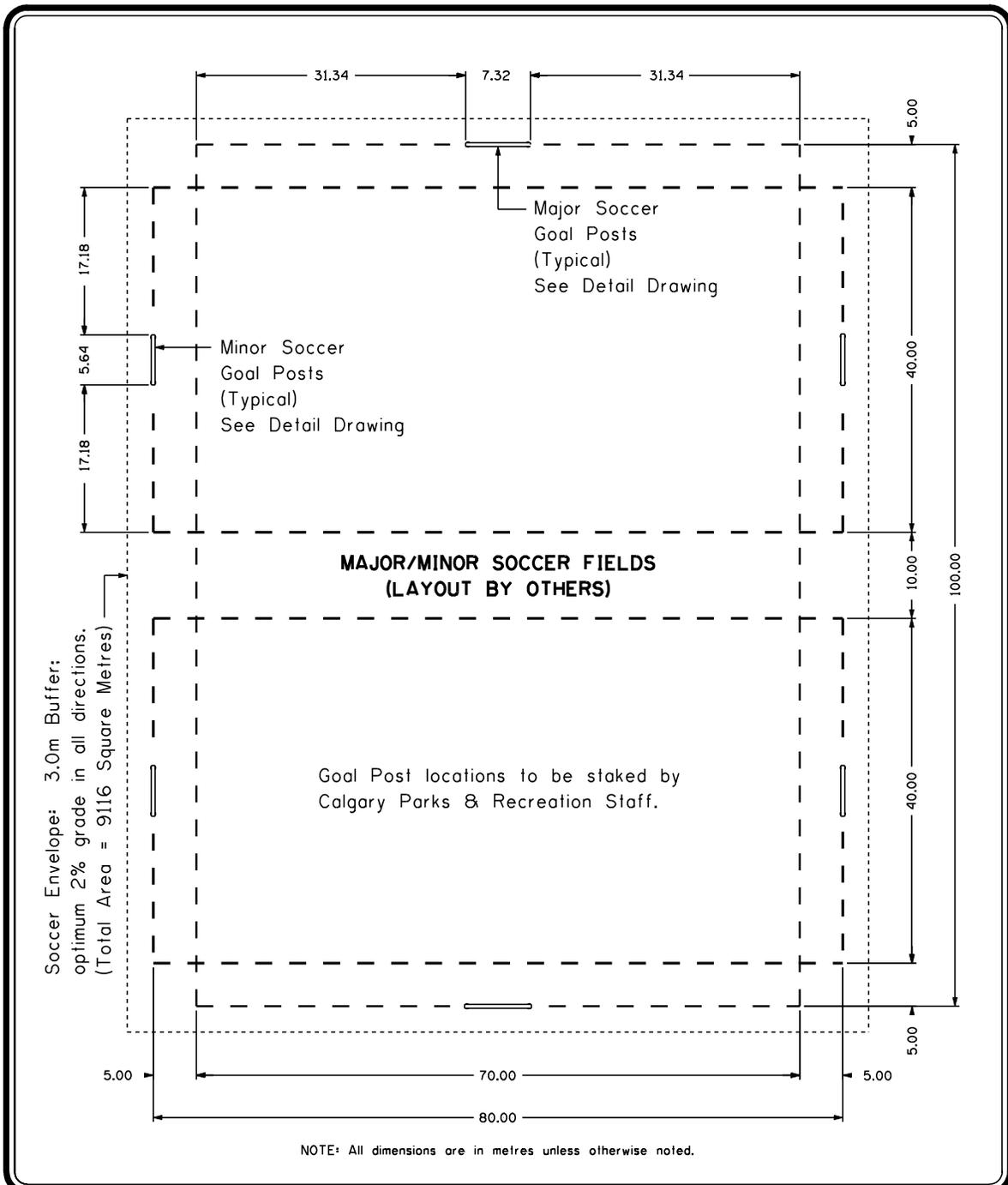
DATE

SCALE
N.T.S.

SHEET NO.
2

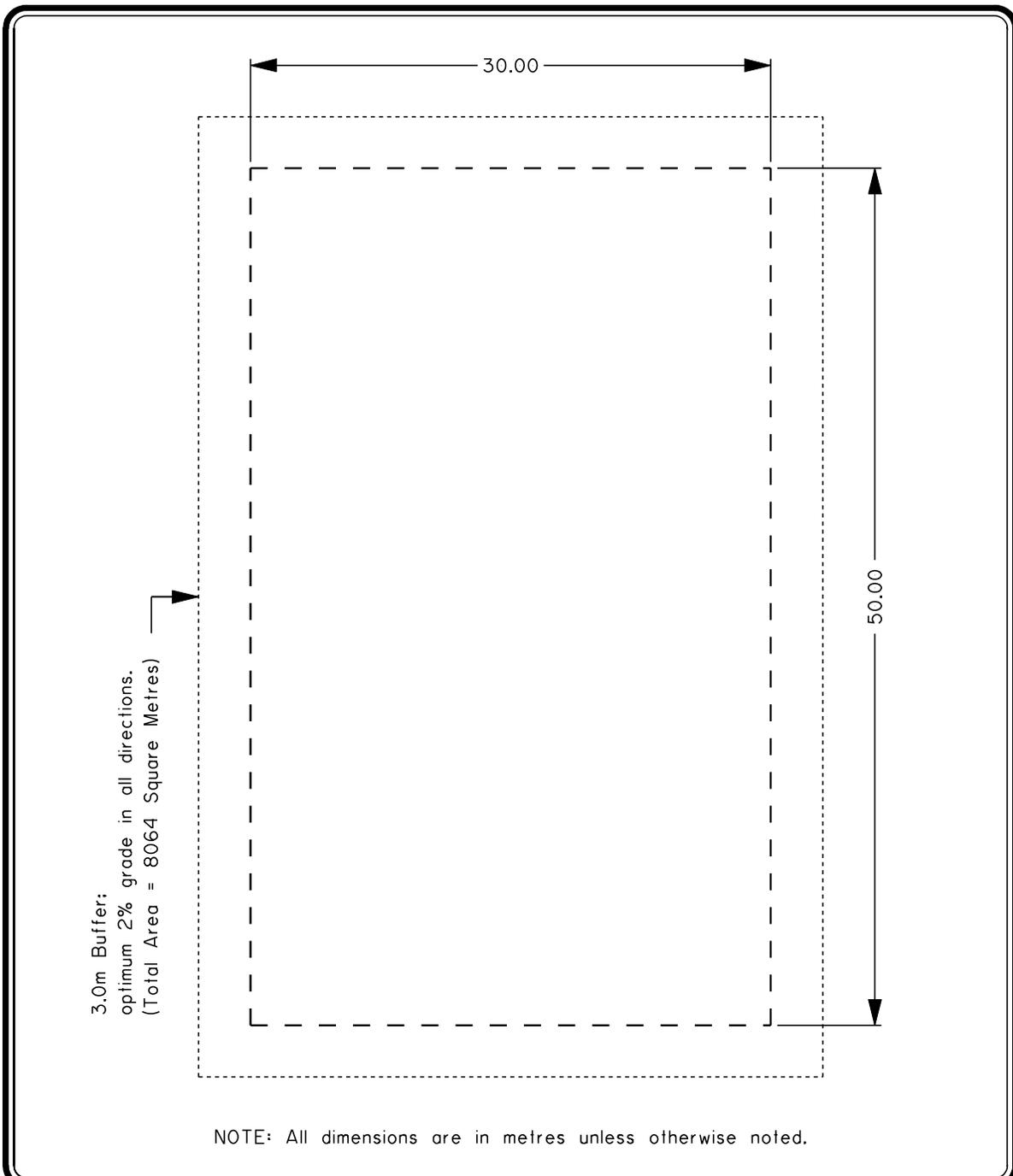
FILE NO.

Detail Sheet 3: Soccer Fields and Goal Posts



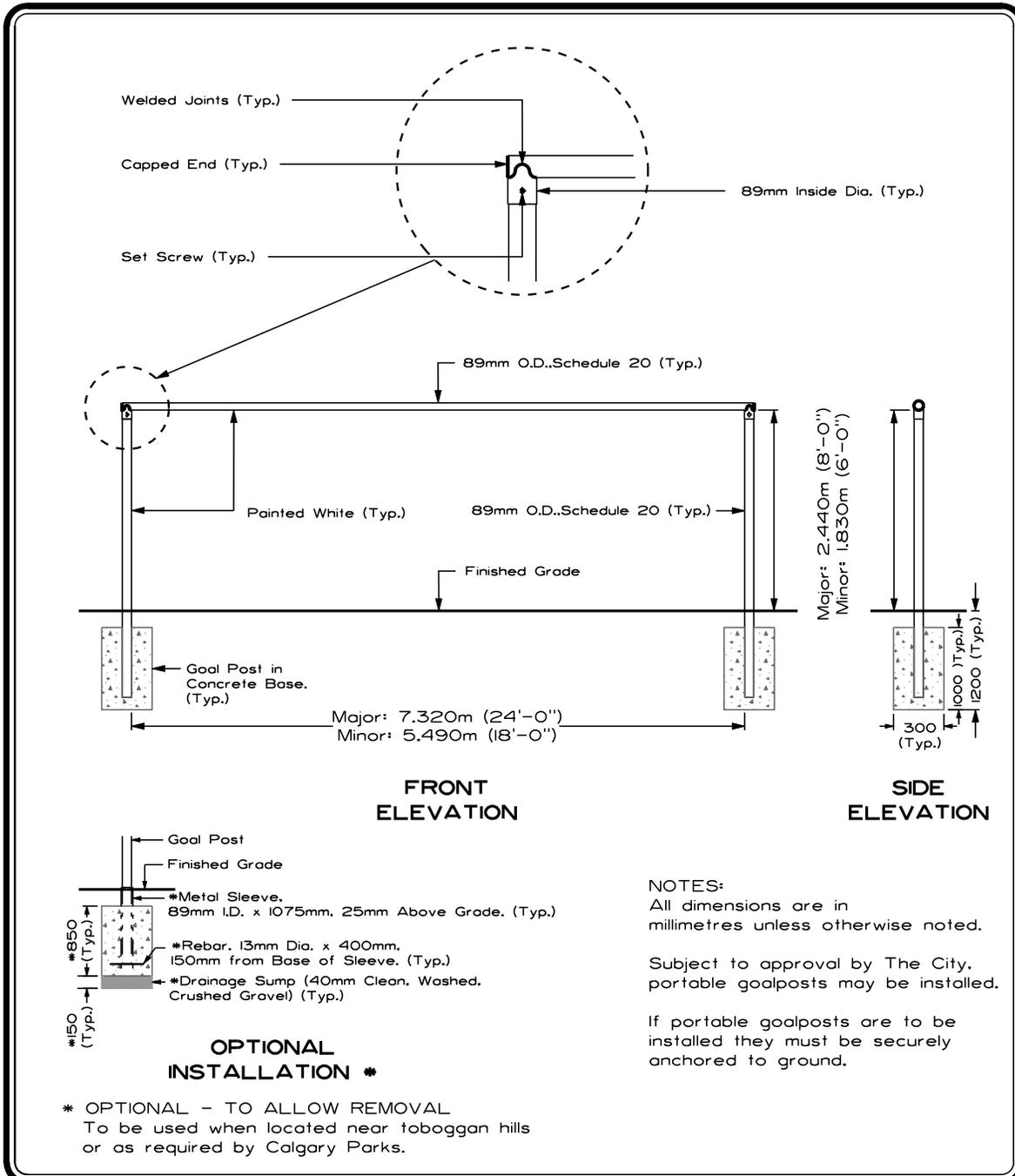
	PROJECT TITLE	DRAWN BY	SCALE
	SPECIFICATIONS	WB /MM	N.T.S.
	SHEET TITLE	DATE 2006 02 03	SHEET NO.
	COMBINATION MAJOR - MINOR SOCCER FIELD	DESIGN BY	3
		DATE 1995 02 25	FILE NO.

Detail Sheet 4: Soccer Fields and Goal Posts



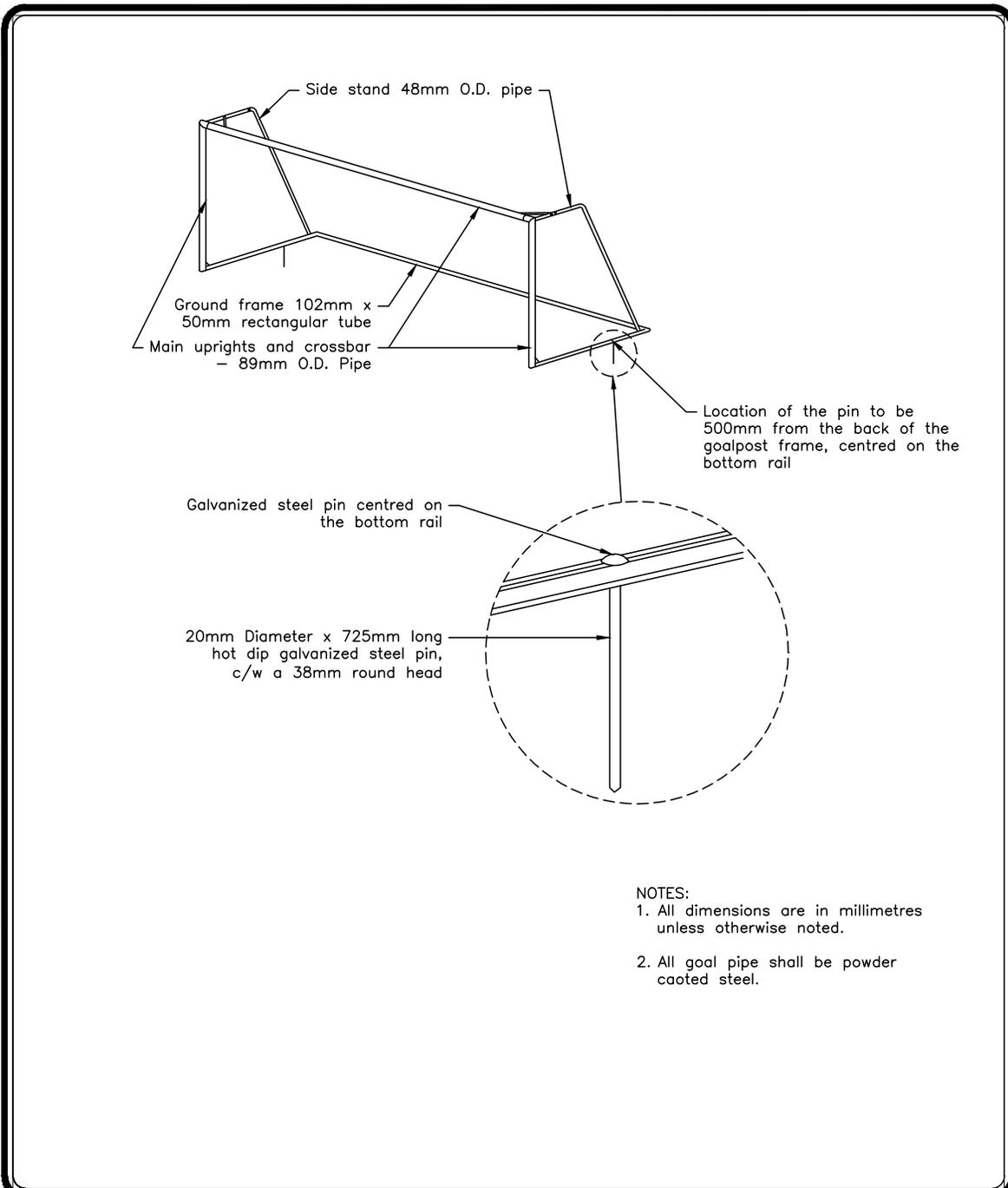
	PROJECT TITLE SPECIFICATIONS	DRAWN BY WB	SCALE N.T.S.
	SHEET TITLE ACTIVE OPEN RECREATION SPACE	DATE 2009 03 26	SHEET NO. 4
		DESIGN BY	FILE NO.
		DATE 2009 03 26	

Detail Sheet 5: Soccer Fields and Goal Posts



	PROJECT TITLE	DRAWN BY	SCALE
	SPECIFICATIONS	W.B.	N.T.S.
	SHEET TITLE	DATE 2009-10-27	SHEET NO.
	MAJOR / MINOR SOCCER GOAL POST DETAIL	DESIGN BY D.LaF.	5
		DATE 1997-07	FILE NO.

Detail Sheet 5a: Soccer Fields and Goal Posts - Portable Soccer Goal

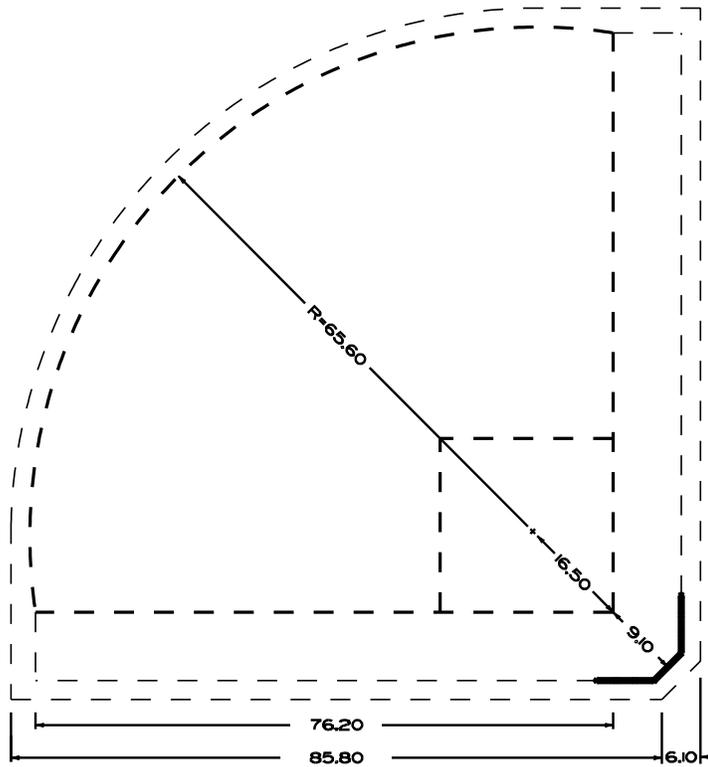


- NOTES:
1. All dimensions are in millimetres unless otherwise noted.
 2. All goal pipe shall be powder coated steel.

	PROJECT TITLE SPECIFICATIONS	DRAWN BY TCP	SCALE N.T.S.
	SHEET TITLE PORTABLE SOCCER GOAL	DATE 2010/11/25	SHEET NO. 5a
		DESIGN BY D.B.	FILE NO. N.T.S.
	DATE 2010/11/25		

Detail Sheet 6: Ball Diamonds and Backstops

- 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



PROJECT TITLE

SPECIFICATIONS

SHEET TITLE

**76.2m
SOFTBALL DIAMOND**

DRAWN BY

WB /MM

DATE **2006 02 03**

DESIGN BY

DATE

SCALE

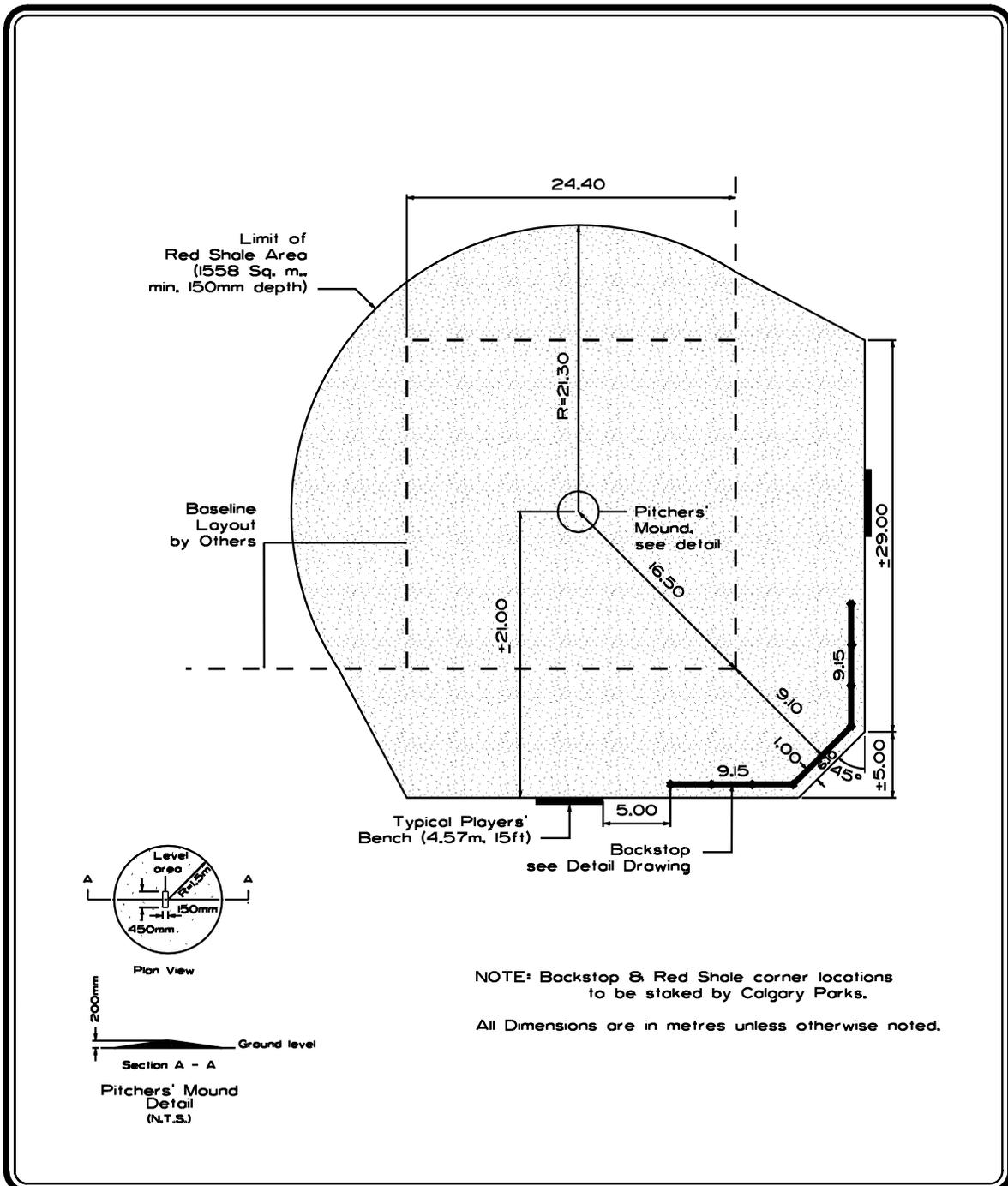
N.T.S.

SHEET NO.

6

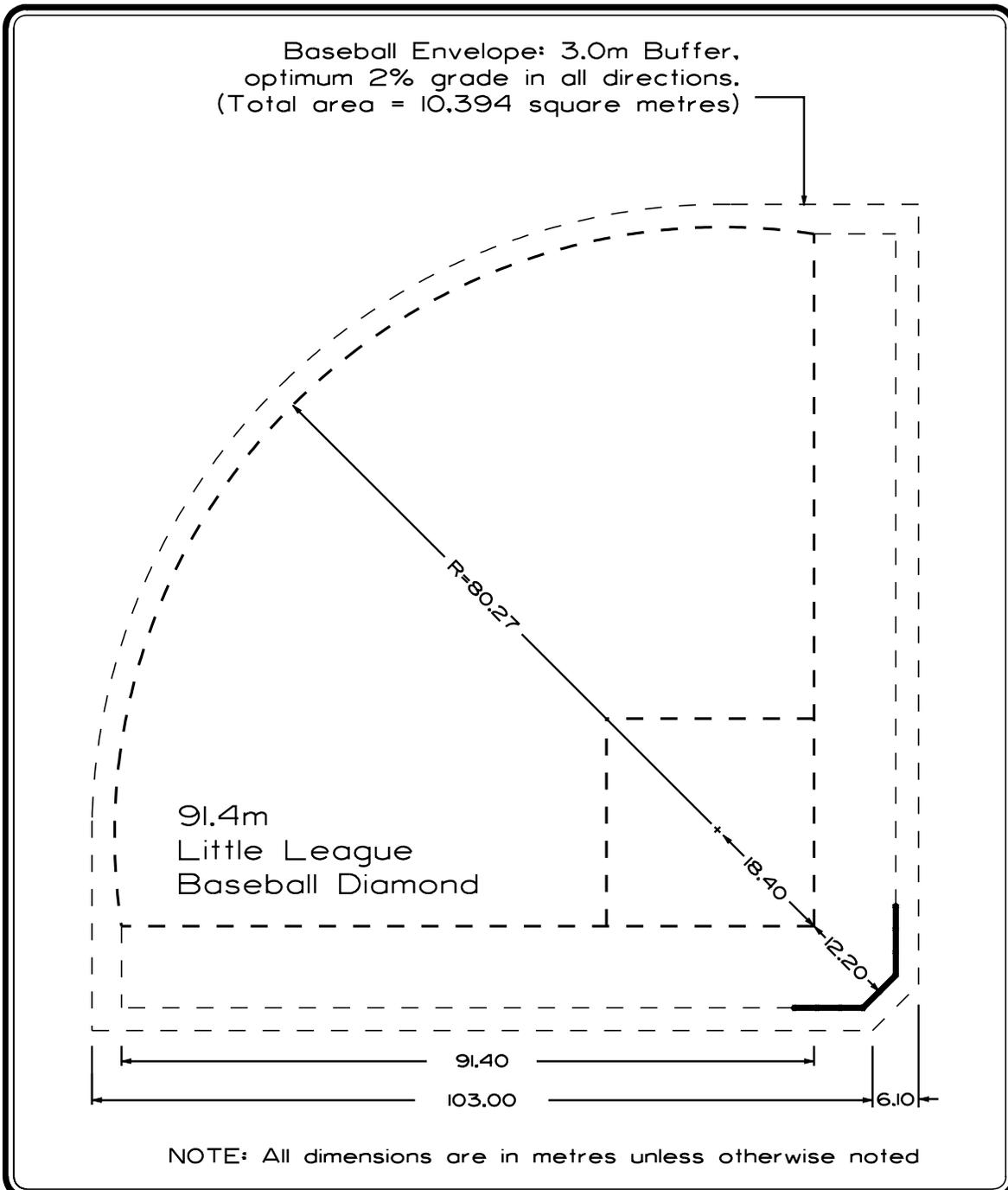
FILE NO.

Detail Sheet 7: Ball Diamonds and Backstops



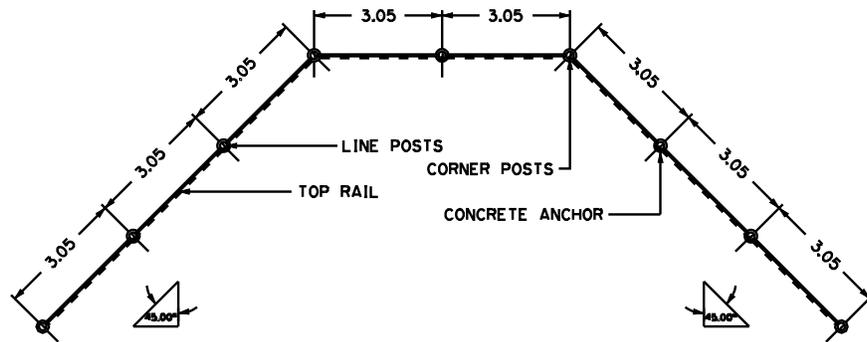
	PROJECT TITLE SPECIFICATIONS	DRAWN BY W.B.	SCALE 1:400
	SHEET TITLE 76.2m LITTLE LEAGUE BASEBALL DIAMOND INFIELD	DATE 2005 01 25	SHEET NO. 7
		DESIGN BY D.LaF.	FILE NO.
		DATE 1997-03-08	

Detail Sheet 9: Ball Diamonds and Backstops

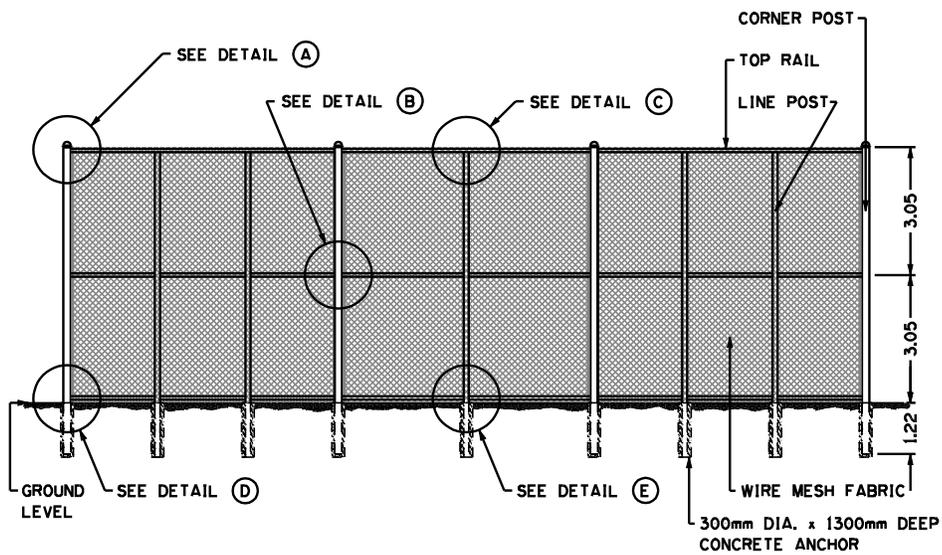


	PROJECT TITLE	DRAWN BY	SCALE
	SPECIFICATIONS	WB /MM	N.T.S.
	SHEET TITLE	DATE 2006 02 03	SHEET NO.
	91.4m LITTLE LEAGUE BASEBALL DIAMOND	DESIGN BY	9
		D. LaF.	FILE NO.
		DATE 1996 03 08	

Detail Sheet 10: Ball Diamonds and Backstops



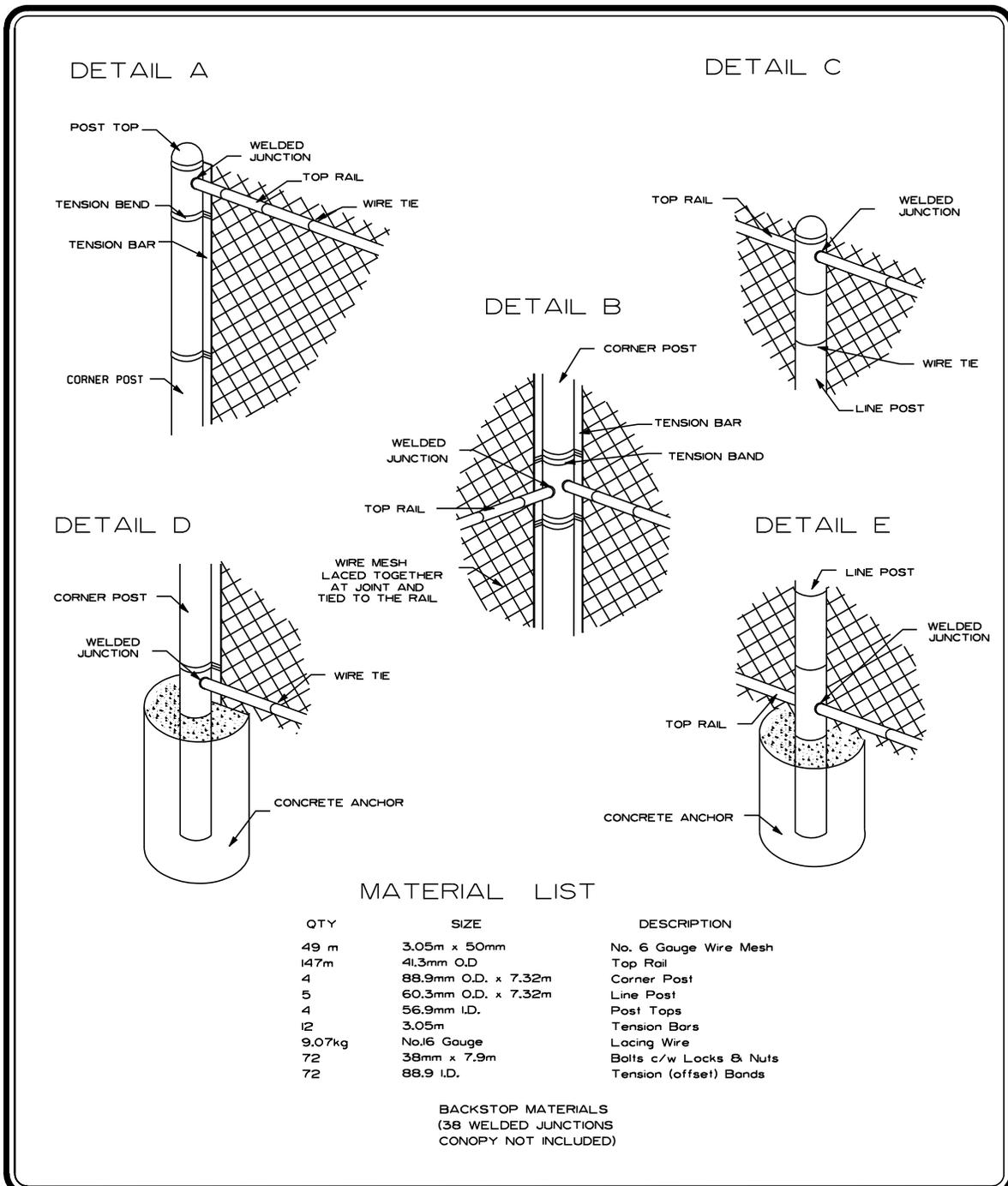
BACKSTOP PLAN



BACKSTOP ELEVATION

	PROJECT TITLE	DRAWN BY	SCALE
	SPECIFICATIONS	WB / MM	N.T.S.
	SHEET TITLE	DATE 2006 02 04	SHEET NO.
	BACKSTOP DETAIL	DESIGN BY	10
	DATE	FILE NO.	

Detail Sheet 12: Ball Diamonds and Backstops



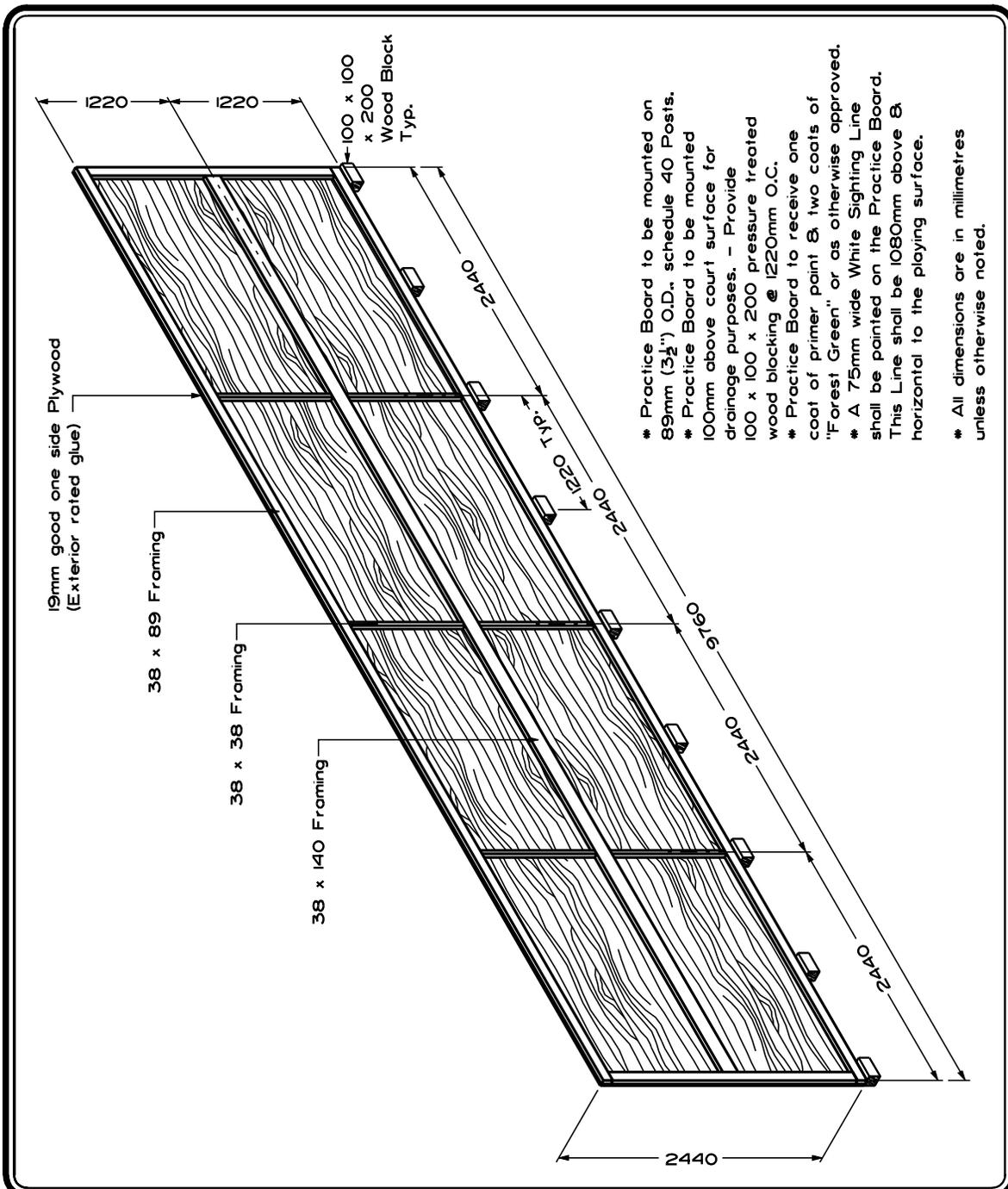
MATERIAL LIST

QTY	SIZE	DESCRIPTION
49 m	3.05m x 50mm	No. 6 Gauge Wire Mesh
147m	41.3mm O.D.	Top Rail
4	88.9mm O.D. x 7.32m	Corner Post
5	60.3mm O.D. x 7.32m	Line Post
4	56.9mm I.D.	Post Tops
12	3.05m	Tension Bars
9.07kg	No.16 Gauge	Lacing Wire
72	38mm x 7.9m	Bolts c/w Locks & Nuts
72	88.9 I.D.	Tension (offset) Bands

BACKSTOP MATERIALS
(38 WELDED JUNCTIONS
CONOPY NOT INCLUDED)

	PROJECT TITLE	DRAWN BY	SCALE
	SPECIFICATIONS	MK	N.T.S
	SHEET TITLE	DATE	SHEET NO.
	BACKSTOP DETAIL	2006 05 24	12
	DESIGN BY	FILE NO.	
	DATE		

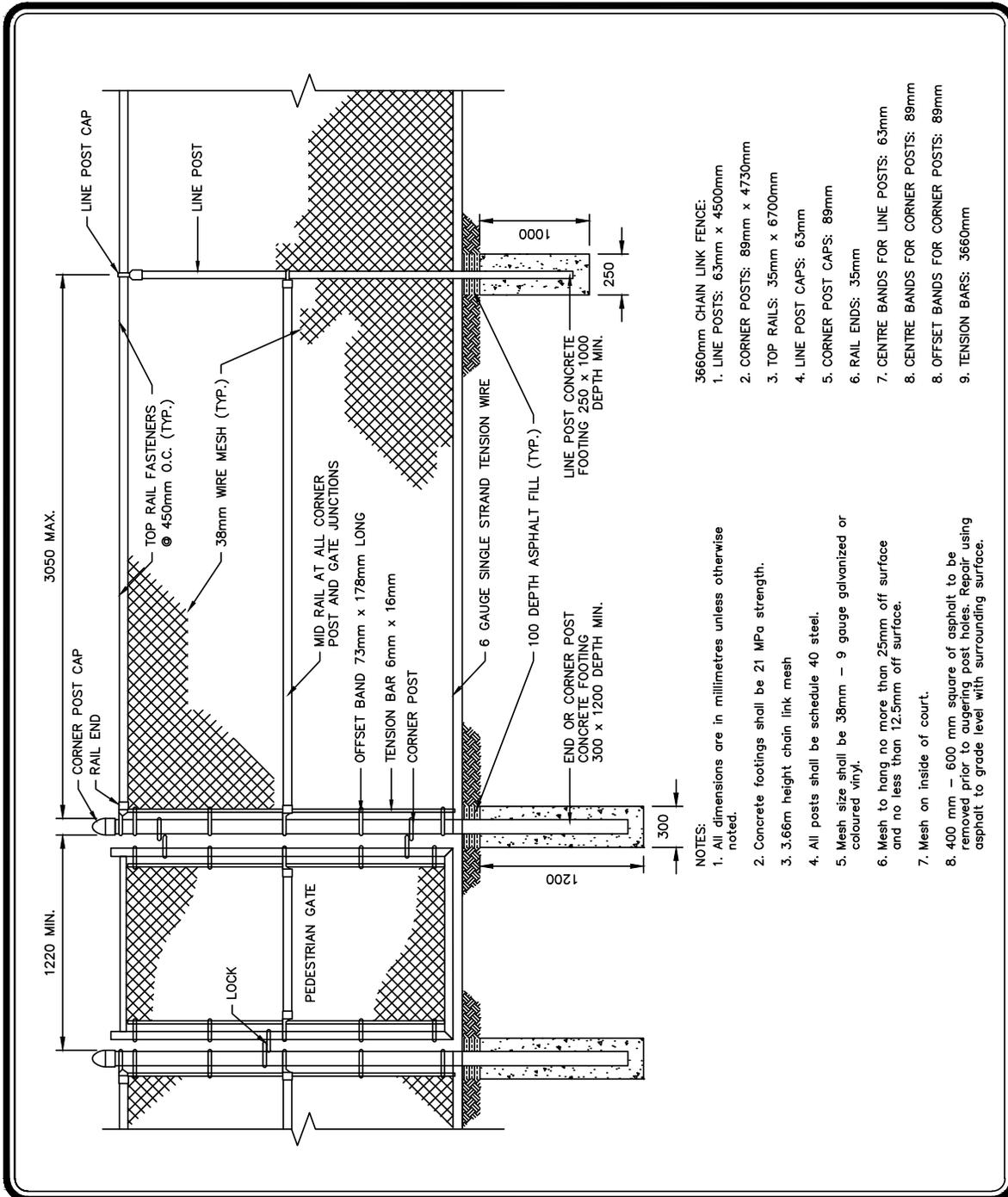
Detail Sheet 14: Tennis Courts



- * 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.

	PROJECT TITLE	DRAWN BY	SCALE
	SPECIFICATIONS	WB	N.T.S.
	SHEET TITLE	DATE 2006 02 04	SHEET NO.
	TENNIS COURT CONSTRUCTION (PRACTICE BOARD)	DESIGN BY	14
	DATE	FILE NO.	

Detail Sheet 14a: Tennis Courts - Fencing



- 360mm CHAIN LINK FENCE:
1. LINE POSTS: 63mm x 4500mm
 2. CORNER POSTS: 89mm x 4730mm
 3. TOP RAILS: 35mm x 6700mm
 4. LINE POST CAPS: 63mm
 5. CORNER POST CAPS: 89mm
 6. RAIL ENDS: 35mm
 7. CENTRE BANDS FOR LINE POSTS: 63mm
 8. CENTRE BANDS FOR CORNER POSTS: 89mm
 8. OFFSET BANDS FOR CORNER POSTS: 89mm
 9. TENSION BARS: 3660mm

- NOTES:
1. All dimensions are in millimetres unless otherwise noted.
 2. Concrete footings shall be 21 MPa strength.
 3. 3.66m height chain link mesh
 4. All posts shall be schedule 40 steel.
 5. Mesh size shall be 38mm - 9 gauge galvanized or coloured vinyl.
 6. Mesh to hang no more than 25mm off surface and no less than 12.5mm off surface.
 7. Mesh on inside of court.
 8. 400 mm - 600 mm square of asphalt to be removed prior to augering post holes. Repair using asphalt to grade level with surrounding surface.



PROJECT TITLE
SPECIFICATIONS

SHEET TITLE
TENNIS COURT FENCING

DRAWN BY
TCP

DATE
2010/11/25

DESIGN BY

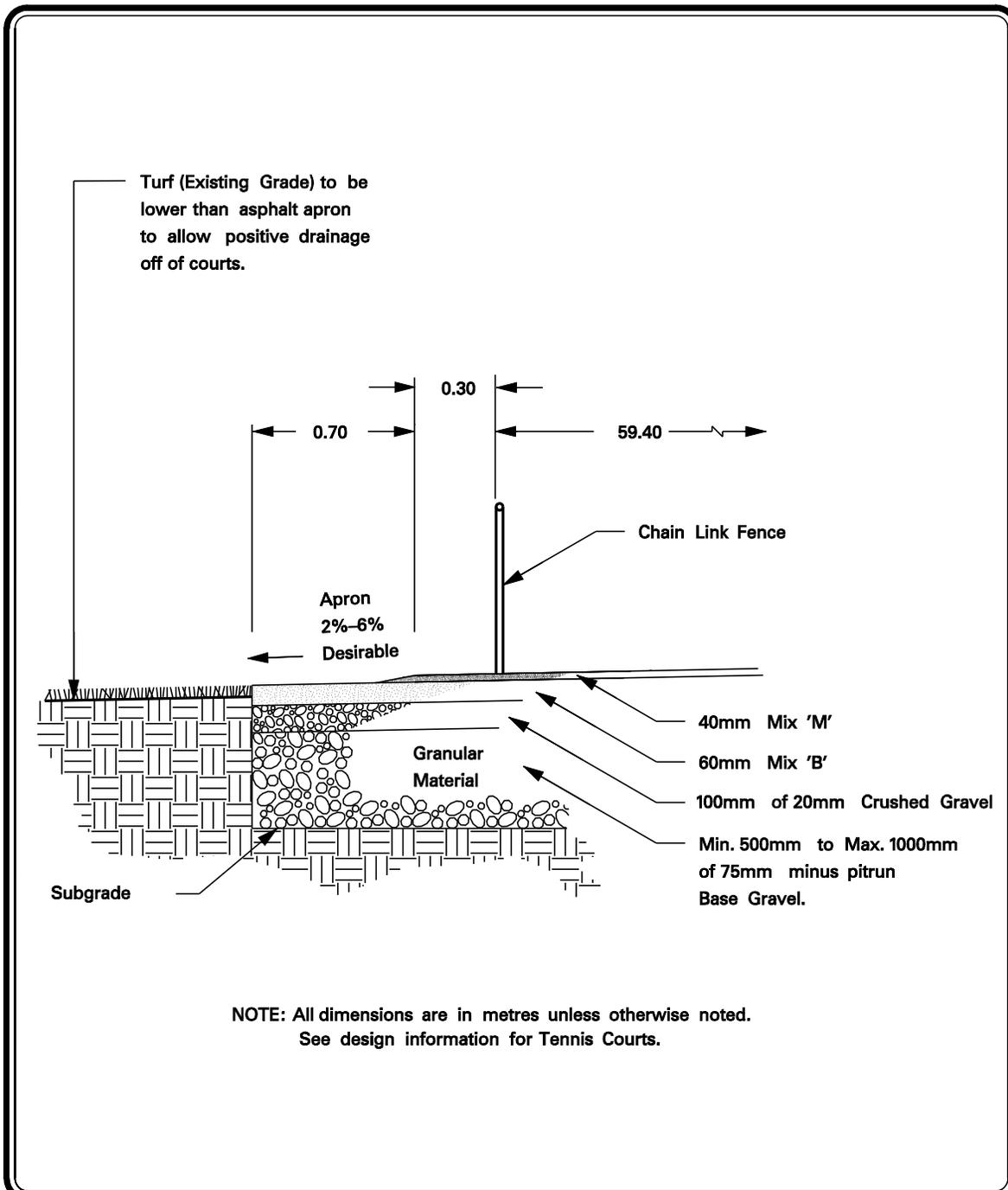
DATE

SCALE
N.T.S.

SHEET NO.
14a

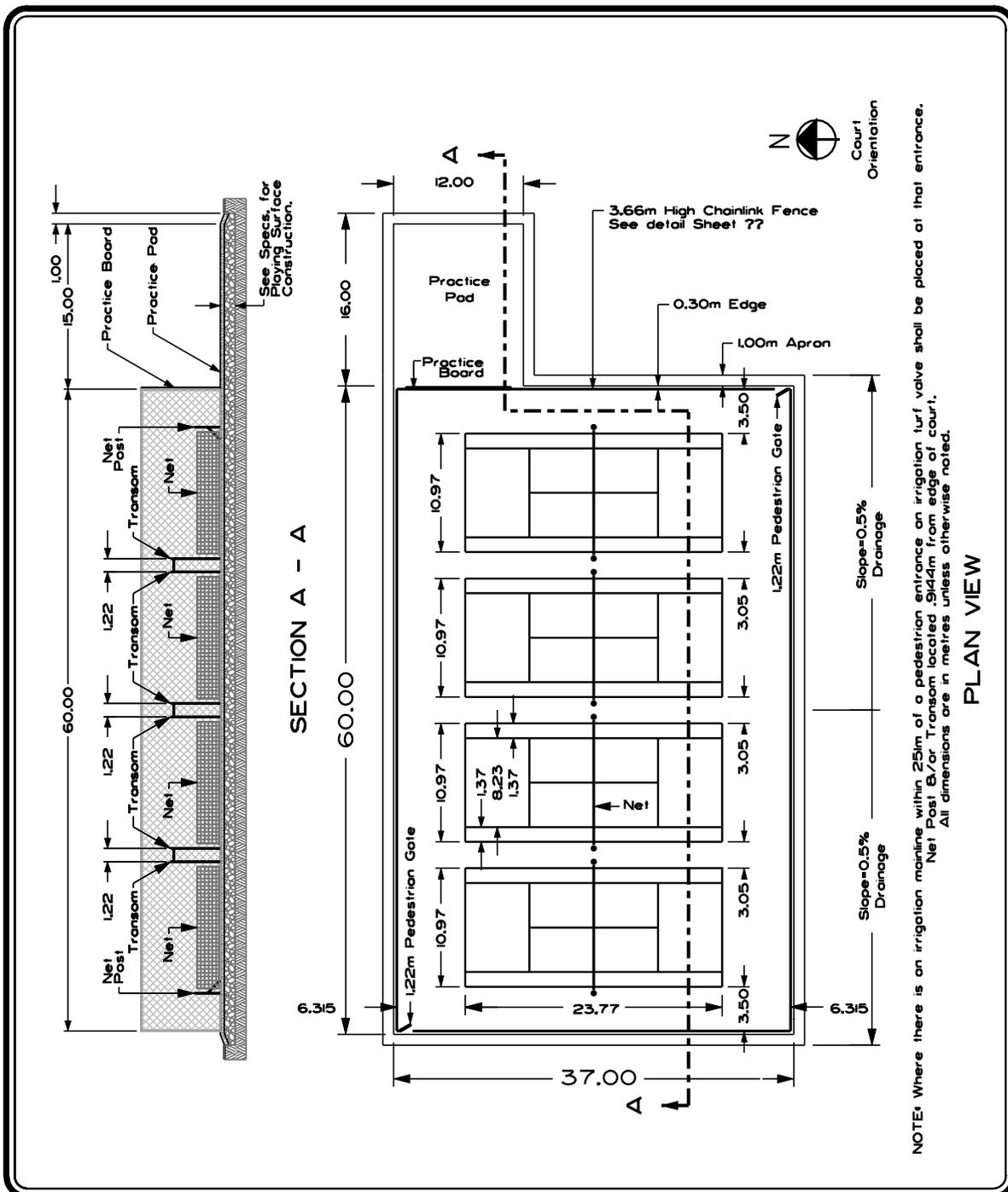
FILE NO.

Detail Sheet 15: Tennis Courts - Construction Apron



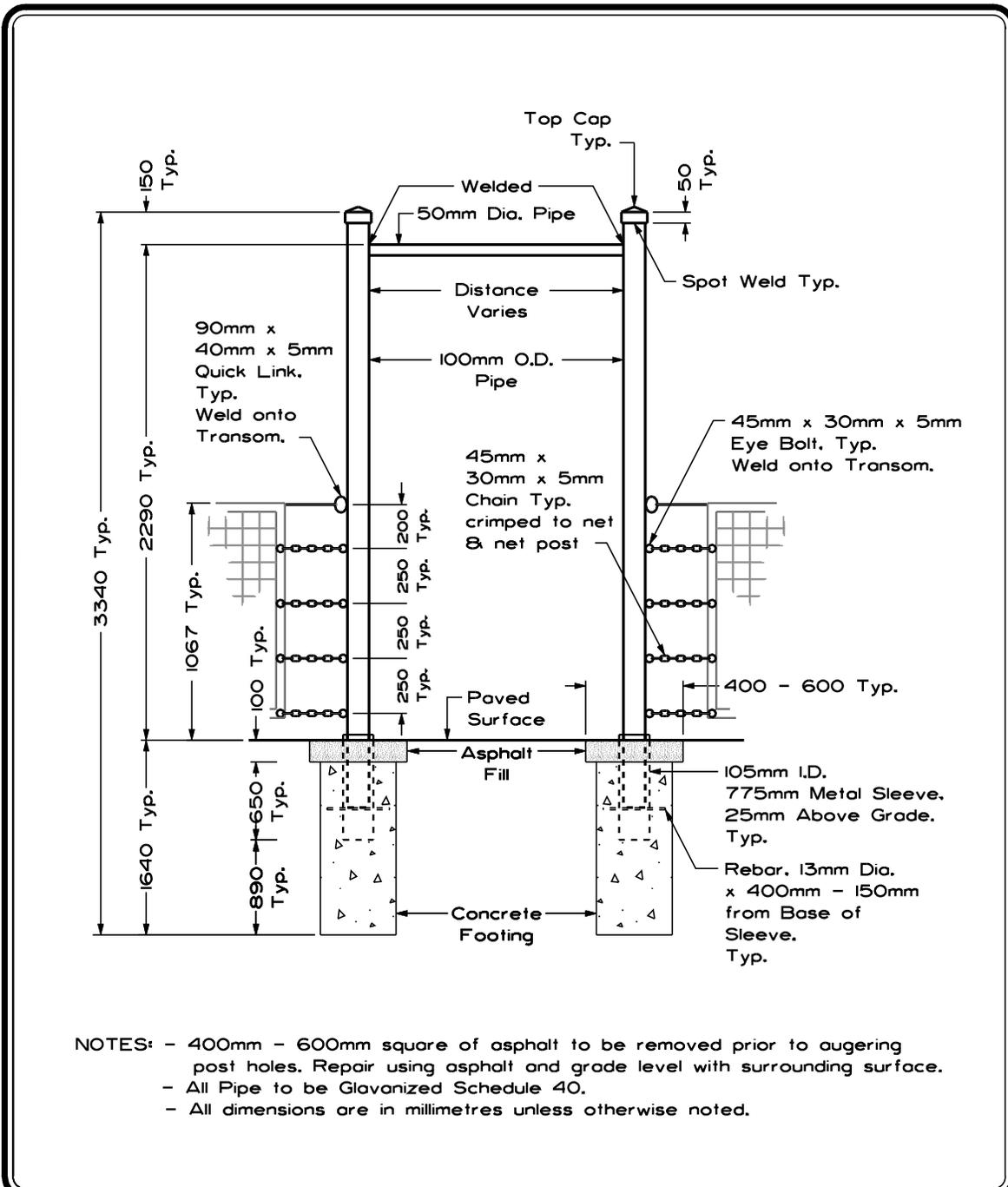
	PROJECT TITLE	DRAWN BY	SCALE
	SPECIFICATIONS	W.B./M.M.	N.T.S.
	SHEET TITLE	DATE 2010 06 16	SHEET NO.
	TENNIS COURT CONSTRUCTION APRON DETAIL	DESIGN BY	15
	DATE	FILE NO.	

Detail Sheet 16: Tennis Courts - Construction (Permanent Transom)



	PROJECT TITLE	DRAWN BY	SCALE
	SPECIFICATIONS	WB	N.T.S.
	SHEET TITLE	DATE 2010 08 13	SHEET NO.
	TENNIS COURT CONSTRUCTION (PLAN & SECTION VIEW)	DESIGN BY TDS / MM	13
		DATE 2010 08 13	FILE NO.

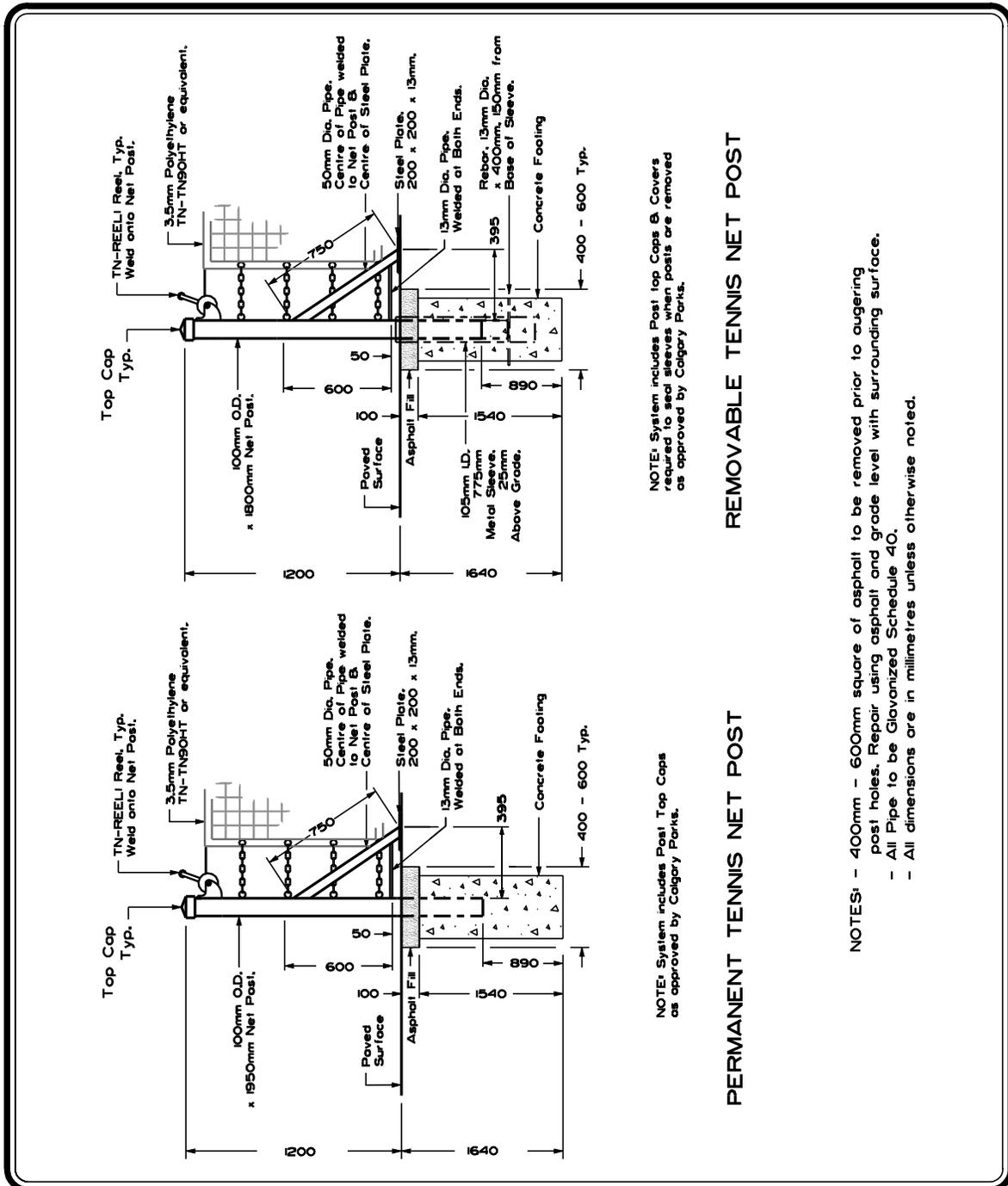
Detail Sheet 17: Tennis Courts - Construction (Removable Transom)



- 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.

	PROJECT TITLE	DRAWN BY	SCALE
	SPECIFICATIONS	WB	N.T.S.
	SHEET TITLE	DATE 2010 08 13	SHEET NO.
	TENNIS COURT CONSTRUCTION (REMOVABLE TRANSOM)	DESIGN BY TDS /M.M.	17
		DATE 2010 08 13	FILE NO.

Detail Sheet 18: Tennis Courts - Construction Net Post Details



PROJECT TITLE
SPECIFICATIONS

SHEET TITLE
**TENNIS COURT
 CONSTRUCTION
 NET POST DETAILS**

DRAWN BY
WB

DATE **2010 08 13**

DESIGN BY
TDS / M.M.

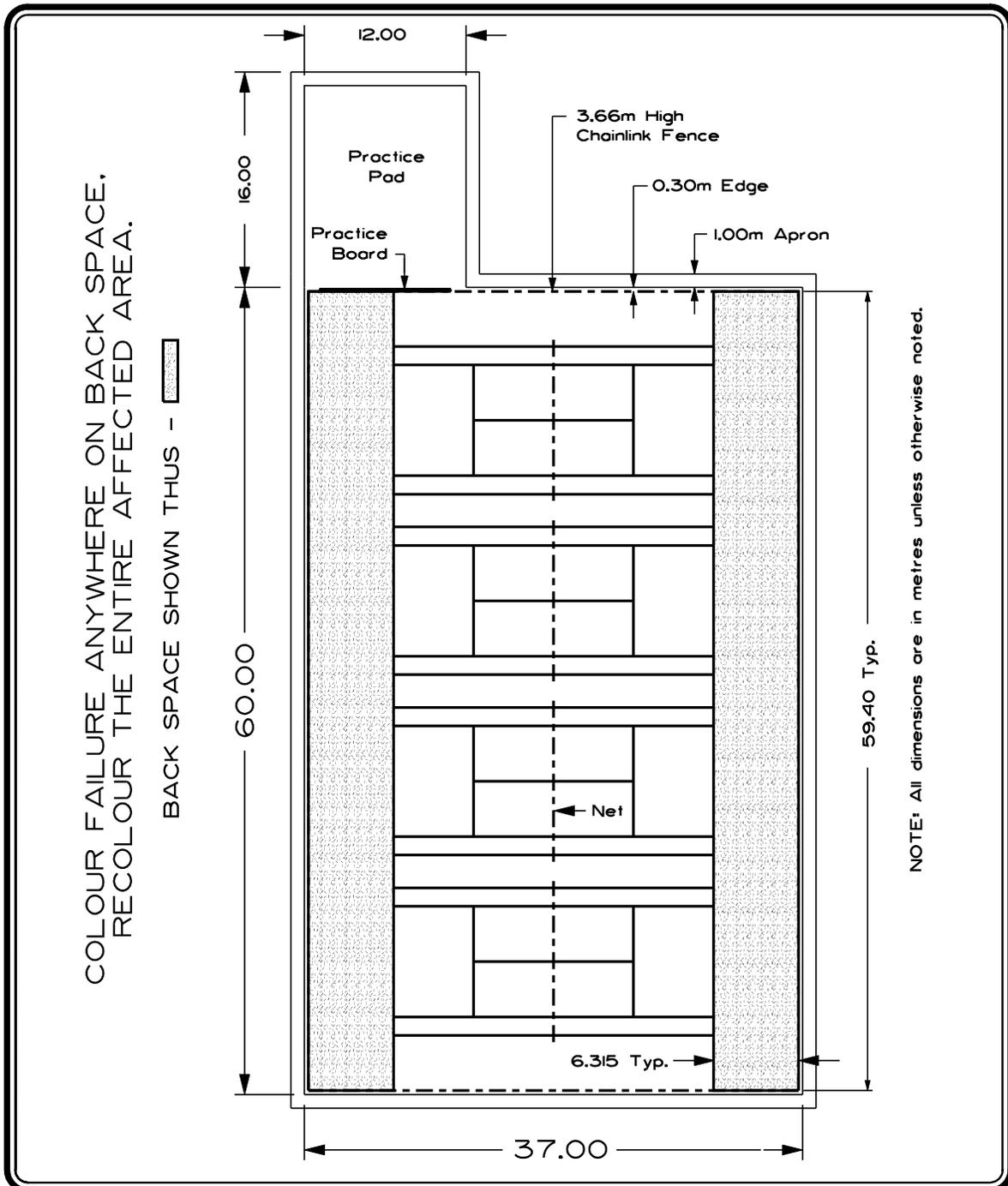
DATE **2010 08 13**

SCALE
N.T.S.

SHEET NO.
18

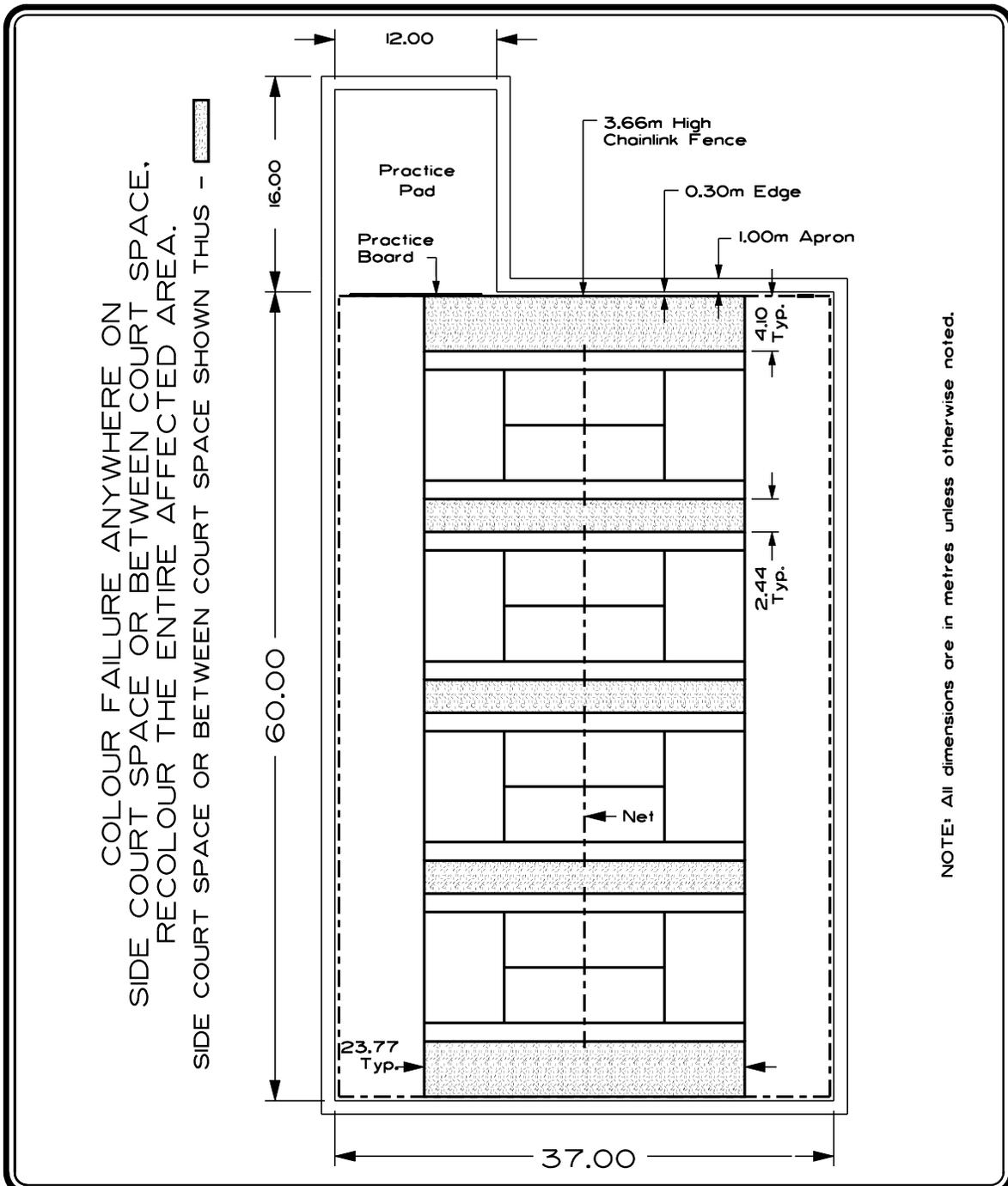
FILE NO.

Detail Sheet 19: Tennis Courts



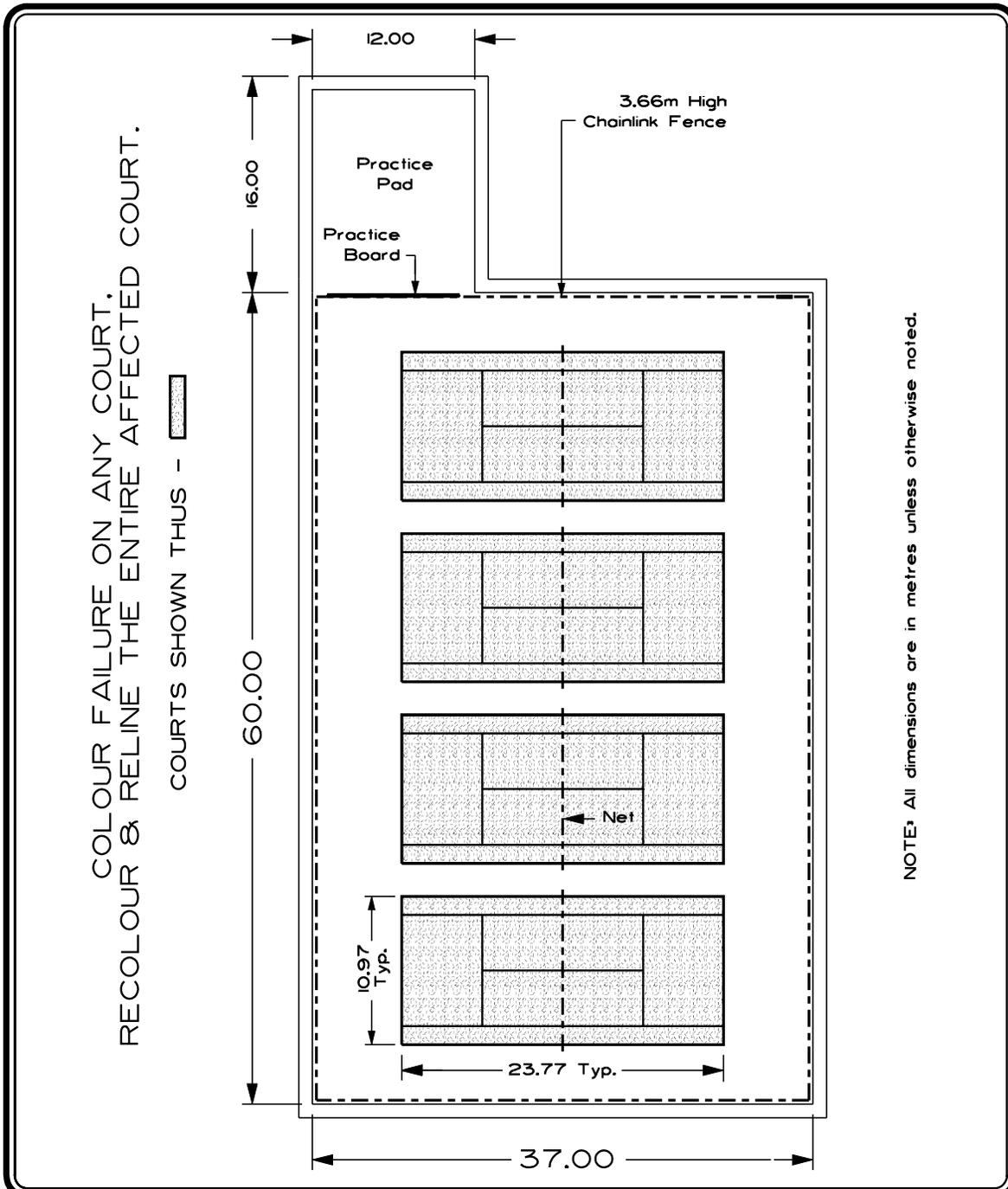
	PROJECT TITLE	DRAWN BY	SCALE
	SPECIFICATIONS	WB	N.T.S.
	SHEET TITLE	DATE 2006 02 06	SHEET NO.
	TENNIS COURT CONST. SURFACE REPAIR SCHEDULE #1	DESIGN BY	19
		DATE 1994 01	FILE NO.

Detail Sheet 20: Tennis Courts



	PROJECT TITLE	DRAWN BY	SCALE
	SPECIFICATIONS	WB	N.T.S.
	SHEET TITLE	DATE 2006 02 06	SHEET NO.
	TENNIS COURT CONSTR. SURFACE REPAIR SCHEDULE #2	DESIGN BY	20
		TDS	FILE NO.
		DATE 1994 01	

Detail Sheet 21: Tennis Courts



	PROJECT TITLE	DRAWN BY	SCALE
	SPECIFICATIONS	WB	N.T.S.
	SHEET TITLE	DATE 2006 02 06	SHEET NO.
	TENNIS COURT CONSTR. SURFACE REPAIR SCHEDULE #3	DESIGN BY	21
		DATE 1994 01	FILE NO.

Detail Sheet 23: Tree/Shrub Planting

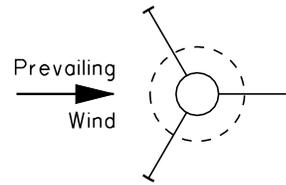
TREE PLANTING DETAIL

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.

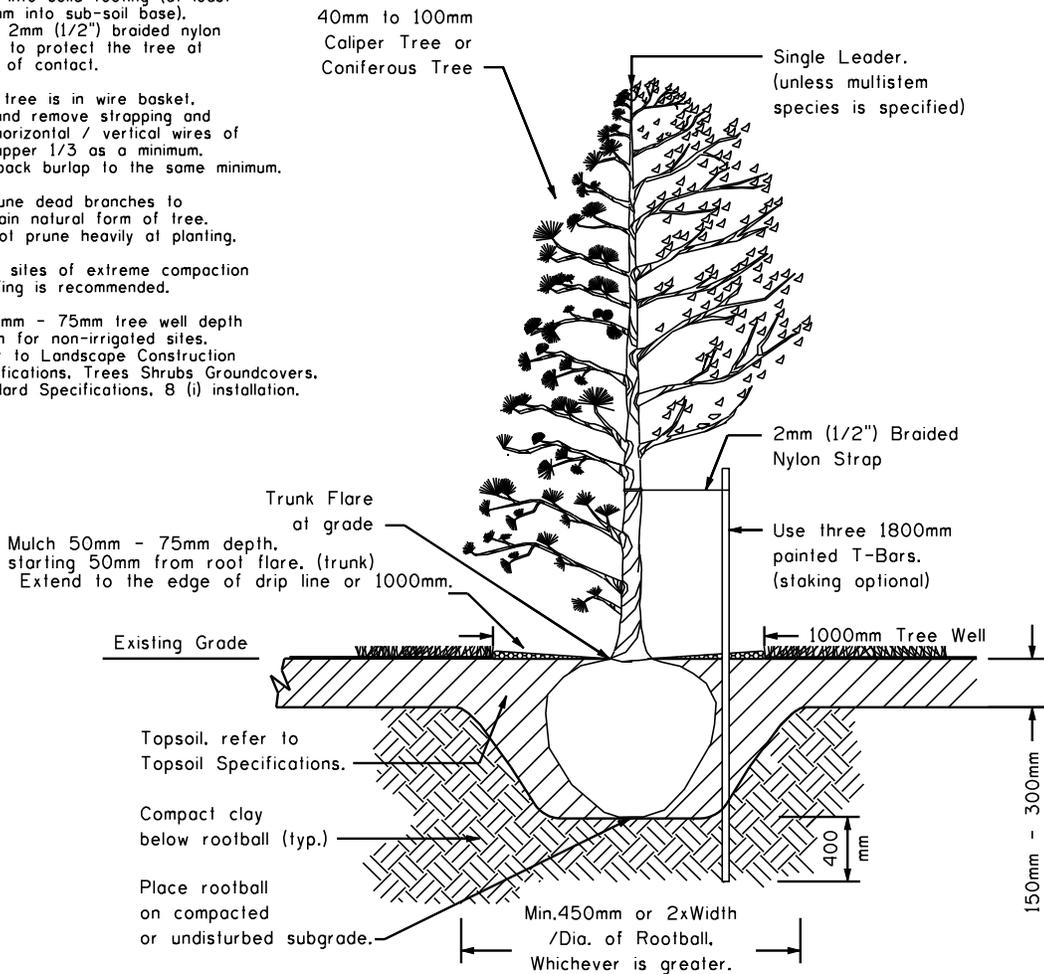
On non-irrigated sites an increase in topsoil depth to increase water holding capacity may be desired.

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.



PLAN FOR TREE STAKING
(optional)



PROJECT TITLE
SPECIFICATIONS

SHEET TITLE
TREE PLANTING DETAIL

40mm TO 100mm CALIPER TREES

DRAWN BY
W.B./M.M.

DATE
2009 10 27

DESIGN BY

DATE

SCALE
N.T.S.

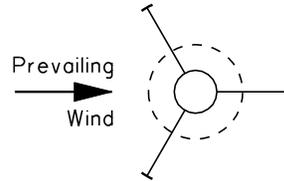
SHEET NO.
23

FILE NO.

Detail Sheet 24: Tree/Shrub Planting

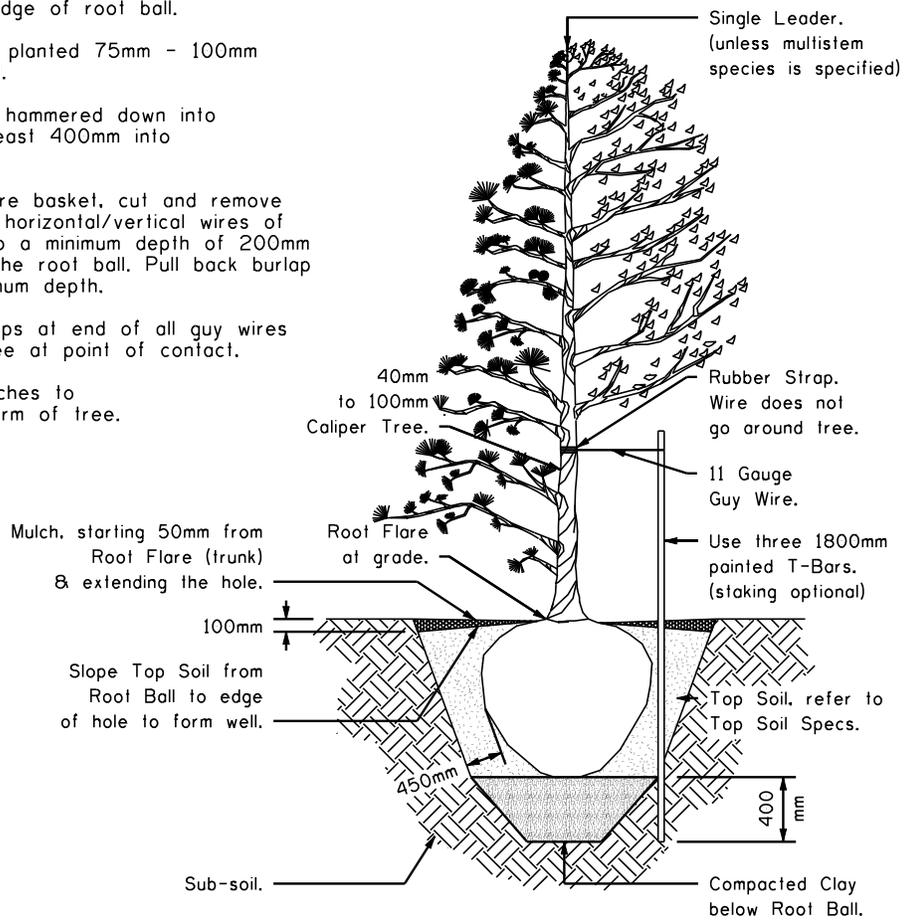
TREE PLANTING DETAIL

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.



PROJECT TITLE
SPECIFICATIONS

SHEET TITLE
TREE PLANTING DETAIL
40mm - 100mm CALIPER TREES
SPADE DUG

DRAWN BY
W.B.

DATE **2003-01-23**

DESIGN BY

DATE

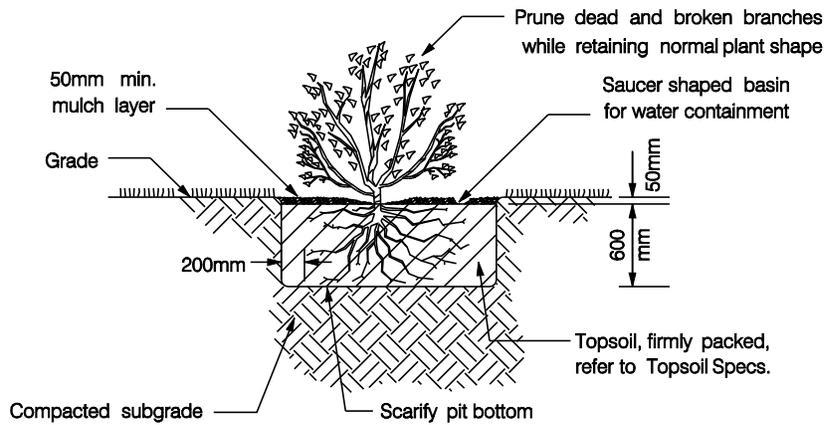
SCALE
N.T.S.

SHEET NO.
24

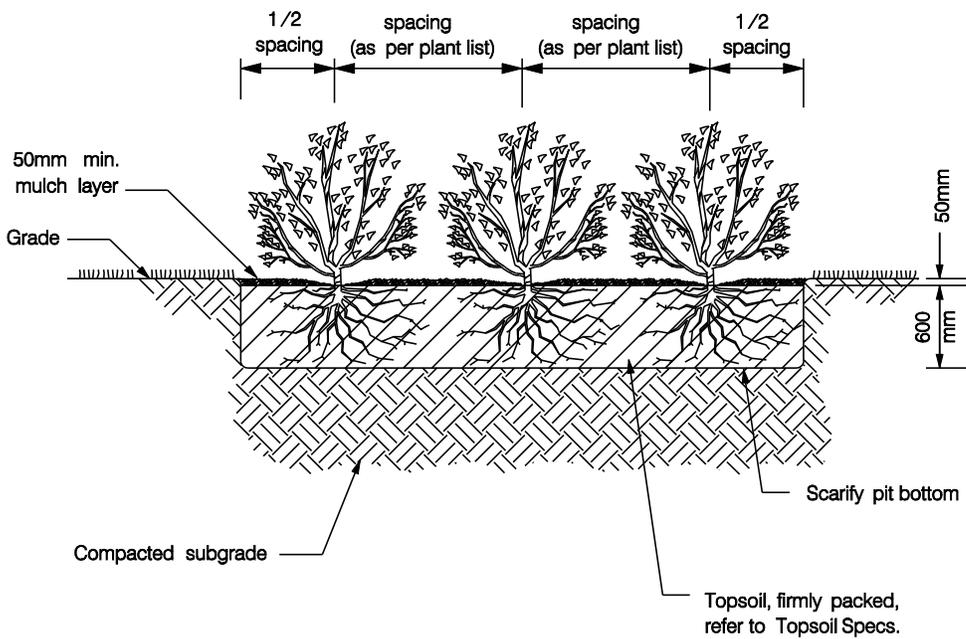
FILE NO.

Detail Sheet 25: Tree/Shrub Planting

The following shrub planting detail will be used for all potted deciduous or coniferous shrubs



Shrub Pit



Shrub Bed



PROJECT TITLE
SPECIFICATIONS
 SHEET TITLE
SHRUB PLANTING DETAIL

DRAWN BY
W.B./M.M.
 DATE **2006 02 06**
 DESIGN BY
 DATE

SCALE
N.T.S.
 SHEET NO.
25
 FILE NO.

Detail Sheet 26: Tree/Shrub Planting

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.

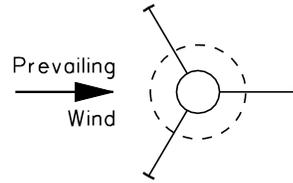
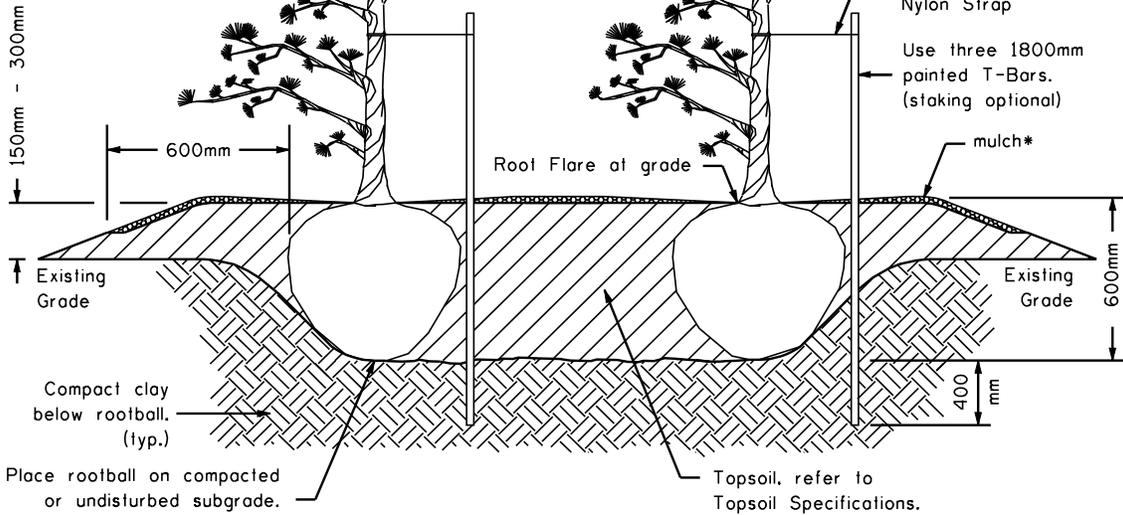
- If staking, stake beyond edge of root ball. Bars should be hammered down into solid footing (at least 400mm into sub-soil base). Use 2mm (1/2") braided nylon strap to protect the tree at point of contact.

- 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.



PLAN FOR TREE STAKING
(optional)



PROJECT TITLE

SPECIFICATIONS

SHEET TITLE

TREE BED DETAIL

DRAWN BY

W.B./M.M.

DATE

2009 10 27

DESIGN BY

DATE

SCALE

N.T.S.

SHEET NO.

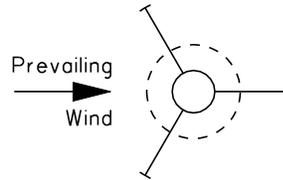
26

FILE NO.

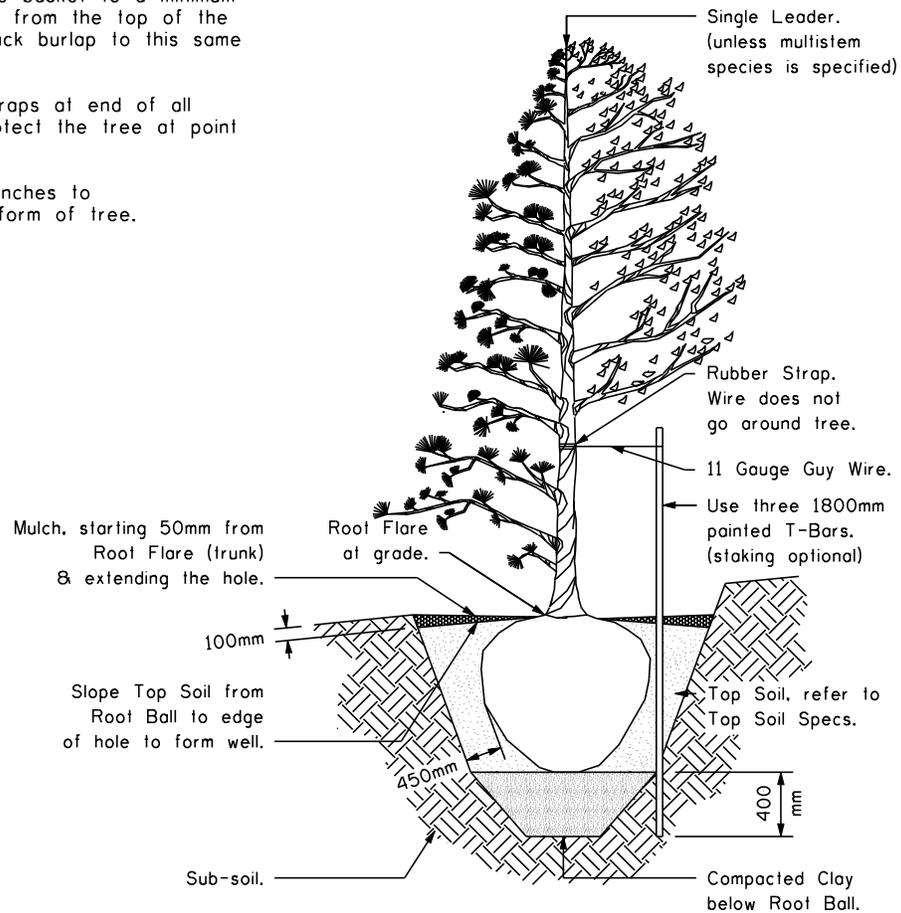
Detail Sheet 27: Tree/Shrub Planting

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)



PROJECT TITLE
SPECIFICATIONS

SHEET TITLE
TREE PLANTING DETAIL FOR SLOPES

DRAWN BY
W.B.

DATE **2003-01-23**

DESIGN BY

DATE

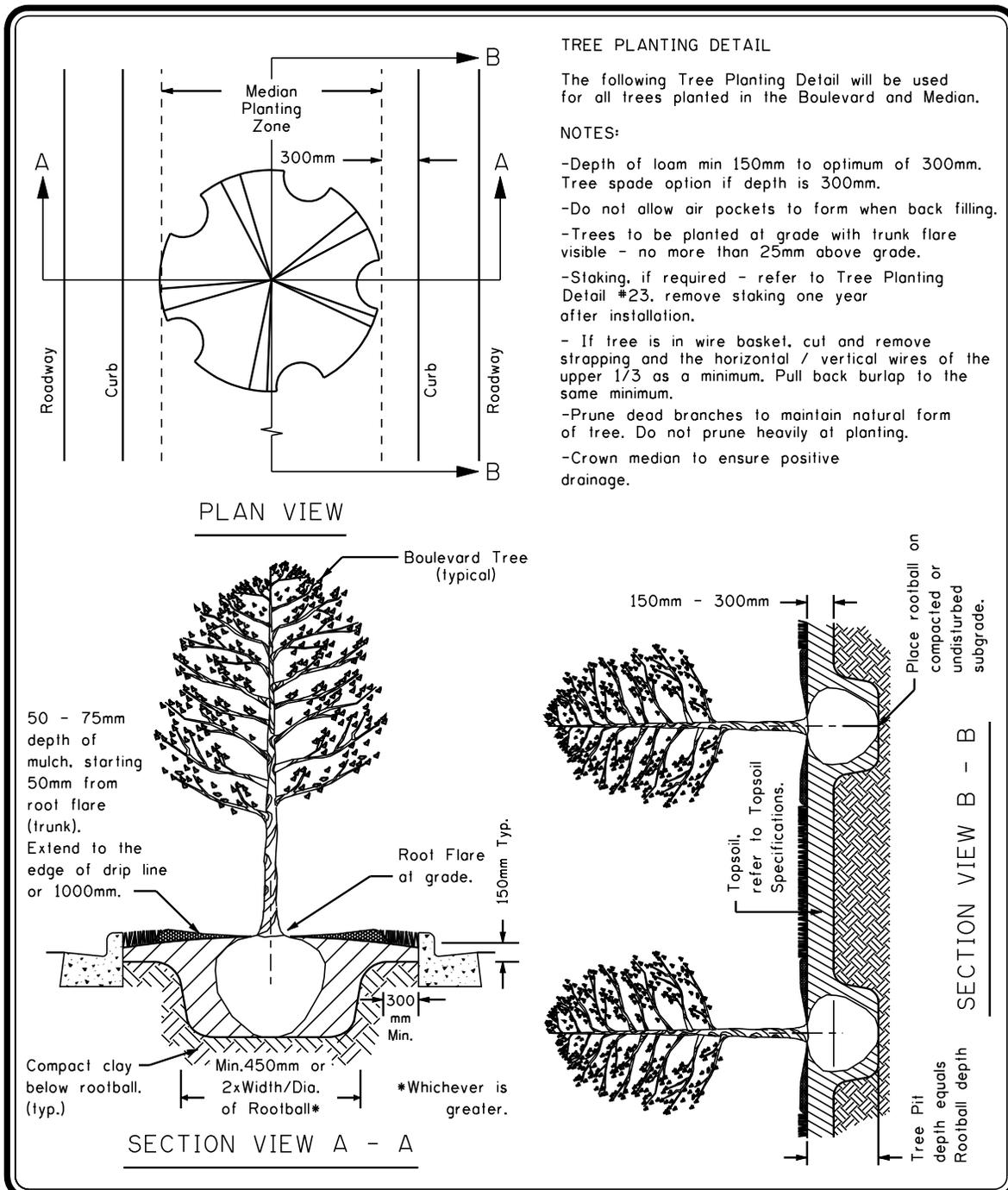
SCALE
N.T.S.

SHEET NO.

27

FILE NO.

Detail Sheet 27a: Tree/Shrub Planting



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.



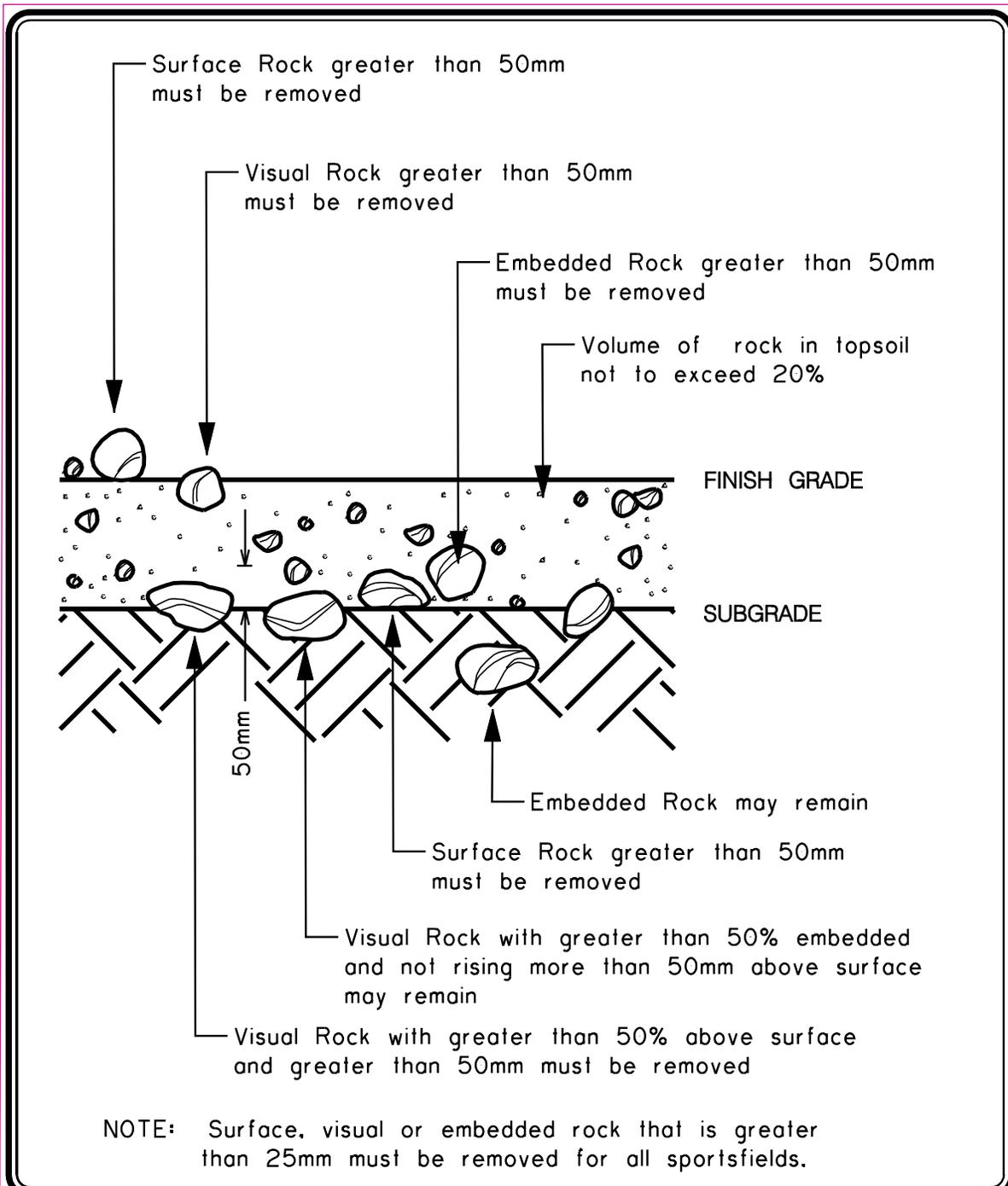
PROJECT TITLE
SPECIFICATIONS

SHEET TITLE
**TREE PLANTING, TRENCH,
DETAIL
BOULEVARDS AND MEDIANS**

DRAWN BY
W.B./M.M.
DATE
2009 10 27
DESIGN BY
DATE

SCALE
N.T.S.
SHEET NO.
27a
FILE NO.

Detail Sheet 28: Topsoil/Subgrade Preparation



	PROJECT TITLE SPECIFICATIONS	DRAWN BY MM	SCALE N.T.S.
	SHEET TITLE TOPSOIL /SUBGRADE PREPARATION	DATE 2006 01 06	SHEET NO. 28
		DESIGN BY DATE	FILE NO.

Detail Sheet 28a: Non-Engineered Fill Drawing

THE CITY OF CALGARY PARKS		NON-ENGINEERED FILL DRAWING		Report #
Community		Subdivision		Plan Block Lot
Phase		Developer		Development Agreement #
Legal / Municipal address				
Consultant		Contact Person		Phone
Contractor		Contact Person		Phone
C.C.C. Application Received: <input type="checkbox"/> Yes <input type="checkbox"/> No				Date yyyy mm dd
--- -- -- -- -- LIMIT OF BORROW AREA DEPTH OF BORROW = _____				

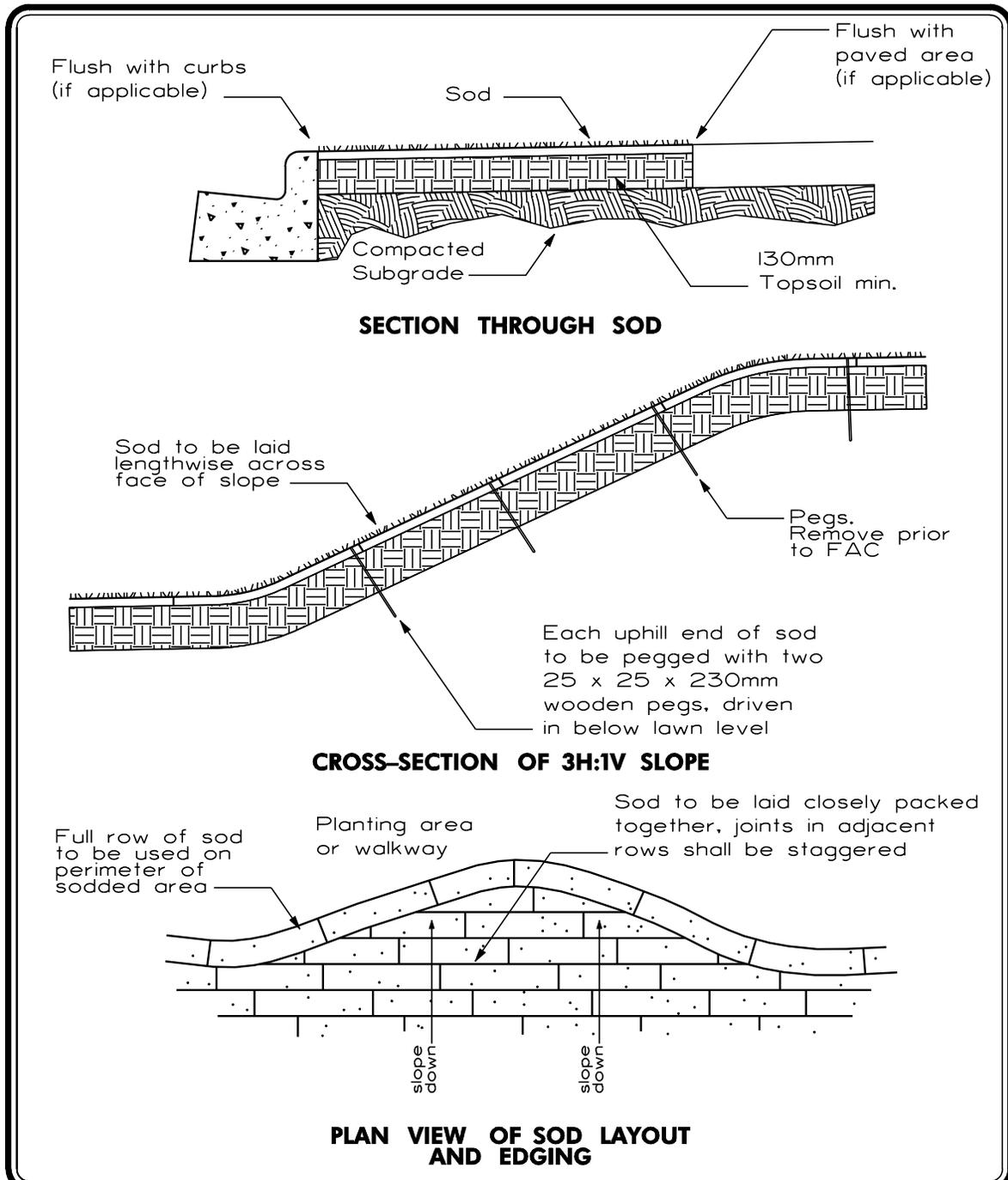
LIST OF POINTS

SCALE 1:1500

POINT	NORTHING	EASTING	POINT	NORTHING	EASTING
1	XXXX.XXX	XXXX.XXX	6	XXXX.XXX	XXXX.XXX
2	XXXX.XXX	XXXX.XXX	7	XXXX.XXX	XXXX.XXX
3	XXXX.XXX	XXXX.XXX	8	XXXX.XXX	XXXX.XXX
4	XXXX.XXX	XXXX.XXX	9	XXXX.XXX	XXXX.XXX
5	XXXX.XXX	XXXX.XXX	10	XXXX.XXX	XXXX.XXX
			11	XXXX.XXX	XXXX.XXX

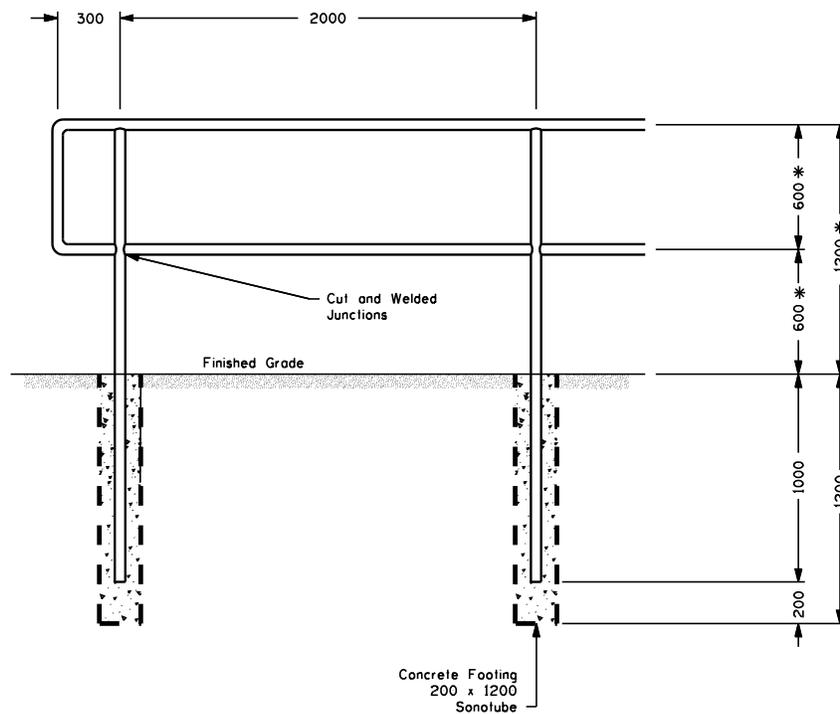
	PROJECT TITLE	DRAWN BY	SCALE
	SPECIFICATIONS	WB	N.T.S.
	SHEET TITLE	DATE 2007 06 28	SHEET NO.
	NON-ENGINEERED FILL DRAWING	DESIGN BY	28a
	DATE	FILE NO.	

Detail Sheet 29: Sod Detail



	PROJECT TITLE	DRAWN BY	SCALE
	SPECIFICATIONS	MM	N.T.S.
	SHEET TITLE	DATE 2006 01 09	SHEET NO.
	SOD DETAIL	DESIGN BY	29
	DATE	FILE NO.	

Detail Sheet 30: Pathway Handrail



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.



PROJECT TITLE
SPECIFICATIONS

SHEET TITLE
PATHWAY HANDRAIL

DRAWN BY
W.B./M.M./H.S.

DATE **2010 03 24**

DESIGN BY
G.S.

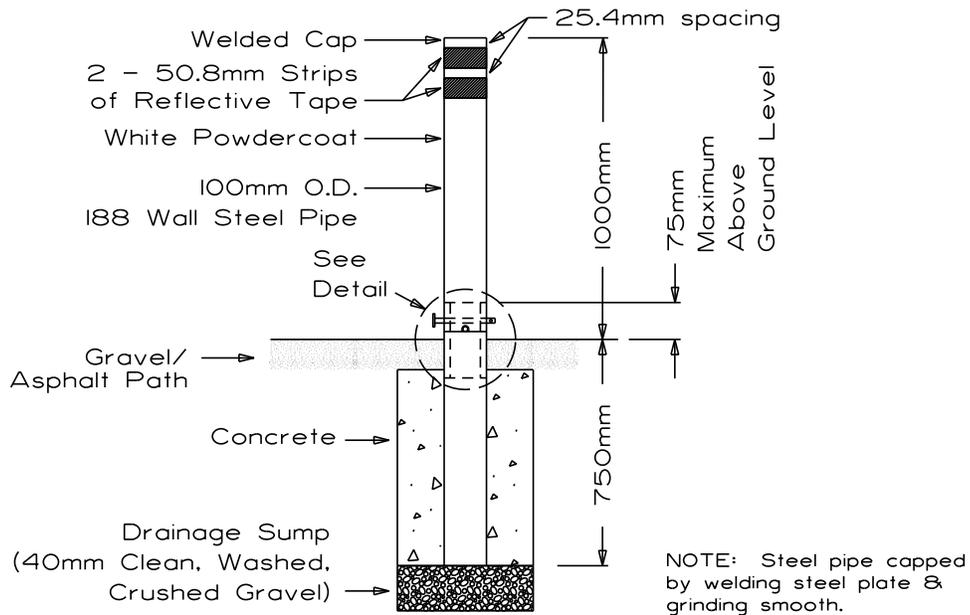
DATE **1997 06**

SCALE
N.T.S.

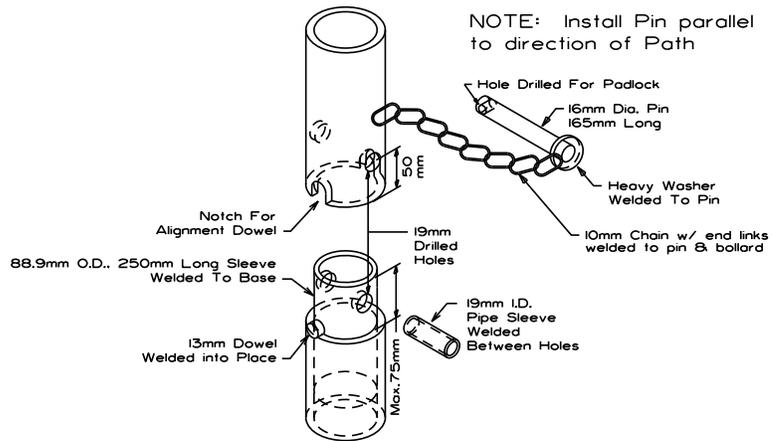
SHEET NO.
30

FILE NO.

Detail Sheet 31: Bollards



ELEVATION
N.T.S.



DETAIL
N.T.S.

NOTE: See Bollard in Pathways, Trails & Paving Stones section. Pg.93 Sec. 1.2.F.iii
All dimensions are in millimetres unless otherwise noted.



PROJECT TITLE
SPECIFICATIONS

SHEET TITLE
**REMOVABLE BOLLARD
DETAIL**

DRAWN BY
S.P. / W.B.

DATE **2006 06 07**

DESIGN BY
G.S.

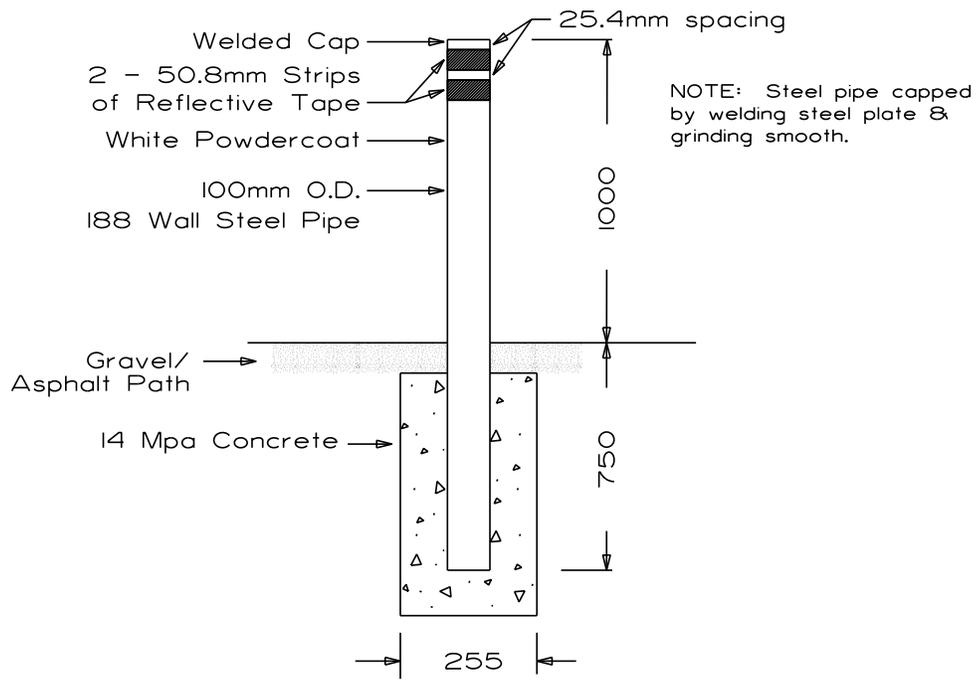
DATE **1997-06**

SCALE
N.T.S.

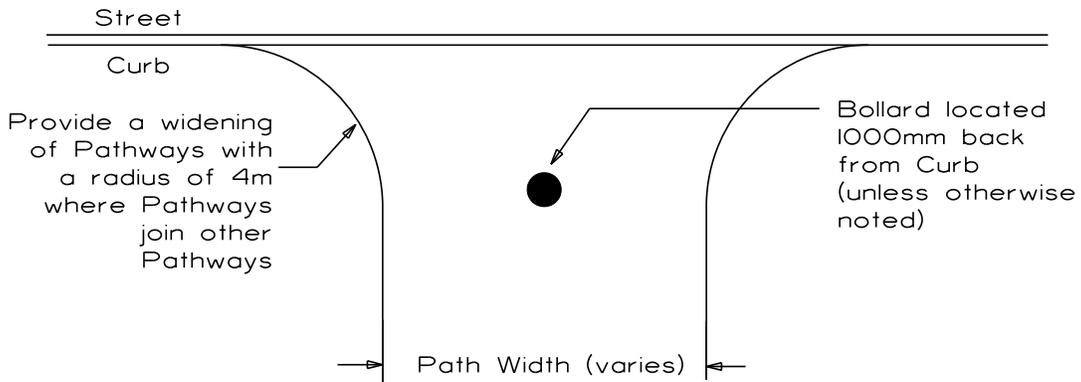
SHEET NO.
31

FILE NO.

Detail Sheet 32: Bollards



ELEVATION /SECTION

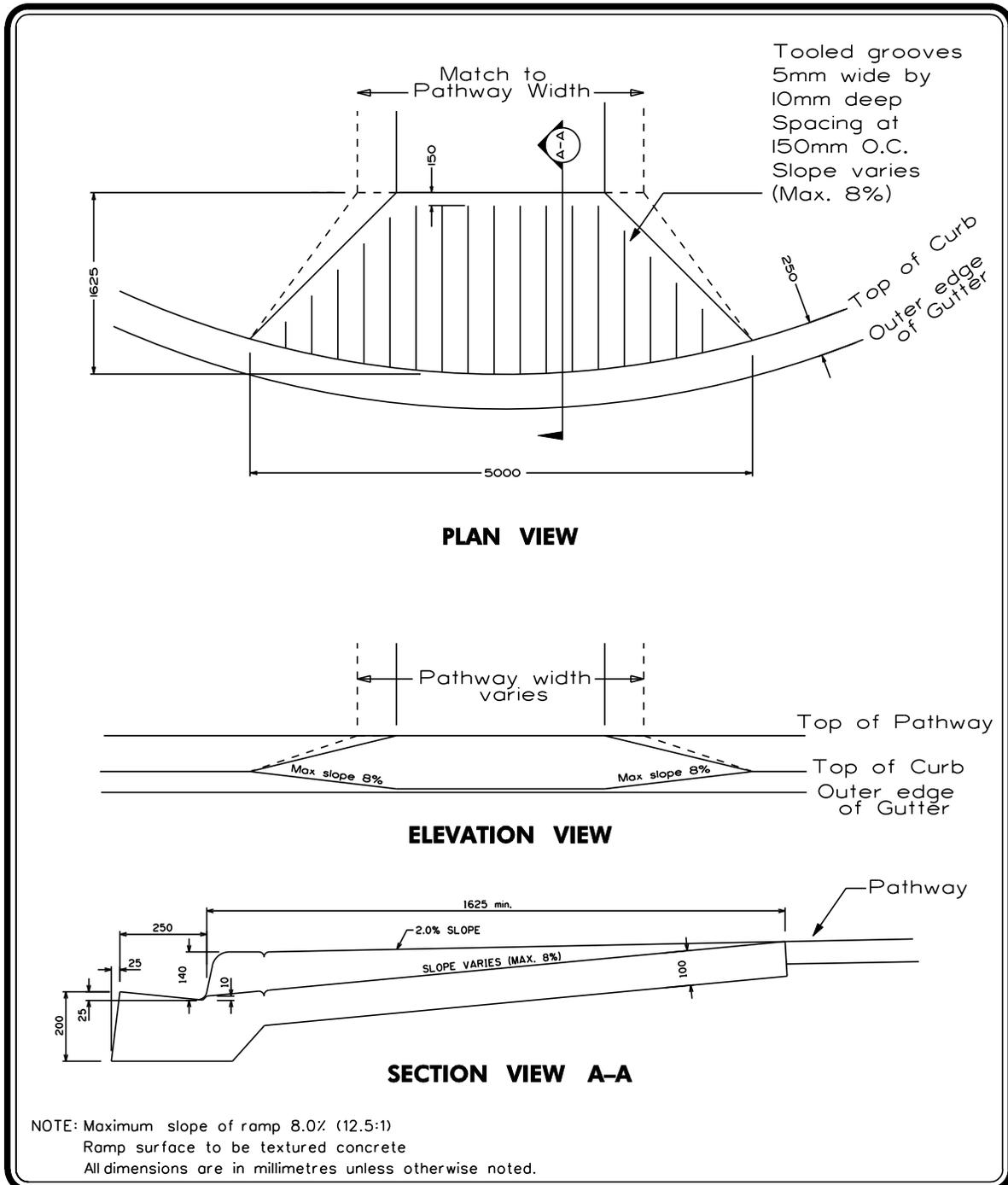


PLAN VIEW OF FLARE

NOTE: See Bollard in Pathways, Trails & Paving Stones section. Pg.94 Sec. 1.2.F.iii
All dimensions are in millimetres unless otherwise noted.

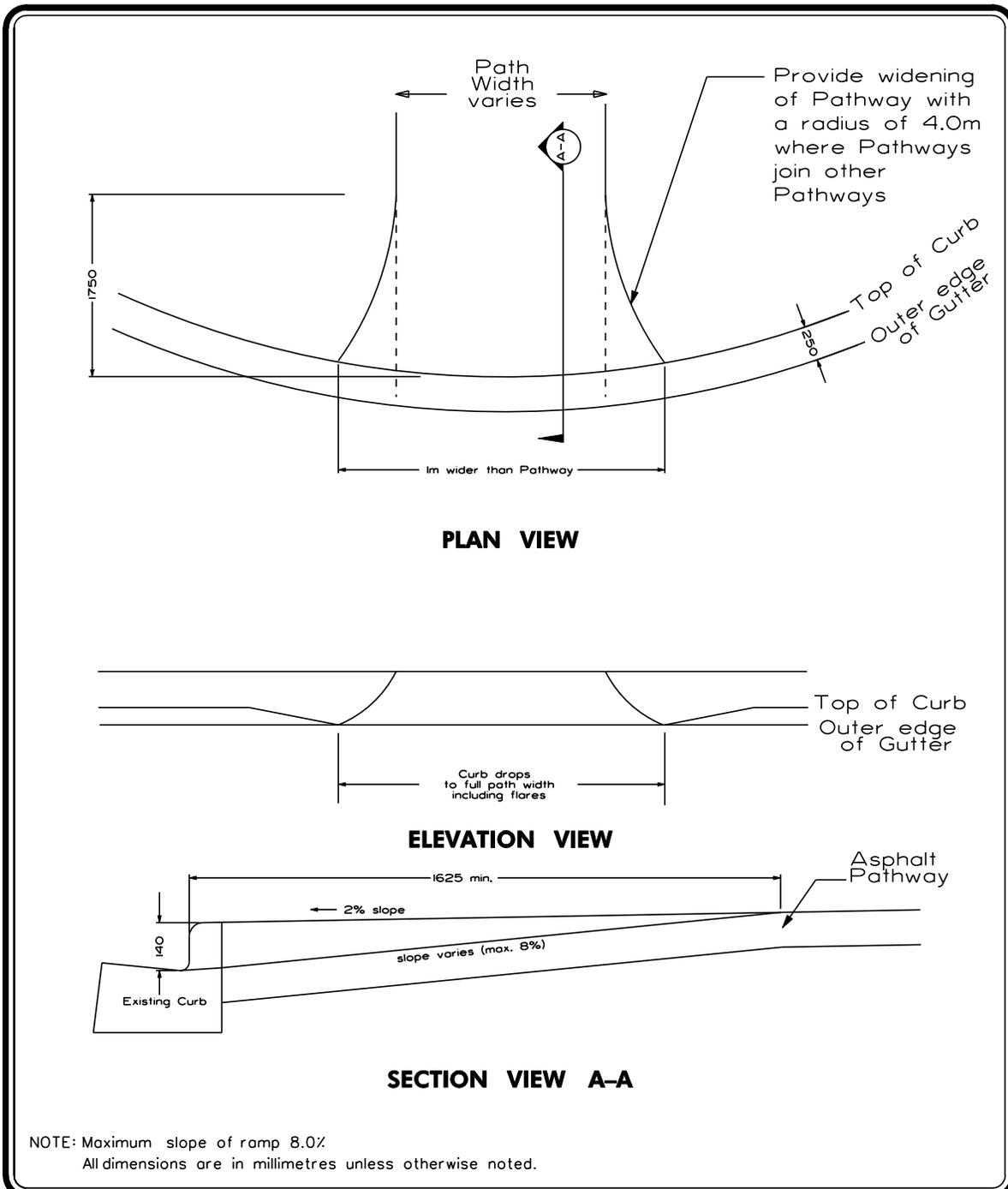
	PROJECT TITLE	DRAWN BY	SCALE
	SPECIFICATIONS	SP /WB /MM	N.T.S.
	SHEET TITLE	DATE 2006 06 07	SHEET NO.
	PERMANENT BOLLARD DETAIL	DESIGN BY	32
		DATE	FILE NO.

Detail Sheet 33: Wheel Chair Ramp



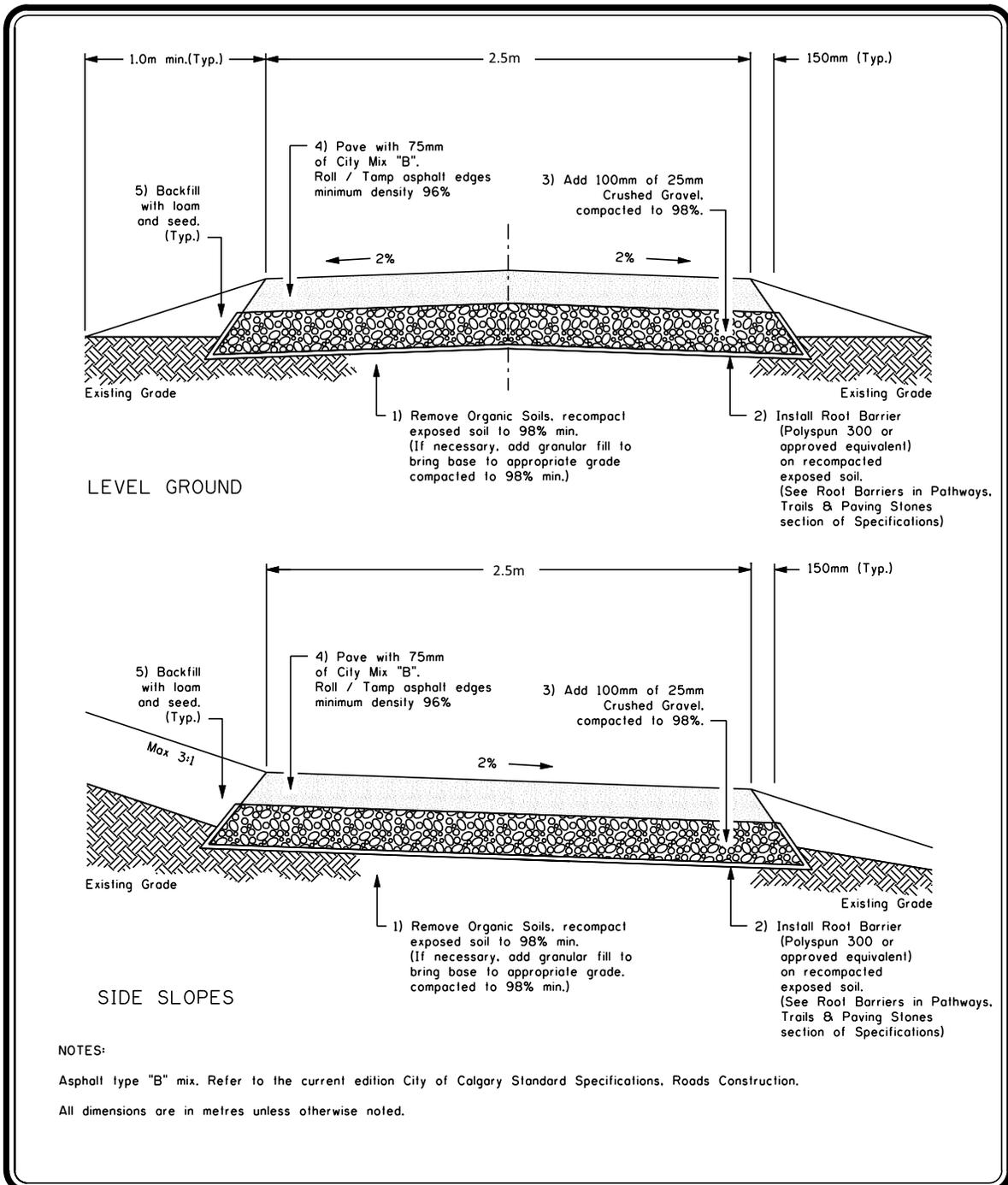
	PROJECT TITLE	DRAWN BY	SCALE
	SPECIFICATIONS	MM	N.T.S.
	SHEET TITLE	DATE 2006 01 03	SHEET NO.
	CONCRETE WHEELCHAIR RAMP	DESIGN BY WF	33
		DATE 1996 12 23	FILE NO.

Detail Sheet 34: Wheel Chair Ramp



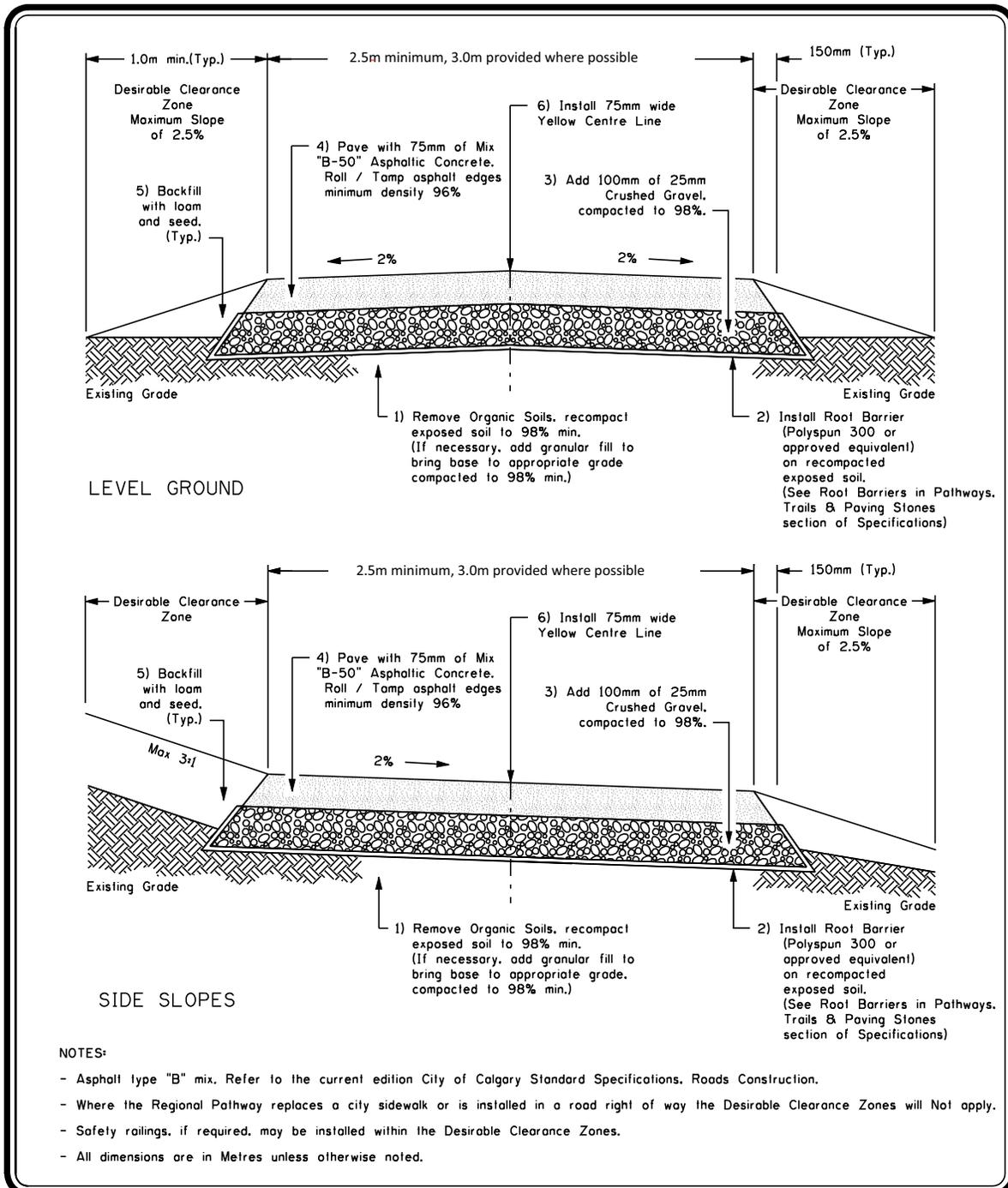
	PROJECT TITLE	DRAWN BY	SCALE
	SPECIFICATIONS	MM	N.T.S.
	SHEET TITLE	DATE 2006 06 07	SHEET NO.
	ASPHALT WHEELCHAIR RAMP	DESIGN BY	34
		D.LaF.	FILE NO.
		DATE 2001 03 08	

Detail Sheet 35: Pathways



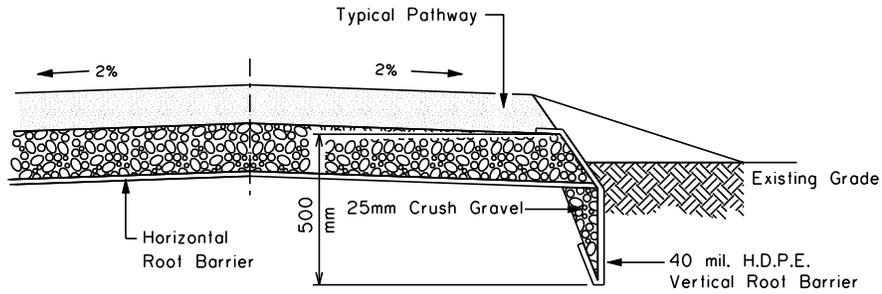
	PROJECT TITLE	DRAWN BY	SCALE
	SPECIFICATIONS	W.B.	N.T.S.
	SHEET TITLE	DATE 2006 05 17	SHEET NO.
	TYPICAL LOCAL PATHWAY CROSS SECTIONS	DESIGN BY	35
		G.S.	FILE NO.
		DATE 2002-03-05	

Detail Sheet 36: Pathways - Typical Regional Pathway Cross Sections



	PROJECT TITLE	DRAWN BY	SCALE
	SPECIFICATIONS	W.B.	N.T.S.
	SHEET TITLE	DATE 2011 02 01	SHEET NO.
	TYPICAL REGIONAL PATHWAY CROSS SECTIONS	DESIGN BY	36
		DATE 2011 02 01	FILE NO.

Detail Sheet 37: Root Barriers



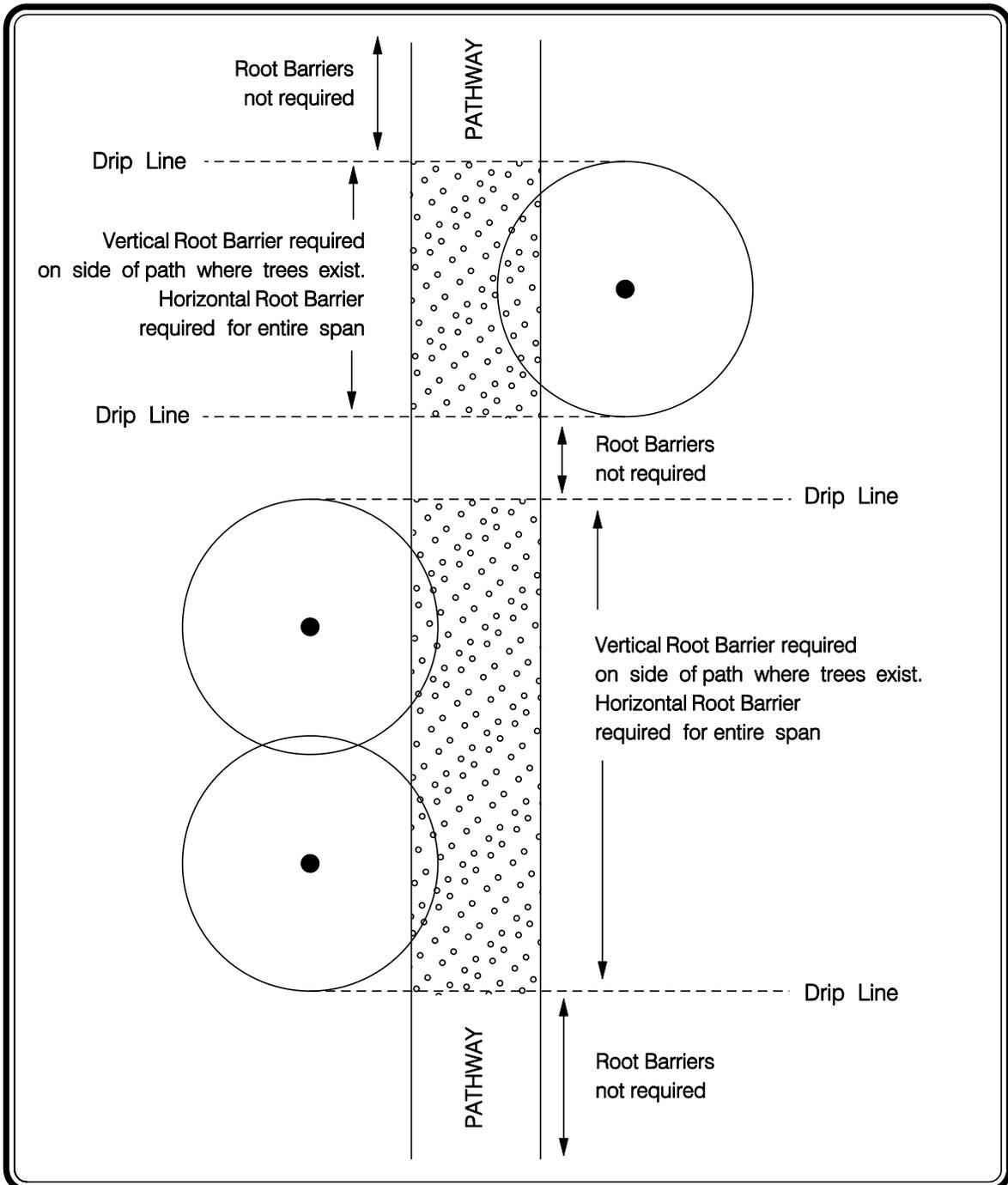
NOTES:

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.

 <p>THE CITY OF CALGARY PARKS</p>	PROJECT TITLE SPECIFICATIONS	DRAWN BY MM	SCALE N.T.S.
	SHEET TITLE ROOT BARRIERS	DATE 2006 01 06	SHEET NO. 37
		DESIGN BY D.LaF.	FILE NO.
		DATE 1997 12 02	

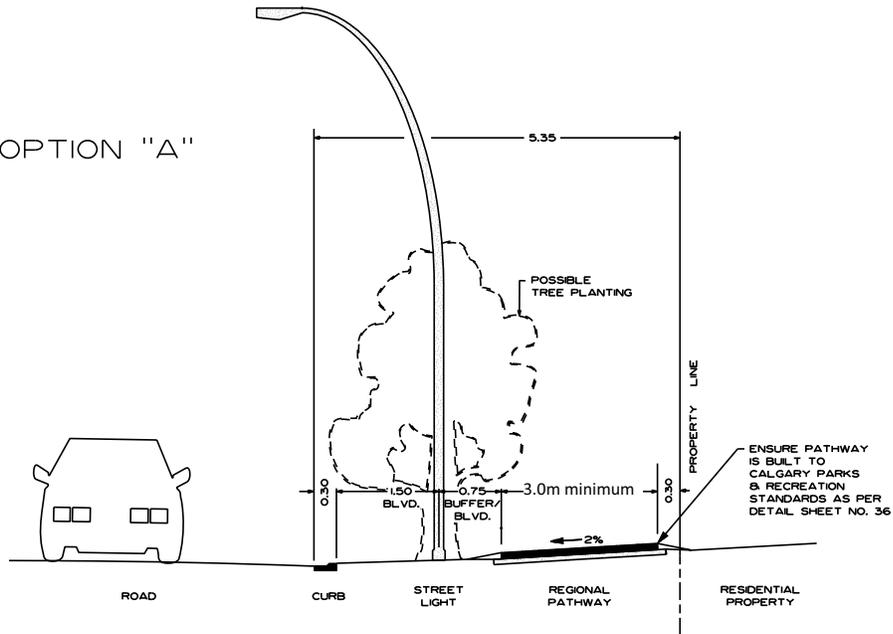
Detail Sheet 37a: Root Barriers



	PROJECT TITLE	DRAWN BY	SCALE
	SPECIFICATIONS	MM	N.T.S.
	SHEET TITLE	DATE 2006 02 09	SHEET NO.
	LOCATION OF ROOT BARRIERS	DESIGN BY	37a
		DATE 1998 04 16	FILE NO.

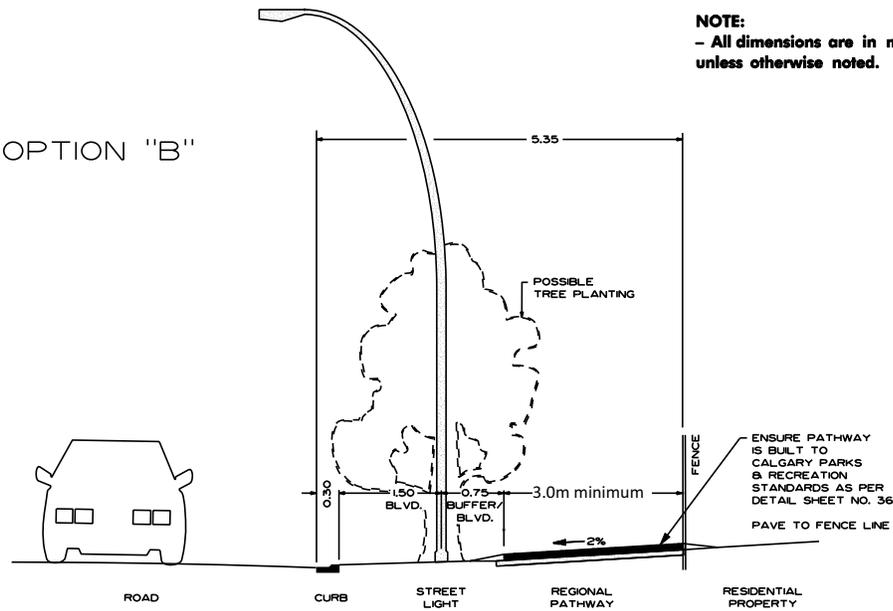
Detail Sheet 37b: Regional Pathways, Residential Boulevards

OPTION "A"



NOTE:
- All dimensions are in meters unless otherwise noted.

OPTION "B"



PROJECT TITLE
SPECIFICATIONS

SHEET TITLE
**REGIONAL PATHWAYS,
RESIDENTIAL BOULEVARDS**

DRAWN BY
W.B.

DATE **2006 05 19**

DESIGN BY

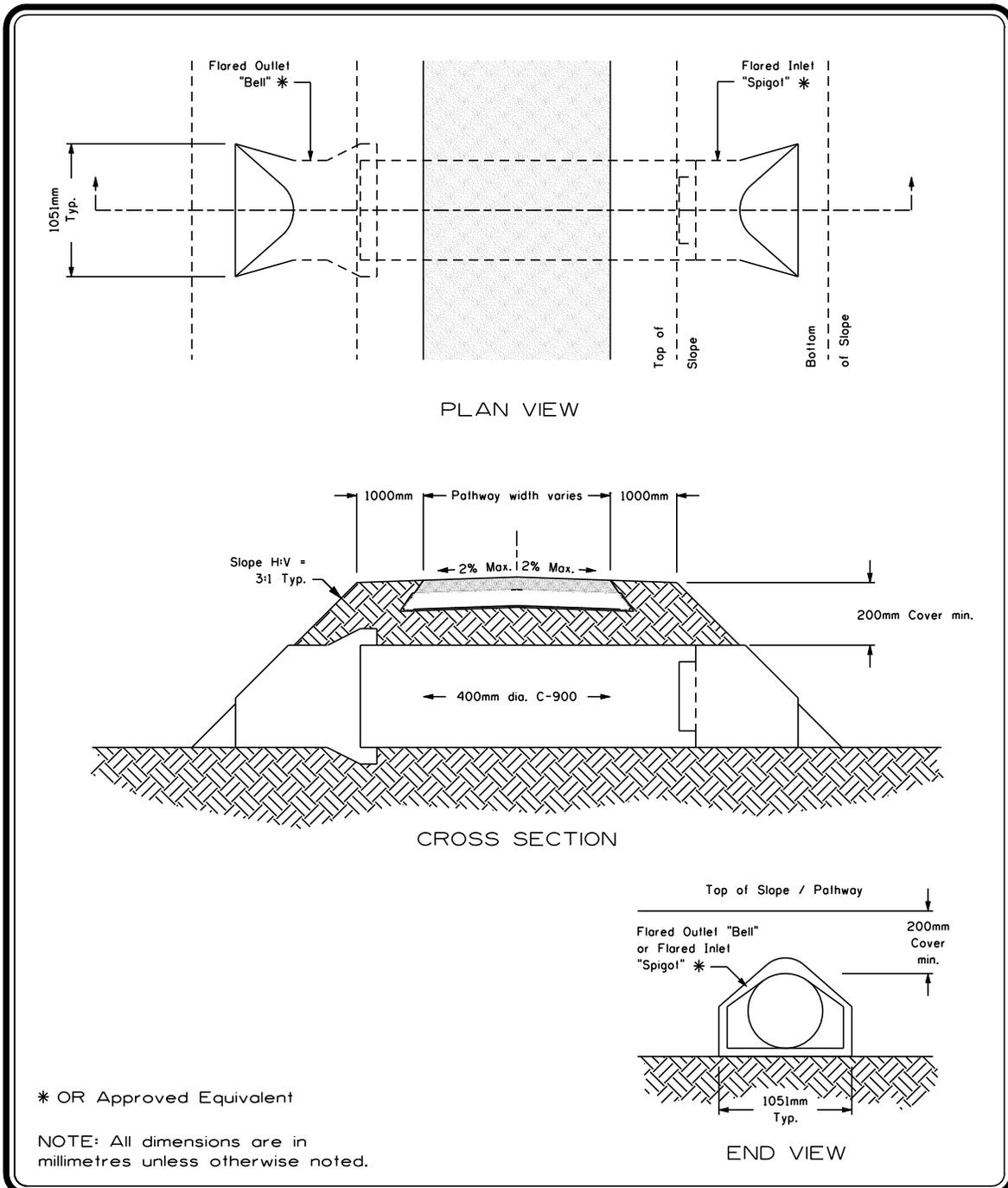
DATE

SCALE
N.T.S.

SHEET NO.
37b

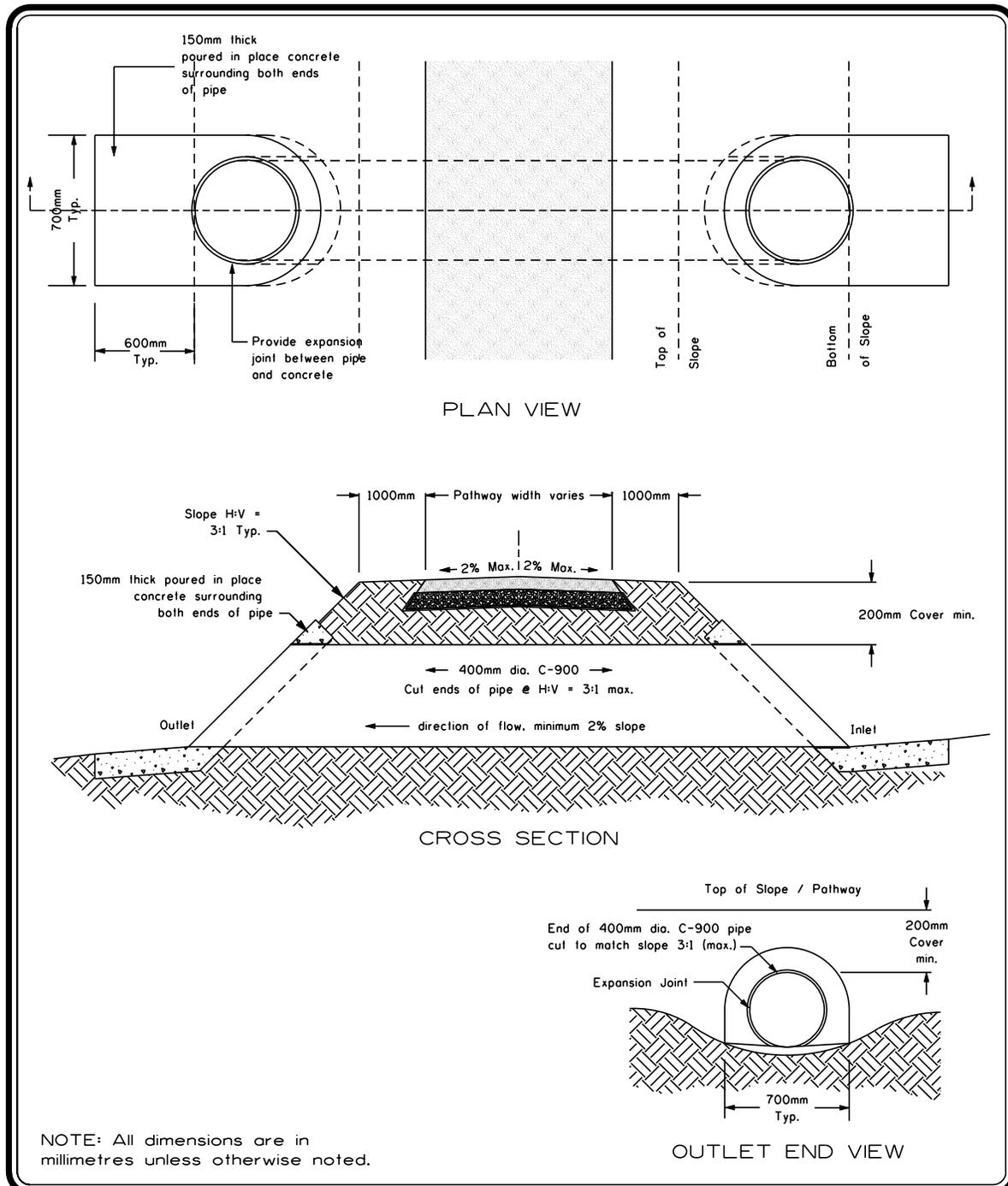
FILE NO.

Detail Sheet 38: Pathway Culvert and Edge Detail



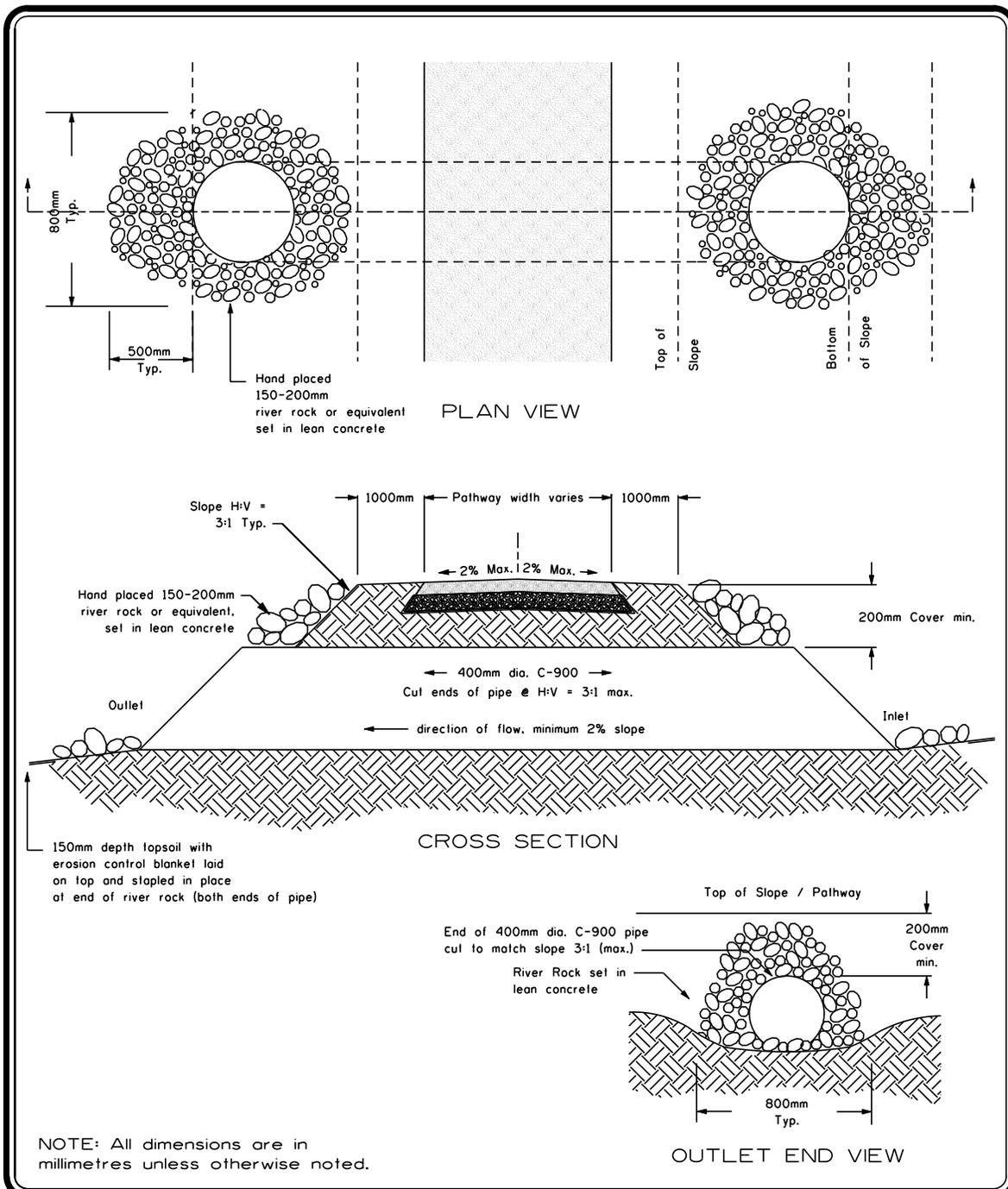
 <p>THE CITY OF CALGARY PARKS</p>	PROJECT TITLE SPECIFICATIONS	DRAWN BY W.B.	SCALE N.T.S.
	SHEET TITLE PATHWAY CULVERT AND EDGE DETAIL	DATE 2005-02-03	SHEET NO. 38
	DESIGN BY	DATE	FILE NO.

Detail Sheet 38a: Pathway Culvert and Edge Detail



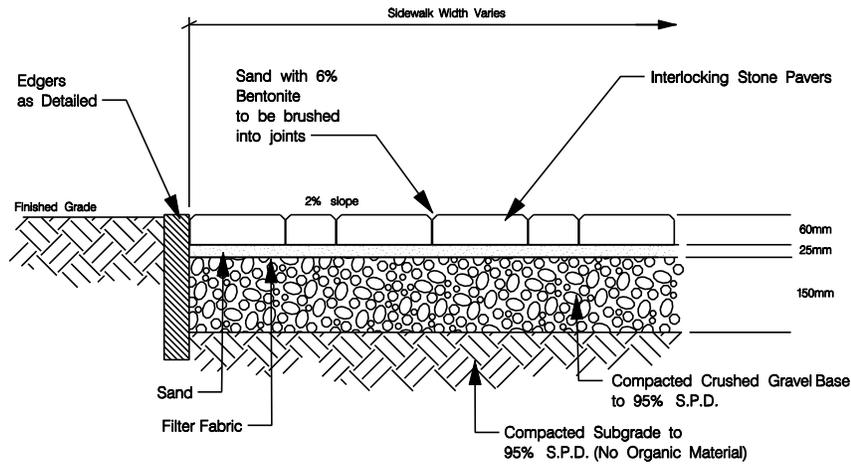
	PROJECT TITLE	DRAWN BY	SCALE
	SPECIFICATIONS	W.B./M.M.	N.T.S.
	SHEET TITLE	DATE 2008-01-18	SHEET NO.
	CULVERT WITH P-I-P CONCRETE AT ENDS	DESIGN BY	38a
	DATE	FILE NO.	

Detail Sheet 38b: Pathway Culvert and Edge Detail

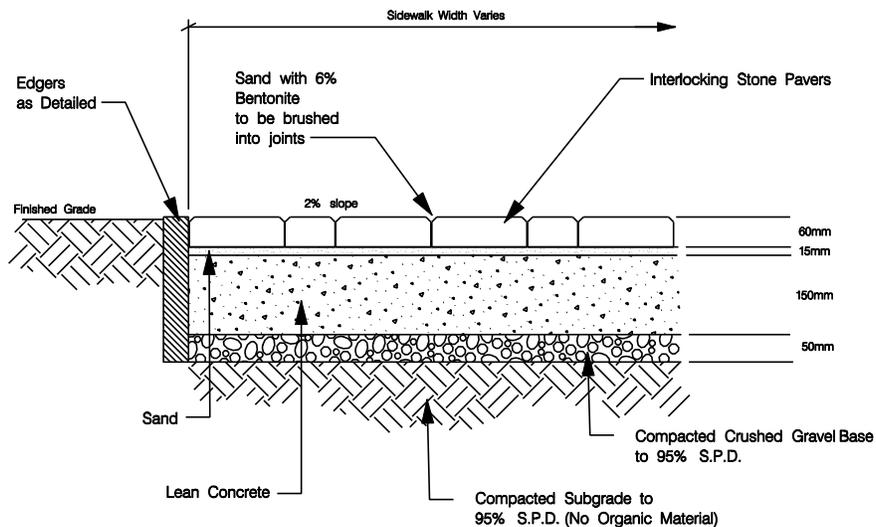


 <p>THE CITY OF CALGARY PARKS</p>	PROJECT TITLE	DRAWN BY	SCALE
	SPECIFICATIONS	W.B./M.M.	N.T.S.
	SHEET TITLE	DATE 2008-01-18	SHEET NO.
	CULVERT WITH RIVER ROCK AT ENDS	DESIGN BY	38b
		DATE	FILE NO.

Detail Sheet 39: Concrete Paving Stones/Weeping Tile



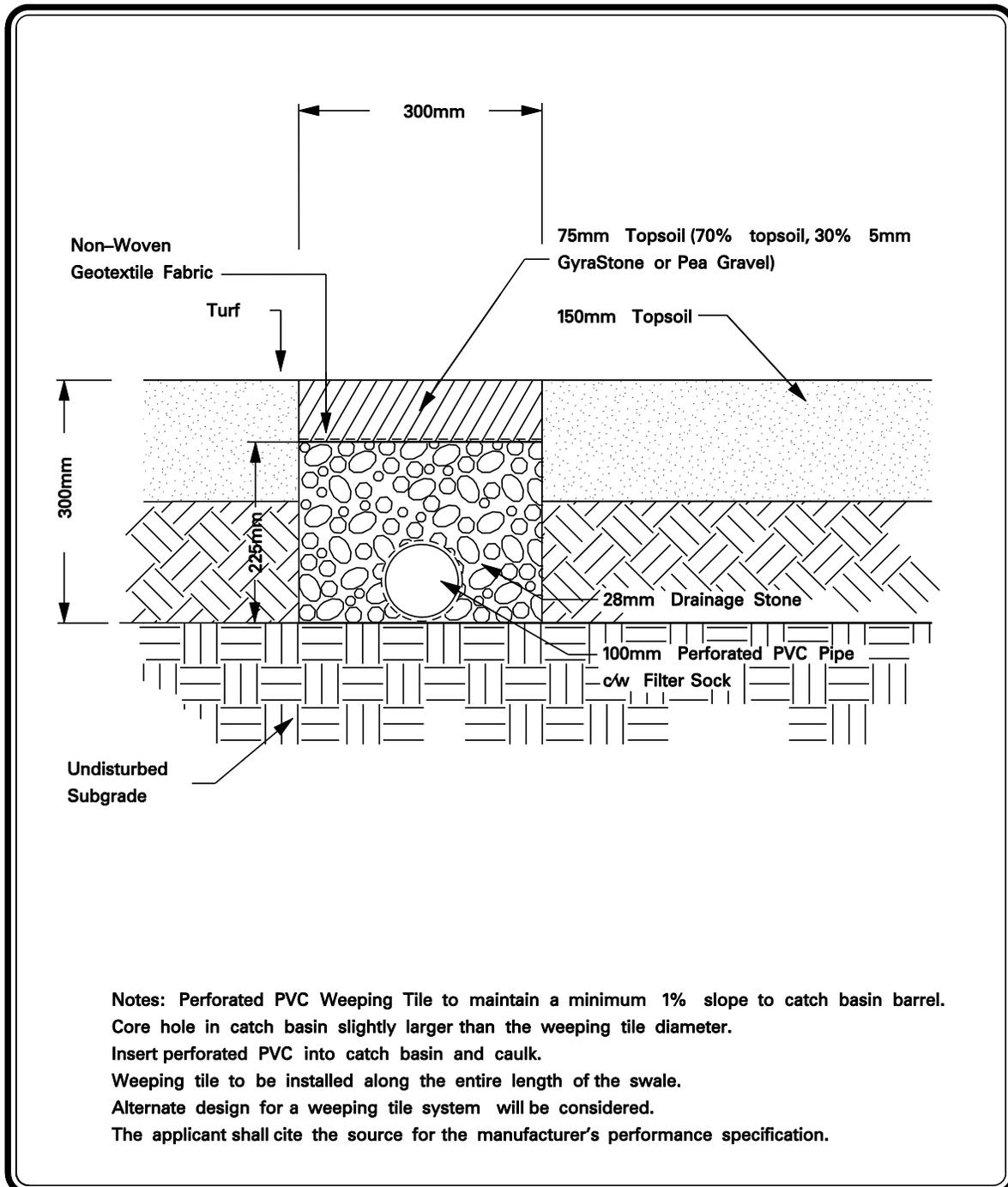
AREAS NOT SUBJECT TO VEHICLE TRAFFIC



AREAS SUBJECT TO VEHICLE TRAFFIC AND AREAS WITHIN THE STREETS RIGHT-OF-WAY

	PROJECT TITLE	DRAWN BY	SCALE
	SPECIFICATIONS	MM	N.T.S.
	SHEET TITLE	DATE 2006 02 14	SHEET NO.
	CONCRETE PAVING STONE	DESIGN BY	39
		DATE 1997 03 15	FILE NO.

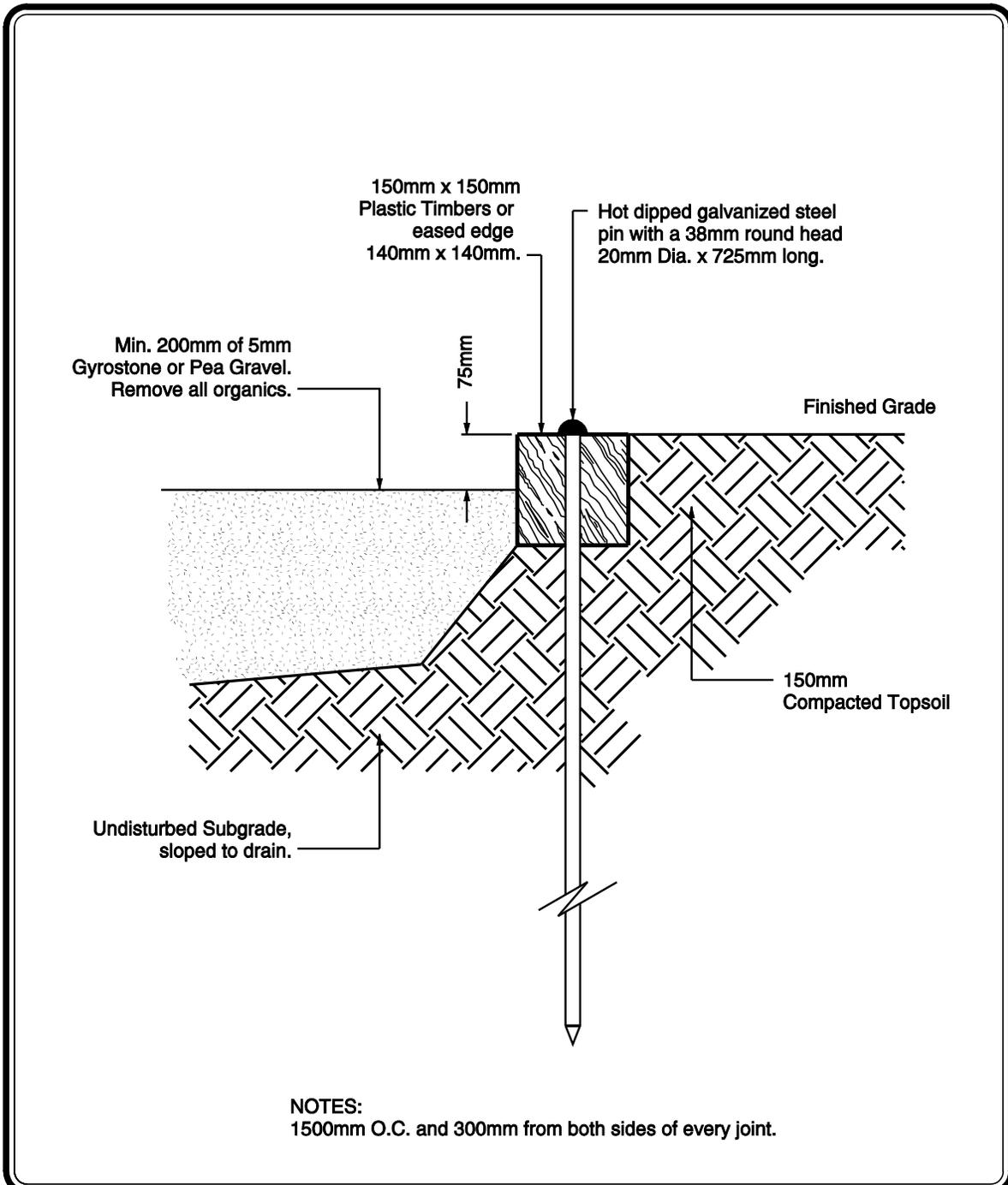
Detail Sheet 39a: Concrete Paving Stones/Weeping Tile



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.

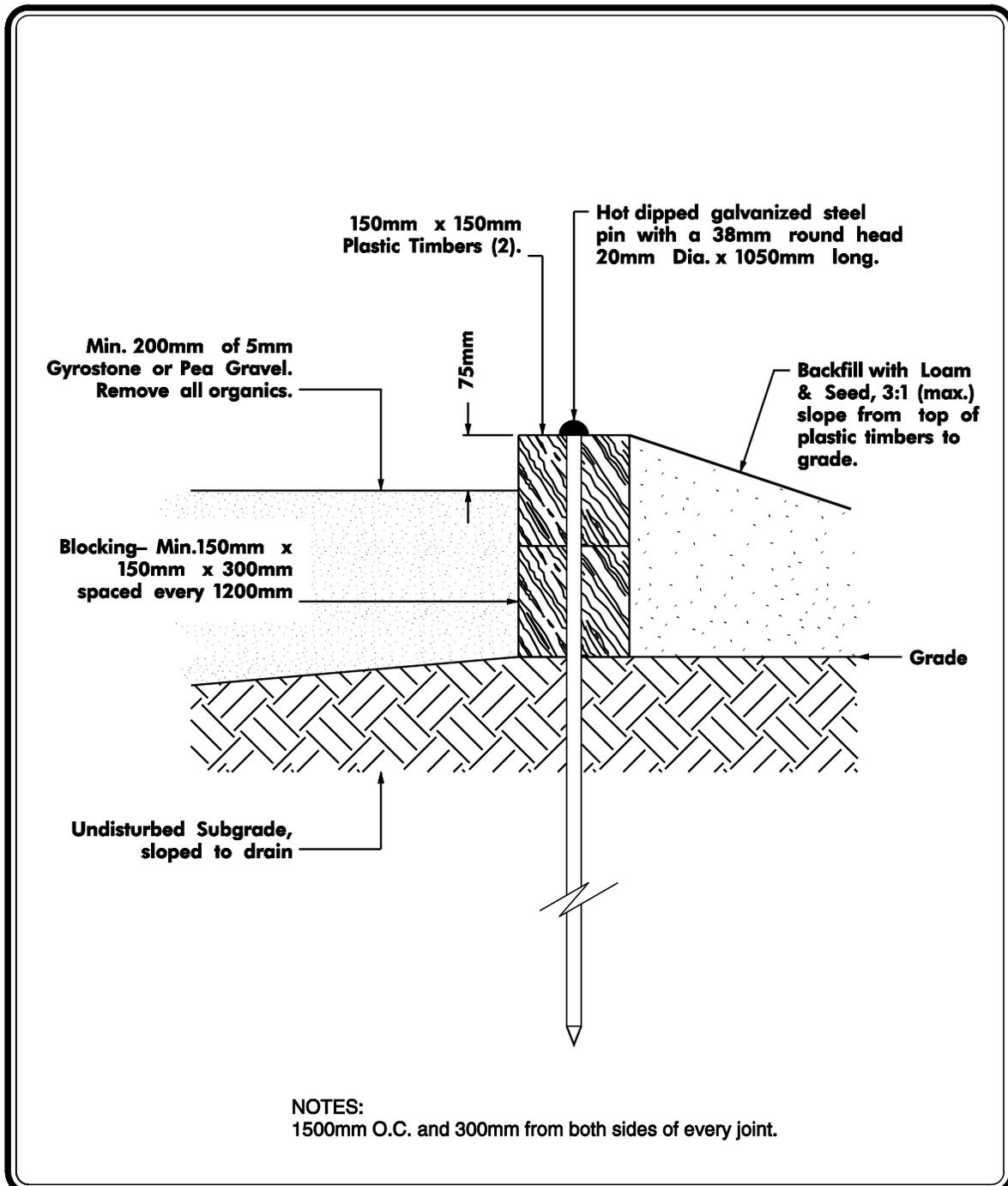
	PROJECT TITLE	DRAWN BY	SCALE
	SPECIFICATIONS	W.B./M.M.	N.T.S.
	SHEET TITLE	DATE 2005 01 25	SHEET NO.
	WEeping TILE IN <4% SWALES OVER 60m IN LENGTH	DESIGN BY	39a
		DATE	FILE NO.

Detail Sheet 40: Playground Edge Restraints (Plastic Timber)



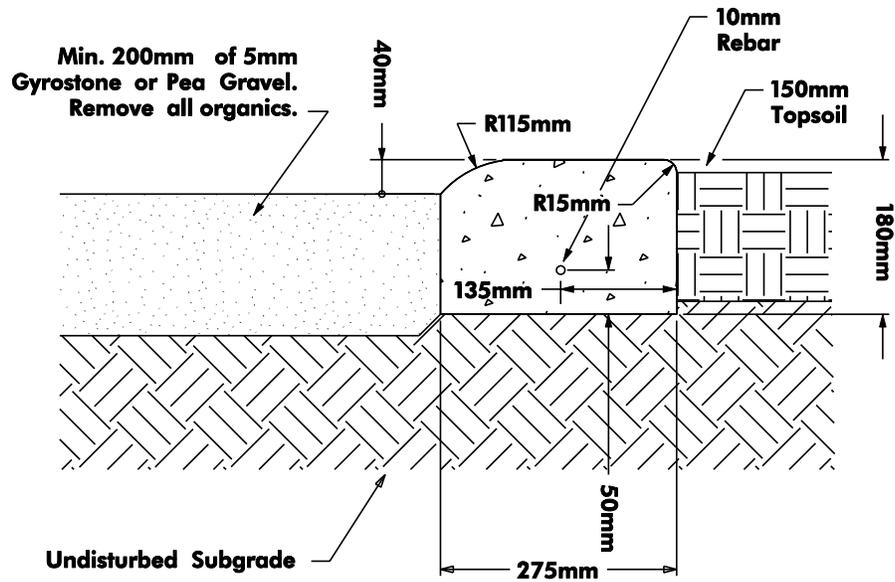
	PROJECT TITLE	DRAWN BY	SCALE
	SPECIFICATIONS	WB / MM / HT	N.T.S.
	SHEET TITLE	DATE 2011 02 01	SHEET NO.
	PLAYGROUND EDGE RESTRAINT (PLASTIC TIMBER)	DESIGN BY DB	40
		DATE 2011 02 01	FILE NO.

Detail Sheet 40a: Playground Edge Restraints (Plastic Timber Above Ground)



	PROJECT TITLE	DRAWN BY	SCALE
	SPECIFICATIONS	W.B./H.T.	N.T.S.
	SHEET TITLE	DATE 2011 02 01	SHEET NO.
	PLAYGROUND EDGE RESTRAINT (PLASTIC TIMBER) ABOVE GROUND	DESIGN BY D.B.	40a
		DATE 2011 02 01	FILE NO.

Detail Sheet 41: Playground Edge Restraints



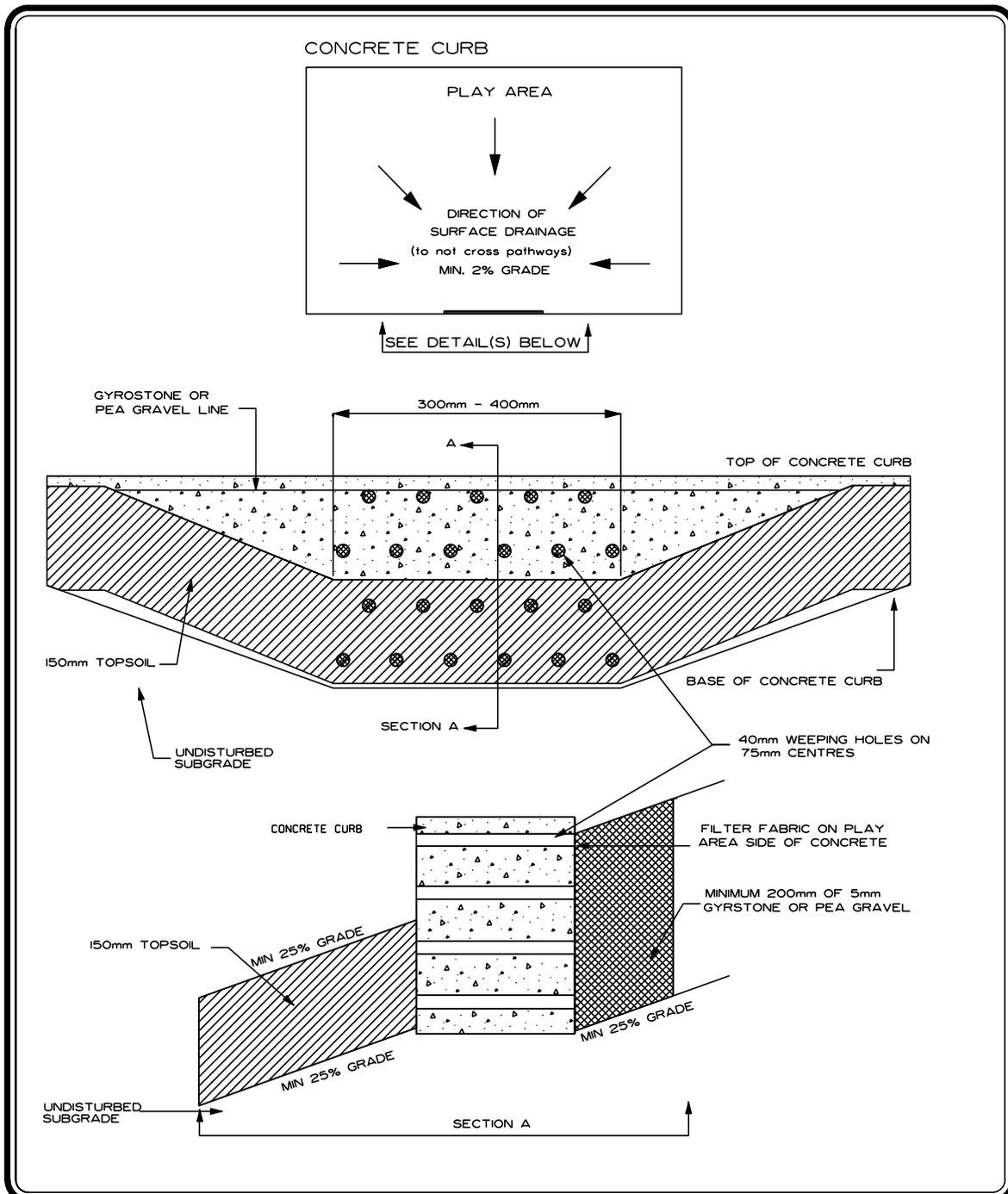
NOTES:

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.

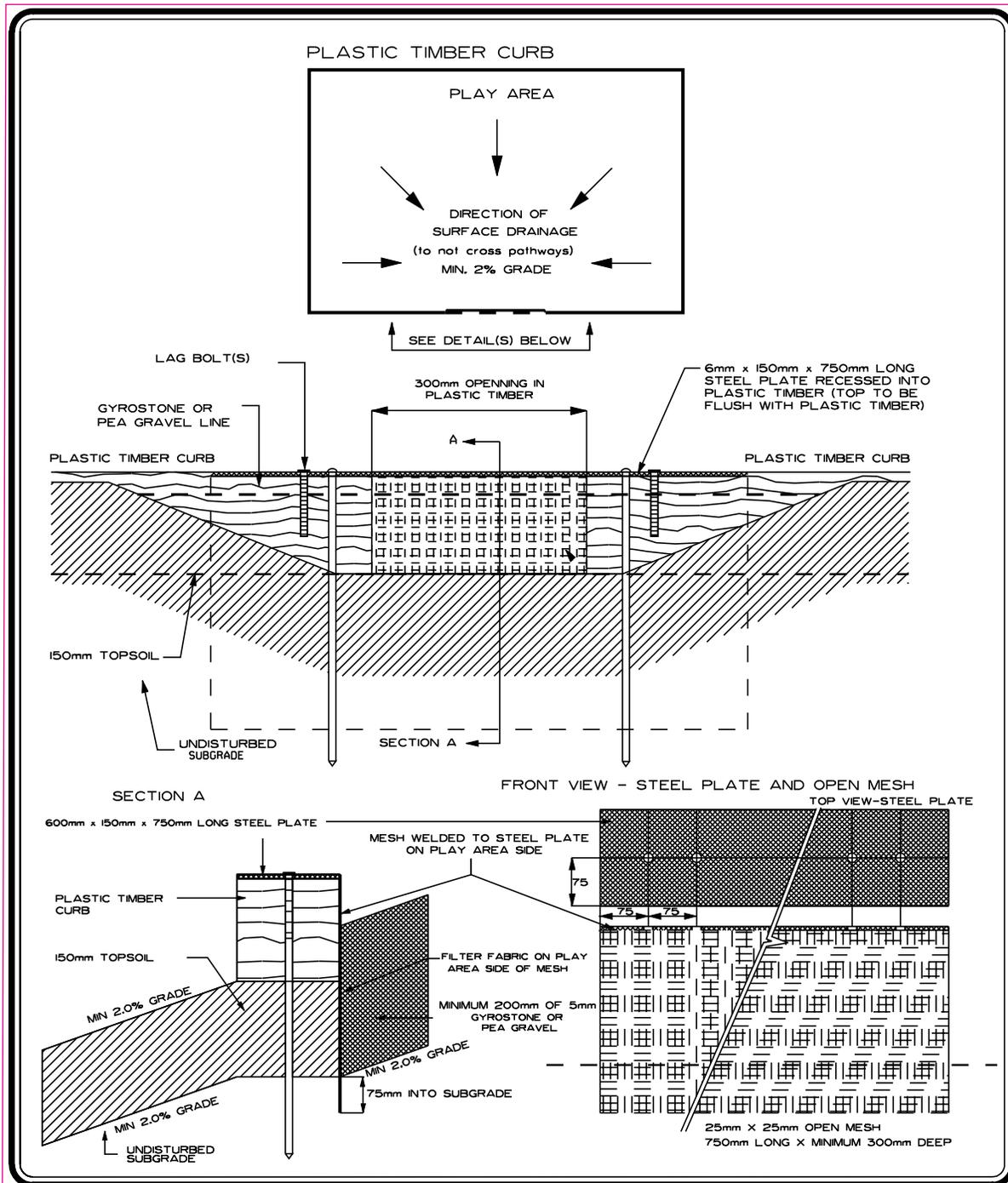
	PROJECT TITLE SPECIFICATIONS	DRAWN BY W.B.	SCALE N.T.S.
	SHEET TITLE PLAYGROUND EDGE RESTRAINT (CONCRETE)	DATE 2002-08-28	SHEET NO. 41
		DESIGN BY DATE	FILE NO.

Detail Sheet 42: Playground Edge Restraints



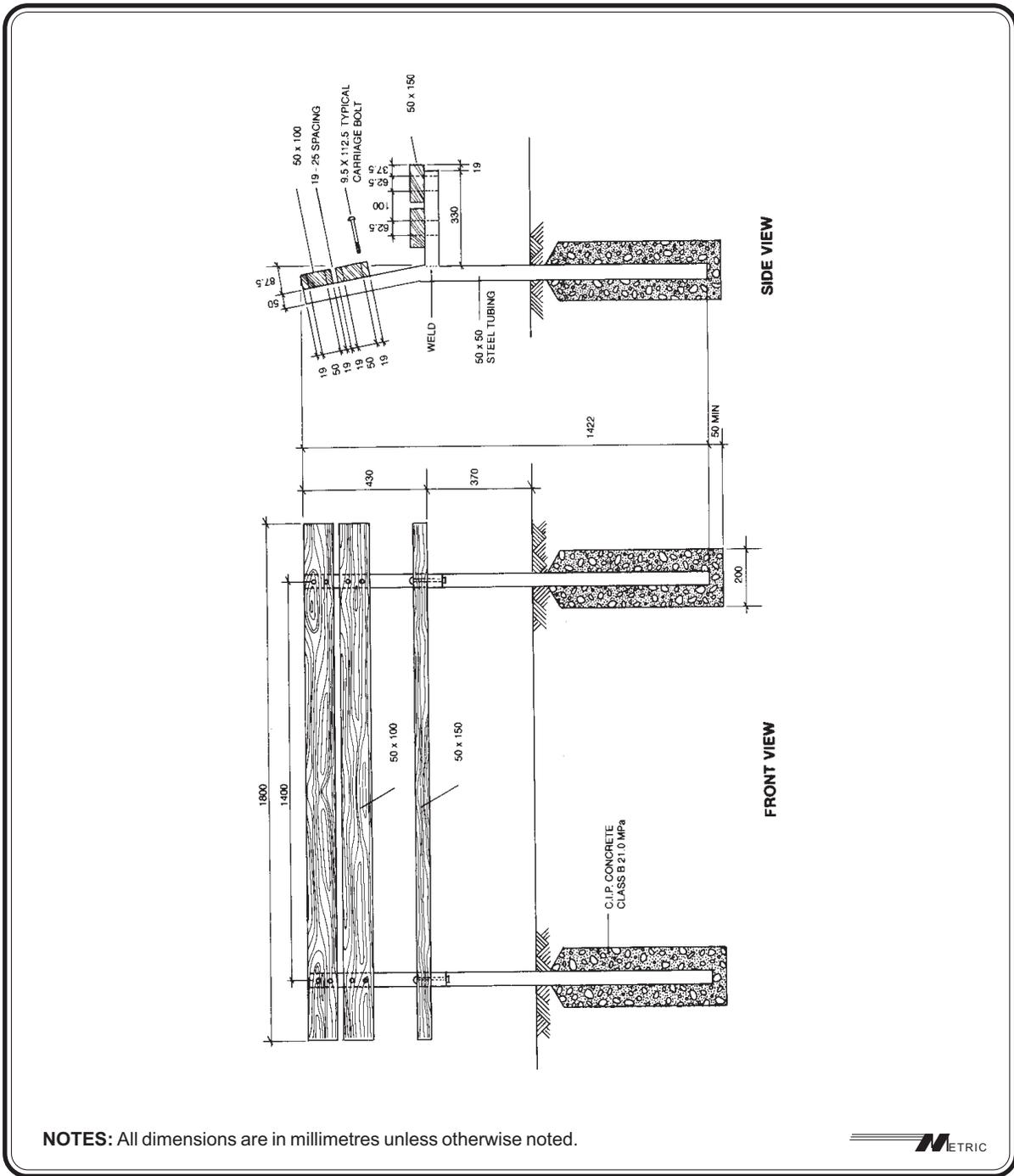
	PROJECT TITLE	DRAWN BY	SCALE
	SPECIFICATIONS	MK	N.T.S.
	SHEET TITLE	DATE 2006 05 23	SHEET NO.
	PLAYGROUND DRAINAGE CONCRETE EDGE DETAIL	DESIGN BY	42
	DATE	FILE NO.	

Detail Sheet 43: Playground Edge Restraints



	PROJECT TITLE	DRAWN BY	SCALE
	SPECIFICATIONS	MK	N.T.S.
	SHEET TITLE	DATE 2009 03 26	SHEET NO.
	PLAYGROUND DRAINAGE PLASTIC TIMBER EDGE DETAIL	DESIGN BY	43
	DATE	FILE NO.	

Detail Sheet 44: Park Bench



NOTES: All dimensions are in millimetres unless otherwise noted.



PROJECT TITLE
SPECIFICATIONS

SHEET TITLE
**STANDARD PARK BENCH
DETAIL**

DRAWN BY

DATE 2003 02 20

DESIGN BY

DATE

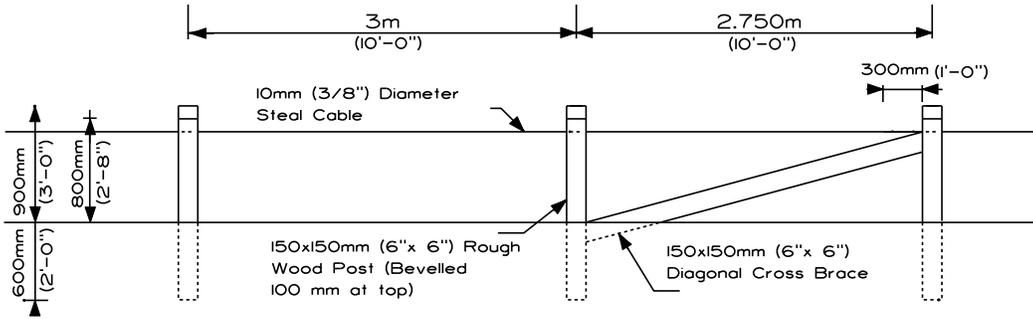
SCALE
N.T.S.

SHEET NO.
44

FILE NO.

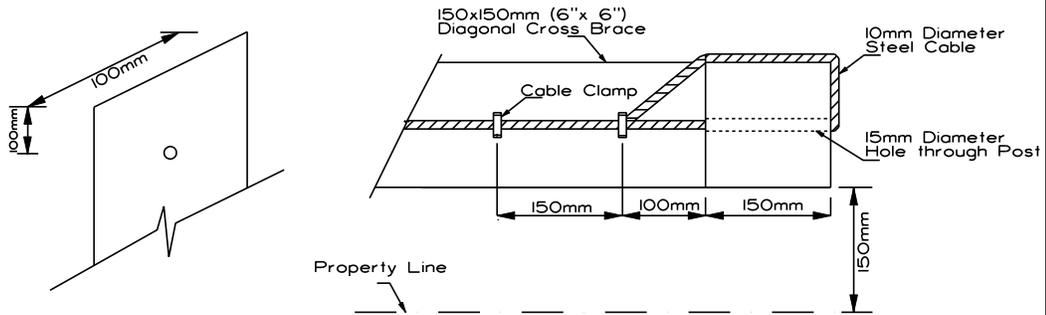
Detail Sheet 45: Fence - Post-and-Cable

Elevation



Post Top Detail

Plan View (End Post)



- 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.



PROJECT TITLE
SPECIFICATIONS

SHEET TITLE
**POST &
CABLE BARRIER**

DRAWN BY
MK

DATE **2006 05 23**

DESIGN BY

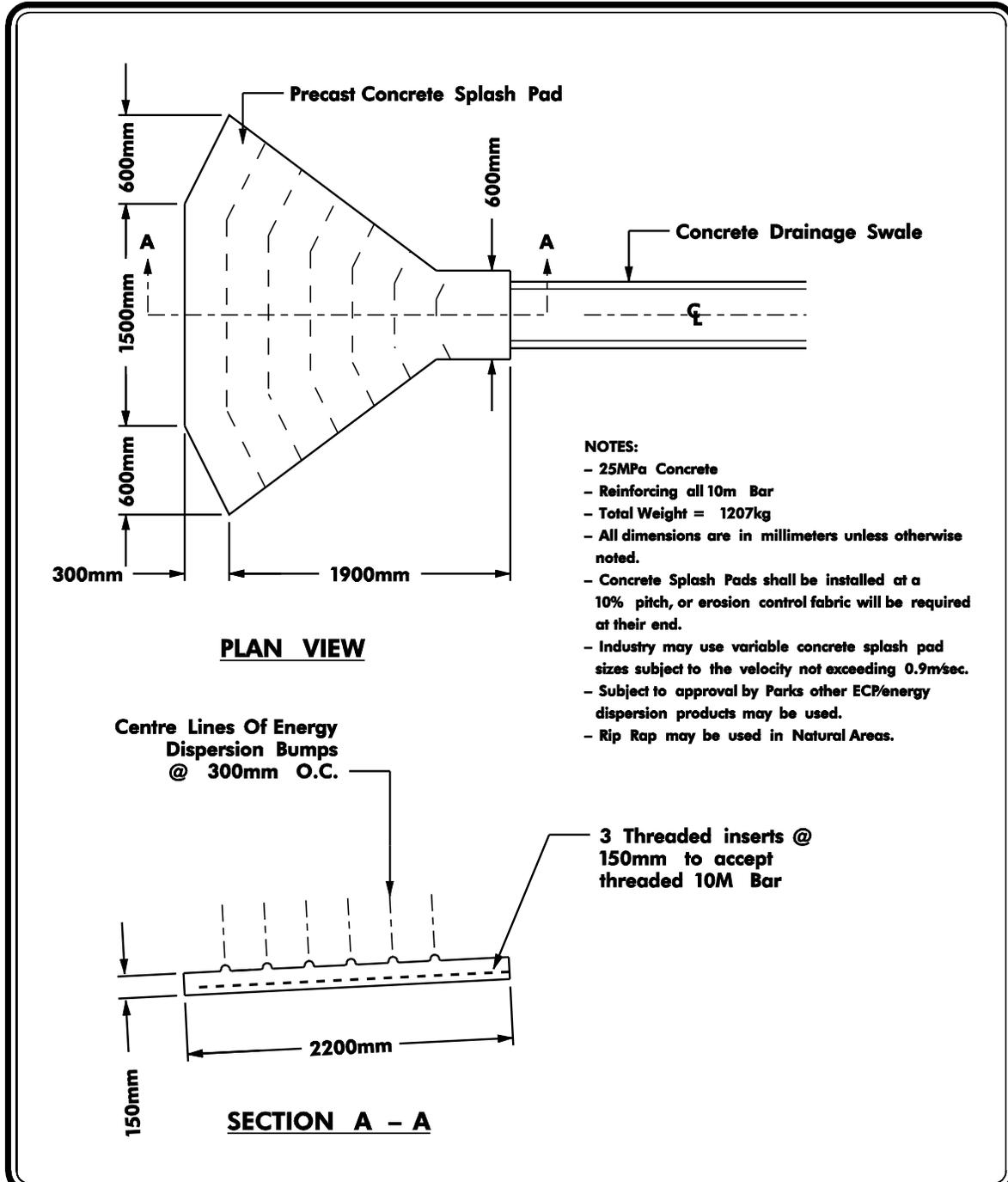
DATE

SCALE
N.T.S.

SHEET NO.
45

FILE NO.

Detail Sheet 46: Concrete Splash Pad



	PROJECT TITLE	DRAWN BY	SCALE
	SPECIFICATIONS	W.B.	N.T.S.
	SHEET TITLE	DATE 2009 03 26	SHEET NO.
	CONCRETE SPLASH PAD ON PUBLIC EASEMENTS	DESIGN BY	46
		DATE	FILE NO.

Detail Sheet 47: Irrigation - As-Built



PROJECT TITLE
SPECIFICATIONS

SHEET TITLE
TYPICAL IRRIGATION AS-BUILT DRAWING

DRAWN BY
W.B.

DATE
2009-01-16

DESIGN BY

DATE

SCALE
N.T.S.

SHEET NO.
47

FILE NO.



THE CITY OF CALGARY
OFFICE OF PLANNING & DEVELOPMENT
PARCEL DEVELOPMENT & OPERATIONS

REVISION / ADDITIONAL DRAWN DATE

DESIGNED BY: _____ DATE: _____

APPROVED FOR: _____ BY: _____ DATE: _____

CONSTRUCTION: _____

INSTALLED BY: _____

SURVEYED BY: _____

DRAWN BY: JP SECTION BY: _____

DATE: 1-20-09 DATE: _____

SCALE: 1" = 20'

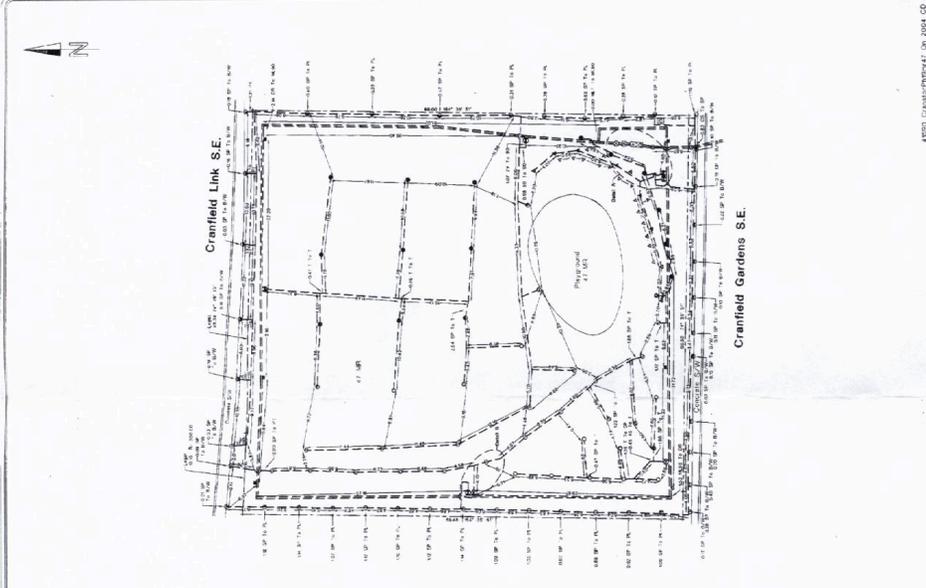
PROJECT TITLE
Cranfield Phase 1B,
Lot 47 MR

Managers Address:
10 Cranfield Gardens S.E.
Calgary, Alberta T2C 1L4 (Block 3, Lot 47 MR)

SHEET TITLE
Irrigation System "As Built"

SHEET NO.
1 of 1

FILE NO.
7171



Cranfield Link S.E.

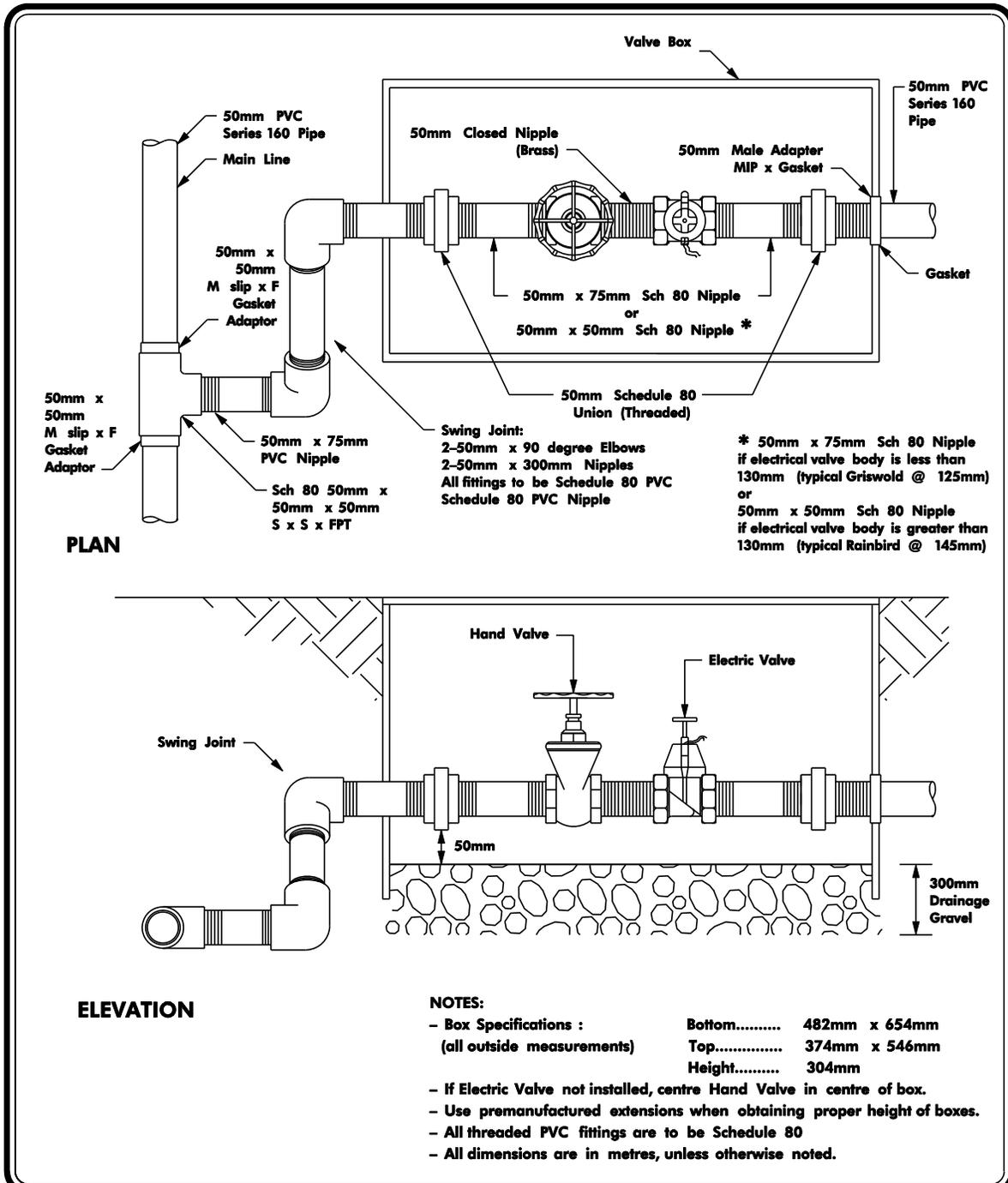
Cranfield Gardens S.E.

Pond

Legend

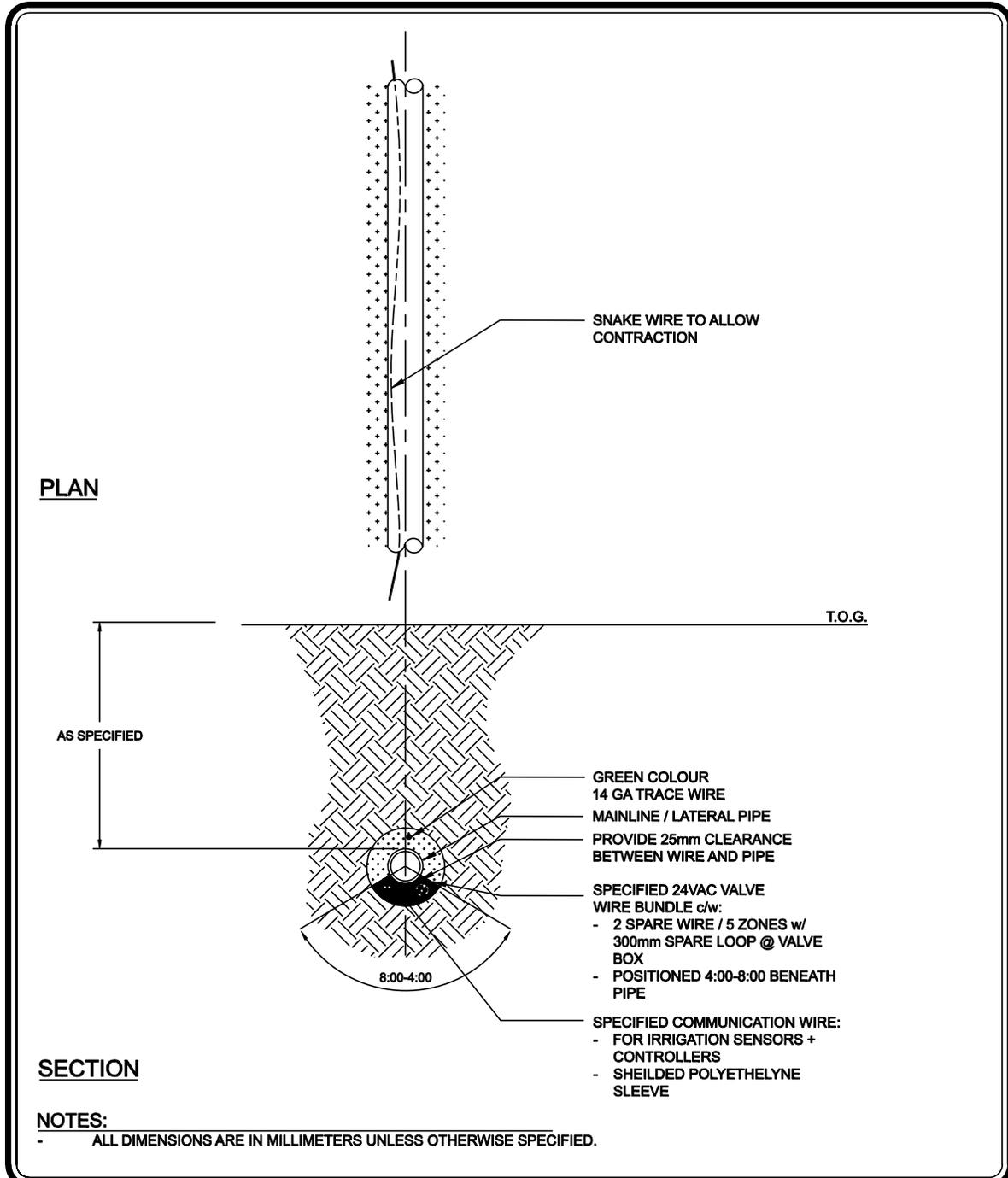
- 1. 1/2" Polyethylene Glycol (PE) Pipe, 100' Length
- 2. 1/2" Polyethylene Glycol (PE) Pipe, 50' Length
- 3. 1/2" Polyethylene Glycol (PE) Pipe, 25' Length
- 4. 1/2" Polyethylene Glycol (PE) Pipe, 10' Length
- 5. 1/2" Polyethylene Glycol (PE) Pipe, 5' Length
- 6. 1/2" Polyethylene Glycol (PE) Pipe, 2' Length
- 7. 1/2" Polyethylene Glycol (PE) Pipe, 1' Length
- 8. 1/2" Polyethylene Glycol (PE) Pipe, 0.5' Length
- 9. 1/2" Polyethylene Glycol (PE) Pipe, 0.25' Length
- 10. 1/2" Polyethylene Glycol (PE) Pipe, 0.125' Length
- 11. 1/2" Polyethylene Glycol (PE) Pipe, 0.0625' Length
- 12. 1/2" Polyethylene Glycol (PE) Pipe, 0.03125' Length
- 13. 1/2" Polyethylene Glycol (PE) Pipe, 0.015625' Length
- 14. 1/2" Polyethylene Glycol (PE) Pipe, 0.0078125' Length
- 15. 1/2" Polyethylene Glycol (PE) Pipe, 0.00390625' Length
- 16. 1/2" Polyethylene Glycol (PE) Pipe, 0.001953125' Length
- 17. 1/2" Polyethylene Glycol (PE) Pipe, 0.0009765625' Length
- 18. 1/2" Polyethylene Glycol (PE) Pipe, 0.00048828125' Length
- 19. 1/2" Polyethylene Glycol (PE) Pipe, 0.000244140625' Length
- 20. 1/2" Polyethylene Glycol (PE) Pipe, 0.0001220703125' Length
- 21. 1/2" Polyethylene Glycol (PE) Pipe, 0.00006103515625' Length
- 22. 1/2" Polyethylene Glycol (PE) Pipe, 0.000030517578125' Length
- 23. 1/2" Polyethylene Glycol (PE) Pipe, 0.0000152587890625' Length
- 24. 1/2" Polyethylene Glycol (PE) Pipe, 0.00000762939453125' Length
- 25. 1/2" Polyethylene Glycol (PE) Pipe, 0.000003814697265625' Length
- 26. 1/2" Polyethylene Glycol (PE) Pipe, 0.0000019073486328125' Length
- 27. 1/2" Polyethylene Glycol (PE) Pipe, 0.00000095367431640625' Length
- 28. 1/2" Polyethylene Glycol (PE) Pipe, 0.000000476837158203125' Length
- 29. 1/2" Polyethylene Glycol (PE) Pipe, 0.0000002384185791015625' Length
- 30. 1/2" Polyethylene Glycol (PE) Pipe, 0.00000011920928955078125' Length
- 31. 1/2" Polyethylene Glycol (PE) Pipe, 0.000000059604644775390625' Length
- 32. 1/2" Polyethylene Glycol (PE) Pipe, 0.0000000298023223876953125' Length
- 33. 1/2" Polyethylene Glycol (PE) Pipe, 0.00000001490116119384765625' Length
- 34. 1/2" Polyethylene Glycol (PE) Pipe, 0.000000007450580596923828125' Length
- 35. 1/2" Polyethylene Glycol (PE) Pipe, 0.0000000037252902984619140625' Length
- 36. 1/2" Polyethylene Glycol (PE) Pipe, 0.00000000186264514923095703125' Length
- 37. 1/2" Polyethylene Glycol (PE) Pipe, 0.000000000931322574615478515625' Length
- 38. 1/2" Polyethylene Glycol (PE) Pipe, 0.0000000004656612873077392578125' Length
- 39. 1/2" Polyethylene Glycol (PE) Pipe, 0.00000000023283064365386962890625' Length
- 40. 1/2" Polyethylene Glycol (PE) Pipe, 0.000000000116415321826934814453125' Length
- 41. 1/2" Polyethylene Glycol (PE) Pipe, 0.0000000000582076609134674071875' Length
- 42. 1/2" Polyethylene Glycol (PE) Pipe, 0.00000000002910383045673370359375' Length
- 43. 1/2" Polyethylene Glycol (PE) Pipe, 0.000000000014551915228366851796875' Length
- 44. 1/2" Polyethylene Glycol (PE) Pipe, 0.0000000000072759576141834258984375' Length
- 45. 1/2" Polyethylene Glycol (PE) Pipe, 0.00000000000363797880709171269421875' Length
- 46. 1/2" Polyethylene Glycol (PE) Pipe, 0.000000000001818989403545856347109375' Length
- 47. 1/2" Polyethylene Glycol (PE) Pipe, 0.0000000000009094947017729281735546875' Length
- 48. 1/2" Polyethylene Glycol (PE) Pipe, 0.000000000000454747350886464286789375' Length
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- 55. 1/2" Polyethylene Glycol (PE) Pipe, 0.0000000000000035527136788005022405419921875' Length
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- 57. 1/2" Polyethylene Glycol (PE) Pipe, 0.000000000000000888178419700125560135498046875' Length
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Detail Sheet 48: Irrigation - Valve Hook-Ups, Field Wire Alignment



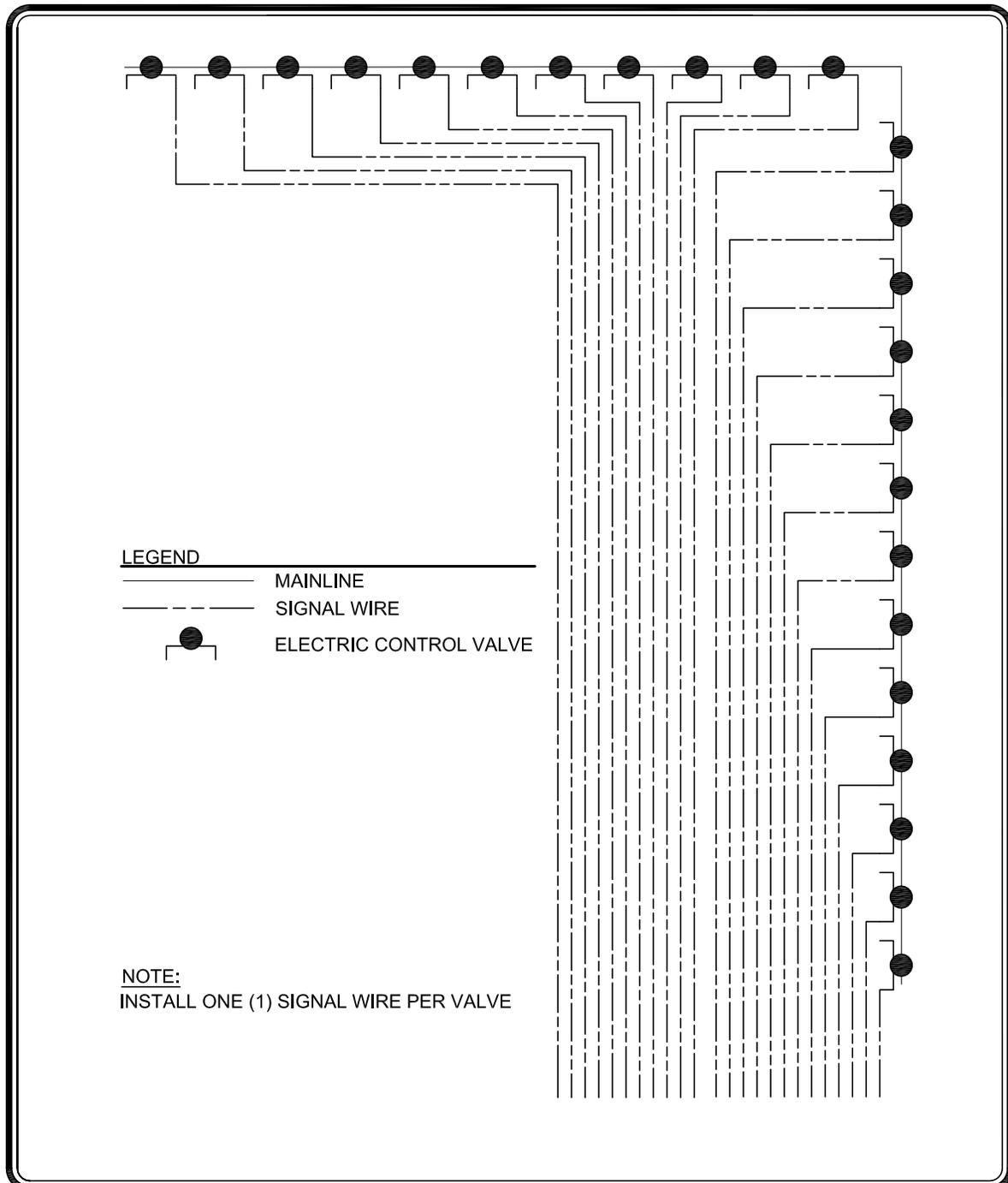
 <p>THE CITY OF CALGARY PARKS</p>	PROJECT TITLE	DRAWN BY	SCALE
	SPECIFICATIONS	W.B.	N.T.S.
	SHEET TITLE	DATE 2006 05 17	SHEET NO.
	VALVE HOOK-UP (PVC) 50mm TO 50mm	DESIGN BY	48
	DATE	FILE NO.	

Detail Sheet 48a: Irrigation - Valve Hook-Ups, Field Wire Alignment



	PROJECT TITLE	DRAWN BY	SCALE
	SPECIFICATIONS	MRM	N.T.S.
	SHEET TITLE	DATE 2006 05 24	SHEET NO.
	IRRIGATION FIELD WIRE ALIGNMENT	DESIGN BY	48a
	DATE	FILE NO.	

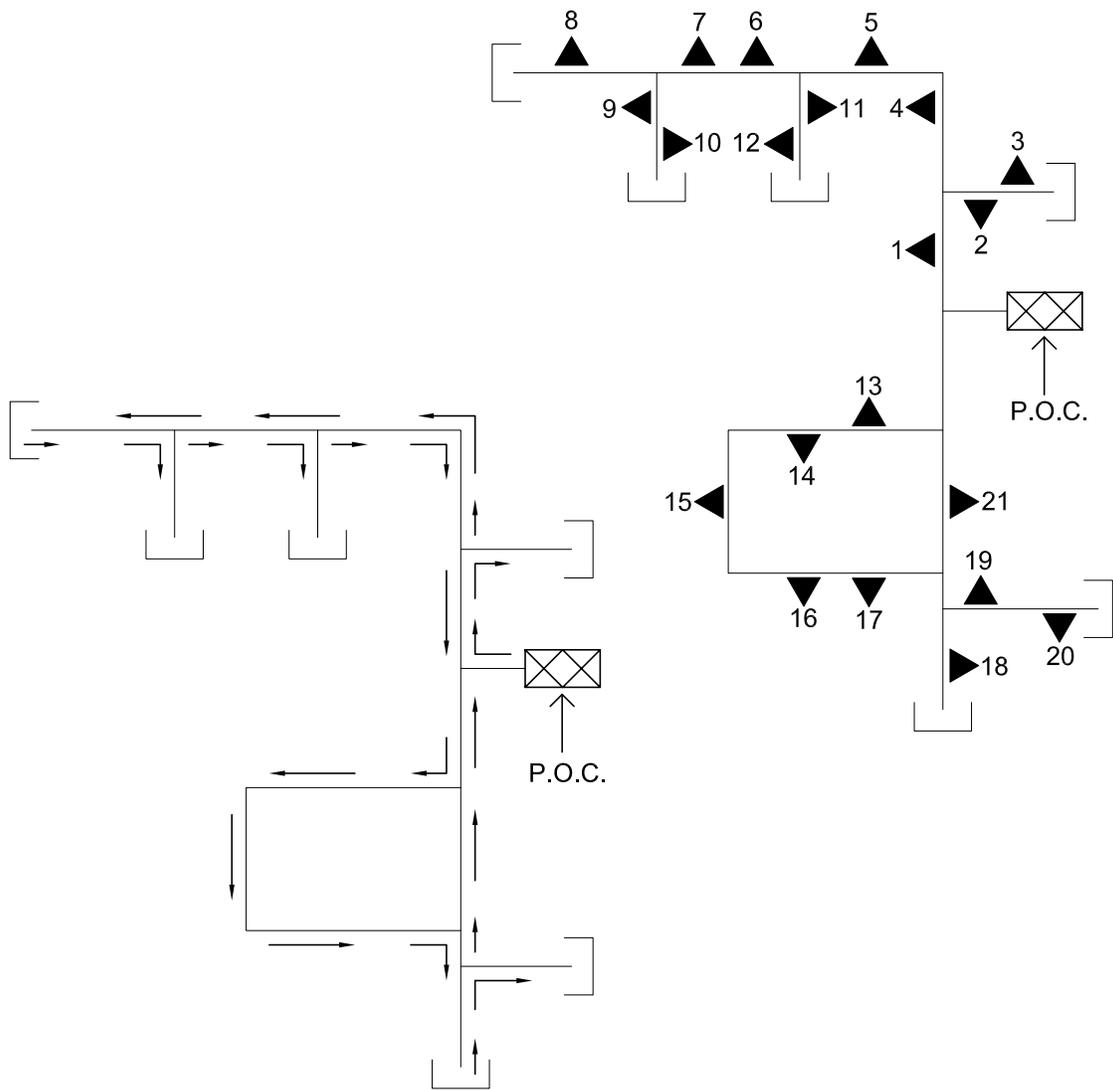
Detail Sheet 48b: Irrigation - Valve Hook-Ups, Field Wire Alignment



	PROJECT TITLE SPECIFICATIONS	DRAWN BY MM	SCALE N.T.S.
	SHEET TITLE ELECTRIC CONTROL VALVE SIGNAL WIRE SCHEMATIC	DATE 2009 01 16	SHEET NO. 48b
		DESIGN BY MM	FILE NO.
		DATE 2009 01 16	

Detail Sheet 48c: Irrigation - Valve Hook-Ups, Field Wire Alignment

RIGHT HAND VALVE WIRING RULE



P.O.C: (POINT OF CONNECTION)



PROJECT TITLE
SPECIFICATIONS

SHEET TITLE
**RIGHT HAND VALVE
WIRING RULE**

DRAWN BY
WYC

DATE **2009 02 25**

DESIGN BY
MM

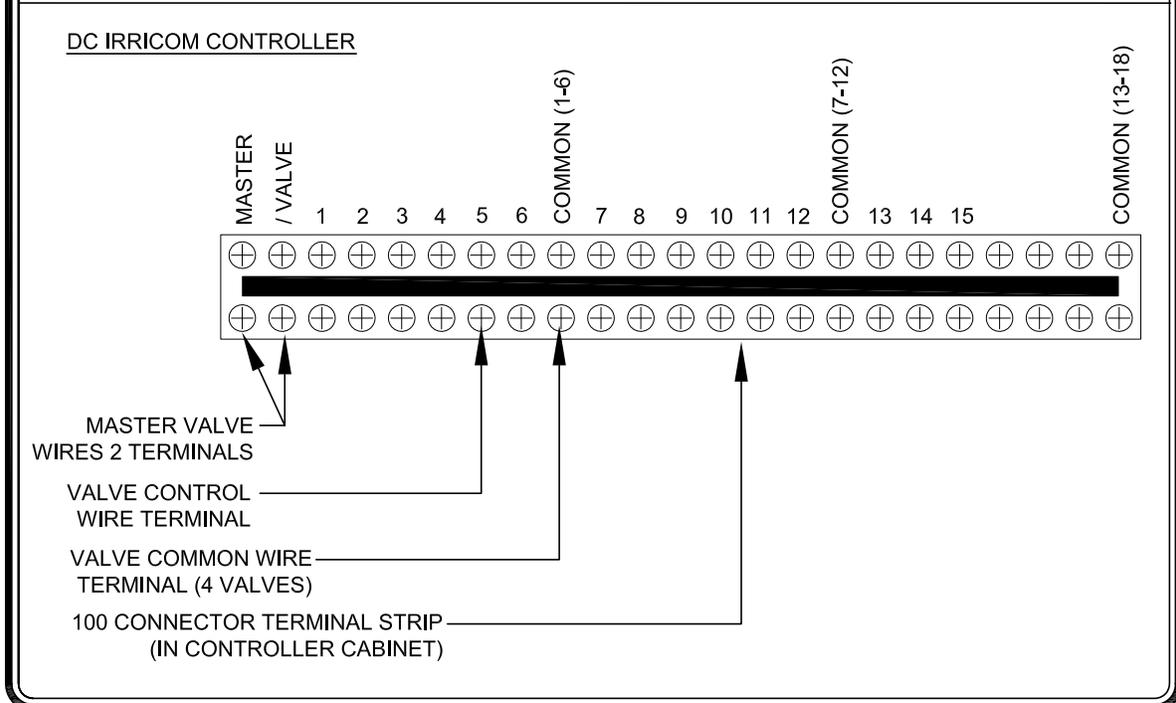
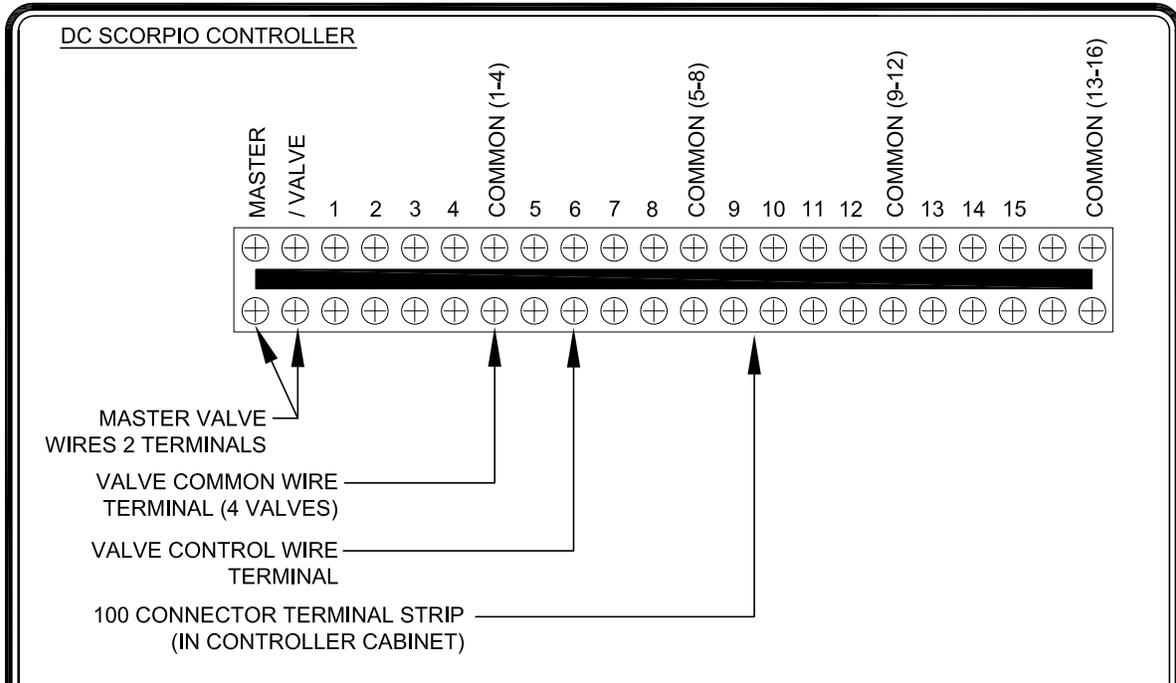
DATE **2009 02 25**

SCALE
N.T.S.

SHEET NO.
48c

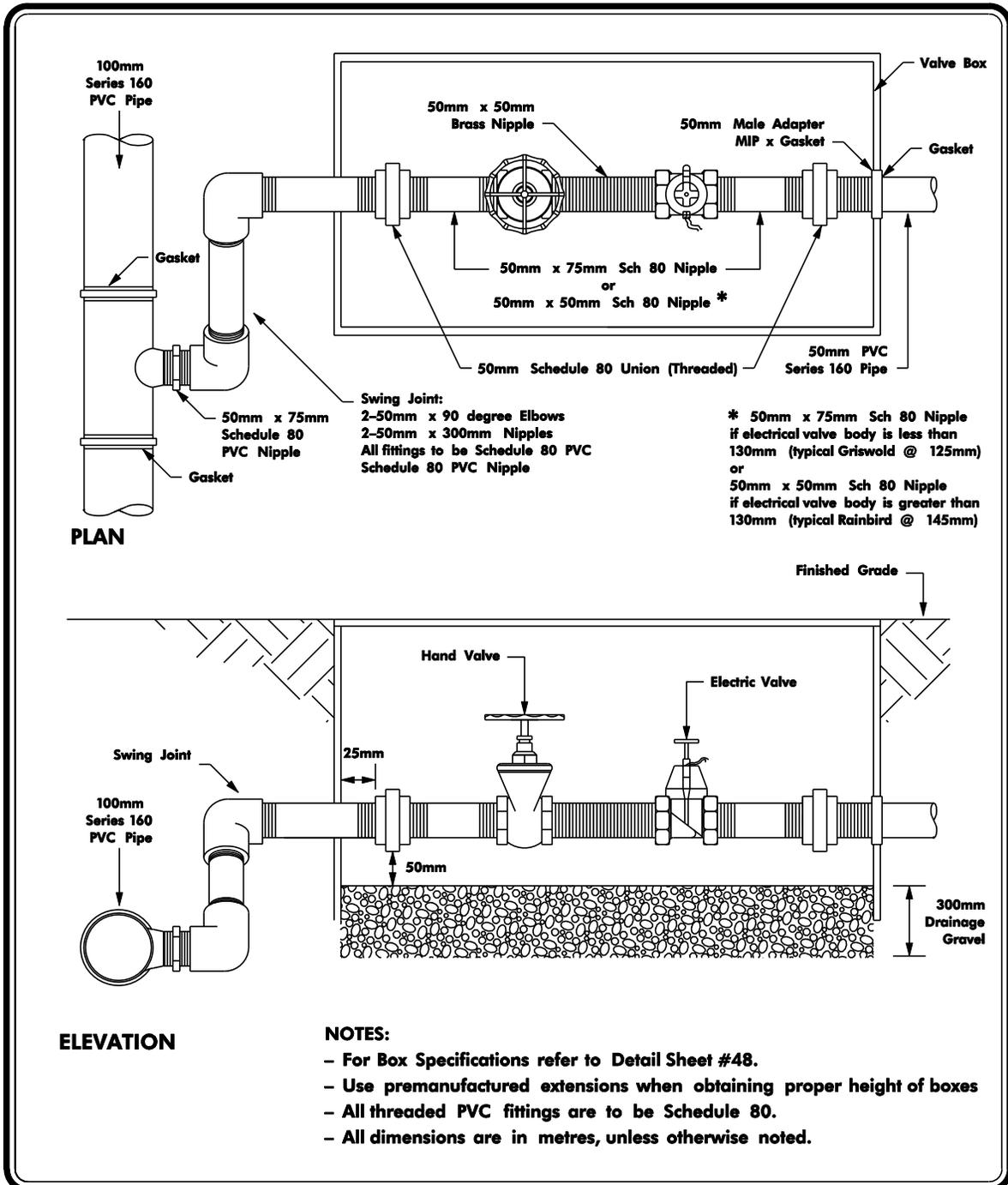
FILE NO.

Detail Sheet 48d: Irrigation - Valve Hook-Ups, Field Wire Alignment



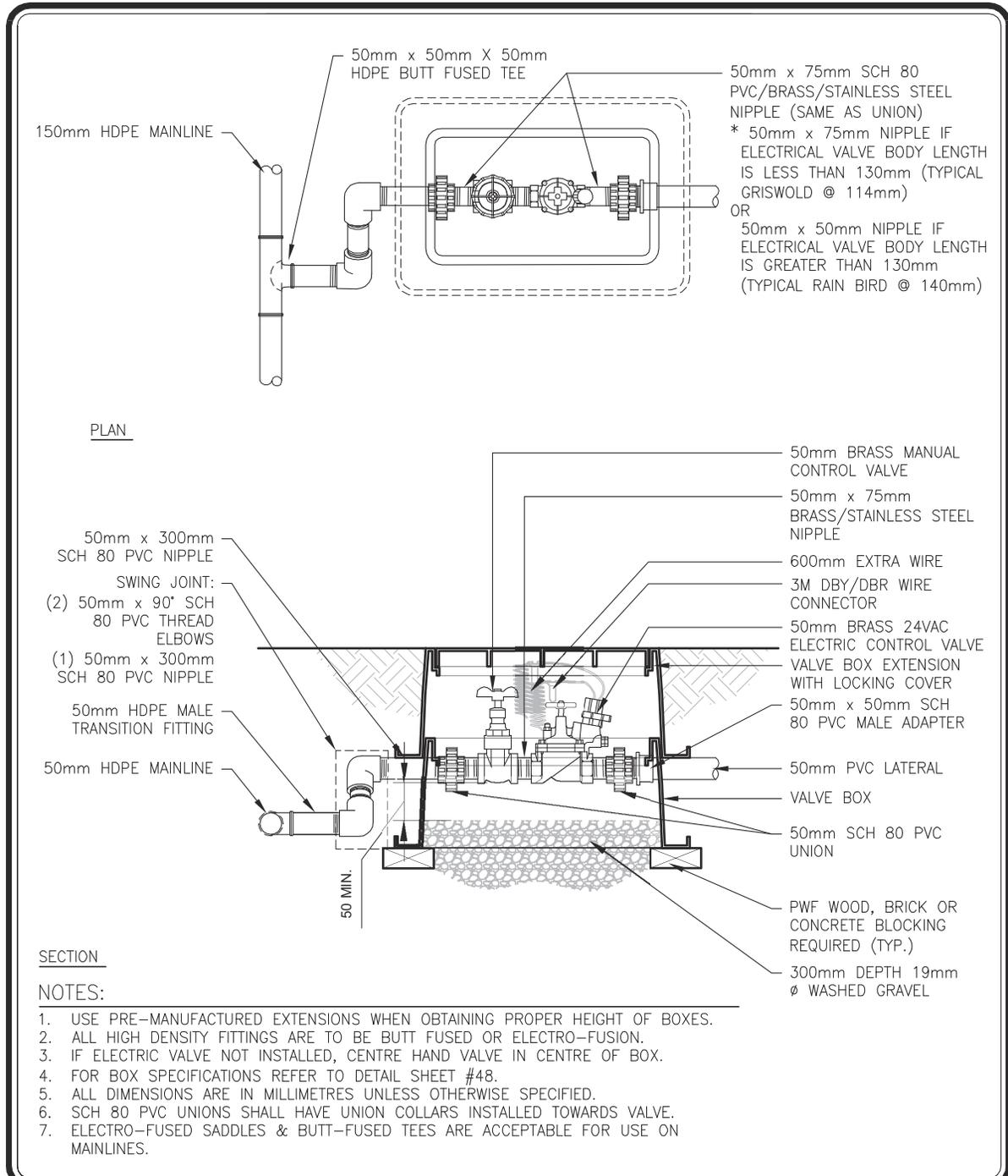
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	<p>SHEET TITLE</p> <p>VALVE WIRING, DC MOTOROLA CONTROLLERS</p>	<p>DESIGN BY</p> <p>MM</p> <p>DATE</p> <p>2008/12/05</p>	<p>SHEET NO.</p> <p>48d</p>
			<p>FILE NO.</p>

Detail Sheet 49: Irrigation - Valve Hook-Ups, Field Wire Alignment



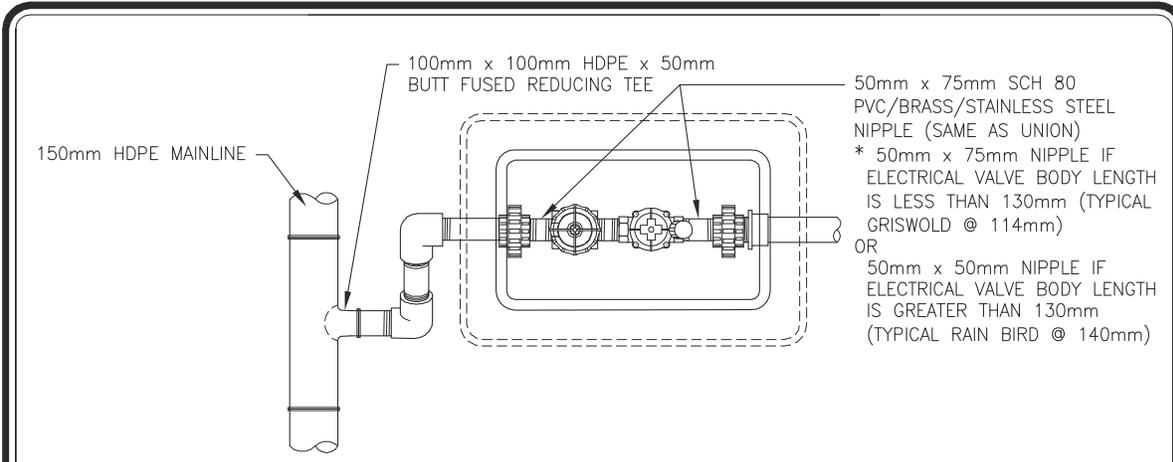
	PROJECT TITLE	DRAWN BY	SCALE
	SPECIFICATIONS	W.B.	N.T.S.
	SHEET TITLE	DATE 2006 05 17	SHEET NO.
	VALVE HOOK-UP (PVC) 100mm TO 50mm	DESIGN BY	49
		DATE	FILE NO.

Detail Sheet 50: Irrigation - 50 mm to 50 mm HDPE Valve Connection

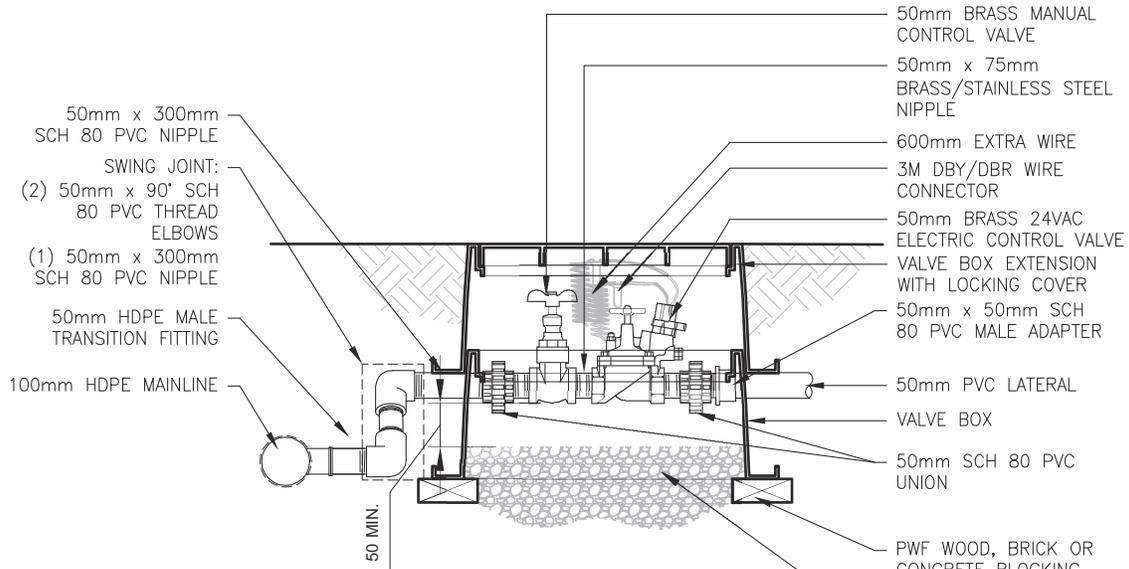


	PROJECT TITLE	DRAWN BY	SCALE
	SPECIFICATIONS	TCP	N.T.S.
	SHEET TITLE	DATE	SHEET NO.
	50mm TO 50mm HDPE VALVE CONNECTION	2010/12/22	50
		DESIGN BY	FILE NO.
		DATE	

Detail Sheet 50a: Irrigation - 100 mm to 50 mm HDPE Valve Connection



PLAN



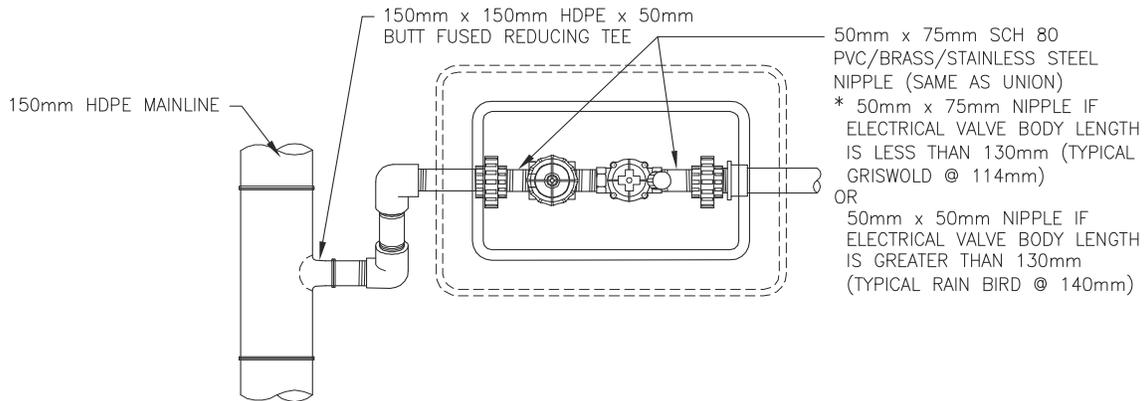
SECTION

NOTES:

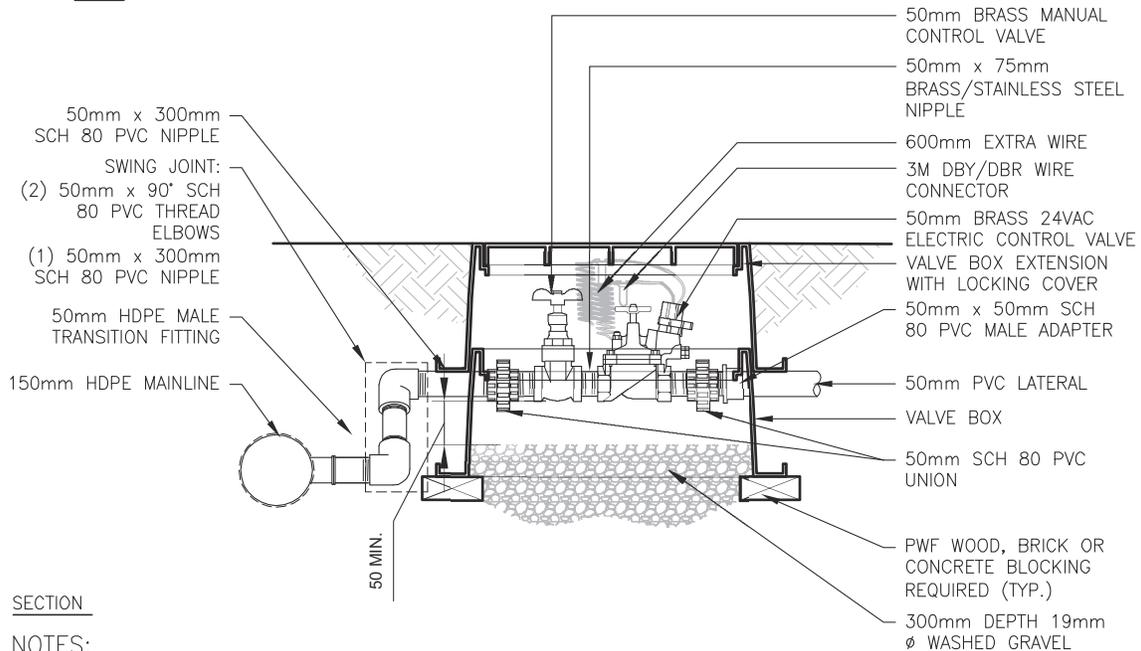
1. USE PRE-MANUFACTURED EXTENSIONS WHEN OBTAINING PROPER HEIGHT OF BOXES.
2. ALL HIGH DENSITY FITTINGS ARE TO BE BUTT FUSED OR ELECTRO-FUSION.
3. IF ELECTRIC VALVE NOT INSTALLED, CENTRE HAND VALVE IN CENTRE OF BOX.
4. FOR BOX SPECIFICATIONS REFER TO DETAIL SHEET #48.
5. ALL DIMENSIONS ARE IN MILLIMETRES 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.

 <p>THE CITY OF CALGARY PARKS</p>	PROJECT TITLE SPECIFICATIONS	DRAWN BY TCP	SCALE N.T.S.
	SHEET TITLE 100mm TO 50mm HDPE VALVE CONNECTION	DATE 2010/12/22	SHEET NO. 50a
		DESIGN BY	FILE NO.
		DATE	

Detail Sheet 50b: Irrigation - 150 mm to 50 mm HDPE Valve Connection



PLAN



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.



PROJECT TITLE
SPECIFICATIONS

SHEET TITLE
150mm TO 50mm HDPE VALVE CONNECTION

DRAWN BY
TCP

DATE
2010/12/22

DESIGN BY

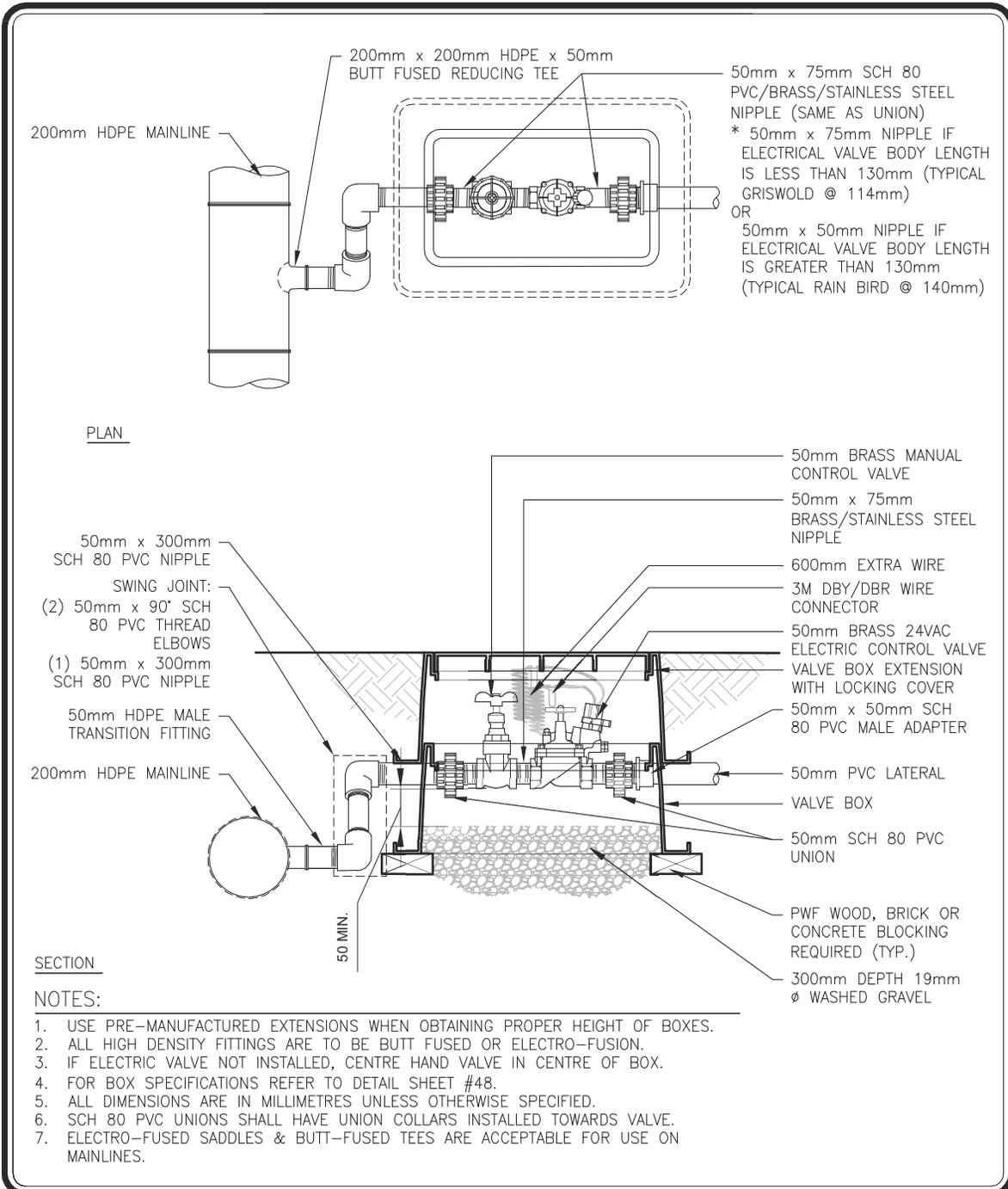
DATE

SCALE
N.T.S.

SHEET NO.
50b

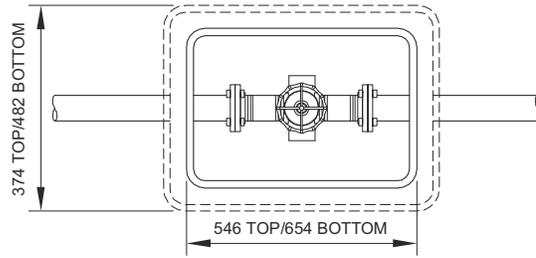
FILE NO.

Detail Sheet 50c: Irrigation - 200 mm to 50 mm HDPE Valve Connection

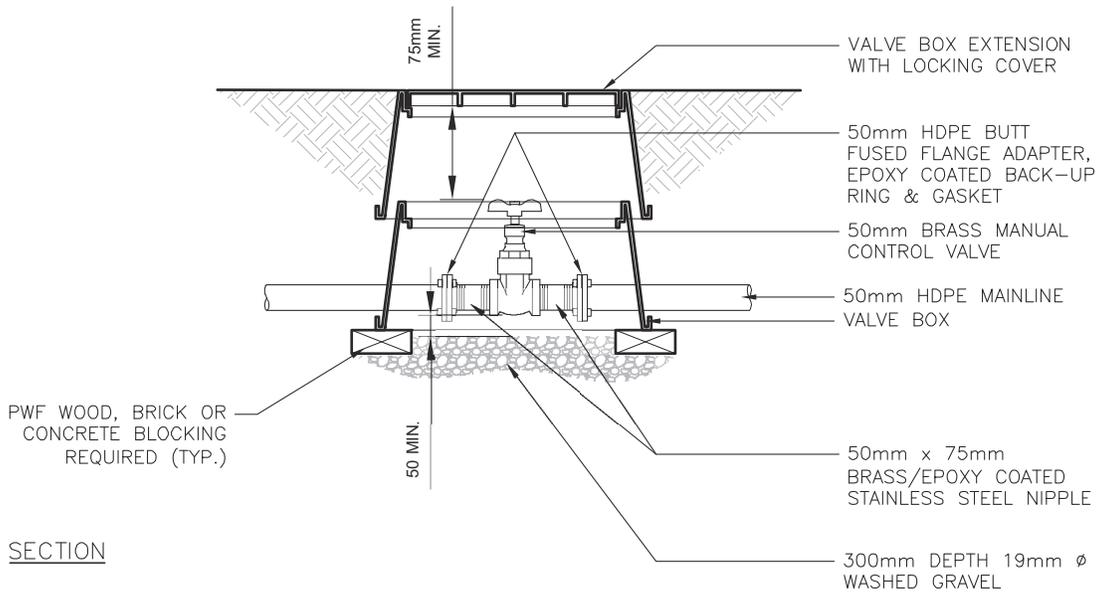


	PROJECT TITLE	DRAWN BY	SCALE
	SPECIFICATIONS	TCP	N.T.S.
	SHEET TITLE	DATE	SHEET NO.
	200mm TO 50mm HDPE VALVE CONNECTION	2010/12/22	50c
		DESIGN BY	FILE NO.
		DATE	

Detail Sheet 50d: Irrigation - 50 mm Isolation Main Control Valve



PLAN



SECTION

NOTES:

1. ALL DIMENSIONS ARE IN MILLIMETERS UNLESS OTHERWISE SPECIFIED.
2. ALL BOLT HEADS ON FLANGES SHALL BE FACING TOWARDS VALVE.



PROJECT TITLE

SPECIFICATIONS

SHEET TITLE

**50mm ISOLATION VALVE
MAIN CONTROL VALVE (HDPE)**

DRAWN BY

TCP

DATE

2010/12/22

DESIGN BY

DATE

SCALE

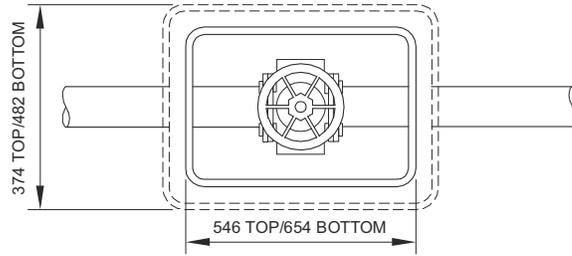
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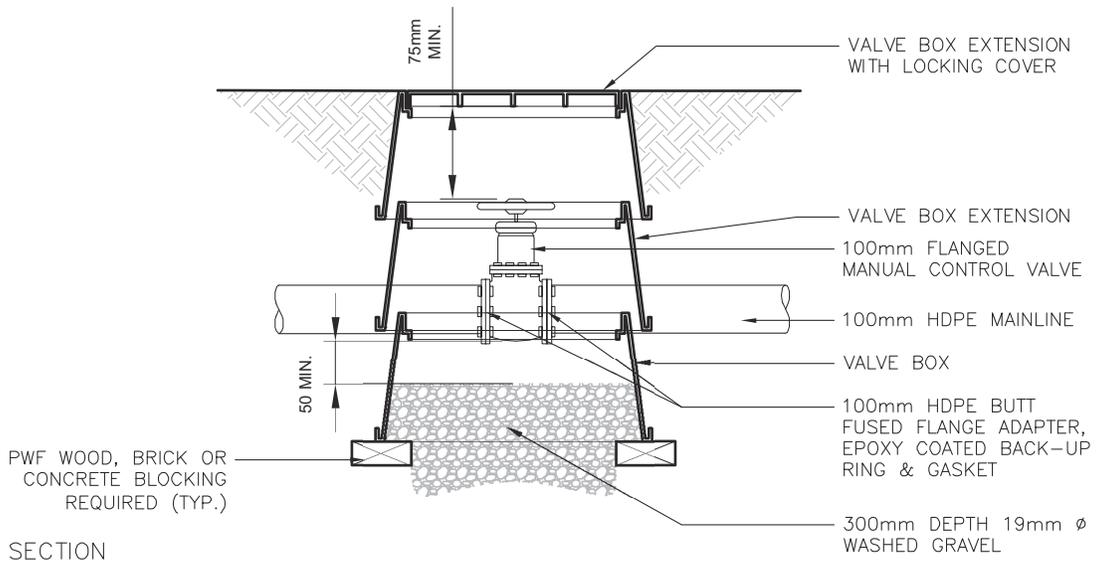
50d

FILE NO.

Detail Sheet 50e: Irrigation - 100 mm Isolation Main Control Valve



PLAN



SECTION

NOTES:

1. ALL DIMENSIONS ARE IN MILLIMETERS UNLESS OTHERWISE SPECIFIED.
2. ALL BOLT HEADS ON FLANGES SHALL BE FACING TOWARDS VALVE.



PROJECT TITLE
SPECIFICATIONS

SHEET TITLE
**100mm ISOLATION VALVE
MAIN CONTROL VALVE (HDPE)**

DRAWN BY
TCP

DATE
2010/12/22

DESIGN BY

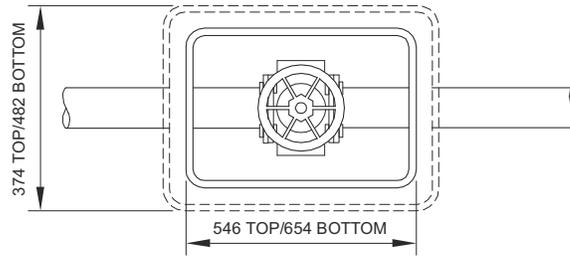
DATE

SCALE
N.T.S.

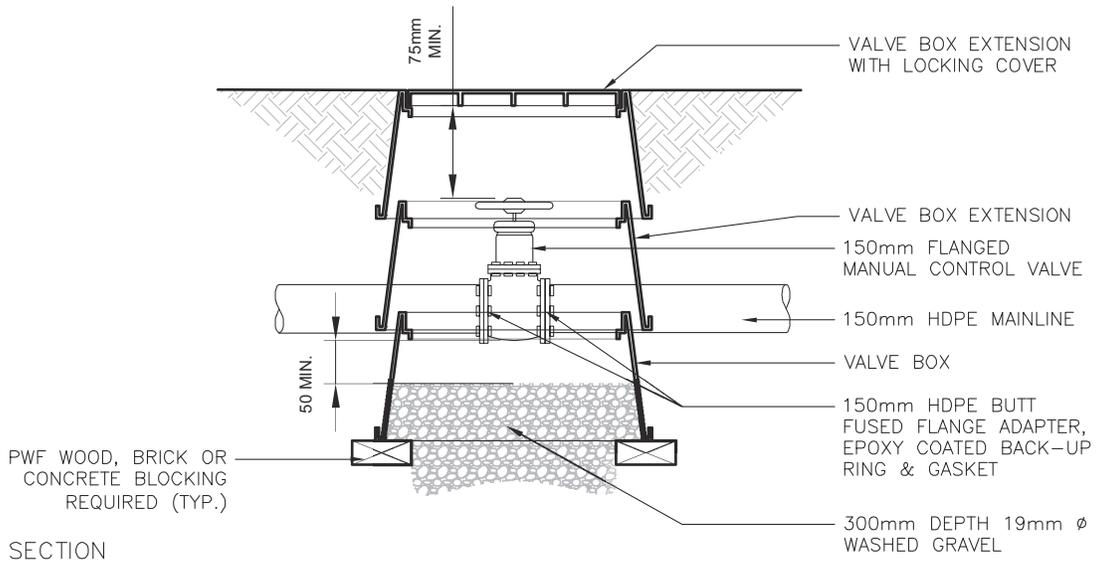
SHEET NO.
50e

FILE NO.

Detail Sheet 50f: Irrigation - 150 mm Isolation Main Control Valve



PLAN



SECTION

NOTES:

1. ALL DIMENSIONS ARE IN MILLIMETERS UNLESS OTHERWISE SPECIFIED.
2. ALL BOLT HEADS ON FLANGES SHALL BE FACING TOWARDS VALVE.

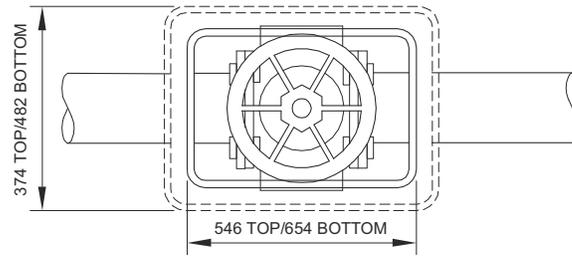


PROJECT TITLE	SPECIFICATIONS
SHEET TITLE	150mm ISOLATION VALVE MAIN CONTROL VALVE (HDPE)

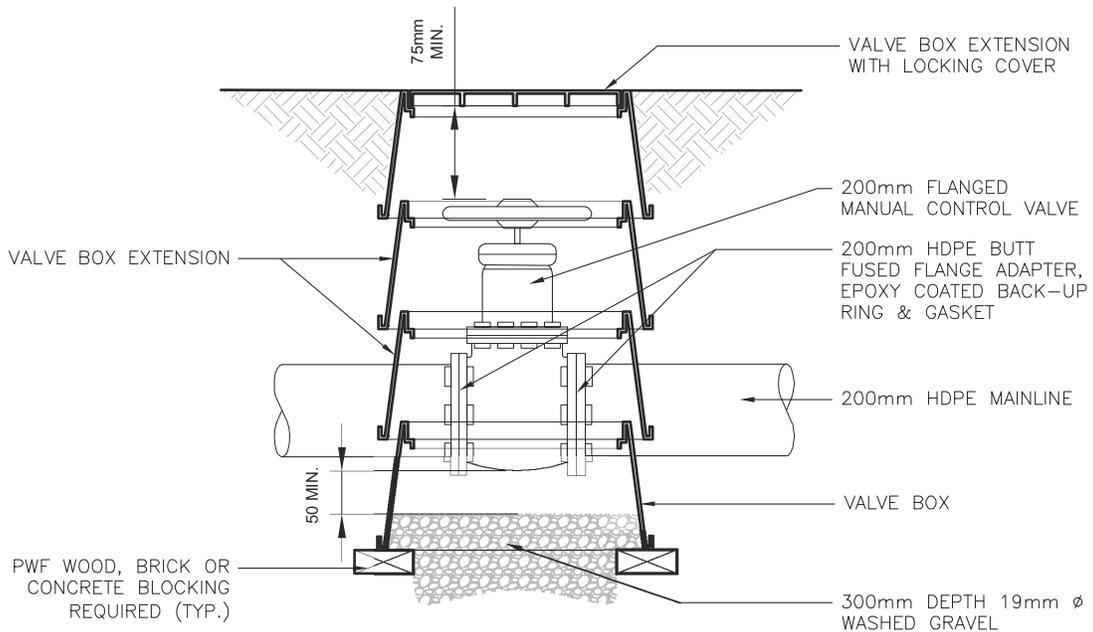
DRAWN BY	TCP
DATE	2010/12/22
DESIGN BY	
DATE	

SCALE	N.T.S.
SHEET NO.	50f
FILE NO.	

Detail Sheet 50g: Irrigation - 200 mm Isolation Main Control Valve



PLAN



SECTION

NOTES:

1. ALL DIMENSIONS ARE IN MILLIMETERS UNLESS OTHERWISE SPECIFIED.
2. ALL BOLT HEADS ON FLANGES SHALL BE FACING TOWARDS VALVE.



PROJECT TITLE
SPECIFICATIONS

SHEET TITLE
**200mm ISOLATION VALVE
MAIN CONTROL VALVE (HDPE)**

DRAWN BY
TCP

DATE
2010/12/22

DESIGN BY

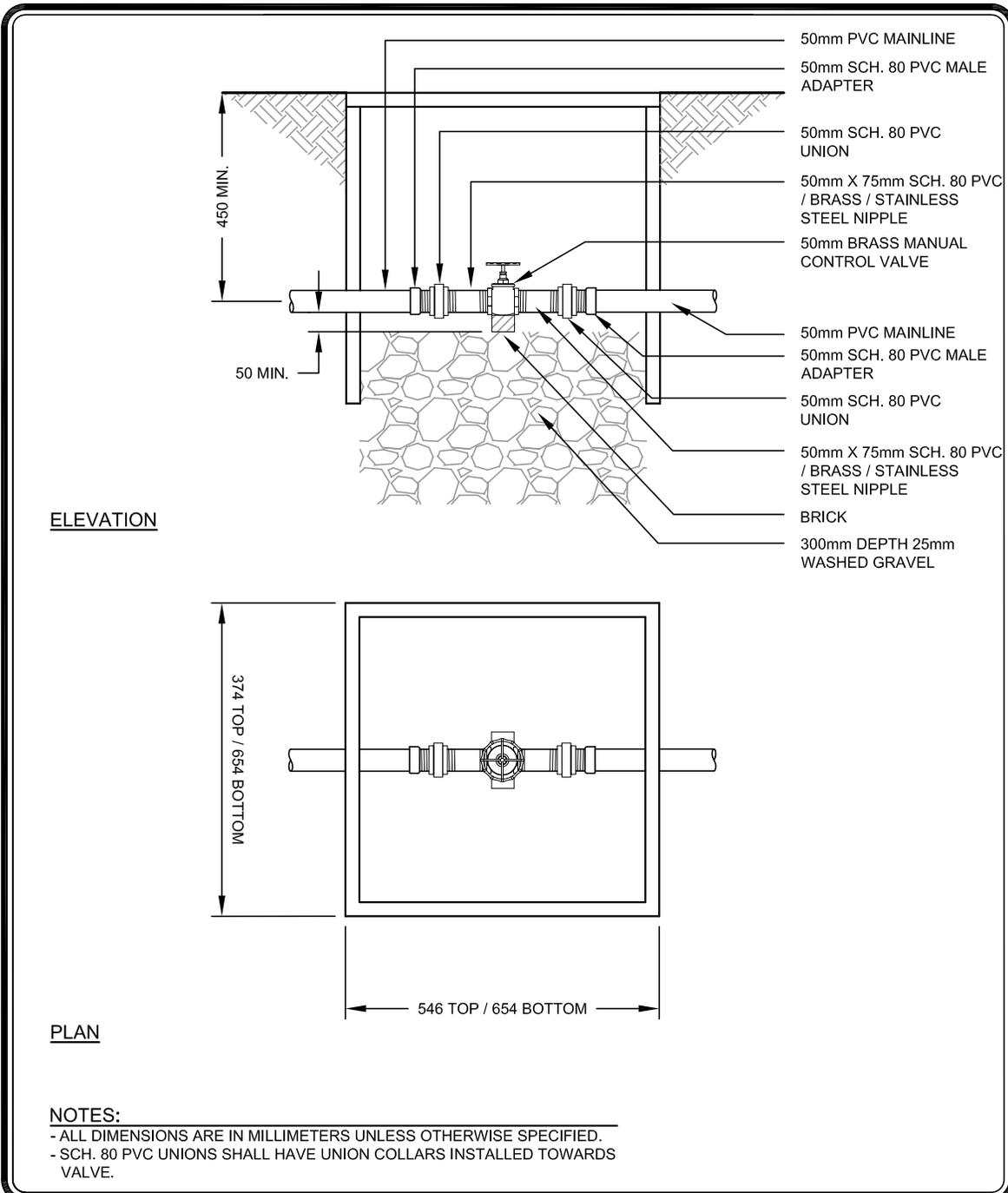
DATE

SCALE
N.T.S.

SHEET NO.
50g

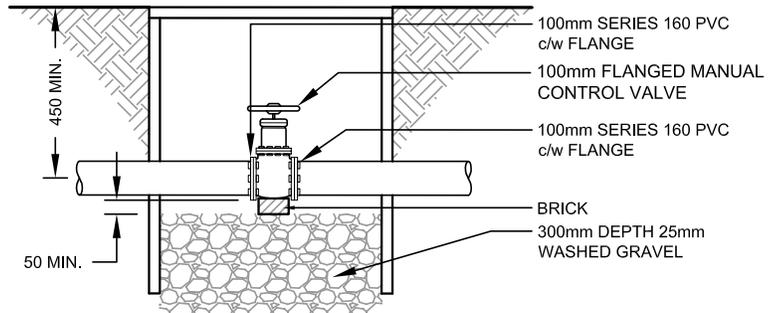
FILE NO.

Detail Sheet 50h: Irrigation - Valve Hook-Ups, Field Wire Alignment

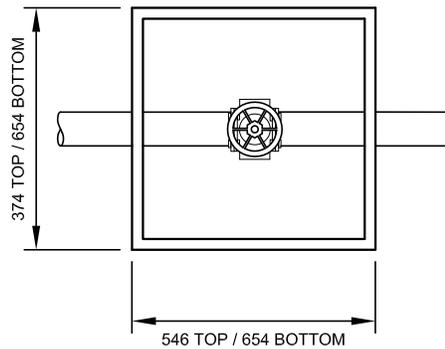


	PROJECT TITLE SPECIFICATIONS	DRAWN BY WYC	SCALE N.T.S.
	SHEET TITLE 50mm ISOLATION VALVE MAIN CONTROL VALVE (PVC)	DATE 2008 12 05	SHEET NO. 50h
		DESIGN BY DATE	FILE NO.

Detail Sheet 50i: Irrigation - Valve Hook-Ups, Field Wire Alignment



ELEVATION



PLAN

NOTES:

- ALL DIMENSIONS ARE IN MILLIMETERS UNLESS OTHERWISE SPECIFIED.
- ALL BOLT HEADS ON FLANGES SHALL BE FACING AWAY FROM VALVE.



PROJECT TITLE
SPECIFICATIONS

SHEET TITLE
**100mm ISOLATION VALVE
MANUAL CONTROL VALVE
(PVC)**

DRAWN BY
WYC

DATE **2008 12 05**

DESIGN BY

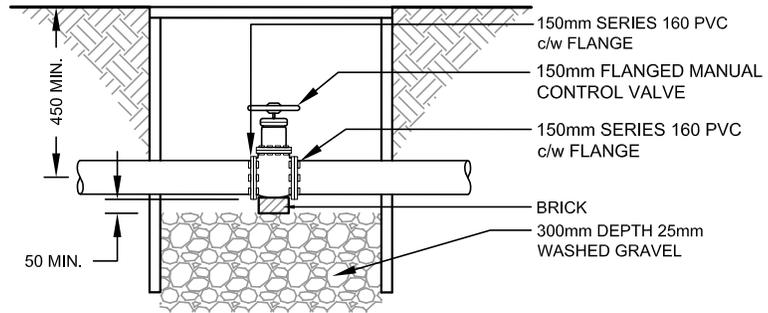
DATE

SCALE
N.T.S.

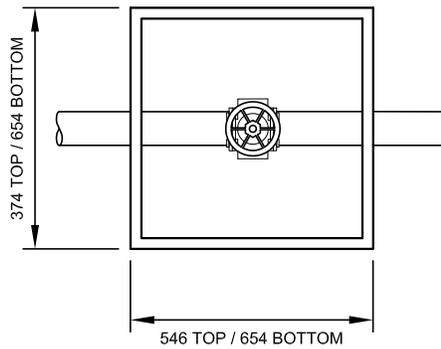
SHEET NO.
50i

FILE NO.

Detail Sheet 50j: Irrigation - Valve Hook-Ups, Field Wire Alignment



ELEVATION



PLAN

NOTES:

- ALL DIMENSIONS ARE IN MILLIMETERS UNLESS OTHERWISE SPECIFIED.
- ALL BOLT HEADS ON FLANGES SHALL BE FACING AWAY FROM VALVE.



PROJECT TITLE
SPECIFICATIONS

SHEET TITLE
**150mm ISOLATION VALVE
MANUAL CONTROL VALVE
(PVC)**

DRAWN BY
WYC

DATE **2008 12 05**

DESIGN BY

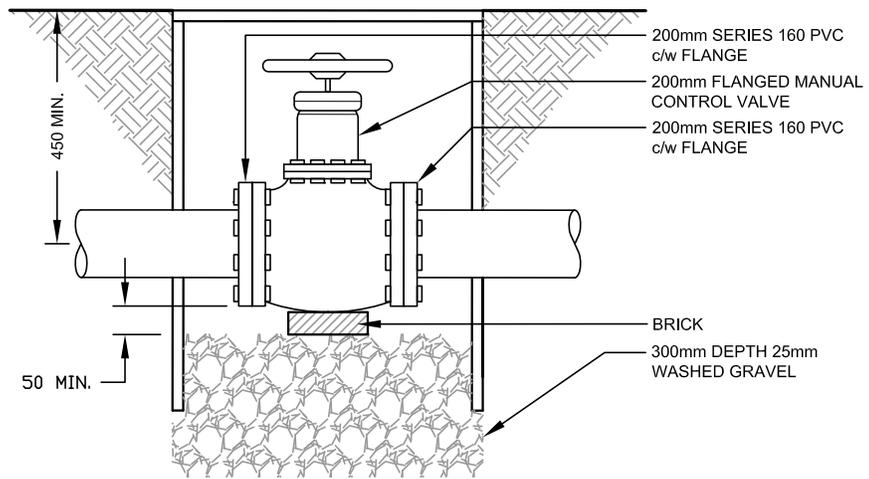
DATE

SCALE
N.T.S.

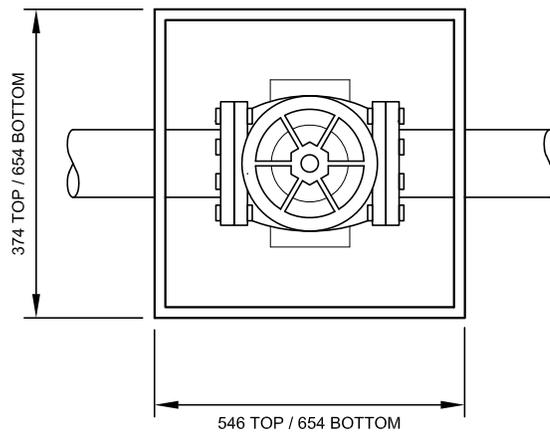
SHEET NO.
50j

FILE NO.

Detail Sheet 50k: Irrigation - Valve Hook-Ups, Field Wire Alignment



ELEVATION



PLAN

- NOTES:**
- ALL DIMENSIONS ARE IN MILLIMETERS UNLESS OTHERWISE SPECIFIED.
 - ALL BOLT HEADS ON FLANGES SHALL BE FACING AWAY FROM VALVE.



PROJECT TITLE
SPECIFICATIONS

SHEET TITLE
**200mm ISOLATION VALVE
MANUAL CONTROL VALVE
(PVC)**

DRAWN BY
WYC

DATE **2008 12 05**

DESIGN BY

DATE

SCALE
N.T.S.

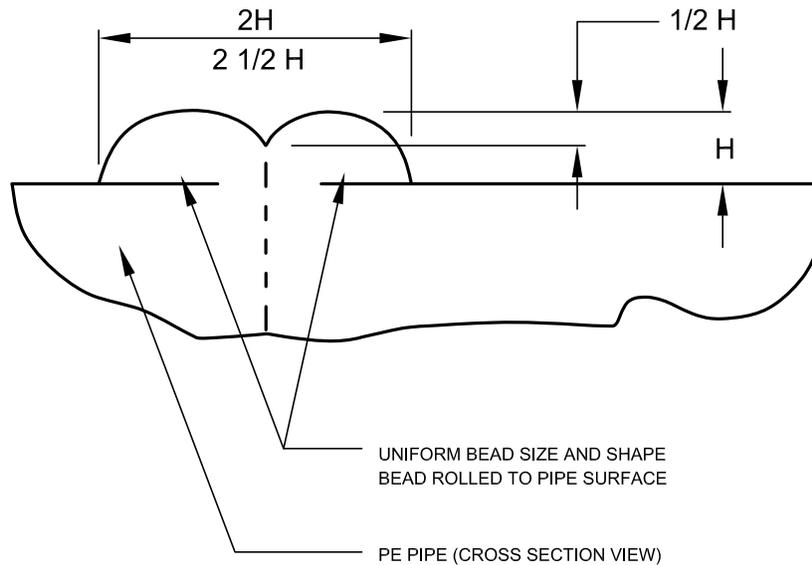
SHEET NO.
50k

FILE NO.

Detail Sheet 50I: Irrigation - HDPE Bead Melt

HDPE BEAD MELT DETAIL

PIPE SIZE		APPROX. MELT BEAD SIZE	
Inches	Millimeters	Inches	Millimeters
<1 1/4	<31.25	1/32 - 1/16	.75 to 1.5
1 1/4 to 3	31.25 to 75	about 1/16	1.5
3 to 8	75 to 200	1/8 to 3/16	3 to 4.5
8 to 12	200 to 300	3/16 to 1/4	4.5 to 6.25



PROJECT TITLE
SPECIFICATIONS

SHEET TITLE
HDPE BEAD MELT DETAIL

DRAWN BY
WYC
DATE
2008/12/05

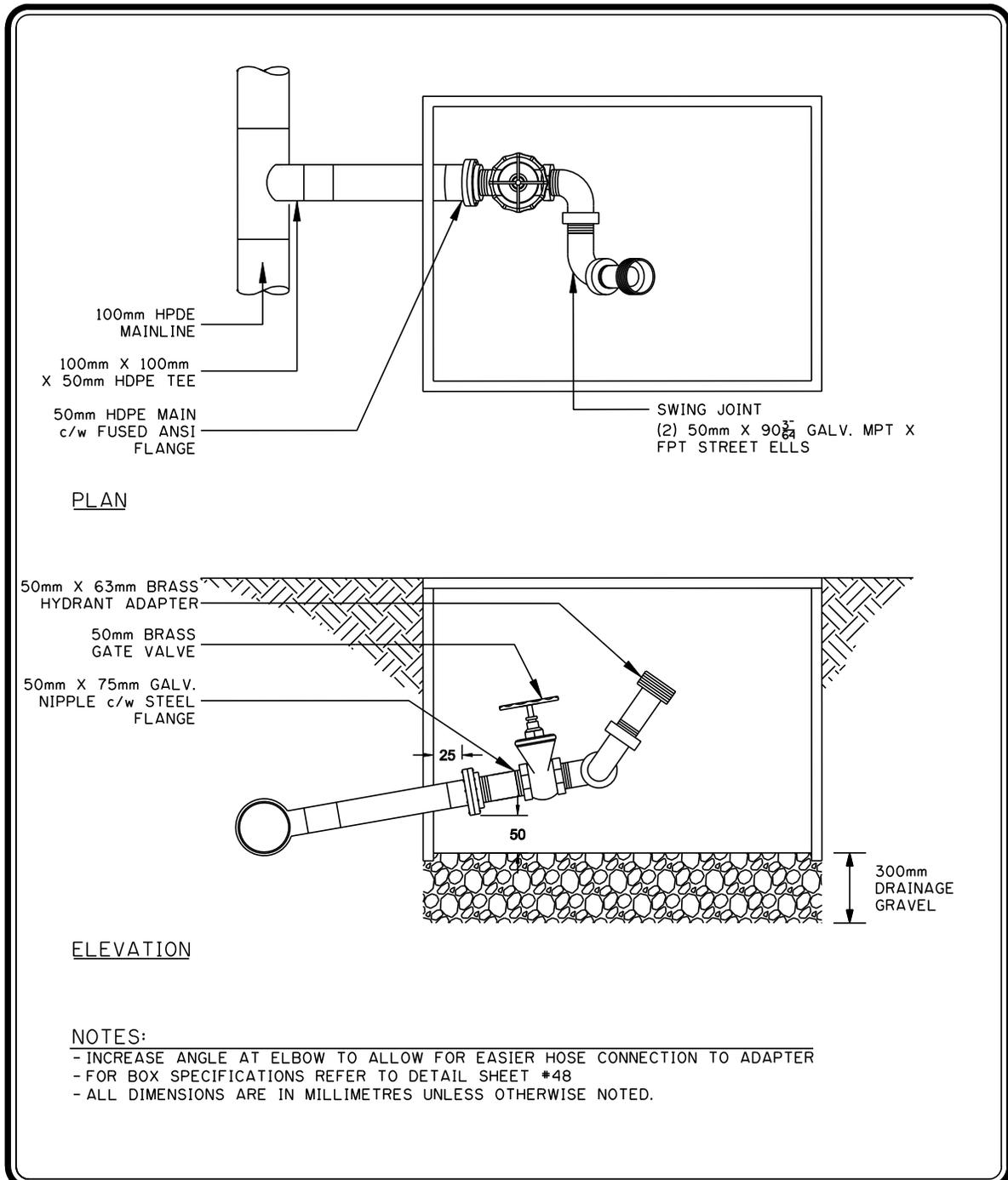
DESIGN BY
DATE

SCALE
N.T.S.

SHEET NO.
50-I

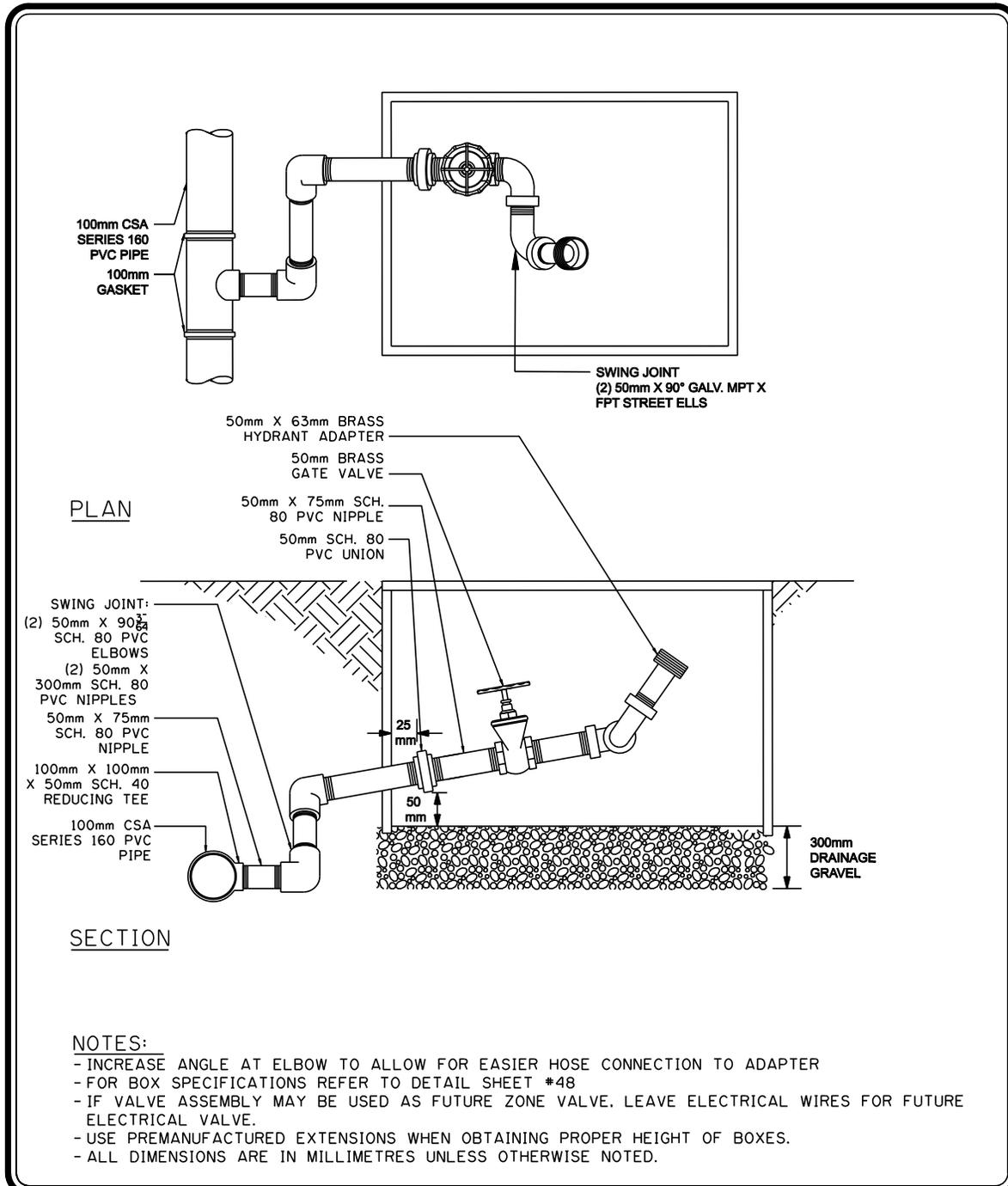
FILE NO.

Detail Sheet 51: Irrigation - Compressor Connection and Meter Test Outlet Assembly



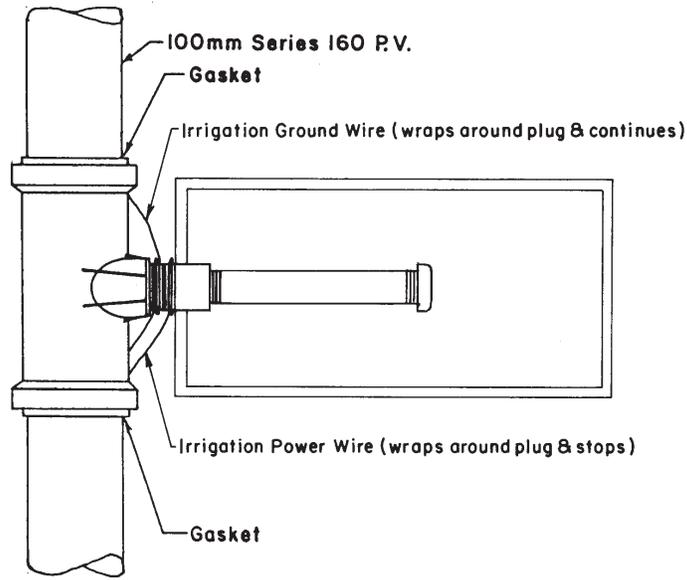
	PROJECT TITLE	DRAWN BY	SCALE
	SPECIFICATIONS	W.B./M.M./RSP	N.T.S.
	SHEET TITLE	DATE 2006 05 24	SHEET NO.
	50mm COMPRESSOR CONNECTION & METER TEST OUTLET ASSEMBLY	DESIGN BY	51
		DATE	FILE NO.

Detail Sheet 51a: Irrigation - 50 mm Field Gate Valve Assembly

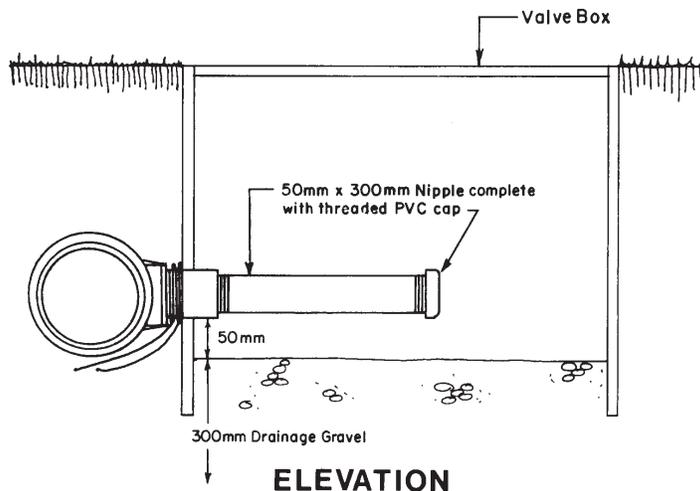


	PROJECT TITLE	DRAWN BY	SCALE
	SPECIFICATIONS	W.B./M.M./MRM	N.T.S.
	SHEET TITLE	DATE 2006 05 19	SHEET NO.
	50mm FIELD GATE VALVE ASSEMBLY	DESIGN BY	51a
	DATE	FILE NO.	

Detail Sheet 52: Irrigation - Tee Hook Ups



PLAN



ELEVATION

NOTE :

- Box Specifications: (all outside measurements)
 - Bottom..... 482mm x 654mm
 - Top..... 374mm x 546mm
 - Height..... 304mm
- All dimensions are in metres unless otherwise noted.



**PROJECT TITLE
SPECIFICATIONS**

**SHEET TITLE
TEE HOOK-UP**

DRAWN BY

W.B.

DATE 1997 03 08

DESIGN BY

D.LaF.

DATE 1997 03 08

SCALE

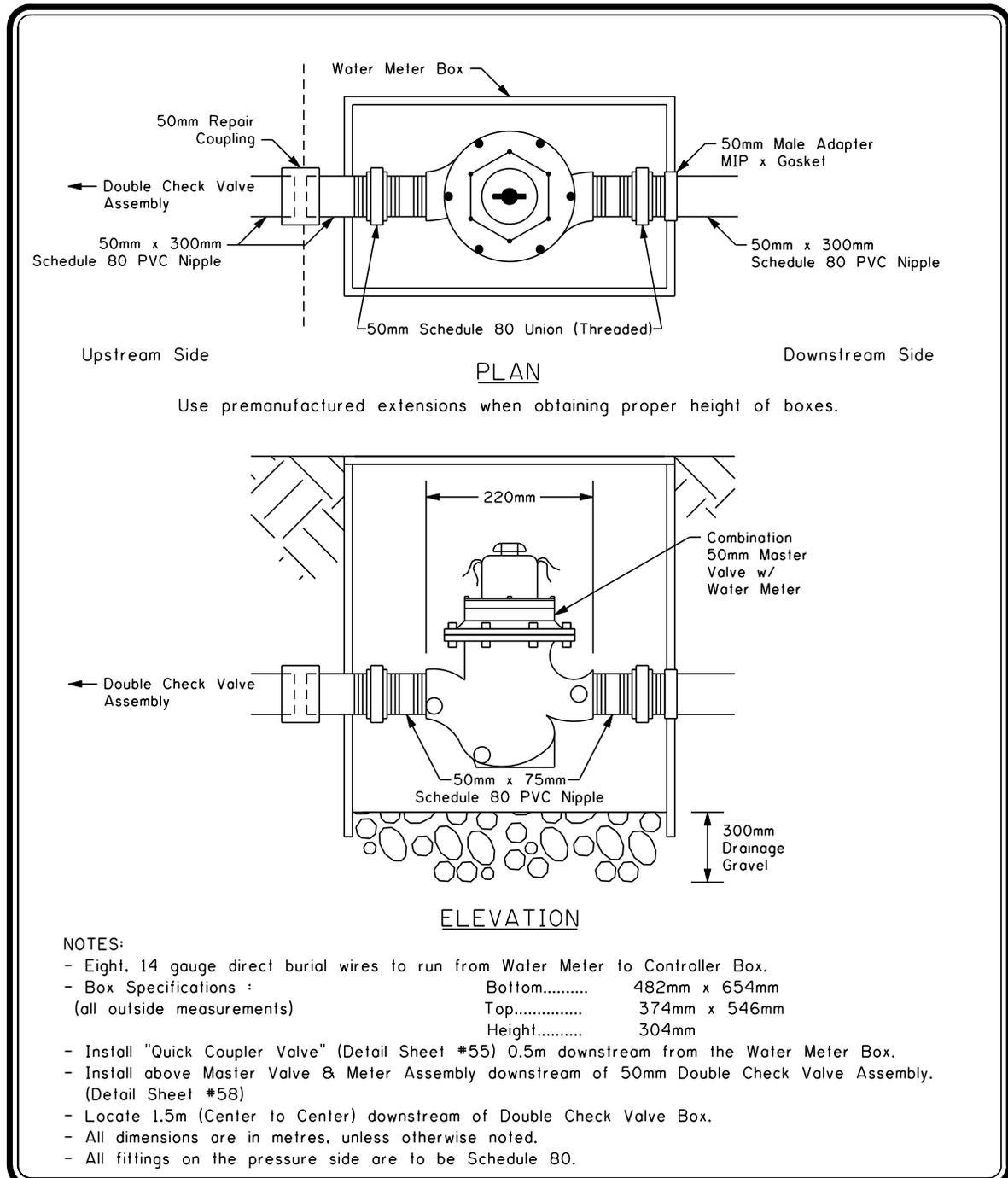
N.T.S.

SHEET NO.

52

FILE NO.

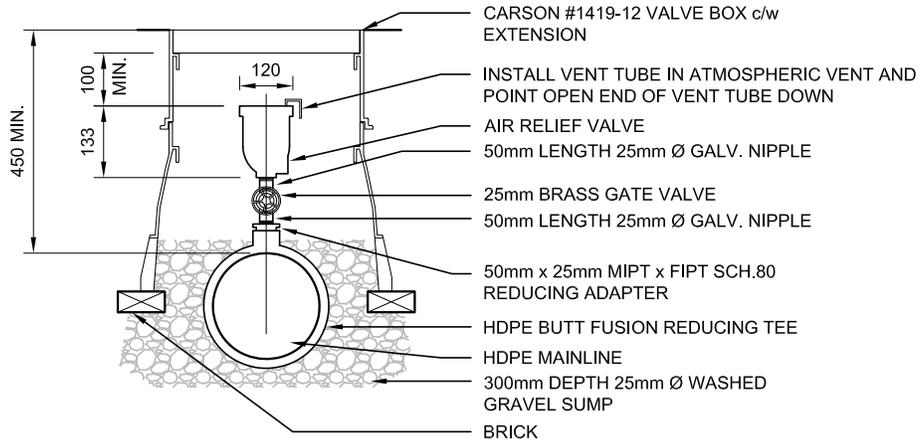
Detail Sheet 53: Irrigation - Master Valve with Water Meter



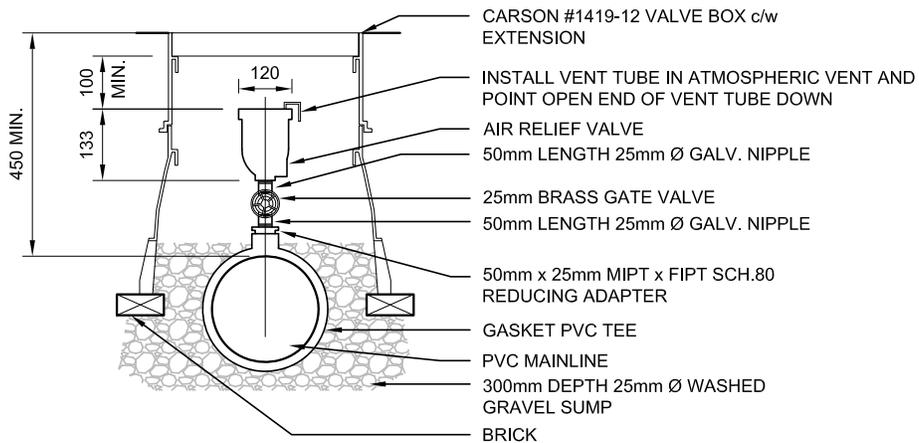
	PROJECT TITLE	DRAWN BY	SCALE
	SPECIFICATIONS	W.B.	N.T.S.
	SHEET TITLE	DATE 2006 05 19	SHEET NO.
	VALVE HOOK-UP (PVC) 50mm TO 50mm COMBINATION 50m MASTER VALVE WITH WATER METER	DESIGN BY	53
		DATE	FILE NO.

Detail Sheet 53a: Irrigation - Air Relief Valve

AIR RELIEF VALVE (HDPE)



AIR RELIEF VALVE (PVC)



NOTE:
 - ENSURE MAINLINE DEPTH FROM TOP OF PIPE TO FINISHED GRADE IS AT MINIMUM 450mm.



PROJECT TITLE
SPECIFICATIONS

SHEET TITLE
**AIR RELIEF VALVE
 HDPE / PVC**

DRAWN BY
WYC

DATE **2008 12 05**

DESIGN BY
MM

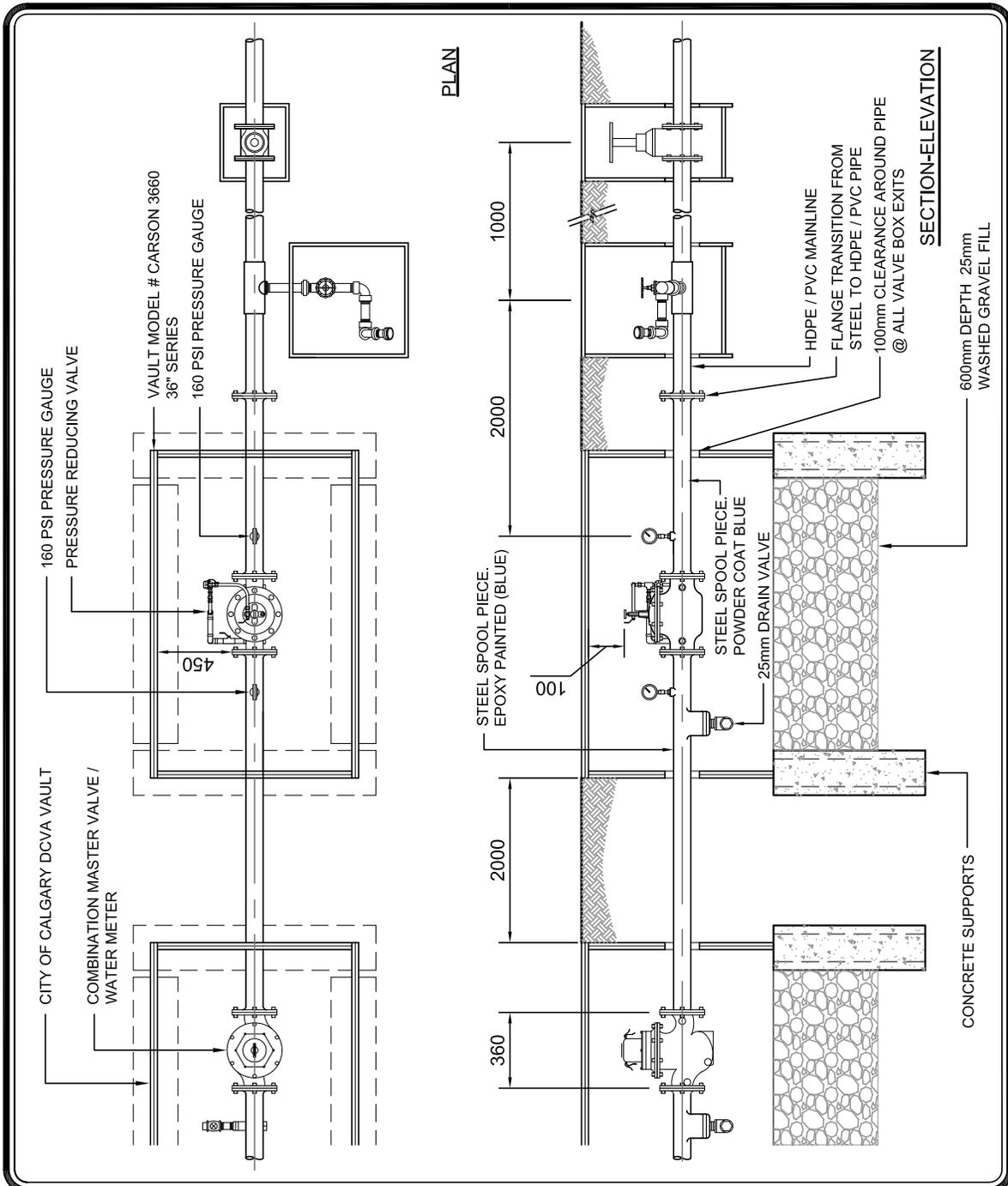
DATE **2008 12 05**

SCALE
N.T.S.

SHEET NO.
53a

FILE NO.

Detail Sheet 53b: Irrigation - Pressure Reducing Valve Assembly



PROJECT TITLE
SPECIFICATIONS

SHEET TITLE
**PRESSURE REDUCING
VALVE ASSEMBLY**

DRAWN BY
WYC

DATE **2008 12 05**

DESIGN BY
MS

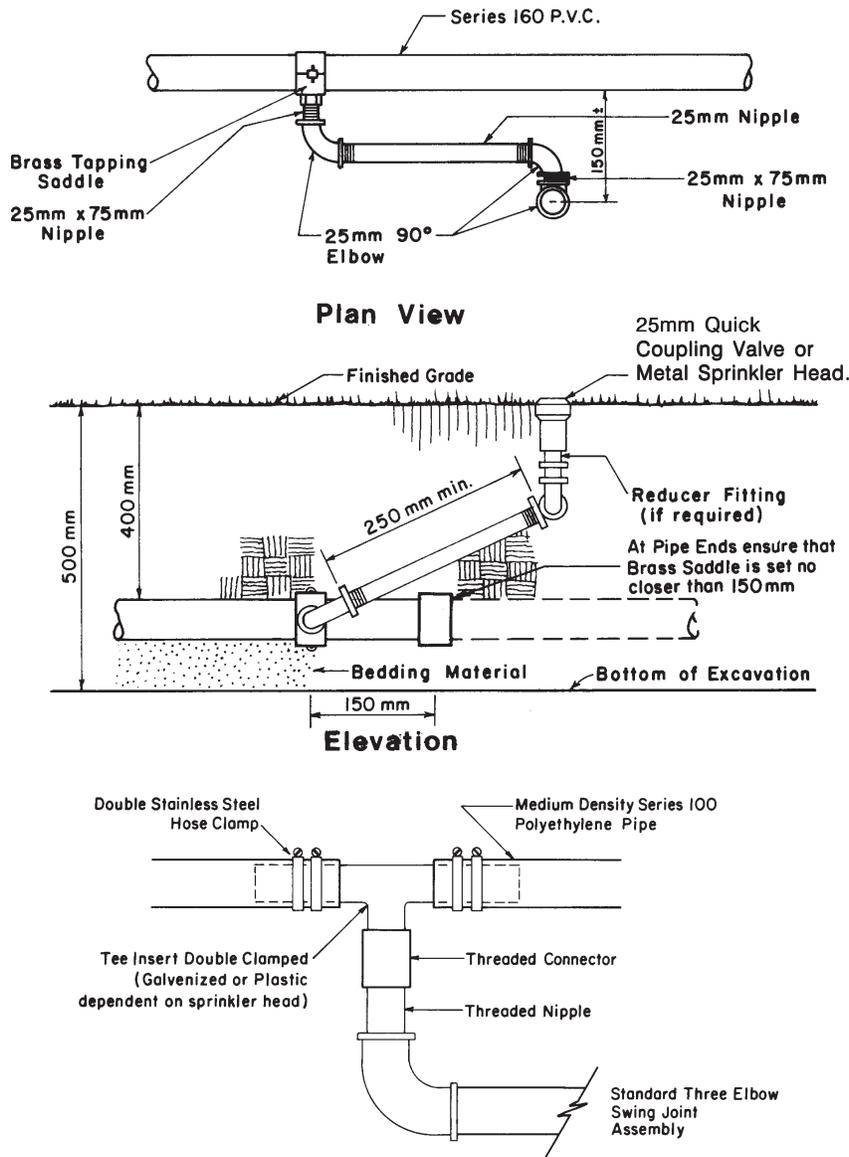
DATE

SCALE
N.T.S.

SHEET NO.
53b

FILE NO.

Detail Sheet 54: Irrigation - Three Elbow Swing Joint for Metal Sprinkler Head



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 P.V.C. Fittings and Schedule 80 P.V.C. Nipples when installing Plastic Sprinkler Heads.
- All dimensions are in metres unless otherwise noted.



PROJECT TITLE SPECIFICATIONS

SHEET TITLE
THREE ELBOW SWING JOINT FOR METAL SPRINKLER HEAD

DRAWN BY
W.B.

DATE 2010 10 24

DESIGN BY
D.LaF. / D.B.

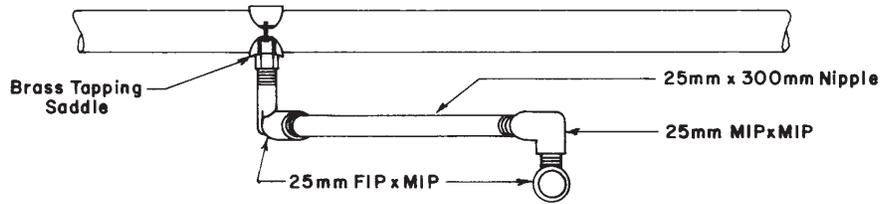
DATE 2010 10 24

SCALE
N.T.S.

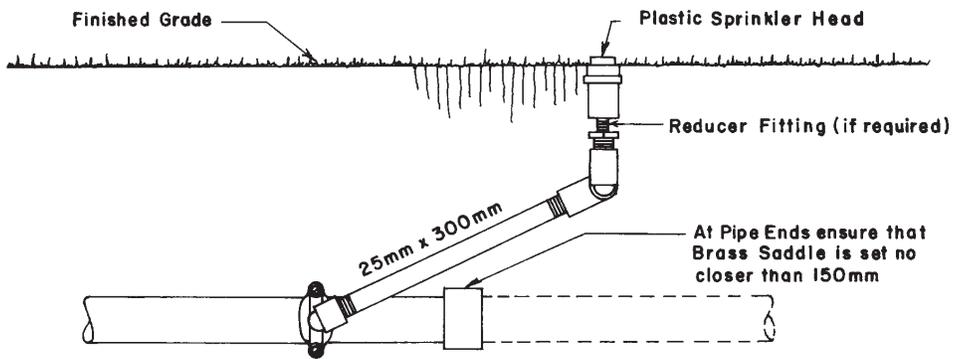
SHEET NO.
54

FILE NO.

Detail Sheet 55: Irrigation - Three Elbow Swing Joints



Plan View



Elevation

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 P.V.C. Fittings and Schedule 80 P.V.C. Nipples when installing Plastic Sprinkler Heads.
- All dimensions are in metres unless otherwise noted.

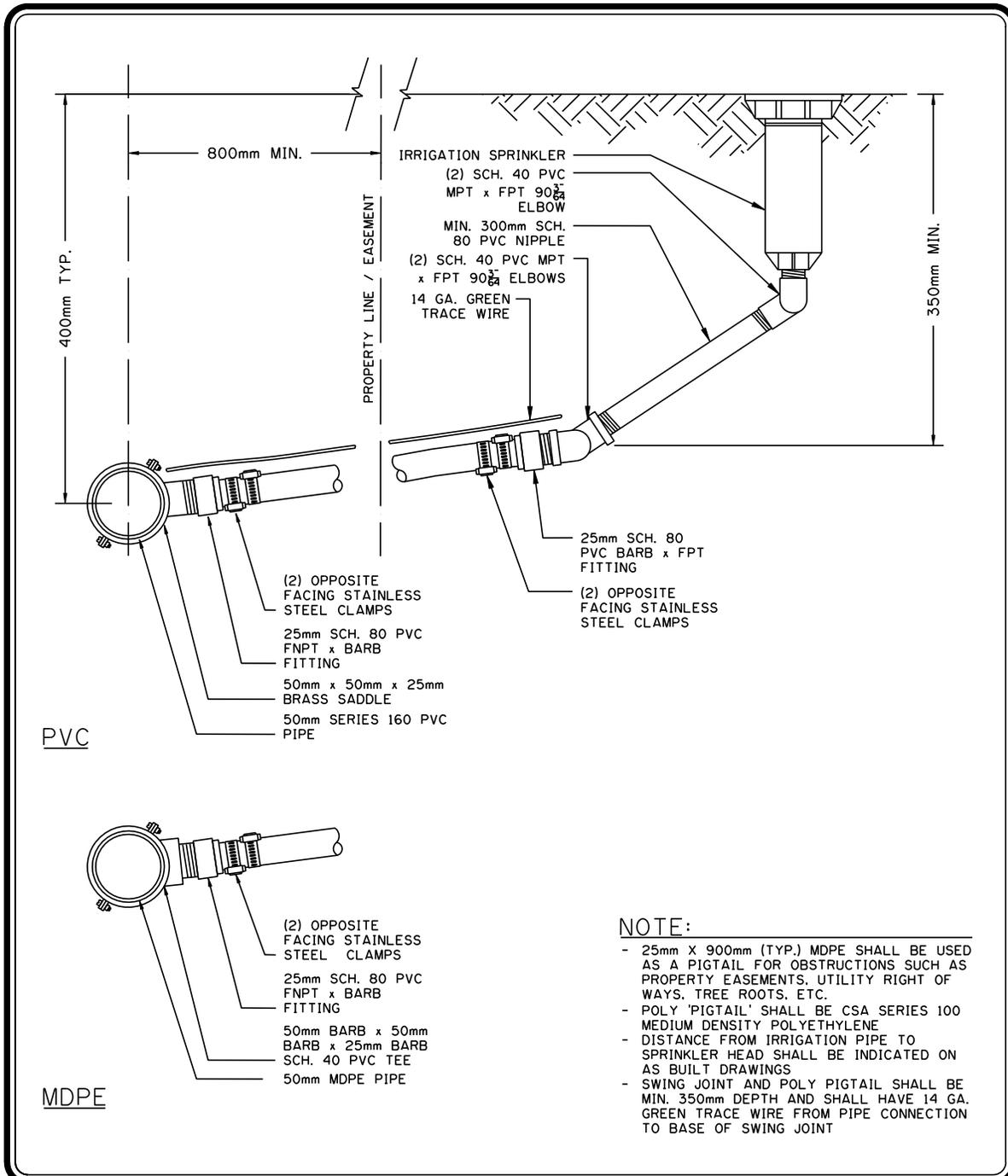


PROJECT TITLE
SPECIFICATIONS
SHEET TITLE
THREE ELBOW
SWING JOINT FOR
PLASTIC SPRINKLER HEAD

DRAWN BY
W.B.
DATE 1997 03 08
DESIGN BY
D.LaF.
DATE 1997 03 08

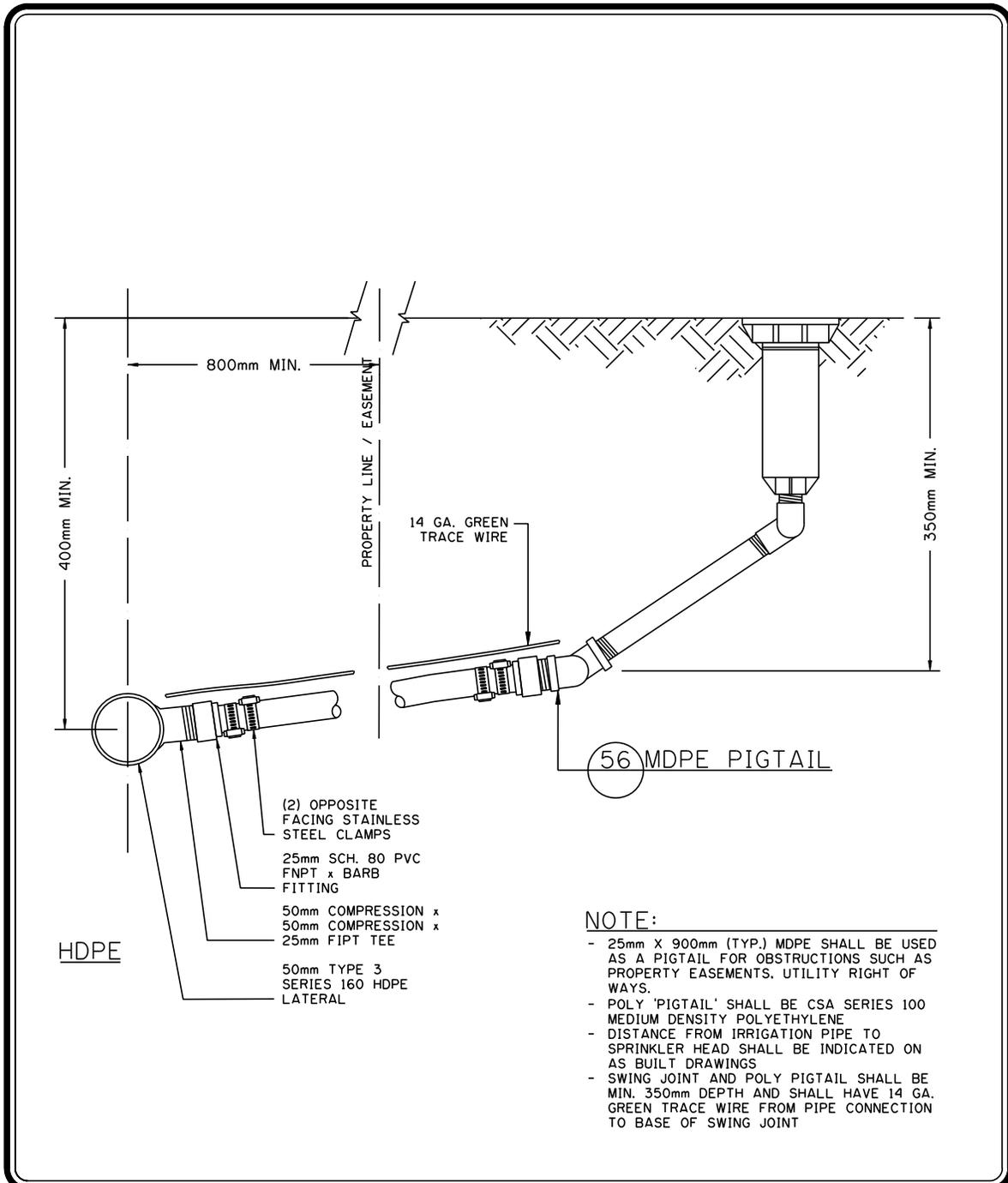
SCALE
N.T.S.
SHEET NO.
55
FILE NO.

Detail Sheet 56: Irrigation - Pigtail Swing Joint



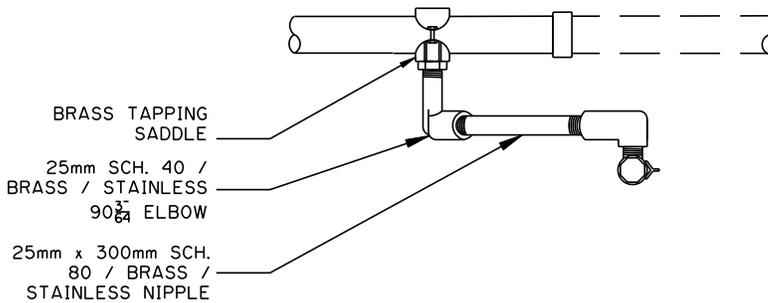
	PROJECT TITLE	DRAWN BY	SCALE
	SPECIFICATIONS	MRM	N.T.S.
	SHEET TITLE	DATE 2005 05 24	SHEET NO.
	PIGTAIL SWING JOINT FOR PVC + MDPE	DESIGN BY MRM	56
	DATE 2005 05 24	FILE NO.	

Detail Sheet 57: Irrigation - Pigtail Swing Joint

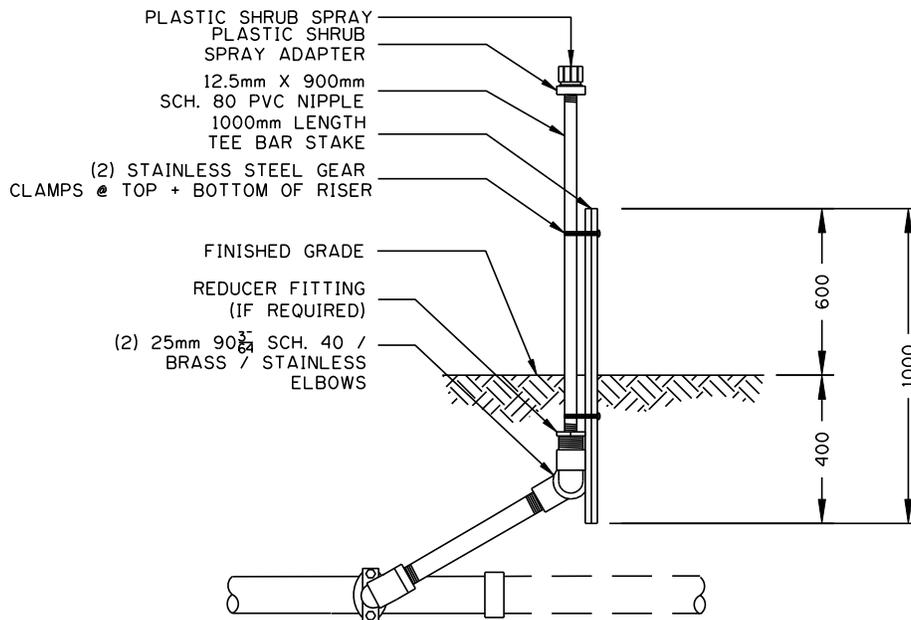


	PROJECT TITLE	DRAWN BY	SCALE
	SPECIFICATIONS	MRM	N.T.S.
	SHEET TITLE	DATE 2006 05 24	SHEET NO.
	PIGTAIL SWING JOINT FOR HDPE	DESIGN BY	57
	DATE	FILE NO.	

Detail Sheet 57a: Irrigation - Three Elbow Sing Joint for Plastic Riser & Shrub Head



PLAN



ELEVATION

NOTES:

- USE GALVANIZED FITTINGS WHEN INSTALLING TURF VALVES OR METAL SPRINKLER 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.



PROJECT TITLE
SPECIFICATIONS

SHEET TITLE
**THREE ELBOW SWING
JOINT FOR PLASTIC
RISER + SHRUB HEAD**

DRAWN BY
RSP

DATE **2006 05 24**

DESIGN BY

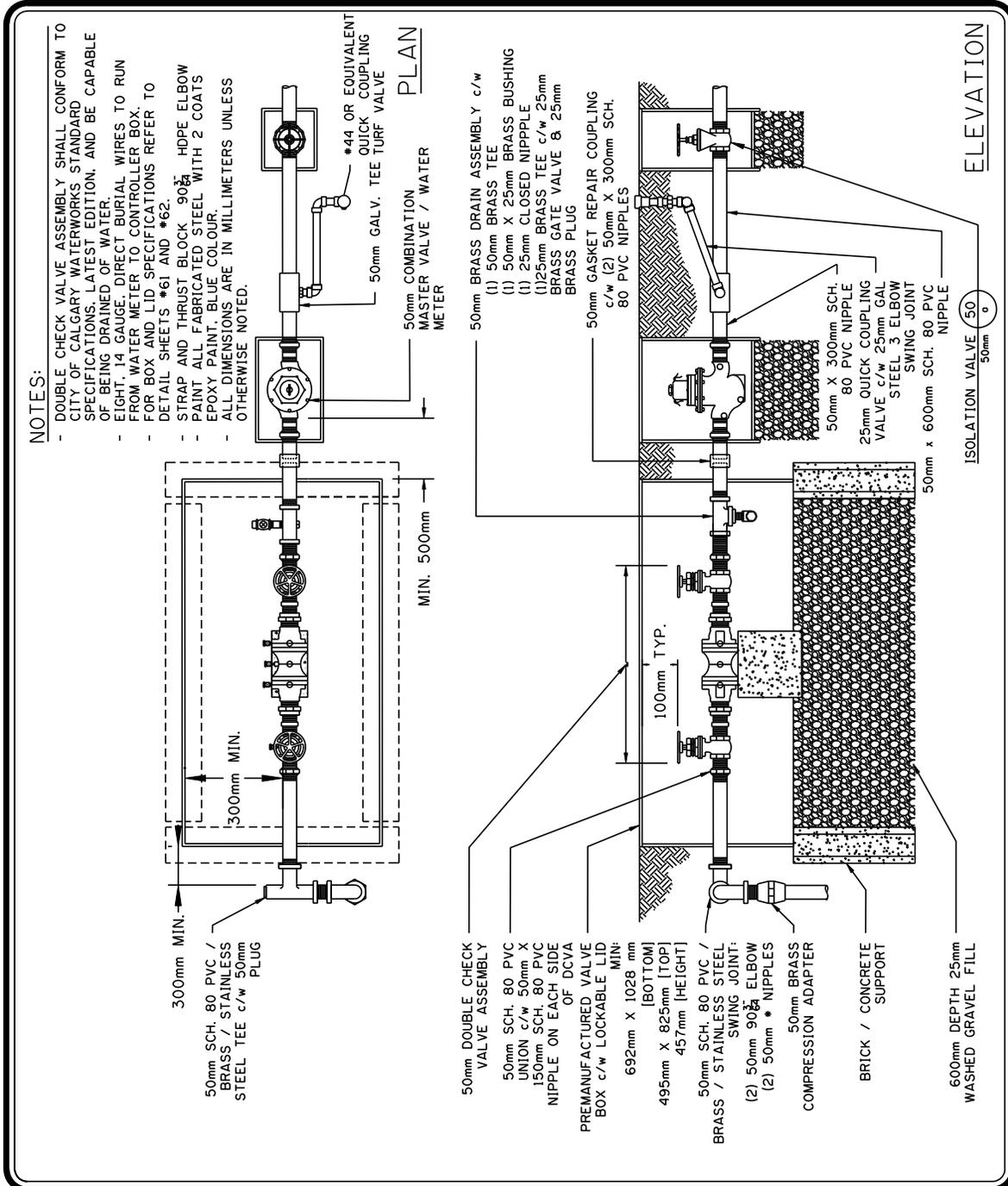
DATE

SCALE
N.T.S.

SHEET NO.
57a

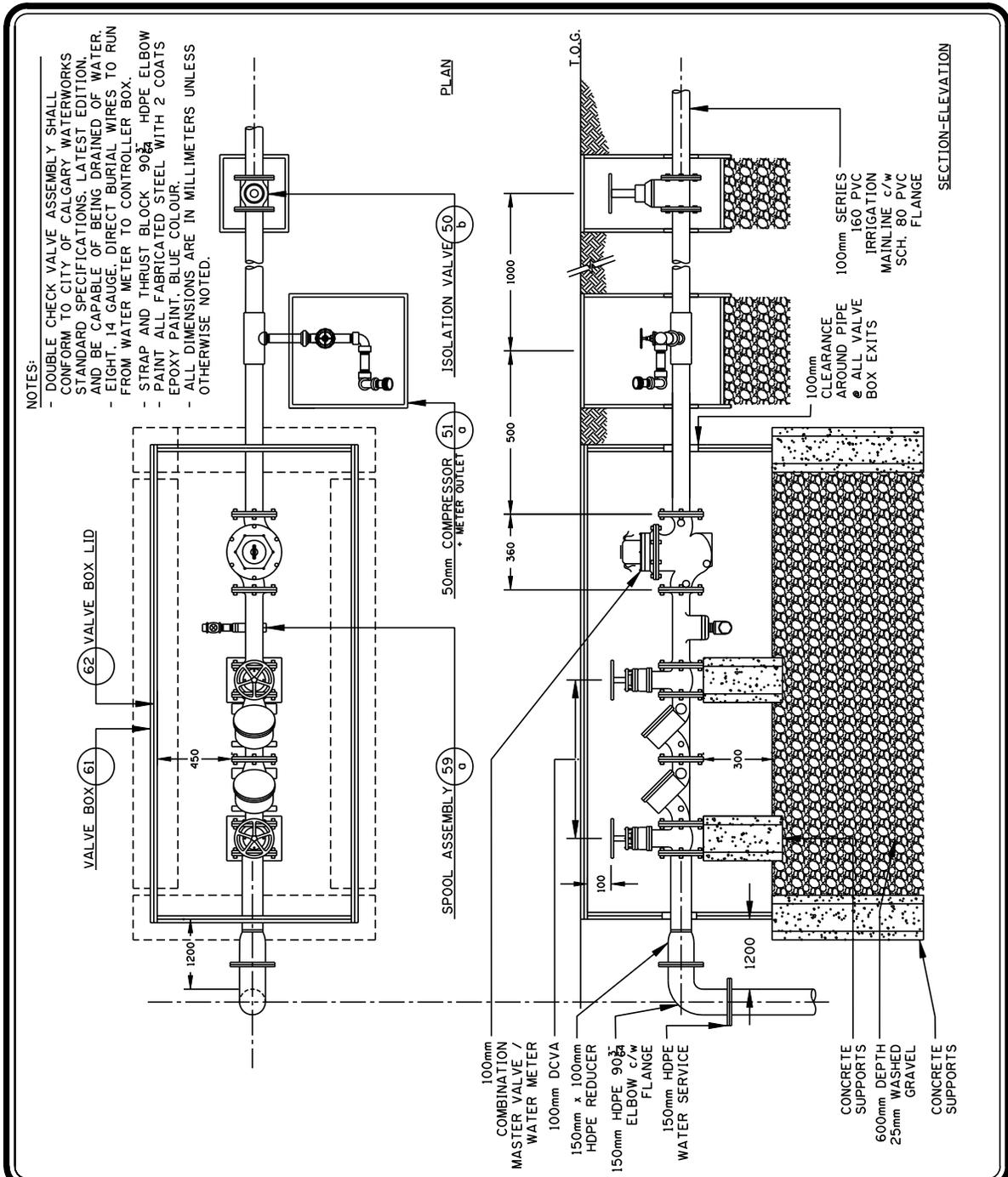
FILE NO.

Detail Sheet 58: Irrigation - Double Check Valve



	PROJECT TITLE	DRAWN BY	SCALE
	SPECIFICATIONS	W.B./MRM	N.T.S.
	SHEET TITLE	DATE 2006 05 16	SHEET NO.
	50mm DOUBLE CHECK VALVE ASSEMBLY	DESIGN BY	58
		DATE	FILE NO.

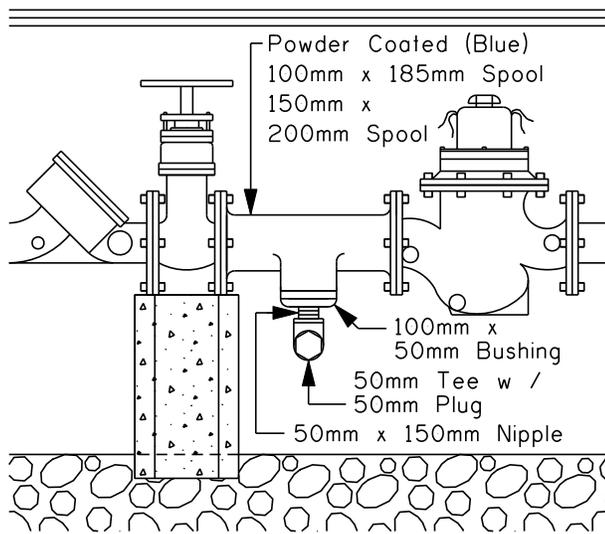
Detail Sheet 59: Irrigation - Double Check Valve



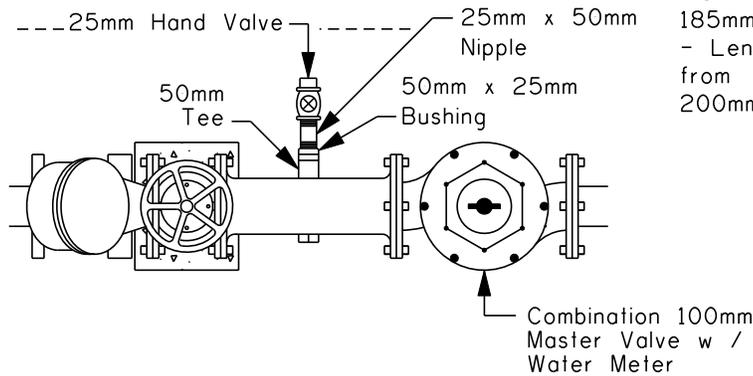
- NOTES:**
- DOUBLE CHECK VALVE ASSEMBLY SHALL CONFORM TO CITY OF CALGARY WATERWORKS STANDARD SPECIFICATIONS, LATEST EDITION, AND BE CAPABLE OF BEING DRAINED OF WATER.
 - EIGHT, 14 GAUGE, DIRECT BURIAL WIRES TO RUN FROM WATER METER TO CONTROLLER BOX.
 - STRAP AND THRUST BLOCK 90° HDPE ELBOW
 - PAINT ALL FABRICATED STEEL WITH 2 COATS EPOXY PAINT, BLUE COLOUR.
 - ALL DIMENSIONS ARE IN MILLIMETERS UNLESS OTHERWISE NOTED.

	PROJECT TITLE	DRAWN BY	SCALE
	SPECIFICATIONS	W.B./MRM	N.T.S.
	SHEET TITLE	DATE 2006 05 23	SHEET NO.
	100mm DOUBLE CHECK VALVE ASSEMBLY	DESIGN BY	59
	DATE	FILE NO.	

Detail Sheet 59a: Irrigation - Double Check Valve



ELEVATION



PLAN

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.



PROJECT TITLE
SPECIFICATIONS

SHEET TITLE
100mm & 150mm DETAIL OF SPOOL ASSEMBLY

DRAWN BY
W.B.

DATE **2005 01 25**

DESIGN BY

DATE

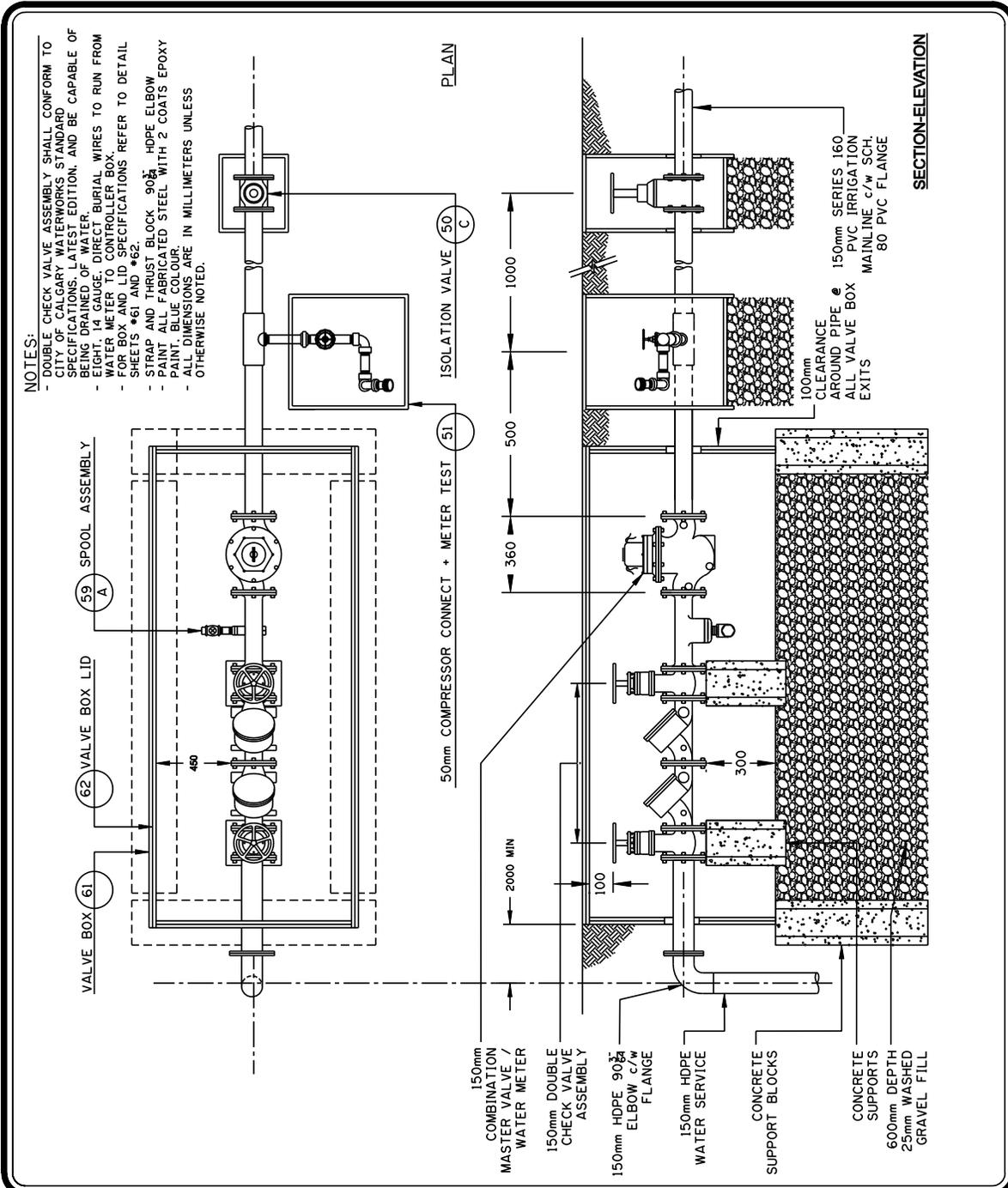
SCALE
N.T.S.

SHEET NO.

59a

FILE NO.

Detail Sheet 59b: Irrigation - Double Check Valve



PROJECT TITLE
SPECIFICATIONS

SHEET TITLE
150mm DOUBLE CHECK VALVE ASSEMBLY

DRAWN BY
W.B./MRM

DATE **2006 05 23**

DESIGN BY

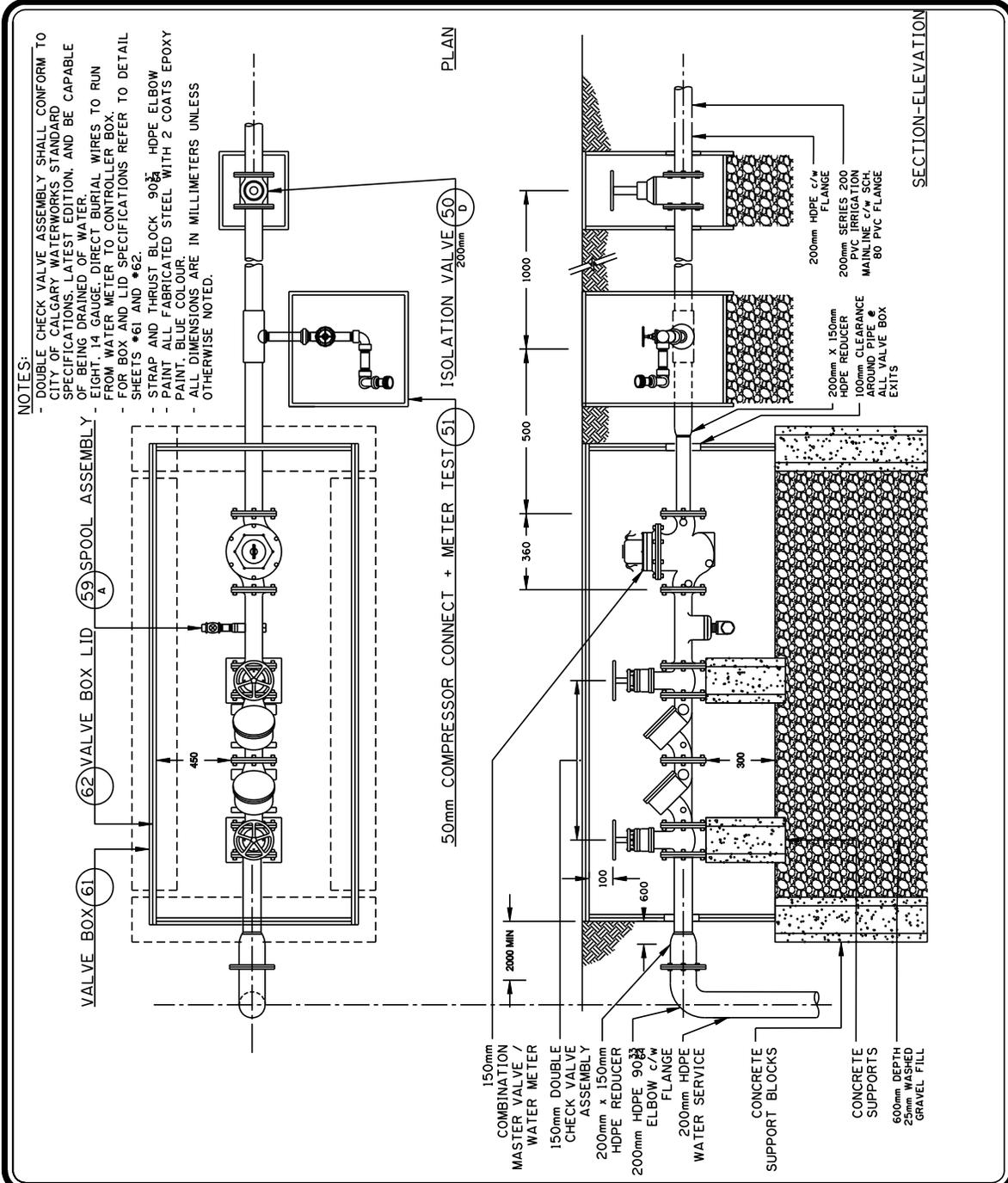
DATE

SCALE
N.T.S.

SHEET NO.
59b

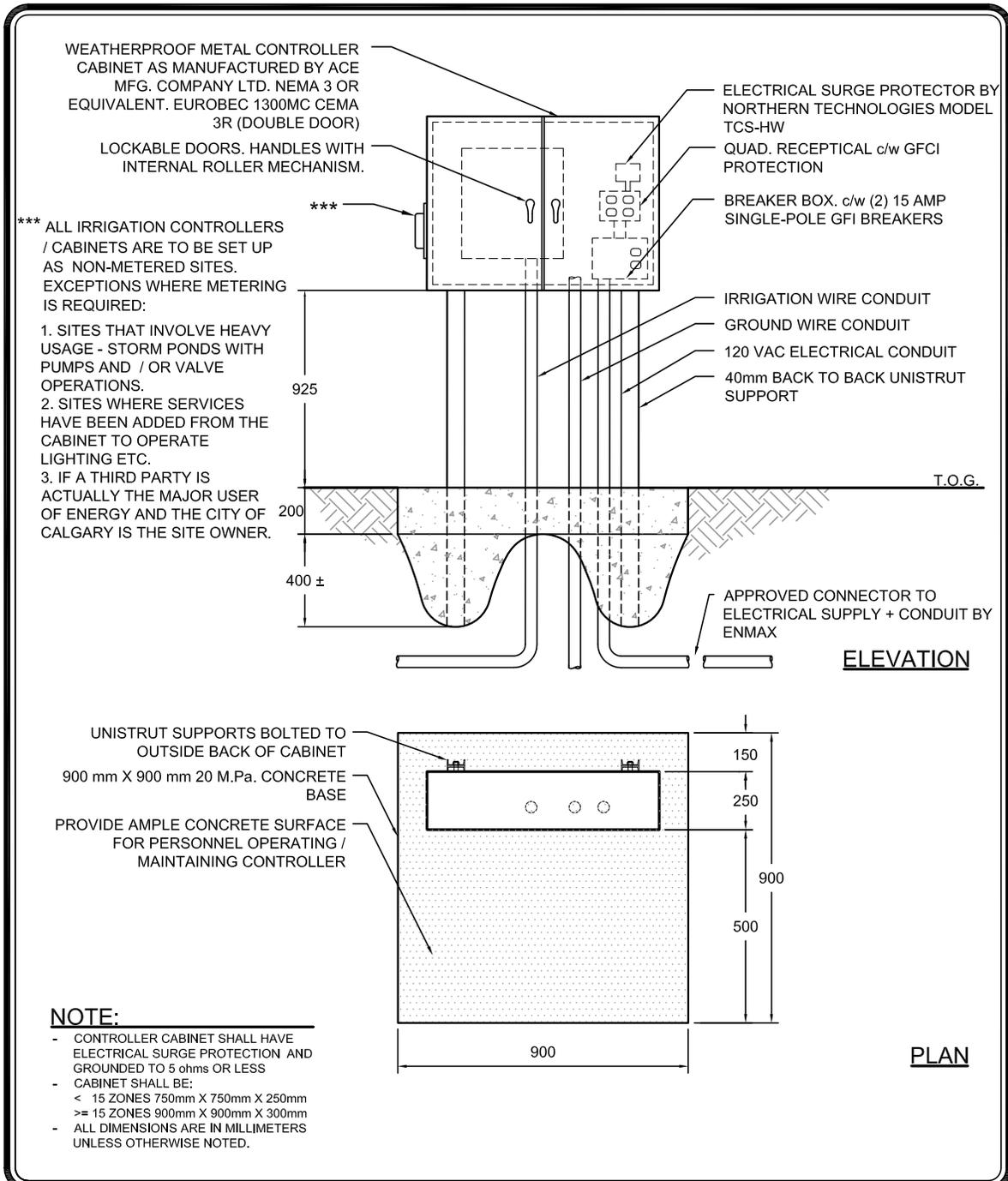
FILE NO.

Detail Sheet 59c: Irrigation - Double Check Valve



 <p>THE CITY OF CALGARY PARKS</p>	<p>PROJECT TITLE</p> <p>SPECIFICATIONS</p>	<p>DRAWN BY</p> <p>W.B./MRM</p>	<p>SCALE</p> <p>N.T.S.</p>
	<p>SHEET TITLE</p> <p>200mm DOUBLE CHECK VALVE ASSEMBLY</p>	<p>DATE</p> <p>2006 05 23</p>	<p>SHEET NO.</p> <p>59c</p>
	<p>DESIGN BY</p>	<p>DATE</p>	<p>FILE NO.</p>

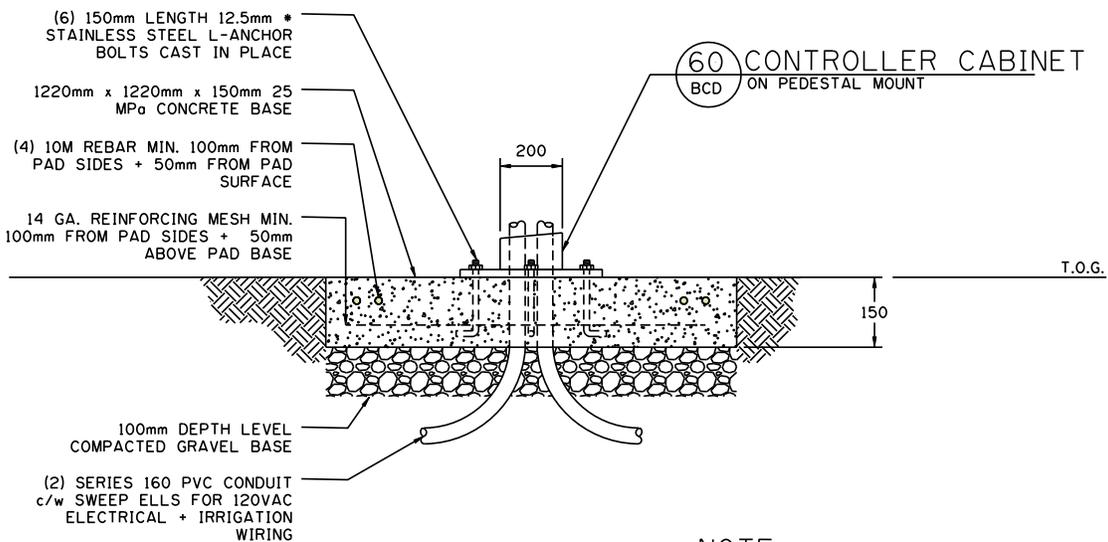
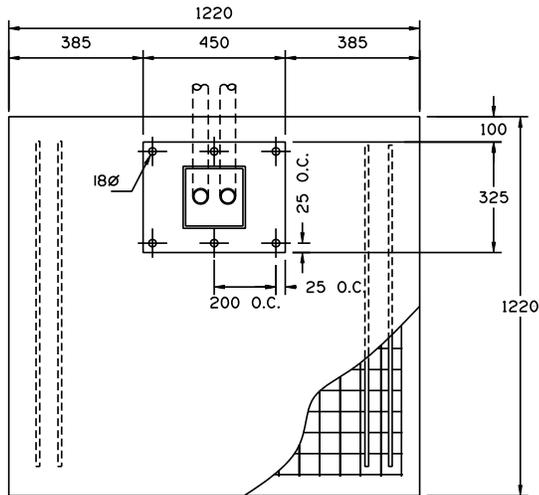
Detail Sheet 60: Irrigation - Irrigation Controller



	PROJECT TITLE SPECIFICATIONS	DRAWN BY CWM	SCALE N.T.S.
	SHEET TITLE IRRIGATION CONTROLLER CABINET	DATE 2008 12 05	SHEET NO. 60
		DESIGN BY JM	FILE NO.
		DATE	

Detail Sheet 60a: Irrigation - Irrigation Controller

PLAN



SECTION

NOTE:

- CONTRACTOR SHALL CONFIRM ALL BOLT TEMPLATES w/ CONTROL BOX MANUFACTURER PRIOR TO CONSTRUCTION OF CONCRETE PAD
- 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

SHEET TITLE
CONCRETE PAD FOR IRRINET /IRRICOM /SCORPIO CONTROLLER CABINETS

DRAWN BY
MRM

DATE **2006 05 24**

DESIGN BY

DATE

SCALE
N.T.S.

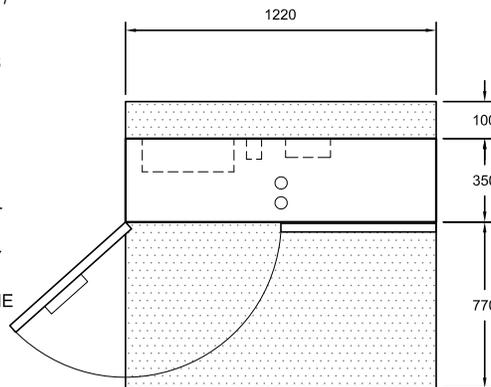
SHEET NO.
60a

FILE NO.

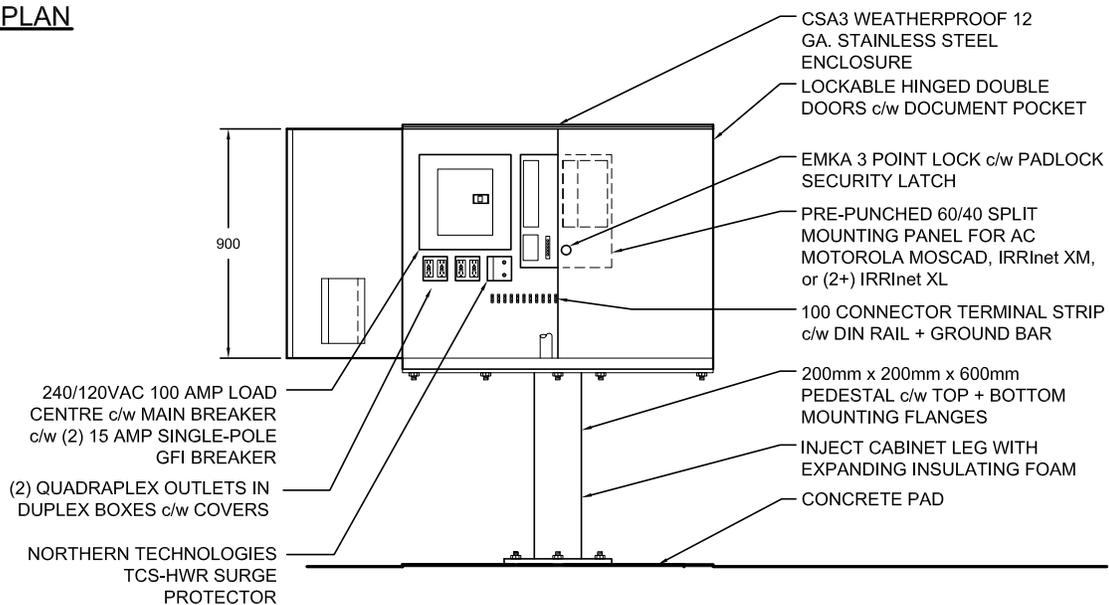
Detail Sheet 60b: Irrigation - Irrigation Controller

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



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-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 CCALMCD02



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.

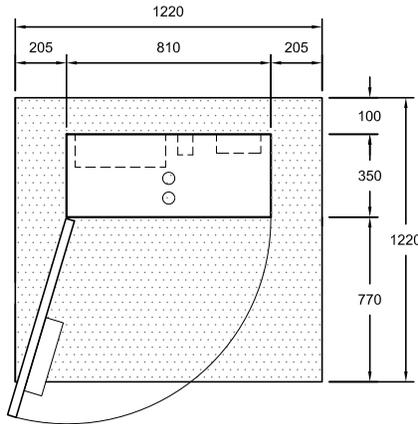
SHEET NO.
60b

FILE NO.

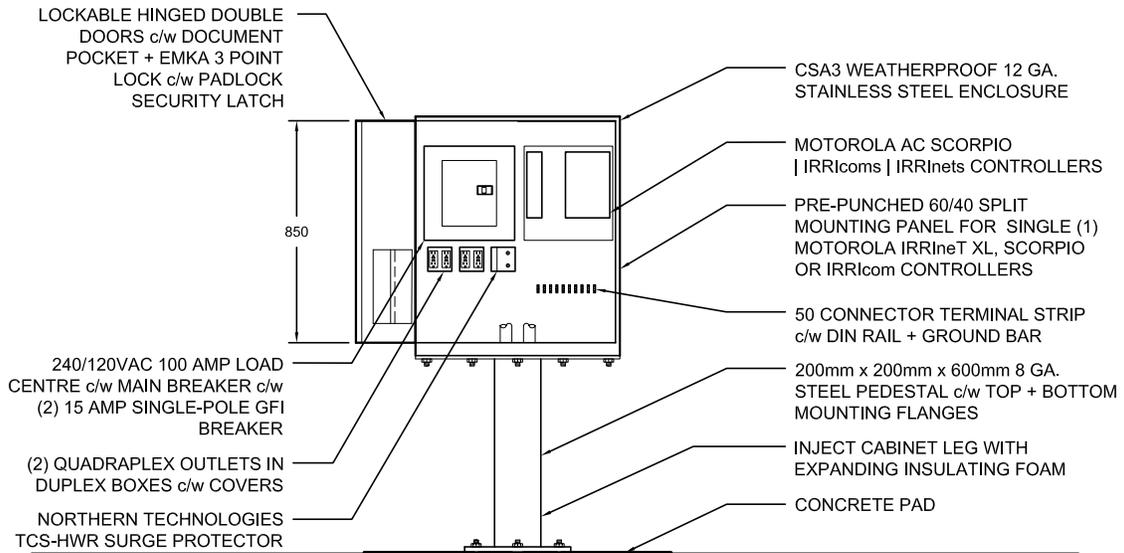
Detail Sheet 60c: Irrigation - Irrigation Controller

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



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-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 CCALMCD03AC



PROJECT TITLE
SPECIFICATIONS

SHEET TITLE
**AC SCORPIO [AC IRRicomS]
AC IRRicom CONTROL
CABINET AND PEDESTAL**

DRAWN BY
CWM

DATE **2008 12 05**

DESIGN BY
DG

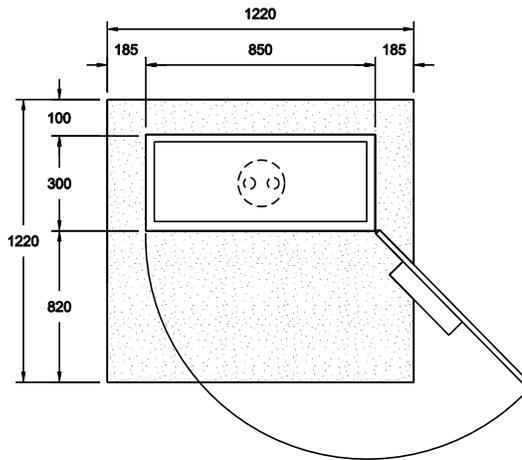
DATE

SCALE
N.T.S.

SHEET NO.
60c

FILE NO.

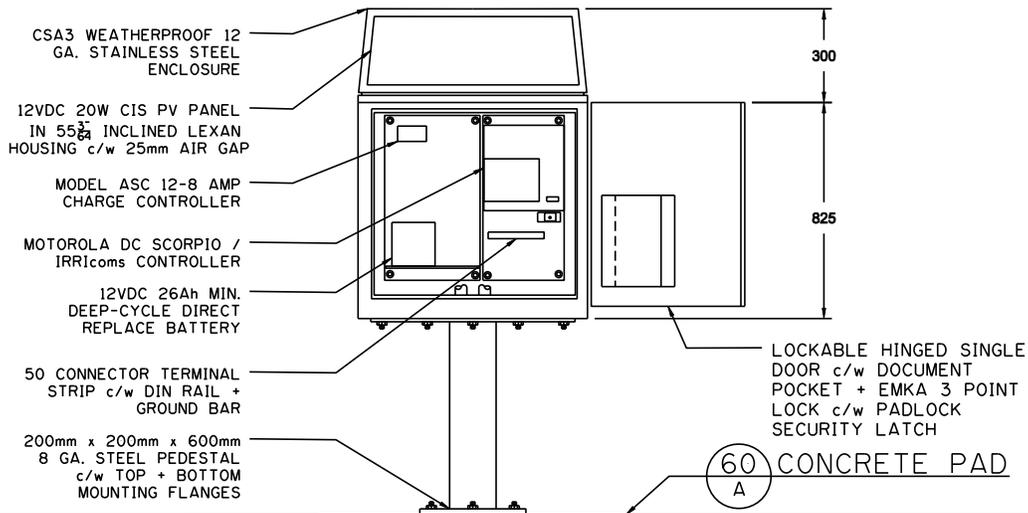
Detail Sheet 60d: Irrigation - Irrigation Controller



PLAN

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-SB 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 CCALMCD03DC



PROJECT TITLE
SPECIFICATIONS

SHEET TITLE
**DC IRRICOMS /DC SCORPIO
CONTROL CABINET +
PEDESTAL**

DRAWN BY
MRM

DATE **2008 01 29**

DESIGN BY

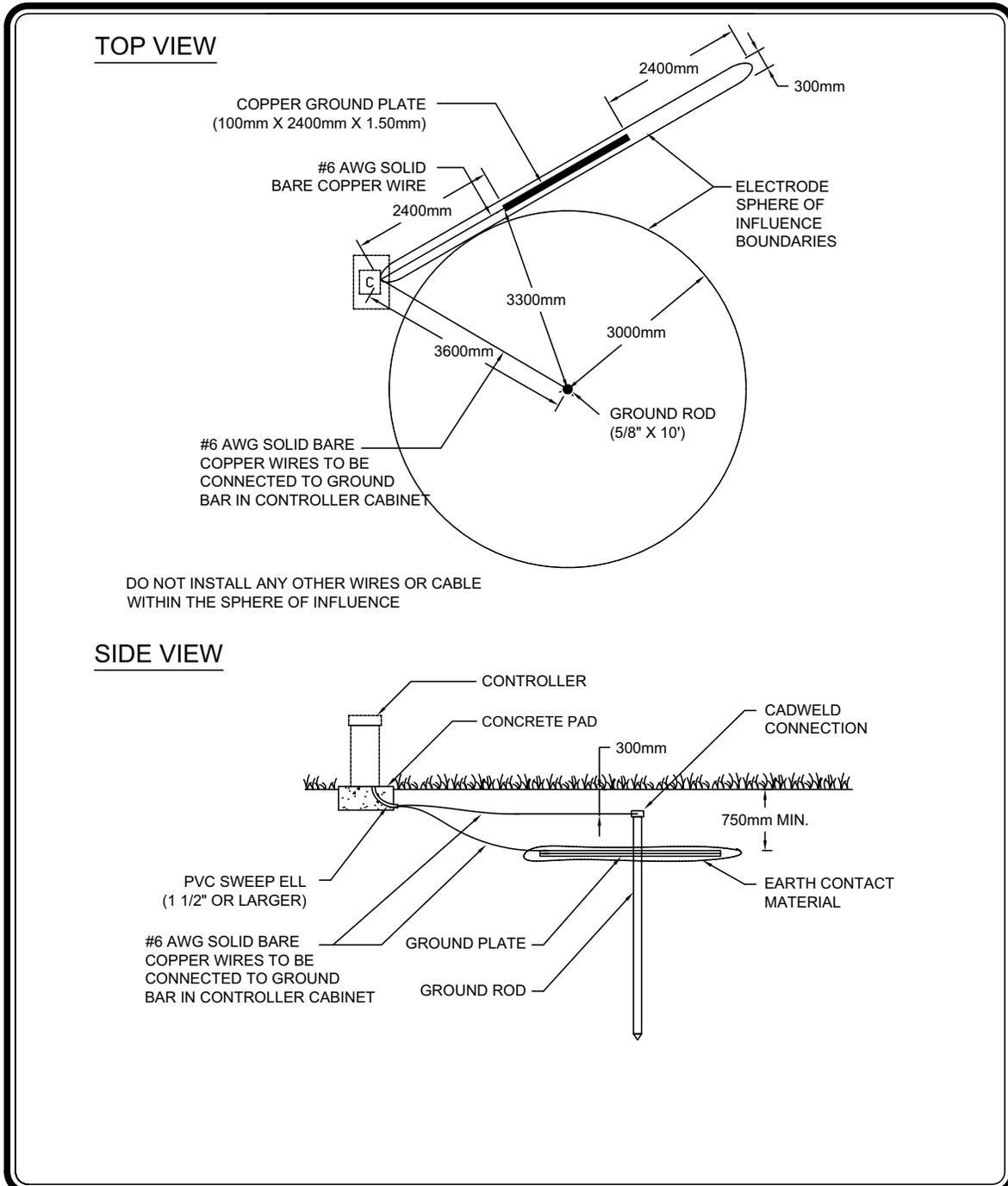
DATE

SCALE
N.T.S.

SHEET NO.
60d

FILE NO.

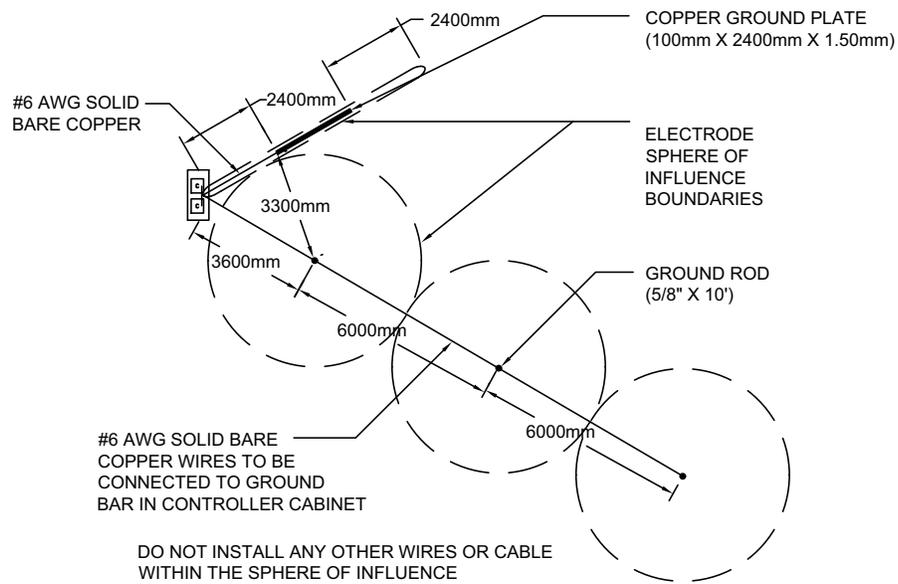
Detail Sheet 60e: Irrigation - Up to 64 Stations, Non Rocky Soils



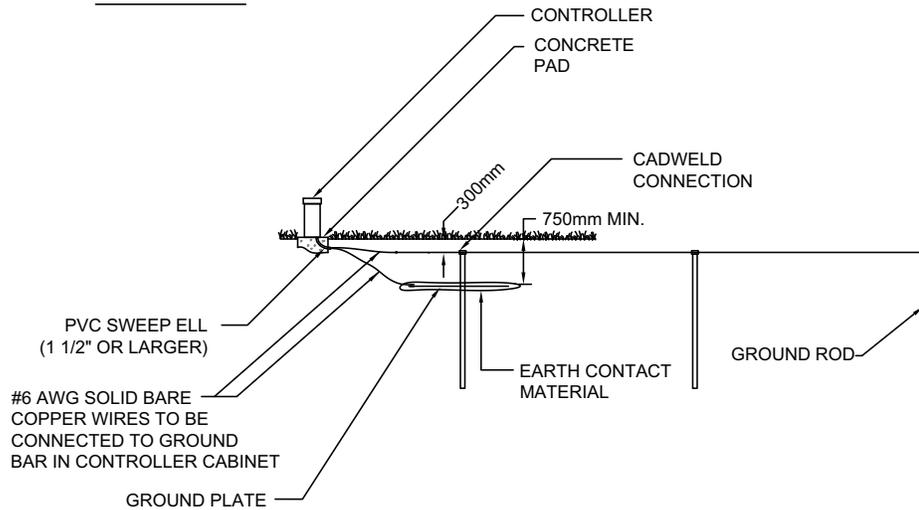
	PROJECT TITLE SPECIFICATIONS	DRAWN BY WYC	SCALE N.T.S.
	SHEET TITLE FIGURE 2-UP TO 64 STATIONS, NON-ROCKY SOILS	DATE 2008 12 05	SHEET NO. 60e
		DESIGN BY AS PER ASIC	FILE NO.
		DATE	

Detail Sheet 60f: Irrigation - Up to 96 Stations, Non Rocky Soils

TOP VIEW



SIDE VIEW



PROJECT TITLE
SPECIFICATIONS

SHEET TITLE
**FIGURE 4-UP TO 96 STATIONS,
NON-ROCKY SOILS**

DRAWN BY
WYC

DATE **2008 12 05**

DESIGN BY
AS PER ASIC

DATE

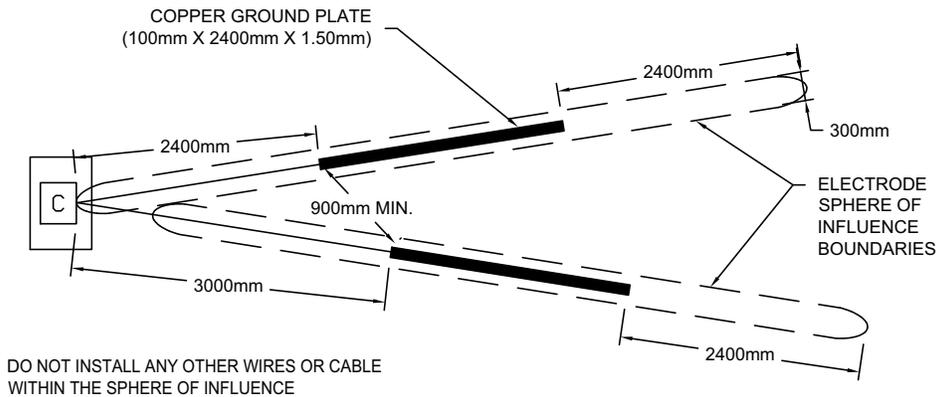
SCALE
N.T.S.

SHEET NO.
60f

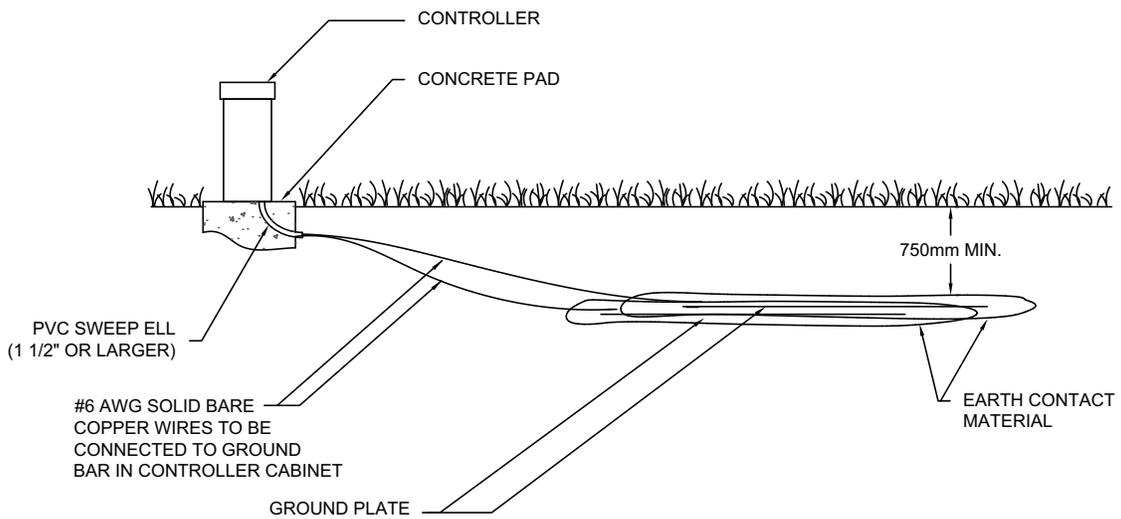
FILE NO.

Detail Sheet 60g: Irrigation - Up to 64 Stations, Rocky Soils

TOP VIEW



SIDE VIEW



PROJECT TITLE
SPECIFICATIONS

SHEET TITLE
**FIGURE 3-UP TO 64 STATIONS,
ROCKY SOILS**

DRAWN BY
WYC

DATE **2008 12 05**

DESIGN BY
AS PER ASIC

DATE

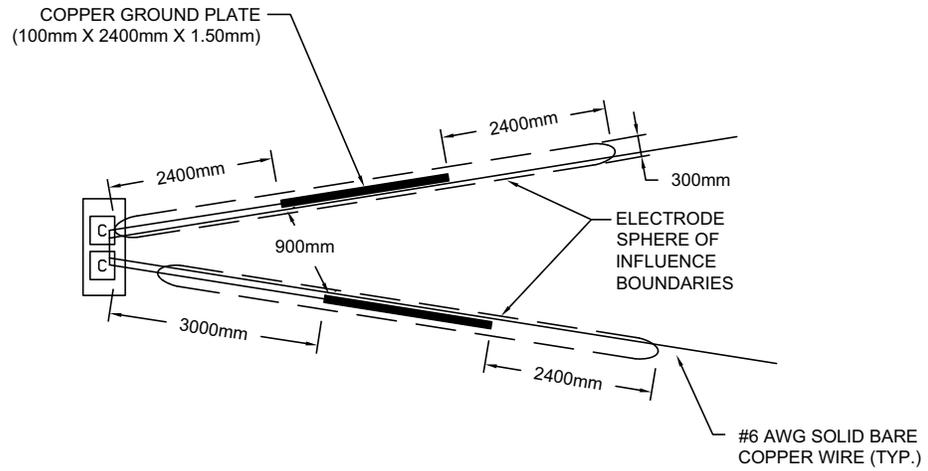
SCALE
N.T.S.

SHEET NO.
60g

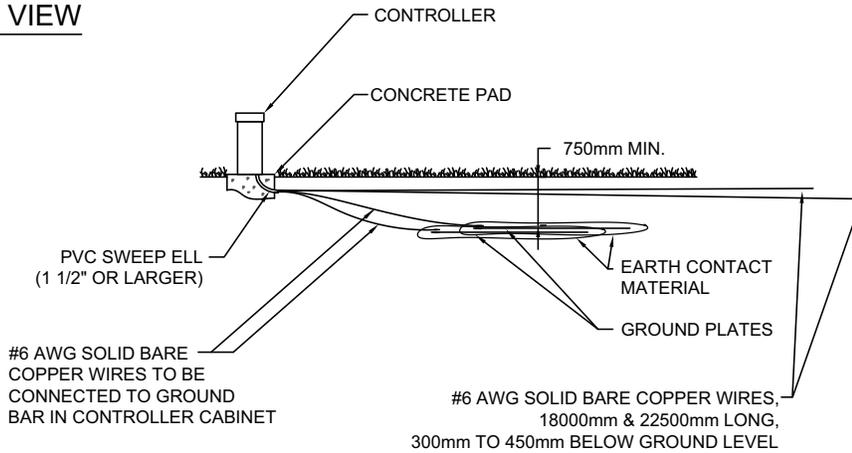
FILE NO.

Detail Sheet 60h: Irrigation - Up to 96 Stations, Rocky Soils

TOP VIEW



SIDE VIEW



PROJECT TITLE
SPECIFICATIONS

SHEET TITLE
**UP TO 96 STATIONS,
ROCKY SOILS**

DRAWN BY
WYC

DATE **2008 12 05**

DESIGN BY
AS PER ASIC

DATE

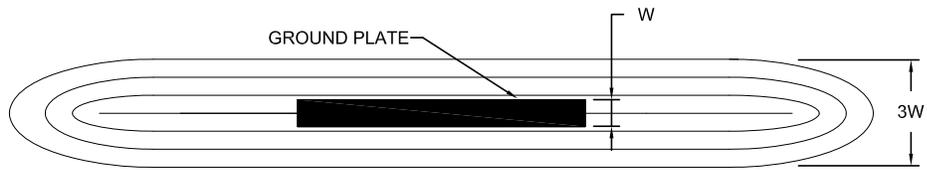
SCALE
N.T.S.

SHEET NO.
60h

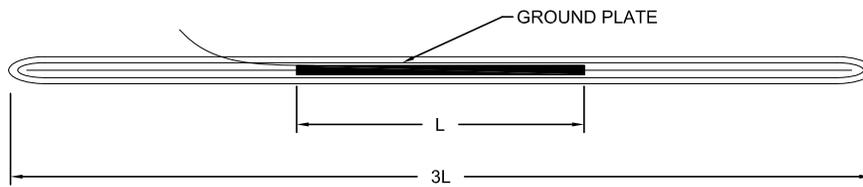
FILE NO.

Detail Sheet 60i: Irrigation - Irrigation Controller Grounding

TOP VIEW



SIDE VIEW



PROJECT TITLE
SPECIFICATIONS

SHEET TITLE
**GROUND PLATE
SPHERE OF INFLUENCE**

DRAWN BY
WYC

DATE **2008 12 05**

DESIGN BY
AS PER ASIC

DATE

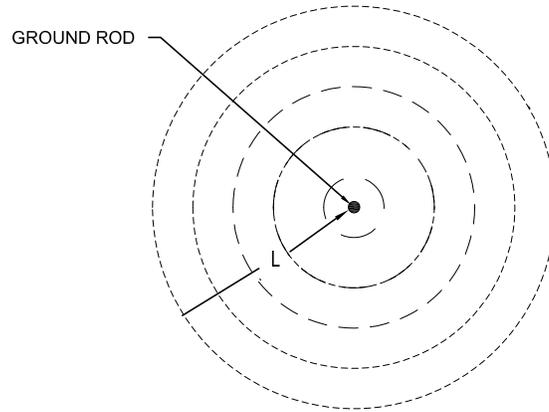
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SHEET NO.
60i

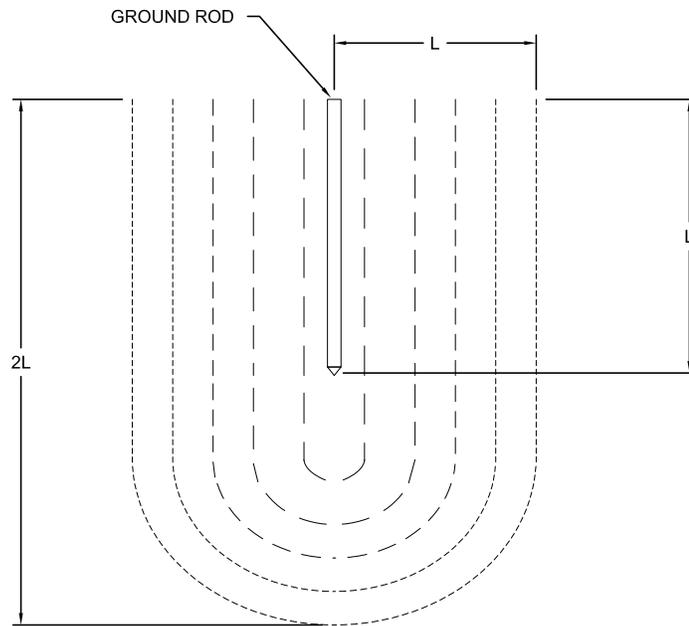
FILE NO.

Detail Sheet 60j: Irrigation - Irrigation Controller Grounding

TOP VIEW



SIDE VIEW



PROJECT TITLE
SPECIFICATIONS

SHEET TITLE
**GROUND ROD
SPHERE OF INFLUENCE**

DRAWN BY
WYC

DATE **2008 12 05**

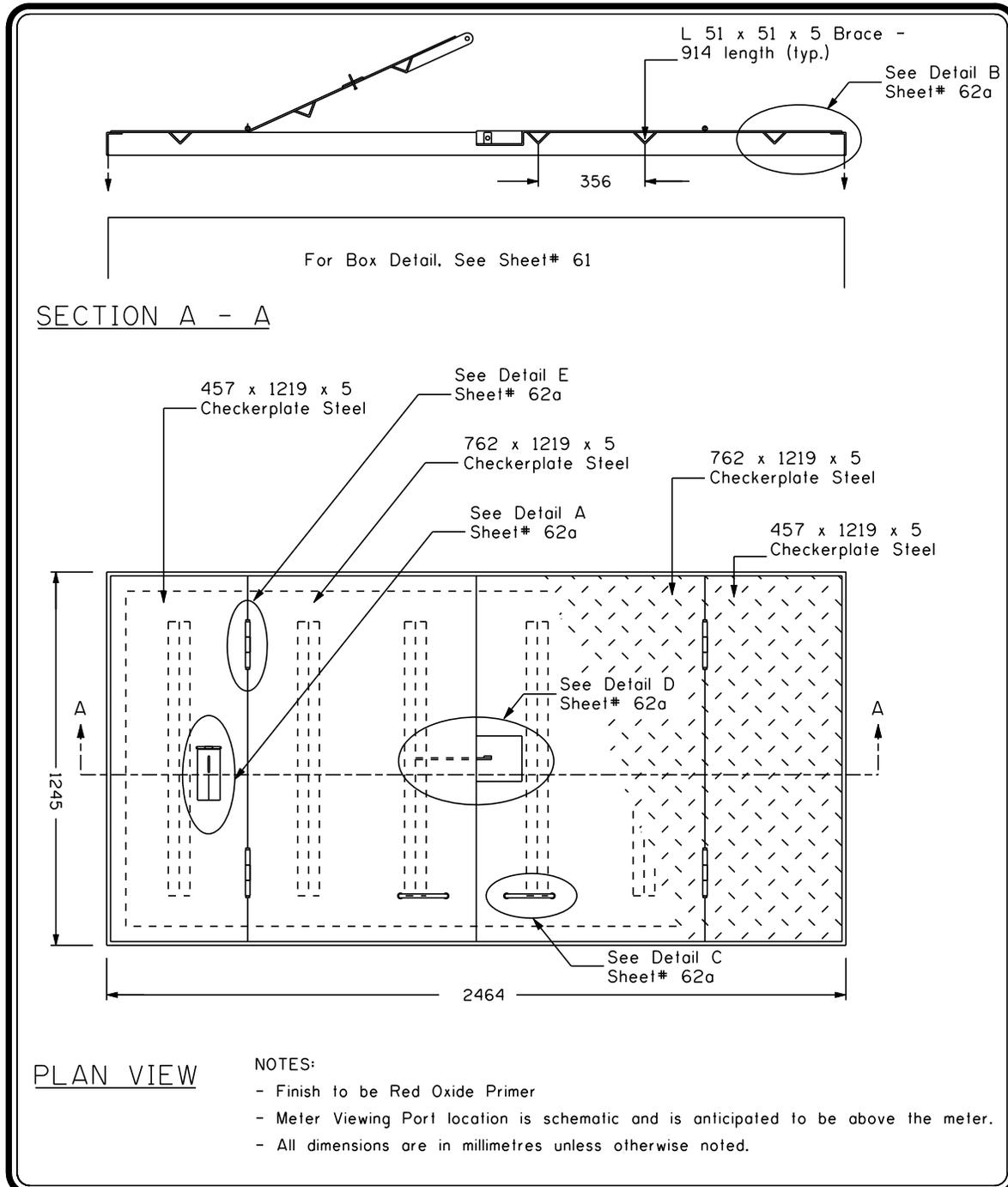
DESIGN BY
AS PER ASIC
DATE

SCALE
N.T.S.

SHEET NO.
60j

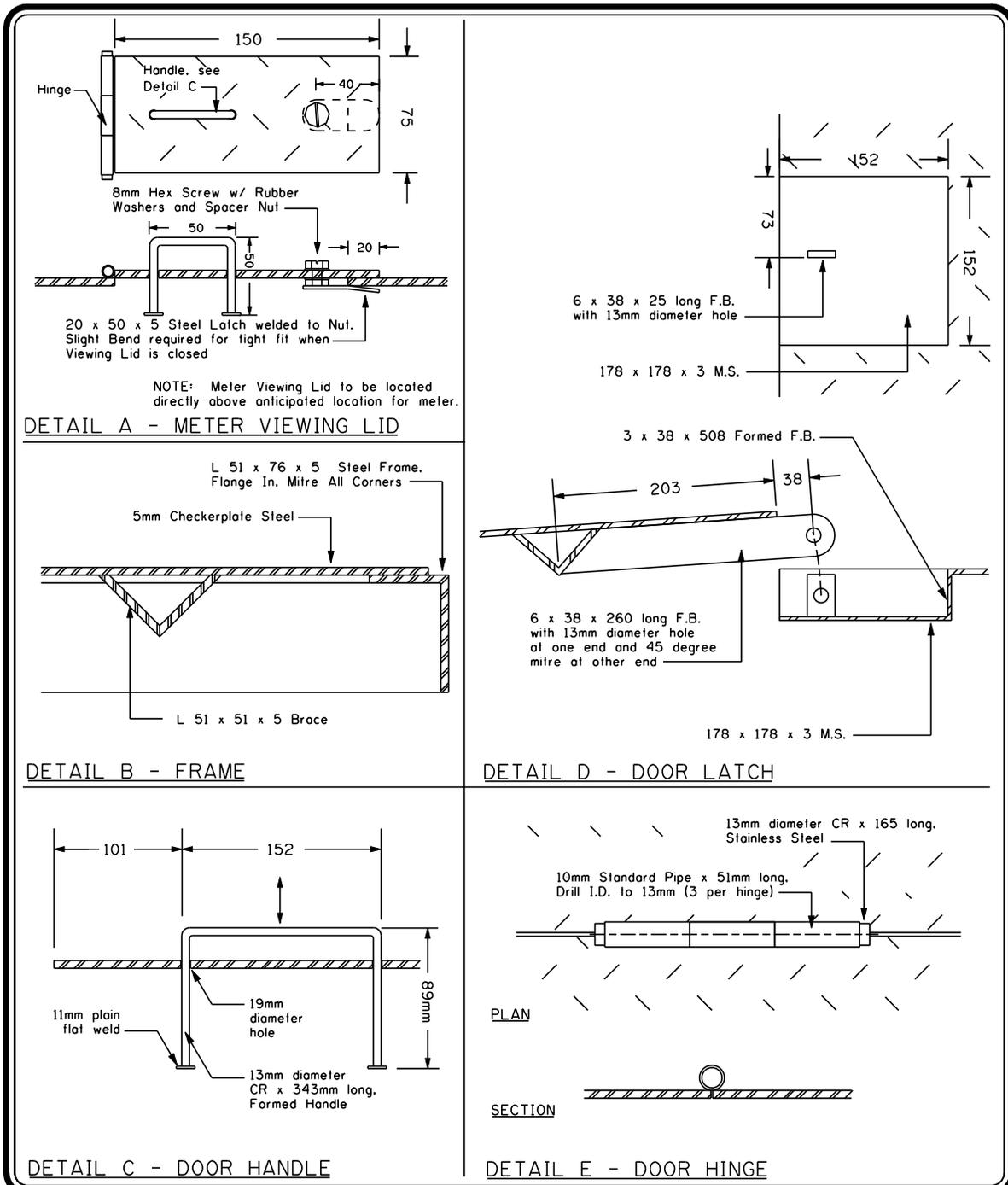
FILE NO.

Detail Sheet 62: Irrigation - Double Check Valve Box



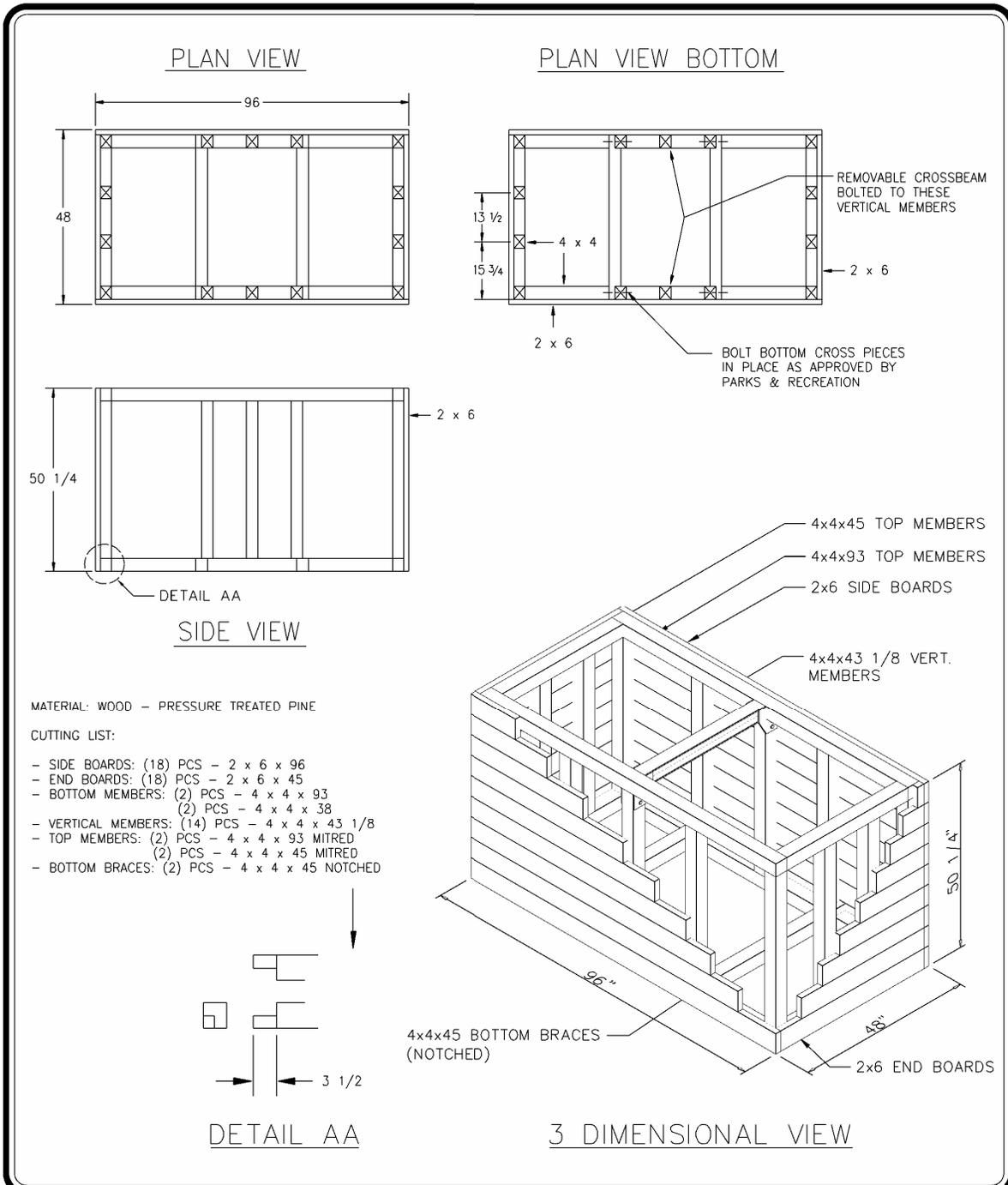
	PROJECT TITLE	DRAWN BY	SCALE
	SPECIFICATIONS	MM /WB	N.T.S.
	SHEET TITLE	DATE 2006 05 19	SHEET NO.
	100mm DOUBLE CHECK VALVE BOX LID WITH METER VIEWING LID	DESIGN BY	62
		DATE	FILE NO.

Detail Sheet 62a: Irrigation - Details for 100 mm Double Check Valve Box Lid with Meter Viewing Lid



	PROJECT TITLE	DRAWN BY	SCALE
	SPECIFICATIONS	MM	N.T.S.
	SHEET TITLE	DATE 2005 02 02	SHEET NO.
	DETAILS FOR 100mm DOUBLE CHECK VALVE BOX LID WITH METER VIEWING LID	DESIGN BY	62a
	DATE	FILE NO.	

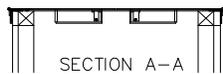
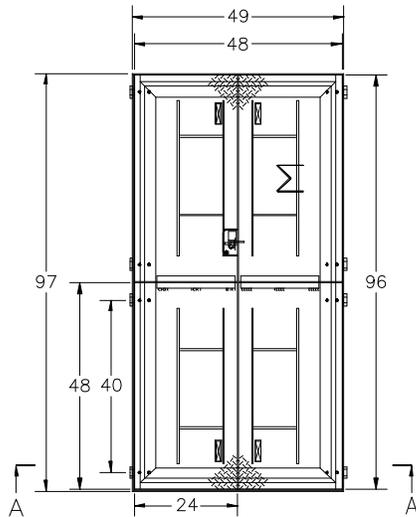
Detail Sheet 62b: Irrigation - Double Check Valve Box c/w Removable Center Brace



	PROJECT TITLE SPECIFICATIONS	DRAWN BY WYC	SCALE N.T.S.
	SHEET TITLE VALVE BOX DETAILS FOR 100mm DOUBLE CHECK VALVE ASSEMBLY	DATE 2008 12 05	SHEET NO. 62b
		DESIGN BY JM	FILE NO.
		DATE 2008 12 05	

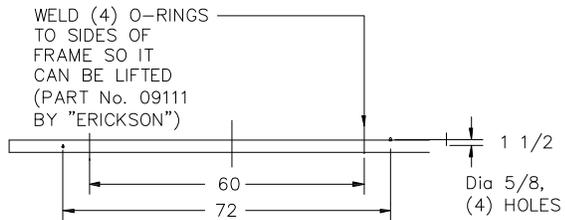
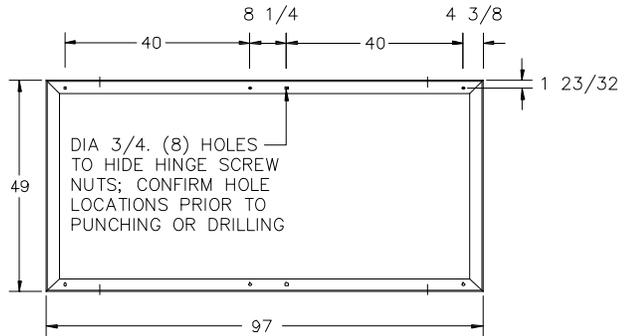
Detail Sheet 62c: Irrigation - Double Check Valve Box Aluminum Lid

GENERAL ARRANGEMENT

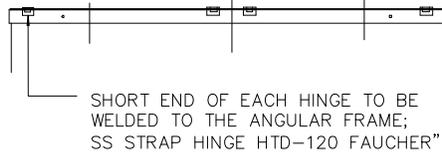


FOR MAIN WOODEN BOX c/w CROSSBEAM. SEE SHEET #2

MAIN ANGULAR FRAME



304SS ANGLE FRAME 3 x 3 x 1/4



PROJECT TITLE
SPECIFICATIONS

SHEET TITLE
**FRAME DETAIL FOR 100mm
DOUBLE CHECK VALVE BOX
ALUMINUM LID**

DRAWN BY
WYC

DATE **2008 12 05**

DESIGN BY
JM

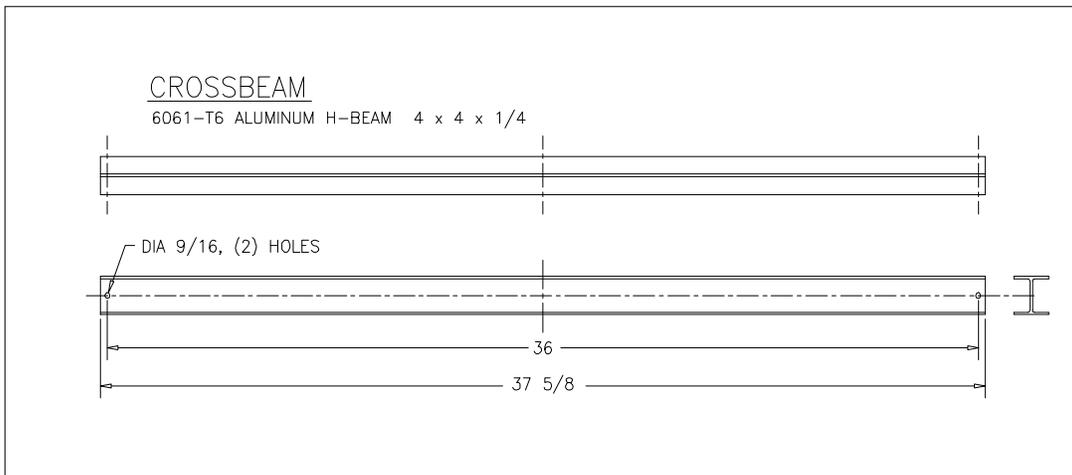
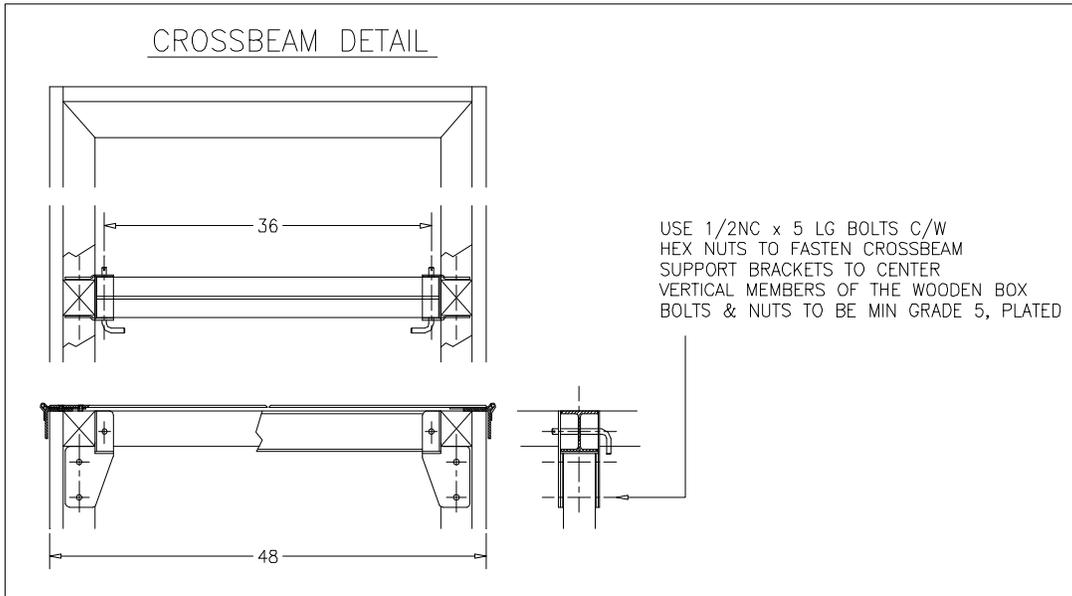
DATE **2008 12 05**

SCALE
N.T.S.

SHEET NO.
62c

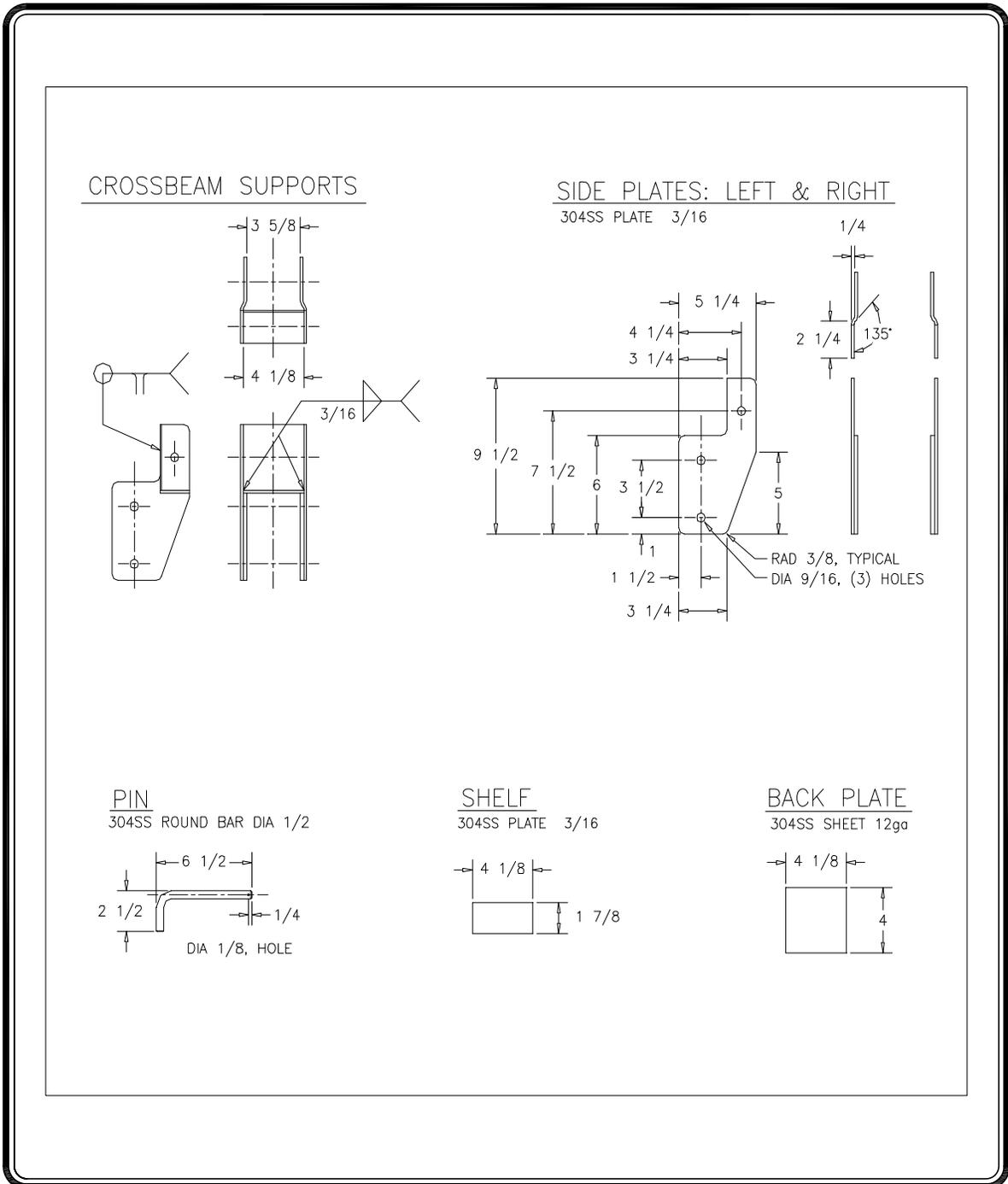
FILE NO.

Detail Sheet 62d: Irrigation - Double Check Valve Box Aluminum Lid



 <p>THE CITY OF CALGARY PARKS</p>	<p>PROJECT TITLE SPECIFICATIONS</p>	<p>DRAWN BY WYC</p>	<p>SCALE N.T.S.</p>
	<p>SHEET TITLE VALVE BOX CROSSBEAM SUPPORT DETAILS FOR 100mm DOUBLE CHECK VALVE ASSEMBLY</p>	<p>DATE 2008 12 05</p>	<p>SHEET NO. 62d</p>
		<p>DESIGN BY JM</p> <p>DATE 2008 12 05</p>	<p>FILE NO.</p>

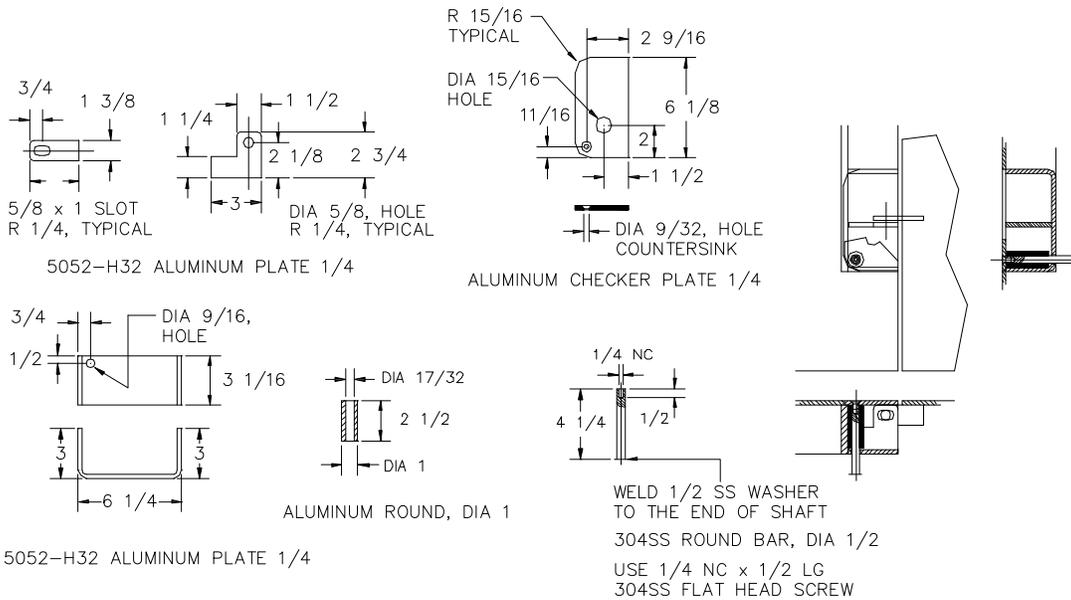
Detail Sheet 62e: Irrigation - Double Check Valve Box Aluminum Lid



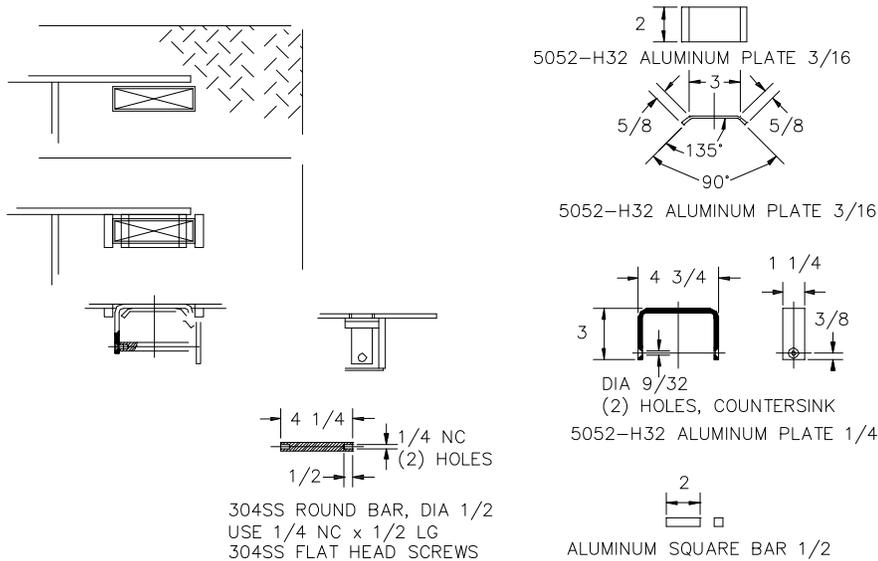
 <p>THE CITY OF CALGARY PARKS</p>	<p>PROJECT TITLE SPECIFICATIONS</p>	<p>DRAWN BY WYC</p>	<p>SCALE N.T.S.</p>
	<p>SHEET TITLE VALVE BOX CROSSBEAM SUPPORT DETAILS FOR 100mm DOUBLE CHECK VALVE ASSEMBLY</p>	<p>DATE 2008 12 05</p>	<p>SHEET NO. 62e</p>
		<p>DESIGN BY JM</p>	<p>FILE NO.</p>
		<p>DATE 2008 12 05</p>	

Detail Sheet 62f: Irrigation - Double Check Valve Box Aluminum Lid

PADLOCK BOX DETAIL



HANDLE DETAIL



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

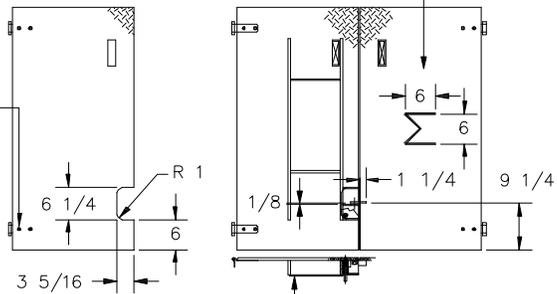
FILE NO.

Detail Sheet 62g: Irrigation - Double Check Valve Box Aluminum Lid

COVER PLATES DETAIL

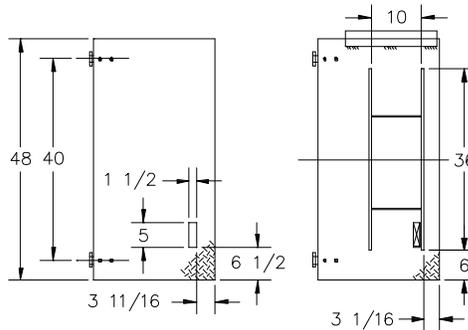
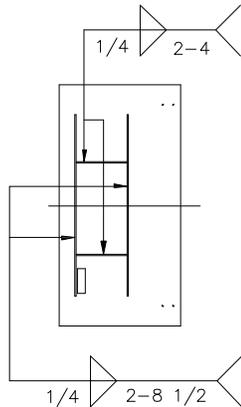
MARK LOCATION OF THE METER ON TOP COVER;
WELD-ON "M" IN THE CENTER OF COVER

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



PROJECT TITLE
SPECIFICATIONS

SHEET TITLE
**DETAILS FOR 100mm DOUBLE
CHECK VALVE BOX
ALUMINUM LID**

DRAWN BY
WYC

DATE **2008 12 05**

DESIGN BY
JM

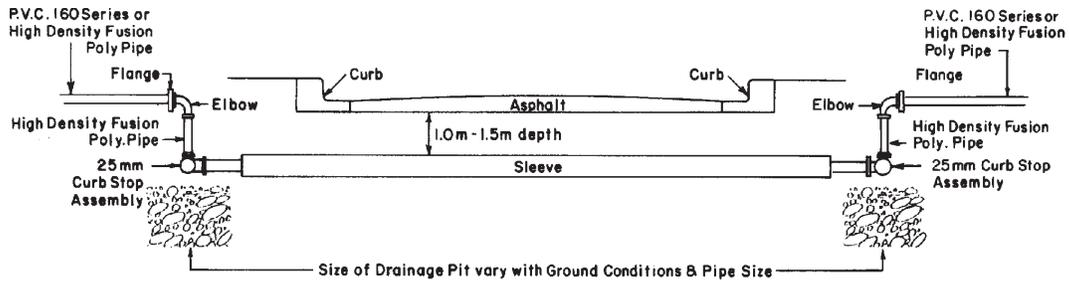
DATE **2008 12 05**

SCALE
N.T.S.

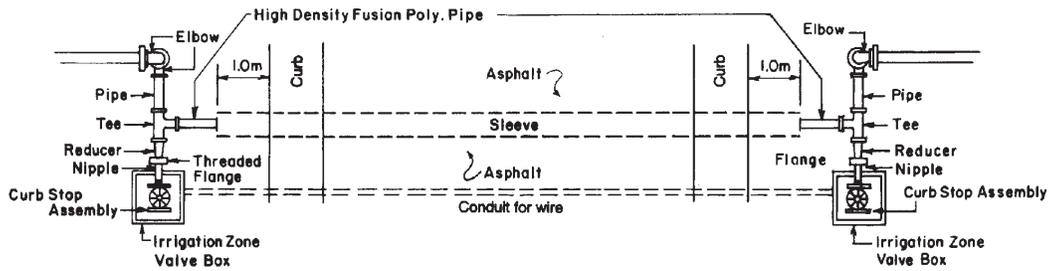
SHEET NO.
62g

FILE NO.

Detail Sheet 63: Irrigation - Road Crossing High Density Poly



Elevation



Plan View

Note - All dimensions are in metres unless otherwise noted.

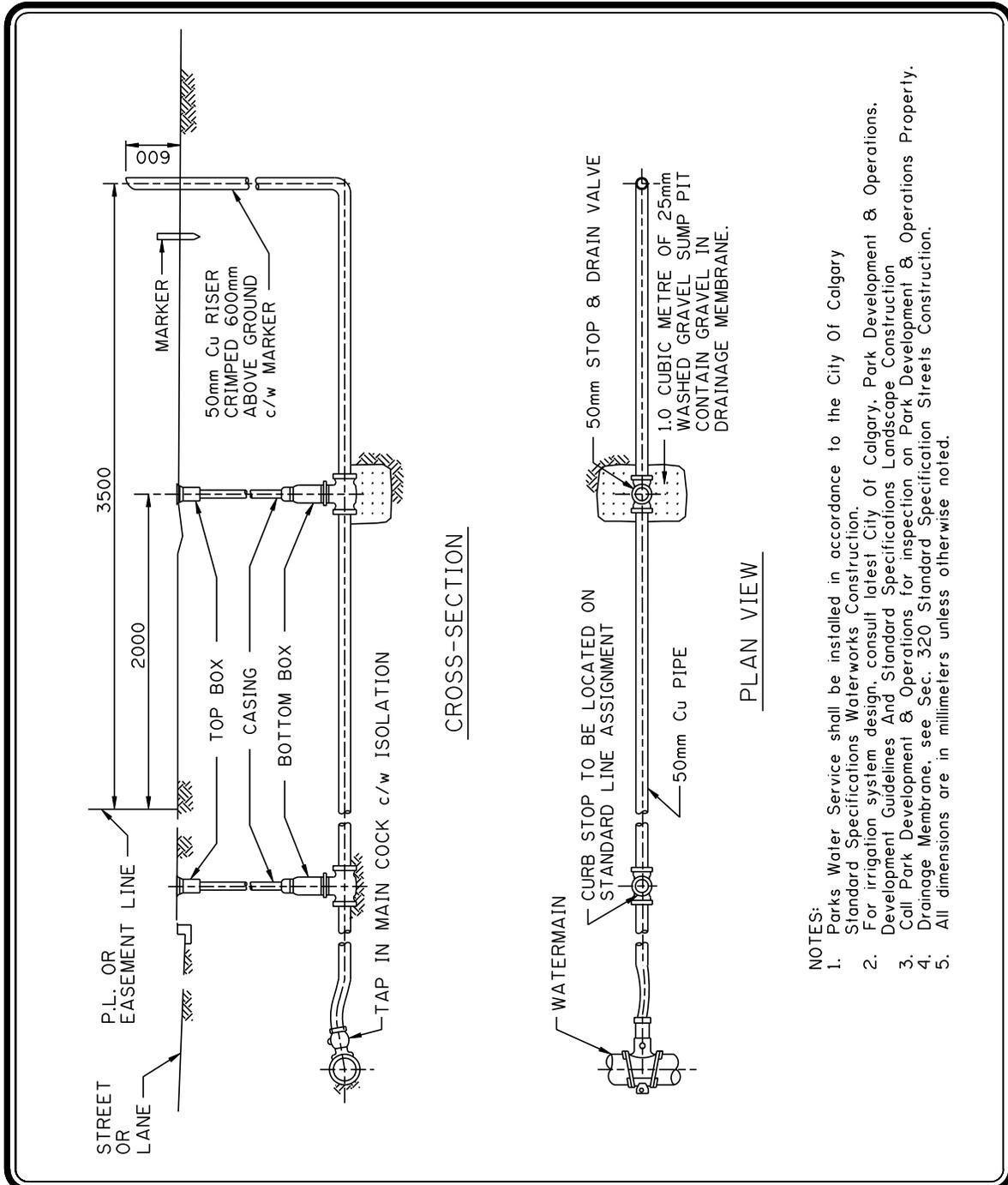


PROJECT TITLE
SPECIFICATIONS
SHEET TITLE
ROAD CROSSING
HIGH DENSITY POLY

DRAWN BY
W.B.
DATE 1997 03 08
DESIGN BY
D.LaF.
DATE 1997 03 08

SCALE
N.T.S.
SHEET NO.
63
FILE NO.

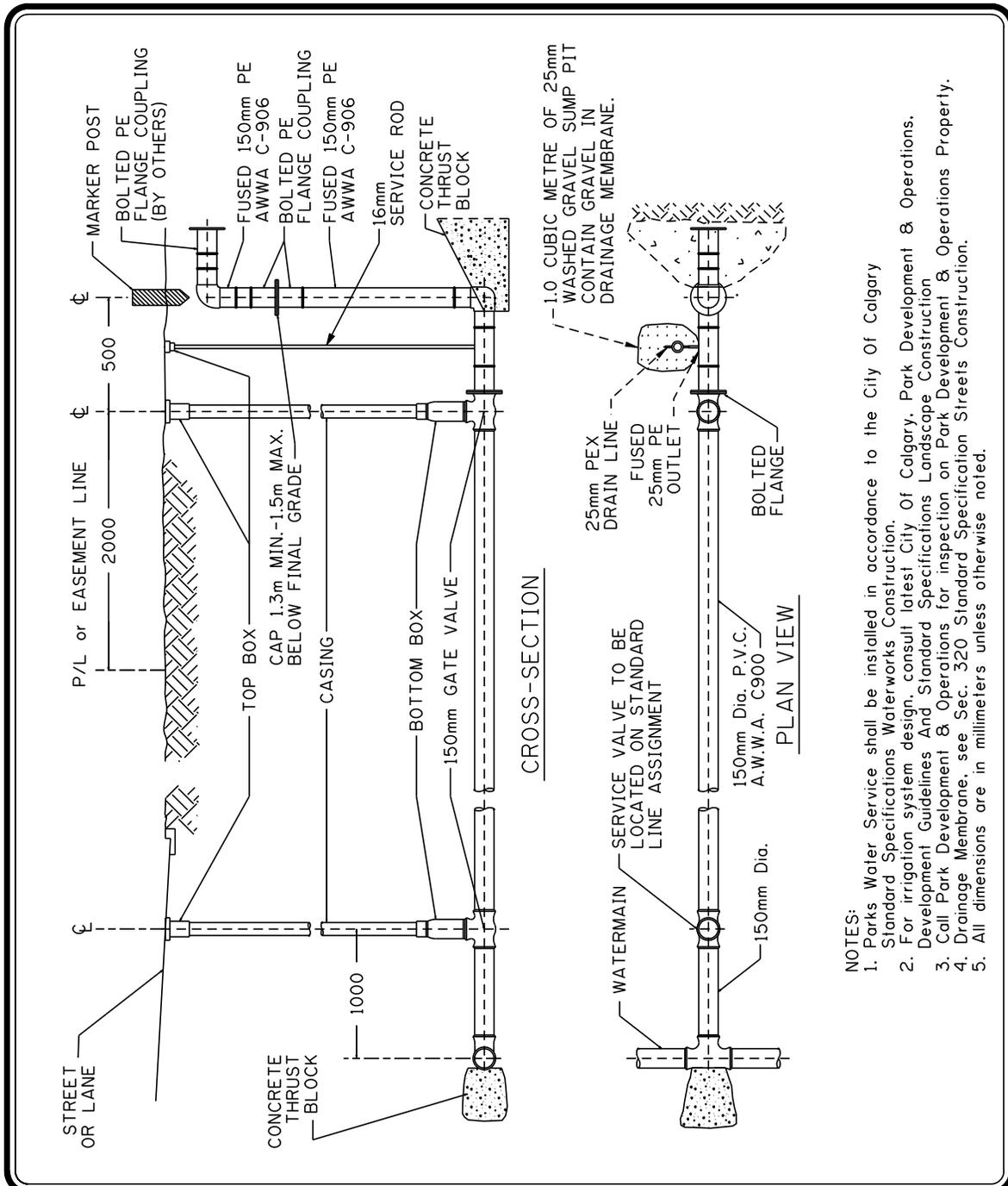
Detail Sheet 64: Irrigation - Park Water Service



- 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
 3. Call Park Development & Operations for inspection on Park Development & Operations Properly.
 4. Drainage Membrane, see Sec. 320 Standard Specification Streets Construction.
 5. All dimensions are in millimeters unless otherwise noted.

	PROJECT TITLE	DRAWN BY	SCALE
	SPECIFICATIONS		N.T.S.
	SHEET TITLE	DATE 2004 03 11	SHEET NO.
	TYPICAL 50mm PARKS WATER SERVICE	DESIGN BY	64
	DATE	FILE NO.	

Detail Sheet 65: Irrigation - Park Water Service



- 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
 3. Call Park Development & Operations for inspection on Park Development & Operations Properly.
 4. Drainage Membrane, see Sec. 320 Standard Specification Streets Construction.
 5. All dimensions are in millimeters unless otherwise noted.



PROJECT TITLE
SPECIFICATIONS

SHEET TITLE
TYPICAL 150mm PARKS WATER SERVICE

DRAWN BY

DATE **2002 03 05**

DESIGN BY

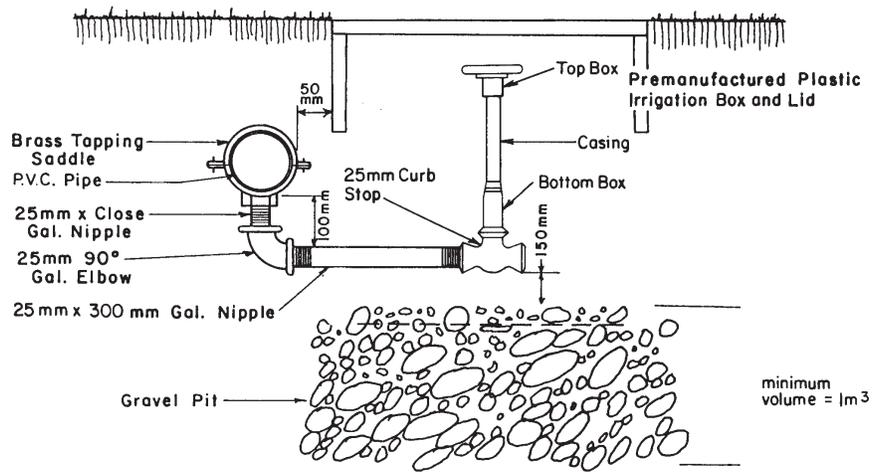
DATE

SCALE
N.T.S.

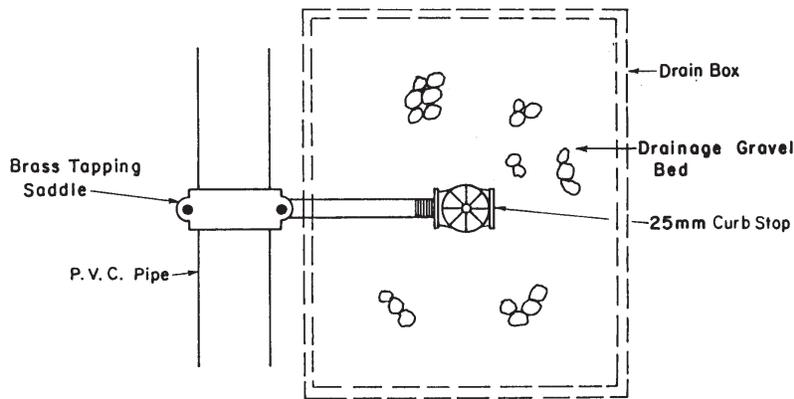
SHEET NO.
65

FILE NO.

Detail Sheet 66: Irrigation - Curb Stop Assembly



Elevation



Plan

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



PROJECT TITLE
SPECIFICATIONS

SHEET TITLE
25mm CURB STOP ASSEMBLY

DRAWN BY
W.B.

DATE 1997 03 08

DESIGN BY

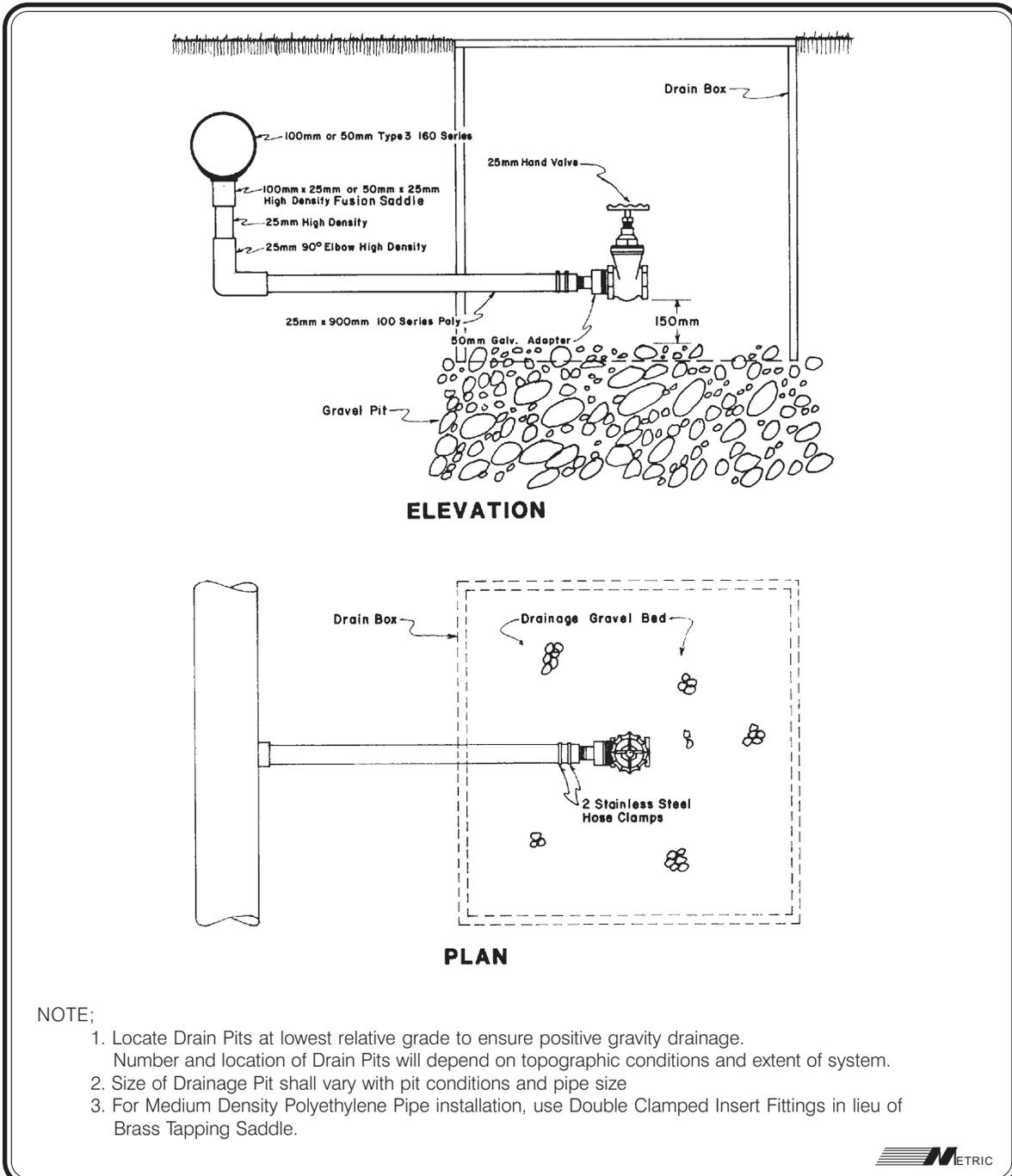
DATE

SCALE
N.T.S.

SHEET NO.
66

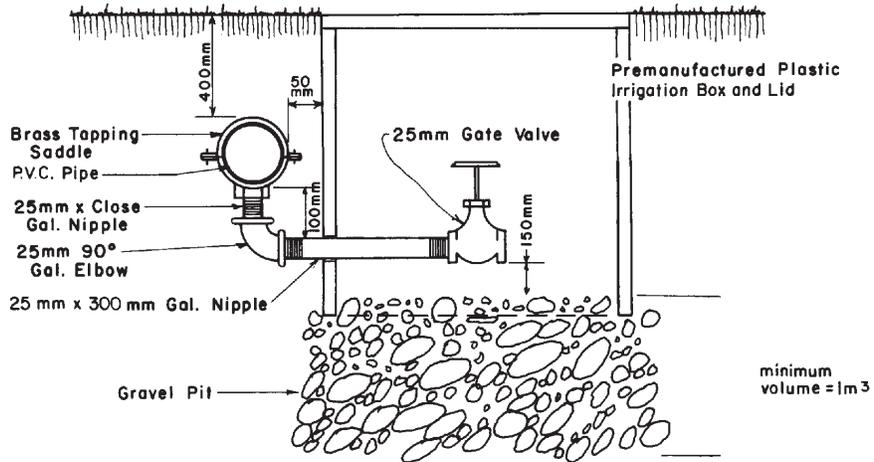
FILE NO.

Detail Sheet 67: Irrigation - Drain Pit



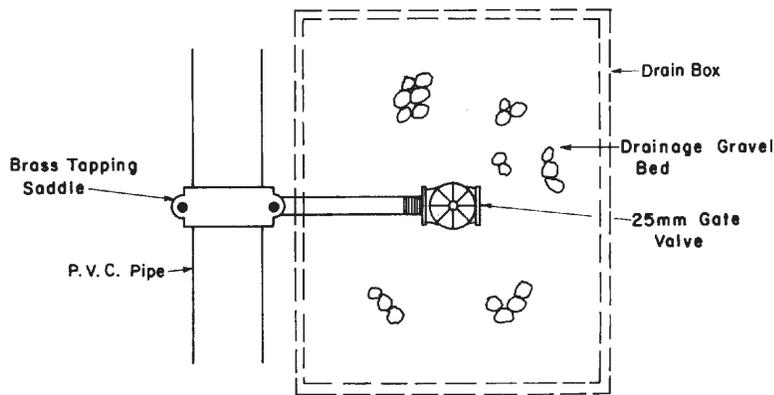
<p>THE CITY OF CALGARY PARKS</p>	<p>PROJECT TITLE SPECIFICATIONS</p>	<p>DRAWN BY W.B.</p>	<p>SCALE N.T.S.</p>
	<p>SHEET TITLE DRAIN PIT FOR HIGH DENSITY PIPE</p>	<p>DATE 1997 03 08</p>	<p>SHEET NO. 67</p>
		<p>DESIGN BY</p>	<p>FILE NO.</p>
		<p>DATE</p>	

Detail Sheet 68: Irrigation - Drain Pit



Use premanufactured extensions when obtaining proper height of boxes.

Elevation



Plan

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



PROJECT TITLE
SPECIFICATIONS

SHEET TITLE
DRAIN PIT FOR
P.V.C. PIPE

DRAWN BY
W.B.

DATE 1997 03 08

DESIGN BY

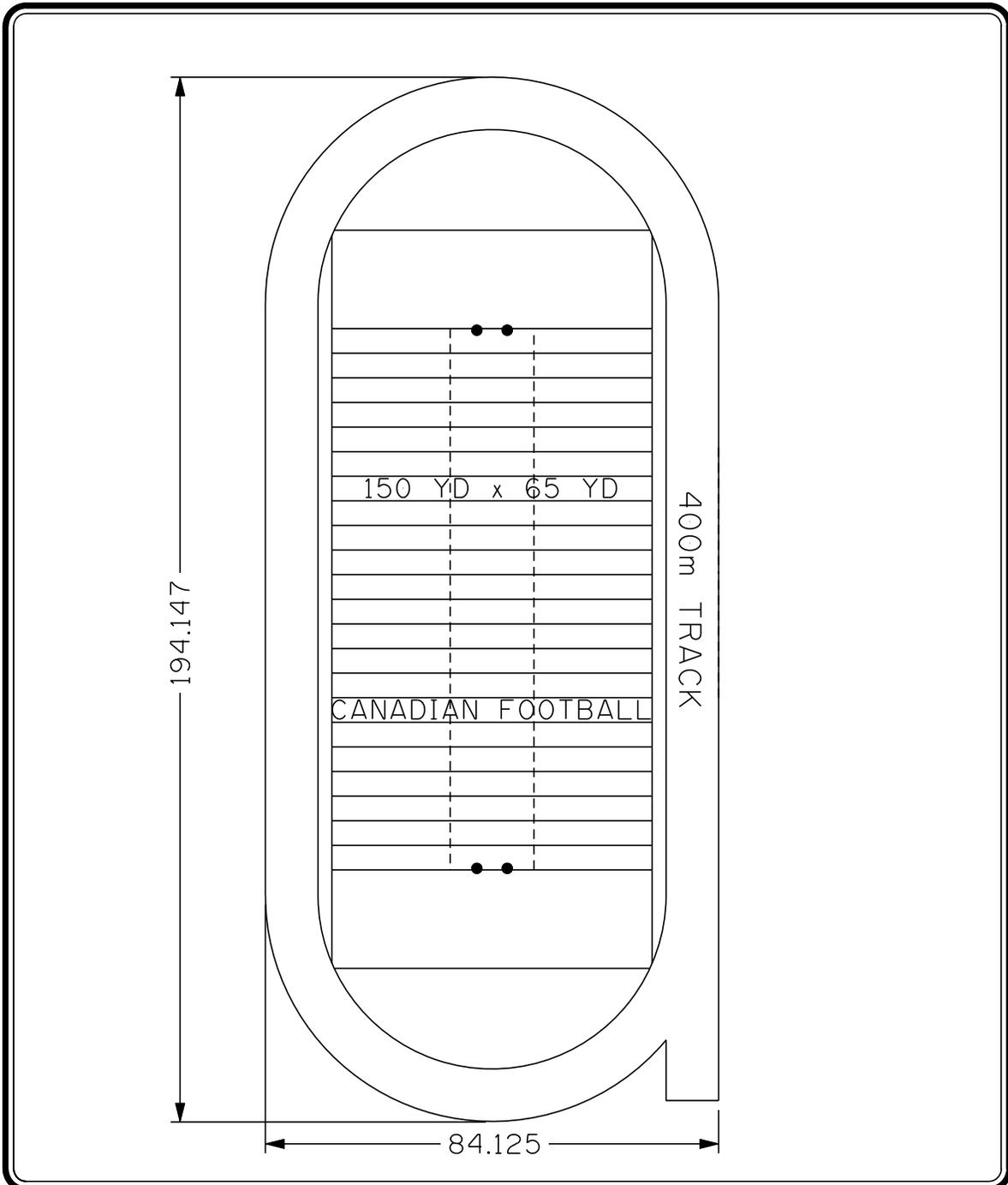
DATE

SCALE
N.T.S.

SHEET NO.
68

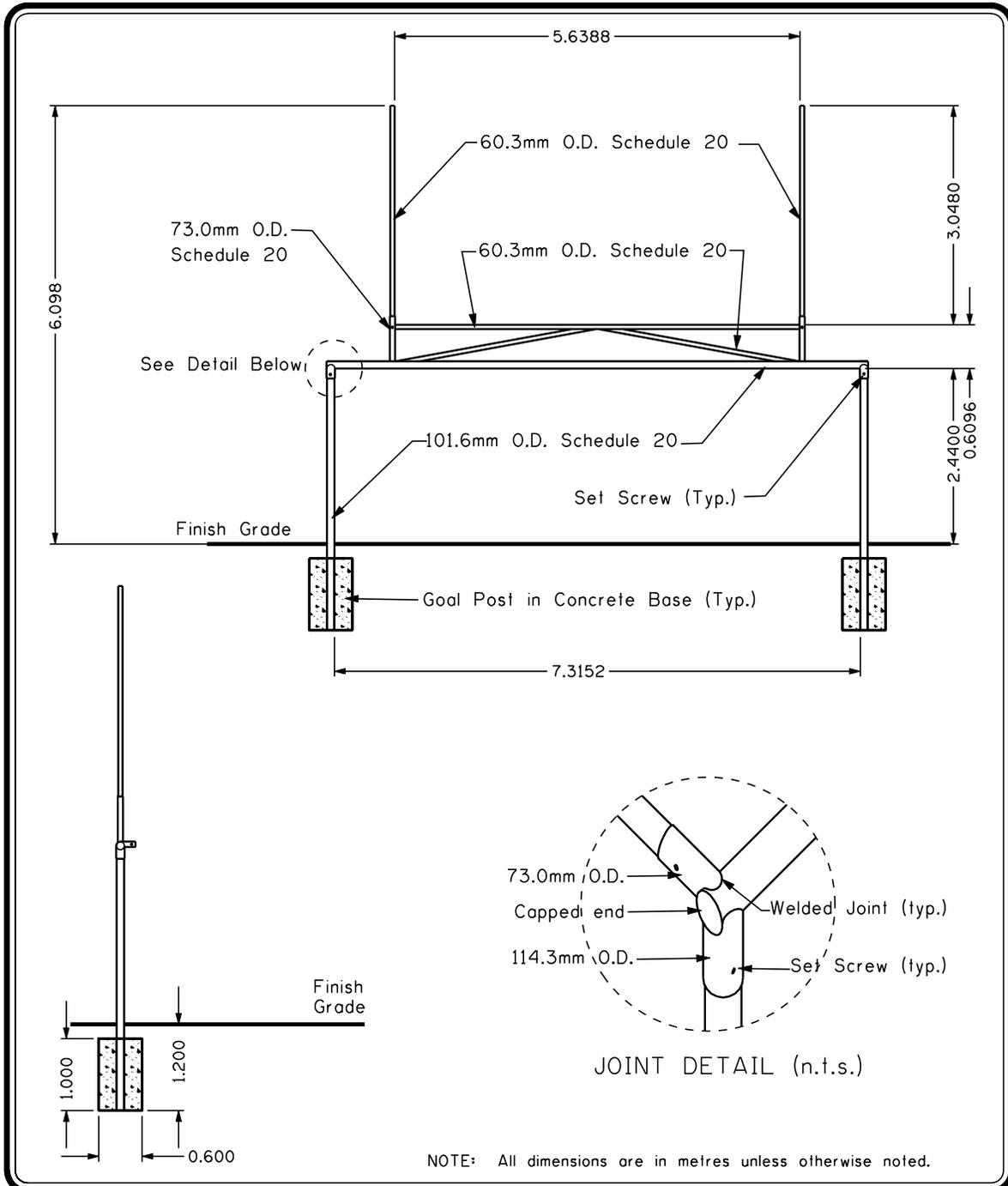
FILE NO.

Detail Sheet 69: Football Fields and Goal Posts



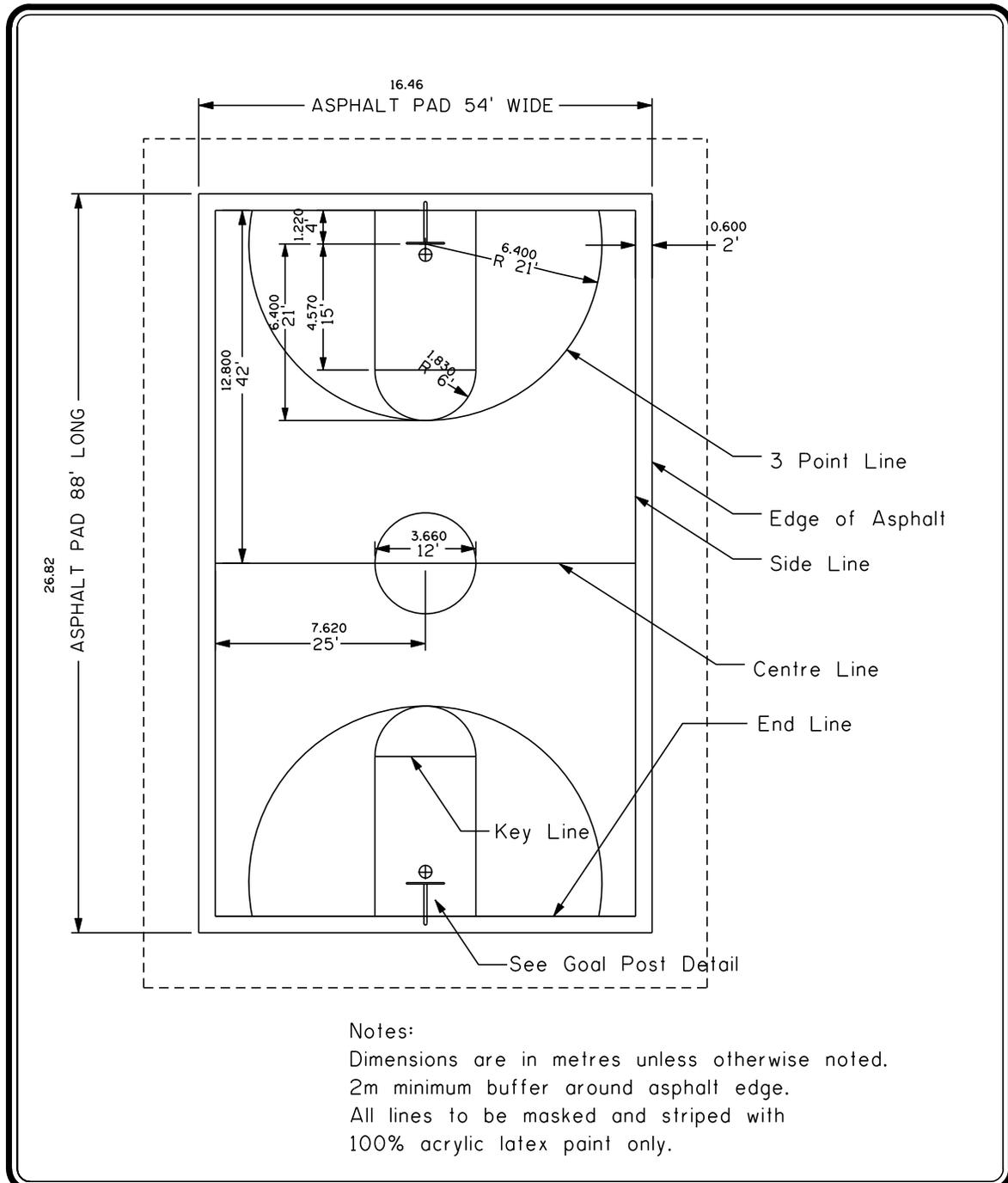
 <p>THE CITY OF CALGARY PARKS</p>	<p>PROJECT TITLE</p> <p>SPECIFICATIONS</p>	<p>DRAWN BY</p> <p>M.M.</p>	<p>SCALE</p> <p>1:1000</p>
	<p>SHEET TITLE</p> <p>400m TRACK AND FOOTBALL FIELD</p>	<p>DATE</p> <p>2002 01 25</p>	<p>SHEET NO.</p> <p>69</p>
	<p>DATE</p>	<p>FILE NO.</p>	

Detail Sheet 70: Football Fields and Goal Posts - Football Goalpost



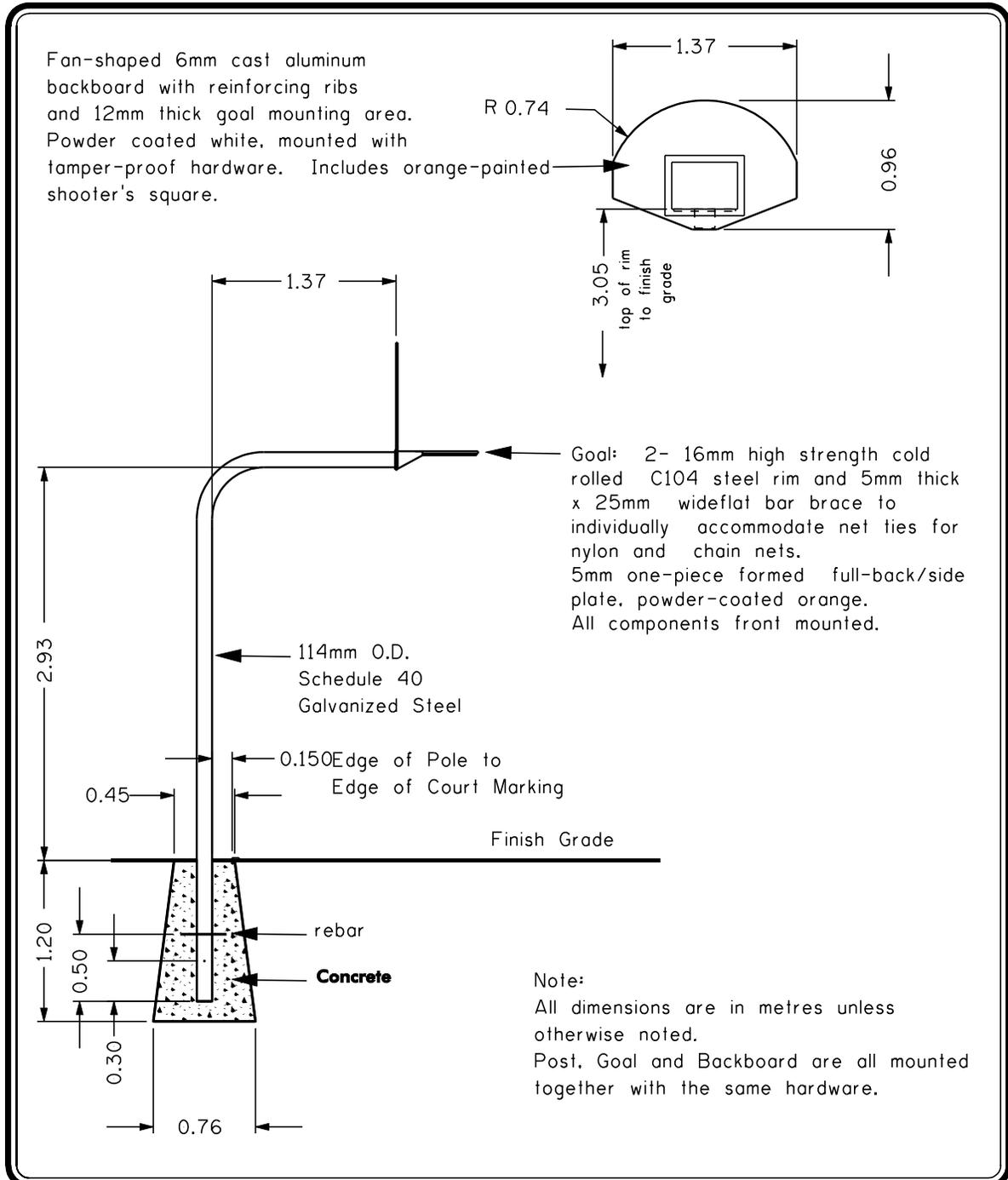
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	SPECIFICATIONS	M.M./H.S	N.T.S.
	SHEET TITLE	DATE 2010 01 12	SHEET NO.
	FOOTBALL GOAL POSTS	DESIGN BY	70
	DATE	FILE NO.	

Detail Sheet 71: Basketball - Court



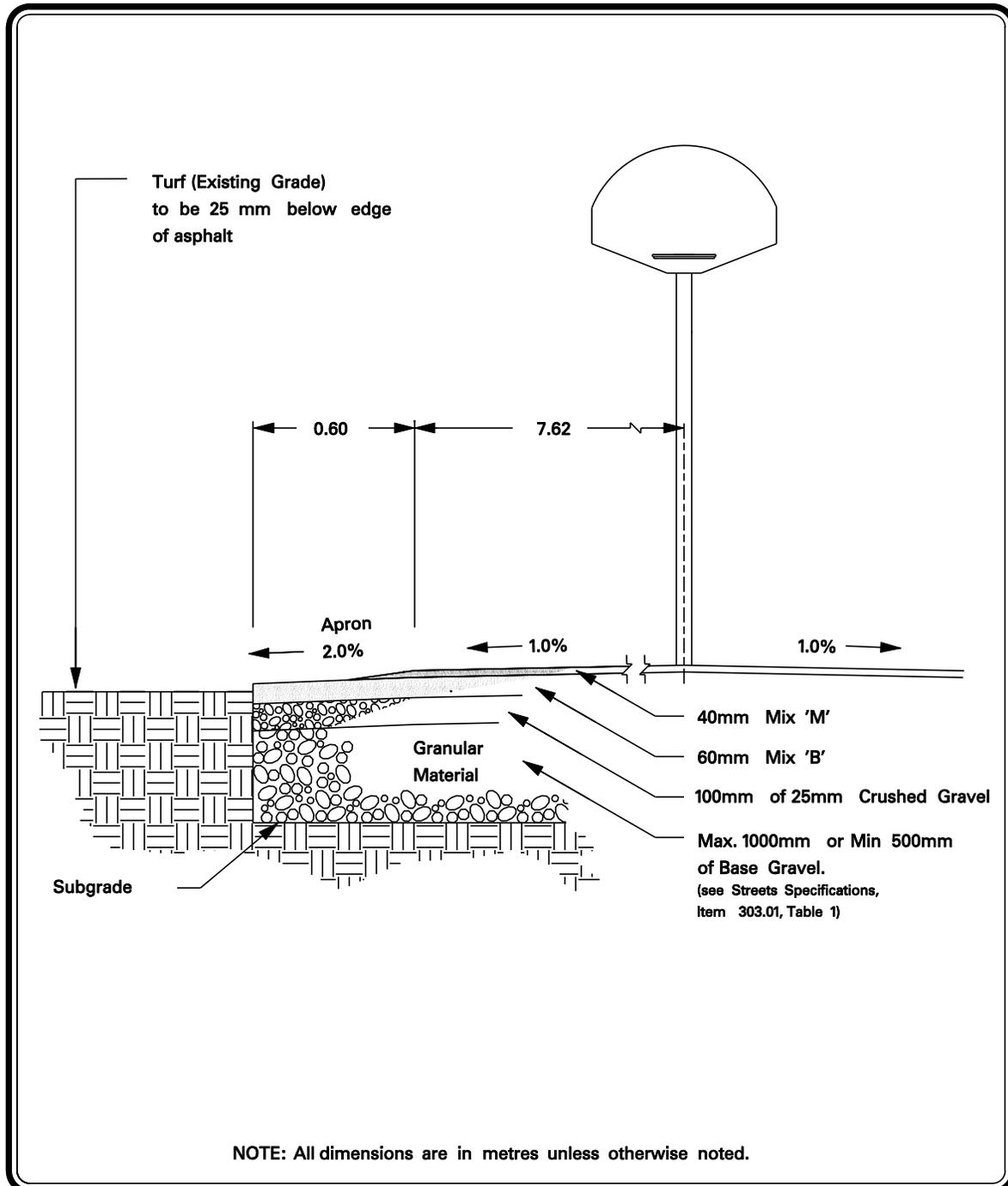
	PROJECT TITLE	DRAWN BY	SCALE
	SPECIFICATIONS	M.M.	N.T.S.
	SHEET TITLE	DATE 2003 01 23	SHEET NO.
	BASKETBALL COURT	DESIGN BY	71
		S.C.	FILE NO.
		DATE 2002 09 09	

Detail Sheet 72: Basketball - Goal Post



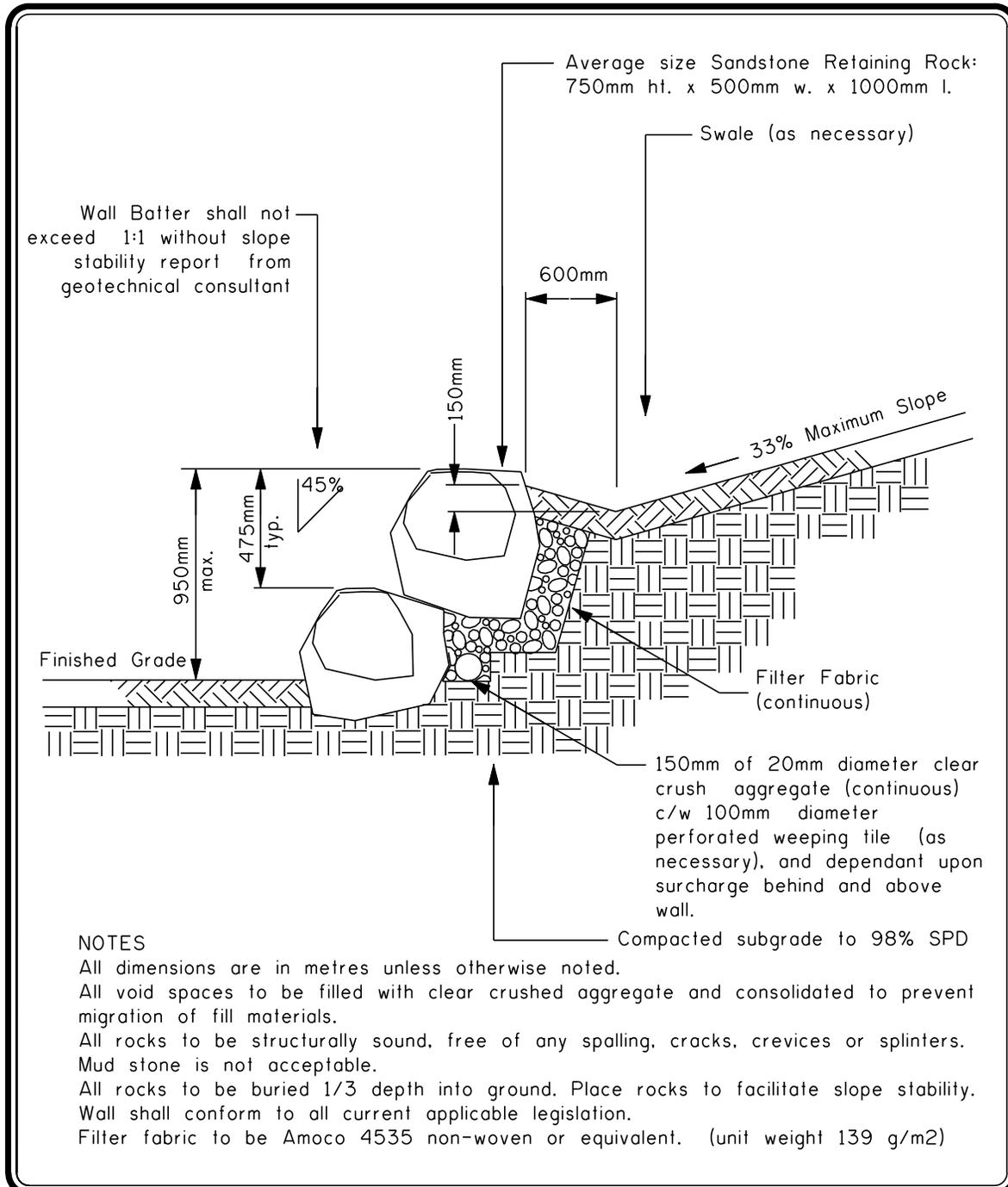
	PROJECT TITLE	DRAWN BY	SCALE
	SPECIFICATIONS	M.M.	N.T.S.
	SHEET TITLE	DATE 2010 03 19	SHEET NO.
	BASKETBALL GOAL POST	DESIGN BY S.C.	72
		DATE 2002 09 09	FILE NO.

Detail Sheet 73: Basketball - Court Surface Construction



	PROJECT TITLE	DRAWN BY	SCALE
	SPECIFICATIONS	W.B./M.M.	N.T.S.
	SHEET TITLE	DATE 2003 01 23	SHEET NO.
	BASKETBALL COURT SURFACE CONSTRUCTION	DESIGN BY	73
		S.C.	FILE NO.
		DATE 2002 09 09	

Detail Sheet 74: Dry Pack Rock Retaining Wall



	PROJECT TITLE	DRAWN BY	SCALE
	SPECIFICATIONS	W.B./M.M.	N.T.S.
	SHEET TITLE	DATE 2003 12 31	SHEET NO.
	DRY PACK ROCK RETAINING WALL	DESIGN BY	74
	DATE	FILE NO.	