

City of Kelowna
Regular Council Meeting
AGENDA



Monday, August 26, 2024
1:30 pm
Council Chamber
City Hall, 1435 Water Street

Pages

1. Call to Order

I would like to acknowledge that we are gathered today on the traditional, ancestral, unceded territory of the syilx/Okanagan people.

This Meeting is open to the public and all representations to Council form part of the public record. A live audio-video feed is being broadcast and recorded on kelowna.ca.

2. Confirmation of Minutes

4 - 15

PM Meeting - August 12, 2024

3. Reports

3.1 Special Achievement in GIS Award

16 - 17

To update Council on the receipt of the 2024 Esri Special Achievement in GIS Award.

4. Development Application Reports & Related Bylaws

4.1 Rezoning Bylaws Supplemental Report to Council

18 - 19

To receive a summary of notice of first reading for Rezoning Bylaws No. 12689, 12690, 12691, 12692, and 12693 and to give the bylaws further reading consideration.

4.2 Rezoning Applications

To give first, second and third reading to rezoning applications.

The following bylaws will be read together unless Council wants to separate one of the bylaws.

4.2.1 St. Amand Rd 3150 3210 3220 KLO Rd 1559 - BL12690 (Z24-0002) - Acacia Garden Properties Development Corp., Inc.No. BC1440521 20 - 20

To give Bylaw No. 12690 first, second and third reading in order to rezone the subject properties from the MF1 - Infill Housing zone to the MF2 – Townhouse Housing zone.

4.2.2 St. Paul St 1428 - BL12691 (Z24-0025) - City of Kelowna 21 - 21

To give Bylaw No. 12691 first, second and third reading in order to rezone the subject properties from the UC1 – Downtown Urban Centre zone to the UC1r – Downtown Urban Centre Rental Only zone.

4.2.3 Badke Rd 765 - BL12692 (Z24-0021) - Kerr Properties 002 Ltd., Inc.No. BCo813930 22 - 22

To give Bylaw No. 12692 first, second and third reading in order to UC4 – Rutland Urban Centre zone to the UC4r – Rutland Urban Centre Rental Only zone.

4.2.4 Swainson Rd 1785 - BL12693 (Z24-0012) - G.P. Sandher Holdings Ltd., Inc.No. BC1392723 23 - 24

To give Bylaw No. 12693 first, second and third reading in order to rezone a portion of the subject property from the A1 – Agriculture zone to the RU1 – Large Lot Housing zone.

4.3 Rezoning Applications

To give first, second and third reading and adopt rezoning applications.

4.3.1 Jim Bailey Cr 8860 - BL12689 (Z24-0020) - 0983997 B.C. Ltd., Inc.No. BCo983997 25 - 25

To give Bylaw No. 12689 first, second and third reading and adopt in order to rezone the subject property from the I3 – Heavy Industrial zone to the I2 – General Industrial zone.

4.4 Solly Ct 865 - DP24-0020 - 865 Solly Ct LTD., INC., NO. BC1389060 26 - 71

To issue a Development Permit for the form and character of a townhouse housing development.

5. Bylaws for Adoption (Development Related)

5.1 Monterey Ct 1095-1097 - BL12672 (Z23-0076) - 1280331 BC Ltd., Inc.No. BC1280031 72 - 72

To adopt Bylaw No. 12672 in order to rezone the subject property from the MF1 – Infill Housing zone to the MF2 – Townhouse Housing zone.

6. Non-Development Reports & Related Bylaws

6.1 Subdivision Development and Servicing Bylaw No. 7900 Amendment 73 - 86

To amend the Subdivision, Development and Servicing Bylaw No. 7900 so it aligns with industry best practice, provides clear direction and ensures construction of safe and long-lasting infrastructure. To approve a minor change to Council Policy No. 101.

6.2 BL12694 Amendment No. 28 to Subdivision, Development and Servicing Bylaw No. 7900 87 - 362

To give Bylaw No. 12694 first, second and third reading.

6.3 2024 Sustainable Urban Forest Strategy 363 - 499

To review and adopt the 2024 Sustainable Urban Forest Strategy.

7. Mayor and Councillor Items

8. Termination



**City of Kelowna
Regular Council Meeting
Minutes**

Date:	Monday, August 12, 2024
Location:	Council Chamber City Hall, 1435 Water Street
Members Present	Mayor Tom Dyas, Councillors Ron Cannan, Maxine DeHart*, Charlie Hodge, Gord Lovegrove*, Mohini Singh, Luke Stack*, Rick Webber and Loyal Wooldridge
Staff Present	City Manager, Doug Gilchrist; City Clerk, Laura Bentley; Community Planning & Development Manager, Dean Stachan*; Urban Planning Manager, Jocelyn Black*; Development Planning Department Manager, Nola Kilmartin*; Infill Housing Planning Manager, James Moore*; Planner, Mark Tanner*; Controller, Matt Friesen*; General Manager, Corporate Services, Joe Sass*; Budget Supervisor, Jay Jean*; Financial Planning Manager, Melanie Antunes*; Fire Chief, Dwight Seymore*; Senior Transportation Planning Engineer, Chad Williams*; Business Performance and Advisory Services Manager, Shelly Little*; Corporate Assurance Supervisor, Jennifer Grills*; Utility Planning Manager, Rod MacLean*; General Manager, Infrastructure, Mac Logan*; Legislative Technician, Natasha Beauchamp
Staff Participating Remotely	Legislative Coordinator (Confidential), Arlene McClelland

(* Denotes partial attendance)

1. Call to Order

Mayor Dyas called the meeting to order at 1:33 p.m.

I would like to acknowledge that we are gathered today on the traditional, ancestral, unceded territory of the syilx/Okanagan people.

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2. Confirmation of Minutes

Moved By Councillor Hodge/Seconded By Councillor Lovegrove

THAT the Minutes of the Regular Meetings of July 22, 2024 be confirmed as circulated.

Carried

3. Development Application Reports & Related Bylaws

3.1 Morrison Rd 2062 - A24-0001 - Various Owners

Staff:

- Displayed a PowerPoint Presentation summarizing the application.

City Clerk:

- Invited the Applicant or the Applicant's representative to come forward.

No one in the Gallery came forward.

Moved By Councillor Wooldridge/Seconded By Councillor Lovegrove

THAT Agricultural Land Reserve Application No. A24-0001 for Lot 14 Section 36 Township 26 ODYD Plan 425, located at 2062 Morrison Road, Kelowna, BC for a non-farm use application in the Agricultural Land Reserve pursuant to Section 20(2) of the Agricultural Land Commission Act, NOT be supported by Council;

AND THAT Council directs Staff NOT to forward the subject application to the Agricultural Land Commission for consideration.

Carried

3.2 Jim Bailey Cr 8860 - Z24-0020 (BL12689) - 0983997 B.C. Ltd., Inc. No. BC0983997

Staff:

- Displayed a PowerPoint Presentation summarizing the application.

Moved By Councillor Wooldridge/Seconded By Councillor Webber

THAT Rezoning Application No. Z24-0020 to amend the City of Kelowna Zoning Bylaw No. 12375 by changing the zoning classification of Lot 1 Section 2 Township 20 ODYD PLAN KAP71932, located at 8860 Jim Bailey Cr, Kelowna, BC from the I3 – Heavy Industrial zone to the I2 – General Industrial zone be considered by Council.

Carried

3.3 St. Amand Rd 3150 3210 3220 KLO Rd 1559 - Z24-0002 (BL12690) - Acacia Garden Properties Development Corp., Inc. No. BC1440521

Staff:

- Displayed a PowerPoint Presentation summarizing the application.

Moved By Councillor Lovegrove/Seconded By Councillor Hodge

THAT Rezoning Application No. Z24-0002 to amend the City of Kelowna Zoning Bylaw No. 12375 by changing the zoning classification of:

- Lot 1 District Lot 131 ODYD Plan 15011 Except Plan KAP78065, located at 1559 KLO Rd, Kelowna, BC;
- Lot 1 District Lot 131 ODYD Plan 17156, located at 3150 St. Amand Rd, Kelowna, BC;
- Lot 2 District Lot 131 ODYD Plan 17156, located at 3210 St. Amand Rd, Kelowna, BC; and,
- Lot 3 District Lot 131 ODYD PLAN 17156, located at 3220 St. Amand Rd, Kelowna, BC;

from the MF1 - Infill Housing zone to the MF2 – Townhouse Housing zone, be considered by Council;

AND THAT final adoption of the Rezoning Bylaw be considered subsequent to the outstanding conditions of approval as set out in Attachment "A" attached to the Report from the Development Planning Department dated August 12, 2024.

Carried

3.4 St. Paul St 1428 - Z24-0025 (BL12691) - City of Kelowna

Staff:

- Displayed a PowerPoint Presentation summarizing the application and responded to questions from Council.

Moved By Councillor Wooldridge/Seconded By Councillor Lovegrove

THAT Rezoning Application No. Z24-0025 to amend the City of Kelowna Zoning Bylaw No. 12375 by changing the zoning classification of Lot 18 District Lot 139 ODYD Plan 800, located at 1428 St Paul St, Kelowna, BC and Lot 19 District Lot 139 ODYD Plan 800, located at 1428 St Paul St, Kelowna, BC, from the UC1 – Downtown Urban Centre zone to the UC1r – Downtown Urban Centre Rental Only zone, be considered by Council;

AND THAT final adoption of the Rezoning Bylaw be considered subsequent to the outstanding condition of approval as set out in Attachment "A" attached to the Report from the Development Planning Department dated August 12, 2024;

AND FURTHER THAT final adoption of the Rezoning Bylaw be considered subsequent to the approval of the Ministry of Transportation and Infrastructure.

Carried

3.5 Badke Rd 765 - Z24-0021 (BL12692) - Kerr Properties 002 Ltd., Inc. No. BCo813930

Staff:

- Displayed a PowerPoint Presentation summarizing the application.

Moved By Councillor Wooldridge/Seconded By Councillor Hodge

THAT Rezoning Application No. Z24-0021 to amend the City of Kelowna Zoning Bylaw No. 12375 by changing the zoning classification of Lot E Section 27 Township 26 ODYD Plan 22268, located at 765 Badke Road, Kelowna, BC from the UC4 – Rutland Urban Centre zone to the UC4r – Rutland Urban Centre Rental Only zone, be considered by Council;

AND THAT final adoption of the Rezoning Bylaw be considered subsequent to the approval of the Ministry of Transportation and Infrastructure.

Carried

3.6 Swainson Rd 1785 - Z24-0012 (BL12693) - G.P. Sandher Holdings Ltd., Inc. No. BC1392723

Staff:

- Displayed a PowerPoint Presentation summarizing the application and responded to questions from Council.

Moved By Councillor Wooldridge/Seconded By Councillor Singh

THAT Rezoning Application No. Z24-0012 to amend the City of Kelowna Zoning Bylaw No. 12375 by changing the zoning classification of portions of Lot A Sections 19 and 30 Township 27

and of Section 24 Township 26 ODYD Plan EPP120799 located at 1785 Swainson Rd, Kelowna, BC, from the A1 – Agriculture zone to the RU1 – Large Lot Housing zone as shown on Map "A" attached to the Report from the Development Planning Department dated August 12, 2024, be considered by Council;

AND THAT final adoption of the Rezoning Bylaw be considered subsequent to the issuance of a Preliminary Layout Review Letter by the Approving Officer;

AND FURTHER THAT final adoption of the Rezoning Bylaw be considered subsequent to the outstanding conditions of approval as set out in Attachment "A" attached to the Report from the Development Planning Department dated August 12, 2024.

Carried

3.7 Rezoning Bylaws Supplemental Report to Council

City Clerk:

- Commented on notice of first reading and correspondence received for Cerise Drive.

3.8 Rezoning Applications

3.8.1 Cerise Dr 1236 - BL12680 (Z24-0023) - Anira Properties Ltd

Moved By Councillor Hodge/Seconded By Councillor Lovegrove

THAT Bylaw No. 12680 be read a first, second and third time and adopted.

Carried

3.7 Rezoning Bylaws Supplemental Report to Council

Councillor DeHart declared a conflict of interest as their employer is involved in this application and left at 1:58 p.m.

City Clerk:

- Commented on notice of first reading and correspondence received for Solly Court.

3.8.2 Solly Ct 865 - BL12681 (Z24-0004) - 865 Solly Court Ltd., Inc. No. BC1389060

Moved By Councillor Hodge/Seconded By Councillor Lovegrove

THAT Bylaw No. 12681 be read a first, second and third time and adopted.

Carried

Councillor DeHart returned to the meeting at 2:00 p.m.

3.9 Wilkinson St 2110-2140 - BL12517 (Z22-0068) - Wilkinson St Holdings Ltd., Inc. No. BC1321697

Councillor Lovegrove declared a perceived conflict of interest for item 3.9 and 3.10 as they know the Applicant and departed the meeting at 2:01 p.m.

Moved By Councillor Wooldridge/Seconded By Councillor Singh

THAT Bylaw No. 12517 be amended at third reading by deleting ",2120-2122, 2128-2130 &" and replacing it with "-";

AND THAT Bylaw No. 12517 be amended at third reading by deleting the Legal Description that reads:

- "a. Lot 3 Section 19 Township 26 Osoyoos Division Yale District Plan 10906 Except Plans H14021 and 36316 located on Wilkinson Street Kelowna, BC;
- b. Lot 4 Section 19 Township 26 Osoyoos Division Yale District Plan 10906 Except Plan H14021 located on Wilkinson Street Kelowna, BC;
- c. Lot 5 Section 19 Township 26 Osoyoos Division Yale District Plan 10906 located on Wilkinson Street Kelowna, BC; and
- d. Lot 6 Section 19 Township 26 Osoyoos Division Yale District Plan 10906"

And replacing it with "Lot 1 Section 19 Township 26 ODYD Plan EPP135640";

AND THAT Bylaw No. 12517 be amended at third reading by deleting the underlying zone that reads "RU4 – Duplex Housing" and replacing it with "MF1 – Infill Housing".

Carried

Moved By Councillor Wooldridge/Seconded By Councillor Singh

THAT Bylaw No. 12517, as amended, be adopted.

Carried

3.10 Wilkinson St 2110-2140 - DP22-0196 - Wilkinson St Holdings Ltd., Inc. No. BC1321697

Staff:

- Displayed a PowerPoint presentation summarizing the application.

Moved By Councillor Wooldridge/Seconded By Councillor DeHart

THAT Rezoning Bylaw No. 12517 be amended at third reading to revise the legal description of the subject property from:

- Lot 3 Section 19 Township 26 ODYD Plan 10906 Except Plans H14021 and 36316 located at 2110 Wilkinson St, Kelowna, BC;
- Lot 4 Section 19 Township 26 ODYD Plan 10906 Except Plan H14021 located at 2120-2122 Wilkinson St, Kelowna, BC;
- Lot 5 Section 19 Township 26 ODYD Plan 10906 located at 2128-2130 Wilkinson St, Kelowna, BC; and,
- Lot 6 Section 19 Township 26 ODYD Plan 10906 located at 2140 Wilkinson St, Kelowna, BC,

to Lot 1 Section 19 Township 26 ODYD Plan EPP135640 located at 2110-2140 Wilkinson St, Kelowna, BC;

AND THAT final adoption of Rezoning Bylaw No. 12517 be considered by Council;

AND THAT Council authorizes the issuance of Development Permit No. DP22-0196 for Lot 1 Section 19 Township 26 ODYD Plan EPP135640, located at 2110-2140 Wilkinson St, Kelowna, BC subject to the following:

1. The dimensions and siting of the building to be constructed on the land be in accordance with Schedule "A";
2. The exterior design and finish of the building to be constructed on the land be in accordance with Schedule "B";
3. Landscaping to be provided on the land be in accordance with Schedule "C";

4. The applicant be required to post with the City a Landscape Performance Security deposit in the amount of 125% of the estimated value of the Landscape Plan, as determined by a Registered Landscape Architect;

AND THAT the applicant be required to enter into a Car-Share Agreement for a minimum of two years from the date of Building Occupancy as set out in Attachment "C" attached to the Report from the Development Planning Department dated August 12, 2024;

AND THAT the applicant be required to complete the above noted conditions of Council's approval of the Development Permit Application in order for the permits to be issued;

AND FURTHER THAT this Development Permit is valid for two (2) years from the date of Council approval, with no opportunity to extend.

Carried

Councillor Lovegrove returned to the meeting at 2:10 p.m.

3.11 Montgomery Rd 450 - BL12591 (Z23-0060) - Montgomery Living Ltd., Inc. No. BC1423482

Moved By Councillor Hodge/Seconded By Councillor Lovegrove

THAT Bylaw No. 12591 be amended at third reading by deleting the Legal Description that reads:

"Lot 11 Section 26 Township 26 ODYD Plan 7783"

And replacing it with:

"Lot 11 Section 26 Township 26 ODYD Plan 7783 Except Plan EPP137940"

Carried

Moved By Councillor Hodge/Seconded By Councillor Lovegrove

THAT Bylaw No. 12591, as amended, be adopted.

Carried

3.12 Montgomery Rd 450 - DP23-0157 - Montgomery Living Ltd., Inc. No. BC1423482

Staff:

- Displayed a PowerPoint Presentation summarizing the application and responded to questions from Council.

Moved By Councillor Wooldridge/Seconded By Councillor Lovegrove

THAT Rezoning Bylaw No. 12591 be amended at third reading to revise the legal description of the subject property from Lot 11 Section 26 Township 26 ODYD Plan 7783 to Lot 11 Section 26 Township 26 ODYD Plan 7783 Except Plan EPP137940;

AND THAT final adoption of Rezoning Bylaw No. 12591 be considered by Council;

AND THAT Council authorizes the issuance of Development Permit No. DP23-0157 for Lot 11 Section 26 Township 26 ODYD Plan 7783 Except Plan EPP137940, located at 450 Montgomery Rd, Kelowna, BC subject to the following:

1. The dimensions and siting of the building to be constructed on the land be in accordance with Schedule "A";
2. The exterior design and finish of the building to be constructed on the land be in accordance with Schedule "B";
3. Landscaping to be provided on the land be in accordance with Schedule "C";
4. The applicant be required to post with the City a Landscape Performance Security deposit in the amount of 125% of the estimated value of the Landscape Plan, as determined by a Registered Landscape Architect;
5. The applicant be required to make a payment into the Public Amenity & Streetscape Capital Reserve Fund as established by Bylaw No. 12386 in accordance with Table 6.8.a. in Zoning Bylaw No. 12375;

AND THAT the applicant be required to complete the above noted conditions of Council's approval of the Development Permit Application in order for the permits to be issued;

AND FURTHER THAT this Development Permit is valid for two (2) years from the date of Council approval, with no opportunity to extend.

Carried

Councillors Cannan, Hodge and Webber – Opposed

Moved By Councillor DeHart/Seconded By Councillor Stack

THAT Council directs staff to consider common parking concerns relative to some recent multi-family development projects and bring forward for discussion and evaluation, options for possible amendments to select sections of the associated regulations and policies, inclusive of cash-in-lieu.

Carried

Councillor Lovegrove – Opposed

3.13 Hiram Walker Ct 270 - BL12648 (Z23-0019) - 270 HWC GP Inc., Inc. No. A0124511

Moved By Councillor Hodge/Seconded By Councillor Lovegrove

THAT Bylaw No. 12648 be adopted.

Carried

3.14 Hiram Walker Ct 270 - DP23-0026 - 270 HWC GP Inc., Inc. No. A0124511

Staff:

- Displayed a PowerPoint Presentation summarizing the application and responded to questions from Council.

Moved By Councillor Webber/Seconded By Councillor Stack

THAT final adoption of Rezoning Bylaw No. 12648 be considered by Council;

AND THAT Council authorizes the issuance of Development Permit No. DP23-0026 for Lot 3 Section 2 Township 20 ODYD Plan EPP98124, located at 270 Hiram Walker Ct, Kelowna, BC subject to the following:

1. The dimensions and siting of the building to be constructed on the land be in accordance with Schedule "A";
2. The exterior design and finish of the building to be constructed on the land be in accordance with Schedule "B";
3. Landscaping to be provided on the land be in accordance with Schedule "C";

4. The applicant be required to post with the City a Landscape Performance Security deposit in the amount of 125% of the estimated value of the Landscape Plan, as determined by a Registered Landscape Architect;

AND THAT the applicant be required to complete the above noted conditions of Council's approval of the Development Permit Application in order for the permits to be issued;

AND FURTHER THAT this Development Permit is valid for two (2) years from the date of Council approval, with no opportunity to extend.

Carried

3.15 Gore St 2654 - DP24-0005 - H&H Joint Ventures Ltd., Inc. No. BC1185908

Staff:

- Displayed a PowerPoint Presentation summarizing the application.

Moved By Councillor Stack/Seconded By Councillor DeHart

THAT Council authorizes the issuance of Development Permit No. DP24-0005 for Lot 4 District Lot 14 ODYD Plan 7927, located at 2654 Gore St, Kelowna, BC subject to the following:

1. The dimensions and siting of the building to be constructed on the land be in accordance with Schedule "A";
2. The exterior design and finish of the building to be constructed on the land be in accordance with Schedule "B";
3. Landscaping to be provided on the land be in accordance with Schedule "C";
4. The applicant be required to post with the City a Landscape Performance Security deposit in the amount of 125% of the estimated value of the Landscape Plan, as determined by a Registered Landscape Architect;

AND THAT the applicant be required to complete the above noted conditions of Council's approval of the Development Permit Application in order for the permits to be issued;

AND FURTHER THAT this Development Permit is valid for two (2) years from the date of Council approval, with no opportunity to extend.

Carried

4. Bylaws for Adoption (Development Related)

4.1 Glenmore Dr 1232 -1250 - BL12659 (Z24-0009) - City of Kelowna

Moved By Councillor Hodge/Seconded By Councillor Lovegrove

THAT Bylaw No. 12659 be amended at 3rd reading as follows:

By deleting the Legal Description that reads:

- " a. Lot B Section 29 Township 26 ODYD Plan 39467, located on Glenmore Drive, Kelowna, BC;
1. Lot 2 Section 29 Township 26 ODYD Plan 16352, located on Glenmore Drive, Kelowna, BC;
 2. Lot A Section 29 Township 26 ODYD Plan KAP47536, located on Glenmore Drive, Kelowna, BC;";

And replacing it with:

"Lot 1 Section 29 Township 26 ODYD Plan EPP137397, located on Glenmore Drive, Kelowna, BC";

And by deleting "1232, 1240, 1250 Glenmore Drive,";

And replacing it with "1232-1250 Glenmore Drive-".

Carried
Councillor Cannan – Opposed

Staff:

- Responded to questions from Council.

Moved By Councillor Hodge/Seconded By Councillor Lovegrove

THAT Bylaw No. 12659, as amended, be adopted.

Carried
Councillors Cannan and Singh - Opposed

The meeting recessed at 3:07 p.m.

The meeting reconvened at 3:18 p.m.

5. Non-Development Reports & Related Bylaws

5.1 Enhanced Rental Housing Grant Program - Eligibility Criteria

Councillor Stack declared a perceived conflict of interest as clients they have worked with in the past have applied for grants under this policy and departed the meeting at 3:18 p.m.

Staff:

- Spoke to the changes to the eligibility criteria for the enhanced Rental Housing Grants Program for 2024/2025.

Moved By Councillor Wooldridge/Seconded By Councillor DeHart

THAT Council receives, for information, the report from Housing Policy and Programs dated August 12, 2024, with respect to changes to the eligibility criteria for the Rental Housing Grants Program;

AND FURTHER THAT Council approves changes to the eligibility criteria of the Rental Housing Grants Program for 2024/2025 as outlined in the Report from Planning, Climate Sustainability, and Development Services dated August 12, 2024.

Carried

Councillor Stack returned to the meeting at 3:20 p.m.

5.2 Second Quarter 2024 Financial Performance

Staff:

- Displayed a PowerPoint Presentation summarizing the second quarter financial activity for the City of Kelowna and responded to questions from Council.

Moved By Councillor Lovegrove/Seconded By Councillor DeHart

THAT Council receives, for information, the Second Quarter 2024 Financial Performance Report from the Financial Services Controller as a continued approach of presenting timely and relevant financial information.

Carried

5.3 Quarter two Amendment to the 2024 Financial Plan

Staff:

- Displayed a PowerPoint Presentation outlining the quarter two amendments to the 2024 Financial Plan and responded to questions from Council.

Moved By Councillor DeHart/Seconded By Councillor Hodge

THAT Council receives, for information, the Report from Financial Services dated August 12, 2024 with respect to quarter two amendments to the 2024 Financial Plan;

AND THAT the 2024 Financial Plan be amended to include budget amendments detailed in this report.

Carried

5.4 Unsheltered Community Costs-Phase 1 Value for Money

Staff:

- Displayed a PowerPoint Presentation summarizing the results of the Unsheltered Community Costs and responded to questions from Council.

Moved By Councillor Stack/Seconded By Councillor DeHart

THAT Council receives, for information, the report from the Audit Committee dated August 12, 2024, with respect to the results of the Unsheltered Community Costs (Phase 1) Value for Money engagement as of the end of June 2024.

Carried

5.5 2024-2034 Community Works Fund Agreement

Staff:

- Displayed a PowerPoint Presentation providing an overview of the 2024-2034 Community Works Fund Agreement investment categories and changes made from the previous agreement and responded to questions from Council.

Moved By Councillor DeHart/Seconded By Councillor Hodge

THAT Council authorizes the Mayor and Corporate Officer to sign the 2024-2034 Canada Community-Building Agreement;

AND THAT the 2024 Financial Plan be amended to reflect the renewed funding agreement.

Carried

5.6 Diking Authority Designation - Mill Creek Flood Protection Project

Staff:

- Provided an overview of the application process in order to have Diking Authority for flood control structures as part of the Mill Creek Flood Protection project and responded to questions from Council.

Moved By Councillor Stack/Seconded By Councillor Lovegrove

THAT Council receives, for information, the report from Utility Services dated August 12, 2024, with respect to the Diking Authority designation for sub-projects as part of the Mill Creek Flood Protection Project;

AND THAT Council agrees, pursuant to the *Dike Maintenance Act*, to the City of Kelowna assuming the role of Diking Authority with respect to the necessary dikes or berms to be constructed along Mill Creek in accordance with the Mill Creek Flood Protection Project.

Carried

6. Bylaws for Adoption (Non-Development Related)

6.1 BL12685 - Amendment No. 27 to Bylaw No. 7900

Moved By Councillor Webber/Seconded By Councillor Stack

THAT Bylaw No. 12685 be adopted.

Carried

6.2 BL12686 - Amendment No. 2 to Development Application Fees Bylaw No. 12552

Moved By Councillor Stack/Seconded By Councillor Webber

THAT Bylaw No. 12686 be adopted.

Carried

6.3 BL12688 - Amendment No. 2 to Revitalization Tax Exemption Program Bylaw No. 12561

Councillor Stack declared a perceived conflict of interest as clients they have worked with in the past have applied for grants under this policy and departed the meeting at 4:12 p.m.

Moved By Councillor Webber/Seconded By Councillor DeHart

THAT Bylaw No. 12688 be adopted.

Carried

Councillor Stack returned to the meeting at 4:13 p.m.

6.4 BL12674 - Amendment No. 3 to Good Neighbour Bylaw 11500

Moved By Councillor Stack/Seconded By Councillor Webber

THAT Bylaw 12674 be adopted.

Carried

7. Mayor and Councillor Items

Councillor Lovegrove:

- Spoke to their attendance at the Apple Triathlon sprint series.
- Made a Notice of Motion regarding automated noise cameras for traffic noise.

Councillor Singh:

- Congratulated Kelowna's Jerome Black for winning the Olympic Gold Medal in the Canadian Men's Relay team.
- Made a Notice of Motion to shorten timeframe for a reapplication of rezoning at 1064-1084 Glenmore Drive.

Councillor DeHart:

- Commented on the history of traffic noise enforcement and support from the Province and other local governments.

Councillor Cannan:

- Congratulated Malindi Elmore on her Marathon at the 2024 Olympic Games.
- Asked the community to support local arts and performers.
- Requested staff contact for the dog park in City Park.
- Seeking information on fruit packing facilities to support farmers affected by the closure of BC Tree Fruits.

City Manager

- Enquiries for the dog park in City Park can be sent to his office to be directed accordingly.
- Commented on the review of options to support fruit packing needs and advanced options within the City's bylaw.

Mayor Dyas:

- Commented on the City's role in facilitating meetings with farmers and supporting the agricultural industry following the closure of BC Tree Fruits.

Councillor Hodge:

- Spoke to their attendance at two Water Basin Board Meeting with global warning and mussels as topics.

8. Termination

This meeting was declared terminated at 4:31 p.m.

Mayor Dyas

lb/acm



City Clerk

City Clerk

Report to Council



Date: August 26, 2024
To: Council
From: City Manager
Subject: 2024 Esri Special Achievement in GIS Award
Department: Information Services

Recommendation:

THAT Council receives for information the report from the General Manager, Corporate Services regarding the receipt of the 2024 Esri Special Achievement in GIS award, dated August 26, 2024.

Purpose:

To update Council on the receipt of the 2024 Esri Special Achievement in GIS award.

Background:

The City of Kelowna was presented with the 2024 Special Achievement in GIS (SAG) Award at the Esri User Conference in San Diego on July 15, 2024 by Jack Dangermond, Esri's president and founder. The SAG Awards are presented to outstanding organizations that have pioneered new ways of using GIS technology. Since the inception of this prestigious award in 2015, 14 Canadian organizations have been honored, and the City of Kelowna is proud to be the fifth municipality and the first one in BC to receive this recognition.

Esri is the world's leading provider of geographic information system (GIS) software, location intelligence and mapping. Esri was established in 1969 and Esri Canada was formed in 1984. Esri is committed to helping customers use geographic science and geospatial analytics to empower people in business, government, and education to make informed and timely decisions by using the power of mapping and spatial analytics. Globally, Esri solutions serve more than 650,000 organizations across all sectors and regions, including most national governments, and 12,000 universities.

Discussion:

The City of Kelowna is being honored for addressing rapid growth challenges with GIS, revolutionizing asset management, creating a digital twin for efficient planning and development, and successfully engaging citizens in community development.

As Canada's fastest growing city, City of Kelowna's population grew to 150,000 in 2021 and is projected to reach 230,000 by 2040. Our stunning natural landscape attracts residents, but also restricts development areas and exposes the city to natural hazards like flooding, landslides, and wildfires.

To cope with the challenges of fast growth and climate change, the Data Services and Analytics team are using our enterprise GIS platform to provide innovative solutions. We are embracing digital transformation and using automation to enhance city operations and public services, while advancing IT and business goals without increasing staff or software expenses.

The City adopted Esri technology in 2005 to handle data from our CAD system and to geo-enabled some of our in-house custom applications. Although many departments used maps and spatial data for services and operations, not all recognized the potential value GIS could bring to the community.

This significantly changed in 2016, when the City adopted the GIS-based solution Cityworks to support our Corporate Asset Management System. This resulted in tremendous efficiencies by digitally transforming our asset management processes.

Recognizing the value of GIS, the City worked with Esri Canada's Management Consulting team in 2019 to assess the needs of key departments. They developed a long-term geospatial strategy and roadmap to build a foundation for innovation. Since then, the City has expanded its use of GIS to support land management, planning and development, transportation, emergency management and public engagement.

We are using GIS to meet the targets set out in our Official Community Plan to build 36,000 housing units to accommodate 70,000 more residents by 2040. To better plan for growth, we created Model City, a parcel-based digital twin data model. Model City uses Esri's ArcGIS technology to integrate disparate data and provide a comprehensive picture of what Kelowna looks like today, tomorrow and in the future.

Recently, the City released Explore3D Kelowna, which enables citizens to ask questions about planned developments in the City's urban centers and receive immediate, up-to-date and complete answers. Citizens can use insightful 3D tools to see different scenarios—e.g., how their community would appear if buildings were higher or lower than proposed. The app helps us overcome development challenges, effectively manage and synthesize large data repositories, and improve community engagement.

Our Esri enterprise license agreement provides us with affordable access to ArcGIS technology, so that we have the right tools for the job. More importantly, the City's leadership team fosters innovation by encouraging staff to learn from mistakes. Our GIS program plays a vital role in our digital transformation and smart city projects. It enables us to use data and spatial analytics to improve operations, enhance services, and plan for the future. We take pride in the innovative solutions developed using Esri technology and the positive effects they have on our community.

The award was presented to Cheryl Trent, Data and Analytics Manager and Naomi Pears, Business Systems Analyst.

Submitted by: Joe Sass, General Manager Corporate Services

Approved for inclusion: Joe Sass, General Manager Corporate Services

Report to Council



Date: August 26, 2024
To: Council
From: City Manager
Department: Office of the City Clerk
Subject: Rezoning Bylaws Supplemental Report to Council

Recommendation:

THAT Council receives, for information, the report from the Office of the City Clerk dated August 26, 2024, with respect to five rezoning applications;

AND THAT Rezoning Bylaws No. 12689, 12690, 12691, 12692, and 12693 be forwarded for further reading consideration.

Purpose:

To receive a summary of notice of first reading for Rezoning Bylaws No. 12689, 12690, 12691, 12692, and 12693 and to give the bylaws further reading consideration.

Background:

A public hearing cannot be held for zoning bylaws for residential development that are consistent with the OCP. A public hearing is not required for all other zoning bylaws that are consistent with the OCP. Public notice is given before first reading with signage on the subject property, newspaper advertisements, and mailouts in accordance with the Local Government Act and Development Application & Heritage Procedures Bylaw No. 12310.

Discussion:

The five Rezoning Applications were brought forward to Council for initial consideration on August 12, 2024. Notice of first reading was completed as outlined above.

Correspondence was received as per the following table:

Address	Application	Bylaw	Public Hearing Option	Recommended Readings	Correspondence Received
Jim Bailey Cr 8860	Z24-0020	12689	Yes	1 st , 2 nd , 3 rd , adopt	0
St. Amand Rd 3150 3210 3220 and KLO Rd 1559	Z24-0002	12690	No	1 st , 2 nd , 3 rd	0
St. Paul St 1428	Z24-0025	12691	No	1 st , 2 nd , 3 rd	0
Badke Rd 765	Z24-0021	12692	No	1 st , 2 nd , 3 rd	0
Swainson Rd 1785	Z24-0012	12693	No	1 st , 2 nd , 3 rd	0

These applications were brought forward with a recommendation of support from the Development Planning Department. Staff are recommending Council proceed with further readings of the Bylaws.

Conclusion:

Following notice of first reading, staff are recommending that Council give Rezoning Bylaws No. 12689, 12690, 12691, 12692, and 12693 further reading consideration.

Considerations applicable to this report:

Legal/Statutory Authority:

Local Government Act s. 464(2)

Legal/Statutory Procedural Requirements:

Following the notification period under s. 467 of the Local Government Act, Council may choose to:

- give a bylaw reading consideration,
- defeat the bylaw, or
- for non-residential bylaws, give a bylaw first reading and advance the bylaw to a Public Hearing.

Considerations not applicable to this report:

Existing Policy:

Financial/Budgetary Considerations:

External Agency/Public Comments:

Communications Comments:

Submitted by: N Beauchamp, Legislative Technician

Approved for inclusion: M Jud, Acting City Clerk

cc: Development Planning

CITY OF KELOWNA

BYLAW NO. 12690

Z24-0002

3150, 3210, 3220 St. Amand Road and 1559 KLO Road

A bylaw to amend the "City of Kelowna Zoning Bylaw No. 12375".

The Municipal Council of the City of Kelowna, in open meeting assembled, enacts as follows:

1. THAT City of Kelowna Zoning Bylaw No. 12375 be amended by changing the zoning classification of:
 - a. Lot 1 District Lot 131 ODYD Plan 15011 Except Plan KAP78065, located on KLO Road, Kelowna, BC;
 - b. Lot 1 District Lot 131 ODYD Plan 17156, located on St. Amand Road, Kelowna, BC;
 - c. Lot 2 District Lot 131 ODYD Plan 17156, located on St. Amand Road, Kelowna, BC; and
 - d. Lot 3 District Lot 131 ODYD Plan 17156, located on St. Amand Road, Kelowna, BC;

from the MF1 - Infill Housing zone to the MF2 – Townhouse Housing zone.

2. This bylaw shall come into full force and effect and is binding on all persons as and from the date of adoption.

Read a first, second and third time by the Municipal Council this

Adopted by the Municipal Council of the City of Kelowna this

Mayor

City Clerk

CITY OF KELOWNA

BYLAW NO. 12691

Z24-0025

1428 St. Paul Street

A bylaw to amend the "City of Kelowna Zoning Bylaw No. 12375".

The Municipal Council of the City of Kelowna, in open meeting assembled, enacts as follows:

1. THAT City of Kelowna Zoning Bylaw No. 12375 be amended by changing the zoning classification of:
 - a. Lot 18 District Lot 139 ODYD Plan 800 located on St. Paul Street, Kelowna, BC, and
 - b. Lot 19 District Lot 139 ODYD Plan 800 located on St. Paul Street, Kelowna, BC

from the UC1 – Downtown Urban Centre zone to the UC1r – Downtown Urban Centre Rental Only zone.

2. This bylaw shall come into full force and effect and is binding on all persons as and from the date of adoption.

Read a first, second and third time by the Municipal Council this

Approved under the Transportation Act this

(Approving Officer – Ministry of Transportation)

Adopted by the Municipal Council of the City of Kelowna this

Mayor

City Clerk

CITY OF KELOWNA

BYLAW NO. 12692

Z24-0021

765 Badke Road

A bylaw to amend the "City of Kelowna Zoning Bylaw No. 12375".

The Municipal Council of the City of Kelowna, in open meeting assembled, enacts as follows:

1. THAT City of Kelowna Zoning Bylaw No. 12375 be amended by changing the zoning classification of Lot E Section 27 Township 26 ODYD Plan 22268 located on Badke Road, Kelowna, BC from the UC₄ – Rutland Urban Centre zone to the UC_{4r} – Rutland Urban Centre Rental Only zone.
2. This bylaw shall come into full force and effect and is binding on all persons as and from the date of adoption.

Read a first, second and third time by the Municipal Council this

Approved under the Transportation Act this

(Approving Officer – Ministry of Transportation)

Adopted by the Municipal Council of the City of Kelowna this

Mayor

City Clerk

CITY OF KELOWNA

BYLAW NO. 12693

Z24-0012

1785 Swainson Road

A bylaw to amend the "City of Kelowna Zoning Bylaw No. 12375".

The Municipal Council of the City of Kelowna, in open meeting assembled, enacts as follows:

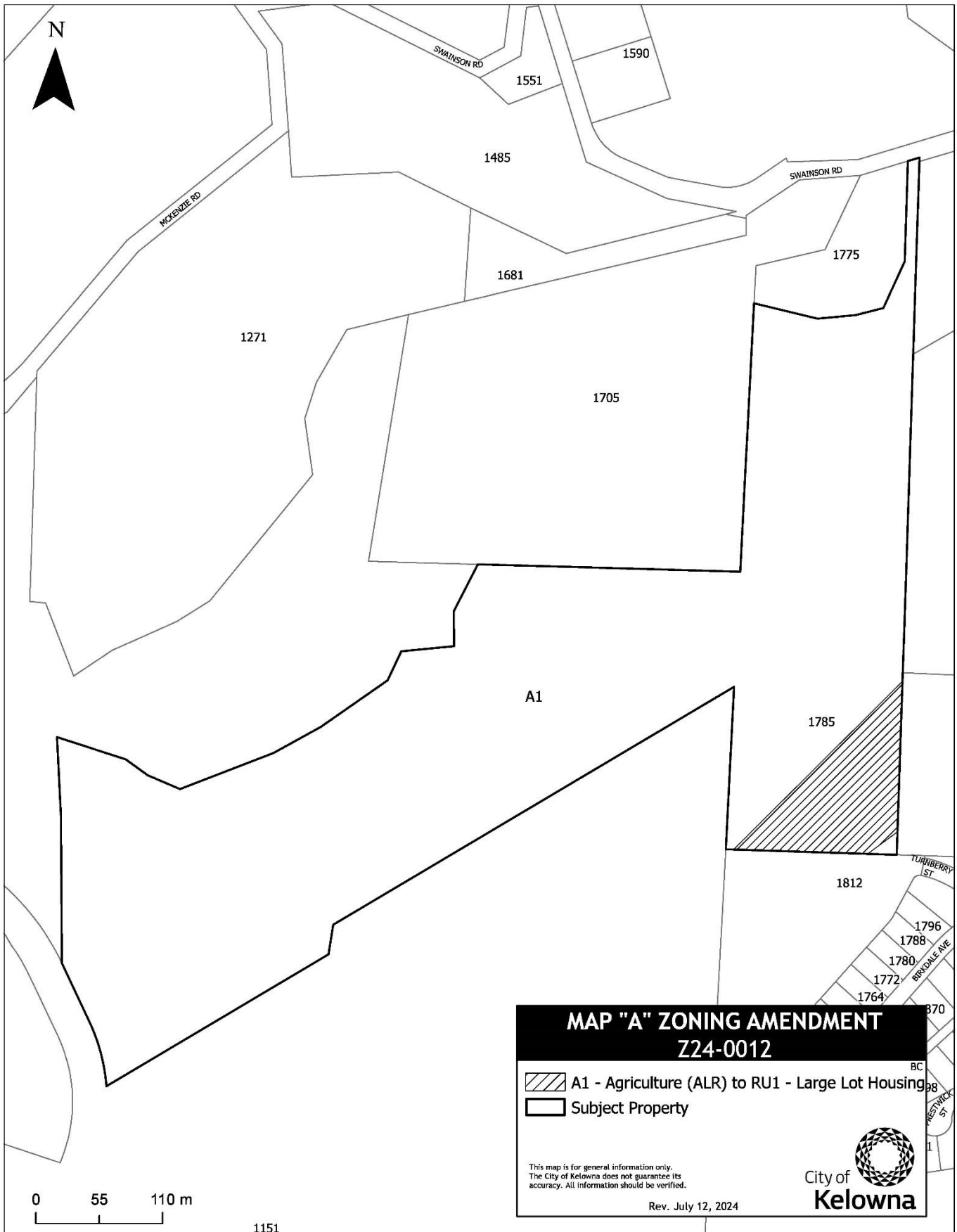
1. THAT City of Kelowna Zoning Bylaw No. 12375 be amended by changing the zoning classification of portions of Lot A Sections 19 and 30 Township 27 and of Section 24 Township 26 ODYD Plan EPP120799 located on Swainson Road, Kelowna, BC from the A1 – Agriculture zone to the RU1 – Large Lot Housing zone as shown on Map "A" attached to and forming part of this bylaw.
2. This bylaw shall come into full force and effect and is binding on all persons as and from the date of adoption.

Read a first, second and third time by the Municipal Council this



Adopted by the Municipal Council of the City of Kelowna this

Mayor


City Clerk



**MAP "A" ZONING AMENDMENT
Z24-0012**

 A1 - Agriculture (ALR) to RU1 - Large Lot Housing
 Subject Property

This map is for general information only.
 The City of Kelowna does not guarantee its accuracy. All information should be verified.


City of Kelowna

Rev. July 12, 2024

CITY OF KELOWNA
BYLAW NO. 12689
Z24-0020
886o Jim Bailey Crescent

A bylaw to amend the "City of Kelowna Zoning Bylaw No. 12375".

The Municipal Council of the City of Kelowna, in open meeting assembled, enacts as follows:

1. THAT City of Kelowna Zoning Bylaw No. 12375 be amended by changing the zoning classification of Lot 1 Section 2 Township 20 ODYD Plan KAP71932 located on Jim Bailey Crescent, Kelowna, BC from the I3 – Heavy Industrial zone to the I2 – General Industrial zone.
2. This bylaw shall come into full force and effect and is binding on all persons as and from the date of adoption.

Read a first, second and third time by the Municipal Council this

Adopted by the Municipal Council of the City of Kelowna this

Mayor

City Clerk

REPORT TO COUNCIL DEVELOPMENT PERMIT



Date: August 26, 2024
To: Council
From: City Manager
Address: 865 Solly Ct
File No.: DP24-0020
Zone: MF2 – Townhouse Housing

1.0 Recommendation

THAT Council authorizes the issuance of Development Permit No. DP24-0020 for Lot 2 Section 26 Township 26 ODYD PLAN 20566, located at 865 Solly Ct, Kelowna, BC subject to the following:

1. The dimensions and siting of the building to be constructed on the land be in accordance with Schedule "A";
2. The exterior design and finish of the building to be constructed on the land be in accordance with Schedule "B";
3. Landscaping to be provided on the land be in accordance with Schedule "C";
4. The applicant be required to post with the City a Landscape Performance Security deposit in the amount of 125% of the estimated value of the Landscape Plan, as determined by a Registered Landscape Architect.

AND THAT the applicant be required to complete the above noted conditions of Council's approval of the Development Permit Application in order for the permit to be issued;

AND FURTHER THAT this Development Permit is valid for two (2) years from the date of Council approval, with no opportunity to extend.

2.0 Purpose

To issue a Development Permit for the form and character of a townhouse housing development.

3.0 Development Planning

Staff support the proposed Development Permit for the form and character of townhouse housing. The proposed project generally aligns with the Official Community Plan (OCP) Form and Character Design Guidelines for townhouses. Key guidelines that are met include:

- Orienting building entries, windows, patios, and balconies to face the fronting street, with the primary entry clearly visible and directly accessible from the sidewalk;
- Providing usable outdoor amenity spaces and generous and well-designed landscaped areas that offer privacy, screening, and attractive interfaces with streets and open spaces; and
- Using building articulation, scaling, and setbacks to define individual units or intervals and to contribute to a consistent frontage pattern, pedestrian scale and rhythm along the fronting street.

The proposed townhomes consist of two buildings, each containing six units. The front-facing units are ground-oriented and face Solly Ct, with each unit offering three bedrooms. Building materials include white/black fibre cement siding, grey brick siding, green board and batten siding, vinyl windows and doors, glass guard rails, and wood privacy slats. Each unit will have private amenity spaces, including private decks and ground-level patios. A variety of shared amenities will be available, including a harvest table, community garden plot, tool storage cabinet, and a two-seat table.

The development meets all parking requirements, providing two parking spaces per unit, with a mix of four double-car garages and the remaining single-car garages with tandem stalls on-site. Additionally, two visitor parking spaces, including one accessible space, are provided. In-ground refuse and recycling bins will be provided on-site. All landscaping requirements have been fulfilled, including the planting of eight trees (four large and four medium) on-site. The existing cedar hedge at the rear of the property will be retained.

4.0 Subject Property & Background

4.1 Subject Property Map



The subject property is located within a cul-de-sac neighbourhood on Solly Ct, and is near the intersection with Hartman Rd. The surrounding area is zoned MF1 – Infill Housing area and P5 – Municipal District Park. The site is in close proximity to Rutland Recreation Park and Rutland Elementary, Middle, and Senior Secondary Schools. Approximately 300 m to the west is Rutland Rd N, a Transit Supportive Corridor with BC Transit stops.

5.0 Zoning Bylaw Regulations Summary

AREA & UNIT STATISTICS	
Gross Lot Area	1,649.87 m ²
Total Number of Units	12
Townhome	12

DEVELOPMENT REGULATIONS		
CRITERIA	MF ₂ ZONE	PROPOSAL
Total Maximum Floor Area Ratio	1.0 FAR	0.96 FAR
Max. Site Coverage (buildings)	55 %	39.9 %
Max. Site Coverage (buildings, parking, driveways)	80 %	80.0 %
Max. Height	11.0 m / 3 storeys	9.9 m / 3 storeys
Setbacks		
Min. Front Yard (West)	2.0 m	2.0 m
Min. Side Yard (North)	2.1 m	3.0 m
Min. Side Yard (South)	2.1 m	3.0 m
Min. Rear Yard (East)	4.5 m	4.5 m
Amenity Space		
Total Required Amenity Space	180 m²	432.9 m²
Common	48.0 m ²	48.15 m ²
Private	132.0 m ²	384.75 m ²
Landscaping		
Min. Number of Trees	8 trees	8 trees
Min. Large Trees	4 trees	4 trees

PARKING REGULATIONS		
CRITERIA	MF ₂ ZONE REQUIREMENTS	PROPOSAL
Total Required Vehicle Parking	22 stalls	22 stalls
Residential	20	20
Visitor	2	2
Ratio of Regular to Small Stalls	Min. 50% Regular Max. 50% Small	63.6 % Regular 36.4 % Small
Bicycle Stalls Short-Term	4.0 stalls	4.0 stalls

6.0 Application Chronology

Application Accepted: January 31, 2024
 Neighbour Notification Received: July 2, 2024
 Adoption of Zone Amending Bylaw: August 12, 2024

Report prepared by: Sara Skabowski, Planner I
Reviewed by: Jocelyn Black, Urban Planning Manager
Reviewed by: Nola Kilmartin, Development Planning Department Manager
Approved for Inclusion: Ryan Smith, Divisional Director, Planning, Climate Action & Development Services

Attachments:

Attachment A: Draft Development Permit DP24-0020

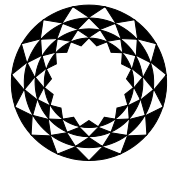
Schedule A: Site Plan & Floor Plans

Schedule B: Elevations & Sections

Schedule C: Landscape Plan

Attachment B: OCP Form and Character Development Permit Guidelines

For additional information, please visit our Current Developments online at www.kelowna.ca/currentdevelopments.



Development Permit

DP24-0020

City of
Kelowna

This permit relates to land in the City of Kelowna municipally known as

865 Solly Ct

and legally known as

Lot 2 Section 26 Township 26 ODYD PLAN 20566

and permits the land to be used for the following development:

Townhouse Housing

The present owner and any subsequent owner of the above described land must comply with any attached terms and conditions.

Date of Council Approval: August 26th, 2024

Development Permit Area: Form and Character

Existing Zone: MF2 – Townhouse Housing

Future Land Use Designation: C-NHD – Core Area Neighbourhood

This Development Permit is valid for two (2) years from the date of approval, with no opportunity to extend.

This is NOT a Building Permit.

In addition to your Development Permit, a Building Permit may be required prior to any work commencing. For further information, contact the City of Kelowna, Development Services Branch.

NOTICE

This permit does not relieve the owner or the owner's authorized agent from full compliance with the requirements of any federal, provincial or other municipal legislation, or the terms and conditions of any easement, covenant, building scheme or agreement affecting the building or land.

Owner: 865 Solly Ct LTD., INC., NO. BC1389060

Applicant: New Town Architecture and Engineering Inc.

Nola Kilmartin
Development Planning Department Manager
Planning & Development Services

Date of Issuance

1. SCOPE OF APPROVAL

This Development Permit applies to and only to those lands within the Municipality as described above, and any and all buildings, structures and other development thereon.

This Development Permit is issued subject to compliance with all of the Bylaws of the Municipality applicable thereto, except as specifically varied or supplemented by this permit, noted in the Terms and Conditions below.

The issuance of a permit limits the permit holder to be in strict compliance with regulations of the Zoning Bylaw and all other Bylaws unless specific variances have been authorized by the Development Permit. No implied variances from bylaw provisions shall be granted by virtue of drawing notations that are inconsistent with bylaw provisions and that may not have been identified as required Variances by the applicant or Municipal staff.

2. CONDITIONS OF APPROVAL

THAT Council authorizes the issuance of Development Permit No. DP24-0020 for Lot 2 Section 26 Township 26 ODYD PLAN 20566 located at 865 Solly Ct, Kelowna, BC, subject to the following:

- a) The dimensions and siting of the building to be constructed on the land be in accordance with Schedule "A";
- b) The exterior design and finish of the building to be constructed on the land be in accordance with Schedule "B";
- c) Landscaping to be provided on the land be in accordance with Schedule "C";
- d) The applicant be required to post with the City a Landscape Performance Security deposit in the amount of 125% of the estimated value of the Landscape Plan, as determined by a Registered Landscape Architect;

AND FURTHER THAT this Development Permit is valid for two (2) years from the date of Manager approval, with no opportunity to extend.

3. PERFORMANCE SECURITY

As a condition of the issuance of this Permit, Council is holding the security set out below to ensure that development is carried out in accordance with the terms and conditions of this Permit. Should any interest be earned upon the security, it shall accrue to the Developer and be paid to the Developer or his or her designate if the security is returned. The condition of the posting of the security is that should the Developer fail to carry out the development hereby authorized, according to the terms and conditions of this Permit within the time provided, the Municipality may use enter into an agreement with the property owner of the day to have the work carried out, and any surplus shall be paid over to the property owner of the day. Should the Developer carry out the development as per the conditions of this permit, the security shall be returned to the Developer or his or her designate following proof of Substantial Compliance as defined in Bylaw No. 12310. There is filed accordingly:

- a) An Irrevocable Letter of Credit **OR** certified cheque **OR** a Surety Bond in the amount of **\$111,246.90**

Before any bond or security required under this Permit is reduced or released, the Developer will provide the City with a statutory declaration certifying that all labour, material, workers' compensation and other taxes and costs have been paid.

4. INDEMNIFICATION

Upon commencement of the works authorized by this Permit the Developer covenants and agrees to save harmless and effectually indemnify the Municipality against:

- a) All actions and proceedings, costs, damages, expenses, claims, and demands whatsoever and by whomsoever brought, by reason of the Municipality said Permit.

All costs, expenses, claims that may be incurred by the Municipality where the construction, engineering or other types of works as called for by the Permit results in damages to any property owned in whole or in part by the Municipality or which the Municipality by duty or custom is obliged, directly or indirectly in any way or to any degree, to construct, repair, or maintain.

**The PERMIT HOLDER is the CURRENT LAND OWNER.
Security shall ONLY be returned to the signatory of the
Landscape Agreement or their designates.**

SCHEDULE

A

This forms part of application

DP24-0020

Planner
Initials

SS



ALL CONTRACTORS ARE REQUIRED TO PERFORM THEIR WORK AND SUPPLY THEIR PRODUCTS IN COMPLIANCE WITH ALL BUILDING CODES AND LAWS OF THE PROVINCE OF BRITISH COLUMBIA.
This drawing is an instrument of service and the property of New Town Services. The use of this drawing shall be restricted to the original site for which it was prepared and publication thereof is expressly limited to such use.

This drawing must not be scaled.
Verify all dimensions and details prior to commencement of work.
Report all errors and omissions to the Architect.



NEW TOWN
ARCHITECTURE
URBAN PLANNING
CIVIL ENGINEERING
www.newtownservices.ca



Revisions

No.	DATE	ISSUED FOR
1	2023-10-31	PRE-APP MEETING
2	2024-01-10	IFDP
3	2024-05-23	RE-IFDP

SOLLY CT TOWNHOMES

RE-IFDP, 2024-05-23



ARCHITECTURAL

NEW TOWN ARCHITECTURE & ENGINEERING
300-1050 BERTRAM STREET
KELOWNA, BC, V1Y 2G4
e: lenka@newtownservices.net t: (250) 860-8185

- A0.000 COVER PAGE
- A1.010 ZONING & BYLAW
- A2.010 SITE PLAN
- A3.010 LEVEL 1 FLOOR PLAN
- A3.020 LEVEL 2 FLOOR PLAN
- A3.030 LEVEL 3 FLOOR PLAN
- A3.040 ROOF PLAN
- A4.010 BUILDING ELEVATIONS
- A4.020 BUILDING ELEVATIONS
- A4.030 STREET ELEVATION - CONTEXT
- A8.010 UNIT PLANS
- A8.020 UNIT PLANS
- A8.030 UNIT PLANS
- A8.040 RENDERINGS

LANDSCAPE

CTQ
1334 ST. PAUL STREET
KELOWNA, BC, V1Y 2E1
e: djames@ctqconsultants.ca t: (250) 979-1221 Ext. 143

- LDP 1: COVER SHEET / ANALYSIS TABLE
- LDP 2: LANDSCAPE PLAN - ON-SITE
- LDP 3: LANDSCAPE PLAN - OFF-SITE
- LDP 4: LANDSCAPE PLAN - HYDROZONE PLAN

SURVEY

ALL TERRA
1315 ST PAUL ST
KELOWNA, BC V1Y 2E2
e: bdenton@allterrasurvey.ca t: (250)-762-0122

CLIENT

865 SOLLY COURT LTD., INC. NO. BC1389060
DAVE GILL
7809 GRAYSTONE DR
COLDSTREAM, BC V1B 4A9
e: dgill786@gmail.com

FOR PERMIT ONLY (NOT FOR TENDER)

project title
SOLLY CT TOWNHOMES

project address
**865 Solly Ct,
Kelowna, BC**

project no. **4226**

drawing title
COVER PAGE

approved: _____
date: _____
checked: _____
drawing no: _____
sheet: _____

A0.00D

print date: 23/05/2024 3:36:48 PM

SCHEDULE A

This forms part of application

DP24-0020

Planner Initials **SS**



ALL CONTRACTORS ARE REQUIRED TO PERFORM THEIR WORK AND SUPPLY THEIR PRODUCTS IN COMPLIANCE WITH ALL BUILDING CODES AND LAWS OF THE PROVINCE OF BRITISH COLUMBIA. This drawing is an instrument of service and the property of New Town Services. The use of this drawing shall be restricted to the original site for which it was prepared and publication thereof is expressly limited to such use. This drawing must not be scaled. Verify all dimensions and details prior to commencement of work. Report all errors and omissions to the Architect.



Revisions

No.	DATE	ISSUED FOR
1	2024-03-31	PRE-APP MEETING
2	2024-01-10	FDP
3	2024-05-23	RE-FDP

SOLLY CT TOWNHOMES

ADDRESS:
865 SOLLY COURT, KELOWNA, V1X 2X4, BRITISH COLUMBIA, CANADA

LEGAL ADDRESS:
LOT 2, SECTION 26 TOWNSHIP 26 OSOYOOS DIVISION YALE DISTRICT PLAN 20566

GRADES:
EXISTING: FLAT
PROPOSED: FLAT

NUMBER OF BUILDINGS:
2 BUILDINGS (12 UNITS)

ZONING ANALYSIS

EXISTING:
R1 - SINGLE FAMILY RESIDENTIAL

PROPOSED:
MF2 - TOWNHOUSE HOUSING

FUTURE LAND USE (2040 OCP):
C-NHD

TRANSIT SUPPORTED CORRIDOR:
N

ADJACENT LAND USES:
NORTH: R14
SOUTH: R12
EAST: P5
WEST: N/A

USE:
DUPLICATE HOUSING
MEDIUM LOT HOUSING
MUNICIPAL DISTRICT PARK

MF2 ZONING REQUIREMENTS

	REQUIRED:	PROPOSED:
SITE AREA (m²)	900m ²	1,649.87m ²
SITE WIDTH (m)	20.0m	39.2m
SITE DEPTH (m)	30.0m	42.1m
MAXIMUM SITE COVERAGE OF BUILDINGS (%)	55%	39.9%
MAXIMUM SITE COVERAGE OF IMPERMEABLE SURFACES (%)	80%	80.0%
VEHICULAR ACCESS FROM LANE OR LOWER CLASSED ROAD	Y	Y

DEVELOPMENT REQUIREMENTS

	REQUIRED:	PROPOSED:
TOTAL NUMBER & TYPES OF UNITS:		12 UNITS
FLOOR AREA (GFANFA)(m²):	1,649.87m ² MAX (BASED ON 1.0 FAR)	1,576.43m ² (658.23m ² GFA FOR SITE COVERAGE)
FLOOR AREA RATIO:		
BASE	1.0	0.96
BUILDING HEIGHT (m):		
OCP DESIGNATED	10.0m (3 STOREYS)	9.9m (3 STOREYS)
MAX. CONTINUOUS FRONTAGE:		
	100.0m	10.0m
SETBACKS (m):		
FRONT (WEST)	2.0m	2.0m
SIDE B (SOUTH)	3.0m	3.0m
SIDE B (NORTH)	3.0m	3.0m
BACK (EAST)	4.5m	4.5m
AMENITY SPACE (m²):		
COMMON AND PRIVATE	15.0m ² /UNIT+180.0m ²	269.1m ² (ON GRADE) 189.29m ² (DECK L3) 55.57m ² (DECK L3) 432.9m ²
COMMON AMENITY (PART OF)	4.0m ² /UNIT+48.0m ²	48.15m ²
PARKING STALLS:		
3-BED	1.6/UNIT+19.2	20
VISITOR	0.14/UNIT+1.68	2
ACCESSIBLE	1 (part of)	1 (part of)
TOTAL	21	22
DRIVE AISLE (WIDTH)	6.0m	6.5m
REGULAR STALL RATIO	50%	63.6% (14 STALLS)
SMALL STALL RATIO	50%	36.4% (8 STALLS)
BIKE STALLS (PER DWELLING UNIT):		
SHORT TERM	4.0	4.0
TOTAL	4.0	4.0

area calculation for FAR

UNIT#	area	sqm	sf
101	126.66 m ²	1363.36 SF	
102	140.16 m ²	1508.53 SF	
103	129.39 m ²	1396.51 SF	
104	129.75 m ²	1396.62 SF	
105	140.21 m ²	1509.72 SF	
106	126.26 m ²	1359.09 SF	
107	115.56 m ²	1244.69 SF	
108	140.16 m ²	1508.53 SF	
109	129.75 m ²	1396.62 SF	
110	129.75 m ²	1396.62 SF	
111	141.73 m ²	1525.52 SF	
112	126.66 m ²	1363.36 SF	
TOTAL	1576.43 m²	16968.91 SF	

PRIVATE DECK AREAS

UNIT#	area	sqm	sf
LEVEL 1			
101	18.90 m ²	204.52 SF	
102	7.29 m ²	78.59 SF	
103	11.45 m ²	123.29 SF	
104	11.48 m ²	123.82 SF	
105	11.47 m ²	123.47 SF	
106	12.37 m ²	133.04 SF	
108	11.53 m ²	124.53 SF	
109	11.53 m ²	124.53 SF	
110	11.53 m ²	124.53 SF	
111	12.43 m ²	134.03 SF	
112	11.77 m ²	126.49 SF	
LEVEL 2			
101	3.58 m ²	38.19 SF	
105	7.77 m ²	83.83 SF	
106	7.77 m ²	83.83 SF	
107	7.77 m ²	83.83 SF	
108	7.77 m ²	83.83 SF	
109	7.77 m ²	83.83 SF	
110	7.77 m ²	83.83 SF	
111	7.77 m ²	83.83 SF	
112	7.77 m ²	83.83 SF	

PRIVATE DECK AREAS

UNIT#	area	sqm	sf
LEVEL 3			
101	4.43 m ²	47.47 SF	
102	4.43 m ²	47.47 SF	
103	4.43 m ²	47.47 SF	
104	4.43 m ²	47.47 SF	
105	4.43 m ²	47.47 SF	
106	4.43 m ²	47.47 SF	
107	4.43 m ²	47.47 SF	
108	4.43 m ²	47.47 SF	
109	4.43 m ²	47.47 SF	
110	4.43 m ²	47.47 SF	
111	4.43 m ²	47.47 SF	
112	4.43 m ²	47.47 SF	



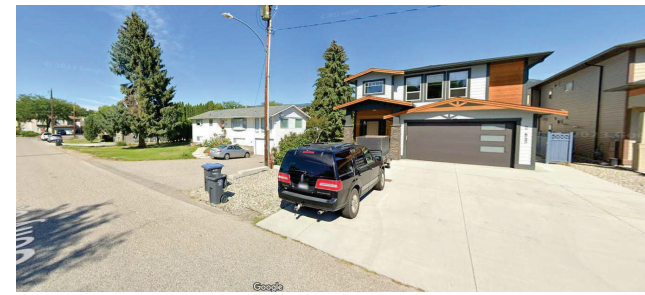
SITE CONTEXT - NTS



STREET VIEW OF 865 SOLLY COURT, KELOWNA



PROPERTY STREET VIEW OF NORTH OF SOLLY COURT



PROPERTY STREET VIEW OF SOUTH OF SOLLY COURT

FOR PERMIT ONLY (NOT FOR TENDER)

project title
SOLLY CT TOWNHOMES

project address
865 Solly Ct, Kelowna, BC

project no. **4226**

drawing title
ZONING & BAYLAW

approved: [Signature] LA 1:10
date: [Date] LA
checked: [Signature] JA
drawing no. **A1.01D**
issue: 23/05/2024 3:38:50 PM

SCHEDULE A

This forms part of application

DP24-0020

Planner Initials **SS**



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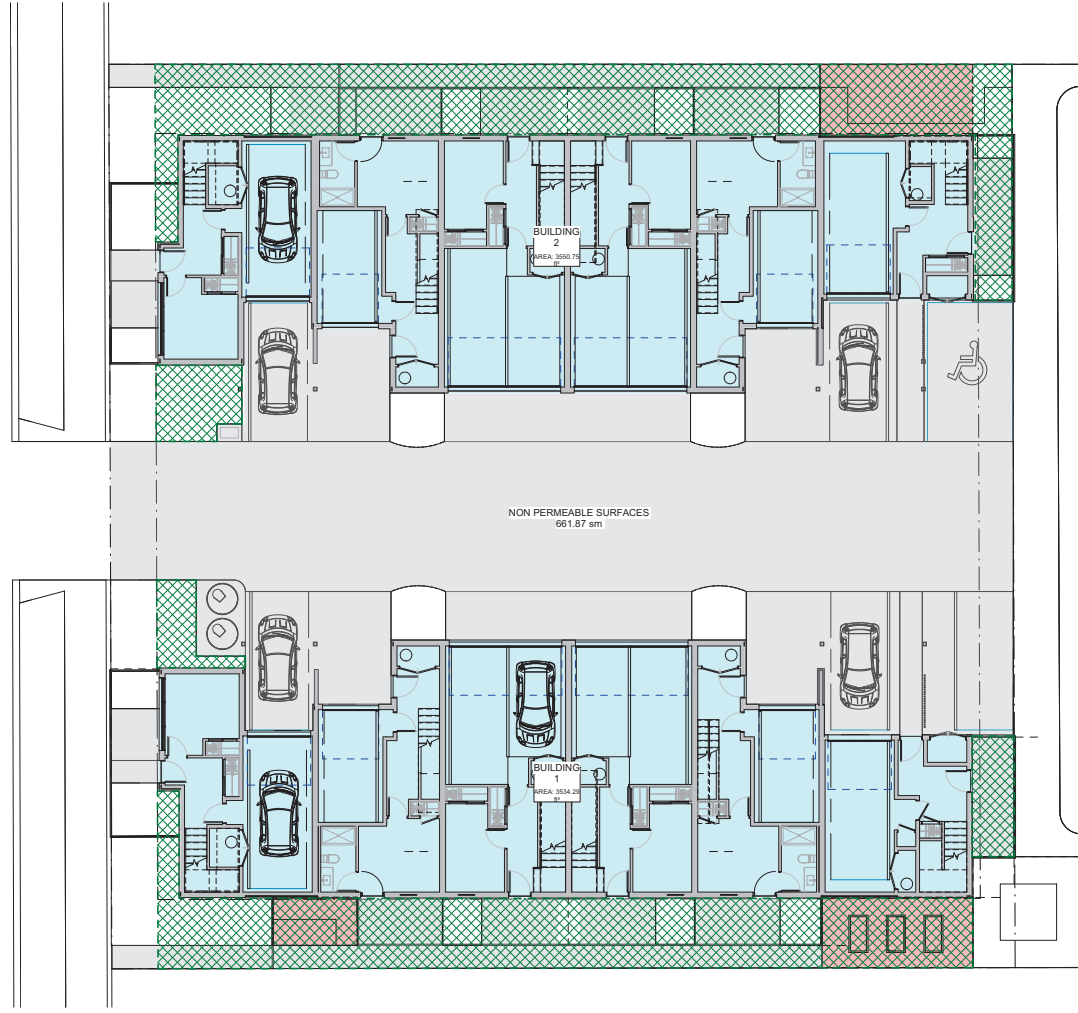
Revisions

No.	DATE	ISSUED FOR
1	2024-01-10	IFGP
2	2024-02-20	RP-IFGP

PRINT IN COLOUR

SITE COVERAGE AREA LEGEND

	NON-PERMEABLE SURFACES	661.87m ²
	BUILDING FOOTPRINT	658.23m ²
	COMMON AMENITY SPACE	48.15m ²
	PRIVATE OPEN SPACE	269.1m ²



FOR PERMIT ONLY (NOT FOR TENDER)

project title
SOLLY CT TOWNHOMES

project address
**865 Solly Ct,
Kelowna, BC**

project no. **4226**

drawing title
**SITE
COVERAGE
PLAN**

scale 1 : 100

drawn LA

checked LA

drawing date UA

A1.02D

print 23/05/2024 3:38:53 PM

SCHEDULE A

This forms part of application

DP24-0020

Planner Initials

SS

City of Kelowna
KEYNOTES - SITE
COMMUNITY PLANNING



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Seal

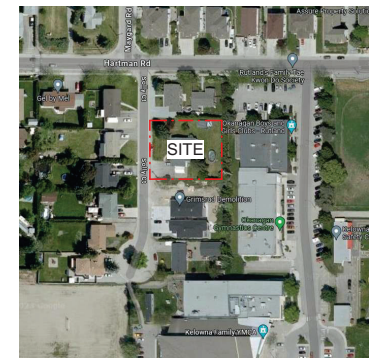


Revisions

No.	DATE	ISSUED FOR
1	2023-10-31	PRE-APP MEETING
2	2024-01-10	FPDP
3	2024-05-23	RE-FDP



OVERHEAD POWERLINES (to remain)



SITE CONTEXT
1" = 40'-0"

FOR PERMIT ONLY (NOT FOR TENDER)

project title
SOLLY CT TOWNHOMES

project address
**865 Solly Ct,
Kelowna, BC**

project no. **4226**

drawing title
SITE PLAN

Author: LA
Drawn: LA
Checked: LA
Designing: LA
Project: 23/05/2024 3:38:57 PM

A2.01D

SCHEDULE A

This forms part of application

DP24-0020



City of
Kelowna
COMMUNITY PLANNING

Planner Initials **SS**

KEYNOTES - FLOOR PLAN

ID DESCRIPTION



ALL CONTRACTORS ARE REQUIRED TO PERFORM THEIR WORK AND SUPPLY THEIR PRODUCTS IN COMPLIANCE WITH ALL BUILDING CODES AND LAWS OF THE PROVINCE OF BRITISH COLUMBIA.
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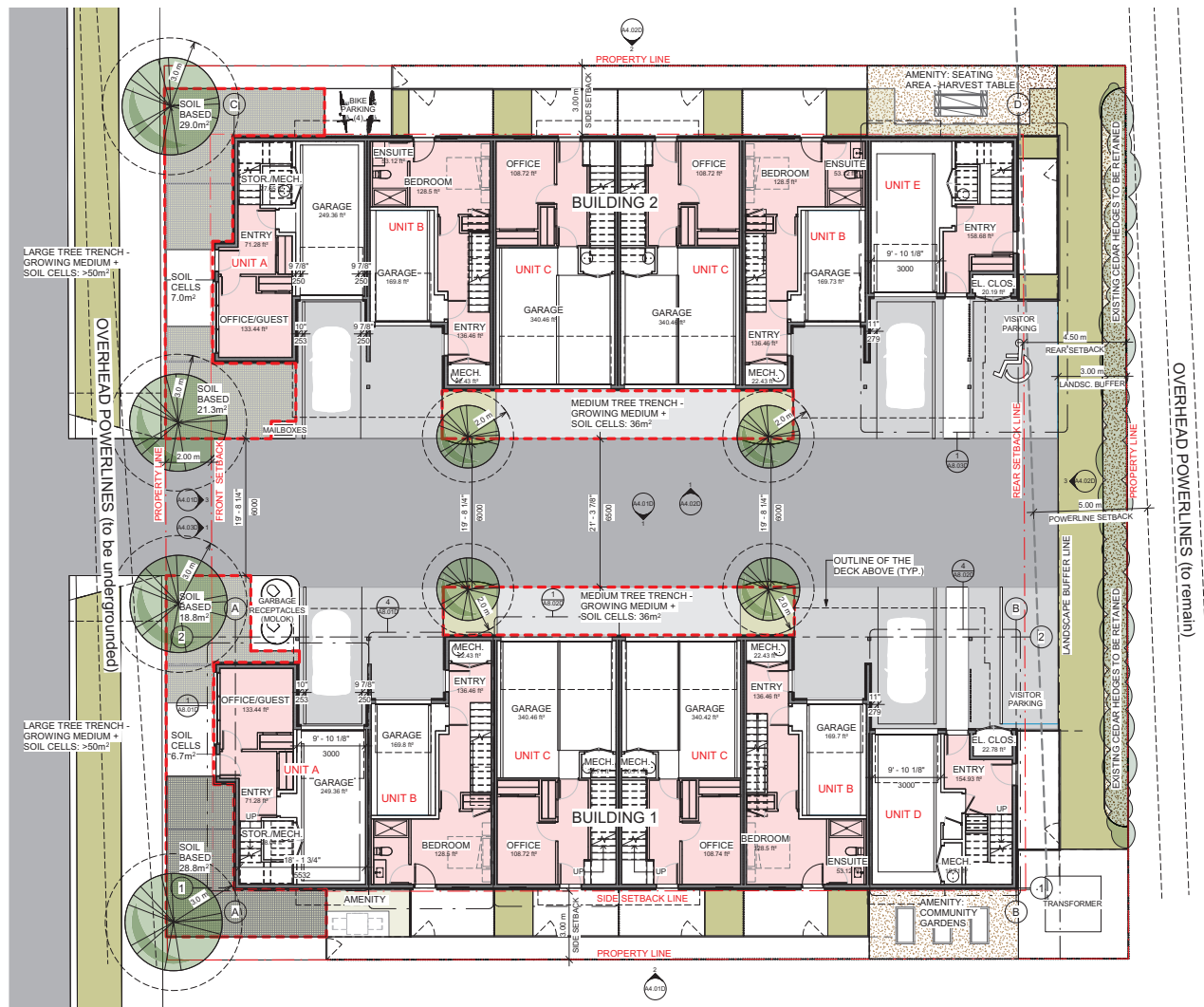


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Revisions

No.	DATE	ISSUED FOR
1	2024-03-31	PRE-APP MEETING
2	2024-01-19	FDP
3	2024-05-23	RE-FDP



FOR PERMIT ONLY (NOT FOR TENDER)

project title
SOILY CT TOWNHOMES

project address
**865 Soily Ct,
Kelowna, BC**

project no. **4226**

drawing title
LEVEL 1 FLOOR PLAN

scale
LA 1/8" = 1'-0"
LA
LA
UA

A3.01D

23/05/2024 9:37:03 PM

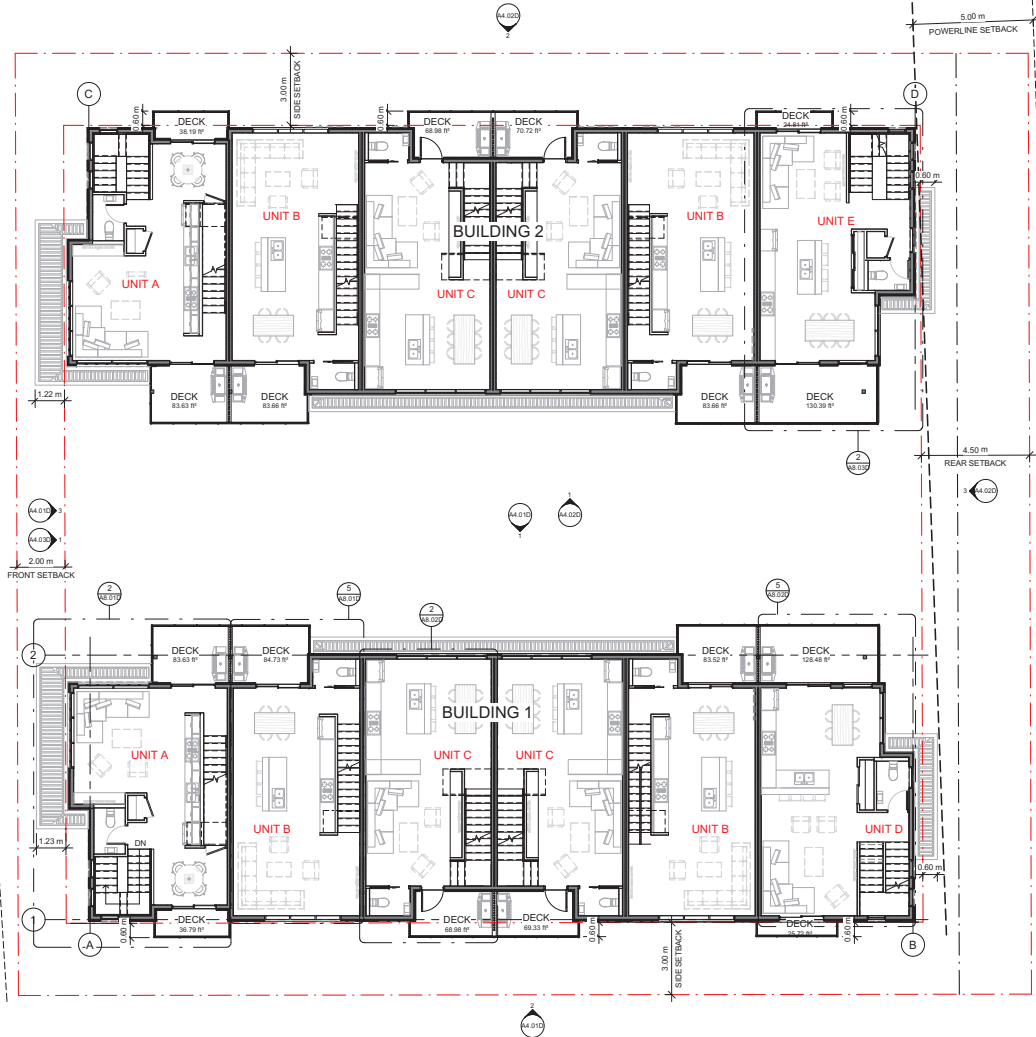
SCHEDULE A

This forms part of application

DP24-0020

Planner Initials **SS**

KEYNOTES - FLOOR PLAN
1.D DESCRIPTION



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Revisions

No.	DATE	ISSUED FOR
1	2023-10-31	PRE-APP MEETING
2	2024-01-19	FDP
3	2024-05-23	RE-FDP

FOR PERMIT ONLY (NOT FOR TENDER)

project title
SOLLY CT TOWNHOMES

project address
**865 Solly Ct,
Kelowna, BC**

project no. **4226**

drawing title
LEVEL 2 FLOOR PLAN

approved **LA** scale **1/8" = 1'-0"**
drawn **LA**
checked **UA**

A3.02D

print 23/05/2024 3:37:06 PM

SCHEDULE A

This forms part of application

DP24-0020

Planner Initials **SS**

KEYNOTES - FLOOR PLAN



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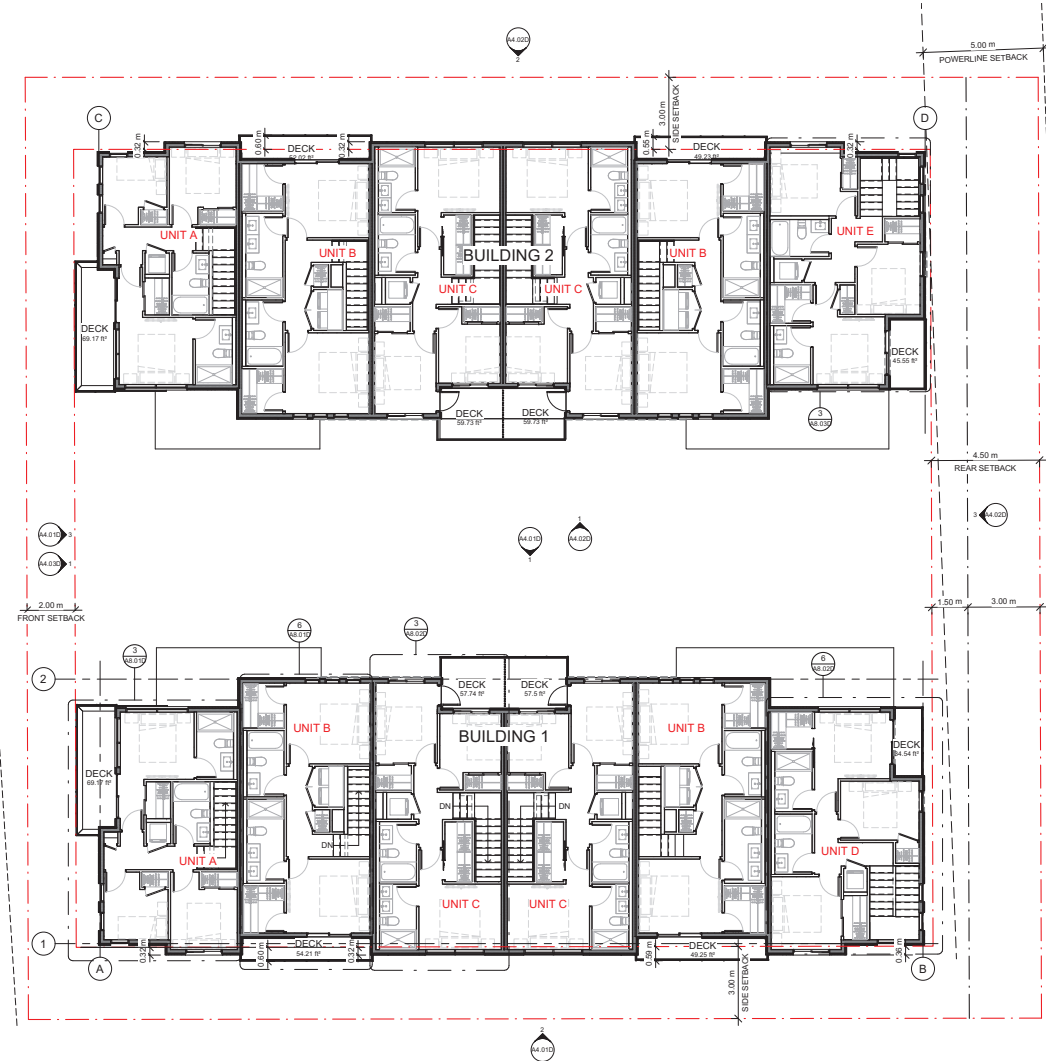


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URBAN PLANNING
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Revisions

No.	DATE	ISSUED FOR
1	2023-10-31	PRE-APP MEETING
2	2024-01-10	FDP
3	2024-05-23	RE-FDP



FOR PERMIT ONLY (NOT FOR TENDER)

project title
SOLLY CT TOWNHOMES

project address
**865 Solly Ct,
Kelowna, BC**

project no. **4226**

drawing title
LEVEL 3 FLOOR PLAN

sheet **LA** of **18'** x **14'**
drawn **LA**
checked **UA**

A3.03D

print date 23/05/2024 3:37:10 PM

SCHEDULE A

This forms part of application

DP24-0020

Planner Initials **SS**



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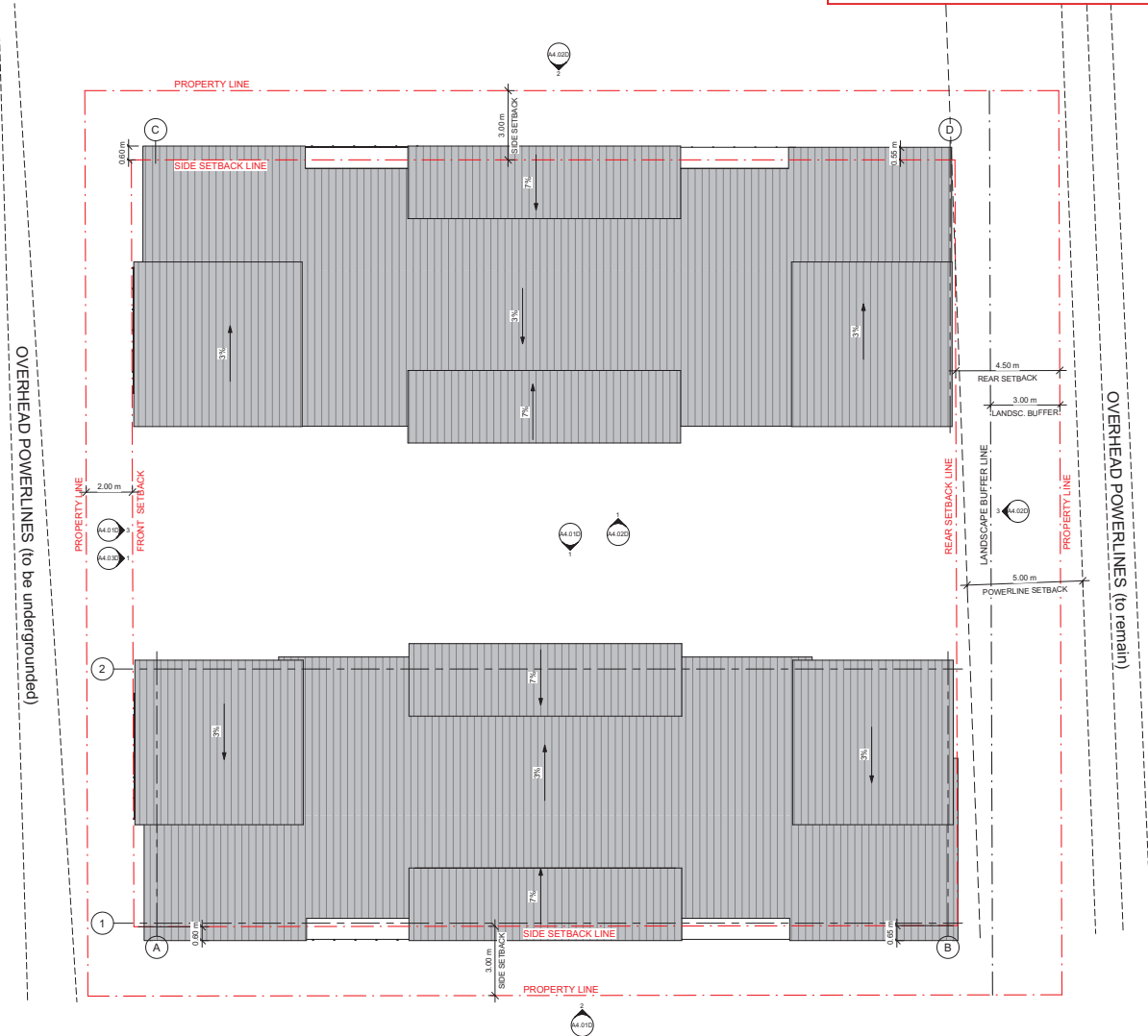


Revisions

No.	DATE	ISSUED FOR
1	2024-01-10	RFIP
2	2024-02-27	RF-FCIP

PRINT IN COLOUR

FOR PERMIT ONLY (NOT FOR TENDER)



OVERHEAD POWERLINES (to be undergrounded)

OVERHEAD POWERLINES (to remain)

project title
SOILY CT TOWNHOMES

project address
**865 Soily Ct,
Kelowna, BC**

project no. **4226**

drawing title
ROOF PLAN

approved: **LA** scale: **1/8" = 1'-0"**

drawn: **LA**

checked: **UA**

drawing no. **A3.04D**

print date: **23/05/2024 9:37:10 PM**

SCHEDULE A

This forms part of application

DP24-0020



City of
Kelowna
COMMUNITY PLANNING

Planner
Initials

SS
881

16'-10 7/8"

5151

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Revisions

No.	DATE	ISSUED FOR
1	2024-01-10	4/3P
2	2024-02-23	RP-4/3P

FOR PERMIT ONLY (NOT FOR TENDER)

project title
SOILY CT TOWNHOMES

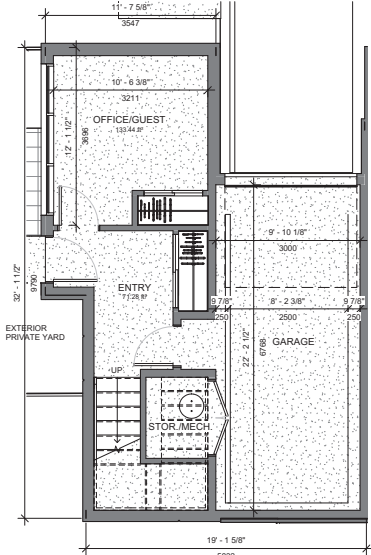
project address
**865 Soily Ct,
Kelowna, BC**

project no. **4226**

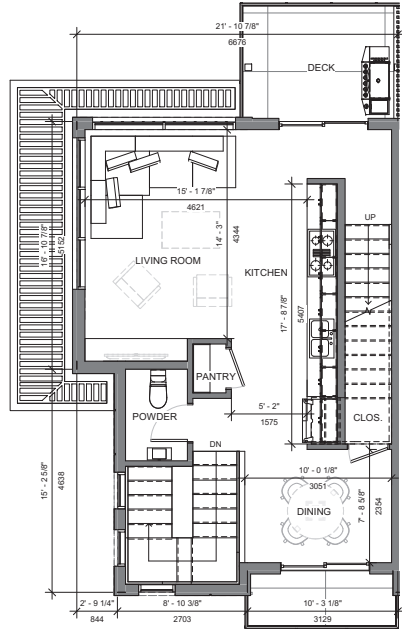
drawing title
UNIT PLANS

approved	date	scale
LA	1/4" = 1'-0"	

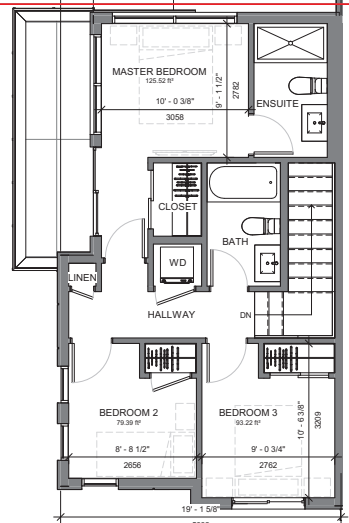
A8.01D
23/05/2024 9:37:45 PM



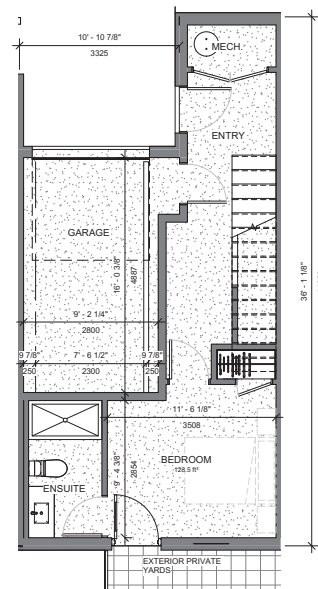
1 UNIT A - L1
1/4" = 1'-0"



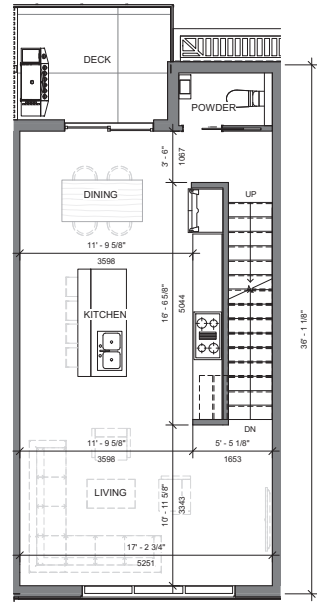
2 UNIT A - L2
1/4" = 1'-0"



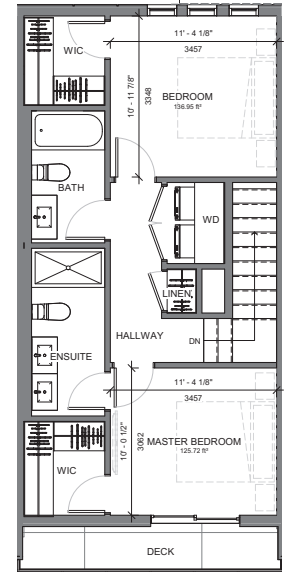
3 UNIT A - L3
1/4" = 1'-0"



4 UNIT B - L1
1/4" = 1'-0"



5 UNIT B - L2
1/4" = 1'-0"



6 UNIT B - L3
1/4" = 1'-0"

SCHEDULE A

This forms part of application

DP24-0020



City of
Kelowna
COMMUNITY PLANNING

Planner
Initials

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URBAN PLANNING
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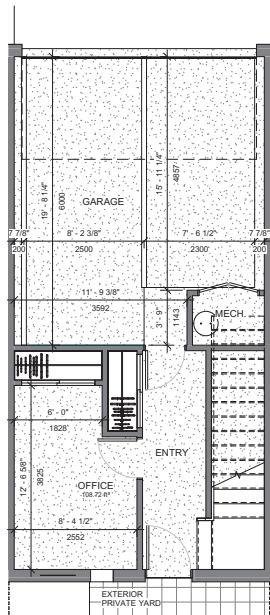
Scale



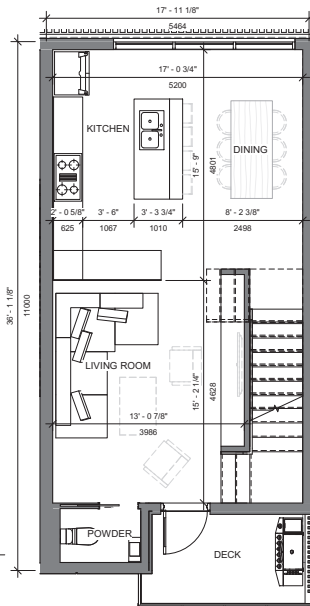
Revisions

No.	DATE	ISSUED FOR
1	2024-01-10	RFIP
2	2024-02-23	RF-FCIP

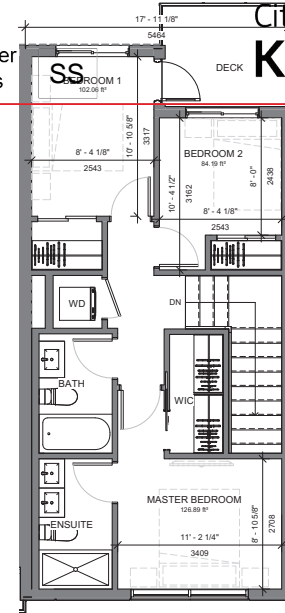
1 UNIT C - L1
1/4" = 1'-0"



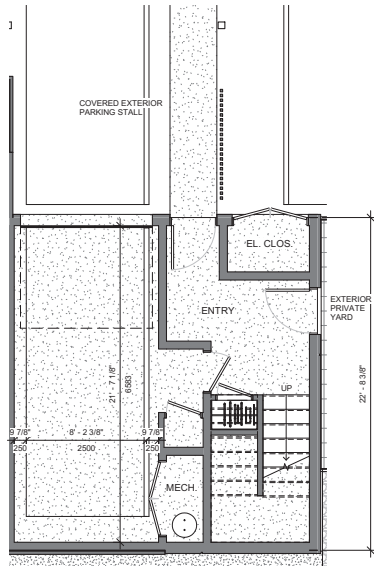
2 UNIT C - L2
1/4" = 1'-0"



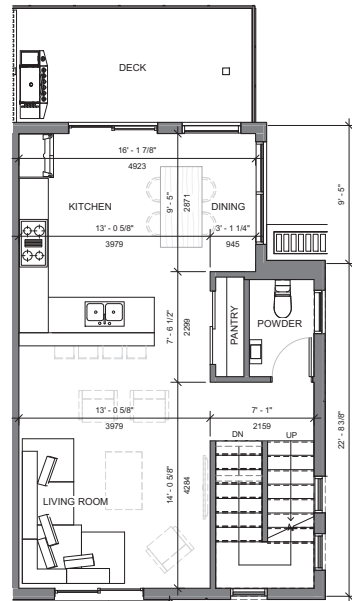
3 UNIT C - L3
1/4" = 1'-0"



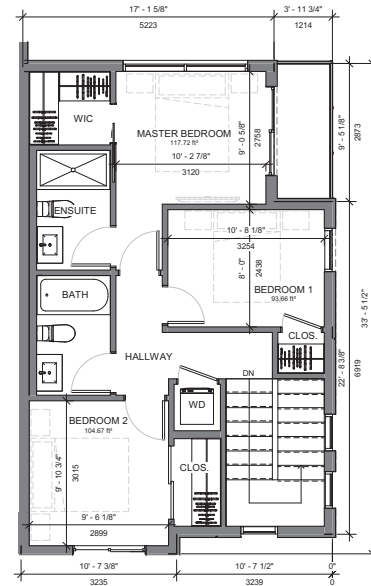
4 UNIT D - L1
1/4" = 1'-0"



5 UNIT D - L2
1/4" = 1'-0"



6 UNIT D - L3
1/4" = 1'-0"



FOR PERMIT ONLY (NOT FOR TENDER)

project title
SOLLY CT TOWNHOMES

project address
**865 Solly Ct,
Kelowna, BC**

project no. **4226**

drawing title
UNIT PLANS

approved	date	scale
LA	1/4" = 1'-0"	

A8.02D

printed 23/05/2024 9:37:48 PM

SCHEDULE A

This forms part of application

DP24-0020



City of
Kelowna
COMMUNITY PLANNING

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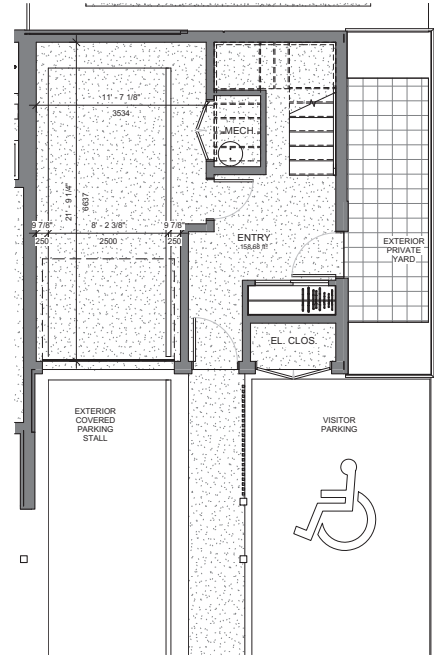


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CIVIL ENGINEERING
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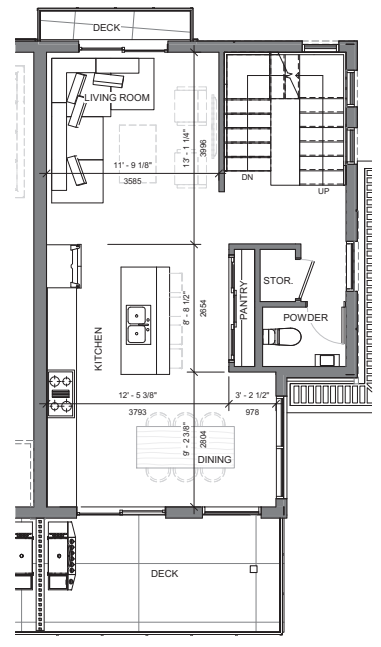


Revisions

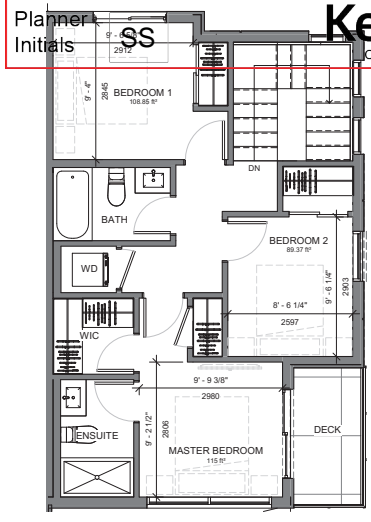
No.	DATE	ISSUED FOR
1	2024-01-19	RFIP
2	2024-02-23	RF-RTCP



1 UNIT E - L1
1/4" = 1'-0"



2 UNIT E - L2
1/4" = 1'-0"



3 UNIT E - L3
1/4" = 1'-0"

FOR PERMIT ONLY (NOT FOR TENDER)

project title
SOLLY CT TOWNHOMES

project address
**865 Solly Ct,
Kelowna, BC**

project no. **4226**

drawing title
UNIT PLANS

designed by LA
drawn by LA
checked by UA
drawing no. **A8.03D**
print date 23/05/2024 9:37:47 PM

SCHEDULE B

This forms part of application

DP24-0020



City of
Kelowna
COMMUNITY PLANNING

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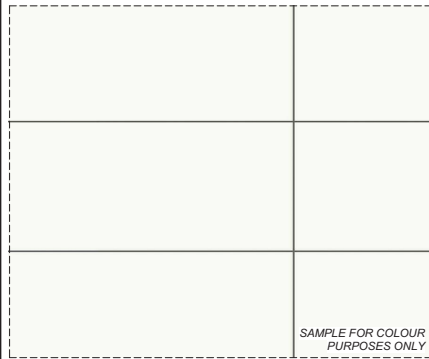
Revisions

No.	DATE	ISSUED FOR
1	2024-05-23	REV-RFP

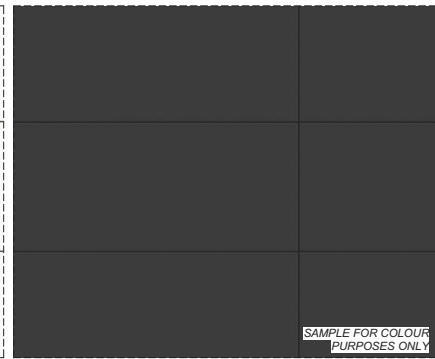
PRINT IN COLOUR

FOR PERMIT ONLY (NOT FOR TENDER)

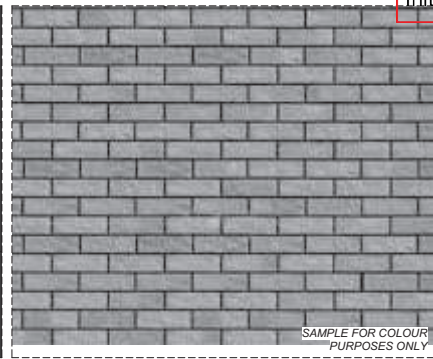
PRODUCT: FIBRE CEMENT SIDING C/W REVEAL
COLOUR & CODE: WHITE
I.D NUMBER: 1.



PRODUCT: FIBRE CEMENT SIDING C/W REVEAL
COLOUR & CODE: IRON GREY / BLACK
I.D NUMBER: 2.



MANUFACTURER: T.B.C.
PRODUCT: BRICK SIDING
COLOUR & CODE: GREY
I.D NUMBER: 3.



MANUFACTURER: T.B.C.
PRODUCT: BOARD & BATTEN FIBRE CEMENT SIDING
COLOUR & CODE: GREEN
I.D NUMBER: 4.



MANUFACTURER: LONGBOARD
PRODUCT: ALUMINUM SOFFIT - PLANK
COLOUR & CODE: WOOD GRAINS: REM (ROCK ELM)
I.D NUMBER: 5.



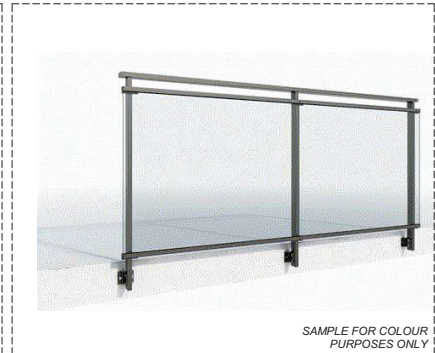
PRODUCT: VINYL SLIDING DOOR
COLOUR & CODE: CLEAR GLASS, BLACK FRAME
I.D NUMBER: 6.



PRODUCT: VINYL WINDOW
COLOUR & CODE: CLEAR GLASS, BLACK FRAME
I.D NUMBER: 7.



PRODUCT: GLASS RAILING
COLOUR & CODE: BLACK GALV. ALU POSTS W/TRANSP. GLASS PANELS
I.D NUMBER: 8.



PRODUCT: MOLOK GARBAGE GARBAGE CONTAINERS
COLOUR & CODE: AS PER MANUFACTURER
I.D NUMBER: 9.



PRODUCT: LOOP - 2 SPACE BIKE RACK
COLOUR & CODE: BLACK
I.D NUMBER: 10.



MANUFACTURER: T.B.C.
PRODUCT: WOOD PRIVACY SCREEN
COLOUR & CODE: WOOD GRAINS: REM (ROCK ELM)
I.D NUMBER: 11.



MANUFACTURER: T.B.C.
PRODUCT: BOARD & BATTEN FIBRE CEMENT SIDING
COLOUR & CODE: GREY
I.D NUMBER: 12.



project title
SOILY CT TOWNHOMES

project address
**865 Soily Ct,
Kelowna, BC**

project no. **4226**

drawing title
MATERIALS

approved	date	scale
LA		1 : 10
drawn		LA
checked		UA
drawing title		

A4.00D

print 23/05/2024 9:37:11 PM

SCHEDULE B

This forms part of application

DP24-0020



City of
Kelowna
COMMUNITY PLANNING

Planner
Initials

SS

KEYNOTES - ELEVATION

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ARCHITECTURE
URBAN PLANNING
CIVIL ENGINEERING
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Revisions

No.	DATE	ISSUED FOR
1	2023-10-31	PRE-APP MEETING
2	2024-01-10	FPDP
3	2024-05-23	RE-FDP

PRINT IN COLOUR

FOR PERMIT ONLY (NOT FOR TENDER)



1 NORTH ELEVATION
1/8" = 1'-0"



2 SOUTH ELEVATION
1/8" = 1'-0"



3 WEST ELEVATION
1/8" = 1'-0"

- MATERIAL LEGEND**
1. COMPOSITE PANEL SIDING - WHITE
 2. COMPOSITE PANEL SIDING - GREY
 3. BRICK VENEER - GREY
 4. VERTICAL FIBRE CEMENT BOARD & BATTEN - GREEN
 5. ALUMINIUM SOFFIT PLANK - WOOD GRAIN
 6. VINYL SLIDING DOOR - CLEAR GLASS, BLACK FRAME
 7. VINYL WINDOW - CLEAR GLASS, BLACK FRAME
 8. GLASS RAILING - BLACK GALV. ALU POSTS W/TRANSP. GLASS PANELS
 9. MOLK GARBAGE CONTAINERS
 10. LOOP - 2 SPACE BIKE RACK - BLACK
 11. VERTICAL WOOD PRIVACY SCREEN - NATURAL
 12. VERTICAL FIBRE CEMENT BOARD & BATTEN - GREY

project title
SOILY CT TOWNHOMES

project address
**865 Soily Ct,
Kelowna, BC**

project no. **4226**

drawing title
BUILDING ELEVATIONS

approved: _____
LA: _____ As indicated

drawn: _____ LA

checked: _____ LA

drawing no. _____ UA

A4.01D

print 23/05/2024 9:37:21 PM

SCHEDULE B

This forms part of application

DP24-0020



City of
Kelowna
COMMUNITY PLANNING

Planner
Initials

SS

KEYNOTES - ELEVATION

ID DESCRIPTION

ALL CONTRACTORS ARE REQUIRED TO PERFORM THEIR WORK AND SUPPLY THEIR PRODUCTS IN COMPLIANCE WITH ALL BUILDING CODES AND LAWS OF THE PROVINCE OF BRITISH COLUMBIA.

This drawing is an instrument of service and the property of New Town Services. The use of this drawing shall be restricted to the original site for which it was prepared and publication thereof is expressly limited to such use.

This drawing must not be scaled. Verify all dimensions and details prior to commencement of work. Report all errors and omissions to the Architect.



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Revisions

No.	DATE	ISSUED FOR
1	2023-10-31	PRE-APP MEETING
2	2024-01-10	FDP
3	2024-05-23	RE-FDP

PRINT IN COLOUR

FOR PERMIT ONLY (NOT FOR TENDER)

project title
SOILY CT TOWNHOMES

project address
**865 Soily Ct,
Kelowna, BC**

project no. **4226**

drawing title
BUILDING ELEVATIONS

approved: LA As Indicated
drawn: LA
checked: LA
drawing no: UA

A4.02D

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1 SOUTH ELEVATION - BUILDING 2
1/8" = 1'-0"



2 NORTH ELEVATION - BUILDING 2
1/8" = 1'-0"



3 EAST ELEVATION
1/8" = 1'-0"

- MATERIAL LEGEND**
1. COMPOSITE PANEL SIDING - WHITE
 2. COMPOSITE PANEL SIDING - GREY
 3. BRICK VENEER - GREY
 4. VERTICAL FIBRE CEMENT BOARD & BATTEN - GREEN
 5. ALUMINUM SOFFIT PLANK - WOOD GRAIN
 6. VINYL SLIDING DOOR - CLEAR GLASS, BLACK FRAME
 7. VINYL WINDOW - CLEAR GLASS, BLACK FRAME
 8. GLASS RAILING - BLACK GALV. ALU POSTS W/TRANSP. GLASS PANELS
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SCHEDULE B

This forms part of application

DP24-0020



City of
Kelowna
COMMUNITY PLANNING

Planner Initials **SS**

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Revisions

No.	DATE	ISSUED FOR
1	2024-05-23	RD-F3P

PRINT IN COLOUR

FOR PERMIT ONLY (NOT FOR TENDER)

project title
SOILY CT TOWNHOMES

project address
**865 Solly Ct,
Kelowna, BC**

project no. **4226**

drawing title
**STREET
ELEVATION -
CONTEXT**

scale: LA 1/8" = 1'-0"

date: LA
checked: UA
drawing no.

A4.03D

print: 23/05/2024 9:37:42 PM



885 SOILY COURT



845 SOILY COURT



SCHEDULE B

This forms part of application

DP24-0020



City of
Kelowna
COMMUNITY PLANNING

Planner Initials **SS**

ALL CONTRACTORS ARE REQUIRED TO PERFORM THEIR WORK AND SUPPLY THEIR PRODUCTS IN COMPLIANCE WITH ALL BUILDING CODES AND LAWS OF THE PROVINCE OF BRITISH COLUMBIA.
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Verify all dimensions and details prior to commencement of work.
Report all errors and omissions to the Architect.



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Seal



Revisions

NO.	DATE	ISSUED FOR
1	2023-10-31	PRE-APP MEETING
2	2024-01-10	FPDP
3	2024-05-23	RE-FDP

PRINT IN COLOUR



RENDERING NUMBER 1 - VIEW FROM SOLLY CT



RENDERING NUMBER 2 - VIEW FROM SOLLY CT



RENDERING NUMBER 3 - VIEW FROM REAR OF THE SITE



RENDERING NUMBER 4 - VIEW FROM REAR OF THE SITE

FOR PERMIT ONLY (NOT FOR TENDER)

project title
SOLLY CT TOWNHOMES

project address
**865 Solly Ct,
Kelowna, BC**

project no. **4226**

drawing title
RENDERINGS

designed **LA** scale **1 : 10**
drawn **LA**
checked **UA**

A9.01D
28/05/2024 9:37:47 PM

SCHEDULE C

This forms part of application
DP24-0020



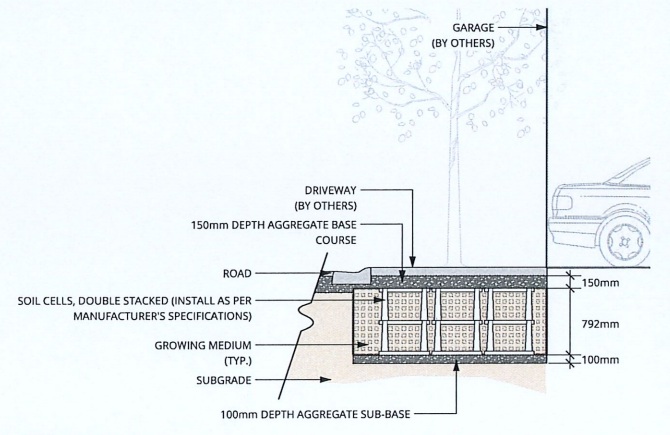
Planner Initials **SS**

City of Kelowna
COMMUNITY PLANNING

PRECEDENT IMAGES:



REPRESENTATIVE PLANTING



SECTION A-A - THROUGH DRIVEWAY
SCALE: NTS

PLANT LIST

QTY	BOTANICAL NAME	COMMON NAME	SIZE	ROOT
Deciduous Trees				
4	<i>Carpinus betulus 'Fastigiata'</i>	Pyramidal European Hornbeam	6cm Cal	B&B
4	<i>Fagus sylvatica 'Fastigiata'</i>	Fastigate Beech	6cm Cal	B&B
Shrubs				
	<i>Buddleia x 'Miss Molly'</i>	Butterfly Bush	#02	Potted
	<i>Buxus 'Green Velvet'</i>	Green Velvet Boxwood	#02	Potted
	<i>Cornus alba 'Baillhala'</i>	Ivory Halo Dogwood	#02	Potted
	<i>Hydrangea paniculata 'Little Quick Fire'</i>	Panicle Hydrangea	#02	Potted
	<i>Syringa meyeri 'Palibin'</i>	Dwarf Korean Lilac	#02	Potted
Ornamental Grasses				
	<i>Calamagrostis x acutiflora 'Overdam'</i>	Feather Reed Grass	#01	Potted
	<i>Helictotrichon sempervirens</i>	Blue Oat Grass	#01	Potted
	<i>Miscanthus sinensis 'Gracillimus'</i>	Chinese Silver Grass	#01	Potted
	<i>Molina caerulea 'Skyracer'</i>	Purple Moor Grass	#01	Potted
Perennials				
	<i>Achillea filipendulina 'Gold Plate'</i>	Fern-Leaf Yarrow	#01	Potted
	<i>Eupatorium dubium 'Baby Joe'</i>	Joe-Pye Weed	#01	Potted
	<i>Geranium 'Rozanne'</i>	Rozanne geranium	#01	Potted

* - CoK Bylaw No.12375 Required Tree

NOTES:

- THIS DRAWING DEPICTS FORM AND CHARACTER AND IS TO BE USED FOR DEVELOPMENT PERMIT SUBMISSION ONLY. IT IS NOT INTENDED FOR USE AS A CONSTRUCTION DOCUMENT.
- ALL PLANT MATERIALS AND CONSTRUCTION METHODS SHALL CONFORM TO THE MINIMUM STANDARDS SET OUT IN THE CANADIAN LANDSCAPE STANDARD (CURRENT EDITION).
- ALL PLANTING BEDS SHALL RECEIVE 50mm OF COMPOSTED BARK MULCH UNLESS OTHERWISE NOTED.
- ALL LANDSCAPE AREAS ARE TO BE IRRIGATED WITH A HIGH EFFICIENCY AUTOMATIC IRRIGATION SYSTEM.
- SOIL DEPTH TO BE AS FOLLOWS:
LAWN AREAS 150mm MIN
SHRUB AREAS 450mm MIN
TREES 900mm MIN UNLESS OTHERWISE NOTED.



PATIO PRIVACY SCREEN & FENCE



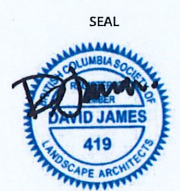
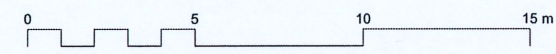
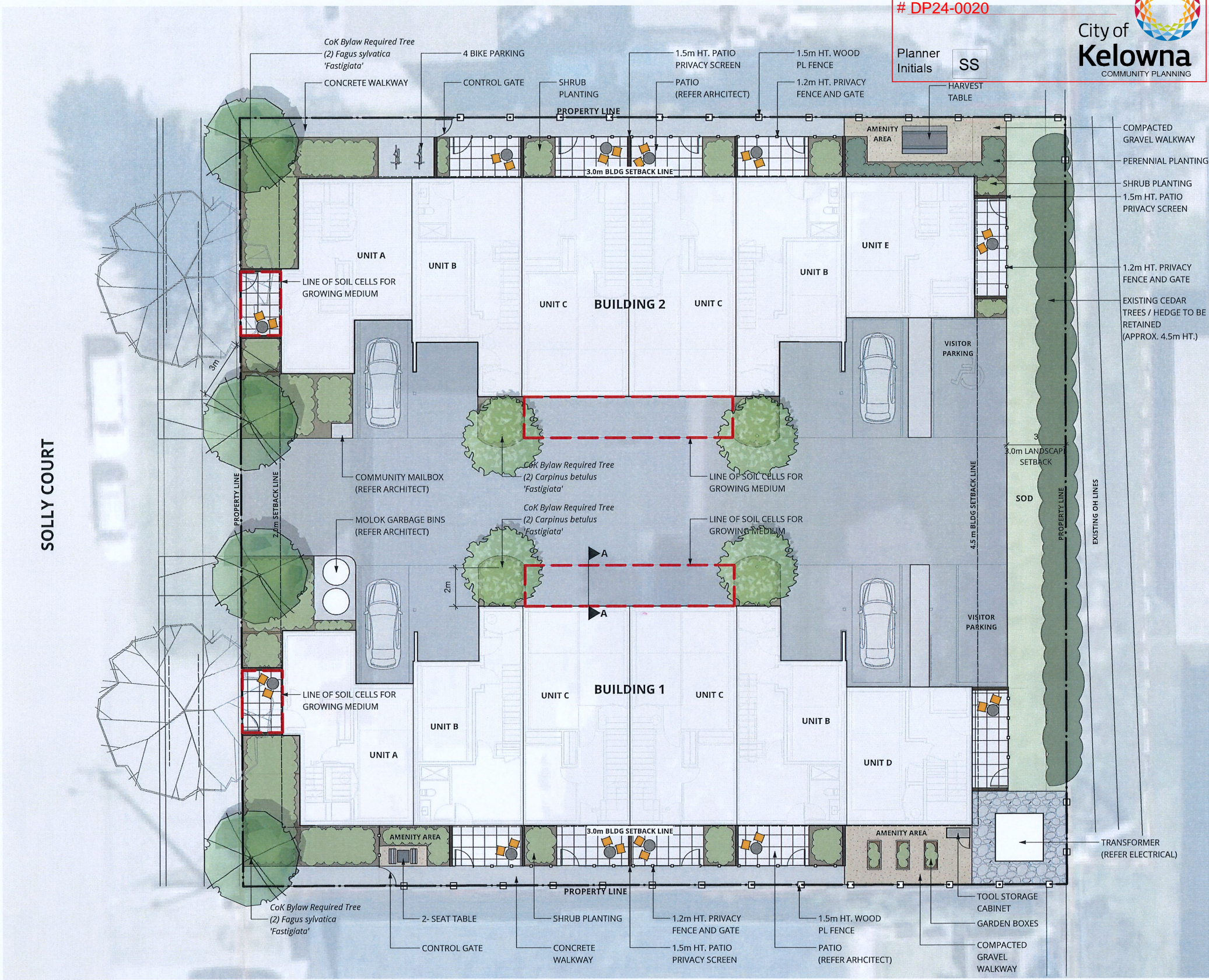
2 SEAT TABLE



HARVEST TABLE



GARDEN BOXES



NO.	DESCRIPTION	DATE
3	RE-ISSUED FOR DEVELOPMENT PERMIT	2024-05-02
2	ISSUED FOR CLIENT REVIEW	2024-04-02
1	ISSUED FOR DEVELOPMENT PERMIT	2024-01-12



Planner Initials **SS**



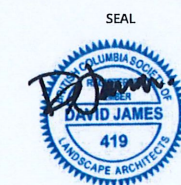
REPRESENTATIVE PLANTING

PLANT LIST

QTY	BOTANICAL NAME	COMMON NAME	SIZE	ROOT
Deciduous Trees				
2	<i>Acer rubrum 'Frank Jr.'</i>	Redpointe Maple	6cm Cal	B&B

NOTES:

- THIS DRAWING DEPICTS FORM AND CHARACTER AND IS TO BE USED FOR DEVELOPMENT PERMIT SUBMISSION ONLY. IT IS NOT INTENDED FOR USE AS A CONSTRUCTION DOCUMENT.
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LAWN AREAS 150mm MIN
SHRUB AREAS 450mm MIN
TREES 900mm MIN UNLESS OTHERWISE NOTED.



SCALE: 1:100

NO.	DESCRIPTION	DATE
3	RE-ISSUED FOR DEVELOPMENT PERMIT	2024-05-02
2	ISSUED FOR CLIENT REVIEW	2024-04-02
1	ISSUED FOR DEVELOPMENT PERMIT	2024-01-12

LANDSCAPE PLAN - OFF SITE

LDP 3

PROJECT NO.: 23111-100 DATE: 2024-01-08

LEGEND:

- LOW WATER REQUIREMENTS GRASSES / PERENNIALS
- MEDIUM WATER REQUIREMENTS SHRUBS
- HIGH WATER REQUIREMENTS SOD

SCHEDULE C

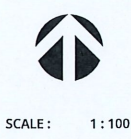
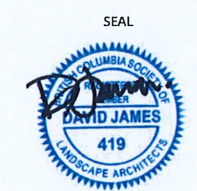
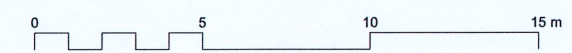
This forms part of application
DP24-0020

Planner Initials SS



City of Kelowna
COMMUNITY PLANNING

SOLLY COURT



NO.	DESCRIPTION	DATE
3	RE-ISSUED FOR DEVELOPMENT PERMIT	2024-05-02
2	ISSUED FOR CLIENT REVIEW	2024-04-02
1	ISSUED FOR DEVELOPMENT PERMIT	2024-01-12

Consideration has been given to the following guidelines as identified in Chapter 18 of the City of Kelowna 2040 Official Community Plan:

SECTION 4.0: TOWNHOUSES & INFILL						
RATE PROPOSALS COMPLIANCE TO PERTINENT GUIDELINE <i>(1 is least complying & 5 is highly complying)</i>	N/A	1	2	3	4	5
3.1 Townhouses & Infill						
3.1.1 Relationship to the Street						
a. Design primary unit entrances to provide: <ul style="list-style-type: none"> • A clearly visible front door directly accessible from a public street or publicly accessible pathway via a walkway, porch and/or stoop; • Architectural entrance features such as stoops, porches, shared landings, patios, recessed entries, and canopies; • A sense of transition from the public to the private realm by utilizing strategies such as changes in grade, decorative railings, and planters; and • Punctuation, articulation, and rhythm along the street 	N/A					✓
b. A maximum 1.2 m height (e.g. 5-6 steps) is desired for front entryways or stoops. Exceptions can be made in cases where the water table requires this to be higher.						✓
c. In the case of shared landings that provide access to multiple units, avoid having more than two doors in a row facing outward.						✓
d. For buildings oriented perpendicularly to the street (e.g. shotgun townhomes), ensure that the end unit facing the street is a custom street-oriented unit with primary entry directly accessible from the fronting street and primary living space at grade.						✓
e. For large townhouse projects (e.g. master planned communities with internal circulation pattern), Guidelines 3.1.1.a-d apply for units facing strata roads as well as those units fronting onto public streets.	✓					
3.1.2 Scale and Massing						
a. Wherever possible, reflect the positive attributes of adjacent housing while integrating new higher density forms of housing as envisioned in the OCP.					✓	
b. Scale and site buildings to establish consistent rhythm along the street by, for example, articulating individual units through integration of recessed entries, balconies, a change in materials and slight projection/recess in the façade.					✓	
c. Limit the number of connected townhouse units to a maximum of 6 units before splitting into multiple buildings. <ul style="list-style-type: none"> • In larger townhouse developments (e.g., master planned communities with internal circulation pattern), integrate a large proportion of 4 unit townhouse buildings to create a finer gran of development and limit visual impacts. 						✓
3.1.3 Site Planning						
	N/A	1	2	3	4	5

a. Gated or walled communities are not supported.							✓
b. For large townhouse projects, consider including communal amenity buildings.	✓						
Connectivity							
c. Provide pedestrian pathways on site to connect: <ul style="list-style-type: none"> • Main building entrances to public sidewalks and open spaces; • Visitor parking areas to building entrances; • From the site to adjacent pedestrian/trail/cycling networks (where applicable). 							✓
d. When pedestrian connections are provided on site, frame them with an active edge – with entrances and windows facing the path or lane.							✓
e. For large townhouse projects (e.g. master planned communities with internal circulation pattern): <ul style="list-style-type: none"> • Design the internal circulation pattern to be integrated with and connected t the existing and planned public street network. 	✓						
Facing Distances and Setbacks							
f. Locate and design buildings to maintain access to sunlight, and reduce overlook between buildings and neighbouring properties.						✓	
g. Separate facing buildings on site a minimum of 10 – 12 m to provide ample spatial separation and access to sunlight.				✓			
h. Limit building element projections, such as balconies, into setback areas, streets, and amenity areas to protect solar access.						✓	
i. Front yard setbacks on internal roads should respond to the height of townhouses, with taller townhouses (e.g. 3 storeys) having greater setbacks to improve liveability and solar access.	✓						
3.1.4 Open Spaces							
a. Design all units to have easy access to useable private or semi-private outdoor amenity space.							✓
b. Design front yards to include a path from the fronting street to the primary entry, landscaping, and semi-private outdoor amenity space.							✓
c. Avoid a 'rear yard' condition with undeveloped frontages along streets and open spaces.							✓
d. Design private outdoor amenity spaces to: <ul style="list-style-type: none"> • Have access to sunlight; • Have railing and/or fencing to help increase privacy; and • Have landscaped areas to soften the interface with the street or open spaces/ 							✓
e. Design front patios to: <ul style="list-style-type: none"> • Provide an entrance to the unit; and • Be raised a minimum of 0.6 m and a maximum of 1.2 m to create a semi-private transition zone. 							✓
f. Design rooftop patios to: <ul style="list-style-type: none"> • Have parapets with railings; • Minimize direct sight lines into nearby units; and • Have access away from primary facades. 	✓						

g. Design balconies to be inset or partially inset to offer privacy and shelter, reduce building bulk, and minimize shadowing. <ul style="list-style-type: none"> Consider using balcony strategies to reduce the significant potential for heat loss through thermal bridge connections which could impact energy performance. 						✓
h. Provide a minimum of 10% of the total site area to common outdoor amenity spaces that: <ul style="list-style-type: none"> Incorporate landscaping, seating, play space, and other elements that encourage gathering or recreation; and Avoid isolated, irregularly shaped areas or areas impacted by parking, mechanical equipment, or servicing areas. 					✓	
i. For large townhouse projects, provide generous shared outdoor amenity spaces integrating play spaces, gardening, storm water and other ecological features, pedestrian circulation, communal amenity buildings, and other communal uses.	✓					
j. Design internal roadways to serve as additional shared space (e.g. vehicle access, pedestrian access, open space) using strategies such as: <ul style="list-style-type: none"> High quality pavement materials (e.g. permeable pavers); and Providing useable spaces for sitting, gathering and playing. 					✓	
3.1.5 Site Servicing, Access, and Parking	N/A	1	2	3	4	5
a. Provide landscaping in strategic locations throughout to frame building entrances, soften edges, screen parking garages, and break up long facades.						✓
Site Servicing						
b. Exceptions for locating waste collection out of public view can be made for well-designed waste collection systems such as Molok bins.						✓
Parking						
c. Rear-access garage or integrated tuck under parking is preferred in townhouses, in general, and is required for townhouses facing public streets.	✓					
d. Centralized parking areas that eliminate the need to integrate parking into individual units are supported.	✓					
e. Front garages and driveway parking are acceptable in townhouses facing internal strata roads, with the following considerations: <ul style="list-style-type: none"> Architecturally integrate the parking into the building and provide weather protection to building entries; and Design garage doors to limit visual impact, using strategies such as recessing the garage from the rest of the façade. 						✓
f. Provide visitor parking in accessible locations throughout the site and provide pedestrian connections from visitor parking to townhouse units. Acceptable locations include: <ul style="list-style-type: none"> Distributed through the site adjacent to townhouse blocks; and Centralized parking, including integration with shared outdoor amenity space 						✓
Access						

g. Ensure that internal circulation for vehicles is designed to accommodate necessary turning radii and provides for logical and safe access and egress.						✓
h. For large townhouse projects (e.g. master planned communities with internal circulation pattern), a minimum of two access/egress points to the site is desired.	✓					
i. Locate access points to minimize impacts of headlights on building interiors.						✓
j. Design the internal circulation pattern and pedestrian open space network to be integrated with and connected to the existing and planned public street and open space network.						✓
3.1.6 Building Articulation, Features, and Materials	N/A	1	2	3	4	5
a. Design facades to articulate the individual units while reflecting positive attributes of neighbourhood character. Strategies for achieving this include: <ul style="list-style-type: none"> • Recessing or projecting facades to highlight the identity of individual units; and • Using entrance features, roofline features, or other architectural elements. 						✓
b. To maximize integration with the existing neighbourhood, design infill townhouses to: <ul style="list-style-type: none"> • Incorporate design elements, proportions, and other characteristics found within the neighbourhood; and • Use durable, quality materials similar or complementary to those found within the neighbourhood. 					✓	
c. Maintain privacy of units on site and on adjacent properties by minimizing overlook and direct sight lines from the building using strategies such as: <ul style="list-style-type: none"> • Off-setting the location of windows in facing walls and locating doors and patios to minimize privacy concerns from direct sight lines; • Use of clerestory windows; • Use of landscaping or screening; and • Use of setbacks and articulation of the building. 						✓
d. In larger townhouse developments (e.g. master planned communities with internal circulation pattern), provide modest variation between different blocks of townhouse units, such as change in colour, materiality, building, and roof form.	✓					



City of
Kelowna



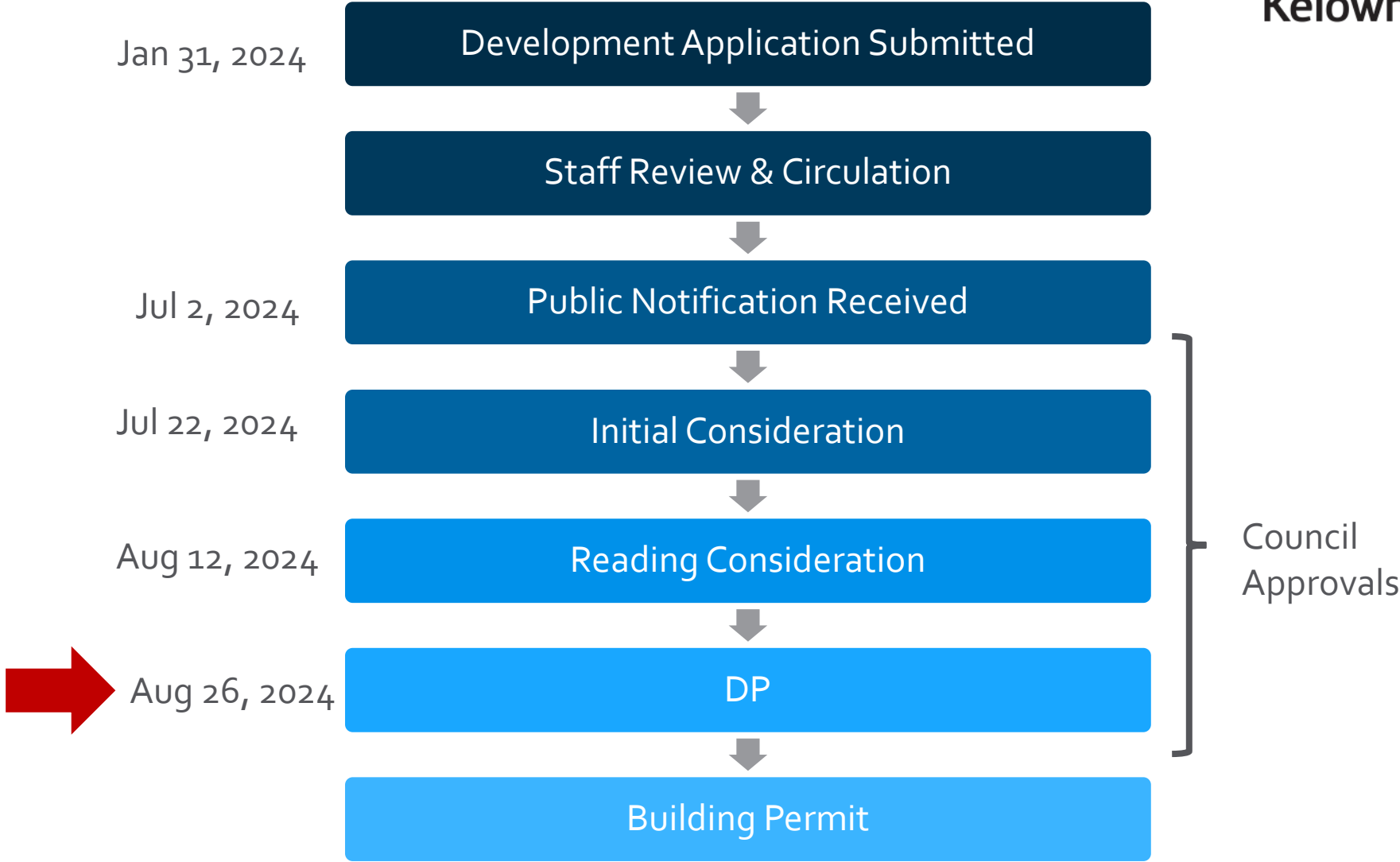
DP24-0020
865 Solly Ct

Development Permit

Purpose

- ▶ To issue a Development Permit for the form and character of a townhouse housing development.

Development Process

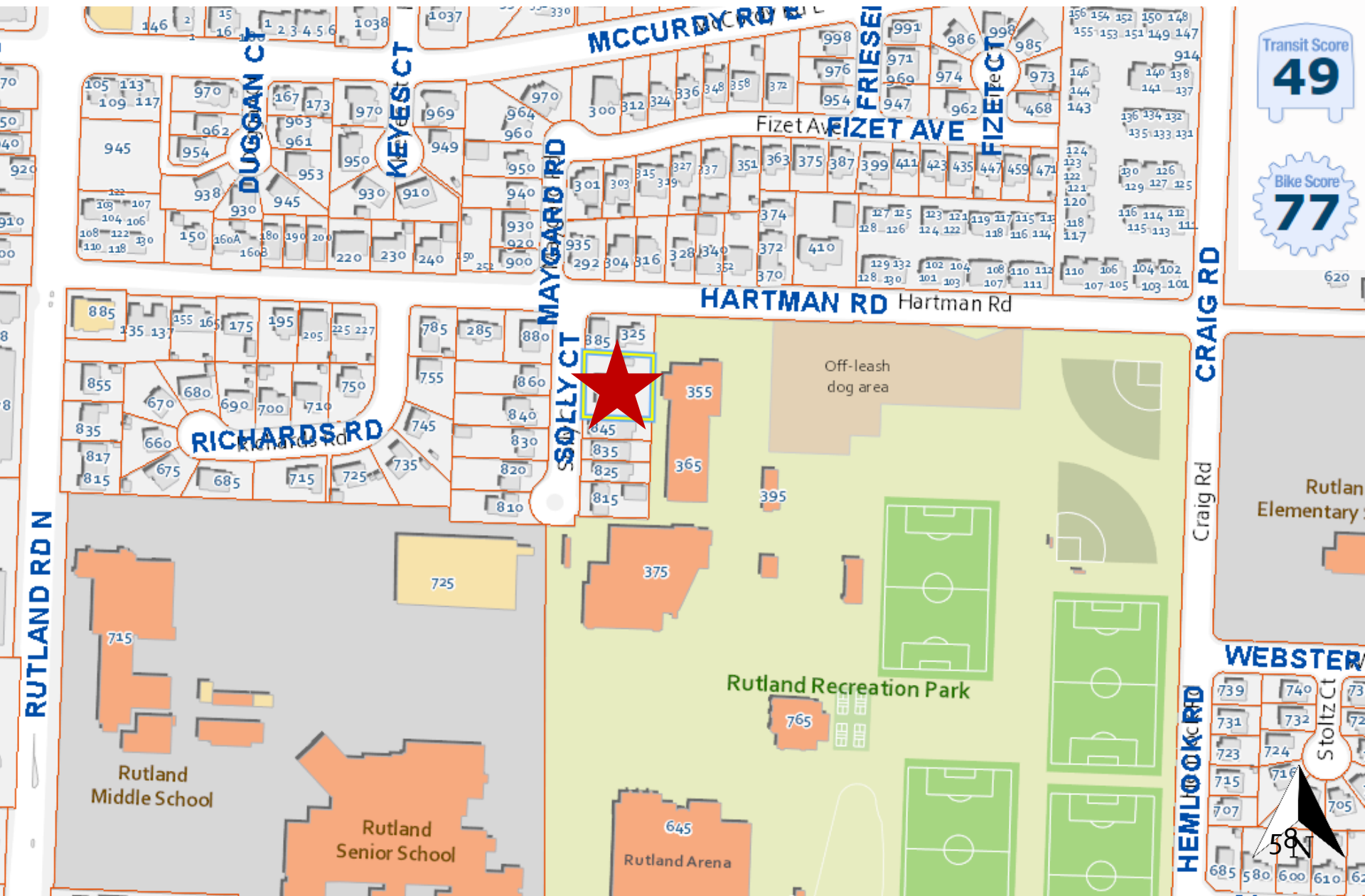


Context Map

Walk Score
53

Transit Score
49

Bike Score
77



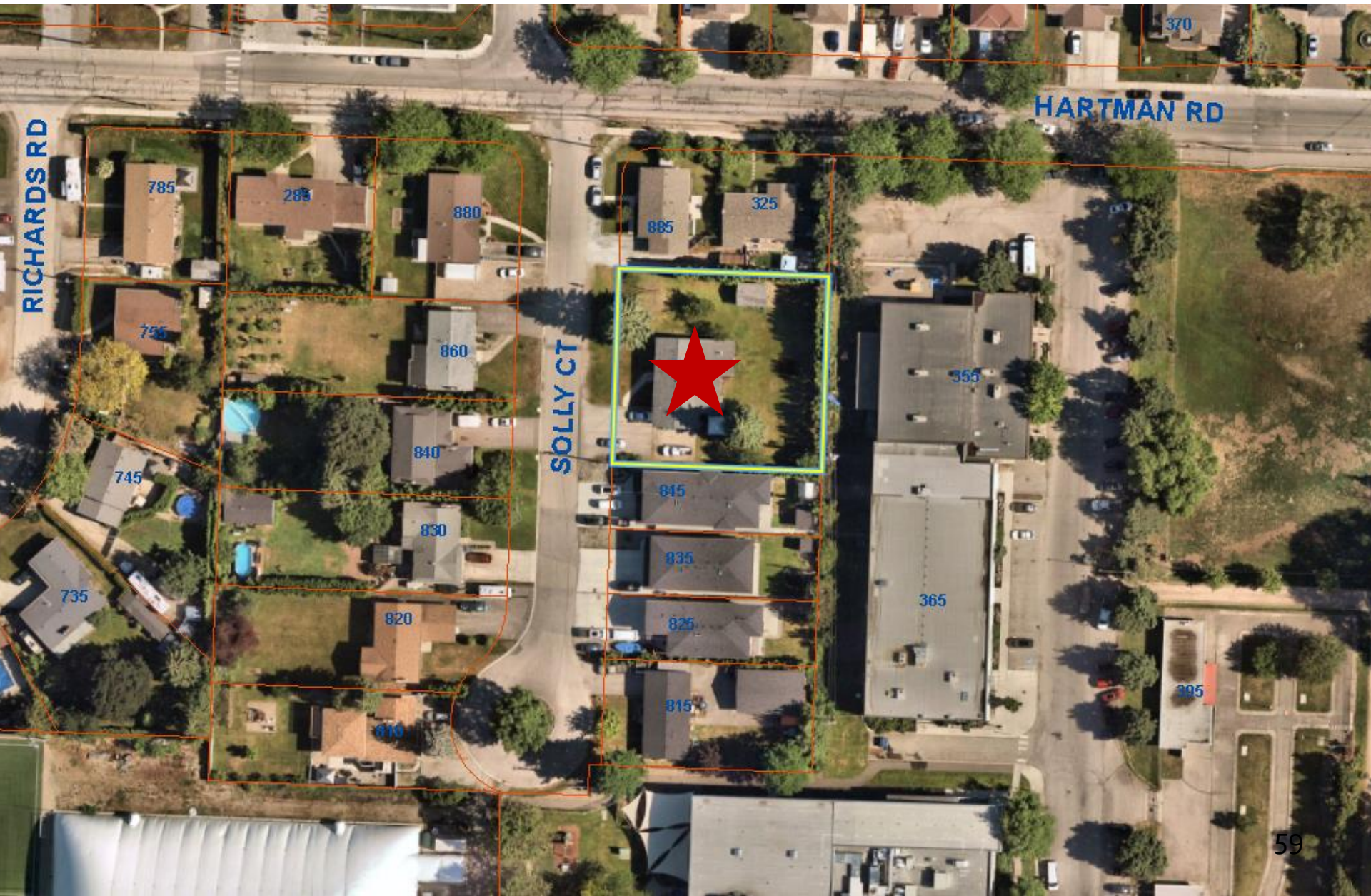
620

Rutlan Elementary

WEBSTER

58°N

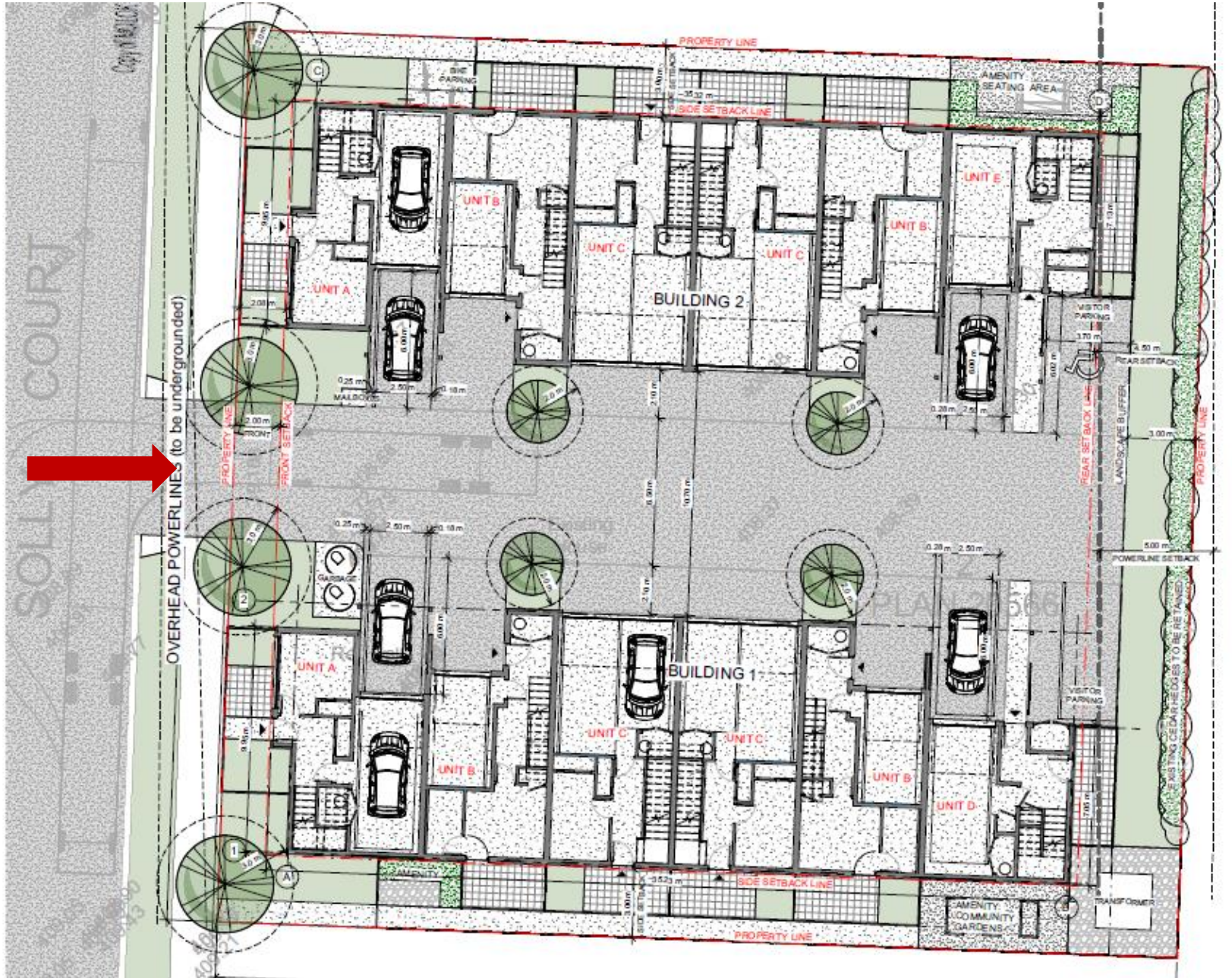
Subject Property Map



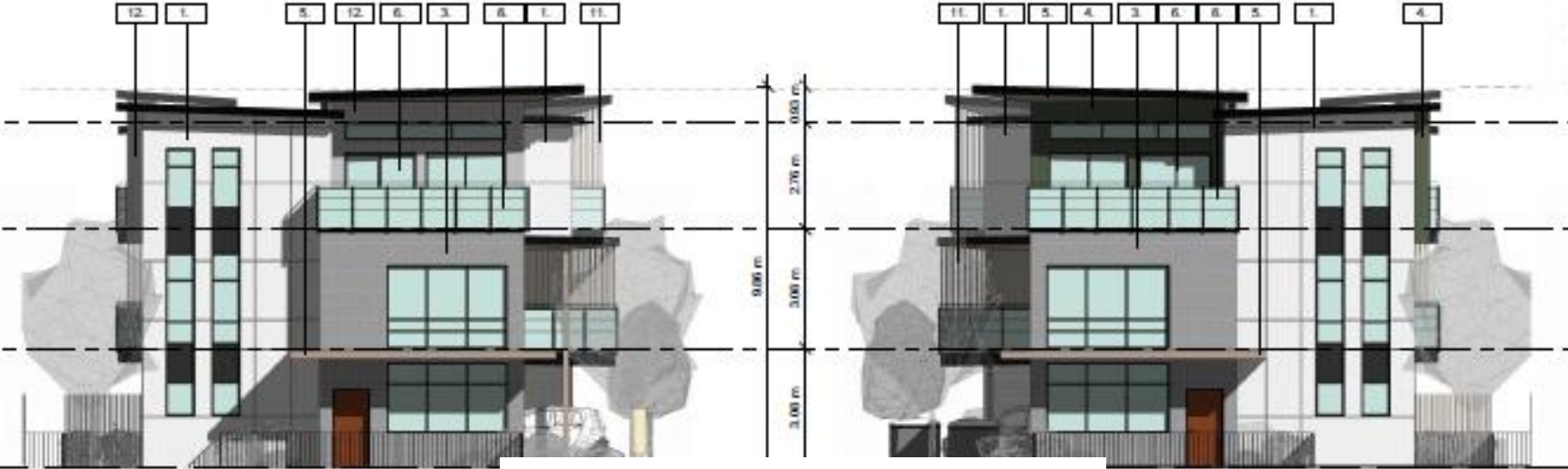
Technical Details

- ▶ MF2 – Townhouse Housing
 - ▶ 12 townhouse units, 2 buildings
 - ▶ 3-bedroom units
 - ▶ 3 storeys in height
 - ▶ 22 Parking Stalls
 - ▶ 4 Bicycle Parking Stalls
 - ▶ 8 trees in total
 - ▶ 4 large trees
 - ▶ Amenities: balconies, ground-level patios, harvest table, community garden, tool shed, 2-seat table

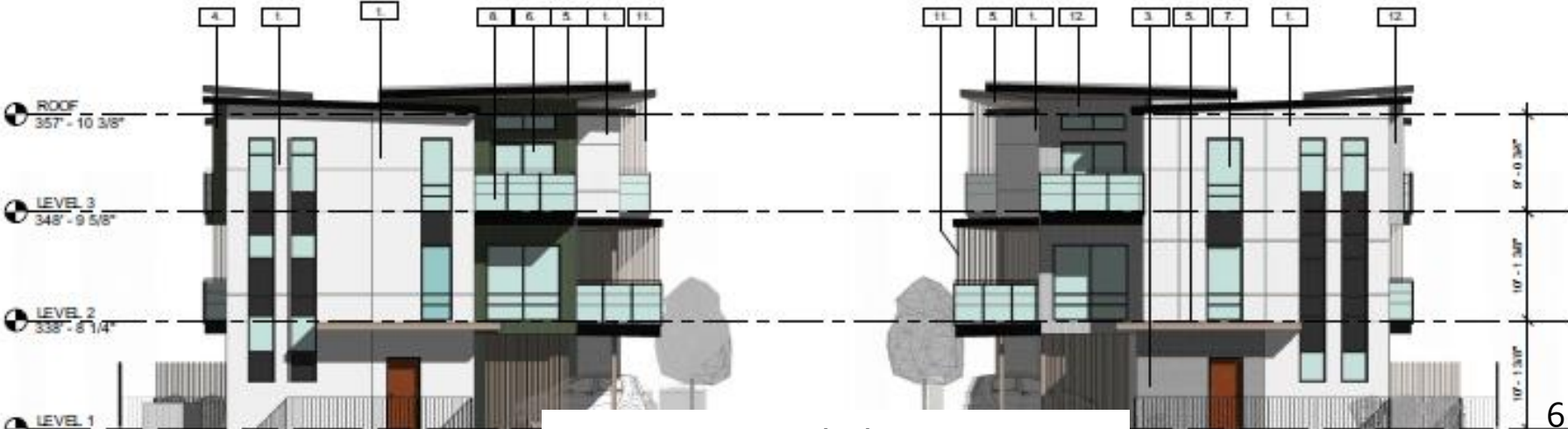
Site Plan



Elevation – West & East



Solly Ct Elevation



Rear Yard Elevation

Elevation – North & South (Building 1)



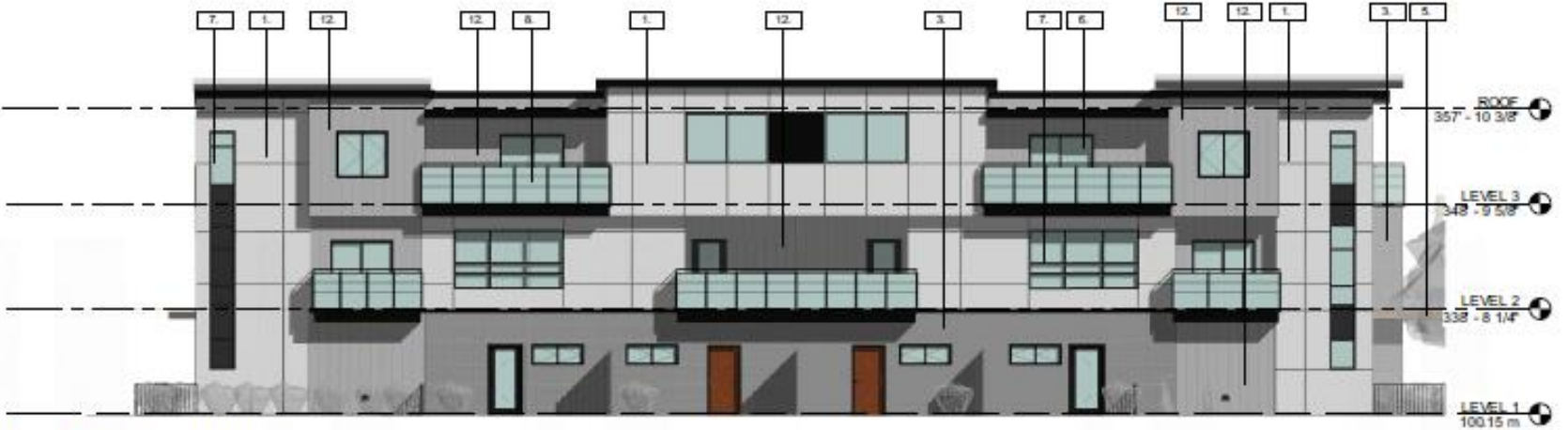
1 NORTH ELEVATION
1/8" = 1'-0"



Elevation – North & South (Building 2)



1 SOUTH ELEVATION - BUILDING 2
1P+TP

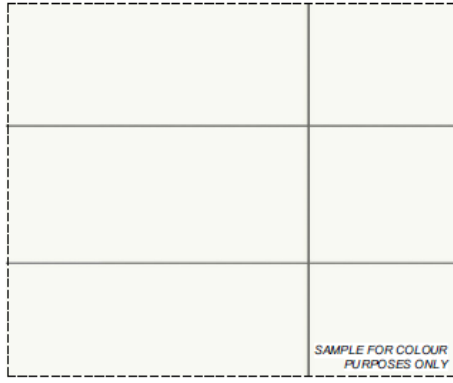


2 NORTH ELEVATION - BUILDING 2
1P+TP

Materials Board

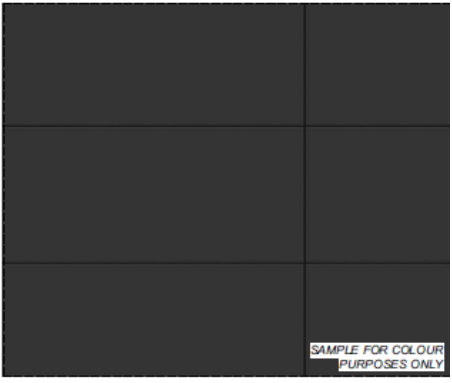


PRODUCT: FIBRE CEMENT SIDING C/W REVEAL
 COLOUR & CODE: WHITE
 I.D NUMBER: 1.



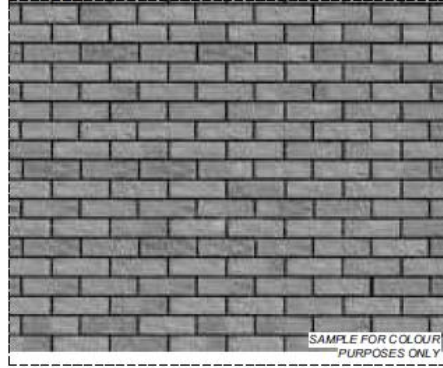
SAMPLE FOR COLOUR PURPOSES ONLY

PRODUCT: FIBRE CEMENT SIDING C/W REVEAL
 COLOUR & CODE: IRON GREY / BLACK
 I.D NUMBER: 2.



SAMPLE FOR COLOUR PURPOSES ONLY

MANUFACTURER: T.B.C.
 PRODUCT: BRICK SIDING
 COLOUR & CODE: GREY
 I.D NUMBER: 3.



SAMPLE FOR COLOUR PURPOSES ONLY

MANUFACTURER: T.B.C.
 PRODUCT: BOARD & BATTEN FIBRE CEMENT SIDING
 COLOUR & CODE: GREEN
 I.D NUMBER: 4.



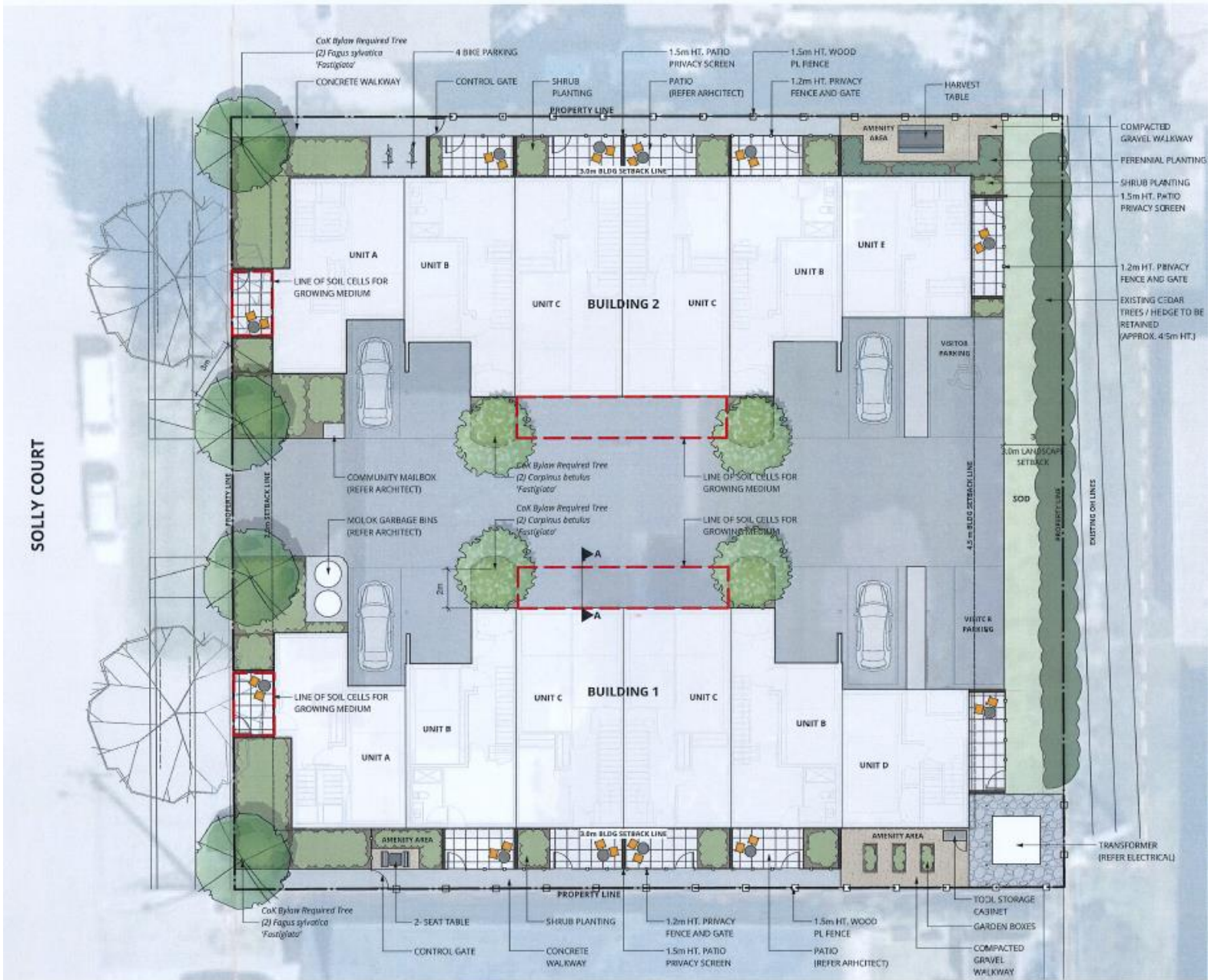
SAMPLE FOR COLOUR PURPOSES ONLY

MANUFACTURER: T.B.C.
 PRODUCT: BOARD & BATTEN FIBRE CEMENT SIDING
 COLOUR & CODE: GREY
 I.D NUMBER: 12.



SAMPLE FOR COLOUR PURPOSES ONLY

Landscape Plan



Rendering – West facing Solly Ct



RENDERING FOR
ILLUSTRATIVE
PURPOSES ONLY

Rendering – East facing rear yard



Street Context



885 SOLLY COURT



845 SOLLY COURT



OCP Design Guidelines

- ▶ Orienting building entries, windows, patios, and balconies to face the fronting street
- ▶ Providing usable outdoor amenity spaces and well-designed landscape areas that offer privacy and screening
- ▶ Using building articulation, scaling and setbacks to define individual units

Staff Recommendation

- ▶ Staff recommend **support** for the proposed development permit as it:
 - ▶ Meets majority of OCP Design Guidelines
 - ▶ Provides density near Rutland Elementary, Middle and Senior Schools
 - ▶ Proximity to recreation and other amenities
 - ▶ Proximity to Rutland Rd Transit Supportive Corridor
 - ▶ No variances required

CITY OF KELOWNA
BYLAW NO. 12672
Z23-0076
1095-1097 Monterey Court

A bylaw to amend the "City of Kelowna Zoning Bylaw No. 12375".

The Municipal Council of the City of Kelowna, in open meeting assembled, enacts as follows:

1. THAT City of Kelowna Zoning Bylaw No. 12375 be amended by changing the zoning classification of Lot 4 Section 23 Township 26 ODYD Plan 25174, located on Monterey Ct, Kelowna, BC from the MF1 – Infill Housing zone to the MF2 – Townhouse Housing zone.
2. This bylaw shall come into full force and effect and is binding on all persons as and from the date of adoption.

Read a first, second and third time by the Municipal Council this 8th day of July, 2024.

Adopted by the Municipal Council of the City of Kelowna this

Mayor

City Clerk

Report to Council



Date: August 26, 2024
To: Council
From: City Manager
Subject: Subdivision, Development and Servicing Bylaw No. 7900 & Council Policy No. 101 Amendments
Department: Corporate Services

Recommendation:

THAT Council receives, for information, the report from Corporate Services, dated August 26, 2024, with respect to amending the Subdivision, Development and Servicing Bylaw No. 7900 and Council Policy No. 101;

AND THAT Bylaw No. 12694, being Amendment No. 28 to Subdivision, Development and Servicing Bylaw No. 7900 be forwarded for reading consideration;

AND FURTHER THAT Council Policy No. 101, being Conversion of Overhead Power Lines to Underground Installation, be revised as outlined in the Report from Corporate Services dated August 26, 2024.

Purpose:

To amend the Subdivision, Development and Servicing Bylaw No. 7900 so it aligns with industry best practice, provides clear direction and ensures construction of safe and long-lasting infrastructure. To approve a minor change to Council Policy No. 101.

Background:

The Subdivision, Development & Servicing Bylaw No. 7900 (SDS Bylaw) establishes the necessary standards for infrastructure design and construction pertaining to public works and services. It also outlines the application processes related to land subdivision and development within the City's limits. These standards are relevant for projects initiated by both the City and developers and cover the design and construction standards for water distribution systems, sanitary sewers, stormwater management, roadways, pedestrian paths, traffic signals, streetlights, and green spaces.

The SDS Bylaw is frequently revised to meet industry standards and provide durable infrastructure for the present and future. A dedicated Bylaw Working Group, comprising members from various departments like Infrastructure, Development Engineering, Planning, Civic Operations, Asset

Management, and Financial Services, convenes regularly to assess parts of the SDS Bylaw, consult with stakeholders such as the Urban Development Institute, and suggest amendments to the Council.

Discussion:

In recent years, extensive updates have been implemented to refresh the SDS Bylaw, featuring revisions to the infrastructure design requirements for Transportation, Water, Wastewater, Stormwater, Roadway Lighting, and Traffic Signals. This latest amendment to the SDS Bylaw is focused on the construction standards, which saw their last overhaul in 2012. The modifications incorporate the latest MMCD (2019) edition as the foundational construction specification. These amendments are encompassed within Schedule 6 of the SDS Bylaw. Additionally, Kelowna's specific supplementary construction specifications and standard detail drawings found in Schedule 5 have been revised for consistency with the new MMCD version and to meet local construction stipulations.

The City of Kelowna is a sponsoring member of the Master Municipal Construction Documents Association (MMCD). The MMCD Association is a non-profit society, founded in 1995 and supported by BC municipalities, consulting companies and contractors. Their mandate was to create improved construction documents for municipal infrastructure, rather than each municipality creating and maintaining their own contracts and specifications. Now, over 90 municipalities use the MMCD on a regular basis.

A summary of the changes is provided below with a brief description of the reason for the change.

Document	Revision
Schedule 5 – Supplemental Construction Standards to MMCD	New sections for Traffic Control, Environmental Protection and Tree Preservation, to provide private development with similar requirements to City capital projects
	New specifications for the increased use of recycled concrete and asphalt for road building, to save costs over quickly depleting local gravel reserves and to reduce emissions.
	New specifications for quality control testing requirements for road building, asphalt and concrete.
	New Roadway Lighting and Traffic Signal sections and Standard Drawings to ensure electrical work is completed to City requirements.
	Major updates to the irrigation system requirements for City owned systems.
	General updates to some of the Standard Drawings to reflect current practices.
Schedule 6 – Construction Standards (MMCD 2019)	Amend reference to latest addition edition of Master Municipal Construction Documents (MMCD 2019) and associated MMCD supplemental specifications

A housekeeping item is included in this report to amend Council Policy 101. Council Policy No. 101 provides direction when existing overhead electrical and communication wiring must be converted to underground as a condition of subdivision or development approval. On March 4, 2024, Council approved changes in response to the implementation of the Provincial legislation for Small-Scale Multi-

Unit Housing and Transit Oriented Development Areas. A part of this change set the threshold for undergrounding overhead power lines to 12,000 volts; however, the direction should have been that an overhead power line is not required underground where the voltage is greater than 120,000 volts.

Consultation and Engagement:

Staff met with Urban Development Institute (UDI) and members of the construction industry to solicit feedback on potential impacts of the SDS Bylaw amendments. Comments from UDI and the construction industry were incorporated into the Bylaw amendments where appropriate, and all changes were communicated back to these stakeholders.

Conclusion:

This SDS Bylaw update is the latest in a series to ensure City infrastructure is high quality, long-lasting and delivers services the community relies upon now and in the future. Staff have worked with the development community and the construction industry to modernize the bylaw and bring it into alignment with industry best practice and make it user friendly and accessible.

The proposed change to Council Policy No. 101 will align with the original intent of maintaining an acceptable level of service for community safety and ensuring a robust standard for the provision of municipal civil infrastructure.

Communications Comments:

The SDS Bylaw is available on the City's website at [Subdivision, Development & Servicing Bylaw | City of Kelowna](#). The website will be updated to reflect the proposed changes upon Council's approval.

Internal Circulation:

Infrastructure Delivery Manager
Infrastructure Operations Manager
Technical Services Supervisor
Development Engineering Manager
Parks Services Manager

Considerations applicable to this report:

Existing Policy: Council Policy No. 101

Considerations not applicable to this report:

Legal/Statutory Authority:

Legal/Statutory Procedural Requirements:

Financial/Budgetary Considerations:

Submitted by: Joel Shaw, Asset Management & Capital Planning Manager

Approved for inclusion: Joe Sass, General Manager, Corporate Services

Attachments: Attachment 1 – Proposed Council Policy No. 101

Attachment 2 - Presentation for Bylaw 7900 update

cc: City Clerk
General Manager, Infrastructure
Divisional Director, Planning & Development Services
Divisional Director, Corporate Strategic Services



City of Kelowna
1435 Water Street
Kelowna, BC V1Y 1J4
250 469-8500
kelowna.ca

Council Policy

Conversion of Overhead Power Lines to Underground Installation

ESTABLISHED March 3, 2003

Contact Department: Development Engineering

Guiding Principles

The 2040 Official Community Plan sets a strategic course for how the city should grow, which includes support for vibrant and functional urban streetscapes. The City utilizes the Development Cost Charges program to accommodate the community's projected growth by supporting development approvals in a consistent, proportional, fair, and transparent manner.

Purpose

To direct when existing overhead electrical and communication wiring must be converted to underground as a condition of subdivision or development approval.

Application

This policy applies to an application for subdivision or development.

Definitions

"Core Area" means 'Core Area' as defined in Kelowna 2040 – Official Community Plan Bylaw No. 12300.

"Development" means 'Development' as defined in Subdivision, Development and Servicing Bylaw No. 7900.

"Dwelling" means 'Dwelling' as defined in Zoning Bylaw No. 12375.

"Subdivision" means 'Subdivision' as defined in Subdivision, Development and Servicing Bylaw No. 7900.

"Urban Centre" means 'Urban Centre' as defined in Kelowna 2040 – Official Community Plan Bylaw No. 12300.

"Village Centre" means 'Village Centre' as defined in Kelowna 2040 – Official Community Plan Bylaw No. 12300.

"Works" means 'Works and Services' as defined in Subdivision, Development and Servicing Bylaw No. 7900.

Policy Statements

1. Where underground electrical and communication wiring is required under Subdivision, Development and Servicing Bylaw No. 7900 and a proposed subdivision or development has frontage along a highway, burial of existing overhead electrical and communication wiring along that frontage of a proposed subdivision or development is required in the following cases:
 - a) All mixed-use, commercial, or industrial subdivision or development within the Core Area, an Urban Centre, or a Village Centre;
 - b) Any residential subdivision creating a new lot within the Core Area, an Urban Centre, or a Village Centre;
 - c) Any residential development that results in 1 or more additional dwelling unit(s) on a lot within an Urban Centre or a Village Centre; or
 - d) Any residential development that results in 3 or more total dwelling units on a lot within the Core Area.
2. Notwithstanding the above, an overhead power line is not required to be undergrounded where the voltage is greater than 120,000 volts.

Amendments

Last Revised:

Replacing: 24/03/04; R375/2010-04-26; R1039/2008-11-24; R191/2003-03-03



City of
Kelowna

Subdivision, Development and Servicing Bylaw Update to Construction Stds.

August 26th, 2024

Overview

- ▶ What is the SDS Bylaw 7900?
- ▶ Why modernize the bylaw?
- ▶ Proposed amendments
- ▶ Partner engagement

Subdivision, Development and Servicing (Bylaw 7900)

- ▶ Sets out subdivision application procedures
- ▶ Provides Design and Construction Standards for works and services
- ▶ Applicable to developer and City led projects,



Updates Completed and Planned

- ✓ Schedule 5 & 6 – Construction Stds (today's report)
- ✓ Sanitary Sewer Design
- ✓ Drainage Design
- ✓ Water Design
- ✓ Approved Products list
- ✓ Drawing Standards
- ✓ Electrical, Street Lighting & Signals Design
- ✓ Transportation Design
- ▶ Landscaping & Irrigation
- ▶ Hillside Development Standards



Objectives of Current Update

- ▶ Schedule 5 - Supplementary Specifications and Supplementary Detail Drawings
- ▶ Schedule 6 – Adopt latest MMCD (2019)
- ▶ Living Document





Background

- ▶ The City of Kelowna is a sponsoring member of the MMCD
- ▶ The MMCD Association is a non-profit society, founded in 1995 and supported by BC municipalities, consulting companies and contractors.
- ▶ Their mandate is to provide and maintain construction documents for municipal infrastructure in BC,
- ▶ Over 90 municipalities use the MMCD on a regular basis,
- ▶ The City utilizes the MMCD contract and specifications, along with Kelowna specific supplementals to reflect local preferences and practices.

Highlights of this Update

- ▶ Construction standards to reflect and align with latest edition of MMCD.
- ▶ New sections for Traffic Control, Environmental Protection and Tree Preservation,
- ▶ New specifications for the increased use of recycled concrete and asphalt for road building,
- ▶ New specifications for quality control testing requirements for road building, asphalt and concrete.
- ▶ New Roadway Lighting and Traffic Signal sections and Standard Drawings,
- ▶ Major updates to the irrigation system requirements for City owned systems,
- ▶ General updates to some of the Standard Drawings to reflect current practices.

Partner engagement

- ▶ Urban Development Institute – Okanagan
 - ▶ Representing developers and consultants
- ▶ Civil Contractors
 - ▶ EAC, Peters Bros., Lafarge, CGL, Copcan, R&L
- ▶ City Departments
 - ▶ Road, Parks and Utility Operations
 - ▶ Integrated Transportation, Utility Planning, Parks Planning
 - ▶ City Construction Staff





City of
Kelowna

Questions

CITY OF KELOWNA

Bylaw No. 12694

Amendment No. 28 to Subdivision, Development and Servicing Bylaw No. 7900

The Municipal Council of the City of Kelowna, in open meeting assembled, enacts that the Subdivision, Development and Servicing Bylaw No. 7900 be amended as follows:

1. THAT **Index, Schedules, Section 5** be amended by deleting the following wording:
"City of Kelowna Construction Standards (Supplemental Standards to MMCD "PLATINUM" Edition Volume II, 2009)"
and replacing with the following wording:
"City of Kelowna Supplemental Construction Standards to MMCD 2019 Edition – Volume II"
2. THAT **Index, Schedules, Section 6** be amended by deleting the following wording:
"Master Municipal Construction Documents (MMCD) – 2009 Platinum Edition Volume II – Published and Available from "The Master Municipal Construction Documents Association""
and replacing with the following wording:
"City of Kelowna Construction Standards – MMCD 2019 Edition – Volume II"
3. THAT Schedule '5' City of Kelowna Construction Standards (Supplemental Standards to MMCD "PLATINUM" Edition Volume II, 2009 be deleted in its entirety.
4. THAT Schedule '5' City of Kelowna Supplemental Construction Standards to MMCD 2019 Edition – Volume II, as attached to and forming part of this bylaw, be added.
5. THAT Schedule '6' be deleted in its entirety.
6. THAT Schedule '6' City of Kelowna Construction Standards – MMCD 2019 Edition – Volume II, as attached to and forming part of this bylaw, be added.
7. This bylaw may be cited as "Bylaw No. 12694, being Amendment No. 28 to Subdivision, Development and Servicing Bylaw No. 7900."
8. This bylaw shall come into full force and effect and is binding on all persons as and from the date of adoption.

Read a first, second and third time by the Municipal Council this

Adopted by the Municipal Council of the City of Kelowna this

Mayor

City Clerk

**SCHEDULE 5
OF
BYLAW 7900**

CITY OF KELOWNA

**SUPPLEMENTAL CONSTRUCTION STANDARDS
TO
MMCD 2019 EDITION – VOLUME II**

- 1. SUPPLEMENTAL CONSTRUCTION SPECIFICATIONS**
- 2. SUPPLEMENTAL STANDARD DETAIL DRAWINGS**

Schedule 5 is the supplemental construction standards to the Master Municipal Construction Documents (MMCD) and includes:

1. **Supplemental Construction Specifications, and**
2. **Supplemental Standard Detailed Drawing.**

These supplemental construction standards are to be applied in conjunction with the MMCD (Schedule 6) including MMCD Supplementary Updates for Works and Services constructed within the City of Kelowna.

The provisions of the **Supplemental Construction Specifications**, along with the City's **Approved Products List (APL)**, **Supplemental Standard Detail Drawings** and related bylaws, augment and supersede the provisions of the MMCD. The Supplemental Construction Specifications and the Supplemental Standard Detailed Drawings take precedence over the MMCD.

1. SUPPLEMENTAL CONSTRUCTION SPECIFICATION TO THE MMCD

Section and article numbers in the Supplemental Construction Specification coincide with those of the MMCD. Reference numbers that include * do not have an accompanying MMCD specification and have been added as an additional supplemental specification.

INDEX

Division	Reference	Section Title
01 GENERAL REQUIREMENTS	01 55 00S	Traffic Control, Vehicle Access and Parking
	01 57 01S	Environmental Protection
03 CONCRETE	03 30 20S	Concrete Walks, Curbs and Gutters
26 ELECTRICAL	26 56 01S	Roadway Lighting
31 EARTHWORKS	31 05 17S	Aggregates and Granular Materials
	31 11 41S	Shrub and Tree Preservation
	31 23 01S	Excavating, Trenching and Backfilling
	31 24 13S	Roadway Excavation, Embankment and Compaction
32 ROADS AND SITE IMPROVEMENTS	32 11 16.1S	Granular Subbase
	33 11 23S	Granular Base
	32 12 16S	Hot Mix Asphalt Concrete Paving
	32 92 21S	Topsoil and Finish Grading
	32 92 23S *	Soil Cells
	32 93 01S	Planting of Trees, Shrubs & Ground Covers
33 UTILITIES	32 94 01S *	Irrigation System
	33 11 01S	Waterworks
	33 30 01S	Sanitary Sewers
	33 34 01S	Sewage Forcemains
	33 40 01S	Storm Sewers
	33 44 01S	Manholes and Catch Basins
34 TRANSPORTATION	34 41 13S	Traffic Signals

1.0 General

(replace 1.0.6)

- 1.0.6 The City of Kelowna is responsible for issuing Road Usage Permits and conditions set forth, in accordance with Traffic Bylaw No. 8120. The Contractor will be required to obtain a Road Usage Permit prior to work within City Right-of-Way. For projects involving arterial roads, Traffic Control Plans shall be prepared or reviewed and approved by a Professional Engineer with traffic experience or a Professional Traffic Operations Engineer (PTOE). Step by step reference can be found in the "**City of Kelowna Traffic Management Guide**" at the City's website kelowna.ca.
- 1.0.7 In addition to the Public Notice required in Section 01 58 01, the Contractor shall provide additional written notice to residents and businesses one day prior to access closures or restrictions. The content and form of the written notifications shall be reviewed and approved by the Contract Administrator prior to delivery. Emergency, vehicle and pedestrian access to all businesses and residences shall be maintained at all times unless otherwise approved by the Contract Administrator. Suitable access shall have a minimum lane width of 3.0m and be defined as a bladed and comfortable driving surface, free of potholes and other impediments, sufficient to accommodate a standard two-wheel drive passenger vehicles at a speed of 20 km/h.
- 1.0.8 Working hours are outlined in Good Neighbour Bylaw No. 11500. Requests to vary working hours must be approved in advance, in accordance with the provisions of Bylaw No. 11500.
- 1.0.9 All regulatory signs that are affected by the work must be removed and replaced by the City of Kelowna in accordance with Traffic Bylaw No. 8120. Requests for sign changes must be made 15 Days in advance of proposed work.

END OF SECTION

1.2 Temporary Erosion and Sediment Controls

1.2.2 Work Adjacent to Watercourses
(replace (1.2.2))

- (1) Work around watercourses shall be done in accordance with terms and conditions of the Federal, Provincial and Municipal permits and approvals included in the Contract Documents, and the most recent version of the "Land Development Guidelines" published by the Provincial Ministry of Environment.

1.4 Environmental Protection

(replace 1.4.2)

1.4.2 Site Clearing and Plant Protection:

- (1) Construct Tree Protection Zones in accordance with Tree Protection Bylaw No. 8041 and Municipal Properties Tree Bylaw No. 8042. Any tree damage must be reported immediately to the City Engineer.
- (2) Protect roots of retained trees during excavation and site grading by ensuring a Tree Protection Zone is maintained and any fallen fencing is repaired immediately. Construction material, soil, and equipment storage is prohibited within Tree Protection Zones.
- (3) Temporary access within Tree Protection Zones must be monitored by an arborist or equivalent Qualified Professional to ensure appropriate protection measures (such as 300mm wood chip mulch laid over geotextile fabric, 25mm plywood, or other as dictated by intensity of access) are in place over the root zone prior to temporary access. An arborist must oversee root pruning if excavation in a retained tree root zone is necessary.
- (4) Minimize the spread of invasive plant species by cleaning machinery prior to accessing site.
- (5) Minimize stripping of topsoil and vegetation.

1.4.3 Pollution Control:
(add)

- (5) Ensure proper containment and disposal of concrete wash water.

(add)

1.4.4 Spill Contingency Plan:

Prepare and provide a written Spill Contingency Plan prior to commencement of construction activities.

Spill Contingency Plan shall include the following as applicable:

- (1) Provisions for secondary containment for all stationary bulk fuelling tanks, equipment washing and maintenance areas. Secondary containment for fuelling tanks must be a minimum 110% of the volume of the tank or 40% of the volume of all the containers stored, whichever is the greater volume.
- (2) Spill Kits and protective equipment that include adsorbent pads, booms, etc. for containing and mopping up small spills, and gloves, coveralls, shovels, containers, etc. to use to mop up spilled substances.
- (3) Segregation and disposal procedure (or contingency plan) for contaminated soils and/or contaminated groundwater.
- (4) Reporting procedure that includes "reportable volumes" and numbers to call in the event of a spill. For example, spills of oil or diesel fuel equal to or in excess of 100 L must be reported to the Provincial Emergency Program (PEP) at 1.800.663.3456.

When calling PEP be prepared to answer the following:

- your name and contact phone number;
 - name and phone number of the person who caused the spill;
 - location and time of the spill;
 - type and quantity of the substances spilled;
 - cause and effect of the spill, and details of action taken or proposed;
 - description of the spill location and surrounding area;
 - names of agencies on scene and name of other persons or agencies advised of the spill.
- (5) Small spills less than 10 L may be dealt with by the Contractor (or sub-contractor) provided equipment is available to contain and clean-up the spilled substances and all soils affected by the soil. Any spill to a surface water or City of Kelowna utility must be reported to the Fire Hall Dispatch at 250-860-8801, or use 911 in any emergency situations where response times are critical.

(add)

- 1.4.5 Work Near Fish Bearing Streams and/or Sensitive Habitats:
 - (1) Mitigation measures and best management practices must be employed for work in or near fish bearing streams and/or sensitive habitats in accordance with applicable Municipal, Provincial and Federal regulations.
 - (2) The Contractor is responsible to ensure all necessary Municipal, Provincial, and Federal approvals have been attained prior to undertaking Work within an Environmentally Sensitive Area, as defined in the Kelowna 2040 – Official Community Plan Bylaw No. 12300.
 - (5) The Contractor shall be responsible for ensuring that they have copies of the City of Kelowna Natural Environment Development Permit and the Provincial Water Act authorization at the work site and are familiar with the requirements.

**1.5 Temporary Storm
Water Pollution
Controls**

(add)

- 1.5.1 No person shall discharge or allow or cause to be discharged into a storm drain, any substance except storm water, in accordance with Sanitary Sewer/Storm Drain Regulation Bylaw No. 6618-90. For temporary construction dewatering discharge, a Temporary Discharge Permit must be obtained from the City in accordance with Bylaw No. 6618-90.

END OF SECTION

1.0 GENERAL

1.5 Inspection and Testing

(add)

1.5.2 One (1) compressive strength test (3 field-cured cylinders to ASTM C31M) shall be made for each 150 square metres of concrete work. Minimum one test per batch or per day. The Contractor is to protect cylinders on site, maintaining a temperature of 16-27°C, for minimum of 16 hours and a maximum of 48 hours, after which they can be sent to the laboratory. One cylinder shall be tested at 7 days and two at 28 days. If tests do not meet specified strength, the Contract Administrator may require additional testing or removal and replacement in accordance with CSA 23.1

3.0 EXECUTION

3.9 Expansion Joints

(delete 3.9.3 and replace with the following:)

3.9.3 Expansion joint material is not required for curbs and sidewalks; use bond break compound. Expansion joint material is required in plaza areas as shown on the Drawings and where walks are placed against fixed objects that extend above the walk, such as structures, kiosks or poles, and surrounding stamped concrete truck aprons.

END OF SECTION

3.0 EXECUTION

3.10 Luminaires and
Photocells

(replace 3.10.2)

- 3.10.2 Install post top and pendant fixtures level. Cobra style fixtures to be installed parallel with the longitudinal grade of the road surface, to reduce glare on the downhill side.

END OF SECTION

1.0 GENERAL

1.3 Approvals *(add)*

1.3.5 Crushing and/or screening of granular aggregates shall only be permitted within the project area or on any City of Kelowna road right-of-way when specifically approved by the City of Kelowna. Any applications for gravel processing would need to adequately address dust, noise and location/proximity of production in accordance with Zoning and/or Temporary Use Permits.

2.0 PRODUCTS

2.1 Materials - General *(add)*

2.1.3 The physical properties of the materials for Select Granular Subbase and Granular Base course shall meet the following specifications:

Physical Property	Test Designation	Granular Sub-base	Granular Base
MgSO ₄ Loss % Course Ag (Max) Fine Ag (Max)	ASTM C88/C88M	20 25	20 25
Sand Equivalent % (Min)	ASTM D2419	25	35
Micro-Deval Loss % (Max)			
Course Agg. (Max)	ASTM D6982	30	25
Fine Agg. (Max)	ASTM D6982	35	30
Plasticity Index % (Max)	ASTM D4318	0	0
Crushed Particles (one face) % (Min)	MoTI-202 (A)	-	60
Flat & Elongated Particles (4:1 Ratio) % (Max)	ASTM D4791	-	10
Asphalt Coated Particles % (Max)	MTO LS-621	30	30
Clay and Friable Particles % (Max)	ASTM C142	1	1
California Bearing Ratio (Soaked) % (Min)	ASTM D1883	40	80

Note: MTO = Ontario Ministry of Transportation

2.7 Granular Pipe Bedding and Surround Material

(replace 2.7.2)

2.7.2 Recycled concrete shall not be used as pipe bedding material.

(replace 2.7.3)

2.7.3 Other permissible materials: only where shown on Contract Drawings or directed by the Contract Administrator shall drain rock, pit run sand, or approved native material be used for bedding and pipe surround. If native material is approved, warning tape is required.

(add)

2.7.4 A maximum percentage by weight of 30% Reclaimed Asphalt Pavement (RAP) may be uniformly blended with virgin aggregates and used for Type 1 Granular Pipe Bedding and Surround Materials. The maximum size of the RAP material shall be 19mm. Recycled concrete shall not be used as pipe bedding.

2.8 Select Granular Sub-base

(replace 2.8.1)

2.8.1 Granular subbase aggregate shall be composed of well graded granular material capable of withstanding the deleterious effects of water, freeze/thaw, handling, spreading, compacting and the design traffic loading. The aggregate particles shall be uniform in quality and conform to the following gradation:

Sieve Designation	Percent Passing
150 mm	100
100 mm	85 - 100
50 mm	65 - 100
19 mm	40 - 100
4.75 mm	20 - 70
0.150 mm	0 - 20
0.075 mm	0 - 8

(add)

- 2.8.2 Maximum aggregate particle size to be no more than 50% of total thickness of sub-base layer.

2.10 Granular Base

(replace 2.10.1)

- 2.10.1 Granular base aggregate shall be composed of well graded granular material capable of withstanding the deleterious effects of exposure to water, freeze/thaw, handling, spreading and compacting and design traffic loading. The aggregate particles shall be uniform in quality and conform to the following gradation:

Sieve Designation	Percent Passing
25 mm	100
19 mm	80 - 100
9.5 mm	60 - 90
4.75mm	35 - 70
2.36 mm	25 - 50
1.18 mm	15 - 35
0.300 mm	5 - 20
0.075 mm	2 - 8

2.11 Recycled Aggregate Material

(replace 2.11.1)

- 2.11.1 Aggregates containing recycled material may be use if approved and certified by the Contract Administrator in consultation with the geotechnical consultant. In addition to meeting all other conditions of this specification, recycled material should not reduce the quality of construction achievable with quarried materials. Recycled material shall consist only of aggregates, crushed Portland cement concrete, or asphalt that is free of impurities.

(replace 2.11.2)

2.11.2 Recycled Concrete and Asphalt (RCA) may be used as subbase or base within the pavement structure and can be used as random fill in the subgrade with the following restrictions:

- (1) Recycled Asphalt Pavement (RAP) content in the RCA shall be limited to a maximum of 30% by weight of the final blended product as determined by test method MTO LS-621 (see Section 2.1.1).
- (2) RCA shall only be placed below areas that will be capped with asphalt concrete, concrete, chip seal or other impermeable surfacing.
- (3) RCA shall not be used for bridge end fill or backfill for retaining walls.
- (4) RCA shall not be stockpiled or doubled handled on the project site without Contract Administrator approval in consultation with the geotechnical consultant.
- (5) RCA shall not be placed within 30 m of drinking water wells/intakes, as measured in a straight line along the ground surface from the edge of the RCA to the water well/intake.
- (6) RCA shall not be placed within 30 m of a designated stream (as defined by the B.C. Water Sustainability Act), as measured in a straight line along the ground surface from the edge of the RCA to the seasonal high-water mark of the stream.
- (7) RCA shall not be placed below the 1 in 200-year flood elevation or the seasonal high-water table elevation.

(replace 2.11.3)

2.11.3 All recycled concrete aggregate shall be at least 28 days or older prior to processing and blending into RCA. The RCA blend shall contain an aggregated weight of less than 1 percent of construction waste and deleterious materials. Construction waste and deleterious materials include reinforcing steel, other metals, expansion material, plastics, rubber, glass, organic materials, brick, mica, schist glass, gypsum, clay and friable materials. Construction waste and deleterious materials

excluding clay and friable materials should be visually identified, separated, and removed from the sample for weighing. Testing for the clay and friable material component shall be according to ASTM C142 (see Section 2.1.1) and shall be combined with the weight of the separated and removed materials for final weighing.

(replace 2.11.4)

2.11.4 Prior to the placement of RCA materials, each source of RCA must provide laboratory test results meeting the requirements for physical properties outlined in Clause 2.1.3. On-going, quality control requirements for RCA are as shown in the following table:

Physical Property	Test Designation	Test Frequency
Aggregate Gradation	ASTM C136	Every 2,500 m ³
Standard Test Methods for Laboratory Compaction Characteristics of Soil using Standard Effort	ASTM D698	Every 2,500 m ³
Standard Test Methods for In-Place Density and Water Content of Soil and Soil-Aggregate by Nuclear Methods (Shallow Depth)	ASTM D6938	Five random tests per lift for every 2,500 m ²
Micro-Deval Loss (% , Max)	ASTM D6928	
Course Agg. (Max) Fine Agg. (Max)		Every 5,000 m ³ Every 5,000 m ³
Asphalt Coated Particles (% , Max)	MTO LS-621	Every 2,500 m ³
Construction Waste, Deleterious Particles, Clay and Friable Materials (% , Max)	ASTM C142	Every 2,500 m ³
Soaked California Bearing Ratio (% , Min)	ASTM D1883	Every 5,000 m ³

All samples for testing shall be taken from the stockpile at the location where the RCA is being produced.

END OF SECTION

1.0 GENERAL

1.5 Definitions

(add)

1.5.1 *Tree Protection Zone*, as identified as a requirement of City of Kelowna Tree Protection Bylaw No. 8041 and Municipal Properties Tree Bylaw No. 8042, is the area of the site required for the protection of trees, shrubs and understory vegetation shown on the Contract Drawings and includes the earth beneath the tree protection zone.

1.5.2 *Drip Line* is the area of ground beneath the outermost branch tips of a tree or shrub.

2.1 Materials

(add)

2.1.10 For material and specifications for construction of *Tree Protection Zones* refer to Tree Protection Bylaw No. 8041 and Municipal Properties Tree Bylaw No. 8042.

3.1 Existing Trees

(replace 3.1.1)

3.1.1 Inspect with Contract Administrator and clearly identify on site all existing shrubs and trees shown on Contract Drawings to be preserved. Establish *Tree Protection Zones* around such shrubs and trees and maintain the *Tree Protection Zone* barricades, fencing or markings until directed by the Contract Administrator to remove.

(replace 3.1.6)

3.1.6 Water preserved, retained, and city trees within *Tree Protection Zones* every week during the growing season or as needed during drought periods, following the advice of a qualified professional irrigation scheduler or certified arborist. Soak area immediately around shrubs and below tree crowns sufficiently deep to reach feeder roots, at minimum to a depth of 30 cm.

(add)

3.1.7 Root pruning should only be undertaken under the supervision of a certified arborist. For accidentally severed tree roots greater

than 25mm diameter, cut cleanly using a sharp cutting tool to minimize exposed face of cut surface.

- 3.1.8 Any damage to a protected, retained, or city tree must be reported to the Contract Administrator and City Engineer immediately and the tree must be assessed by a certified arborist to determine what repair/protection measures are needed.

**3.3 Lowering Grade
Around Existing
Trees**

(replace 3.3.2)

- 3.3.2 Excavations within a *Tree Protection Zone* must be supervised by a Certified Arborist.

3.4 Pruning

(add)

- 3.4.1 Pruning of retained tree, protected tree, or city tree as defined in Bylaw 8041 and 8042 requires a Tree Cutting Permit issued by the City of Kelowna. If hazardous limb removal is deemed necessary, work must be supervised by a certified arborist unless there is an imminent threat to safety.

3.5 Clean Up

(replace 3.5.2)

- 3.5.2 Replace or provide compensation for any trees the Contract Administrator assesses as irreparably damaged as determined by an Arborist and according to the requirements of the International Society of Arboriculture Guide for Establishing Value of Trees or Other Plants, 1983.

3.6 Tree Protection Zone

(add Sub-Section)

- 3.6.1 Install barrier prior to clearing, tree removal, grubbing, demolition or alteration of the grade of the site. *Tree Protection Zones* are required for any trees to be protected or retained on site, in accordance with Bylaw 8041, or within 10m of the site where City Trees are present, in accordance with Bylaw 8042.
- 3.6.2 Submit request for changes to the limits or requirements of a tree protection zone to the Contract Administrator for review and approval prior to alteration of or encroachment into a tree protection zone. The approval shall apply only to the tree protection zone around each specific tree identified in the

Contractor's request, and not to any or all tree protection zones on the site.

3.7 Trenching Near Existing Trees

(add Sub-Section)

- 3.7.1 Work within a Tree Protection Zone is discouraged. A proposal for any work must be approved by a certified arborist and include details for approved methods of excavation. This proposal must be provided to the Contract Administrator for approval prior to work commencing.

END OF SECTION

1.0 GENERAL

1.7 Disposal

(add)

- 1.7.2 The deposit or removal of soil on any land within the City is regulated under the Soil Removal and Deposit Regulation Bylaw No. 9612. The Contractor is responsible to ensure a permit for such deposit or removal pursuant to the provisions of Bylaw No. 9612 has been obtained prior to commencing construction.

1.11 Inspection and Testing

(add)

- 1.11.2 As a minimum, the frequency of quality control testing for compaction densities for trench backfill and road subgrade shall be at least one test per 50 linear metres of trench (including services) or lane width, and the number of tests shall vary per vertical depth as follows:

- (1) Trench backfill and subgrade fill 0.6 m depth or less shall include 1 vertical test per 50 m;
- (2) Trench backfill and subgrade fill between 0.6 m and 1.8 m depth shall include 2 vertical tests per 50 m, with vertical test intervals being equally spaced;
- (3) Trench backfill and subgrade fill greater than 1.8 m depth shall include 3 vertical tests per 50 m, with vertical test intervals being equally spaced.

3.0 EXECUTION

3.5 Backfill and Compaction

(add)

- 3.5.5 Trench backfill and road subgrade material shall be placed and compacted in maximum 300 mm vertical lifts unless otherwise approved by the Contract Administrator.

3.6 Surface Restoration

- 3.6.7 Permanent pavement restoration:
(replace (5))

- (5) Restore pavement as detailed on City of Kelowna Supplemental Standard Detail Drawing SS-G5 and the following:

- .1 Final asphalt cutting and milling of edges shall be conducted after trench excavation and backfill processes are completed, just prior to paving so that edges are undamaged.
- .2 Where the edge of the saw cut or milled asphalt, whichever is wider, extends into the travel lane, it shall be extended to the mid-point of that lane. Where the edge extends past the mid-point of the travel lane, it shall be extended to the far edge of that travel lane.
- .3 Where the edge of the saw cut or milled asphalt, whichever is wider, is less than 1.5 m from the lip of gutter or edge of paved shoulder, it shall be extended to the lip of gutter or edge of paved shoulder.
- .4 When an area of existing asphalt between two parallel or transverse trenches is less than one third (1/3) of the total area of the proposed paving of the two trenches, plus the area between them (based on the shortest trench), the existing asphalt shall be removed, and the full area paved in conjunction with the paving of the two trenches.
- .5 Regardless of the above, if the longitudinal distance between two trenches is less than three (3) metres it shall be removed, and the area paved in conjunction with the paving of the two trenches. The minimum restoration width shall be sufficient for machine paving unless permitted by the City Engineer.

3.6 Surface Restoration

(add)

3.6.8 Concrete curb and sidewalk restoration:

Existing curbs, sidewalks, and driveways shall be reconstructed and reinstated to ensure proper drainage and appearance, to match existing finish. Concrete curb and gutter to be reinstated between control joints. Concrete sidewalk and driveways to be reinstated to nearest panel joint.

END OF SECTION

1.0 GENERAL

1.9 Inspection and
Testing

(add)

1.9.2 The frequency of density tests for embankment fill (subgrade fill) shall be one test per 250 m² for each 300 mm vertical lift.

3.4 Placing

(add)

3.4.8 Materials shall be placed and compacted in maximum 300 mm vertical lifts unless otherwise approved by the Contract Administrator.

END OF SECTION

1.0 GENERAL

1.5 Inspection and
Testing

(add)

- 1.5.2 The frequency of density tests for subbase shall be at least one test per 150 m² placed, minimum one per day, and the test interval shall be consistent and evenly spaced along length and width of the Work. For Work that involves roadway, curb and sidewalk, test locations shall be staggered amongst the travelled lanes, curbs, and sidewalks.

END OF SECTION

1.0 GENERAL

1.5 Inspection and
Testing

(add)

- 1.5.2 The frequency of density tests for base shall be at least one test per 150 m² placed, minimum one per day, and the test interval shall be consistent and evenly spaced along length and width of the Work. For Work that involves roadway, curb and sidewalk, test locations shall be staggered amongst the travelled lanes, curbs, and sidewalks.

END OF SECTION

2.0 PRODUCTS

2.1 Materials *(replace 2.1.1)*

2.1.1 Asphalt cement: to CGSB-16.3-M90, Grade 80-100, Class A or PG 64-22.

2.1.3 *(replace (2))*

(2) Gradations to be within limits specified when tested to ASTM D5444.

**Table 2.1.3.2
Hot Mix Asphalt Aggregate Gradation Specification**

Sieve Designation	Percent Passing
	Lower and Surface Course
19 mm	100
12.5 mm	84 - 95
9.5 mm	73 - 90
4.75 mm	50 - 75
2.36 mm	35 - 57
1.18 mm	25 - 45
0.600 mm	18 - 34
0.300 mm	10 - 26
0.150 mm	6 - 17
0.075 mm	3 - 7

2.1.3 *(replace (8))*

(8) Micro Deval % Loss: ASTM D6928, Coarse Aggregate: 18 max.

2.1.3 *(replace (12))*

(12) Crushed fragments (fraction retained on 4.75mm sieve): at least 85% of particles by mass, to have at least 2 freshly fractured faces. Determination of amount fractured material will be in accordance with MoTI Specification I-11, Fracture Count for Coarse Aggregate, Method "B", which determines

fractured faces by mass.

2.2 Mix Design

(replace full section)

- 2.2.1 The Contractor, at their cost, must retain a Canadian Council of Independent Laboratories (CCIL) certified, independent testing consultant to perform trial mix designs and to submit the job mix formula. The trial mix design must be performed in accordance with the current Asphalt Institute MS-2 and ASTM D6926 (75 blows per face) and must include five (5) separate trial values of asphalt content. The Contractor must pay for trial mix designs and submissions.
- 2.2.2 Mixes may contain up to 20% of Reclaimed Asphalt Pavement (RAP) without changing binder grade, provided that the properties of RAP material are considered in the trial mix design. Submissions for RAP mixes must contain all data relevant to RAP utilized in the mix design. Use of Recycled Asphalt Shingles (RAS) will not be permitted.

The amount of total AC in the RAP will be calculated as follows:

$$\% \text{ AC Replacement} = \frac{a \times b}{c}$$

a = AC content of RAP

b = RAP percent in mixture by total weight of mix

c = Total Percent AC content in mixture

- 2.2.3 Design of mix: Include the following data with the trial mix design submission:
- (1) Aggregate bulk specific gravity and water absorption.
 - (2) Sand equivalent, Micro Deval, Flat and Elongated, Coarse Aggregate Fracture, Fine Aggregate Angularity and Manufactured Fine Content values.
 - (3) Asphalt cement properties including mixing and compaction temperatures, based on temperature viscosity properties of asphalt cement.
 - (4) A graph of the temperature-viscosity relationship for the asphalt cement.

- (5) Aggregate gradations and blending proportions.
- (6) Maximum theoretical density of trial mixes.
- (7) Asphalt absorption values.
- (8) Information on additives, including source, type, percent by mass of asphalt cement and test results when anti-stripping tests are required.
- (9) Percent Air Voids, Marshall flow, voids in the mineral aggregate, and Marshall stability of the mixture selected.
- (10) Graphs of the air voids, Marshall flow, voids in the mineral aggregate and Marshall stability plotted against asphalt cement content.
- (11) Mix physical requirements to meet Table 2.2.3 below.
- (12) Do not change job-mix without prior approval from the Contract Administrator. Should change in material source be proposed, new job-mix formula to be submitted to the Contract Administrator for review and approval.

**Table 2.2.3
Specified Physical Requirements of Hot Mix Asphalt**

Property	Mix Type
	Lower and Surface Course
Stability @ 60°C, kN (min)	9.0
Flow Index, 0.25 mm units	8 - 14
Voids in Mineral Aggregate % (min)	14.0
Air Voids, % ⁽²⁾	3.0 - 5.0
Tensile Strength Ratio, % (min) ⁽³⁾	80

Notes:

- (1) Percent air voids in compacted trial mixes must be determined in accordance with ASTM D3203, with asphalt cement absorbed into the aggregate compensated for in the calculation.
- (2) In accordance with AASHTO T 283

3.0 EXECUTION

3.1 Plant and Mixing Requirements

3.1.1 Batch and continuous mixing plants:
(replace (3))

(3) Before mixing, dry aggregates to a moisture content not greater than 1.0% by mass or to a lesser moisture content if required to meet mix design requirements.

(9) Where RAP is to be incorporated into the mix: **(add)**

(5) RAP shall be introduced such that the RAP is not directly exposed to the flame.

3.1.4 Mix tolerances including variations resulting from adding RAP:
(replace (1))

(1) Permissible variation in aggregate gradation from job mix (percent of total mass):

(1)	4.75 mm sieve and larger	± 5
(2)	2.36 and 1.18 mm sieves	± 4.0
(3)	0.600 mm sieve	± 3.0
(4)	0.300 mm sieve	± 2.0
(5)	0.150 mm sieve	± 1.5
(6)	0.075 mm sieve	± 1.0

3.2 Equipment

3.2.1 **(add)**

(1) Pavers must be capable of placing a standard mat width not less than 3 m and must be capable of paving wider widths in 150 mm and 300 mm increments by means of equipment supplied by the manufacturer of the equipment. The screed must include a tamping bar or strike-off device.

(2) Control of the screed must be by automatic sensing devices. Longitudinal control must be by a sensor that follows a stringline, ski or other reference. The grade sensor must be movable, and mounts provided so that grade control can be established on either side of the paver. A slope control sensor must be provided to maintain the proper transverse

slope of the screed.

3.6 Compaction

3.6.1 **(add)**

Re-rolling of the asphalt will not be accepted as a remedy to increase test that do not meet specifications.

3.6.2 General: **(replace (1))**

(1) Provide sufficient compaction equipment to ensure that the compaction rate meets or exceeds the placement rate and to ensure that specified density is achieved before the temperature of the mat falls below 100°C.

3.7 Joints

3.7.1 General: **(add)**

(4) When placing final pavement layer against concrete curb & gutter, compacted pavement must meet the gutter at the same elevation or a maximum of 10 mm above and along the entire lip of the gutter. For reverse grade gutter, compacted pavement must meet the gutter at the same elevation to prevent ponding.

Add the following Sub-Sections:

**4.0 COMPLIANCE WITH SPECIFICATIONS AND
PAYMENT ADJUSTMENT FOR NON-COMPLIANCE**

4.1 General

- 4.1.1 The Contractor Shall provide a finished product conforming to the quality and tolerance requirements of this Specification. Where no tolerances are specified, the standard of workmanship shall be in accordance with accepted industry standards.
- 4.1.2 Acceptance of any unit of work area at full payment will occur if there are no obvious defects and the results of asphalt content, pavement density, air voids and thickness meet or exceed specified tolerances.
- 4.1.3 Unit price reductions will only be applied based on full quality assurance testing in accordance with Table 5.3.4.
- 4.1.4 The Engineer of Record who provides a letter of professional assurance for asphalt paving must satisfy the requirements of this specification. Quality control and quality assurance documentation must be available upon request. Companion samples taken as part

of quality assurance testing must be available upon request by the City Engineer.

4.1.5 Any material or workmanship deficiencies are subject to either a payment adjustment to be paid to the City of Kelowna or removal and replacement. Payment adjustments will be determined by the guidelines in this specification. Removal and replacement will be at the discretion of the City Engineer.

4.2 Aggregate Gradation

4.2.1 When the aggregate fails to comply with tolerances set forth in Section 3.1.4.1 of this specification, the City Engineer will initiate the following action:

- (1) When two consecutive gradation analyses identify non-compliance with the specified tolerances, the contractor shall be notified in writing and a third test will be completed.
- (2) If the third test indicates aggregate gradation non-compliance, the Contractor must suspend asphalt production and placement until corrective action has been taken and additional testing shows compliance with specified tolerance limits.

4.3 Asphalt Cement

4.3.1 Payment adjustment for non-compliance with the tolerance specified:

Asphalt Content Deviation from Design %	Payment Adjustment Factor
0.30 OR LESS	0.00
0.31 TO 0.40	0.30
0.41 TO 0.50	0.75
0.50 OR GREATER	Remove and replace (at the discretion of the City Engineer)

- 4.3.2 Adjustment for asphalt cement (AC) content non-compliance to the amount payable for Hot Mix Asphalt Paving equals the unit bid price times the payment adjustment factor times the quantity to which the factor is to be applied, i.e.:

$$A_c = P (F_c)(Q_n)$$

Where:

A_c = Adjustment for AC content non-compliance

P = Unit bid price

F_c = Adjustment Factor for AC Content non-compliance

Q_n = Asphalt measured for payment which was produced during the production period to which a test applies

4.4 Pavement Thickness

- 4.4.1 Pavement of any type found to be deficient in thickness by more than 10 mm must be removed and replaced by pavement of specified thickness, at the contractor's expense.

- 4.4.2 Pavement of any type found to be deficient by less than 10 percent of its specified compacted thickness will not be subject to payment adjustment for thickness non-compliance.

- 4.4.3 Pavement of any type found to be deficient in thickness by more than 10 percent of its specified thickness but not more than 10 mm shall give rise to an adjustment in the amount to be paid to the Contractor. The adjustment shall be subtracted from the amount otherwise payable to the Contractor, and the amount of the adjustment will be paid to the City. The adjustment shall be calculated as follows:

$$A_t = 1.3 \left(\frac{T_d}{T_s} \right) (P)(Q_t) \quad -$$

Where:

A_t = Adjustment for thickness deficiency

T_d = Deficiency in thickness measured in mm and being greater than 10% of specified thickness but not greater than 10 mm.

T_s = Specified thickness in mm.

P = Unit Bid Price

Q_t = Asphalt measured for payment lying within a unit of work area defined in 5.2.2, where the thickness deficiency has been identified.

NOTE: No allowance will be made for the tolerance provided for in Section 4.4.2. No payment will be made for additional thickness.

4.5 Density

4.5.1 The minimum specified density for acceptance, without payment adjustment, must be 97% of the 75 blow Marshall bulk relative density as most recently determined by the appointed testing agency.

4.5.2 Payment adjustment for density non-compliance will be as follows:

DENSITY (% OF 75 BLOW MARSHALL BULK RELATIVE DENSITY)	PAYMENT ADJUSTMENT FACTOR
97 and greater	0.0
96.5 to 96.9	7.5 %
96.0 to 96.4	15.0 %
95.5 to 95.9	22.5 %
95.0 to 95.4	30.0 %
Less than 95.0	No Payment (Note 1)

Note 1: Subject to removal and replacement at the discretion of the City Engineer.

Adjustment for density specification non-compliance shall be determined as follows:

$$A_D = P (F_D) (Q_{nD})$$

Where:

A_D = Adjustment for density non-compliance

P = Unit Bid Price for Hot Mix Asphalt Cement paving (m²)

F_D = Payment Adjustment Factor for density non-compliance (%)

Q_{nD} = Asphalt measured for payment within a unit of test area as defined in 5.1.3 (m²).

- 4.6 Adjusted Payments** 4.6.1 The total adjustment arising from pavement deficiencies identified in the foregoing shall be determined as follows:

$$A_r = A_c + A_t + A_D$$

Where:

- A_r = Total Adjustment
 A_c = Adjustment for asphalt cement content non-compliance
 A_t = Adjustment for thickness deficiency
 A_D = Adjustment for density non-compliance

The total adjustment (A_r) shall be applied to the unit price for the quantity of work being accessed.

- 4.7 Segregation** 4.7.1 The finished surface shall have a uniform texture and be free of segregated areas. A segregated area is defined as an area of the pavement where the texture differs visually from the texture of the surrounding pavement.

- 4.7.2 All segregation will be assessed using ASTM E965. The City Engineer to determine repair requirements.

The severity of segregation will be rated as follows:

Slight - The matrix of asphalt cement and fine aggregate is in place between the coarse aggregate particles, however there is more stone in comparison to the surrounding acceptable mix.

Moderate - Significantly more stone than the surrounding mix and exhibit a lack of surrounding matrix.

Severe - Appears as an area of very stony mix, stone against stone, with very little or no matrix.

- 4.7.3 Areas of moderate segregation may be left in place for lower courses, subject to approval of the City Engineer, but are considered defective areas for surface course. Areas of severe segregation are considered defective areas for lower and surface courses. Defective areas shall be removed and replaced with acceptable hot mix asphalt of the same type and compacted to the satisfaction of the City Engineer.

- 4.7.4 Any other methods of repair proposed by the Contractor will be subject to the approval of the City Engineer.

- 4.7.5 Repairs will be carried out by the Contractor at their expense.
- 4.8 Smoothness**
- 4.8.1 The completed asphalt concrete surface shall be smooth and true to the established crown and grade. The surface course shall be free from deviations exceeding 5 mm as measured in any direction with a 3 m straight edge.
- 4.8.2 When deviations more than the above tolerances are found, the pavement surface shall be corrected by methods satisfactory to the City Engineer. Correction of defects shall be carried out until there are no deviations anywhere greater than the allowable tolerances.
- 5.0 TESTING FREQUENCY AND PROCEDURES**
- 5.1 General**
- 5.1.1 The City Engineer shall have access to all production processes and materials used for the work to monitor material quality as often as deemed necessary. Such inspection and testing shall not in any way relieve the Contractor of the responsibility for meeting the requirements of this specification.
- 5.1.2 At least three weeks prior to commencing work, inform the Contract Administrator of the proposed source of aggregates, provide access for sampling, provide equipment to obtain representative samples from stockpiles, and provide samples of asphalt cement in accordance with Section 2.1.1.
- 5.1.3 The unit of work area considered for acceptance is each 1,500 m² of continuous paving production. When less than 1,500 m² is produced in a construction period the actual production for that period may, at the discretion of the Contract Administrator, be added to the previously completed pavement construction.
- 5.1.4 Minimum testing outlined in Table 5.3.4 must be completed for full payment and acceptance of work.
- 5.2 Quality Control**
- 5.2.1 Quality control is the responsibility of the Contractor throughout every stage of the project, to ensure that all materials and work conform to the requirements as specified in the Contract Documents.
- 5.2.2 Reclaimed asphalt pavement (RAP) shall be considered as an aggregate for the purposes of quality control.

- 5.2.3 All quality control shall be conducted by qualified personnel. The Contractor shall bear the cost of all quality control testing and consulting services.
- 5.2.4 Quality Control testing, sampling and minimum frequencies are described in Table 5.2.4, Quality Control Requirements.
- 5.2.5 Pre-Production Quality Control test data as specified in Table 5.2.4 shall be reported to the City Engineer one week prior to commencing the project, or as requested.

Table 5.2.4: Quality Control Requirements

Quality Control Requirements	Test Standards	Minimum Frequency
Pre-Production		
Asphalt Cement Certification	-	Once per year or for change in supplier.
Aggregate Physical Properties Sec. 2.1.3	Section 2.1.3	Once per year, or for change in source.
Coarse Aggregate, Manufactured Sand, Natural Fines, Blend Sand Aggregates Gradation	ASTM C117 ASTM C136	One for every 1,000 tonnes of each class of material processed into stockpile, or one analysis for each material every production day when production rate is less than 1000 tonnes.
RAP Asphalt Content and Gradation	ASTM D6307 ASTM D2172 ASTM D5444	One sample per 500 tonnes or a minimum of ten samples per stockpile, whichever amount is greater.
Trial Mix Design by Marshall Method	Section 2.2 Asphalt Institute MS-2	One per mix type every production year, or as required for a change in asphalt cement supply, aggregate gradation or aggregate source.
Post- Production		
Hot Mix Asphalt Analysis (including Asphalt Content, Aggregate Gradation, Marshall Bulk Relative Density and Void Properties)	ASTM D6307 ASTM D2172 ASTM D5444 ASTM D3203	For each mix type one hot mix analysis for every 500 tonnes or one sample per day of paving, whichever is greater. Samples must be taken at the paving location. See Note 1.
Compaction Monitoring (Core Density)	ASTM D2726 ASTM D2950	Minimum Frequency not specified. See Note 2.

Note 1:

Where an individual test indicates non-compliance, the Contractor must immediately initiate remedial measures, and submit, at its expense, evidence that compliance exists with the approved mix design.

Note 2:

Coring is subject to the approval of the Contract Administrator.

- 5.3 Quality Assurance**
- 5.3.1 Acceptance of all hot mix asphalt material and paving will be based on the results of Quality Assurance (QA) testing from a lab that is Canadian Council of Independent Laboratories (CCIL) certified.
- 5.3.2 Quality assurance testing is the responsibility of the Contract Administrator for acceptance of work completed.
- 5.3.3 Quality Assurance sampling and testing is described in Table 5.3.4, Quality Assurance Minimum Testing Requirements.
- 5.3.4 Quality Assurance Sampling Procedures:
- (1) Loose mix samples shall be acquired from the work site in accordance with ASTM D979. Sampling from the auger can be substituted for this standard provided that no sample segregation is probable. Companion samples must be taken for use as 3rd Party appeal test samples.
 - (2) The timing of mix sampling shall be stratified, with each sample representing a similar production quantity.
 - (3) Core locations will be selected using representative random sampling procedures. The unit of work area will be divided into segments meeting or exceeding the minimum frequency in Table 5.3.4 and of approximately equal area. The longitudinal coordinates will have similar spacing on roadway and transverse coordinates will be located using random numbers. Coring locations will be determined in the office prior to sampling, approved by the Contract Administrator. Core sampling requires written approval by the City of Kelowna.
 - (4) Areas within 5.0 m of transverse joints or 0.5 m of a mat edge are excluded from compaction acceptance sampling and testing.
 - (5) The Contract Administrator for a private project must be able to provide the opportunity for the City Engineer to sample paving materials when the City of Kelowna deems it necessary.

Table 5.3.4: Quality Assurance Minimum Requirements

Quality Assurance Requirements	Test Standards	Minimum Frequency
Hot Mix Asphalt Analysis (including Binder Content, Aggregate Gradation, Marshall Bulk Relative Density, Maximum Relative Density, Marshall Stability and Flow and Void Properties)	ASTM D6307 ASTM D2172 ASTM D5444 ASTM D3203 ASTM D6927 ASTM D2041	For each mix type one hot mix analysis per 1500 m ² or one test per 4.0 hrs of continuous paving, whichever is greater. Companion samples must be taken for use as 3rd Party appeal test samples.
Compaction Testing (Core Density) and Thickness Determination	ASTM D2726 ASTM D3549	Three cores per 1,500 m ² . Three cores for areas between 500m ² and 1,500m ² . Number of tests required for areas less than 500m ² will be at the discretion of the Contract Administrator.
Hot Mix Asphalt Temperature	-	No minimum frequency.

5.4 Appeal of Quality Assurance Testing Results

- 5.4.1 The Contractor may appeal the results of acceptance testing for Compaction Standard or Asphalt Content for any area subject to rejection or unit price reduction. The notice of appeal shall be in writing and submitted to the City Engineer within 7 days of receipt of the acceptance testing results.
- 5.4.2 Appeals will only be considered if a cause can be proven, and the requirements of Table 5.2.4 have been satisfied.
- 5.4.3 Quality Control tests initiated after the Contractor's receipt of the Quality Assurance test results will not be considered when evaluating cause for appeal. Heating and remolding pavement cores for the purpose of determining asphalt content, gradation or Marshall volumetric properties is not acceptable.
- 5.4.4 Only Quality Control testing during production for the subject project will be considered when evaluating cause for appeal provided test results are submitted to the City Engineer prior to the receipt of the acceptance testing results.
- 5.4.5 Laboratories conducting acceptance testing for appeals must be CCIL certified for the subject test procedures.

- 5.5 Asphalt Content, Compaction Standard or Air Void Appeals**
- 5.5.1 The testing laboratory conducting the project acceptance sampling and testing will routinely retain companion samples sufficient for the determination of asphalt content, maximum relative density and/or Marshall relative density. Minimum companion sample size should be 10 kg for this purpose.
- 5.5.2 For asphalt content, compaction standard or air void (Marshall relative density) appeal testing, the Contractor will have the option for the testing to be done by the testing laboratory undertaking the Quality Assurance testing, or an independent testing laboratory selected by the City Engineer. If the independent testing laboratory does not have a valid asphalt correction factor as per ASTM D6307 - Asphalt Content of Hot Mix Asphalt by Ignition Oven the lab should have the capability to perform ASTM D2172 - Quantitative Extraction of Bitumen from Bituminous Paving Mixtures.
- 5.5.3 The appeal test results will be used for acceptance and unit price adjustment and shall be binding on both the City of Kelowna and the Contractor.
- 5.5.4 If the new asphalt content, new compaction and/or new air voids content verifies that any unit price reduction or rejection applies for that area of work, the costs of the appeal sampling and testing will be borne by the Contractor. If the results show that a penalty or rejection no longer applies, the sampling and appeal costs will be the responsibility of the City of Kelowna.
- 5.6 Core Density and Thickness Appeals**
- 5.6.1 Core density and thickness appeals will only be considered if a case can be made that the stratified random sampling plan was biased, or sampling and testing was in error.

END OF SECTION

1.0 GENERAL

1.3 Source Quality Control

(add)

1.3.3 Submit soil analysis results to Contract Administrator minimum 5 Days prior to deliver or placement of growing medium (topsoil). Contractor not to supply or place growing medium and amendments that will not or do not meet the physical and chemical properties described in this Section without the prior written approval of the Contract Administrator.

1.5 Inspection and Testing

(add)

1.5.2 Submit 1.0kg sample of each proposed material and amendment to the Contract Administrator and soil testing laboratory. Independent soil testing laboratory to be approved by the Contract Administrator.

1.5.3 Have testing laboratory analyse samples for chemical, physical and biological properties specified in this Section, to include pH, lime requirements, soluble salts or electrical conductivity (E.C.), % Sands + % Fines (Silt and Clay) + % Organic Matter = 100%, % Total Nitrogen, and available levels of phosphorous, potassium, calcium and magnesium.

1.5.4 Have testing laboratory advise on suitability of material for intended use and make recommendations for manufacture and amendment of growing medium to meet requirements of the Contract Documents. Note that the Contract Administrator may accept the soil if it closely meets the requirements, based upon the recommendations of the laboratory.

1.5.5 Results of laboratory testing to be made available to the City Engineer upon request.

2.0 PRODUCTS

2.9 Fertilizers

(add)

2.9.2 Chemical fertilizer use must be approved by City Engineer prior to use and should be limited to areas where compost is not available/suitable.

2.9.3 Fertilizer should not be used in restoration.

2.10 Growing Medium *(replace Table 2)*

Table 2: Properties of Growing Medium for Different Applications

	<u>Tree Pits & Low Traffic Lawn Areas</u>	<u>High Traffic Lawn Areas</u>	<u>Planting Beds & Planters</u>	<u>Naturalized Grass</u>	<u>Naturalized Beds</u>
Particle Size (% of dry weight mineral fraction per <u>Canadian System of Soil Classification</u>)					
Gravel >2mm	0-5	0-5	0-5	0-10	0-10
Sand 0.05mm-2mm	50-70	80-90	50-70	30-70	30-70
Silt 0.002mm-0.05mm	10-25	5-15	10-25	15-50	15-50
Clay <0.002mm	0-20	0-5	0-20	15-30	15-30
Silt + Clay	25 max	15 max	25 max	60 max	60 max
Acidity (pH)	6.0-7.0	6.0-7.0	5.5-7.0	6.0-7.0	6.0-7.0
Organic Content (% of dry weight)	3-5	3-5	15-20	5-10	10-15
Drainage	Percolation shall be such that no standing water is visible 60 minutes after at least 10 minutes of moderate to heavy rain or irrigation.				

2.11 Compost *(add sub-section)*

2.11.1 Compost to be uniform blend of natural source-separated organic materials, composted such that it is brown-black in colour and has carbon to nitrogen ratio of 25 to 1 or lower and pH 6 to 7. Compost to be substantially free from subsoil, pests, roots, wood, construction debris, undesirable grasses or weeds, and seeds or parts thereof. Compost to be substantially free from toxic materials, crabgrass, couch grass, equisetum, other weeds, and seeds or parts thereof.

2.11.2 Use of compost to be approved in writing by the Contract Administrator prior to mixing or placement.

3.0 EXECUTION

3.4 Placing Growing Medium *(replace 3.4.5)*

3.4.5 Place growing medium to minimum depth after settlement specified on Contract Drawings. Where no depth is specified on Contract Drawings place growing medium to minimum depth after settlement specified in Table 3 for Coarse Textured Subsoil to increase water retention.

3.7 Acceptance

(add)

3.7.2 If analysis of placed growing medium indicates that the physical or chemical properties of the material varies from the limits and ranges specified in this Section, the Contract Administrator may do one or a combination of the following:

- (1) Require removal and replacement of growing medium that does not meet the limits and ranges specified in this Section.
- (2) Require the application and incorporation of soil amendments to enable the soil to meet the physical and chemical requirements specified in this Section.
- (3) Accept the work at a reduced price determined by G.C. 9 Valuation of Changes and Extra Work.

3.10 Drainage
Control

(add sub-section)

3.10.1 Provide proper water management and drainage of site during construction. Include silt traps, erosion control measures, temporary water collection ditches, as well as maintenance during construction period.

END OF SECTION

1.0 GENERAL	1.0.1	Section 32 91 23S refers to those portions of the work that are unique to the use of soil cells for the planting of trees and landscaping in pedestrian and vehicular areas. This section must be referenced to and interpreted simultaneously with all other sections pertinent to the works described herein.	
1.1 Related Work	1.1.1	Concrete Walks, Curbs and Gutters	<u>Section 03 30 20</u>
	1.1.2	Cast-in-Place Concrete	<u>Section 03 30 53</u>
	1.1.3	Aggregates and Granular Materials	<u>Section 31 05 17</u>
	1.1.4	Excavation, Trenching and Backfilling	<u>Section 31 23 01</u>
	1.1.5	Roadway Excavation, Embankment and Compaction	<u>Section 31 24 13</u>
	1.1.6	Geosynthetics	<u>Section 31 32 19</u>
	1.1.7	Granular Base	<u>Section 32 11 23</u>
	1.1.8	Topsoil and Finish Grading	<u>Section 32 91 21</u>
	1.1.9	Irrigation System	<u>Section 32 94 01S</u>
	1.1.10	Planting of Trees, Shrubs and Ground Covers	<u>Section 32 93 01</u>
1.2 Mock Up	1.2.1	Prior to the installation of soil cell system, construct a mockup of complete installation at the discretion of the Contract Administrator.	
	1.2.2	Mock up to be a minimum 10m ² in area and to consist of complete soil cell system, including soil cell frames, geogrid, growing medium, soil cell deck and geotextile, all installed in excavation on prepared and approved granular base, geotextile, and subgrade.	
	1.2.3	Mock up may, upon approval of the Contract Administrator, remain as part of the installed work at end of project if it remains in good condition and meets requirements of Contract Documents. Otherwise, mock-up to be removed at Contractor's expense.	
1.3 Site Conditions	1.3.1	Inspect all areas to receive soil cells prior to placement. Before proceeding with work check and verify dimensions, quantities, grade elevations, drainage, compaction, and contamination.	

- | | | | |
|------------|---------------------------------------|-------|--|
| | | 1.3.2 | Report defects in dimensions, quantities, grade elevations, drainage, compaction and contamination to the Contract Administrator immediately and make good to satisfaction of the Contract Administrator prior to construction of soil cell system. |
| 1.4 | Delivery, Storage and Handling | 1.4.1 | Deliver packaged materials in original, unopened containers showing weight, certified analysis and name and address of manufacturer. |
| | | 1.4.2 | Do not handle, deliver or place bulk materials in frozen, wet or muddy conditions. Deliver materials to site at or near optimum compaction moisture content. |
| | | 1.4.3 | Protect excavation from freezing conditions, accumulation of water and contamination until placement of soil cells, growing medium, geotextile and root barrier. Maintain protection of excavation and placed material until installation of hard surfaced roadway or pedestrian surface above. |
| | | 1.4.4 | Growing medium, granular base and backfill that is excessively wet, segregated or contaminated will be rejected. Remove rejected material from site and replace with approved material at Contractor's expense. |
| 1.5 | Layout and Elevation Control | 1.5.1 | Provide layout and elevation control during installation of soil cells. Utilize grade stakes, benchmarks, surveying equipment and other means and methods to ensure that layout and elevations conform to layout and elevations shown on Contract Drawings. |
| 1.6 | Scheduling | 1.6.1 | Schedule installation of soil cells after all affecting walls, curbs, footings and utility work in the area have been installed. Coordinate schedule with scheduling of other trades on site. |
| 1.7 | Measurement and Payment | 1.7.1 | Payment for soil cells will be made separately for each vertical column of soil cell assembly, and includes all soil cell components, growing medium, site preparation, placement, geogrid and geotextile, protection of work and incidentals. Payment will be made separately for assemblies comprised of one, two or three layers of soil cell frames. |
| | | 1.7.2 | Payment for excavation, backfilling and embankment of soil cells will be made under Section 31 23 01 - Excavating, Trenching and Backfilling or Section 31 24 13 - Roadway Excavation, Embankment and Compaction, as provided in the Schedule of Quantities and Unit Prices. |

- 1.7.3 Payment for placement and compaction of granular base will be made under Section 32 11 23 - Granular Base, as provided in the Schedule of Quantities and Unit Prices.
- 1.7.4 Payment for pedestrian or vehicle surfaces above soil cells will be made under separate sections as appropriate.
- 1.7.5 Payment for tree planting, associated non-soil cell growing medium, root barrier, tree grates and concrete surrounds will be made under separate sections as appropriate.
- 1.8 Inspection and Testing**
- 1.8.1 Refer to General Conditions, Clause 4.12, Inspections and Testing.
- 1.8.2 Refer to Section 32 91 21 - Topsoil and Finish Grading - 1.3 and 1.5.
- 2.0 PRODUCTS**
- 2.1 Soil Cell**
- 2.1.1 Soil cell to be fiberglass-reinforced polypropylene structure, or other materials, designed to support sidewalk loads, designed to be filled with growing medium for the purpose of growing tree roots, and for rainwater filtration, detention and retention.
- Acceptable soil cell systems include the following:

 - (1) Silva Cell by DeepRoot Partners, including:
 - .1 Silva Cell frame: 400 x 600 x 1200 mm
 - .2 Silva Cell deck: 50 x 600 x 1200 mm, including manufactured installed galvanized steel tubes
 - .3 Silva Cell modified: 400 x 600 x 150 mm modified Silva Cell frame designed to stiffen and align frames as growing medium and backfill is placed
 - .4 Silva Cell deck screws: manufacturer supplied stainless steel screws to attach decks to frames
 - (2) Approved Equal.
- 2.2 Anchor Spike**
- 2.2.1 Galvanized steel spike with spiral twist, 8mm diameter and 250mm length.
- 2.3 Drainage Pipe**
- 2.3.1 Drainage pipe to be perforated drainpipe per Section 33 40 01 - Storm Sewers - 2.7, as specified on Drawings.
- 2.3.2 Fittings to be compatible with specified pipe and by same manufacturer.

			2.3.3	PVC pipe solvent and primer combinations shall be as recommended by manufacturer and suitable for use with specified materials and application.	
2.4	Inspection Assembly	Riser	2.4.1	Inspection riser to be 100mm diameter Schedule 40 non-perforated PVC pipe per Section 32 94 01S– Irrigation System. Cut four (4) 3mm wide slots in bottom of pipe that extend to soil cell deck to allow water access for inspection.	
			2.4.2	Fittings and caps to be compatible with specified pipe and by same manufacturer. Cap to be solid threaded cleanout or removable inlet grate designed to fit inspection riser and be compatible with pedestrian traffic and operational practice.	
2.5	Geogrid		2.5.1	Geogrid to be high molecular weight high tenacity polyester multifilament yarns woven in tension and polymer-coated, with the following ASTM D 6637 mechanical properties:	
			(1)	Tensile strength:	29.2 kN/m
			(2)	Creep reduced strength:	18.5 kN/m
			(3)	Long term allowable design load:	18.5 kN/m
			(4)	Grid aperture size (machine direction):	22.2mm
			(5)	Grid aperture size:	25.4mm
			(6)	Mass /unit area (ASTM D 5261):	254.3 g/m ²
2.6	Geotextile		2.6.1	Geotextile to be non-woven polypropylene fabric, with the following properties:	
			(1)	Grab tensile strength:	167.8 kg
			(2)	Grab tensile elongation:	50%
			(3)	Mullen burst strength:	2,620 kPa
			(4)	Puncture strength:	58.97 kg
			(5)	Apparent opening size:	US sieve 80 (0.180 mm)
			(6)	Water flow rate:	3,870.8 l/min/m ²
			(7)	Minimum roll width:	3600 mm
2.7	Granular Base		2.7.1	Granular base and subbase to be as shown on Contract Drawings and to conform to Section 32 11 23 - Granular Base.	
2.8	Backfill		2.8.1	Backfill material adjacent to soil cells to be as shown on Contract Drawings.	
2.9	Growing Medium		2.9.1	Growing medium to be as shown on Contract Drawings and to conform to Section 32 91 21– Topsoil and Finish Grading.	

- 2.10 Root Barrier** 2.10.1 Root barrier to be per Section 32 93 01 - Planting of Trees, Shrubs and Ground Covers - 2.15.
- 3.0 EXECUTION**
- 3.1 Soil Cell Frame**
- 3.1.1 Confirm that granular base meets compaction requirements of 95% of maximum dry density in accordance with ASTM D698 Standard Proctor method prior to placement of soil cell frame units. Grade sub-base surface on a plane parallel to the proposed finish grade above.
- 3.1.2 Identify tree openings, utility routes and edges of hard surfaces above soil cells on granular base using spiked string and/or spray paint.
- 3.1.3 Confirm that width and length of excavation are a minimum of 150mm beyond the edges of the Soil Cells. Layout location of all drain lines. Do not locate drain lines within 150mm of any Soil Cell post. Provide field engineering when drain lines are being installed to assure that the slope on all drains is 1% minimum towards intended outfalls. Place frame units by hand.
- 3.1.4 Place first layer of frame units on prepared and approved granular base and geotextile. Work away from tree and utility openings. Place frame units no less than 25mm apart and no more than 75mm apart.
- 3.1.5 Verify that horizontal and vertical position of frame units are consistent with required locations and dimensions of tree and utility openings, paving edges, surfaces and other structures to be constructed above soil cells. Report conflicts to the Contract Administrator and make adjustments as necessary.
- 3.1.6 Ensure that each frame unit sits firmly on granular base. Ensure frames do not rock or bend over any stone or other obstruction and do not bend into dips in base.
- 3.1.7 Check each frame unit for damage prior to placing in excavation. Do not use frame units that are cracked or chipped.
- 3.1.8 Secure soil cell to granular base with four anchor spikes driven through molded holes in base of frame unit.

- 3.1.9 For applications where soil cells are installed over waterproofed structures, develop a spacing system consistent with requirements of waterproofing system and do not use anchor spikes that will come within 150mm of any waterproofing material. Submit shop drawing of spacing and anchoring system for approval by the Contract Administrator.
- 3.1.10 Install next layer of frame units on top of previous layer. Build layers as stacks of frame units set one directly over the other. Do not set frame unit half on one unit below and half on another unit.
- 3.1.11 Register each upper frame unit on top of lower frame unit post. Ensure contact points are free of dirt, mud and debris prior to placement. Ensure each upper unit is solidly seated on unit below. Rotate each frame registration arrow in the opposite direction from frame unit below to ensure connector tabs firmly connect.
- 3.1.12 Install no more than two layers of frame units before installation of growing medium and backfill.
- 3.2 Modified Soil Cell Frame**
- 3.2.1 Install modified frame unit on top of frame unit prior to installation of growing medium and backfill. Modified frame unit is required only during installation and compaction of growing medium and backfill.
- 3.2.2 Remove modified frame unit prior to installation of deck unit and as installation of growing medium and backfill progresses across soil cell framework. Place and remove modified frame units by hand.
- 3.3 Geogrid**
- 3.3.1 Install geogrid curtain prior to installation of growing medium and backfill.
- 3.3.2 Geogrid curtain is required between edge of soil cell and any backfill or granular base beyond extent of soil cell framework that will support pedestrian or vehicular paving.
- 3.3.3 Install geogrid curtain where required. Do not install geogrid curtain between edge of soil cell and any planting area or tree opening adjacent to soil cell.
- 3.3.4 Pre-cut geogrid to allow for 150mm minimum underlap below backfill, and 300mm minimum overlap above soil cell deck.
- 3.3.5 Where soil cell layout causes a change of direction in plane of geogrid, slice top and bottom flaps of geogrid and fold so it lies flat on top of soil cell deck and granular base course along both planes.

- 3.3.6 Provide 300mm minimum overlap between different sheets of geogrid.
- 3.3.7 Secure geogrid to frame units and deck units with 4.5mm x 300mm plastic zip ties in locations recommended by manufacturer. After deck unit is secured in place fold 300mm overlap of geogrid over top of unit.
- 3.4 Growing Medium and Backfill**
- 3.4.1 Install root barrier as shown on Contract Drawings. Protect root barrier from damage and displacement during installation of growing medium and backfill.
- 3.4.2 Install growing medium and backfill as indicated on Contract Drawings. The process of installation requires that these two materials be installed and compacted together in alternating lifts to achieve correct compaction relationships between the materials.
- 3.4.3 Place growing medium in soil cell framework and spread by hand or hand tool through each soil cell in a maximum 200mm lift. Work soil under horizontal beams of soil cell frame and utility conduit to eliminate air pockets there. Ensure equipment bucket does not contact soil cell framework. Hold plywood sheet against geogrid during placement and compaction of growing medium to protect geogrid and maintain consistent separation of materials.
- 3.4.4 Finalize installation of utility conduit, drainage pipes and irrigation where shown on Contract Drawings.
- 3.4.5 Compact growing medium lift by stepping on entire exposed surface of growing medium. Do not step on frame units. Ensure there is a minimum of 250mm of growing medium over horizontal beams of frame units before beginning compaction. Leave top 50mm of frame unit exposed above growing medium to allow placement of next layer of frame units.
- 3.4.6 Compact growing medium to 85% of standard proctor density. Remove growing medium that is over compacted and reinstall.
- 3.4.7 Place backfill to 95% of maximum dry density in space between geogrid and sides of excavation and spread by hand adjacent to soil cell framework to provide maximum 200mm lift. Ensure geogrid under lap lays flat under backfill. Ensure equipment bucket does not contact soil cell framework. Hold plywood sheet against geogrid during placement and compaction of backfill to protect geogrid and maintain consistent separation of materials. Do not place backfill material in tree or planting bed opening.

- 3.4.8 Compact backfill per Contract Documents. Ensure compaction equipment does not contact soil cell frame or deck.
- 3.4.9 Repeat placement and compaction of growing medium and backfill in lifts to top of topmost frame unit. Finish grade of growing medium to be 25mm below bottom of deck unit, except as indicated otherwise on Contract Drawings.
- 3.4.10 Do not place final lift of backfill until adjacent deck unit is secured in place. Then install and compact backfill flush with soil cell deck. Ensure compaction equipment does not contact deck unit. Maintain modified frame unit in place until installation of deck unit.
- 3.5 Soil Cell Deck**
- 3.5.1 Obtain the Contract Administrator's approval of placement and compaction of growing medium and backfill prior to installation of soil cell deck.
- 3.5.2 Process for installation of deck units requires that deck units be installed immediately after removal of modified frame units.
- 3.5.3 Ensure contact points are free of dirt, mud and debris prior to placement. Register deck unit on top of frame unit post. Do not set deck unit half on one frame unit below and half on another frame unit. Ensure deck unit is solidly seated on frame unit.
- 3.5.4 Snap deck unit onto frame unit using snapping mechanism on corners of deck unit. A rubber mallet may be used to hammer snaps into place.
- 3.5.5 Secure deck unit corners to frame unit posts using screws provided by manufacturer.
- 3.6 Geotextile**
- 3.6.1 Place geotextile over top of soil cell deck and where indicated on Drawings. Extend geotextile minimum 450mm beyond outside edge of excavation. Overlap geotextile joints minimum 450mm. Cut geotextile to provide minimum 200mm overlap of tree, planting and utility openings.
- 3.7 Inspection Riser Assembly**
- 3.7.1 Install inspection riser assembly on top of geotextile in location shown on Contract Drawings immediately prior to placement of granular base. Maintain assembly in fixed position during placement of granular base and final hard surface treatment.
- 3.8 Geotextile**
- 3.8.1 Supply and install geotextile under soil cell system as shown on Contract Drawings and per Section 31 32 19 - Geosynthetics.

- 3.8.2 Supply and install geotextile on soil cell deck as shown on Contract Drawings and per Section 31.32.19 - Geosynthetics.
- 3.8.3 Place geotextile over top of soil cell deck and where indicated on Drawings.
- 3.8.4 Extend geotextile minimum 450mm beyond outside edge of excavation. Overlap geotextile joints minimum 450mm. Cut geotextile to provide minimum 200mm overlap of tree, planting and utility openings.
- 3.8.5 Repair cut or damaged geotextile with a second piece of geotextile prior to placement of granular base. Overlap edges of cut or damaged area with second piece by a minimum of 300mm.
- 3.9 Granular Base**
 - 3.9.1 Supply and install granular sub-base course under soil cell system as shown on Contract Drawings and as specified in Section 32.11.23 - Granular Base.
 - 3.9.2 Supply and install aggregate base course above soil cell system as shown on Contract Drawings and as specified in Section 32.11.23 - Granular Base.
 - 3.9.3 Maximum tolerance for deviations in finished surface of granular base for soil cell system is 6mm over a 1200mm distance. Adjust granular base under each frame unit to provide a continuous solid base of support to required grade elevation.
 - 3.9.4 Install granular base course on geotextile immediately after installation of geotextile.
 - 3.9.5 Place granular base on soil cell system from one side of soil cell deck to other, to ensure geotextile and granular base conforms to cell deck contours.
 - 3.9.6 Do not place or spread granular base in several positions at same time.
 - 3.9.7 Load granular base onto soil cell system from equipment located outside limits of soil cell excavated area. Do not drive vehicles or operate equipment directly on top of soil cell deck, geotextile or granular base. Do not drive vehicles or operate equipment greater than 450kg directly on granular base over soil cell deck.

- 3.9.8 Spread granular base on soil cell system using hand tools or by light use of equipment bucket.
- 3.9.9 Compact granular base in lifts not to exceed 150mm, to 95% of maximum dry density. Compact granular base on top of soil cell system using walk behind type vibratory plate tamper, vibratory roller or jumping compacter having a maximum weight of 450kg.
- 3.9.10 For alternate method of placing and compacting granular base on top of soil cell system (e.g. for large area, small area, area of difficult access) submit shop drawing of proposed equipment and procedure to Contract Administration for approval.
- 3.10 Protection of Work**
 - 3.10.1 Protect soil cell system, geotextile and granular base from vehicles, equipment, other materials and excessive moisture.
 - 3.10.2 Use temporary fencing or hoarding to keep vehicles and equipment away off soil cell area until final surface materials are placed.
- 3.11 Clean Up**
 - 3.11.1 Dispose of surplus materials and all construction debris off site.

END OF SECTION

2.0 PRODUCTS

2.1 Plant Material

2.1.2 *(replace (12))*

(12) All trees and plants to be inspected by the Contract Administrator and the City Engineer (for city trees) upon delivery to site.

(add)

(13) Container stock #3 and less is to be considered small; and container stock #5 and up is to be considered large as specified on Table 3 in Section 32 92 21 Topsoil and Finish Grading.

(add)

2.1.3 Submit written requests for plant material substitutions to the Contractor Administrator for review within 20 Days of receiving Notice to Proceed. Provide explanation for substitution and evidence the plant material is not available within 400km of the site.

2.4 Mulch

(replace 2.4.1)

2.4.1 Mulch to be 'Glenmore Grow' or 'Ogogrow' as determined by the Contract Administrator, obtained from City of Kelowna Landfill Operations (location to be confirmed), and shall be free of all soil, stones, sticks, roots or other extraneous matter. Depth after settlement as specified.

2.5 Stakes

(replace 2.5.1)

2.5.1 Stakes to be as shown on Contract Documents. Where not otherwise shown on Contract Documents, stakes to be pressure treated wood 50-70mm diameter approximately 2.0m long.

2.6 Guying Collar

(replace 2.6.1)

2.6.1 Acceptable products for guying collars and tree ties include the following:

- .1 Deep Root ArborTie series
- .2 Approved Equal

**2.13 Tree Rings, Grate,
Frames, Guards
and Boxes**

(add)

- 2.13.1 Tree rings, grates, frames, guards and boxes to be as shown on Contract Documents. Where not otherwise shown on Contract Documents tree rings, grates, frames, guards and boxes to be per Shop Drawing approved by the Contract Administrator.

2.14 Root Barrier

(add)

- 2.14.1 Depth and length of root barrier product to be as shown on Contract Drawings. Acceptable root barrier products include the following:
- .1 Deep Root UB series
 - .2 Approved Equal

END OF SECTION

- | | | | | |
|------------|---------------------|--------|--|-------------------------|
| 1.0 | GENERAL | 1.0.1 | Section 32 94 01S refers to those portions of the work that are unique to the complete or partial installation or repair of an automatic underground irrigation system, including all necessary preparatory work and all electrical, wiring and plumbing connections, and maintenance work during the guarantee period. | |
| | | 1.0.2 | This section applies to General Contractors and Sub-Contractors for all services and sites that will be maintained by City of Kelowna staff. This section must be referenced and interpreted simultaneously with all other MMCD (Master Municipal Construction Document) sections pertinent to the works described herein. Where standards in this document exceed those in MMCD, these standards shall take precedence. | |
| 1.1 | Related Work | 1.1.1 | Project Record Documents | <u>Section 01 33 01</u> |
| | | 1.1.2 | Cast-in-Place Concrete | <u>Section 03 30 53</u> |
| | | 1.1.3 | Precast Concrete | <u>Section 03 40 01</u> |
| | | 1.1.4 | Aggregates and Granular Materials | <u>Section 31 05 17</u> |
| | | 1.1.5 | Site Grading | Section 31 22 01 |
| | | 1.1.6 | Excavating, Trenching and Backfilling | Section 31 23 01 |
| | | 1.1.7 | Topsoil and Finish Grading | <u>Section 32 91 21</u> |
| | | 1.1.8 | Hydraulic Seeding | <u>Section 32 92 19</u> |
| | | 1.1.9 | Seeding | <u>Section 32 92 20</u> |
| | | 1.1.10 | Sodding | <u>Section 32 92 23</u> |
| | | 1.1.11 | Planting of Trees, Shrubs and Ground Covers | <u>Section 32 93 01</u> |
| | | 1.1.12 | Waterworks | Section 33 11 01 |
| 1.2 | References | 1.2.1 | Abbreviations referenced within this document with respect to testing, materials, fabrication and supply are fully described in References – Section 01 42 00. | |

- 1.2.2 Installation of irrigation components near trees must meet City of Kelowna tree protection Bylaws 8041 and 8042.
- 1.3 Codes and Permits**
- 1.3.1 Perform all work of this section in strict accordance with all municipal, provincial, or federal guidelines, regulations, and codes. Requirements of these specifications not conflicting therewith, exceeding code requirements govern.
- 1.3.2 Contractor is responsible for obtaining all necessary permits and approvals required to undertake and complete the work.
- 1.4 Quality Assurance**
- 1.4.1 Provide documentation in writing of minimum of 5 years of industry experience and a member in good standing of at least one of the following organizations:
- (1) Irrigation Industry Association of British Columbia (IIABC)
 - (2) The Irrigation Association (IA)
- 1.4.2 If the irrigation design involves High Density Polyethylene (HDPE) pipe, all welds required during project construction must be done by an HDPE installer who holds a current training certificate from a recognized HDPE training organization to weld and install HDPE pipe. Provide documentation to the Contract Administrator.
- 1.4.3 All electrical components or products specified or used in construction of the proposed irrigation system must be CSA approved and installed in accordance with the most recent versions of the Safety Standards Act and Electrical Safety Regulation.
- 1.4.4 Install all irrigation components per manufacturer's instructions and specifications.
- 1.4.5 All materials to be new and without flaws.
- 1.4.6 Attend a mandatory pre-construction meeting with City of Kelowna Parks Department Representative.

- 1.5 Definitions**
- 1.5.1 *Journeyman Plumber* is an individual who: (i) holds a Certificate of Qualifications; (ii) follows the BC Plumbing Code; (iii) is governed by the local plumbing authority; (iv) and is responsible for all required permits and inspections.
- 1.5.2 *Certified Electrician* is an individual who: (i) holds a Certificate of Qualifications; (ii) follows the BC and Canadian Electrical Code; (iii) is governed by Technical Safety BC; (iv) and is responsible for all required permits and inspections.
- 1.5.3 *Contract Administrator* is a person or company appointed by the City of Kelowna and identified in writing to the Contractor to be the City of Kelowna’s representative for the purposes referenced herein.
- 1.5.4 *City of Kelowna Parks Department Representative* is a person designated by the City of Kelowna Parks Department to represent the City of Kelowna Parks Department at project meetings, tests and inspections.
- 1.5.5 *Owner* means the City of Kelowna. Where project action or involvement are required, the Owner’s representative will be the City of Kelowna Parks Department Representative.
- 1.6 Scheduling**
- 1.6.1 Ensure that sequencing of irrigation work is carried out in coordination with the work of other trades and that sleeving, conduit, wire, pipes, valves and other equipment are installed to minimize disruptions.
- 1.6.2 Plan, schedule and execute work to ensure water is available for landscape establishment and maintenance purposes at the appropriate time, volume, and operating pressures to ensure irrigation is delivered in accordance with plant water needs.
- 1.7 Substitutions**
- 1.7.1 Where materials are specified by brand name, model number, and/or size, such specifications facilitate a description of the materials and material quality and establish a standard for performance and quality against which proposed substitutes will be evaluated.

- 1.7.2 Proposed substitutes will match specified materials in quality, performance, flow parameters and pressure loss so as to not compromise the intent of the design or overall performance of the irrigation system.
- 1.7.3 Proposed substitutes and Shop Drawings; as necessary per the requirements set out below; will be submitted to the Contract Administrator and the Contract Administrator will obtain approval from the City of Kelowna Parks Department Representative.
- 1.7.4 Proposed substitutions must be submitted to the Contract Administrator at least 10 days before the Tender Closing Date for consideration as an approved equal during the tender period.
- 1.7.5 Substitution requests by Contractor will have no impact on the Milestone Dates.
- 1.7.6 Purchase or installation of materials that are not specified will not be paid for unless:
- (1) The materials have been reviewed and approved by Contract Administrator and the City of Kelowna Parks Representative as an Approved Equal as per Section 7.0, Instructions to Tenderers, or
 - (2) The materials have been reviewed and approved by Contract Administrator and the City of Kelowna Parks Representative as a Change Order, per Section 7.3 of the General Conditions.
- 1.7.7 Installation of materials that are not specified or are not an Approved Equal will be removed and replaced with the specified material at Contractor's expense.
- 1.7.8 Where a revision is required to the irrigation system design that will markedly alter the original design, Shop Drawing(s) must be submitted to the Contract Administrator.
- 1.7.9 After contract award, proposed substitutions must be submitted to the Contract Administrator within 5 days of Notice to Proceed.

1.8 Irrigation Record Drawings	1.8.1	Further to Schedule 3, maintain accurate scaled records of installed irrigation system and its components on a marked-up set of Contract Drawings on a daily basis during construction. Show all deviations from Contract Drawings. Make marked-up Contract Drawings available to the Contract Administrator and/or designated site inspector upon request.
	1.8.2	Prepare Record Drawings showing the as-installed location of all irrigation system components including but not limited to, sprinklers, valves, grounding point(s), points of connection, controllers, wire splice boxes, valve boxes, vaults, mainlines, lateral lines, irrigation sleeves. Identify each zone numerically, complete with precipitation rate and US gpm per zone.
	1.8.3	Provide Record Drawings in digital AutoCAD (2020 or newer) and Adobe pdf hard copy sized Per project requirements and one laminated drawing in Arch B or Ansi B.
1.9 Operating Manual	1.9.1	Provide one digital copy of the Operating Manual for irrigation system. Content of Operating Manual to include: <ul style="list-style-type: none">(1) Copies of plumbing permit, electrical permit, HDPE certification.(2) Electrical Inspection Request Form and final approval.(3) Copies of irrigation inspection reports and test results signed by the individual who presided over the inspection or test.(4) Product warranty statement for controllers, meters, backflow prevention assemblies, valves, filters, sensors, electronic components, and related irrigation components. Date warranty with date of issuance of the Certificate of Substantial Performance.(5) Written guarantee for work completed, for a minimum of 1 year to commence from the issuance of the Certificate of Substantial Performance.
	1.10	Submittals
	1.10.1	Submit complete set of Record Drawings to Contract Administrator prior to issuance of Certificate of Substantial Performance.

- 1.10.2 Submit complete digital copy of Operating Manual to the Contract Administrator and City of Kelowna Parks Representative prior to issuance of Certificate of Substantial Performance.
- 1.11 Measurement for Payment**
- 1.11.1 Point of Connection: Unless otherwise specified in the Schedule of Quantities and Prices, payment for supply and installation of irrigation point of connection will be measured as a lump sum. The work includes:
- (1) Permits & fees.
 - (2) Supply, installation and testing of the connection to the water service line and booster pump.
 - (3) Water meter.
 - (4) Backflow prevention assembly.
 - (5) Hydrometer.
 - (6) Blowout assemblies.
 - (7) Pressure regulating valve.
 - (8) Filters.
 - (9) Fittings.
 - (10) Vaults, valve boxes & lids.
 - (11) Excavation, trenching, conduits, backfill and restoration.
 - (12) Inspections and testing.
 - (13) All incidentals necessary for the proper installation and operation of a complete irrigation point of connection including water supply to the irrigation point of connection and irrigation system.
- 1.11.2 Electrical Service: Unless otherwise specified in the Schedule of Quantities and Unit Prices, payment for supply and installation of electrical service will be measured as a lump sum. The work includes:
- (1) Permits & fees.
 - (2) Supply, installation and testing of the connection to the electrical source.
 - (3) Electrical meter.

- (4) Excavation, trenching, conduits, backfill and restoration.
- (5) Inspections and testing.
- (6) All incidentals necessary for the proper installation and operation of a complete electrical service to the irrigation system.

1.11.3 Control System: Unless otherwise specified in the Schedule of Quantities and Unit Prices, payment for supply and installation of control system will be as a lump sum. The work includes:

- (1) Permits & fees.
- (2) Supply, installation, testing, programming, and adjustment of irrigation system controller(s).
- (3) Transmitters, decoders & communication cartridges
- (4) Electrical conduits.
- (5) Controller kiosk(s).
- (6) Vaults, splice boxes & lids.
- (7) Fittings.
- (8) Excavation, trenching, backfill, and restoration.
- (9) Inspections and testing.
- (10) All incidentals necessary for the proper installation and operation of a complete irrigation control system.

1.11.4 Pipes, valves, sprinklers and micro irrigation: Unless otherwise specified in the Schedule of Quantities and Unit Prices, payment for supply and installation of pipes, valves and sprinklers and micro irrigation components will be measured as a lump sum. The work includes but is not limited to:

- (1) Supply, installation, testing and adjustment of irrigation pipe.
- (2) Supply, installation, testing and adjustment of irrigation dripline.
- (3) Sleeves and conduit.
- (4) Zone control valves.

- (5) Control wire, common wire, flow sensor wire and spare wires.
 - (6) Drain valves.
 - (7) Isolation valves.
 - (8) Air/vacuum relief valves.
 - (9) Pressure regulators.
 - (10) Swing joint assemblies.
 - (11) Sprinklers.
 - (12) Root watering systems.
 - (13) Emitters and bubblers.
 - (14) Fittings
 - (15) Valve boxes & lids.
 - (16) Excavation, trenching, backfill and restoration.
 - (17) Inspections and testing.
 - (18) All incidentals necessary for the proper installation and operation of a complete irrigation system.
- 1.11.5 Post Construction Submittals: Unless otherwise specified in the Schedule of Quantities and Unit Prices, payment for Record Drawings and Operating Manual will be measured as a lump sum.
- 1.12 Tests and Inspections**
- 1.12.1 Refer to General Conditions, Clause 4.12, Tests and Inspections.
 - 1.12.2 During construction, inspection and testing of components will be required to ensure performance of irrigation system meets expected standards.
 - 1.12.3 Provide equipment and personnel necessary for performance of inspections and tests.
 - 1.12.4 As a condition of issuance of Certificate of Substantial Performance confirm in writing to the City of Kelowna Parks Department Representative, at least one week prior to application for Substantial Performance, that the following inspections and tests have been successfully completed:

- (1) Layout Inspection
 - (2) Vault drainage test
 - (3) Irrigation Point of Connection Inspection
 - (4) Backflow Prevention Assembly Test per BCWWA (British Columbia Water Works Association)
 - (5) Mainline pressure test
 - (6) Open trench inspection
 - (7) HDPE pipe strap test
 - (8) Two-wire System Grounding Inspection
 - (9) System coverage test
 - (10) System operation test
 - (11) Dripline/emitter test
 - (12) Substantial Performance inspection
- 1.12.5 Total Performance inspection will be completed after Substantial Performance inspection.
- 1.12.6 Conduct all inspections and tests in the presence of Contract Administrator. Provide minimum 3 days (72 hours) notice to the Contract Administrator to attend all inspections and tests. Contract Administrator must invite City of Kelowna Parks Department Representative to all tests within 24 hours of receiving the invitation from the Contractor.
- 1.12.7 The Contract Administrator will ensure that results of that test or inspection are provided to the City of Kelowna Parks Representative within 48 hours of completion.
- 1.13 Layout Inspection**
- 1.13.1 Conduct Layout Inspection prior to commencement of irrigation system installation. ~~project construction.~~
- 1.13.2 Coordinate location of irrigation components with landscaping, building and physical features of site.
- 1.13.3 Layout and stake irrigation system per Drawings to confirm:

			<ul style="list-style-type: none"> (1) Layout is within project boundary and property lines. (2) Minimum horizontal and vertical clearances from electrical and other utilities are met. (3) Location of all sleeving, supply piping, kiosks, vaults, valve boxes, sprinkler heads and splice boxes and other irrigation components match Contract Drawings.
1.14	Vault Drainage Test	1.14.1	Plug drain hole, fill point of connection vault with water to a depth of 300mm and leave water to drain.
		1.14.2	Test is passed if water drains in 1 hour or less.
		1.14.3	If test is failed, Contractor to rectify drainage issues and organize secondary inspection.
		1.14.4	Supply photo of drain pit installation to Contract Administrator.
1.15	Point of Connection Inspection	1.15.1	Verify installed components are per Approved Products List and in accordance with Drawings.
1.16	Backflow Prevention Device Test	1.16.1	Backflow Prevention Test will be conducted prior to commencement of irrigation system operation..
1.17	Mainline Pressure Test	1.17.1	<p>Mainline Pressure Test to be conducted as follows:</p> <ul style="list-style-type: none"> (1) Allow minimum 48 hours from the last glue joint or fusion weld for sections that will be tested. (2) Install pressure gauge on the second blowout assembly in the Point of Connection vault. (3) Fill mainline with water until all air is expelled from mainline and system has been charged to operating pressure. (4) Maintain water in pipe for 4 hours. (5) Record initial pressure reading. Record and report any variance greater than 5% from beginning to end of test.
		1.17.2	Test results are based on the difference in recorded pressures at beginning and end of test. Passed test is 5% or less drop in pressure from beginning pressure reading to ending pressure reading.

- 1.17.3 If test is failed, identify source of leak and replace any and all defective materials and workmanship as necessary to eliminate leak.
- 1.17.4 Repeat mainline pressure test and make replacements as necessary until a passed result is achieved.
- 1.18 Open Trench Inspections**
 - 1.18.1 Open Trench Inspection(s) will be conducted throughout construction schedule.
 - 1.18.2 Contractor to ensure that a minimum of 50% of mainline and 50% lateral pipelines inspected prior to burial.
 - 1.18.3 Inspections are to determine if pipe layout, pipe depth, joining procedures, wiring, bedding material and caution tape placement are in accordance with Drawings.
 - 1.18.4 Contractor to rectify any issues which limit successful completion of inspection and organize secondary inspection if necessary.
- 1.19 HDPE Weld Inspections and Testing**
 - 1.19.1 HDPE Weld Inspections are to be conducted a minimum of three times during project installation. HDPE welds must meet requirements per ASTM F2620.
 - 1.19.2 Conduct minimum of one HPDE weld strap test prior to installing pipe within trench.
 - 1.19.3 Ensure HDPE welding equipment meets requirements per Plastic Pipe Institute Technical Report TR-33 and ASTM F2620.
 - 1.19.4 If a visual or tactile inspection indicates a substandard weld, a strap test of said weld will be required.
 - 1.19.5 Pipe strap test protocol is as follows:
 - (1) Conduct visual or tactile inspection of several welds. Where bead does not roll back correctly and/or is not consistent in height or width, the Contractor will perform the strap test.

- (2) At the welded joint selected, Contractor to cut fusion weld from pipe, allowing 8" (200mm) on either side of the weld to work with.
 - (3) Cut pipe lengthways through fusion weld to create a strap 1" (25mm) wide.
 - (4) Bend strap back on itself. If weld breaks repeat test on another fusion weld, chosen by Contract Administrator. If second weld fails the Contractor Administrator may request that all welds be investigated at the expense of the Contractor.
 - (5) If fusion weld does not break then weld is acceptable and no further pipe strap testing is required.
- 1.20 Two-Wire System Grounding Inspection** 1.20.1 Two-wire System Grounding inspection to be conducted as per installed two-wire system manufacturer's requirements.
- 1.21 System Coverage Test** 1.21.1 System Coverage Test will be conducted as part of the Substantial Performance Inspection, after installation and operation of complete irrigation system and prior to issuance of Certificate of Substantial Performance.
- 1.21.2 Conduct visual inspection to confirm that:
- (1) Head spacing does not exceed that shown on Drawings.
 - (2) Heads, valve boxes, vaults and trenches are flush with finished grade.
 - (3) Heads and valves have been installed as per the Drawings.
- 1.21.3 Conduct operational tests to verify that:
- (1) Performance provides head-to-head coverage or meets approved design parameters.
 - (2) Minimal overspray occurs onto different zones, hard surfaces or other improvements and/or the spray patterns meet approved design parameters.

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| 1.22 System Operation Test | 1.22.1 | System Operation Test will be conducted as part of the Substantial Performance inspection, after installation and operation of complete irrigation system and prior to issuance of Certificate of Substantial Performance. |
| | 1.22.2 | Conduct operational tests to verify that: <ul style="list-style-type: none">(1) Controller can be programmed manually on site and remotely via Owner's central irrigation control system.(2) Each zone can be operated automatically and in succession via programmed controller.(3) Operating pressure is within design parameters.(4) Hydrometer readings at controller are within +/-5% accuracy of design flows for all zones.(5) Controller flow readings are within +/-5% of the hydrometer flow readings for all zones. |
| 1.23 Dripline/Emitter Test | 1.23.1 | Dripline/emitter Test will be conducted while all dripline and/or emitter zones are exposed. |
| | 1.23.2 | Perform inspection and testing of dripline/emitter manifold and lines to identify potential leaks and confirm manifold, driplines and emitters are able to operate at design pressure. Conduct inspection and testing prior to backfilling of manifold, driplines or emitter supply lines. |
| | 1.23.3 | Verify that dripline / emitter layouts are in accordance with Drawings. |
| | 1.23.4 | Charge and maintain manifold and lines with water at operating pressure. While charged, visually inspect manifold, driplines and fittings for leaks and replace any and all defective materials and workmanship as necessary to eliminate leak. |
| | 1.23.5 | Repeat inspection and testing and make replacements as necessary until further leaks are identified. |
| 1.24 Substantial Performance inspection | 1.24.1 | Substantial Performance inspection is to verify that the installation has reached a point where the Certificate of Substantial Performance can be awarded, and that the installation has met the requirements of these specifications. |

		1.24.2	Substantial Performance Inspection will include 1.21 System Coverage Test and 1.22 System Operation Test.
		1.24.3	Inspection of all plant material to ensure that impacted existing plant material and new material are healthy and in satisfactory growing condition.
1.25	Total Performance Inspection	1.25.1	Total Performance inspection is to verify that any outstanding deficiencies identified during the testing and inspection processes set out within these specifications, have been rectified.
2.0	PRODUCTS		
2.1	Water Service and Meter	2.1.1	Unless already installed or otherwise required by the water utility having jurisdiction over the site provide a metered water service, including but not limited to: <ul style="list-style-type: none"> (1) Plumbing permit. (2) Establishment and verification of water account with appropriate utility provider. (3) Supply and installation of water meter and backflow prevention assembly; installed in accordance with requirements of the water utility.
		2.1.2	Type and size of water meter to be as specified by the water utility having jurisdiction over the site.
2.2	Electrical Service and Meter	2.2.1	Unless already installed or otherwise required by the electrical utility having jurisdiction over the site provide a metered electrical service, including but not limited to: <ul style="list-style-type: none"> .1 Electrical permit. .2 Electric meter. .3 Establishment and verification of electrical account with appropriate utility provider.
		2.2.2	Type and size of electrical service to be as specified on Contract Drawings.

		2.2.3	Electric meter to be supplied and installed per standards and specifications of electrical utility.
2.3	Isolation Valve	2.3.1	Per Approved Products List.
2.4	Air Relief Valve	2.4.1	Per Approved Products List.
2.5	Hydrometer	2.5.1	Per Approved Products List.
2.6	Hydrometer Air Relief Vent	2.6.1	Per Approved Products List.
2.7	Hydrometer Communication Cable	2.7.1	Per Approved Products List.
2.8	Pressure Reducing Valve	2.8.1	Per Approved Products List.
2.9	Backflow Prevention Device	2.9.1	Per Approved Products List.
		2.9.2	Reduced Pressure Backflow Assembly (RPBA) as per approved design.
2.10	Vault and Lid	2.10.1	Vault and matching lid as per Approved Products List.
		2.10.2	Lid must have recessed hinges and locking hardware.
2.11	Ground Assembly	2.11.1	Ground assembly to consist of CSA and BC Electrical Code endorsed products per irrigation controller manufacturer's recommendations for grounding.
2.12	Irrigation Controller	2.12.1	As specified on Contract Drawings.
2.13	Decoder	2.13.1	As specified on Contract Drawings.
2.14	Controller Kiosk and Base	2.14.1	Per Approved Products List.
2.15	Electric Control Valve	2.15.1	Per Approved Products List.
2.16	Electric Control Valve; Low Flow	2.16.1	Per Approved Products List.
2.17	Filter	2.17.1	Per Approved Products List.
2.18	Quick Coupler Valve	2.18.1	Per Approved Products List.

2.19	Swing Joint Assembly	2.19.1	Fabricated with three threaded Schedule 40 PVC street elbows and one threaded Schedule 80 PVC nipple.
		2.19.2	Length of nipple to be sufficient to permit installed head or valve to be set as per Drawings.
		2.19.3	Diameter of nipple to match inlet for valve or head shown on Drawings.
2.20	Lateral Flush Assembly	2.20.1	Per City of Kelowna Detail Drawing.
2.21	Valve Box	2.21.1	Per Approved Products List.
		2.21.2	Valve box and overlapping matching lid and extensions will be commercial grade and green in colour.
2.22	Control Wire	2.22.1	Conventional system: Control wire from irrigation controller to electric control valve to be minimum #14 gauge, direct burial, type TWU-40 wire. Control wire to be any colour other than white, blue or red.
		2.22.2	Conventional system: Common wire from irrigation controller to electric control valve to be minimum #12 gauge direct burial, type TWU-40 wire. Common wire to be white in colour.
		2.22.3	Conventional system: Hydrometer wire from the controller to the hydrometer solenoid to be minimum #14 gauge direct burial, type TWU-40 wire. Wire to be red in colour.
		2.22.4	Conventional system: Spare control wire to be blue in colour.
		2.22.5	Conventional system: Spare common wire to be white in colour.
		2.22.6	Decoder system: Two-wire (dual conductor) control wiring to match controller brand.
		2.22.7	Wire connectors to be new, two-step, CSA approved for watertight applications and assembled according to the manufacturer's recommendations.
2.23	Wire Spice Box	2.23.1	Wire splice box as per Approved Products List.
2.24	Irrigation Sleeve	2.24.1	Schedule 40 PVC pipe for irrigation sleeves under hard surfaces.

		2.24.2	Irrigation sleeve diameter to be minimum 4" (100mm) or twice the diameter of the pipe running through it; whichever is greater.
		2.24.3	System wire conduit to be a minimum 2" (50mm) diameter electrical conduit.
2.25	Polyvinyl Chloride (PVC) Pipe	2.25.1	Must conform to CSA B137.3-93.
		2.25.2	Must be new and without flaws, extruded from virgin, high impact materials, solvent weldable with belled ends, continually and permanently marked showing manufacturer's name, material, size, pressure rating, and CSA approval.
		2.25.3	Pipe series and size as specified on Contract Drawings.
2.26	Polyethylene (PE) Pipe	2.26.1	Must be new and without flaws, CSA Series 100, MDPE (Medium Density Polyethylene), extruded from virgin materials, continually and permanently marked showing manufacturers name, material, size, and pressure rating.
		2.26.2	Pipe series and size as specified on Contract Drawings.
2.27	High Density Polyethylene (HDPE) Pipe	2.27.1	Must be new and without flaws, CSA approved, continually and permanently marked showing manufacturers name, material, size, and pressure rating.
		2.27.2	Acceptable HDPE pipe is dependent on operating pressure and to have minimum Standard Dimension Ratios (SDR) as follows:
		(1)	Maximum pressure 160 psi: DR11
		(2)	Maximum pressure 200 psi: DR9
2.28	PVC and PE Fittings	2.28.1	Must be new and without flaws.
		2.28.2	Fittings for PVC pipe systems must be PVC in composition and intended for use with PVC pipe for either solvent welding applications or threaded connections.
		2.28.3	Threaded nipples are to be Schedule 80 PVC.

- 2.28.4 Where pipe changes from metal to PVC pipe, the metal end of the pipe must be a female adapter and the PVC fitting must be a Schedule 80 nipple.
- 2.28.5 Fittings for PE pipe must meet ASTM D2609 standards, complete with stainless steel gear clamps.
- 2.29 HDPE Fittings**
- 2.29.1 Must be new and without flaws.
- 2.29.2 Must be UL or ULC approved.
- 2.29.3 Butt fusion fittings for use on HDPE must meet ASTM F2206 Standard Specification and be designed for butt fusion welding to HDPE pipe.
- 2.29.4 Electrofusion type fittings for use on HDPE must meet ASTM F1055 Standard Specification and be designed for electrofusion welding to HDPE pipe.
- 2.29.5 SDR rating of HDPE fittings must match the SDR rating of the HDPE pipe specified.
- 2.29.6 HDPE pipe fittings to be moulded or fabricated by a pipe manufacturer. HDPE pipe fittings and flange adapters made by contractors, sub-contractors or distributors are prohibited.
- 2.29.7 Use of mechanical fittings on HDPE is prohibited unless approved in writing by City of Kelowna Parks Representative.
- 2.30 Pipe Solvent Cement and Primer**
- 2.30.1 Per Approved Products List.
- 2.31 Vault Pipe and Fittings**
- 2.31.1 Vault pipe and fittings shall be brass, stainless steel or HDPE.
- 2.31.2 Brass piping must be in new condition and conform to NSF/ANSI 372.
- 2.31.3 Stainless steel piping must be in new condition, must be Type 304L or 316L and must conform to ASTM A312.
- 2.31.4 Selected material for pipe and fittings must be consistent throughout vault.

		2.31.5	All pipe and fittings must meet BC Plumbing Code requirements for use with potable water.
2.32	Thrust Block	2.32.1	Thrust blocks shall adhere to MMCD Section 33 11 01 Item 3.13 and MMCD Standard Detail Drawing W1.
2.33	Sprayhead Sprinkler	2.33.1	Per Approved Products List.
2.34	Rotary Sprinkler	2.34.1	Per Approved Products List.
2.35	Dripline	2.35.1	Per Approved Products List.
2.36	Drip Emitter /Bubbler	2.36.1	As specified on Contract Drawings.
2.37	Root Watering Systems	2.37.1	Per Approved Product List.
2.38	Bedding and Backfill Sand	2.38.1	Pit run sand, 2mm or less, per MMCD Section 31 05 17.
2.39	Drain Rock	2.39.1	Drain rock per MMCD <u>Section 31 05 17</u> .
2.40	Bolts	2.40.1	All bolts used in system construction to be stainless steel 304 or 316.
3.0	EXECUTION		
3.1	Existing Conditions	3.1.1	Report existing conditions at variance with Contract Drawings to Contract Administrator. Contract Administrator to report information to City of Kelowna Parks Representative.
		3.1.2	Verify locations of underground utilities prior to commencing excavation and conduct work so to prevent interruption and damage to services and utilities. Make good all damages to same at Contractor's cost.
		3.1.3	Verify location of all services in building walls before boring or drilling holes. Make good all damages to same at Contractor's cost.
		3.1.4	Protect existing conditions and completed work from disturbance during Work. Make good all damages to same at Contractor's cost.

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- 3.1.5 Proposed adjustments to installation of irrigation system to avoid existing conditions, completed work and utilities will be permitted subject to prior approval by the Contract Administrator.
- 3.2 Excavation**
- 3.2.1 Excavate to ensure depth and bedding requirements are met.
- 3.2.2 All excavation is unclassified. Report any material or site condition that cannot be excavated by normal mechanical or manual means or that may affect excavation to required depth to the Contract Administrator.
- 3.2.3 Identify and recycle all suitable materials recovered during construction.
- 3.2.4 Remove and dispose of buried debris exposed during excavation, including decommissioned irrigation materials and underground utility components.
- 3.3 Water Service**
- 3.3.1 Verify that the provided wate service meets irrigation design requirements as indicated on the irrigation design.
- 3.3.2 Notify Contract Administrator if the water service provided does not meet design requirements as indicated on the irrigation design and await notice to proceed or other instructions.
- 3.3.3 Ensure connection to supplied water service meets City of Kelowna Subdivision Bylaw, MCCD Platinum Edition, applicable American Water Works Association standards and BC Plumbing Code.
- 3.4 Electrical Service and Account**
- 3.4.1 Within 5 Days of receipt of Notice to Proceed provide Contract Administrator with information necessary for Owner to make application to electrical utility for service connection.
- 3.4.2 Certified electrician or FSR to obtain permits and approvals necessary to install and operate irrigation system.
- 3.4.3 Coordinate with electrical utility to confirm the availability, suitability, and location of an acceptable service connection.
- 3.4.4 Install all electrical connections in accordance with local, provincial and national electrical codes.

		3.4.5	Ensure grounding is included on electrical permit.
3.5	Water Meter	3.5.1	Install water meter per approved Drawings and requirements of water utility.
		3.5.2	Where a water meter is not being installed at the time of construction, install spacers and unions sufficient to allow for the future installation of a correctly sized water meter.
3.6	Isolation Valve	3.6.1	Install isolation valve per Contract Drawings.
3.7	Hydrometer	3.7.1	Install Hydrometer in location specified on Contract Drawings.
		3.7.2	Follow manufacturer’s instructions for installation. Air relief valve is to be installed on the first blowout, threaded into the ball valve or gate valve depending on size of the vault. It is to be used during start-up, once system is charged ball or gate valve can be closed with air relief vent attached. Remove during winterization process.
		3.7.3	Install hydrometer drain valve prior to installation. Hydrometer drain valve to be supplied by City of Kelowna Parks Department.
		3.7.4	Where system utilizes a conventional wiring layout, communication wire to be PE39 cable; no substitutions permitted. No splices are permitted on the wire path from controller to hydrometer.
		3.7.5	Where system utilizes two-wire technology, communication from controller to hydrometer to be as per manufacturer’s specifications.
3.8	Pressure Reducing Valve	3.8.1	Prior to installation, confirm in writing from the City of Kelowna, if a Pressure Reducing Valve (PRV) is required to be installed in the Point of Connection to stabilize pressure/flow.
		3.8.2	Install PRV per manufacturer’s instructions in location shown on Drawings and as required to maintain operating pressure within manufacturer’s recommended range.
		3.8.3	Adjust PRV to provide water at design pressure.

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| 3.9 | Backflow Prevention Device | 3.9.1 | All backflow prevention assemblies must be installed by Journeyman Plumber carrying required cross connection certification and in accordance with BC Plumbing Code. |
| | | 3.9.2 | Double Check Valve Assembly (DCVA) to be installed within lockable vault. |
| | | 3.9.3 | Reduced Pressure Backflow Assembly installation will require drawing approval by the Building and Permitting Department of the water purveyor in the jurisdiction of installation. |
| | | 3.9.4 | Install backflow prevention assemblies with positive drainage and room for maintenance and servicing. |
| 3.10 | Irrigation Vault and Lid | 3.10.1 | Install vault(s) in location shown on Contract Drawings. |
| | | 3.10.2 | Support and brace point of connection components, piping and valves within vaults using adjustable aluminium pipe stands complete as per Approved Products List in the quantities indicated below: |
| | | (1) | 1" to 4" (25-100mm) 3 supports |
| | | (2) | Larger than 4" (100mm) as per Drawings |
| | | 3.10.3 | Install irrigation vault drain and connect to drain pit, dry well, manhole or catch basin. |
| | | 3.10.4 | Drainage pit dimensions will match the depth, width and length of the vault installed. |
| | | 3.10.5 | Extend selected piping for POC outside the vault a minimum of 300mm. |
| | | 3.10.6 | Ensure no vault is installed within 200mm of any hardscape. |
| 3.11 | Ground Assembly | 3.11.1 | To meet BC Electrical Code requirements. |
| 3.12 | Irrigation Controller | 3.12.1 | Install approved irrigation controller in approved irrigation kiosk. |
| | | 3.12.2 | Install approved irrigation controller to allow controller door to open sufficiently for full access to control components. |

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| | | 3.12.3 | Install approved irrigation controller wiring in accordance with local, provincial and national electrical codes. |
| | | 3.12.4 | Where applicable, install and test the ground assembly using a "Megger" to ensure earth resistance to ground does not exceed controller manufacturer's recommendations. |
| | | 3.12.5 | Install communication components per manufacturer's instructions. Establish communication between controller and Owner's central irrigation control system, including relays as specified by designer. |
| | | 3.12.6 | Operate Controller through 1 year warranty period for plant establishment. Include 1 year warranty period irrigation schedule in Operating Manual. |
| 3.13 | Irrigation Kiosk, Antenna and Kiosk Base | 3.13.1 | Install Irrigation Kiosk (Kiosk), Antenna and Kiosk Base per Contract Drawings. |
| | | 3.13.2 | Provide electrical service to Kiosk as shown on Contract Drawings. |
| | | 3.13.3 | Where dedicated electrical meter is required, install electric meter in the Kiosk per electrical utility's requirement. |
| | | 3.13.4 | Install one duplex 120v GFI receptacle, on dedicated breaker, in Kiosk. |
| 3.14 | Electric Control Valve | 3.14.1 | Install in valve box per Contract Drawings. |
| | | 3.14.2 | Identify Electric Control Valve with permanent label or tag indicating zone number of valve. |
| 3.15 | Filters | 3.15.1 | Install as per Contract Drawings. |
| 3.16 | Quick Coupler Valve | 3.16.1 | Install as shown on Contract Drawings. |
| | | 3.16.2 | Do not install Quick Coupler Valves in same valve box as electric control valve. |
| 3.17 | Swing Joint Assembly | 3.17.1 | Fabricate assembly of triple swing joint using three threaded Schedule 40 PVC elbows and one threaded Schedule 80 PVC nipple. |

- 3.17.2 Install swing joint assembly to rotate clockwise when depressed.
- 3.17.3 Tape threads of PVC fittings with Teflon tape and make hard hand tight.
- 3.18 **Lateral Flush Assembly**
 - 3.18.1 Install Lateral Flush Assembly on swing joint assembly in valve box per Contract Drawings.
 - 3.18.2 Coil hose in valve box.
- 3.19 **Valve Box**
 - 3.19.1 Install all manual and electric control valves, control zone kits and quick coupler valves in valve boxes or concrete vault as shown on Contract Drawings.
 - 3.19.2 Do not install valve boxes in hardscapes.
 - 3.19.3 Install valve box flush with finish grade and arrange in a neat and orderly manner.
 - 3.19.4 Valve box must not contact irrigation pipe. Use matching valve box extensions as required.
 - 3.19.5 Up to three 1" (25mm) control valves or two 1½" (38mm) control valves may be contained within a single valve box provided there is 4" (100mm) of clearance between valves. Install valve 2" (50mm) and larger in their own valve box.
- 3.20 **Control Wire**
 - 3.20.1 Install control wire per code and by qualified personnel employed by the company holding the electrical permit.
 - 3.20.2 Bury control wire per applicable code.
 - 3.20.3 Bed control wire in sand with minimum 3" (75mm) sand around control wire. Where control wire is in same trench as pipe, place wire beside pipe (not directly above) with horizontal clearance of a minimum of 3" (75mm) and in accordance with BC Electrical Code depth.
 - 3.20.4 Bundle multiple lengths of wire in same trench or conduit with ties at maximum 10' (3m) intervals.

- 3.20.5 Install wire with minimum 24" (600mm) length of coiled slack at all changes of direction, in wire splice boxes and at connections to controlled components.
- 3.20.6 Identify all control wires entering controller kiosk with permanent label or tag indicating zone number of valve operated by each control wire.
- 3.20.7 Maintain consistent wire colour through wire splice box.
- 3.20.8 Minimize wire splices. Where wire splices are unavoidable make splice only in wire splice box using specified connector.
- 3.20.9 Identify spliced wire with permanent label or tag indicating zone number of spliced control wire.
- 3.20.10 Provide one spare control wire to for every five (5) electric valves shown on Contract Drawings. Location of spare control wires as per Contract Drawings.
- 3.20.11 Provide 24" (600mm) length of coiled slack of each wire end in wire splice box. Identify spare control wires as 'spare' wire with permanent label or tag.
- 3.20.12 Provide minimum two spare common wires. Location of spare common wires as per Contract Drawings.
- 3.20.13 Where the system is a two-wire system, approved two-wire must be as specified by the manufacturer of the controller utilized and installed as per Contract Drawings.
- 3.21 Wire Splice Box**
 - 3.21.1 Locate wire splice box in planting bed where possible and locate for ease of access, maintenance, and testing.
 - 3.21.2 Install wire splice box per Contract Drawings.
 - 3.21.3 Do not install valves in wire splice box.
- 3.22 Irrigation Sleeve**
 - 3.22.1 Install irrigation sleeves in locations shown on Contract Drawings.
 - 3.22.2 Install irrigation sleeve to depth as follows:
 - (1) Mainline Piping

- .1 24" (600mm) below walkways
 - .2 36" (915mm) below driveways, roads and plazas
 - (2) Lateral Piping
 - .1 18" (450mm) below walkways
 - .2 36" (900mm) below driveways, roads and plazas
- 3.22.3 Install sleeve to extend 20" (0.5m) past edge of hard surface into soft landscape surface.
- 3.22.4 Cap sleeve with removable plug or cover. Maintain plug in sleeve until such time as pipe or wire is ready to be installed.
- 3.22.5 Bed sleeve as follows:
 - (1) Under walkways, 4" (100mm) of sand placed all around.
 - (2) Under driveways, roads and plazas, compacted base aggregate all around per materials shown on Contract Drawings.
- 3.22.6 Bury ½" (12mm) width rebar piece beside each end of sleeve to enable location of sleeve end by metal detector after burial. Rebar piece to be positioned so that the top of the rebar is 6" (150mm) below finished grade.
- 3.22.7 Record location of sleeve ends and label size of sleeve on Record Drawings.
- 3.23 Pipe and Fittings**
 - 3.23.1 Verify that all pipe, fittings, and connecting materials or equipment are compatible for proper installation.
 - 3.23.2 Minimum and maximum burial depth and clearances for pipe and wire are as per Drawings and in keeping with applicable codes.
 - 3.23.3 Nearest side of trench is not to be closer than 12" (300mm) from hard surface or feature.
 - 3.23.4 Keep inside of pipe and outside of pipe ends clean at all times. Cap or plug open pipe ends to keep out dirt and debris.
 - 3.23.5 Follow manufacturer's instructions and standards for installation of all pipe and fittings.

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- 3.23.6 Follow manufacturer's instructions and standards for installation of pipe and fittings; minimize excess runoff.
- 3.23.7 Allow sufficient space between fittings to facilitate future repairs. There shall be a minimum of two times pipe diameter or 2" (50mm) distance between fittings, whichever is greater.
- 3.23.8 Adhere to HDPE Certification standards and requirements for installation of HDPE pipe and fittings.
- 3.23.9 Flush irrigation pipe fully to remove accumulation of dirt and debris prior to installation of heads, dripline, emitters and filters. Flush lateral lines to prevent clogging of screens, nozzles and emitters.
- 3.23.10 Follow manufacturer's recommendations to allow for expansion and contraction of pipe in trench.
- 3.23.11 Set mainlines and laterals with 3" (75mm) sand on sides and bottom and 3" (75mm) sand above.
- 3.23.12 Ensure lateral lines are not installed directly above mainline.
- 3.23.13 For pipe in landscaped areas backfill trench to depths as per Detail Drawings and tamp in lifts to achieve compaction equal to the adjacent growing medium.
- 3.23.14 For pipe in native soil, sub-surface fill, rocky soils and aggregate base or sub-base material backfill remainder of trench with suitable non-sand material under 1" (25mm) in diameter and free of materials that could result in settling or damage to pipe or surface improvements.
- 3.23.15 Install thrust blocks at all changes in direction of PVC pipe 3" (75mm) in diameter or greater, and for any change in direction of gasketed pipe.
- 3.23.16 Cut pipe ends at right angle to pipe length. Clean burrs prior to joining pipe and fittings.
- 3.23.17 Do not join pipe or fittings under wet or muddy conditions.

- | | | |
|--------------------------|--------|---|
| 3.24 Thrust Block | 3.24.1 | Thrust block installation to adhere to MMCD Section 33 11 01 Item 3.13 and Standard Detail Drawing W1. |
| 3.25 Sprinklers | 3.25.1 | Install per manufacturer's recommendations and in location shown on Contract Drawings. |
| | 3.25.2 | Location of heads as illustrated on Contract Drawings is intended as a guide to layout of heads. Establish actual head locations in the field to ensure complete and adequate coverage of all areas to be irrigated and minimal overspray onto adjacent surfaces and improvements. Do not exceed head spacing shown on Contract Drawings. |
| | 3.25.3 | Where obstructions or site improvements hinder or block head to head coverage advise the Contract Administrator and determine best method to maximize coverage. |
| | 3.25.4 | For head adjacent to hard surface or improvement set head 2" (50mm) from hardscape as shown on Contract Drawings. |
| | 3.25.5 | For flat surfaces install head plumb to finished grade. For sloped surfaces install head perpendicular to half the grade of the slope. |
| | 3.25.6 | Mount pop-up heads on triple swing-joint assembly. Connect bottom inlet of sprinkler to swing joint assembly. Side inlet connection not permitted. Adjust swing joint assembly to set head flush with finish grade. |
| | 3.25.7 | Adjust sprinklers to achieve head to head coverage of area to be irrigated, with minimum or no overspray onto other surfaces. |
| 3.26 Dripline | 3.26.1 | Install per manufacturer's recommendations in location shown on Contract Drawings. |
| | 3.26.2 | Ensure approved filtration is installed. |
| | 3.26.3 | Do not install driplines of different flow rates on the same zone. |
| | 3.26.4 | Place dripline on prepared surface. Surface to be free of sharp rocks or other objects that may damage dripline. Surface to be at grade necessary for dripline to be at specified depth after placement of remainder of topsoil or growing medium. |

		3.26.5	Placement of dripline by trenching using hand or mechanical methods permitted only if specified as such on Contract Drawings or upon written approval of the Contract Administrator.
		3.26.6	Do not drive or operate equipment over exposed dripline.
		3.26.7	Thoroughly flush each zone after installation and before beginning regular operation of drip zone.
3.27	Drip Irrigation for Planting Beds	3.27.1	For dripline in planting bed stake dripline using manufacturer's recommended stakes at 18" (450mm) on centre.
3.28	Drip Irrigation for Turf Areas	3.28.1	Install per manufacturer's instructions and as shown on Contract Drawings.
3.29	Emitter/Bubbler	3.29.1	Install per manufacturer's recommendations and as shown on Contract Drawings.
		3.29.2	Install approved filtration per manufacturer's instructions and as shown on Contract Drawings.
3.30	Root Watering System	3.30.1	Install as shown on Contract Drawings.
		3.30.2	Root watering system to be installed equidistant, complete with sock and pea gravel.
3.31	Hose Bib	3.31.1	Install as shown on Contract Drawings
		3.31.2	Do not install Hose Bibs in same valve box as electric control valve.
3.32	Clean-up and Restoration	3.32.1	Remove and properly dispose of all waste and debris resulting from irrigation installation from site.
		3.32.2	Restore all disturbed surfaces to original condition and repair all trench settlement.
3.33	Instructions to Owner	3.33.1	Schedule on-site meeting to instruct City of Kelowna Parks Representative in complete operating and maintenance procedures for irrigation system, including start-up, winterization, and programming.

- 3.33.2 Review Record Drawings and Operating Manual with City of Kelowna Parks Representative on site.
- 3.34 Maintenance – General**
- 3.34.1 Inspect, operate, maintain and adjust irrigation system through the one-year guarantee period for construction until issuance of Certificate of Acceptance to ensure it operates as intended, including but limited to:
- (1) Adjust irrigation program to ensure health and growth of the plant material and respond to changes in soil conditions and seasons for site.
 - (2) Clean sprinkler heads and adjust coverage to eliminate over watering, under watering and overspray onto adjacent surfaces.
 - (3) Monitor and clean filtration equipment.
 - (4) Restore grass areas, planting beds, hard surfaces and improvements affected by trench settlement and erosion.
 - (5) Respond to requests from the Contract Administrator for program adjustments, servicing, adjustments and repairs.
 - (6) Provide digital documentation to the Contract Administrator of any repairs related to vandalism.
- 3.35 Maintenance – Winterization**
- 3.35.1 During one-year guarantee period for construction, be responsible for winterization of irrigation system at end of growing season and prior to onset of air temperatures below 0° Celsius. Be liable for any damage resulting from late or improper winterization.
- 3.35.2 Conduct winterization in the presence of the Contract Administrator. Provide minimum 3 days (72 hours) notice to the Contract Administrator to attend. Contract Administrator must invite City of Kelowna Parks Department Representative to winterization within 24 hours of receiving the invitation from the Contractor.
- 3.35.3 Winterization includes but is not limited to:
- (1) Saturation of soil with water to a depth of 300mm to provide deep watering of all lawn areas, planting beds and tree pits.
 - (2) Deactivation of water supply.

- (3) Deactivation of controller.
 - (4) Contact City of Kelowna Parks Department to determine if any components within the point of connection are to be removed prior to winterization and if there are specific guidelines to be followed for winterization of the point of connection.
- 3.36 Maintenance – Spring Start-up**
- 3.36.1 During one-year guarantee period for construction be responsible for spring start-up of irrigation system at beginning of growing season or within 5 Days of request for start-up from Owner. Be liable for any damage resulting from late or improper start-up.
 - 3.36.2 Conduct spring start-up in the presence of the Contract Administrator. Provide minimum 3 days (72 hours) notice to the Contract Administrator to attend. Contract Administrator must invite City of Kelowna Parks Department Representative to Spring start-up within 24 hours of receiving the invitation from the Contractor.
 - 3.36.3 Spring start-up includes but is not limited to:
 - (1) Activate water supply slowly and provide location for air to escape prior to charging lines.
 - (2) Checking and testing for leaks.
 - (3) Cycling irrigation control program through all zones to ensure proper function and performance.
 - (4) Checking and adjusting heads and emitters to achieve even coverage with minimum over spray onto other surfaces.
 - (5) Testing of backflow prevention assembly. Submit test results to Contract Administrator and place test results tag on the backflow prevention assembly. Test tag must be firmly attached to the tested assembly and include the following information in waterproof ink: Name of Owner, Test Date, Tester initials, Tester Certification Number.
 - (6) Saturation of the soil with water to a depth of 12" (300mm) to provide deep watering of all lawn areas, planting beds and tree pits.

- 3.37 Guarantee**
- 3.37.1 Submit written guarantee, in approved form, stating that all work showing defects in materials, workmanship or operation will be repaired or replaced at no cost to Owner for a period of one year from date of Substantial Performance.
 - 3.37.2 Guarantee includes the supply of labour, materials and equipment necessary for the repair and replacement of damaged or defective materials and workmanship. Guarantee includes Spring start-up, winterization, maintenance, necessary testing, program corrections or adjustments and restoration of settled trenches, valve boxes, and sprinkler heads. Guarantee includes flow sensing verification.
 - 3.37.3 Guarantee will not apply to materials or workmanship damaged after Substantial Performance by causes beyond the Contractor's control, such as vandalism or abuse.

END OF SECTION

2.0 PRODUCTS

2.2 Mainline Pipe,
Joints and Fittings

2.2.1 Ductile iron pipe:

(add)

- (3) Wrap: Ductile iron pipe and fittings to be installed with a polyethylene encasement conforming to AWWA C104, unless suitable testing of the soil conditions indicate that there is no risk of accelerated corrosion, as approved by the City Engineer.

2.2.4 Fittings:

(replace (8) Bolts and nuts:)

- (1) Bolts to be UNC rolled threaded, high-strength low-alloy stainless steel to AWWA C111/A21.11 / ASTM F593, type 304, heavy hex style. Bolt sizes to AWWA C110.
- (2) Nuts and washers: nuts to be high-strength low-alloy stainless steel to AWWA C111/A21.11 / ASTM F594, type 304, heavy hex style. Washers to be flat hardened stainless steel, type 304, equivalent to ASTM F436/F436M.

(replace (9) Tie Rods and Nuts:)

- (1) Tie rods to be continuous threaded, quenched and tempered high-strength low-alloy stainless steel, equivalent to ASTM A354, Grade BC. Tie rod sizes to be minimum 19 mm diameter or greater as shown on Contract Drawings.
- (2) Nuts and internally threaded couplings to be high-strength low-alloy stainless steel to AWWA C111/A21.11 / ASTM F594, type 304, heavy hex style.

2.5 Service
Connections,
Pipe, Joints and
Fittings

(replace 2.5.1)

- 2.5.1 Pipe diameter 25 mm and 50 mm to be Pressure Class 160 polyethylene tubing certified to CSA B137.1, or crosslinked polyethylene pipe certified to AWWA C904.

- (replace 2.5.5)*
- 2.5.5 Copper tubing joints to be compression type suitable for 1100 KPa working pressure.
- 2.6 Hydrants** *(replace 2.6.2)*
- 2.6.2 Colour: All hydrants are to be painted in accordance with the City Standard Drawing SS-W4 and the Approved Products List.
- 2.7 Underground Service Line Valves and Fittings** *(add)*
- 2.7.5 Curb stops for 50mm services to be accessed by a valve box similar to mainline valves.
- 2.10 Joint Wrapping** *(add section)*
- 2.10.1 As listed in the Approved Products List.
- 3.0 EXECUTION**
- 3.6 Pipe Installation** 3.6.1 *(add)*
- All pipe to be delivered from manufacturer with weatherproof plugs/bagging to prevent contamination while being delivered and during storage. Pipe to remain this way until placed into trench and installed.
- (replace 3.6.6)*
- 3.6.6 Do not exceed **50%** of the maximum joint deflection recommended by the pipe manufacturer. Refer to AWWA C600 for ductile iron pipe and AWWA C605 for PVC pipe. PVC pipe deflections achieved by bending the barrel are not permitted. For PVC pipe deflections exceeding 50% of manufacturer's recommendation, use:
- (1) PVC High Deflection coupling rated at 1380kPa (100mm-300mm)
 - (2) PVC long radius 5 degree bend rated at 1620kPa (100mm-750mm).

(add)

3.6.15 Marking tape labelled WATERWORKS and tracer wire is to be placed above all pipes at a depth of 0.45m below finished grade in statutory rights-of-way and any other locations where pipe alignment is irregular, as required by the City Engineer.

**3.10 Service
Connection
Installation**

(add)

3.10.13 Decommissioning of existing services that are no longer required shall be completed as indicated on the Contract Drawings. Curb stops and valve boxes are to be removed. Requirements depend on the age, size, and material of the main and service, as well as the ability to shut down the main. The options to decommission at the main are as follows:

- (1) Removal of the corporation stop and/or saddle. Once completed a repair clamp is to be installed over the service location. The watermain will need to be shut down during decommissioning.
- (2) If the saddle is in good condition, cap the corporation stop by installing a solid plug behind the flare/compression nut or adapt to a solid cap. After installation, the corporation stop must be opened and closed to confirm no leakage. Abandonment saddle may need to be installed over the corporation stop where it has been direct tapped.
- (3) If the water service was connected to the water main with a flange, then a blind plate is required on the tee, service valve must be removed. The watermain will need to be shut down during decommissioning.

Contractor to coordinate with City of Kelowna representative and Contract Administrator for witnessing of decommissioning work.

3.12 Hydrants

(replace 3.12.6)

3.12.6 For hydrants not in service, place an orange bag over the entire hydrant, secured at the bottom with tape and labelled in black "Not In Service." Isolation valve to remain closed until the hydrant

is put into service. Remove bag and open valve once the water main has been accepted by the Contract Administrator. If the hydrant valve is connected to a live water main, the valve to be operated only by Water Utility staff.

(add)

3.12.7 Prior to putting hydrant into service, Contractor to complete flow testing and submit hydrant data in the form required by the City of Kelowna.

3.14 Corrosion Protection

(add)

3.14.2 All bolts, tie rods and nuts to have petrolatum paste and tape applied.

3.19 Testing Procedure

(add)

3.19.8 Hydrant flow testing to be completed in accordance with the AWWA Manual of Water Supply Practices, Installation, Field Testing & Maintenance of Fire Hydrants (M17).

3.20 Disinfection, General

(add)

3.20.3 Disinfect and flush water reservoirs and appurtenances in accordance with AWWA C652.

3.21 Disinfection and Flushing Procedures

(add)

3.21.10 Flush water main and dispose to a suitable location as approved by the Contract Administrator. If disposing to the storm system or any other environmental sensitive area, dispose to a tanker truck or holding facility and dechlorinate the disinfection solution using Ascorbic Acid (Vita-D-Chlor). Confirm that the solution has been neutralized prior to disposing to the approved disposal location.

3.21.11 Results from the disinfection procedure must be documented by the Contract Administrator and include actual concentration levels at 0 & 16 hours from both ends of the pipe, in accordance with AWWA C651.

- 3.21.12 Test water main in accordance with AWWA C651 to confirm that no bacteria exist. Testing to include two consecutive sets of samples at least 16 hours apart, taken at both ends of the pipe, including all branches and at intervals in between as specified in AWWA C651. Tests required for the samples are Total Coliform, Fecal Coliform, Background Bacteria, and a Chlorine Residual.
- 3.21.13 The Contract Administrator to provide the following to the City of Kelowna Water Utility with "Form 6, Request for Connection to the City Water System". Contact watertiein@kelowna.ca.
1. Copies of all test results including those from other companies that performed any of the tests.
 2. A sketch or copy of a drawing showing the sections tested and the location of the tie-in(s).
- 3.21.14 If the pipe is left idle for a period of more than 1 month, the line is to be re-flushed. Zero hour and 16 hour bacteria samples are to be taken. Repeat flushing and testing until water quality is satisfactory.
- 3.21.15 Contractors must keep minimum chlorine residual within the pipe until the pipe is connected to an active system.

3.23 Connections to Existing Mains

(add)

- 3.23.2 Make connection (or disconnection) in presence of the City Engineer and Contract Administrator. Provide two full working days notice to schedule inspection. Obtain and authorize a City Third Party Work order prior to connection (or disconnection). Contractor is responsible to pay for tie-in inspections.

END OF SECTION

3.0 EXECUTION

3.6 Pipe Installation *(add)*

3.6.14 Marking tape labeled SANITARY SEWER and tracer wire is to be placed above all pipes at a depth of 0.45m below finished grade in statutory rights-of-way and any other locations where pipe alignment is irregular, as required by the City Engineer.

3.12 Leakage Testing General 3.12.1 *(remove (5))*

3.18 Video Inspection *(replace 3.18.1)*

3.18.1 The Contractor shall video inspect completed sanitary sewers and service connections (main to IC) following completion of installation per Section 33 01 30.1 – CCTV Inspection of Pipelines. Copies of the digital video files and written report shall be forwarded to the Contract Administrator as soon as they are available.

3.20 Connection to Existing Mains *(add)*

3.20.3 Make connection (or disconnection) in presence of City Engineer and Contract Administrator. Provide two full working days notice to schedule inspection. Obtain and authorize a City Third Party Work order prior to connection (or disconnection). Contractor is responsible to pay for tie-in inspections.

END OF SECTION

2.0 PRODUCTS

2.2 Pipe, Joints and Fittings

2.2.1 Ductile iron pipe:

(delete 2.2.1 -ductile iron pipe not permitted for forcemains)

2.2.2 Polyvinyl Chloride (PVC) pressure Pipe:

(add)

(4) Forcemain pipe color is to be white.

2.3 Valves and Valve Boxes

2.3.2 Gate Valves:

(delete 2.3.2 – gate vales not permitted for forcemains)

3.0 EXECUTION

3.6 Pipe Installation

(add)

3.6.11 Marking tape labeled SANITARY FORCEMAIN and tracer wire is to be placed above all pipes at a depth of 0.45m below finished grade in roads and statutory rights-of-way and any other locations where pipe alignment is irregular, as required by the City Engineer.

3.16 Connection to Existing Mains

(add)

3.16.3 Make connection (or disconnection) to mains and manholes in presence of City Engineer and Contract Administrator. Provide two full working days notice to schedule inspection. Obtain and authorize a City Third Party Work order prior to connection (or disconnection). Contractor is responsible to pay for tie-in inspections.

END OF SECTION

3.0 EXECUTION

3.6 Pipe Installation

(add)

3.6.14 Marking tape labeled STORM SEWER and tracer wire is to be placed above all pipes at a depth of 0.45m below finished grade in statutory rights-of-way and any other locations where pipe alignment is irregular, as required by the City Engineer.

3.12 Inspection and Testing

(replace 3.12.1)

3.12.1 The Contractor shall video inspect completed storm sewers, catchbasin leads and service connections (main to IC) following completion of installation per Section 33 01 30.1 – CCTV Inspection of Pipelines. Copies of the digital video files and written report shall be forwarded to the Contract Administrator as soon as they are available.

3.14 Connection to Existing Mains

(add)

3.14.3 Make connection (or disconnection) in presence of City Engineer and Contract Administrator. Provide two full working days notice to schedule inspection. Obtain and authorize a City Third Party Work Order prior to connection (or disconnection). Contractor is responsible to pay for tie-in inspections.

END OF SECTION

2.0 PRODUCTS

2.1 Materials

(replace 2.1.7)

2.1.7 Cast iron frame and cover: as indicated in the City of Kelowna Approved Products List and Supplemental Detail Drawings.

- (1) The manhole frame must conform to ASTM A48/A48M and be designed to withstand H20 loading.
- (2) Frame and cover assembly must not create a point load on the concrete riser rings and must keep the frame centered and stable over the manhole chimney.
- (3) Frame must be able to achieve adjustment to within 6mm of finished surface elevation. Rim to be set uniform with contour of road surface and not higher.
- (4) Where surface inflow is likely, Sanitary Sewer manholes shall be installed with an approved watertight frame and cover.

(replace 2.1.11)

2.1.11 Catchbasin leads to be minimum 200 mm diameter PVC DR35.

2.1.15 Mortar:

(add)

- (3) Support concrete to be non-shrink type, minimum 20 MPa @ 28 days, maximum 10mm diameter aggregate.

(add)

2.1.23 Sulphate resistant concrete required where soil conditions warrant it, as specified on Contract Drawings or as recommended by Geotechnical Engineer.

(add)

2.1.24 Grade Rings:

- (5) Grade rings are to be reinforced dry cast concrete to H20 load.

3.0 EXECUTION

3.3 Manhole
Installation

(replace)

3.3.1 Install manholes as shown on Standard Detail Drawings, concurrently with pipe laying. Use pre-benched manhole bases unless otherwise approved by the City Engineer.

(add)

3.3.12 (7) During adjustment maximize grade ring thicknesses to reduce joints between grade rings. Grade rings are to be available in 50mm, 75mm, 100mm and 150mm thicknesses.

(8) For roads with steep grades 4% and 8% sloped concrete grade rings are to be used in conjunction with the adjustable manhole frame assembly. Only one sloped grade ring required for each adjustment.

(9) In addition to adjustable manhole frame assembly for roads with grades between 4% and 8%, use 4% sloped concrete grade ring. For roads between 8% and 12% use 8% sloped concrete grade ring.

(10) Grade rings must be smooth and fit tight. Manhole frame assembly to fit flush and centered on concrete grade ring. Remove any dry cast slag from grade ring edges.

(add)

3.3.19 Where manholes are to be installed in new or re-constructed roadways that require two lifts of asphalt, final adjustment of manhole frames and covers is to occur after first lift of asphalt is in place.

3.9 Adjusting Tops of
Existing Units

(add)

3.9.6 Remove and replace existing non-conforming manhole frames and covers within work zone with new frames and covers in conformance with City Standards.

END OF SECTION

2.0 PRODUCTS

(replace 2.6.4)

2.6.4 Steel Pedestrian/Cyclist Pushbutton Posts: Fabrication to conform to Standard Detail Drawing E6.3, with the exception that the pushbutton be mounted at 750 mm above surface level.

2.7 Conductors and Cables

(add)

2.7.5 IMSA cable: Type 19-1, stranded. Number and size of conductor as per Contract Drawings.

2.11 Service Panels

(replace 2.11.1)

2.11.1 Service panels shall be as shown on the Contract Drawings.

2.15 Traffic and Pedestrian Signals

(replace 2.15.1 and delete 2.15.2)

2.15.1 Traffic signal heads to be 300mm yellow polycarbonate with tunnel visors, number and type as per Contract Drawings. If a backboard is specified it shall be yellow aluminium with 75mm border of yellow prismatic, retro-reflective sheeting. Pedestrian heads to be green polycarbonate, number and type as per Contract Drawings.

2.16 LED Signal Modules

(add)

2.16.2 All ball indication traffic signal heads shall have a 15-year warranty.

2.17 Signal Mounting Hardware

(replace 2.17.1)

2.17.1 Side mount brackets as per Standard Detail Drawings E5.2 and Supplemental Drawing SS-E5.3

(replace 2.17.2 and delete 2.17.3 - 2.17.7)

2.17.2 Overhead signal head mounting as per Standard Detail Drawing E5.9.

- | | | |
|-------------|--|---|
| 2.18 | Audible Signals | <i>(replace 2.18.1)</i> |
| | | 2.18.1 For head mounted APS speakers, mount as per Supplemental Drawing SS-E5.12. For integral pushbutton, APS systems to replace the standard bulldog pushbutton, mounted at 750 mm above surface. |
| 2.24 | NEMA Traffic Control Cabinets | <i>(replace 2.24.1 and delete 2.24.2 - 2.24.4)</i> |
| | | 2.24.1 Traffic Control Cabinets to be supplied by the City. |
| 2.25 | Video Detection System | <i>(replace 2.25.1 and delete 2.24.2 - 2.24.3)</i> |
| | | 2.24.1 Video detection system to be supplied by the City. |
| 2.26 | Uninterruptable Power Supply | <i>(replace 2.26.1)</i> |
| | | 2.26.1 Uninterruptable Power System to be supplied by the City. |
| 3.0 | EXECUTION | |
| 3.4 | Junction Boxes and Vaults | <i>(replace 3.4.1)</i> |
| | | 3.4.1 Install junction boxes and vaults as shown on Supplemental Drawings SS-E2.1 – 2.5 and Standard Detail Drawing E2.6. |
| 3.6 | Poles and Related Equipment | <i>(replace 3.6.7)</i> |
| | | 3.6.7 Field drilling of holes larger than 33 mm diameter not allowed in Type 1, 3, 6, 7, L, & S shafts, and all arms and extensions. Where larger holes are required, reinforce holes with welded bushing prior to galvanizing. |
| 3.7 | Traffic Signal and Pedestrian Head Mounting | <i>(replace 3.7.1)</i> |
| | | 3.7.1 Install traffic and pedestrian heads as shown in Standard Detail Drawings E5.2, E5.9 and Supplemental Drawing SS-E5.3. |

- 3.8 Audible Signals** *(replace 3.8.1)*
- 3.8.1 For head mounted APS speakers, mount as per Supplemental Drawing SS-E5.12. For integral pushbutton, APS systems to replace the standard bulldog pushbutton, mounted at 750 mm above surface.
- 3.9 Pedestrian Pushbuttons** *(replace 3.9.1)*
- 3.9.1 Install pedestrian pushbuttons and posts as shown on Standard Detail Drawings E6.1 to E6.3. Pedestrian activated pushbuttons to be mounted at 750 mm above surface.
- 3.10 Luminaires and Photocells** *(replace 3.10.2)*
- 3.10.2 Luminaires to be installed parallel with the longitudinal grade of the road surface, to reduce glare on the downhill side.
- 3.11 Electrical Service** *(replace 3.11.1)*
- 3.11.1 Install services as per FortisBC standards.
- 3.12 Electrical Service Panels** *(replace 3.12.1)*
- 3.12.1 Mount electrical service and meter panels as shown in Supplementary Drawing SS-E1.4.
- 3.14 Wiring** *(replace 3.14.1)*
- 3.14.1 Streetlight light wiring to be spliced in the handhole as per Supplemental Drawing SS-E7.11. Wiring for signal heads to be spliced in the nearest junction box.
- (replace 3.14.3)*
- 3.14.3 Video detection and Pre-emption wiring to run from cabinet to device with no splice.
- (replace 3.14.4)*
- 3.14.4 19 conductor IMSA cable to be run from cabinet to junction box nearest pole and spliced as per Standard Detail Drawing E7.13.

Single conductors to be run from junction box to signal heads and spliced as per Supplemental Drawing SS-E7.19.

(replace 3.14.13)

3.14.13 Bond all steel junction box lids with #8 RW90 conductor.

END OF SECTION

2. SUPPLEMENTAL STANDARD DETAILED DRAWINGS TO MMCD

Standard Detail Drawings for all Works and Services constructed within the City of Kelowna are contained in the Master Municipal Construction Documents (MMCD) 2019 Edition - Volume II, except as specified in the following Index and Cross Reference to MMCD (the Index).

The Supplemental Standard Detail Drawings augment and supersede the MMCD Standard Detail Drawing" as set out herein.

The Index lists only the Supplemental Standard Detailed Drawing. The order of drawings listed in the updated Index mirrors the order of drawings in MMCD (alphabetical), with the City of Kelowna specific sections listed at the end (Linear Park Trails, Landscaping and Irrigation).

**CITY OF KELOWNA STANDARD DRAWINGS
INDEX AND CROSS-REFERENCE TO MMCD**

MMCD Standard Drawings		City of Kelowna Standard Drawings		
Dwg.	Title	Comment	Dwg.	Title
	CONCRETE AND MISCELLANEOUS DETAILS			
C7	Driveway Crossing for Barrier Curbs	Replaced	SS-C7a	Driveway Crossing for Barrier Curbs - Separate Sidewalk and Letdown
		Added	SS-C7b	Driveway Crossing for Barrier Curbs - Combined Sidewalk and Letdown
C8	Wheelchair Ramp for Sidewalk, Infill and Barrier Curbs	Replaced	SS-C8	Sidewalk Ramp Details
C9	Wheelchair Ramp for Sidewalk and Barrier Curbs	Replaced	SS-C9	Sidewalk Ramp Layouts
C10	Concrete Walkway	Deleted		(See SS-R28)
C11	Bicycle Baffle	Deleted		
C12	Removable Barrier Post	Deleted	SS-C12b	Permanent Bollard (Barrier Post)
	ELECTRICAL			
E1.1	Type M (NEMA Cabinet) Concrete Controller Base	Replaced	SS-E1.1	Type M (NEMA Cabinet) Concrete Controller Base
E1.2	Type P (NEMA Cabinet) Concrete Controller Base	Replaced	SS-E1.2	Type P (NEMA Cabinet) Concrete Controller Base
E1.4	Controller Installation (For Type P and M Cabinets)	Replaced	SS-E1.4	Controller Service Panel Installation
		Added	SS-E1.8	Typical Installation for Traffic Controller
E2.1	Round Plastic Junction Boxes	Replaced	SS-E2.1	Large Round Plastic Junction Box Details
E2.3	Large Concrete Junction Boxes	Replaced	SS-E2.3	Traffic Signal Main Vault Details
E2.4	Large Concrete Junction Boxes	Added	SS-E2.4	Traffic Signal Junction Box Details
E2.5	Concrete Vault	Replaced	SS-E2.5	Concrete Traffic Communication Pull Box Details
E2.6	Concrete Vault	Replaced	SS-E2.6	Plastic Communication Pull Box Details
E5.12	Audible Signals	Replaced	SS-E5.12	Pedestrian and Audible Signal Installation Details
E5.3	Side of Pole Signal Head Mounting (Method 2)	Replaced	SS-E.5.3	Signal/Pedestrian Head Mounting on traffic Signal Poles
		Added	SS-E5.16	Roadside Pedestrian Activated Flashers (No Median Option)
		Added	SS-E5.16a	Solar Roadside Pedestrian Activated Flashers (No Median Option)

2. Supplemental Standard Detail Drawings

MMCD Standard Drawings		City of Kelowna Standard Drawings		
Dwg.	Title	Comment	Dwg.	Title
		Added	SS-E5.17	Roadside Pedestrian Activated Flashers (Median Option)
		Added	SS-E5.17a	Solar Roadside Pedestrian Activated Flashers (Median Option)
		Added	SS-E5.18	Roadside Pedestrian Activated Flashers (Overhead Sign Option)
		Added	SS-E5.19	Roadside Pedestrian Activated Flashers (Overhead Sign Median Option)
		Added	SS-E5.20	Signal Head Quick Change Kit
E7.10	Service Ground Plate Installation Detail	Replaced	SS-E7.10	Grounding of Electrical Service Installation Details
E7.11	Luminaire Wining in Pole Handhole	Replaced	SS-E7.11	Luminaire Wining on Pole Handhole Detail
		Added	SS-E7.19	Signal Wiring Colour Code Chart (From JB to Pole)
E8.2	Detector Loops	Replaced	SS-E8.2	Detector Loops
E8.8	Pre-Formed Diamond Detector Loop Installation Details	Replaced	SS-E8.8	Pre-Formed Diamond Detector Loops
E8.9	Pre-Formed Diamond Detector Loop Installation Details	Replaced	SS-E8.9	Pre-Formed Diamond Detector Loops
E8.10	Pre-Formed Diamond Detector Loop Installation Details	Replaced	SS-E8.10	Pre-Formed Diamond Detector Loops
	GENERAL DETAILS			
G1	General Legend for Contract Drawings	Deleted		(Legend as per City Drawing Standards)
G2	Legend for Materials	Deleted		(Legend as per City Drawing Standards)
G3	Legend for Street Light and Traffic Signal Drawings	Deleted		(Legend as per City Drawing Standards)
G4	Utility Trench	Replaced	SS-G4	Utility Trench
G5	Pavement Restoration	Replaced	SS-G5	Pavement Restoration
	ROADWORKS			
R1	Paved Shoulders	Deleted		
R2	Driveway Letdowns, Cross-Section	Deleted		(See SS-C7a and SS-C7b)
R3	Sidewalks, Interim Asphalt	Deleted		
R4	Single Ramp Letdown with Parallel Scoring	Deleted		(See SS-C8 and SS-C9)
R5	Traffic Calming, Speed Hump and Table	Deleted		(See ITE TAC standards)
R6	Traffic Calming, Raised Intersection Details	Deleted		(Guideline only, subject to detailed approval)
R7	Traffic Calming, Typical Raised Median	Deleted		

2. Supplemental Standard Detail Drawings

MMCD Standard Drawings		City of Kelowna Standard Drawings		
Dwg.	Title	Comment	Dwg.	Title
R8	Traffic Calming, Curb Extensions and On-Street Parking Bay	Deleted		(See SS-R51 and SS-R52)
		Added	SS-R20	Left Turn Lane (Raised Median)
		Added	SS-R21	Left Turn Lane (Painted) and Two-Way Left Turn Lane
		Added	SS-R23	Concrete Drainage Swale Across Asphalt
		Added	SS-R28	Walkway Gate
		Added	SS-R50	Smart Channel Right Turn
		Added	SS-R51	Intersection Curb Extension - Higher Class Road No Parking
		Added	SS-R52	Intersection Curb Extension - Higher Class Road With Parking
		Added	SS-R53	Cul-De-Sac Turnaround
		Added	SS-R54	Hammerhead Turnaround
		Added	SS-R55	Standard Ditch Section
		Added	SS-R56	Utility Access and Location at Ditch
		Added	SS-R57	Rock Cut Cross Section
		Added	SS-R58	Driveway Grades
		Added	SS-R59	Urban Transit Stop Layout
		Added	SS-R60	Urban Transit Stop Shelter Pad Details
		Added	SS-R61	Post Mounted Sign
		Added	SS-R62	Street Name Blade Details
	CROSS SECTION STANDARDS			
		Added	XS-R01	Hillside Laneway
		Added	XS-R02	Suburban / Core Area / Urban Centre Laneways
		Added	XS-R20	Rural Local
		Added	XS-R21	Hillside Village Local Residential
		Added	XS-R22	Hillside Local Condition A (Development Both Sides)
		Added	XS-R23	Hillside Local Condition B (Development One Side)
		Added	XS-R24	Hillside Local Condition C (No Development Either Side)
		Added	SX-R25	Suburban Local
		Added	XS-R26	Industrial Local
		Added	XS-R27	Core Area Local
		Added	XS-R28	Urban Centre Local
		Added	XS-R40	Rural Collector

2. Supplemental Standard Detail Drawings

MMCD Standard Drawings		City of Kelowna Standard Drawings		
Dwg.	Title	Comment	Dwg.	Title
		Added	XS-R41	Hillside Village Collector Condition A (Retail/M.F. Fronting)
		Added	XS-R42	Hillside Village Collector Condition B (No Retail Fronting)
		Added	XS-R43	Hillside - Collector Condition A (Development Both Sides)
		Added	XS-R44	Hillside Collector Condition B (Development One Side)
		Added	XS-R45	Hillside Collector Condition C (No Development Either Side)
		Added	XS-R46	Hillside Minor Collector Condition A
		Added	XS-R47	Hillside Minor Collector Condition B
		Added	XS-R48	Suburban Collector
		Added	XS-R49	Suburban Collector (With Bike Lanes)
		Added	XS-R50	Industrial Collector
		Added	XS-R51	Core Area Collector
		Added	XS-R52	Core Area Collector (With Bike Lanes)
		Added	XS-R53	Urban Centre Collector
		Added	XS-R54	Urban Centre Collector (With Bike Lanes)
		Added	XS-R60	Rural Minor Arterial
		Added	XS-R61	Rural Minor Arterial (With Multi-Use Path)
		Added	XS-R62	Hillside Arterial Condition A (Village Parkway)
		Added	XS-R63	Hillside Arterial Condition B (Within 0.8km Walking Distance of Village)
		Added	XS-R64	Hillside Arterial Condition C (Greater Than 0.8km Walking Distance of Village)
		Added	XS-R65	Suburban Minor Arterial
		Added	XS-R66	Core Area Minor Arterial
		Added	XS-R67	Urban Centre Minor Arterial
		Added	XS-R80	Rural Major Arterial (3 Lane)
		Added	XS-R81	Rural Major Arterial (3 Lane with Multi-Use Path)
		Added	XS-R82	Rural Major Arterial (5 Lane)
		Added	XS-R83	Rural Major Arterial (5 Lane with Multi-Use Path)
		Added	XS-R84	Suburban Major Arterial (3 Lane)
		Added	XS-R85	Suburban Major Arterial (5 Lane)
		Added	XS-R86	Core Area Major Arterial (3 Lane)
		Added	XS-R87	Core Area Major Arterial (5 Lane)
		Added	XS-R88	Urban Centre Major Arterial (3 Lane)
		Added	XS-R89	Urban Centre Major Arterial (5 Lane)

2. Supplemental Standard Detail Drawings

MMCD Standard Drawings		City of Kelowna Standard Drawings		
Dwg.	Title	Comment	Dwg.	Title
	STORM AND SANITARY SEWERS			
S1	Standard and Sump Manholes	Replaced	SS-S1a	Manholes
		Added	SS-S1b	Manhole Frame and Cover
		Added	SS-S1C	Adjustable Manhole Frame and Cover
S4	Inside Drop Manhole	Replaced	SS-S4	Inside Drop Manhole
S6	Sewer Clean-Out	Replaced	SS-S6	Clean-Out Detail (Temporary)
S7	Sanitary Sewer Service Connection	Replaced	SS-S7	Sanitary Sewer Service Connection
S9	Inspection Chamber for 100 to 200 Sanitary Sewer Connection	Replaced	SS-S9	Inspection Chamber for 100 to 200 Sanitary Sewer Connection
S11	Top Inlet Catch Basin	Replaced	SS-S11a	Catch Basin 900 mm diameter
		Added	SS-S11b	Catch Basin Castings Combined Side and Gutter Inlet
		Added	SS-S11c	Catch Basin - Top Slabs
		Added	SS-S13b	Storm Drain Outlet with Safety Grillage
		Added	SS-S50	Manhole Requirement for Services
		Added	SS-S51	Drainage Drywell
		Added	SS-S52	Drainage Drywell Installation
		Added	SS-S52a	Drywell Installation with Perforated Pipe System
		Added	SS-S53	Pipe Perforation and Bedding Detail for Ground Water Recharge
		Added	SS-S54	Catch Basin Trapping Hood
		Added	SS-S55a	Flow Control Chamber - City Facility
		Added	SS-S55b	Flow Control Chamber - Private Facility
		Added	SS-S56	IDF Curves
		Added	SS-S57	Riprap Design Chart
		Added	SS-S58	Groundwater Recharge Suitability Map
		Added	SS-S59	Typical Lift Station Site Layout
		Added	SS-S60	Sanitary Lift Station
		Added	SS-S61	Above Ground Valve Kiosk
		Added	SS-S62	Pigging Port
		Added	SS-S63	Radio Antenna Mast and Base

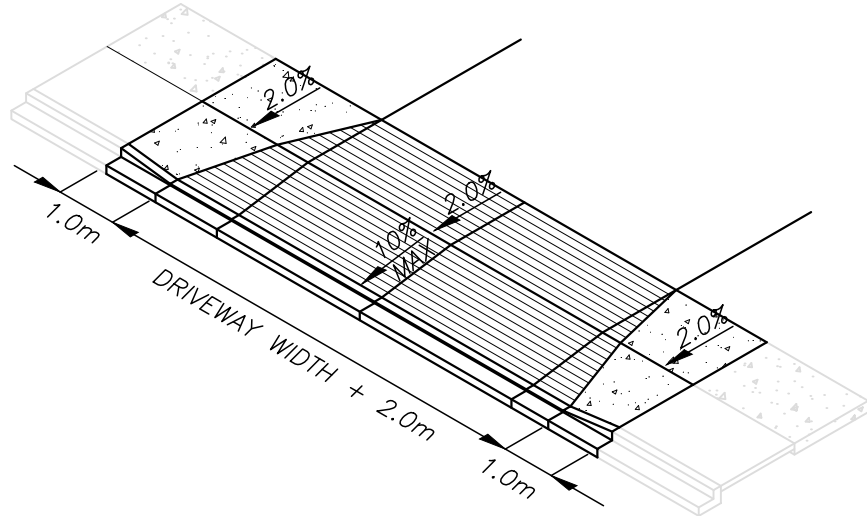
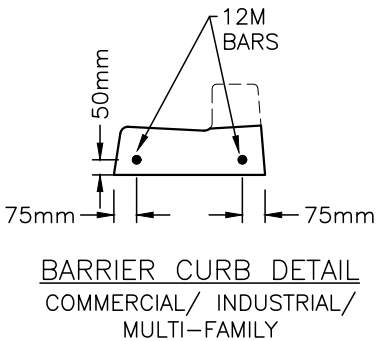
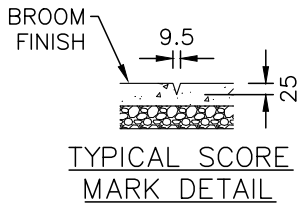
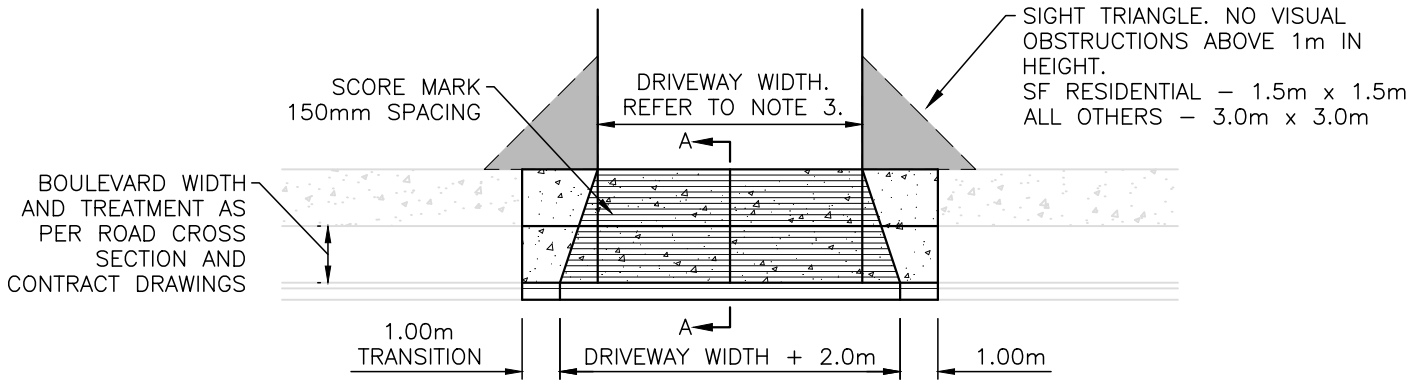
2. Supplemental Standard Detail Drawings

MMCD Standard Drawings		City of Kelowna Standard Drawings		
Dwg.	Title	Comment	Dwg.	Title
	WATERWORKS			
W2a	Water Service Connection	Replaced	SS-W2	Water Service Connection
W2b	Water Service Connection	Deleted		
W2c	Meter Installation for 19mm & 25mm Service Connections	Deleted		
W2d	Meter Installation for 38mm & 50mm Service Connections	Deleted		
W4	Fire Hydrant Installation	Replaced	SS-W4	Hydrant
W6	Air Valve Assemblies - 25 and 50 mm Valves	Replaced	SS-W6a	25mm Underground Air Valve (50mm Air Valves as directed by City Engineer)
W7	Air Valve Assembly - 100 mm Valve	Deleted		
W8	Blow-Off for Water Main	Replaced	SS-W8a	Blow-Off (for mains 100mm & smaller)
		Added	SS-W8b	100mm Blow-Off (for mains 150mm & larger)
		Added	SS-W50	Irrigation Service
		Added	SS-W51	U-Bend Detail (Pipe Crossing Conflict)
		Added	SS-W52	AC Watermain Crossings
		Added	SS-W53a	Pressure Reducing Station
		Added	SS-W53b	Pressure Reducing Station
	LINEAR PARK TRAILS			
		Added	SS-T01	Class 1 - Major Urban Promenade
		Added	SS-T02	Class 2 - Major Multi-Use Urban
		Added	SS-T03	Class 3 - Major Multi-Use Rural
		Added	SS-T04	Class 4 - Standard Multi-Use Rural
		Added	SS-T05	Class 5 - Narrow Multi-Use Rural
		Added	SS-T06	Class 6 - Nature Trail Rural
	LANDSCAPING			
		Added	SS-L01	Growing Medium - Boulevard Groundcover
		Added	SS-L02	Growing Medium - Boulevard Planting Bed
		Added	SS-L03	Tree - in Open Green Space
		Added	SS-L04	Tree - in Planting Bed
		Added	SS-L05a	Tree - in Boulevard - Section
		Added	SS-L05b	Tree - in Boulevard - Plan
		Added	SS-L06a	Boulevard Tree - in Soil Cell (Plan)
		Added	SS-L06b	Boulevard Tree - in Soil Cell (Section A-A')

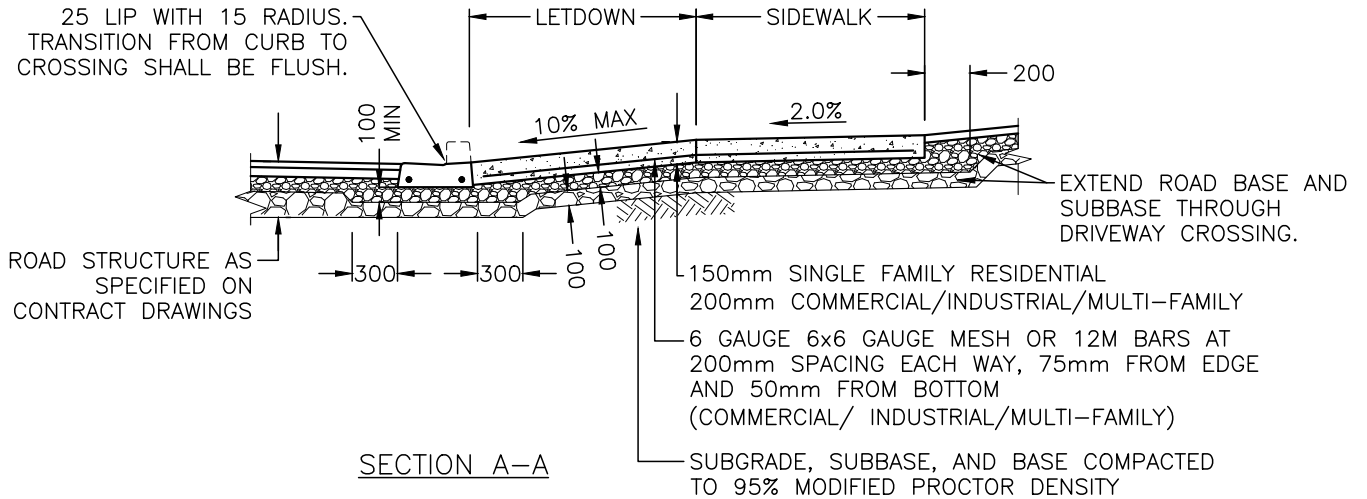
2. Supplemental Standard Detail Drawings

MMCD Standard Drawings		City of Kelowna Standard Drawings		
Dwg.	Title	Comment	Dwg.	Title
	IRRIGATION			
		Added	SS-IR.01a	Standard Kiosk - Non-Metered
		Added	SS-IR.01b	Double-Sided Metered Kiosk - External
		Added	SS-IR.01c	Double-Sided Metered Kiosk - Internal
		Added	SS-IR.02a	Irrigation Vault - Kon Kast 1102
		Added	SS-IR.02b	Irrigation Vault - Kon Kast 1132
		Added	SS-IR.03a	Point of Connection - 25mm to 50mm
		Added	SS-IR.03b	Point of Connection - 100mm
		Added	SS-IR.03c	Irrigation Service
		Added	SS-IR.04a	Trench Section
		Added	SS-IR.04b	Wire Splice Box
		Added	SS-IR.05a	Gate Valve - 25mm to 75mm
		Added	SS-IR.05b	Resilient Wedge Gate Valve - 75mm to 150mm
		Added	SS-IR.05c	Quick Coupler
		Added	SS-IR.05d	Electric Control Valve - 25mm to 50mm
		Added	SS-IR.05e	Drip Zone Kit - 25mm
		Added	SS-IR.05f	Drip Zone Kit - 38mm
		Added	SS-IR.06a	Sprayhead Sprinkler
		Added	SS-IR.06b	Rotor Sprinkler
		Added	SS-IR.06c	Root Watering System
		Added	SS-IR.07a	Dripline Layout - Inline Drip
		Added	SS-IR.07b	Dripline Layout - Point Source Drip
		Added	SS-IR.07c	Flush Valve Assembly
		Added	SS-IR.07d	Air Relief Valve

BYLAW NOTE



25 LIP WITH 15 RADIUS.
TRANSITION FROM CURB TO
CROSSING SHALL BE FLUSH.



NOTES:

1. DRIVEWAYS TO BE ORIENTATED AT 90° TO CURB, UNLESS OTHERWISE APPROVED.
2. ALL DIMENSIONS ARE IN MILLIMETRES UNLESS OTHERWISE NOTED.
3. REFER TO BYLAW 7900 FOR DRIVEWAY WIDTHS. UPON DEMONSTRATED NEED (TURN PATH ANALYSIS OR CAPACITY ANALYSIS), A VARIANCE TO THESE STANDARDS MAY BE CONSIDERED BY CITY ENGINEER.

STANDARD
DETAIL
DRAWING

DATE:
OCT 31/22

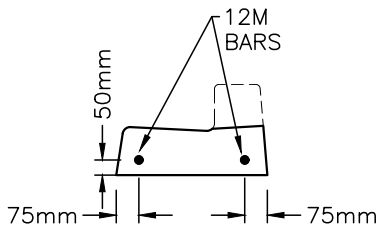
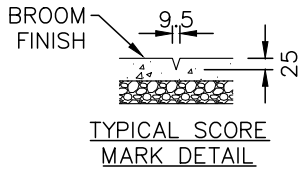
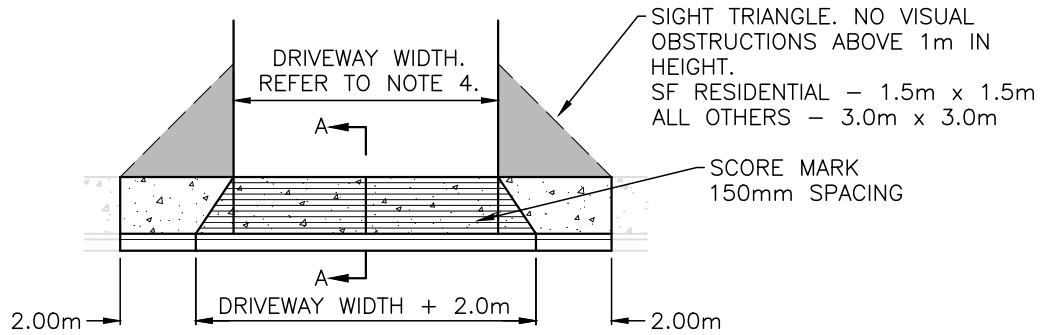
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DRIVEWAY CROSSING FOR
BARRIER CURBS
SEPARATE SIDEWALK AND LETDOWN

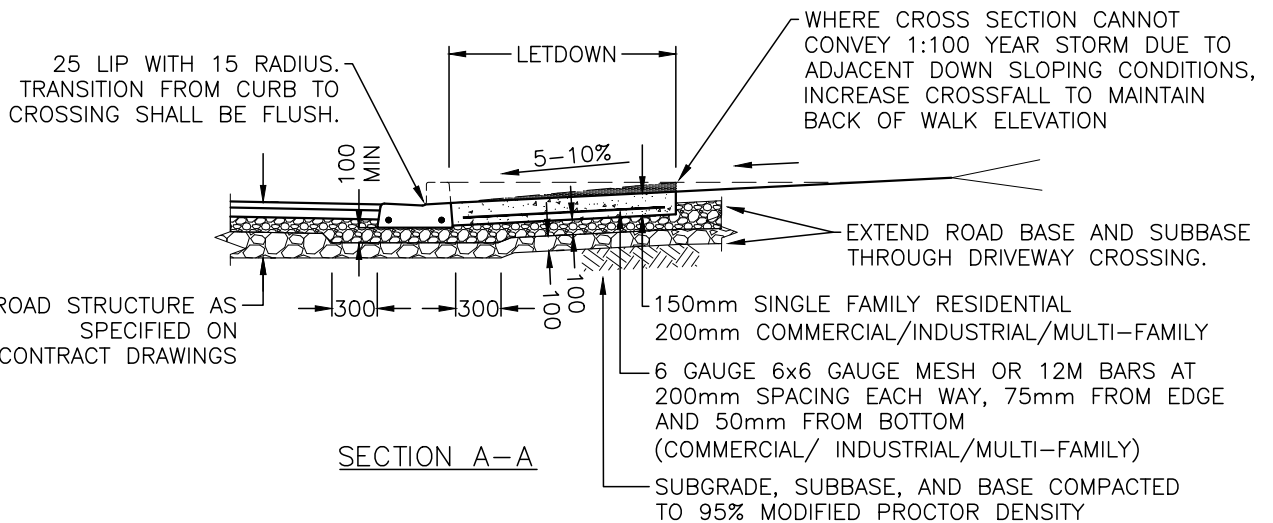
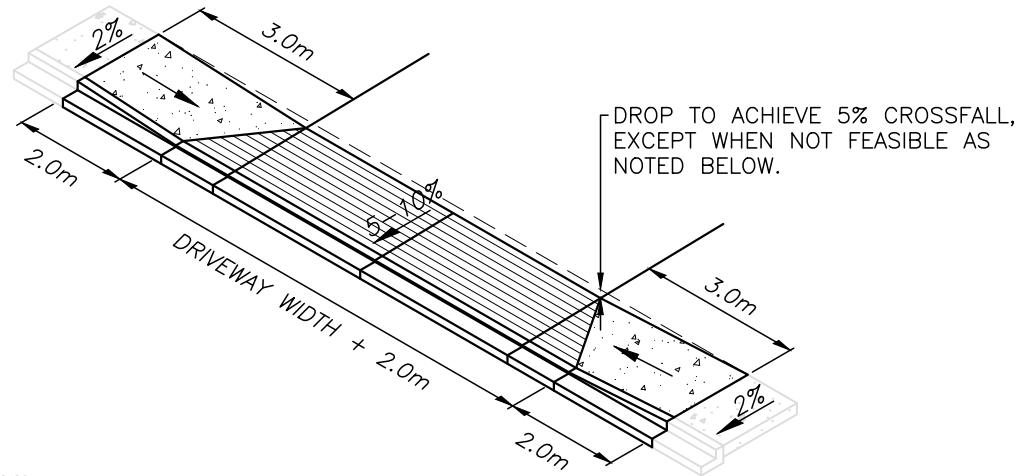
DWG. NO.

SS-C7a





BARRIER CURB DETAIL
COMMERCIAL/ INDUSTRIAL/
MULTI-FAMILY



NOTES:

1. THIS STANDARD IS TO BE USED WHERE SIDEWALK SEPARATION FROM CURB & GUTTER IS NOT POSSIBLE. SEE DRAWING SS-C7a FOR PREFERRED OPTION.
2. DRIVEWAYS TO BE ORIENTATED AT 90° TO CURB, UNLESS OTHERWISE APPROVED.
3. ALL DIMENSIONS ARE IN MILLIMETRES UNLESS OTHERWISE NOTED.
4. REFER TO BYLAW 7900 FOR DRIVEWAY WIDTHS. UPON DEMONSTRATED NEED (TURN PATH ANALYSIS OR CAPACITY ANALYSIS), A VARIANCE TO THESE STANDARDS MAY BE CONSIDERED BY THE CITY ENGINEER.

STANDARD
DETAIL
DRAWING

DATE:
OCT 31/22

SCALE:
NTS

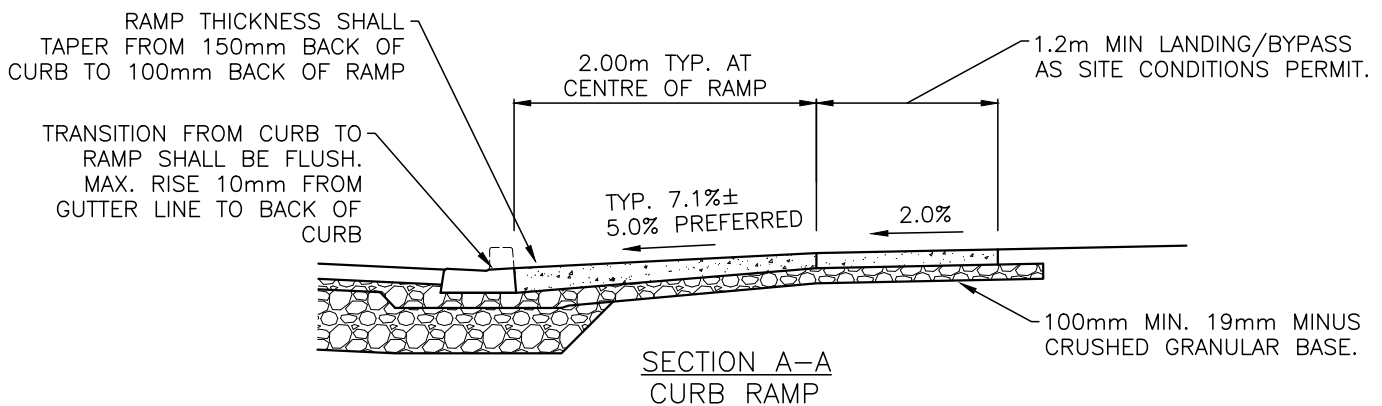
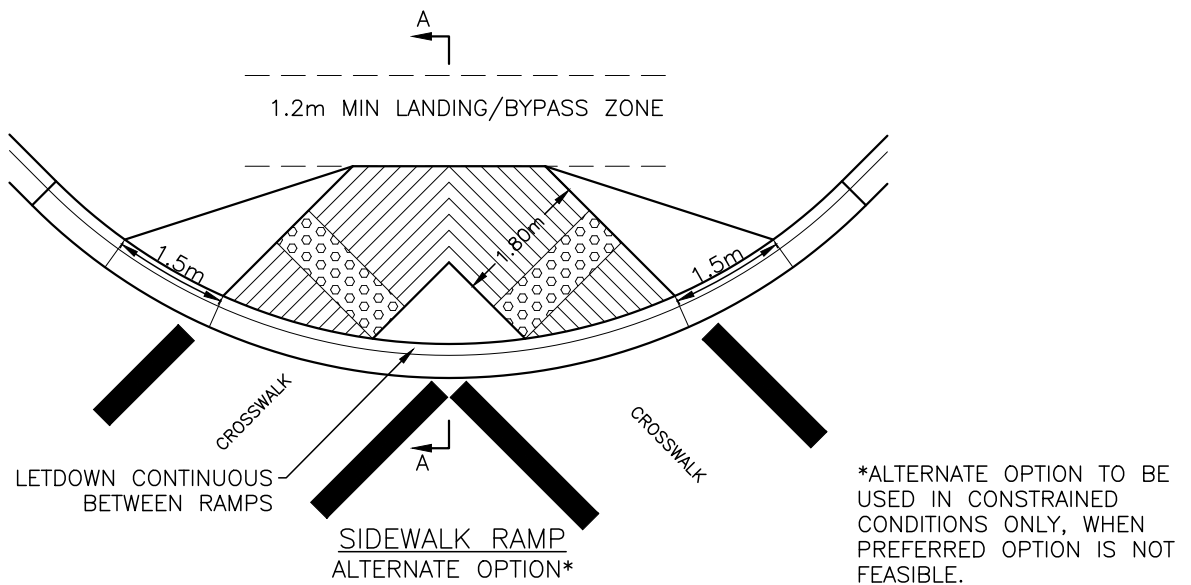
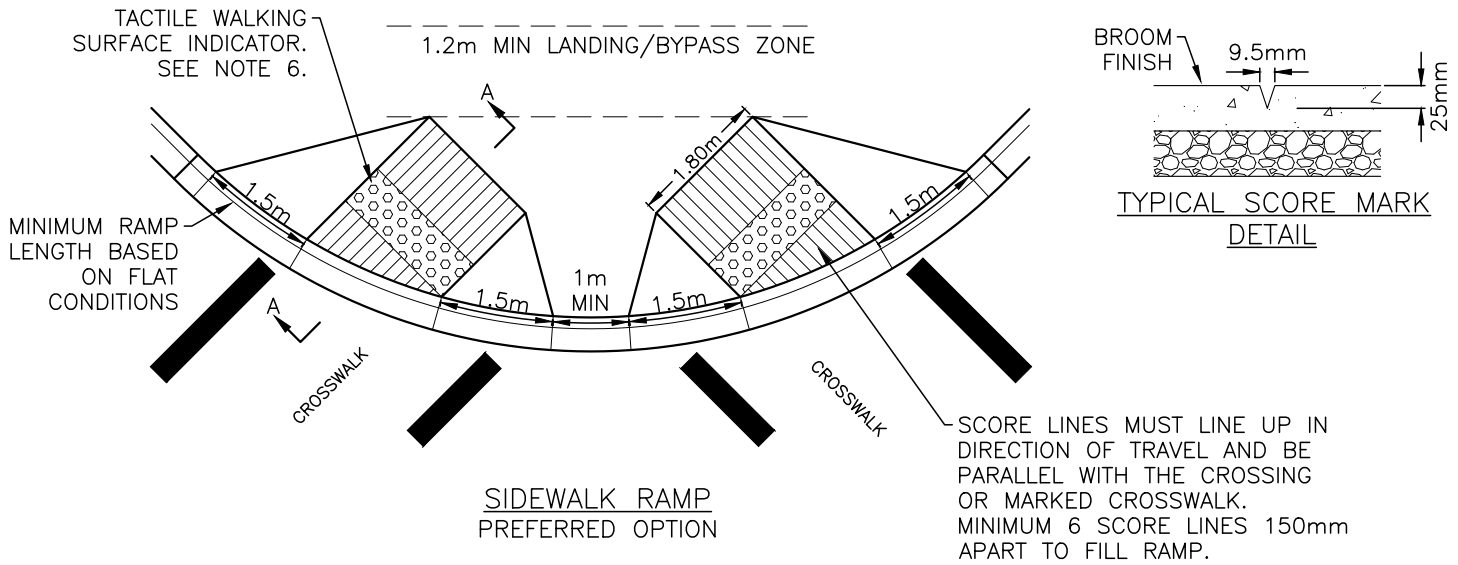
DRIVEWAY CROSSING FOR
BARRIER CURBS
COMBINED SIDEWALK AND LETDOWN

DWG. NO.

SS-C7b



BYLAW NOTE



NOTES:

1. STANDARD RAMP LENGTH : 2.0m TYP.(±) AT CENTRE OF RAMP.
2. STANDARD RAMP SLOPE: 7.1%(±) AT CENTRE OF RAMP.
3. PREFERRED RAMP SLOPE: 5% AT CENTRE OF RAMP WHERE VIABLE AND MAINTAINING THE LANDING/BYPASS ZONE.
4. MAX. SLOPE 8.3% (1:12) AT ANY POINT WHERE TOPOGRAPHY REQUIRES.
5. ADJUST LENGTH OF RAMP AS REQUIRED.
6. WHEN SITE CONDITIONS DO NOT PERMIT TYPICAL LAYOUT, CONTACT CITY ENGINEER FOR APPROVAL OF DESIGN.
7. REFER TO BYLAW 7900 FOR GUIDANCE AS TO WHEN TACTILE WALKING SURFACE INDICATORS ARE REQUIRED.

**STANDARD
DETAIL
DRAWING**

DATE:
JUNE 22/23

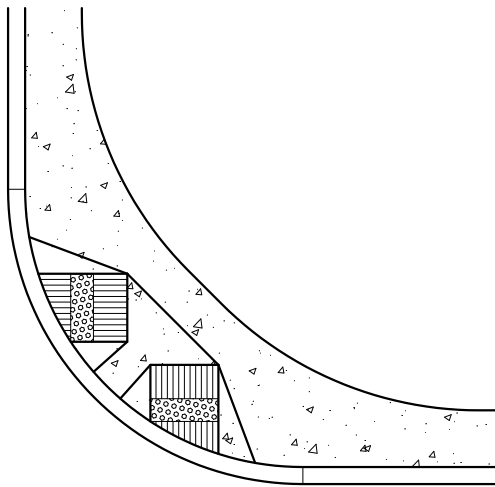
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SIDEWALK RAMP DETAILS

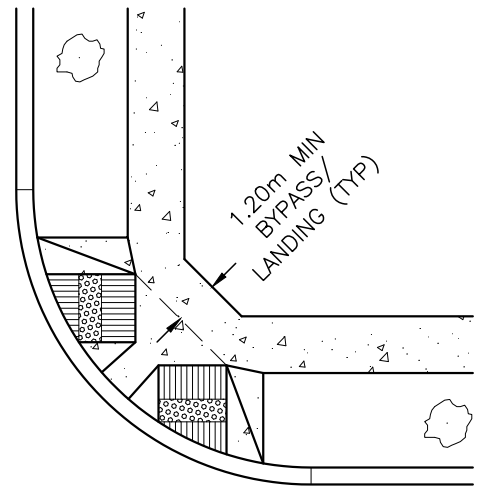
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SS-C8

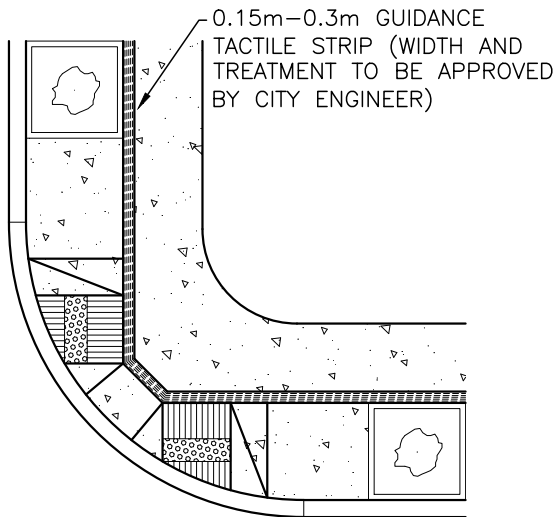




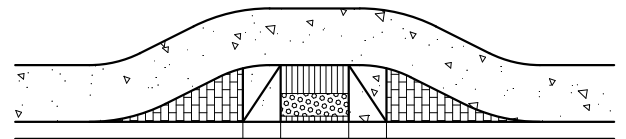
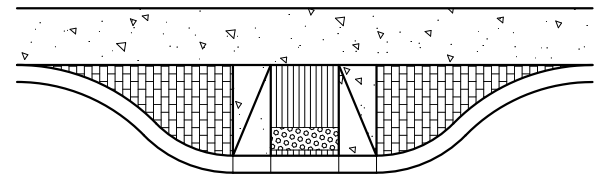
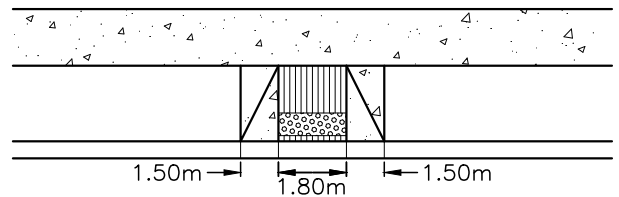
INTERSECTION
MONOLITHIC SIDEWALK



INTERSECTION
SEPARATED SIDEWALK



INTERSECTION
URBAN CENTRES WITH HARD
SURFACE BOULEVARD



MID-BLOCK / 'T' INTERSECTION
CROSSING OPTIONS

NOTES:

1. REFER TO DRAWING SS-C8 FOR SIDEWALK RAMP DETAILS
2. FOR THE DESIGN OF LOCAL AND COLLECTOR ROADS WITH ON-STREET PARKING, CURB EXTENSIONS SHALL BE INCLUDED BOTH AT INTERSECTIONS AND AT PEDESTRIAN CROSSINGS TO IMPROVE VISIBILITY. REFER TO DRAWINGS SS-R51, SS-R52, AND BYLAW 7900.
3. BOULEVARD TREATMENT AS PER LANDSCAPING SECTION 7.

**STANDARD
DETAIL
DRAWING**

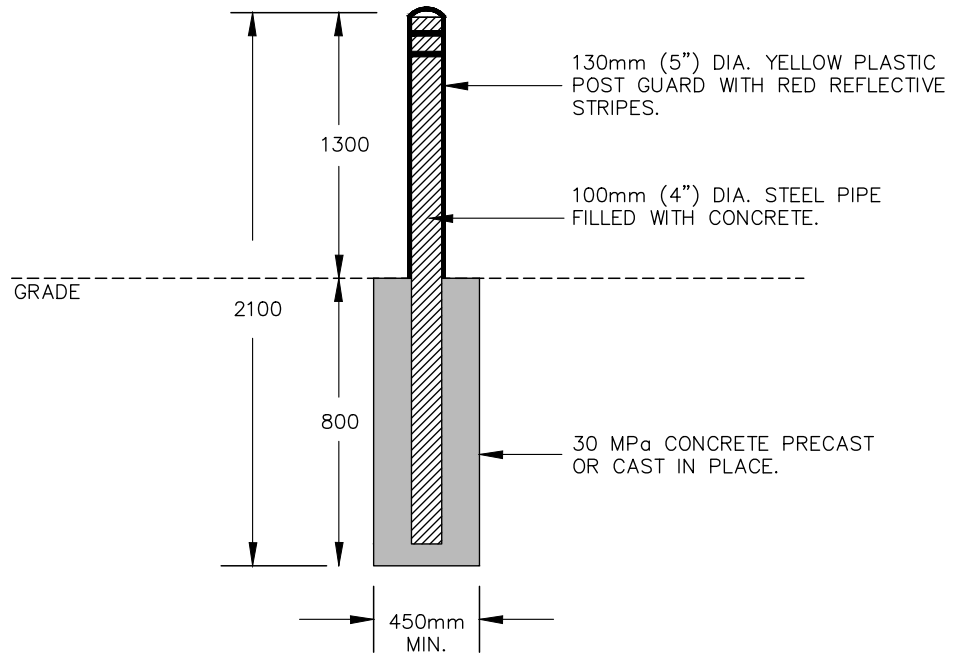
DATE:
SEPT 12/22
SCALE:
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SIDEWALK RAMP LAYOUTS

DWG. NO.

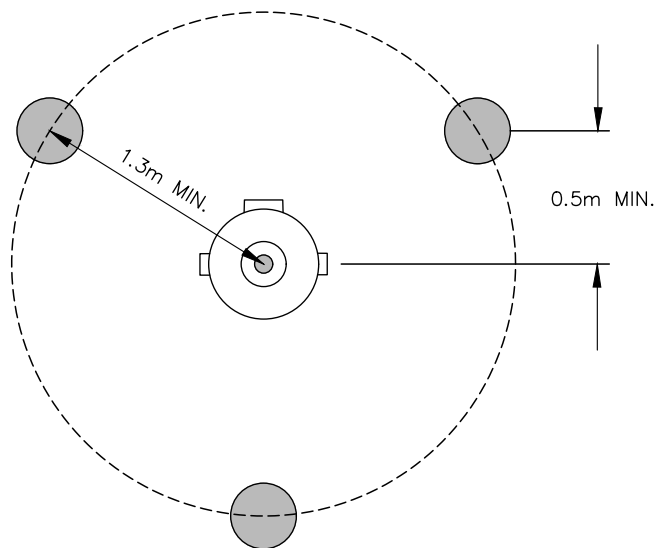
SS-C9





SLEEVE TO BE INSTALLED IN ACCORDANCE WITH MANUFACTURERS DIRECTIONS.

FOR HYDRANTS UNPROTECTED BY CURB:
 BOLLARDS SHALL BE A MINIMUM 1.3m MEASURED FROM THE CENTRE OF THE HYDRANT TO CENTRE OF BOLLARDS. OFFSET BOLLARDS FROM HYDRANT PORTS TO ALLOW FOR EASE OF HOSE CONNECTIONS.



OPTIONAL REAR BOLLARD
 WHERE VEHICLE ACCESS IS POSSIBLE

NOTE: REMOVABLE BOLLARDS TO BE INSTALLED WITH RECEIVER ASSEMBLY WITH HINGED LID AS PER APPROVED PRODUCTS LIST

**STANDARD
 DETAIL
 DRAWING**

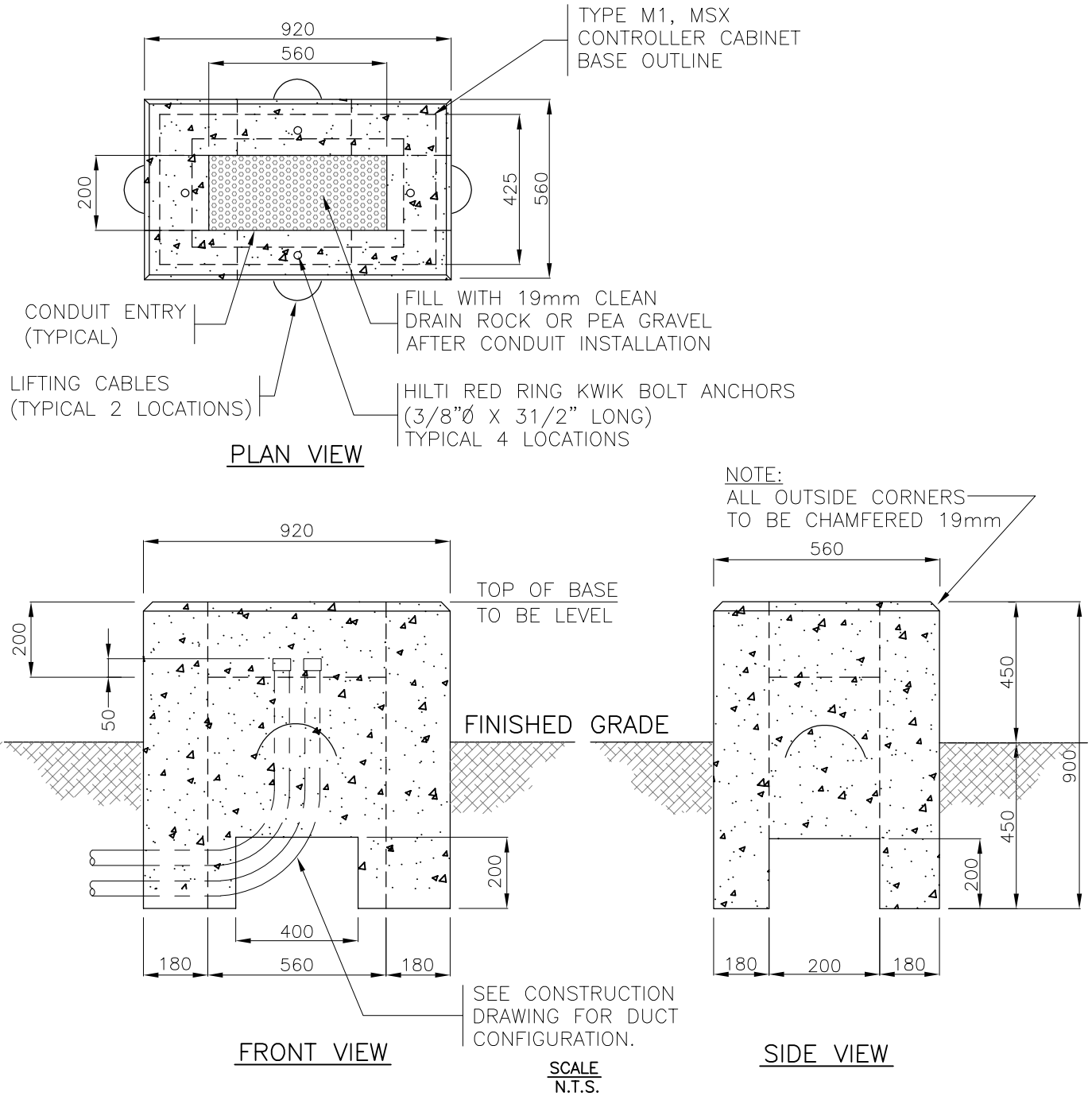
DATE:
 JUN 24/24
 SCALE:
 NTS

**PERMANENT BOLLARD
 (BARRIER POST)**

DWG. NO.

SS-C12b





NOTES

1. REFER TO CONTRACT DRAWINGS AND SECTION 34 41 13 FOR DETAILED SPECIFICATIONS.
2. ALL DIMENSIONS IN MILLIMETERS UNLESS OTHERWISE NOTED.
3. BASES TO BE PRE-CAST OR CAST-IN-PLACE.
4. BASE TO BE LOCATED A MINIMUM 1.5m AWAY FROM ANY OTHER ELECTRICAL EQUIPMENT OR STRUCTURE.

**STANDARD
DETAIL
DRAWING**

DATE:
7/20/20

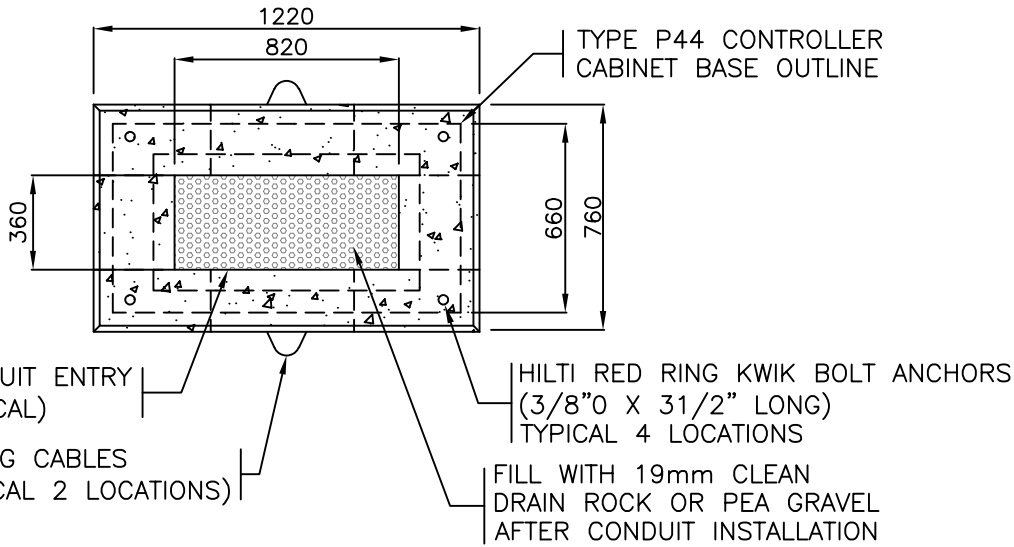
SCALE:
NTS

**TYPE M (NEMA CABINET)
CONCRETE CONTROLLER BASE**

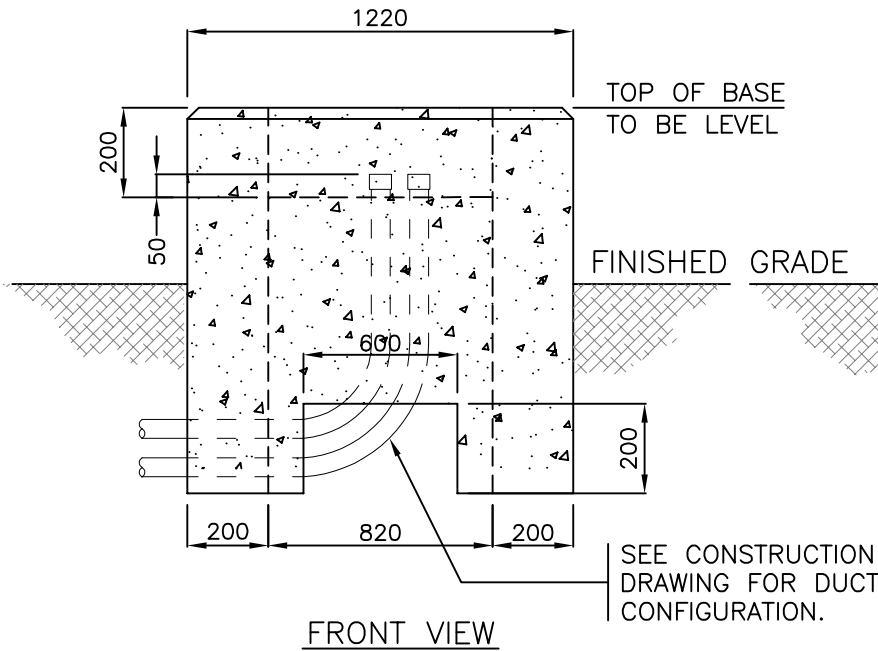
DWG. NO.

SS-E1.1

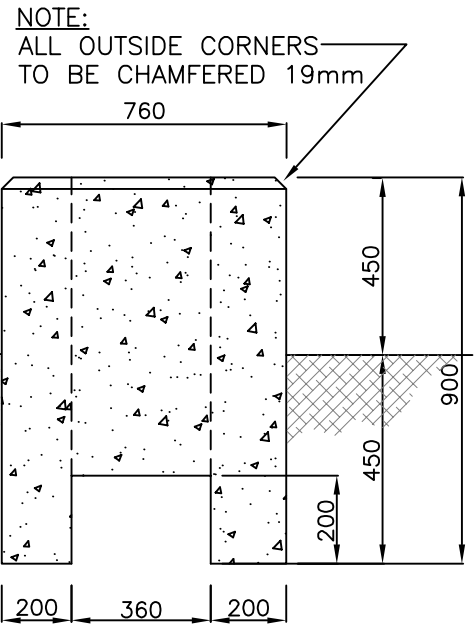




PLAN VIEW



FRONT VIEW



SIDE VIEW

NOTES

1. REFER TO CONTRACT DRAWINGS AND SECTION 34 41 13 FOR DETAILED SPECIFICATIONS.
2. ALL DIMENSIONS IN MILLIMETERS UNLESS OTHERWISE NOTED.
3. BASES TO BE PRE-CAST OR CAST-IN-PLACE.
4. BASE TO BE LOCATED A MINIMUM 1.5m AWAY FROM ANY OTHER ELECTRICAL EQUIPMENT OR STRUCTURE.

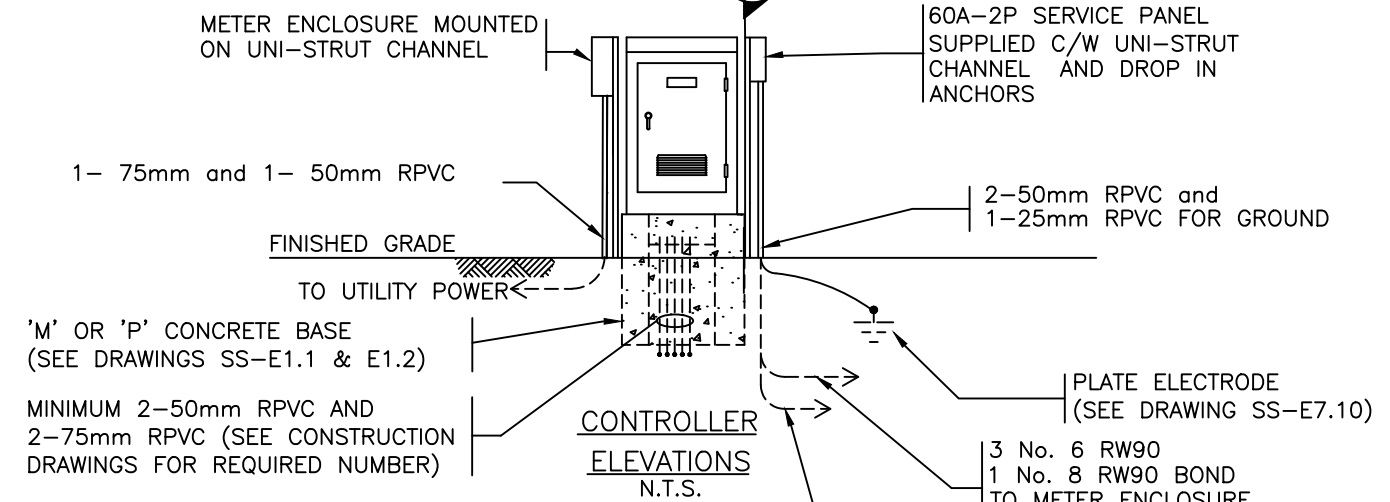
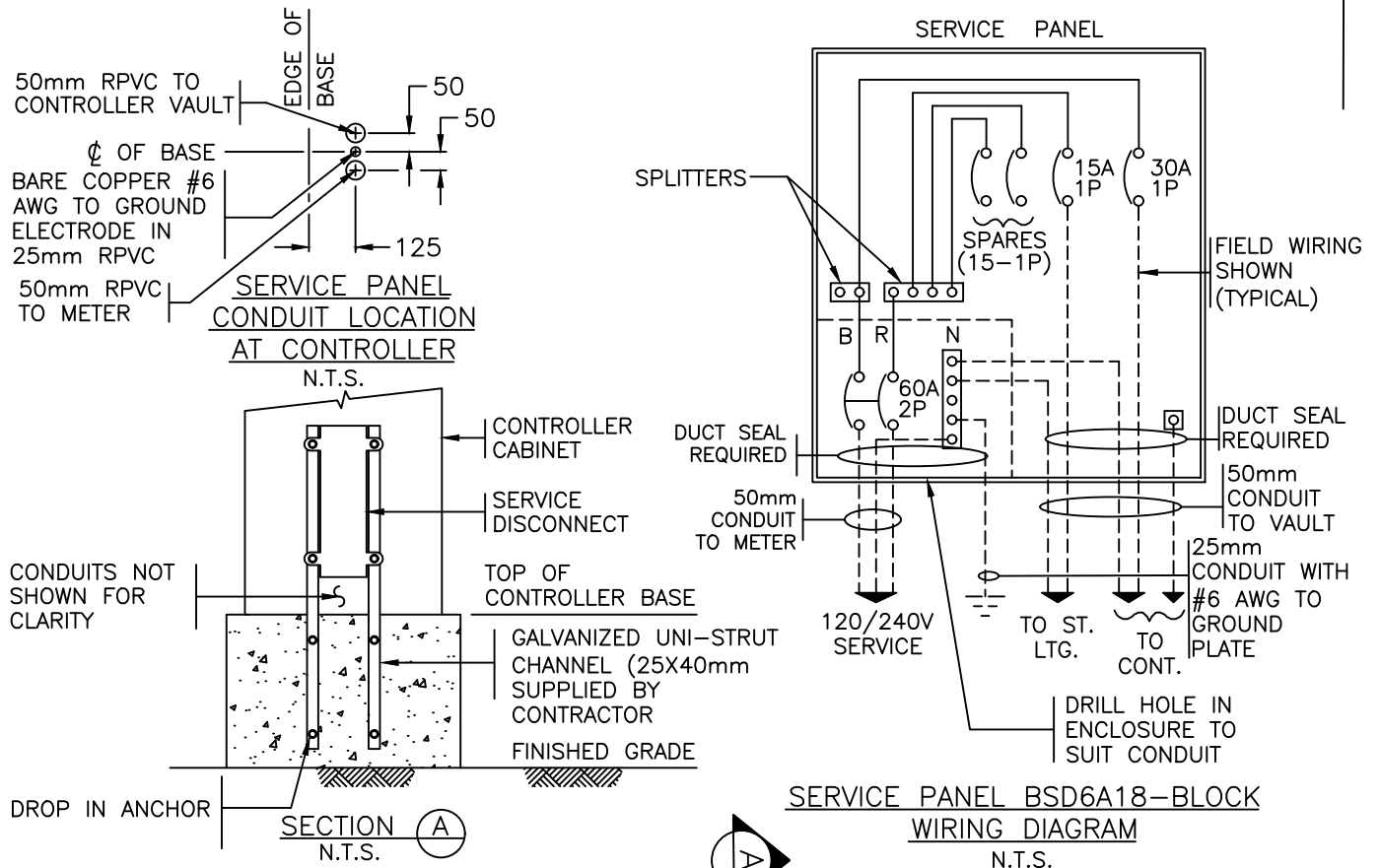
**STANDARD
DETAIL
DRAWING**

DATE:
07/20/20
SCALE:
NTS

**TYPE P (NEMA CABINET)
CONCRETE CONTROLLER BASE**

DWG. NO.
SS-E1.2





NOTES

1. REFER TO CONTRACT DRAWINGS AND SECTION 34 41 13 FOR DETAILED SPECIFICATIONS.
2. ALL DIMENSIONS IN MILLIMETERS UNLESS OTHERWISE NOTED.
3. DISCONNECT AND METER CABINETS TO BE LOCATED MINIMUM 1.0m AWAY FROM ANY OTHER ELECTRICAL EQUIPMENT OR STRUCTURE.
4. INSTALL SERVICE PANEL AND METER ENCLOSURE AS PER CANADIAN ELECTRIC CODE

**STANDARD
DETAIL
DRAWING**

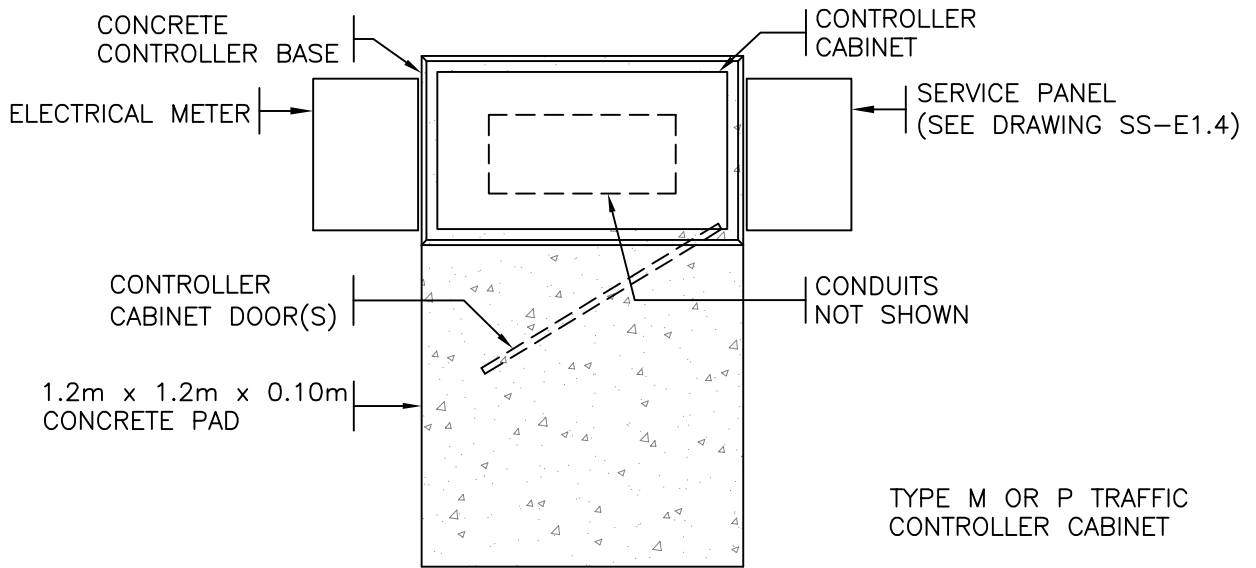
DATE:
04/19/21
SCALE:
NTS

**CONTROLLER SERVICE PANEL
INSTALLATION**

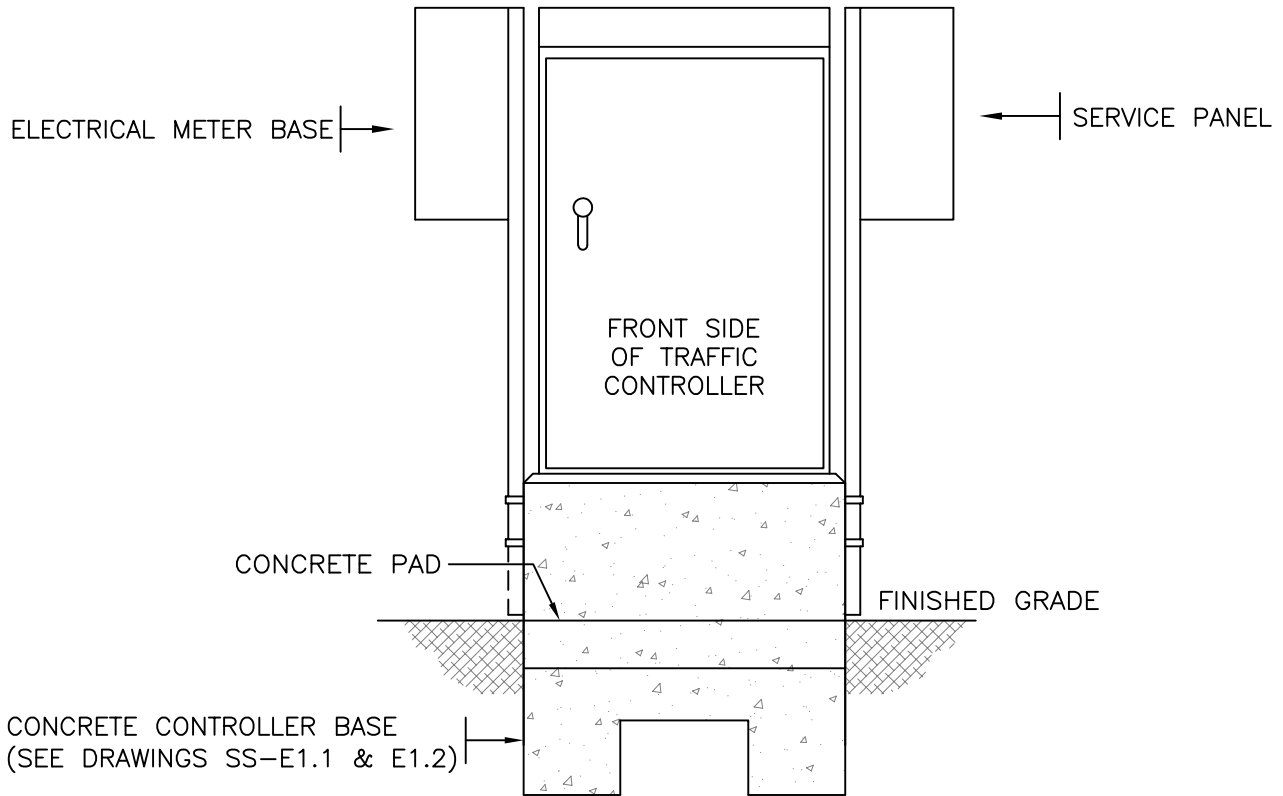
DWG. NO.

SS-E1.4





PLAN VIEW
N.T.S.



FRONT VIEW
N.T.S.

NOTES

1. REFER TO CONTRACT DRAWINGS AND SECTION 34 41 13 FOR DETAILED SPECIFICATIONS.
2. ALL DIMENSIONS IN MILLIMETERS UNLESS OTHERWISE NOTED.

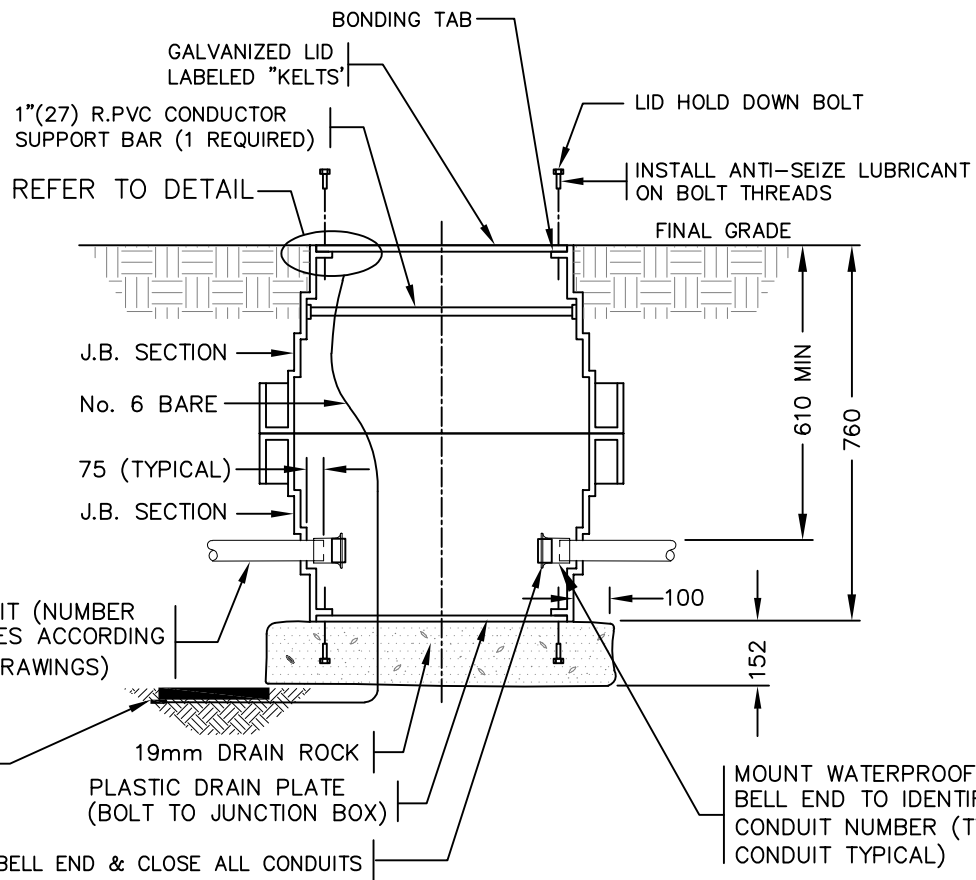
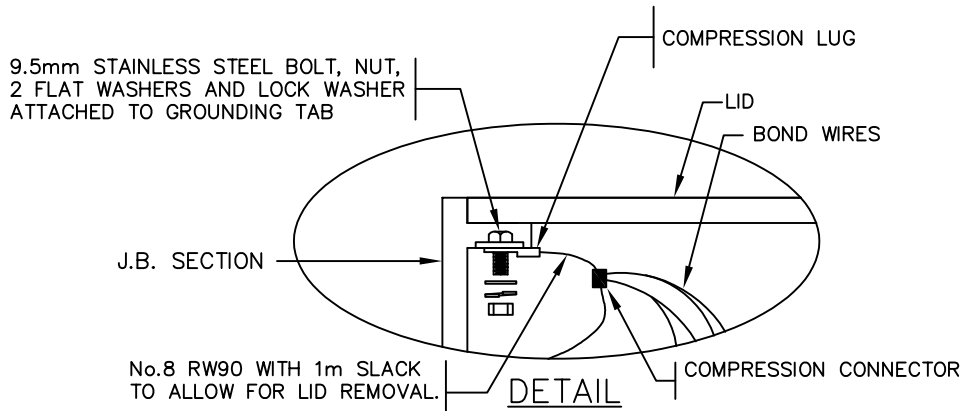
**STANDARD
DETAIL
DRAWING**

DATE:
07/20/20
SCALE:
NTS

**TYPICAL INSTALLATION FOR
TRAFFIC CONTROLLER**
ORIENTATION, SERVICE PANEL AND CONCRETE PAD

DWG. NO.
SS-E1.8





LARGE ROUND PLASTIC JUNCTION BOX

NOTES

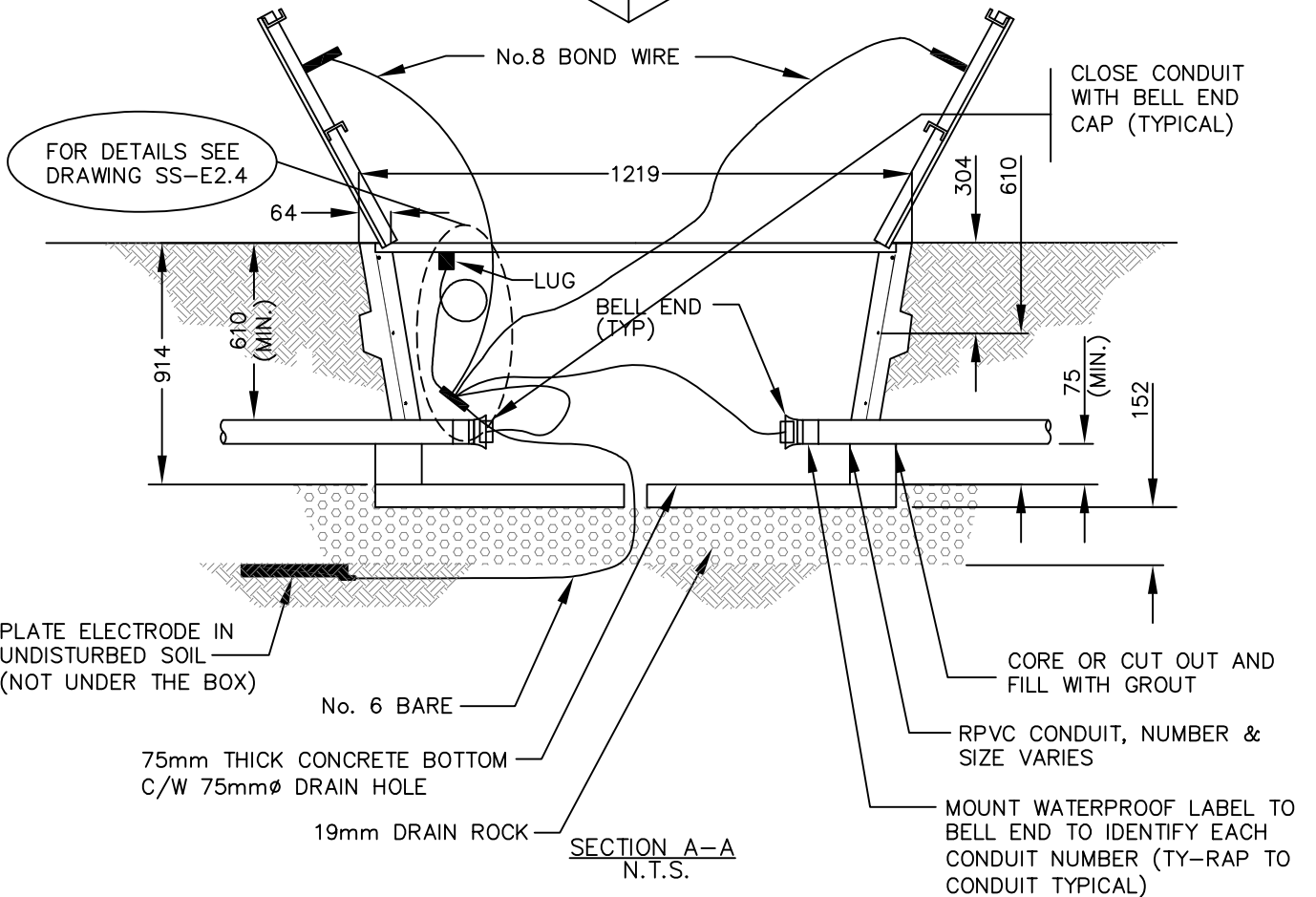
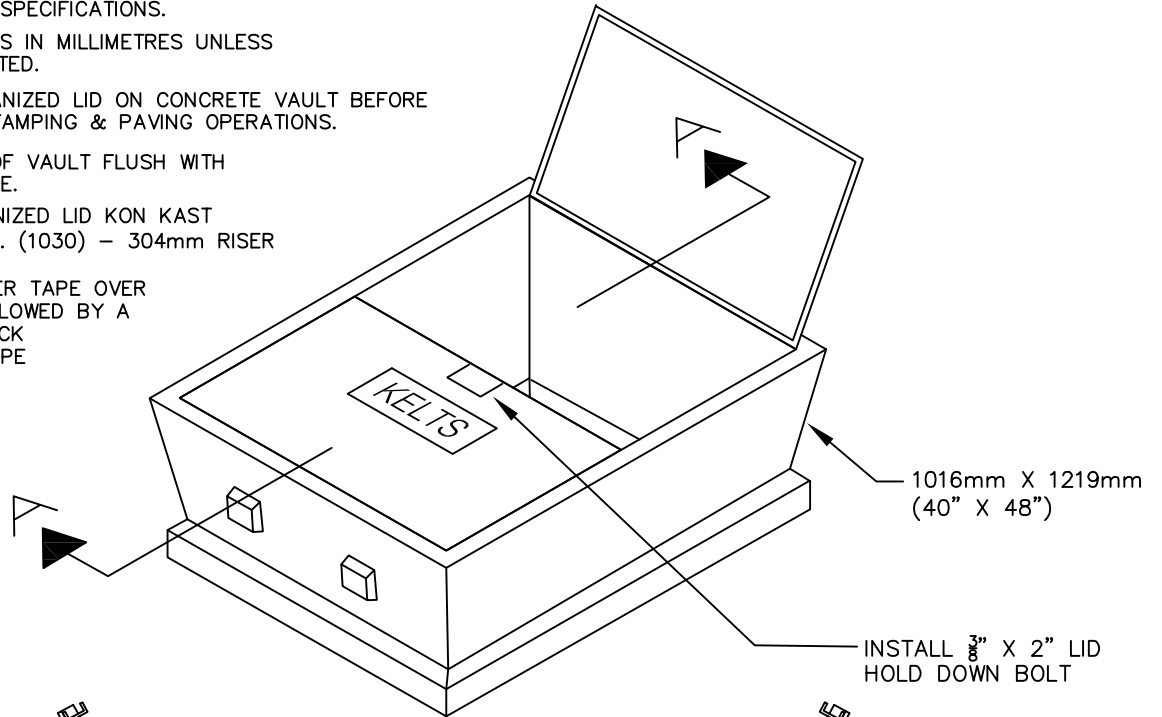
1. REFER TO CONTRACT DRAWINGS AND SECTION 34 41 13 FOR DETAILED SPECIFICATION
2. ALL DIMENSIONS IN MILLIMETRES UNLESS OTHERWISE NOTED
3. INSTALL LID ON PLASTIC JUNCTION BOX BEFORE BACKFILLIE, TAMPING & PAVING OPERATIONS
4. INSTALL TOP OF PLASTIC JUNCTION BOX FLUSH WITH FINISH GRADE
5. INSTAL ELECTRODE PLATE ON UNDISTURBED GROUND

NUMBER OF CONDUITS ENTERING JUNCTION BOX NOT TO EXCEED 10 (UNLESS OTHERWISE NOTED)

STANDARD DETAIL DRAWING	DATE: 07/20/20	LARGE ROUND PLASTIC JUNCTION BOX DETAILS	DWG. NO.	 City of Kelowna
	SCALE: NTS		SS-E2.1	

NOTES

1. REFER TO CONTRACT DRAWINGS AND SECTIONS 34 41 13 FOR DETAILED SPECIFICATIONS.
2. ALL DIMENSIONS IN MILLIMETRES UNLESS OTHERWISE NOTED.
3. INSTALL GALVANIZED LID ON CONCRETE VAULT BEFORE BACKFILLING, TAMPING & PAVING OPERATIONS.
4. INSTALL TOP OF VAULT FLUSH WITH FINISHED GRADE.
5. BOX & GALVANIZED LID KON KAST PRODUCTS LTD. (1030) – 304mm RISER
6. INSTALL RUBBER TAPE OVER MARRETTE FOLLOWED BY A LAYER OF BLACK ELECTRICAL TAPE



**STANDARD
DETAIL
DRAWING**

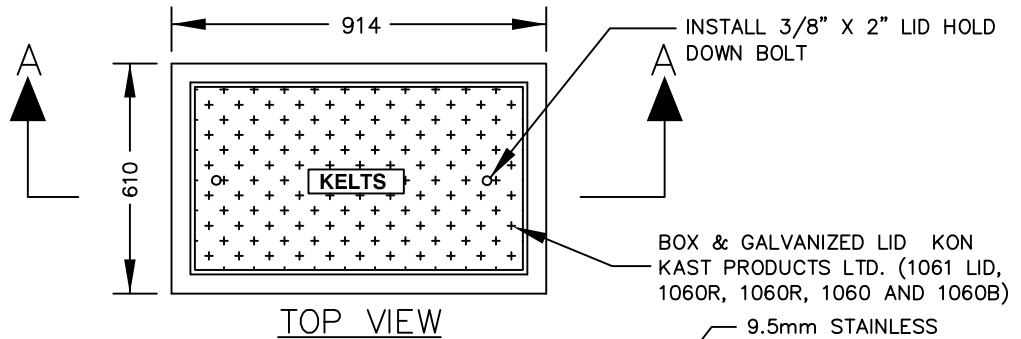
DATE:
07/20/20
SCALE:
NTS

**TRAFFIC SIGNAL MAIN VAULT
DETAILS**

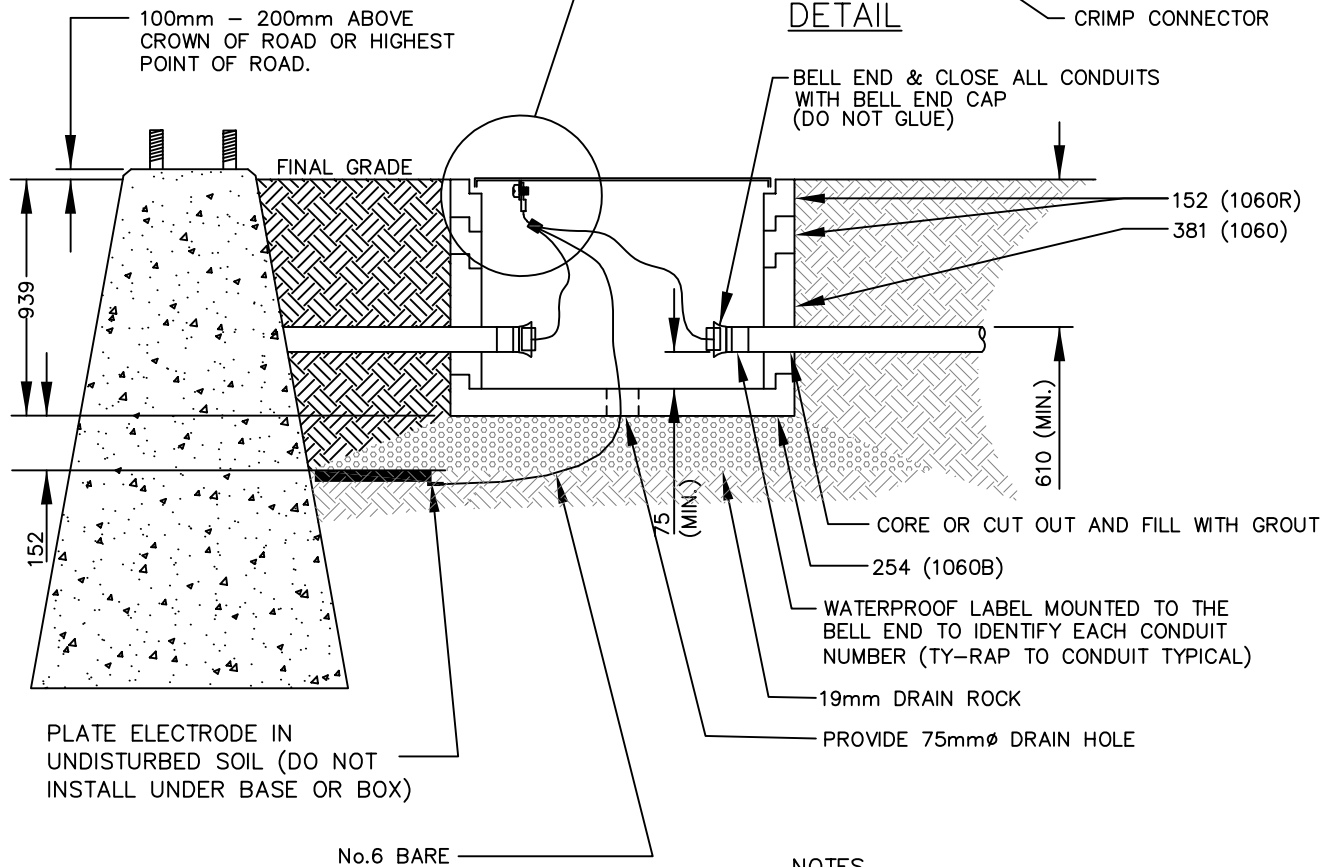
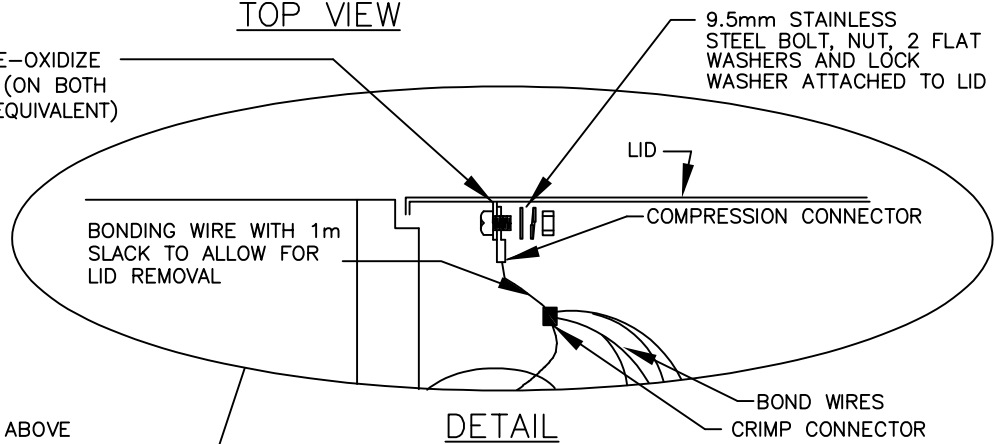
DWG. NO.

SS-E2.3





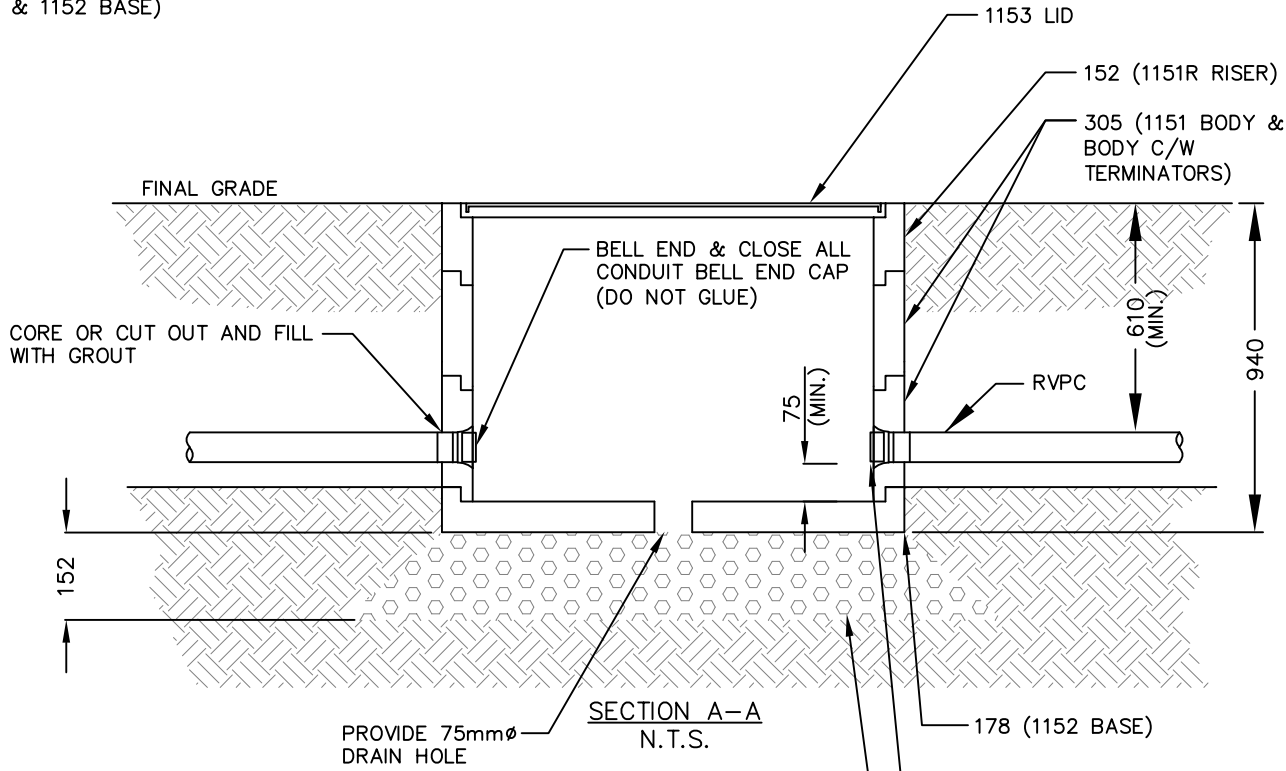
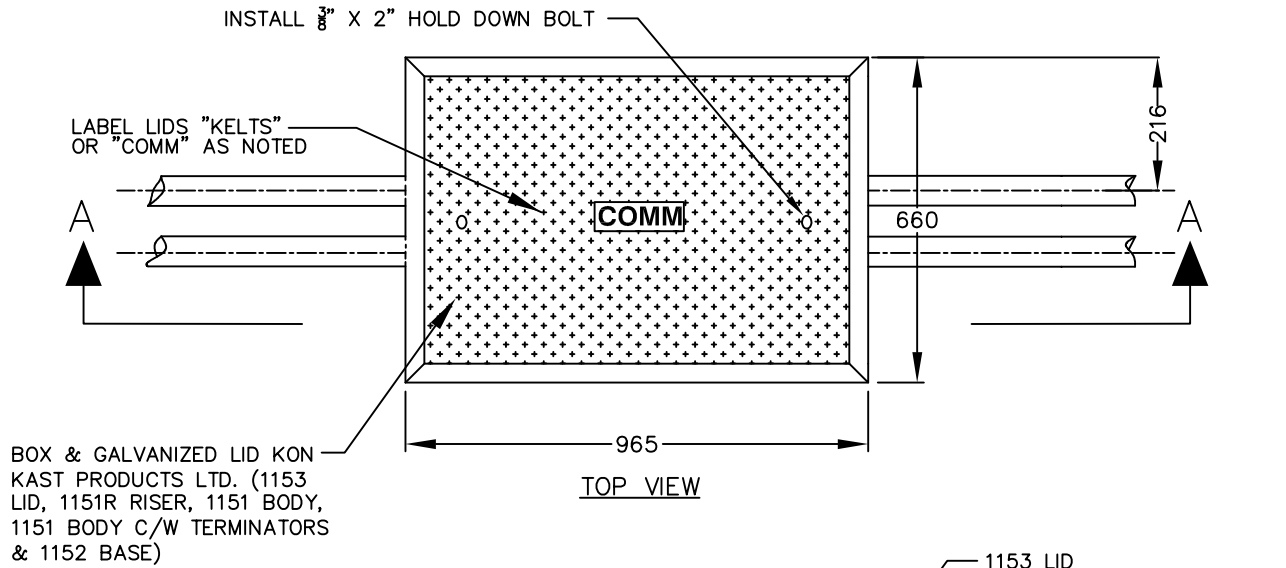
REMOVE PAINT AND APPLY DE-OXIDIZE COMPOUND TO GROUND TAB (ON BOTH SIDES) (USE PENETROX OR EQUIVALENT)



SECTION A-A
N.T.S

- NOTES**
1. REFER TO CONTRACT DRAWINGS AND SECTIONS 34 41 13 FOR DETAILED SPECIFICATIONS.
 2. ALL DIMENSIONS IN MILLIMETRES UNLESS OTHERWISE NOTED.
 3. INSTALL RUBBER TAPE OVER MARRETTE FOLLOWED BY A LAYER OF BLACK ELECTRICAL TAPE

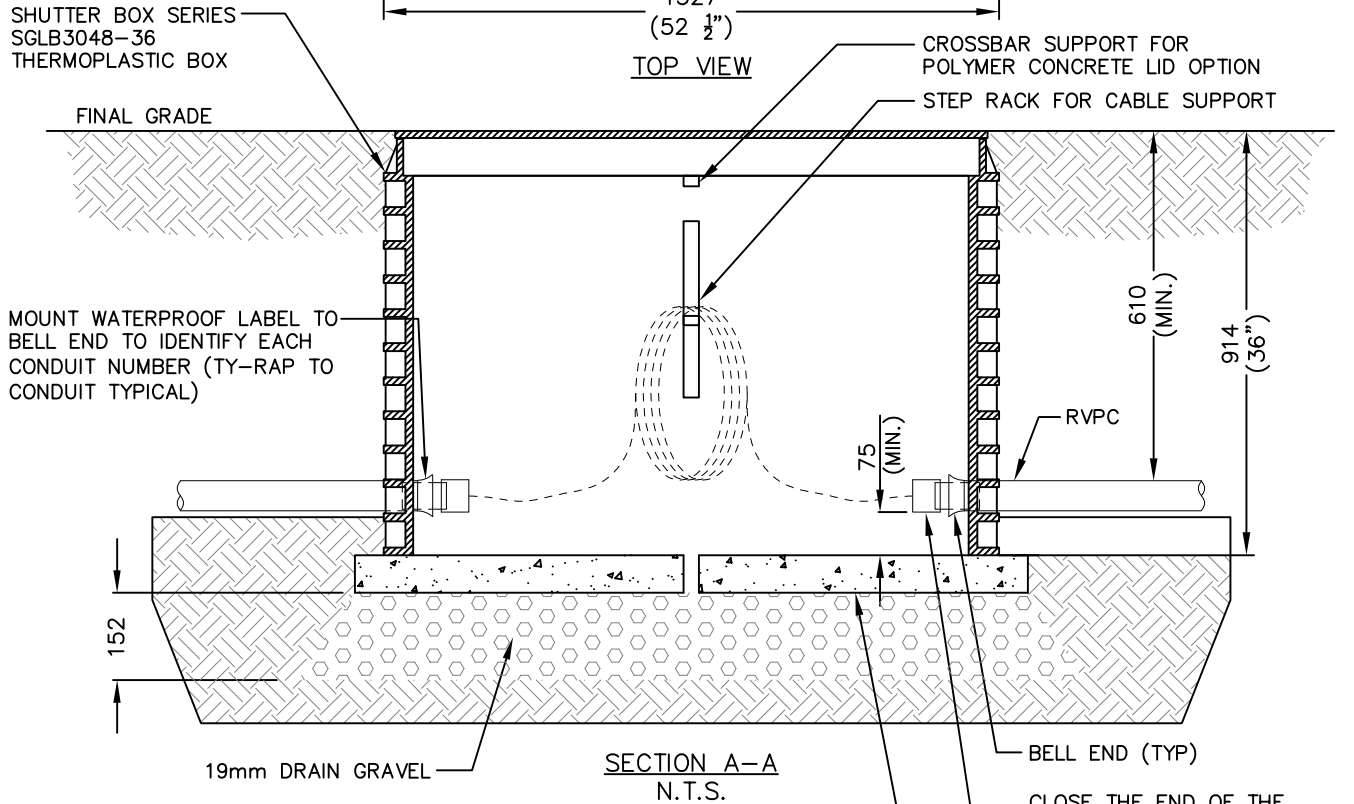
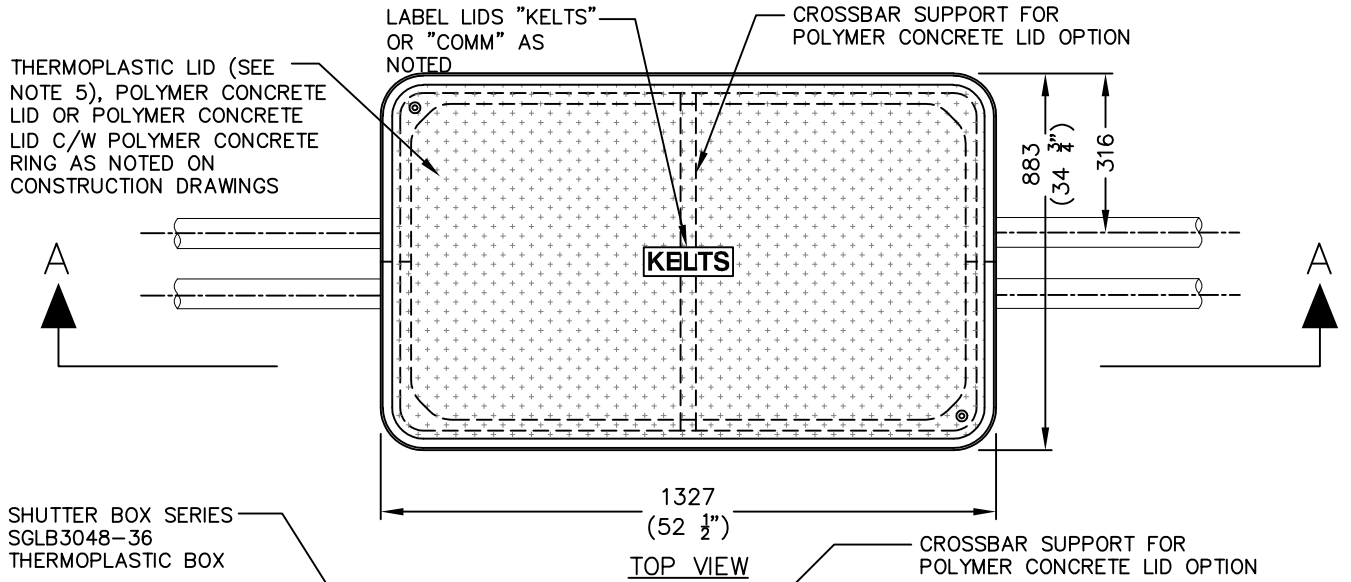
STANDARD DETAIL DRAWING	DATE: 07/20/20	TRAFFIC SIGNAL JUNCTION BOX DETAILS	DWG. NO.	 City of Kelowna
	SCALE: NTS		SS-E2.4	



NOTES

1. REFER TO CONTRACT DRAWINGS AND SECTION 34 41 13 FOR DETAILED SPECIFICATIONS.
2. ALL DIMENSIONS IN MILLIMETERS UNLESS OTHERWISE NOTED
3. INSTALL LID ON CONCRETE PULL BOX BEFORE BACKFILLING, TAMPING & PAVING OPERATIONS.
4. INSTALL TOP OF PULL BOX FLUSH WITH FINISHED GRADE
5. INSTALL RUBBER TAPE OVER MARRETTE FOLLOWED BY BLACK ELECTRICAL TAPE

STANDARD DETAIL DRAWING	DATE: 7/20/20	CONCRETE TRAFFIC COMMUNICATION PULL BOX DETAILS	DWG. NO.	 City of Kelowna
	SCALE: NTS		SS-E2.5	



NOTES

1. REFER TO CONTRACT DRAWINGS AND SECTION 34 41 13 FOR DETAILED SPECIFICATIONS.
2. ALL DIMENSIONS IN MILLIMETRES UNLESS OTHERWISE NOTED.
3. INSTALL LID ON PULL BOX BEFORE BACKFILLING, TAMPING & PAVING OPERATIONS.
4. INSTALL TOP OF PULL BOX FLUSH WITH FINISHED GRADE.
5. THERMOPLASTIC LID TO BE USED IN SOFT LANDSCAPED AREAS ONLY.

**STANDARD
DETAIL
DRAWING**

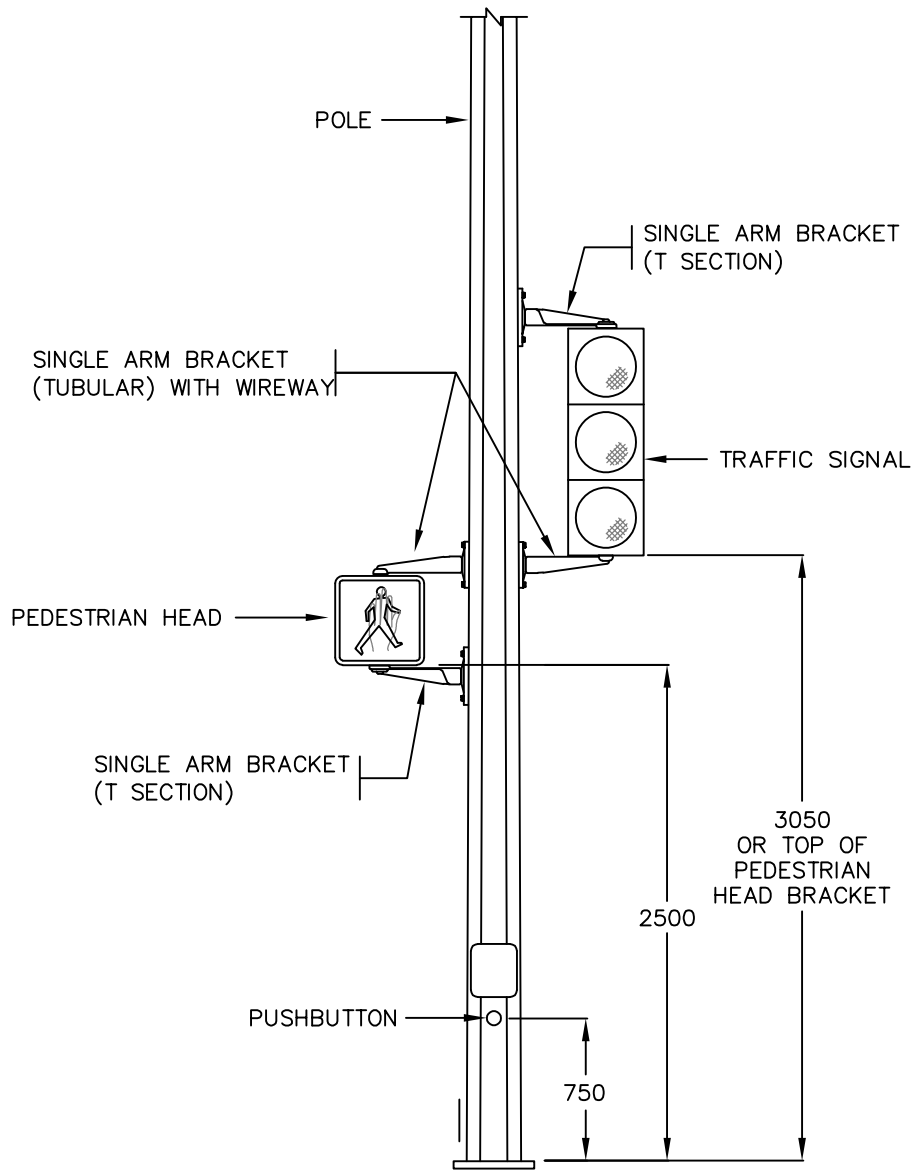
DATE:
07/20/20
SCALE:
NTS

**PLASTIC COMMUNICATION PULL
BOX DETAILS**

DWG. NO.

SS-E2.6



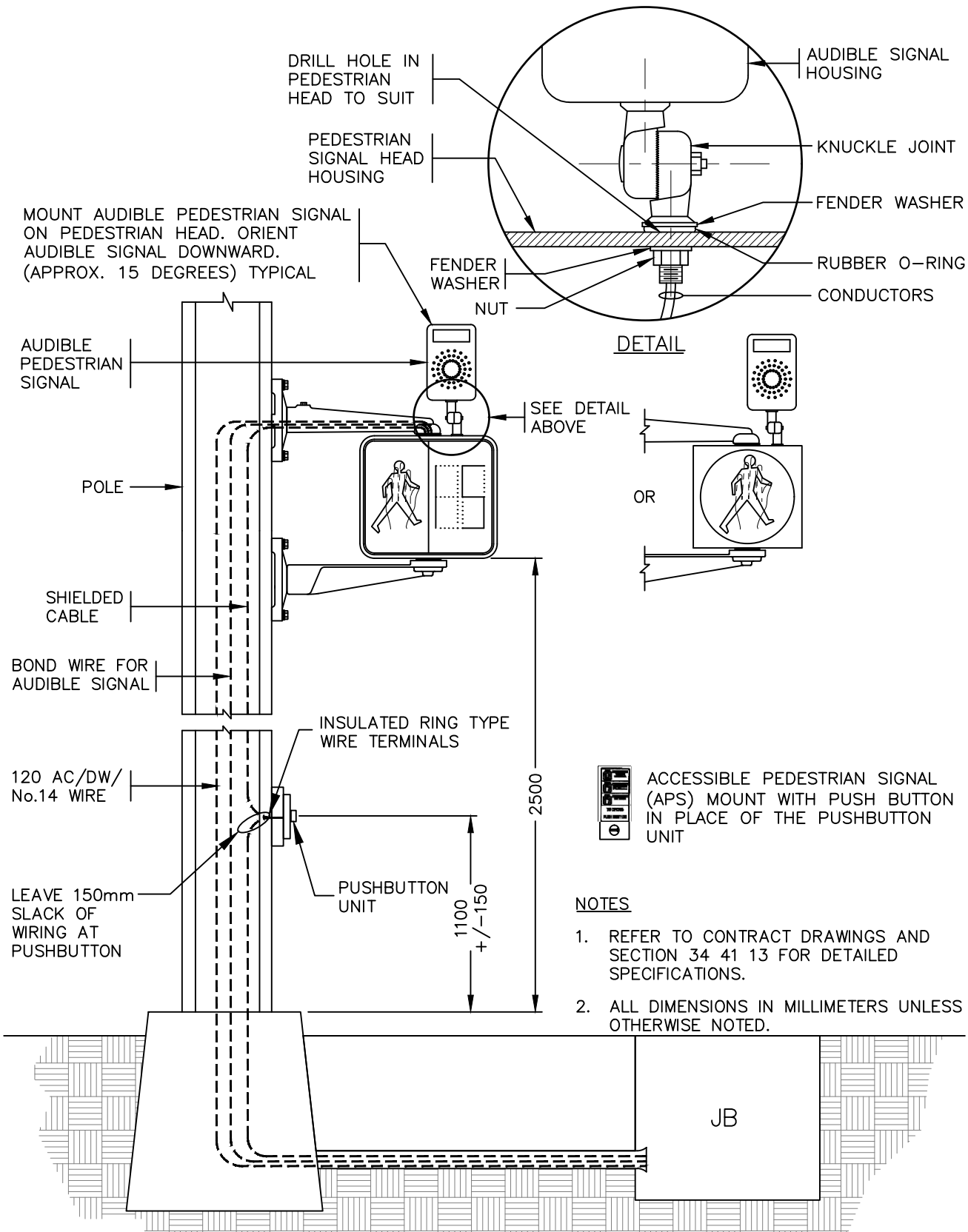


ELEVATION
N.T.S.

NOTES

1. REFER TO CONTRACT DRAWINGS AND SECTION 34 41 13 FOR DETAILED SPECIFICATIONS.
2. ALL DIMENSIONS IN MILLIMETERS UNLESS OTHERWISE NOTED.

STANDARD DETAIL DRAWING	DATE: 07/20/20	SIGNAL/PEDESTRIAN HEAD MOUNTING ON TRAFFIC SIGNAL POLES	DWG. NO.	 City of Kelowna
	SCALE: NTS		SS-E5.3	



NOTES

1. REFER TO CONTRACT DRAWINGS AND SECTION 34 41 13 FOR DETAILED SPECIFICATIONS.
2. ALL DIMENSIONS IN MILLIMETERS UNLESS OTHERWISE NOTED.

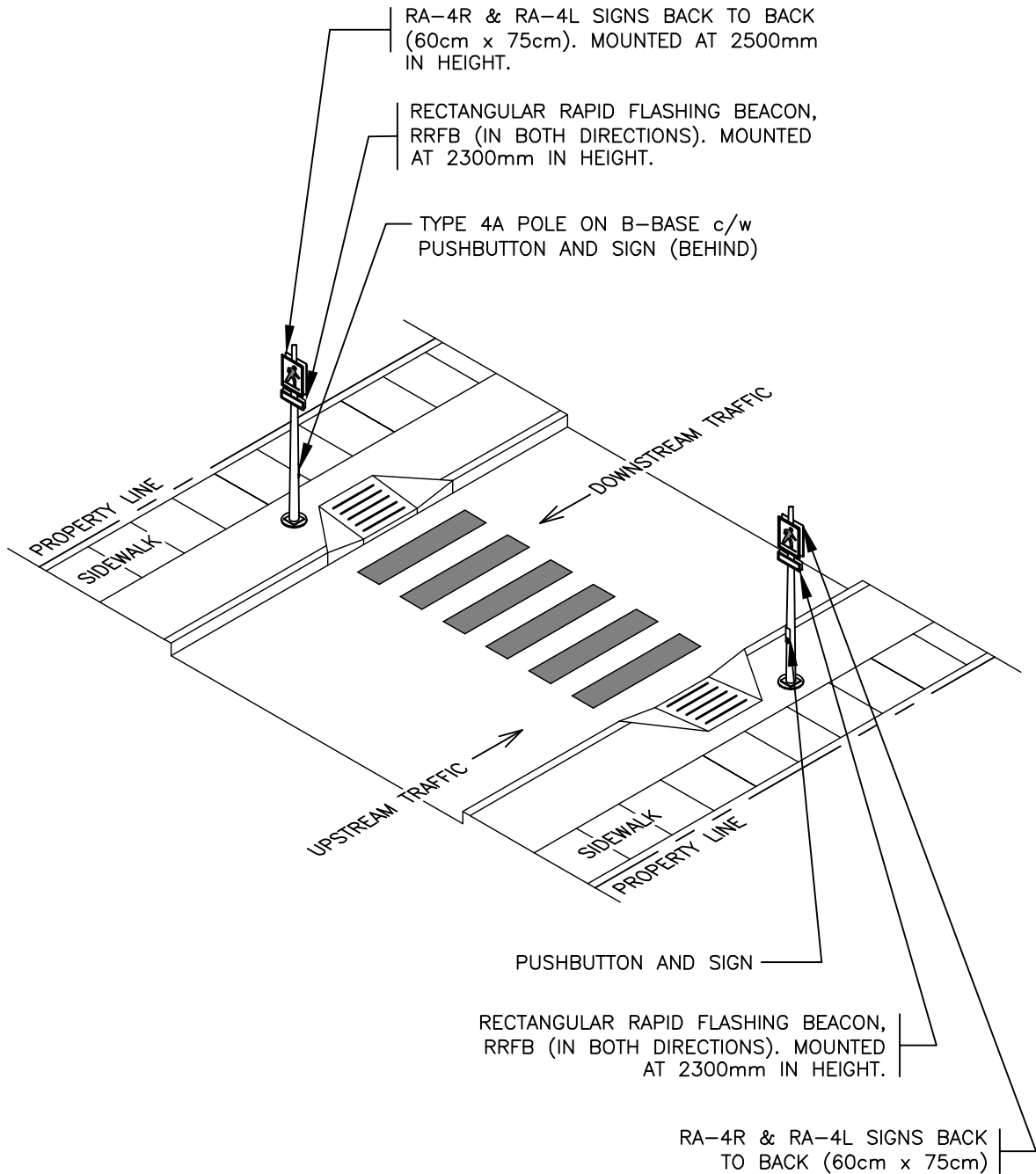
**STANDARD
DETAIL
DRAWING**

DATE:
07/20/20
SCALE:
NTS

**PEDESTRIAN AND AUDIBLE
SIGNAL INSTALLATION DETAILS**

DWG. NO.
SS-E5.12





NOTES

1. REFER TO CONTRACT DRAWINGS AND SECTION 34 41 13 FOR DETAILED SPECIFICATIONS.
2. ALL DIMENSIONS IN MILLIMETERS UNLESS OTHERWISE NOTED.
3. PUSH BUTTONS MOUNTED AT 750mm.
4. RRFB MOUNTED AT 2300mm.

**STANDARD
DETAIL
DRAWING**

DATE:
03/27/23

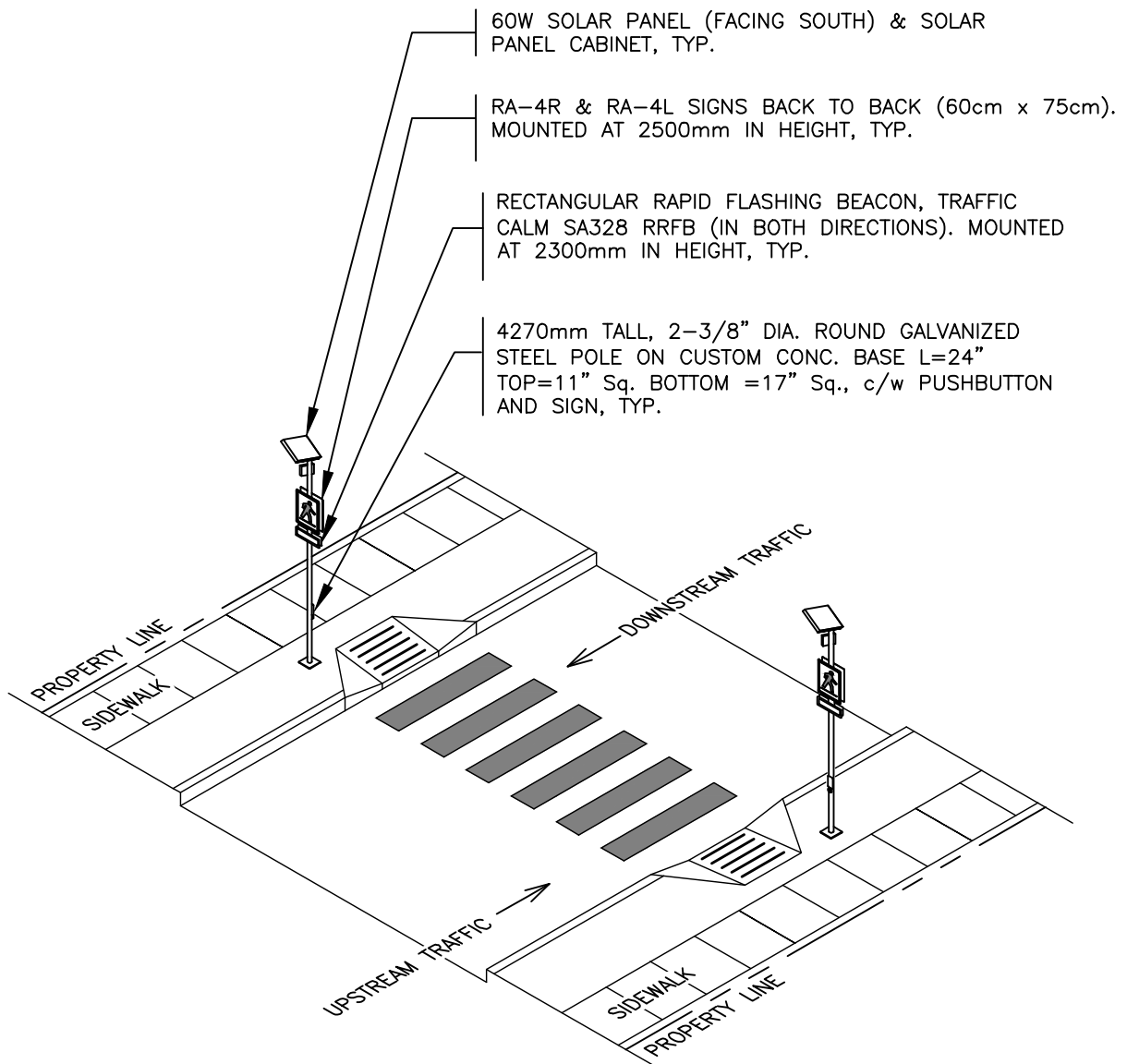
SCALE:
NTS

**ROADSIDE PEDESTRIAN
ACTIVATED FLASHERS
(NO MEDIAN OPTION)**

DWG. NO.

SS-E5.16





NOTES

1. REFER TO CONTRACT DRAWINGS AND SECTION 34 41 13 FOR DETAILED SPECIFICATIONS.
2. ALL DIMENSIONS IN MILLIMETERS UNLESS OTHERWISE NOTED.
3. PUSH BUTTONS MOUNTED AT 750mm.
4. RRFB MOUNTED AT 2300mm.

**STANDARD
DETAIL
DRAWING**

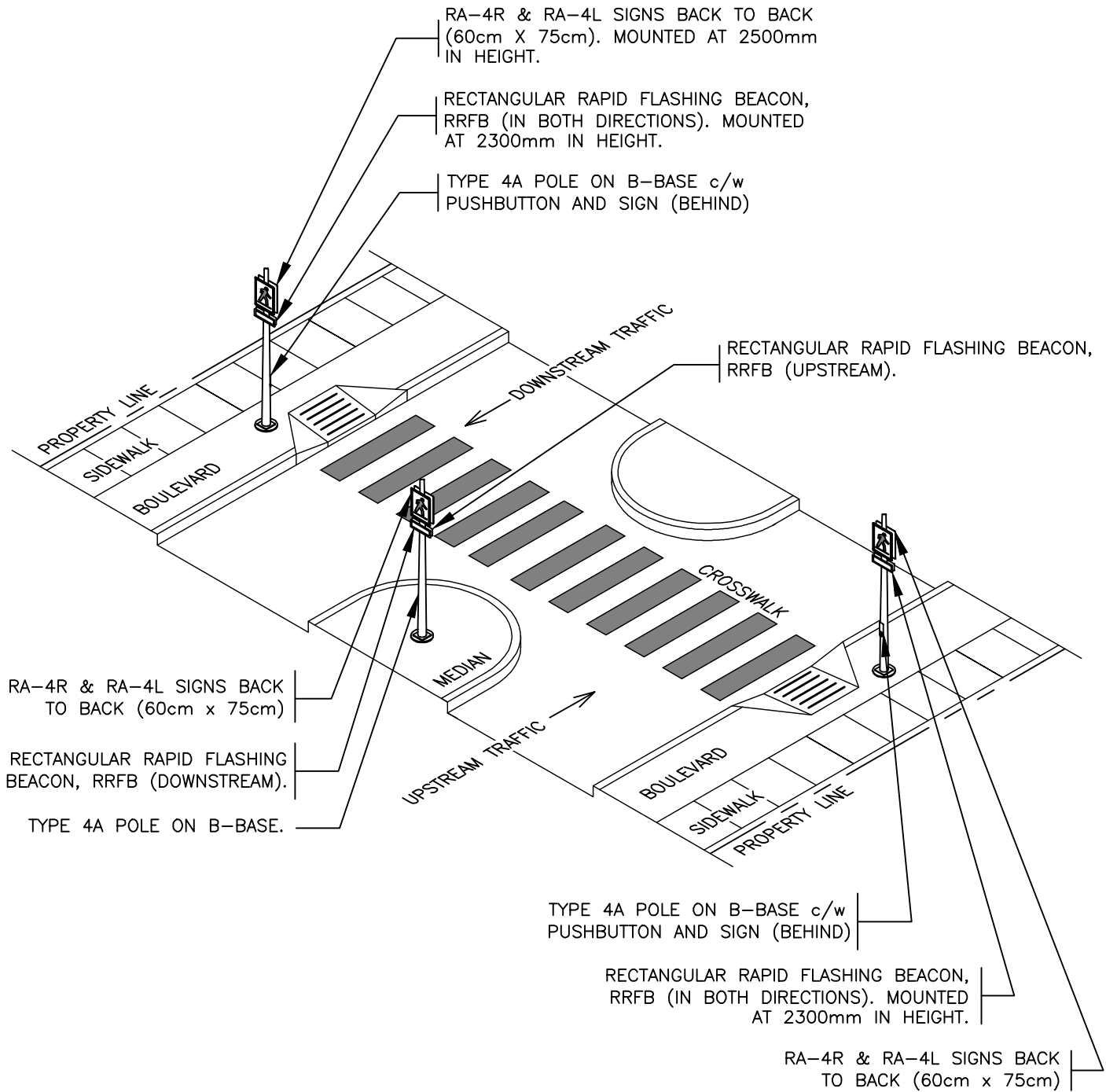
DATE:
03/27/23
SCALE:
NTS

**SOLAR ROADSIDE PEDESTRIAN
ACTIVATED FLASHERS
(NO MEDIAN OPTION)**

DWG. NO.

SS-E5.16a





NOTES

1. REFER TO CONTRACT DRAWINGS AND SECTION 34 41 13 FOR DETAILED SPECIFICATIONS.
2. ALL DIMENSIONS IN MILLIMETERS UNLESS OTHERWISE NOTED.
3. PUSH BUTTONS MOUNTED AT 750mm.
4. RRFB MOUNTED AT 2300mm.

**STANDARD
DETAIL
DRAWING**

DATE:
03/27/23

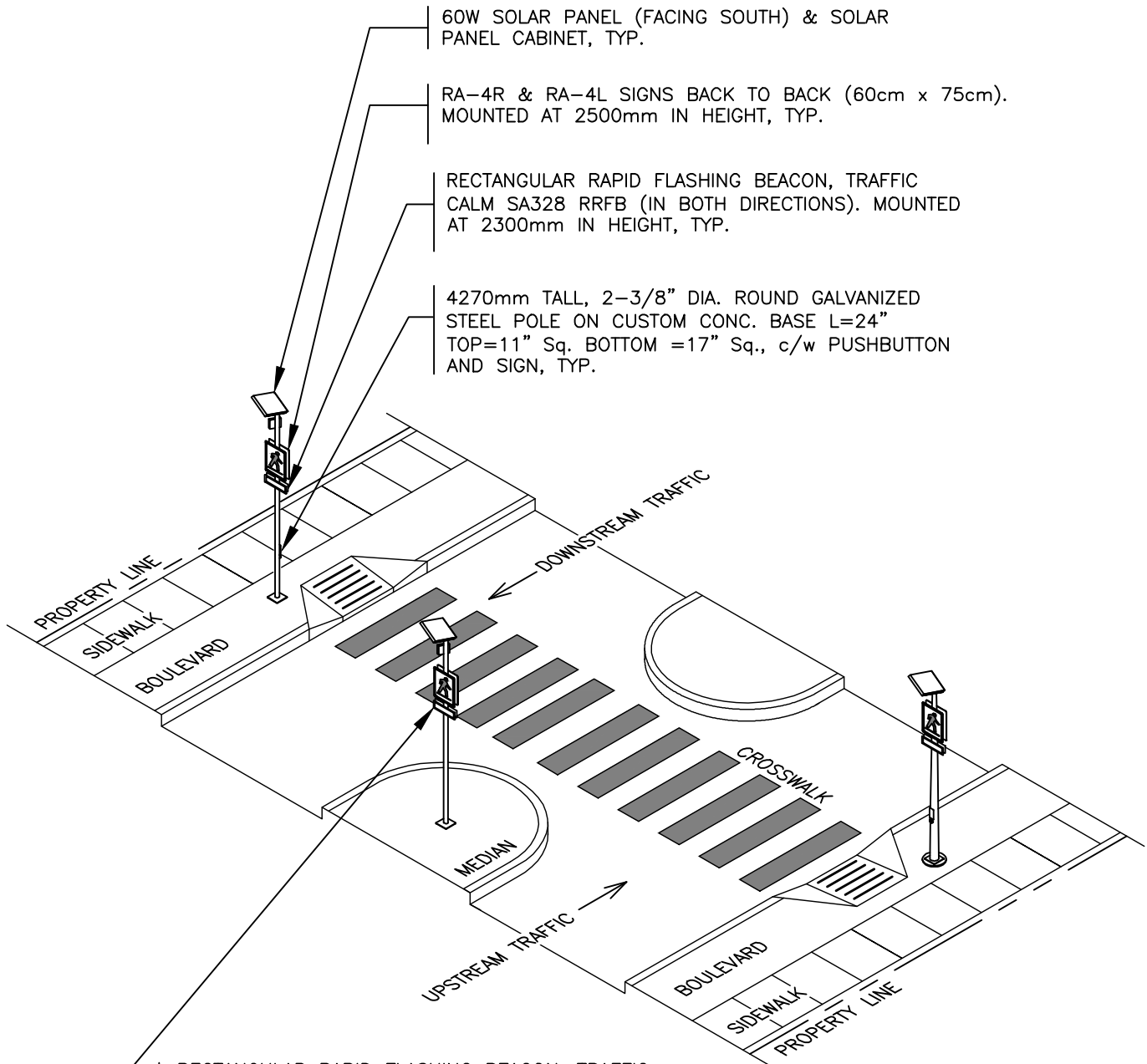
SCALE:
NTS

**ROADSIDE PEDESTRIAN
ACTIVATED FLASHERS
(MEDIAN OPTION)**

DWG. NO.

SS-E5.17





RECTANGULAR RAPID FLASHING BEACON, TRAFFIC CALM SA328 RRFB (IN BOTH DIRECTIONS). MOUNTED AT 2300mm IN HEIGHT, TYP. NO PUSH BUTTON ON CENTER POLE.

NOTES

1. REFER TO CONTRACT DRAWINGS AND SECTION 34 41 13 FOR DETAILED SPECIFICATIONS.
2. ALL DIMENSIONS IN MILLIMETERS UNLESS OTHERWISE NOTED.
3. PUSH BUTTONS MOUNTED AT 750mm.
4. RRFB MOUNTED AT 2300mm.

**STANDARD
DETAIL
DRAWING**

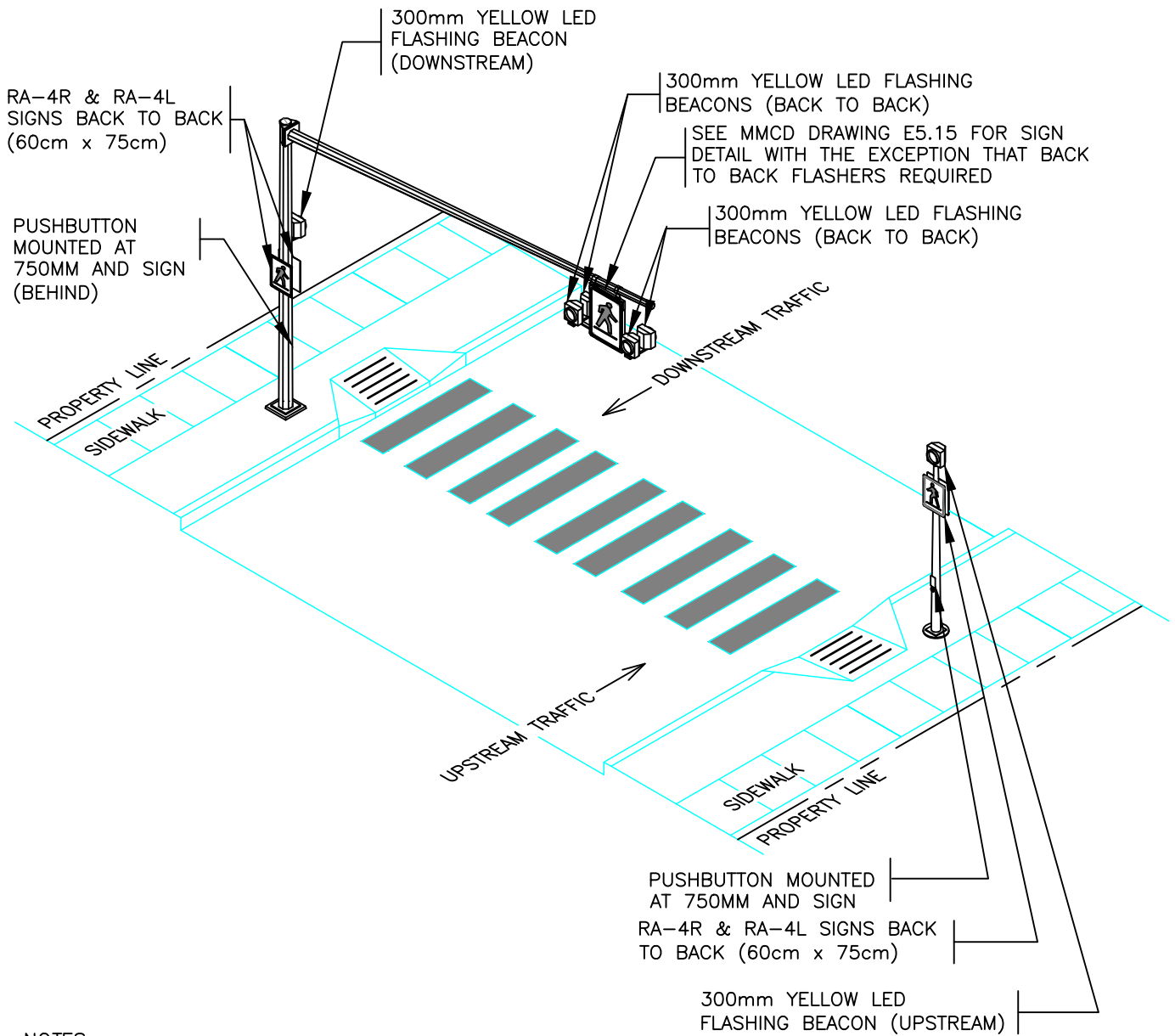
DATE:
03/27/23
SCALE:
NTS

**SOALR ROADSIDE PEDESTRIAN
ACTIVATED FLASHERS
(MEDIAN OPTION)**

DWG. NO.

SS-E5.17a





NOTES

1. REFER TO CONTRACT DRAWINGS AND SECTION 34 41 13 FOR DETAILED SPECIFICATIONS.
2. ALL DIMENSIONS IN MILLIMETERS UNLESS OTHERWISE NOTED.
3. FLASHER CONTROLLER TO BE INSTALLED AT 1200MM TO THE BOTTO OF THE CABINET ON THE POLE RECEIVING THE SERVICE

**STANDARD
DETAIL
DRAWING**

DATE:
07/20/20

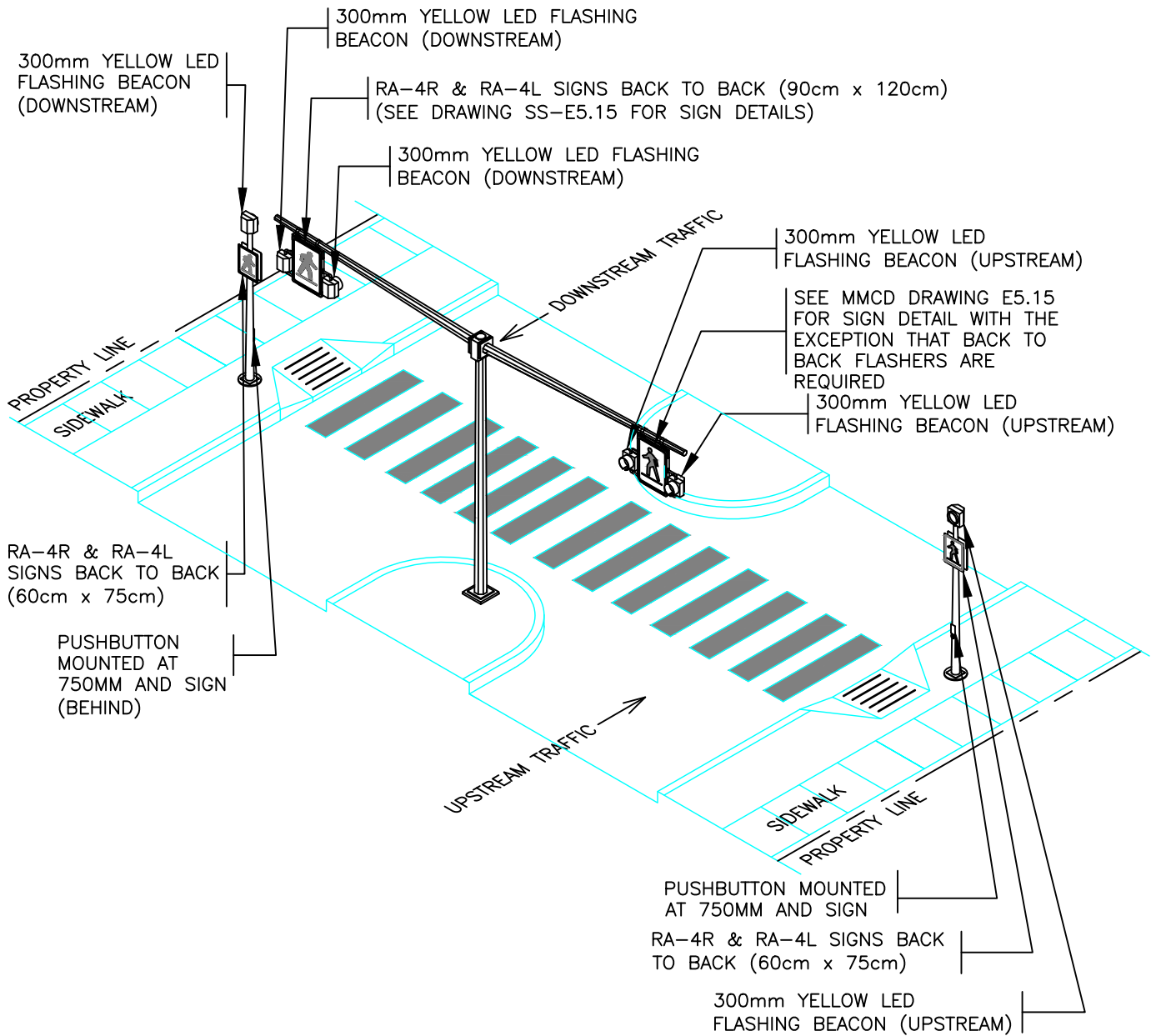
SCALE:
NTS

**ROADSIDE PEDESTRIAN
ACTIVATED FLASHERS
(OVERHEAD SIGN OPTION)**

DWG. NO.

SS-E5.18





NOTES

1. REFER TO CONTRACT DRAWINGS AND SECTION 34 41 13 FOR DETAILED SPECIFICATIONS.
2. ALL DIMENSIONS IN MILLIMETERS UNLESS OTHERWISE NOTED.
3. FLASHER CONTROLLER TO BE INSTALLED AT 1200MM TO THE BOTTOM OF THE CABINET ON THE POLE RECEIVING THE SERVICE

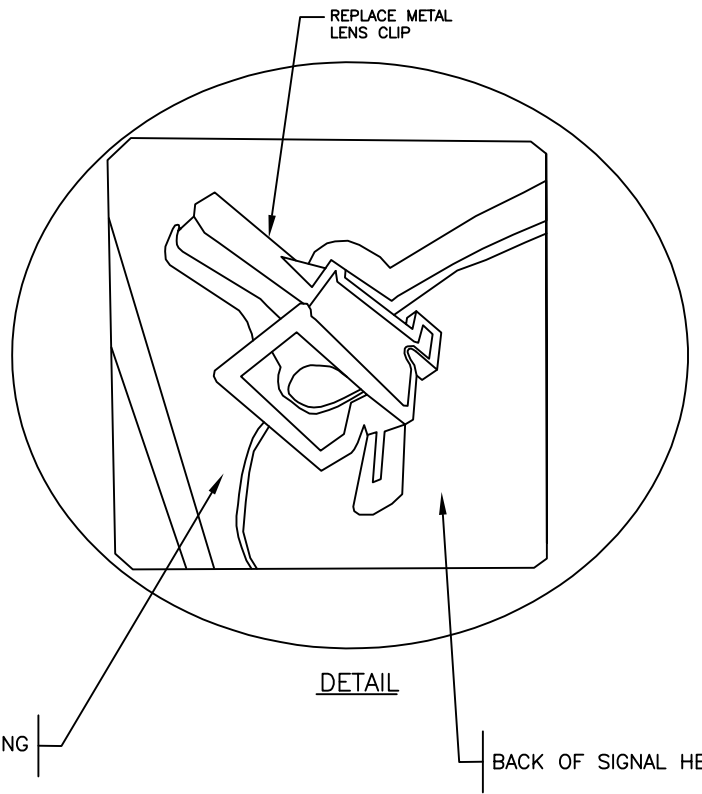
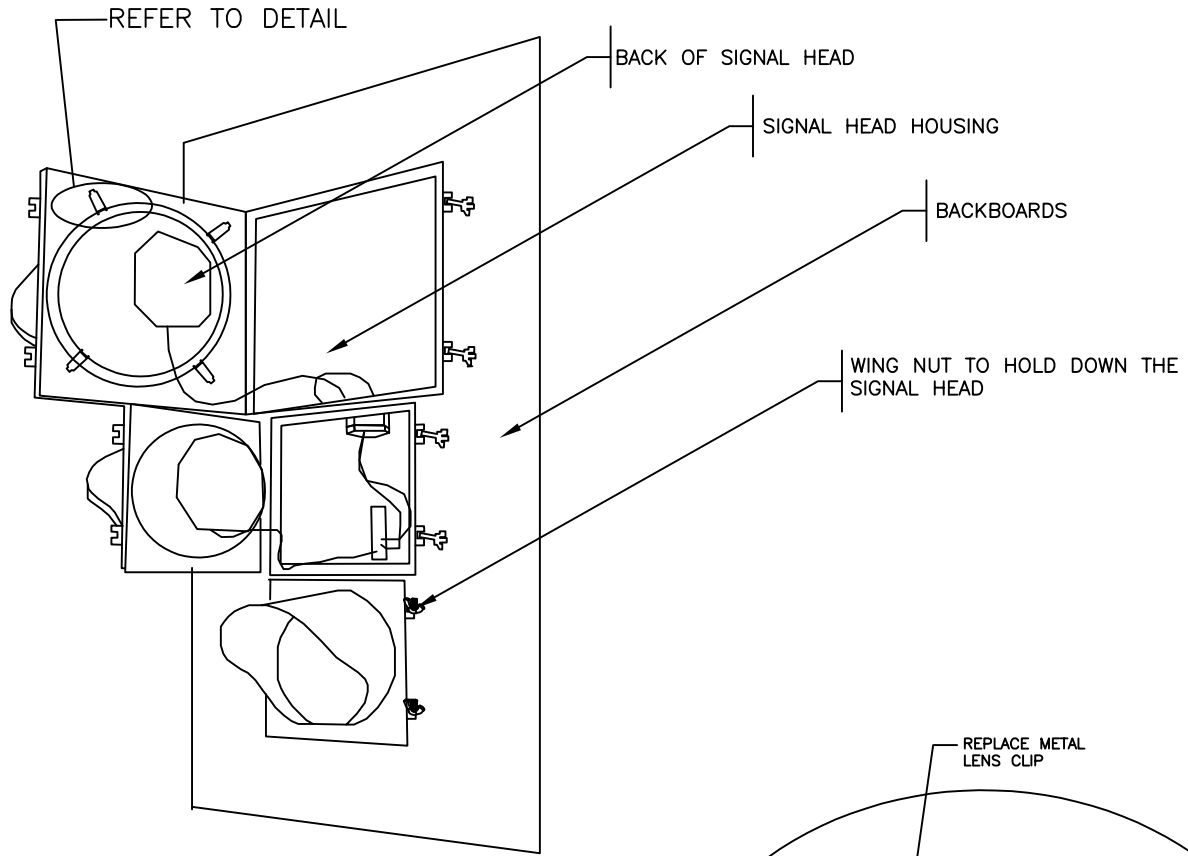
**STANDARD
DETAIL
DRAWING**

DATE:
07/20/20
SCALE:
NTS

**ROADSIDE PEDESTRIAN
ACTIVATED FLASHER
(OVERHEAD SIGN MEDIAN OPTION)**

DWG. NO.
SS-E5.19





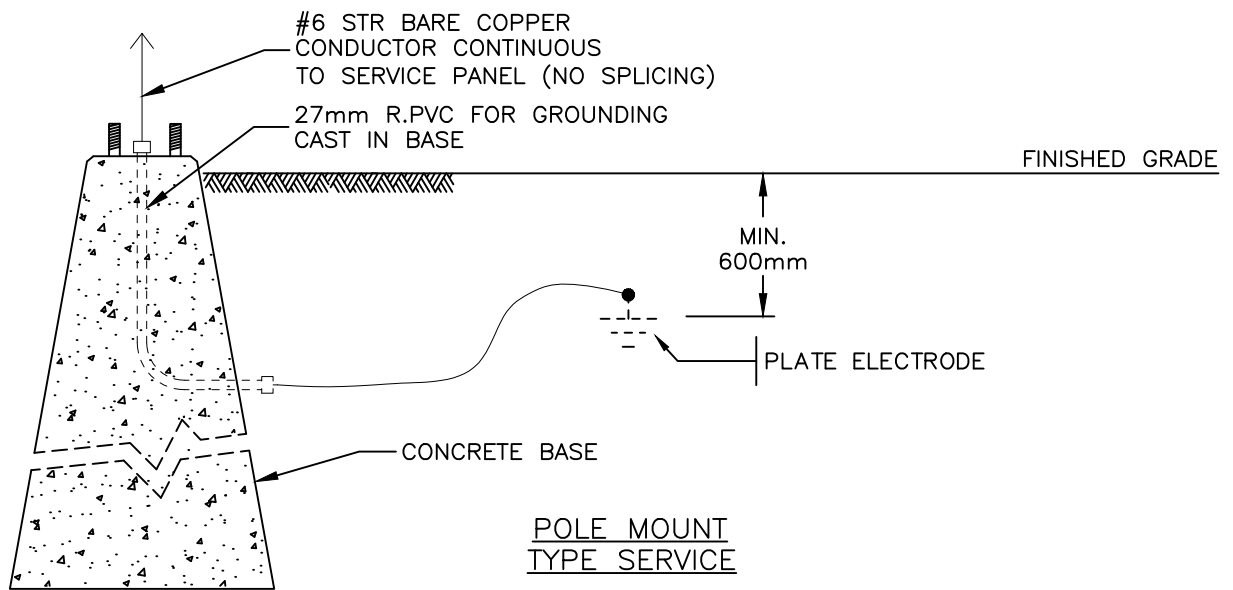
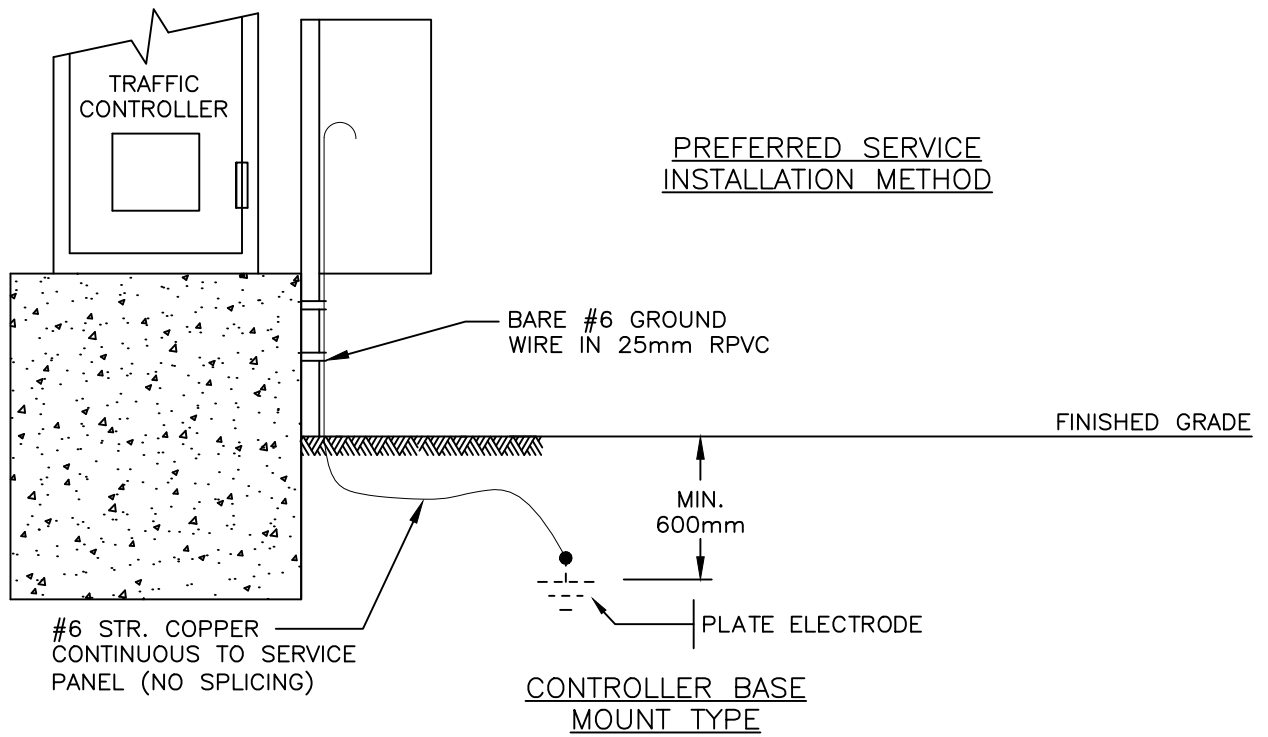
**STANDARD
DETAIL
DRAWING**

DATE:
07/20/20
SCALE:
NTS

**SIGNAL HEAD QUICK CHANGE
KIT**

DWG. NO.
SS-E5.20

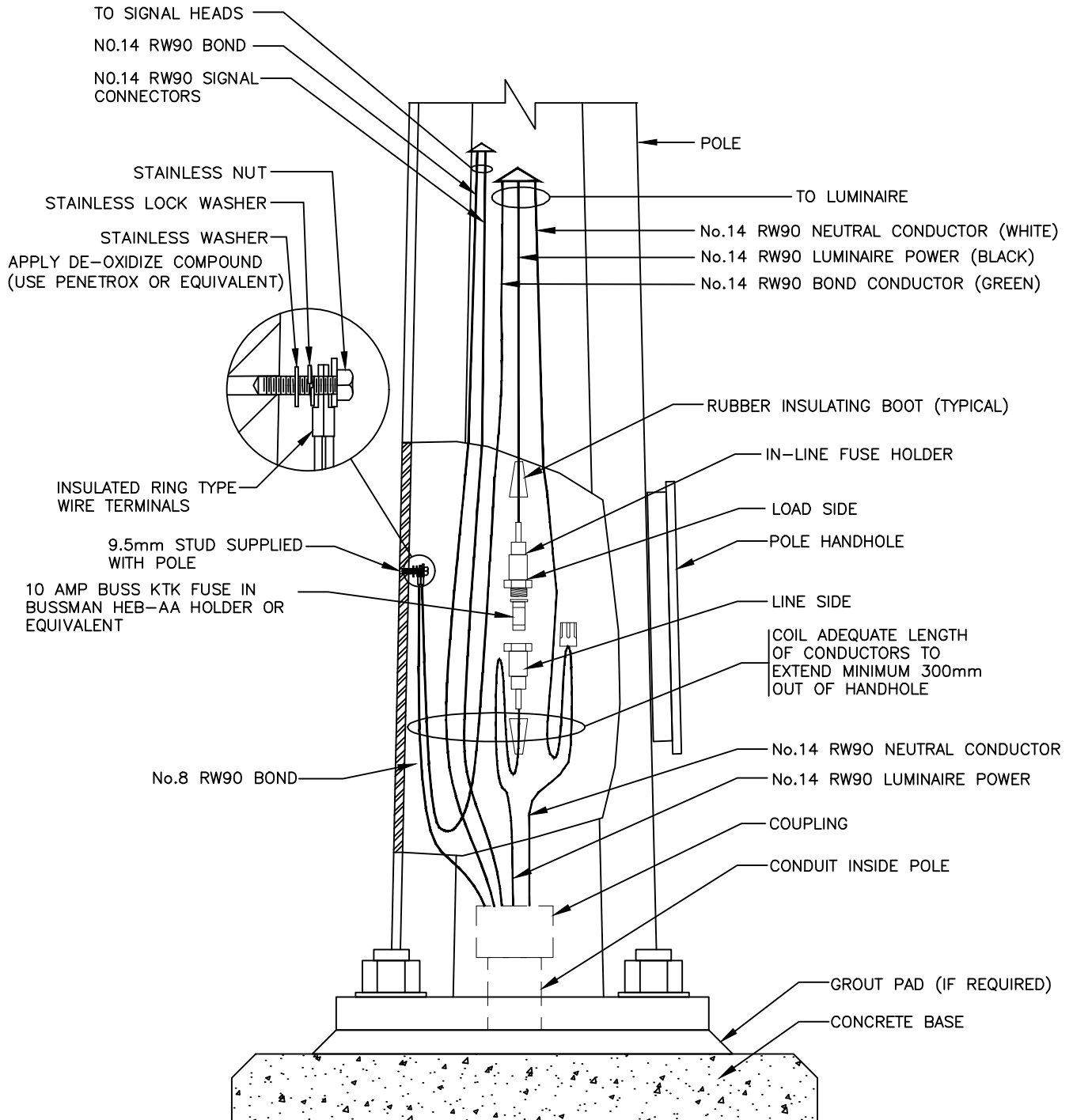




NOTES

1. REFER REFER TO CONTRACT DRAWINGS AND SECTION 34 41 13 FOR DETAILED SPECIFICATIONS.
2. ALL DIMENSIONS IN MILLIMETRES UNLESS OTHERWISE NOTED.
3. REFER TO CONTRACT DRAWINGS FOR ADDITIONAL INSTALLATION DETAILS AND LOCATION
4. GROUND RODS NOT TO BE PLACED WITHIN 5m OF OTHER UTILITY GROUNDING.

STANDARD DETAIL DRAWING	DATE: 04/19/21	GROUNDING OF ELECTRICAL SERVICE INSTALLATION DETAILS	DWG. NO.	 City of Kelowna
	SCALE: NTS		SS-E7.10	



ELEVATION
N.T.S.

NOTES

1. REFER TO CONTRACT DRAWINGS AND SECTION 34 41 13 FOR DETAILED SPECIFICATIONS.
2. ALL DIMENSIONS IN MILLIMETERS UNLESS OTHERWISE NOTED.

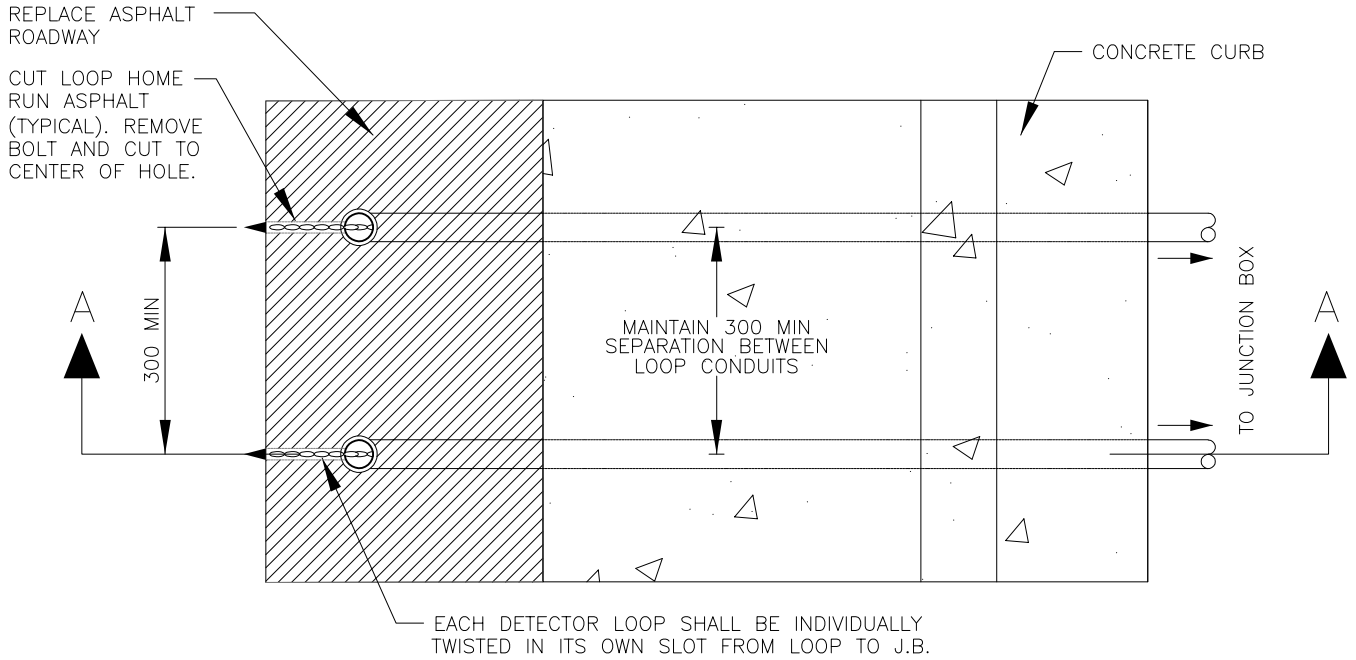
STANDARD DETAIL DRAWING	DATE: 08/04/24	LUMINAIRE WIRING ON POLE HANDHOLE DETAIL	DWG. NO.	 City of Kelowna
	SCALE: NTS		SS-E7.11	

COLOUR CODE CHART			
ITEM	DISPLAY	CONDUCTOR COLOUR	ID TAPE
Phase 2 (NB)	RED YELLOW GREEN WALK DON'T WALK P. BUTTON	RED ORANGE BLUE BLUE BROWN YELLOW	RED RED RED RED/BLACK RED/BLACK RED/BK & RED/BK/BK
Phase 5 (NB-LT)	Green Ar Yellow Ar	BROWN YELLOW	RED RED
Phase 4 (EB)	RED YELLOW GREEN WALK DON'T WALK P. BUTTON	RED ORANGE BLUE BLUE YELLOW BROWN	YELLOW YELLOW YELLOW YELLOW/BLACK YELLOW/BLACK Y/BK & Y/BK/BK
Phase 7 (EB-LT)	Green Ar Yellow Ar	BROWN YELLOW	YELLOW YELLOW
Phase 6 (SB)	RED YELLOW GREEN WALK DON'T WALK P. BUTTON	RED ORANGE BLUE BLUE BROWN YELLOW	BLUE BLUE BLUE BLUE/BLACK BLUE/BLACK BL/BK & BL/BK/BK
Phase 1 (SB-LT)	Green Ar Yellow Ar	BROWN YELLOW	BLUE BLUE
Phase 8 (WB)	RED YELLOW GREEN WALK DON'T WALK P. BUTTON	RED ORANGE BLUE BLUE YELLOW BROWN	GREEN GREEN GREEN GREEN/BLACK GREEN/BLACK G/BK & G/BK/BK
Phase 3 (WB-LT)	Green Ar Yellow Ar	BROWN YELLOW	GREEN GREEN
Street Lighting	—	BLACK	WHITE
Controller Power	—	BLACK	—
Neutral	—	WHITE	—
Bond	—	GREEN	—

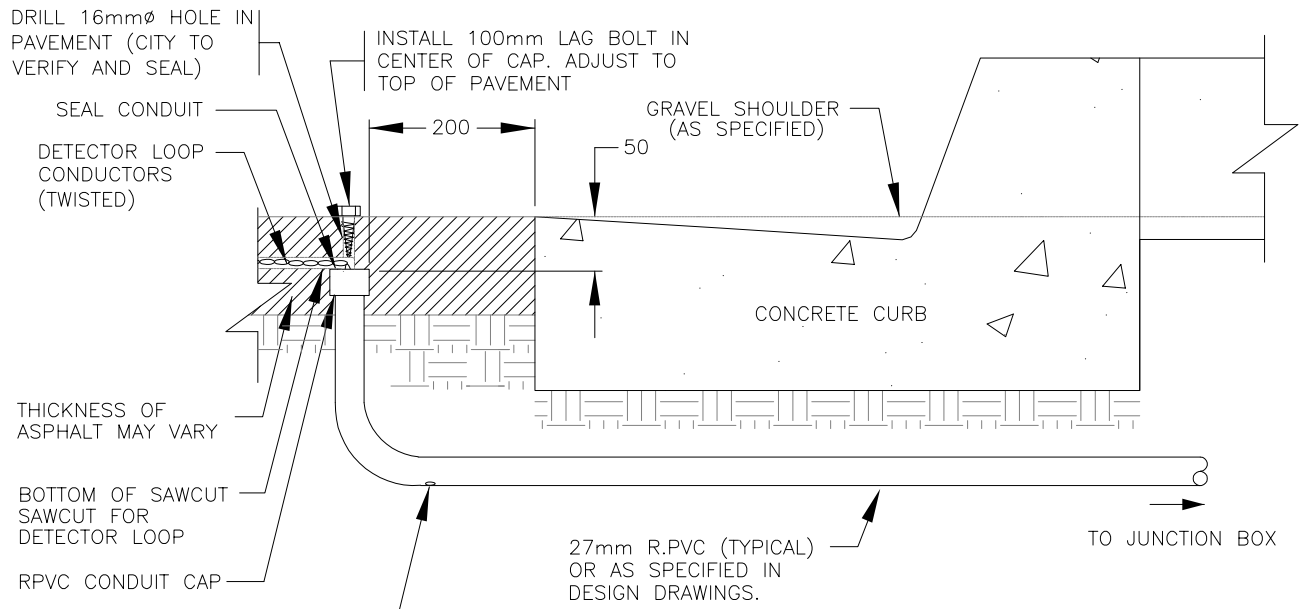
NOTES

1. REFER TO CONTRACT DRAWINGS AND SECTION 34 41 13 FOR DETAILED SPECIFICATIONS.

STANDARD DETAIL DRAWING	DATE: 07/20/20	SIGNAL WIRING COLOUR CODE CHART (FROM JB TO POLE)	DWG. NO.	 City of Kelowna
	SCALE: NTS		SS-E7.19	



TOP VIEW



**SECTION A-A
N.T.S.**

NOTES

1. REFER TO CONTRACT DRAWINGS AND SECTION 34 41 13 FOR DETAILED SPECIFICATIONS.
2. ALL DIMENSIONS IN MILLIMETRES UNLESS OTHERWISE NOTED.
3. LAG BOLT IS FOR LOCATING CONDUIT STUB AND IS TO BE REMOVED UPON INSTALLATION OF LOOP WIRES.

**STANDARD
DETAIL
DRAWING**

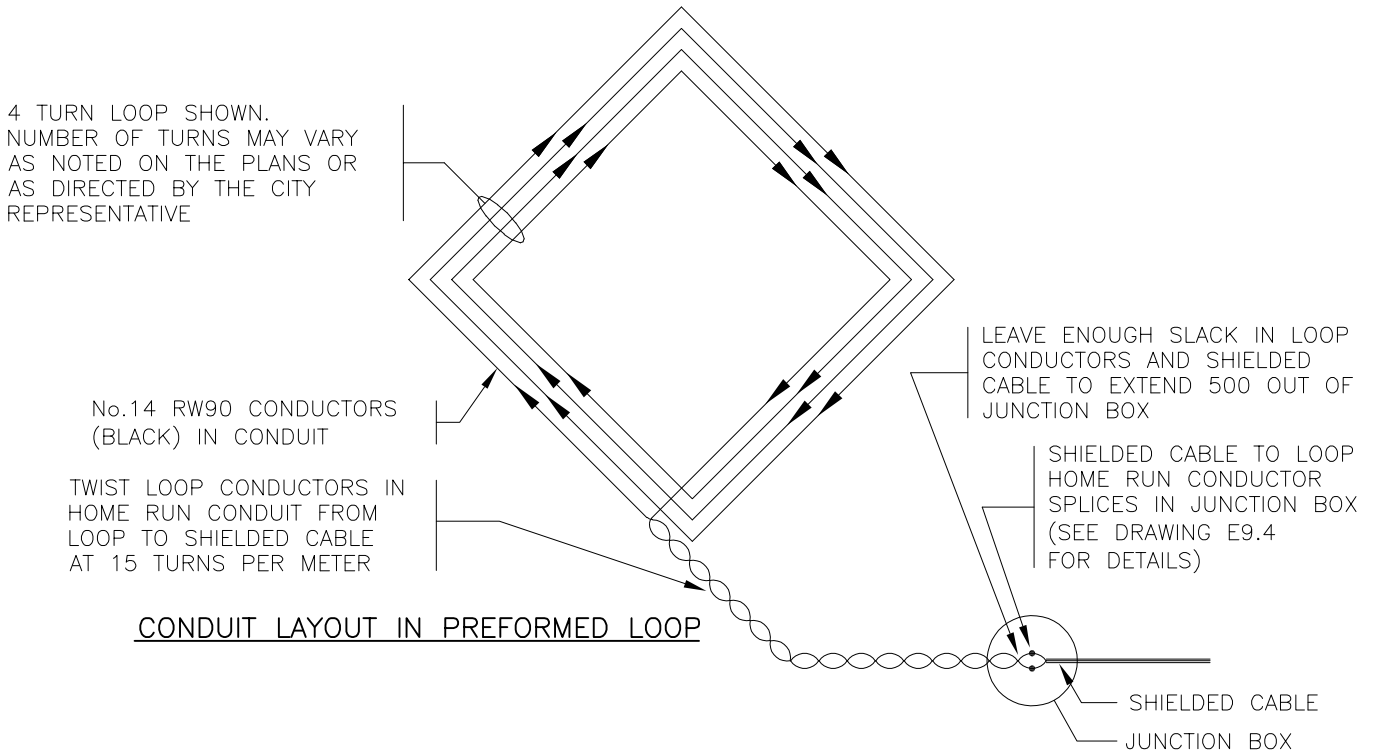
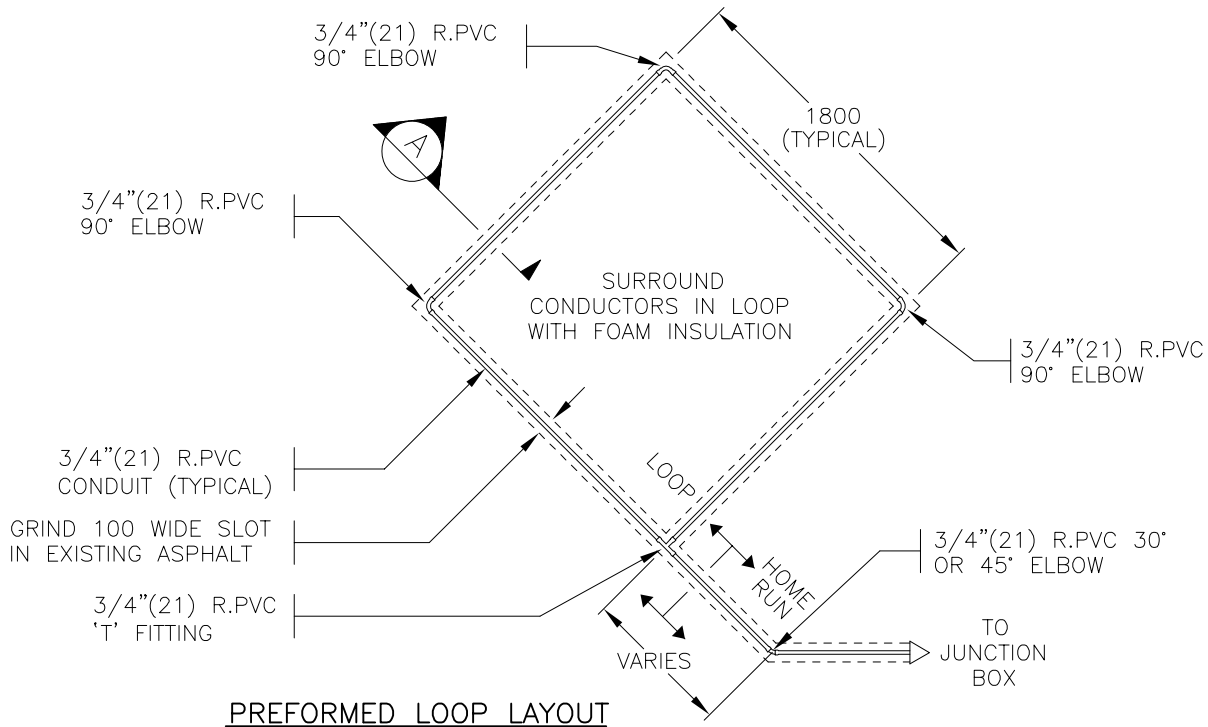
DATE:
07/20/20
SCALE:
NTS

DETECTOR LOOPS

DWG. NO.

SS-E8.2





NOTES

1. REFER TO CONTRACT DRAWINGS AND SECTIONS 34 41 13 FOR DETAILED SPECIFICATIONS.
2. ALL DIMENSIONS IN MILLIMETRES UNLESS OTHERWISE NOTED.
3. LOOP INDUCTANCE TO BE EQUAL TO OR GREATER THAN SHIELDED CABLE INDUCTANCE. (A 2:1 RATIO IS PREFERABLE) No. 14 SHIELDED CABLE INDUCTANCE IS 0.72 μ H PER METRE

**STANDARD
DETAIL
DRAWING**

DATE:
07/20/20

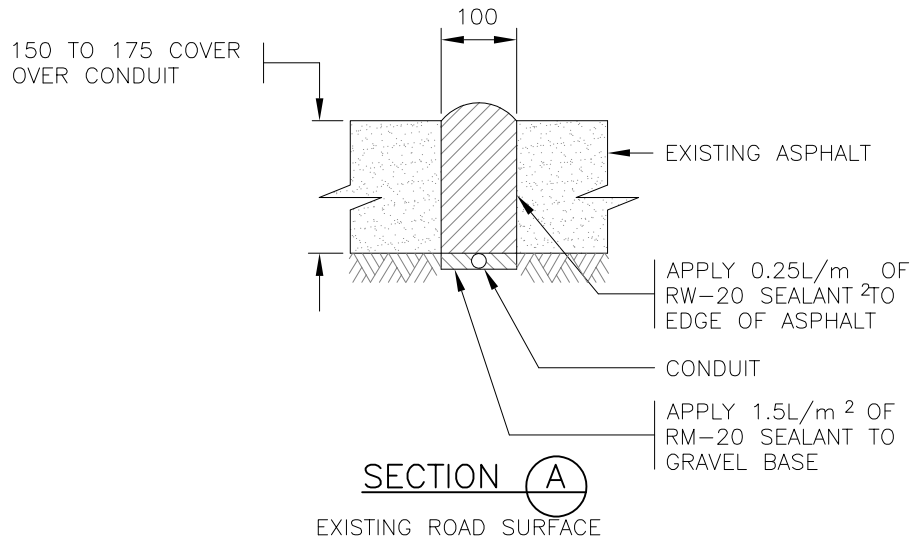
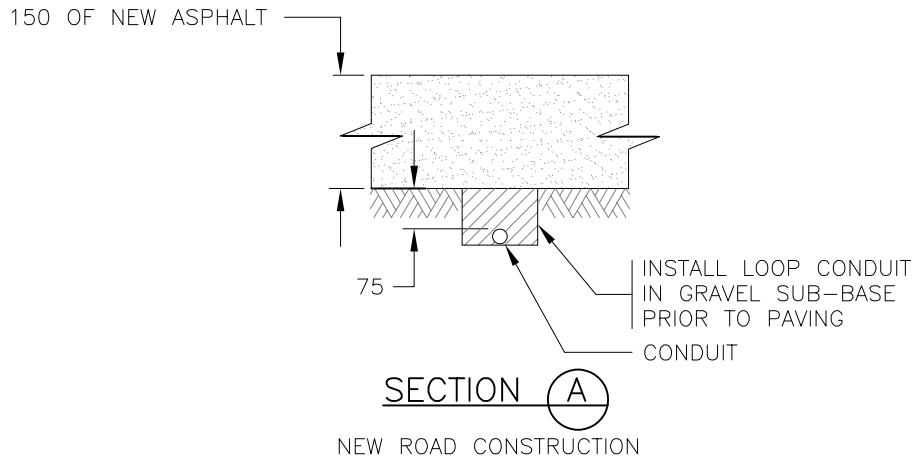
SCALE:
NTS

**PRE-FORMED DIAMOND
DETECTOR LOOPS**

DWG. NO.

SS-E8.8

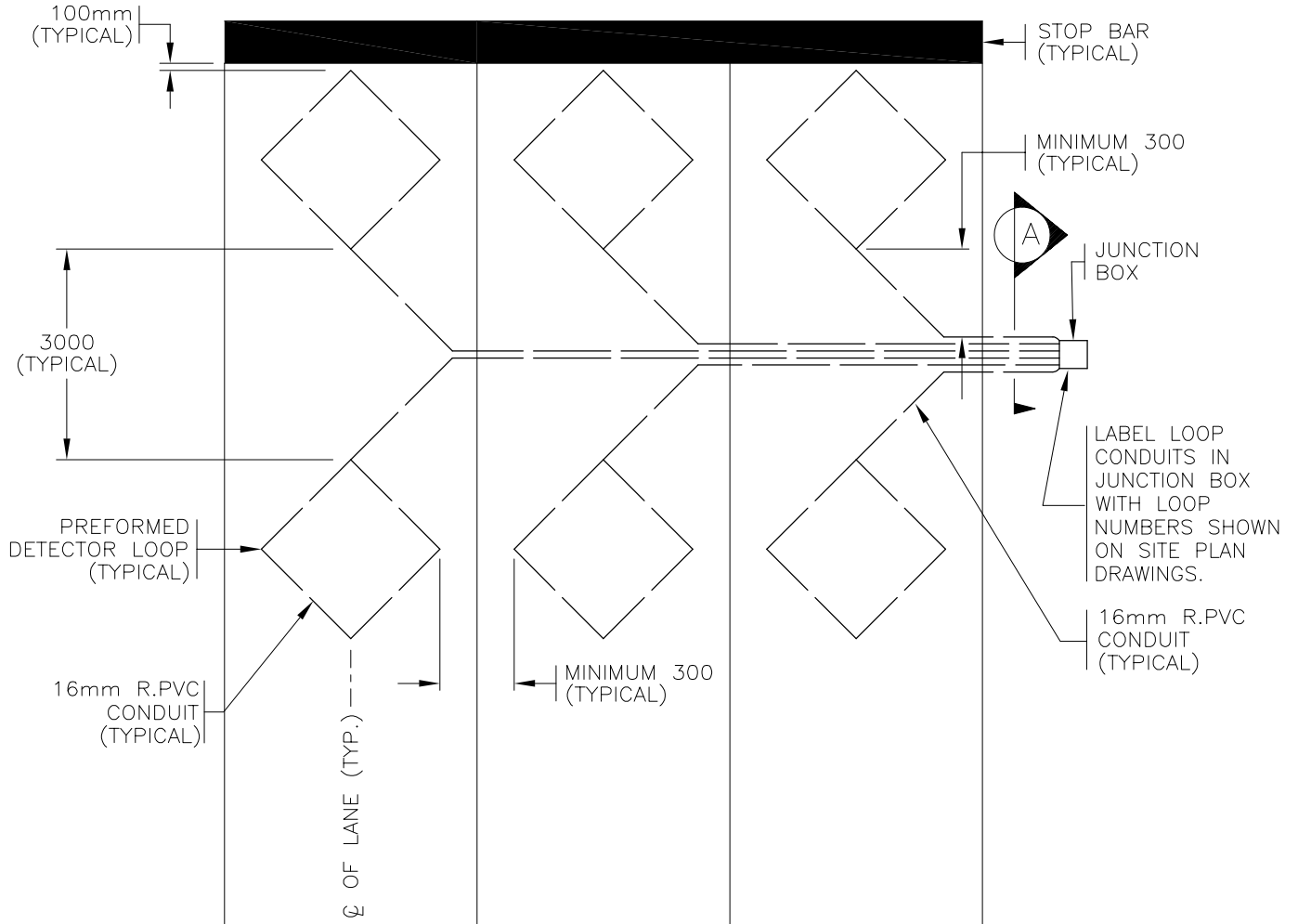




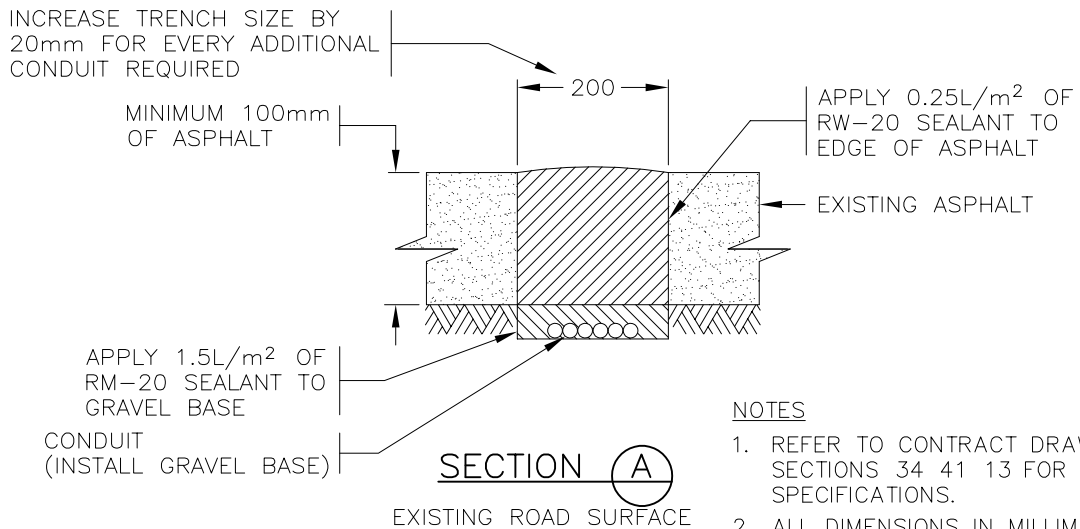
NOTES

1. REFER TO CONTRACT DRAWINGS AND SECTION 34 41 13 FOR DETAILED SPECIFICATIONS.
2. ALL DIMENSIONS ARE IN MILLIMETRES UNLESS OTHERWISE NOTED.
3. WHERE INSTALLING PREFORMED LOOPS IN EXISTING ASPHALT GRIND OUT SLOT AND INSTALL PREFORMED LOOP. BACKFILL SLOT WITH HOT MIXED ASPHALT PAVEMENT. COMPACT ASPHALT WITH VIBRATING MECHANICAL COMPACTOR WITH 75mm SQUARE PLATE. WHERE INSTALLING PREFORMED LOOPS IN NEW ROAD CONSTRUCTION, PLACE CONDUIT IN GRAVEL SUB-BASE JUST BELOW ASPHALT. LAYOUT STOP BARS, CURB RETURNS, ISLANDS, MEDIANS, LANE LINES AND LOOPS AND VERIFY WITH CITY REPRESENTATIVE PRIOR TO CONSTRUCTION. FAILURE TO CORRECTLY LOCATE THE LOOPS IN THEIR REQUIRED LOCATIONS WILL RESULT IN REINSTALLATION OF THE LOOPS AT THE CONTRACTORS EXPENSE.
4. PREFORMED LOOPS SHALL MEET THE APPROVAL OF THE CITY REPRESENTATIVE PRIOR TO INSTALLATION.
5. CONTRACTOR SHALL VERIFY LOOPS LOCATIONS (CUT INTO OVERLAYED OR NEW PAVED ROADWAYS) WITH THE CITY REPRESENTATIVE AFTER INSTALLATION.

STANDARD DETAIL DRAWING	DATE: 07/20/20	PRE-FORMED DIAMOND DETECTOR LOOPS	DWG. NO.	 City of Kelowna
	SCALE: NTS		SS-E8.9	



TYPICAL PREFORMED LOOP LAYOUT



NOTES

1. REFER TO CONTRACT DRAWINGS AND SECTIONS 34 41 13 FOR DETAILED SPECIFICATIONS.
2. ALL DIMENSIONS IN MILLIMETRES UNLESS OTHERWISE NOTED.

**STANDARD
DETAIL
DRAWING**

DATE:
07/20/20
SCALE:
NTS

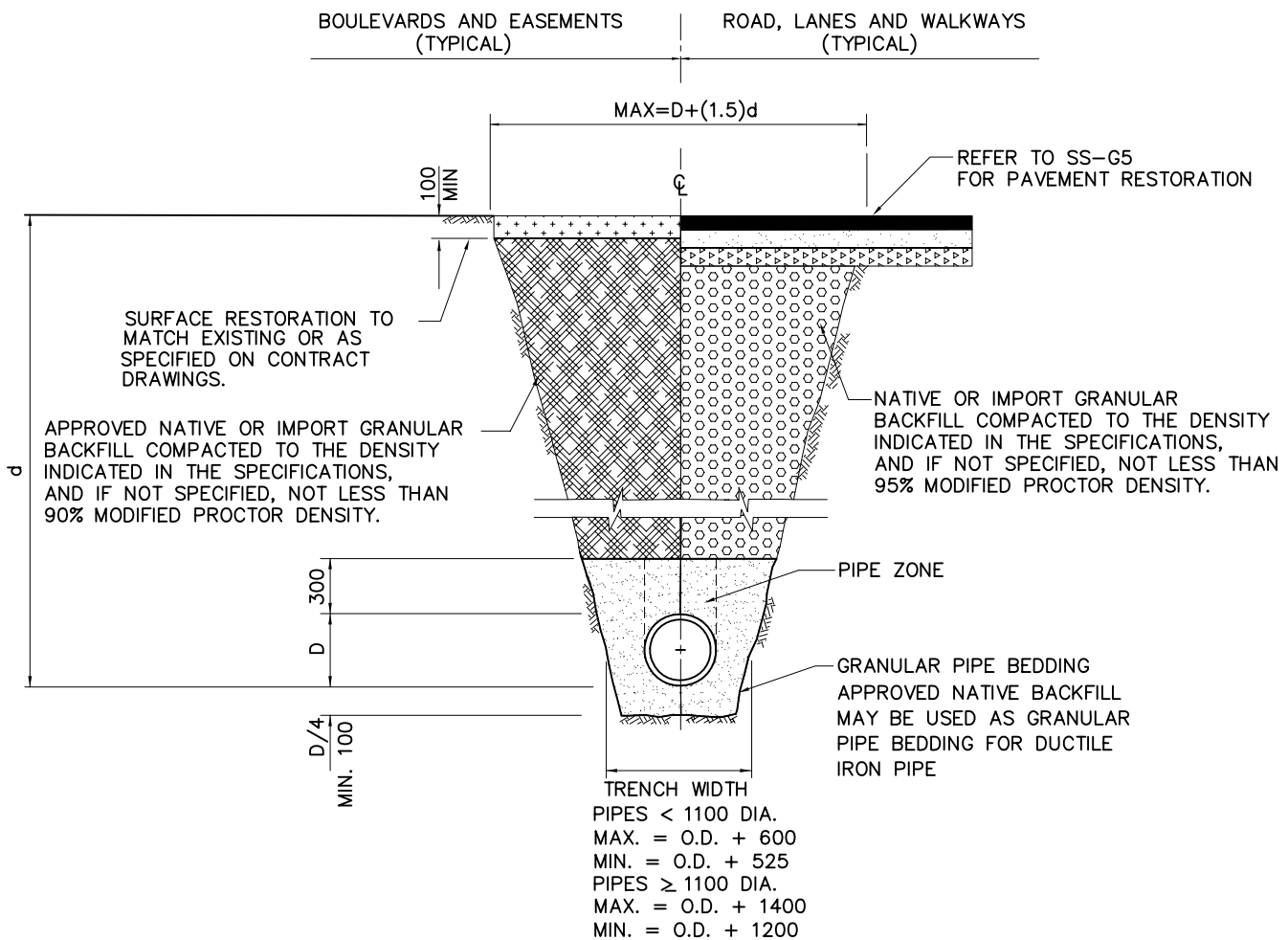
**PRE-FORMED DIAMOND
DETECTOR LOOPS**

DWG. NO.

SS-E8.10



STANDARD DETAIL DRAWINGS



NOTE:

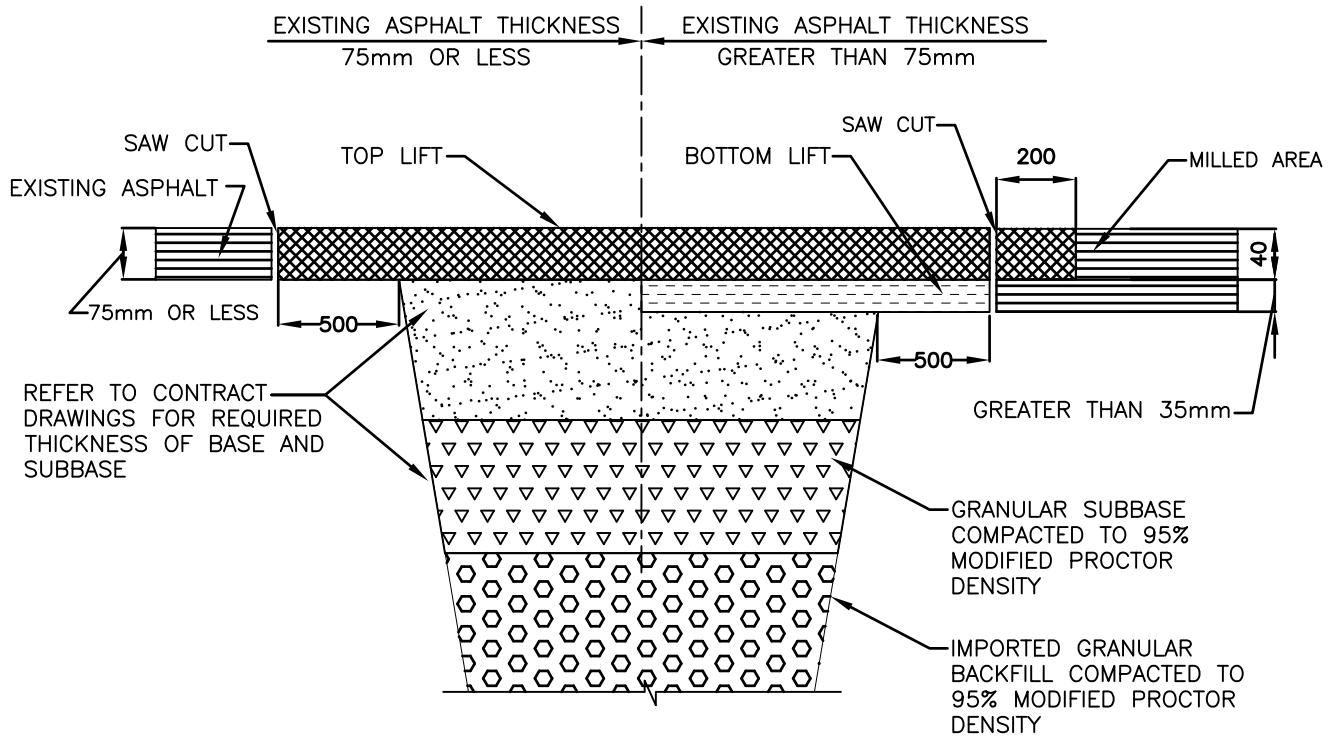
1. TRENCHING TO COMPLY WITH ALL REQUIREMENTS OF THE WORKERS COMPENSATION BOARD.
2. REFER TO CONTRACT DRAWINGS AND SECTION 02223 FOR DETAILED SPECIFICATIONS.

MAY 09/02

UTILITY TRENCH

SS-G4

STANDARD DETAIL DRAWINGS



CROSS SECTION

H:\WU\DRAWING\STD-DWGS\MMCD\SS-G5

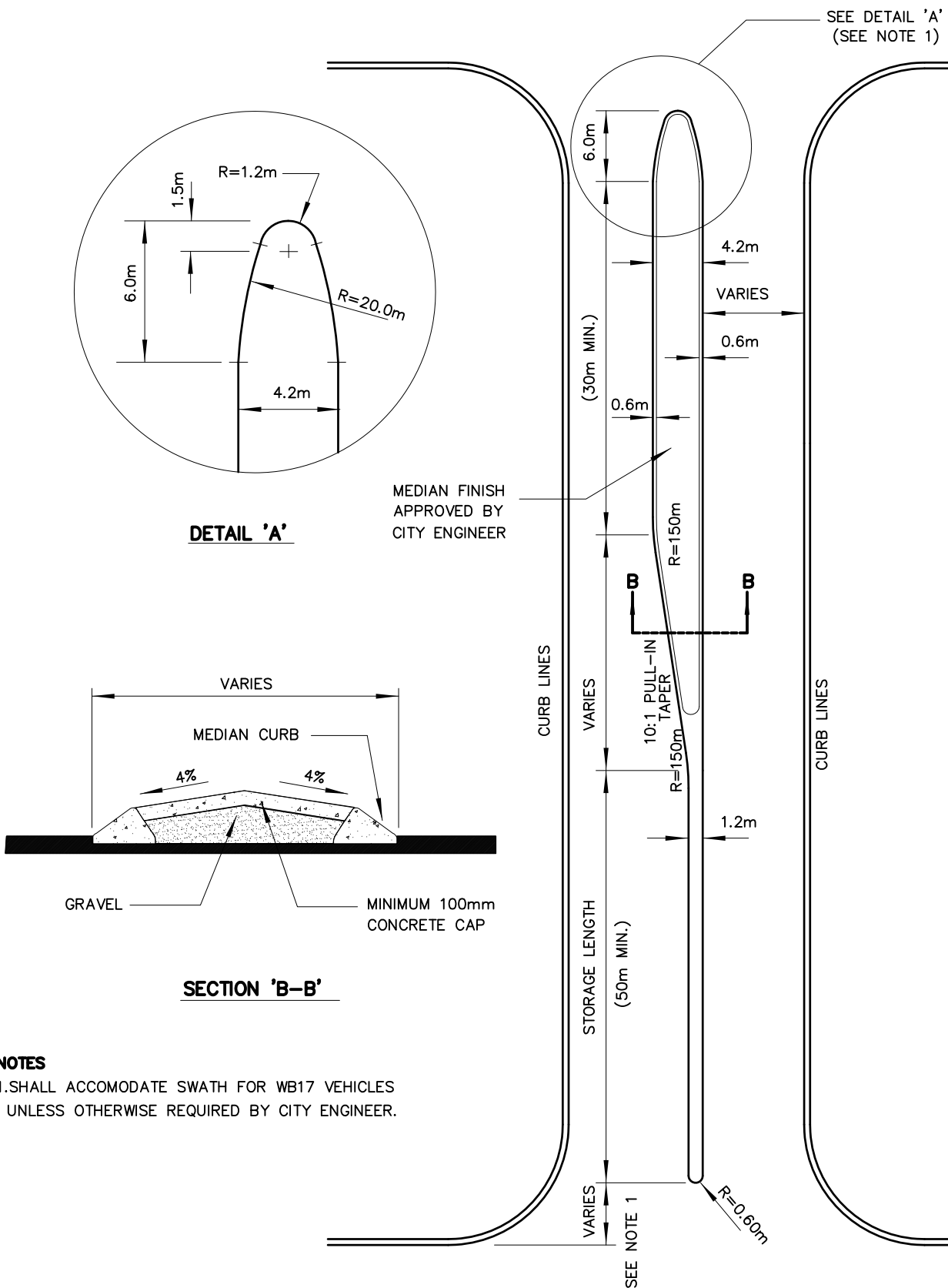
PAVEMENT RESTORATION

SS-G5

REV: JAN.29/01

DATE: OCT.12/01

STANDARD DETAIL DRAWINGS

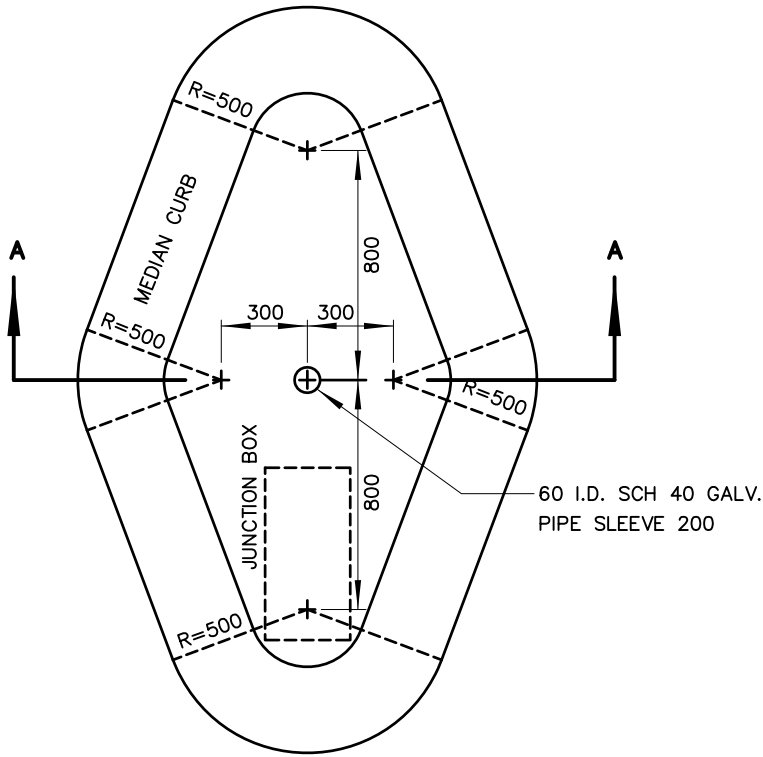


NOV. 2/98

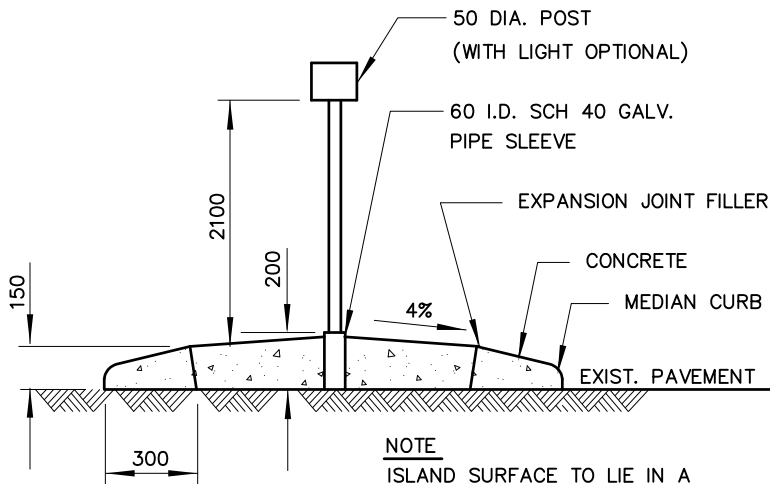
LEFT TURN LANE (RAISED MEDIAN)

SS-R20

STANDARD DETAIL DRAWINGS



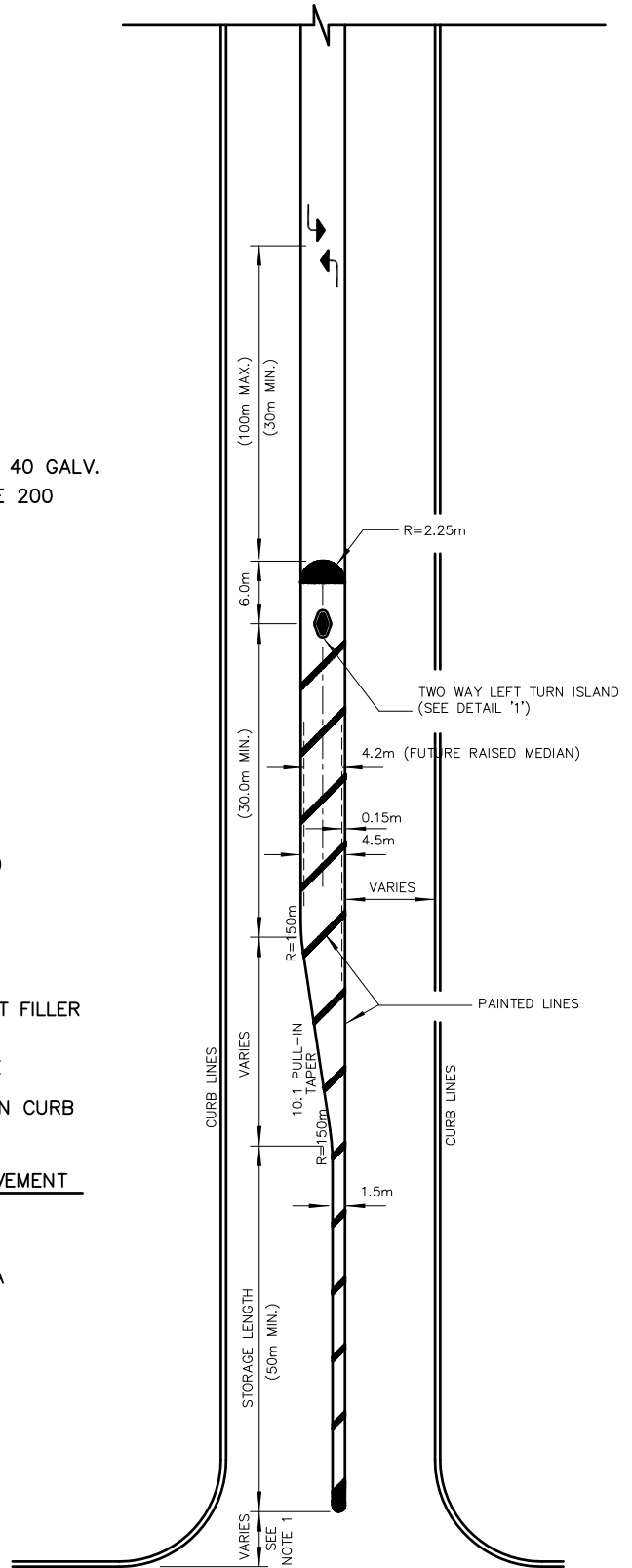
**PLAN OF RAISED ISLAND
(DETAIL '1')**



NOTE
ISLAND SURFACE TO LIE IN A
PLANE PARALLEL TO ROAD

NOTES

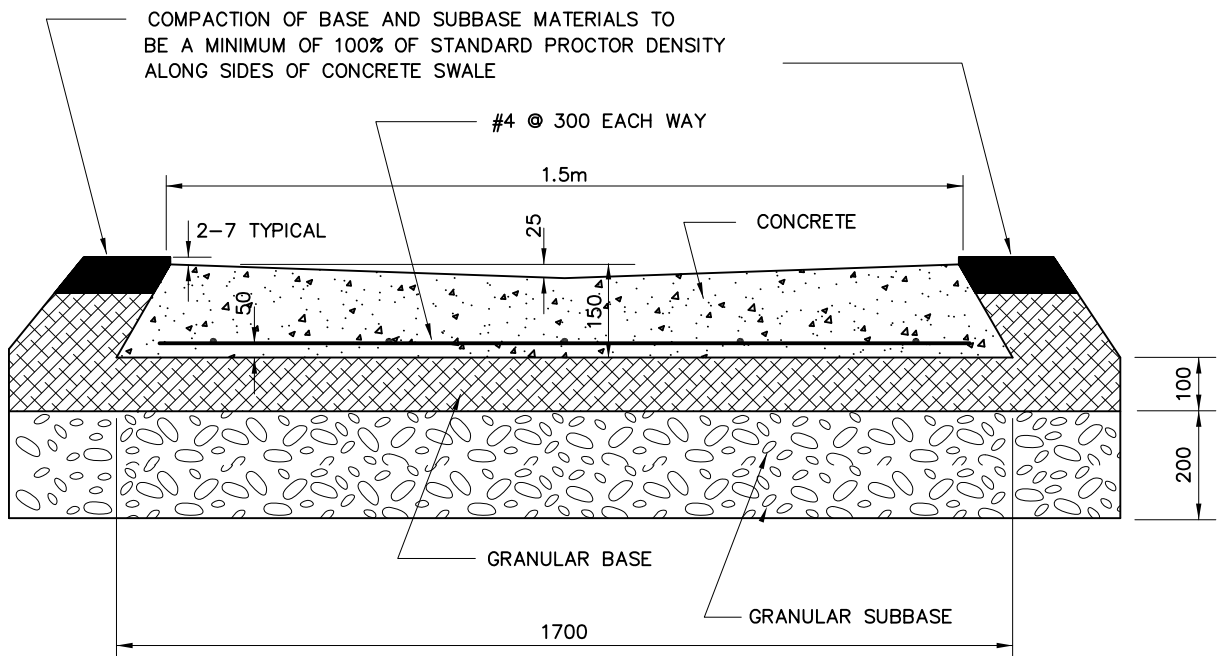
1. SHALL ACCOMMODATE SWATH FOR WB17 DESIGN VEHICLES
UNLESS OTHERWISE REQUIRED BY CITY ENGINEER.



**LEFT TURN LANE (PAINTED) AND
TWO-WAY LEFT TURN LANE**

SS-R21

STANDARD DETAIL DRAWINGS



SECTION

NOTES:

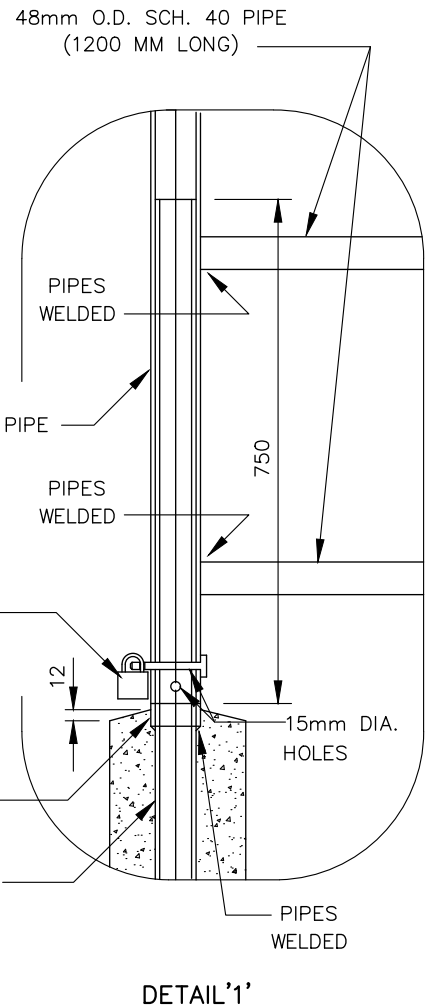
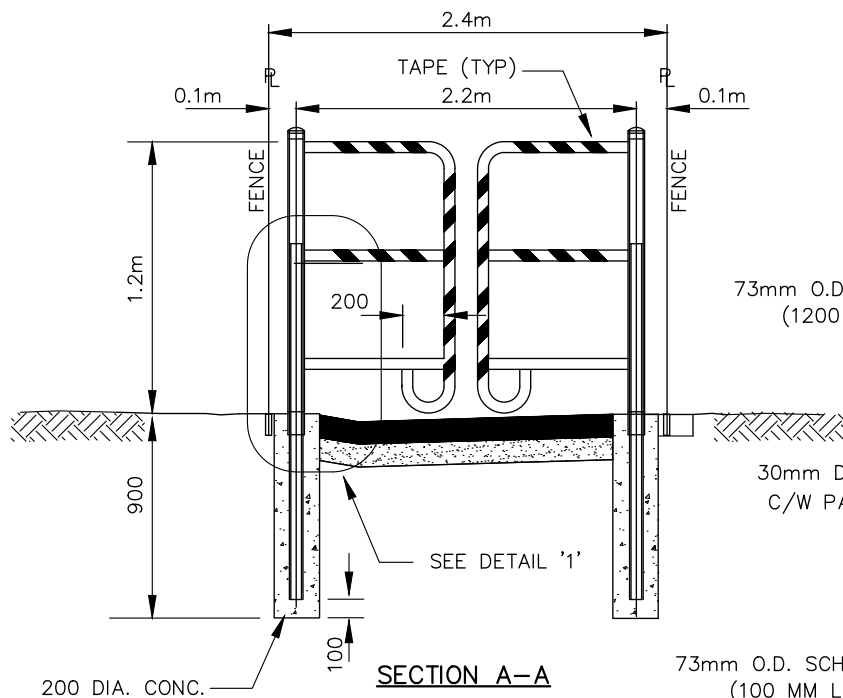
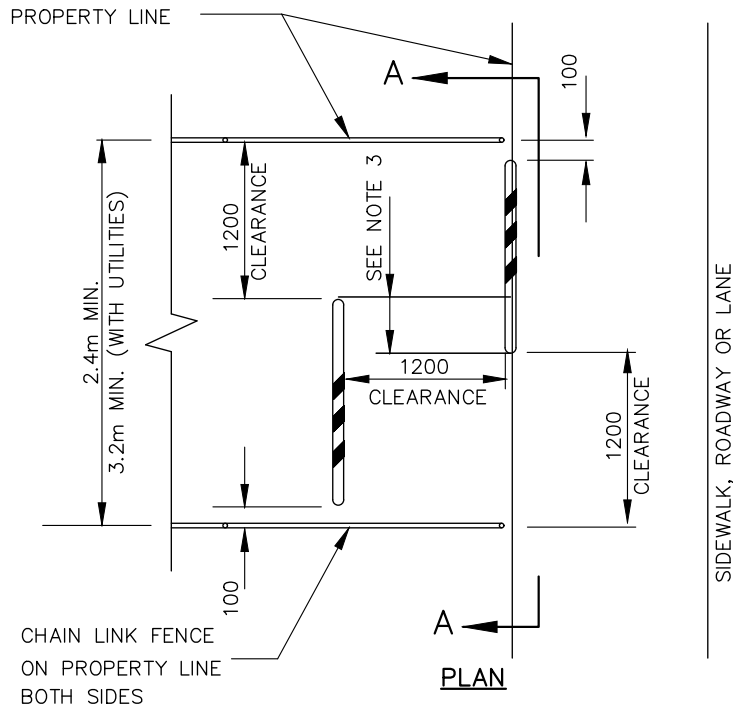
1. CONCRETE TO HAVE A 28 DAY COMPRESSIVE STRENGTH OF 30 MPa.
2. BRUSH FINISH.
3. MINOR VARIATION IN CROSS SECTION WILL BE CONSIDERED TO ACCOMMODATE EXTRUDING OR SLIPFORM MACHINES.
4. MINIMUM GRADE 1.0%.
5. EXPANSION JOINTS AT EACH END ONLY.
6. THIS STANDARD IS ONLY TO BE USED IF SPECIAL APPROVAL IS OBTAINED FROM THE CITY ENGINEER.

\\WU\DRAWING\STD-DWGS\D44\D44-370

NOV. 2/98

**CONCRETE DRAINAGE SWALE
ACROSS ASPHALT**

SS-R23



NOTES:

1. ALL METAL IS TO BE HOT DIPPED GALVANIZED AFTER FABRICATION, EXCEPT WHERE FIELD JOINTS ARE NECESSARY IN WHICH CASE 2 COATS OF GALVICAN CAN BE USED.
2. WRAP GATE VERTICALS/LATERALS WITH RETROREFLECTIVE TAPE (DIAMOND GRADE)
3. WHERE WALKWAY IS GREATER THAN 2.4m WIDE, GATES NOT TO OVERLAP MORE THAN 0.9m
4. CATCH BASIN REQUIRED WHERE DRAINAGE WOULD CROSS SIDEWALK

**STANDARD
DETAIL
DRAWING**

DATE:
MAY 09/24

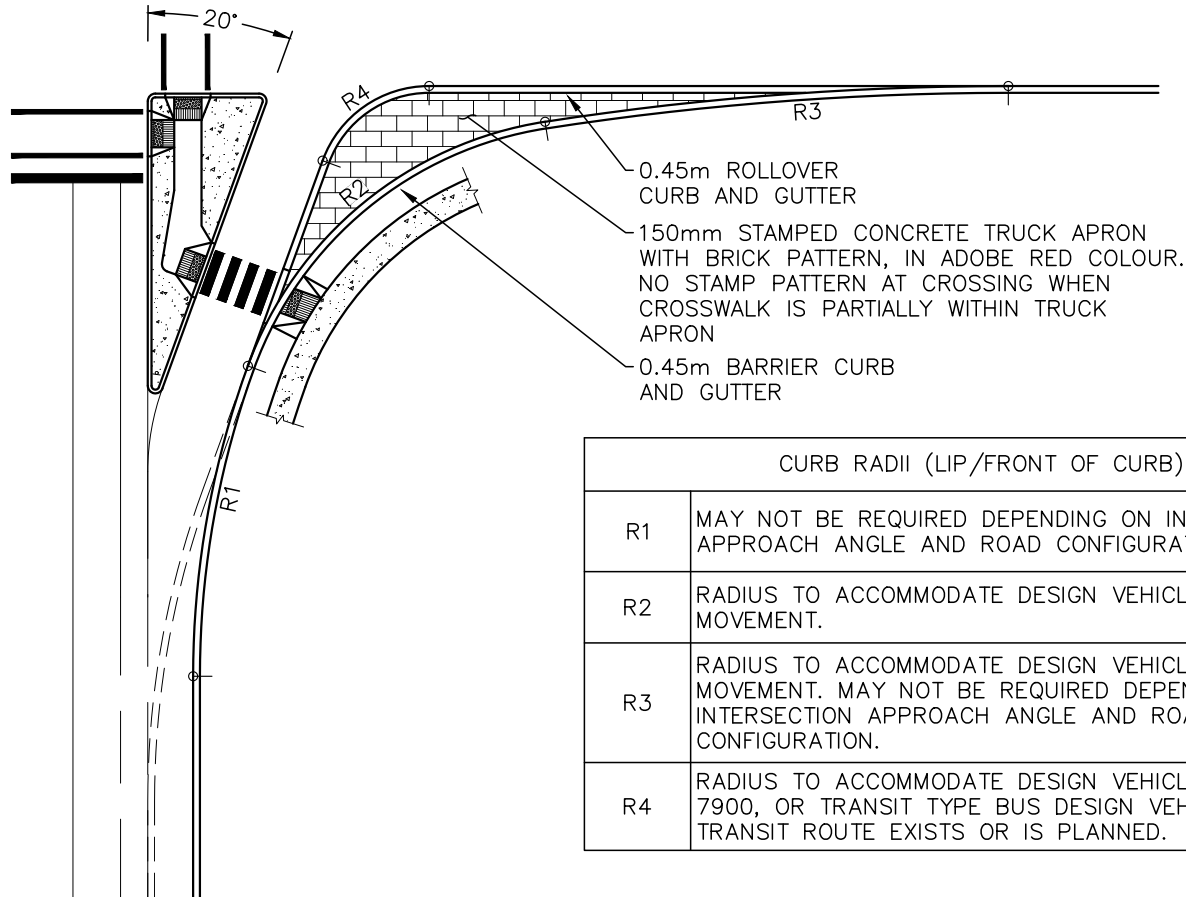
SCALE:
NTS

WALKWAY GATE

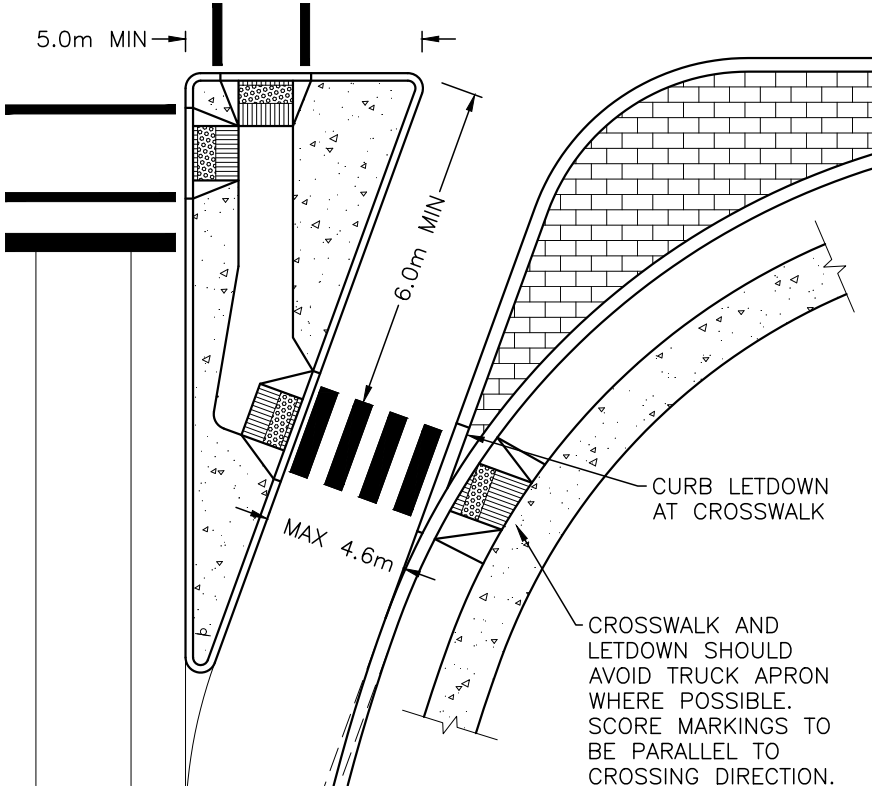
DWG. NO.

SS-R28





CURB RADII (LIP/FRONT OF CURB)	
R1	MAY NOT BE REQUIRED DEPENDING ON INTERSECTION APPROACH ANGLE AND ROAD CONFIGURATION.
R2	RADIUS TO ACCOMMODATE DESIGN VEHICLE TURNING MOVEMENT.
R3	RADIUS TO ACCOMMODATE DESIGN VEHICLE TURNING MOVEMENT. MAY NOT BE REQUIRED DEPENDING ON INTERSECTION APPROACH ANGLE AND ROAD CONFIGURATION.
R4	RADIUS TO ACCOMMODATE DESIGN VEHICLE PER BYLAW 7900, OR TRANSIT TYPE BUS DESIGN VEHICLE IF TRANSIT ROUTE EXISTS OR IS PLANNED.

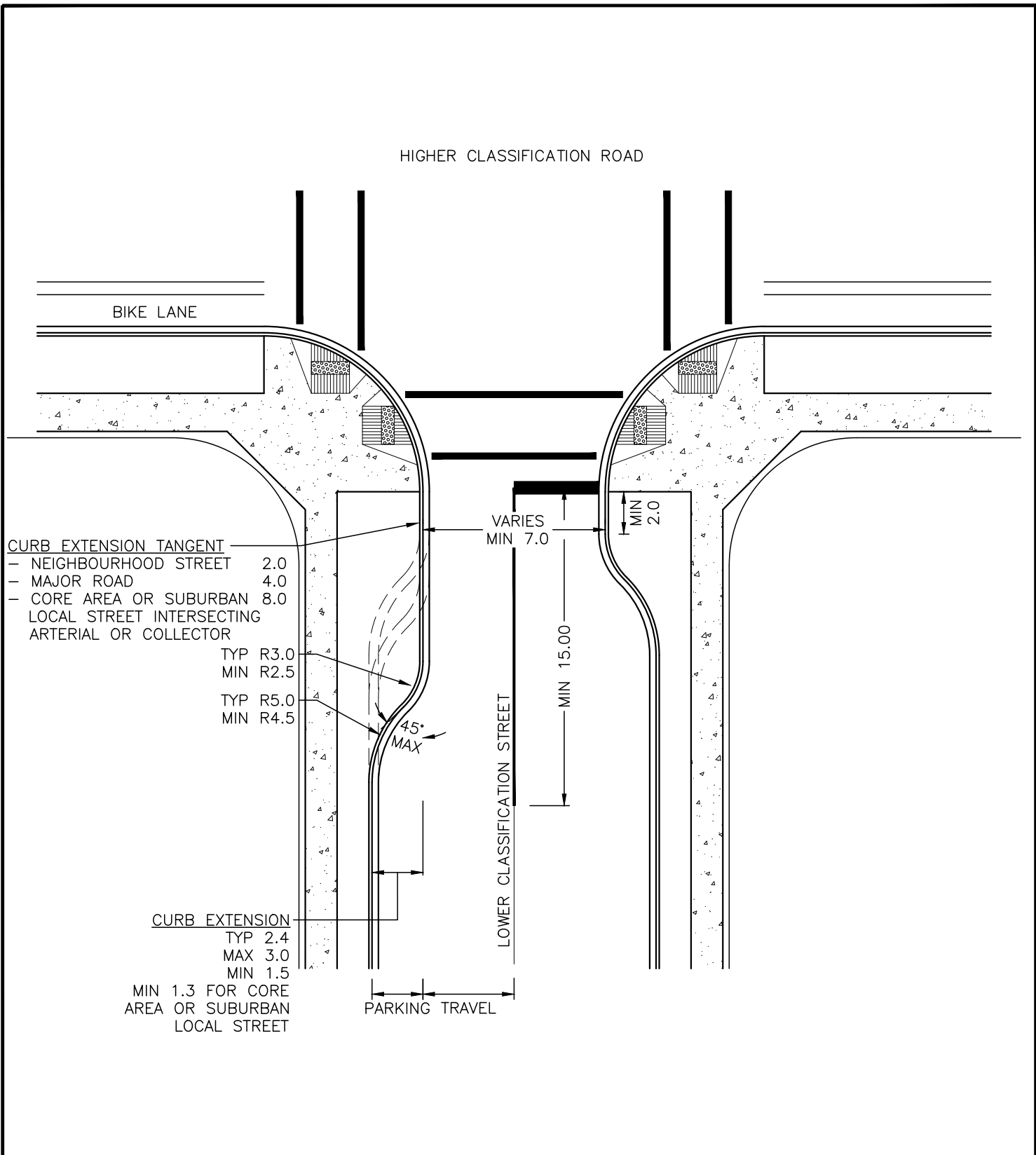


ISLAND DETAIL

NOTES:

1. THIS DRAWING IS INTENDED TO BE USED AS A GENERAL DESIGN GUIDANCE. TURN PATH ANALYSIS AND SITE SPECIFIC DESIGN IS REQUIRED. DESIGNS TO BE APPROVED BY CITY ENGINEER.
2. ALL DIMENSIONS ARE IN METRES UNLESS STATED OTHERWISE.
3. REFER TO DRAWINGS SS-C8 AND SS-C9 FOR SIDEWALK RAMP DETAILS.
4. CURB TRANSITIONS AT SIDEWALK RAMP TO BE FLUSH, TYPICAL FOR ALL CURB TYPES.

STANDARD DETAIL DRAWING	DATE: OCT 31/22	SMART CHANNEL RIGHT TURN	DWG. NO.	 City of Kelowna
	SCALE: NTS		SS-R50	

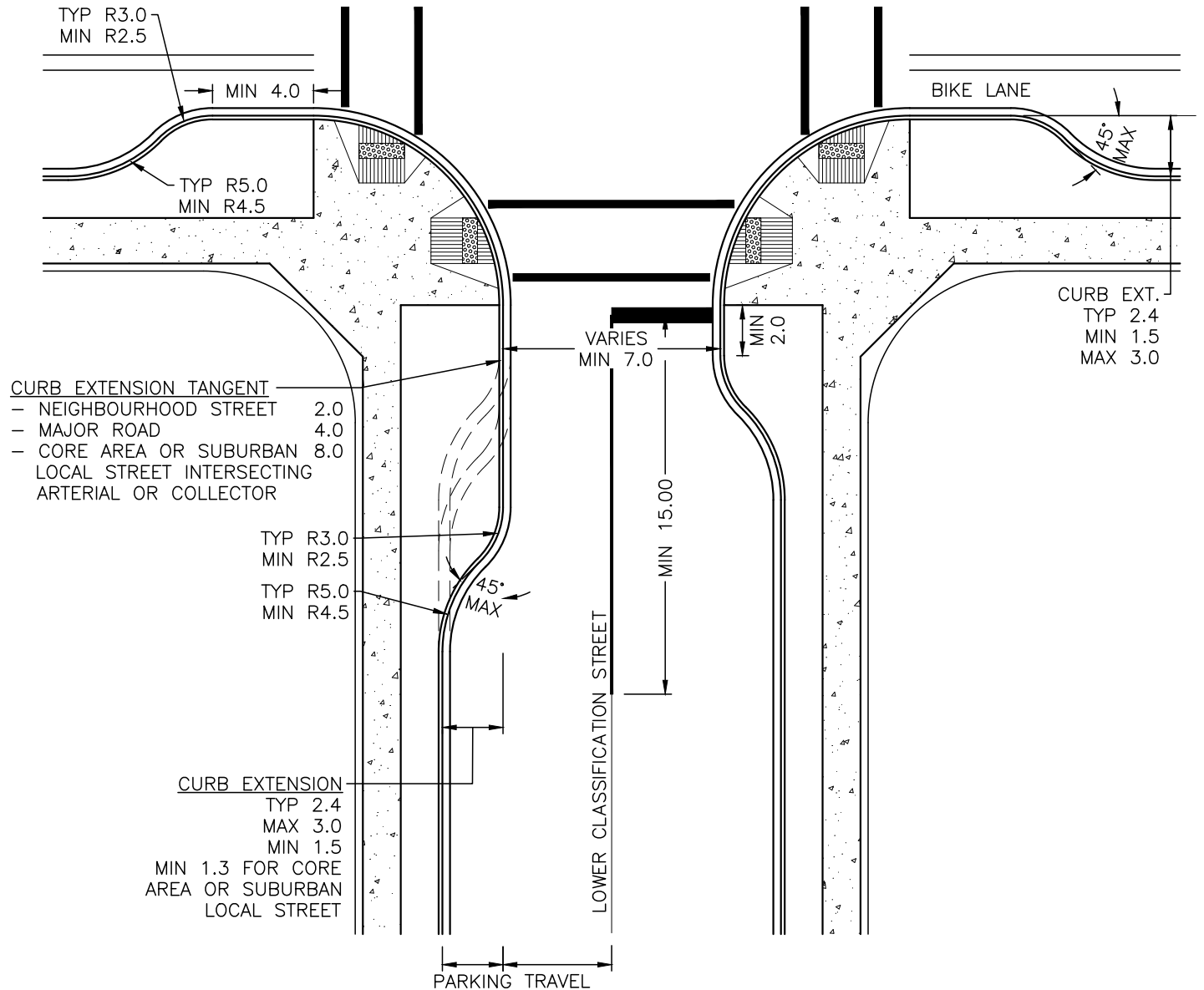


NOTES:

1. THIS DRAWING IS INTENDED TO BE USED AS A GENERAL DESIGN GUIDANCE. TURN PATH ANALYSIS AND SITE SPECIFIC DESIGN IS REQUIRED.
2. ALL DIMENSIONS ARE IN METRES UNLESS STATED OTHERWISE.
3. CURB DIMENSIONS ARE TO THE FACE OF CURB (150mm FROM BACK OF CURB).
4. SEE DRAWING SS-C8 AND SS-C9 FOR SIDEWALK RAMP DETAILS.

STANDARD DETAIL DRAWING	DATE: SEPT 22/22	INTERSECTION CURB EXTENSIONS HIGHER CLASS ROAD NO PARKING	DWG. NO.	 City of Kelowna
	SCALE: NTS		SS-R51	

HIGHER CLASSIFICATION ROAD



NOTES:

1. THIS DRAWING IS INTENDED TO BE USED AS A GENERAL DESIGN GUIDANCE. TURN PATH ANALYSIS AND SITE SPECIFIC DESIGN IS REQUIRED.
2. ALL DIMENSIONS ARE IN METRES UNLESS STATED OTHERWISE.
3. CURB DIMENSIONS ARE TO THE FACE OF CURB (150mm FROM BACK OF CURB).
4. SEE DRAWING SS-C8 AND SS-C9 FOR SIDEWALK RAMP DETAILS.

**STANDARD
DETAIL
DRAWING**

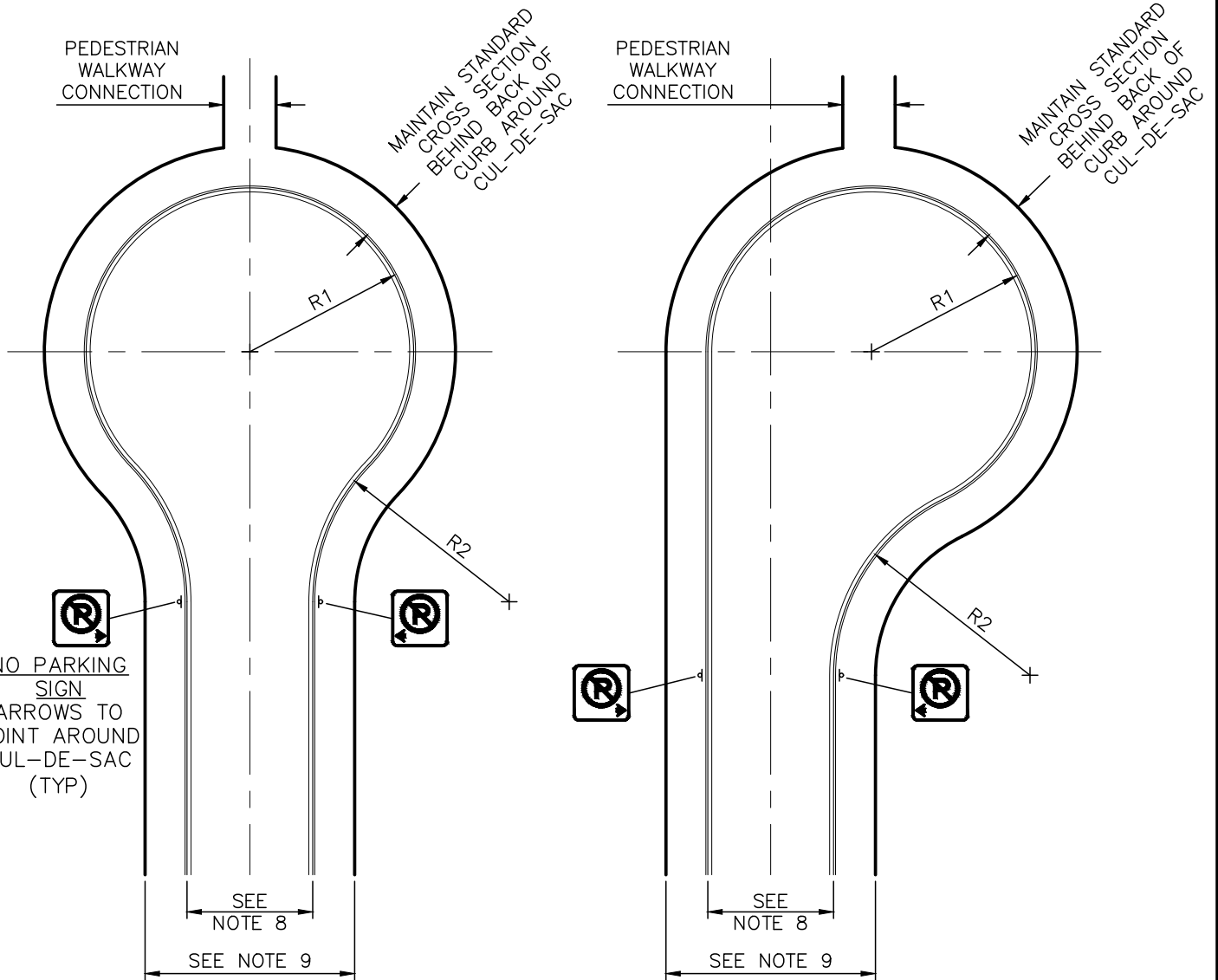
DATE:
SEPT 22/22
SCALE:
NTS

**INTERSECTION CURB
EXTENSIONS**
HIGHER CLASS ROAD WITH PARKING

DWG. NO.

SS-R52



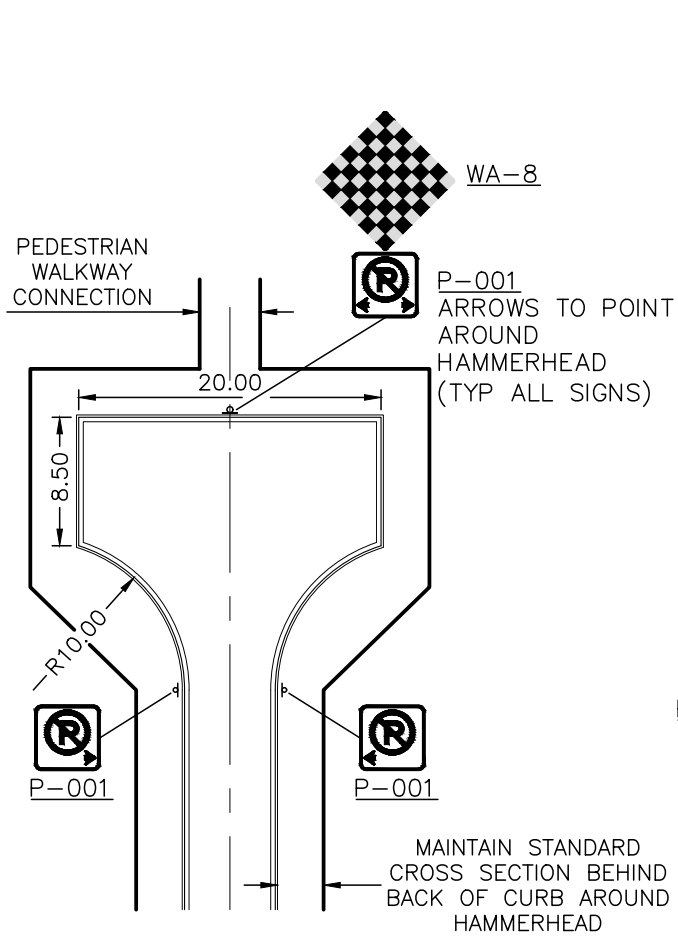


CLASS	R1 (MIN)	R2 (MIN)
LOCAL RURAL	12.5m	15.0m
LOCAL SUBURBAN	12.5m	15.0m
LOCAL CORE AREA	12.5m	15.0m
LOCAL HILLSIDE	12.5m	15.0m
LOCAL INDUSTRIAL	15.0m	15.0m

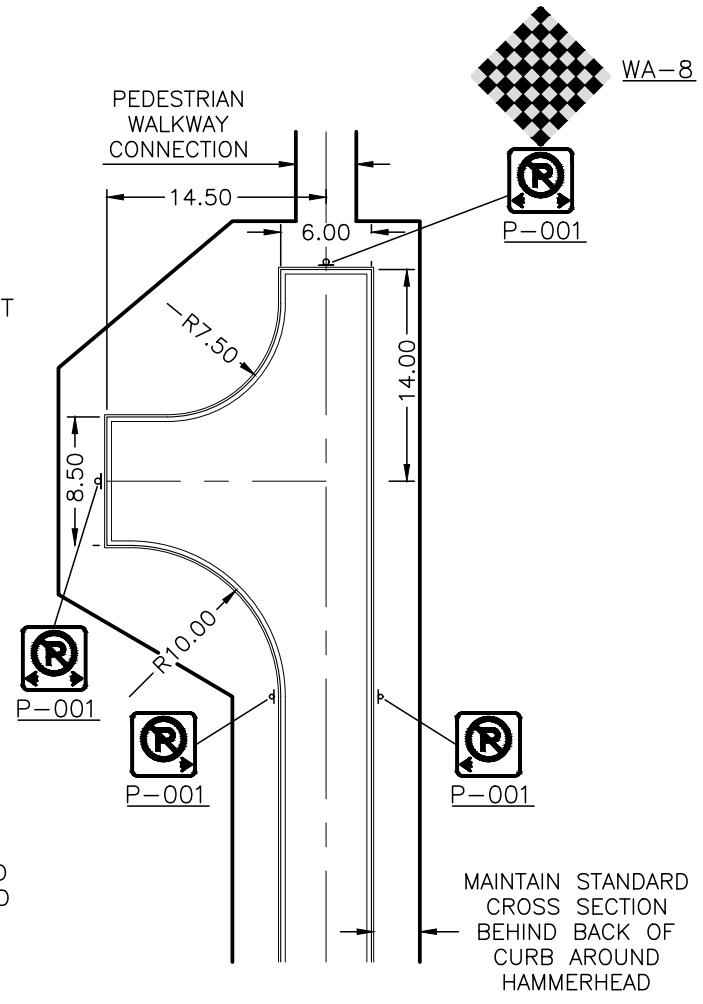
NOTES:

1. CUL-DE-SAC TURNAROUNDS ARE ONLY IMPLEMENTED ON LOCAL STREETS.
2. CUL-DE-SAC IMPLEMENTATION TO MEET BYLAW LENGTH AND NETWORK CONNECTION REQUIREMENT.
3. NEW CUL-DE-SACS ARE NOT SUPPORTED IN URBAN CENTRES
4. NO PARKING WITHIN CUL-DE-SAC.
5. SPECIAL PROVISIONS FOR CUT AND FILL SLOPES MAY BE REQUIRED BY CITY ENGINEER.
6. CUL-DE-SAC TO HAVE MINIMUM LONGITUDINAL DRAINAGE OF 0.5%.
7. RADIUS DIMENSIONS SHOWN ARE TO FACE OF CURB (150mm FROM BACK OF CURB)
8. PAVEMENT WIDTH, SIDEWALK, AND BOULEVARD AS PER ROAD CROSS SECTION.
9. ROAD DEDICATION AS PER ROAD CROSS SECTION.

STANDARD DETAIL DRAWING	DATE: JUN 22/23	CUL-DE-SAC TURNAROUND	DWG. NO.	 City of Kelowna
	SCALE: NTS		SS-R53	



HAMMERHEAD



MODIFIED HAMMERHEAD

NOTES:

1. CITY PREFERENCE IS FOR CUL-DE-SAC. HAMMERHEAD TURNAROUND IS ONLY TO BE USED IN HILLSIDE ZONES UPON DEMONSTRATED NEED WHERE TOPOGRAPHICAL CONSTRAINTS ARE PRESENT AND AS APPROVED BY THE CITY ENGINEER.
2. PAVEMENT WIDTH AS PER ROAD CROSS SECTION.
3. ROAD DEDICATION AND FRONTAGE IMPROVEMENTS AS PER ROAD CROSS SECTION.
4. DIMENSIONS ARE ALL IN METRES UNLESS OTHERWISE NOTED.
5. DIMENSIONS ARE TO FACE OF CURB (150mm FROM BACK OF CURB).

**STANDARD
DETAIL
DRAWING**

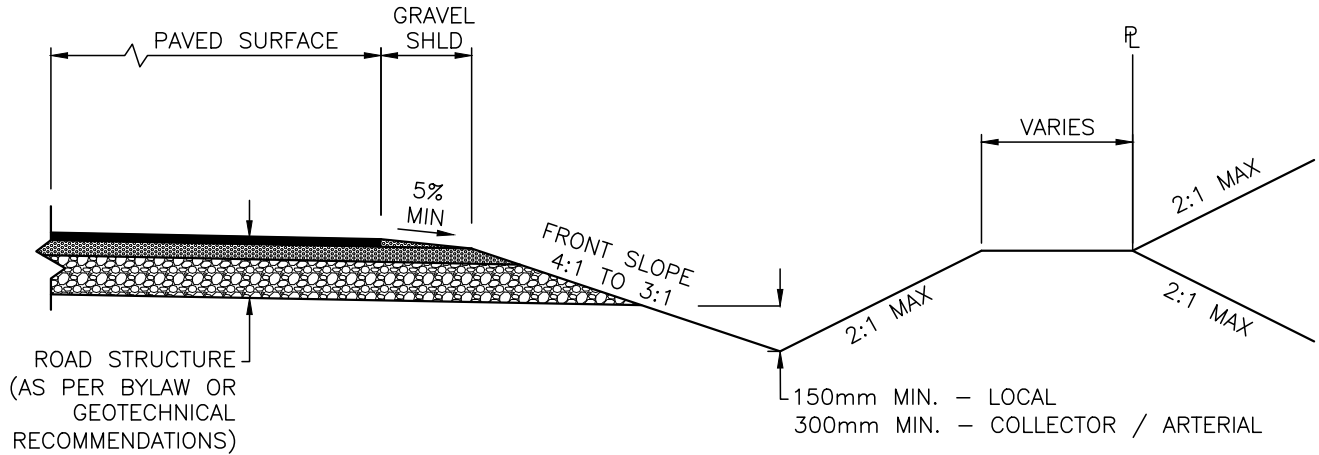
DATE:
JUN 22/23
SCALE:
NTS

HAMMERHEAD TURNAROUND

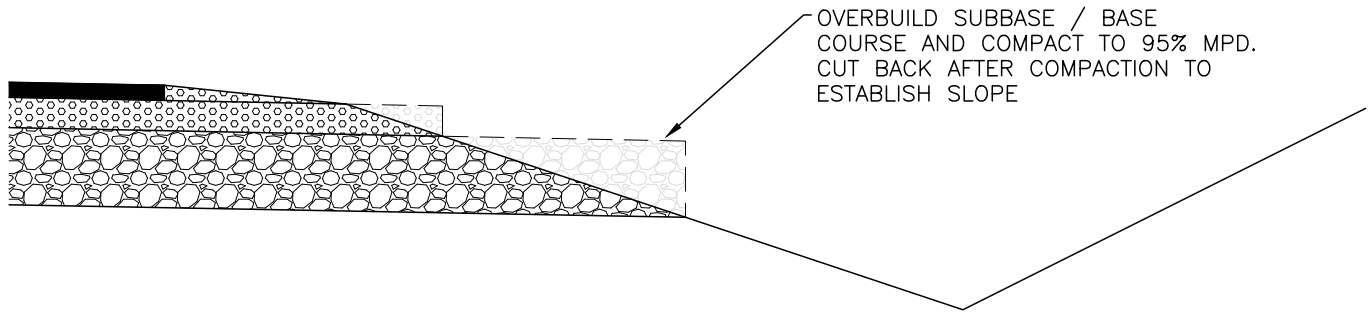
DWG. NO.

SS-R54





TYPICAL DITCH SECTION



OVERBUILD DETAIL

NOTES:

1. WHERE THE CROSS SLOPE IS STEEPER THAN 4:1, ENGINEERING ANALYSIS IS REQUIRED WITH CONSIDERATION OF TAC GEOMETRIC DESIGN GUIDE FOR CANADIAN ROAD CHAPTER 7 AND MOTI BC SUPPLEMENT.
2. 2:1 SLOPES CAN BE CONSIDERED ON LOW VOLUME ROAD UPON DEMONSTRATED NEED AS PER TAC CHAPTER 7, IF APPROVED BY THE CITY ENGINEER

**STANDARD
DETAIL
DRAWING**

DATE:
SEPT 23/22
SCALE:
NTS

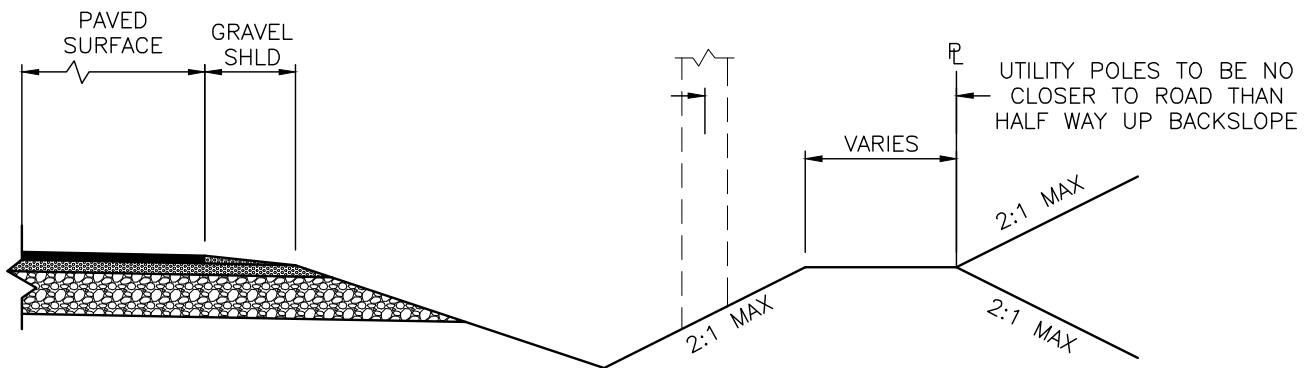
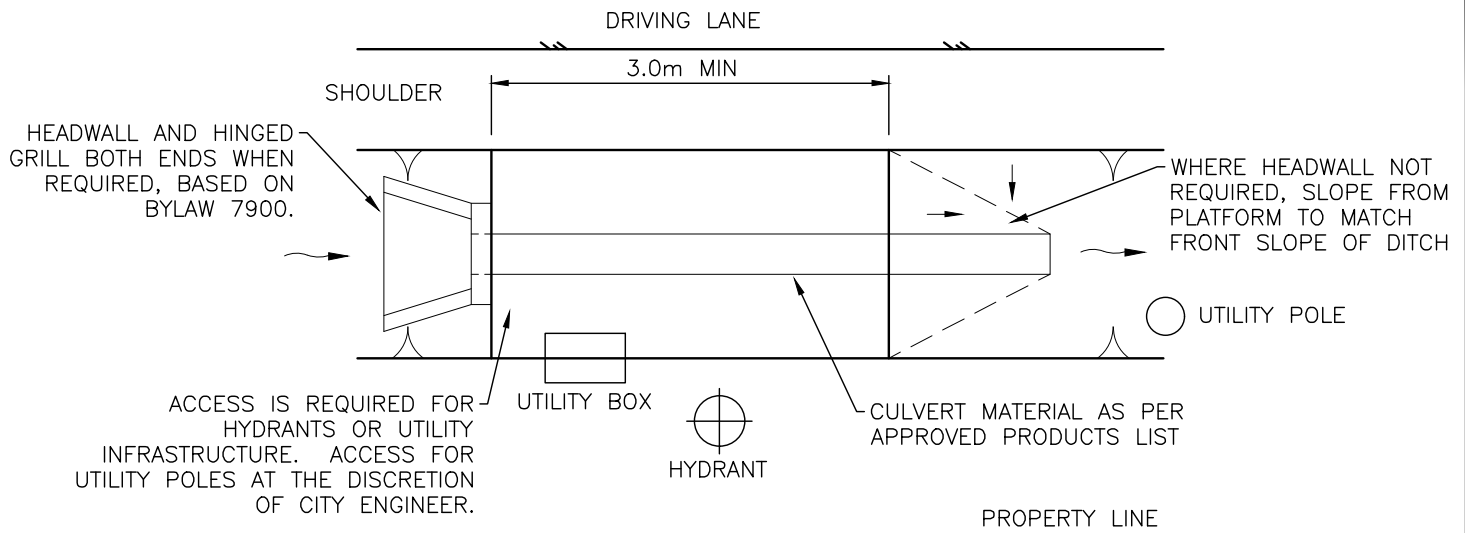
STANDARD DITCH SECTION

DWG. NO.

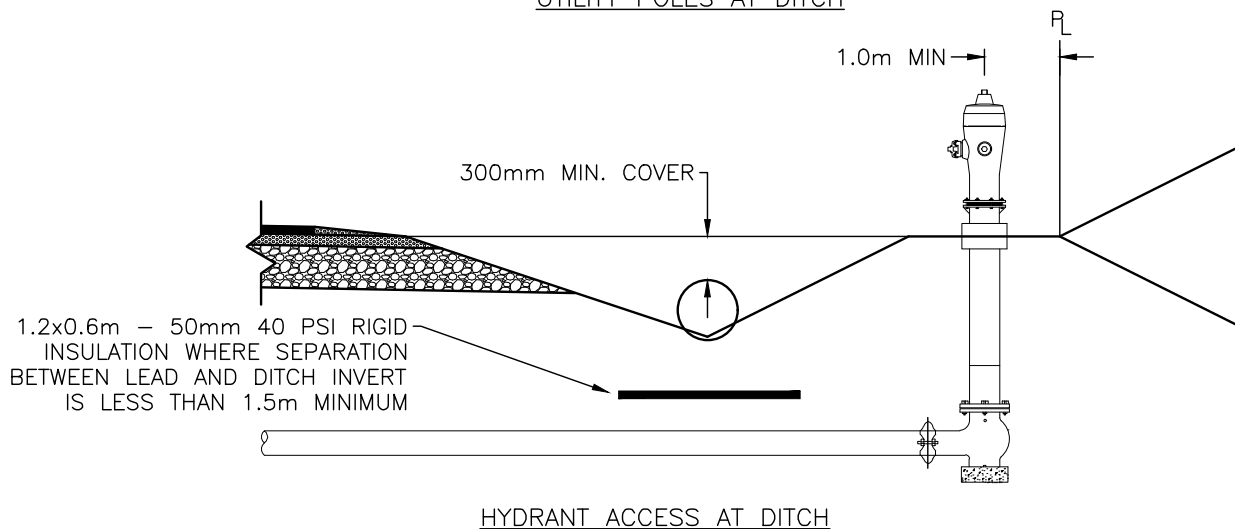
SS-R55



BYLAW NOTE



UTILITY POLES AT DITCH



NOTES:

1. REFER TO DRAWING SS-R55 FOR TYPICAL DITCH SECTION DETAILS.

**STANDARD
DETAIL
DRAWING**

DATE:
SEPT 23 /22

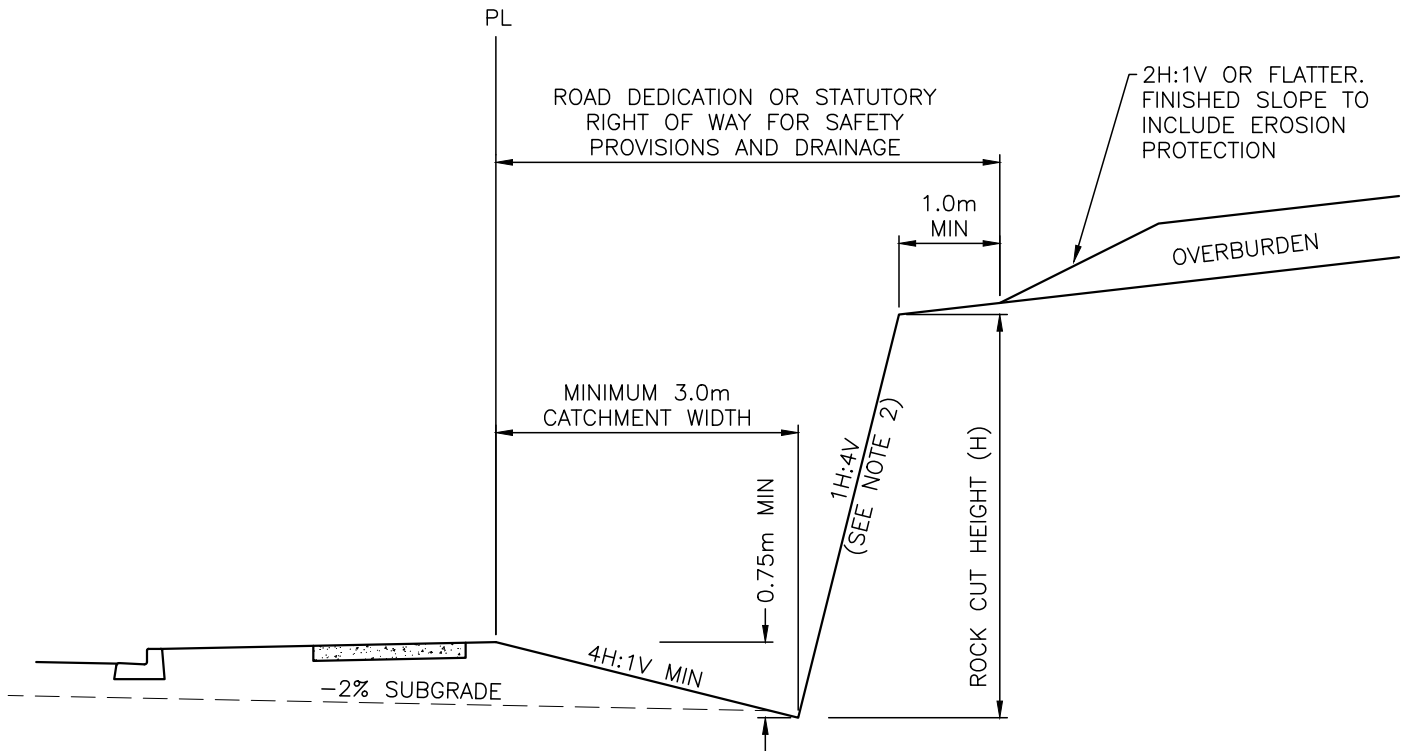
SCALE:
NTS

**UTILITY ACCESS AND
LOCATION AT DITCH**

DWG. NO.

SS-R56

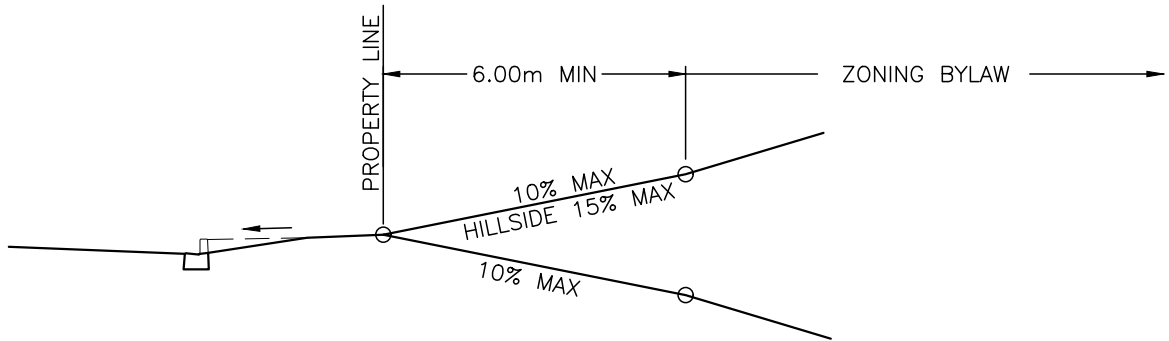




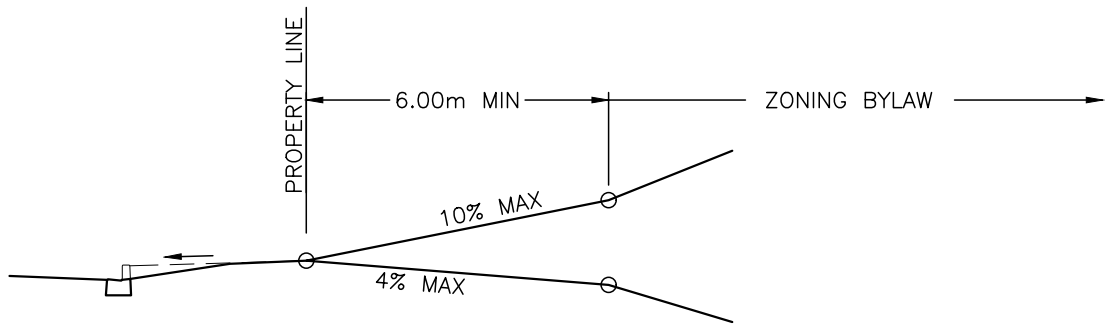
NOTES:

1. SITE SPECIFIC GEOTECHNICAL DESIGN REQUIRED FOR ALL ROCK CUT HEIGHTS GREATER THAN 4m AND WHERE GEOHAZARDS EXIST.
2. A VERTICAL BACKSLOPE MAY BE USED IF APPROVED BY THE GEOTECHNICAL DESIGN. MINIMUM CATCHMENT WIDTH WOULD THEN BE INCREASED BASED ON THE ROCK CUT HEIGHT (I.E. 3.0m + 25% OF ROCK CUT HEIGHT (H)), OR AS DIRECTED BY GEOTECHNICAL DESIGN.
3. DRAINAGE COLLECTION PROVISIONS TO BE ADDRESSED FOR CATCHMENT AREA.
4. GROUNDWATER SEEPAGE WITHIN OVERBURDEN, IF ANY, MUST BE ADDRESSED BY GEOTECHNICAL ENGINEERING DESIGN

STANDARD DETAIL DRAWING	DATE: JUN 22/23	ROCK CUT CROSS SECTION	DWG. NO.	 City of Kelowna
	SCALE: NTS		SS-R57	



GROUND-ORIENTED
INFILL HOUSING / SINGLE & TWO DWELLING



COMMERCIAL / MULTI-DWELLING

NOTES:

1. MAXIMUM GRADE CHANGE AT ANY TRANSITION POINT 12% OR AS PER K-VALUE IN TABLE 4.4.1 SCHEDULE 4 SECTION 4.

**STANDARD
DETAIL
DRAWING**

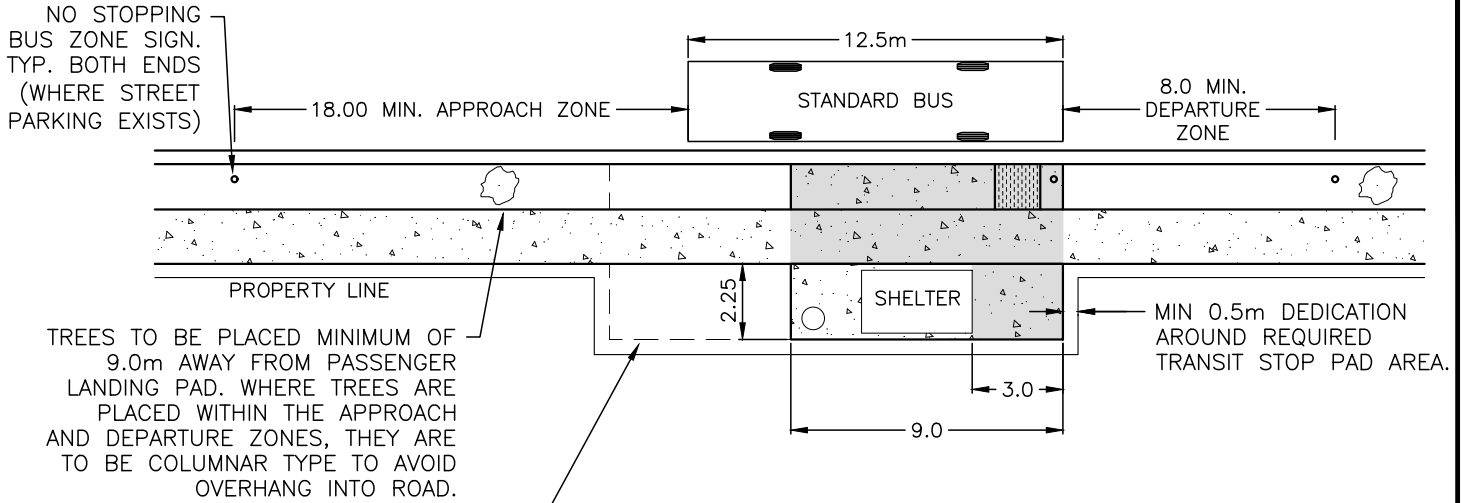
DATE:
OCT 31 /22
SCALE:
NTS

DRIVEWAY GRADES

DWG. NO.

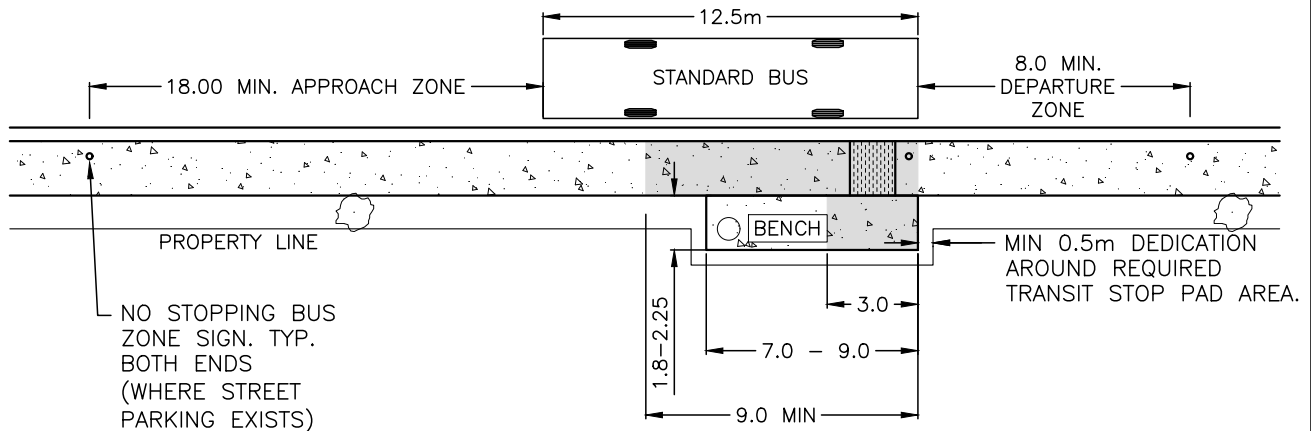
SS-R58





SHELTER GENERAL LAYOUT

WHERE ARTICULATED BUSES ARE USED OR PLANNED FOR USE ON TRANSIT ROUTE, PASSENGER LANDING PAD TO BE INCREASED TO 15m AND SHELTER PAD TO BE INCREASED TO MIN. 10m MAX. 15m



BENCH GENERAL LAYOUT

NOTES:

1. ALL DIMENSIONS ARE IN METRES UNLESS SPECIFIED OTHERWISE.
2. THIS DRAWING IS INTENDED TO BE USED AS A GENERAL DESIGN GUIDANCE, SITE SPECIFIC DESIGN IS REQUIRED.
3. REFER TO ADDITIONAL DETAILS AND INFORMATION IN THE BC TRANSIT INFRASTRUCTURE DESIGN SUMMARY AND CONSULT CITY ENGINEER.
4. BOULEVARD AND SIDEWALK AS PER STANDARD CROSS SECTIONS.
5. IN RURAL AREAS, AS REQUIRED BY CITY ENGINEER, STOP REQUIREMENTS AS PER BC TRANSIT GUIDANCE FOR RURAL BUS STOP PADS.
6. ON ARTERIAL AND COLLECTOR ROADS WHERE BOULEVARD IS >3.5m, SHELTER PAD COULD BE ACCOMMODATED IN BOULEVARD IF IT DOES NOT BLOCK PEDESTRIAN FACILITY
7. IF NO SHELTER AND BENCH WARRANTED AS PER TABLE 4.13.2 SCHEDULE 4 SECTION 4, CONSTRUCT STOP AS PER GENERAL BENCH LAYOUT WITHOUT BENCH.

CLEAR ZONE FREE OF OBSTRUCTIONS

**STANDARD
DETAIL
DRAWING**

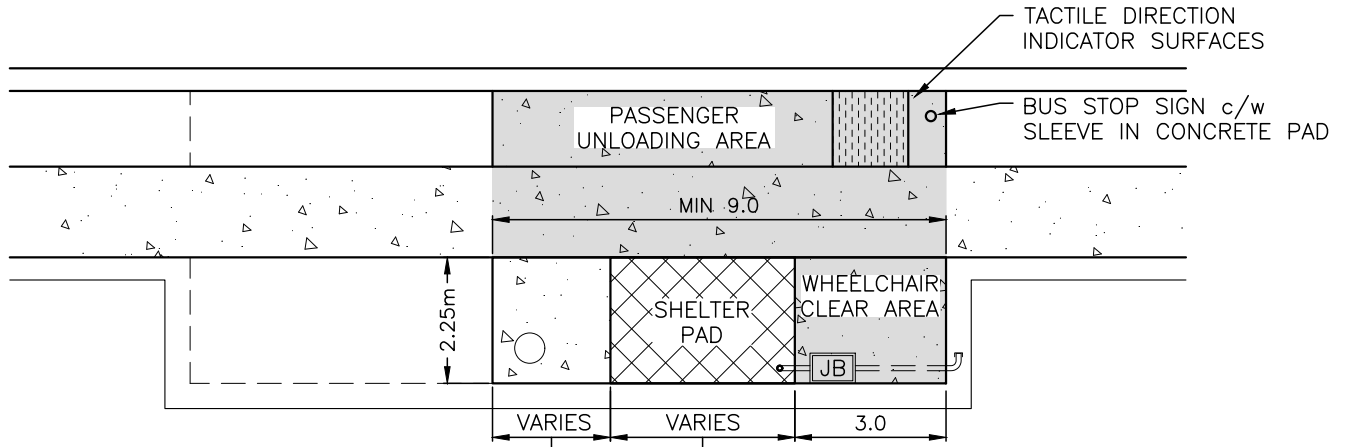
DATE:
OCT 31/22
SCALE:
NTS

**URBAN TRANSIT
STOP LAYOUT**

DWG. NO.

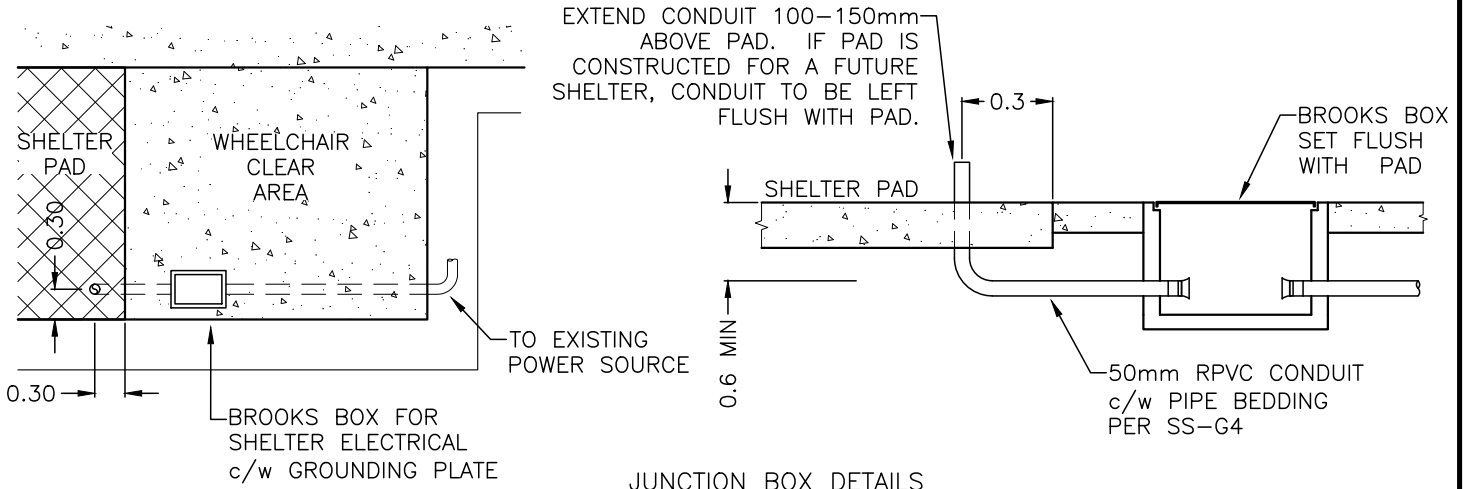
SS-R59



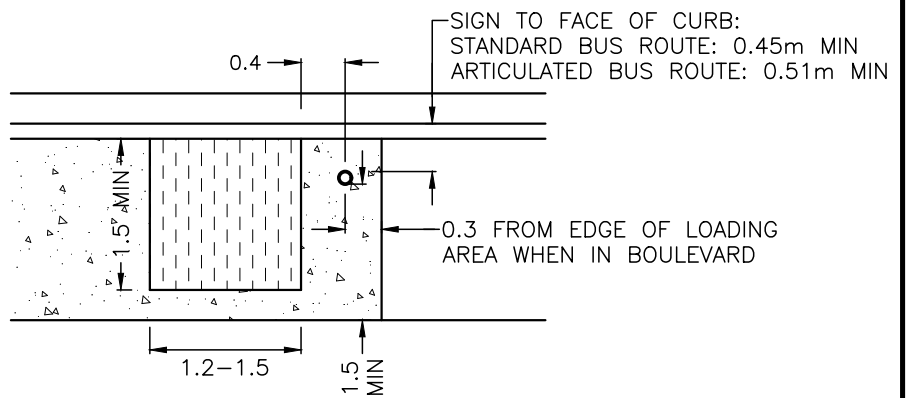


AREA FOR STREET FURNITURE
(GARBAGE BIN, ETC.)

REINFORCED CONCRETE PAD FOR SHELTER.
MODEL SPECIFIC FOUNDATION DESIGN IS
REQUIRED. CONSULT WITH CITY ENGINEER.



JUNCTION BOX DETAILS



TACTILE SURFACE INDICATOR/TRANSIT SIGN LOCATION

NOTES:

1. ALL DIMENSIONS ARE IN METRES UNLESS SPECIFIED OTHERWISE.
2. THIS DRAWING IS INTENDED TO BE USED AS A GENERAL DESIGN GUIDANCE, SITE SPECIFIC DESIGN IS REQUIRED.

**STANDARD
DETAIL
DRAWING**

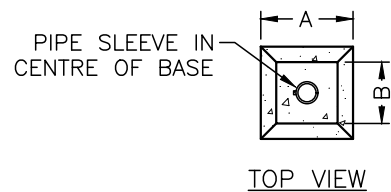
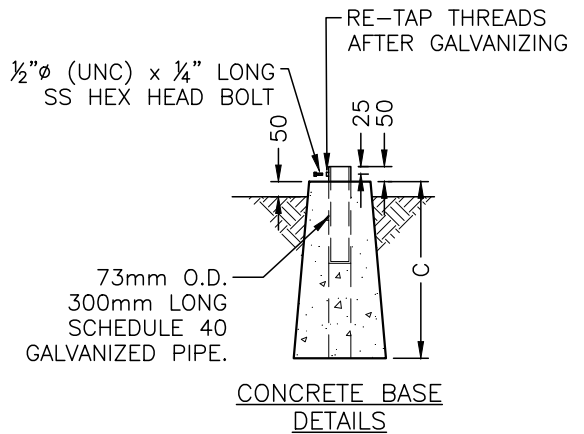
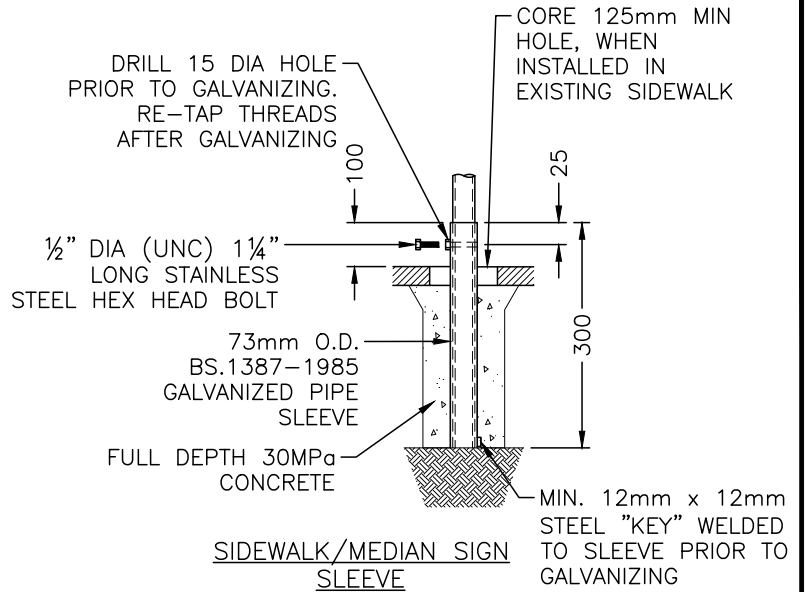
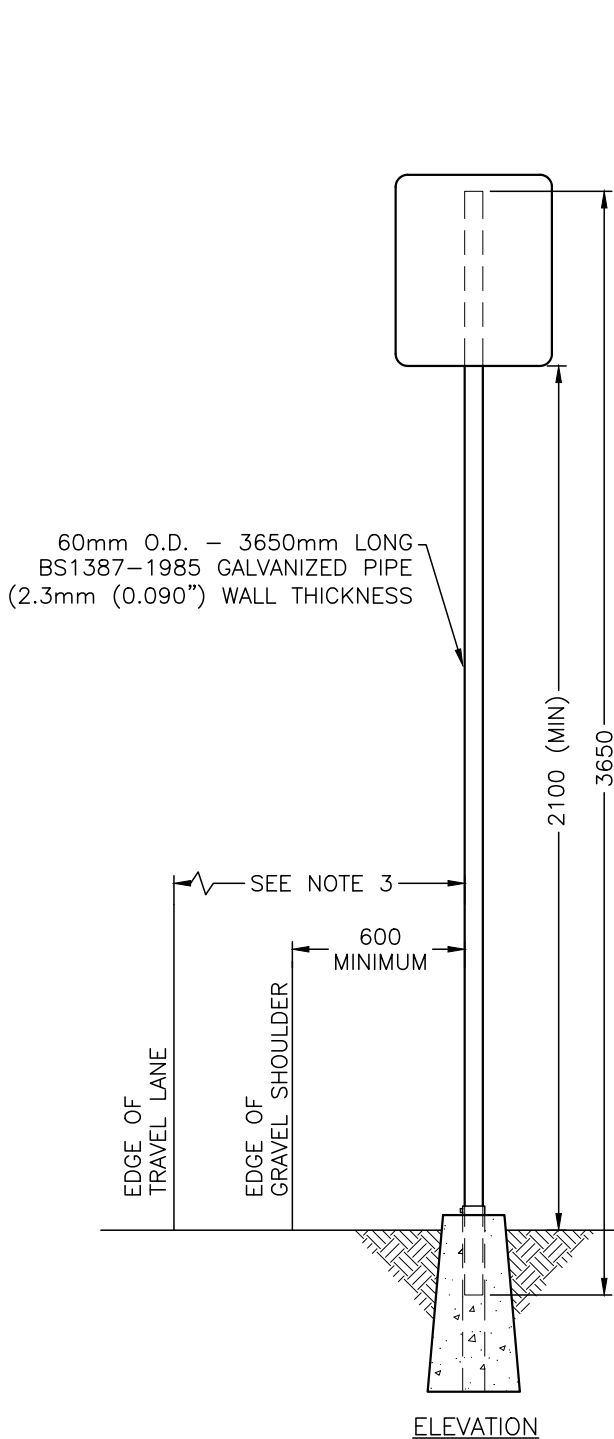
DATE:
SEPT 23/22
SCALE:
NTS

**URBAN TRANSIT STOP
SHELTER PAD DETAILS**

DWG. NO.

SS-R60





NOTES:

1. DETAIL IS FOR SINGLE POST SIGNS.
2. ALL DIMENSIONS IN MILLIMETRES UNLESS OTHERWISE NOTED.
3. HORIZONTAL CLEARANCES BASED ON DESIGN SPEEDS UP TO 60 km/h AS PER SECTION 4.15 IN BYLAW 7900. FOR HIGHER SPEED ROADS REFER TO TAC TRANSPORTATION ASSOCIATION OF CANADA ROADSIDE DESIGN.
4. SIGN SLEEVE TO BE PLACED PRIOR TO SIDEWALK POUR, OR TO BE CORED IN AFTER. FOR EXISTING SIDEWALK CORE MINIMUM 125mm HOLE IN SIDEWALK, SUB-EXCAVATE AND FILL WITH CONCRETE AROUND SLEEVE.

CONCRETE BASE					
APPLICATION	A mm	B mm	C mm	APPROX. MASS	VOLUME OF CONCRETE
GRAVEL SHOULDER OR HIGHWAY	305	203	584	85 kg	0.05m ³
PAVED SHOULDER OR LANDSCAPE	229	152	457	37 kg	0.02m ³

**STANDARD
DETAIL
DRAWING**

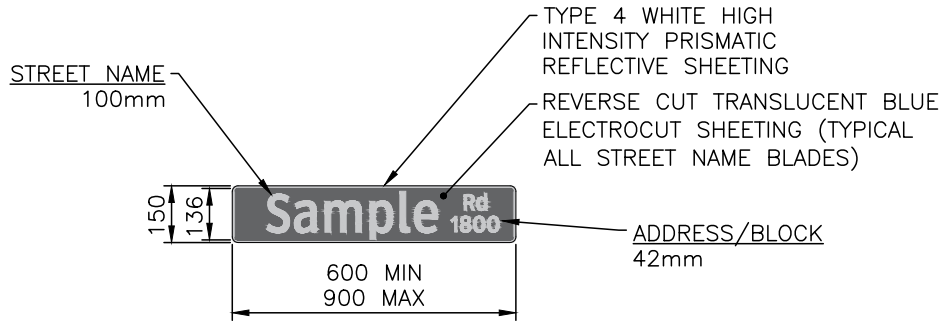
DATE:
OCT 31/22
SCALE:
NTS

POST MOUNTED SIGN

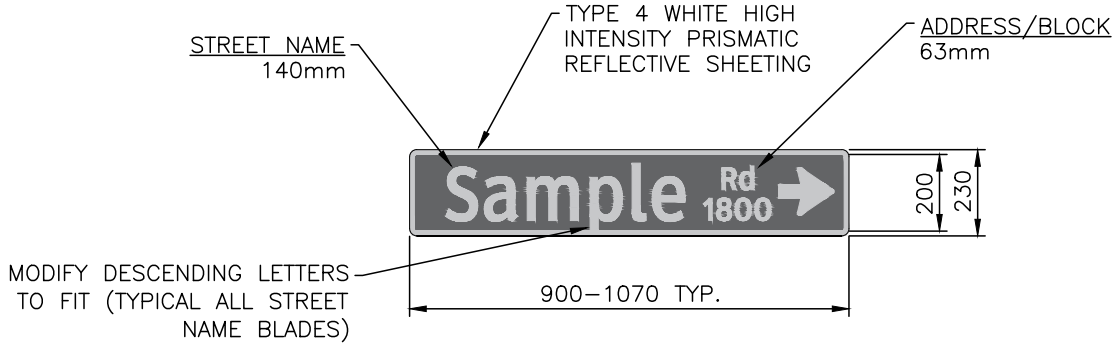
DWG. NO.

SS-R61

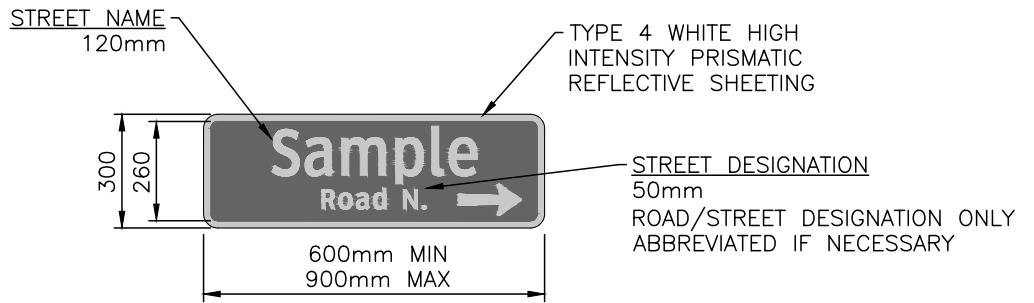




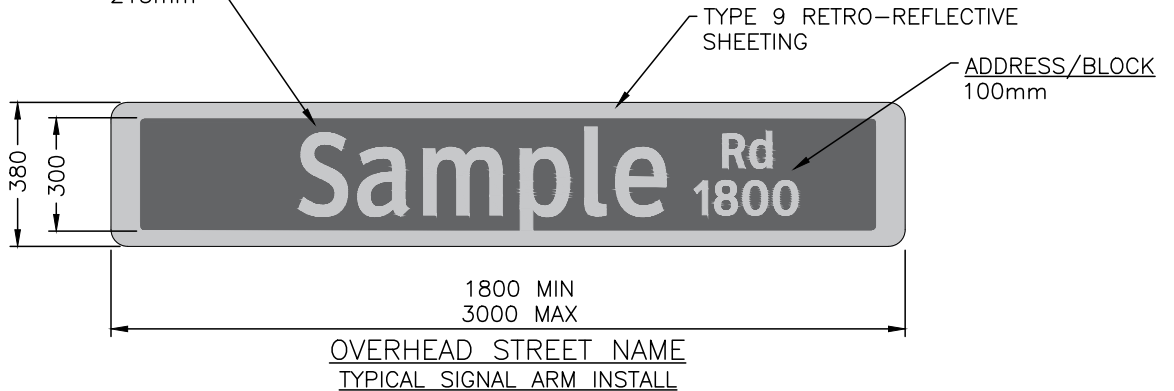
STANDARD STREET NAME BLADE



OVERSIZE STREET NAME BLADE
HIGH SPEED/VOLUME MULTI LANE ROUTES



ADVANCE STREET NAME BLADE



OVERHEAD STREET NAME
TYPICAL SIGNAL ARM INSTALL

**STANDARD
DETAIL
DRAWING**

DATE:
JULY 11/22
SCALE:
NTS

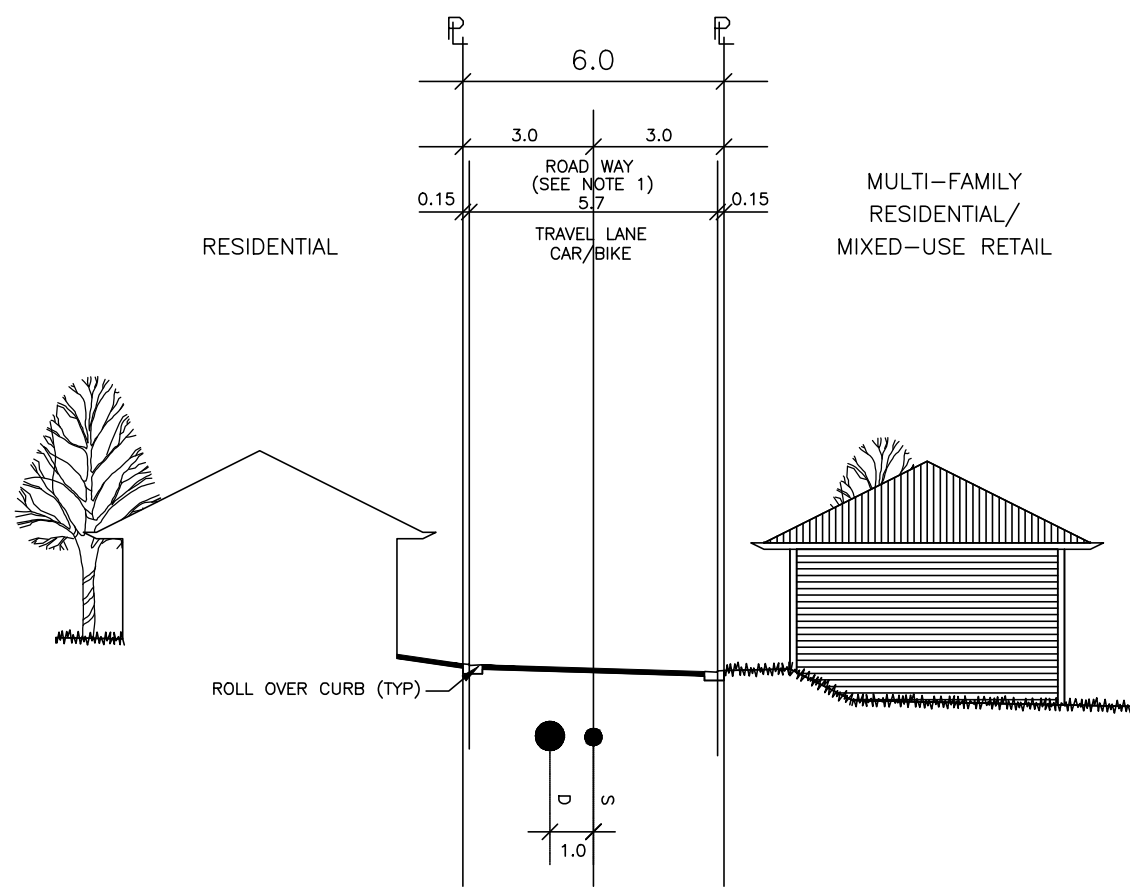
STREET NAME BLADE DETAILS

DWG. NO.

SS-R62



HILLSIDE ZONE STANDARDS



NOTE:

1. WHERE SINGLE FAMILY ABUTS BOTH SIDES, TRAVEL LANE MAY BE REDUCED TO 4.5M. IN THIS CASE, BOULEVARDS MUST BE TREATED WITH A LOW PROFILE, WEED FREE, AUTO ACCESSIBLE SURFACE. GRAVEL BASES TO EXTEND TO FULL WIDTH OF ROW (6.0M).
2. AT THE RECOMMENDATION OF THE CITY ENGINEER, THE APPROVING OFFICER MAY REQUIRE SPECIAL PROVISIONS OR ADDITIONAL ROW FOR THE ROAD TO BE ADEQUATELY SUPPORTED, PROTECTED, OR DRAINED.

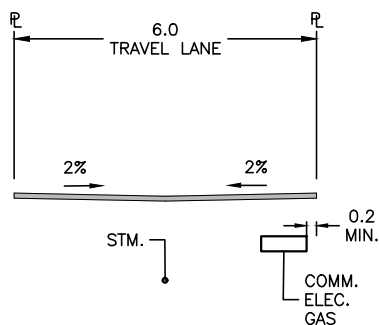
**STANDARD
DETAIL
DRAWING**

DATE:
JULY 4/23
SCALE:
NTS

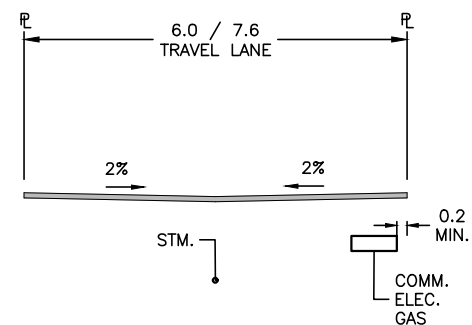
HILLSIDE LANEWAY

DWG. NO.
XS-R01





SUBURBAN



CORE AREA / URBAN CENTRE

NOTES:

1. NO NEW INFRASTRUCTURE SHALL BE INSTALLED SUCH THAT IN ENCROACHES INTO THE LANEWAY, THEREBY REDUCING THE EFFECTIVE WIDTH OR FUNCTION OF THE LANEWAY
2. IF AN INDUSTRIAL LANEWAY IS REQUIRED IT MUST BE DESIGNED TO ACCOMMODATE THE ANTICIPATED DESIGN VEHICLE.
3. AT THE RECOMMENDATION OF THE CITY ENGINEER, THE APPROVING OFFICER MAY REQUIRE SPECIAL PROVISIONS OR ADDITIONAL ROW FOR THE ROAD TO BE ADEQUATELY SUPPORTED, PROTECTED, OR DRAINED.
4. REFER TO SCHEDULE 4, TABLE 4.3.1, NOTE 12 TO DETERMINE THE APPROPRIATE CORE AREA LANE WIDTH.

**STANDARD
DETAIL
DRAWING**

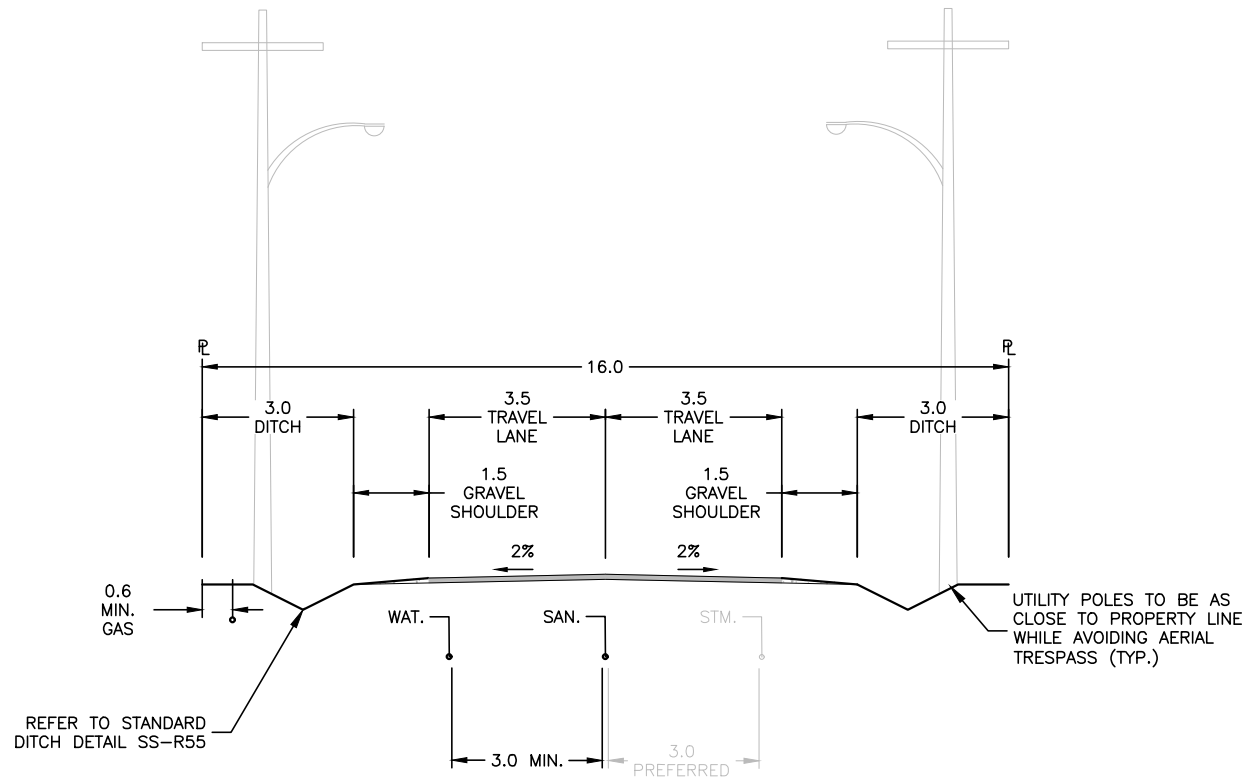
DATE:
JULY 4/23
SCALE:
NTS

**SUBURBAN / CORE AREA / URBAN CENTRE
LANEWAYS**

DWG. NO.

XS-R02





REFER TO STANDARD DITCH DETAIL SS-R55

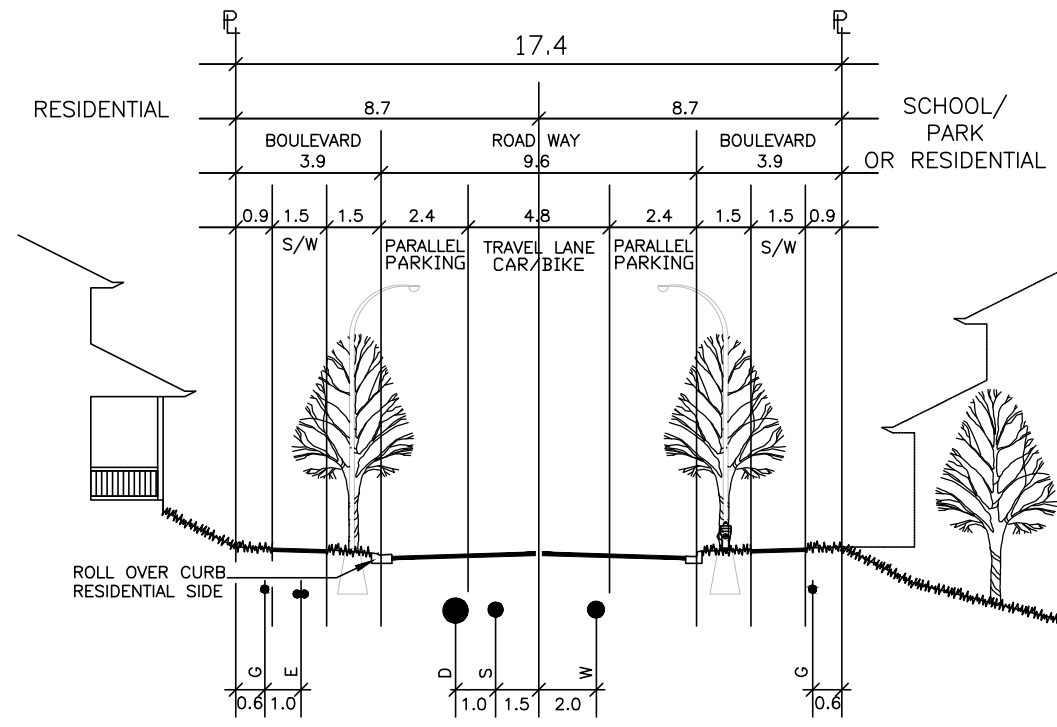
UTILITY POLES TO BE AS CLOSE TO PROPERTY LINE WHILE AVOIDING AERIAL TRESPASS (TYP.)

NOTES:

1. AT THE RECOMMENDATION OF THE CITY ENGINEER, THE APPROVING OFFICER MAY REQUIRE SPECIAL PROVISIONS OR ADDITIONAL ROW FOR THE ROAD TO BE ADEQUATELY SUPPORTED, PROTECTED, OR DRAINED.

STANDARD DETAIL DRAWING	DATE: JULY 4/23	RURAL LOCAL	DWG. NO.	
	SCALE: NTS		XS-R20	

HILLSIDE ZONE STANDARDS



NOTES:

1. AT THE RECOMMENDATION OF THE CITY ENGINEER, THE APPROVING OFFICER MAY REQUIRE SPECIAL PROVISIONS OR ADDITIONAL ROW FOR THE ROAD TO BE ADEQUATELY SUPPORTED, PROTECTED, OR DRAINED.

**STANDARD
DETAIL
DRAWING**

DATE:
JULY 4/23
SCALE:
NTS

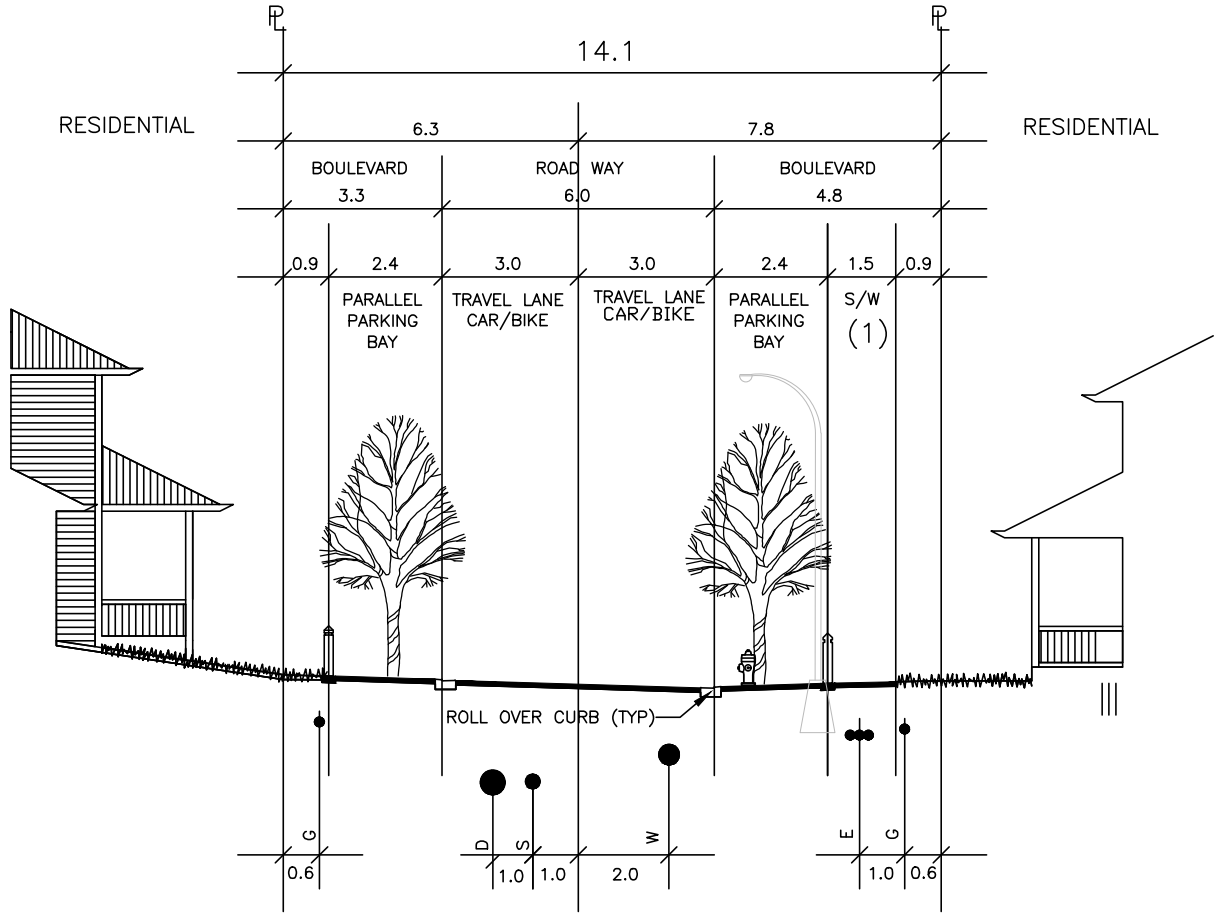
HILLSIDE VILLAGE LOCAL-RESIDENTIAL

DWG. NO.

XS-R21



HILLSIDE ZONE STANDARDS

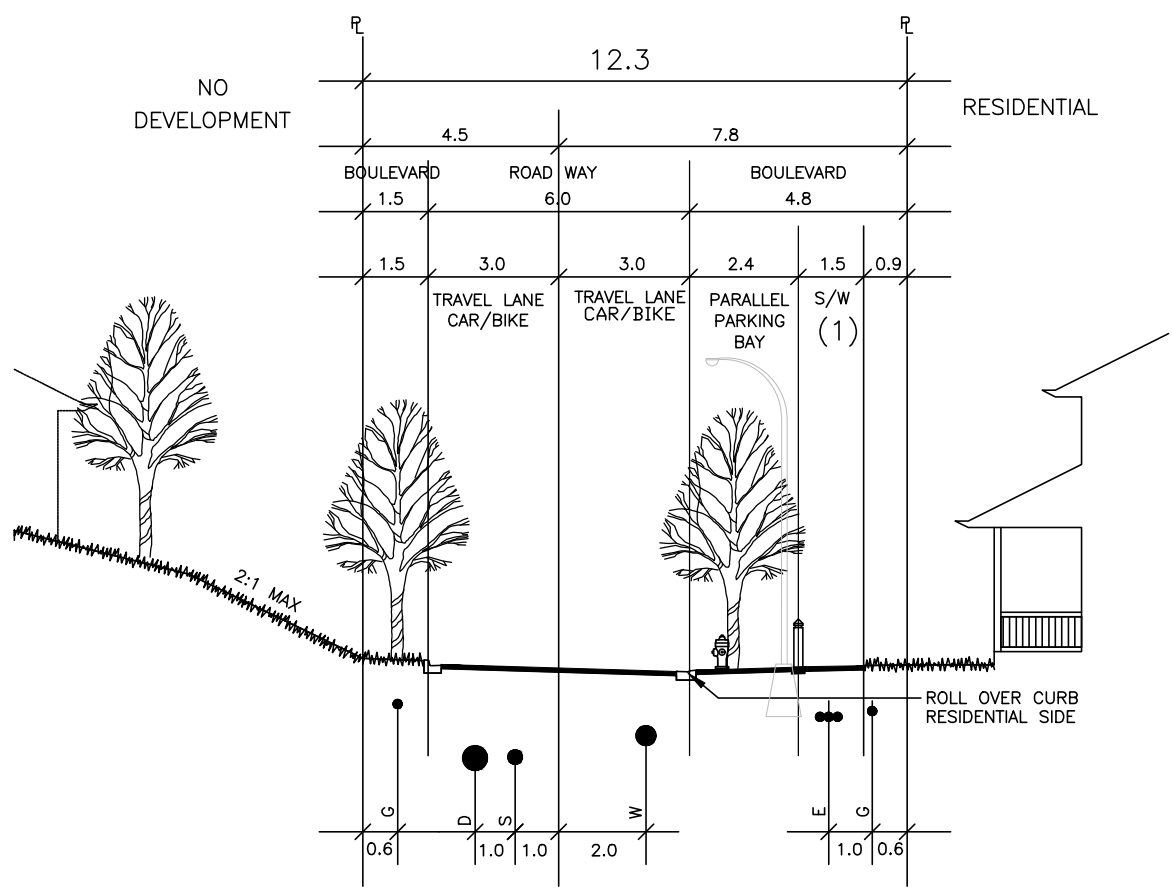


NOTES:

1. UNLESS NECESSARY FOR PEDESTRIAN CONNECTIVITY TO SCHOOLS, PARKS, COMMERCIAL AREAS OR LANDS BEYOND, A SIDEWALK IS NOT REQUIRED FOR LOCAL STREETS ACCESSING 30 LOTS OR LESS. THE STREET ROW WIDTH MAY BE REDUCED ACCORDINGLY IF SIDEWALK IS NOT REQUIRED.
2. AT THE RECOMMENDATION OF THE CITY ENGINEER, THE APPROVING OFFICER MAY REQUIRE SPECIAL PROVISIONS OR ADDITIONAL ROW FOR THE ROAD TO BE ADEQUATELY SUPPORTED, PROTECTED, OR DRAINED.

STANDARD DETAIL DRAWING	DATE: JULY 4/23	HILLSIDE LOCAL-CONDITION A (DEVELOPMENT BOTH SIDES)	DWG. NO.	
	SCALE: NTS		XS-R22	

HILLSIDE ZONE STANDARDS

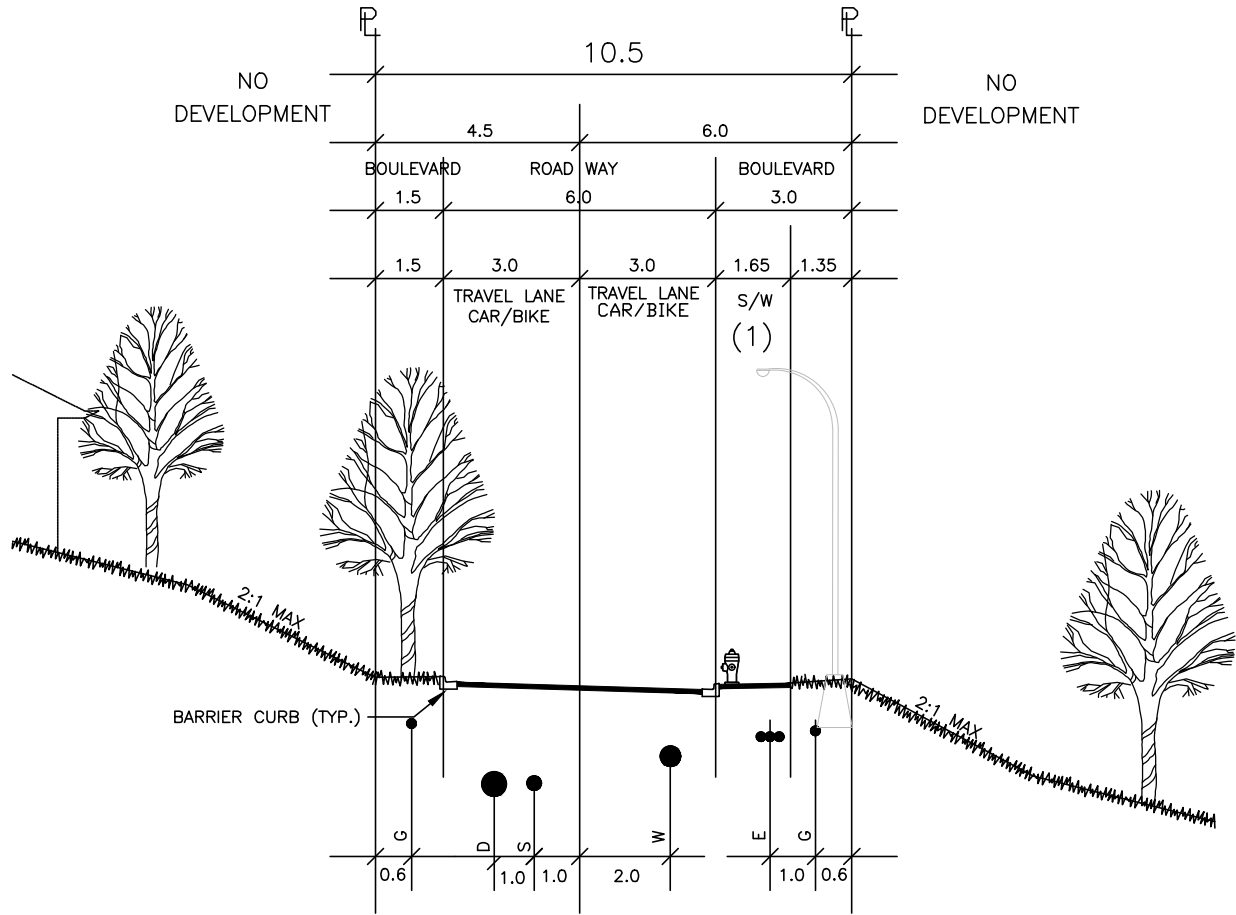


NOTES:

1. UNLESS NECESSARY FOR PEDESTRIAN CONNECTIVITY TO SCHOOLS, PARKS, COMMERCIAL AREAS OR LANDS BEYOND, A SIDEWALK IS NOT REQUIRED FOR LOCAL STREETS ACCESSING 30 LOTS OR LESS. THE STREET ROW WIDTH MAY BE REDUCED ACCORDINGLY IF SIDEWALK IS NOT REQUIRED.
2. AT THE RECOMMENDATION OF THE CITY ENGINEER, THE APPROVING OFFICER MAY REQUIRE SPECIAL PROVISIONS OR ADDITIONAL ROW FOR THE ROAD TO BE ADEQUATELY SUPPORTED, PROTECTED, OR DRAINED.

STANDARD DETAIL DRAWING	DATE: JULY 4/23	HILLSIDE LOCAL CONDITION B (DEVELOPMENT ONE SIDE)	DWG. NO.	
	SCALE: NTS		XS-R23	

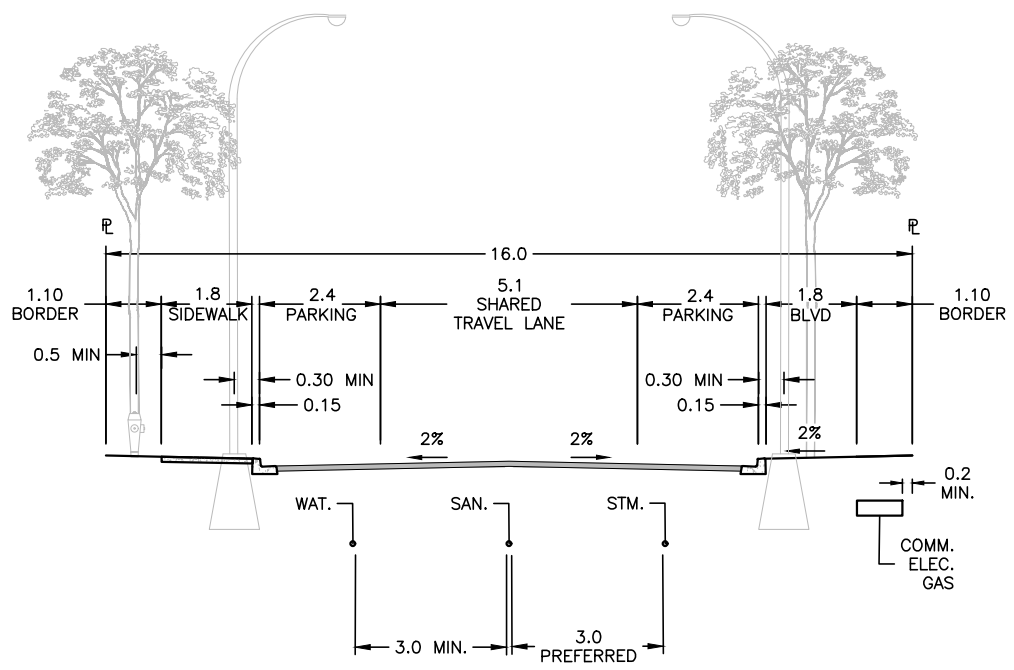
HILLSIDE ZONE STANDARDS



NOTES:

1. UNLESS NECESSARY FOR PEDESTRIAN CONNECTIVITY TO SCHOOLS, PARKS, COMMERCIAL AREAS OR LANDS BEYOND, A SIDEWALK IS NOT REQUIRED FOR LOCAL STREETS ACCESSING 30 LOTS OR LESS.
2. AT THE RECOMMENDATION OF THE CITY ENGINEER, THE APPROVING OFFICER MAY REQUIRE SPECIAL PROVISIONS OR ADDITIONAL ROW FOR THE ROAD TO BE ADEQUATELY SUPPORTED, PROTECTED, OR DRAINED.

<p>STANDARD DETAIL DRAWING</p>	DATE: JULY 4/23	<p>HILLSIDE LOCAL CONDITION C (NO DEVELOPMENT EITHER SIDE)</p>	DWG. NO.	
	SCALE: NTS		<p>XS-R24</p>	



NOTES:

1. AT THE RECOMMENDATION OF THE CITY ENGINEER, THE APPROVING OFFICER MAY REQUIRE SPECIAL PROVISIONS OR ADDITIONAL ROW FOR THE ROAD TO BE ADEQUATELY SUPPORTED, PROTECTED, OR DRAINED.

**STANDARD
DETAIL
DRAWING**

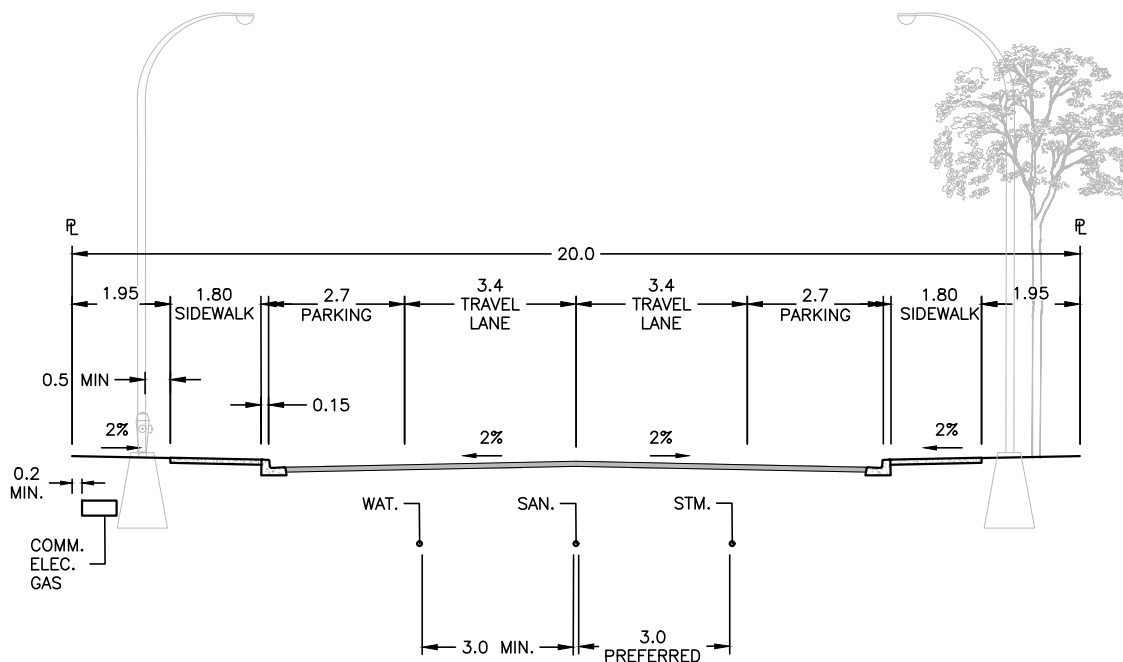
DATE:
JULY 4/23
SCALE:
NTS

**SUBURBAN
LOCAL**

DWG. NO.

XS-R25





NOTES:

1. AT THE RECOMMENDATION OF THE CITY ENGINEER, THE APPROVING OFFICER MAY REQUIRE SPECIAL PROVISIONS OR ADDITIONAL ROW FOR THE ROAD TO BE ADEQUATELY SUPPORTED, PROTECTED, OR DRAINED.
2. SEPARATED SIDEWALK PLACED 0.3M OFF PL IS REQUIRED DEPENDING ON SURROUNDING LAND USE AND PEDESTRIAN CONNECTIONS AT THE CITY ENGINEER'S DISCRETION.

**STANDARD
DETAIL
DRAWING**

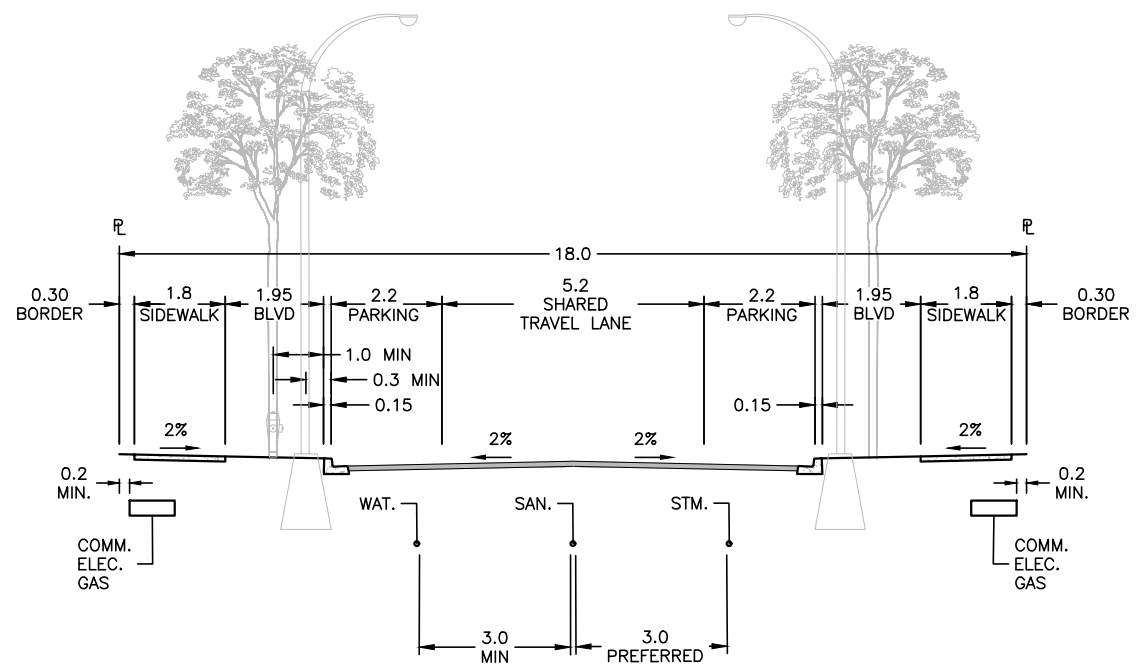
DATE:
JULY 4/23
SCALE:
NTS

**INDUSTRIAL
LOCAL**

DWG. NO.

XS-R26





NOTES:

1. AT THE RECOMMENDATION OF THE CITY ENGINEER, THE APPROVING OFFICER MAY REQUIRE SPECIAL PROVISIONS OR ADDITIONAL ROW FOR THE ROAD TO BE ADEQUATELY SUPPORTED, PROTECTED, OR DRAINED.

**STANDARD
DETAIL
DRAWING**

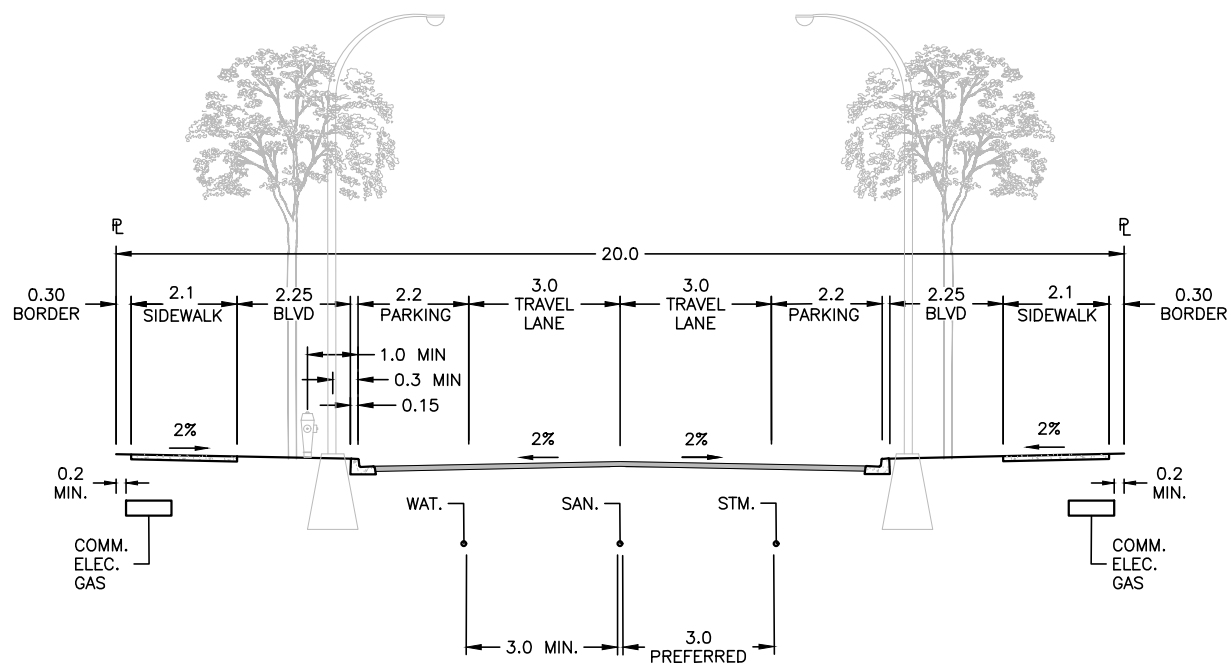
DATE:
JULY 4/23
SCALE:
NTS

**CORE AREA
LOCAL**

DWG. NO.

XS-R27





NOTES:

1. AT THE RECOMMENDATION OF THE CITY ENGINEER, THE APPROVING OFFICER MAY REQUIRE SPECIAL PROVISIONS OR ADDITIONAL ROW FOR THE ROAD TO BE ADEQUATELY SUPPORTED, PROTECTED, OR DRAINED.

**STANDARD
DETAIL
DRAWING**

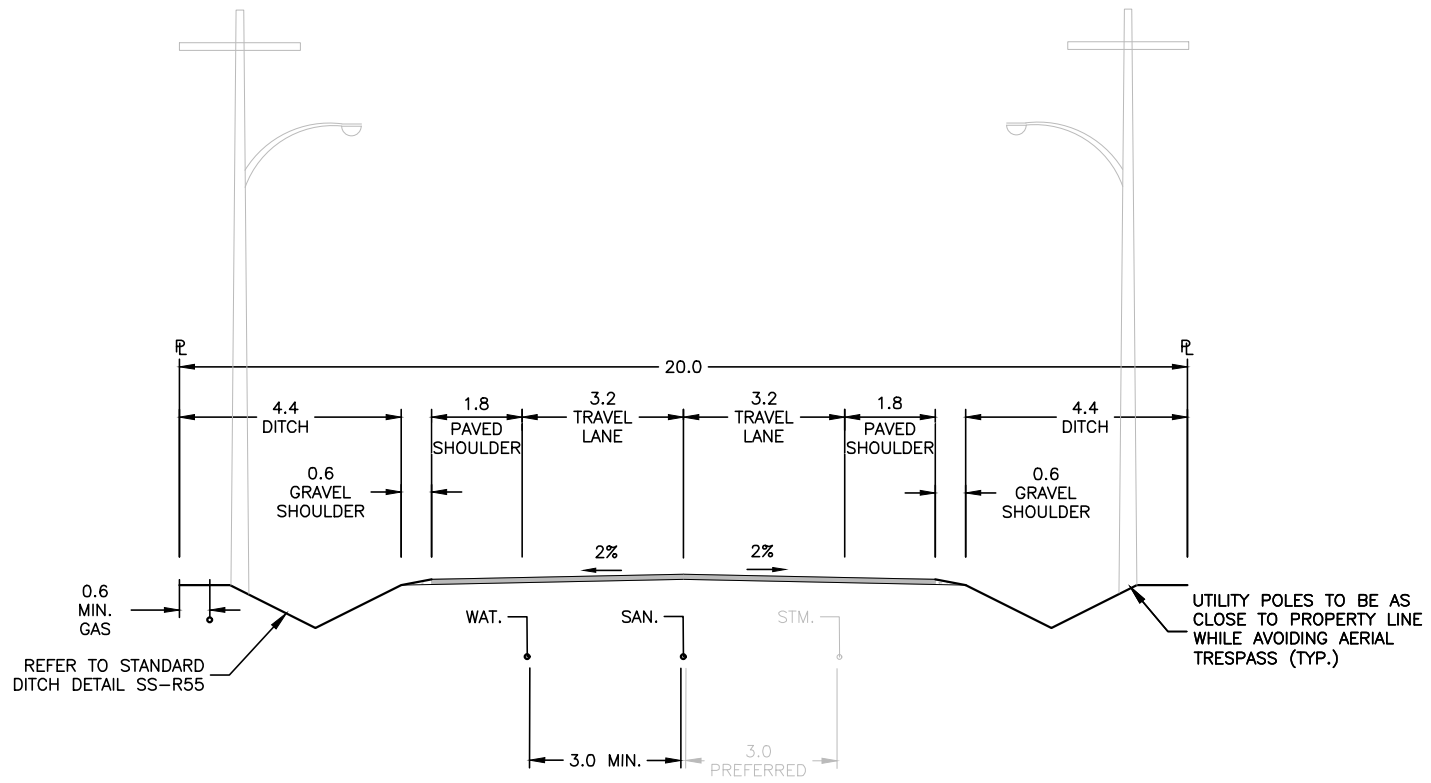
DATE:
JULY 4/23
SCALE:
NTS

**URBAN CENTRE
LOCAL**

DWG. NO.

XS-R28





NOTES:

1. AT THE RECOMMENDATION OF THE CITY ENGINEER, THE APPROVING OFFICER MAY REQUIRE SPECIAL PROVISIONS OR ADDITIONAL ROW FOR THE ROAD TO BE ADEQUATELY SUPPORTED, PROTECTED, OR DRAINED.

**STANDARD
DETAIL
DRAWING**

DATE:
JULY 4/23
SCALE:
NTS

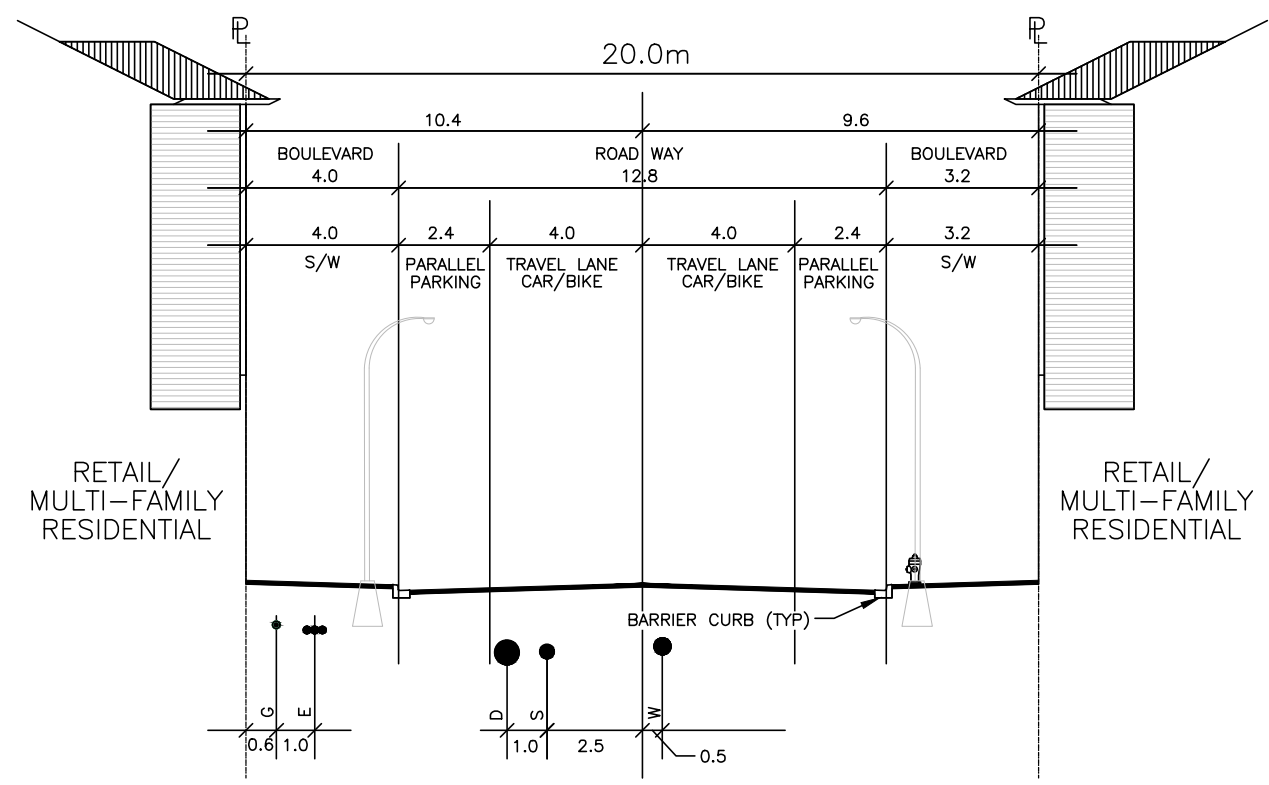
**RURAL
COLLECTOR**

DWG. NO.

XS-R40



HILLSIDE ZONE STANDARDS

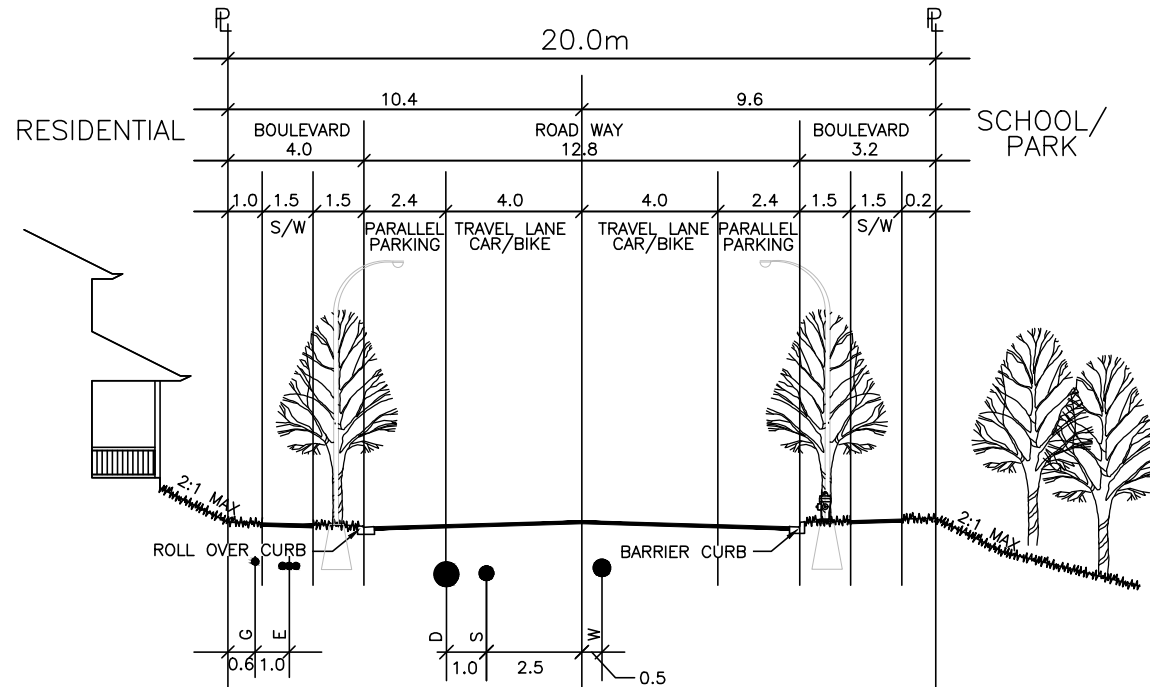


NOTES:

1. AT THE RECOMMENDATION OF THE CITY ENGINEER, THE APPROVING OFFICER MAY REQUIRE SPECIAL PROVISIONS OR ADDITIONAL ROW FOR THE ROAD TO BE ADEQUATELY SUPPORTED, PROTECTED, OR DRAINED.

STANDARD DETAIL DRAWING	DATE: JULY 4/23	HILLSIDE - VILLAGE COLLECTOR CONDITION A (RETAIL/M.F. FRONTING)	DWG. NO.	
	SCALE: NTS		XS-R41	

HILLSIDE ZONE STANDARDS



NOTES:

1. AT THE RECOMMENDATION OF THE CITY ENGINEER, THE APPROVING OFFICER MAY REQUIRE SPECIAL PROVISIONS OR ADDITIONAL ROW FOR THE ROAD TO BE ADEQUATELY SUPPORTED, PROTECTED, OR DRAINED.

**STANDARD
DETAIL
DRAWING**

DATE:
JULY 4/23
SCALE:
NTS

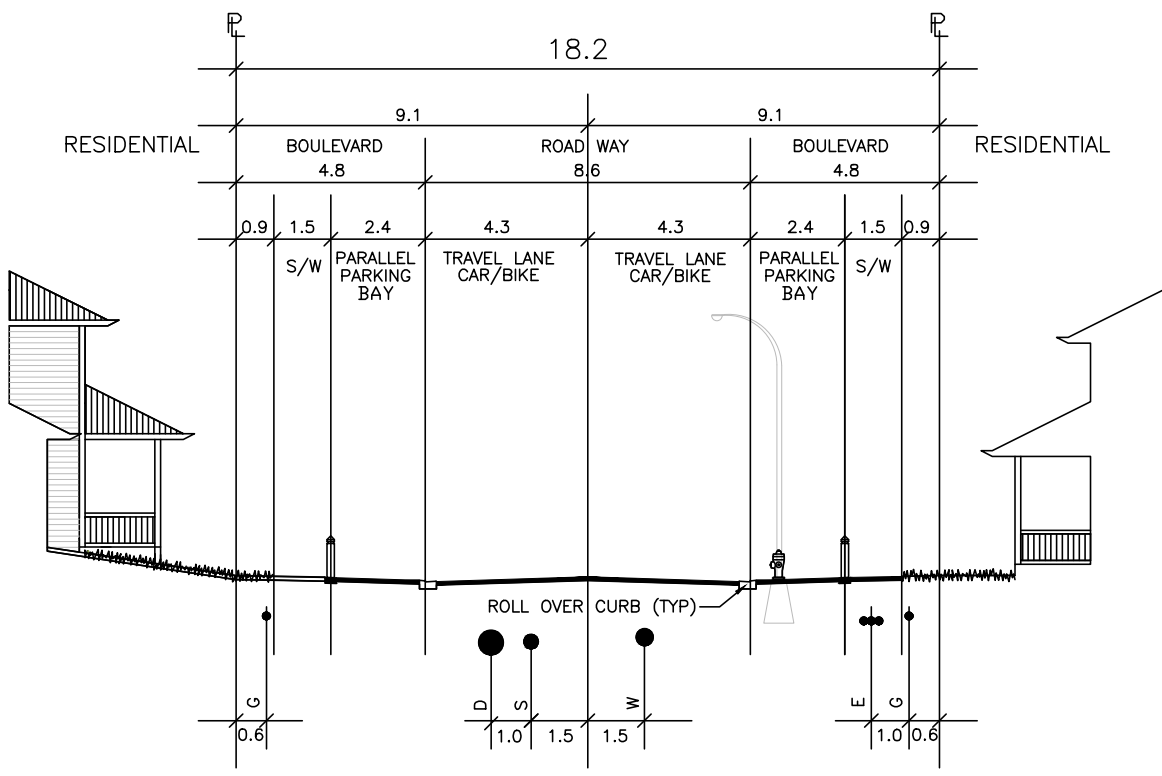
**HILLSIDE - VILLAGE COLLECTOR CONDITION B
(NO RETAIL FRONTING)**

DWG. NO.

XS-R42



HILLSIDE ZONE STANDARDS



NOTES:

1. AT THE RECOMMENDATION OF THE CITY ENGINEER, THE APPROVING OFFICER MAY REQUIRE SPECIAL PROVISIONS OR ADDITIONAL ROW FOR THE ROAD TO BE ADEQUATELY SUPPORTED, PROTECTED, OR DRAINED.

**STANDARD
DETAIL
DRAWING**

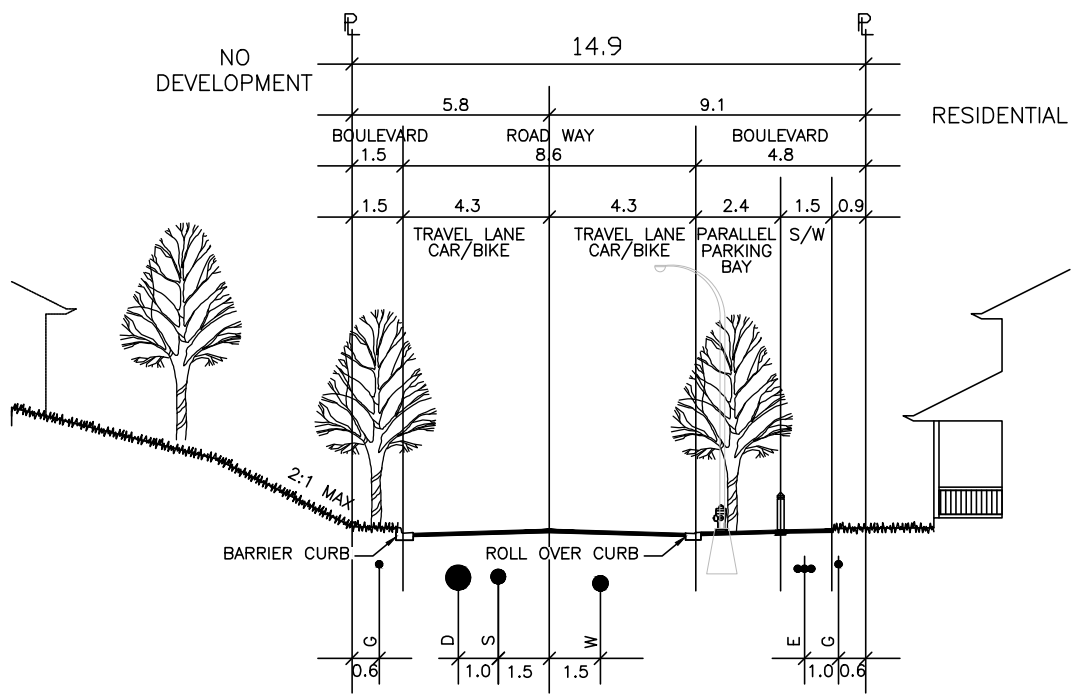
DATE:
JULY 4/23
SCALE:
NTS

HILLSIDE - COLLECTOR CONDITION-A (DEVELOPMENT BOTH SIDES)

DWG. NO.
XS-R43



HILLSIDE ZONE STANDARDS



NOTES:

1. AT THE RECOMMENDATION OF THE CITY ENGINEER, THE APPROVING OFFICER MAY REQUIRE SPECIAL PROVISIONS OR ADDITIONAL ROW FOR THE ROAD TO BE ADEQUATELY SUPPORTED, PROTECTED, OR DRAINED.

**STANDARD
DETAIL
DRAWING**

DATE:
JULY 4/23
SCALE:
NTS

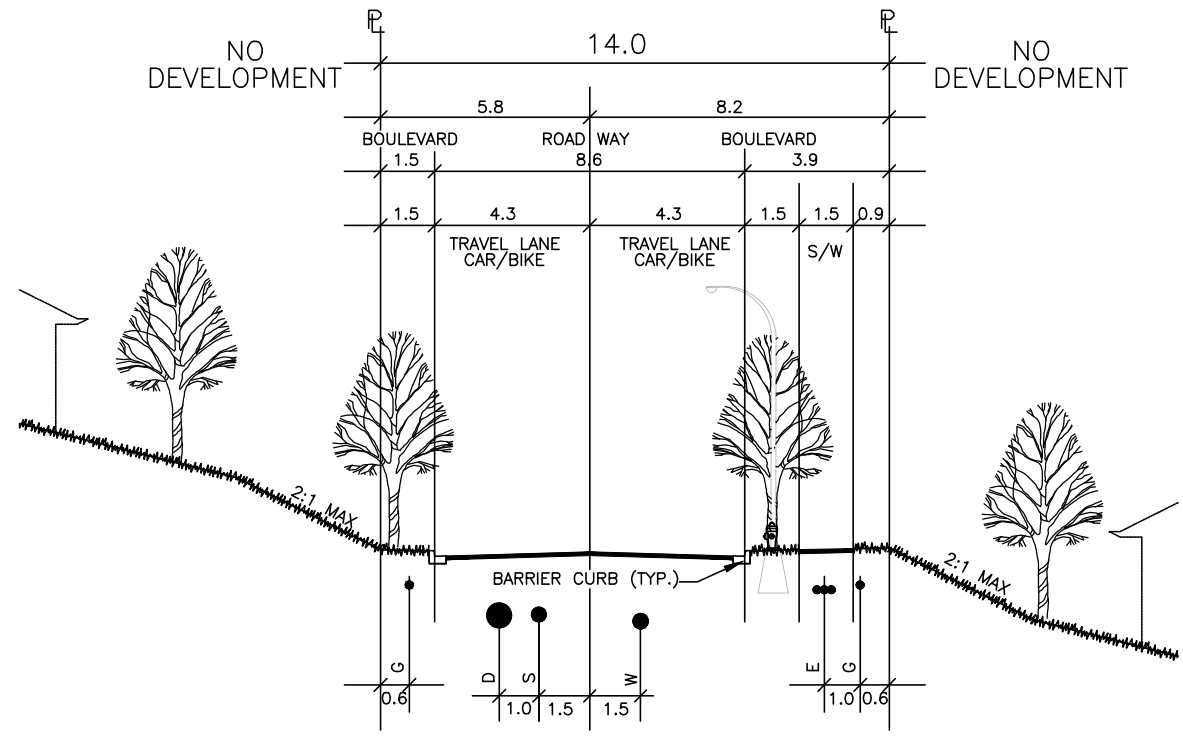
HILLSIDE - COLLECTOR CONDITION-B (DEVELOPMENT ONE SIDE)

DWG. NO.

XS-R44



HILLSIDE ZONE STANDARDS

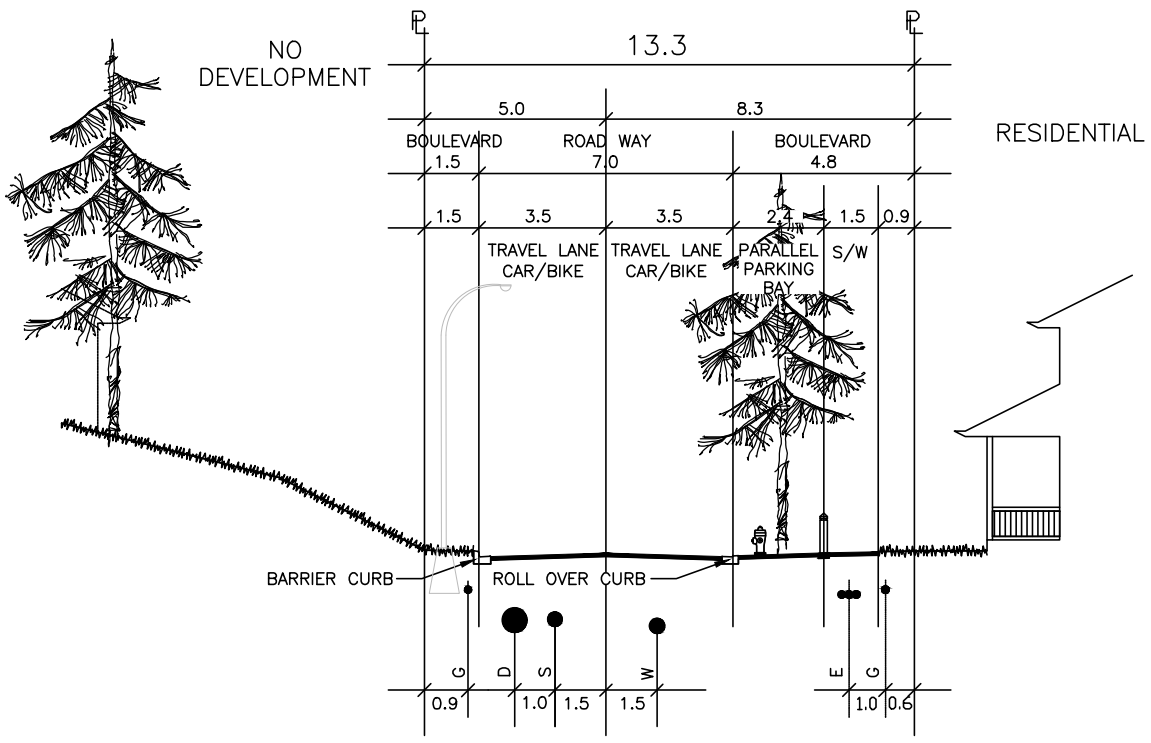


NOTES:

1. AT THE RECOMMENDATION OF THE CITY ENGINEER, THE APPROVING OFFICER MAY REQUIRE SPECIAL PROVISIONS OR ADDITIONAL ROW FOR THE ROAD TO BE ADEQUATELY SUPPORTED, PROTECTED, OR DRAINED.

<p>STANDARD DETAIL DRAWING</p>	DATE: JULY 4/23	<p>HILLSIDE - COLLECTOR CONDITION-C (NO DEVELOPMENT EITHER SIDE)</p>	DWG. NO.	
	SCALE: NTS		<p>XS-R45</p>	

HILLSIDE ZONE STANDARDS



NOTES:

1. AT THE RECOMMENDATION OF THE CITY ENGINEER, THE APPROVING OFFICER MAY REQUIRE SPECIAL PROVISIONS OR ADDITIONAL ROW FOR THE ROAD TO BE ADEQUATELY SUPPORTED, PROTECTED, OR DRAINED.

**STANDARD
DETAIL
DRAWING**

DATE:
JULY 4/23
SCALE:
NTS

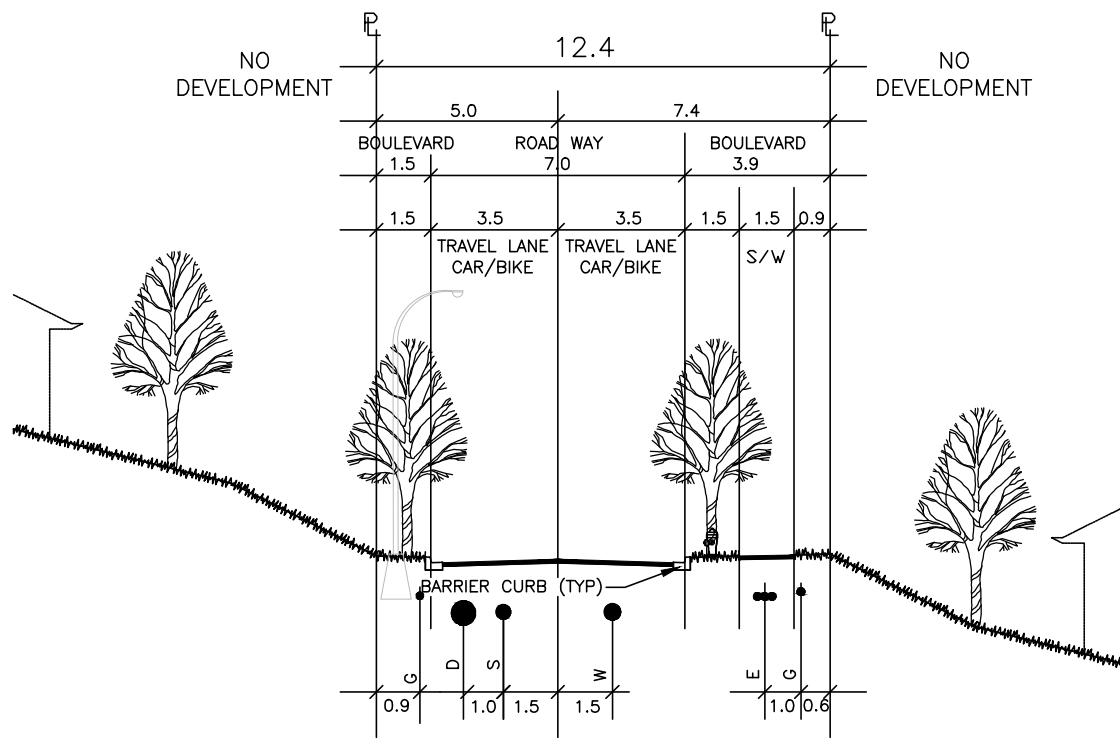
HILLSIDE - MINOR COLLECTOR CONDITION-A

DWG. NO.

XS-R46



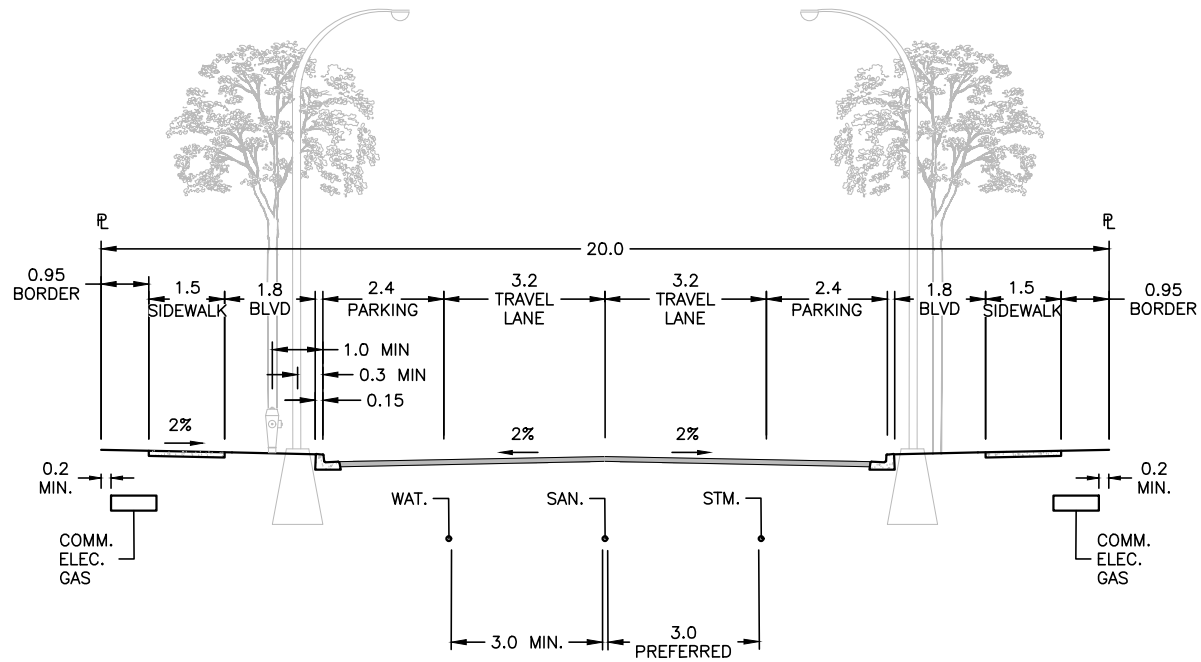
HILLSIDE ZONE STANDARDS



NOTES:

1. AT THE RECOMMENDATION OF THE CITY ENGINEER, THE APPROVING OFFICER MAY REQUIRE SPECIAL PROVISIONS OR ADDITIONAL ROW FOR THE ROAD TO BE ADEQUATELY SUPPORTED, PROTECTED, OR DRAINED.

STANDARD DETAIL DRAWING	DATE: JULY 4/23	HILLSIDE - MINOR COLLECTOR CONDITION-B	DWG. NO. XS-R47	
	SCALE: NTS			



NOTES:

1. AT THE RECOMMENDATION OF THE CITY ENGINEER, THE APPROVING OFFICER MAY REQUIRE SPECIAL PROVISIONS OR ADDITIONAL ROW FOR THE ROAD TO BE ADEQUATELY SUPPORTED, PROTECTED, OR DRAINED.
2. HYDRANT TO BE CLEAR OF SIDEWALK, AND 1.0m ZONE SURROUNDING IT.

**STANDARD
DETAIL
DRAWING**

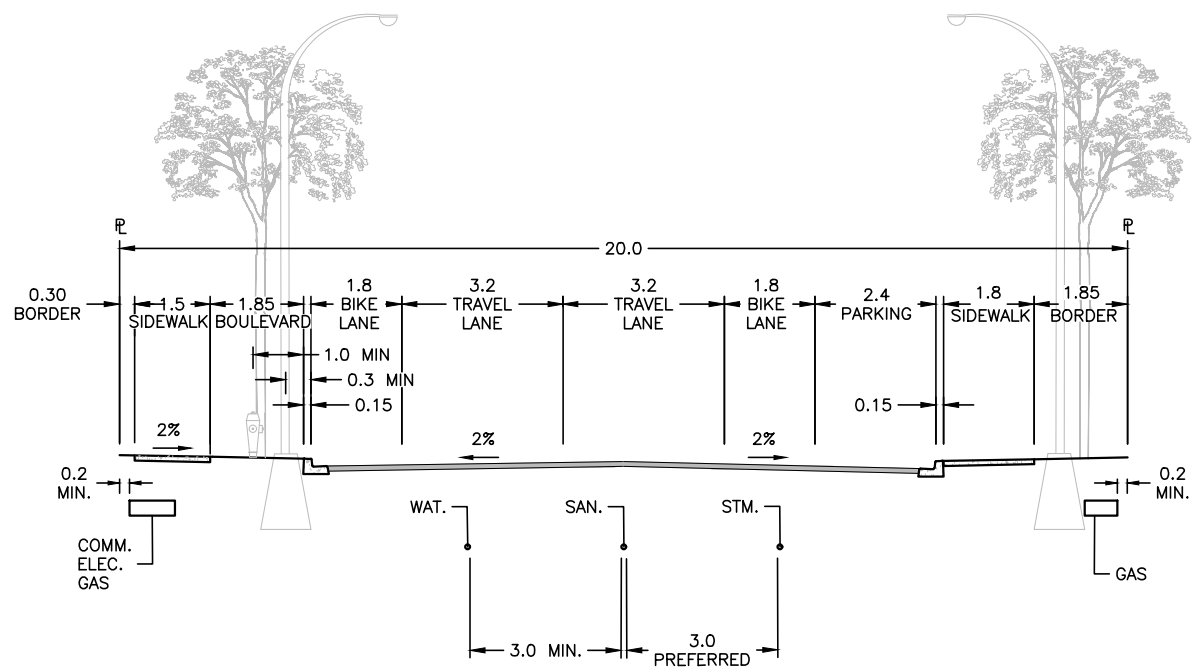
DATE:
JULY 4/23
SCALE:
NTS

**SUBURBAN
COLLECTOR**

DWG. NO.

XS-R48





NOTES:

1. AT THE RECOMMENDATION OF THE CITY ENGINEER, THE APPROVING OFFICER MAY REQUIRE SPECIAL PROVISIONS OR ADDITIONAL ROW FOR THE ROAD TO BE ADEQUATELY SUPPORTED, PROTECTED, OR DRAINED.
2. SIDEWALK MAY BE MONOLITHIC OR SEPARATED TO ACCOMMODATE SIDEWALK, SHALLOW UTILITIES, AND STREET TREES.

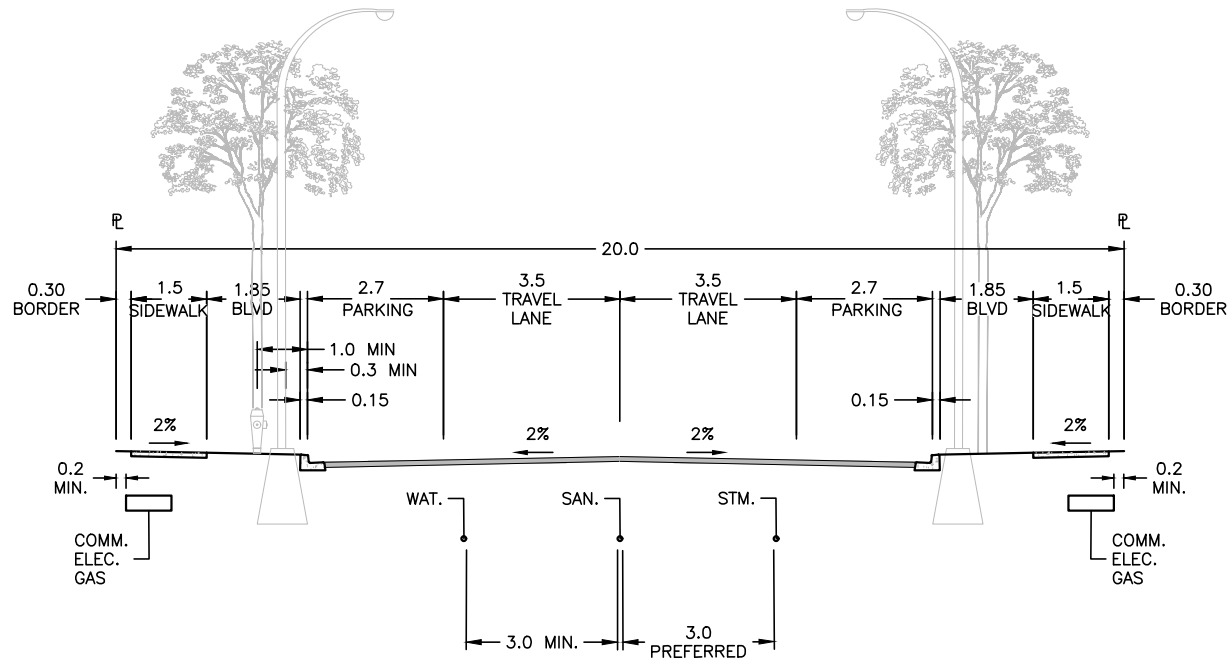
**STANDARD
DETAIL
DRAWING**

DATE:
JULY 4/23
SCALE:
NTS

**SUBURBAN
COLLECTOR (WITH BIKE LANES)**

DWG. NO.
XS-R49





NOTES:

1. AT THE RECOMMENDATION OF THE CITY ENGINEER, THE APPROVING OFFICER MAY REQUIRE SPECIAL PROVISIONS OR ADDITIONAL ROW FOR THE ROAD TO BE ADEQUATELY SUPPORTED, PROTECTED, OR DRAINED.
2. AUXILIARY LANES REQUIRED AS NECESSARY, AS PER BYLAW 7900.

**STANDARD
DETAIL
DRAWING**

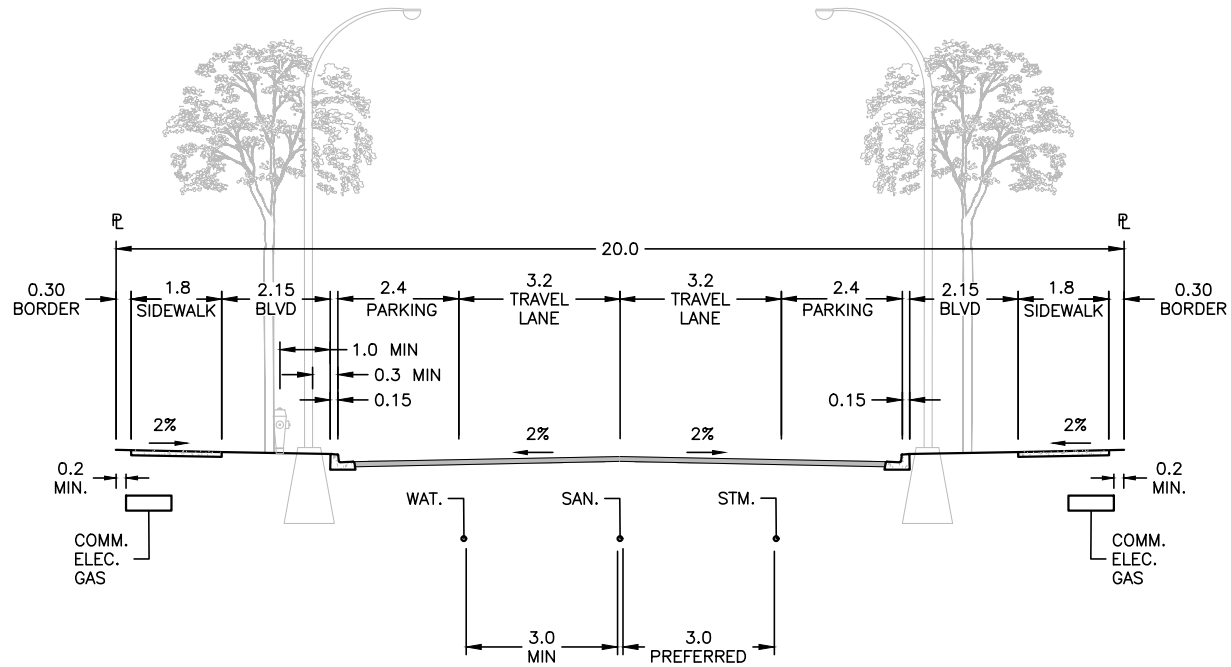
DATE:
JULY 4/23
SCALE:
NTS

**INDUSTRIAL
COLLECTOR**

DWG. NO.

XS-R50





NOTES:

1. AT THE RECOMMENDATION OF THE CITY ENGINEER, THE APPROVING OFFICER MAY REQUIRE SPECIAL PROVISIONS OR ADDITIONAL ROW FOR THE ROAD TO BE ADEQUATELY SUPPORTED, PROTECTED, OR DRAINED.
2. AUXILIARY LANES REQUIRED AS NECESSARY, AS PER BYLAW 7900.

**STANDARD
DETAIL
DRAWING**

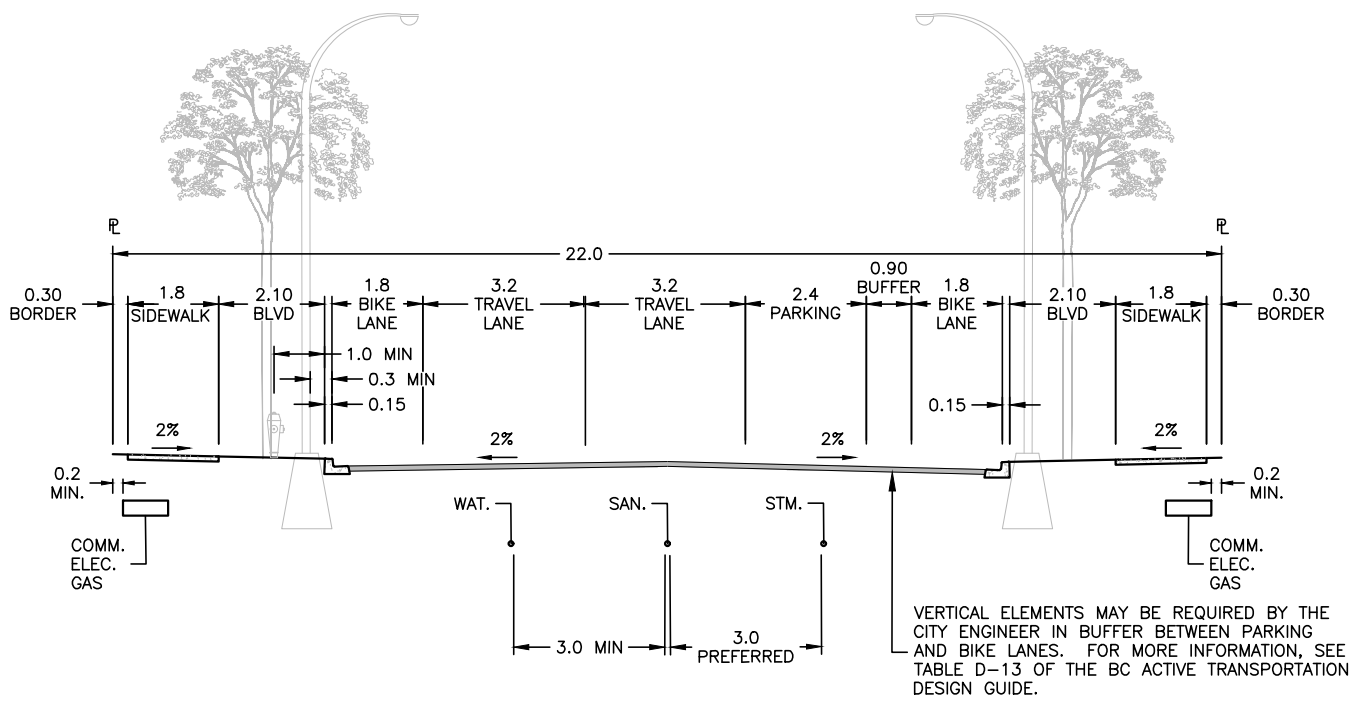
DATE:
JULY 4/23
SCALE:
NTS

**CORE AREA
COLLECTOR**

DWG. NO.

XS-R51

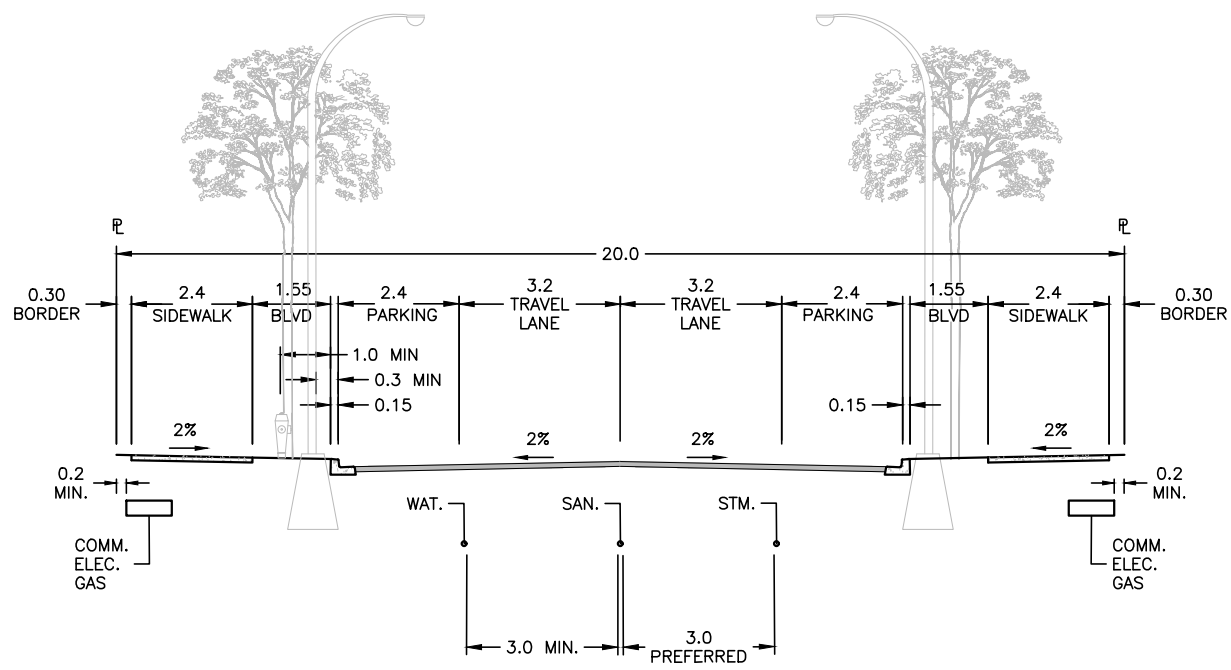




NOTES:

1. AT THE RECOMMENDATION OF THE CITY ENGINEER, THE APPROVING OFFICER MAY REQUIRE SPECIAL PROVISIONS OR ADDITIONAL ROW FOR THE ROAD TO BE ADEQUATELY SUPPORTED, PROTECTED, OR DRAINED.
2. AUXILIARY LANES REQUIRED AS NECESSARY, AS PER BYLAW 7900.

STANDARD DETAIL DRAWING	DATE: JULY 4/23	CORE AREA COLLECTOR (WITH BIKE LANES)	DWG. NO.	
	SCALE: NTS		XS-R52	



NOTES:

1. AT THE RECOMMENDATION OF THE CITY ENGINEER, THE APPROVING OFFICER MAY REQUIRE SPECIAL PROVISIONS OR ADDITIONAL ROW FOR THE ROAD TO BE ADEQUATELY SUPPORTED, PROTECTED, OR DRAINED.
2. AUXILIARY LANES REQUIRED AS NECESSARY, AS PER BYLAW 7900.

**STANDARD
DETAIL
DRAWING**

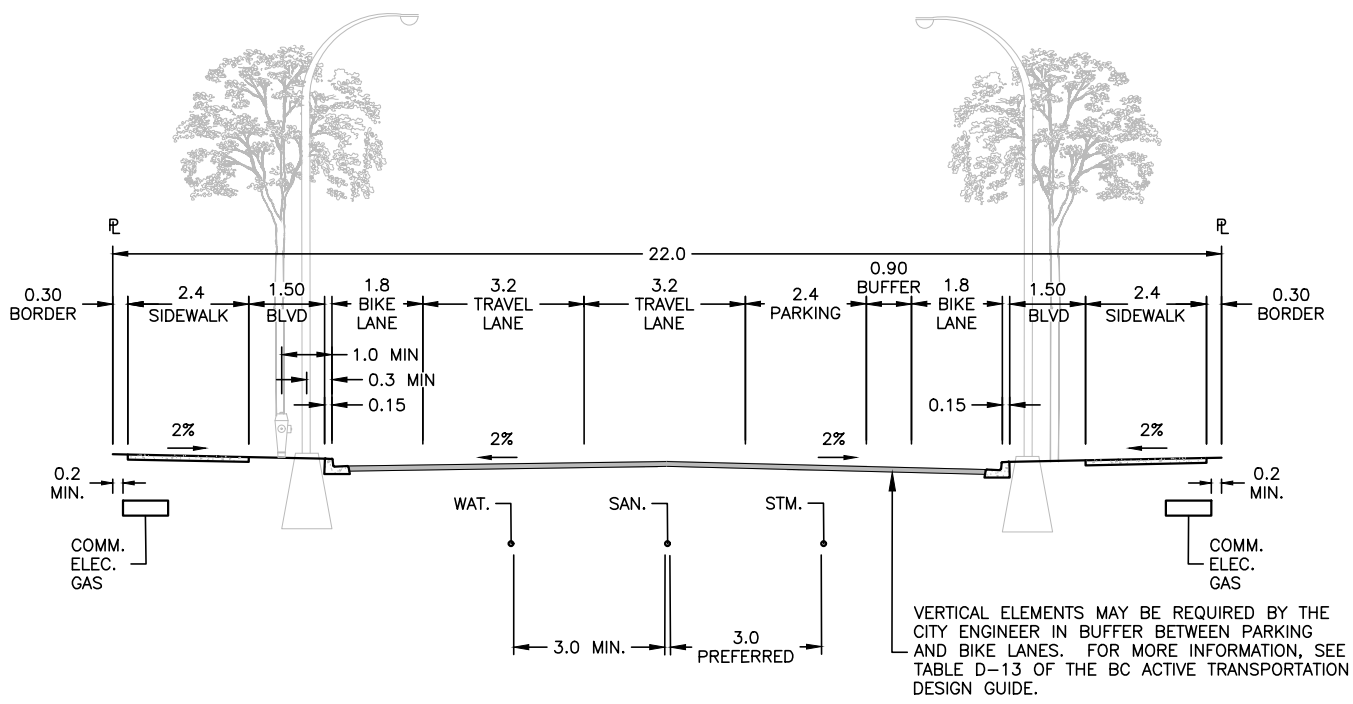
DATE:
JULY 4/23
SCALE:
NTS

**URBAN CENTRE
COLLECTOR**

DWG. NO.

XS-R53

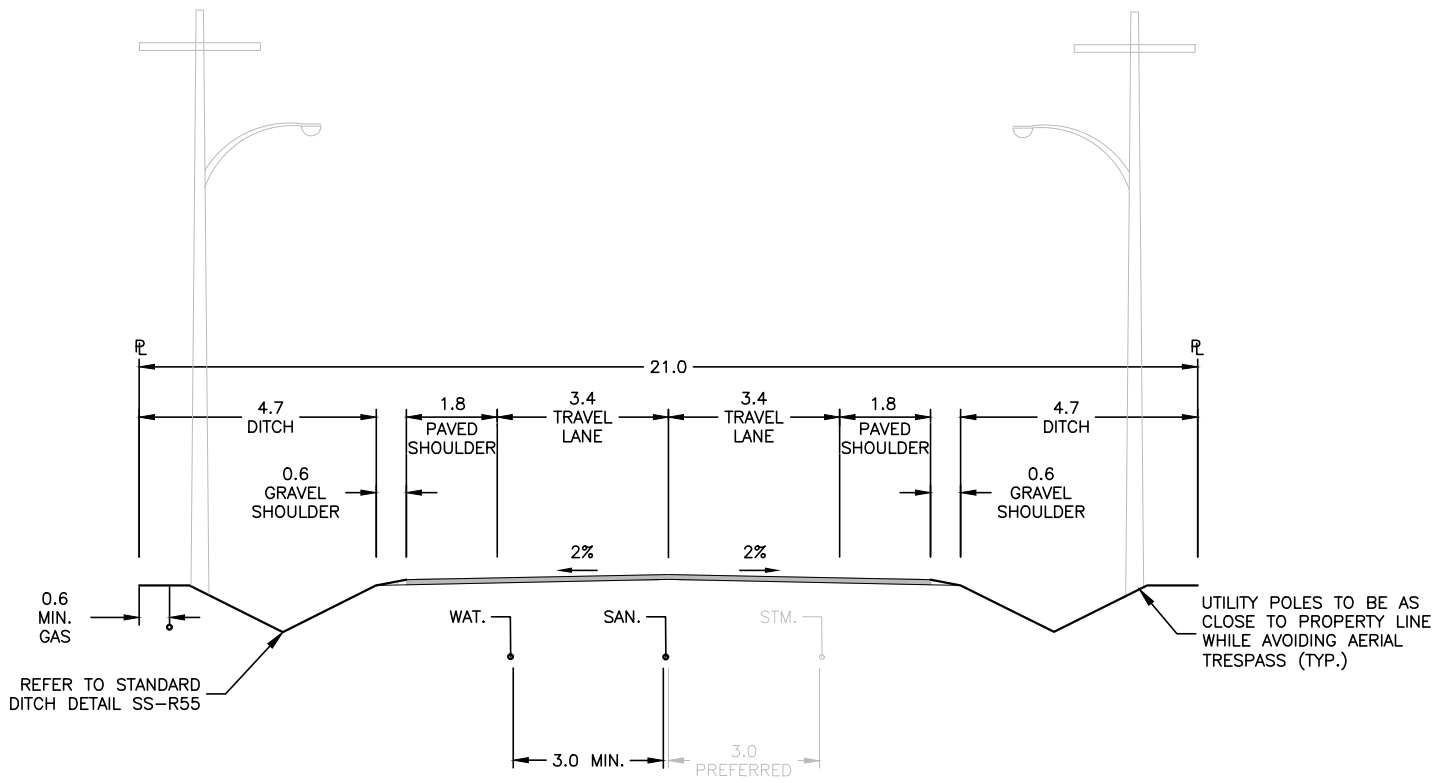




NOTES:

1. AT THE RECOMMENDATION OF THE CITY ENGINEER, THE APPROVING OFFICER MAY REQUIRE SPECIAL PROVISIONS OR ADDITIONAL ROW FOR THE ROAD TO BE ADEQUATELY SUPPORTED, PROTECTED, OR DRAINED.
2. AUXILIARY LANES REQUIRED AS NECESSARY, AS PER BYLAW 7900.

STANDARD DETAIL DRAWING	DATE: JULY 4/23	URBAN CENTRE COLLECTOR (WITH BIKE LANES)	DWG. NO.	
	SCALE: NTS		XS-R54	



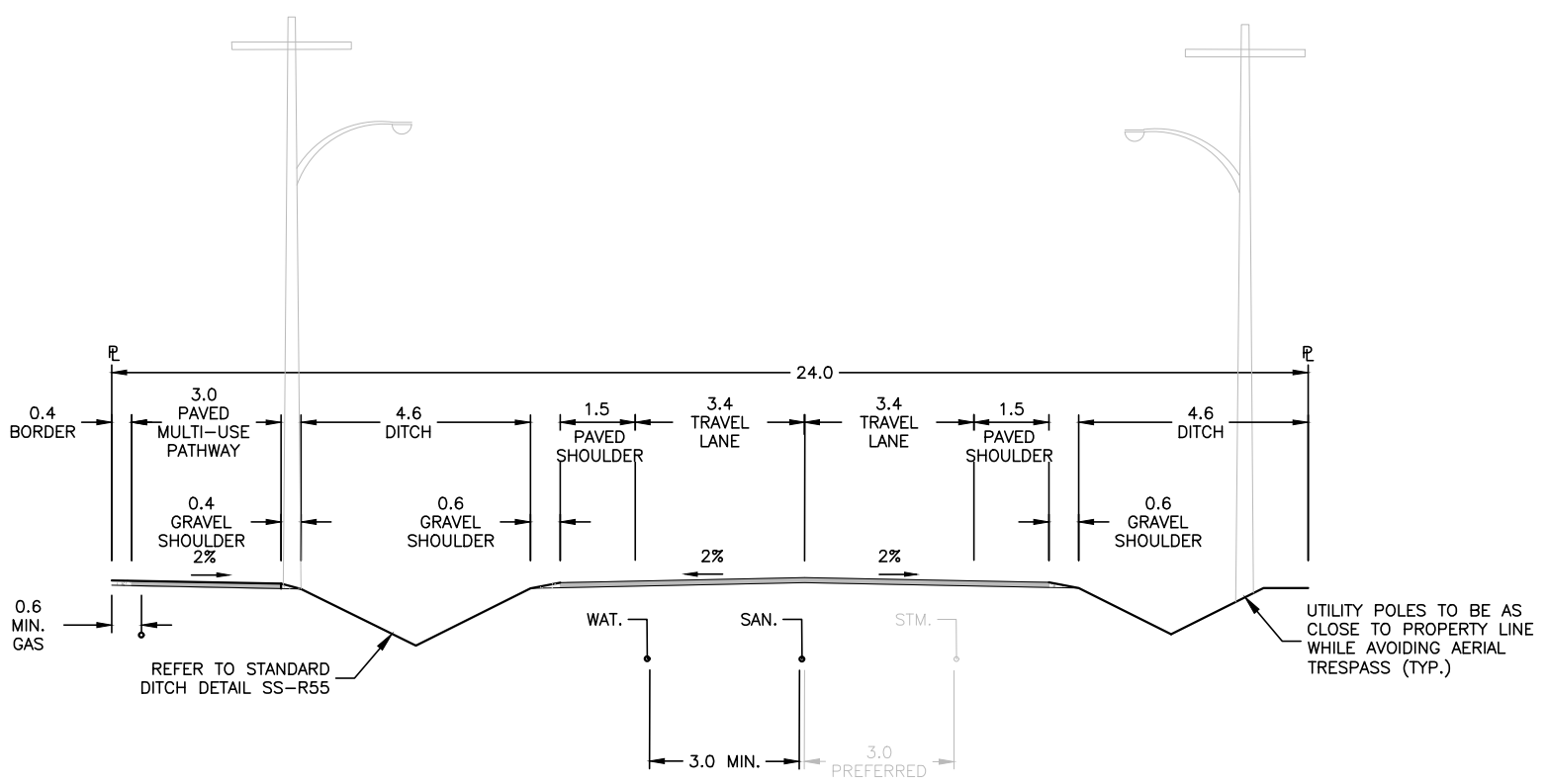
0.6 MIN. GAS
REFER TO STANDARD DITCH DETAIL SS-R55

UTILITY POLES TO BE AS CLOSE TO PROPERTY LINE WHILE AVOIDING AERIAL TRESPASS (TYP.)

NOTES:

1. AT THE RECOMMENDATION OF THE CITY ENGINEER, THE APPROVING OFFICER MAY REQUIRE SPECIAL PROVISIONS OR ADDITIONAL ROW FOR THE ROAD TO BE ADEQUATELY SUPPORTED, PROTECTED, OR DRAINED.
2. AUXILIARY LANES REQUIRED AS NECESSARY, AS PER BYLAW 7900.

STANDARD DETAIL DRAWING	DATE: JULY 4/23	RURAL MINOR ARTERIAL	DWG. NO.	
	SCALE: NTS		XS-R60	

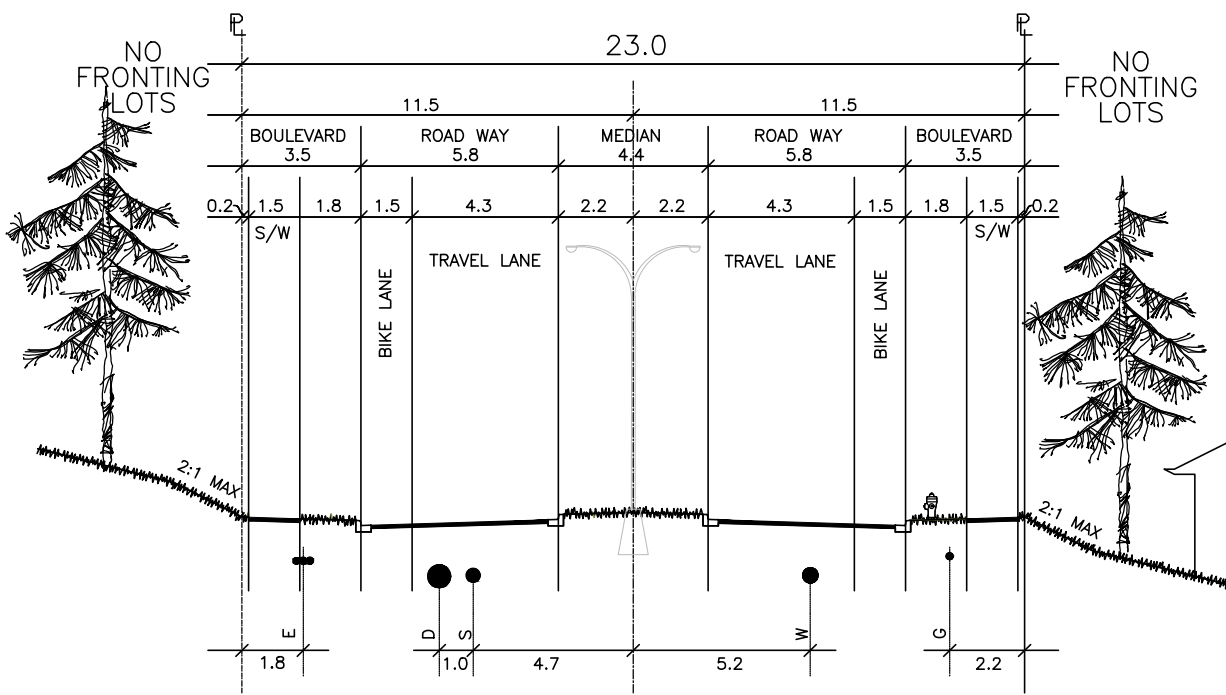


NOTES:

1. AT THE RECOMMENDATION OF THE CITY ENGINEER, THE APPROVING OFFICER MAY REQUIRE SPECIAL PROVISIONS OR ADDITIONAL ROW FOR THE ROAD TO BE ADEQUATELY SUPPORTED, PROTECTED, OR DRAINED.
2. AUXILIARY LANES REQUIRED AS NECESSARY, AS PER BYLAW 7900.

STANDARD DETAIL DRAWING	DATE: JULY 4/23	RURAL MINOR ARTERIAL (WITH MULTI-USE PATH)	DWG. NO. XS-R61	
	SCALE: NTS			

HILLSIDE ZONE STANDARDS

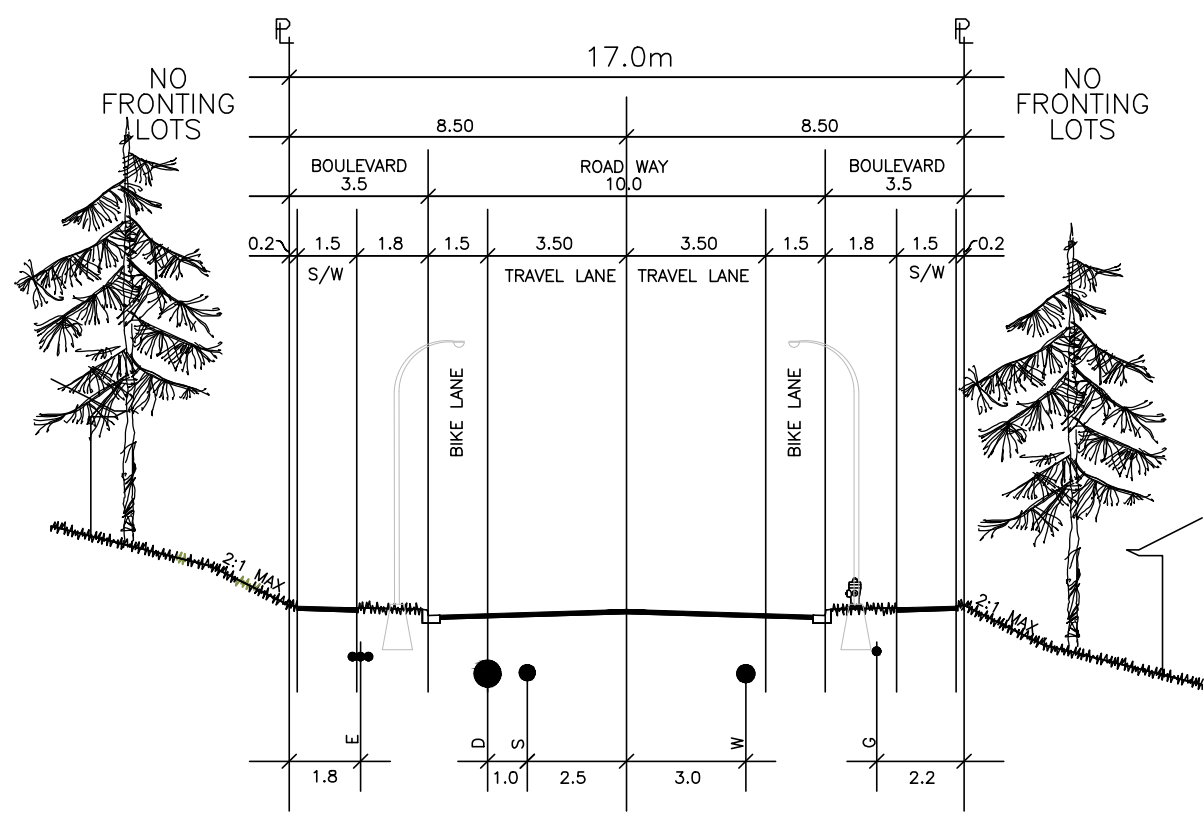


NOTES:

1. AT THE RECOMMENDATION OF THE CITY ENGINEER, THE APPROVING OFFICER MAY REQUIRE SPECIAL PROVISIONS OR ADDITIONAL ROW FOR THE ROAD TO BE ADEQUATELY SUPPORTED, PROTECTED, OR DRAINED.
2. AUXILIARY LANES REQUIRED AS NECESSARY, AS PER BYLAW 7900.

STANDARD DETAIL DRAWING	DATE: JULY 4/23	HILLSIDE - ARTERIAL CONDITION A (VILLAGE PARKWAY)	DWG. NO.	
	SCALE: NTS		XS-R62	

HILLSIDE ZONE STANDARDS



NOTES:

1. AT THE RECOMMENDATION OF THE CITY ENGINEER, THE APPROVING OFFICER MAY REQUIRE SPECIAL PROVISIONS OR ADDITIONAL ROW FOR THE ROAD TO BE ADEQUATELY SUPPORTED, PROTECTED, OR DRAINED.
2. AUXILIARY LANES REQUIRED AS NECESSARY, AS PER BYLAW 7900.

**STANDARD
DETAIL
DRAWING**

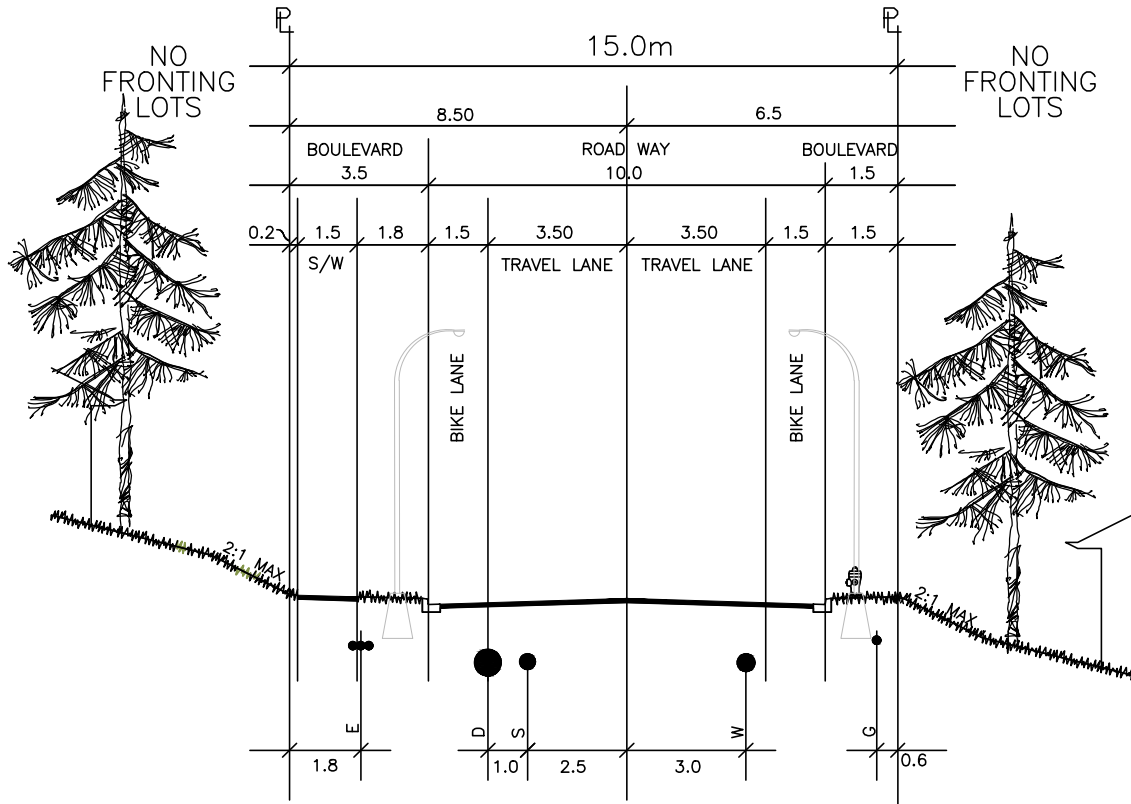
DATE:
JULY 4/23
SCALE:
NTS

**HILLSIDE - ARTERIAL CONDITION B
(WITHIN 0.8 KM WALKING DISTANCE OF VILLAGE)**

DWG. NO.
XS-R63



HILLSIDE ZONE STANDARDS



NOTES:

1. AT THE RECOMMENDATION OF THE CITY ENGINEER, THE APPROVING OFFICER MAY REQUIRE SPECIAL PROVISIONS OR ADDITIONAL ROW FOR THE ROAD TO BE ADEQUATELY SUPPORTED, PROTECTED, OR DRAINED.
2. AUXILIARY LANES REQUIRED AS NECESSARY, AS PER BYLAW 7900.

**STANDARD
DETAIL
DRAWING**

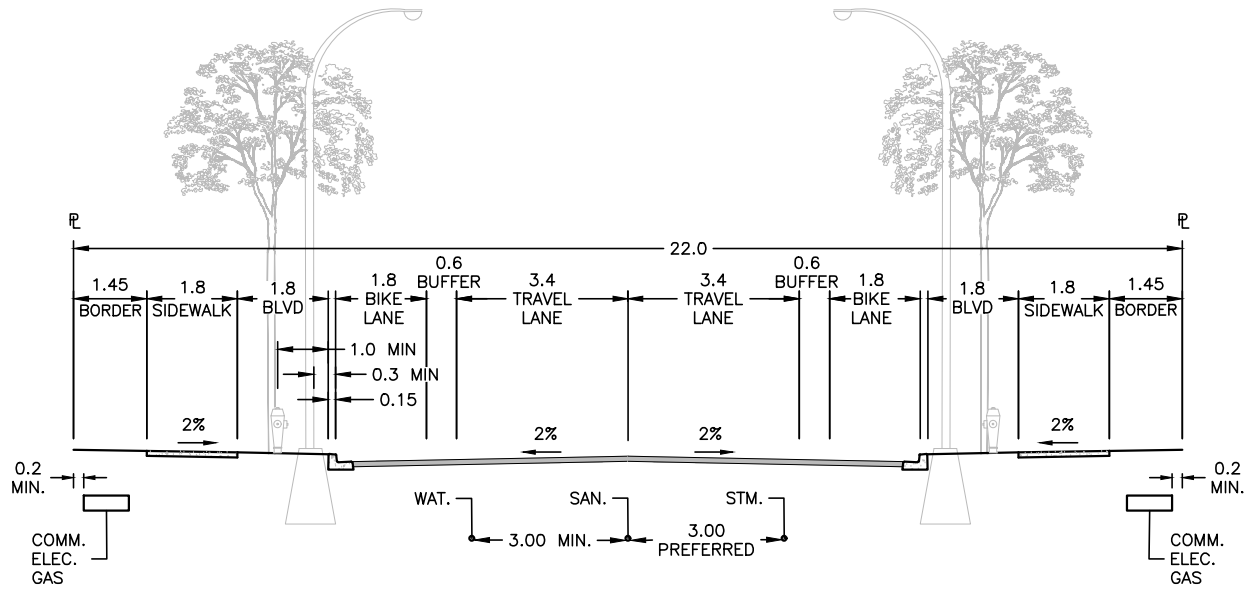
DATE:
JULY 4/23
SCALE:
NTS

**HILLSIDE - ARTERIAL CONDITION-C (GREATER THAN 0.8
KM WALKING DISTANCE OF VILLAGE)**

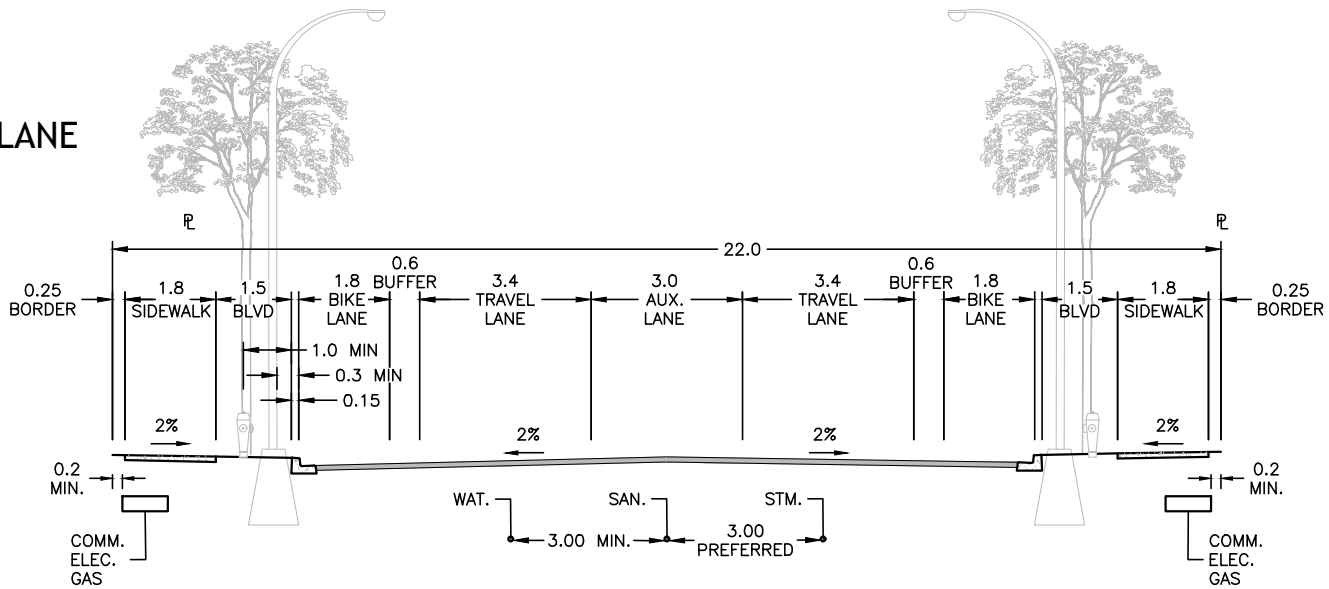
DWG. NO.

XS-R64





WITH AUXILIARY LANE



NOTES:

1. AT THE RECOMMENDATION OF THE CITY ENGINEER, THE APPROVING OFFICER MAY REQUIRE SPECIAL PROVISIONS OR ADDITIONAL ROW FOR THE ROAD TO BE ADEQUATELY SUPPORTED, PROTECTED, OR DRAINED.
2. AUXILIARY LANES REQUIRED AS NECESSARY, AS PER BYLAW 7900.

**STANDARD
DETAIL
DRAWING**

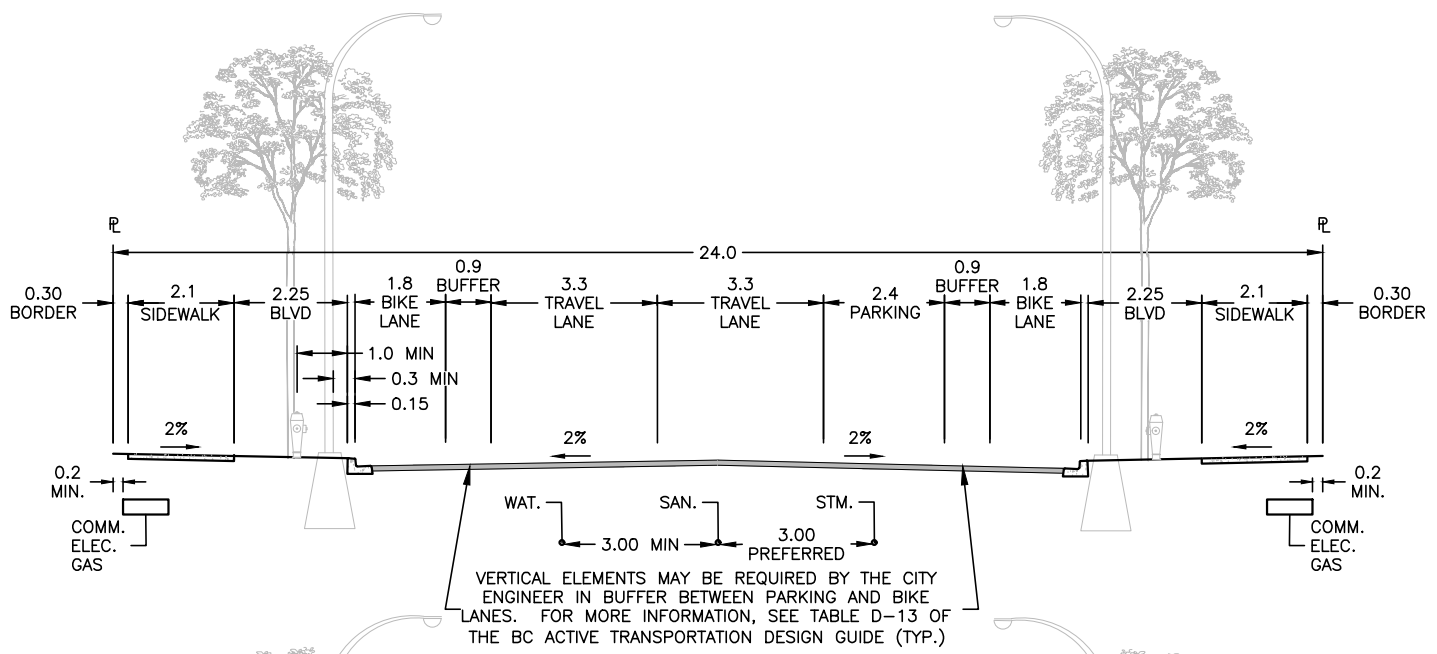
DATE:
JULY 4/23
SCALE:
NTS

**SUBURBAN
MINOR ARTERIAL**

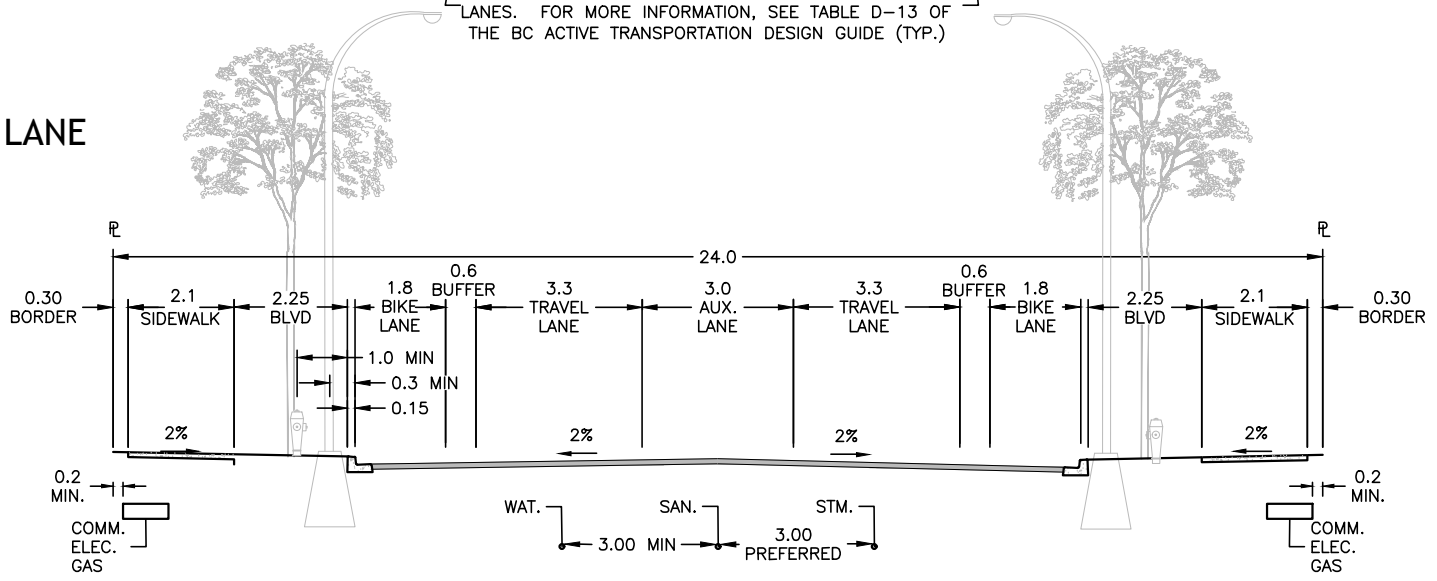
DWG. NO.

XS-R65





WITH AUXILIARY LANE



NOTES:

1. AT THE RECOMMENDATION OF THE CITY ENGINEER, THE APPROVING OFFICER MAY REQUIRE SPECIAL PROVISIONS OR ADDITIONAL ROW FOR THE ROAD TO BE ADEQUATELY SUPPORTED, PROTECTED, OR DRAINED.
2. AUXILIARY LANES REQUIRED AS NECESSARY, AS PER BYLAW 7900.

**STANDARD
DETAIL
DRAWING**

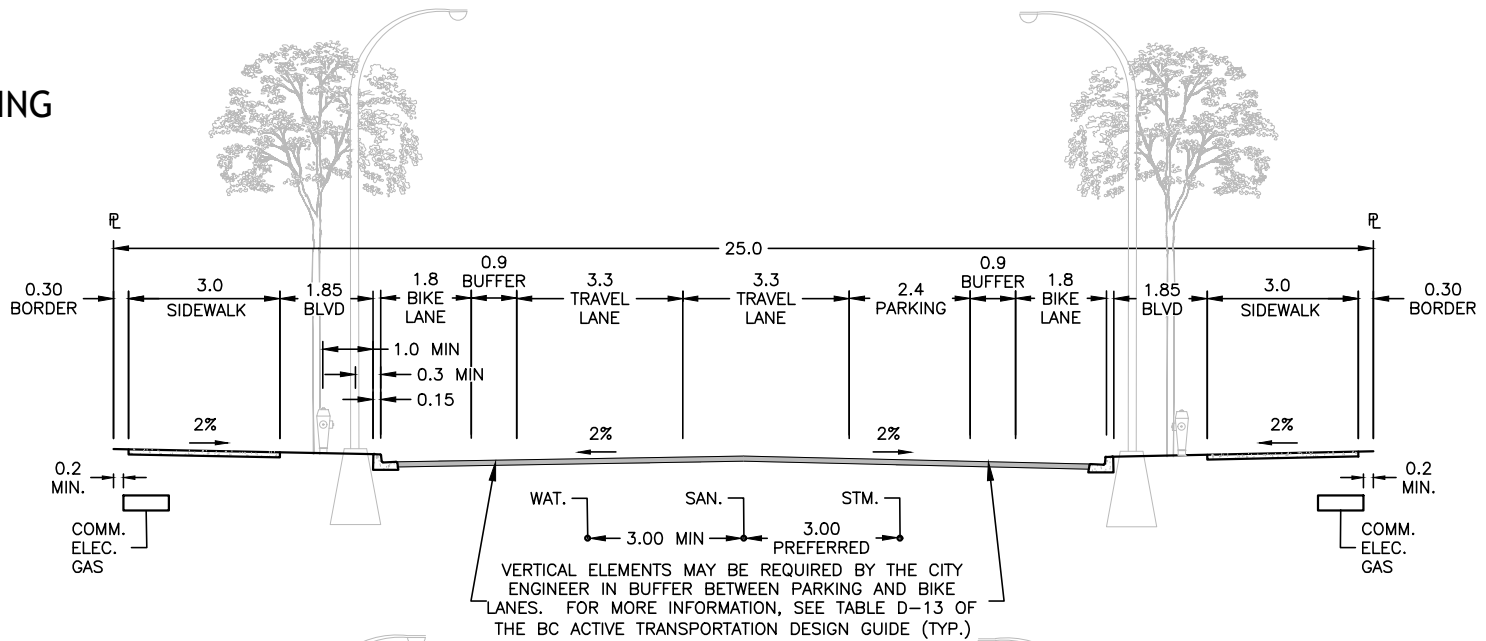
DATE:
JULY 4/23
SCALE:
NTS

**CORE AREA
MINOR ARTERIAL**

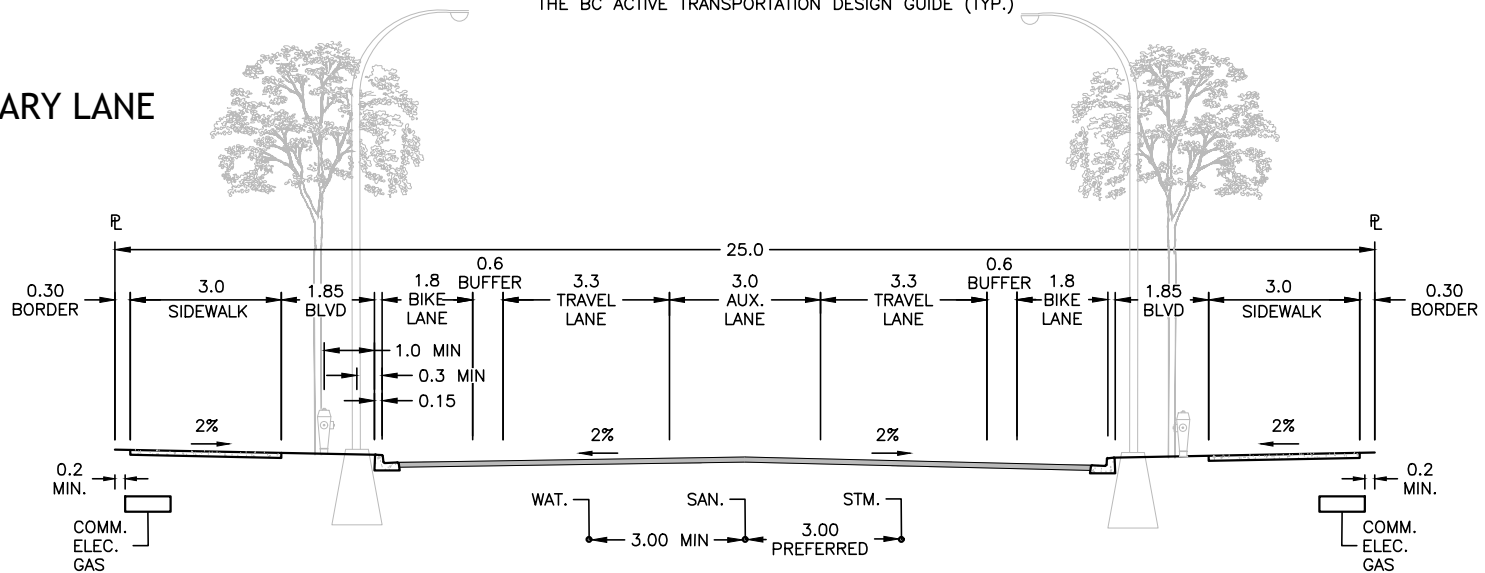
DWG. NO.
XS-R66



WITH PARKING



WITH AUXILIARY LANE



NOTES:

1. AT THE RECOMMENDATION OF THE CITY ENGINEER, THE APPROVING OFFICER MAY REQUIRE SPECIAL PROVISIONS OR ADDITIONAL ROW FOR THE ROAD TO BE ADEQUATELY SUPPORTED, PROTECTED, OR DRAINED.
2. AUXILIARY LANES REQUIRED AS NECESSARY, AS PER BYLAW 7900.

STANDARD
DETAIL
DRAWING

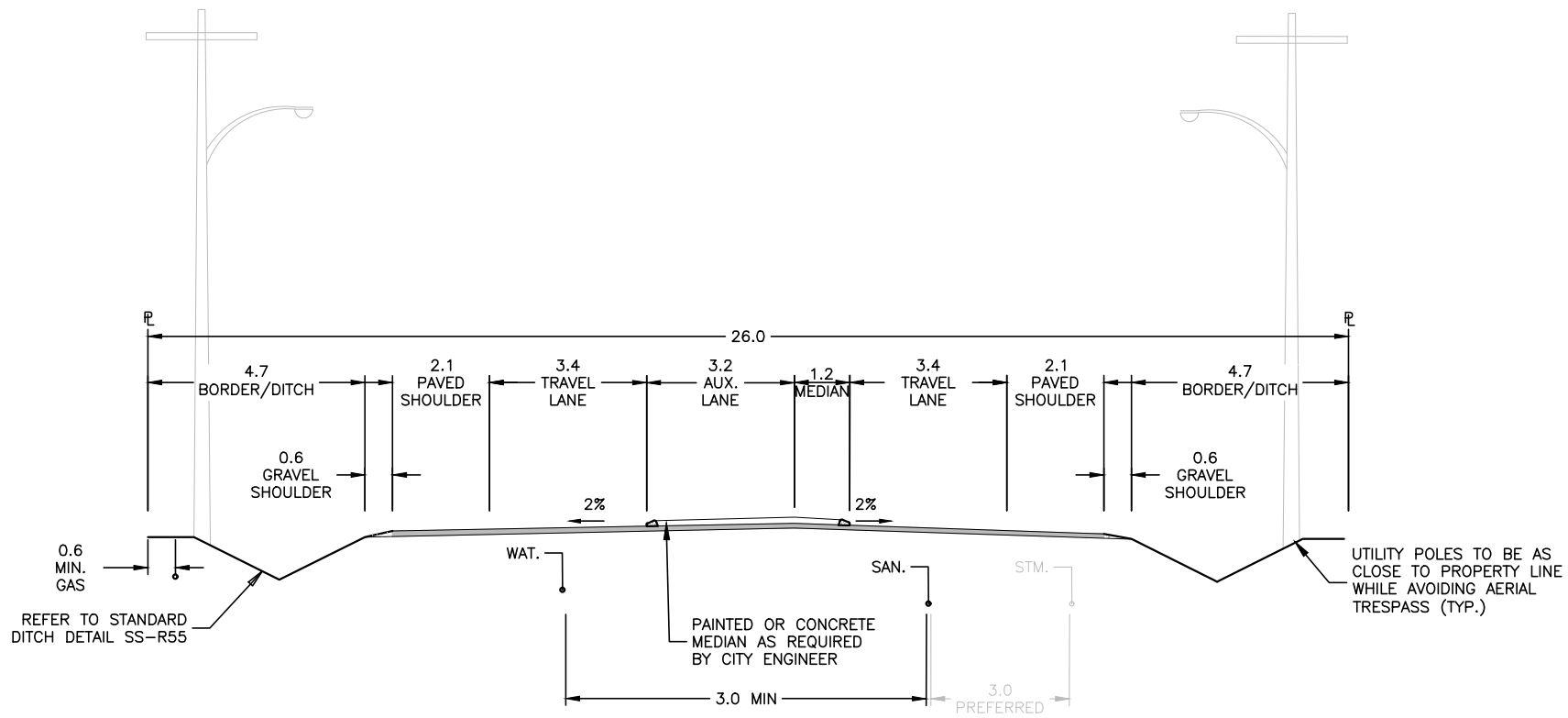
DATE:
JULY 4/23
SCALE:
NTS

URBAN CENTRE MINOR ARTERIAL

DWG. NO.


XS-R67

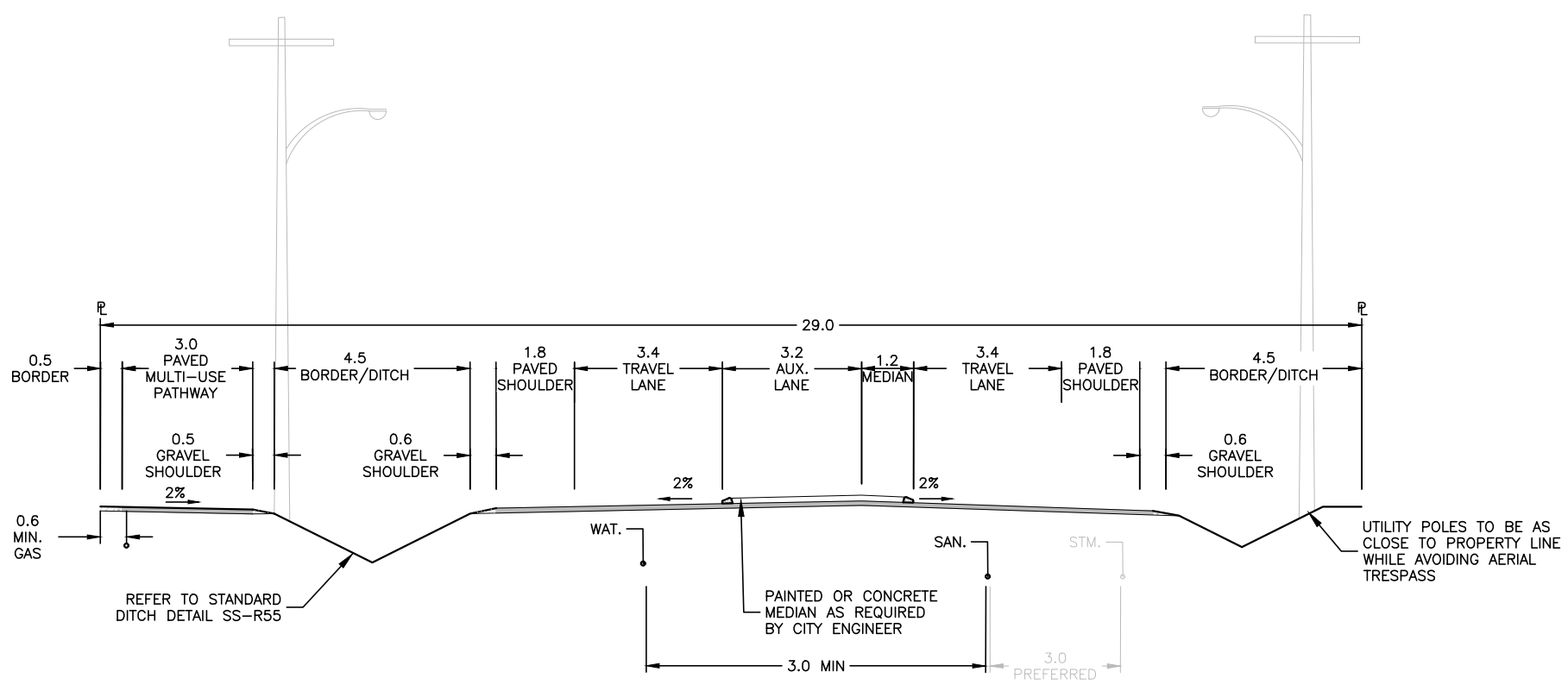




NOTES:

1. AT THE RECOMMENDATION OF THE CITY ENGINEER, THE APPROVING OFFICER MAY REQUIRE SPECIAL PROVISIONS OR ADDITIONAL ROW FOR THE ROAD TO BE ADEQUATELY SUPPORTED, PROTECTED, OR DRAINED.
2. AUXILIARY LANES REQUIRED AS NECESSARY, AS PER BYLAW 7900.

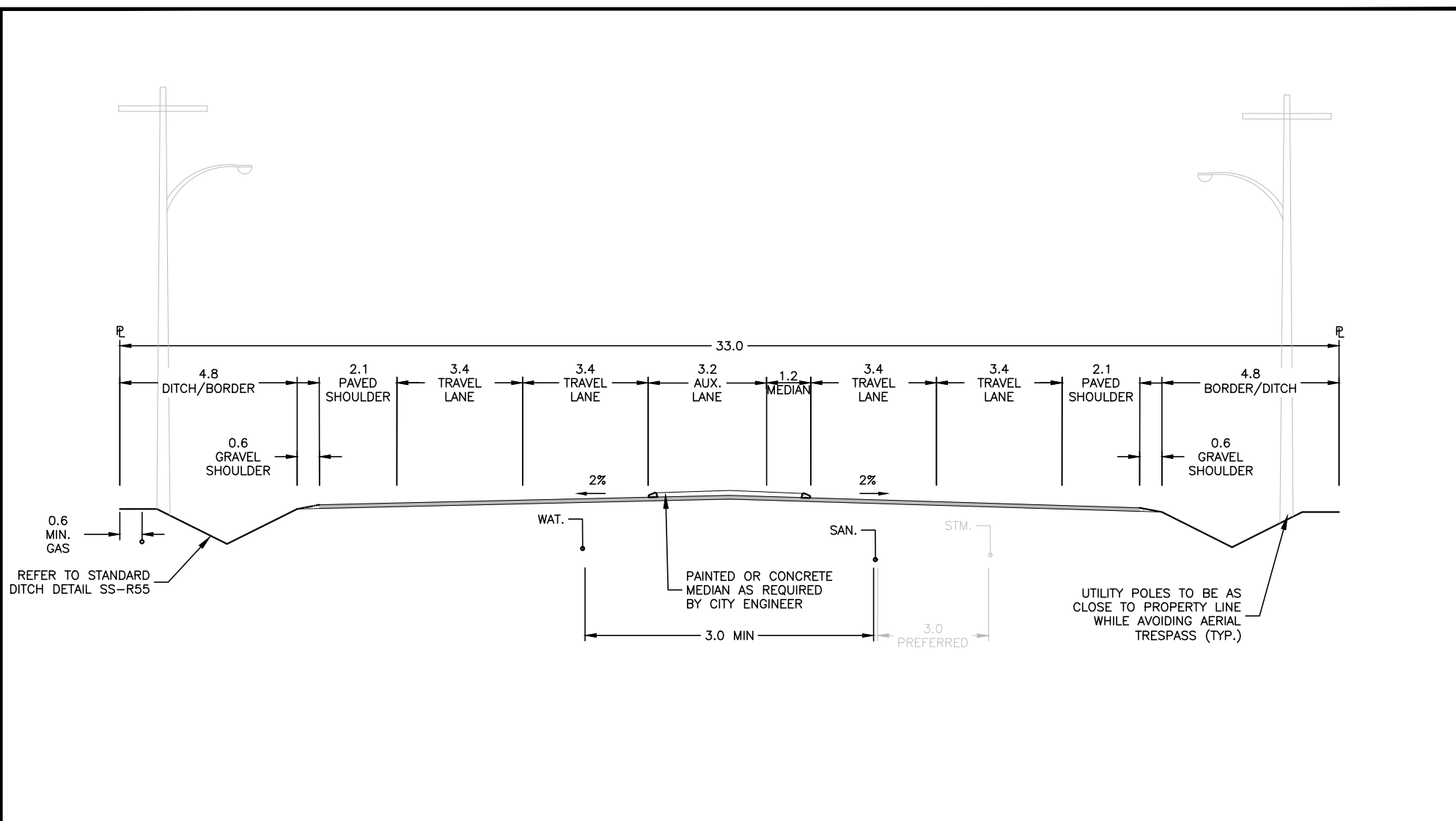
STANDARD DETAIL DRAWING	DATE: JULY 4/23	RURAL MAJOR ARTERIAL (3 LANE)	DWG. NO.	
	SCALE: NTS		XS-R80	



NOTES:

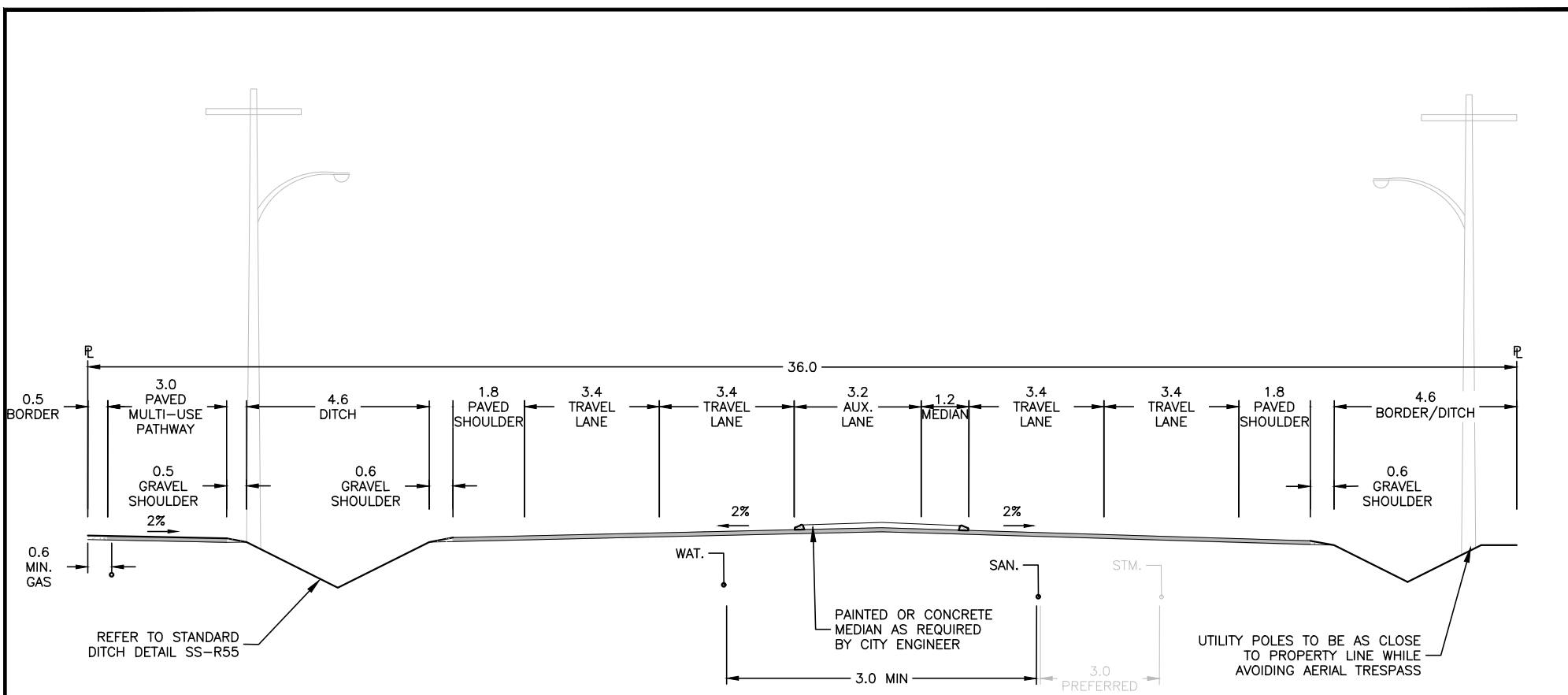
1. AT THE RECOMMENDATION OF THE CITY ENGINEER, THE APPROVING OFFICER MAY REQUIRE SPECIAL PROVISIONS OR ADDITIONAL ROW FOR THE ROAD TO BE ADEQUATELY SUPPORTED, PROTECTED, OR DRAINED.
2. AUXILIARY LANES REQUIRED AS NECESSARY, AS PER BYLAW 7900.

STANDARD DETAIL DRAWING	DATE: JULY 4/23	RURAL MAJOR ARTERIAL (3 LANE WITH MULTI-USE PATH)	DWG. NO.	
	SCALE: NTS		XS-R81	



- NOTES:
1. AT THE RECOMMENDATION OF THE CITY ENGINEER, THE APPROVING OFFICER MAY REQUIRE SPECIAL PROVISIONS OR ADDITIONAL ROW FOR THE ROAD TO BE ADEQUATELY SUPPORTED, PROTECTED, OR DRAINED.
 2. AUXILIARY LANES REQUIRED AS NECESSARY, AS PER BYLAW 7900.

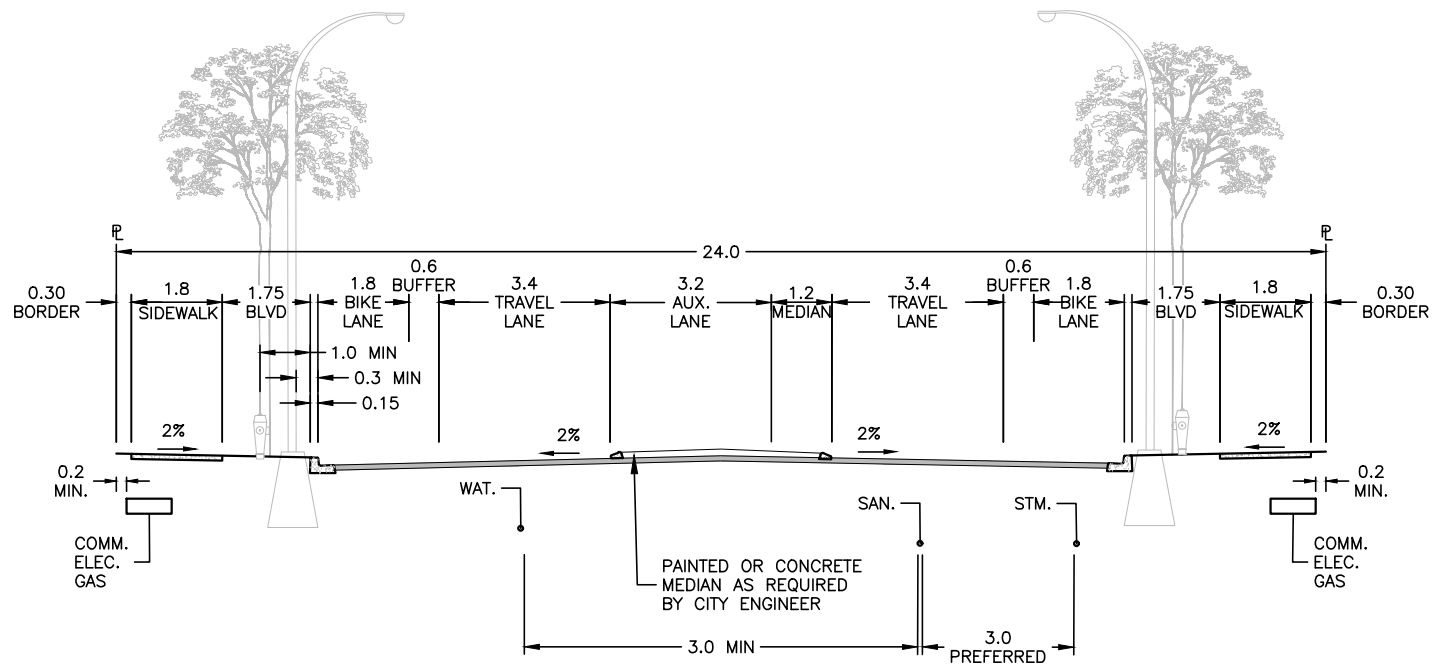
STANDARD DETAIL DRAWING	DATE: JULY 4/23	RURAL MAJOR ARTERIAL (5 LANE)	DWG. NO.	
	SCALE: NTS		XS-R82	



NOTES:


1. AT THE RECOMMENDATION OF THE CITY ENGINEER, THE APPROVING OFFICER MAY REQUIRE SPECIAL PROVISIONS OR ADDITIONAL ROW FOR THE ROAD TO BE ADEQUATELY SUPPORTED, PROTECTED, OR DRAINED.
2. AUXILIARY LANES REQUIRED AS NECESSARY, AS PER BYLAW 7900.

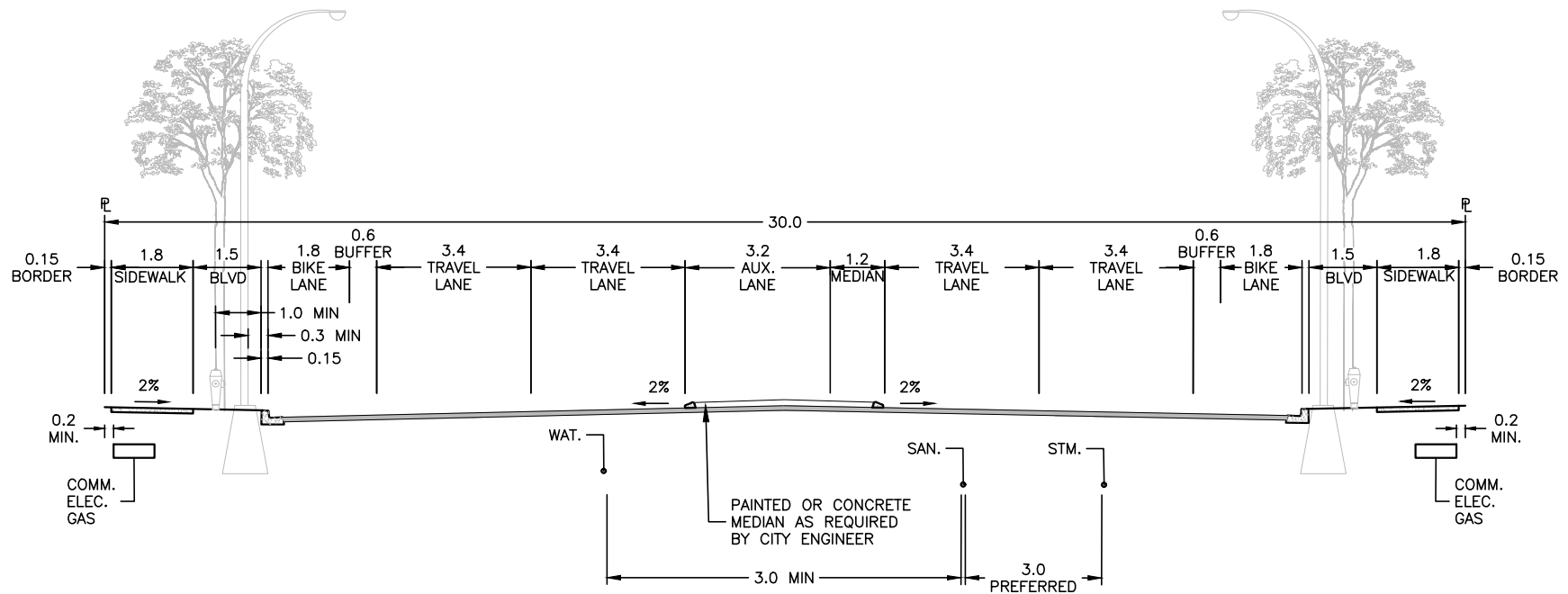
<p>STANDARD DETAIL DRAWING</p>	DATE: JULY 4/23	<p>RURAL MAJOR ARTERIAL (5 LANE WITH MULTI-USE PATHWAY)</p>	DWG. NO.	
	SCALE: NTS		<p>XS-R83</p>	



NOTES:

1. AT THE RECOMMENDATION OF THE CITY ENGINEER, THE APPROVING OFFICER MAY REQUIRE SPECIAL PROVISIONS OR ADDITIONAL ROW FOR THE ROAD TO BE ADEQUATELY SUPPORTED, PROTECTED, OR DRAINED.
2. AUXILIARY LANES REQUIRED AS NECESSARY, AS PER BYLAW 7900.

STANDARD DETAIL DRAWING	DATE: JULY 4/23	SUBURBAN MAJOR ARTERIAL (3 LANE)	DWG. NO.	 City of Kelowna
	SCALE: NTS		XS-R84	



NOTES:

1. AT THE RECOMMENDATION OF THE CITY ENGINEER, THE APPROVING OFFICER MAY REQUIRE SPECIAL PROVISIONS OR ADDITIONAL ROW FOR THE ROAD TO BE ADEQUATELY SUPPORTED, PROTECTED, OR DRAINED.
2. AUXILIARY LANES REQUIRED AS NECESSARY, AS PER BYLAW 7900.

**STANDARD
DETAIL
DRAWING**

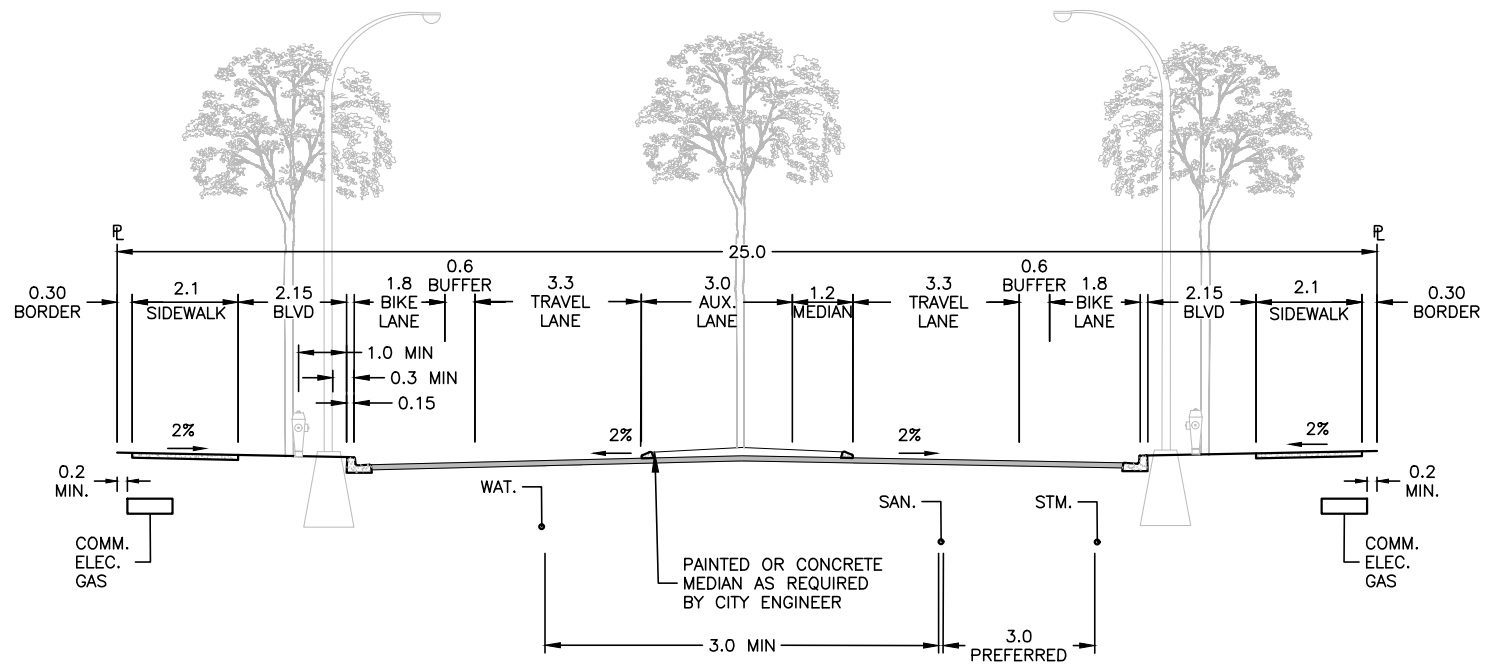
DATE:
JULY 4/23
SCALE:
NTS

**SUBURBAN MAJOR ARTERIAL
(5 LANE)**

DWG. NO.

XS-R85





NOTES:

1. AT THE RECOMMENDATION OF THE CITY ENGINEER, THE APPROVING OFFICER MAY REQUIRE SPECIAL PROVISIONS OR ADDITIONAL ROW FOR THE ROAD TO BE ADEQUATELY SUPPORTED, PROTECTED, OR DRAINED.
2. AUXILIARY LANES REQUIRED AS NECESSARY, AS PER BYLAW 7900.

**STANDARD
DETAIL
DRAWING**

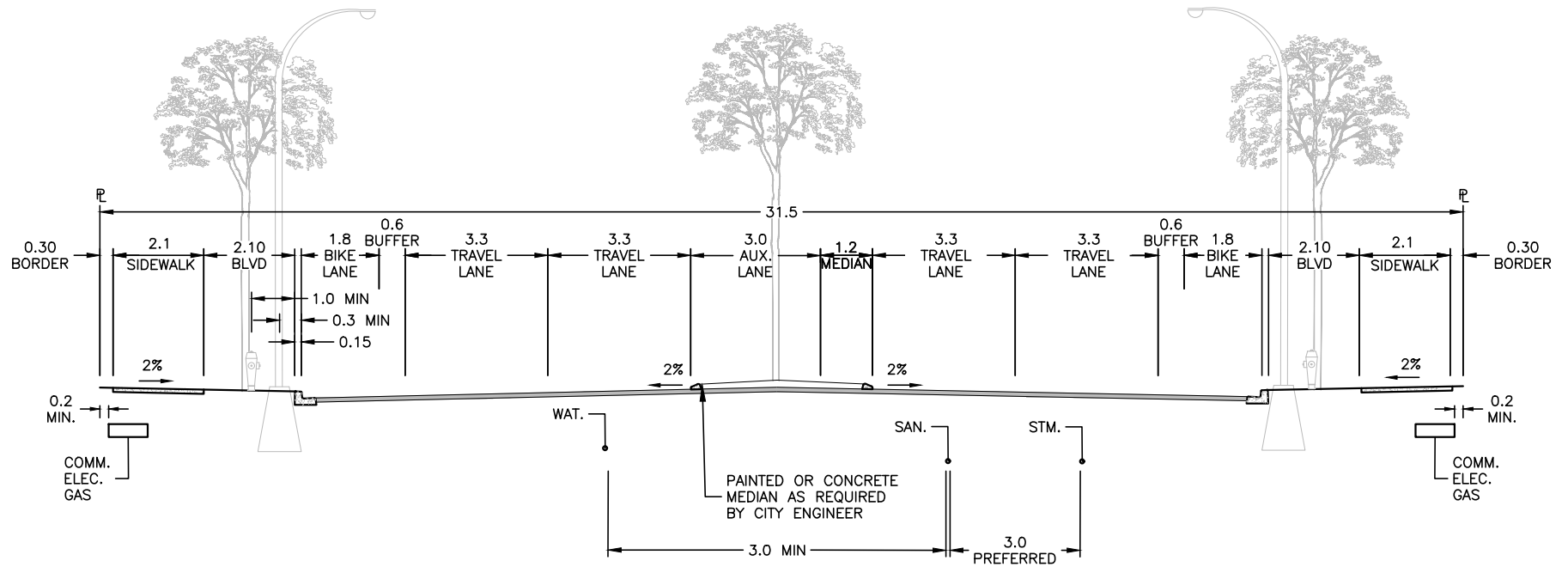
DATE:
JULY 4/23
SCALE:
NTS

**CORE AREA MAJOR ARTERIAL
(3 LANE)**

DWG. NO.

XS-R86





NOTES:

1. AT THE RECOMMENDATION OF THE CITY ENGINEER, THE APPROVING OFFICER MAY REQUIRE SPECIAL PROVISIONS OR ADDITIONAL ROW FOR THE ROAD TO BE ADEQUATELY SUPPORTED, PROTECTED, OR DRAINED.
2. AUXILIARY LANES REQUIRED AS NECESSARY, AS PER BYLAW 7900.

**STANDARD
DETAIL
DRAWING**

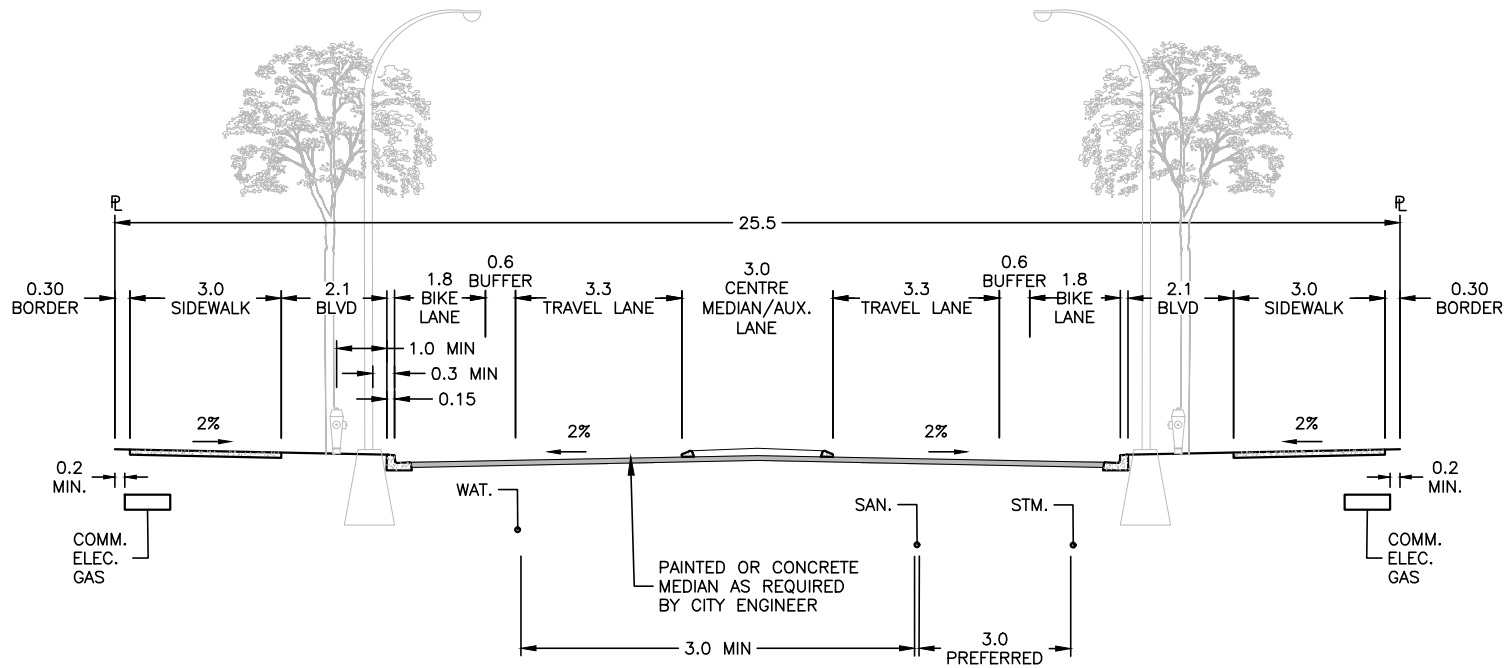
DATE:
JULY 4/23
SCALE:
NTS

**CORE AREA MAJOR ARTERIAL
(5 LANE)**

DWG. NO.

XS-R87





NOTES:

1. AT THE RECOMMENDATION OF THE CITY ENGINEER, THE APPROVING OFFICER MAY REQUIRE SPECIAL PROVISIONS OR ADDITIONAL ROW FOR THE ROAD TO BE ADEQUATELY SUPPORTED, PROTECTED, OR DRAINED.
2. AUXILIARY LANES REQUIRED AS NECESSARY, AS PER BYLAW 7900.

**STANDARD
DETAIL
DRAWING**

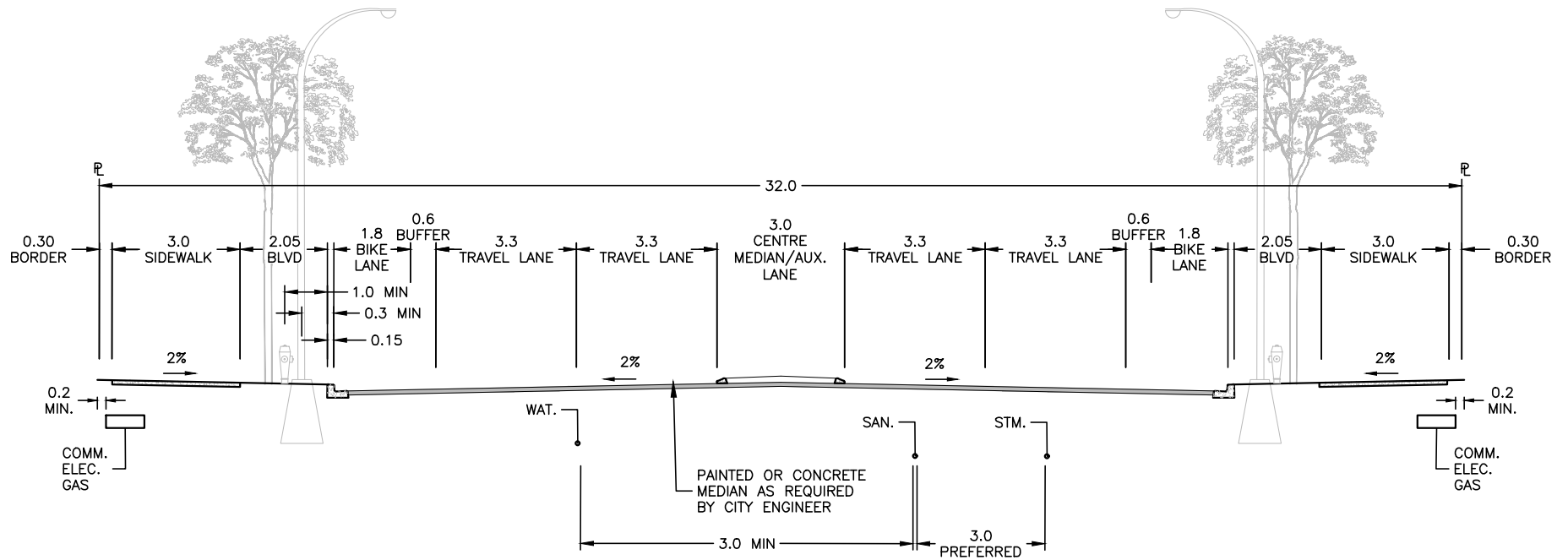
DATE:
JULY 4/23
SCALE:
NTS

**URBAN CENTRE MAJOR ARTERIAL
(3 LANE)**

DWG. NO.

XS-R88





NOTES:

1. AT THE RECOMMENDATION OF THE CITY ENGINEER, THE APPROVING OFFICER MAY REQUIRE SPECIAL PROVISIONS OR ADDITIONAL ROW FOR THE ROAD TO BE ADEQUATELY SUPPORTED, PROTECTED, OR DRAINED.
2. AUXILIARY LANES REQUIRED AS NECESSARY, AS PER BYLAW 7900.

**STANDARD
DETAIL
DRAWING**

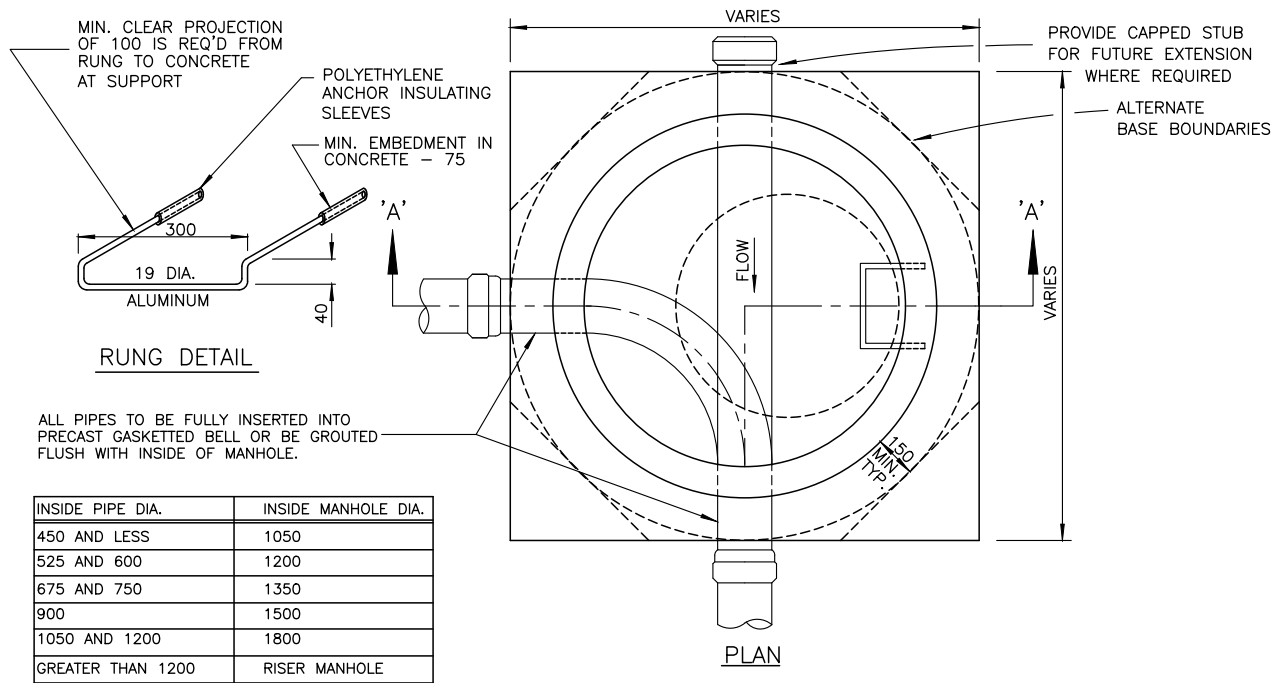
DATE:
JULY 4/23
SCALE:
NTS

**URBAN CENTRE MAJOR ARTERIAL
(5 LANE)**

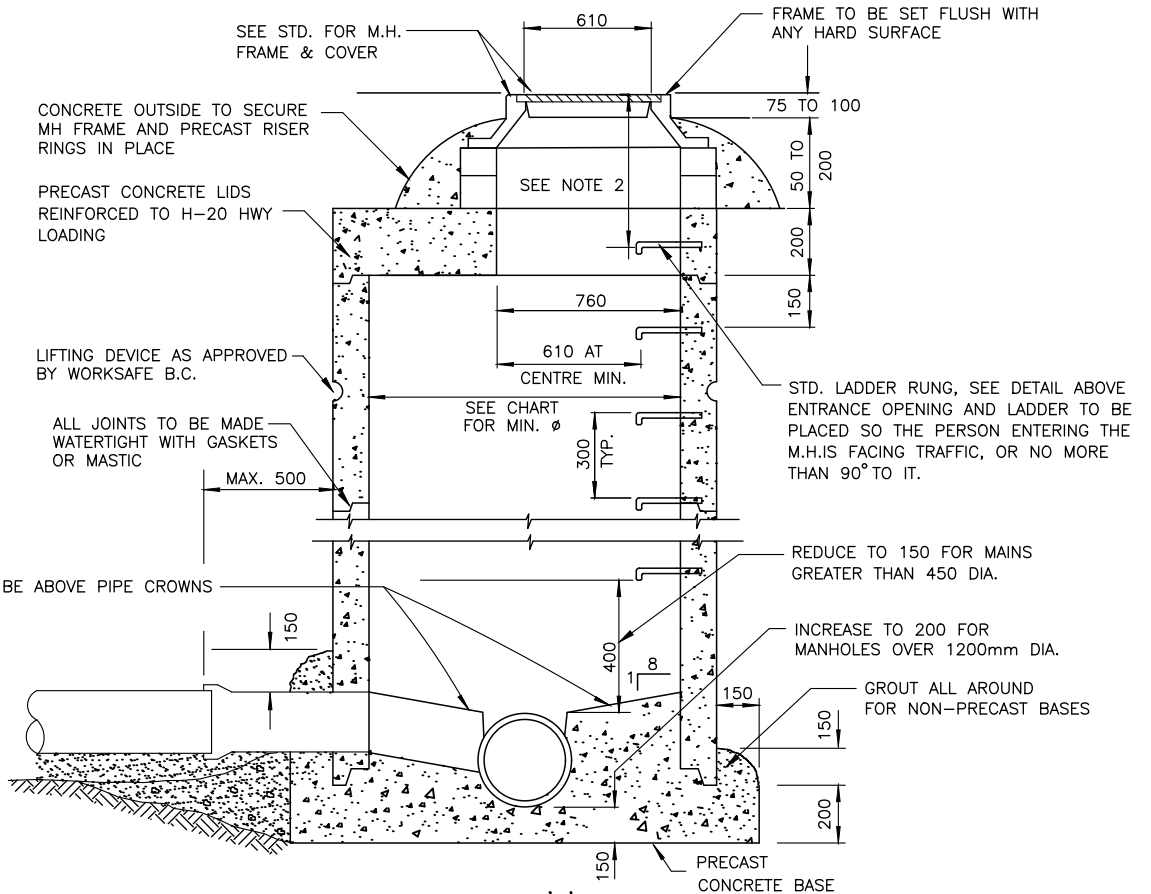
DWG. NO.

XS-R89





ALL PIPES TO BE FULLY INSERTED INTO PRECAST GASKETTED BELL OR BE GROUTED FLUSH WITH INSIDE OF MANHOLE.



NOTES:

1. ALL PRECAST M.H.'S MUST CONFORM TO A.S.T.M. & CSA SPECIFICATIONS AND HAVE A MIN. 114 WALL THICKNESS.
2. MAXIMUM DEPTH TO FIRST RUNG IS 500MM. WHEN HANDHOLD IS INSTALLED BETWEEN TOP AND FIRST RUNG, MAXIMUM DEPTH MAY BE INCREASED TO 660MM
3. CAST-IN-PLACE BASE SHOWN. PRECAST BASE REQUIRED, UNLESS OTHERWISE APPROVED.
4. FOR OVER-BUILD MH'S, PIPE ENTERING MH MUST NOT PROTRUDE FURTHER THAN 25MM AND BE NO LESS THAN FLUSH WITH INSIDE OF BARREL.

**STANDARD
DETAIL
DRAWING**

DATE:
JUNE 6/24
SCALE:
NTS

MANHOLES

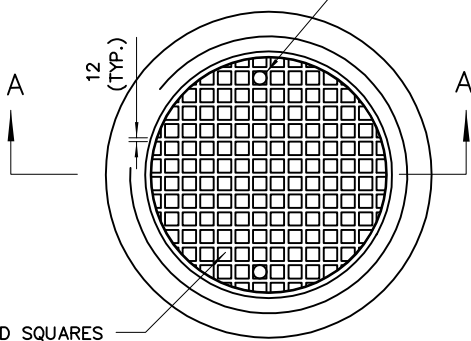
DWG. NO.

SS-S1a



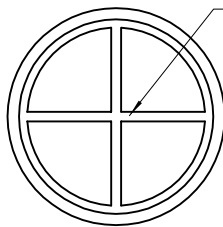
STANDARD DETAIL DRAWINGS

2 - 22mm DIA. PICK-OUT HOLES REQ'D

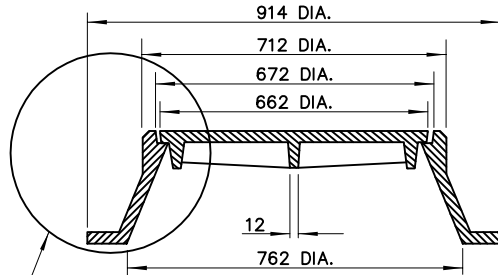


RAISED SQUARES
(5mm HIGH)

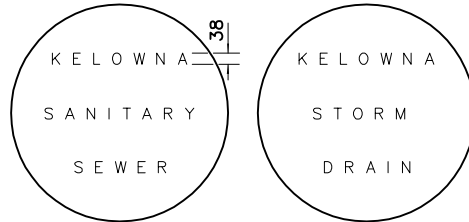
PLAN



WEBBING TO ACCOMMODATE
SPECIFIED LOAD

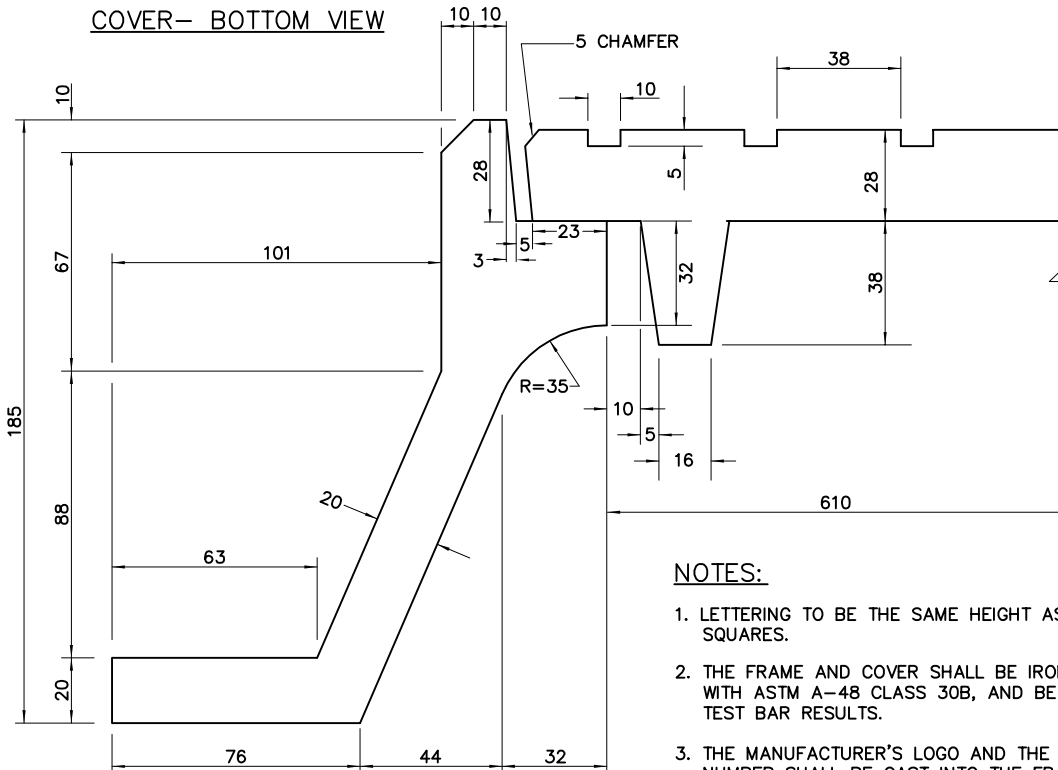


SEE DETAIL 'A'
SECTION 'A-A'



STANDARD LETTERING ON COVER

COVER- BOTTOM VIEW



DETAIL 'A'

NOTES:

1. LETTERING TO BE THE SAME HEIGHT AS THE RAISED SQUARES.
2. THE FRAME AND COVER SHALL BE IRON IN ACCORDANCE WITH ASTM A-48 CLASS 30B, AND BE ACCOMPANIED BY TEST BAR RESULTS.
3. THE MANUFACTURER'S LOGO AND THE HEAT SERIES NUMBER SHALL BE CAST INTO THE FRAME AND COVER.
4. COVER AND FRAME TO BE ABLE TO WITHSTAND 175 kN (40 000LBS) LOAD APPLIED AT THE CENTER OF THE COVER ON A 50mm THICK 250 x 250 RUBBER PAD.
5. THE CONTACT SURFACES BETWEEN THE FRAME AND THE COVER ARE TO BE MACHINED SMOOTH.

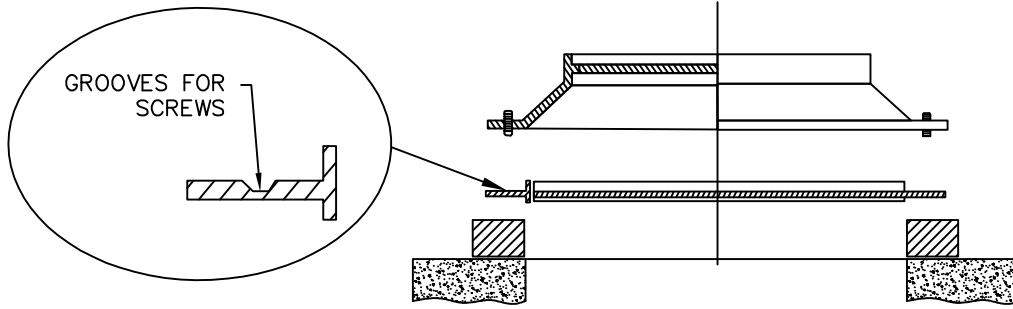
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MANHOLE FRAME AND COVER

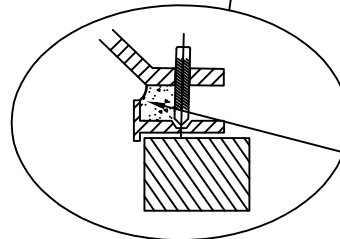
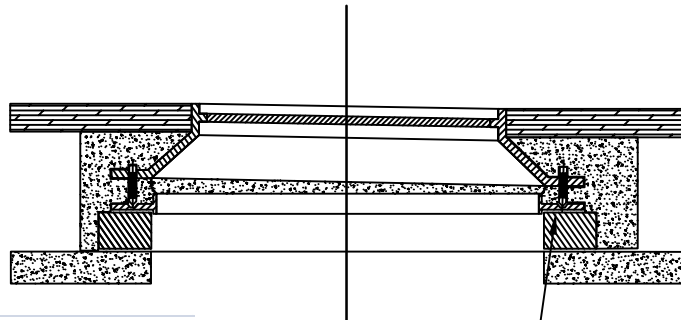
SS-S1b

JUNE 28/18

STANDARD DETAIL DRAWINGS



NOTES:
 FOR GRADES >4% USE
 LONGER SET SCREWS OR
 USE SLOPE GRADE RINGS
 AS RECOMMENDED BELOW.



15mm MINIMUM GAP BETWEEN
 TOP OF SUPPORT RING FORM
 TO BOTTOM OF CASTING

ROAD GRADE	GRADE RING	ADJUSTBABLE FRAME
8-12%	8%	AFSR
4-8%	4%	AFSR
0-4%		AFSR ONLY

RAKE FINISH SURFACE OF CONCRETE
 MAINTAIN MINIMUM 50mm ASPHALT
 THICKNESS OVER CONCRETE

MIN. ASPHALT THICKNESS TO BE
 50mm AROUND FRAME

FILL VOID
 WITH CONCRETE

MATCH CONTOUR OF ROAD
 SURFACE.

SET SCREW TO HAVE BONDED
 THREAD PROTECTION AND
 GRAPHITE. THREADED HOLES
 IN FRAME

DO NOT EXCAVATE
 BEYOND GRADE RINGS
 100mm, RECOMMEND
 HYDRO EXCAVATION

PLACE CONCRETE BETWEEN FRAME
 AND SUPPORTING RING, IN A SINGLE
 HOMOGENEOUS MANNER.
 EXPOSED CONCRETE INSIDE CHIMNEY
 TO BE HAND FINISHED SMOOTH

NOTE: PROTECT SET SCREW
 THREADS FROM CONCRETE
 USING PLASTIC THREAD CAPS
 OR OTHER APPROVED EQUAL.
 (SEE MANUFACTURERS
 RECOMMENDATIONS.)
 THICKNESS OF CONCRETE TO
 BE 100mm
 -CONCRETE 30 MPA
 -10mm AGREGATE REDUCE
 SHRINKAGE BY USE OF
 PLASTISIZER

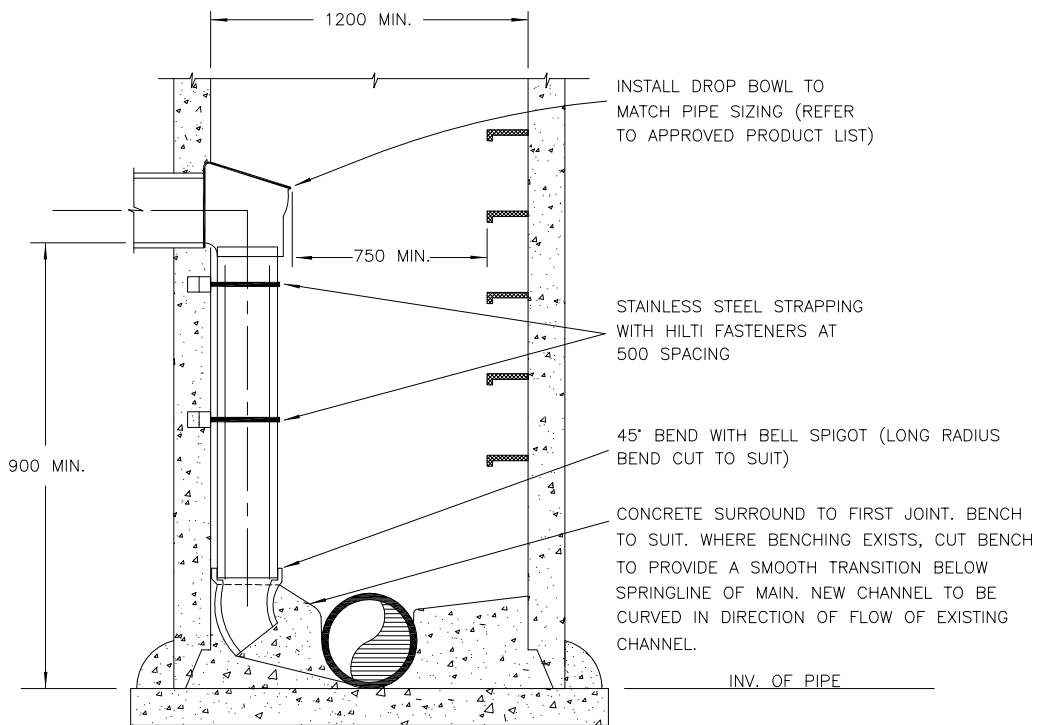
P:\DRAFTING\Standard Drawings\City_of_Kelowna\Utilities\Drainage and Sanitary\Proposed for Council

ADJUSTABLE MANHOLE FRAME AND COVER

SS-S1c

JUNE 28/2014

STANDARD DETAIL DRAWINGS



INSIDE DROP TYPE

- NOTE:**
1. INSIDE DROP TO BE USED WHERE SPECIFIED BY ENGINEER.
 2. ALL INSIDE PIPE AND FITTINGS PVC DR 28/35.
 3. THIS DRAWING SHOWS INSIDE DROP ONLY. SEE DRAWING SS-S1A FOR ALL OTHER DETAILS PERTAINING TO MANHOLE REQUIREMENTS.
 4. REFER TO CONTRACT DRAWINGS. SECTION 33 44 01 FOR DETAILED SPECIFICATIONS.

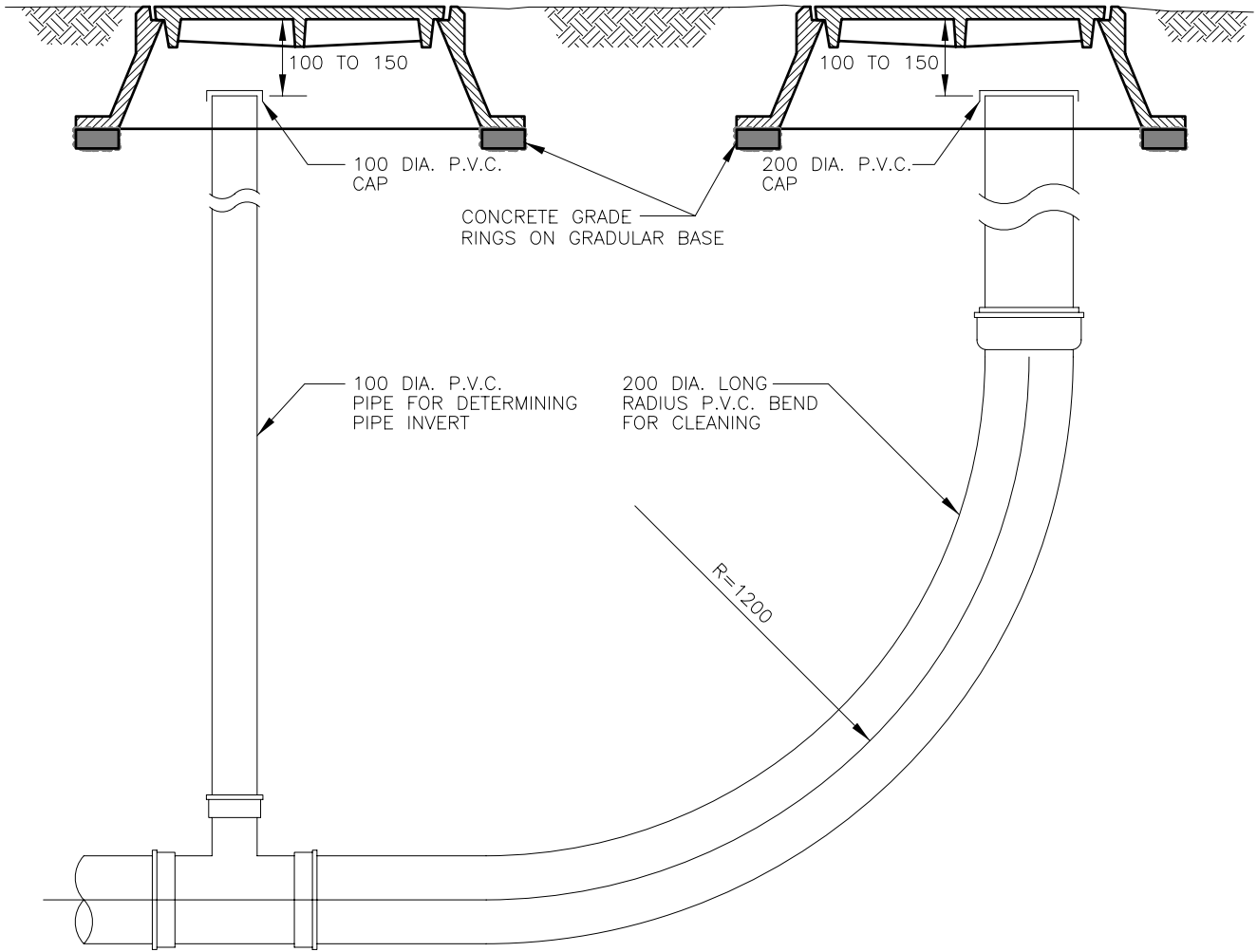
NOT TO SCALE

INSIDE DROP MANHOLE

SS-S4

JULY 4/18

STANDARD DETAIL DRAWINGS

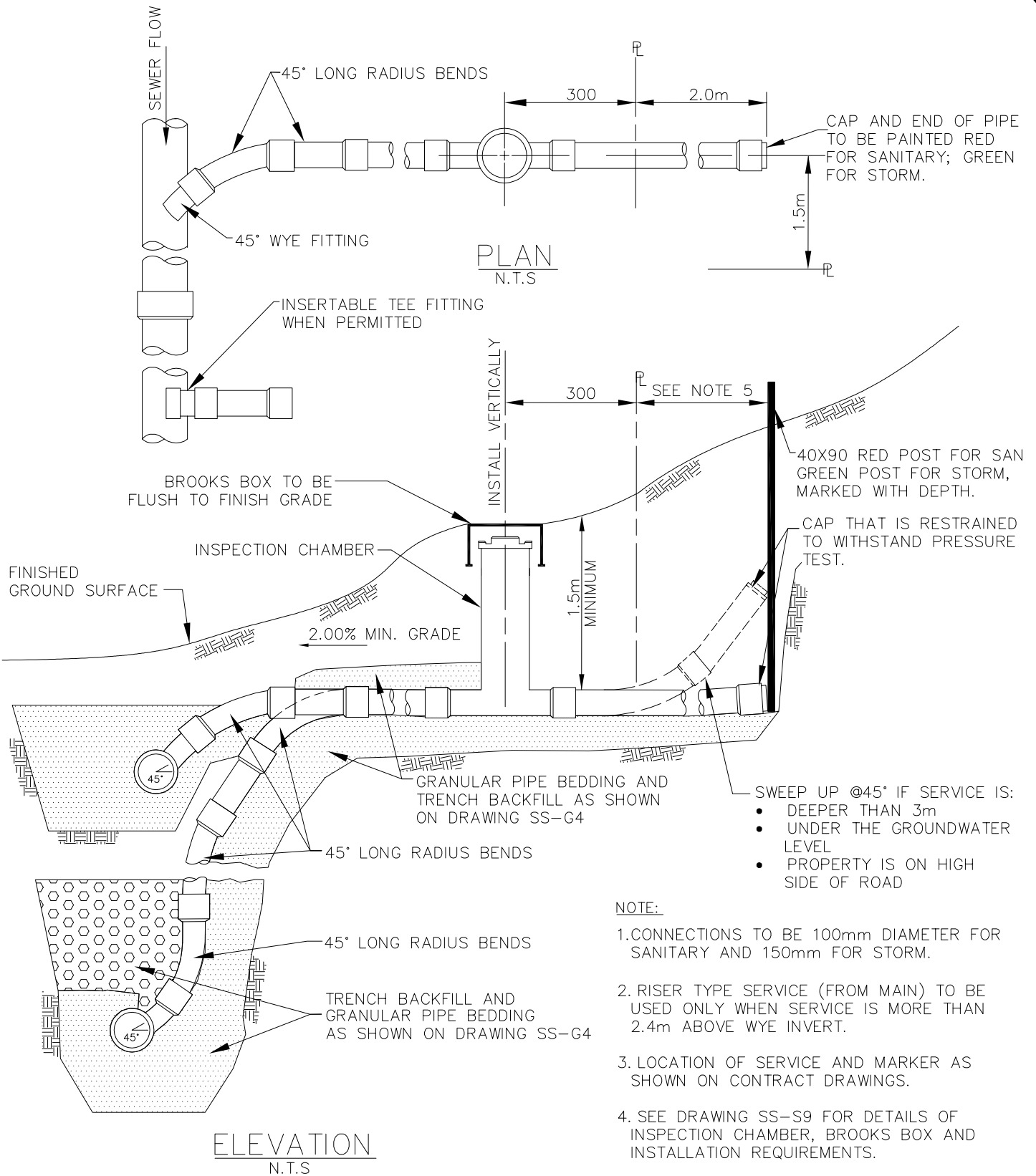


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CLEANOUT DETAIL (TEMPORARY)

SS-S6

APRIL 15/08

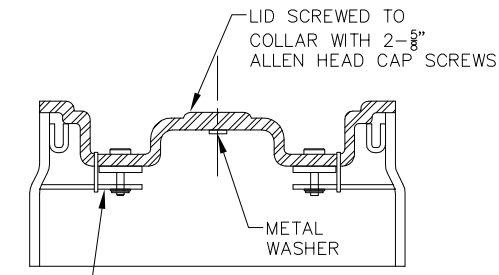
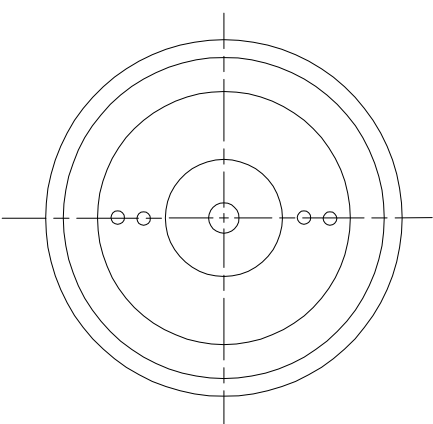


- NOTE:**
1. CONNECTIONS TO BE 100mm DIAMETER FOR SANITARY AND 150mm FOR STORM.
 2. RISER TYPE SERVICE (FROM MAIN) TO BE USED ONLY WHEN SERVICE IS MORE THAN 2.4m ABOVE WYE INVERT.
 3. LOCATION OF SERVICE AND MARKER AS SHOWN ON CONTRACT DRAWINGS.
 4. SEE DRAWING SS-S9 FOR DETAILS OF INSPECTION CHAMBER, BROOKS BOX AND INSTALLATION REQUIREMENTS.
 5. 2.0m TYPICAL. WHEN ON LOW SIDE OF ROAD AND PIPE DEPTHS > 2.0m, USE 4.0m
 6. HORIZONTAL SEPARATION BETWEEN SANITARY SEWER SERVICE AND ADJUST WATER AND STORM SERVICES TO BE MINIMUM OF 0.5m

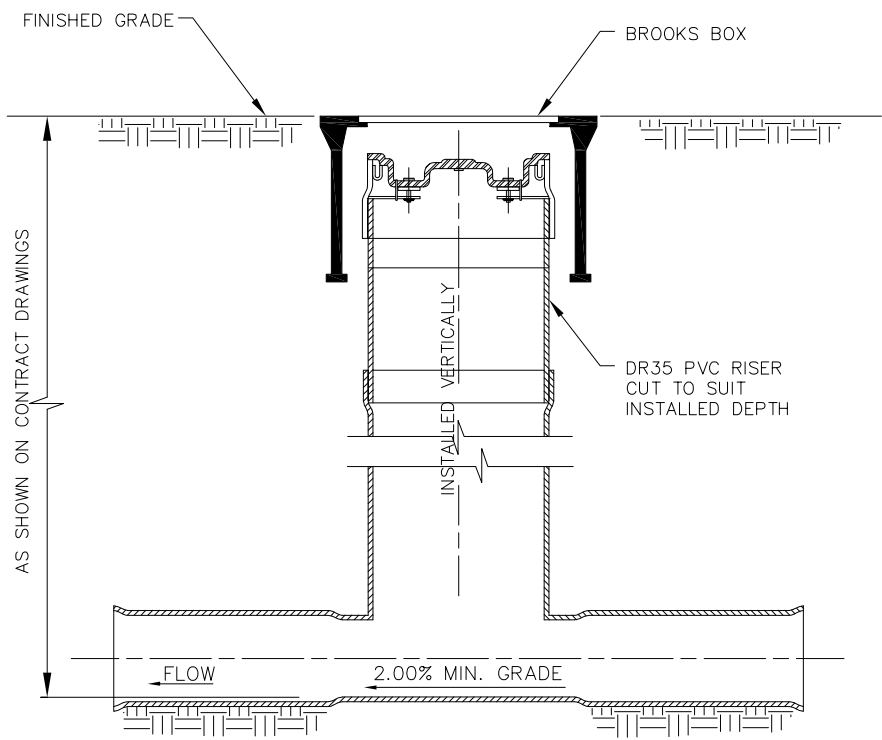
SANITARY AND STORM SEWER SERVICE CONNECTION

DRAWING NUMBER
SS-S7

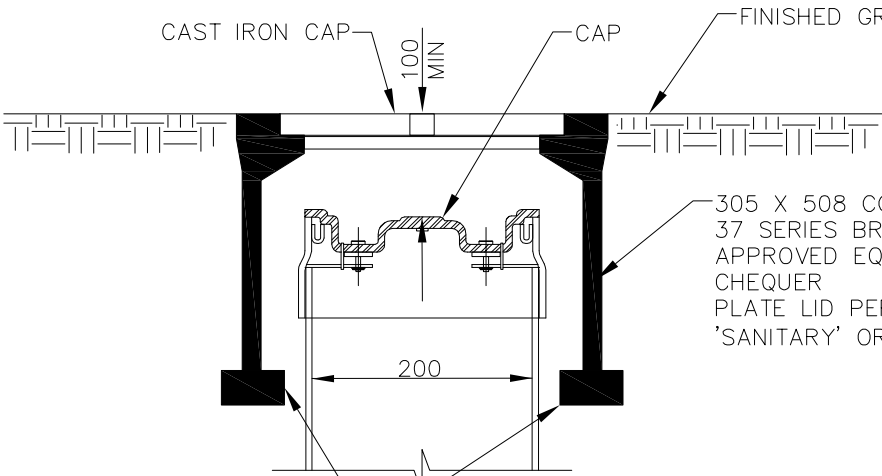
P:\DRAFTING\STANDARD_DRAWINGS\CITY_OF_KELOWNA\UTILITIES\DRAINAGE_AND_SANITARY\PROPOSED_FOR_COUNCIL\SS-S9



CAP DETAIL
N.T.S



PROFILE VIEW
N.T.S



BROOKS BOX DETAIL
N.T.S

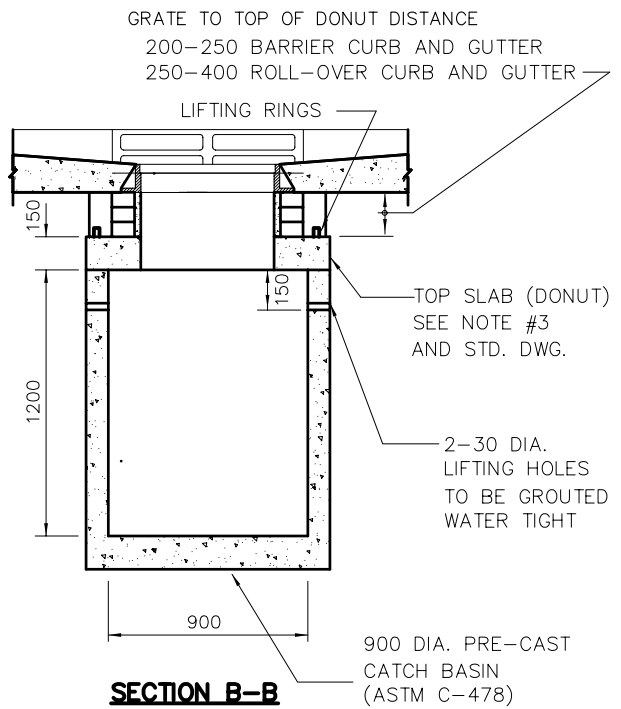
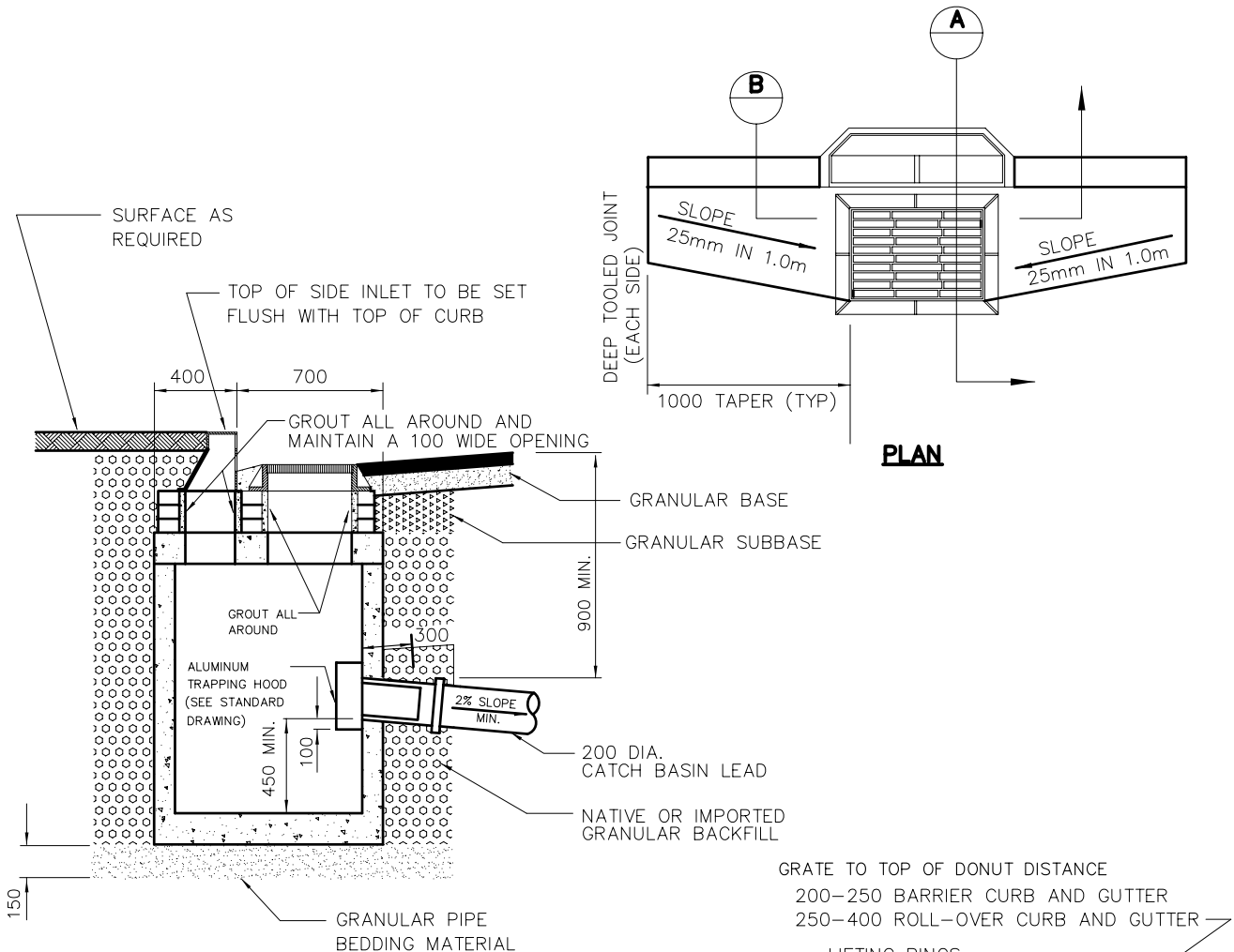
305 X 508 CONCRETE PULL BOX
37 SERIES BROOKS PRODUCTS LTD. OR
APPROVED EQUIVALENT WITH STEEL
CHEQUER
PLATE LID PERMANENTLY MARKED
'SANITARY' OR 'STORM' AS REQUIRED.

- NOTE:**
1. REFER TO DRAWING SS-S7 FOR INSTALLATION REQUIREMENTS.
 2. INSPECTION TO BE APPROVED MANUFACTURED FITTING.
 3. REFER TO CONTRACT DRAWINGS FOR SITE SPECIFIC DIMENSIONS AND SECTION O2731 FOR DETAILED SPECIFICATIONS.
 4. RED CAP FOR SANITARY AND GREEN CAP FOR STORM CONNECTIONS.

INSPECTION CHAMBER FOR 100 TO 200 SANITARY SEWER OR STORM DRAIN CONNECTION

DRAWING NUMBER
SS-S9

STANDARD DETAIL DRAWINGS



- NOTES:**
1. FOR DETAILS OF METAL CASTINGS; SEE STANDARD.
 2. REFER TO CATCH BASIN TOP SLAB FOR DETAILS.
 3. a) METAL CASTINGS ADJUSTED TO GRADE WITH CONCRETE GRADE RINGS. INSIDE SURFACES TO BE GROUTED SMOOTH.
 b) FOR INSTALLATION OF CATCH BASIN IN ROLLOVER CURB CURB AND GUTTER, USE ROLLOVER FRAME AND GRATE. (WESTVIEW SALES LTD RB7 OR EQUAL)
 c) FOR INSTALLATION OF CATCH BASIN WITHOUT CURB AND GUTTER, BLOCK CURB INLET OPENING IN TOP SLAB WITH SOLID NON-DECOMPOSABLE MATERIAL.
 4. GRATE TO BE SET BELOW FIRST LIFT OF ASPHALT WHERE FINAL LIFT IS NOT BEING INSTALLED WITHIN ONE MONTH.

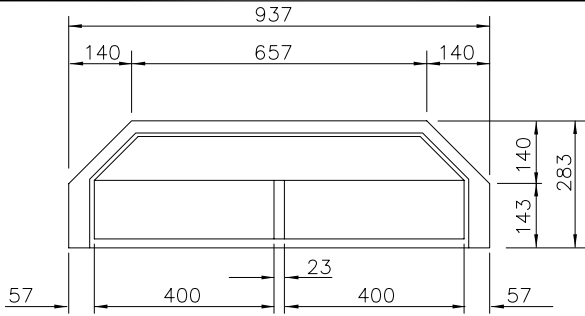
CATCH BASIN (900mm DIA.)

SS-S11a

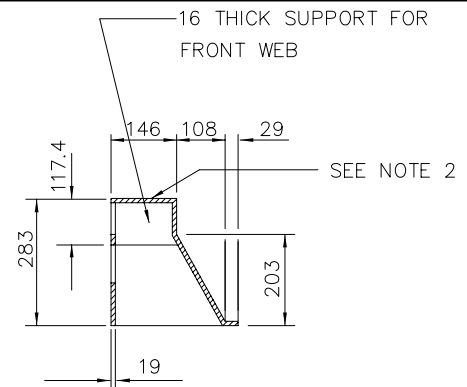
APRIL 15/08

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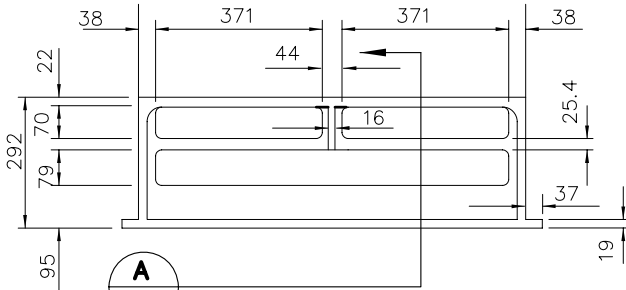
STANDARD DETAIL DRAWINGS



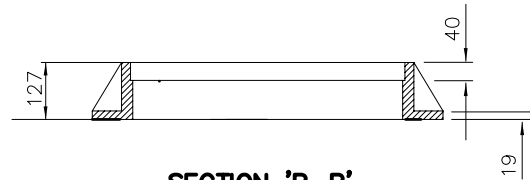
BOTTOM VIEW
(BARRIER CURB ONLY)



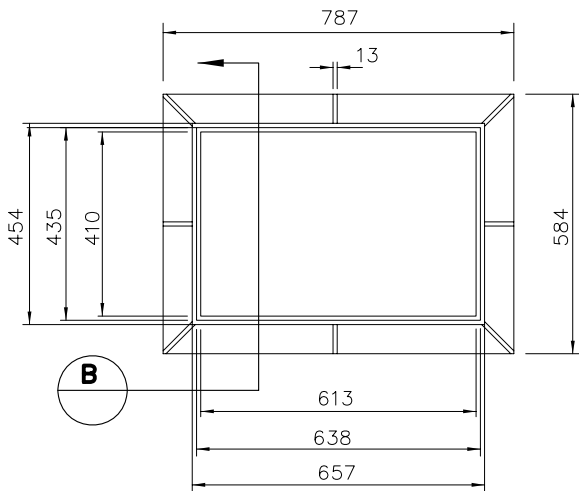
SECTION 'A-A'



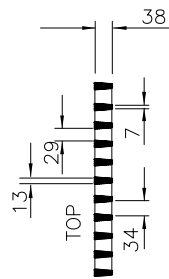
FRONT ELEVATION
(BARRIER CURB ONLY)



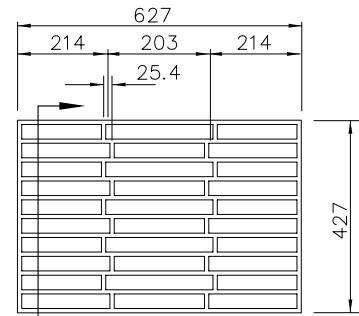
SECTION 'B-B'



PLAN VIEW
(CATCH BASIN FRAME CASTING)



SECTION C-C



PLAN VIEW
(CATCH BASIN GRATE)

NOTE:

1. CURB INLET CASTING GRATE AND FRAME CASTING TO BE DUCTILE IRON (DESIGNED FOR H-20 LOADING)
2. FISH DESIGN CAN BE ADDED TO TOP OF SIDE INLET BUT MUST BE APPROVED BY THE CITY ENGINEER PRIOR TO CONSTRUCTION.
3. FOR ROLL CURB USE ROLLOVER FRAME & GRATE (WESTVIEW SALES LTD RB7 OR EQUAL)

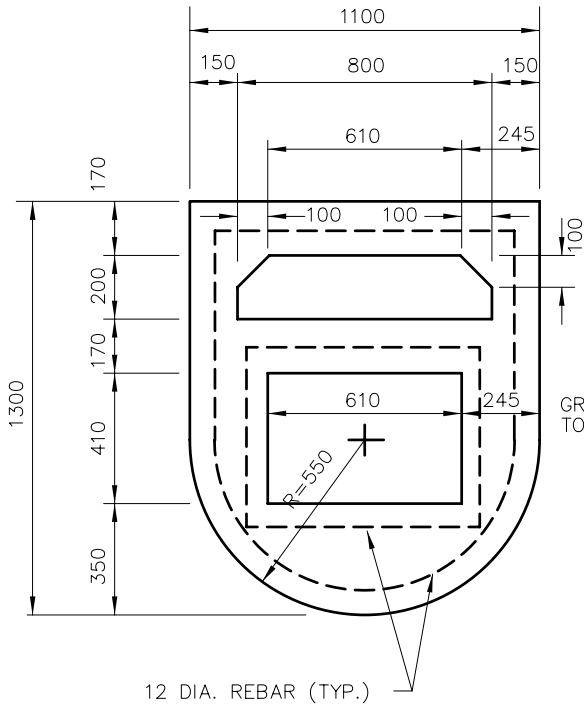
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CATCH BASIN CASTINGS COMBINED SIDE & GUTTER INLET

APRIL 15/08

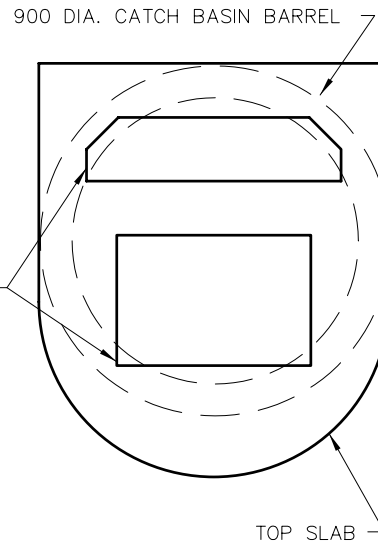
SS-S11b

STANDARD DETAIL DRAWINGS

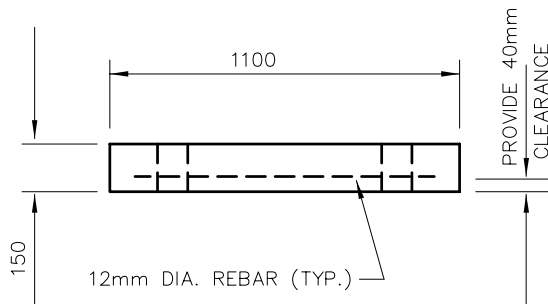


12 DIA. REBAR (TYP.)

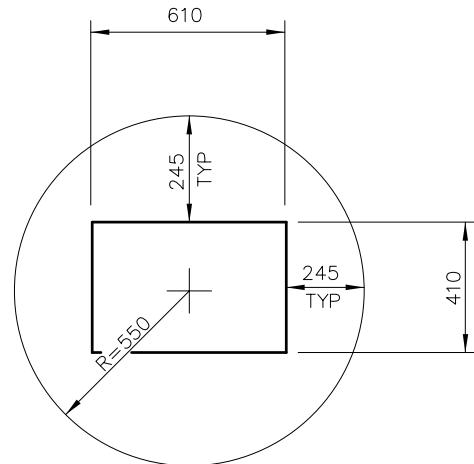
PLAN TOP SLAB



**POSITION OF TOP SLAB
ON 900mm DIA. CATCH BASIN**



FRONT ELEVATION



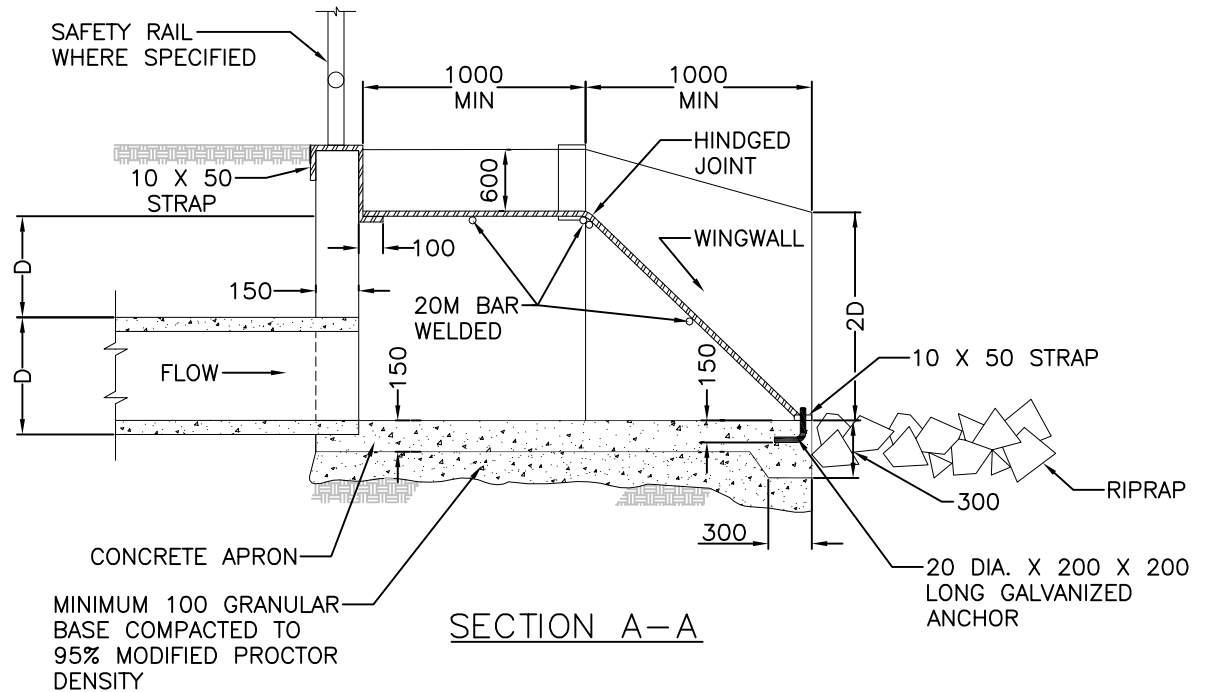
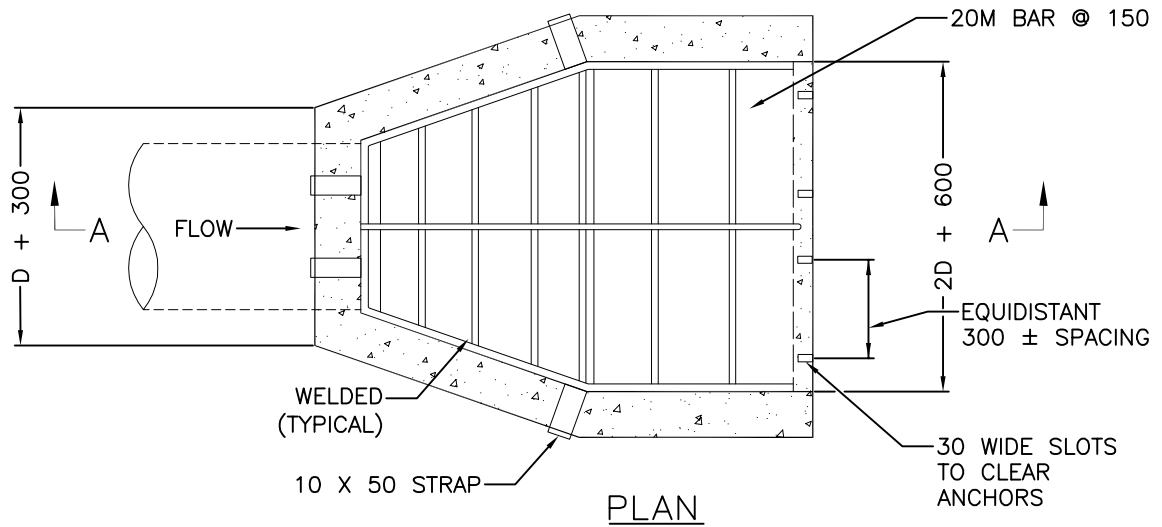
**TOP SLAB
(WITHOUT CURB INLET OPENING)**

NOTES:

1. ALL CONCRETE WORK TO BE A MINIMUM OF 30MP_a STRENGTH AND DESIGNED FOR H-20 LOADING.
2. MODIFY OPENINGS FOR ROLLOVER FRAME AND GRATE.

P:\DRAFTING\STD-DWGS\MACD-STD\SS-s11c.dwg

STANDARD DETAIL DRAWINGS



NOTES

1. INSTALL SAFETY HANDRAIL IF SPECIFIED ON CONTRACT DRAWINGS
2. PRECAST UNIT MAY BE PROVIDED AS ALTERNATIVE WITH CONTRACT ADMINISTRATOR'S APPROVAL.
3. ALL STEEL COMPONENTS TO BE HOT DIPPED GALVANIZED AFTER FABRICATION.
4. SAFETY GRILLAGE TO BE WELDED AT ALL JOINTS AND CONNECTIONS EXCEPT AT ANCHOR BOLTS
5. REFER TO CONTRACT DRAWINGS FOR LOCATIONS AND SITE SPECIFIC DIMENSIONS. REFER TO SECTIONS 03200 AND FOR DETAILED SPECIFICATIONS.

STORM DRAIN OUTLET WITH SAFETY GRILLAGE

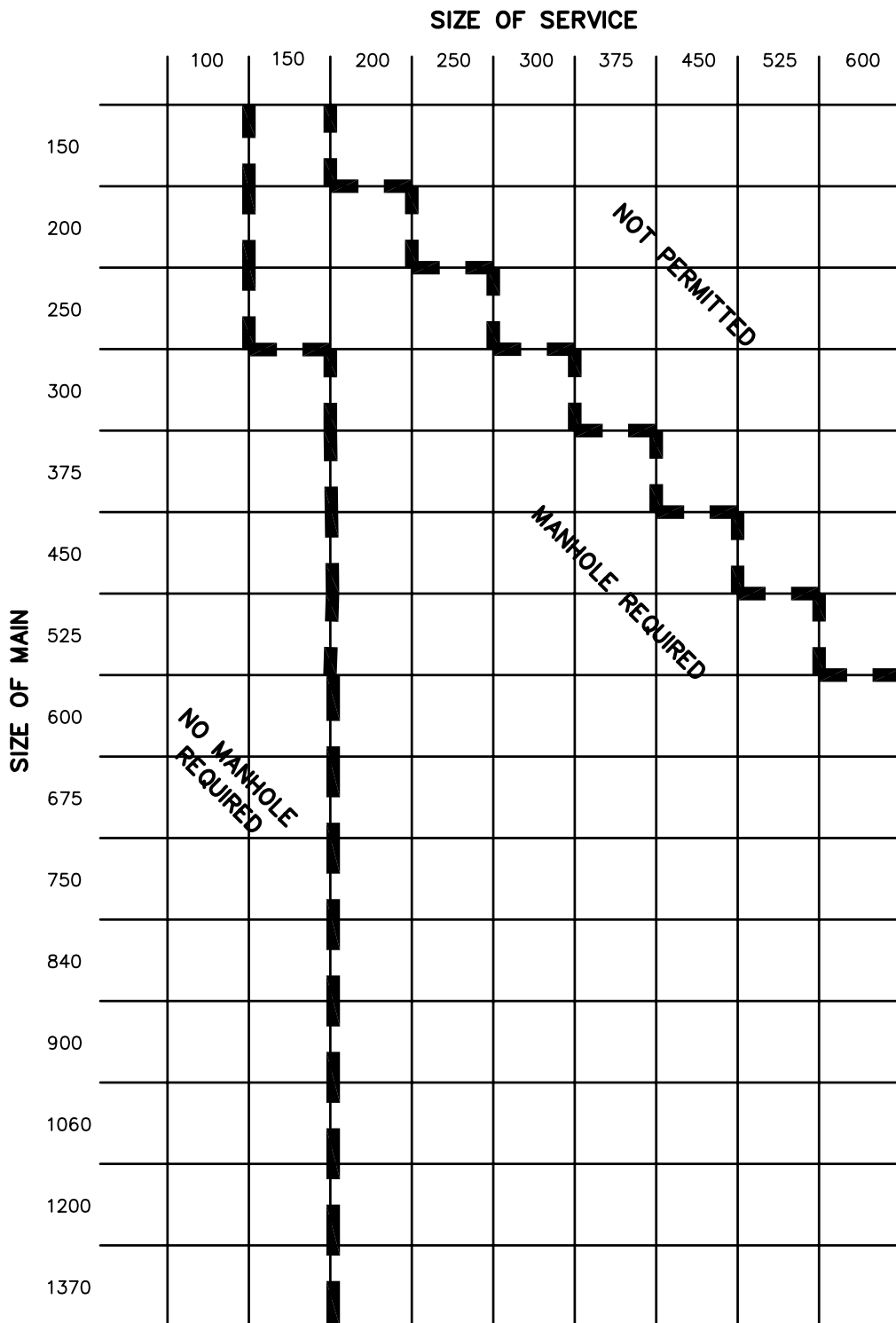
JUNE 28/18

DRAWING NUMBER:

SS-S13B

297

STANDARD DETAIL DRAWINGS



NOTES:

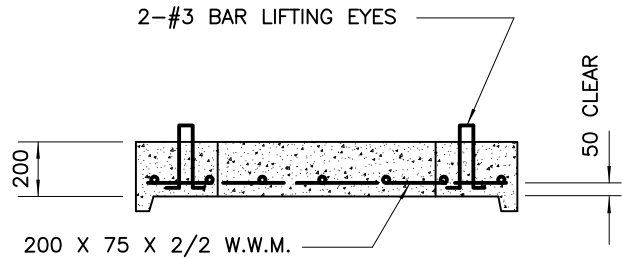
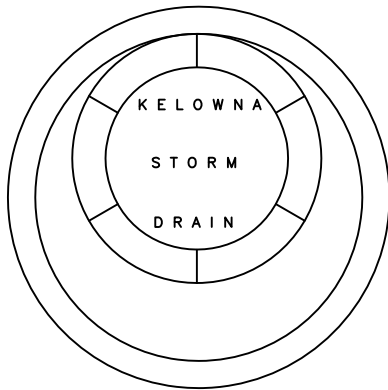
1. ALL CATCH BASIN LEADS MUST BE CONNECTED TO A MANHOLE.

NOV. 2/98

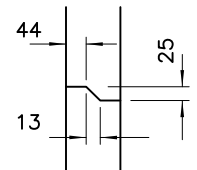
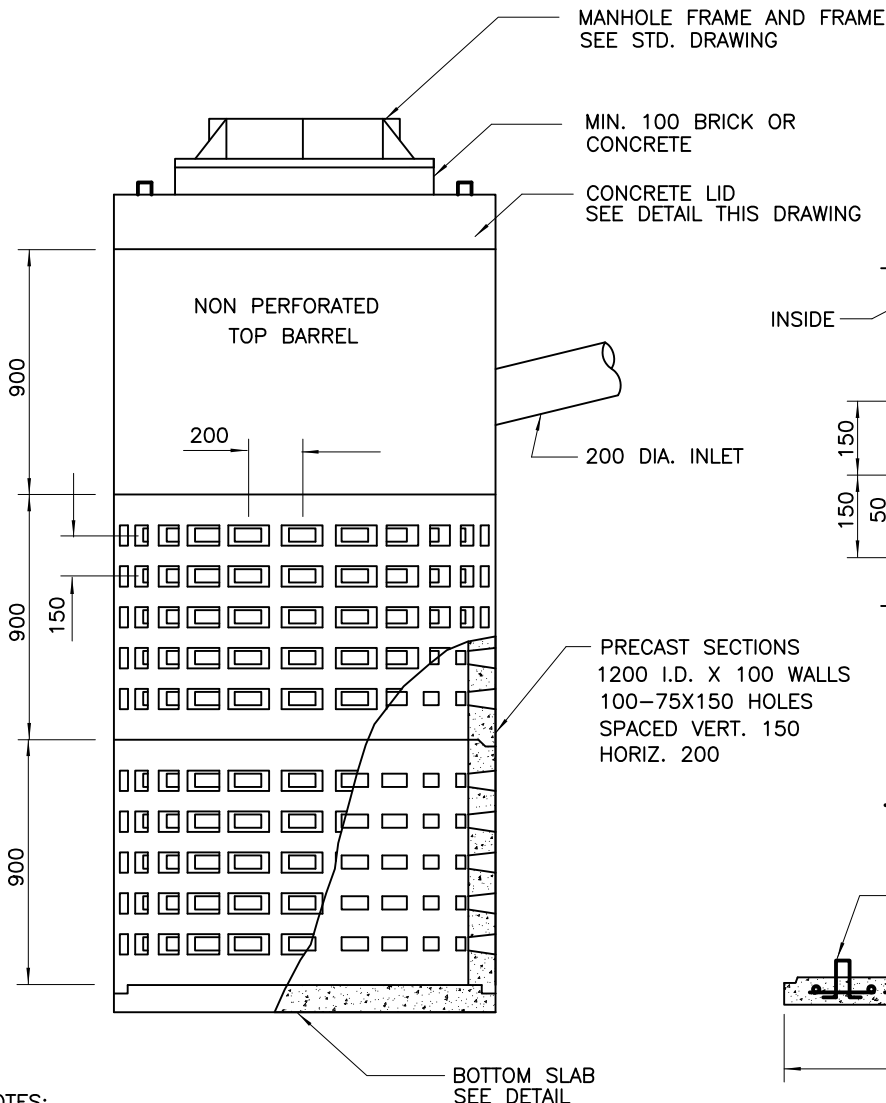
MANHOLE REQUIREMENT FOR SERVICES

SS-S50

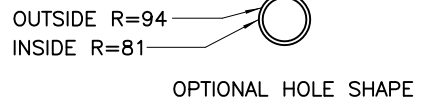
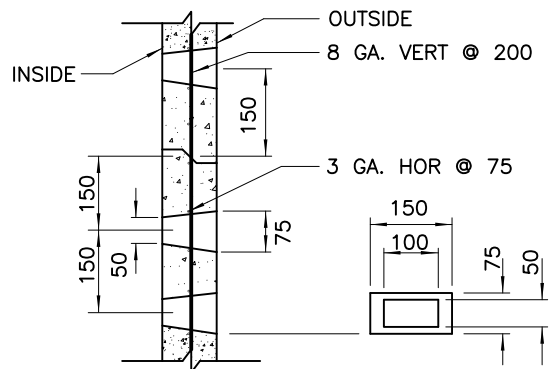
STANDARD DETAIL DRAWINGS



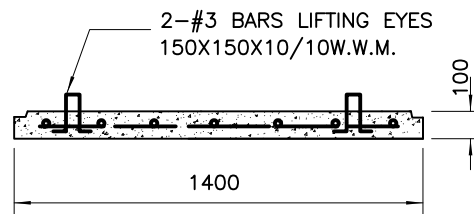
CONCRETE LID DETAIL



JOINT DETAIL



SECTION-BARREL



BOTTOM SLAB DETAIL

NOTES:

1. LADDER RUNGS ARE REQUIRED.
2. SEE MANHOLE STD. DWG. FOR DETAILS.
3. SEE DRAINAGE DRYWELL INSTALLATION STANDARD FOR DETAILS.
4. THIS STANDARD IS ALLOWED ONLY IN ACCORDANCE WITH THE STORM WATER POLICY AND DESIGN MANUAL.

H:\WU\DRAWING\STD-DWGS\MMCD\SS-S51

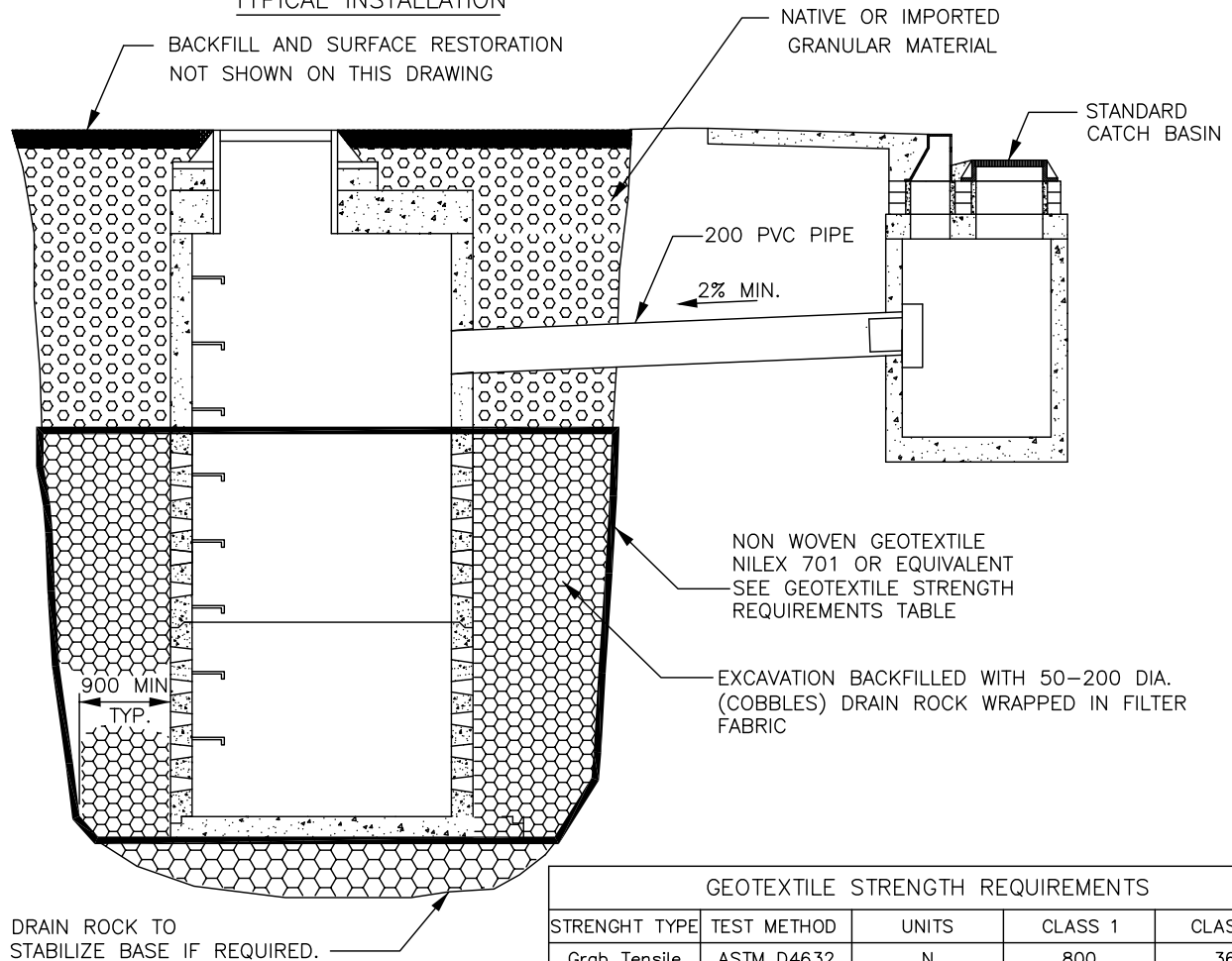
DRAINAGE DRYWELL

SS-S51

NOV 02/98

STANDARD DETAIL DRAWINGS

TYPICAL INSTALLATION



GEOTEXTILE STRENGTH REQUIREMENTS

STRENGTH TYPE	TEST METHOD	UNITS	CLASS 1	CLASS 2
Grab Tensile	ASTM D4632	N	800	360
Puncture	ASTM D4833	N	370	200
Burst	ASTM D3786	kPa	1950	1030
Trapezoidal	ASTM D4533	N	260	130

1 Class 1: Geotextile installation where very coarse shape angular aggregate is used

Compaction >95% Standard Proctor Maximum Dry Density (SPMDD)

Depth of trench > 3.0

2 Class 2: Geotextile installation on smooth graded surfaces having no sharp angular aggregate.

Compaction < 95% SPMDD

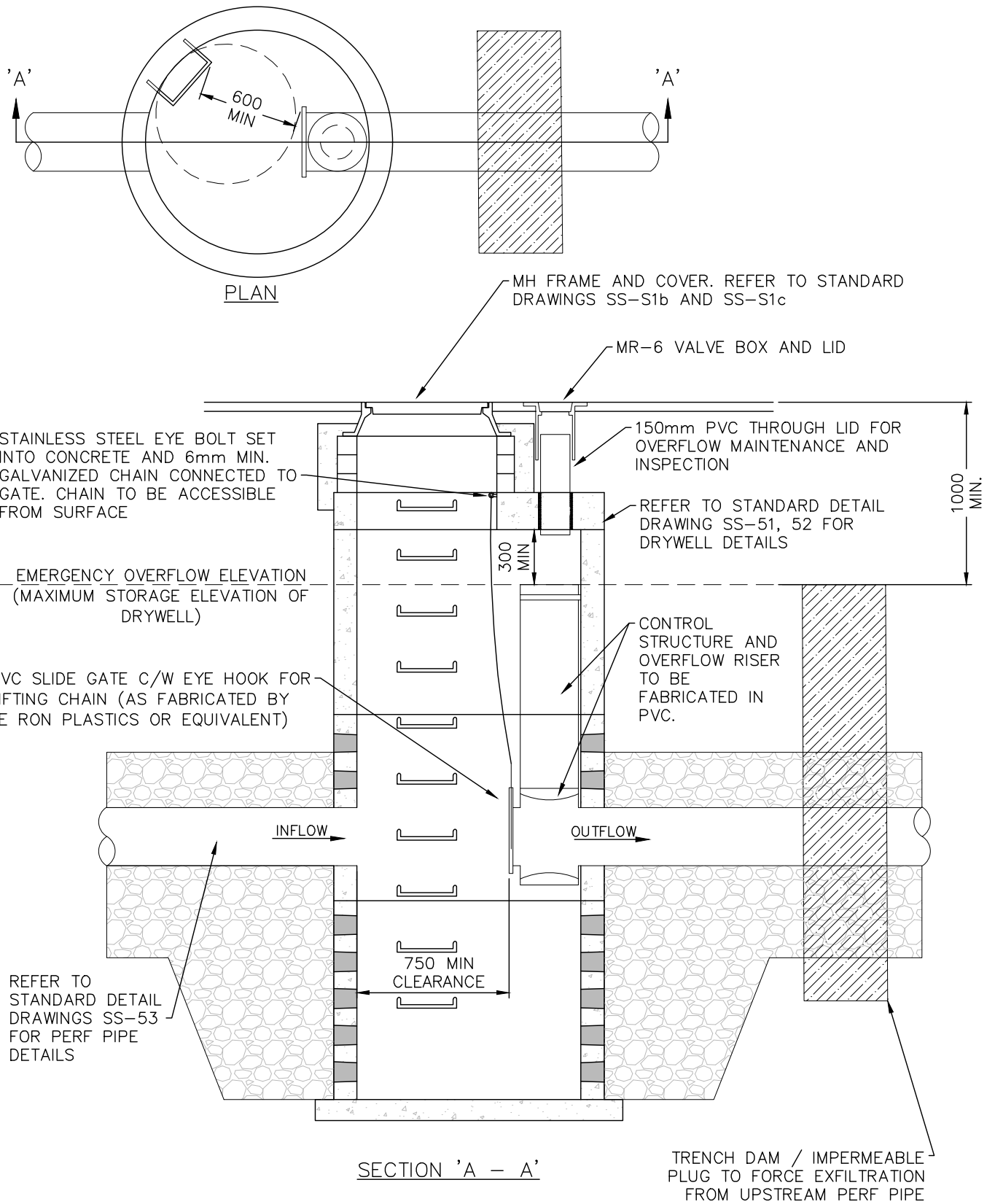
NOTES:

1. THE NUMBER AND SPACING OF DRAINAGE DRYWELLS MUST BE CALCULATED IN ACCORDANCE WITH CITY DESIGN CRITERIA AND WILL DEPEND UPON THE AREA DRAINED AND GROUND CONDITIONS. (SEE ALSO PIPE PERFORATION AND BEDDING DETAIL STANDARD DRAWING SS-S53).
2. FILTER FABRIC TO BE STRETCHED BELOW TOP BARREL SECTION AND REMOVED BY THE CONTRACTOR DURING THE FINAL INSPECTION.
3. DEPTH TO BE SPECIFIED WILL VARY DEPENDING UPON DRAINAGE REQUIREMENTS AND GROUND CONDITIONS. DEPTH TO WATER TABLE MUST BE SHOWN IF LESS THAN 3.6m. THERE IS NO NEED TO PLACE DRYWELLS BELOW LOW WATER TABLE.

DRAINAGE DRYWELL INSTALLATION

SS-S52

FEB 12 2010



NOTES:

1. ALL DIMENSIONS ARE IN MILLIMETRES.

**STANDARD
DETAIL
DRAWING**

DATE:
AUG 11/22
SCALE:
NTS

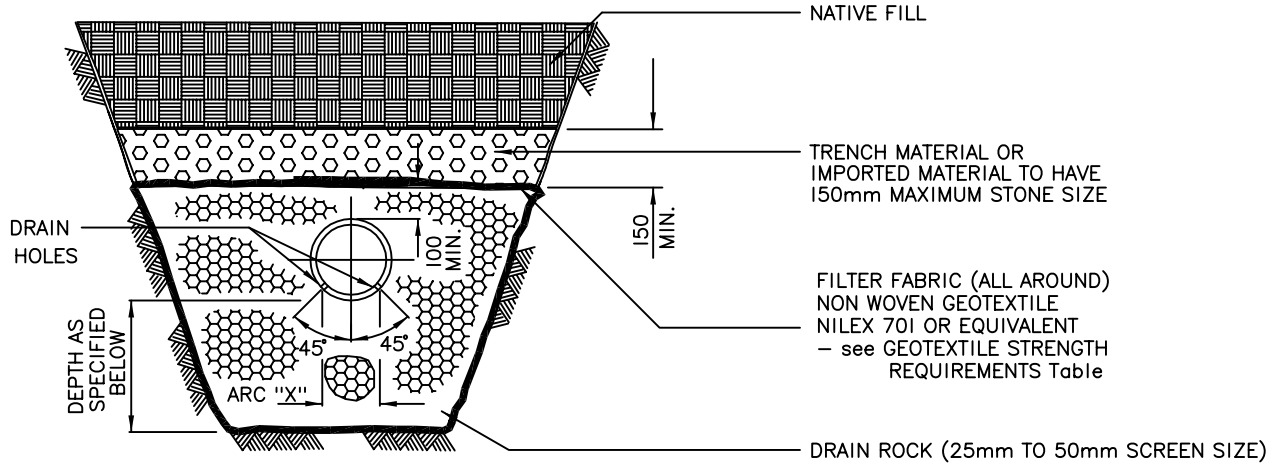
**DRYWELL INSTALLATION WITH
PERFORATED PIPE SYSTEM**

DWG. NO.

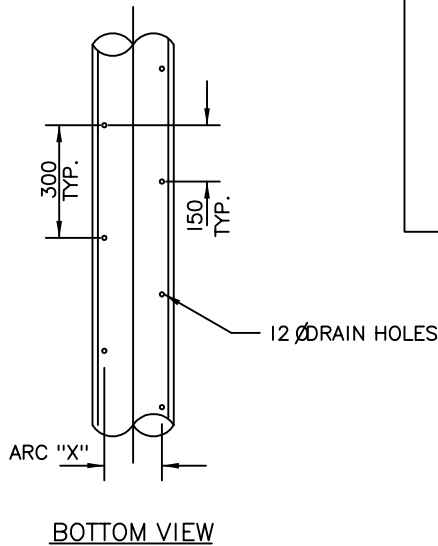
SS-S52a



STANDARD DETAIL DRAWINGS



END VIEW



BOTTOM VIEW

GEOTEXTILE STRENGTH REQUIREMENTS

STRENGTH TYPE	TEST METHOD	UNITS	CLASS 1	CLASS 2
Grab Tensile	ASTM D4632	N	800	360
Puncture	ASTM D4833	N	370	200
Burst	ASTM D3786	kPa	1950	1030
Trapezoidal	ASTM D4533	N	260	130

- 1 Class 1: Geotextile installation where very coarse shape angular aggregate is used
 Compaction >95% Standard Proctor Maximum Dry Density (SPMDD)
 Depth of trench > 3.0
- 2 Class 2: Geotextile installation on smooth graded surfaces having no sharp angular aggregate.
 Compaction < 95% SPMDD

NOMINAL PIPE DIAMETER	ARC "X" (BASED UPON AVERAGE O.D.)
200	160
250	200
300	240
375	290
450	350

NOTES:

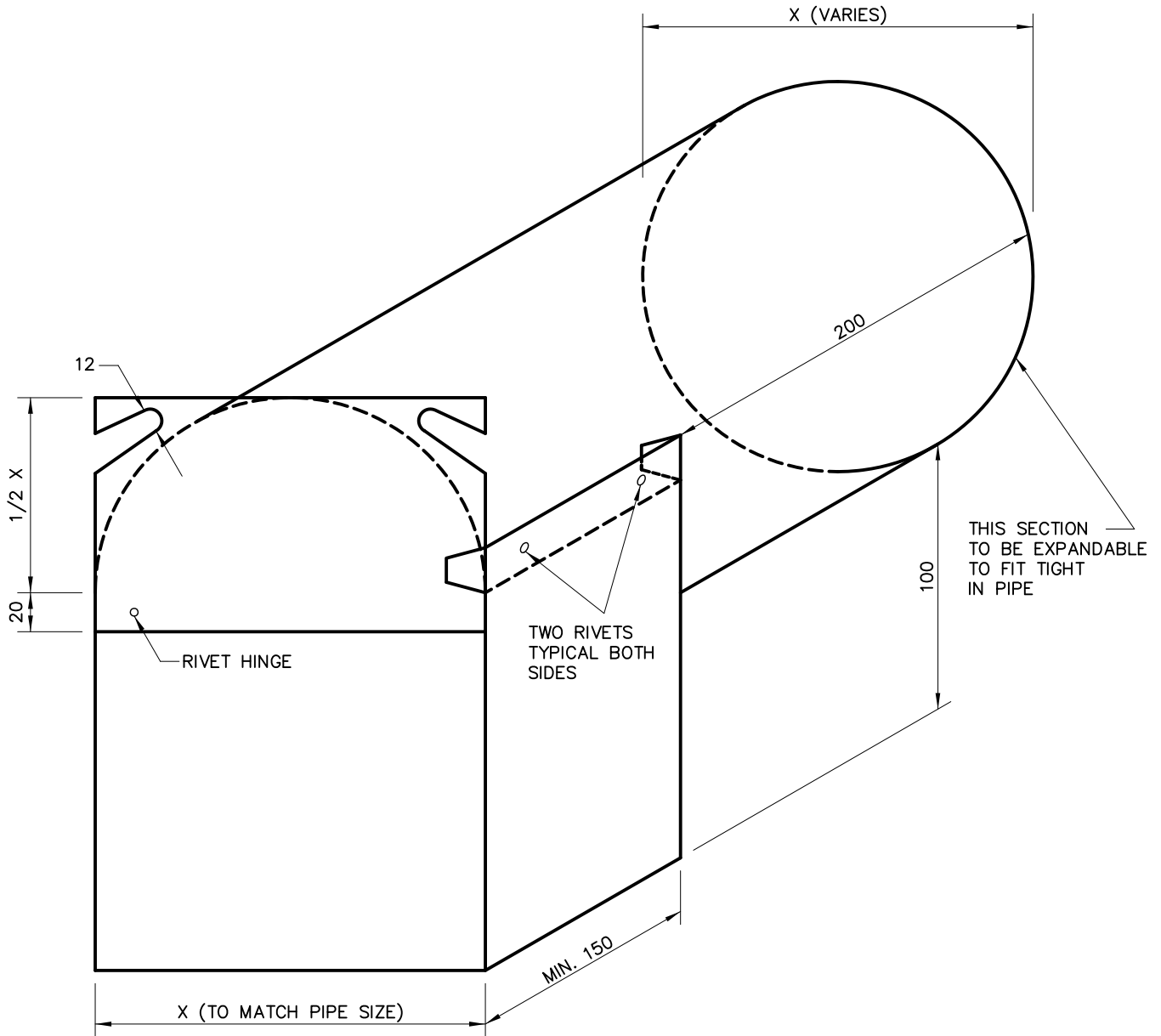
- PERFORATION SECTION APPLIES TO USE OF PVC PIPE.
- FIELD PERFORATION OF PIPE SHALL BE TO THIS STANDARD. FACTORY PERFORATED PIPE MUST BE APPROVED BY THE CITY ENGINEER.
- PROVIDE 0.5m MIN. FABRIC OVERLAP FOR LONGITUDINAL OR TRANSVERSE JOINTS IN FABRIC.
- NUMBER OF DRYWELLS AND DEPTH OF DRAIN ROCK TO BE AS FOLLOWS:
 - FOR PERCOLATION RATE OF 0-15 MIN. PER 25mm
 - USE 5 PER HA.
 - USE 200mm DEPTH OF DRAIN ROCK UNDER PERF. PIPE
 - FOR PERCOLATION RATE OF 15-30 MIN. PER 25mm
 - USE 10 DRYWELLS PER HA.
 - USE 300mm DEPTH OF DRAIN ROCK UNDER PERF. PIPE
 - FOR PERCOLATION RATE OVER 30 MIN. PER 25mm, PERF. PIPE & DRYWELLS ARE NOT RECOMMENDED.

FEB. 12/2010

PIPE PERFORATION AND BEDDING DETAIL
FOR GROUND WATER RECHARGE

SS-S53

STANDARD DETAIL DRAWINGS



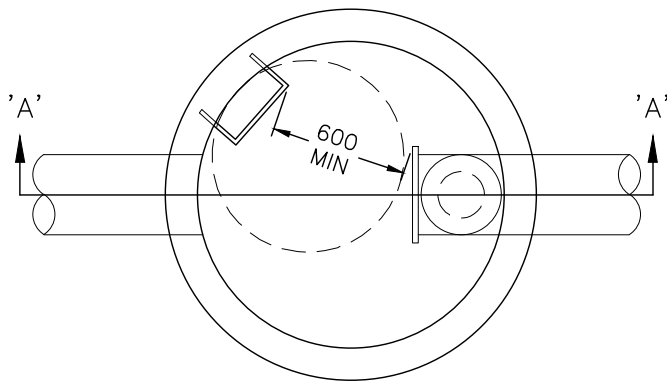
NOTES:

1. SEWER TRAPS SHALL BE MANUFACTURED FROM 16 GAUGE ALUMINUM.
2. BLIND RIVETS ONLY SHALL BE USED. RIVETS SHALL BE ALUMINUM EQUAL TO POP #AD64ABS.

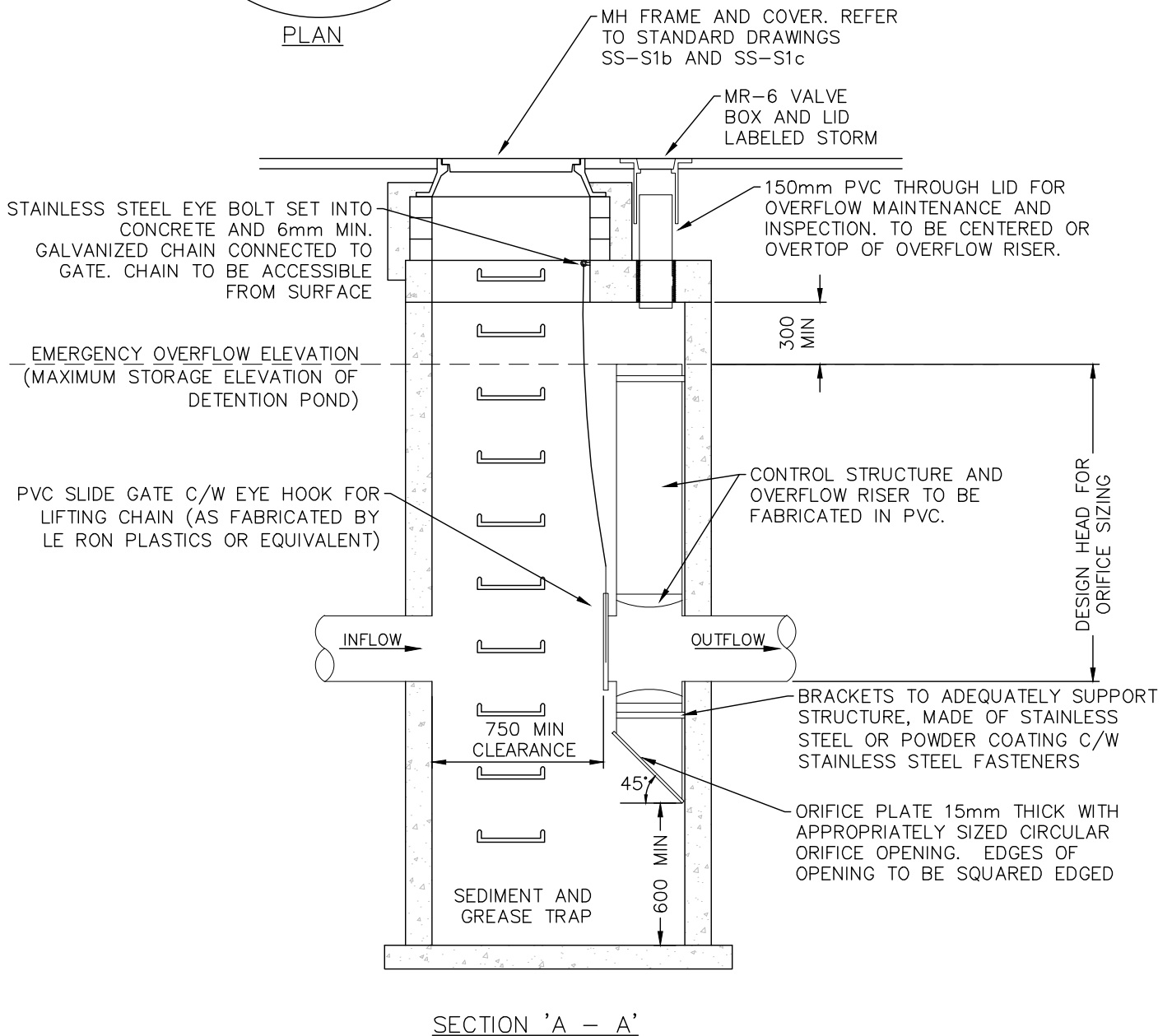
NOV. 2/98

CATCH BASIN TRAPPING HOOD

SS-S54



MANHOLE SIZE	MAX OVERFLOW STRUCTURE SIZE
1200	300
1350	375
1500	450
1800	600



NOTES:

1. ALL DIMENSIONS ARE IN MILLIMETRES.
2. REFER TO STANDARD DRAWING SS-S1a FOR MANHOLE DETAILS

**STANDARD
DETAIL
DRAWING**

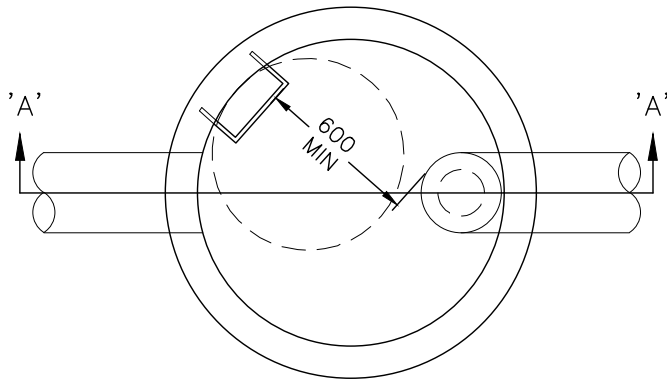
DATE:
AUG 11/22
SCALE:
NTS

**FLOW CONTROL CHAMBER
CITY FACILITY**

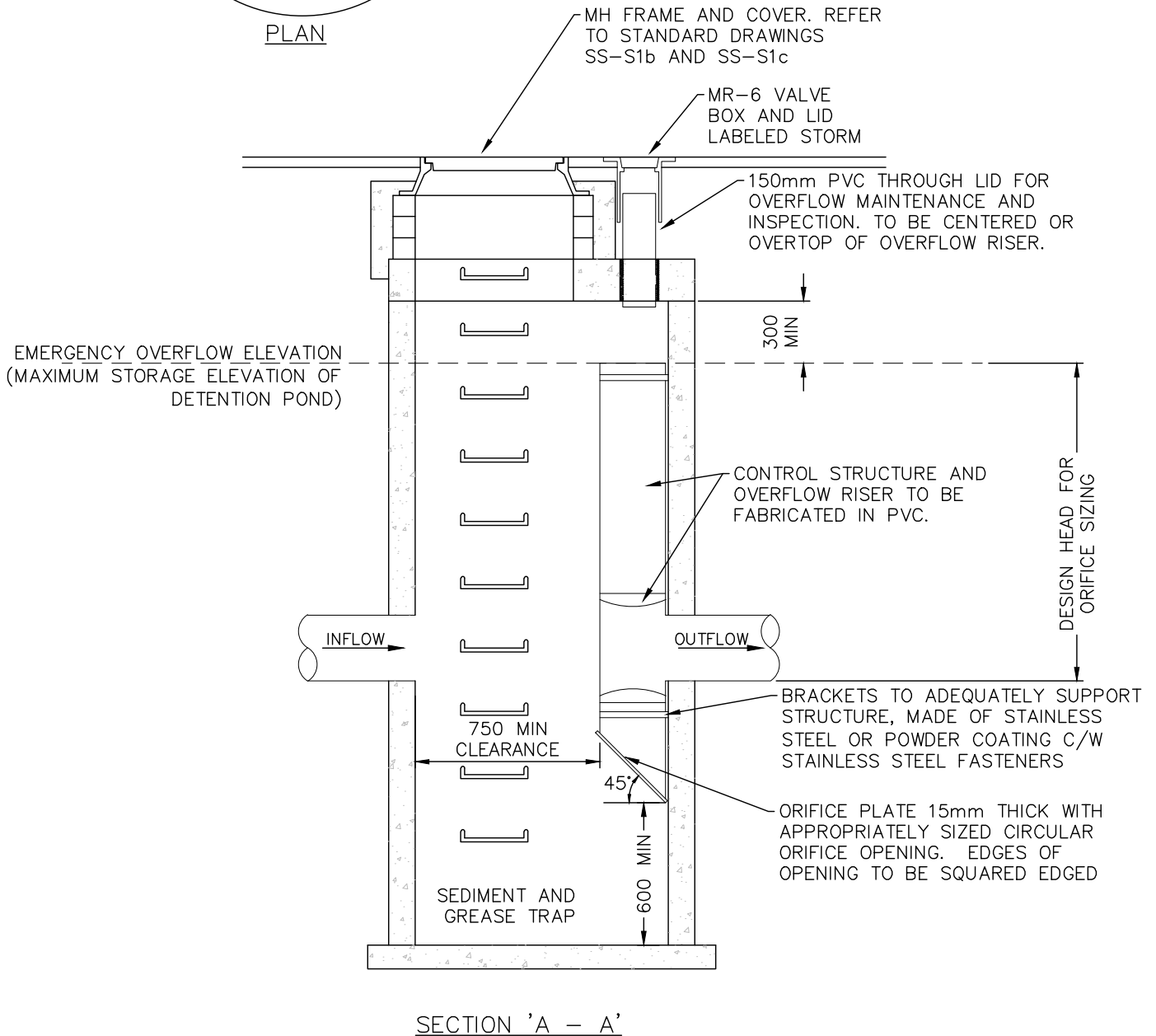
DWG. NO.

SS-S55a





MANHOLE SIZE	MAX OVERFLOW STRUCTURE SIZE
1200	300
1350	375
1500	450
1800	600



NOTES:

1. ALL DIMENSIONS ARE IN MILLIMETRES.
2. REFER TO STANDARD DRAWING SS-S1a FOR MANHOLE DETAILS

**STANDARD
DETAIL
DRAWING**

DATE:
AUG 11/22
SCALE:
NTS

**FLOW CONTROL CHAMBER
PRIVATE FACILITY**

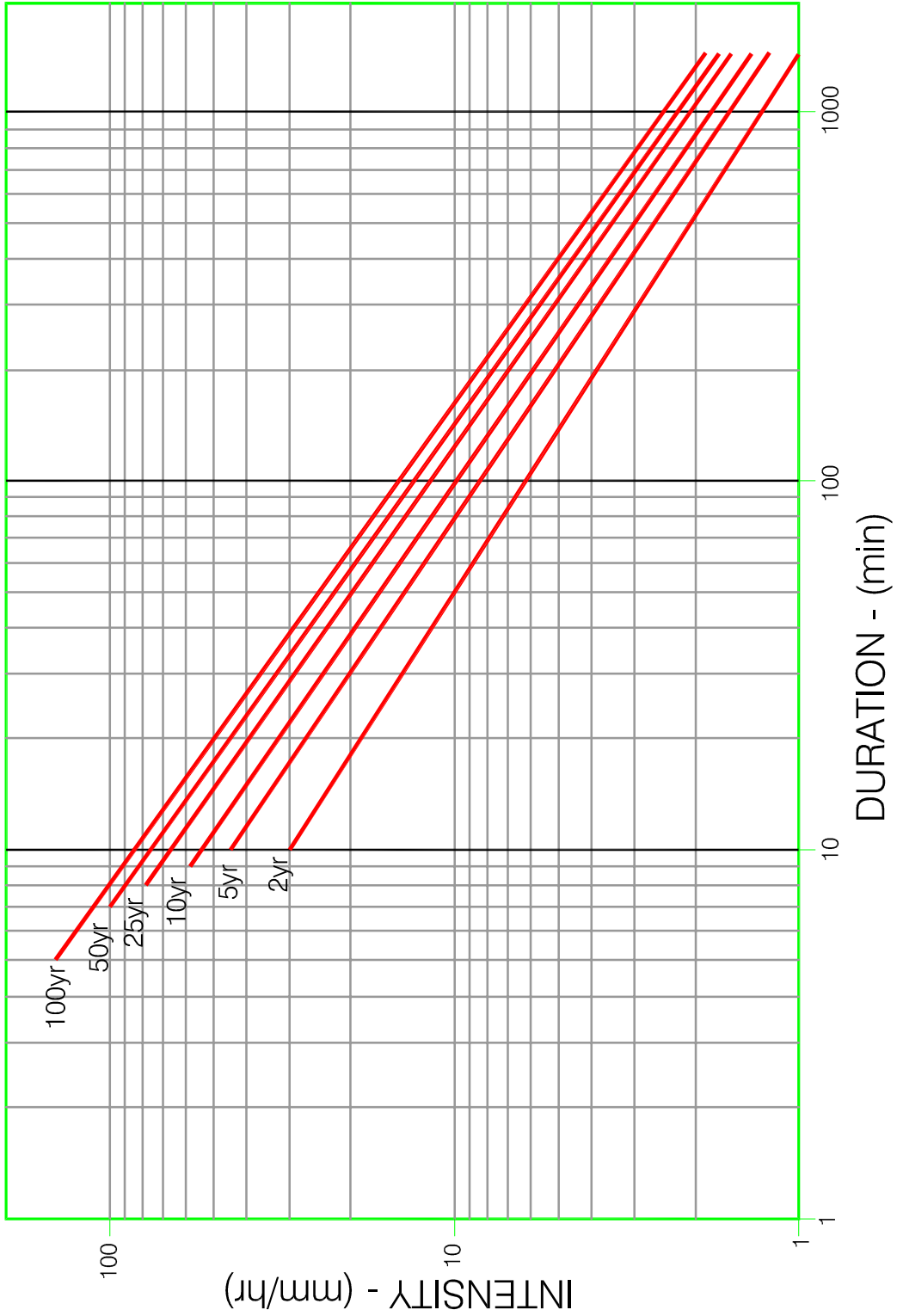
DWG. NO.

SS-S55b



STANDARD DETAIL DRAWINGS

RAINFALL IDF CURVE FOR KELOWNA
(BASED ON RECORDING RAIN GAUGE DATA FOR THE PERIOD 1969-2004)



ATMOSPHERIC ENVIRONMENT SERVICE
ENVIRONMENT CANADA

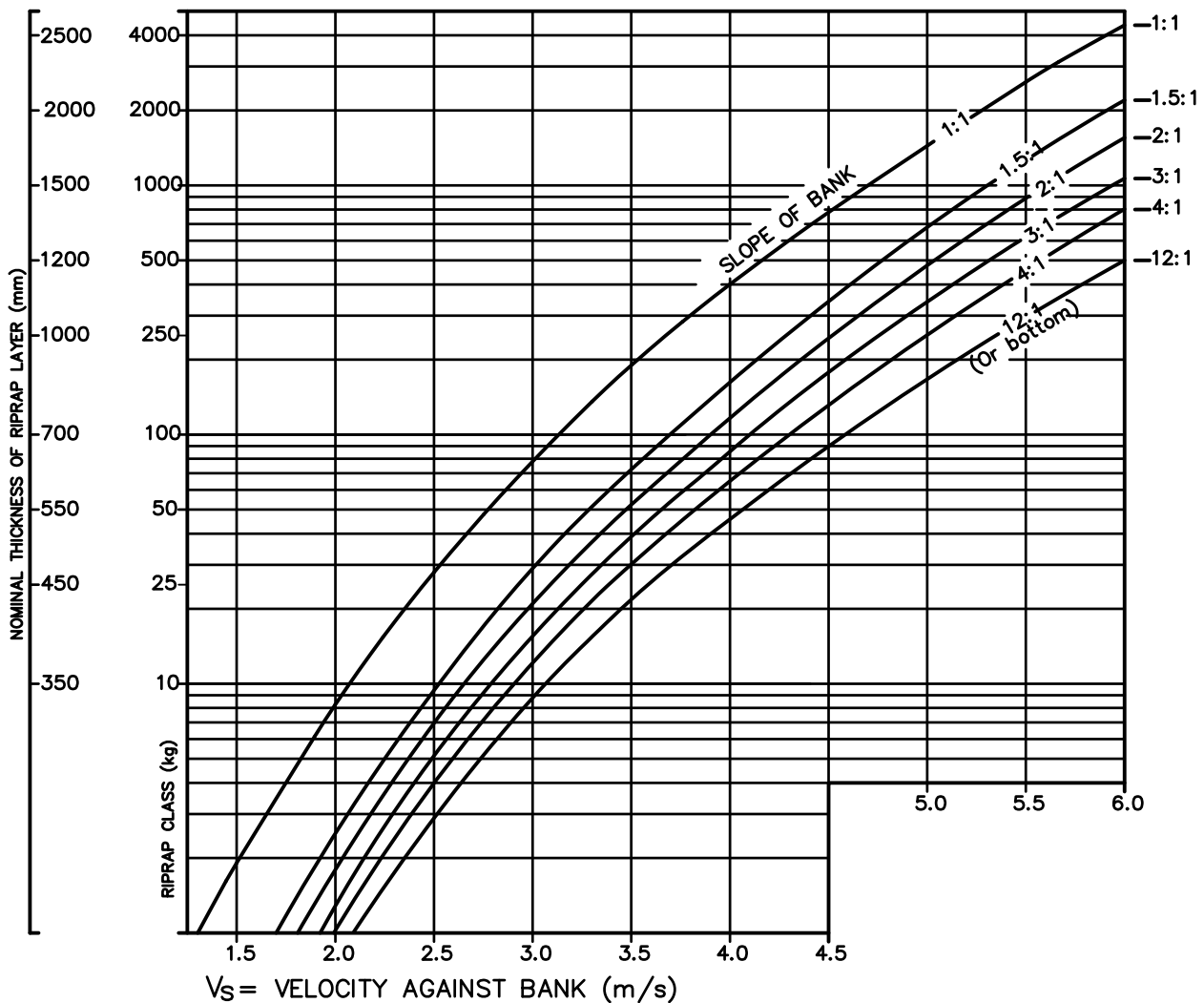
P:\DRAFTING\STD-DWGS\SUBBYLAW\SS-S56

IDF CURVES

SS-S56

DATE: OCT.27/10

STANDARD DETAIL DRAWINGS



SIZE OF ROCK AND THICKNESS OF PROTECTION BLANKET THAT WILL RESIST DISPLACEMENT FOR VARIOUS VELOCITIES AND BANKSIDE SLOPES.

Notes:

- Adapted from report of Sub-committee on slope protection, Am. Soc. Civil Engineers Proc. June 1948.
- Density of stone assumed at 2,640 kg/m³.
- Enter graph at known velocity to intersection with desired slope curve. Move horizontally to required riprap class and thickness.
- V_M = mean stream velocity.
- For parallel flow along tangent bank; $V_S = 2/3 V_M$
- For impinging flow against curved bank; $V_S = 4/3 V_M$
- For direct impingement on the bank; $V_S = 2 V_M$
- The riprap class No. is the mass (kg) of the 50% rock size (i.e., at least half of the riprap must be heavier than its class mass).
- Do not interpolate between riprap classes. Use the next highest class.

H:\WU\DRAWING\STD-DWGS\SS-S57

RIPRAP DESIGN CHART

SS-S57

DATE: MAY08/02

STANDARD DETAIL DRAWINGS

Legend

- Watercourse
- Waterbody
- Wetlands
- Parcel
- City Boundary
- HILLSIDE AREAS

For development in Hillside Areas, the City's focus will be on safe conveyance. Roof or site drainage must discharge directly to the storm system. The City will not permit infiltration to ground except for foundation drainage.

Where storm drains are not available, the City will require a hydrogeological review provided by a qualified Professional (P.Eng. or P.Geo.) to ensure that site infiltration does not exceed pre-development conditions, impact slope stability or off-site seepage, or impact downhill properties. The terms of reference of the review must be confirmed by the City Engineer and approved as a condition for obtaining a Development Permit.

Refer to City of Kelowna Bylaw # 7900, Schedule 4, Section 3.1.4 & 3.9.12b

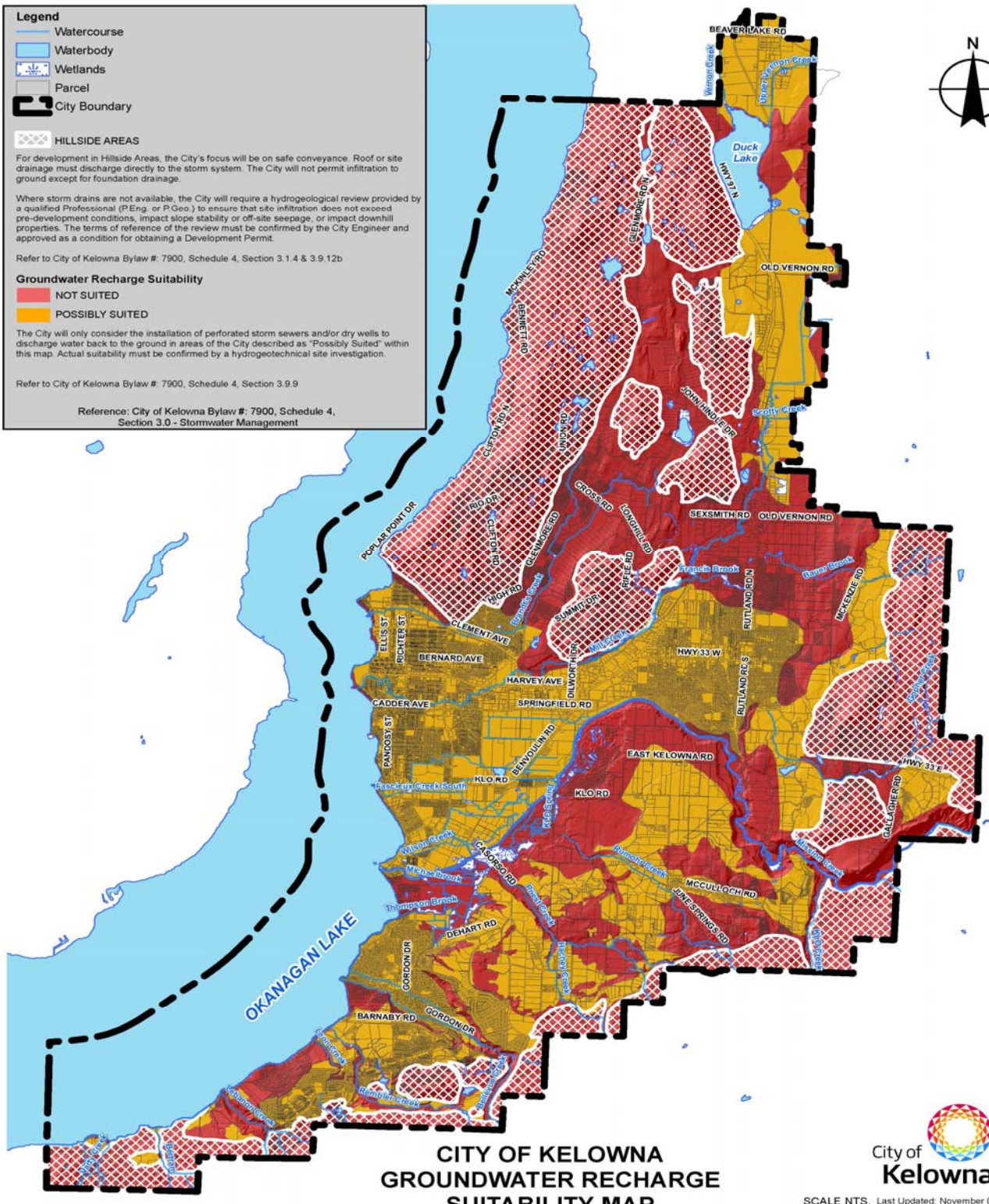
Groundwater Recharge Suitability

- NOT SUITED
- POSSIBLY SUITED

The City will only consider the installation of perforated storm sewers and/or dry wells to discharge water back to the ground in areas of the City described as "Possibly Suited" within this map. Actual suitability must be confirmed by a hydrogeotechnical site investigation.

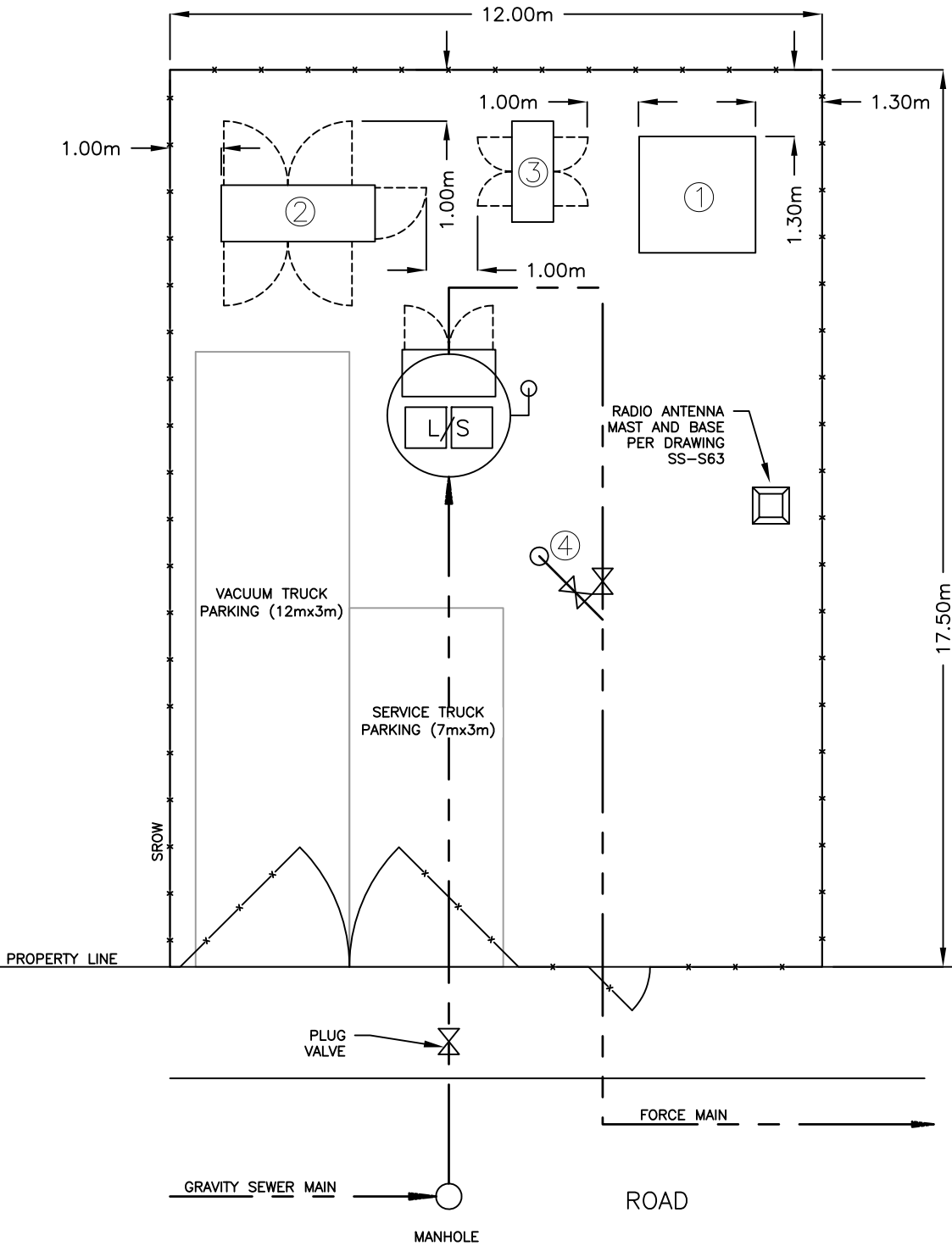
Refer to City of Kelowna Bylaw # 7900, Schedule 4, Section 3.9.9

Reference: City of Kelowna Bylaw # 7900, Schedule 4, Section 3.0 - Stormwater Management



**CITY OF KELOWNA
GROUNDWATER RECHARGE
SUITABILITY MAP**

City of Kelowna
SCALE NTS. Last Updated: November 05/19



NOTES:

- 1.) THE SITE LAYOUT IS INTENDED TO PROVIDE GENERAL GUIDANCE FOR PLACEMENT OF EQUIPMENT, SETBACKS, AND ACCESS. EVERY SITE WILL HAVE UNIQUE SITE SPECIFIC CHALLENGES THAT MAY AFFECT THE OVERALL LAYOUT. THESE ISSUES ARE TO BE DEALT WITH DURING PLANNING AND DESIGN PHASES.
- 2.) IF PERMANENT GENSET IS NOT REQUIRED, PROVIDE A LOCATION FOR A PORTABLE GENSET.
- 3.) CONDUIT FROM KIOSK TO PROPERTY LINE REQUIRED FOR FUTURE FIBRE CONNECTION. TERMINATE IN JUNCTION BOX.
- 4.) CHEMICAL FEED CONDUIT TO BE STUBBED FOR FUTURE ODOUR CONTROL BUILDING.
- 5.) OFF STREET PARKING TO ACCOMMODATE A VACUUM TRUCK (HSU) AND FULL SIZE PICKUP TRUCK SIMULTANEOUSLY.
- 6.) ANTENNA MAST LOCATION TO BE DETERMINED BASED ON SITE CONDITIONS.
- 7.) ENTIRE SITE TO BE PAVED AND FENCED C/W VEHICLE ACCESS GATES AND MAN GATE.
- 8.) IF ODOUR CONTROL BUILDING IS REQUIRED, AN ADDITIONAL 13MX13M AREA MAY BE REQUIRED.
- 9.) CONCRETE BASES FOR TRANSFORMER, ELECTRICAL KIOSK AND GENSET TO BE 200MM ABOVE GRADE.

LEGEND

- ① TRANSFORMER
- ② ELECTRICAL KIOSK
- ③ GENSET
- ④ PIGGING PORT PER DRAWING SS-S62

**STANDARD
DETAIL
DRAWING**

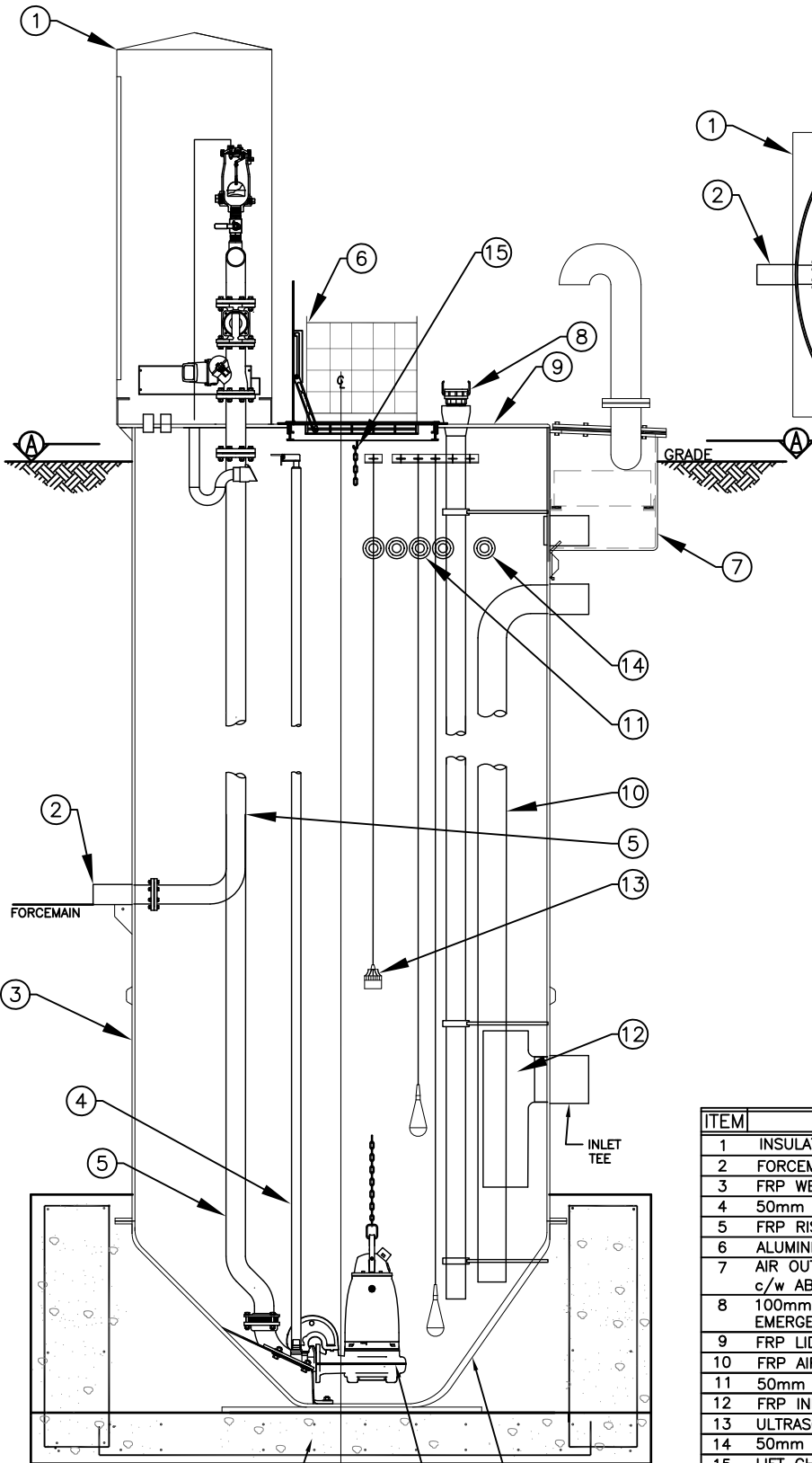
DATE:
06/22/20
SCALE:
NTS

**TYPICAL LIFT STATION
SITE LAYOUT**

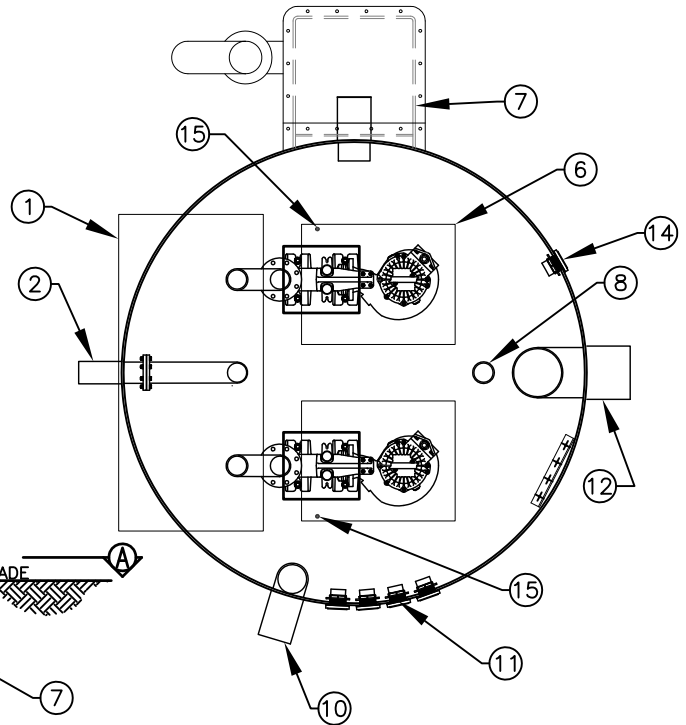
DWG. NO.

SS-S59





ELEVATION
N.T.S.



SECTION "A-A"
N.T.S. - PUMPS LAYOUT

ITEM	DESCRIPTION
1	INSULATED FIBREGLASS VALVE KIOSK, SEE COK STD. DWG. SS-S61
2	FORCEMAIN, MACHINED FRP STUB OR STAINLESS STEEL
3	FRP WET WELL
4	50mm GUIDE BAR Sch.40 316 STAINLESS STEEL
5	FRP RISER PIPE
6	ALUMINIUM OR STAINLESS STEEL HATCH c/w SAFETY GRATES
7	AIR OUTLET TO FIBREGLASS CARBON FILTER ENCLOSURE c/w ABOVE GROUND GOOSENECK OR ODOUR CONTROL BUILDING
8	100mm CAMLOCK c/w DUST CAP AND FRP DROP PIPE FOR EMERGENCY CONNECTION
9	FRP LID (ELEVATION 200mm ABOVE GRADE)
10	FRP AIR INLET FROM ELECTRICAL KIOSK
11	50mm ELECTRICAL CONNECTION
12	FRP INLET TEE (OPEN TOP)
13	ULTRASONIC LEVEL TRANSMITTER
14	50mm CONDUIT FOR CHEMICAL FEED LINE
15	LIFT CHAIN HOOK

NOTES:

- 1.) ALL FASTENERS AND METAL COMPONENTS TO BE 316 STAINLESS STEEL
- 2.) ALL PIPING TO BE FRP OR STAINLESS STEEL

**STANDARD
DETAIL
DRAWING**

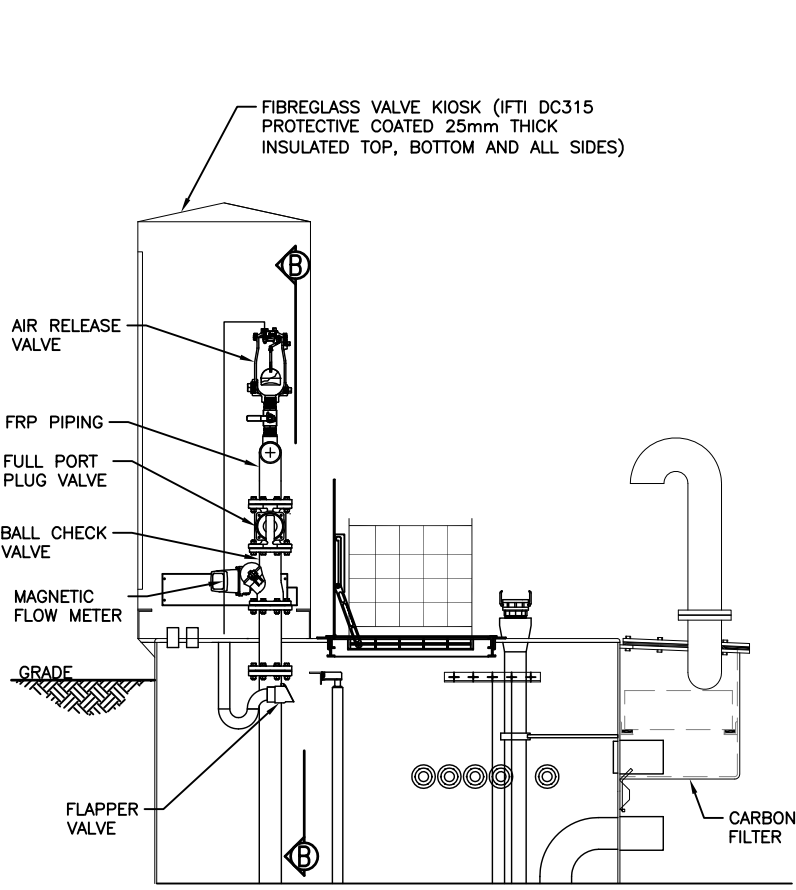
DATE:
05/22/20
SCALE:
NTS

SANITARY LIFT STATION

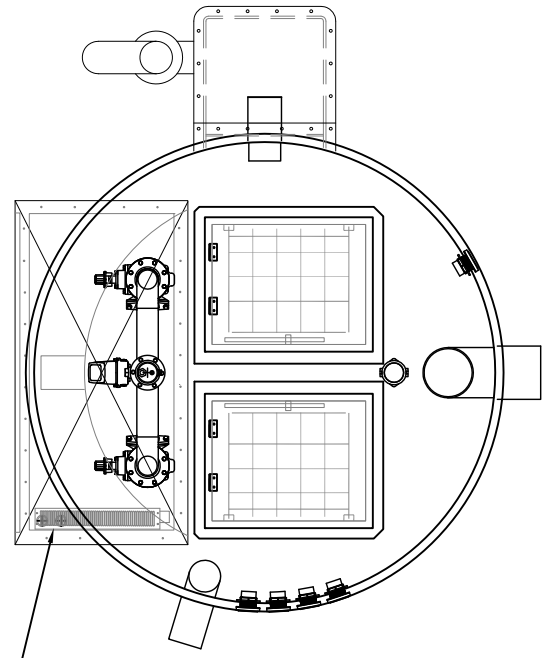
DWG. NO.

SS-S60

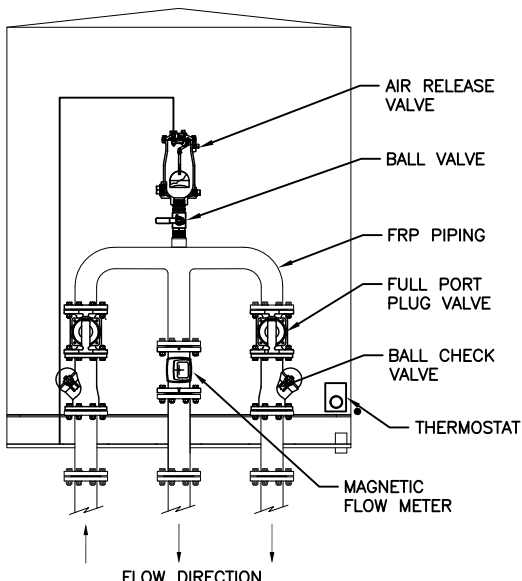




ELEVATION
N.T.S.

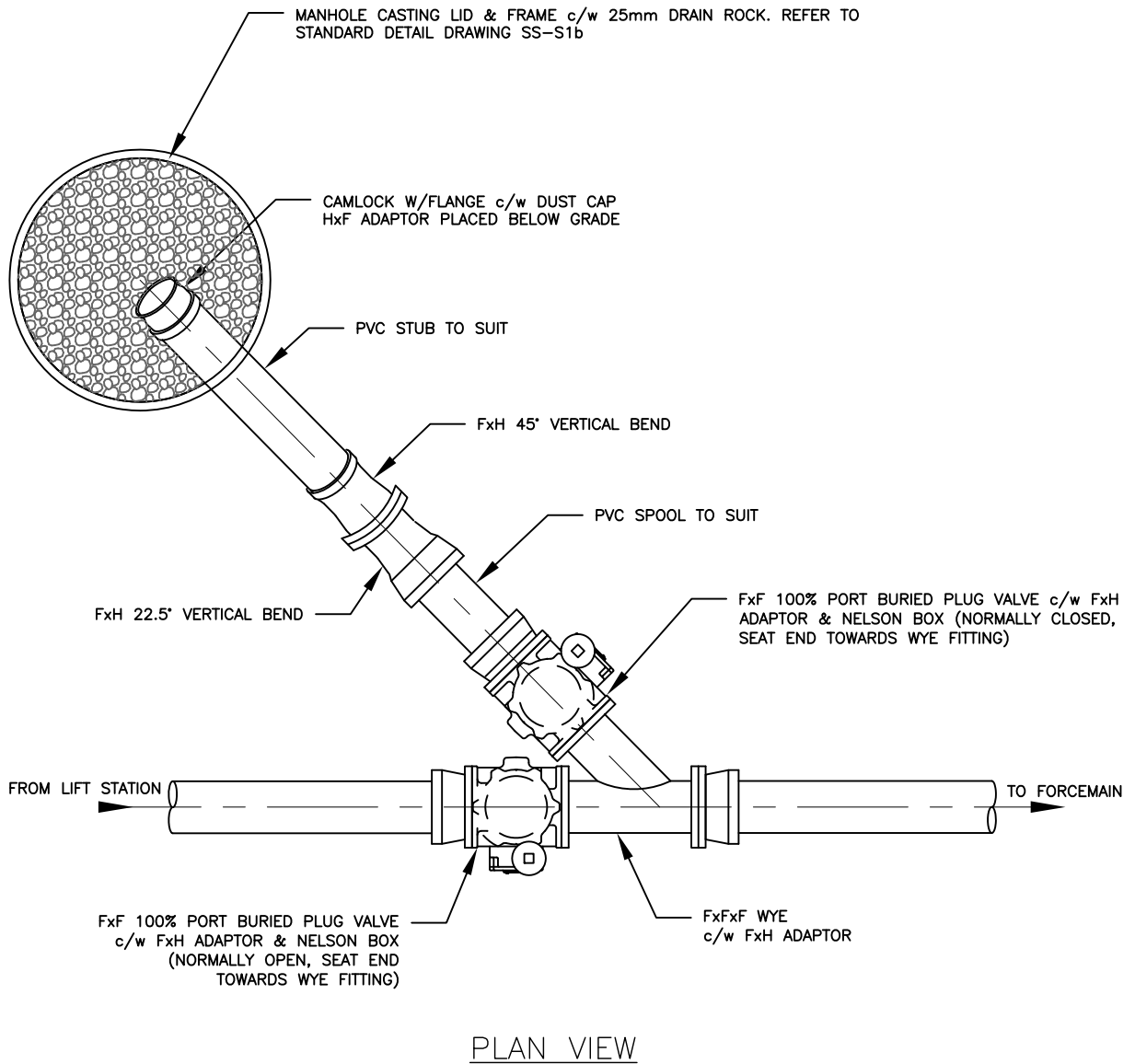


PLAN
N.T.S.



SECTION "B-B"
N.T.S. - VALVE KIOSK PIPING

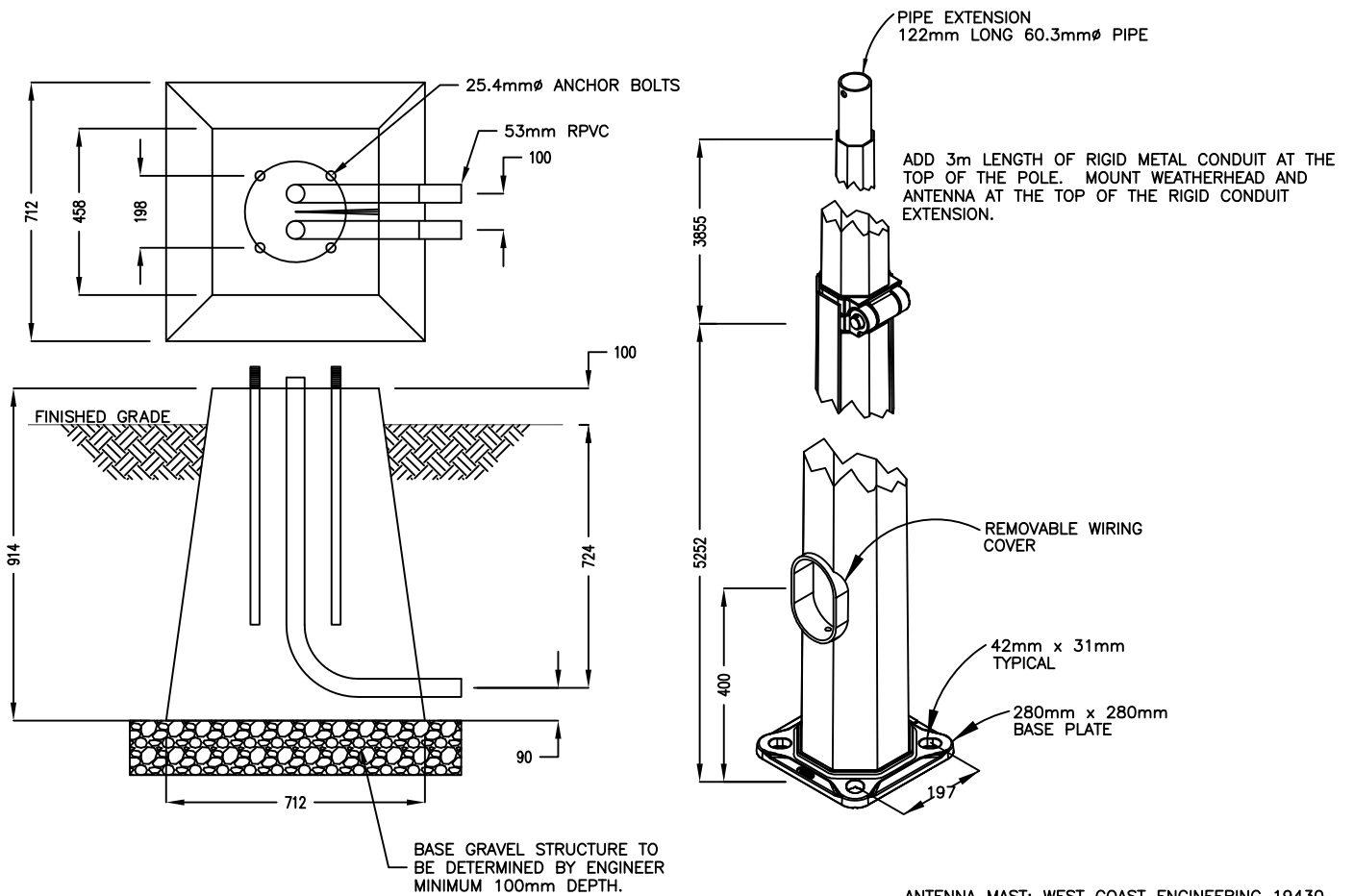
STANDARD DETAIL DRAWING	DATE: 05/22/20	ABOVE GROUND VALVE KIOSK	DWG. NO.	 City of Kelowna
	SCALE: NTS		SS-S61	



NOTES:

- 1.) ALL FITTINGS SHALL BE JOINT RESTRAINED.
- 2.) SIZE OF ALL FITTINGS AND PIPE TO MATCH SIZE OF FORCEMAIN.

STANDARD DETAIL DRAWING	DATE: 05/22/20	PIGGING PORT	DWG. NO.	 City of Kelowna
	SCALE: NTS		SS-S62	



NOTES:

- 1.) PROVIDE ADEQUATE CLEARANCE TO ACCOMMODATE MAST SWING ON SITE LAYOUT.
- 2.) ALL DIMENSIONS IN MILLIMETERS UNLESS NOTED OTHERWISE.

**STANDARD
DETAIL
DRAWING**

DATE:
05/22/20

SCALE:
NTS

**RADIO ANTENNA MAST
AND BASE**

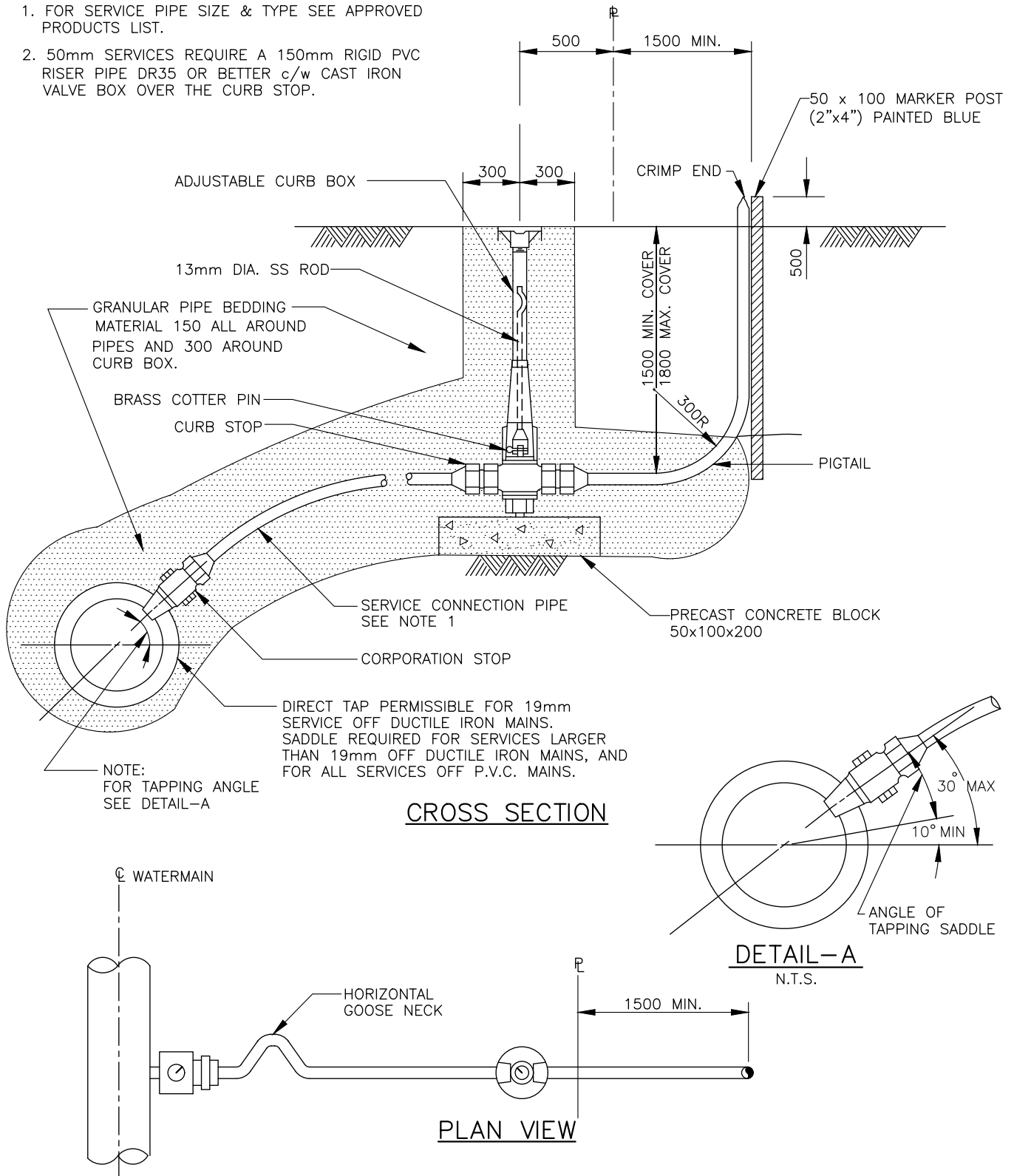
DWG. NO.

SS-S63



NOTES:

1. FOR SERVICE PIPE SIZE & TYPE SEE APPROVED PRODUCTS LIST.
2. 50mm SERVICES REQUIRE A 150mm RIGID PVC RISER PIPE DR35 OR BETTER c/w CAST IRON VALVE BOX OVER THE CURB STOP.



**STANDARD
DETAIL
DRAWING**

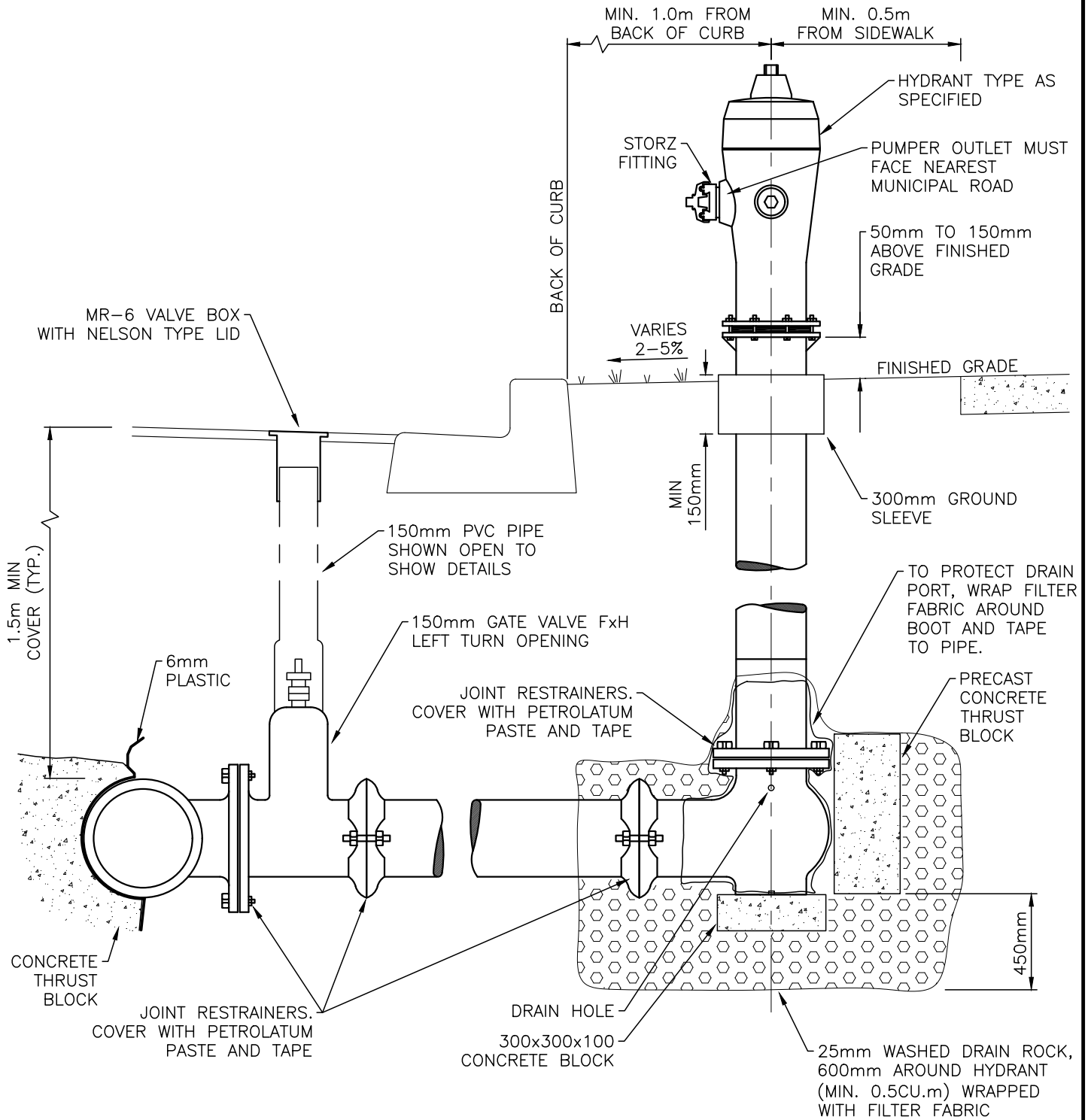
DATE:
MAY 09/24
SCALE:
NTS

WATER SERVICE CONNECTION

DWG. NO.

SS-W2





NOTES:

1. HYDRANTS - IN ACCORDANCE WITH APPROVED PRODUCTS LIST.
2. HYDRANTS SHALL HAVE 2 - 63.5mm OUTLETS B.C. STANDARD AND 1 - 100mm PUMPER OUTLET WITH STORZ FITTING
3. ALL HYDRANTS TO HAVE 300mmØ GROUND SLEEVE (SDR 35 PVC)
4. SEE APPROVED PRODUCTS LIST FOR HYDRANT PAINT TYPE AND COLOR CODE.
5. FOR ALL BOLTS AND JOINT RESTRAINERS, USE DENSO PASTE AND TAPE.
6. MAINTAIN 1.0m MINIMUM CLEARANCE FROM ANY HYDRANT PROJECTION AROUND HYDRANT.
7. FOR HYDRANTS NOT PROTECTED BY A BARRIER CURB, SEE DETAIL DRAWINGS SS-C12B - BOLLARDS.
8. HYDRANT NOT TO INTRUDE INTO SIDEWALK OR PUBLIC CORRIDORS.

**STANDARD
DETAIL
DRAWING**

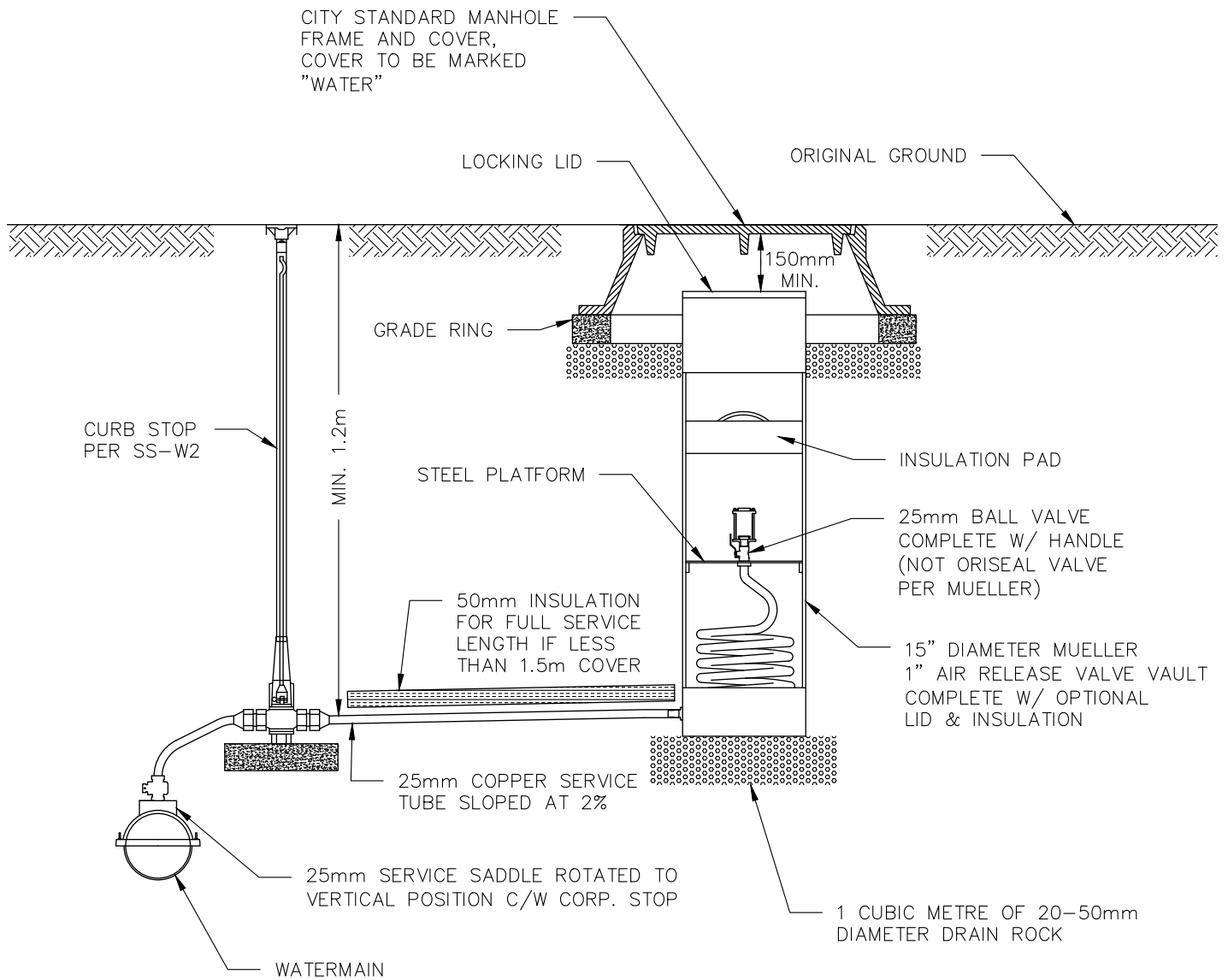
DATE:
JUN 22/23
SCALE:
NTS

HYDRANT

DWG. NO.

SS-W4





NOTES:

1. ALL PIPE & FITTINGS TO BE PER APPROVED PRODUCTS LIST.
2. THIS ASSEMBLY TO BE USED IN STATUTORY RIGHT OF WAYS WHERE POWER IS NOT READILY AVAILABLE.
3. CONTRACTOR TO ENSURE ALL PIPING FROM CORP. STOP TO AIR VALVE IS INSTALLED WITH POSITIVE GRADE, INCLUDING COIL TUBING INSIDE AIR RELEASE VAULT.
4. CONTRACTOR TO ENSURE STEEL PLATFORM FOR AIR VALVE CAN BE PULLED UP & OUT OF AIR RELEASE VAULT.

**STANDARD
DETAIL
DRAWING**

DATE:
JUN 28/24

SCALE:
NTS

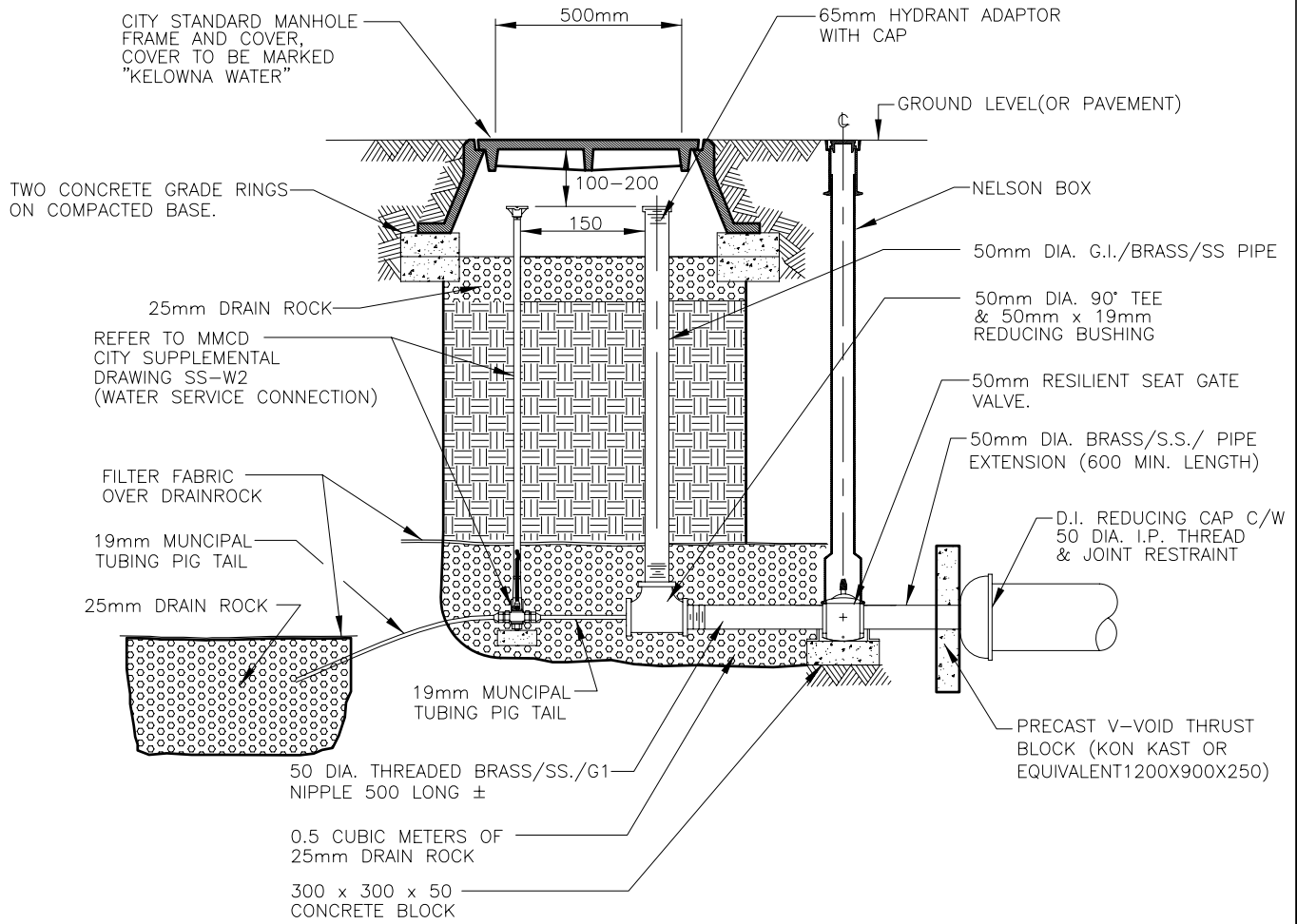
**25mm UNDERGROUND
AIR VALVE**

DWG. NO.

SS-W6a



STANDARD DETAIL DRAWINGS



NOTES:

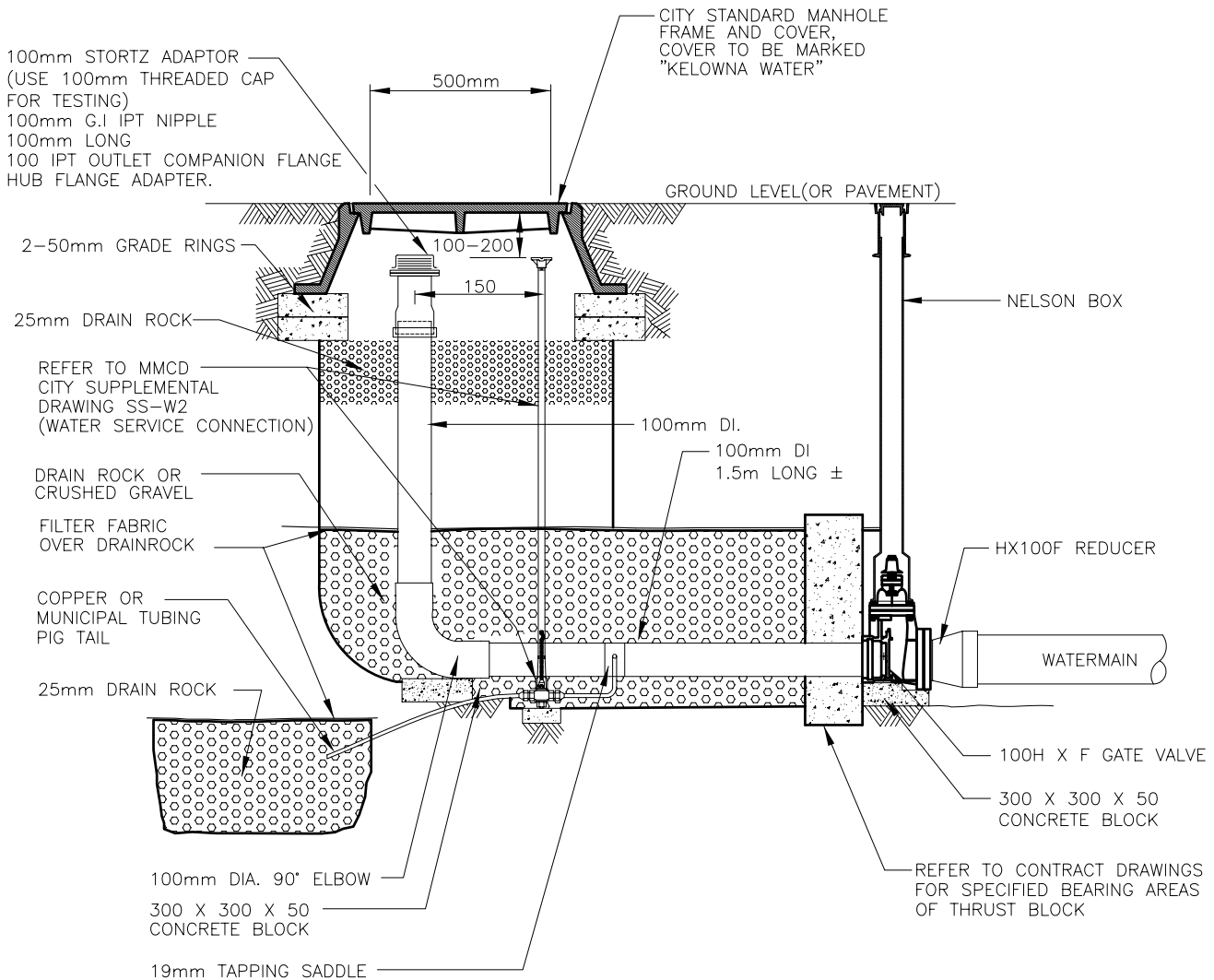
1. SIZE BLOW-OFF ASSEMBLY TO ACHIEVE SPECIFIED MAIN FLUSHING VELOCITY.
2. ENTIRE ASSEMBLY TO BE PRESSURE TESTED.
3. FOR ALL BOLTS AND JOINT RESTRAINERS USE DENSO PASTE AND TAPE.

50mm BLOW-OFF
(FOR MAINS 100mm & SMALLER)

SS-W8a

APRIL 15/08

STANDARD DETAIL DRAWINGS



NOTES:

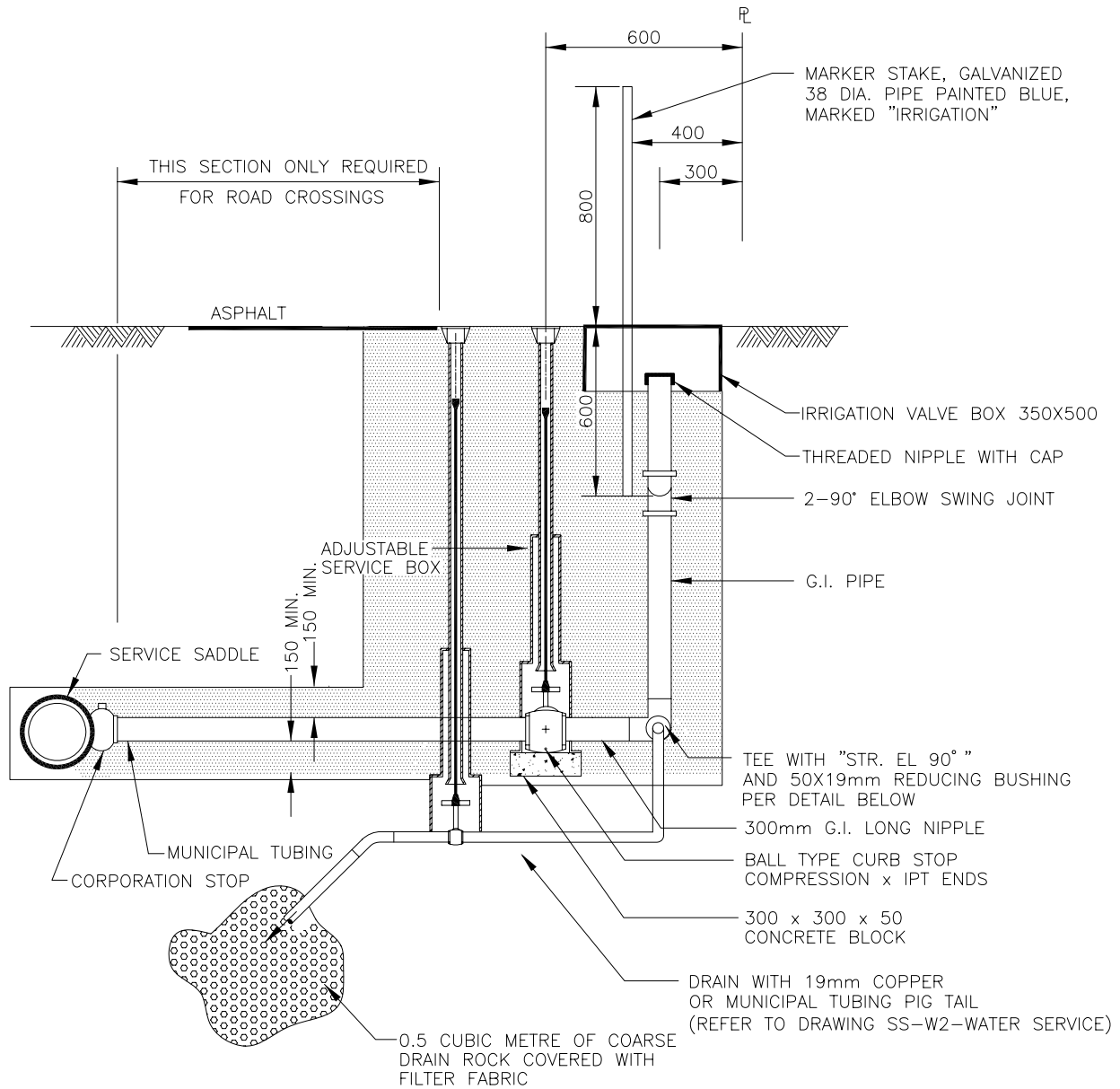
1. USE JOINT RESTRAINTS FOR ALL JOINTS.
2. ALL JOINT RESTRAINTERS TO BE APPROVED AS PER POLICY 266 IN THE CITY OF KELOWNA SUBDIVISION AND SERVICING BYLAW.
3. ALL JOINTS TO BE RESTRAINED AS PER MMCD 02666, 2.2.13 AND THE CITY OF KELOWNA SUBDIVISION AND SERVICING BYLAW SCHEDULE 4 WATER, SECTION 1.13, AND/OR AS SPECIFIED IN THE CONTRACT DOCUMENTS OR DRAWINGS.
4. ENTIRE ASSEMBLY TO BE PRESSURE TESTED.
5. FOR ALL BOLTS AND JOINT RESTRAINTERS, USE DENSO PASTE AND TAPE.
6. PVC C900 PIPE MAYBE APPROVED BY UTILITIES OTHER THAN THE CITY

100mm BLOW-OFF
(FOR MAINS 150mm & LARGER)

SS-W8b

APRIL 15/08

STANDARD DETAIL DRAWINGS



NOTES:

1. REFER TO BEDDING AND BACKFILL STANDARDS FOR DETAILS.

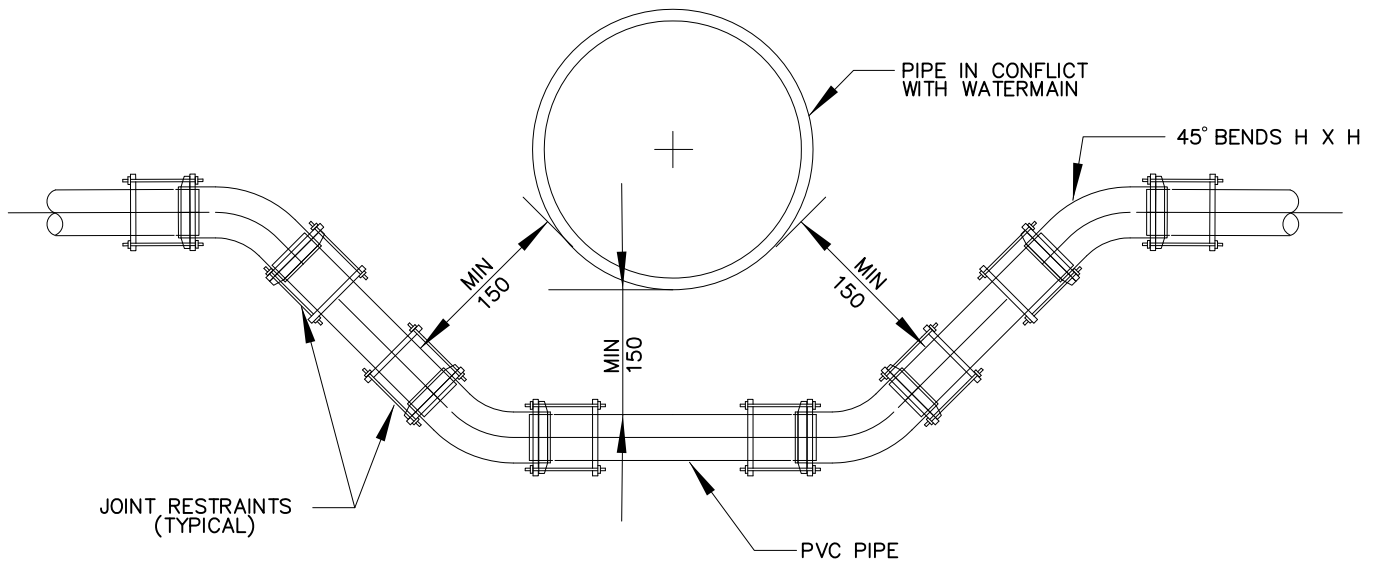
IRRIGATION SERVICE

SS-W50

APRIL 15/08

P:\DRAFTING\STD-DWGS\MMCD-STD\SS-W50.dwg

STANDARD DETAIL DRAWINGS



TYPICAL SECTION

NOTES:

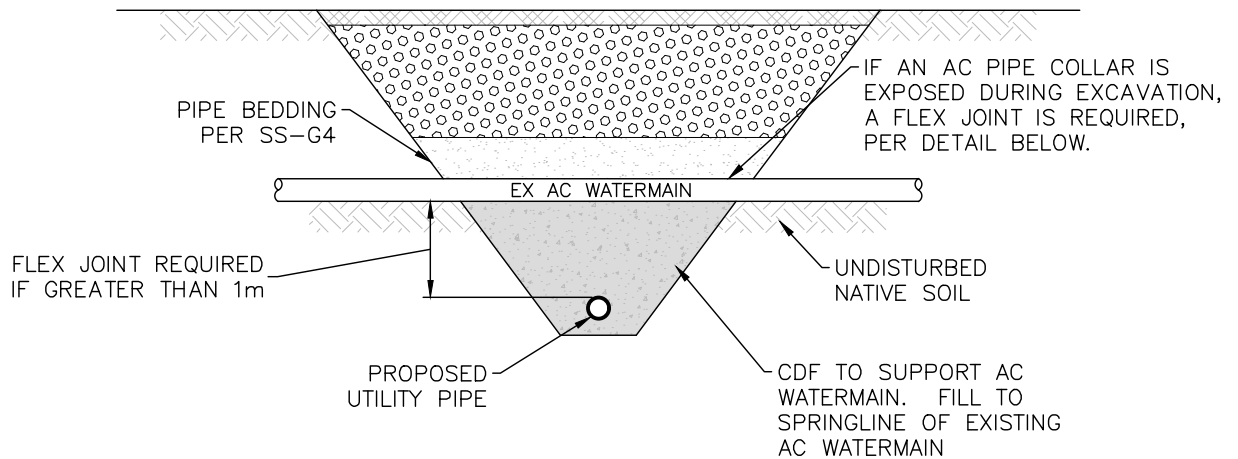
1. ALL JOINT RESTRAINERS TO BE APPROVED AS PER POLICY 266 IN THE CITY OF KELOWNA SUBDIVISION AND SERVICING BYLAW.
2. ALL JOINTS TO BE RESTRAINED AS PER MMCD 02666, 2.2.13 AND THE CITY OF KELOWNA SUBDIVISION AND SERVICING BYLAW SCHEDULE 4 WATER, SECTION 1.13, AND/OR AS SPECIFIED IN THE CONTRACT DOCUMENTS OR DRAWINGS.

\\WU\DRAWING\STD-DWGS\MMCD-STD\SS-W51.dwg

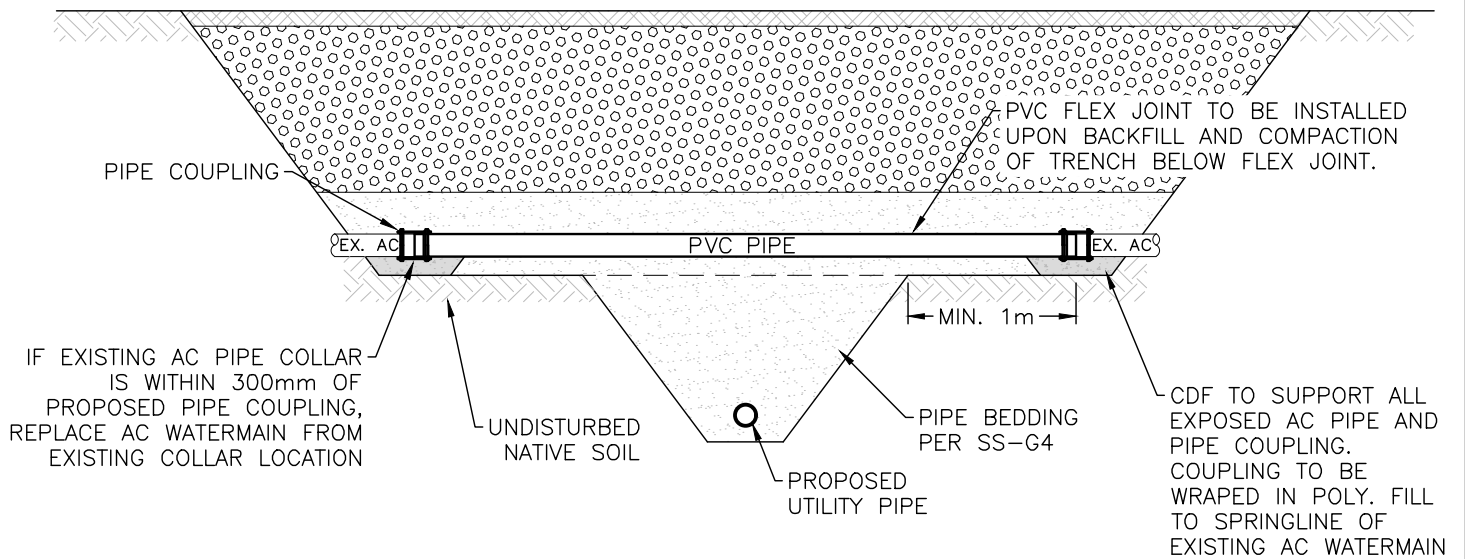
**U-BEND DETAIL
(PIPE CROSSING CONFLICT)**

SS-W51

REV. SEPT. 27/01



CONTROLLED DENSITY FILL (CDF) SUPPORTED CROSSING



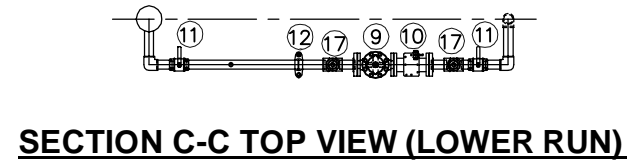
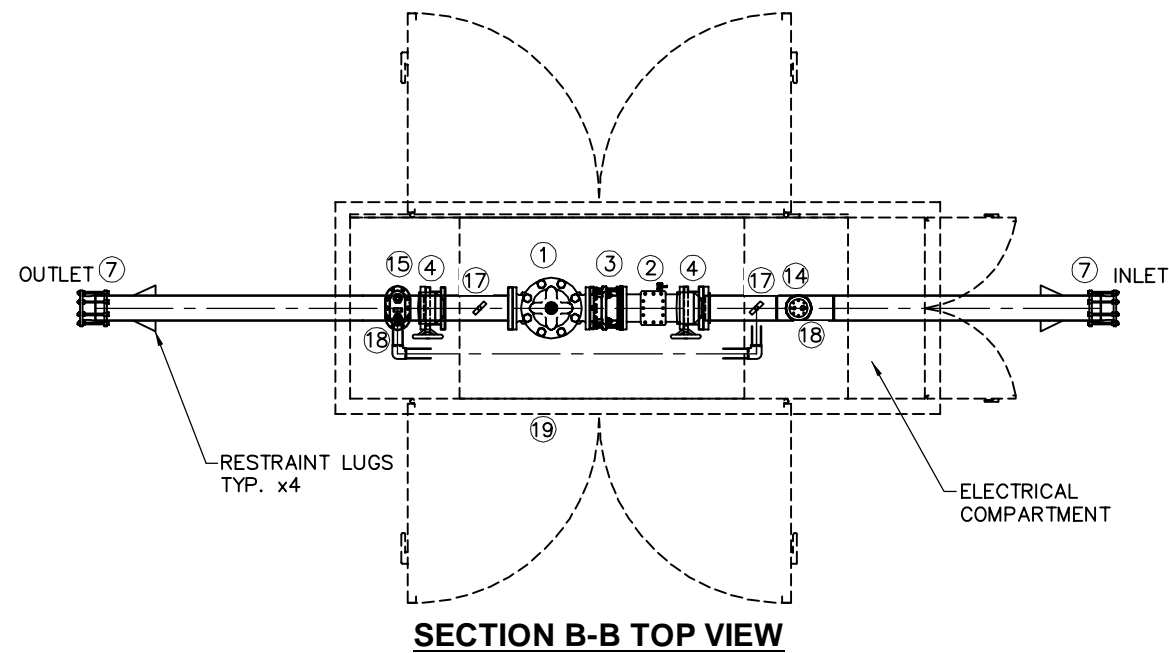
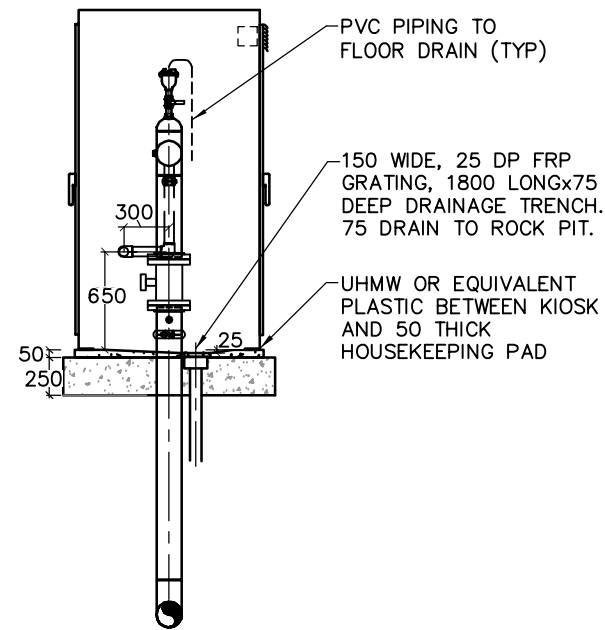
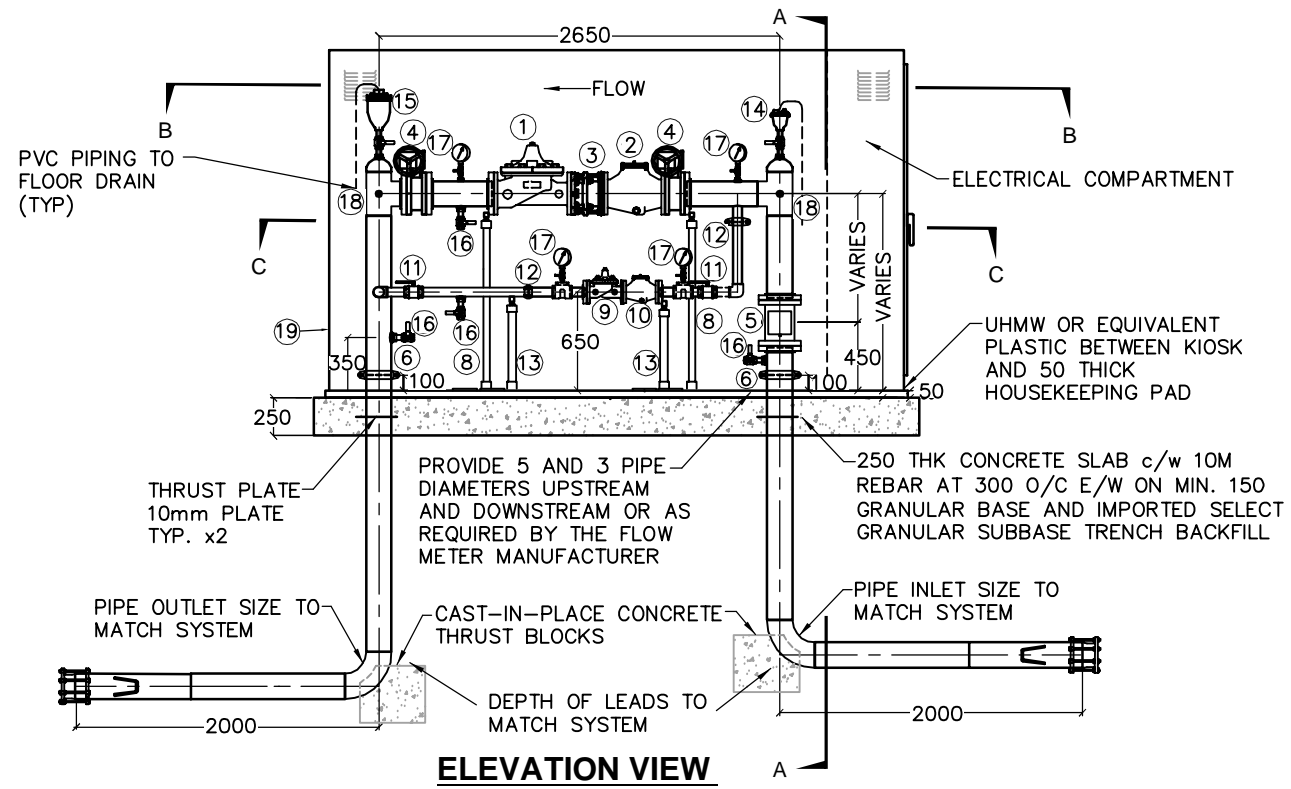
FLEX JOINT CROSSING

NOTES:

1. TRENCHING TO COMPLY WITH WORKSAFE REGULATIONS.
2. PIPE BEDDING & TRENCH BACKFILL TO BE PER SS-G4.
3. SURFACE RESTORATION TO BE AS REQUIRED PER SS-G5.
4. FLEX JOINT REQUIRED IF EXISTING WATERMAIN IS CLASS 100 AC.
5. PROPOSED AND EXISTING MAINS WITHIN CDF TO BE WRAPPED WITH POLY.
6. BASE OF CDF AREA TO BE TWICE THE DIAMETER OF THE SUPPORTED MAIN.
7. PIPE & COUPLINGS TO BE PER APPROVED PRODUCTS LIST.

STANDARD DETAIL DRAWING	DATE: FEB 11/22	AC WATERMAIN CROSSINGS	DWG. NO.	 City of Kelowna
	SCALE: NTS		SS-W52	

STANDARD DETAIL DRAWINGS



NOTES:

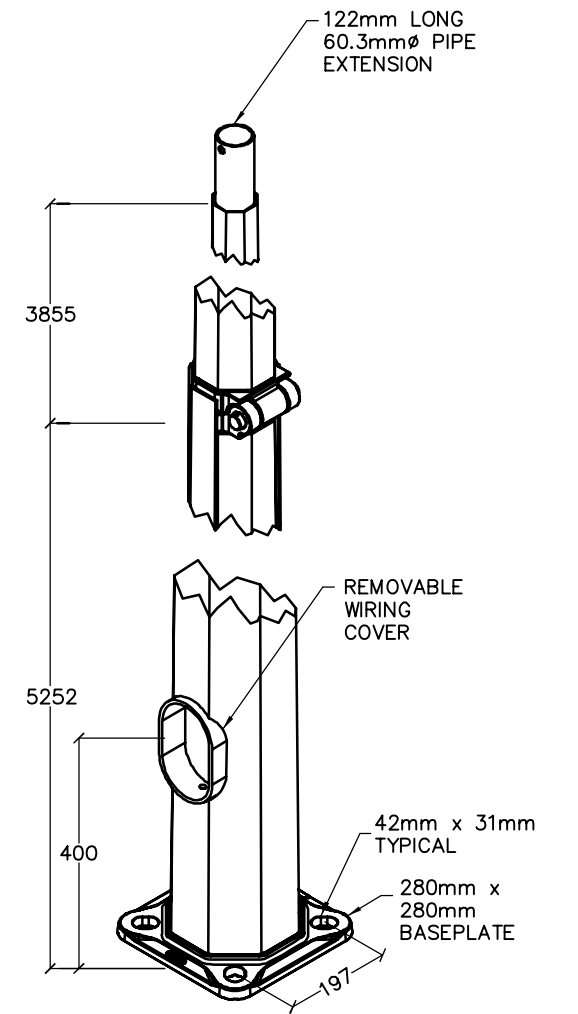
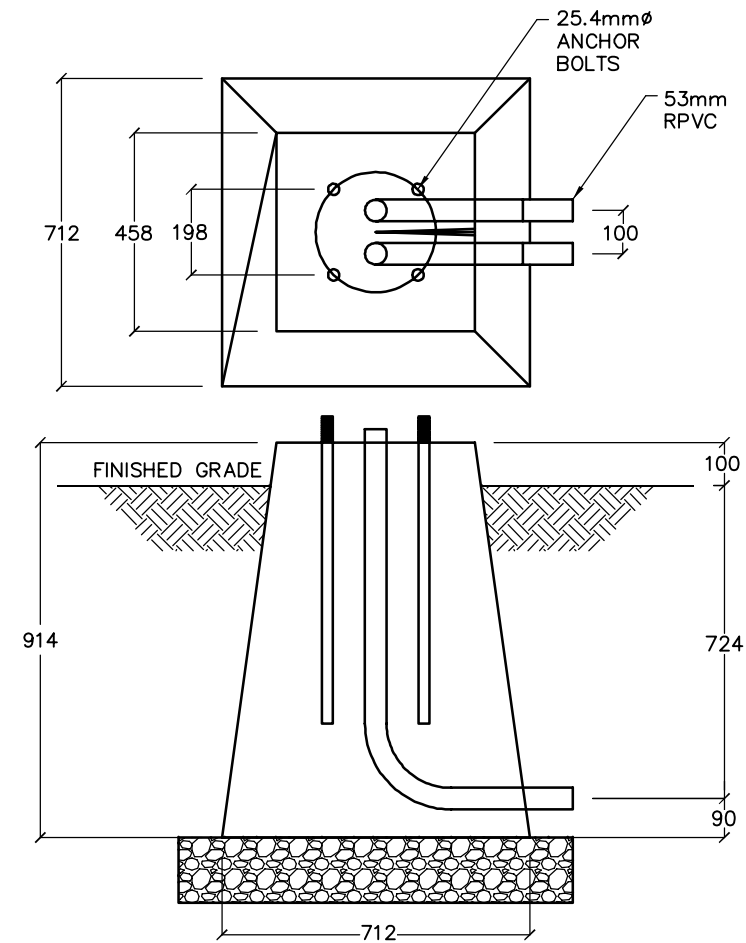
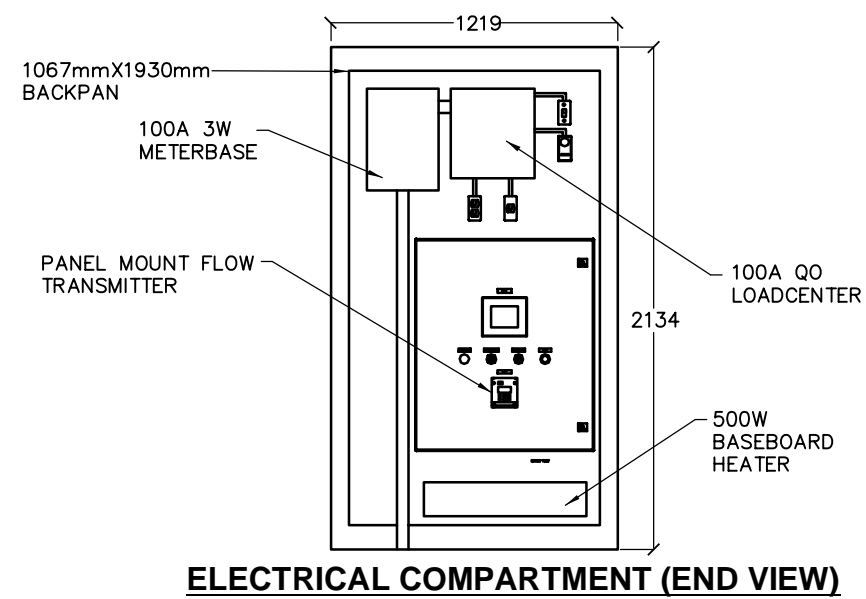
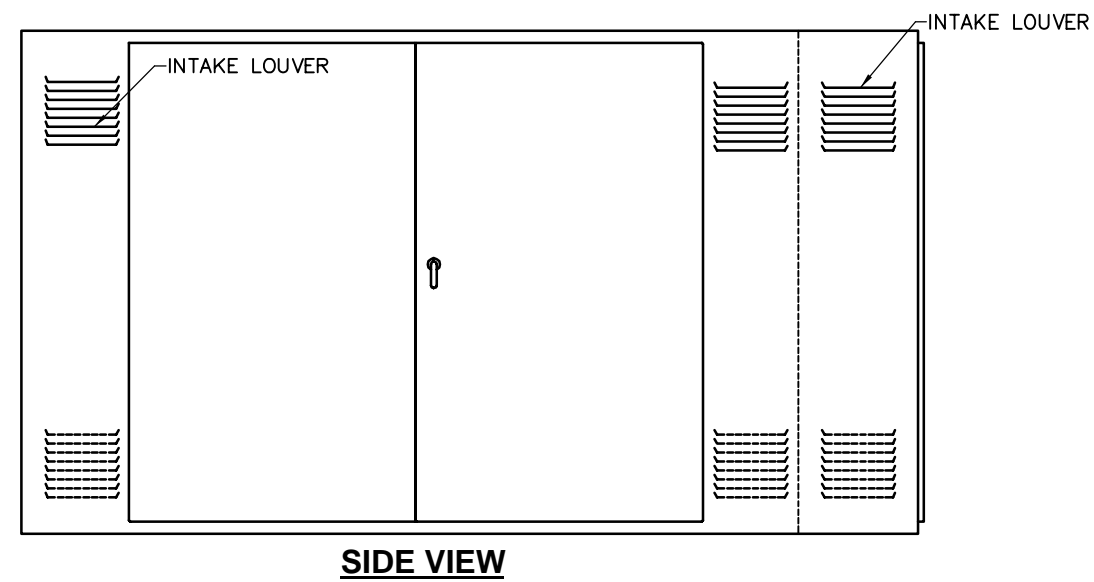
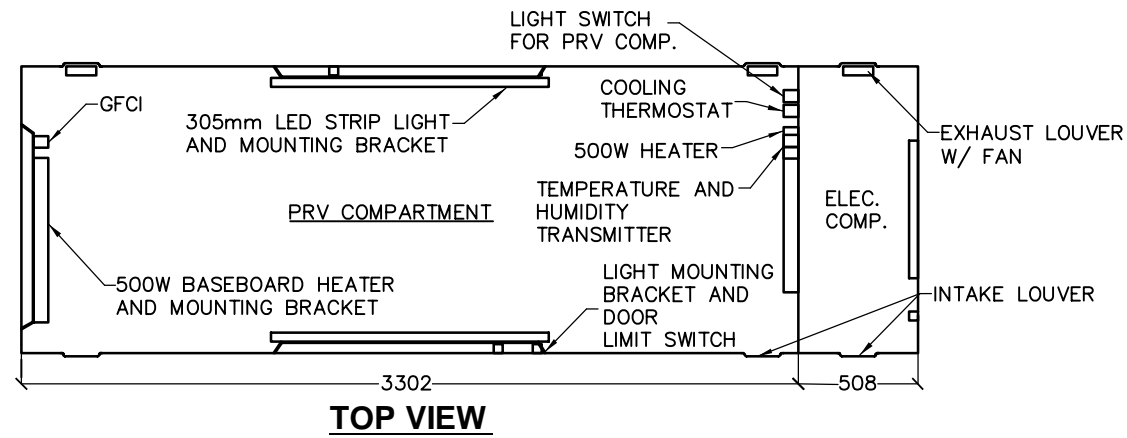
1. ALL PIPE & FITTINGS TO BE PER APPROVED PRODUCTS LIST.
2. ALL PIPING 316 STAINLESS STEEL.
3. COORDINATE WITH FORTIS TO PROVIDE A 120/240 VAC, 100A SERVICE C/W CABLE PULL BOX IN KIOSK.
4. KIOSK TO BE SUPPLIED WITH:
 - 500W BASEBOARD HEATER AND TWO VENTILATION FANS C/W HEATING AND COOLING THERMOSTATS
 - TEMPERATURE AND HUMIDITY TRANSMITTER
 - FLOW TRANSDUCER AND FLOW INDICATING TRANSMITTER
 - 2-15A GFCI RECEPTACLES
 - DATA RADIO AND YAGI ANTENNA
 - 1000VA UPS
 - O&M MANUALS

MATERIALS LIST		
ITEM	QTY	DESCRIPTION
1	1	PRESSURE REDUCING VALVE W/ POSITION INDICATOR, AWWA EPOXY COATING AND S.S. TRIM - APPROVED SUPPLIERS: CLA-VAL OR SINGER
2	1	"H" STRAINER W/ EPOXY COATING, S.S. HARDWARE AND S.S. BLOWDOWN VALVES - APPROVED SUPPLIERS: CLA-VAL OR SINGER
3	1	DISMANTLING JOINT W/ S.S. FASTENERS - APPROVED SUPPLIERS: ROBAR OR OTHER APPROVED SUPPLIER
4	2	BUTTERFLY VALVE W/ S.S. DISC AND HANDWHEEL - APPROVED SUPPLIERS: MUELLER, DEZURIK OR VICTAULIC
5	1	MAG METER W/ REMOTE DISPLAY IN ELECTRICAL CABINET-APPROVED SUPPLIERS: SIEMENS OR ROSEMOUNT
6	2	RIGID COUPLING FOR S.S. - APPROVED SUPPLIERS: VICTAULIC OR SHURJOINT
7	2	EXTERNAL TRANSITION COUPLING - APPROVED SUPPLIERS: ROBAR OR OTHER APPROVED SUPPLIER
8	2	CWS ADJ. GALV. STEEL PIPE SUPPORT
9	1	PRESSURE REDUCING VALVE W/ POSITION INDICATOR, AWWA EPOXY COATING AND S.S. TRIM - APPROVED SUPPLIERS: CLA-VAL OR SINGER (BYPASS)
10	1	"H" STRAINER W/ EPOXY COATING, S.S. HARDWARE AND S.S. BLOWDOWN VALVES - APPROVED SUPPLIERS: CLA-VAL OR SINGER (BYPASS)
11	2	S.S. BALL VALVE (BYPASS)
12	2	RIGID COUPLING FOR S.S. - APPROVED SUPPLIERS: VICTAULIC OR SHURJOINT (BYPASS)
13	2	CWS ADJ. GALV. STEEL PIPE SUPPORT (BYPASS)
14	1	AIR RELEASE VALVE W/ S.S. ISOLATION VALVE AND VENT PIPE - APPROVED SUPPLIERS: VALMATIC OR VENT-O-MAT
15	1	COMBINATION AIR RELEASE VALVE W/ S.S. ISOLATION VALVE AND VENT PIPE - APPROVED SUPPLIERS: VAL-MATIC OR VENT-O-MAT
16	4	THREADOLET W/ S.S. BALL VALVE AND PLUG
17	4	(100mm) LIQUID FILLED PRESSURE GAUGE (6MM NPT) W/ S.S. ISOLATION BALL VALVES AND TEE OR WELDOLET AS REQUIRED - APPROVED SUPPLIERS: SIEMENS OR ABB
18	2	(19mm) THREADOLET FOR WALL MOUNTED PRESSURE TRANSMITTER W/ S.S. BALL VALVE - APPROVED SUPPLIERS: SIEMENS OR ABB
19	1	ALUMINUM QUAD DOOR KIOSK WITH END CABINET PER APPROVED PRODUCTS LIST

PRESSURE REDUCING STATION

SS-W53a

STANDARD DETAIL DRAWINGS

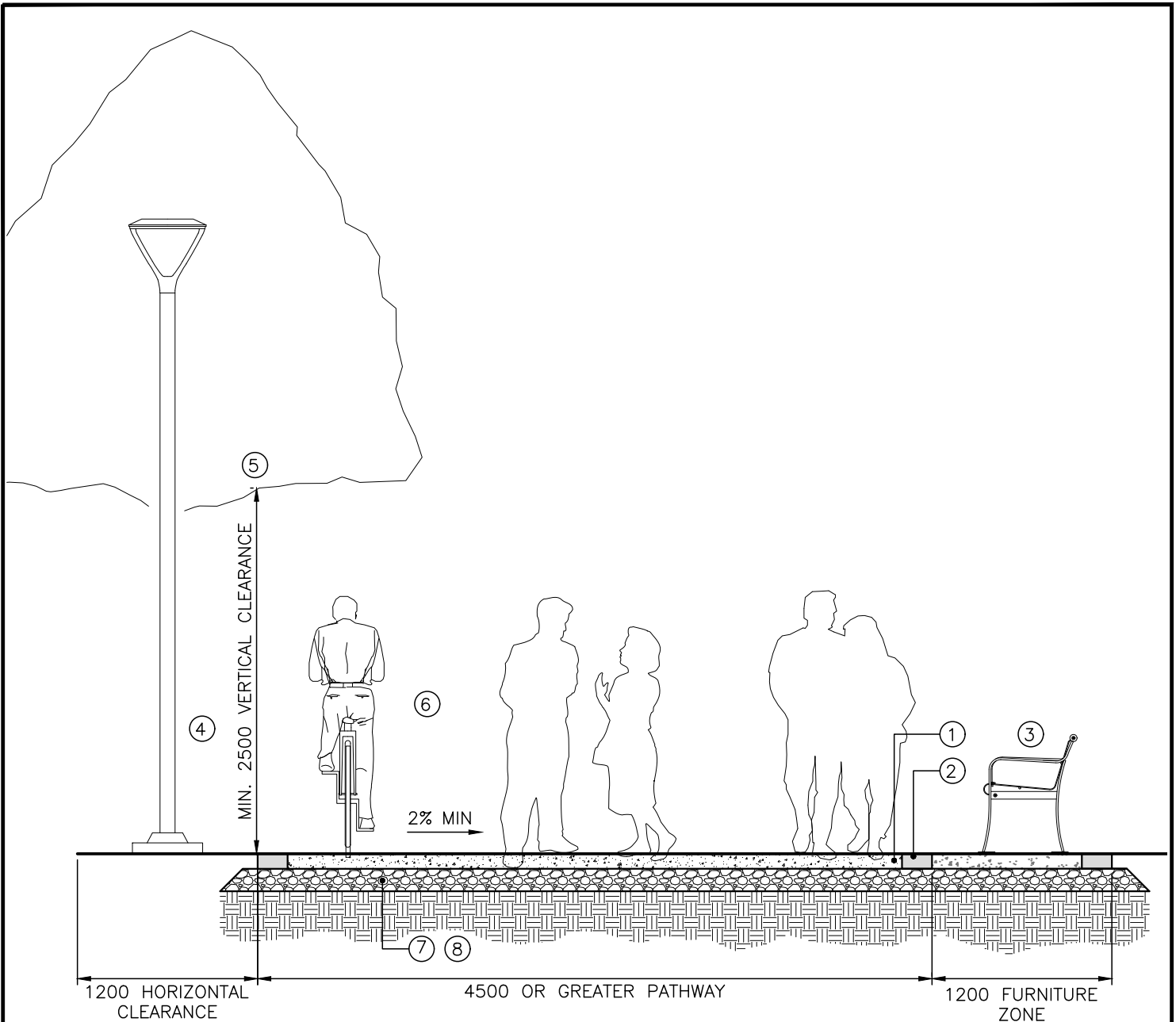


RADIO ANTENNA POLE AND BASE DETAILS

ANTENNA MAST: WEST COAST ENGINEERING 19430 9107mm OVERALL HEIGHT HINGED POLE, HOT DIPPED GALVANIZED. MOUNT ANTENNA MAST ASSEMBLY ON KON KAST (KELOWNA, B.C.) NUMBER 1045 STANDARD BASE

PRESSURE REDUCING STATION

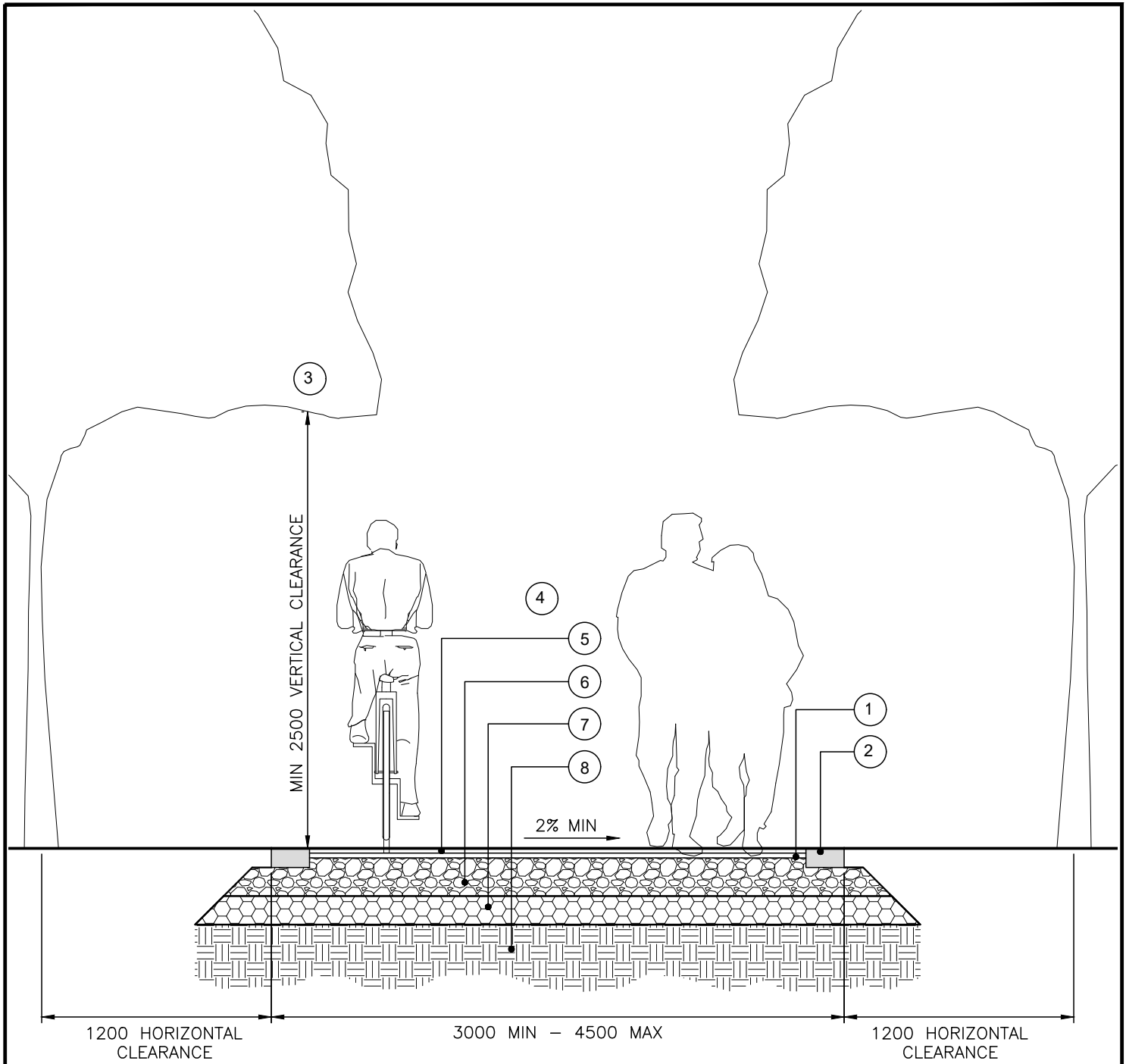
BYLAW NOTE



NOTES:


1. HARD SURFACE (E.G. PAVERS, CONCRETE, SPECIAL PAVING, ETC.) c/w SAW-CUT OR BROOM-OVER FINISHED CONTROL JOINTS
2. ACCENT PAVING EDGE, URBAN BRAILLE OPPORTUNITY
3. COMFORT AMENITY ZONE (BENCH, BIKE RACK, WASTE RECEPTACLES, WAYFINDING SIGNAGE, KIOSKS, ETC.)
4. PEDESTRIAN LIGHTING c/w SHARP-ANGLE CUT-OFF FIXTURE & PAGEANTRY / BANNER OPPORTUNITY
5. TREE PLANTING SPACED EQUALLY BETWEEN LIGHTING c/w APPROVED GROWING MEDIUM AND VOLUME PER CITY STANDARDS
6. SHARED PATHWAY TO BE BARRIER FREE & UNIVERSAL ACCESSIBILITY STANDARDS.
7. 19mm MINUS COMPACTED GRANULAR BASE (95% MPD)
OPTIONAL: SAND LEVELING BED FOR UNIT PAVER SURFACING – REFER TO TRAIL GUIDELINES CHART FOR MAXIMUM SLOPES, MATERIAL DEPTHS AND SPECIFICATIONS
8. REMOVE ALL ORGANIC MATERIAL, LARGE STONES AND COMPACT NATIVE SUBGRADE (95% MPD)
9. ALL DIMENSIONS IN MILLIMETRES UNLESS NOTED OTHERWISE.

STANDARD DETAIL DRAWING	DATE: JUN 26/23	CLASS 1 TRAIL MAJOR URBAN PROMENADE	DWG. NO.	 City of Kelowna
	SCALE: NTS		SS-T01	

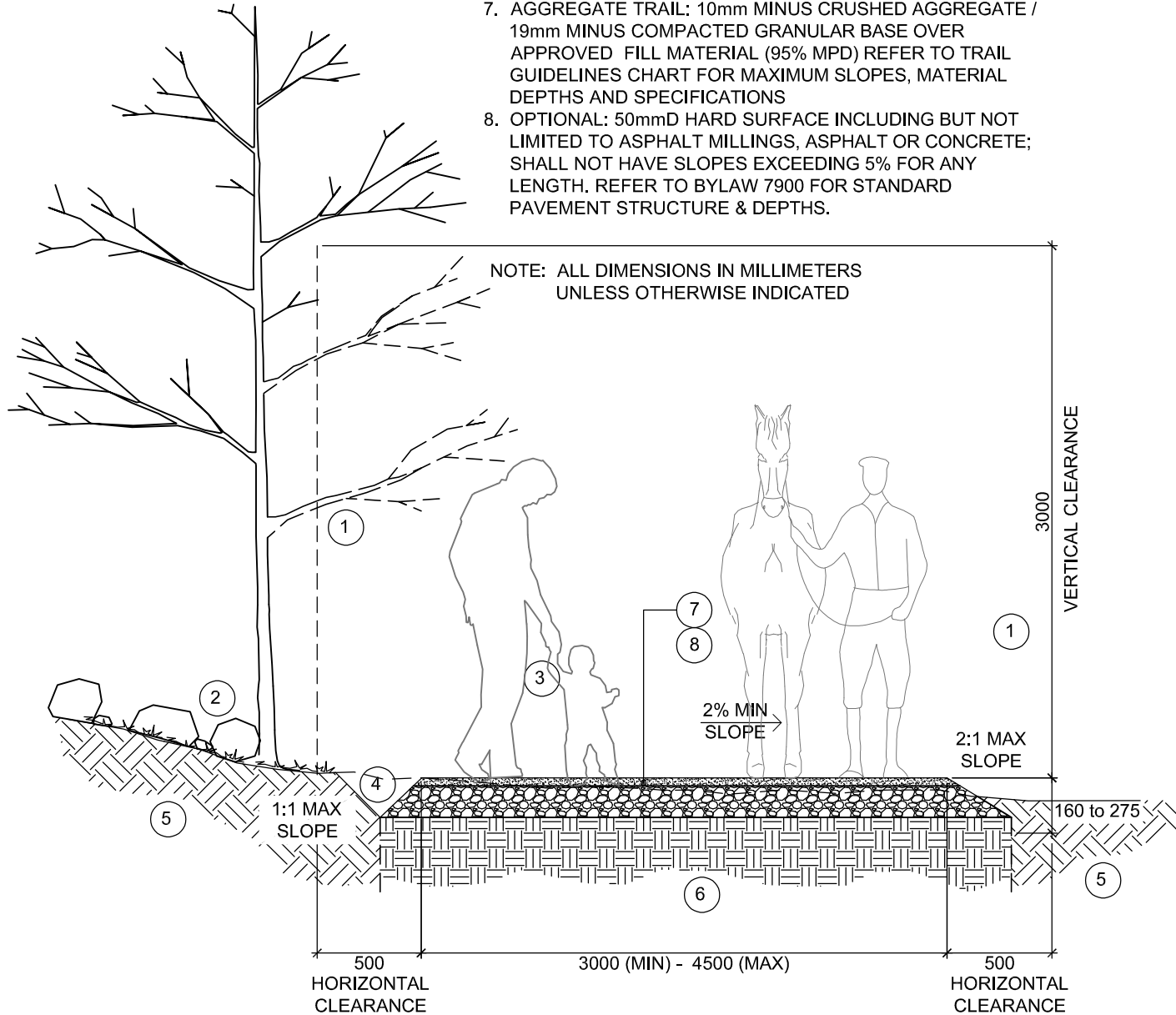


NOTES:

1. ASPHALT OR ASPHALT MILLINGS PAVING
2. ACCENT PAVING / EDGE RESTRAINT
3. TREE PLANTING SPACED EQUALLY BETWEEN LIGHTING c/w APPROVED GROWING MEDIUM AND VOLUME PER CITY STANDARDS
4. SHARED PATHWAY TO BE BARRIER FREE & UNIVERSAL ACCESSIBILITY STANDARDS
5. 50mm ASPHALT SURFACE. REFER TO BYLAW 7900 FOR STANDARD PAVEMENT STRUCTURE DEPTHS.
6. 19mm MINUS COMPACTED GRANULAR BASE (95% MPD) – REFER TO TRAIL GUIDELINES CHART FOR MAXIMUM SLOPES, MATERIAL DEPTHS AND SPECIFICATIONS
7. 75mm MINUS COMPACTED SUB-BASE (95% MPD) – REFER TO TRAIL GUIDELINES CHART FOR MAXIMUM SLOPES, MATERIAL DEPTHS AND SPECIFICATIONS
8. REMOVE ALL ORGANIC MATERIAL, LARGE STONES AND COMPACT NATIVE SUBGRADE (95% MPD)
9. ALL DIMENSIONS IN MILLIMETRES UNLESS NOTED OTHERWISE

STANDARD DETAIL DRAWING	DATE: JUN 26/23	CLASS 2 TRAIL MAJOR MULTI-USE URBAN	DWG. NO.	 City of Kelowna
	SCALE: NTS		SS-T02	

STANDARD DETAIL DRAWING



1. PRUNE BRANCHES BACK TO TRUNK OR LIMB
2. REMOVE LOOSE ROCK & DEBRIS FROM ABOVE TRAIL
3. CLEAR & GRUB SHRUBS & TREES FOR TRAIL EXCEPT THOSE DESIGNATED TO STAY
4. PROVIDE DRAINAGE SWALE AS REQUIRED
5. UNDISTURBED NATIVE SOIL
6. REMOVE ALL ORGANIC MATERIAL, LARGE STONES AND COMPACTED NATIVE SUBGRADE (95% MPD)
7. AGGREGATE TRAIL: 10mm MINUS CRUSHED AGGREGATE / 19mm MINUS COMPACTED GRANULAR BASE OVER APPROVED FILL MATERIAL (95% MPD) REFER TO TRAIL GUIDELINES CHART FOR MAXIMUM SLOPES, MATERIAL DEPTHS AND SPECIFICATIONS
8. OPTIONAL: 50mmD HARD SURFACE INCLUDING BUT NOT LIMITED TO ASPHALT MILLINGS, ASPHALT OR CONCRETE; SHALL NOT HAVE SLOPES EXCEEDING 5% FOR ANY LENGTH. REFER TO BYLAW 7900 FOR STANDARD PAVEMENT STRUCTURE & DEPTHS.

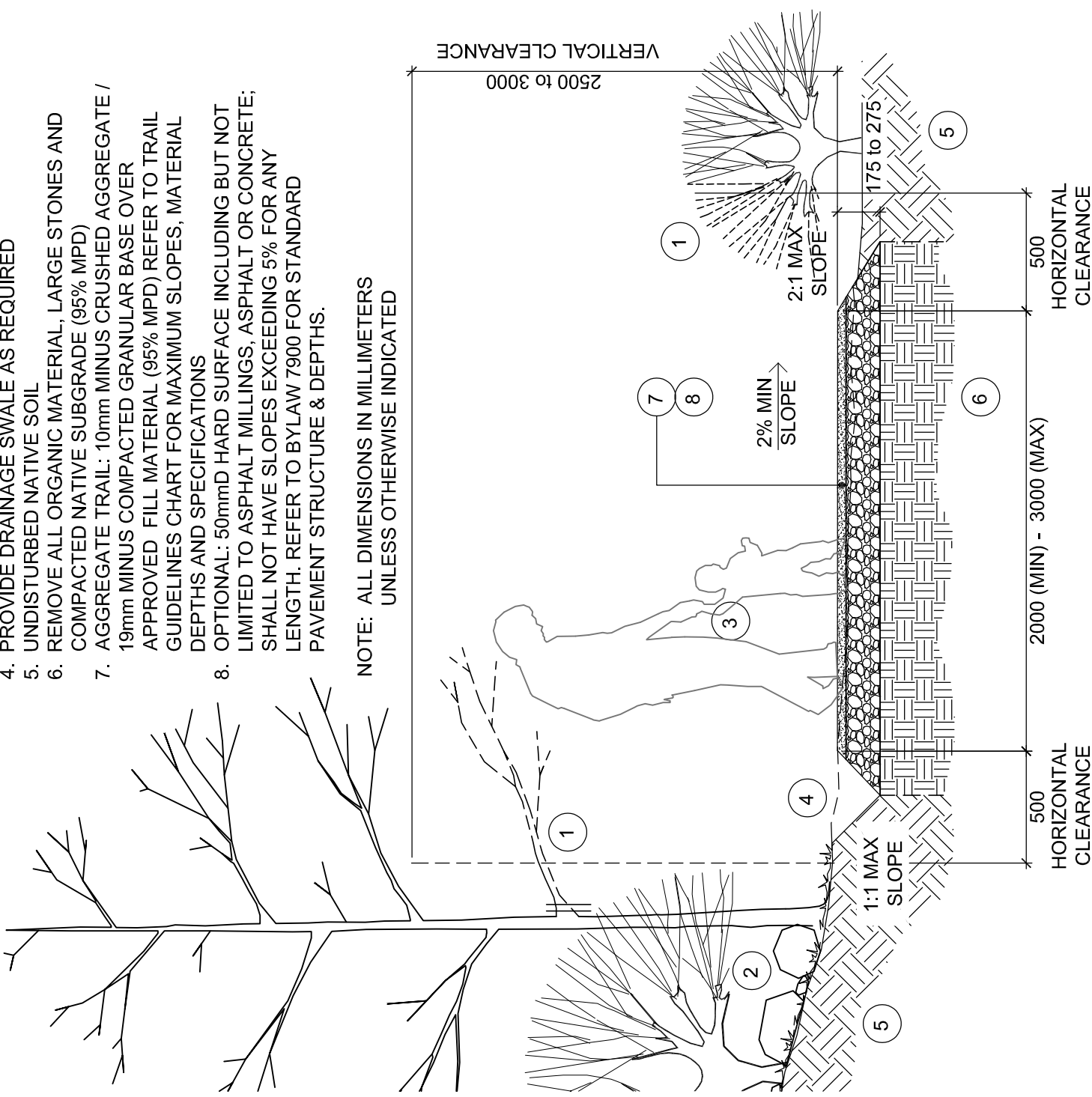
DETAIL No. :
SS-T03

**CLASS 3 - MAJOR MULTI-USE
RURAL**

STANDARD DETAIL DRAWING

1. PRUNE BRANCHES BACK TO TRUNK OR LIMB
2. REMOVE LOOSE ROCK & DEBRIS FROM ABOVE TRAIL
3. CLEAR & GRUB SHRUBS & TREES FOR TRAIL EXCEPT THOSE DESIGNATED TO STAY
4. PROVIDE DRAINAGE SWALE AS REQUIRED
5. UNDISTURBED NATIVE SOIL
6. REMOVE ALL ORGANIC MATERIAL, LARGE STONES AND COMPACTED NATIVE SUBGRADE (95% MPD)
7. AGGREGATE TRAIL: 10mm MINUS CRUSHED AGGREGATE / 19mm MINUS COMPACTED GRANULAR BASE OVER APPROVED FILL MATERIAL (95% MPD) REFER TO TRAIL GUIDELINES CHART FOR MAXIMUM SLOPES, MATERIAL DEPTHS AND SPECIFICATIONS
8. OPTIONAL: 50mmD HARD SURFACE INCLUDING BUT NOT LIMITED TO ASPHALT MILLINGS, ASPHALT OR CONCRETE; SHALL NOT HAVE SLOPES EXCEEDING 5% FOR ANY LENGTH. REFER TO BYLAW 7900 FOR STANDARD PAVEMENT STRUCTURE & DEPTHS.

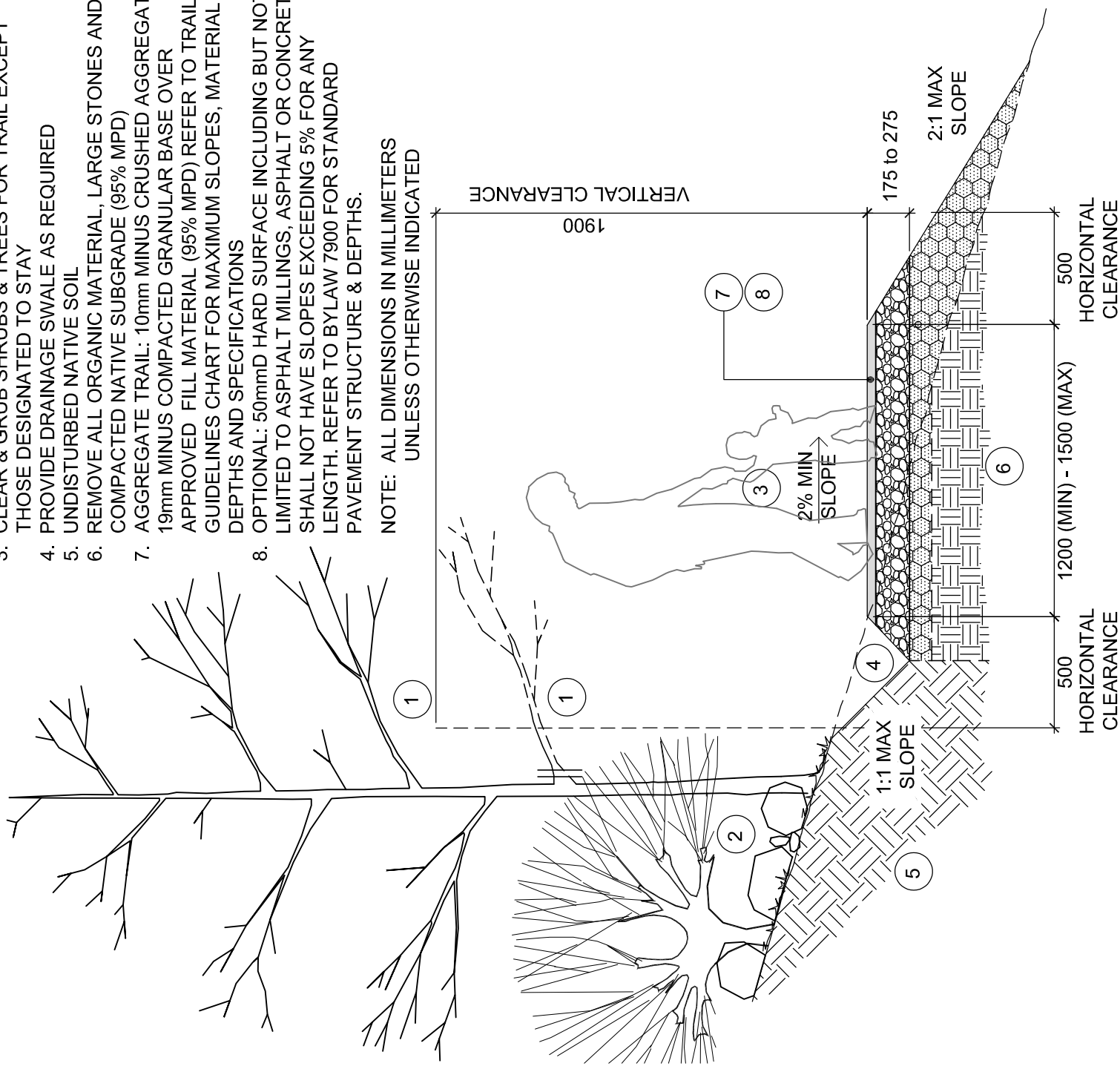
NOTE: ALL DIMENSIONS IN MILLIMETERS UNLESS OTHERWISE INDICATED

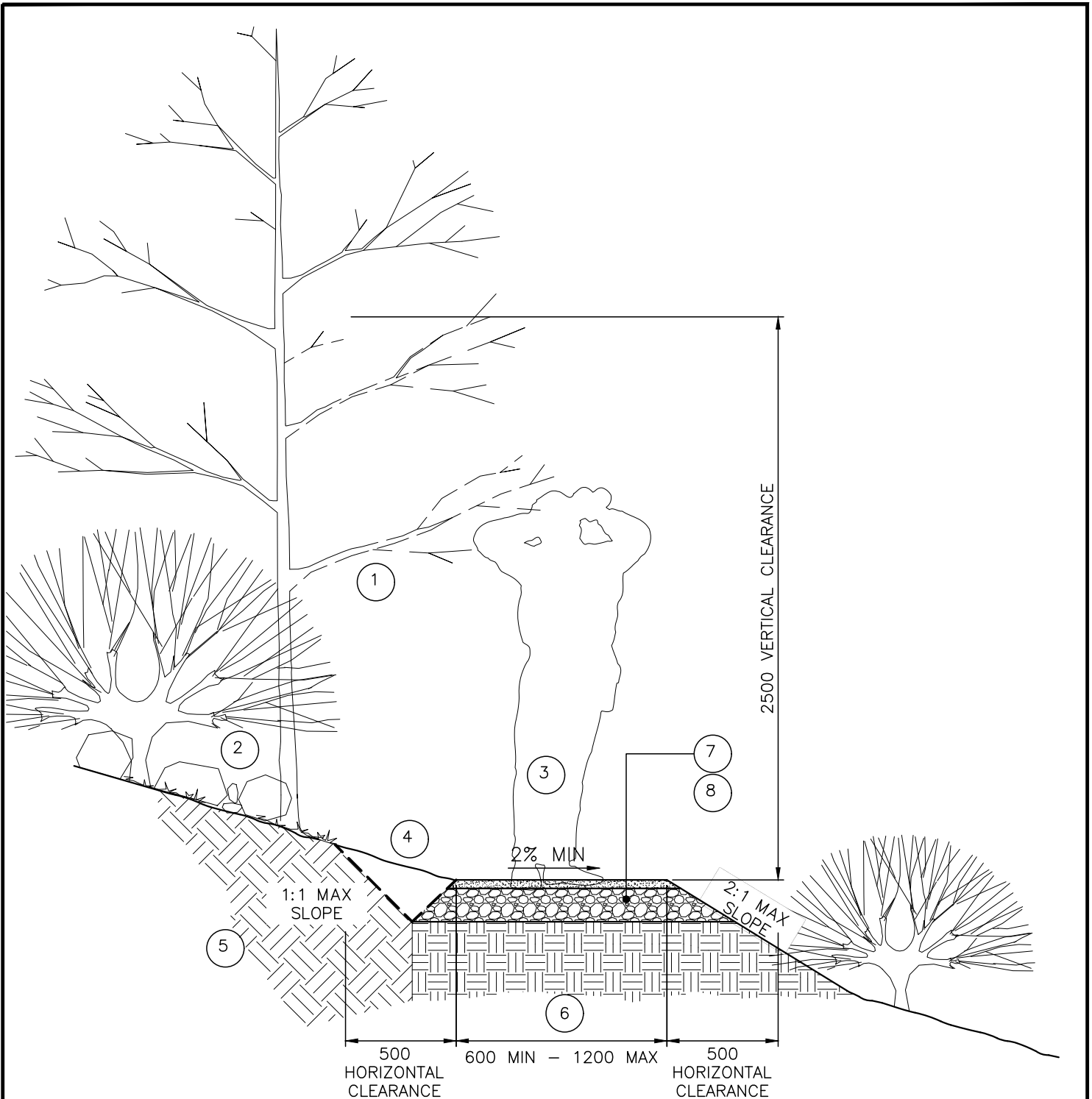


STANDARD DETAIL DRAWING

1. PRUNE BRANCHES BACK TO TRUNK OR LIMB
2. REMOVE LOOSE ROCK & DEBRIS FROM ABOVE TRAIL
3. CLEAR & GRUB SHRUBS & TREES FOR TRAIL EXCEPT THOSE DESIGNATED TO STAY
4. PROVIDE DRAINAGE SWALE AS REQUIRED
5. UNDISTURBED NATIVE SOIL
6. REMOVE ALL ORGANIC MATERIAL, LARGE STONES AND COMPACTED NATIVE SUBGRADE (95% MPD)
7. AGGREGATE TRAIL: 10mm MINUS CRUSHED AGGREGATE / 19mm MINUS COMPACTED GRANULAR BASE OVER APPROVED FILL MATERIAL (95% MPD) REFER TO TRAIL GUIDELINES CHART FOR MAXIMUM SLOPES, MATERIAL DEPTHS AND SPECIFICATIONS
8. OPTIONAL: 50mmD HARD SURFACE INCLUDING BUT NOT LIMITED TO ASPHALT MILLINGS, ASPHALT OR CONCRETE; SHALL NOT HAVE SLOPES EXCEEDING 5% FOR ANY LENGTH. REFER TO BYLAW 7900 FOR STANDARD PAVEMENT STRUCTURE & DEPTHS.

NOTE: ALL DIMENSIONS IN MILLIMETERS UNLESS OTHERWISE INDICATED

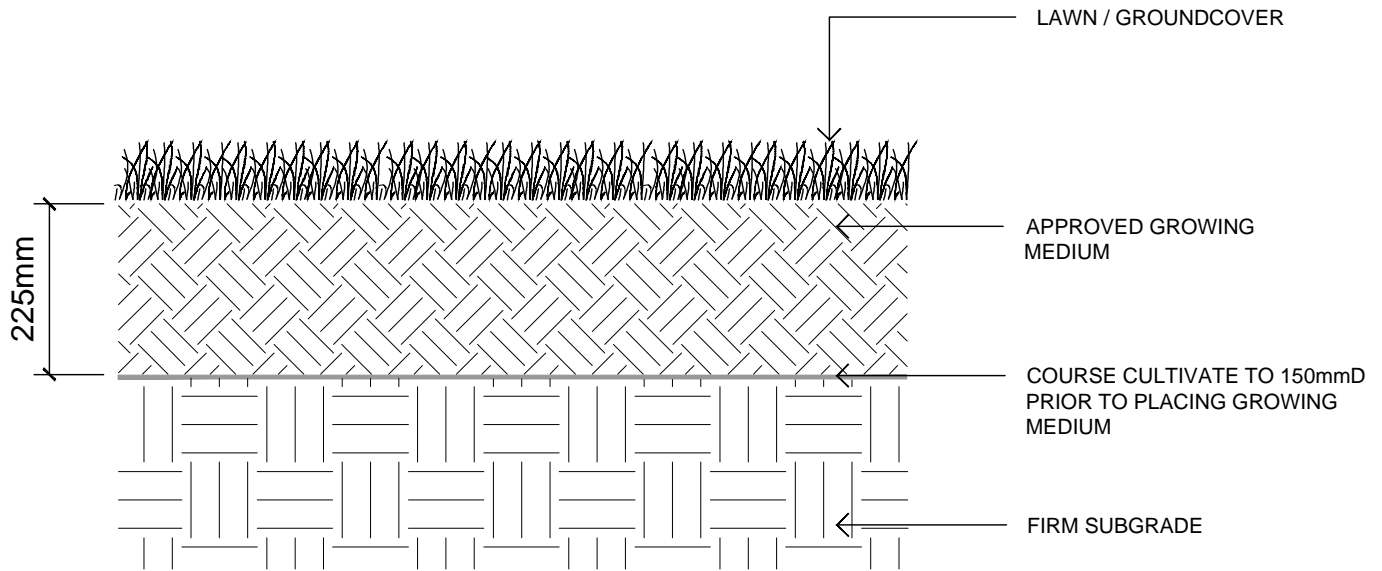




NOTES:

1. PRUNE BRANCHES BACK TO TRUNK OR LIMB
2. REMOVE LOOSE ROCK & DEBRIS FROM ABOVE TRAIL
3. CLEAR & GRUB SHRUBS & TREES FOR TRAIL EXCEPT THOSE DESIGNATED TO STAY
4. PROVIDE DRAINAGE SWALE AS REQUIRED WHERE ADEQUATE DISCHARGE LOCATIONS ARE PRESENT
5. UNDISTURBED NATIVE SOIL
6. REMOVE ALL ORGANIC MATERIAL, LARGE STONES AND COMPACT NATIVE SUBGRADE (95% MPD)
7. APPROVED FILL MATERIAL / NATURAL TRAIL
8. REFER TO TRAIL GUIDELINES CHART FOR MAXIMUM SLOPES AND SPECIFICATIONS
9. OPTIONAL SURFACE: 10mm MINUS CRUSHED AGGREGATE OVER 19mm MINUS COMPACTED GRANULAR BASE (95% MPD)
10. DIMENSIONS ARE IN MILLIMETRES UNLESS NOTED OTHERWISE.

STANDARD DETAIL DRAWING	DATE: JUN 26/23	CLASS 6 TRAIL NATURE TRAIL RURAL	DWG. NO. SS-T06	 City of Kelowna
	SCALE: NTS			



JUNE 2024

STANDARD
DETAIL
DRAWING

DETAIL TITLE:

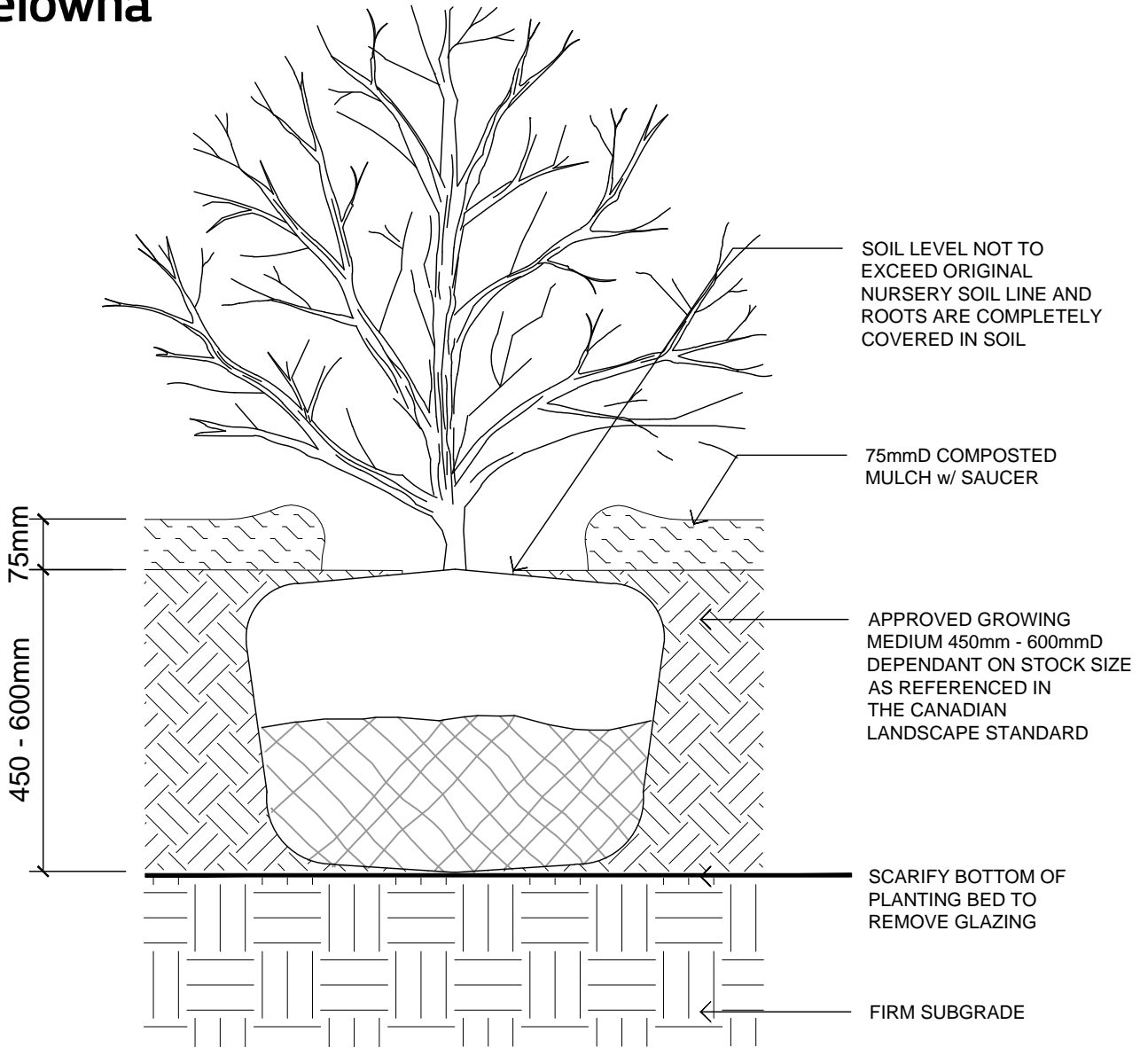
**GROWING MEDIUM
BOULEVARD GROUNDCOVER**

DETAIL No.:

SS L01

SCALE:

NTS



JUNE 2024

STANDARD
DETAIL
DRAWING

DETAIL TITLE:

**GROWING MEDIUM
BOULEVARD PLANTING BED**

DETAIL No.:

SS L02

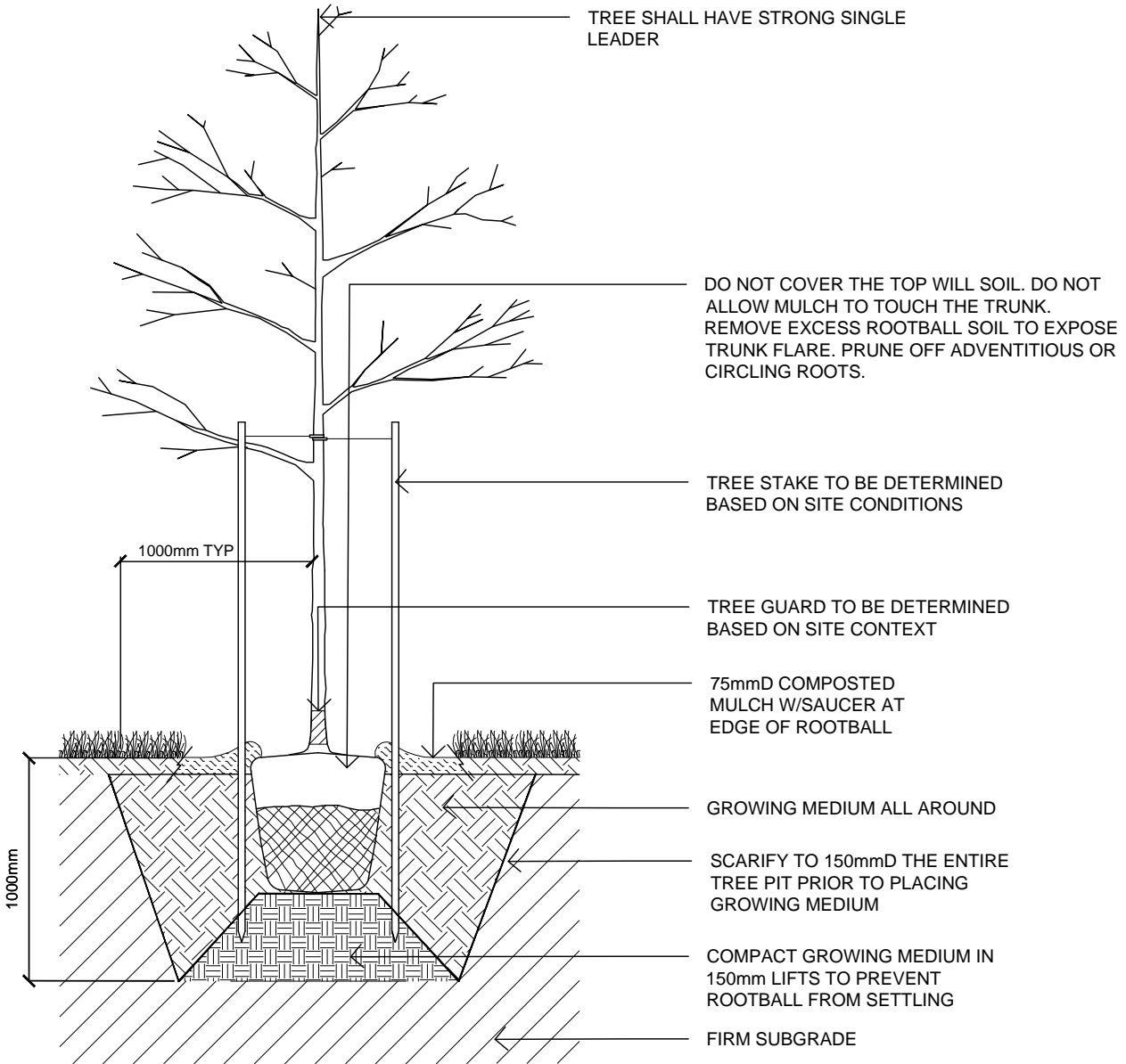
SCALE:

NTS



NOTES:

1. POLY MESH STRAP GUYING ASSEMBLY TO BE DEEP ROOT ARBORTIE INSTALLED PER MANUFACTURER'S INSTRUCTIONS OR APPROVED EQUAL.
2. TREE STAKES TO BE MIN. 75mm CEDAR STAKES, INSTALLED 600mm IN THE GROUND AND NO MORE THAN 2/3 OF THE WAY UP THE TRUNK.



TREE SHALL HAVE STRONG SINGLE LEADER

DO NOT COVER THE TOP WILL SOIL. DO NOT ALLOW MULCH TO TOUCH THE TRUNK. REMOVE EXCESS ROOTBALL SOIL TO EXPOSE TRUNK FLARE. PRUNE OFF ADVENTITIOUS OR CIRCLING ROOTS.

TREE STAKE TO BE DETERMINED BASED ON SITE CONDITIONS

TREE GUARD TO BE DETERMINED BASED ON SITE CONTEXT

75mmD COMPOSTED MULCH W/SAUCER AT EDGE OF ROOTBALL

GROWING MEDIUM ALL AROUND

SCARIFY TO 150mmD THE ENTIRE TREE PIT PRIOR TO PLACING GROWING MEDIUM

COMPACT GROWING MEDIUM IN 150mm LIFTS TO PREVENT ROOTBALL FROM SETTLING

FIRM SUBGRADE

JUNE 2024

STANDARD
DETAIL
DRAWING

DETAIL TITLE:

TREE - IN OPEN GREEN SPACE

DETAIL No.:

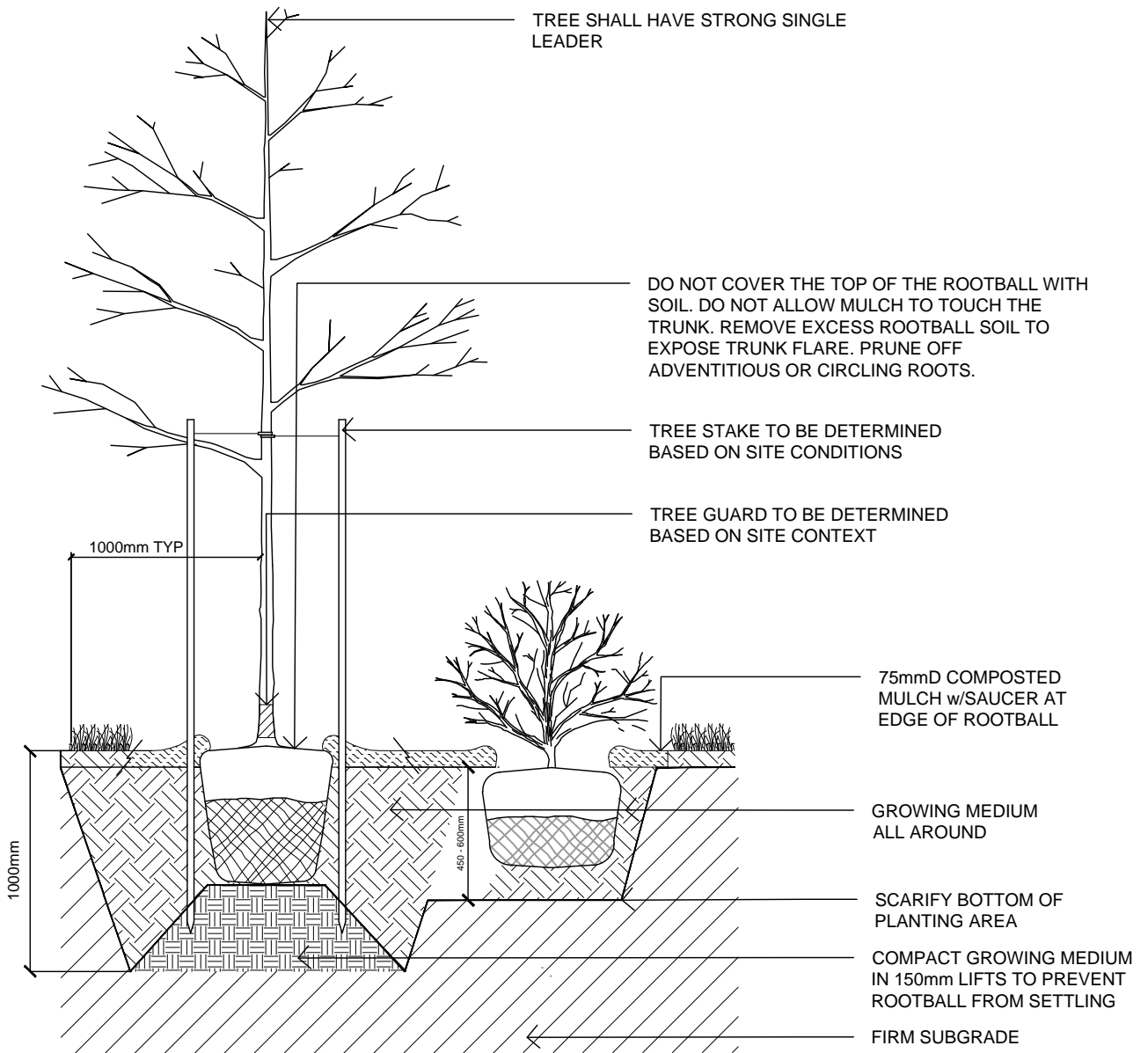
SS L03

SCALE:

NTS

NOTES:

1. POLY MESH STRAP GUYING ASSEMBLY TO BE DEEP ROOT ARBORTIE INSTALLED PER MANUFACTURER'S INSTRUCTIONS OR APPROVED EQUAL.
2. TREE STAKES TO BE MIN. 75mm CEDAR STAKES, INSTALLED 600mm IN THE GROUND AND NO MORE THAT 2/3 OF THE WAY UP THE TRUNK
3. REFERENCE DETAIL SS-L02 FOR SHRUB GROWING MEDIUM DEPTH



JUNE 2024

STANDARD
DETAIL
DRAWING

DETAIL TITLE:

TREE - IN PLANTING BED

DETAIL No.:

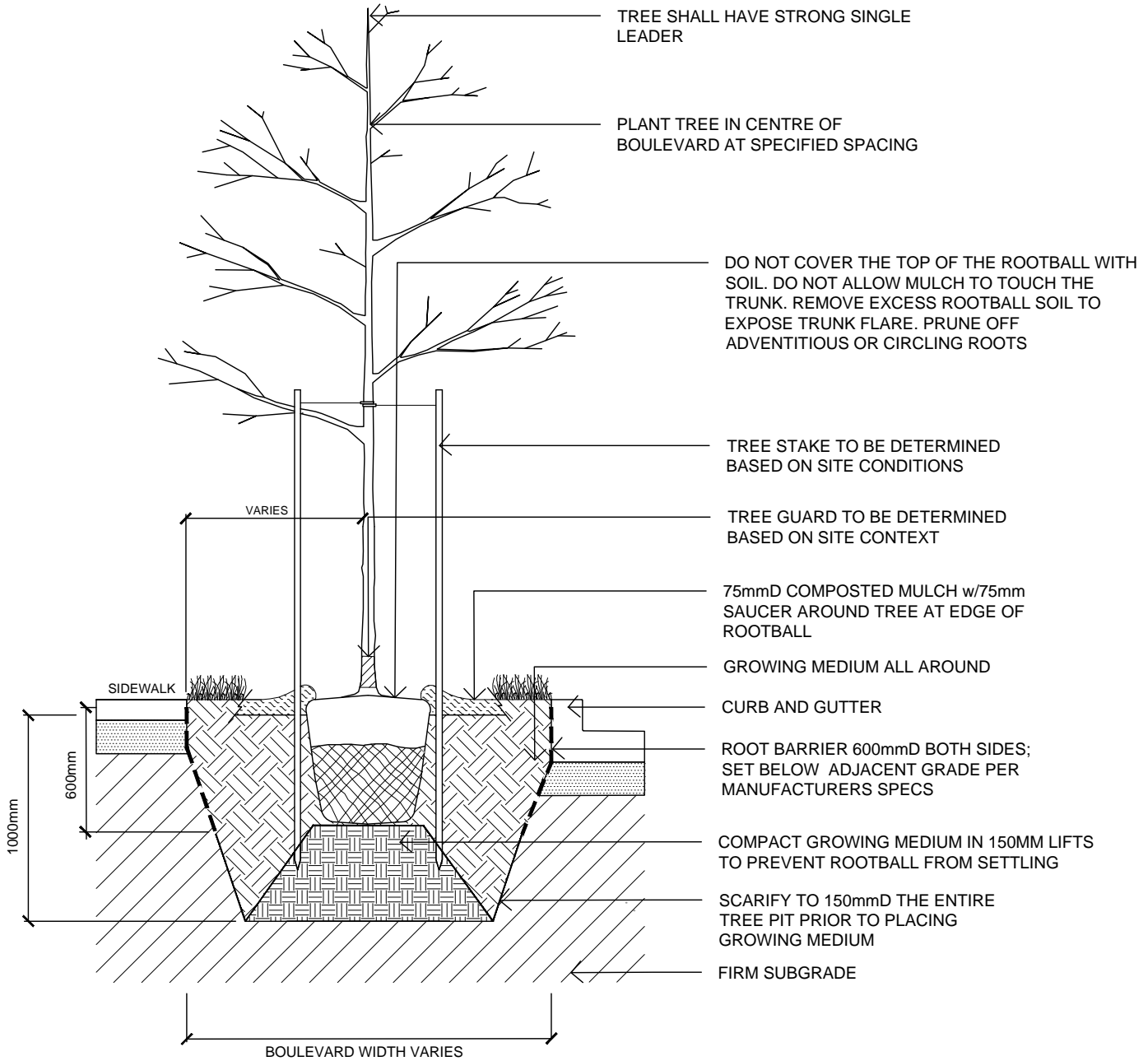
SS L04

SCALE:

NTS

NOTES:

1. POLY MESH STRAP GUYING ASSEMBLY TO BE DEEP ROOT ARBORTIE INSTALLED PER MANUFACTURER'S INSTRUCTIONS OR APPROVED EQUAL.
2. TREE STAKES TO BE MIN. 75mm CEDAR STAKES, INSTALLED 600mm IN THE GROUND AND NO MORE THAT 2/3 OF THE WAY UP THE TRUNK
3. ROOT BARRIER TO BE INSTALLED WHERE TRUNK IS WITHIN 3m OF ADJACENT HARD SURFACE.



JUNE 2024

**STANDARD
DETAIL
DRAWING**

DETAIL TITLE:

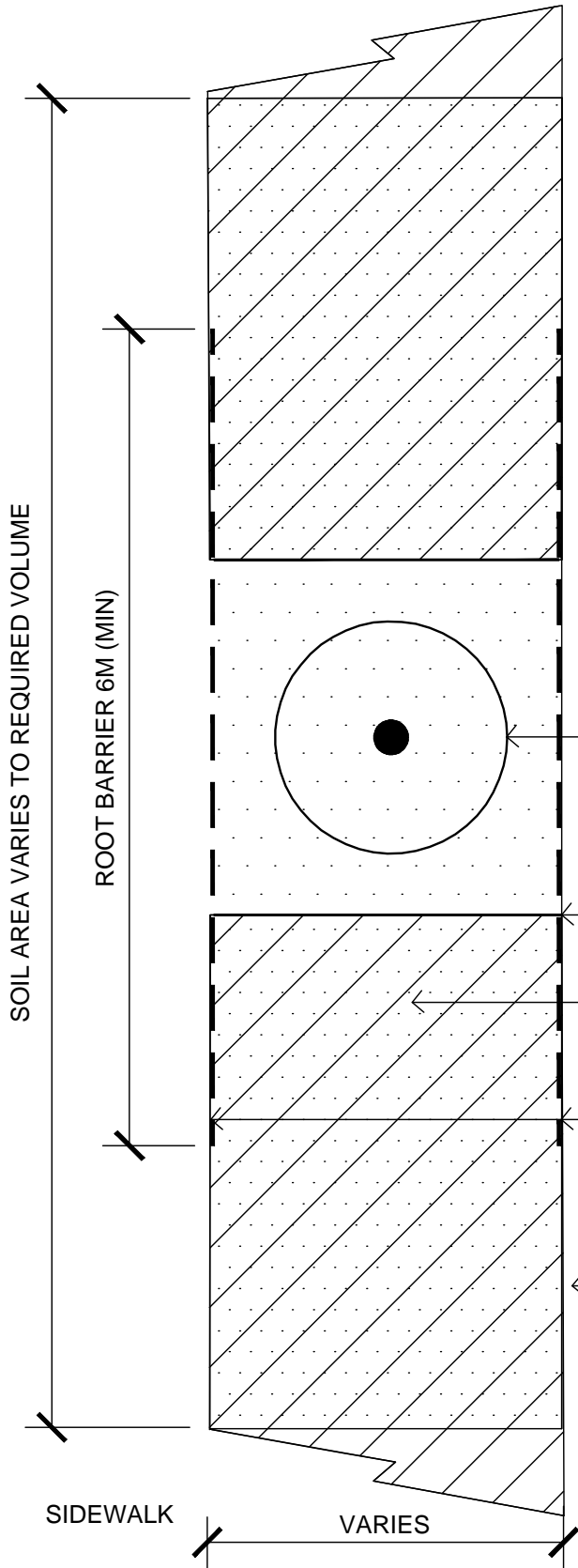
**TREE - IN BOULEVARD
SECTION**

DETAIL No.:

SS L05a

SCALE:

NTS



NOTES:

1. BOULEVARD WIDTH DETERMINES THE LENGTH OF SOIL AREA REQUIRED.

	TOTAL SOIL VOLUME	
	SINGLE TREE	MULTIPLE TREES
LARGE 15 - 25m mature height	20cu m	15cu m
MEDIUM 9 - 15m mature height	18cu m	12cu m
SMALLL <8m mature height	15cu m	10cu m

TREE

LIMIT OF ADJACENT TURF OR PLANTINGS (TYP)

SOIL VOLUME; SEE NOTES

CONTINUOUS ROOT BARRIER FOR MIN. OF 3m ON EITHER SIDE OF TRUNK

CURB

ROAD

SOIL AREA VARIES TO REQUIRED VOLUME

ROOT BARRIER 6M (MIN)

SIDEWALK

VARIES

JUNE 2024

STANDARD
DETAIL
DRAWING

DETAIL TITLE:

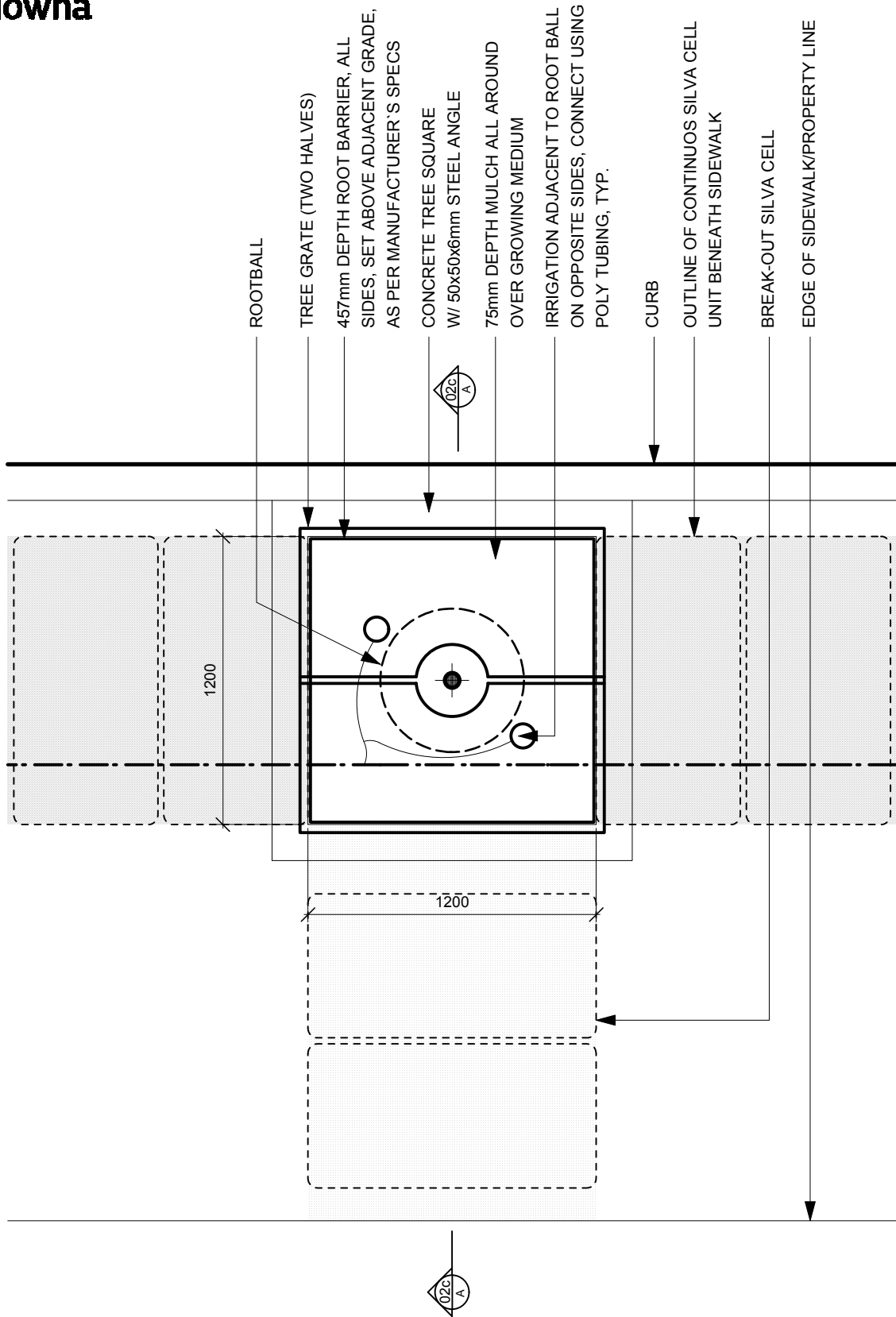
**TREE - IN BOULEVARD
PLAN**

DETAIL No.:

SS L05b

SCALE:

NTS



N.B. All dimensions in millimetres, unless noted otherwise

DECEMBER 2010

**STANDARD
DETAIL
DRAWING**

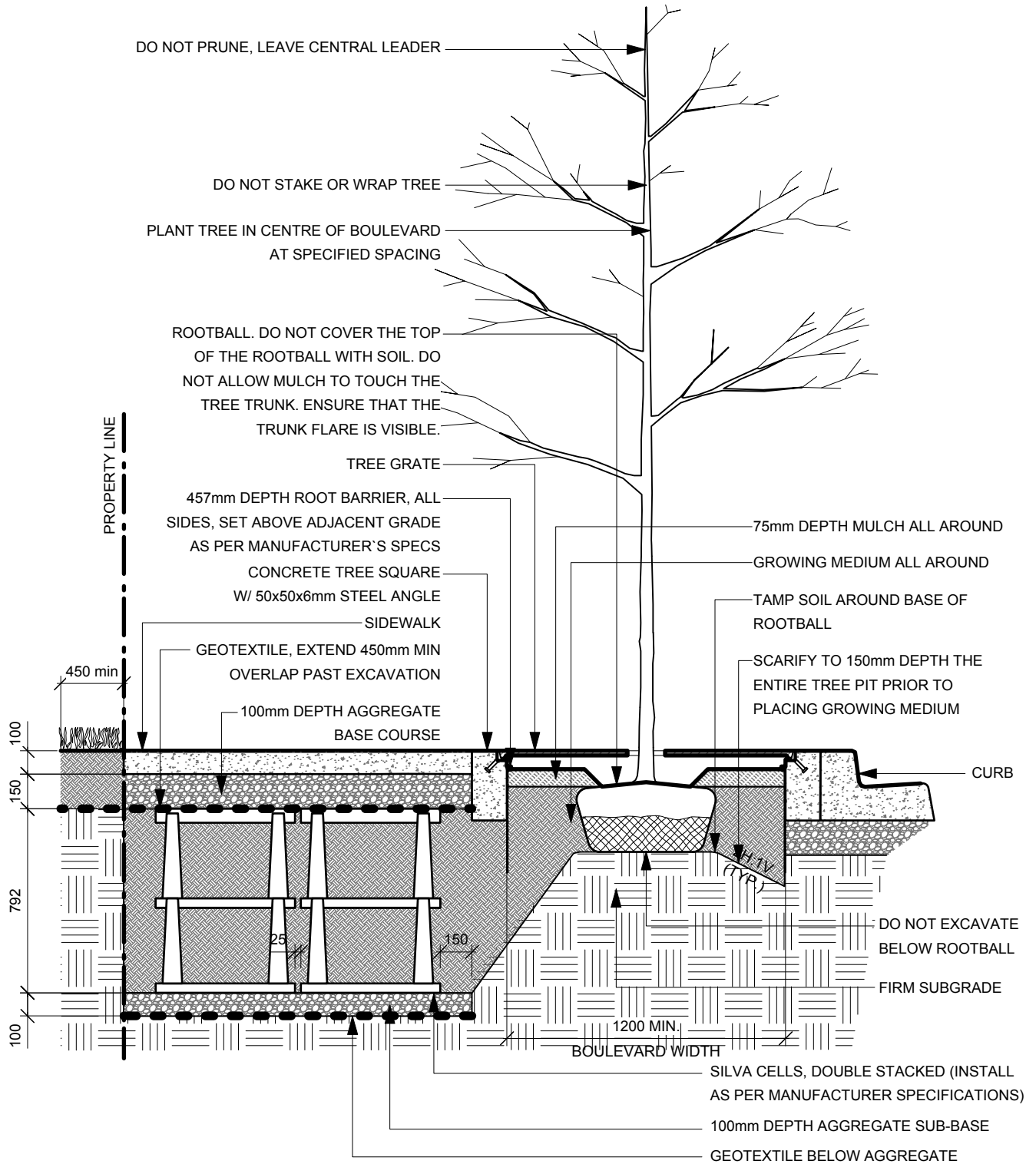
DETAIL
TITLE :

**Boulevard Tree - in Soil Cell
(Plan)**

DETAIL No. :
SS-L.06a
336

NOTES :

1. DO NOT STAKE OR WRAP TREE UNLESS REQUIRED BY CITY. WHEN REQUIRED, STAKE TREES USING ARBOURTIE OR EQUIVALENT TO ALLOW FOR LOCALIZED TREE SWING
2. ROOT BARRIER : INSTALLED PER MANUFACTURER'S INSTRUCTIONS
3. USE ROOT BARRIER ADJACENT TO HARD SURFACE WHERE TREE TRUNK IS WITHIN 3.0m OF HARD SURFACE.
4. DO NOT DISTURB THE ROOTBALL OR PLANTING PIT OF THE TREE WITH THOSE OF OTHER TREES AND SHRUBS PLANTED IN THE PLANTING BED.



N.B. All dimensions in millimetres, unless noted otherwise

DECEMBER 2010

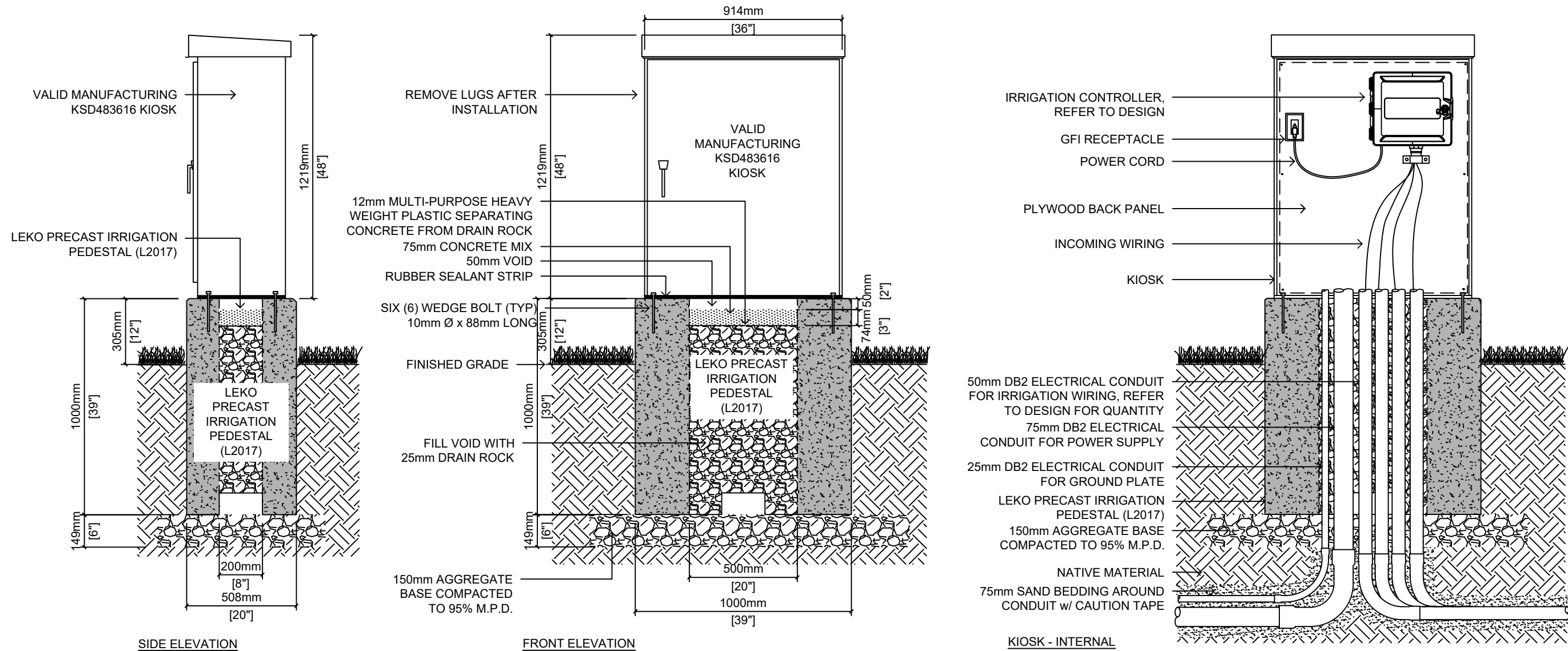
STANDARD
DETAIL
DRAWING

DETAIL
TITLE :

Boulevard Tree - in Soil Cell (Section A-A')

DETAIL No. :

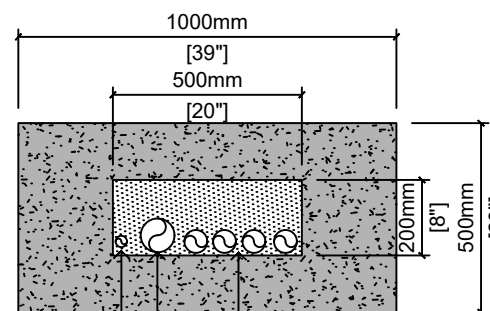
SS-L.06b
337



BASE GENERAL NOTES

- PRECAST CONCRETE SHALL BE EXPOSURE CLASS Hse AND MEET MIN COMPRESSIVE STRENGTH OF 30MPa @28d
 - AIR CATEGORY: 4.0% - 7.0% (EXCEPT WHERE ZERO-SLUMP CONCRETE IS USED)
 - AGGREGATE: CSA/CAN A23.4 MAXIMUM SIZE: 20mm
 - ADMIXTURES: CSA/CAN A23.4
 - REINFORCING: GRADE 400W CSA G30.18, 3x12 W2.5/W2.5
 - INSERT/EMBEDS: AS NOTED IN DRAWING DETAILS
 - MANUFACTURE OF PRECAST CONCRETE UNITS SHALL BE IN ACCORDANCE WITH SPECIFICATION CSA A23.4
- ** LEKO PRECAST LTD. SHALL NOT BE RESPONSIBLE FOR INSTALLATION PRACTICES FOLLOWED ON-SITE UNLESS PERFORMED BY LEKO PRECAST LTD. **

935Kg (2,060 LBS)



- 25mm DB2 FOR GROUND PLATE
- 75mm DB2 FOR POWER SUPPLY
- 50mm DB2 FOR CONTROL WIRING, REFER TO DESIGN FOR QUANTITY

NOTES:

- REFER TO IRRIGATION DESIGN FOR REQUIRED COMMUNICATION HARDWARE
- CONTRACTOR TO CONNECT HYDROMETER AND PROGRAM MASTER VALVE AND FLOW SENSING FUNCTIONS PRIOR TO SUBSTANTIAL COMPLETION
- CONTRACTOR SHALL LABEL ALL WIRES

DETAIL TITLE:

DETAIL No.: **SS-IR.01a**

SCALE: **1:20**

APRIL 2024

DOUBLE-SIDED METERED KIOSK
EXTERNAL

KIOSK CONTENTS

- MICROELECTRIC BS2-INTCVBC - METER BASE, 200A 4 JAW, w/ ISOLATED NEUTRAL BLOCK SQ-D CQ0112M60PC - PANEL, 12CCT 100A, 1Ø 3W 120/240V, W/ 60A MAIN (SERVICE ENTRANCE RATED) (4) SQ-D Q0115 - BREAKERS, 15A 1P, PUSH-ON 10kAIC
- LEVITON GFNT1-W - RECEPTACLE, GFI 15A, 5-15R

KIOSK GENERAL NOTES

- ENCLOSURE CERTIFIED 3R, 240V 60A SUPPLY, 10kA
- KIOSK SHELL MADE OF 0.125" ALUMINUM
- KIOSK SHELL POWDER COATED PC101 (ANSI 61) GREY
- INTERIOR PANELS, WIREWAYS, AND COVERS ARE 14GA GALVANIZED STEEL (UNFINISHED)
- WIREWAYS WITH DEADFRONT COVERS
- HINGED DOORS WITH POUR IN PLACE GASKETS, W/ GAS SHOCK STAYS
- DOOR HANDLES ARE STAINLESS STEEL, PADLOCK-ABLE, AND HAVE THREE POINT LATCHING SYSTEM WIRED FROM METER BASE TO PANEL WITH #3AWG COPPER
- BACK PANEL LAYOUT MAY BE REVISED DURING ASSEMBLY TO ALLOW BETTER FIT OF COMPONENTS WIREWAY FOOTPRINT WILL BE MAINTAINED
- CABLE/CONDUIT CLAMPS SUPPLIED AND INSTALLED BY OTHERS
- SYSTEM DESIGNED FOR HOT-METERED APPLICATIONS
- DESIGNED TO BC HYDRO STANDARD ES54 S1-01 REV 9

CONTROLLER NOTES:

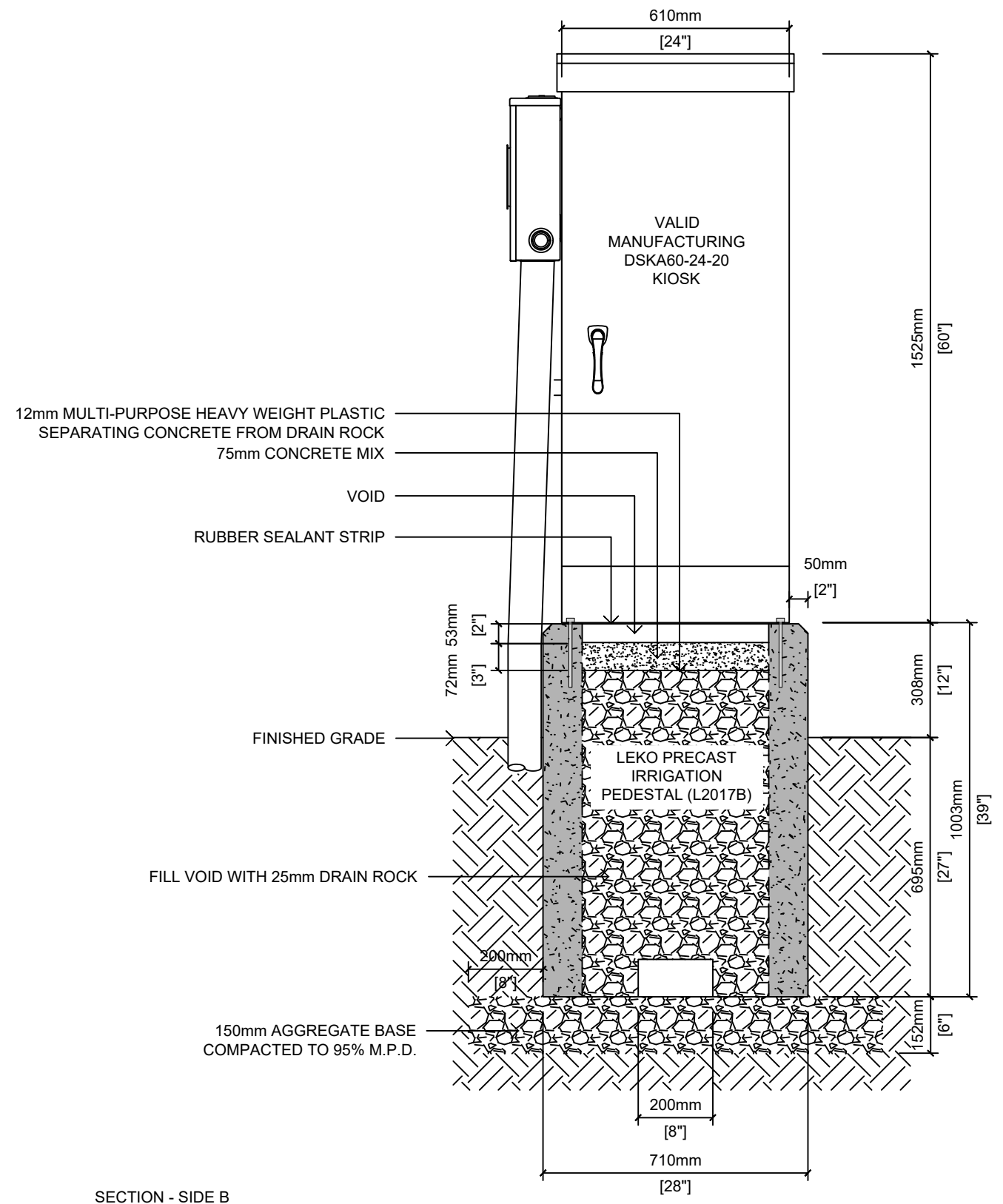
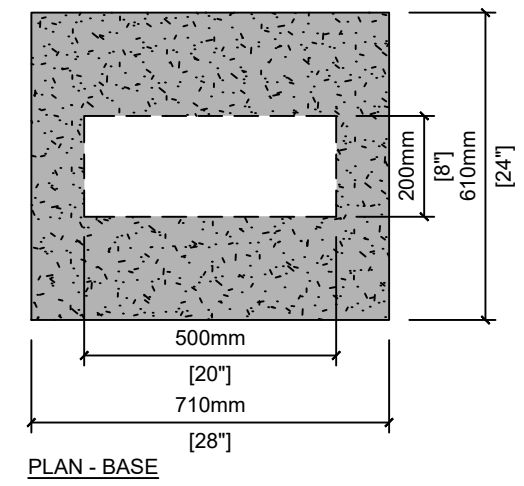
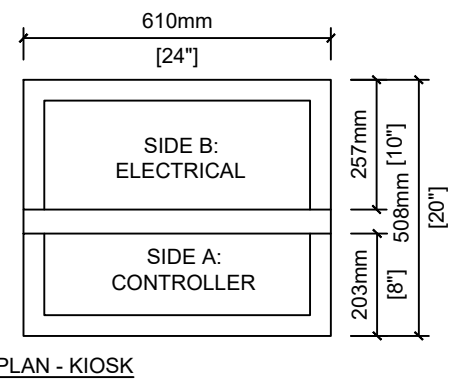
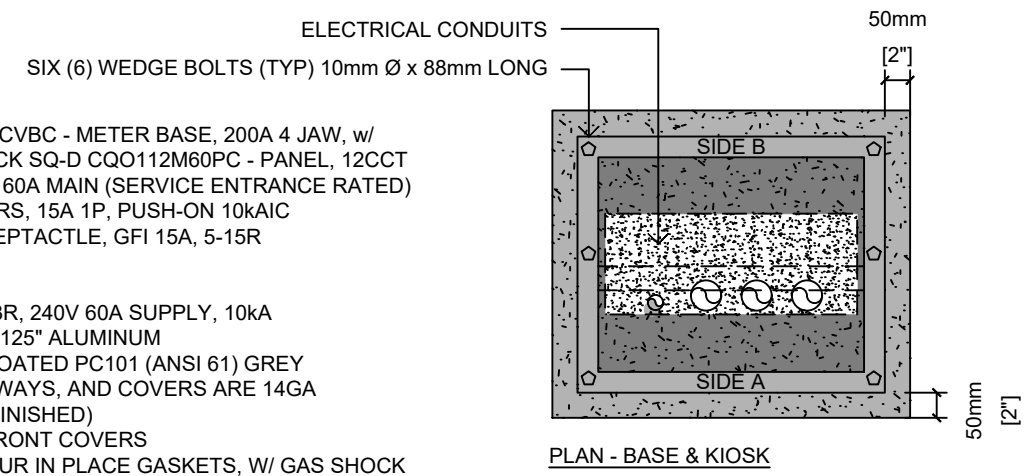
- CONTRACTOR TO INSTALL RAIN BIRD IQ NCC 4G CELLULAR CARTRIDGE
- CONTRACTOR TO CONNECT HYDROMETER AND PROGRAM MASTER VALVE AND FLOW SENSING FUNCTIONS PRIOR TO SUBSTANTIAL COMPLETION
- CONTRACTOR SHALL TO LABEL ALL WIRES

BASE GENERAL NOTES

- PRECAST CONCRETE SHALL BE EXPOSURE CLASS HSe AND MEET MIN COMPRESSIVE STRENGTH OF 30MPa @28d
- AIR CATEGORY: 4.0% - 7.0% (EXCEPT WHERE ZERO-SLUMP CONCRETE IS USED)
- AGGREGATE: CSA/CAN A23.4 MAXIMUM SIZE: 20mm
- ADMIXTURES: CSA/CAN A23.4
- REINFORCING: GRADE 400W CSA G30.18, 3x12 W2.5/W2.5
- INSERT/EMBEDS: AS NOTED IN DRAWING DETAILS
- MANUFACTURE OF PRECAST CONCRETE UNITS SHALL BE IN ACCORDANCE WITH SPECIFICATION CSA A23.4

** LEKO PRECAST LTD. SHALL NOT BE RESPONSIBLE FOR INSTALLATION PRACTICES FOLLOWED ON-SITE UNLESS PERFORMED BY LEKO PRECAST LTD. **

600Kg (1300 LBS)



DETAIL TITLE:

DETAIL No.:
SS-IR.01b

SCALE:
1:15

APRIL 2024

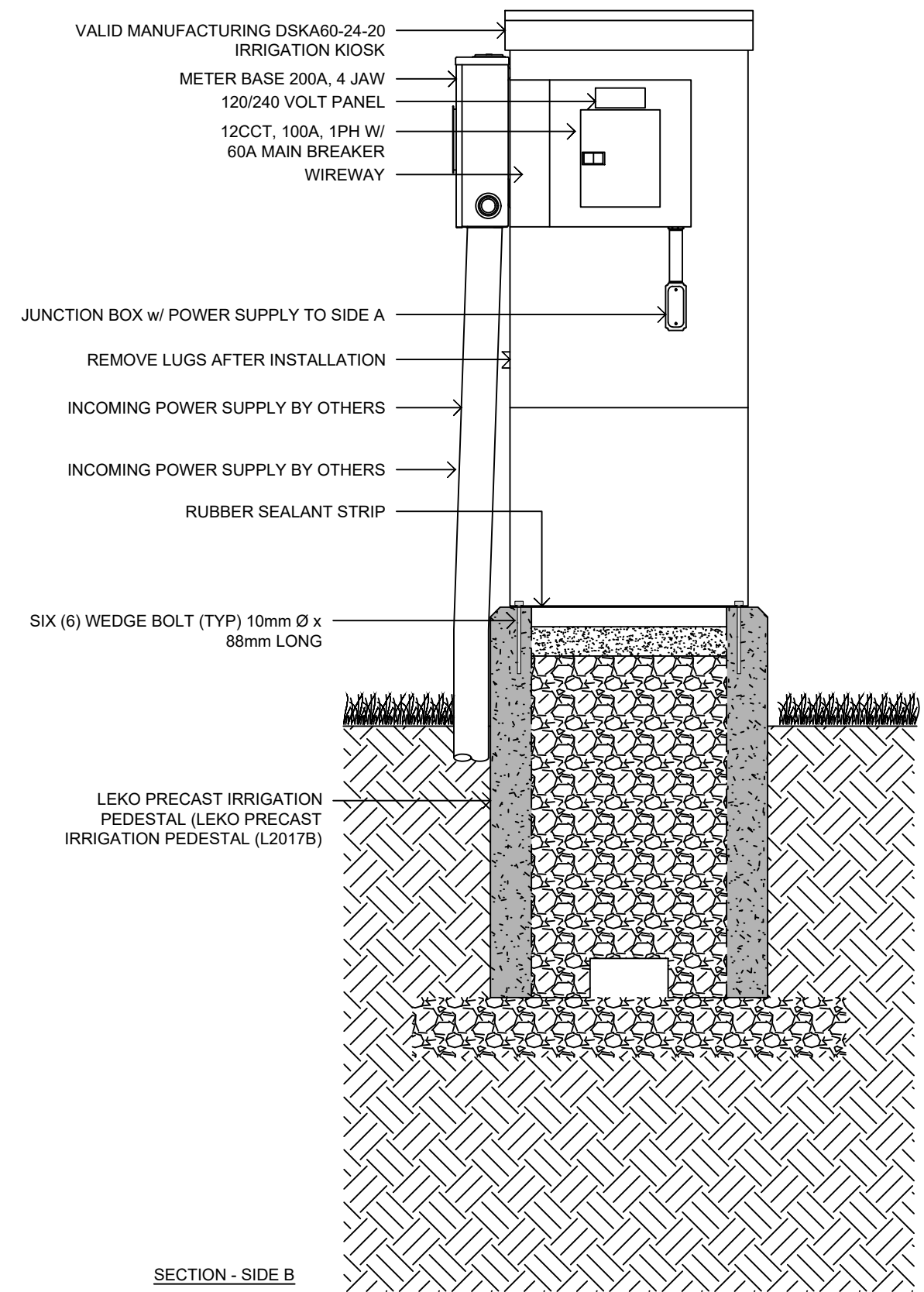
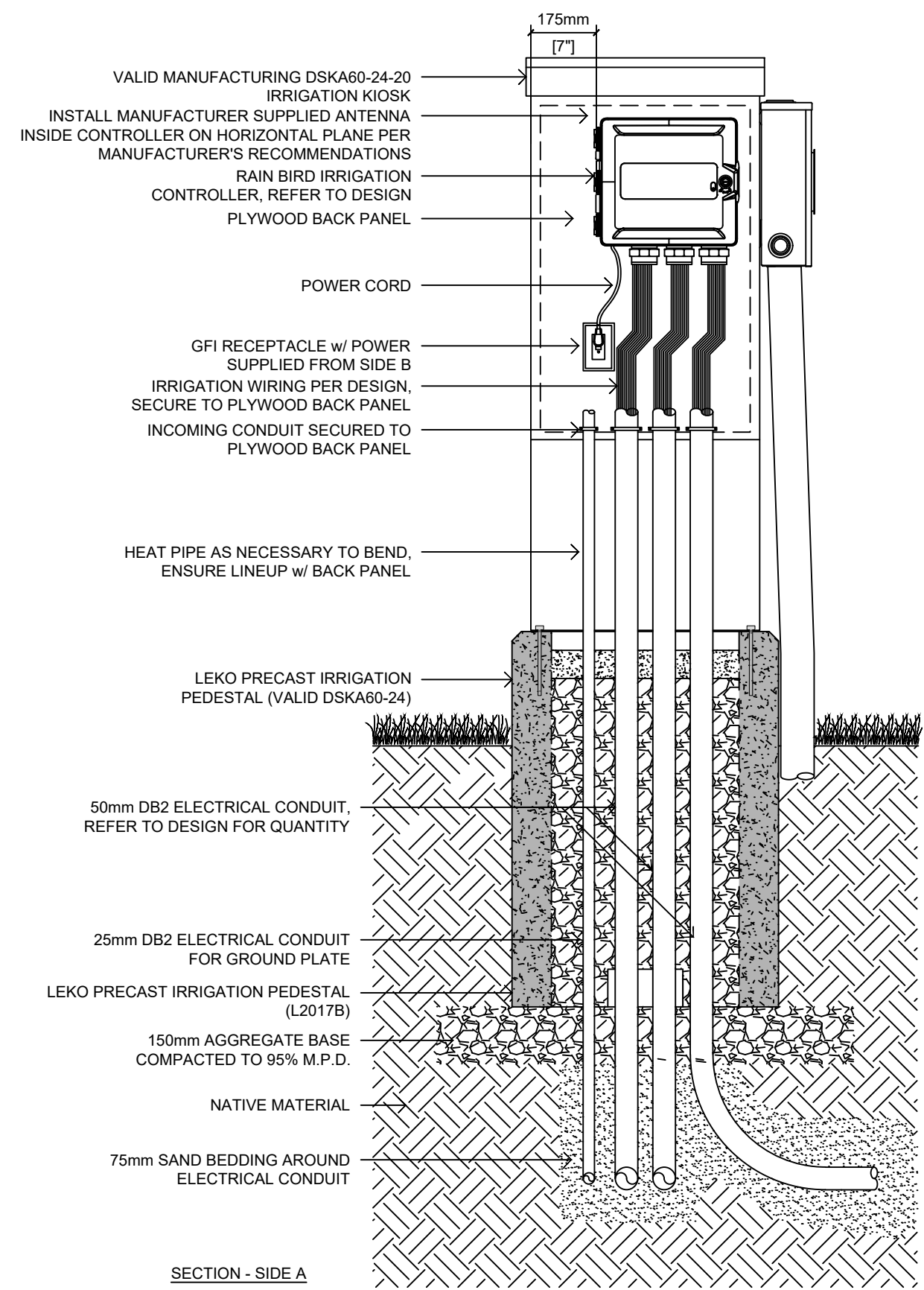
DOUBLE-SIDED METERED KIOSK
INTERNAL

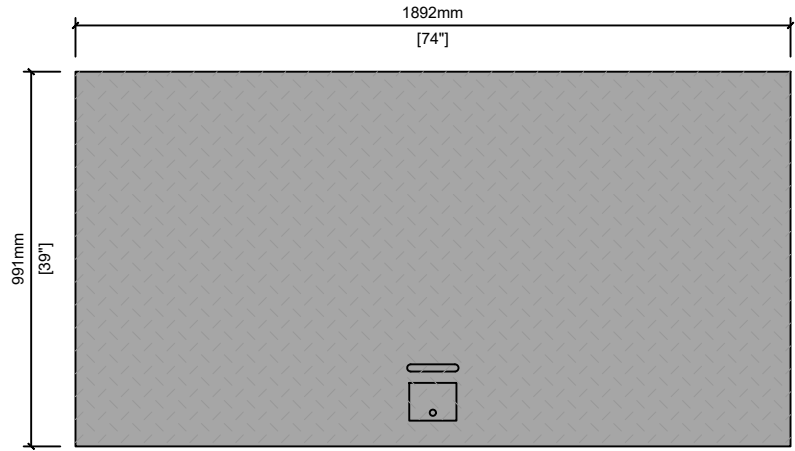
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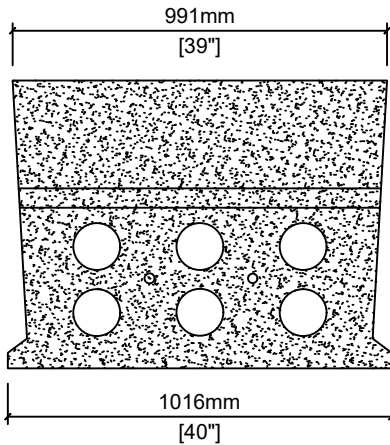
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APRIL 2024

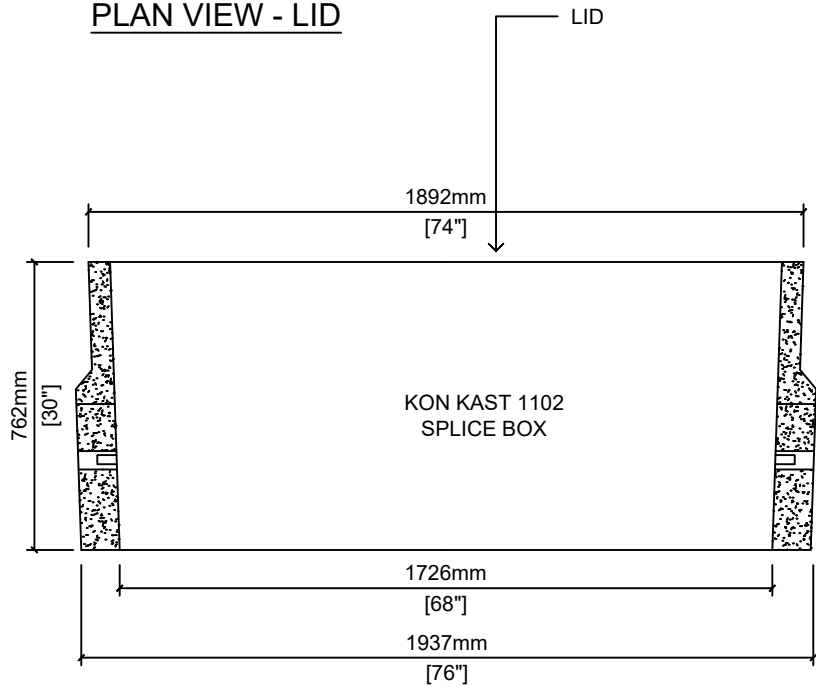




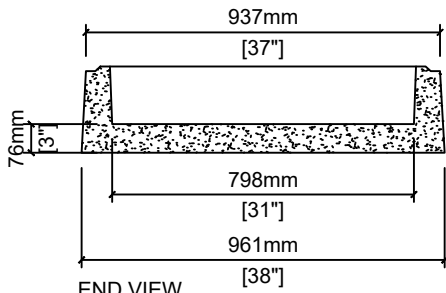
PLAN VIEW - LID



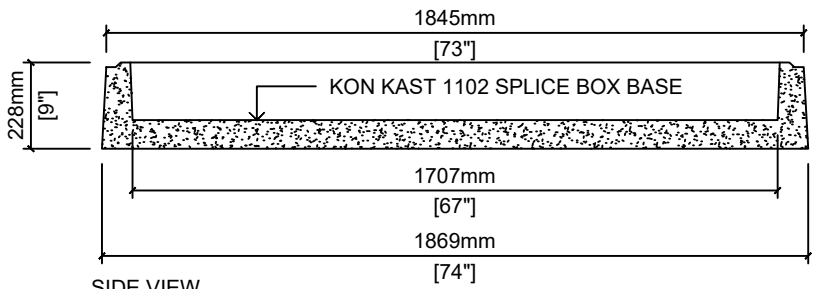
END VIEW



SIDE VIEW



END VIEW



SIDE VIEW

APRIL 2024

STANDARD
DETAIL
DRAWING

DETAIL TITLE:

**IRRIGATION VAULT
KON KAST 1102**

DETAIL No.:

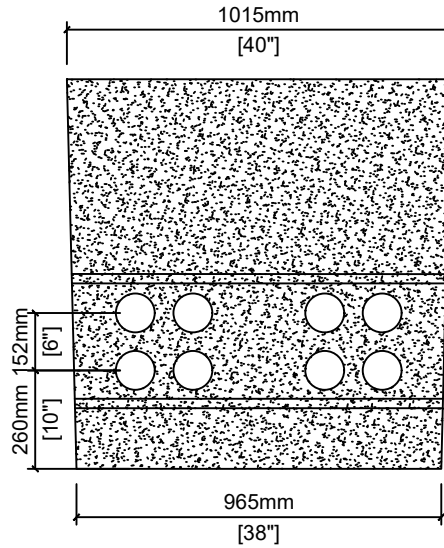
SS-IR.02a

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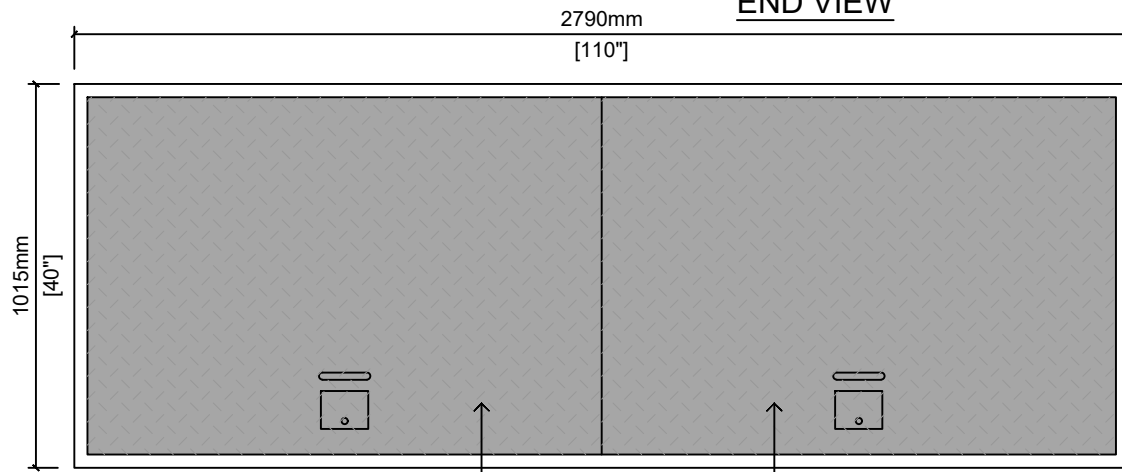
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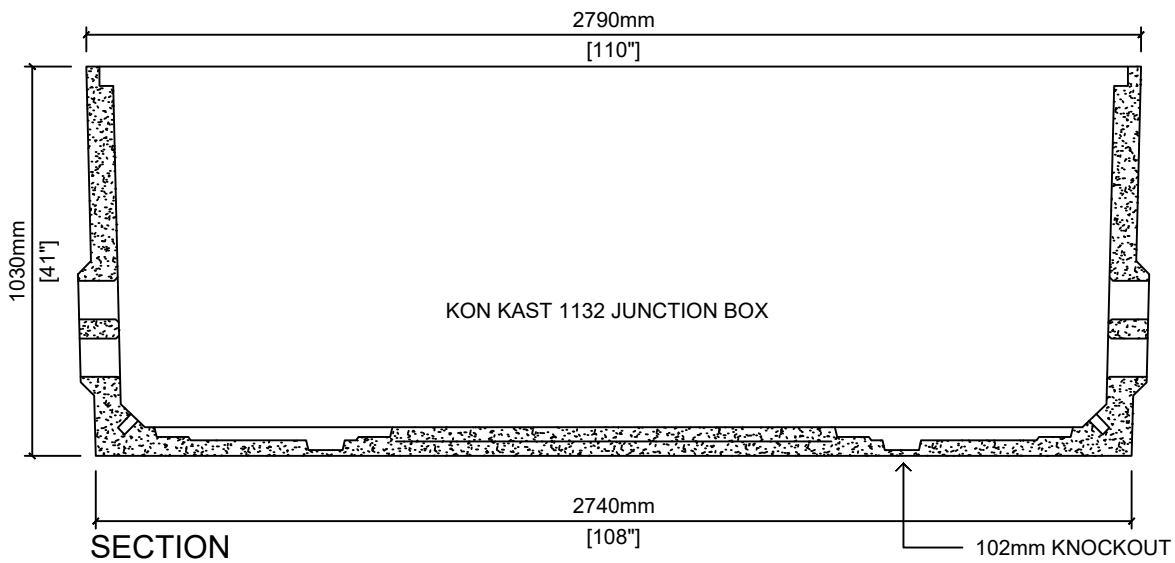
- 30 MPa @ 28 DAYS
- MEETS H-20 LOADING
- SULPHATE RESISTANT CONCRETE



END VIEW



PLAN VIEW - LID



SECTION

APRIL 2024

STANDARD
DETAIL
DRAWING

DETAIL TITLE:

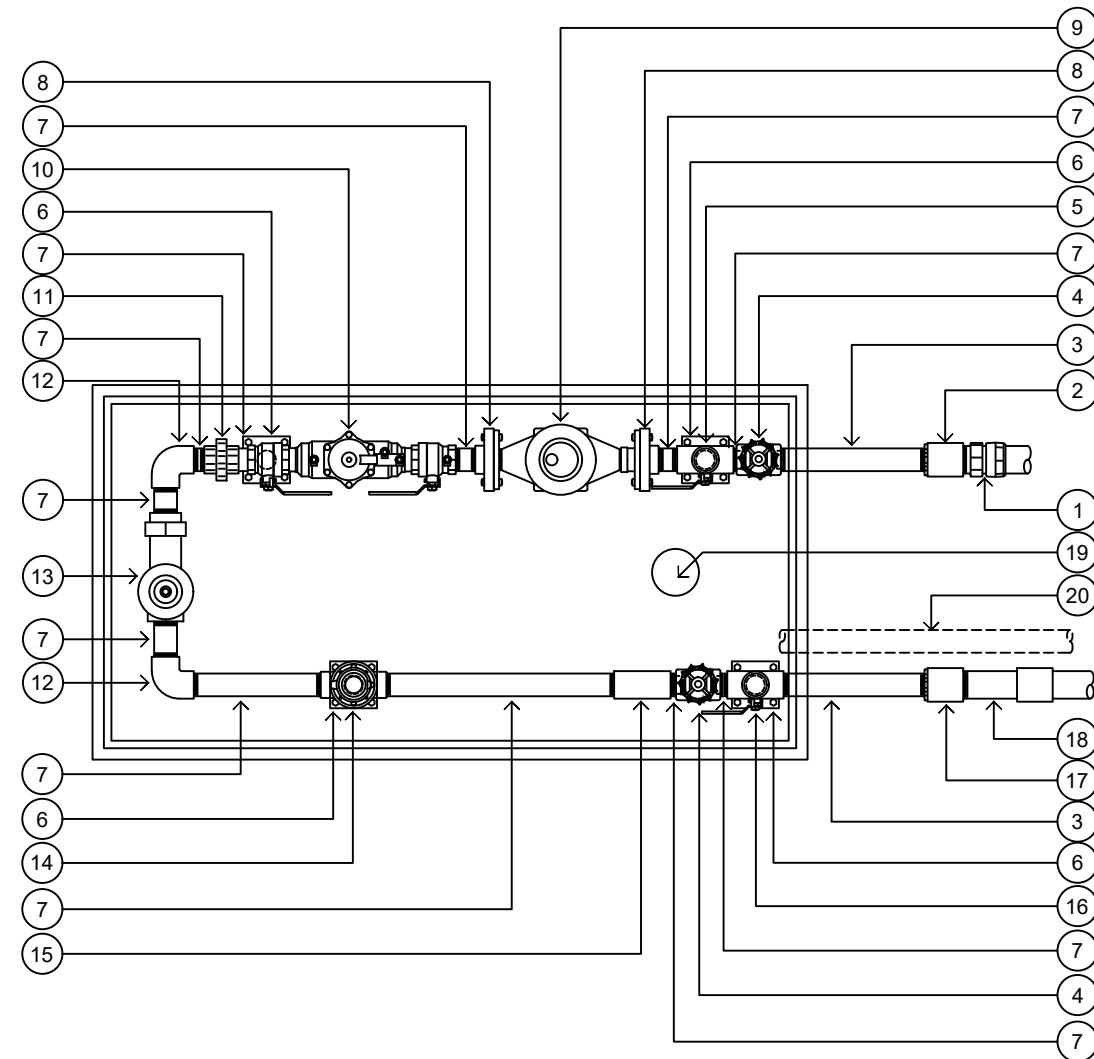
**IRRIGATION VAULT
KON KAST 1132**

DETAIL No.:

SS-IR.02b

SCALE:

1:20

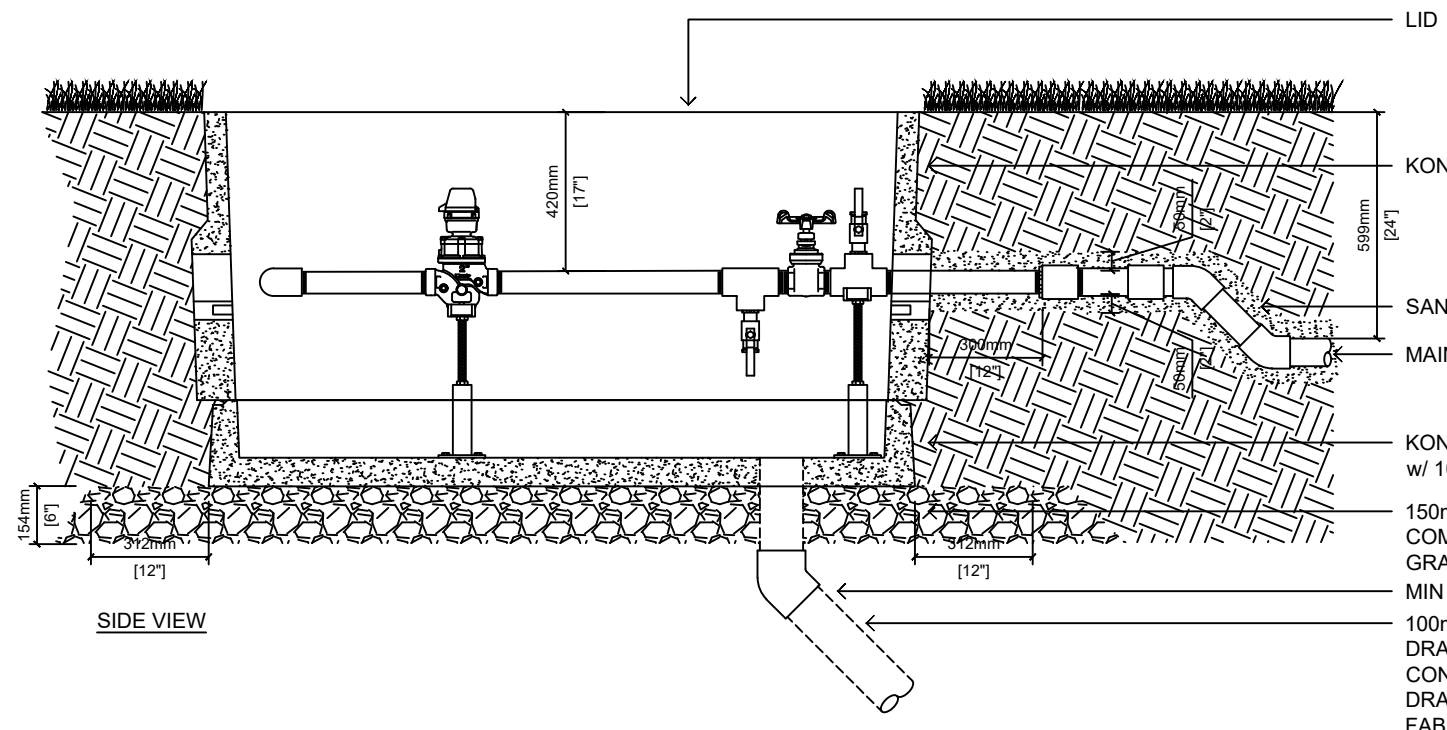


PLAN VIEW - CHAMBER

#	25mm POC	38mm POC	50mm POC
1	BRASS COMPRESSION x MPT w/ STAINLESS STEEL PIPE INSERT	BRASS COMPRESSION x MPT w/ STAINLESS STEEL PIPE INSERT	BRASS COMPRESSION x MPT w/ STAINLESS STEEL PIPE INSERT
2	BRASS COUPLER SIZED TO INCOMING PIPE w/ 25mm BRASS REDUCING BUSHING	BRASS COUPLER SIZED TO INCOMING PIPE w/ 38mm BRASS REDUCING BUSHING	BRASS COUPLER SIZED TO INCOMING PIPE w/ 50mm BRASS REDUCING BUSHING
3	25mm BRASS NIPPLE, EXTEND TO 300mm FROM VAULT	38mm BRASS NIPPLE, EXTEND TO 300mm FROM VAULT	50mm BRASS NIPPLE, EXTEND TO 300mm FROM VAULT
4	25mm GATE VALVE	38mm GATE VALVE	50mm GATE VALVE
5	BLOW-OUT ASSEMBLY w/ 25mm BRASS TEE, 25mm BRASS NIPPLE, 25mm BRASS BALL VALVE, w/ AIR RELIEF VALVE	BLOW-OUT ASSEMBLY w/ 38mm x 25mm BRASS TEE, 25mm BRASS NIPPLE, 25mm BRASS BALL VALVE, w/ AIR RELIEF VALVE	BLOW-OUT ASSEMBLY w/ 50mm x 25mm BRASS TEE, 25mm BRASS NIPPLE, 25mm BRASS BALL VALVE, w/ AIR RELIEF VALVE
6	PIPE STAND	PIPE STAND	PIPE STAND
7	25mm BRASS NIPPLE	38mm BRASS NIPPLE	50mm BRASS NIPPLE
8	25mm BRASS COUPLER	38mm BRASS FLANGED ADAPTER	50mm BRASS FLANGED ADAPTER
9	25mm PURVEYOR APPROVED WATER METER	38mm PURVEYOR APPROVED WATER METER	50mm PURVEYOR APPROVED WATER METER
10	25mm DOUBLE CHECK VALVE ASSEMBLY	38mm DOUBLE CHECK VALVE ASSEMBLY	50mm DOUBLE CHECK VALVE ASSEMBLY
11	25mm BRASS UNION	38mm BRASS UNION	50mm BRASS UNION
12	25mm BRASS ELBOW	38mm BRASS ELBOW	50mm BRASS ELBOW
13	25mm PRESSURE REDUCING VALVE (IF REQUIRED)	38mm PRESSURE REDUCING VALVE (IF REQUIRED)	50mm PRESSURE REDUCING VALVE (IF REQUIRED)
14	38mm HYDROMETER, 38mm BRASS COUPLER w/ 38mm x 25mm BRASS REDUCING BUSHING	38mm HYDROMETER w/ 38mm BRASS COUPLERS	50mm HYDROMETER
15	DOWNWARD FACING BLOW-OUT ASSEMBLY w/ 25mm BRASS TEE, 25mm BRASS NIPPLE, 25mm BRASS BALL VALVE, w/ PLUG	DOWNWARD FACING BLOW-OUT ASSEMBLY w/ 38mm x 25mm BRASS TEE, 25mm BRASS NIPPLE, 25mm BRASS BALL VALVE, w/ PLUG	DOWNWARD FACING BLOW-OUT ASSEMBLY w/ 50mm x 25mm BRASS TEE, 25mm BRASS NIPPLE, 25mm BRASS BALL VALVE, w/ PLUG
16	BLOW-OUT ASSEMBLY w/ 25mm BRASS TEE, 25mm BRASS NIPPLE, 25mm BRASS BALL VALVE	BLOW-OUT ASSEMBLY w/ 38mm x 25mm BRASS TEE, 25mm BRASS NIPPLE, 25mm BRASS BALL VALVE	BLOW-OUT ASSEMBLY w/ 50mm x 25mm BRASS TEE, 25mm BRASS NIPPLE, 25mm BRASS BALL VALVE
17	BRASS COUPLER SIZED TO MAINLINE w/ 25mm REDUCING BUSHING.	BRASS COUPLER SIZED TO MAINLINE w/ 38mm REDUCING BUSHING.	BRASS COUPLER SIZED TO MAINLINE w/ 50mm REDUCING BUSHING.
18	PVC MAINLINE: SCH 80 NIPPLE CUT IN HALF AND SOLVENT WELDED TO SCH 80 COUPLER SIZED TO MAINLINE, THREADED INTO BRASS COUPLER HDPE MAINLINE: MIPT-NPT TRANSITION FITTING SIZED TO MAINLINE	PVC MAINLINE: SCH 80 NIPPLE CUT IN HALF AND SOLVENT WELDED TO SCH 80 COUPLER SIZED TO MAINLINE, THREADED INTO BRASS COUPLER HDPE MAINLINE: MIPT-NPT TRANSITION FITTING SIZED TO MAINLINE	PVC MAINLINE: SCH 80 NIPPLE CUT IN HALF AND SOLVENT WELDED TO SCH 80 COUPLER SIZED TO MAINLINE, THREADED INTO BRASS COUPLER HDPE MAINLINE: MIPT-NPT TRANSITION FITTING SIZED TO MAINLINE
19	100mm DRAIN HOLE w/ GRATE	100mm DRAIN HOLE w/ GRATE	100mm DRAIN HOLE w/ GRATE
20	50mm DB2 ELECTRICAL CONDUIT TO KIOSK	50mm DB2 ELECTRICAL CONDUIT TO KIOSK	50mm DB2 ELECTRICAL CONDUIT TO KIOSK

NOTE:

- APPLY EXPANDING FOAM TO SEAL ALL PIPE PENETRATIONS MADE IN VAULT
- ALL FLANGES TO BE INSTALLED AS PER MANUFACTURER'S RECOMMENDATIONS w/ STAINLESS STEEL BOLTS
- INSTALL AIR RELIEF VALVE ON BLOW-OUT ASSEMBLY UPSTREAM OF THE BACKFLOW



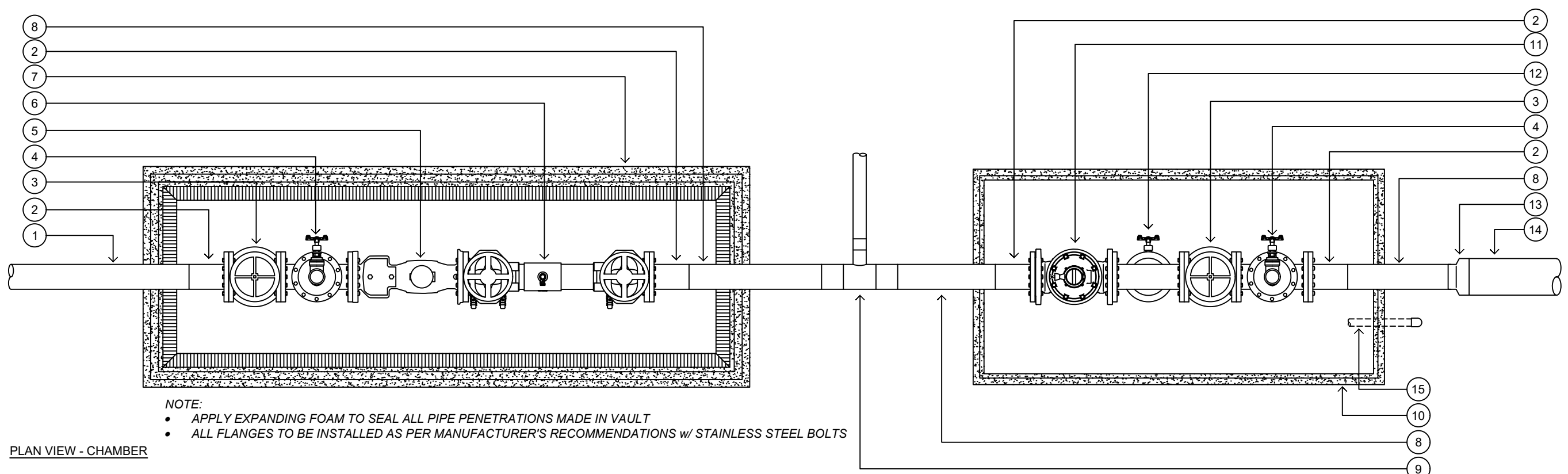
SIDE VIEW

DETAIL TITLE:

DETAIL No.:
SS-IR.03a

SCALE:
1:20

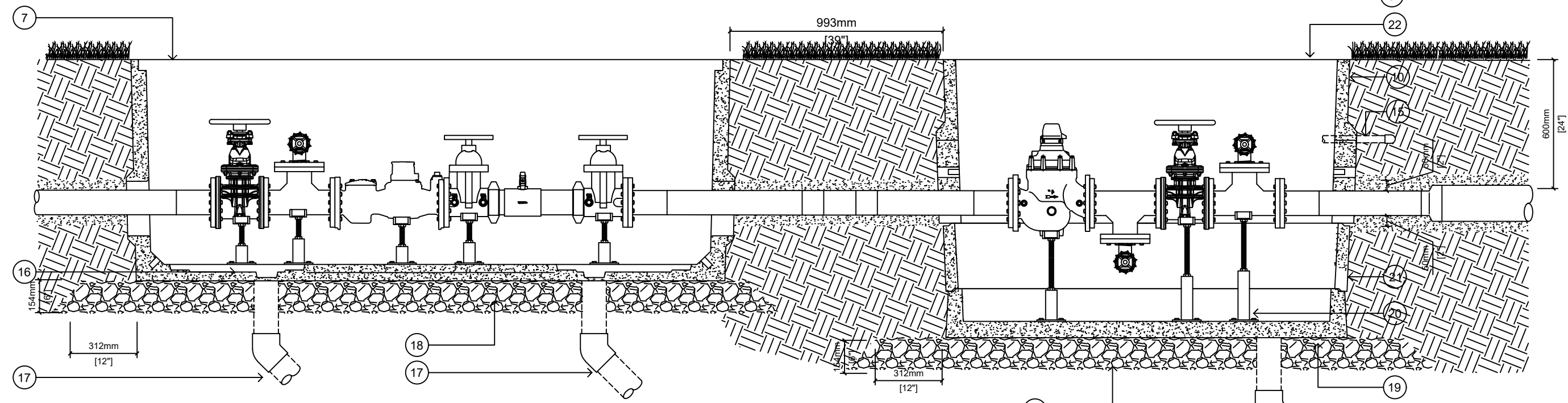
APRIL 2024



NOTE:

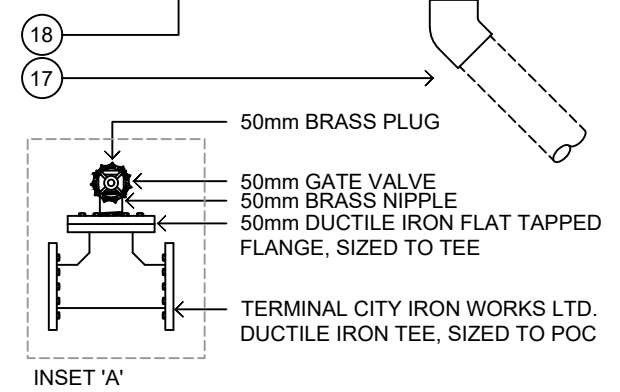
- APPLY EXPANDING FOAM TO SEAL ALL PIPE PENETRATIONS MADE IN VAULT
- ALL FLANGES TO BE INSTALLED AS PER MANUFACTURER'S RECOMMENDATIONS w/ STAINLESS STEEL BOLTS

PLAN VIEW - CHAMBER



SECTION

LEGEND			
1	CONNECT TO WATER SERVICE, TRANSITION TO 100mm HDPE	7	KON KAST 1132 VAULT w/ LID
2	100mm BUTT FUSION (BF) FLANGE ADAPTER	8	100mm HDPE PIPE
3	RESILIENT WEDGE GATE VALVE, FL x FL w/ HANDWHEEL	9	100mm BF TEE FOR SUBMAIN, SIZE PER PLAN
4	BLOW-OUT ASSEMBLY, SEE INSET 'A'	10	KON KAST 1102 SPLICE BOX, REFER TO SS-IR02a
5	100mm PURVEYOR APPROVED WATER METER	11	100mm HYDROMETER
6	100mm DOUBLE CHECK VALVE ASSEMBLY	12	DOWNWARD FACING BLOW-OUT ASSEMBLY, SEE INSET 'A'
		13	150mm BUTT FUSION REDUCER IF REQUIRED, SIZED PER MAINLINE
		14	MAINLINE, REFER TO PLANS FOR SIZING
		15	50mm ELECTRICAL CONDUIT TO CONTROLLER
		16	FIVE (5) PIPE STANDS
		17	100mm PVC DRAIN PIPE TO TIE INTO DRAINAGE SYSTEM OR TO DRAIN PIT CONSISTING OF 2m ² OF 25mm MINUS DRAIN ROCK WRAPPED IN LANDSCAPE FABRIC
		18	150mm DEPTH OF 98% SPD COMPACTED 25mm MINUS GRANULAR BASE
		19	KON KAST 1102 SPLICE BOX BASE
		20	THREE (3) PIPE STANDS
		21	KON KAST 1102 SPLICE BOX 300mm RISER
		22	LID



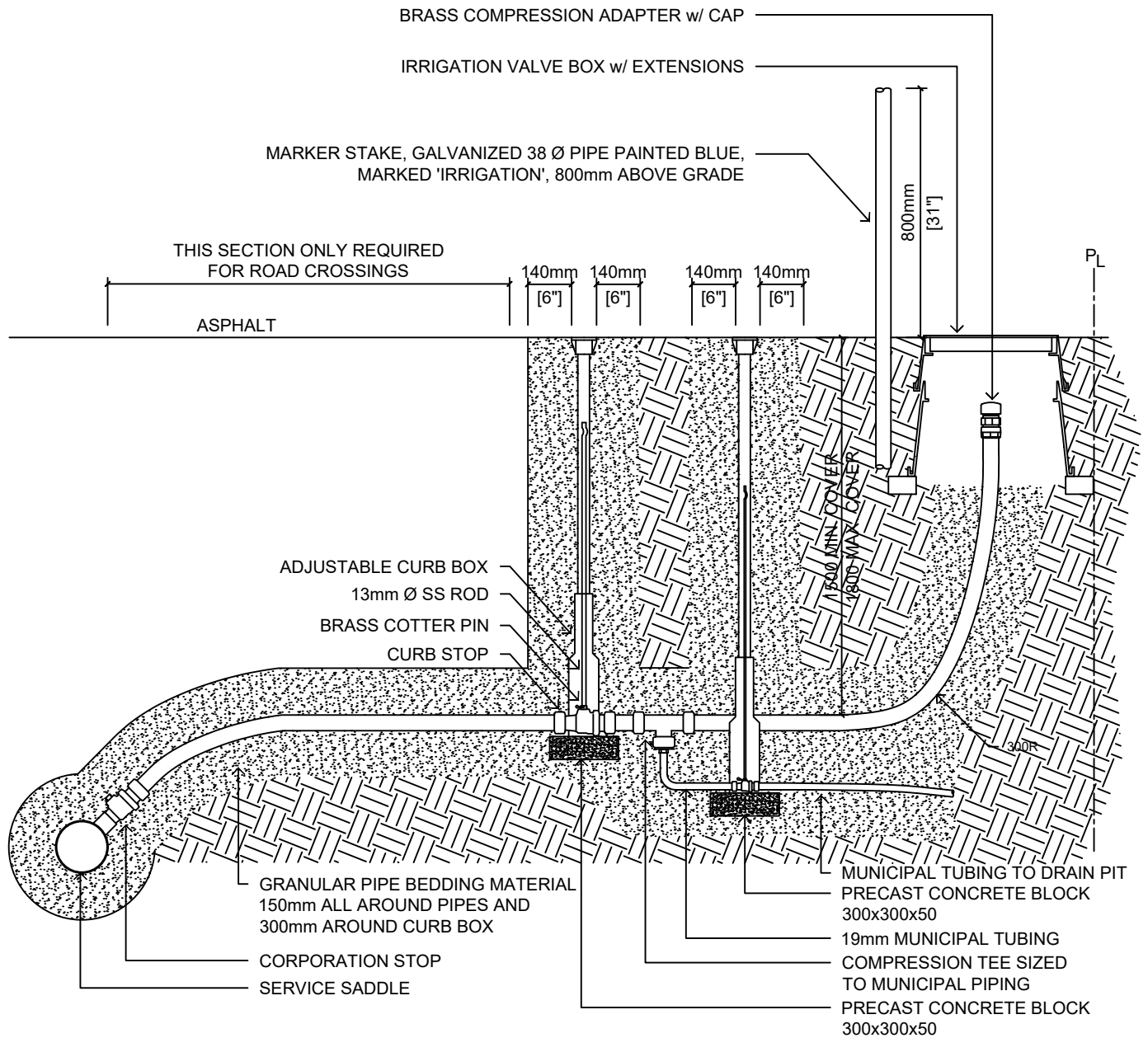
POINT OF CONNECTION
100mm

DETAIL TITLE:

DETAIL No.: **SS-IR.03b**

SCALE: **1:20**

APRIL 2024



NOTE:

- REFER TO BEDDING AND BACKFILL STANDARDS FOR DETAILS
- REFER TO WATERWORKS BYLAW FOR CONNECTIONS TO WATERMAINS

MAY 2024

**STANDARD
DETAIL
DRAWING**

DETAIL TITLE:

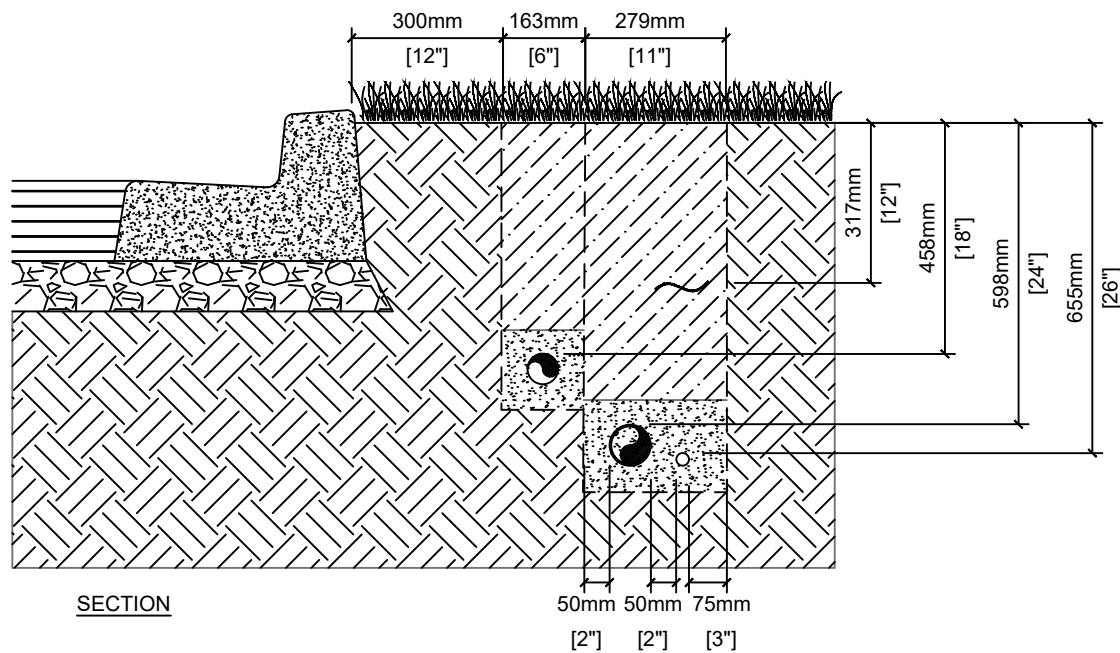
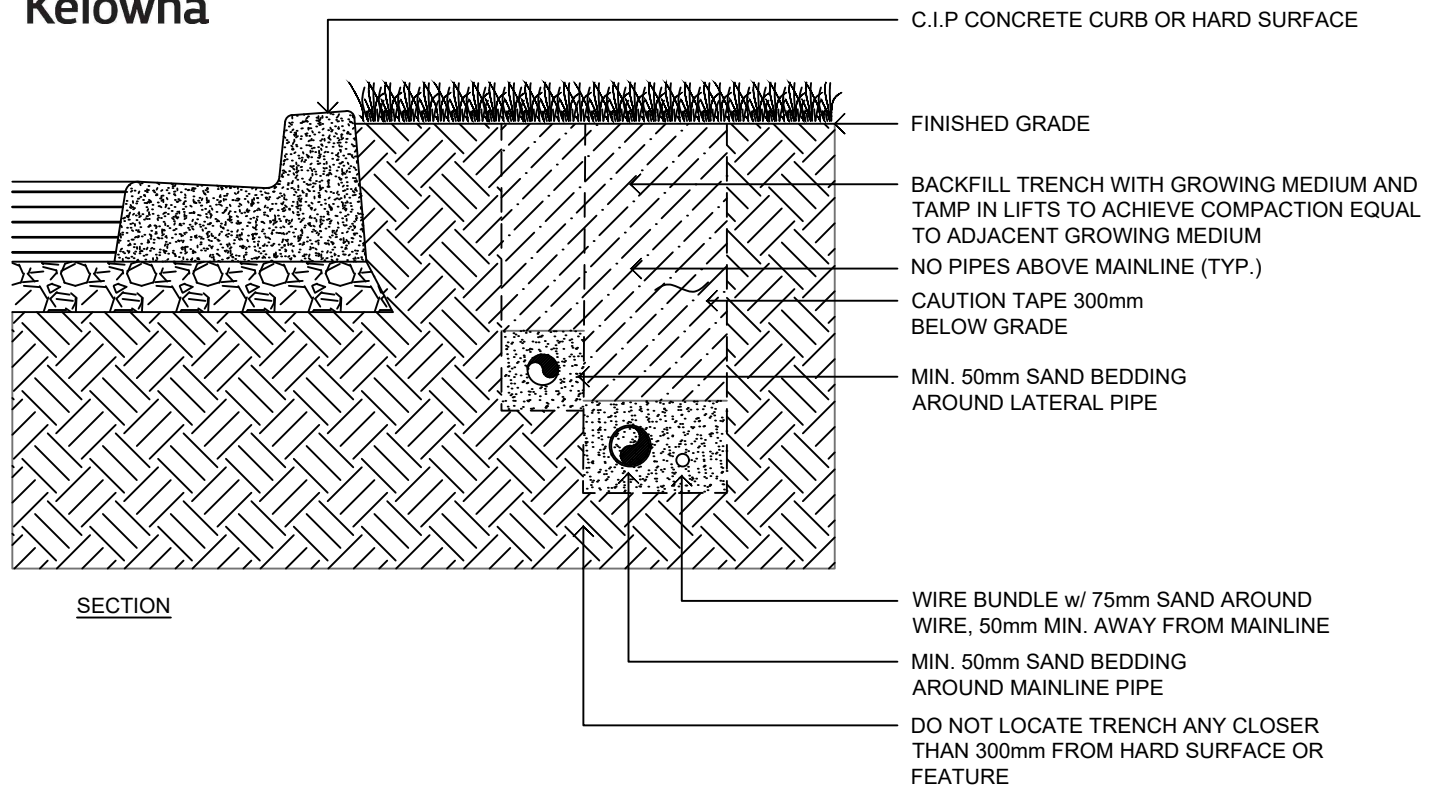
**IRRIGATION
SERVICE**

DETAIL No.:

SS-IR.03c

SCALE:

1:20



APRIL 2024

STANDARD
DETAIL
DRAWING

DETAIL TITLE:

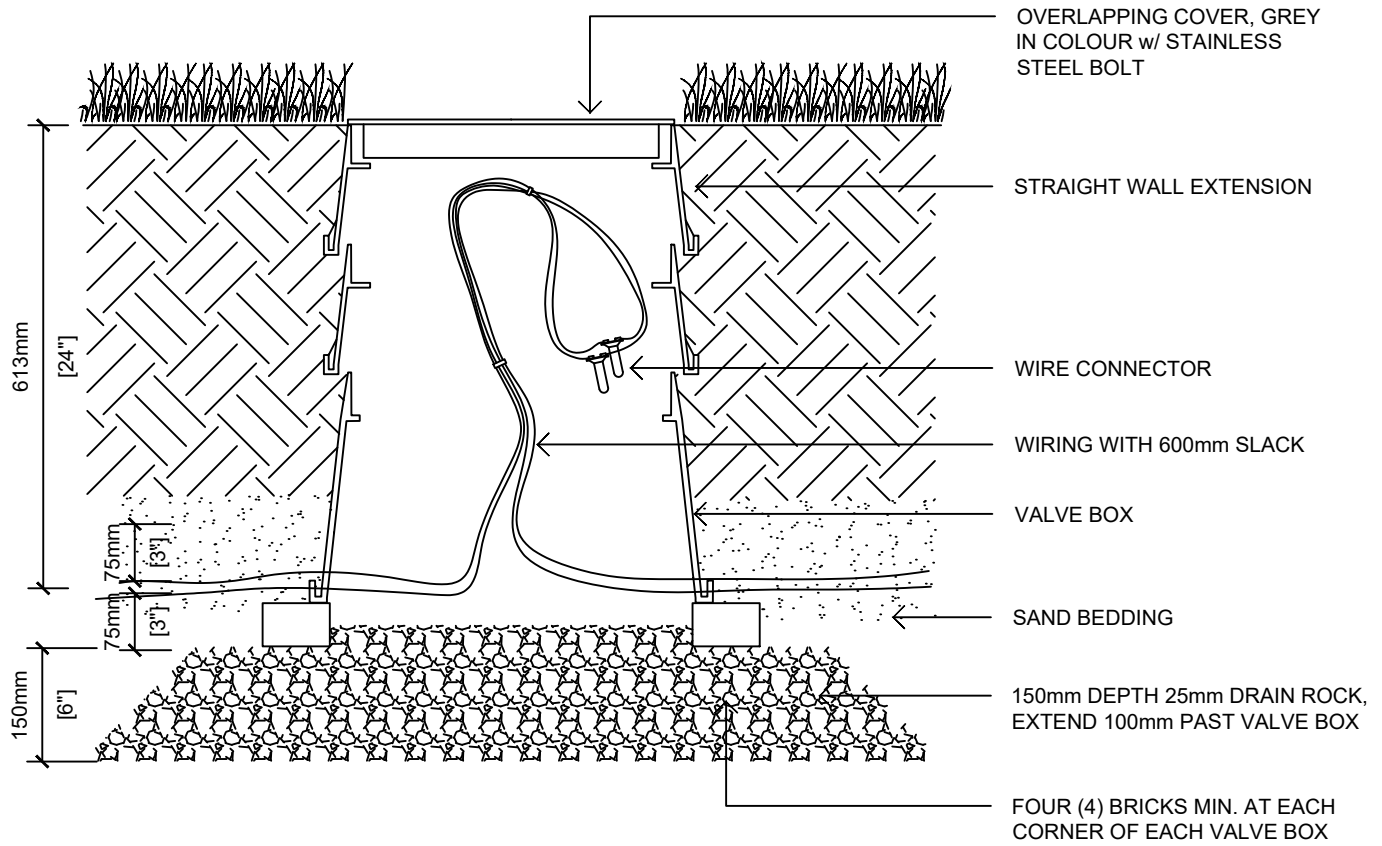
TRENCH SECTION

DETAIL No.:

SS-IR.04a

SCALE:

1:15



SECTION

NOTE:

- WIRE COLOURING TO STAY CONSISTENT
- LABEL ALL WIRING WITH WITH ASSIGNED STATION NUMBER
- WRAP VALVE BOX WITH LANDSCAPE FABRIC TO PREVENT INGRESS OF MATERIAL

APRIL 2024

STANDARD
DETAIL
DRAWING

DETAIL TITLE:

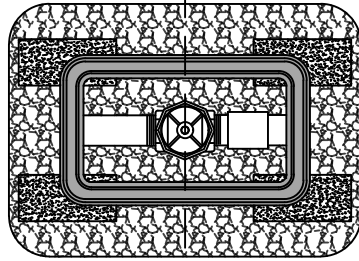
WIRE SPLICE BOX

DETAIL No.:

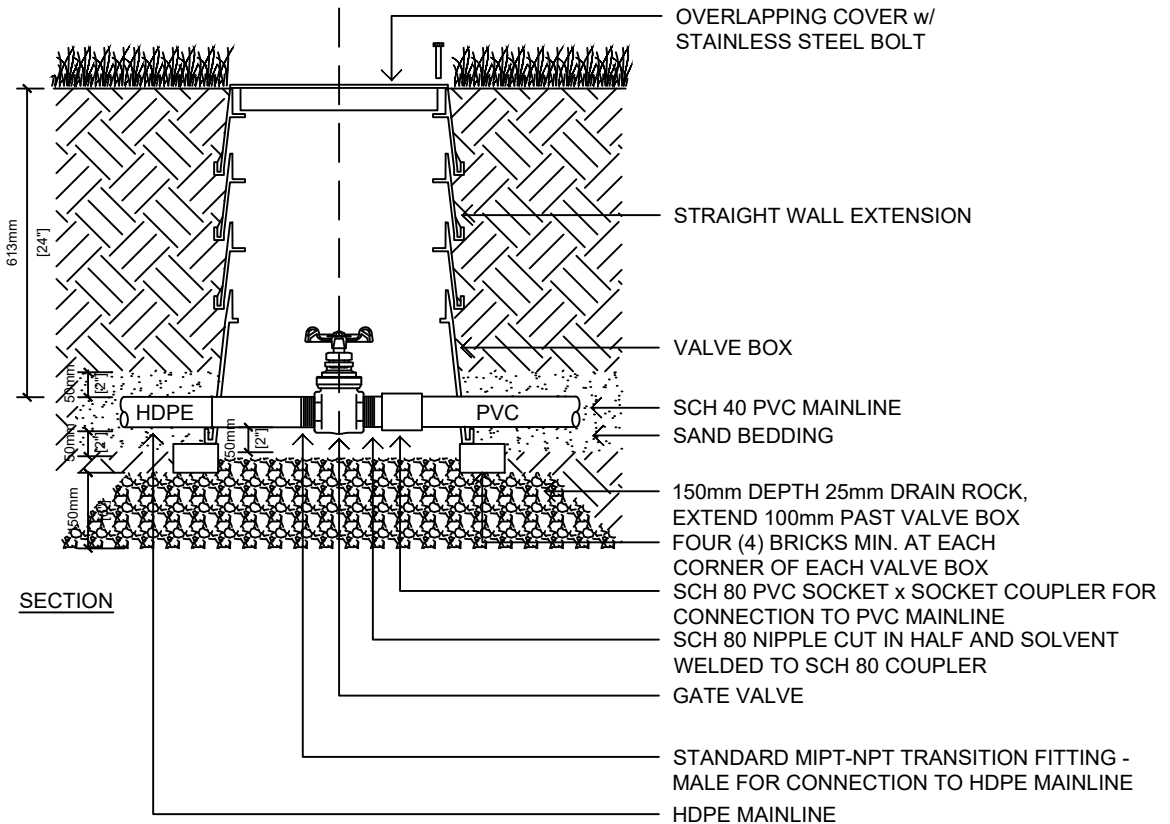
SS-IR.04b

SCALE:

1:10



PLAN



SECTION

NOTE:

- CENTER VALVE IN VALVE BOX
- MAINTAIN 50mm GAP BETWEEN BOTTOM OF VALVE & TOP OF DRAIN ROCK
- WRAP VALVE BOX WITH LANDSCAPE FABRIC TO PREVENT INGRESS OF MATERIAL
- DETAIL REPRESENTS TYPICAL CONNECTIONS TO HDPE OR PVC MAINLINE TO PROVIDE THE INSTALLER WITH METHOD REQUIRED TO CONNECT THE GATE VALVE TO THE MAINLINE.
- REFER TO DESIGN FOR MAINLINE PIPE MATERIAL

APRIL 2024

STANDARD
DETAIL
DRAWING

DETAIL TITLE:

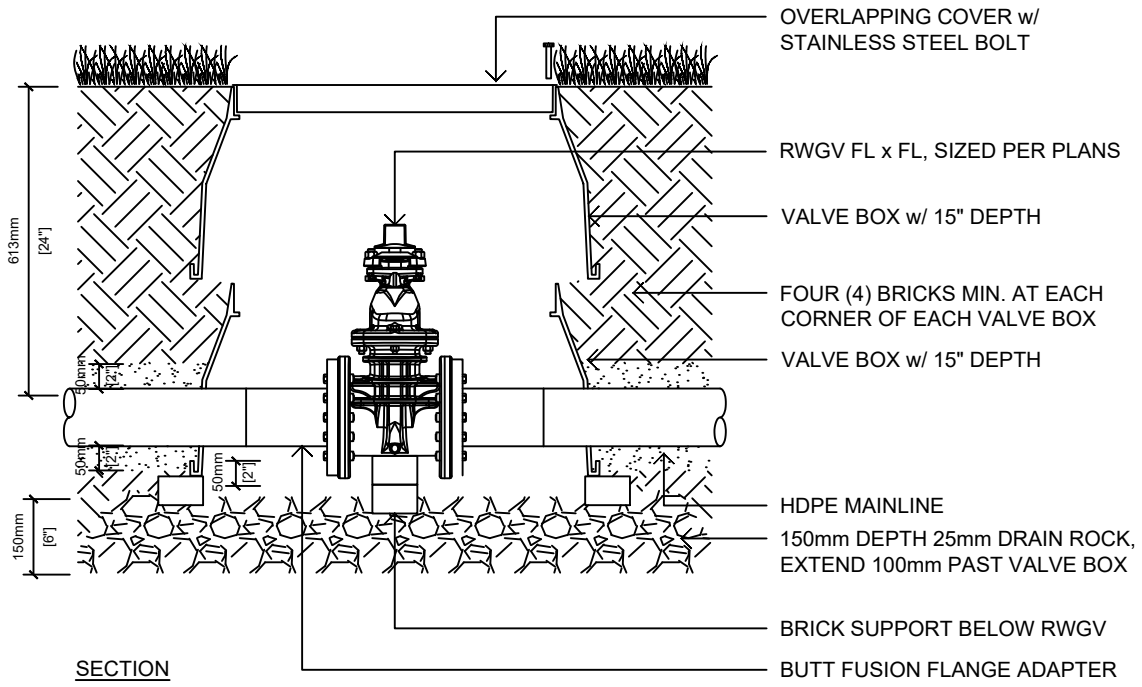
**GATE VALVE
25mm TO 75mm**

DETAIL No.:

SS-IR.05a

SCALE:

1:15



NOTE:

- CENTER VALVE IN VALVE BOX
- MAINTAIN 50mm GAP BETWEEN BOTTOM OF VALVE & TOP OF DRAIN ROCK
- WRAP VALVE BOX WITH LANDSCAPE FABRIC TO PREVENT INGRESS OF MATERIAL

APRIL 2024

STANDARD
DETAIL
DRAWING

DETAIL TITLE:

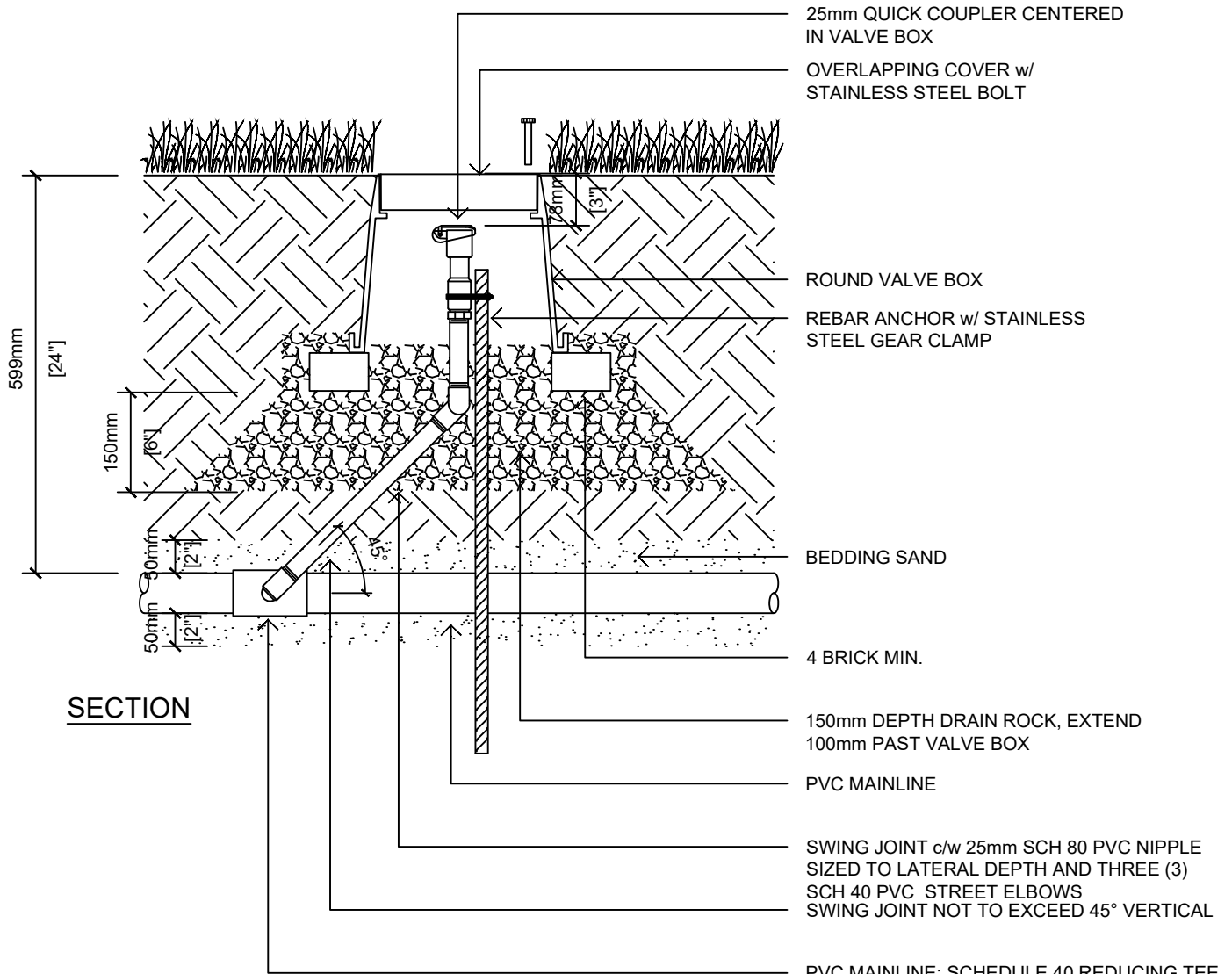
**RESILIENT WEDGE GATE VALVE
75mm TO 150mm**

DETAIL No.:

SS-IR.05b

SCALE:

1:15



NOTE:

- CENTER VALVE IN VALVE BOX
- WRAP VALVE BOX WITH LANDSCAPE FABRIC TO PREVENT INGRESS OF MATERIAL

APRIL 2024

STANDARD
DETAIL
DRAWING

DETAIL TITLE:

QUICK COUPLER

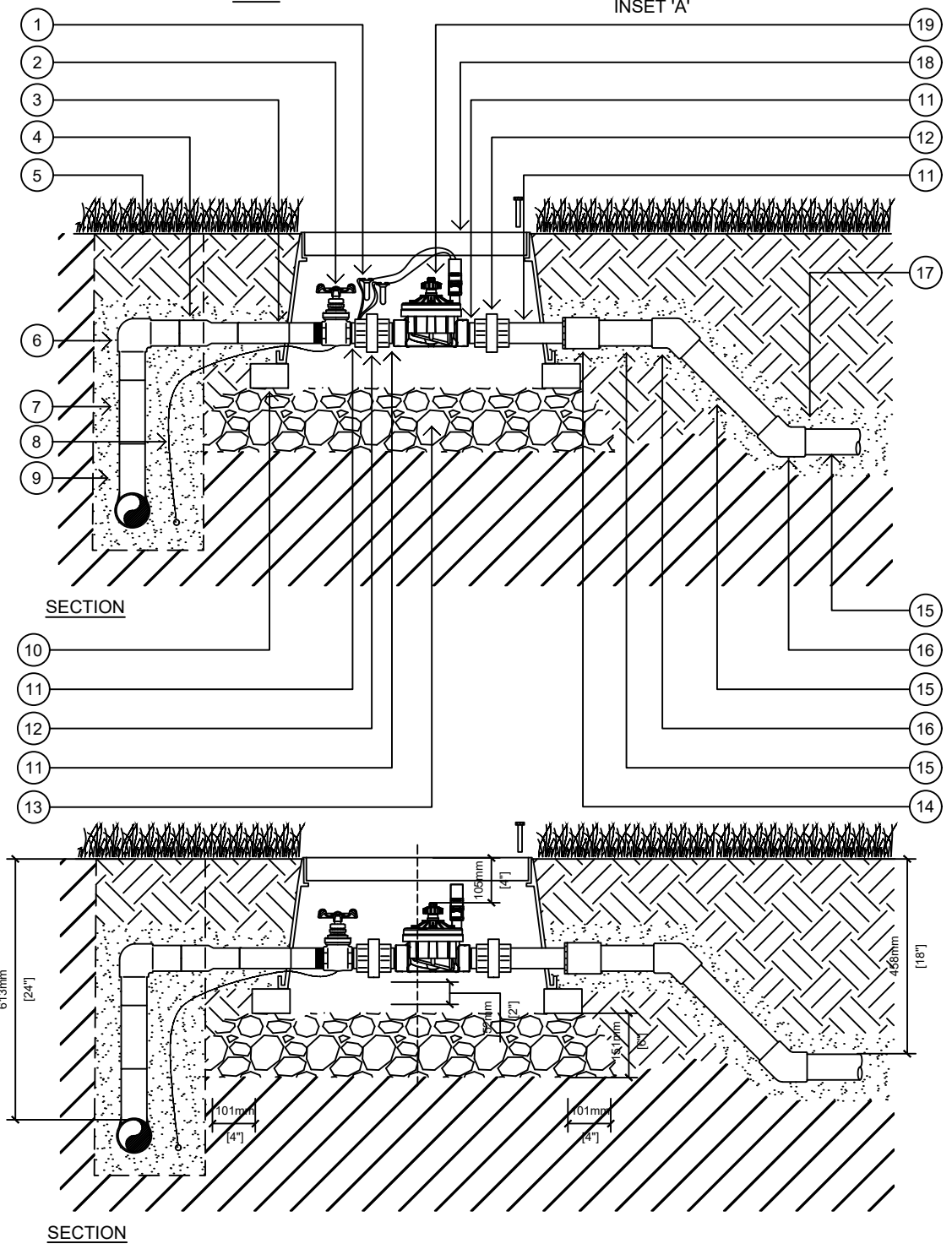
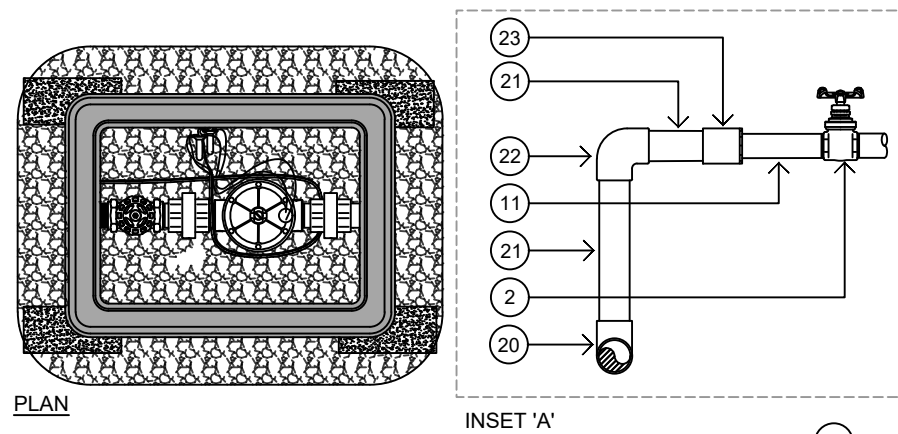
DETAIL No.:

SS-IR.05c

SCALE:

1:10

**ELECTRIC CONTROL VALVE
25mm TO 50mm**



LEGEND

#	25mm ECV	38mm ECV	50mm ECV
1	600mm SLACK WIRE w/ WIRE CONNECTOR	600mm SLACK WIRE w/ WIRE CONNECTOR	600mm SLACK WIRE w/ WIRE CONNECTOR
2	25mm GATE VALVE	38mm GATE VALVE	50mm GATE VALVE
3	25mm STANDARD MIPT-NPT TRANSITION FITTING - MALE	38mm STANDARD MIPT-NPT TRANSITION FITTING - MALE	50mm STANDARD MIPT-NPT TRANSITION FITTING - MALE
4	50mm x 25mm MOLDED BUTT FUSION REDUCER	50mm x 38mm MOLDED BUTT FUSION REDUCER	50mm HDPE MAINLINE
5	FINISHED GRADE	FINISHED GRADE	FINISHED GRADE
6	50mm MOLDED BUTT FUSION 90° ELBOW	50mm MOLDED BUTT FUSION 90° ELBOW	50mm MOLDED BUTT FUSION 90° ELBOW
7	50mm HDPE PIPE, LENGTH TO VALVE HEIGHT	50mm HDPE PIPE, LENGTH TO VALVE HEIGHT	50mm HDPE PIPE, LENGTH TO VALVE HEIGHT
8	WIRING, REFER TO IRRIGATION DESIGN	WIRING, REFER TO IRRIGATION DESIGN	WIRING, REFER TO IRRIGATION DESIGN
9	MOLDED BUTT FUSION REDUCING TEE, REFER TO INSET 'A' IF USING A PVC MAINLINE	MOLDED BUTT FUSION REDUCING TEE, REFER TO INSET 'A' IF USING A PVC MAINLINE	MOLDED BUTT FUSION REDUCING TEE, REFER TO INSET 'A' IF USING A PVC MAINLINE
10	FOUR (4) BRICKS MIN., INSTALLED AT EACH CORNER	FOUR (4) BRICKS MIN., INSTALLED AT EACH CORNER	FOUR (4) BRICKS MIN., INSTALLED AT EACH CORNER
11	25mm SCH 80 NIPPLE CUT IN HALF, THREADED INTO GATE VALVE AND SOLVENT WELDED TO UNION	38mm SCH 80 NIPPLE CUT IN HALF, THREADED INTO GATE VALVE AND SOLVENT WELDED TO UNION	50mm SCH 80 NIPPLE CUT IN HALF, THREADED INTO GATE VALVE AND SOLVENT WELDED TO UNION
12	25mm SCH 80 SOCKET x SOCKET UNION	38mm SCH 80 SOCKET x SOCKET UNION	50mm SCH 80 SOCKET x SOCKET UNION
13	150mm DEPTH 25mm DRAIN ROCK, EXTEND 100mm PAST VALVE BOX	150mm DEPTH 25mm DRAIN ROCK, EXTEND 100mm PAST VALVE BOX	150mm DEPTH 25mm DRAIN ROCK, EXTEND 100mm PAST VALVE BOX
14	SCH 80 COUPLER w/ 25mm REDUCING BUSHING, REFER TO IRRIGATION DESIGN FOR LATERAL PIPE SIZING	SCH 80 COUPLER w/ 38mm REDUCING BUSHING, REFER TO IRRIGATION DESIGN FOR LATERAL PIPE SIZING	SCH 80 COUPLER w/ 50mm REDUCING BUSHING, REFER TO IRRIGATION DESIGN FOR LATERAL PIPE SIZING
15	CSA APPROVED CLASS 200 PVC LATERAL, REFER TO DESIGN FOR LATERAL PIPE SIZING	CSA APPROVED CLASS 200 PVC LATERAL, REFER TO DESIGN FOR LATERAL PIPE SIZING	CSA APPROVED CLASS 200 PVC LATERAL, REFER TO DESIGN FOR LATERAL PIPE SIZING
16	SCHEDULE 40 PVC 45° ELBOW TO TRENCH DEPTH	SCHEDULE 40 PVC 45° ELBOW TO TRENCH DEPTH	SCHEDULE 40 PVC 45° ELBOW TO TRENCH DEPTH
17	SAND BEDDING, REFER TO TRENCH SECTION	SAND BEDDING, REFER TO TRENCH SECTION	SAND BEDDING, REFER TO TRENCH SECTION
18	VALVE BOX	VALVE BOX	VALVE BOX
19	25mm ELECTRIC CONTROL VALVE	38mm ELECTRIC CONTROL VALVE	50mm ELECTRIC CONTROL VALVE
20	SCHEDULE 40 PVC TEE	SCHEDULE 40 PVC TEE	SCHEDULE 40 PVC TEE
21	SCHEDULE 40 PVC MAINLINE	SCHEDULE 40 PVC MAINLINE	SCHEDULE 40 PVC MAINLINE
22	SCHEDULE 40 90° ELBOW	SCHEDULE 40 90° ELBOW	SCHEDULE 40 90° ELBOW
23	SCHEDULE 80 COUPLING w/ REDUCING BUSHING, IF REQUIRED	SCHEDULE 80 COUPLING w/ REDUCING BUSHING, IF REQUIRED	SCHEDULE 80 COUPLING w/ REDUCING BUSHING, IF REQUIRED

NOTE:

- CENTER VALVE IN VALVE BOX
- INSTALL PLASTIC TAG ENGRAVED w/ ZONE NUMBER
- MAINTAIN 50mm GAP BETWEEN BOTTOM OF VALVE & TOP OF DRAIN ROCK
- WRAP VALVE BOX WITH LANDSCAPE FABRIC TO PREVENT INGRESS OF MATERIAL
- DO NOT INSTALL VALVE OVER MAINLINE, INSTALL VALVE PERPENDICULAR TO MAINLINE
- MAINTAIN 600mm OF SLACK TWO-WIRE CONDUCTOR IN VALVE BOX. TAPE WIRING TOGETHER

DETAIL TITLE:

DETAIL No.:
SS-IR.05d

SCALE:
1:15

APRIL 2024

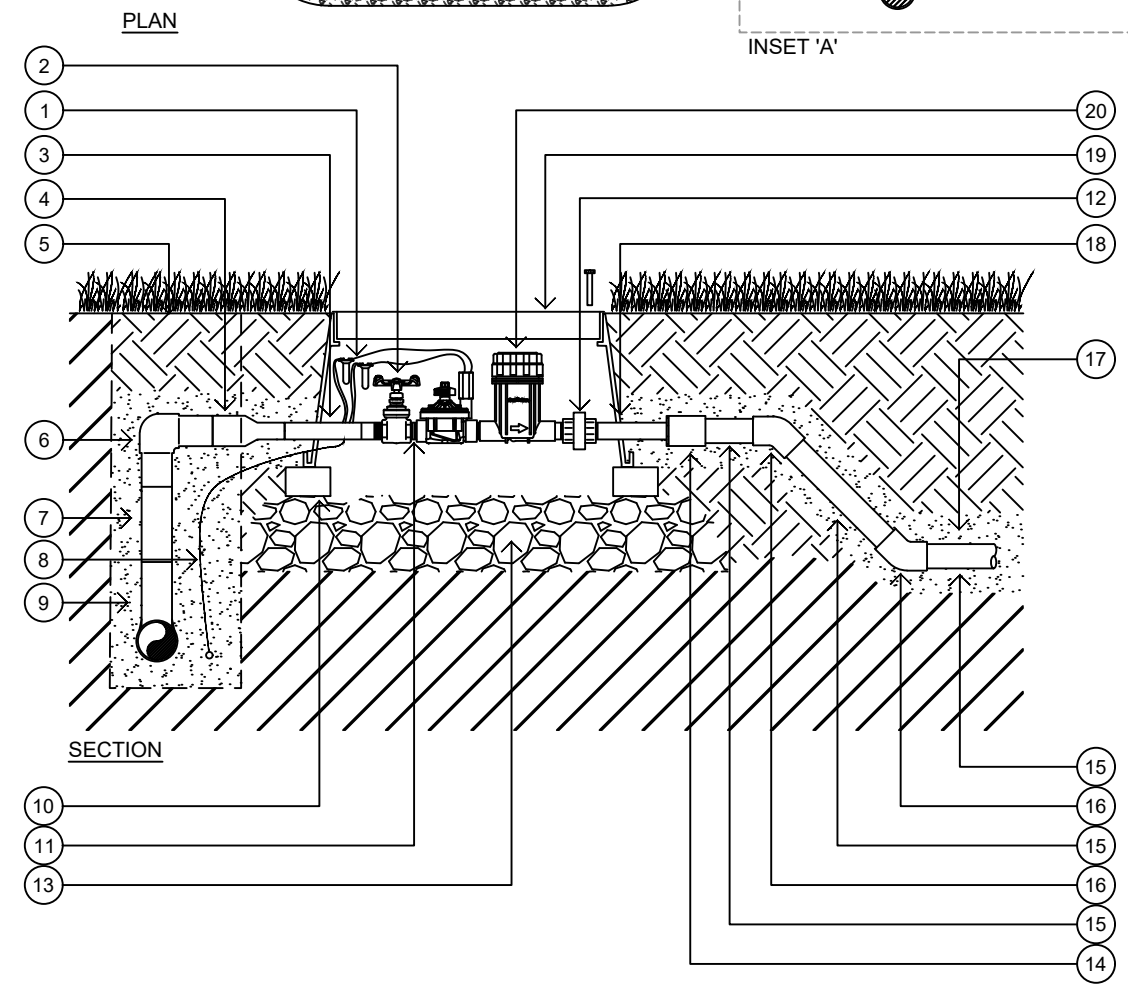
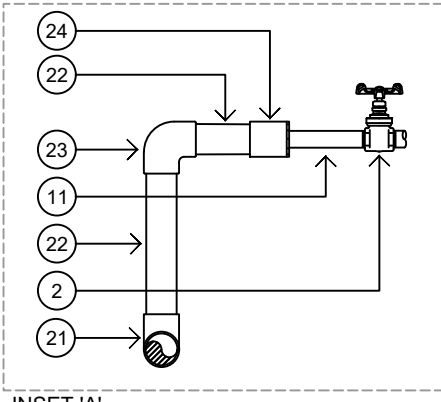
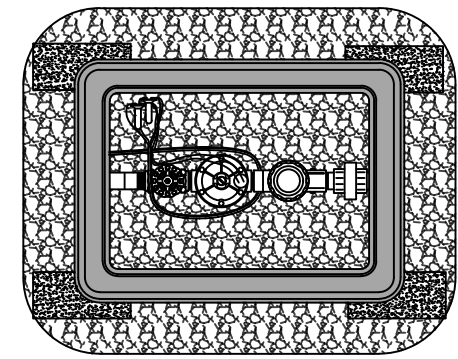
**DRIP ZONE KIT
25mm**

DETAIL TITLE:

MAY 2024

DETAIL No.:
SS-IR.05e

SCALE:
1:15



LEGEND	
#	25mm ECV
1	600mm SLACK WIRE w/ WIRE CONNECTOR
2	25mm GATE VALVE
3	25mm STANDARD MIPT-NPT TRANSITION FITTING - MALE
4	50mm x 25mm MOLDED BUTT FUSION REDUCER
5	FINISHED GRADE
6	50mm MOLDED BUTT FUSION 90° ELBOW
7	50mm HDPE PIPE, LENGTH TO VALVE HEIGHT
8	WIRING, REFER TO IRRIGATION DESIGN
9	MOLDED BUTT FUSION REDUCING TEE, REFER TO INSET 'A' IF USING A PVC MAINLINE
10	FOUR (4) BRICKS MIN., INSTALLED AT EACH CORNER
11	25mm SCH 80 NIPPLE
12	25mm SCH 80 THREADED UNION
13	150mm DEPTH 25mm DRAIN ROCK, EXTEND 100mm PAST VALVE BOX
14	SCH 80 COUPLER w/ 25mm REDUCING BUSHING, REFER TO IRRIGATION DESIGN FOR LATERAL PIPE SIZING
15	CSA APPROVED CLASS 200 PVC LATERAL, REFER TO DESIGN FOR LATERAL PIPE SIZING
16	SCHEDULE 40 PVC 45° ELBOW TO TRENCH DEPTH
17	SAND BEDDING, REFER TO TRENCH SECTION
18	25mm SCH 80 NIPPLE CUT IN HALF, SOLVENT WELDED TO SCH 80 COUPLER w/ BUSHING
19	VALVE BOX
20	25mm DRIP ZONE KIT
21	SCHEDULE 40 PVC TEE
22	SCHEDULE 40 PVC MAINLINE
23	SCHEDULE 40 90° ELBOW
24	SCHEDULE 80 COUPLING w/ 25mm REDUCING BUSHING

- NOTE:
- CENTER VALVE IN VALVE BOX
 - INSTALL PLASTIC TAG ENGRAVED w/ ZONE NUMBER
 - MAINTAIN 50mm GAP BETWEEN BOTTOM OF VALVE & TOP OF DRAIN ROCK
 - WRAP VALVE BOX WITH LANDSCAPE FABRIC TO PREVENT INGRESS OF MATERIAL
 - DO NOT INSTALL VALVE OVER MAINLINE, INSTALL VALVE PERPENDICULAR TO MAINLINE
 - MAINTAIN 600mm OF SLACK TWO-WIRE CONDUCTOR IN VALVE BOX. TAPE WIRING TOGETHER

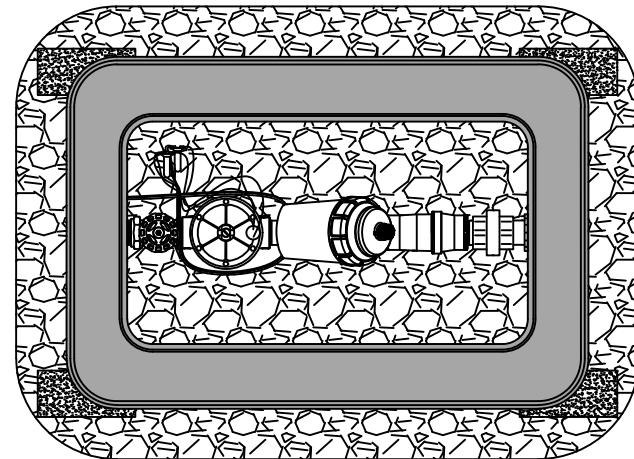
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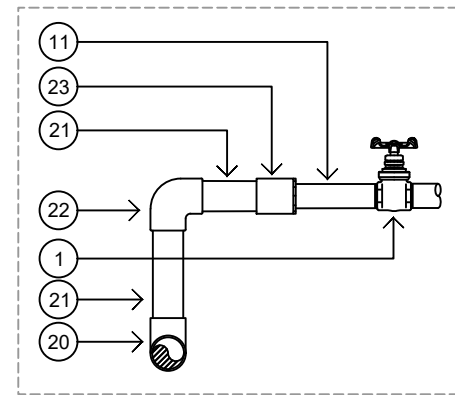
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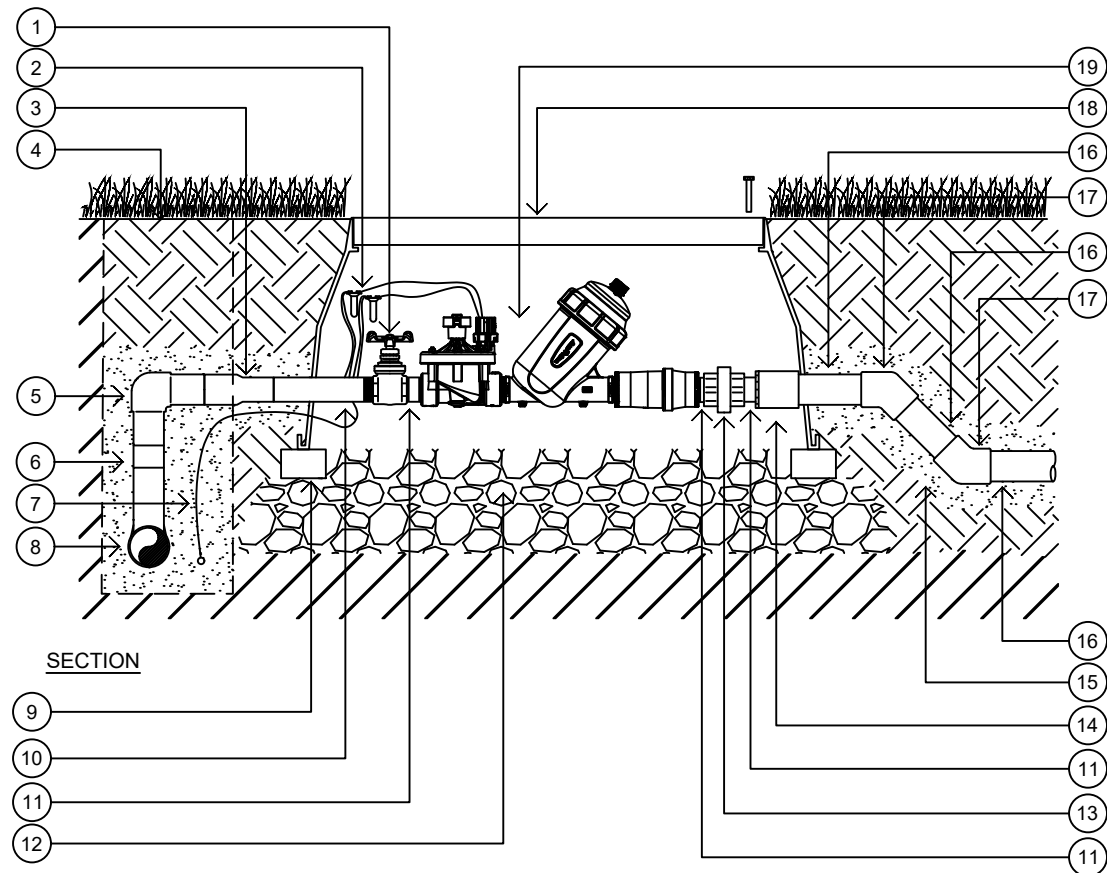
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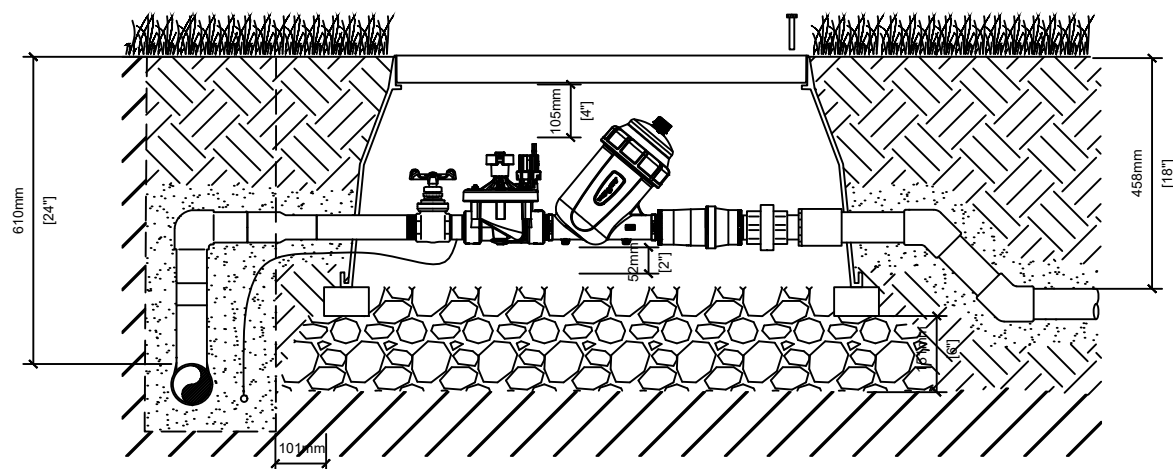
PLAN



INSET 'A'



SECTION

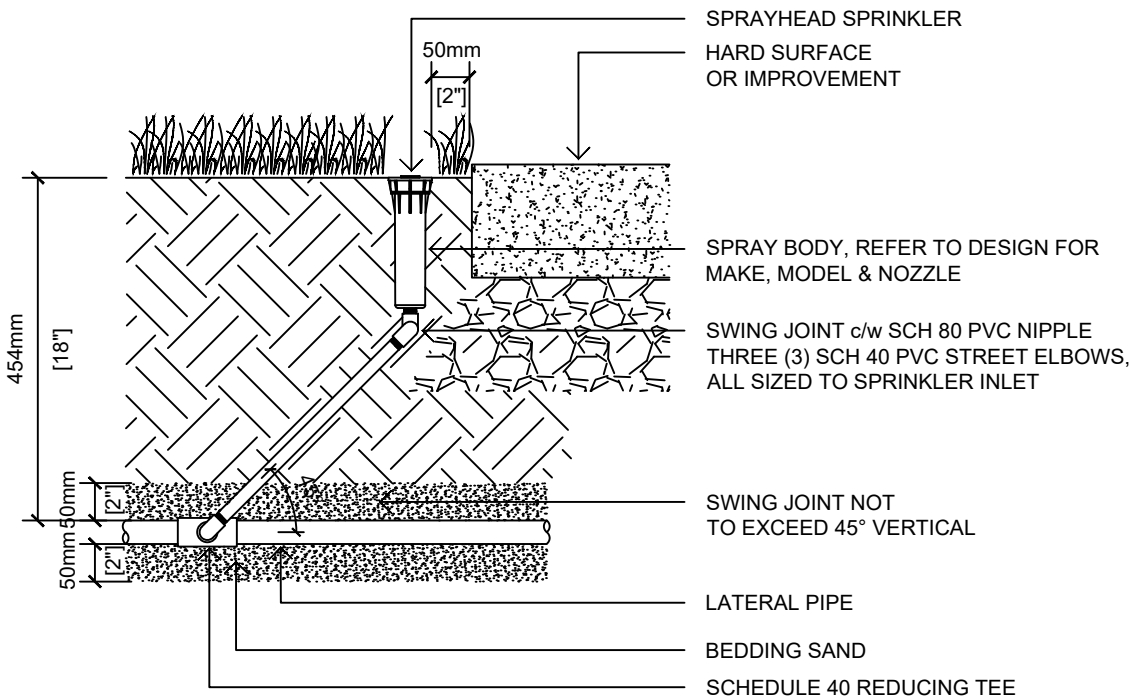


SECTION

LEGEND	
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4	FINISHED GRADE
5	50mm MOLDED BUTT FUSION 90° ELBOW
6	50mm HDPE PIPE, LENGTH TO VALVE HEIGHT
7	WIRING, REFER TO IRRIGATION DESIGN
8	MOLDED BUTT FUSION REDUCING TEE, REFER TO INSET 'A' IF USING A PVC MAINLINE
9	FOUR (4) BRICKS MIN., INSTALLED AT EACH CORNER
10	50mm x 38mm STANDARD MIPT-NPT TRANSITION FITTING - MALE
11	38mm SCHEDULE 80 NIPPLE
12	150mm DEPTH 25mm DRAIN ROCK, EXTEND 100mm PAST VALVE BOX
13	38mm SCHEDULE 80 THREADED UNION
14	SCH 80 COUPLER w/ REDUCING BUSHING IF REQUIRED, REFER TO IRRIGATION DESIGN FOR LATERAL PIPE SIZING
15	SAND BEDDING, REFER TO TRENCH SECTION
16	CSA APPROVED CLASS 200 PVC LATERAL, REFER TO DESIGN FOR LATERAL PIPE SIZING
17	SCHEDULE 40 PVC 45° ELBOW TO TRENCH DEPTH
18	VALVE BOX
19	38mm DRIP ZONE KIT
20	SCHEDULE 40 PVC TEE
21	SCHEDULE 40 PVC MAINLINE
22	SCHEDULE 40 90° ELBOW
23	SCHEDULE 80 COUPLING w/ 38mm REDUCING BUSHING IF REQUIRED

NOTE:

- CENTER VALVE IN VALVE BOX
- INSTALL PLASTIC TAG ENGRAVED w/ ZONE NUMBER
- MAINTAIN 50mm GAP BETWEEN BOTTOM OF VALVE & TOP OF DRAIN ROCK
- WRAP VALVE BOX WITH LANDSCAPE FABRIC TO PREVENT INGRESS OF MATERIAL
- DO NOT INSTALL VALVE OVER MAINLINE, INSTALL VALVE PERPENDICULAR TO MAINLINE
- MAINTAIN 600mm OF SLACK TWO-WIRE CONDUCTOR IN VALVE BOX. TAPE WIRING TOGETHER



APRIL 2024

STANDARD
DETAIL
DRAWING

DETAIL TITLE:

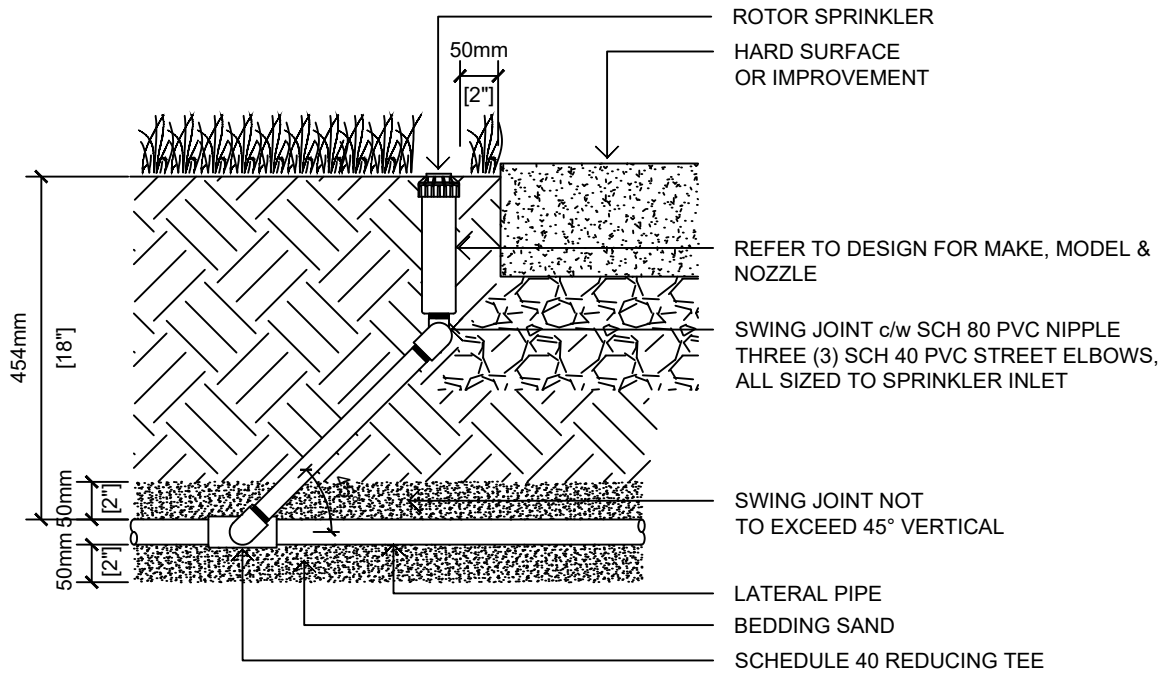
SPRAYHEAD SPRINKLER

DETAIL No.:

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APRIL 2024

STANDARD
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DRAWING

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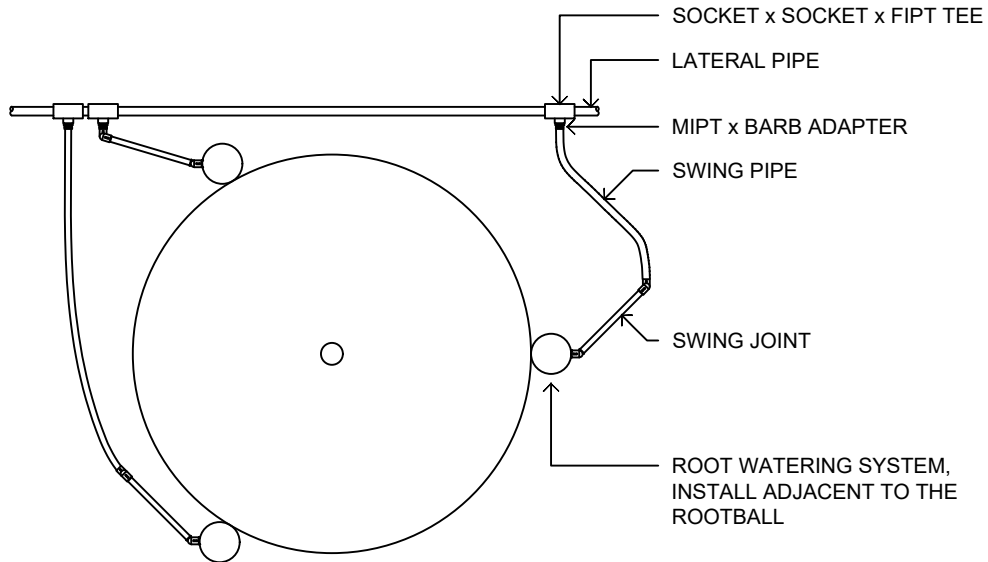
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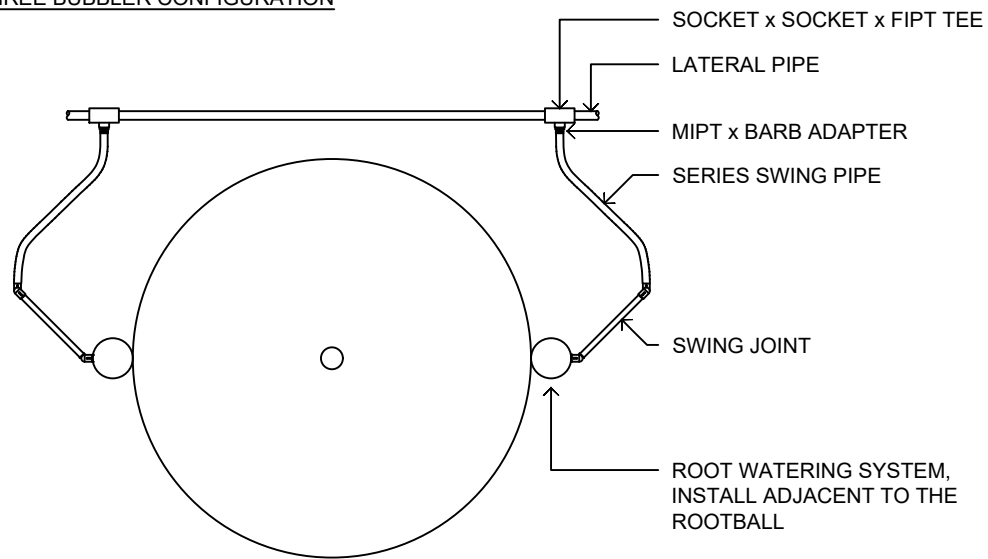
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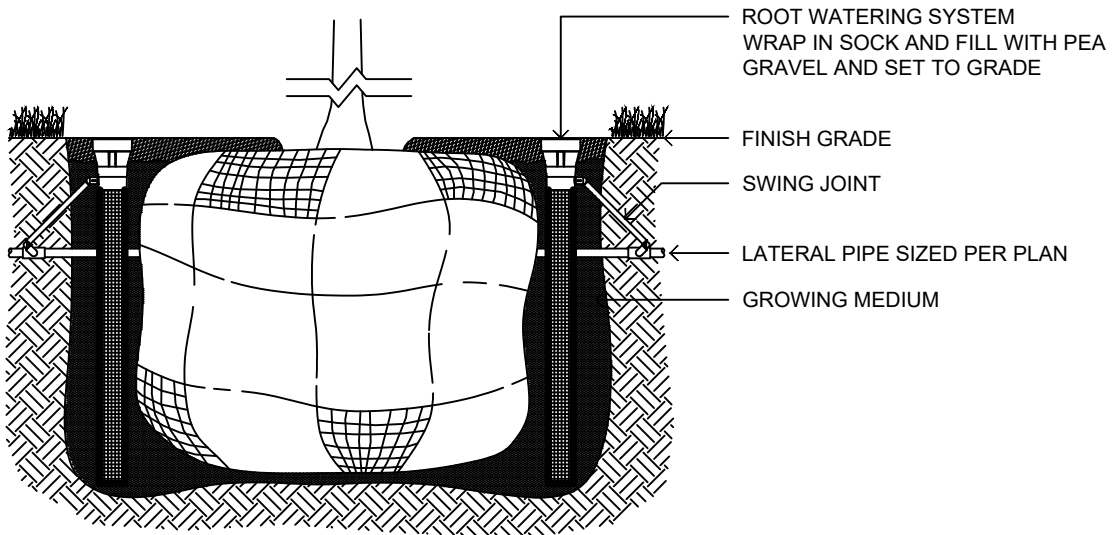
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THREE BUBBLER CONFIGURATION



TWO BUBBLER CONFIGURATION



APRIL 2024

STANDARD
DETAIL
DRAWING

DETAIL TITLE:

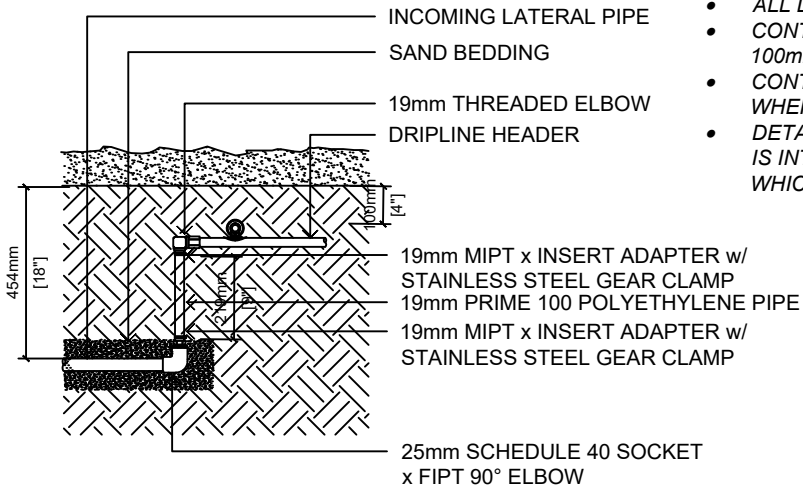
**ROOT WATERING
SYSTEM**

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SS-IR.06c

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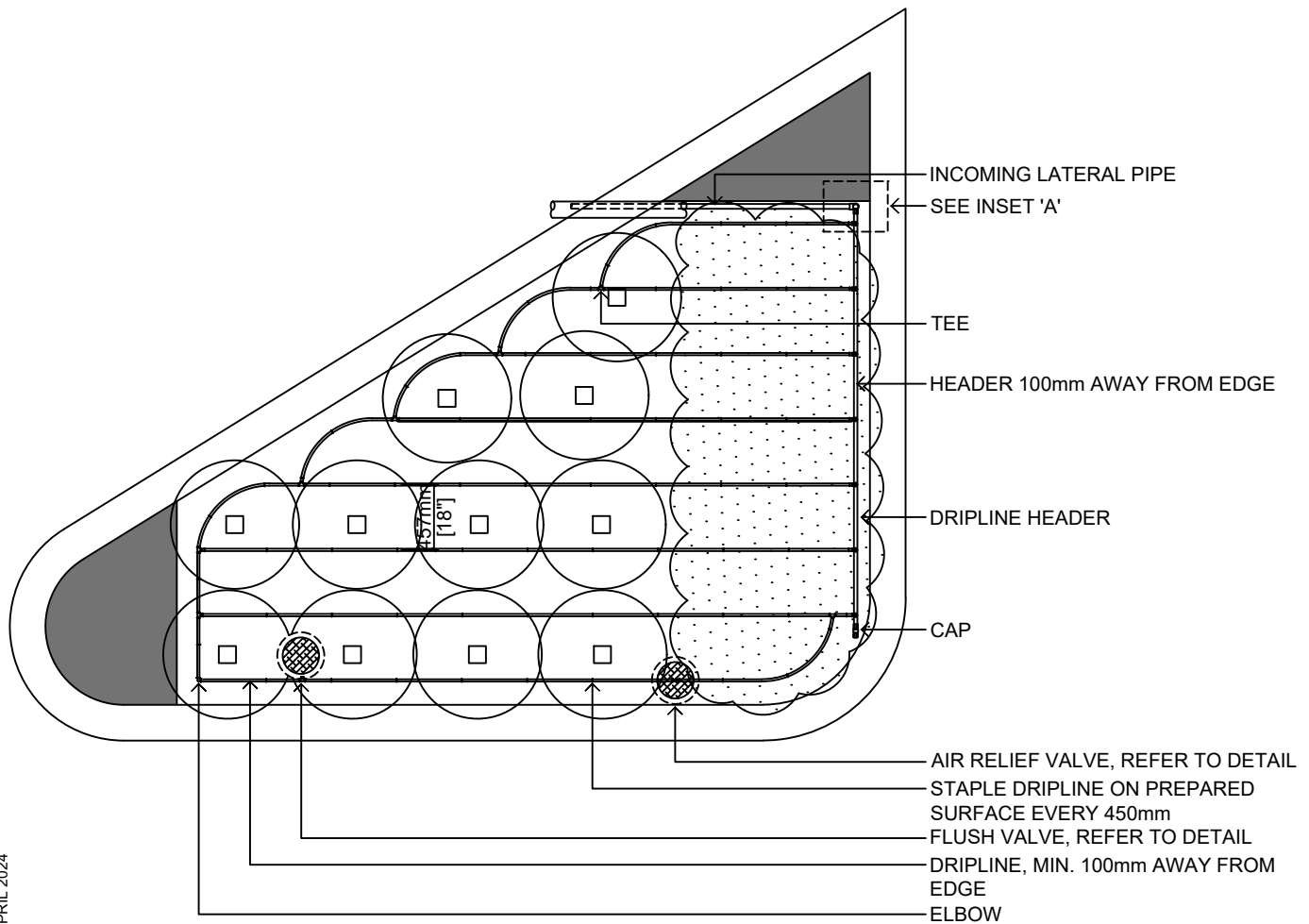
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NOTES:

- STAPLE DRIPLINE EVERY 450mm
- ALL DRIPLINE TO BE INSTALLED ON HIGH SIDE OF PLANT
- CONTRACTOR SHALL ENSURE THAT DRIPLINE IS INSTALLED 100mm BELOW GRADE AND SPACED EVENLY AT 450mm
- CONTRACTOR SHALL INSTALL DRIPLINE IN STRAIGHT ROWS WHEREVER POSSIBLE TO MINIMIZE SHARP BENDS IN PIPE
- DETAIL REPRESENTS TYPICAL LAYOUT FOR DRIP ZONES. DETAIL IS INTENDED TO PROVIDE INSTALLER WITH THE CONCEPT IN WHICH THE DRIP ZONE IS TO BE CONSTRUCTED.

INSET 'A'
1:20



APRIL 2024

STANDARD
DETAIL
DRAWING

DETAIL TITLE:

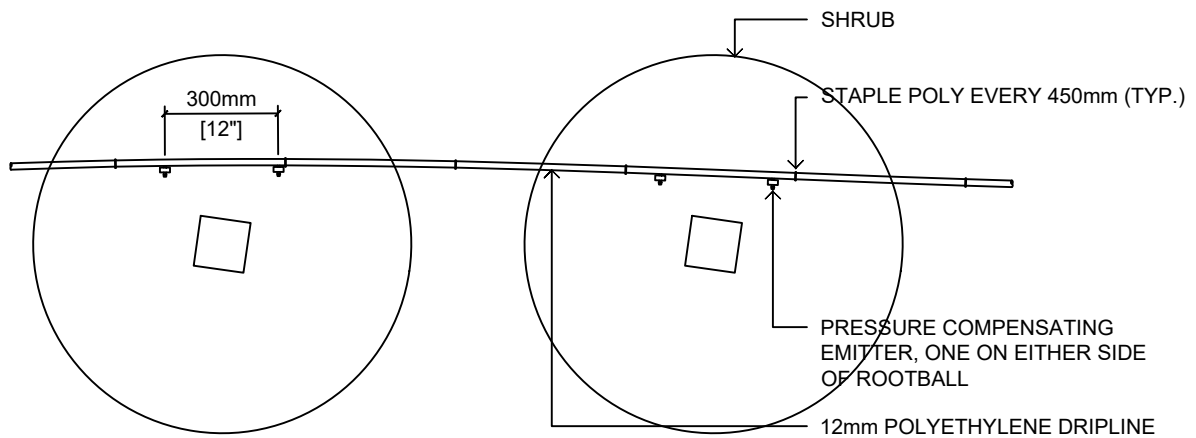
**DRIPLINE LAYOUT
INLINE DRIP**

DETAIL No.:

SS-IR.07a

SCALE:

1:15



NOTES:

- STAPLE DRIPLINE EVERY 450mm
- ALL DRIPLINE AND EMITTERS TO BE INSTALLED ON HIGH SIDE OF PLANT
- TWO (2) EMITTERS PER SHRUB ON EITHER SIDE OF ROOTBALL, TO PROMOTE FUTURE GROWTH
- CONTRACTOR SHALL ENSURE THAT DRIPLINE IS INSTALLED 50mm BELOW GRADE, AND NOT VISIBLE
- CONTRACTOR SHALL INSTALL DRIPLINE IN STRAIGHT ROWS WHEREVER POSSIBLE TO MINIMIZE SHARP BENDS IN PIPE
- DETAIL REPRESENTS TYPICAL LAYOUT FOR DRIP ZONES. DETAIL IS INTENDED TO PROVIDE INSTALLER WITH THE CONCEPT IN WHICH THE DRIP ZONE IS TO BE CONSTRUCTED.

APRIL 2024

STANDARD
DETAIL
DRAWING

DETAIL TITLE:

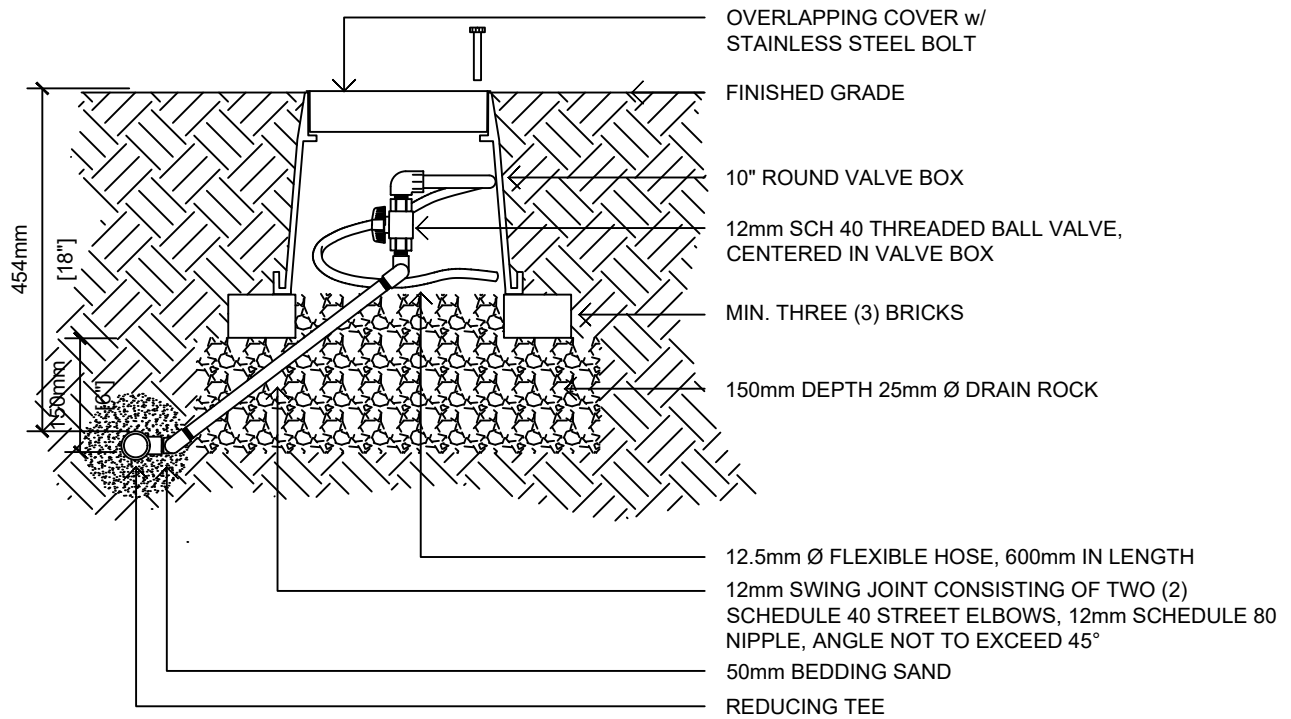
**DRIPLINE LAYOUT
POINT SOURCE DRIP**

DETAIL No.:

SS-IR.07b

SCALE:

1:20



APRIL 2024

STANDARD
DETAIL
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DETAIL TITLE:

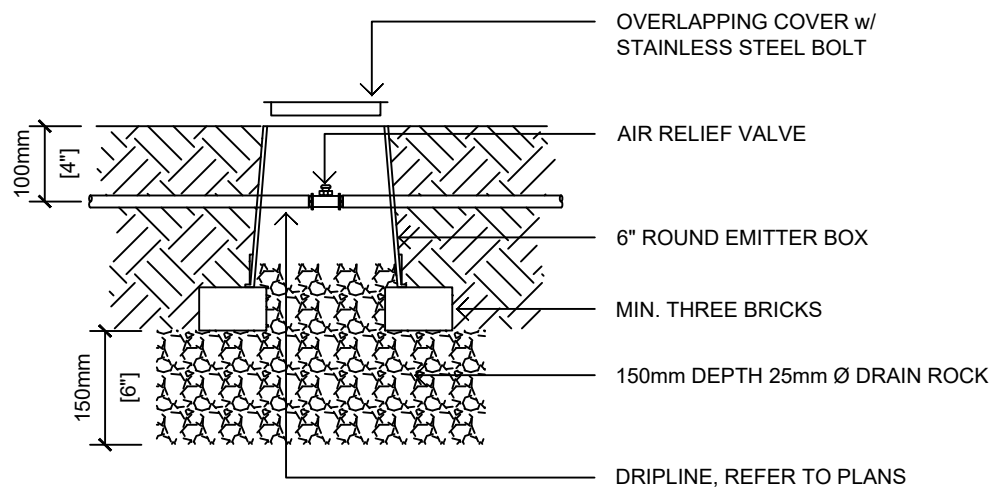
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DETAIL No.:

SS-IR.07c

SCALE:

1:10



APRIL 2024

STANDARD
DETAIL
DRAWING

DETAIL TITLE:

AIR RELIEF VALVE

DETAIL No.:

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SCALE:

1:10

**SCHEDULE 6
OF
BYLAW 7900**

CITY OF KELOWNA

CONSTRUCTION STANDARDS

MASTER MUNICIPAL CONSTRUCTION DOCUMENTS

(MMCD 2019 EDITION - VOLUME II)

MASTER MUNICIPAL CONSTRUCTION DOCUMENTS

This Schedule references the Master Municipal Construction Documents (MMCD) 2019 Edition to be applied in conjunction with the City's Supplemental Construction Standards (Schedule 5) for Works and Services constructed within the City of Kelowna.

The MMCD applies to all Works and Services constructed within the City of Kelowna except where a supplemental to the MMCD is provided in Schedule 5. The supplemental specifications provided in Schedule 5 supersede the provisions of Schedule 6.

The version of MMCD to be applied for Works and Services is as follows:

1. Master Municipal Construction Documents (MMCD) 2019 Edition Volume II - Published and Available from <https://www.mmcd.net/documents/document-overview/>.
2. Supplementary Updates to the MMCD 2019 Edition Volume II - Published and Available from <https://www.mmcd.net/resources/supplementary-updates/>

Report to Council



Date: August 26, 2024
To: Council
From: City Manager
Subject: 2024 Sustainable Urban Forest Strategy
Department: Parks Services & Long Range Planning

Recommendation:

THAT Council receives, for information, the report from Parks Services & Long Range Planning, dated August 26, 2024, with respect to the 2024 Sustainable Urban Forest Strategy;
 AND THAT Council adopt the 2024 Sustainable Urban Forest Strategy as attached to the report from Parks Services & Long Range Planning dated August 26, 2024.

Purpose:

To review and adopt the 2024 Sustainable Urban Forest Strategy.

Council Priority Alignment:

Climate & Environment

Background:

Previous Council Resolution

Resolution	Date
THAT Council receives, for information, the report from the Parks Services and Policy & Planning Departments dated April 17, 2023, with respect to the Sustainable Urban Forest Strategy goals and strategies.	April 17, 2023

Kelowna’s urban forest is defined as the total collection of trees and their growing environments found within the City’s boundary. This can include treed environments in both public and privately owned lands and can be cultivated and managed landscapes or completely natural areas. Kelowna’s urban forest provides a myriad of benefits for our community, including cooling the urban heat island, filtering polluted air and water, providing wildlife habitat, and improving people’s physical and mental health.

In 2011, Kelowna’s first Sustainable Urban Forest Strategy (SUFS) was endorsed by Council providing clear direction for urban forest management. The lifespan of this ten-year strategy has lapsed. As an OCP implementation action (Action #8), staff initiated the development of a new Sustainable Urban Forest Strategy in mid-2022 (as illustrated in Figure 1 below) to respond to the complex challenges faced by Kelowna’s urban forest over the next decade. These challenges include development and urbanization; climate change and extreme weather; forest pests and diseases; tree care and forest management; and urban ecosystem pressures.

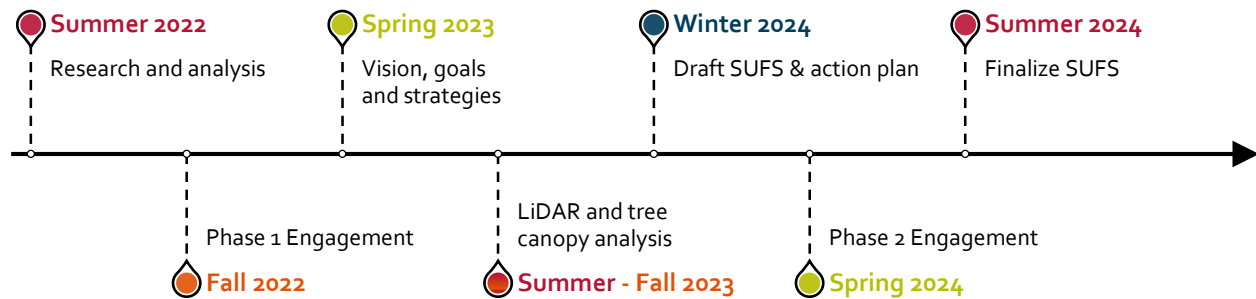


Figure 1: Process for developing the SUFS

Discussion:

Based on technical analysis, best practice review, and input from the community and staff a new Sustainable Urban Forest Strategy has been drafted (see Appendix 1, attached) with the following vision:

Kelowna’s urban forest will continue to expand, connecting our green Urban Centres to our natural areas. Our urban forest will be managed to be healthy, safe and viable nature-based solution that improves livability and helps our community mitigate and adapt to a changing climate.

As part of the development of the SUFS a fulsome tree canopy coverage analysis was completed using LiDAR data collected in 2023. Twenty-two per cent of Kelowna’s land area (excluding the Agricultural Land Reserve) is covered by tree canopy. Canopy coverage throughout the community, however, is not distributed equally as shown in Table 1. The Gateway and Urban Centres have the lowest canopy coverage. This coverage continues to increase moving from the Core Area to the Suburbs to the Rural Growth Strategy District. Of note, 80 per cent of Kelowna’s trees canopy is found in the Rural Growth Strategy District.

Based on this new analysis, the SUFS recommends revising the canopy coverage targets outlined in OCP Policy 14.2.2 Kelowna’s Tree Canopy as outlined in Table 1. The proposed targets take into consideration the following:

- Grassland cities, like Kelowna, typically support 20 to 25 per cent canopy cover;
- Current canopy coverage;
- The separation of targets by growth strategy district to avoid the large size of Rural Growth Strategy district obscuring progress in other areas;
- Land use and impervious area;
- Possible public and private plantable area; and
- Where canopy coverage is needed to support higher population densities.

Table 1: Current canopy cover and proposed targets by Growth Strategy District





Growth Strategy District	2023 Canopy Coverage (excluding ALR)	Current OCP target to 2040	Proposed new target to 2050
Urban Centres	12%	12%	20%
Core Area	15%	20%	20%
Suburban	20%	25% (on average across the three districts)	25%
Gateway	10%		15%
Rural	27%		25%

The timeframe to achieve these targets has been extended from 2040 to 2050. To achieve these targets and the Strategy’s vision will require significant investments in tree planting and protection by the entire community as outlined in the SUFS robust action plan. Based on average canopy size, it is estimated that nearly 80,000 trees will need to be planted by the City, residents, developers, and businesses over the next two decades. This represents approximately 1,200 more trees needed annually over what is currently planted. It should be noted that the proposed target for the Rural Growth Strategy District is lower than its current canopy coverage. As trees and forests in this area are largely natural, they are more likely than irrigated urban trees to be lost because of climate change effects, wildfire, and/or wildfire fuel mitigation projects.

The SUFS Action Plan provides a series of recommendations to protect and expand the urban forest. Developed around four key goals and ten strategies, the Action Plan includes 64 actions as summarized in Table 2. These actions will help steward the urban forest in both the public and private realm. Twenty-two per cent of the urban forest falls on public lands (15 per cent managed by the City, seven per cent in regional parks, schools, etc.) and the actions addressing this include capital projects to expand planting, maintenance and monitoring. Supporting street trees has been identified as critically important to protect our residents from extreme heat and create high quality urban spaces. The remaining 78 per cent of the urban forest falls on private lands and actions for these areas focus on education, programs, incentives, and regulation updates.

The SUFS also includes tree equity mapping which combines social vulnerability indicators, land surface temperatures, canopy coverage, and future canopy goals, to help identify priority areas for actions. As a result of this mapping and analysis, it is clear that the areas most needing trees, Urban Centres and the Core Area, are also the most constrained for access to private lands as our city continues to experience significant growth pressures and prioritizes more housing options to support more complete, compact communities.

Table 2: SUFS goals and strategies

Goal	Strategy	# Actions
Protect, connect, and expand the urban forest 	Strengthen policy, planning, and implementation to protect, connect, and expand tree canopy	17
	Expand the urban forest equitably in Urban and Core Areas	6
	Improve the quality and suitability of trees being planted for the site and climate requirements	3
Maintain a healthy, safe, and viable urban forest 	Clarify City procedures and standards to improve efficiency and manage risk	3
	Transition from reactive to proactive maintenance of City trees	5
	Ensure resourcing is sufficient to deliver levels of service that maximize urban forest benefits	5
Involve people and organizations in forest management 	Improve awareness of and participation in urban forest management	11
	Build relationships with syilx/Okanagan communities, First Nations Governments and Indigenous peoples through urban forest management	1
Monitor and innovate to achieve our urban forest vision 	Monitor change, report, and adapt management to new information	7
	Trial innovative approaches to dryland urban forestry	6

Conclusion:

The urban forest is recognized as an integral component to improve the resilience of people and cities to climate change, by reducing the impact of extreme events and overall improving the livability of our community.

Staff have continued to build on the momentum of the 2011 SUFS in protecting and expanding Kelowna’s urban forest, and the new SUFS formalizes an action plan for the next decade. Some of the initial implementation items, many of which are already in progress, include:

- Zoning bylaw improvements to soil volume requirements
- Development of a landscape standards bylaw
- Expansion of the Neighbourhoods program
- Increase street tree planting
- Improvements to Bylaw 7900 landscaping standards for boulevards and public rights-of-way
- Update canopy cover targets in the OCP
- Research partnership with UBC Urban Ecology and Sustainability Lab in Faculty of Forestry

Internal Circulation:

- Financial Services
- Infrastructure
- Capital Planning & Asset Management
- Climate Action & Environmental Stewardship
- Community Communications
- Data Services & Analytics
- Development Engineering

Development Planning
Fire Prevention
Infrastructure Delivery
Infrastructure Operations
Parks & Buildings Planning
Transportation Engineering
Utility Planning
Water Quality & Customer Care

Considerations applicable to this report:

Existing Policy:

OCP Objective 14.2 Protect and expand a healthy and viable urban forest
Bylaw No. 6469 Nuisance Trees and Shrubs Bylaw
Bylaw No. 8041 Tree Protection Bylaw
Bylaw No. 8042 Municipal Properties Tree Bylaw
Bylaw No. 7900 Subdivision, Development & Servicing Bylaw (Schedule 4, Section 7 Landscape & Irrigation)
Bylaw 10425 Maintenance of Boulevards
Bylaw No. 12375 Zoning Bylaw (Section 7 Landscaping Standards)

Financial/Budgetary Considerations:

The full implementation of the 2024 Sustainable Urban Forest Strategy requires additional funding and resources at various stages. Funding and resourcing options will be investigated and/or budget requests will be made as part of the normal annual budget cycle when necessary. In the 2024 Budget, \$100,000 was allocated from the Council Strategic Fund reserve to begin to tackle some of the actions from the SUFS and advancing the Council priority action to increase the urban tree canopy.

Consultation and Engagement:

Engagement for the 2024 Sustainable Urban Forest Strategy was done in two phases. Phase 1 was done in Fall, 2022 and aimed to help draft the vision, principles and goals of the Strategy. The outcomes of this phase were presented to Council on April 17, 2023.

Phase 2 of the engagement provided the public an opportunity to review and provide feedback on the draft Strategy. This phase was done in conjunction with Phase 2 engagement for the Climate Resilient Kelowna Strategy. As part of this phase, the public had an opportunity to provide their input through a survey (hosted from May 15 to June 9, 2024), two in-person open houses (May 23 and June 6) and one virtual open house (May 29). This engagement is summarized in Appendix 2: Sustainable Urban Forest Strategy Phase 2 Engagement Summary.

Communications Comments:

Once endorsed by Council, the 2024 Sustainable Urban Forest Strategy will be posted on the City's website, and the Get Involved Kelowna project webpage will be updated to reflect the most current version.

Considerations not applicable to this report:

Legal/Statutory Authority

Legal/Statutory Procedural Requirements

Submitted by:

T. Cashin
Urban Forestry Supervisor

T. Guidi
Planner Specialist

Approved for inclusion: R. Miles, Long Range Planning Department Manager

Sustainable Urban Forest Strategy

August 2024



City of
Kelowna

ACKNOWLEDGEMENTS

The development of the Sustainable Urban Forest Strategy was led by the City of Kelowna's Park Services and Planning, Climate Sustainability and Development Services divisions, and prepared by Diamond Head Consulting Ltd. (DHC). We thank City staff, interested and affected parties, and members of the public for their support during the planning process.

Prepared by:



Date: August 2024

Consulting Team:

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Camille Lefrançois
Vlad Romanescu
Nguyet-Anh Nguyen
Marco Sanelli
Shane Hunt
Elliot Bellis

STRATEGY AT A GLANCE: KELOWNA'S URBAN FOREST

Trees and forests improve quality of life for Kelowna's residents and visitors by providing cooling, clean water, critical habitats, and by beautifying the city. Kelowna's first Sustainable Urban Forest Strategy was adopted in 2010, and, since then, challenges associated with rapid growth and climate change have resulted in a need to update the Strategy. The 2024 Sustainable Urban Forest Strategy will guide the City of Kelowna's (the City) urban forest management for the next 10 years.

Our Urban Forest Vision

Kelowna's urban forest will continue to expand, connecting our green urban centres to our natural areas. Our urban forest will be managed to be a healthy, safe and viable nature-based solution that improves our livability and helps our community mitigate and adapt to a changing climate.

In 2023, 22% of the City's land area (excluding the Agricultural Land Reserve) was covered by tree canopy. Canopy cover was measured using LiDAR and imagery to map individual tree canopies. While this estimate is higher than the 16% (+/- 2%) estimate in the previous Strategy, and likely indicates canopy growth, the different methods mean that the absolute change is difficult to determine.

What is certain is that the benefits provided by trees, like cooling the urban heat island, filtering polluted air and water, diverting floods, and improving people's physical and mental health, are more available in some areas than others. Tree canopy is lower than the city-wide average in four of five Growth Strategy Districts used for land use planning: Urban Centres, Core Area, Gateway, and Suburban. The fifth Growth Strategy District, Rural, is where 80% of Kelowna's trees are found. The relative lack of trees in urban areas means more work is needed to provide urban forest benefits where most people live, work, and go to school. At the same time, natural forests in the Rural area backstop city-wide ecosystem services and native biodiversity, but face significant challenges from climate change, wildfire, and forest health factors like insects and fungi.

The Strategy proposes establishing new targets for urban canopy cover in each Growth Strategy District that reflect the need to increase urban forest canopy in urban areas. By 2050, canopy cover should reach:

- ▶ 20% in Urban Centres and the Core Area
- ▶ 25% in Suburban and Rural areas
- ▶ 15% in the Gateway

Reaching the targets will require continued and expanded initiatives for urban forestry involving the entire community.



Actions to reach the targets in the Sustainable Urban Forest Strategy are guided by **ten strategies** organized into **four goals**:



Goal 1: Protect, connect, and expand the urban forest

- ▶ Strengthen policy, planning, and implementation to protect, connect, and expand tree canopy
- ▶ Expand the urban forest equitably in Urban and Core areas
- ▶ Improve the quality and suitability of trees being planted for the site and climate requirements



Goal 2: Maintain a healthy, safe, and viable urban forest

- ▶ Clarify City procedures and standards to improve efficiency and manage risk
- ▶ Transition from reactive to proactive maintenance of City trees
- ▶ Ensure resourcing is sufficient to deliver levels of service that maximize urban forest benefits



Goal 3: Involve people and organizations in urban forest management

- ▶ Improve awareness of and participation in urban forest management
- ▶ Build relationships with syilx/Okanagan communities, First Nations Governments and Indigenous peoples through urban forest management



Goal 4: Monitor and innovate to achieve our urban forest vision

- ▶ Monitor change, report, and adapt management to new information
- ▶ Trial innovative approaches to dryland urban forestry

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1 INTRODUCTION

1.1 Purpose

Kelowna's Sustainable Urban Forest Strategy (the Strategy) serves as a comprehensive plan to manage the urban forest over the next decade. Kelowna is a semi-arid city, naturally vegetated with grasslands and scattered forest cover, and planted with street, park, and yard trees. For the 144,576 people (2021) who live in Kelowna, the urban forest is an essential part of the city's character, livability, biodiversity, and climate resilience. Trees provide shade and habitat, reduce stormwater runoff and erosion, absorb and store carbon, increase property values, and enhance health and well-being. However, urban forests in Kelowna face mounting challenges due to climate change and extreme weather, development pressures, and challenges with forest health.

This is Kelowna's second urban forest strategy. The first, endorsed in 2011, set out a ten-year action plan to preserve and enhance urban forest tree canopy. Over the last decade, the City has continued to improve urban forest management through the NeighbourWoods program, updates to the Municipal Properties Tree Bylaw, updates to landscaping requirements in the Zoning Bylaw, wildland fuel management treatments and staffing and funding increases for the City's Urban Forestry Department.

For the next 10 years, we need to protect, expand, and maintain an urban forest that will be a healthy and resilient asset in the future. The updated Strategy reports on trends in Kelowna's urban forest over the past decade and responds to current challenges and opportunities with updated actions. The Strategy provides a structured approach to maximizing the benefits of the urban forest, while supporting the City's goals for improved protection of the environment, acting on climate change and building an equitable community.

1.2 Strategic alignment

The Strategy builds on and refines actions towards achieving the Imagine Kelowna vision to "...protect the environment, manage growth and be resilient as our future unfolds."

The Strategy also builds on several other key long-term planning documents, including the 2040 Official Community Plan (OCP), the Climate Resilient Kelowna Strategy (under development to replace the 2018 Community Climate Action Plan), the Clean Air Strategy, and the Transportation Master Plan, all of which identify the importance of a healthy and growing urban forest as an important asset for creating an attractive, walkable city, protecting and restoring the environment, and for taking action on climate.

1.3 How to read this document

The Sustainable Urban Forest Strategy contains the following chapters:

1. Introduction

Introduces the Sustainable Urban Forest Strategy, provides background on why the Strategy is being updated, and describes the contents of individual chapters.

2. Urban Forestry 101

Explains what the urban forest is, why it matters, and key principles of urban forest management.

3. Kelowna's Urban Forest Management Program

Describes the City's existing urban forest management program, including how different tree asset classes are planted and cared for over their life cycle, and the policies impacting the urban forest and its management.

4. Status and Trends for Trees in Kelowna

Provides background on the urban forest in the City, offers a summary of what we know about the urban forest's current state and condition, and how it is changing.

5. Canopy Cover Targets

Revisits Kelowna's OCP canopy cover targets in the context of how land uses contribute to goals for each growth strategy districts.

6. Challenges and Opportunities

Discusses issues, trends, and impacts affecting the urban forest and frames what the ten-year implementation plan needs to address.

7. Principles and Vision

Reports on what we heard from the community through engagement and provides a vision for the urban forest to guide how the ten-year implementation plan responds to challenges and opportunities.

8. Goals, Strategies, and Actions

Provides the Strategy a framework for actions and explores case studies that Kelowna can use to help implement the actions.

9. Action and Monitoring Plan

Organizes actions and assigns priorities, key roles and responsibilities, and estimated resource needs, followed by a monitoring plan that identifies measurable indicators to help track implementation, organizes actions and assigns priorities, key roles and responsibilities, and estimated resource needs, followed by a monitoring plan that identifies measurable indicators to help track implementation.



2 URBAN FORESTRY 101

2.1 What is the urban forest?

Kelowna’s urban forest is the total collection of trees and their growing environments found within the City’s boundary. The urban forest encompasses all trees, whether on public or private property and whether planted or naturally occurring. It contains a variety of ecosystems, soils, and tree species and an unknown number of trees. Trees are found on the lakeshore, in urban centres, residential neighbourhoods, City parks and natural areas, rural and agricultural land, and even in commercial and industrial areas with extensive paving. The urban forest is therefore managed by the entire community, including private residents and landowners, major institutions, and City government. The City plays a prominent role in urban forest management through strategic planning, policy development, and the establishment of bylaws.

2.2 Why do urban forests matter?

2.2.1 Urban forests provide ecosystem services

The benefits derived from trees and other green infrastructure are called ‘ecosystem services’ since they parallel the roles and functions of conventional (“grey”) service infrastructure¹. Examples of urban forest ecosystem services that offset the need for conventional infrastructure include rainfall interception and avoided runoff^{2,3}, shading and natural cooling through evapotranspiration^{4,5}, and filtration of pollutants from water and air^{6,7}. Kelowna’s urban forest delivers an

estimated service value of \$9.2 million each year for just eight related services and currently stores an amount of carbon worth an estimated \$81.6 million* . Urban forests also provide numerous other benefits, some of which are harder to quantify, such as wildlife habitat, enhanced biodiversity, and the cultural significance of mature trees⁸ . Ecosystem services can be grouped into four main categories⁹:

- **Provisioning:** the direct products of trees and forests such as medicines, fruits, and nuts
- **Regulating:** functions that maintain ecosystems such as climate regulation, air and water filtration, and erosion control
- **Supporting:** functions that underlie other services, like photosynthesis, pollination, soil formation, and nutrient cycling
- **Cultural:** socioeconomic benefits produced by the urban forest, including beauty, sense of place, mental health, spirituality, recreation, and tourism.

2.2.2 Urban forests enhance climate change resilience

The urban forest can provide protection for people, buildings, and land from climate change impacts. Trees capture heavy rains and reduce erosion, and shade Kelowna’s streets, homes, schools, and parks. On a hot summer day, shaded paved surfaces can be 25 °C cooler than nearby unshaded surfaces of the same type¹⁰.

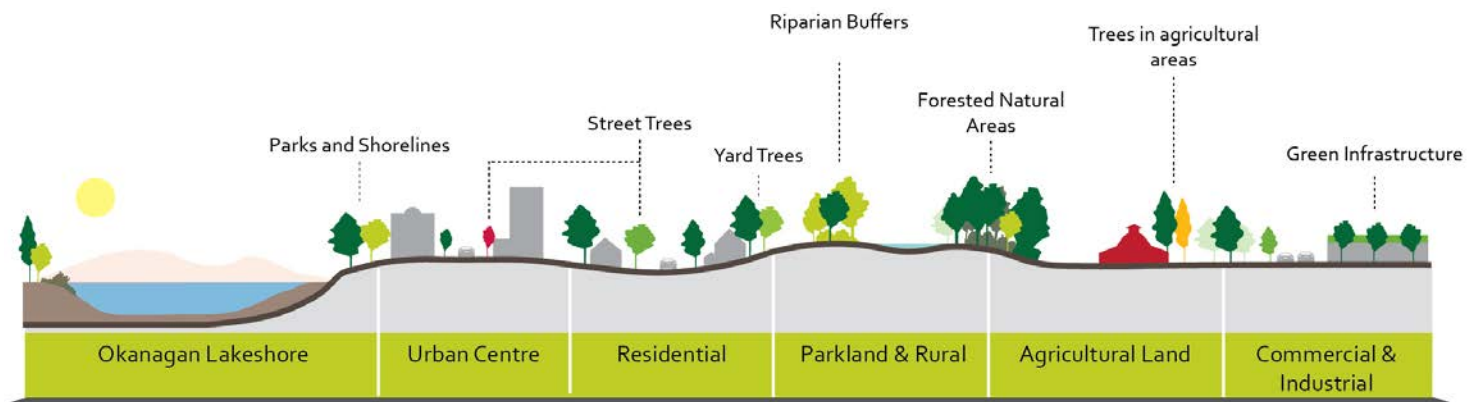


Figure 1. Components of Kelowna's urban forest.

* Estimates of dollar values derived from i-Tree Canopy values for eight ecosystem services: annual rate of carbon sequestration; annual removal of six leading air pollutants (carbon monoxide, nitrogen dioxide, ozone, sulfur dioxide, PM2.5, PM10; and avoided runoff. These estimates are derived by multiplying the preliminary estimate of Kelowna’s tree canopy area (ha) in 2021 by i-Tree Canopy coefficients for each ecosystem service. Coefficients are regional averages and do not represent the cumulative ecosystem service value of individual trees.

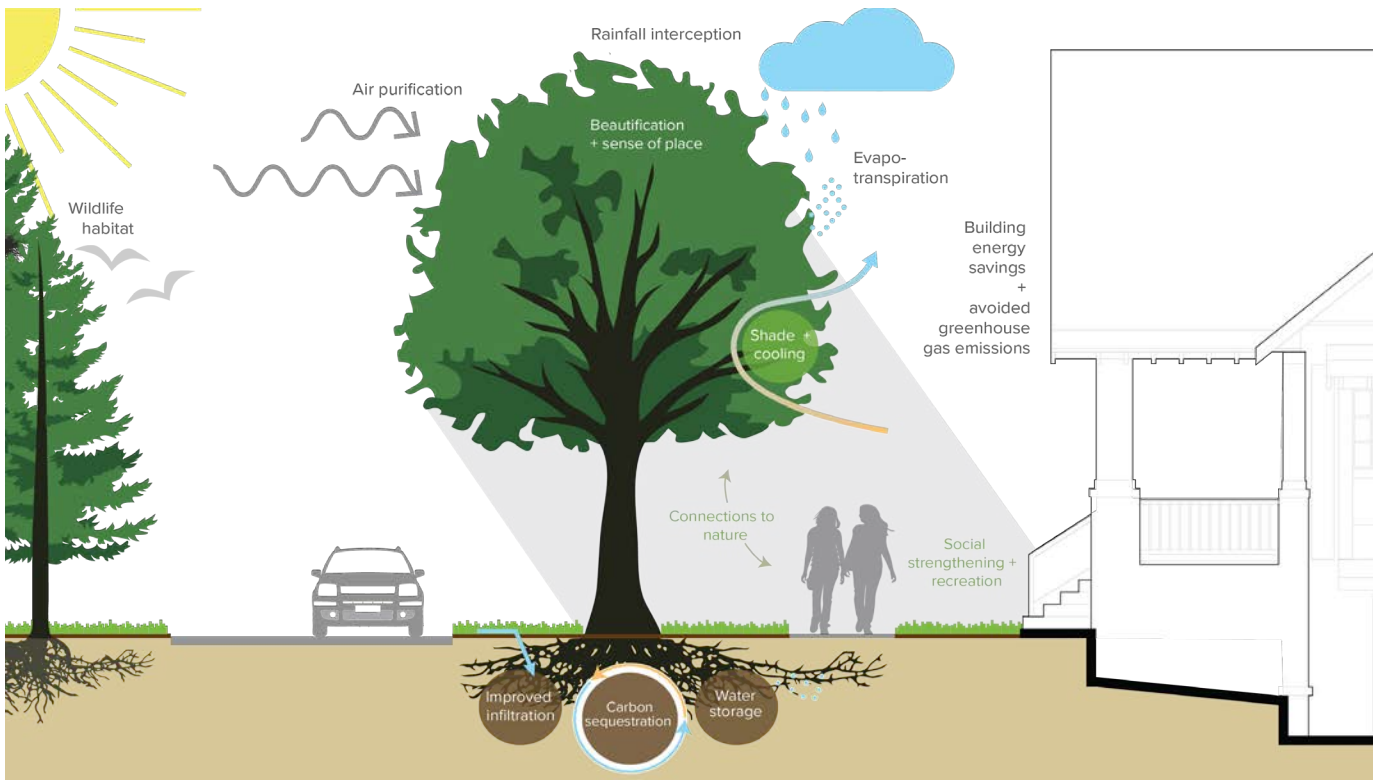


Figure 2. Urban forest benefits.

Trees also provide active cooling through the process of evapotranspiration: releasing water vapour through leaves and needles. Evapotranspiration can lower ambient air temperatures by 1-5 °C¹¹. The combined cooling effects of shade and evapotranspiration are most significant where the urban forest covers extensively paved areas which contribute to the urban heat island effect¹². Public health is protected when the urban forest counteracts the urban heat island effect: for example, during the June 2021 heatwave, heat-related deaths in the BC Lower Mainland were predicted in part by low neighbourhood greenness¹³. Trees also remove carbon dioxide from the atmosphere, storing carbon in wood and reintroducing it to the soil^{14,15,16}. In the process, the urban forest helps offset Kelowna's estimated 767,132 tonnes (2021) of greenhouse gas emissions from transportation, buildings, and waste¹⁷.

2.2.3 The urban forest supports a healthy community

The urban forest is strongly connected to public and social health. Tree canopies promote physical fitness by creating comfortable places for walking, cycling, and exercise^{18,19}. Neighbourhood greenery decreases social isolation by encouraging outdoor activities^{20,21}. People with views of trees or green landscapes recovering

in hospitals from surgery heal faster than patients without these views²². Frequent "doses" of nature can reduce anxiety, leading a growing number of Canadian doctors to prescribe time in the urban forest as part of building mental wellness^{23,24}. Overall, the urban forest is an essential component to creating a healthy, livable complete community.

2.3 What is urban forest management?

Urban forest management is the practice of planning, planting, protecting, and maintaining trees to maximize their benefits and minimize risk in communities. Trees require space below and above ground to fulfill their essential requirements: sunlight, water, carbon, and nutrients. As they grow, their structure and size deliver an expanding array of benefits. Unlike other city assets, trees appreciate in value as they grow, with their worth increasing over time. It is only after several decades that they fully realize their potential as essential components of green infrastructure.

Urban forest management requires that trees live long enough and reach a large enough size to produce the

benefits required by the community. At the same time, tree risk needs to be managed to minimize outcomes like root damage to sidewalks or pipes, premature tree mortality, tree branches failing and impacting people or property, or the threat of wildfire. Urban foresters generally adhere to four key guidelines:

1. **Plant the largest tree suitable for the site:** Large-stature trees provide many times more benefits than small-stature trees.
2. **Retain healthy trees whenever possible:** Healthy, mature trees deliver the most benefits for the least cost.
3. **Manage diversity:** Diversity reduces the risk of large scale tree canopy loss from impacts like pests, disease and drought.
4. **Plant the right tree in the right place:** Planting the right species in the right location will maximize benefits and minimize the costs of management.

2.3.1 Plant the largest tree suitable for the site

The “Large Tree Argument” put forward by the USDA Forest Service summarizes how large-stature trees are able to provide far more benefits than small-stature trees²⁵. This is because large trees have more biomass – the leaves, branches, wood, and roots – which generate ecosystem services. Because trees extend into the soil and air in three dimensions, their volume and biomass increase faster than their canopy cover. Large-stature trees tend to live longer than small-stature trees, which means they enjoy a longer period of time in healthy maturity. Ensuring the urban environment has suitable places for large trees to grow, and that species that can reach large stature are used in planting, is an important goal for urban forest management.

2.3.2 Retain healthy trees whenever possible

Trees require more early- and end-of-life care than they do in middle age, assuming they are planted in

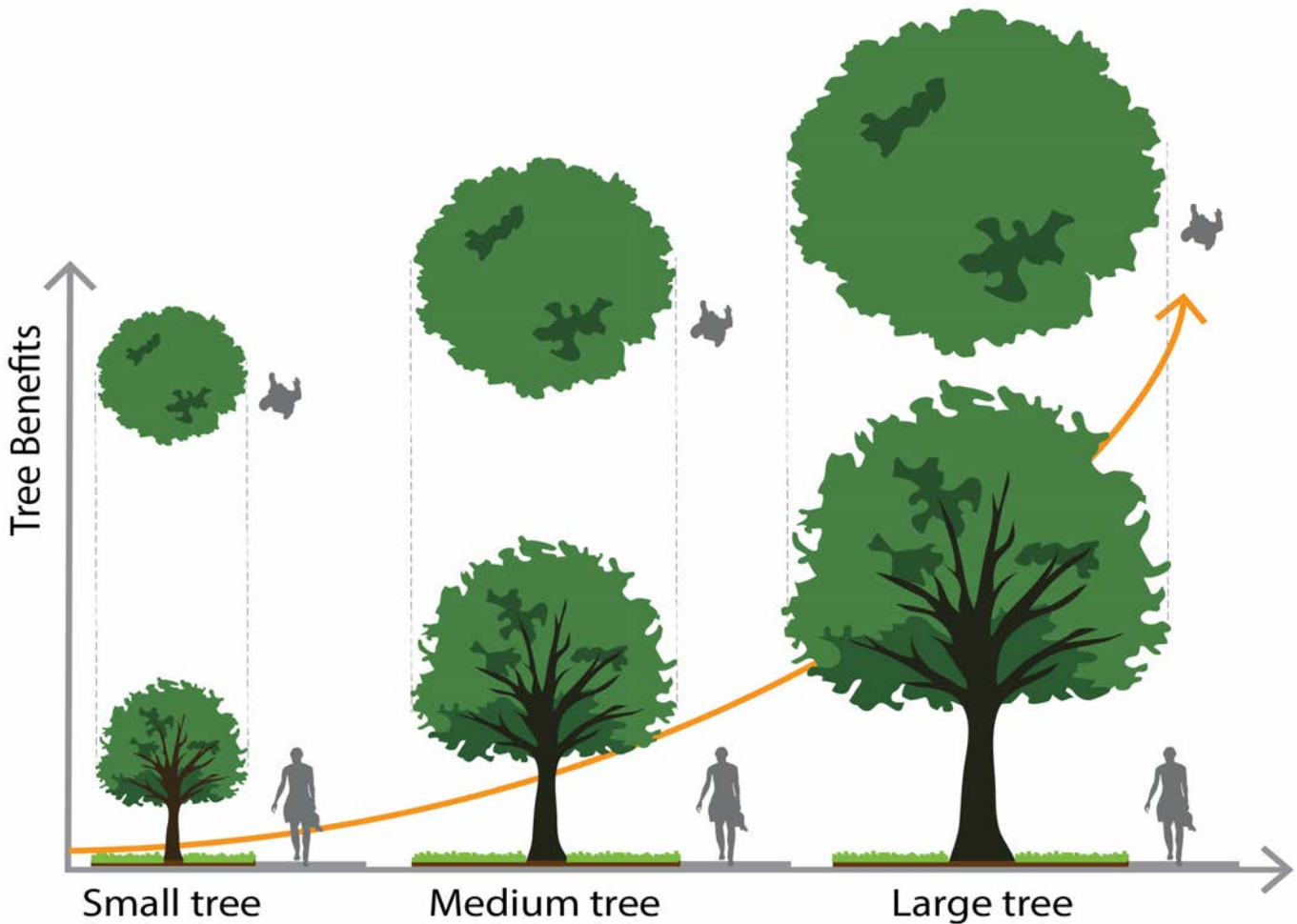


Figure 3. Benefits of large size trees compared to small and medium size trees.

the right place. The cycle of life and death in the urban forest, with associated costs of planting, watering, pruning, end-of-life, and replacement can be visualized to represent this principle. Good urban forest asset management will create conditions for trees to exist in healthy maturity as long as possible, while minimizing the time trees need establishment or end-of-life care.

and construction should be reconsidered. Identifying the right place to plant trees in cities should also consider equity factors, such as the heightened vulnerability of seniors to extreme heat, areas with limited access to green spaces, or low-income areas burdened with pollution from cars or industry.

2.3.3 Manage diversity

Diversity among assets, known as portfolio effect among asset managers, emphasizes that over the long-term, an urban forest with a large number of trees of different shapes, sizes, and species is less likely to be lost to any one cause, like a wildfire, pest infestation, or climate change impact²⁶. Emphasis on a diverse urban forest cover maximizes ecosystem services as it ensures a healthier, more resilient urban environment for both humans and nature²⁷.

2.3.4 Plant the right tree in the right place

Selecting a suitable tree for a specific planting site involves two factors: the site’s ability to support the tree at its full size, and the desired ecosystem services in that area. Planting a tree in an ill-suited location will necessitate increased maintenance, such as pruning, watering, fertilization, and inspection, as well as potential costs to address damage to infrastructure like sidewalks or conduits. If a planting site cannot accommodate the number or size of trees needed for the desired ecosystem services, then the site’s design

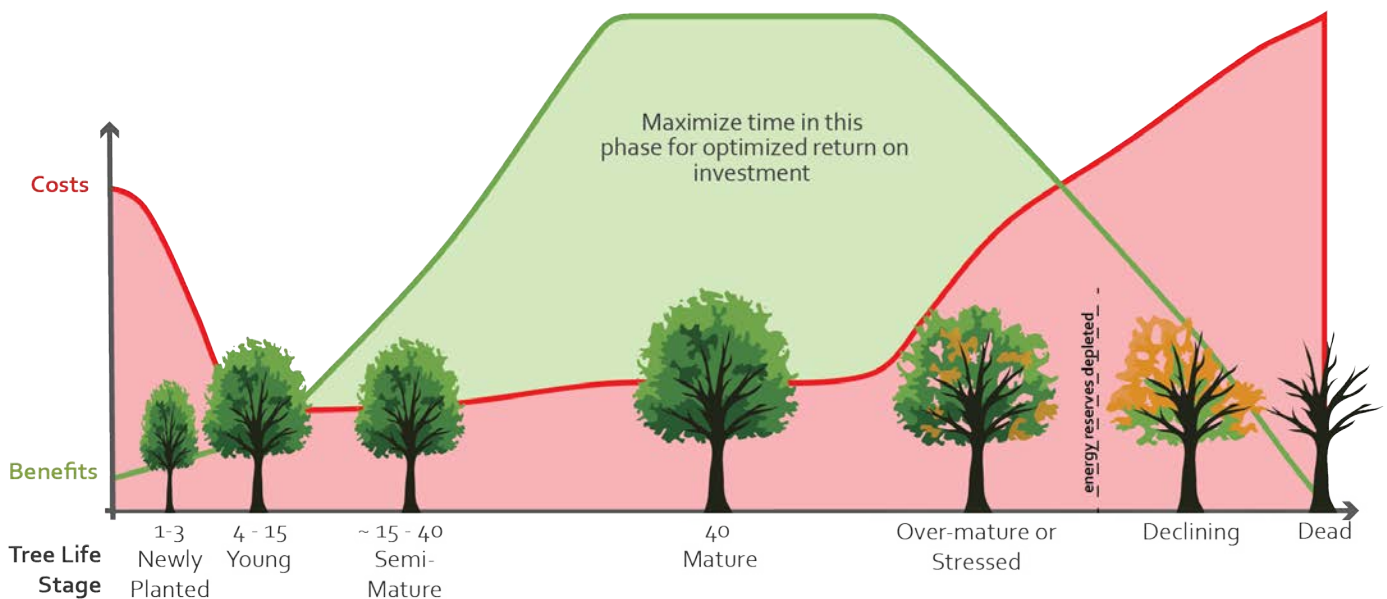


Figure 4. Tree life cycle as related to costs and benefits with asset management.

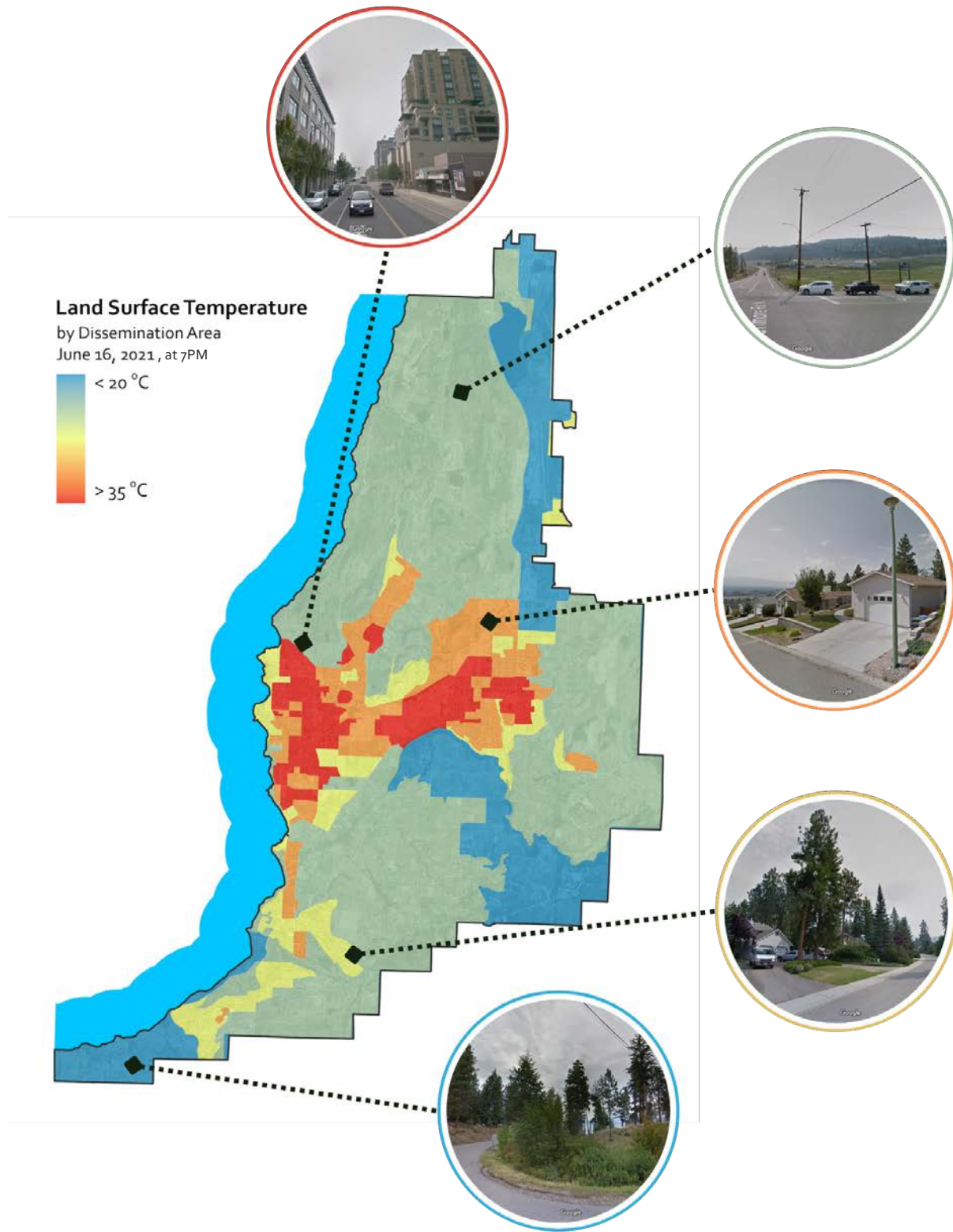


Figure 5. Trees planted in the right place can reduce the impacts of extreme heat. Higher land surface temperatures in Kelowna occur where tree cover is less on average and impervious pavements are extensive.

3 KELOWNA'S URBAN FOREST MANAGEMENT PROGRAM

3.1 Urban forest asset classes

Kelowna's trees are part of its overall asset portfolio. Trees can be grouped into classes of assets that reflect where trees are found in the city and how they are managed. A commitment to a standard of maintenance or service is called a "service level".

Kelowna's urban forest asset classes include:

Street trees Trees in the public street rights-of-way are maintained jointly by the City and the adjacent property owner. The City holds primary responsibility for structural maintenance, like pruning, to protect the health of these important assets because they grow in urban environments with lots of potential conflicts (e.g. limited space, buildings, traffic, sidewalks, utilities, sight lines, etc.). However, we also rely on the neighbouring private property owner to provide water to many street trees when there is no public irrigation source for those trees.

Trees in urban parks Trees in urban parks are maintained by the City and are usually inventoried. These trees have the most frequent assessment schedule of all trees on public lands due to the intensity of park use and the high importance of trees to the functioning of parks. When compared to street trees, park trees generally require fewer management interventions as they grow in better environments and have fewer conflicts.

Trees in forested parks Trees in these areas are not assessed individually. Instead, tree management areas are identified based on risk management assessments along trails/ gathering points to reduce safety risks to people using those trails. Larger forested areas are also assessed for wildland fire risk. Individual tree concerns are responded to on a complaint-driven basis.

Trees on private property The City does not manage private trees but does provide service related to administering and enforcing tree regulations that apply to private property. Landowners have responsibility for managing trees on private property, which make up the majority of Kelowna's urban forest.

3.2 Activities and urban forest program

The Park Services Division is assigned responsibility for the urban forest program, which includes strategic planning, program administration, tree maintenance and operations, overseeing tree protection and capital projects. Other City departments support the urban forest program; in particular, the Planning, Climate Action and Development Services Division oversees the Official Community Plan and development bylaws that influence urban forest outcomes, Financial Services supports Sustainable Urban Forest Strategy implementation through budgeting, asset management, and capital planning processes, and Infrastructure Operations are responsible for managing infrastructure which frequently shares space with trees on City property. The Parks Division maintains service standards for its day-to-day activities in urban parks and for street trees, while many aspects of the urban forest program, particularly in natural areas, have no associated target and occur on an as needed or as available basis. Table 1 lists the core activities of the urban forest program, existing service level targets, annual performance, and gaps.

Kelowna's urban forest program: By the numbers

In 2021 the urban forest program:

- Planted 250 new caliper-sized trees in streets and parks
- Planted 1200 new trees in parks and natural areas
- Responded to 1300 requests for service, which include inquiries about hazard trees, pruning, damage to infrastructure, and other requests
- Watered over 1000 trees through the summer and pruned 20% of the tree inventory
- Inspected 190 km of trail for tree risk and vegetation maintenance needs
- Addressed 150 hazardous trees on City property.

Table 1. Service level targets and recent annual performance of the public urban forest program for core activities.

Activity	Target service level	Annual performance (if known)	Best practices gap
Strategic planning and program oversight			
Program administration	No target	\$2.3 million dollar operating budget Renewal of the Urban Forest Strategy (2023)	Operating budget should be reviewed in context of The Strategy's Action Plan.
Public tree protection	No target	600 tree protection permits issued	Tree legislation not connected to canopy cover goals.
Tree fund	No target		Incomplete tracking of replacement trees.
Capital projects planning	No target		Interdepartmental referrals not consistently including Urban Forestry during initial planning.
Asset management	Include inventoried trees in AM system	Tree inventory is in AM system.	Target is being met.
NeighbourWoods	No target	600 trees	The Program currently is offered City wide – it could be revised or expanded to target low tree equity areas.
Tree maintenance and operations			
Service requests	Respond to 100% of service requests within 48 hours	1300 service requests responded to annually.	Target is not always met because of request volume/timing relative to staff capacity.
Tree planting – caliper-sized	No target	250 trees planted	No tree planting target connected to equity or canopy cover goals.
Replacement tree planting	1:1 on-site tree replacement	50 trees planted. Most replacement planting is done by developers.	Incomplete tracking of replacements in tree inventory.
Watering	Truck/bag watering of non-irrigated trees	2500 trees watered	The service target for watering trees is typically met; however, there are instances during drought years, high planting years, or when resources like staffing are insufficient, that the City's capacity to provide watering is stretched.
Preventive pruning	20% of inventory trees pruned per year	4,750 trees pruned	Target does not specify asset classes (street tree, urban park/plaza tree)
Risk management	Annual visual inspection of beach trees, remove hazard trees as needed	150 hazard trees removed citywide each year	No policy or operational procedures to establish inspection and documentation requirements or thresholds for risk mitigation.

Activity	Target service level	Annual performance (if known)	Best practices gap
Update tree inventory	No target		New trees that are planted by the City are added to the inventory; trees that are mandated for planting by developers are not included in the inventory. No updates were made as part of pruning cycle.
Pest/invasive management	Treat invasives that are removed / all re-growth	500 trees treated	Incomplete tracking
Natural areas/forest management			
Tree planting – plugs/10-gallon	No target	1200 trees planted (seedlings for restoration)	No tree planting target connected to biodiversity & habitat connectivity, equity, or canopy cover goals.
Trails inspection and maintenance	100% of trails inspected annually Maintain trail widths and accessibility	190 km of trail inspected 40 km of trail maintained for accessibility	Target is being met
Fuel management, mowing, and roadside debris	Maintain line of sight & reduce fire risk	Working in partnership with Fire Services to implement Community Wildfire Resiliency Plan	Target is being met

3.3 Policies guiding urban forest management

3.3.1 Relationship between legislation, bylaws, policies, and plans

Kelowna’s urban forest is shaped by legislation, bylaws, and municipal policies and plans. The Community Charter and Local Government Act provide a framework that allows the City to regulate trees on public and private land. The City’s primary tools for implementing urban forest management are bylaws, which create enforceable requirements relating to trees on public and private property. City bylaws and policies must be aligned with Kelowna’s Official Community Plan Bylaw and other relevant federal or provincial legislation.

3.3.2 OCP policies for the urban forest

Kelowna’s 2040 OCP Objective 14.2 is to “protect and expand a healthy and viable urban forest” with supporting policy statements to:

- Manage the urban forest as green infrastructure to enhance ecosystem services

- Expand tree canopy in relation to the growth strategy district
- Use the principle of “right tree in the right location”
- Maximize retention of existing trees on development sites.
- Connect urban forest with other habitats

The OCP also includes a variety of other policies throughout each of the growth strategy district chapters that also focus on encouraging expansion of the urban forest for comfort, cooling, habitat and beautification.

3.3.3 Bylaws regulating tree cutting and damage

The City implements the vision through several bylaws affecting trees and vegetation:

- Municipal Properties Tree Bylaw (No. 8042) protects trees on public property.
- Tree Protection Bylaw (No. 8041) protects designated trees on private property, such as within Natural Environment Development Permit Areas.
- Nuisance Trees and Shrubs Bylaw (No. 6469) addresses the requirement to mitigate private trees impeding public property.

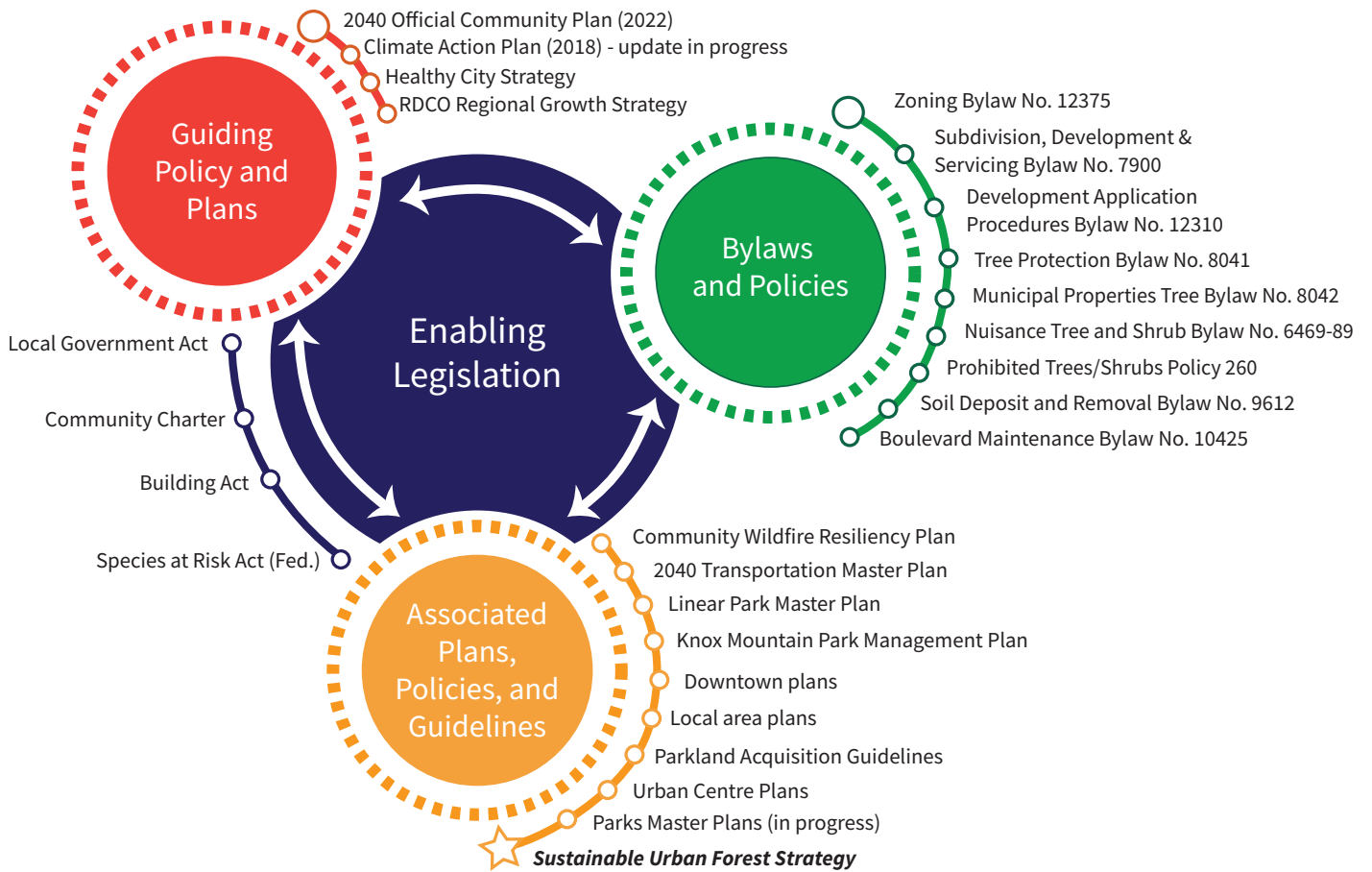


Figure 6. Relevant legislation, bylaws, policies, plans, and guidelines.

3.3.4 Bylaws regulating growing space and tree planting

The Subdivision, Development & Servicing Bylaw (No. 7900) and Zoning Bylaw (No. 12375) govern the urban forest during development, shaping growing environments. The Subdivision, Development & Servicing Bylaw sets the standards and specifications for street tree planting in new subdivisions or road extensions. No less than the greater of 1 tree per lot or per 15 m of frontage must be planted in streets by developers. Guidance is also provided for the selection of tree species, spacing from utilities, irrigation design, and minimum soil volumes.

The Zoning Bylaw governs the installation of trees on private property through development, as well as impacting the urban forest through regulating the size and setback of impervious surfaces on private property. The City recently updated its Zoning Bylaw to include additional requirements for landscaping by zone. There is now a requirement that trees be planted on private property for most zoning approvals other than those for single-family or two-family housing, supported by

requirements for minimum soil volumes of 30 m³ for each large tree.

3.3.5 Other regulatory tools

Other tools to regulate trees on private property include the Natural Environment Development Permit Area which can require trees in sensitive ecosystems become the subject of restrictive or “no-disturb” covenants which are entered on land title. These covenants provide for the retention of trees, mitigation of wildfire risk, or other environmental objectives on individual properties and subdivisions requiring a development approval. The Hazardous Condition Development Permit Area requires proponents to complete a wildfire hazard assessment that identifies where and what wildfire mitigation actions are required prior to approval. The Development Application Procedures Bylaw (No. 12310) requires that development applications prepare and include a landscape plan for certain types of development. These tools help the City achieve urban forest management goals on private property in the absence of a tree bylaw of general application.

Trees in Kelowna's Policies

Urban forest management theme	Federal, Provincial, or First Nations Land	Private property within Natural Environmental/ Hazardous Condition DPA or Tree Cutting Permit Area	Private property requiring DP other than Natural Environmental/ Hazardous Condition DPA	City assets on public property	Other private property
Protect	Trees are not protected by City bylaws. Federal, provincial, or Indigenous laws may apply.	Trees over 10 cm diameter are protected by Tree Protection Bylaw (No. 8041) . A permit application must be submitted to the City. Tree protection standards use a 6x multiplier to determine the root zone.	Trees are not protected, but City requests information through the Development Application Procedures Bylaw (No. 12310) to identify trees with potential to be retained. If retention candidates identified, a Tree Protection Plan is requested and included in the Development Permit conditions of approval.	Trees are protected by Municipal Properties Tree Bylaw (No.8042) . Tree cutting at discretion of Parks Manager. No security deposit is required. Tree protection standards use a 6x multiplier to determine the root zone.	Tree are not protected, other than by federal or provincial law.
Plant	Tree replacement or planting may be required or carried out by other governments.	Trees removed under permit are replaced using a size formula, ranging from 2:1 to 8:1 replacement. Replacement may be waived by the Director of Planning & Development Services. Tree planting is required by the Zoning Bylaw (No.12375) , except in rural areas or on urban lots with fewer than 3 dwelling units.	Tree planting is guided by development permit guidelines. Tree planting is required by the Zoning Bylaw (No.12375) , except in rural areas or on urban lots with fewer than 3 dwelling units.	Trees removed from urbanized City boulevards or formal parks are replaced at 2:1 ratio (can be off-site) (Bylaw No. 8042). The Subdivision and Servicing Bylaw (No. 7900) requires new trees be planted in City boulevards created by development at a rate of 1 per lot or 1 per 15m of lot frontage, whichever is greater (medium-sized trees).	No tree replacement is required for the removal of unprotected trees. Tree planting is required by the Zoning Bylaw (No.12375) , except in rural areas or on urban lots with fewer than 3 dwelling units. Planting requirements are enforced during development.
Maintain	There is no municipal requirement to maintain trees on federal, provincial, or Indigenous land. The City is sometimes consulted as a partner on issues like fuel management.	The Tree Protection Bylaw (No. 8041) requires replacement trees be maintained in accordance with the replacement plan specifications. Irrigation for a minimum of three years to support establishment is required. 125% of the landscape estimate value is taken as a security (paid back after inspections).	Maintenance obligations for landscaping are established through the development permit for the first two years after planting, including an inspection and performance security. No City regulations cover maintenance after this period.	The City's Urban Forest Policy Statement (Schedule A of the Municipal Properties Tree Bylaw No.8042) and Boulevard Maintenance Bylaw No.10425 establish that all trees and treed areas on City property or property managed by the City are the responsibility of the Parks Division.	There is no requirement to maintain trees, other than to avoid the creation of a nuisance tree defined by the Nuisance Trees and Shrubs Bylaw (No.6469) .
Monitor	The City does not inspect trees on federal, provincial, or Indigenous land.	Tree Protection Bylaw (No. 8041) allows City staff to inspect tree protection requirements and planting establishment to meet restoration conditions.	City staff may inspect trees/ landscaping required by a DP.	The City's Parks Division conducts inspections and monitoring on City-owned and City-managed properties.	There are no inspections of private property (other than during development). The City can enter private property if required to mitigate an identified Nuisance Tree after ten days' notice.

Policy gaps

- No general protection for trees on private property
- No protected status for trees retained through a DP, unless a covenant is used.

- Soil volume requirements in **No.7900** (tree planting on city boulevards) are lower than minimum soil volumes in **No. 12375** (tree planting on private property).
- No use of significant tree definition in **OCF** in either tree protection bylaw or municipal properties tree bylaw.

Figure 7. Trees in Kelowna's Policies.

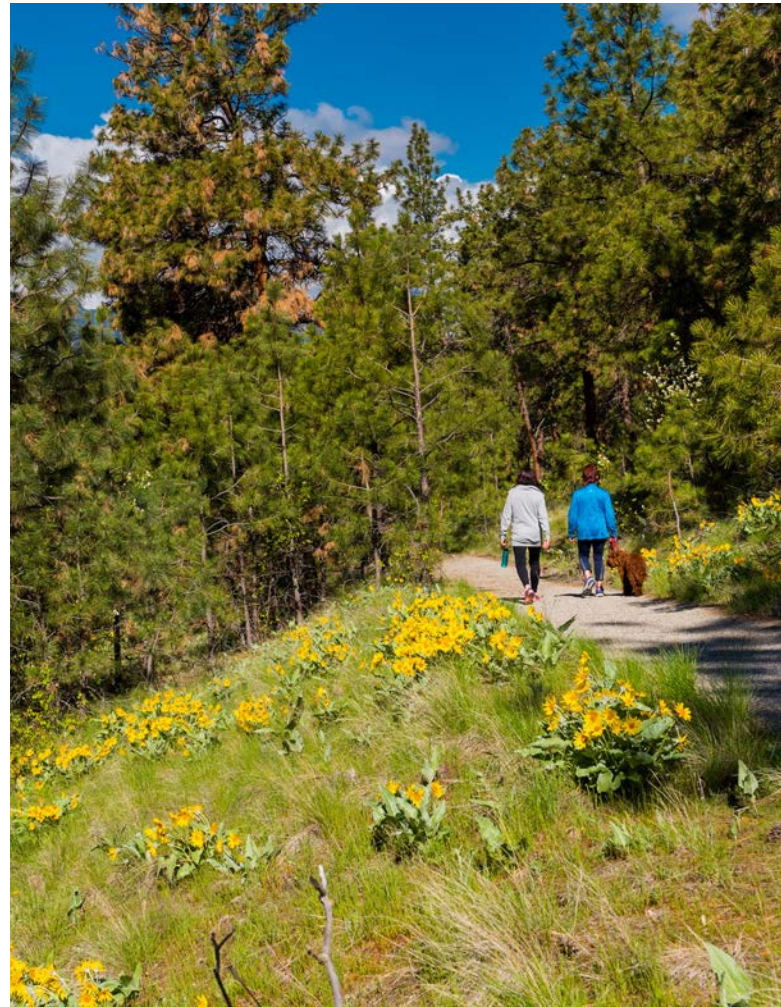
3.3.6 Other related plans

Some of Kelowna's other plans and strategies relate to urban forest management including:

- 2018 Community Climate Action Plan (currently being updated as a Climate Resilient Kelowna Strategy) – recommends implementing the Urban Forest Strategy to reduce GHG emissions.
- Clean Air Strategy recommends the City develop a policy to support reforestation, tree retention, and planting new shade trees.
- Transportation Master Plan – includes policies to incorporate trees and boulevards into streets.
- Community Wildfire Resiliency Plan – discusses wildfire risk on public lands and recommends strategies to reduce risk, including vegetation management.
- Parks Master Plan (in progress) – discusses strategies for providing park and recreation amenities throughout the City.
- Urban Centre Plans – envision walkable urban places supported by green infrastructure.

3.4 Urban Forest Report Card

Kelowna's urban forest program can be compared to best practices for sustainable urban forest programs to assess areas where the City is performing well and where the Sustainable Urban Forest Strategy should guide efforts for further improvement. This comparison provides the City with a "report card" that highlights where current service levels expose the City's urban forest to risk. Best practices come from several sources^{28, 29,30,31} and have been adapted to reflect Kelowna's context. The report card also shows progress since 2011, when the previous Urban Forest Strategy was endorsed. Purple marks on the report card indicate where Kelowna could reach if this Strategy's Action Plan is fully implemented.



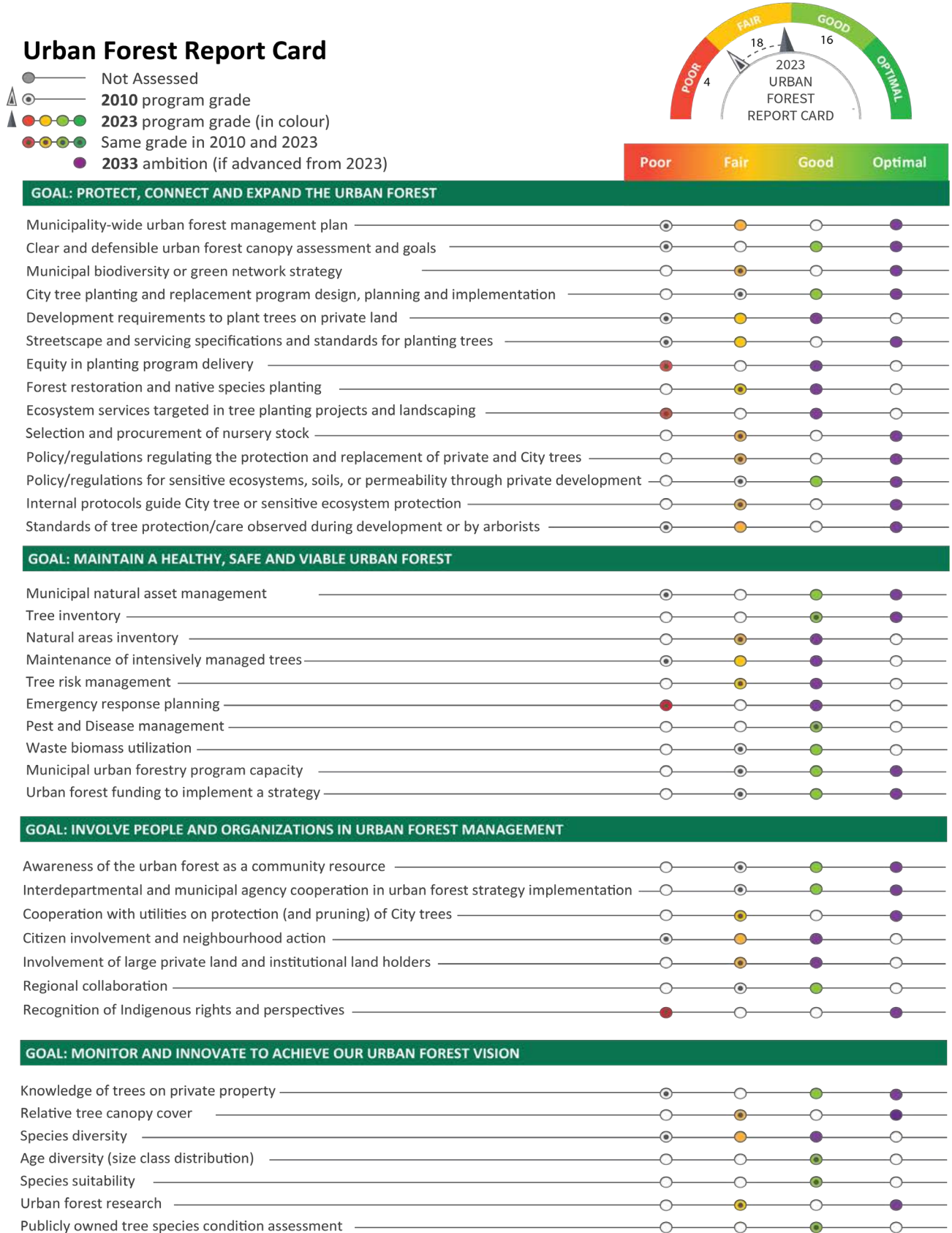


Figure 8. 2023 Urban Forest Report Card.

4 STATUS AND TRENDS FOR TREES IN KELOWNA

4.1 The land comes first

Kelowna’s urban forest has a rich and complex past. The ecosystems managed by syilx/Okanagan people since time immemorial includes grassland, open ponderosa pine forest, upland pine and Douglas-fir forests, riverbank forests of black cottonwood and a few western redcedar. The forests are home to Bear, Salmon, Saskatoon, and Bitterroot – the four Food Chiefs of the syilx/Okanagan people.

In the 1800s, European fur traders arrived, cattle ranchers and the first farmers. In the 1860s, informal trade relationships between Europeans and syilx/Okanagan people were replaced by the federal Indian Act. This move claimed colonial jurisdiction over the land and prioritized pioneer settlement over traditional syilx/Okanagan ways of being on, living with, and caring for the land. The townsite of Kelowna was laid out on this unceded land in 1892, and by incorporation in 1905 the surrounding landscape was rapidly changing as thousands of hectares of grassland and pine forest were transformed into grazed pastures, hayfields, and orchard trees.

Settlers brought various tree species like Norway maple, London plane, Pennsylvania ash, and Austrian pine to the Okanagan, reflecting their origins and contributing to the urban forest. Many of these early plantings are now mature trees in older neighbourhoods. Over time, the urban forest expanded with new trees in parks, residential areas, and roadways. The City established a parks department to manage green spaces, including the urban forest. The first tree inventory was conducted in 1992 and has since grown to over 24,000 trees on City property. The City enacted tree protection bylaws in 1997, and the 2011 Urban Forest Strategy provided strategic guidance for urban forest management. To address tree loss due to rapid growth, the Canopy Enhancement Strategy was explored. The updated Sustainable Urban Forest Strategy aims to ensure the urban forest remains a valued civic asset. As part of a broader commitment to meaningful reconciliation, the City is working to repair relationships with the syilx/Okanagan people and learn how to integrate syilx values and worldviews into how we manage our responsibilities to the land, including urban forests.

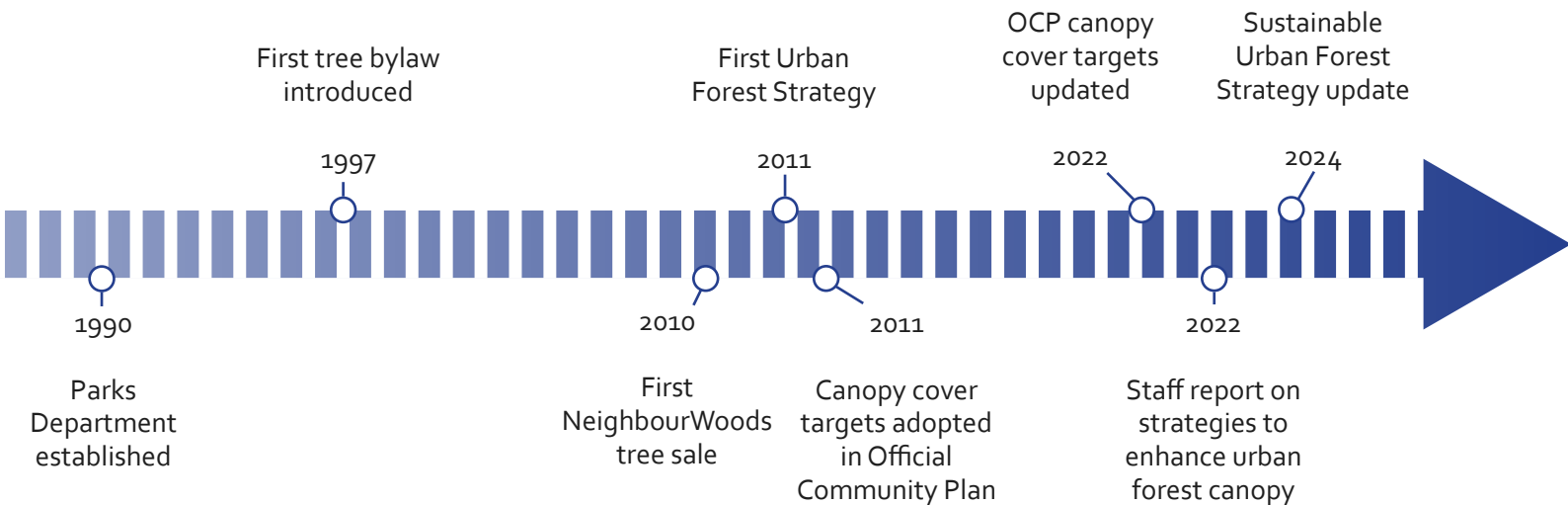


Figure 9. Recent events in Kelowna's urban forest management.

Returning Indigenous knowledge to land management

Urban forest management can start to address the recent legacy of settler-led land management and support the revitalization of Indigenous stewardship. The Indian Act curtailed land management by Indigenous peoples, with effects on the composition and shape of forests. The role of fire exclusion in landscape change is often cited as an example: prior to colonization, syilx /Okanagan people regularly used fire to clean debris from the forest floor, promote berry production and game habitat, obtain medicines, and reduce the potential for severe fire³⁷. Indigenous peoples have returned these practices to the Okanagan after decades of rigorous fire suppression that has increased forest density and allowed the build-up of forest fuels, driving more severe wildfires. Respecting Indigenous knowledge and stewardship practices can help create a more sustainable and resilient urban forest, fostering a deeper understanding of the land and fostering collaboration between Indigenous and non-Indigenous communities.



4.2 The urban forest now

4.2.1 Urban forest canopy

Urban forest canopy cover, a measure of tree coverage in cities, is estimated as the per cent of land covered by trees when viewed from above. In 2011, Kelowna’s canopy cover was estimated at 16% (excluding ALR) using i-Tree Canopy.

LiDAR imagery of Kelowna was collected in July 2023, providing a more accurate method to inform canopy coverage. It shows that the City’s canopy cover is 22% (excluding the ALR). Although it suggests growth since 2011, this result cannot be interpreted as growth of 6 percentage points since the development of the original Sustainable Urban Forest Strategy, because the i-Tree Canopy method did not represent individual trees in Kelowna. The new LiDAR-supported canopy analysis uses detailed 3D imagery and photointerpretation to

"map" the canopy of overstorey trees. It is believed to be more reliable than past estimates. Since it is based on analysis of individual trees, it is also likely to be comparable with future advances in measurement.

Canopy summarized by census dissemination area reveals that tree canopy distribution varies greatly across the city. Most urban areas of the City have canopy cover of between 10% and 20%. Areas with canopy lower than 10% include parts of Downtown, North End, Midtown, Gateway, and agricultural areas or rangelands. Areas with more than 20% canopy cover include newer neighbourhoods which interface natural forests, older neighbourhoods with mature trees, and rural areas. The highest canopy cover is in natural forests, where it is typically over 30%. Currently, canopy cover in natural areas may be higher than historical coverage in these areas due to fire suppression.

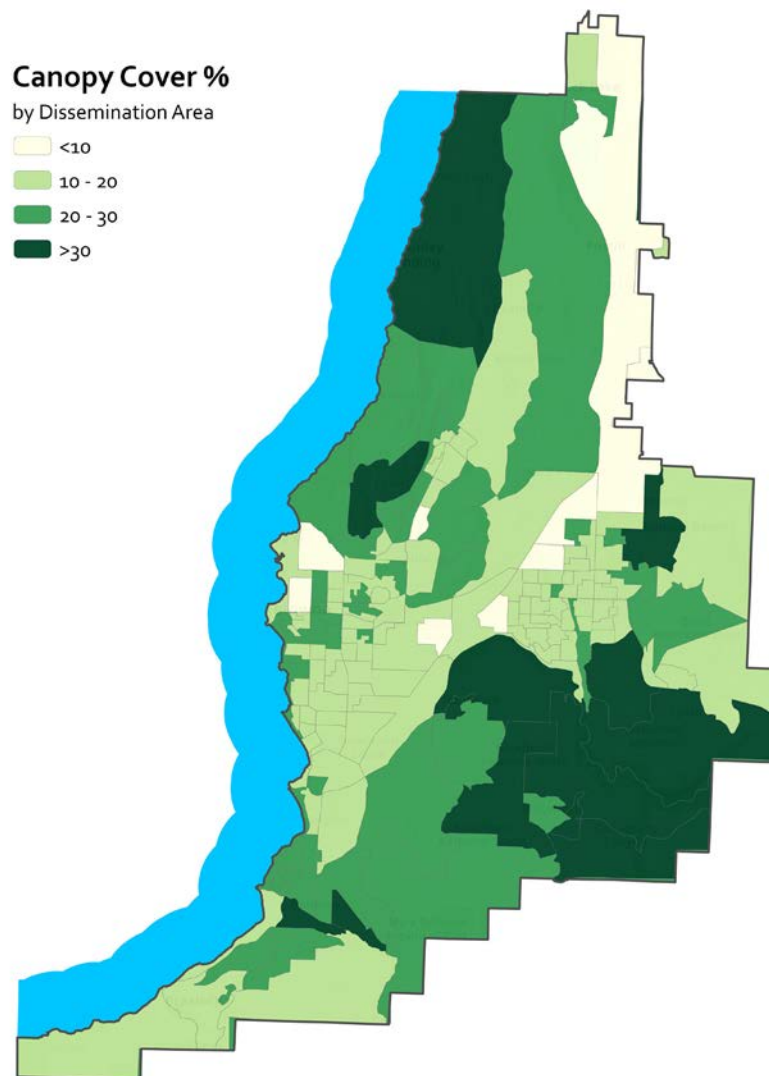


Figure 10. Kelowna's 2023 canopy cover summarized by Census Dissemination Area.

4.2.2 Management of Kelowna’s urban forest canopy

The City directly manages just 15% of the total urban forest canopy in the City: the 758 ha of tree canopy found over City-owned property (including parks) and street rights-of-way. 7% (359 ha) of the urban forest is on other public property, like Regional Parks, hospitals, schools, and Kelowna International Airport. The remaining 78% (3,868 ha) of the urban forest is found on private property. The City has limited influence over how trees are managed beyond City property, except where bylaws apply (i.e., in Natural Environment / Hazardous Condition Development Areas or other designated Tree Cutting Permit Areas).

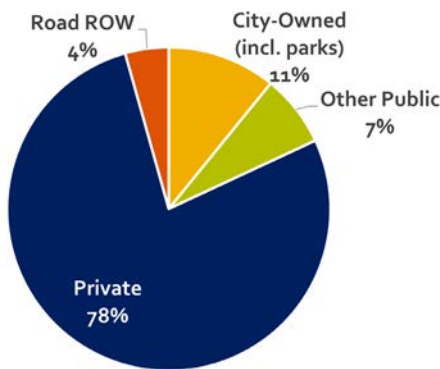


Figure 11. Urban forest ownership distribution.

4.2.3 Canopy cover within each Growth Strategy District

Five Growth Strategy Districts have been identified in the OCP for land use planning purposes: Urban Centres, the Core Area, the Gateway, Suburban Neighbourhoods, and Rural. Canopy cover in each Growth Strategy District is important because different challenges and solutions for urban forest management will arise in each one. Table 2 shows the 2023 canopy cover in each Growth Strategy District, excluding the area in each within the Agricultural Land Reserve (ALR). In the ALR, provincial right-to-farm legislation limits the City's influence over the urban forest.

Table 2. Summary of canopy cover results by Growth Strategy District (excluding Agricultural Land Reserve).

Growth Strategy District	Canopy Cover (2023)
Urban Centres	12%
Core Area	15%
Gateway	10%
Suburban	20%
Rural	27%
ALR (excluded above)	24%

Gateway has the lowest canopy cover followed by Urban Centres, Core Area, Suburban, and Rural (with the most). Only the Rural Growth Strategy District has higher canopy cover than the City as a whole. The area of the Rural Growth Strategy District outside the ALR is a mixture of natural forests and low density rural residential development, often on hillsides. This shows that there are relatively few trees in urban and employment areas, where most of Kelowna’s population lives and where most growth is planned to occur. There is a mismatch between where people live and work and the distribution of urban forest benefits.

4.2.4 Land cover and plantable area

i-Tree Canopy software can be used to estimate the proportion of Kelowna’s land area covered by different surfaces, such as impervious (paving or building), or pervious soil. Although the method is different than what has been used to estimate canopy cover, this shows where there are relatively more opportunities for tree planting or urban forest expansion and where there are barriers to expansion because of a lack of pervious surface. Kelowna’s land area was split by Growth Strategy District and given four non-tree land cover classes: impervious, plantable – private, plantable – public, pervious – non-plantable.

Impervious Hard-surfaced areas, including buildings, parking, or paved roads

Plantable – private Soft surfaces (e.g. soil, dirt, grass, low vegetation) on private land where a tree could be planted

Plantable – public Soft surfaces on public property, including the portion of street boulevards believed to be within City-owned rights-of-way

Pervious – non-plantable Soft surfaces on private or public property where trees cannot be planted because of evident land use conflicts, such as agricultural fields, playgrounds, sports fields, golf course fairways, and gravel or dirt-surfaced trails and roadways

Table 3. Results of i-Tree Canopy land cover analysis by Growth Strategy District.

Growth Strategy District	Land Area (ha)	Canopy Cover outside ALR (2023, LiDAR result)	Impervious %	Plantable – private %	Plantable – public %	Pervious – non-plantable %
Urban Centres	602	12%	70%	12%	5%	3%
Core Area	2,507	15%	55%	20%	7%	4%
Gateway	1,384	10%	29%	25%	6%	30%
Suburban	1,904	20%	25%	37%	12%	10%
Rural	15,380	27%	9%	33%	6%	33%

The land cover analysis indicates that in Urban Centres, 70% of the area consists of hard surfaces, the highest percentage among all Growth Strategy Districts. In the Core Area, over 50% of the land is covered by impervious surfaces. As development continues, impervious surfaces are expected to increase, since the maximum allowed coverage for buildings, structures, and impermeable surfaces in Urban Centre zones ranges from 90-100% of a lot, and at least 70% in all other zones except schools.

The findings indicate that numerous properties in each Growth Strategy District have not yet reached their maximum allowed impervious coverage as per the Zoning Bylaw. As land use intensification occurs, site coverage is likely to approach these maximums, reducing the permeable area available for tree planting on private property. The findings show that existing plantable space on public land is a small proportion of the landbase; however, more opportunities are evident in the Suburban Growth Strategy District. Suburban areas have the highest capacity to receive more tree planting, but also already have more tree canopy compared to other parts of the city that support higher population density.

In every Growth Strategy District, infill and intensification are expected to reduce permeable areas on private land. The Zoning Bylaw includes landscaping standards that mandate tree planting on private property in most development situations, which is likely to help maintain some canopy cover on private land during this transition. However, these standards do not currently apply to single- or two-dwelling land uses, which constitute a significant portion of the City. Supporting future canopy cover in Urban Centres and Core Areas, which have the highest impervious cover, is likely to require investment in public planting infrastructure, such as suspended pavements, to plant trees in streets.



Figure 12. Orthophotos showing typical land use patterns in each Growth Strategy District and the canopy cover in each Growth Strategy District (excluding the Agricultural Land Reserve).

Examining Canopy Cover

Kelowna's canopy cover has been mapped using LiDAR and aerial imagery of the City captured in 2023. A machine learning approach is used to classify the data into areas of tree and non-tree cover. Results were then reviewed for accuracy. The following images compare the resulting canopy map of the City with aerial imagery used for analysis in the same location. Canopy cover information can be summarized for any area within the City, including land uses, ownership, and other layers used by the Sustainable Urban Forest Strategy.

20% canopy cover

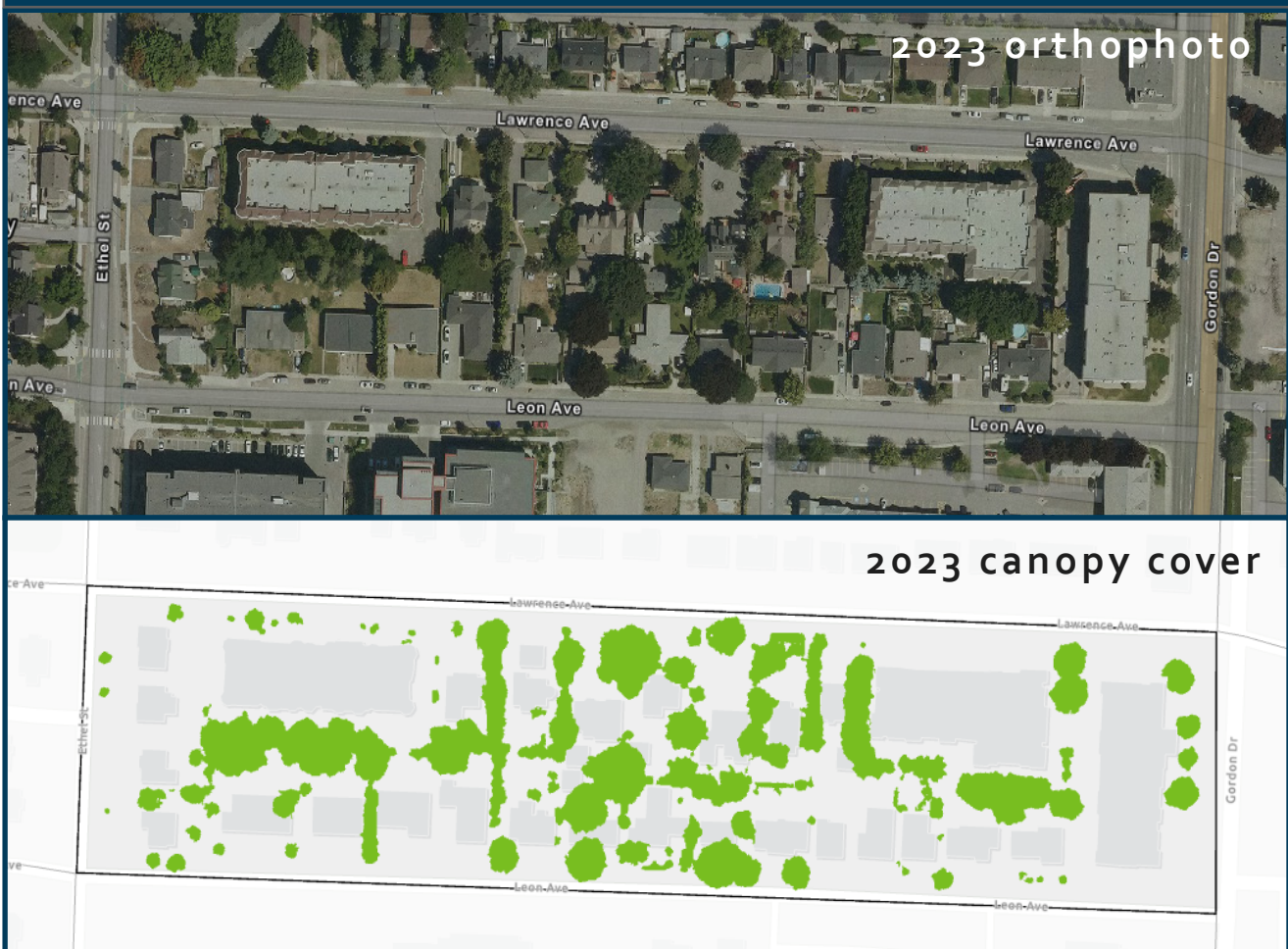


Figure 13. 20% canopy cover is provided by a mix of small and large trees on this block with single-family homes and apartment buildings.

Land surface temperature and land cover

Temperatures are hotter where impervious surface is high and tree canopy is low. Research in Madison, Wisconsin found that daytime air temperature was substantially reduced with greater canopy cover (over 40%), especially on the hottest days³⁸. The extent of impervious surfaces remained an important factor in lowering nighttime temperatures – which are critical for public health. The research showed that the benefits of increasing trees in neighbourhoods can be paired with limits on impervious surfaces to provide daytime and nighttime temperature reductions. Land surface temperature detections from Kelowna show that areas of low tree canopy and high impervious cover overlap with the City's hottest temperatures. There can be a difference of over 15 degrees Celsius between the land surface temperature in rural areas and urban neighbourhoods (Figure 5, page 8).



4.3 Municipal trees

4.3.1 Urban tree inventory

Kelowna’s inventory of over 24,000 trees represents a partial record of trees on City-owned property. The inventory contains information on species, diameter, height and location of street trees and some landscaped park trees, which helps the City evaluate tree condition and make informed management decisions. These inventoried trees are primarily concentrated in Urban Centres and the Core Area, and in recent developments

in the Suburban area. The highest density of inventoried trees is found in Kelowna’s downtown waterfront parks. Older residential areas (> 70 years) and new developments generally have the highest numbers of street trees.

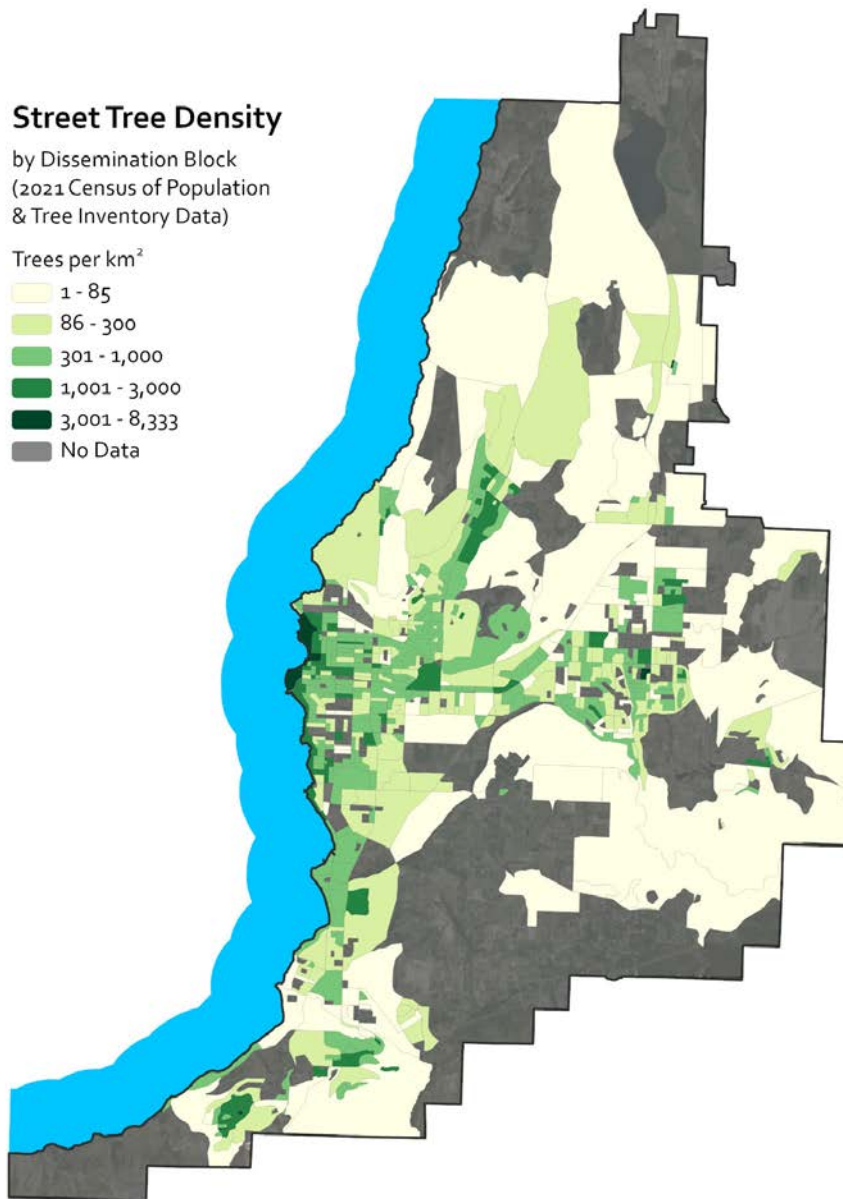


Figure 14. A map of street tree density by dissemination block using 2021 Census of Population and tree inventory data.

4.3.2 Diversity in the tree inventory

The tree inventory contains over 250 species but only 20 species make up most of the inventory. The three most common species are golden honeylocust (12%), Norway maple (8%), and London plane (8%). At the genus level (groups of related tree species), maples are most common (21% of the inventory), followed by ash (13%), honeylocust (12%), pine (10%) and sycamore/ plane (9%). A common guideline for species diversity is the 10-20-30 Rule³²: a city’s urban tree inventory should contain no more than 10% of any one species, 20% of any genus, and 30% of any family. In the face of climate change and increasing uncertainty around the intersecting impacts of pest introduction, urban foresters are considering whether a 5-10-15 Rule or another guide based on the ecosystem services different tree species provide is more appropriate^{33,34}. Research has also shown that even the 10-20-30 Rule can be difficult to achieve in cities with more continental climates³⁵. Kelowna’s tree inventory is currently over-reliant on honeylocust at the species level and maple at the genus level under species diversity guidelines.

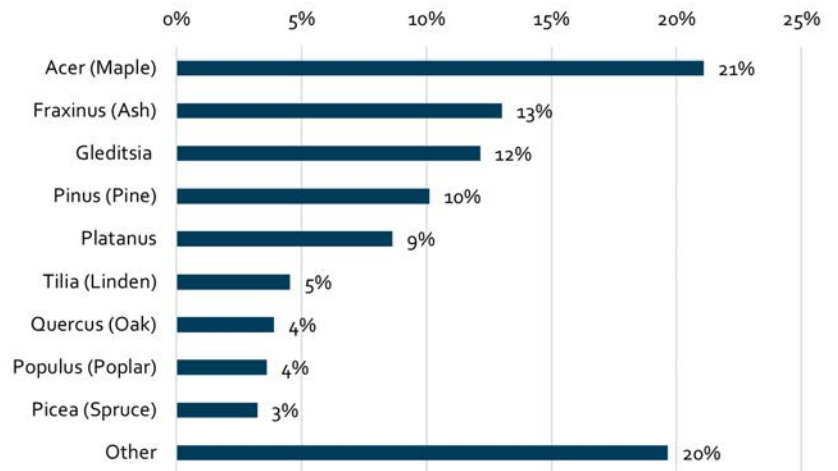


Figure 15. Tree inventory species diversity.

Species selection and climate suitability

Extreme weather events can damage urban vegetation, disturbing years of growth in a single event. Across the Okanagan region, previously abnormal weather conditions such as heat waves, extended periods of drought, and flash freeze events are becoming more common. Species suitability and diversity of Kelowna's canopy cover is important for the long-term health of the urban forest in the City, and is determined by considering a variety of attributes, including hardiness. Hardiness, drought tolerance, and limb strength all vary by species and factor into a tree's resilience to extreme weather and ability to overcome adverse growing conditions. These are metrics that can be used to guide species selection to match changing climate conditions and weather events. As climate change increases the variability of weather, trees that are adapted to a variety of conditions as well as rapid change should be preferred. The City's tree inventory and the observations of tree mortality by community members are important sources of information to understand which species are having problems in Kelowna. Common species that have been observed to have poor responses to recent weather events include red maple and European aspen.



4.3.3 Size and age of trees

Tree size can be used as a proxy of age diversity in the urban forest. As they age, trees grow in height and width (diameter), meaning larger trees are generally older. The median tree in Kelowna’s inventory of over 24,000 trees is 20 cm in diameter, while the average tree size is 33 cm, influenced upward by a few large, old trees. This is consistent with findings of forest structure, which suggest that much of the City’s tree canopy is composed of medium-sized trees (10-20 m in height) which could be a few decades old. Mature size is also species dependent, making this use of the diameter distribution somewhat uncertain. The largest trees in the City tend to be willows (average diameter: 107 cm), catalpa (93 cm), elm (93 cm), giant sequoia (81 cm) and horse chestnut (77 cm).

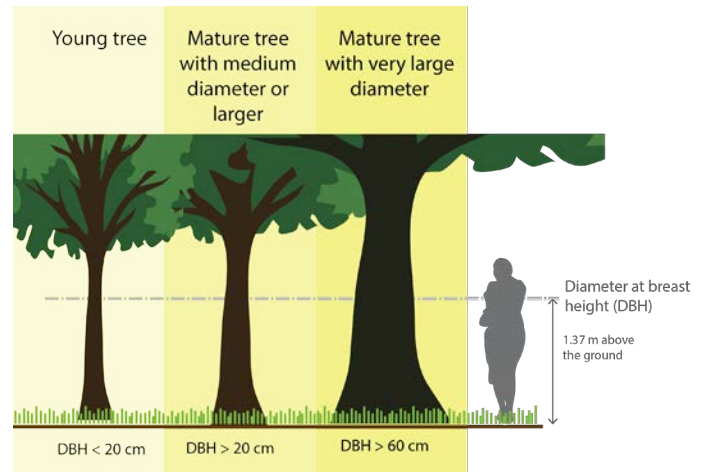


Figure 16. Size of city trees (diameter at breast height).

4.3.4 Threats to urban trees

In addition to the stresses of climate change impacts and potential impacts of development, urban trees face several additional threats to their health and vitality:

- Vandalism and accidents* Trees are damaged by people intentionally, such as unauthorized trimming for views, or accidentally from vehicle impacts.
- Invasive species* Introduced species with a competitive edge can disrupt local ecosystems. Both non-native and native urban trees may be vulnerable. Pests often target specific species or types of trees, and Kelowna's urban forest is particularly at risk from pests affecting maple, pine, honey locust, ash, and plane trees, which constitute a significant part of the City's inventory.
- Agricultural pests* Kelowna's agriculture industry and urban forest overlap, particularly when it comes to pests impacting fruit trees. Several fruit tree species are prohibited from planting in the urban forest. Damage agents that can affect both orchards and the urban forest include fire blight canker, foliar diseases, and problem insects.
- Urban infrastructure* Trees in urban areas face more extreme environmental conditions than those in natural areas, driven by the impacts of high impervious landscaping like road pavement, sidewalks, and buildings. Hard surfaces absorb heat and raise ambient temperatures through the urban heat island effect, increases water consumption by trees. Hard surfaces also collect, channel, and accelerate runoff from heavy rains, which can divert water away from trees and contribute to erosion or localized flooding. Building and roadway foundations compact the soil, alter the natural slope of the land, and create impermeable barriers to groundwater flow, fragmenting urban forest soils into small, isolated patches. These patches can become too dry in summer, too wet after rains, or unable to support beneficial biodiversity like fungi and soil animals, making it harder for trees to withstand increasing climate change impacts.

4.3.5 Trees in natural areas

Forests in natural areas are not captured in the tree inventory because they are managed as a population, rather than as individual tree assets. Forests are monitored for forest health issues and are managed for wildfire fuel reduction, ecological restoration, and hazard tree mitigation along trails. Sensitive ecosystems

identified by the OCP occupy 5,640 ha or 26% of the City’s land base and contribute 1,720 ha of tree canopy, or 34% of the total canopy cover in Kelowna. Natural areas are important generators of ecosystem services for the city. They also perform the vital work of connecting Kelowna’s habitats together, supporting increased biodiversity.



Figure 17. A map of Sensitive Ecosystems and Water Courses Development Permit Areas.

4.3.6 Natural forest communities

Most of Kelowna is situated in the Ponderosa Pine zone of the province’s biogeoclimatic ecosystem classification (BEC) system. Within this zone, diverse terrain features create a variety of forest types. The most prevalent trees in Kelowna’s natural areas include ponderosa pine, Douglas-fir, black cottonwood, lodgepole pine, and trembling aspen. Other tree species found around the city are paper birch, western redcedar, Douglas maple, Rocky Mountain juniper, and more. Kelowna’s natural forests consist of dry ponderosa pine woodlands, mixed conifer forests of ponderosa pine and Douglas-fir on slopes and ridges, floodplain forests are dominated by black cottonwood and trembling aspen, and other ecological niches. Ponderosa pine, the most tolerant native tree of dry environments, encounters a “lower tree line” in the Okanagan Valley below which grassland communities are found. Mature trees can grow to heights of 25 meters or more, particularly in sheltered areas with sufficient soil moisture.

4.3.7 Threats and natural disturbances in forests

The natural forests of Kelowna play a vital role as repositories of native biodiversity, hosting diverse plant, animal, insect, and fungal species that contribute to the

overall health of the ecosystem. This unique dryland forest ecosystem in the Okanagan supports several protected species exclusive to the region. The natural forests within the city boundaries seamlessly blend with the landscape forests found at higher elevations in other BEC zones, which predominantly consist of closed-canopy coniferous forests featuring spruce, pine, larch, Douglas-fir, and subalpine fir. However, climate change poses significant challenges for Kelowna’s natural forest cover. The projected hotter future could potentially shift the lower tree line further into the mountains, leading to the loss of urban forest canopy in beloved areas like Knox Mountain. Kelowna landscape may shift towards being more grassland-dominated. In 2011, the urban forest cover in natural areas of Kelowna was estimated at approximately 23%, aligning with the average canopy cover of grassland biomes in US cities. A global survey also found that cities in grassland regions had an average urban tree cover of 18.5%. With climate change, it is expected that Kelowna’s natural forest cover will decline as existing trees succumb to drought stress, and tree regeneration faces greater challenges due to moisture and heat limitations.

- Wildfire* Wildfires are the most common natural disturbances in Kelowna’s forests. Many native tree species have adapted to fire through thick bark (ponderosa pine, Douglas-fir), serotinous cones (lodgepole pine), or sprouting and suckering (trembling aspen, black cottonwood). However, historical fire suppression and forest management have led to unnatural conditions, such as increased stand density and debris levels, which the City aims to address through its Community Wildfire Resiliency Plan.
- Forest health* Natural forests face insect and pest epidemics, including bark beetles of pine and Douglas-fir, and can host pests that impact the region’s vital agriculture industry. Significant tree diseases include Phellinus and Armillaria root rots.
- Invasive species* Invasive species, including invasive trees like Russian olive, Siberian elm, and tree of heaven threaten native forests.
- Climate change* Climate change-induced stresses, including heatwaves, droughts, and extreme weather events, can significantly impact the health of forests and trees. Kelowna’s natural forest cover is anticipated to decline due to increased tree mortality resulting from drought stress. Additionally, tree regeneration is likely to face higher failure rates due to the combination of limited moisture and elevated temperatures that can impact seedling survival and growth. Damage caused by extreme weather like high winds or hailstorms can exacerbate the occurrence of wildfires by building forest fuel stocks and increases the vulnerability of trees to pests and diseases by leaving them with open wounds.

4.4 Tree equity

Tree equity refers to the idea that equal access to the benefits of urban forests is a crucial social issue, especially in times of population growth, greenspace loss, and increasing climate change impacts such as heat and flooding. Community members have varying levels of vulnerability to climate change. For instance, older adults and young children are more susceptible to extreme heat, while lower-income households may struggle to afford cooling systems for protection during heatwaves.

The non-profit organization American Forests has developed a methodology for assessing tree equity, which combines social vulnerability indicators with existing tree canopy and future canopy goals. Kelowna can use sociodemographic indicators from the Canadian census to identify communities in need within the city. Table 4 contains five indicators adapted to utilize Canadian data sources or LANDSAT land surface temperature detection.

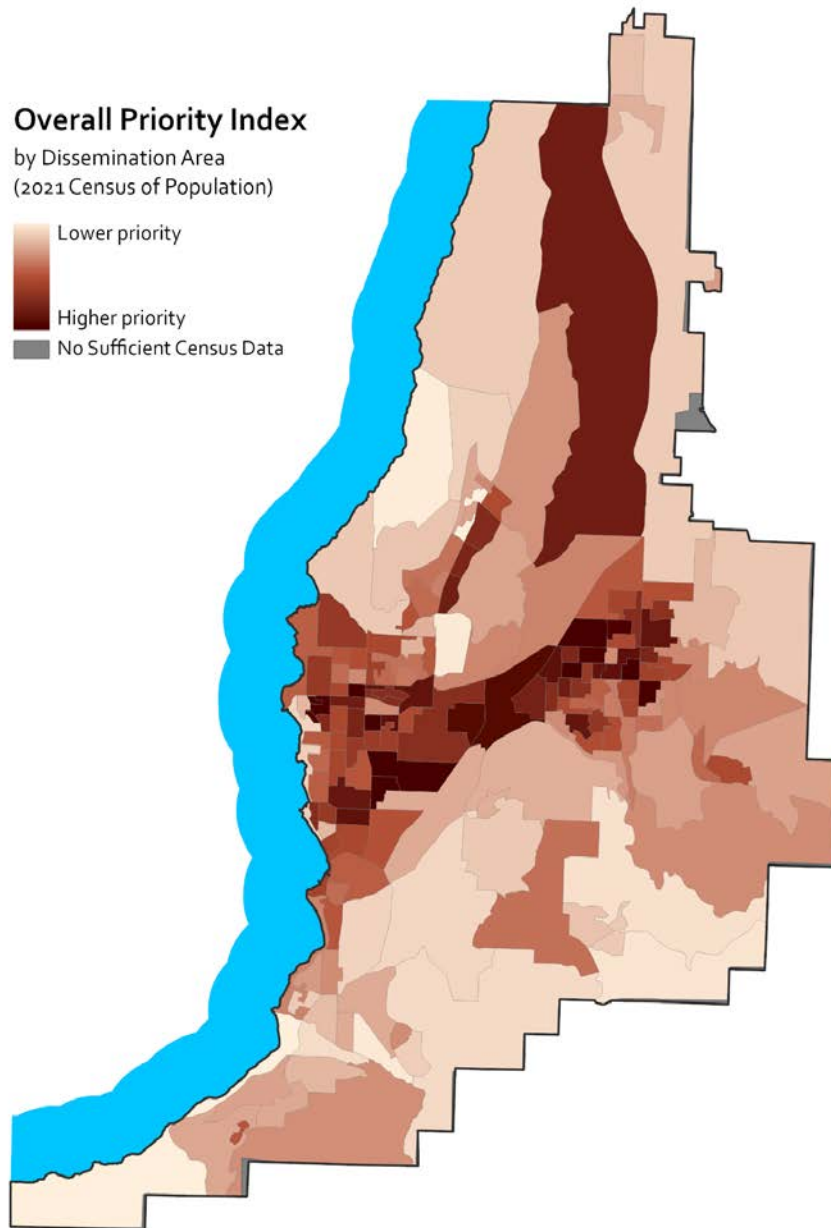


Figure 18. A map of the overall priority index for urban forest canopy expansion, based on five vulnerability indicators.

Table 4. Indicators for assessing tree equity.

Indicator	Metric	Description
Climate	Land surface temperature	Land surface temperature (°C), captured remotely by satellite on June 16, 2021.
Income	People in poverty	Percentage of people living on incomes below 200% of the federally-designated poverty line.
Age	Dependency ratio	Seniors (65+) and children (0-14) as a portion of working age adults (15-64).
Race/ethnicity	People of colour	Percentage of people who belong to visible minority groups as defined by the Employment Equity Act.
Employment	Unemployment rate	Percentage of the labour force that does not have a job and are available and looking for one.

Kelowna's equity indicators reveal a need for increased canopy in several neighbourhoods along the Highway 97 corridor between Downtown and Rutland. While many high-priority areas for improving tree equity have average canopy coverage (10-20%), a few have less than 10% canopy coverage. These areas include neighbourhoods with apartment buildings and older single-family homes near commercial districts with very low canopy cover. Some suburban neighbourhoods appear to be in greater need, possibly due to recent tree planting in newer areas where trees are still small. The University of British Columbia Okanagan campus also emerges as a high-priority area, possibly because a large number of student residents reported low income and/or unemployment.

While trees throughout the community on private and public property influence tree equity, the City has a role in building equity in every neighbourhood, namely by investing in extending its inventory of street trees. When compared against the priority indicators of tree equity, the distribution of Kelowna's street trees shows

some areas are under-served with City tree canopy and could be a priority for planting on public property where space allows. This "street tree canopy equity" shows that older, historically lower income neighbourhoods like Rutland and the North End have relatively little street tree canopy to meet the needs of their populations. Some of the street tree canopy equity analysis results are influenced by the age of neighbourhoods, as trees in newer neighbourhoods are generally younger and smaller in size than in older neighbourhoods with a greater diversity of tree ages.

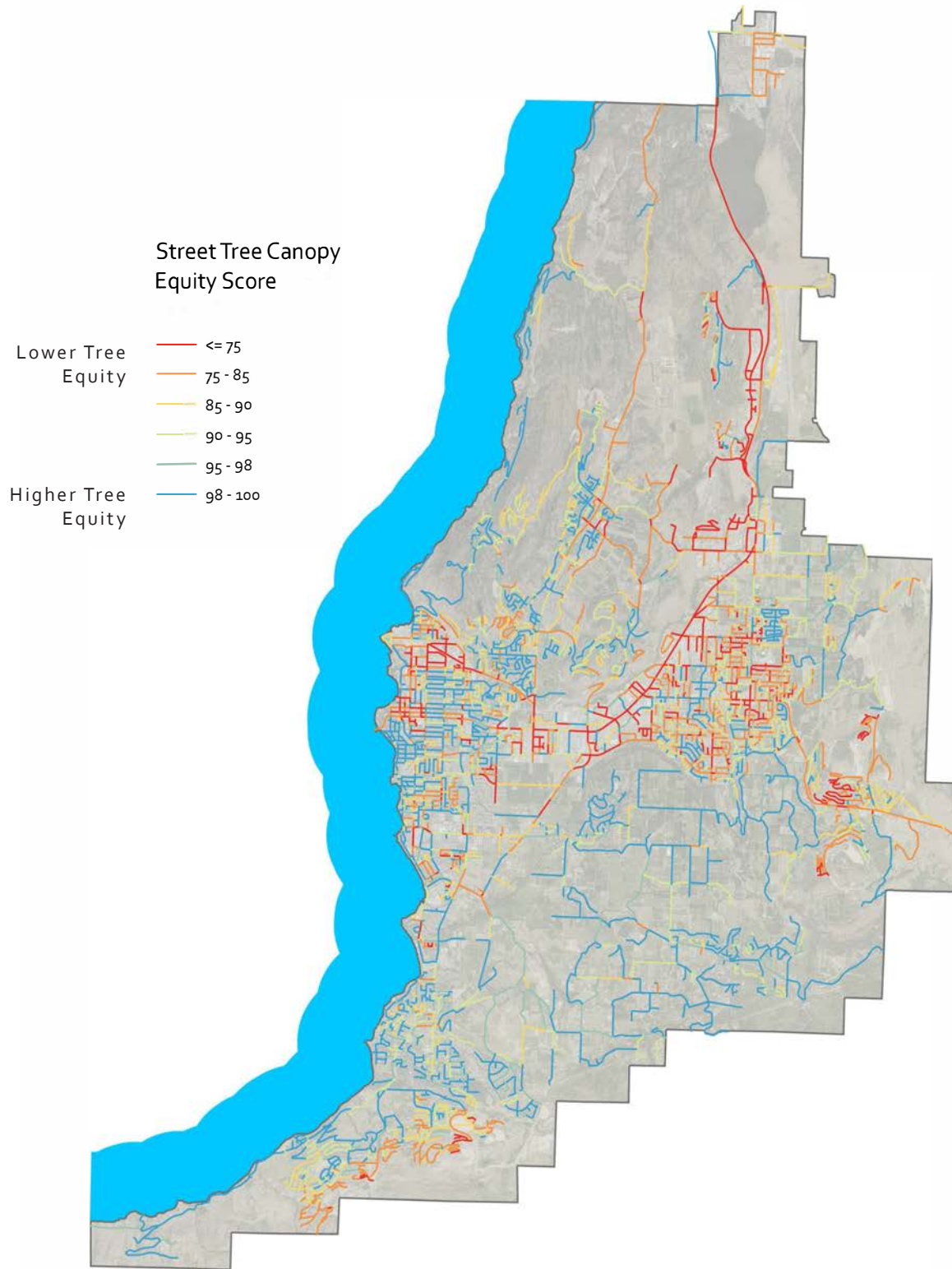


Figure 19. A map of street tree canopy equity by score from low (<=75) to high (100).*

*Notes: To prepare Figure 19, street tree canopy coverage includes both City planted trees as well as canopy from trees on private property that extends within 20 meters of road centerlines. A technique called gap analysis is used to compare how canopy coverage within the street compares with a target of 20% canopy cover for streets. For example, a street segment with 15% canopy coverage would have a "gap" of 5 percentage points. To estimate the final tree equity, the gap score for each street segment is compared with the equity priority index shown in Figure 18. Low street tree canopy equity segments have large gap scores and adjoin census dissemination areas with high equity priority index values. The intent of Figure 19 is to identify potentially high-need areas for street tree planting. The canopy status of a roadway may change over time in response to tree planting, growth, and removal on neighbouring properties and in the street's public realm.

4.5 A changing landscape

One of Canada's fastest growing cities, Kelowna is expected to welcome 45,000 new residents by 2040. To align with the OCP's vision of a thriving, sustainable city, much of this growth needs to be directed toward urban neighbourhoods in Urban Centres and the Core Area where City services can be provided more efficiently. This approach also alleviates development pressure on the forested natural areas surrounding the city. However, conventional city-building relies heavily on hard landscapes serviced with grey infrastructure, which exacerbates the impacts of heat, drought, and heavier rainfalls expected by the 2050s due to climate change.

Converting low-density housing into denser urban areas typically leads to a rise in hard-surfaced or impervious areas, resulting in fragmented and reduced soil volume available for trees. Impervious surfaces already cover 70% of Urban Centres (Downtown, Pandosy, Capri-Landmark, Midtown, and Rutland) and 55% of Core Area neighbourhoods. For example, an analysis in the City of Vancouver showed that canopy cover became increasingly limited as impervious surfaces exceed 50%, and almost non-existent once they exceed 85%³⁶.

In addition to increasing impervious surfaces, urbanization often involves the renewal or installation of new services like stormwater, sewer, and electrical connections. Aboveground power lines and belowground conduits or pipes are essential infrastructure but can interfere with tree-growing spaces. High foot or vehicle traffic can lead to various issues for trees, such as soil compaction in root zones, vandalism or physical damage, and exposure to pollutants like road salt. Overall, Kelowna's urban environment poses challenges for trees, further complicated by a changing climate that enhances these vulnerabilities. In higher-density neighbourhoods and those with a greater proportion of impervious surfaces, it becomes increasingly important to proactively plan and create environments that accommodate the required urban forest canopy. With increasing density, the reliance on roadways for tree canopy increases.

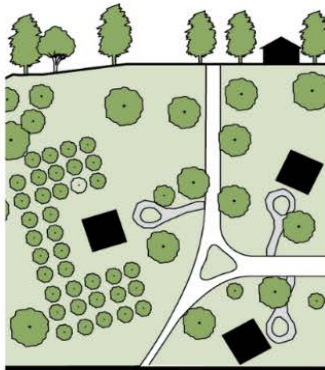
Don't trees use too much water? Tree cover conserves water in a semi-arid climate³⁹

One of the most significant impacts of climate change will be summer drought. A shift to less snowpack and more rainfall, coupled with lower summer precipitation, means Kelowna's water supply will be under greater pressure by the middle of the century. 24% of domestic water use in the Okanagan is used in outdoor landscaping – a figure the City is trying to reduce through its Water Smart program.

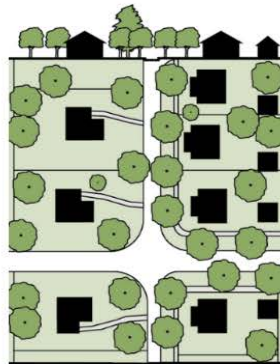
The urban forest can help conserve water by reducing this demand. Researchers in Colorado examined city-wide water demand in Fort Collins, a mid-sized city of 170,000 people with a semi-arid climate. The research revealed that tree cover was associated with lower water consumption. This result challenges conventional wisdom that trees elevate water demand in semi-arid climates because they are large and often require watering. Instead, the study suggests watering trees helps reduce overall water demand, potentially because the shading and cooling benefits of trees prevent water used in landscaping from rapidly evapotranspiring through grass and other plants.

Where can trees fit?

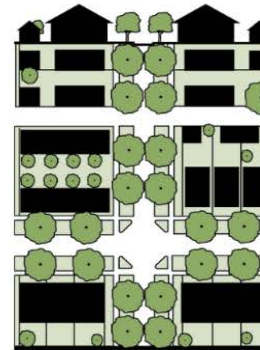
It depends on land use...



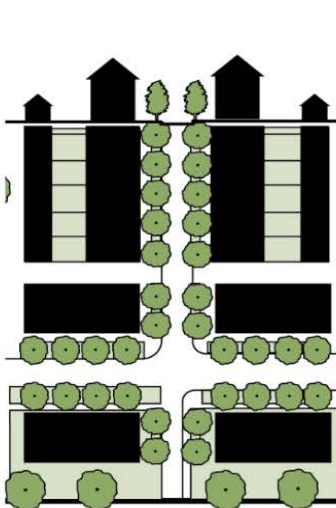
Rural
Trees in forests, windbreaks, yards
Forest canopy ~ 25%



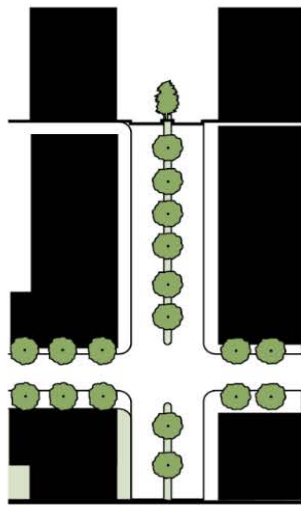
Suburban single-family
Trees in yards, parks, sometimes street trees
Canopy 20 - 30%



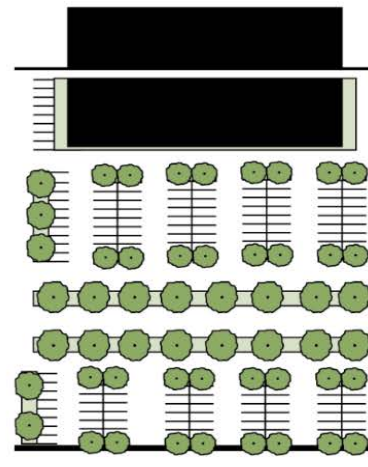
Core Area infill
Trees in streets, parks, sometimes yards
Canopy 15 - 25%



Core Area multi-family
Trees in streets, parks, common areas
Canopy 10 - 20%



Urban Centres
Trees in streets, plazas
Canopy typically 10 - 15%



Commercial
Trees in streets, surface parking
Canopy typically 10- 20%

With increasing residential density, streets and parks become more critical for supporting tree canopy

Figure 20. Appropriate tree location and canopy coverage based on different land uses.

5 EXPLORING CANOPY COVER TARGETS

Establishing “ideal” canopy covers for different uses of land in the city can help refine targets for each Growth Strategy District. The information presented in this section informs setting new targets for each Growth Strategy District.

Figure 21 graphs the land cover over each urban Growth Strategy District and illustrates where canopy and plantable areas are concentrated.

Setting targets for Kelowna should reflect the city’s arid climate and urban context. Temperate cities with high canopy cover targets, like Toronto (40%) or Vancouver (30%) naturally have more canopy cover and lands will naturally regenerate with trees. Natural forests in Kelowna are more open than forests on BC’s coast or in the interior wet belt, and urban areas will have lower tree canopy cover unless tree planting and watering programs are in place. **On average, grassland cities similar to Kelowna have approximately 20-25% canopy cover.** Kelowna’s canopy cover target should be established based on the ideal level of greening that can be achieved in different urban land uses, and to provide canopy cover where people most need it.

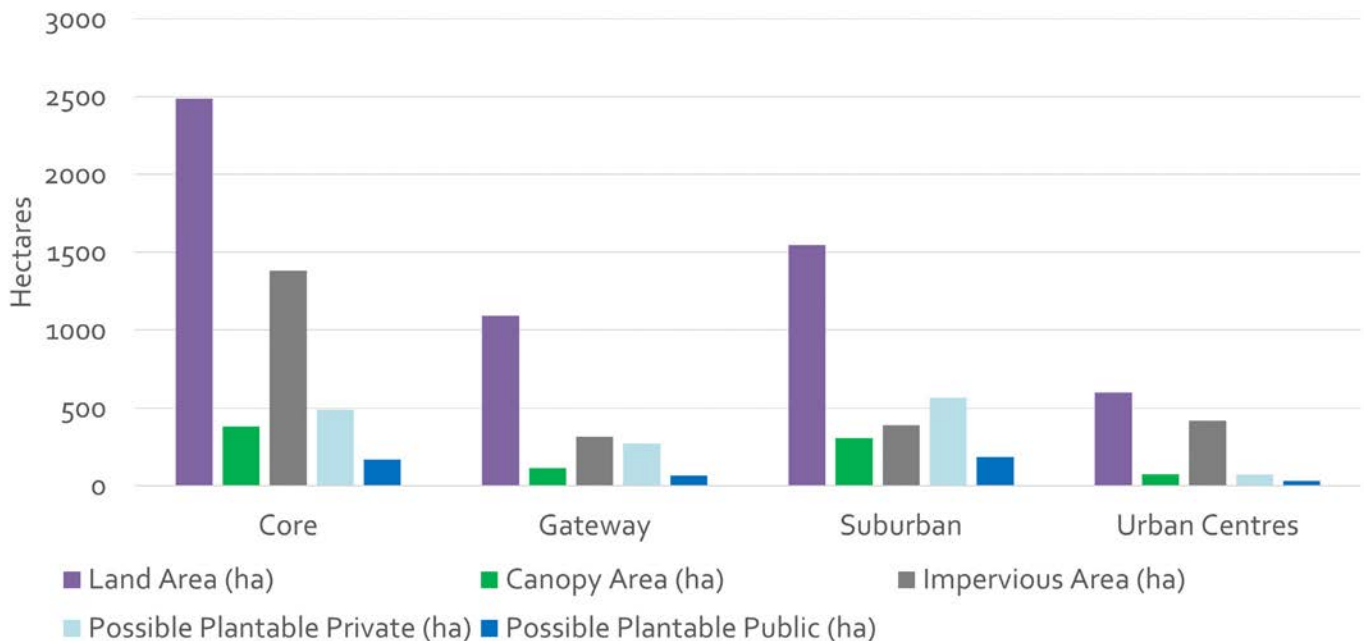


Figure 21. Land cover by Growth Strategy District (excluding Rural lands and Agricultural Land Reserve).

What are Growth Strategy Districts?

Kelowna's Growth Strategy Districts are geographical areas within the city that have been identified for targeted growth and development. These districts are part of the city's Official Community Plan (OCP), which outlines a long-term vision for sustainable development, land use, and growth management.

Growth Strategy Districts

- Urban Centres
- Core Area
- Gateway
- Suburban Neighbourhoods
- Rural

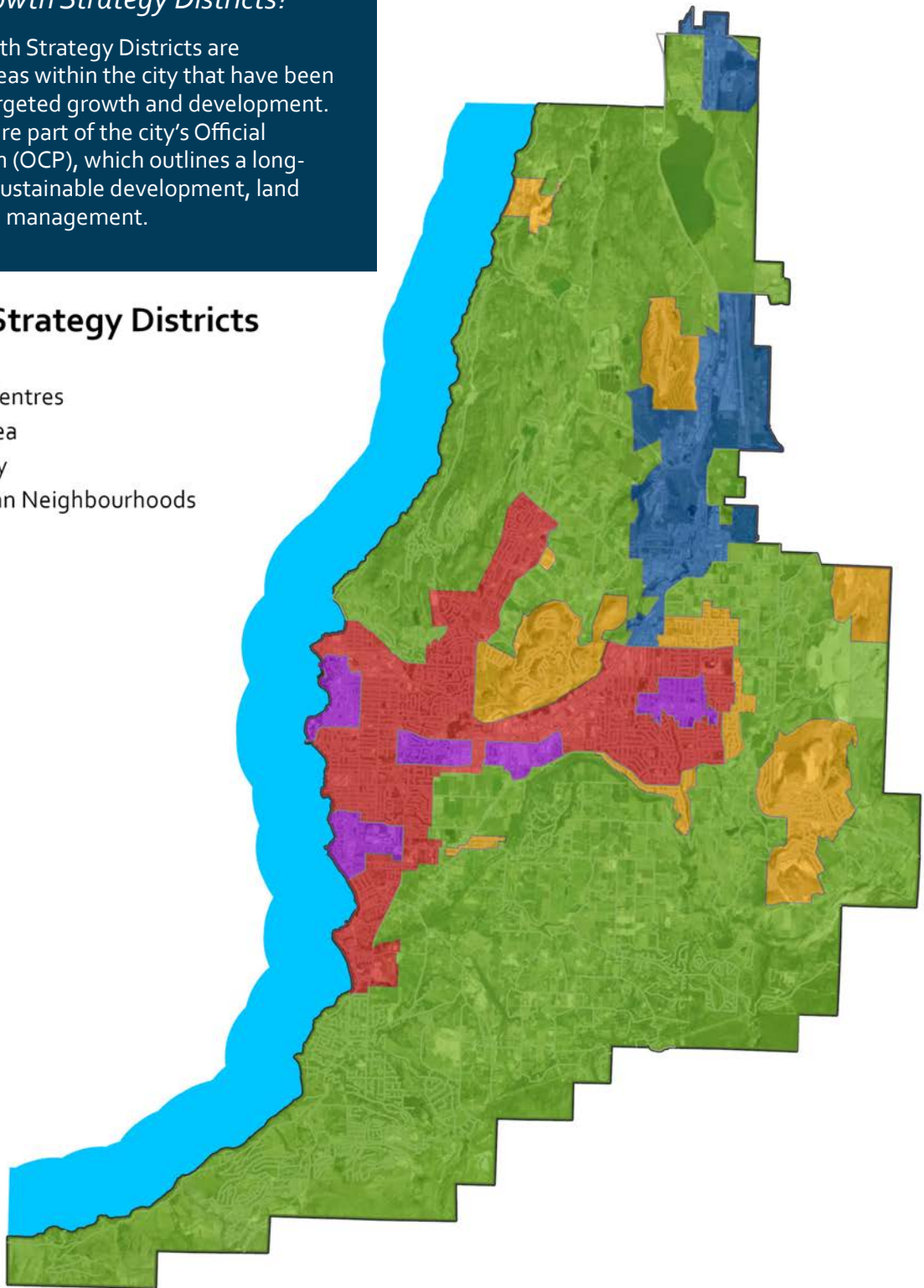


Figure 22. A map of Kelowna's growth strategy districts.

Each area has different land cover and planting potential, described below:

5.5.1 Urban Centres

Downtown, Pandosy, Capri Landmark, Midtown and Rutland. These five areas will have the highest concentration of employment, shopping, entertainment, and housing. While a small land area, Urban Centres are densely built. Canopy cover is low (~12%), impervious cover is high (~70%) and potentially plantable areas are low on both public and private land. Future development will eliminate some plantable area and existing trees but will also create opportunities for new tree planting on streets, in surface parking lots and on private landscapes. In Urban Centres, streets and parks will have to provide much of the tree canopy due to high building coverage on private land.

5.5.2 Core Area

The city’s central residential neighbourhoods are the predominant land use in the Core Area. Some commercial and industrial land uses also occur along Highway 97. Canopy cover is low (~15%), though higher than in Urban Centres. Impervious cover is moderately high (~55%), but there are plantable pervious areas, particularly on private land. The Core Area will see densification in the form of four-plexes, townhouses and low rise apartments, which will reduce the plantable area and create challenges for tree retention, but will also create opportunities for new planting on streets, and will include some private landscapes that support trees. There are also opportunities to plant more trees into existing private landscapes. Street trees will be an important component of increasing urban forest canopy in the Core Area.

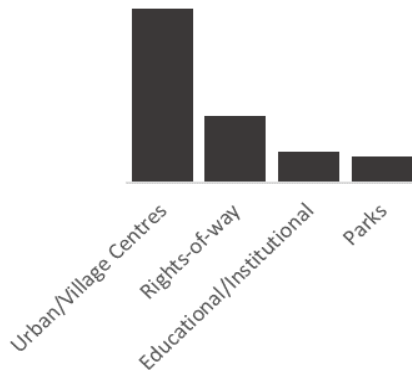


Figure 23. Urban Centre area dominant land use breakdown, land uses >10 ha

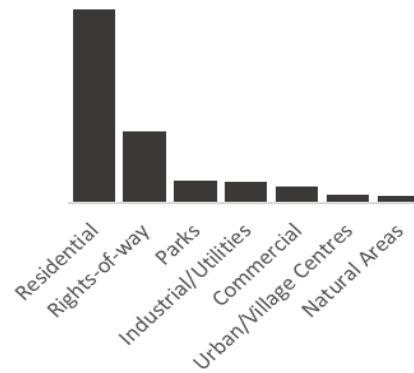
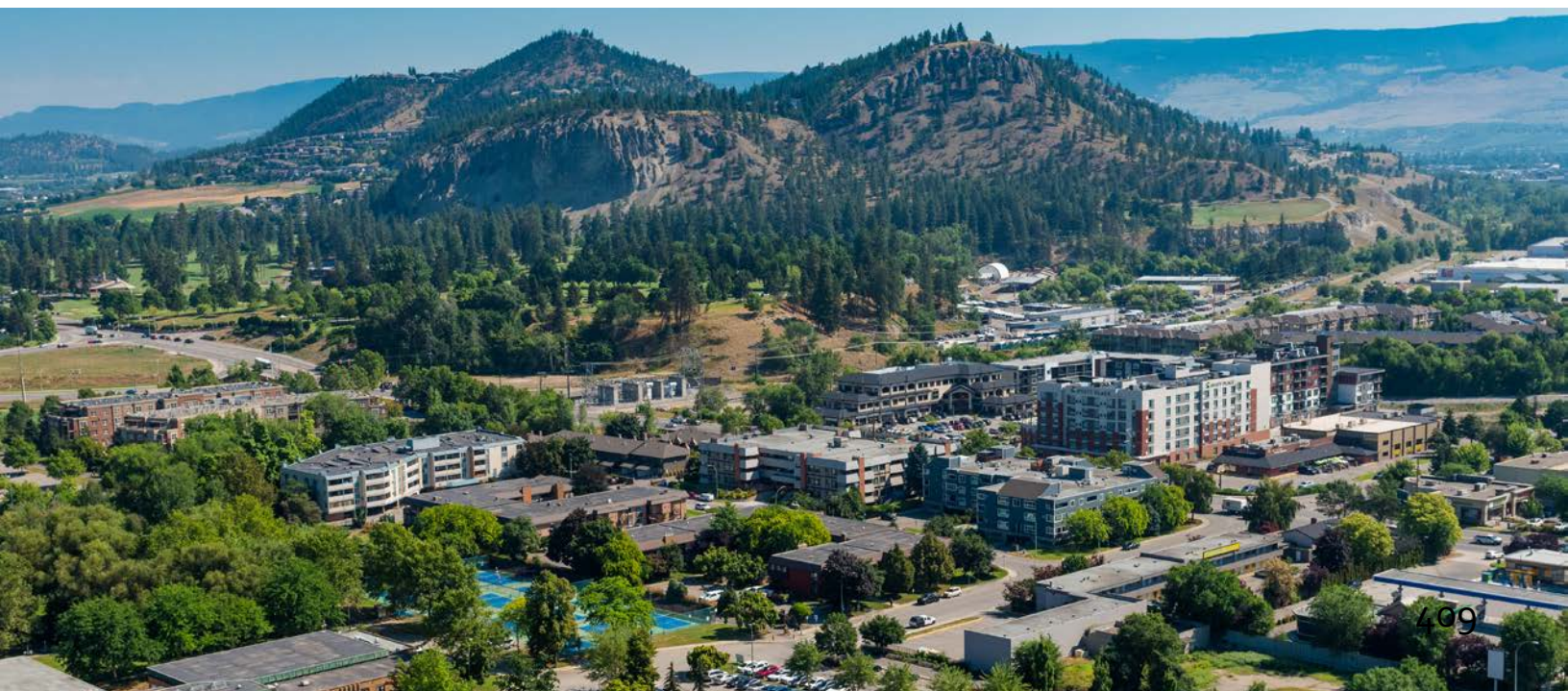


Figure 24. Core area neighbourhood dominant land use breakdown, land uses >10 ha



5.5.3 Gateway

The Gateway includes the University of British Columbia Okanagan (UBCO) campus, the airport and surrounding industrial and commercial lands. These lands, including ALR within the Gateway area, have low canopy cover (~10%), moderate impervious cover (~29%) and moderate plantable area concentrated on private land. However, this area will have growth focused on industrial land, employment and transportation that is likely to increase impervious cover in the Gateway area. This development will create opportunities for planting in parking lots and along transportation corridors. Given the future development of this area, planting in existing pervious areas is not recommended except where development is complete. Landscaped areas in surface parking lots, around buildings and along transportation corridors will contribute most of the tree canopy in the Gateway area. Natural areas within the Gateway may also have some opportunities for restoration, but the most significant benefits for workers and visitors are likely to be through planting in urban locations.

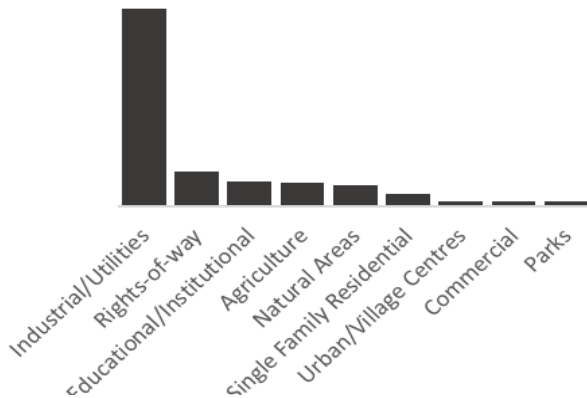


Figure 25. Gateway area dominant land use breakdown, land uses >10 ha

5.5.4 Suburban

The Suburban areas are dominated by residential land uses outside the core area but inside the growth boundary. Canopy cover is the highest among the urban areas (~20%), which is still lower than the City-wide average (excluding ALR) (22%). Impervious cover is relatively low (25%). There are substantial pervious areas that could support additional tree planting, particularly on private land but also on streets. These areas could receive additional tree planting in the immediate future. Trees in yards, parks, golf courses, natural areas and on streets will contribute most of the tree canopy in Suburban areas.

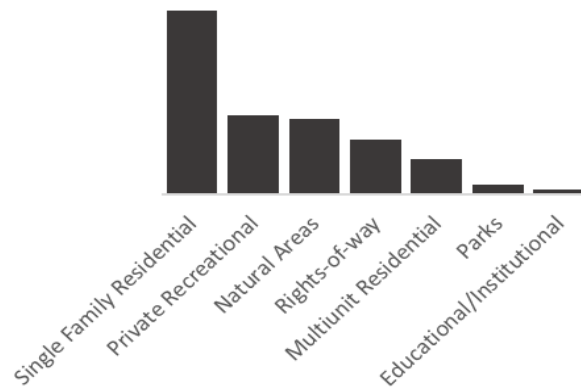


Figure 26. Suburban area dominant land use breakdown, land uses >10 ha

5.5.5 Rural

Rural lands, located outside the permanent growth boundary, primarily comprise agricultural lands and natural areas. As the largest growth strategy district, they account for 80% of the City’s total canopy area. However, due to extensive agricultural use, the City has limited control over canopy changes. Rural areas outside the Agricultural Land Reserve have 27% canopy cover, the highest of any land use division in Kelowna. However, trees and forests in this area are largely unmanaged, and are more likely than irrigated urban trees to be lost because of climate change effects or wildfire. The SUFS considers it probable that forest cover in Rural lands could decline in this area faster than reasonable efforts to offset canopy loss could take place. With low population density in these areas, street or other urban tree planting is considered a lower priority, despite the high plantable area and potential for forest health and climate-related losses. The primary

focus in Rural lands is the protection of agricultural and natural lands, while encouraging tree planting for restoration and biodiversity where feasible. There is also potential for natural forests in Rural lands to support renewed land management keeping with sylv principles and values.

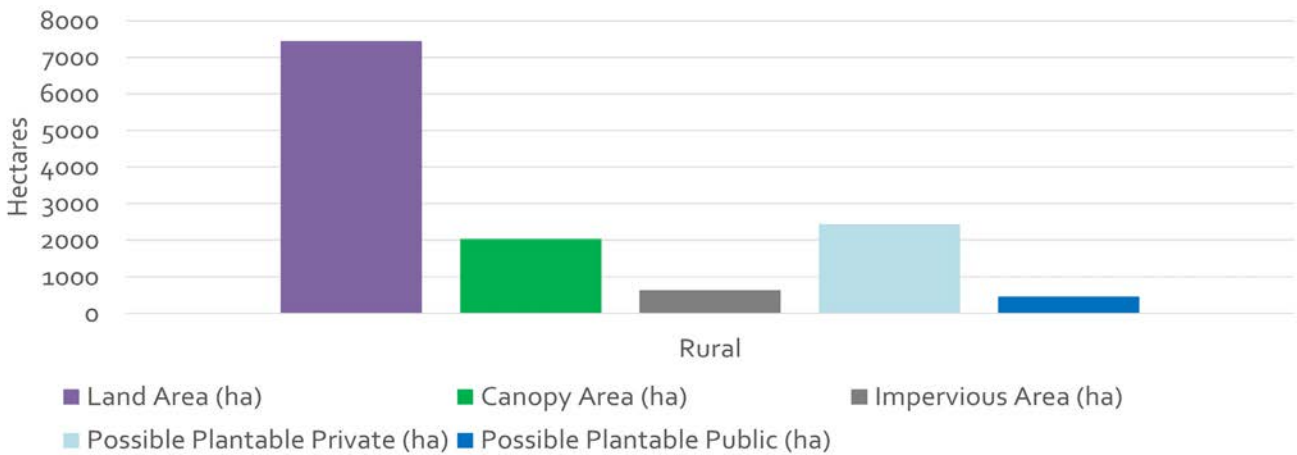


Figure 27. Land cover of the Rural Growth Strategy District (excluding Agricultural Land Reserve).

It is recommended that the City establish separate targets for each Growth Strategy District, rather than for urban and rural areas together. The distinctions are crucial because of the size of Rural lands could obscure changes in canopy in urban areas, making it difficult to track the strategy's success.

Canopy cover targets for each Growth Strategy District are presented in Table 5. These targets are based on the current canopy (2023) and land cover information, plus estimates of how many "new" trees would be required to meet the targets assuming they can be grown to maturity. Reaching the targets will require significant new investments in tree planting and protection recommended in the Strategy's Action Plan. If the Strategy is fully implemented, targets could be reached by 2050.

Table 5. Growth Strategy District summary: land cover, canopy targets, and planting opportunities.

	Urban Centres	Core Area	Gateway	Suburban	Rural
Land Area (ha)	602	2,507	1,384	1,904	15,380
Impervious Cover (%)	70%	55%	29%	25%	9%
# Inventoried Trees	4,333	10,073	852	6,694	1,326
Pervious Cover (Public) (%)	5%	7%	6%	12%	6%
Pervious Cover (Private) (%)	12%	20%	25%	37%	33%
Canopy Cover outside ALR (2023) (%)	12%	15%	10%	20%	27%
OCP Target to 2040	12%	20%	Combined 25% districts		
Proposed Target to 2050	20%	20%	15%	25%	25%
Primary planting opportunities	Streets, parks, plazas	Streets, parks, private property, parking lots	Streets, parking lots, highway corridor	Streets, parks, private property	Private property
Priority for public street and park tree planting	1 - Highest	2	4	3	5 - Lowest
Priority for private landscape planting	4	1 - Highest	3	2	5 – Lowest

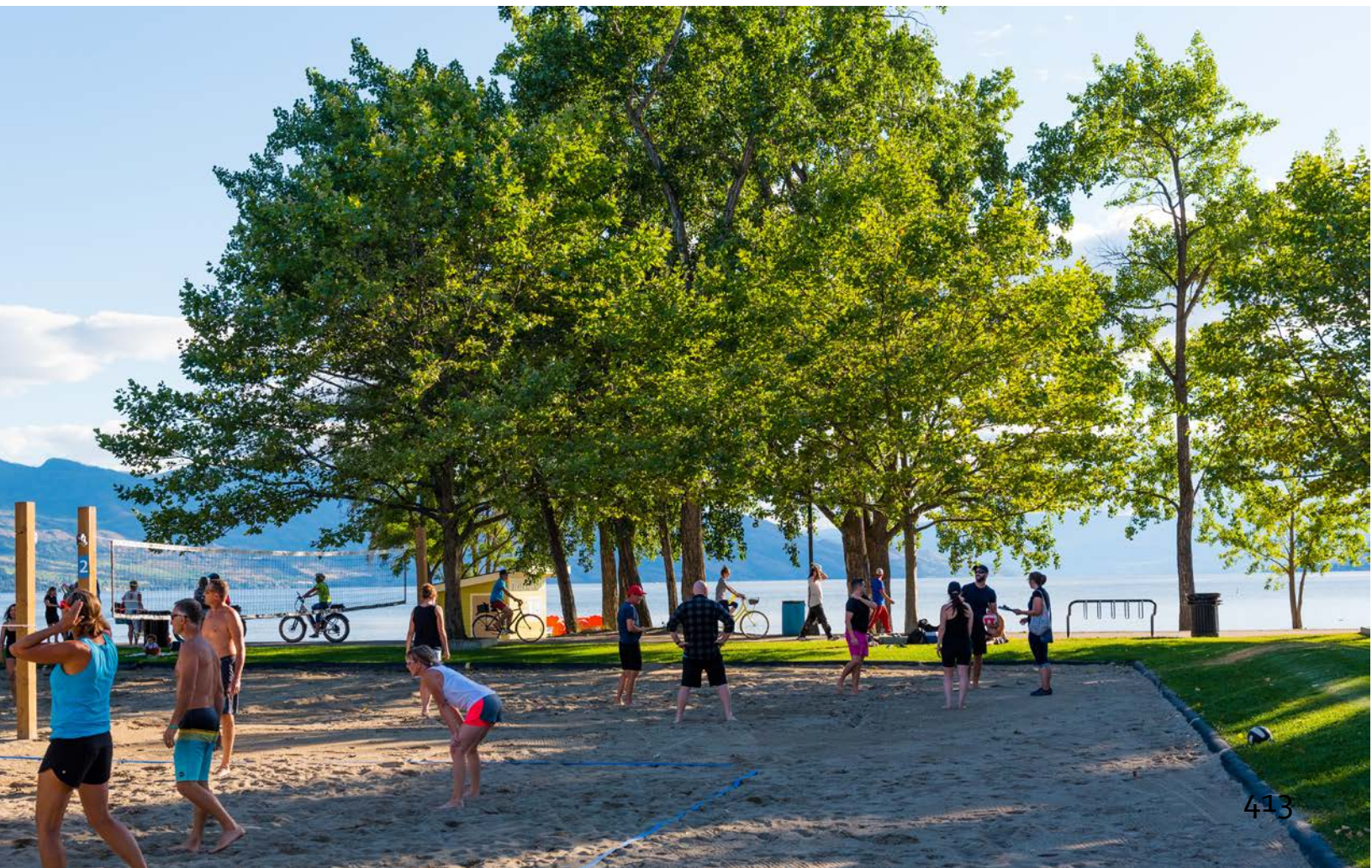
Table 6 provides estimates of the number of net new trees (i.e. trees planted on top of replacement planting) that would be needed to meet the canopy cover targets in each Growth Strategy District. The number assumes that each net new tree can be grown to maturity, and that the average size of trees in the Growth Strategy District is stable over time. Almost 80,000 trees will need to be planted by 2050 across the four urban Growth Strategy Districts — an average planting rate of over 3,100 new trees each year for 25 years. The City currently plants around 250 net new trees per year on public property, while in recent years 600 trees per year have been planted on private property through the NeighbourWoods program. Approximately 1,200 trees per year are planted in natural areas as part of restoration programming (this number is highly variable), although these are frequently smaller seedlings that take longer to contribute urban forest canopy cover. Trees planted through development requirements can help lift the urban forest towards the targets, but often these are replacing trees removed to accommodate new buildings.

Table 6. Summary of current canopy cover, canopy target, and approximate canopy gain and new trees by Growth Strategy District (excluding ALR).

Growth Strategy District	Canopy Cover (2023)	Proposed Target to 2050	Canopy Gain (ha)	New Trees Required**
Urban Centres	12%	20%	28	11,500
Core Area	15%	20%	116	30,000
Suburban	20%	25%	81	23,000
Gateway	10%	15%	51	14,000
Rural	27%	25%	/	/

Although more trees are needed in the Core Area, planting in Urban Areas and the Gateway is expected to pose major challenges in the form of finding suitable planting locations that also confer meaningful benefits for the urban heat island and other ecosystem services. High impervious cover is typical of the commercial, high-density, and industrial land uses found in these Growth Strategy Districts, likely needing tools and programs focused on tree planting in hardscapes.

**Based on average tree canopy size (2023) in each area.



6 WHAT THE FUTURE HOLDS

Kelowna’s urban forest faces a number of challenges, but the City also has opportunities it can leverage to enhance urban forest management. Taking advantage of opportunities will be essential to expanding Kelowna’s urban forest during a period of significant change.

6.5.1 Climate change impacts

Climate change is creating changes within the urban forest. Kelowna’s climate modeling indicates shifts towards hotter, drier summers, milder winters with increased rainfall and reduced snowfall, and a higher likelihood of extreme weather events such as heavy precipitation. While most trees can tolerate some degree of variation, consistent and significant changes in factors like soil moisture and frost days will impact tree and forest health. These impacts may include drought stress, heightened vulnerability to pests and diseases, damage from flooding and wildfires, and diminished tree survival and regeneration in native forests. These issues will intensify as Kelowna’s climate exceeds the conditions local trees can tolerate. Adapting the urban forest requires better tree and nursery supply management and physical modifications to planting environments. Planning and policy adjustments that guide these changes and develop a framework for responsible and proactive monitoring

and maintenance will improve the climate resiliency of the City’s urban forest.

6.5.2 Reconciliation and decolonization

The City recognizes that it is within the traditional, ancestral, unceded territory of the syilx/Okanagan people. The impact of colonization has been a drastically changed landscape – and the creation of an urban forest. The privatization of the landscape and conversion of traditional ecosystems into urban neighbourhoods and agriculture has meant a loss of access to cultural resources and land-based practices. As part of a broader commitment to meaningful reconciliation, the City of Kelowna is working to repair relationships with the syilx/Okanagan people and learn how to integrate syilx values and worldviews into how we manage our responsibilities to the land. Urban forestry, as part of the City’s land management, offers potential avenues for projects and collaborations that can advance this relationship. Staff can learn from Indigenous Ecological Knowledge Holders which species were more common in our community and seek guidance on forest structure and cultural burning practices to re-establish the open grassland-forest ecosystem.

Table 7. Impacts from Climate Projections for the Okanagan Region report (Feb 2020).

	Change in Summer Days Above 30 Degrees	Hottest Day Spring	Hottest Day Summer	Frost Days	Growing Season	Precipitation - Summer	Precipitation All Other Seasons (non-Summer)
Past	24 days	28.3	35.3	102 days	237 days		
2050	Average 32 days (range 19-48)	2.9 degrees warmer (range 2 to 4)	4.4 degrees warmer (range 2 to 6)	53% less (range 63% to 41% less)	44 more days (range 31 to 61 more)	12% less (range 31% less to 4% more)	Ranges from 8% to 13% more depending on season
2080	Average 54 days (range 32 to 78)	4.6 degrees warmer (range 3 to 6)	7.1 degrees warmer (range 5 to 9)	76% less (range 80% to 65% less)	78 more days (range 60 to 93 more)	20% less (range 48% less to 0)	Ranges from 15% to 19% more depending on season

6.5.3 Equity in the urban forest

The urban forest canopy is not distributed so that the people most in need have access to urban forest benefits. A map of the City's inventoried trees shows relatively few are found in lower-income neighbourhoods and neighbourhoods where a high percentage of the population belongs to a visible minority. These areas also happen to be where much of the City's future growth is planned. Building equity in the urban forest is a long-term task that will require sustained investment in new trees and planting sites in under-served areas. The City can continue tracking indicators of social vulnerability and use them to update its planting and program priorities as progress is made.

6.5.4 Development and urbanization

Kelowna has little urban forest canopy in the areas that will be the focus of growth over the next 20 years. Urban Centres have impervious surfaces totalling 70% of their total area, leaving little room for trees. While urbanization has clear sustainability benefits compared to conventional suburban development, effort is needed to ensure urban forest canopy is sustained and increased in urban areas. Kelowna has the opportunity to combine urban development with greening efforts by continuing to improve efforts to integrate green spaces and urban forests into new developments. Development rules can incentivize tree and soil retention or replacement, helping preserve canopy cover or plantable space on private property. The City also needs to invest in planting sites on public property to continue expanding urban forest canopy. With the right policies in place, some of this investment can be supported financially by development through in-kind contributions or contributions to the Tree Fund.



6.5.5 Invasive species and pests

The alteration of native ecosystems due to human activity has introduced invasive species and allowed them to establish in Kelowna's natural environment. These invasive species include noxious weeds, self-seeding tree species, and pests such as fungi and insects that lack natural controls in their new surroundings. Some species were intentionally introduced for economic or cultural reasons, while others arrived accidentally. Invasive species have adverse effects on the urban forest by reducing biodiversity and directly attacking trees, leading to a decline in ecosystem services. Climate change also contributes to the spread of invasive species, as Kelowna's changing environment becomes more hospitable to species from warmer climates. Ongoing monitoring and detection efforts can help prevent and control their impacts, while public participation in stewardship programs plays a crucial role in identifying and eradicating invasive species.



6.5.6 Better asset management

Trees and forests on City-managed property are not currently integrated into the City's asset management systems. This is primarily due to the difficulty of quantifying the value of trees and the limitations of traditional accounting frameworks in capturing natural assets that appreciate over time. There are also technological gaps in how tree assets are inventoried and tracked. The City's management budgets for trees and forests will likely need to grow over time as new trees are added to the inventory in urban areas, and climate change increases both demand for trees and the impacts on forest health. Asset management approaches would help to identify the life-cycle costs

of maintaining urban forest assets, and inform future budgets to ensure they are maintained at a consistent standard.

6.5.7 Water scarcity and limitations

Kelowna's climate is semi-arid and becoming drier over time. Many trees already struggle to access sufficient moisture from the soil during the growing season. Lengthier periods without rainfall and higher temperatures will increase evapotranspiration from soils, exacerbating the impacts of drought. Despite outdoor watering being infrequent for five months each year, over half of the Okanagan Valley's annual household water usage is attributed to outdoor landscaping. Paradoxically, increasing tree canopy cover could aid the City in achieving water conservation goals by providing shade that reduces evapotranspiration from thirsty grasses and turf. Choosing the right species for the right place means selecting more drought tolerant tree species or native riparian species, such as water birch or cottonwood, adapted to take advantage of high water tables.

6.5.8 More wildfire

Kelowna is in a wildfire dependent ecosystem. However, wildfire can also pose a major threat to communities and the urban forest itself. Wildfires of high severity are increasingly frequent in British Columbia, driven by past forest management practices, fire suppression, forest health issues like pine and fir beetles, climate change, and human-caused ignitions. Kelowna seeks to manage the risk of wildfire to the community through implementing its Community Wildfire Resiliency Plan, which includes recommended actions to reduce fuel accumulation in natural areas and improve home building and landscaping in the wildland-urban interface. Urban forest management can support wildfire mitigation efforts by promoting ecosystem health in natural areas (including where appropriate reintroduction of fire as an ecosystem management tool) and fire-conscious landscaping in proximity to homes and business in the interface.



6.5.9 Growing awareness

Through the engagement process, many community members indicated they valued trees and forests and shared ideas and aspirations for improving urban forest management. Kelowna's stewardship and outreach programs are essential tools for generating broader public acceptance and awareness of urban forest management. Since the majority of plantable areas in Kelowna are on private property, programs like NeighbourWoods play a crucial role in fostering community buy-in, providing educational resources on tree planting and maintenance, and creating opportunities to educate the public about the City's other initiatives and tree protection regulations.



7 SHAPING THE VISION & PRINCIPLES

7.1 What we heard: public engagement

The first phase of public engagement for the Sustainable Urban Forest Strategy took place in November and December 2022. The City sought input on a long-term vision to guide urban forest management through an online survey, online mapping tool, and online public open house and a workshop with interested and affected organizations. The second phase of engagement took place in the Spring of 2024 and sought input on the draft SUFS through an online survey, in-person open houses, and a virtual open house. Over 800 people participated in engagement opportunities throughout the project, almost all of whom live in Kelowna.

7.1.1 Imagining the future

Participants value the climate change resilience, ecological, and environmental benefits provided by the urban forest more than other benefits. People believe large and mature trees are an important feature of the urban forest, and that the City and residents play roles in increasing urban forest canopy through more street tree planting and better tree protection to conserve a healthy mix of native and climate-suitable species. People want to ensure Kelowna's future urban forest continues to support native species and biodiversity, even as it adapts to climate change.

In your words: Kelowna's urban forest in 2040

"A tree in every yard [...] Fruit and nut trees in public spaces, helping feed the community. Education modules in schools about trees and gardening, with practical experience to involve youth."

"Lots of trees on every block, trees well placed for safety and appropriate distances from buildings to avoid structural damage. Fewer "weed" trees that cause problems, fewer cedars and intensive water-use trees."

"Every road in the city would have healthy, mature trees (native to area or supporting local bird and other wildlife) shading the sidewalks and roadways"

Survey participants value treed parks and greenspaces for their recreational benefits and the habitat connections they provide between natural areas.

Outside of parks and natural areas, residential areas with many large or older trees are highly valued. An estimated 80 per cent of participants stated they live on a street with no large trees, while 72 per cent of participants would prefer to live on a street with large trees, such as in Figure 28. Residents believe Urban Centres are the most important place for tree planting, followed closely by the Core Area. Rural areas outside the Permanent Growth Boundary were ranked as the lowest priority for tree planting.

In Phase 2 of engagement, a majority of survey respondents (78 per cent) agreed with the proposed vision statement informed by community input during Phase 1. Similar levels of support were shown for proposed canopy cover targets. Open-ended comments received during this phase expressed concern about the trade-offs between the urban forest and wildfires, water scarcity, housing supply, and the cost to citizens as barriers to imagining the future. The draft SUFS was amended to extend discussion on conflicting management priorities for the City.

In your words: Canopy cover targets and draft vision

"An increase in trees on public property equals an increase in costs ultimately borne by the citizens. From maintenance to replacement to management and so on. Somewhere the costs need to be paid for. Residents/individuals ultimately pay for that."

"I think the strategy needs to start without delay. The downtown core is so hot and windy, it is reverting to a desert. Shrubs can do wonders too. All plants remove carbon and beautify the area as well as provide habitat for birds. More trees in the parks!"



Figure 28. 72% of survey respondents would prefer to live on a street with large trees, such as in this image.

7.1.2 Priorities for management

Engagement participants were asked during Phase 1 to prioritize ideas for City and private property to support the urban forest. On City property, several actions are seen as high priority, including constructing new planting spaces for trees, improving species selection and climate suitability to reduce irrigation, and improving engineering standards for soils to support street trees. On private property, there is broad support for adjusting development regulations to require more tree planting, improving engineering standards for tree planting and selection, and continuing to offer incentive programs like NeighbourWoods to encourage tree planting on private land, and requiring more detailed arboricultural information during development processes (Figure 29). Supporters outnumbered those opposed to expanded tree protection on private property and allowing variances to development to incentivize tree protection during both engagement phases.

During phase 2 engagement, survey respondents were asked to prioritize strategies for implementation. While engagement showed majority support for all strategies, support was strongest for strategies to protect, connect, and expand the urban forest.

7.1.3 Stewarding the urban forest

Respondents during both engagement phases showed interest in contributing to urban forest stewardship, and were most likely to plant pollinator-friendly native plants, maintain trees on their property, and plant one or more trees on their property. The results indicate many people have higher interest in caring for trees on their own property; however there is also general support for more public education and stewardship opportunities on City lands.

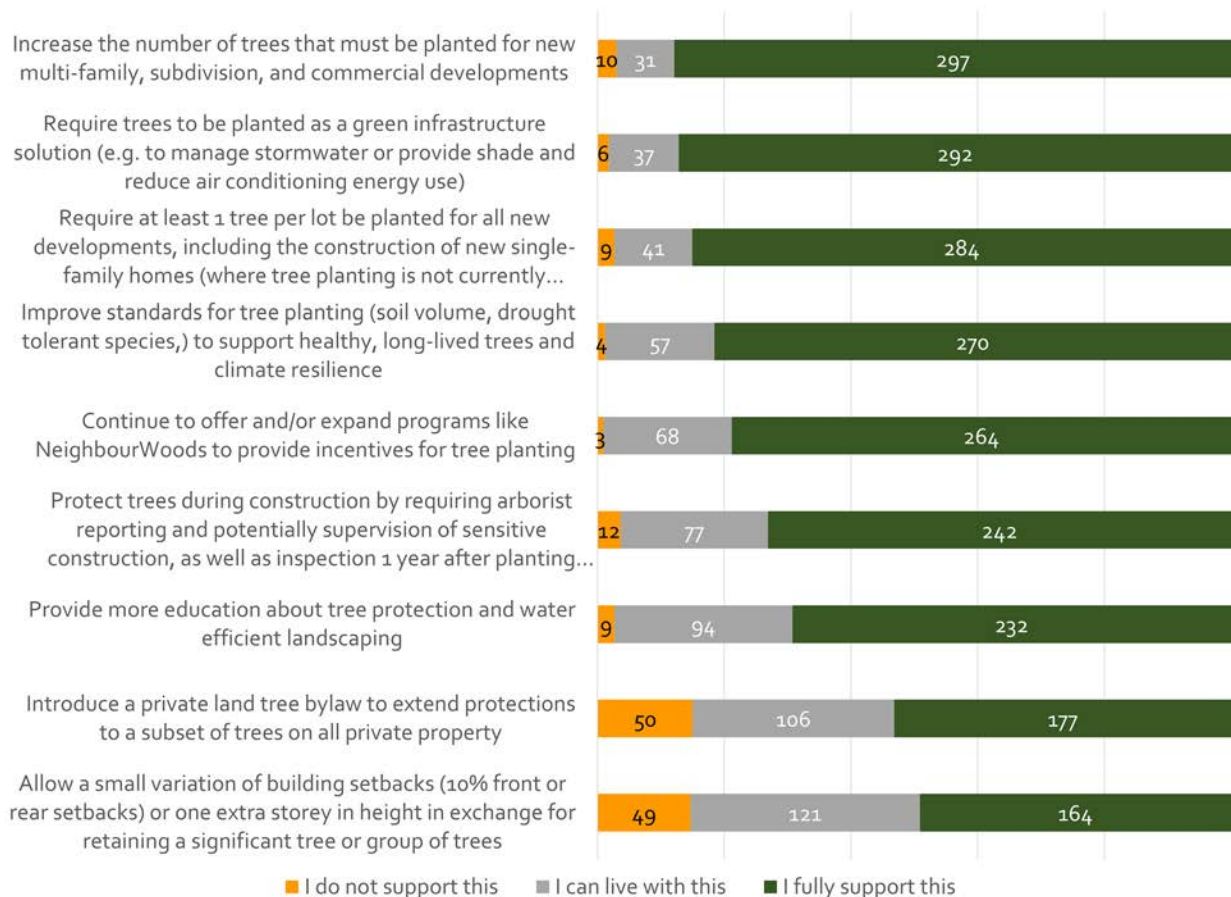


Figure 29. Levels of support for actions to improve the urban forest on private property, from Phase 1 of engagement.

Community participation supports Kelowna's urban forest

Whether through tree planting on private property supported by NeighbourWoods, calls for service to the City regarding trees and vegetation in parks, or watering trees through the Water Me initiative, Kelowna's community is already a key part of maintaining and enhancing the urban forest in the community. The Water Me program organized by Parks Services helps maintain healthy trees in areas where irrigation cannot be installed, such as beaches on Okanagan Lake. The "Water Me" signs, posted near trees on public property, invite volunteers and visitors to water trees to help them establish. Volunteers are invited to visit the tree when they can to provide supplemental watering during the summer growing season, easing the demand on Parks staff for this service.

A white rectangular sign with rounded corners, hanging from a blue string. The sign features the text 'Water ME' in a large, bold, dark green font, with a blue water drop icon next to 'ME'. Below this, there is a small illustration of a green tree growing from a log. The sign is placed on a sandy beach with large grey rocks and a young tree in the background. The background also shows a body of water and distant hills under a clear blue sky.

**Water
ME**

Help prevent
erosion. These rocks
and trees
keep the beach
in place.

Please contact Parks
250 469-8503
for more info

City of



7.1.4 Perceived barriers and opportunities

Engagement participants were satisfied with the current urban forest management program's storm and debris clean up (emergency response), tree pruning, and hazardous tree removal. Participants are dissatisfied with public education around the value and care of trees, tree protection standards and policies, and tree planting.

Participants see space limitations, existing trees, and strata/landlord permissions as being major barriers to planting trees on private property. Incentives for tree planting would be knowing which species are suitable for current and future climate, having space to plant, and having someone to call for help in selecting the appropriate tree species or to provide planting guidance. There is wide interest in partnering broadly with Indigenous peoples to advance mutually beneficial urban forest management, engaging with schools and tree nurseries, and improving communication with residents about urban forestry services and opportunities to volunteer.

Your ideas: How should the urban forest be managed?

"Monitor trees on City-owned land in order to detect problems before they become bigger."

"Weed around young trees to reduce water competition, involving the community."

"Plant more indigenous species, and plant more edible fruit trees to feed the homeless and folks using the foodbank."

"Implement a dollar value per tree species and size that would be considered in the overall cost when determining the worth and viability of future development."

"Engage the community in tree planting and learning about nature. Implement a communications strategy targeting tourists so they take care of our land too. Partner with Okanagan Nation Alliance for Indigenous-led initiatives; we have to learn from the land keepers."

"More trees planted where they have died or been damaged in parks. More trees to provide shade along the lake; it is too darn hot to be in the full sun for very long."

"There is a tremendous opportunity for the planting of more street trees, though it seems making sure soil volumes and water access needs to be designed before trees are planted. Protection needs greater priority."

"Hire skilled arborists. Make sure the companies pruning and caring for trees are properly skilled and educated."

"Accelerate the effort. Trees take a long time to grow. We should be investing the money and time to do more now!"

"Public education of citizens and business owners is critical to build and maintain support for growing out the urban forest. The shade value of trees is becoming increasingly important but seems to be dismissed by many."

"Trees should be protected. 10 years ago our neighbours removed 12 large trees from their property to the south. It changed everything for us: our lawn required more irrigation and our house and theirs were much hotter in the summer."

"Private property is a challenge. How much can private landowners be limited in what they use their land for?"

7.2 The Vision

In consideration of Kelowna's urban forest context, management, challenges, and opportunities, and what we heard, the Sustainable Urban Forest Strategy is guided by the following vision:

Kelowna's urban forest will continue to expand, connecting our green urban centres to our natural areas. Our urban forest will be managed to be a healthy, safe and viable nature-based solution that improves our livability and helps our community mitigate and adapt to a changing climate.

7.2.1 Context on the Vision

The urban forest is a network of diverse and interconnected tree canopies in streets, parks, backyards, and natural areas that provide clean air, shade, wildlife habitat, and myriad of benefits accessible to everyone who lives, works, and visits Kelowna. The urban forest consists of all trees, forests, plants, soils and associated ecosystem components located within the City, and is an integral part of Kelowna's

natural systems and green infrastructure. Trees and forests contribute to the resilience of our community to a changing climate, and the livability of our urban environments. We manage our urban forest using best practices in protection, planting, and maintenance, supported by a robust network of community partners who work together to expand and enhance the urban forest.



7.3 Principles

Eight core principles underpin the strategy and guide the City's urban forest management efforts:

Principle 1: Take action on climate change

Connections between the urban forest and climate resilience are clear, and urban forest management will improve Kelowna's climate resilience.

Principle 2: *Protect and restore our environment*

The urban forest is a reserve of biodiversity and can connect habitats and natural areas into larger, more viable ecosystems.

Principle 3: *Incorporate equity*

The urban forest provides ecosystem services and benefits public health, improving the lives of people who have access. There is a higher need for urban forest ecosystem services in socially vulnerable communities, particularly those exposed to extreme heat.

Principle 4: *Right tree, right place, right function*

The right tree in the right place will maximize the benefits, minimize risks and avoid unnecessary costs.

Principle 5: *Maintain healthy and safe trees*

Healthy trees have longer lives, cost less to manage, and produce more ecosystem services.

Principle 6: *Monitor, learn, and innovate*

Urban forests are dynamic, as are the cities and climate in which they grow. Monitoring change, learning from implementation by innovating will help to improve management through time.

Principle 7: *Work together*

Kelowna's urban forest is a community resource managed by many actors. Only by working together can urban forest management achieve the Vision for the Sustainable Urban Forest Strategy

Principle 8: *Support reconciliation*

Kelowna's place on unceded territory makes it imperative to improve the recognition of Indigenous people and land management through urban forestry.

8 GOALS, STRATEGIES, ACTIONS

The Action Plan to achieve the Vision is built around four Goals, 10 Strategies, and 64 Actions.

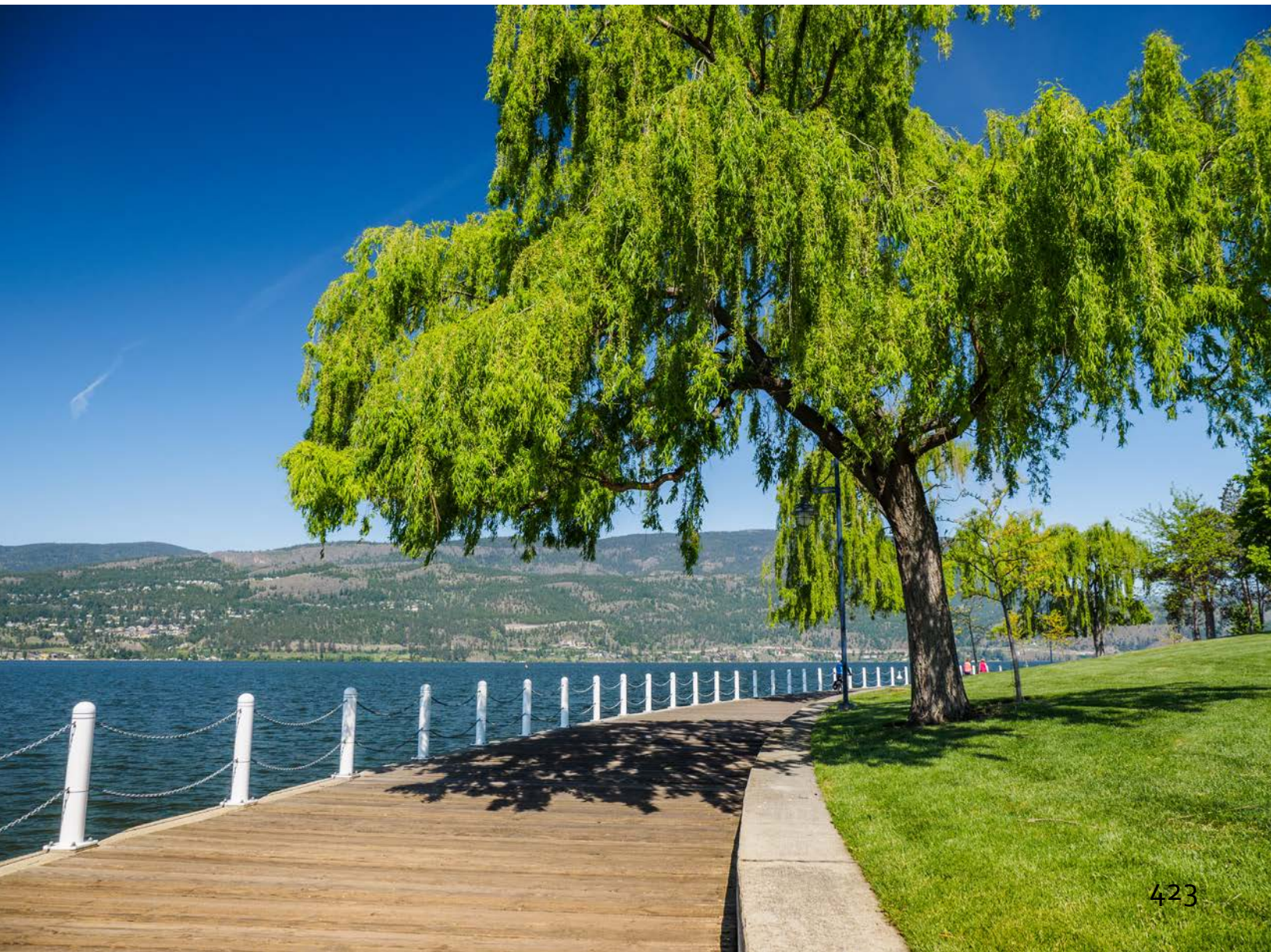
Goals A goal represents the City's aspiration for a key theme of urban forest management. They are strategic directions.

Strategies A strategy is a plan of action to achieve a goal or part of a goal.

Actions An action is something the City can do to implement a strategy.

This chapter provides an overview of what the City will need to do to implement the Sustainable Urban Forest Strategy, focusing on goals and their related strategies.

For detailed actions, see the Action Plan (Chapter 9).



Goal 1: Protect, connect, and expand the urban forest

Increasing canopy cover in the City can address inequity, climate change impacts, and safeguard ecosystem services.

Kelowna must expand its urban canopy to meet the needs of current and future residents. Enhancing the urban forest involves both planting new trees and preserving what already exists.

Kelowna's current canopy cover is estimated at approximately 22% (excluding ALR lands), which is a reflection of the semi-arid, grassland environment and urban planting trends. Urban areas typically have less than 20% coverage, with a few areas being almost devoid of tree cover. This means that Kelowna's canopy is not concentrated where most people live and work.

Low canopy in urban areas reduces ecosystem services and increases the fragmentation of surrounding natural habitats. As climate change leads to higher summer temperatures, urban areas will require more trees to provide cooling benefits. Moreover, urban

planting with irrigation may help counter the loss of forest cover in natural areas due to drought, fire, or a transition to grassland due to climate change.

Strategies under this goal will reshape the City's policy and planning to preserve trees, promote tree planting, and protect natural areas.

Strategy 1: Strengthen policy, planning, and implementation to protect, connect, and expand tree canopy

Kelowna will work to fill policy gaps and improve recognition of trees in project planning and execution. This strategy proposes revising City bylaws to increase tree planting through development, subdivision, and servicing, as well as strengthening tree bylaws for public and private property. This strategy also recommends considering how trees are addressed internally by City staff during the design and planning of capital projects to ensure new trees are added and to reduce avoidable loss of City-owned trees.

Case study: City of North Vancouver’s minor development variance permit

The City of North Vancouver has updated their Development Procedures Bylaw to allow for minor variances from its Official Community Plan and the Zoning Bylaw to allow for tree retention. The bylaw specifies the scope, criteria, and procedures of applying for the minor development variance permit. One of the criteria allows a reduction of the minimum required parking space for vehicles and bicycles to retain mature on-site trees and ensure adequate soil volume to support tree health. The bylaw also allows the delegation of Council powers to city staff to issue Development Permits and Minor Development Variance Permits, as well as require security from permit applicants for retained trees.

Case study: Campbell River’s street tree structural soil breakouts and soil channel standard.

Street trees are an important component of the urban forest, but they are often subject to challenging conditions such as compacted soil, inadequate soil volume, and limited permeability. The City of Campbell River integrates tree planting details in its Subdivision and Development Service Bylaw. Details such as the depth and location of structural soil breakout by street landscape areas are specified with the intention to expand growing space for trees and other vegetation along streets, by connecting soil volumes with permeable area on private property through soil channels and structural soil breakout zones. These measures will help enhance the growing conditions for street trees and promote their overall health and longevity.

Case study: City of Guelph’s Tree Compensation approach

The City of Guelph’s Tree Technical Manual outlines rules and steps for protecting, planting, and maintaining trees during development and construction on public and private properties. The Technical Manual includes compensation requirements for removals or damage of regulated trees (defined by its tree bylaw), as well

as compensation approaches (e.g., applicability and calculation methods). Four compensation approaches are provided – aggregate caliper approach, area based canopy approach, mass planting approach, and cash-in-lieu approach:

1. Aggregate caliper formula: applies when compensation is to be provided in the form of on-site or off-site tree establishment. The total diameter at breast height (DBH) of trees that need to be replaced shall be replaced in whole by an equivalent caliper of replacement trees.
2. Area based canopy compensation: may be applied for on-site compensation of removed plantation communities outside of the Natural Heritage System. This method is typically used for densely treed communities that are difficult to inventory. The compensation required is determined by the area of the plantation community and applying a factor of one tree for every 10 m². A mass planting approach may also be required.
3. Mass planting approach: allows planting shrubs and herbaceous species, in addition to trees, to support on-site tree establishment and ecological restoration goals. The number of plants required is based on the equivalent wholesale value of the proportion of required compensation tree plantings from the compensation method used (aggregate caliper or area based canopy compensation). The mass planting approach is not intended to fully replace tree compensation but to provide flexibility in achieving restoration and management goals relating to Significant Natural Areas, Natural Areas, and Wildlife Crossings.
4. Cash-in-lieu for tree establishment: applies when development makes it impossible to replant vegetation on the site. The City may ask for money compensation as a permit condition according to the Tree Bylaw. This money will be used for tree planting and naturalization projects that align with the goals and objectives of the natural heritage system and support the tree canopy.

Strategy 2: Expand the urban forest equitably in urban and core areas

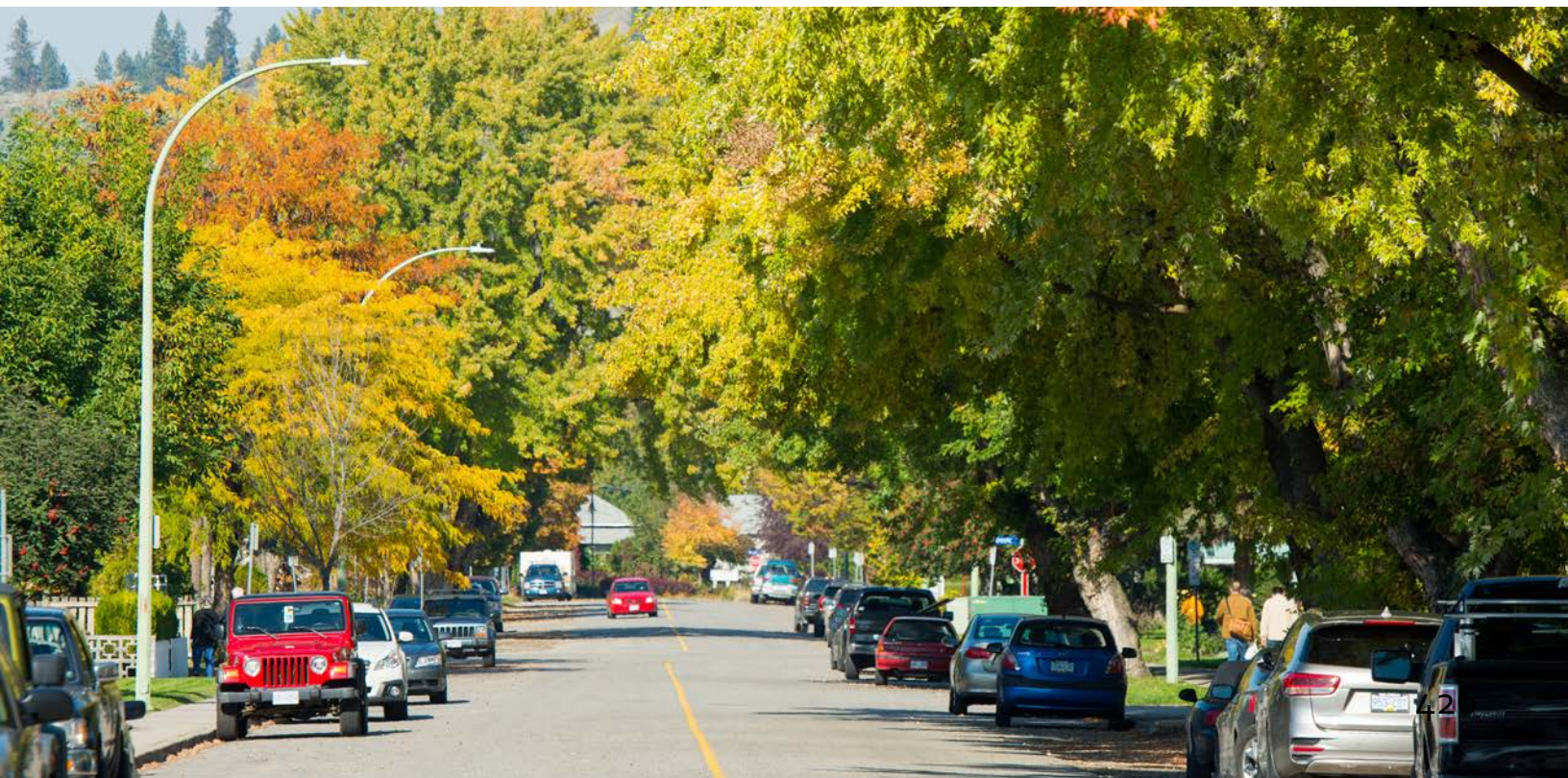
Kelowna will direct tree planting to low equity areas as a priority, guided by enhanced planting design and installation and better tracking of planting sites. This strategy seeks to leverage the available public space in Urban Centres and the Core Area so that its suitability for trees is conserved or enhanced and planting site occupancy increases on City property. The strategy also seeks to expand the NeighbourWoods program to increase tree planting on private property in low equity areas.

Strategy 3: Improve the quality and suitability of trees being planted for the site and climate requirements

Across all planting programs, Kelowna will apply the principle of right tree, right place. This strategy invests in Kelowna's tree nursery and seeks regional partnerships to expand buying power and potentially enable Okanagan communities to access more genetically appropriate stock and species for urban tree planting and natural restoration. The City can also guide better tree selection by reviewing its species lists used for capital projects and development to integrate lists into a single guide that reflects current climate adaptation considerations.

Case study: Landscape Incentives in the Toronto Green Standard

The City of Toronto has established its sustainable design requirements for new private and City-owned developments, known as the Toronto Green Standard. Initially introduced in 2005 as a voluntary standard, it now offers a combination of mandatory and voluntary elements, with higher tiers of performance eligible for development charge refunds. The Toronto Green Standard encourages environmentally sound and sustainable designs and practices. One of the focuses is to increase the urban forest. It requires all new developments to increase tree canopy, soil volumes, and tree watering, promote native species, and exclude invasive species. Additional tree planting or ecological restoration is voluntary and can be used to qualify for a development charge refund.



Case study: Assisted migration trials and seedlot selection tool

Assisted migration is the process of facilitating plant genomes travel in step with suitable climates in order to rematch trees and plants to ecological conditions, maintain habitat for native species, and migrate naturally across fragmented human landscapes. This process typically involves transferring seeds or seedlings within their current species range or just outside of it. The Seedlot Selection Tool, jointly created by the US Forest Service, Oregon State University, and the Conservation Biology Institute, is a GIS-based program to help land managers implement assisted migration trails of common native species in western North America. This tool allows users to select their planting

site location, and set management parameters such as the target species and future climate scenarios. Based on user's input, the tool produces a map showing locations of the appropriate seed sources or planting sites.

Figure 30 shows that the best Ponderosa pine seedstock for planting in Kelowna by the 2050s will come from interior of southern Washington, Oregon, and California under a moderate warming scenario (RCP 4.5), based on climate similarity analysis with a 1961-1990 baseline. The Province of British Columbia is developing a similar tool for use with the Climate-Based Seed Transfer system now being trialed.

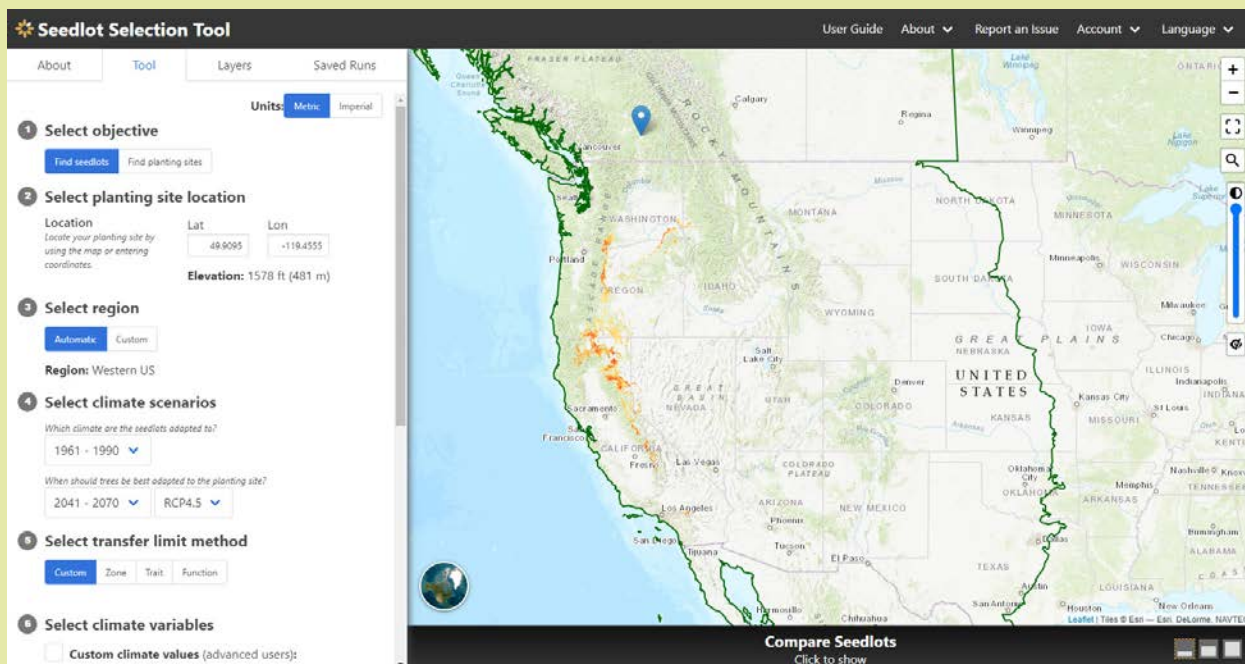


Figure 30. Seedstock selection tool with Ponderosa Pine selected.

Goal 2: Maintain a healthy, safe, and viable urban forest

Shifting the City's urban forest management towards best practices can prolong asset life and reduce the overall costs of management.

Kelowna needs to improve asset management of trees and forests to maximize urban forest value and decrease financial and public safety risks. Shifting urban forest management towards best practices requires re-evaluating service level targets and ensuring the Parks Division has the resources needed to implement the Sustainable Urban Forest Strategy. Kelowna's management of the urban forest has improved since 2011, when the first Sustainable Urban Forest Strategy was prepared. But continuing improvement is part of adaptive management, which recognizes the city's context is changing in terms of climate, landscape, and overall demand for urban forest ecosystem services.

This goal will establish the City as a tree-leader in the community, the Okanagan, and the province. Key to this goal are the principles of asset management: that urban forestry should seek to maximize the length of time trees live in healthy maturity as a strategy to reduce overall costs of management. This means improving documentation of work standards and priorities to aid decision making, as well as adjusting service level targets to provide enhanced care where needed. A well-managed and diverse forest helps reduce the risk of catastrophic loss of urban forest cover and associated benefits.

Strategy 4: Clarify City procedures and standards to improve efficiency and manage risk

Kelowna will document work processes and priorities to provide better service and improve reporting on service level targets. This strategy includes ensuring all subsurface green infrastructure installations are inventoried and marked physically in a visible surface location, but also new written guidance to establish how the City carries out urban forest management functions. The strategy will address the lack of a formal tree risk management policy which establishes clear inspection guidelines for different asset classes to promote public safety. Lastly, urban forest operational practices will be reviewed to find opportunities for more efficient maintenance.

Strategy 5: Transition from reactive to proactive maintenance of City trees

Kelowna will connect the public tree asset inventory and work order systems to improve tracking and budgeting while adjusting service level targets to provide better care. Service level targets currently in use can be specified for asset classes to improve operational efficiency and target maintenance where it is most needed. This strategy also seeks to improve the life cycle planning of urban forest assets, including the use of waste wood.

Strategy 6: Ensure resourcing is sufficient to deliver levels of service that maximize urban forest benefits

Kelowna will adopt fiscally responsible plans to provide enhanced urban forest management, using the budgeting process to adequately fund plan implementation. This strategy calls for the City to examine the staffing impacts of full implementation, which may require new roles in both urban forest operations and for plan review. Additionally, a framework for funding management obligations is needed that relates tree planting and enhanced service level targets to the operational budget for urban forestry. The City should look to external funding sources like the 2 Billion Trees Program, Canada Summer Jobs wage subsidies, or other grant programs as they become available to support urban forest management.

Goal 3: Involve people and organizations in urban forest management

Building partnerships with volunteers, local experts, institutions, and advancing reconciliation with Indigenous Peoples, will strengthen the urban forest.

Kelowna needs to partner with many individuals, organizations, and Indigenous peoples to sustain the urban forest. The City is directly responsible for only the 15% of the urban forest canopy that falls on City-owned property, with most of the urban forest being managed and maintained by others. Moreover, the urban forest is a boundary-crossing ecosystem providing value to every resident and visitor. This goal recognizes the dual purpose of building relationships between urban forest management and the broader community: first, it will help improve public awareness of the urban forest and management challenges in particular; second, it is the primary way the Sustainable Urban Forest Strategy can connect city-wide goals with actions affecting trees on private property. The goal also reflects on how colonial land management has diverted Kelowna's forest ecosystems from their path under Indigenous land management and aims to build dialogue with syilx/Okanagan people on how urban forestry can meet cultural needs and be strengthened by a continuing relationship.

Recent history during the COVID-19 pandemic and engagement for the Sustainable Urban Forest Strategy show that people desire more connections with the

natural environment for health and well-being benefits. Inviting people from many backgrounds to contribute ideas, time, and opportunities to volunteer for the benefit of the urban forest is at once a tool to satisfy this demand while improving equity, climate resiliency, and building transparency around urban forest management. This goal also envisions a city where the urban forest and successes in urban forest management are widely celebrated and acknowledged by the City and by community members.

Strategy 7: Improve awareness of and participation in urban forest management

Kelowna will expand its programs to offer more opportunities for the public to contribute to urban forest management. This strategy explores how the City can build partnerships with individuals to support tree planting and ecological restoration on public and private property, local practitioners and arboricultural industry to promote good standards of care, institutions to access new tree planting opportunities, incentives for tree protection on private property, and transparent reporting to encourage the public to interact with the City's urban forestry data. Actions should be guided by a Communications and Engagement Plan for the urban forest which identifies program priorities, leverages existing connections and relationships, and considers resourcing requirements for selected programs.

Case study: Saanich's Partnership Tree Program

The Saanich Partnership Tree Program invites private property owners to request boulevard tree planting in front of their homes. The District of Saanich is responsible for planting and maintaining the tree during its establishment. Homeowners can submit an application to indicate their preferred planting locations and tree species (from a given tree list), as well as tree care responsibilities they would like to sign up for, such as watering young trees from May to October for a minimum of five years. Since 2016, this program has added between 60 and 75 trees per year to Saanich's streets.

Case study: Victoria, Tree City of the World

The City of Victoria has received the recognition of Tree Cities of the World. The Tree Cities of the World Program is a joint effort by the Arbor Day Foundation and the UN Food and Agriculture Organization to recognize cities and towns for their success in urban forest management. Victoria manages approximately 150,000 trees. Guided by the City's Urban Forest Master Plan, the City proactively inspects and maintains its public trees, engages citizens in tree planting activities, requires a new "Tree Minimum" for private properties, and incentivizes tree retention and planting through its new Stormwater Utility Tax.

Strategy 8: Build relationships with syilx/Okanagan communities, First Nations Governments and Indigenous peoples through urban forest management

As part of a broader commitment to meaningful reconciliation, the City is working to repair relationships with the syilx/Okanagan people and learn how to integrate syilx values and worldviews into how we manage our responsibilities to the land, including urban forests.

Case study: ÁTOL, NEUEL Memorandum of Understanding between WSÁNEĆ Leadership Council and District of Saanich

WSÁNEĆ Leadership Council (WLC) and District of Saanich formalized a memorandum of understanding, ÁTOL, NEUEL (“Respecting One Another”) in December 2021. The MOU represents a commitment by WLC and Saanich to develop a strong and fair government-to-government relationship based on respect, cooperation, and partnership to address shared interests and priorities. The memorandum built on the rich dialogue that took place during the Cordova Bay local area planning process and addresses core themes, including parks management, economic development opportunities, and environmental concerns.

Goal 4: Monitor and innovate to achieve our urban forest vision

Monitoring progress will let us celebrate successes, learn from failures, and adapt to change.

Kelowna needs to track its assets and programs to enable adaptive management of the urban forest. The urban forest changes over time in response to management, factors in the environment, climate change, and the growth of the city. Keeping abreast of change means investing in how records are kept, how data is linked to other data, and how new information is incorporated into tree and forest management. Tracking canopy cover is just one part of a successful urban forest monitoring program. Other key indicators of urban forest sustainability include the rate of tree mortality, tree failure, and the status of pests and pathogens.

Since the urban forest responds to environmental stress, the pace of climate change makes it important for the City to trial new approaches to dryland forestry. Excessive drought and heat expands areas with significant annual soil moisture deficits that could pose challenges for various tree species across Kelowna. This includes the city’s valuable natural areas which currently harbour a substantial reserve of urban forest canopy. While the course of ecological change is uncertain, now is the time to organize and experiment. Since the issue is regional, Kelowna should seek to involve other municipalities, regional districts, the Province, and First Nations in a coordinated effort to address the potential loss of trees from drought impacts and other compounding effects.

Strategy 9: Monitor change, report, and adapt management to new information

Kelowna will improve tracking of tree mortality and removal so that it can compare mortality factors across sites and removal rates against the rate of replacement. A monitoring framework for the city is based on annual reporting on tree mortality, replacement ratios, and classes of forest pest and pathogen plus five-year monitoring of the urban forest canopy using LiDAR surveys (or another future accurate technology). The City’s data can be displayed through an online urban forest dashboard that brings together inventory and monitoring data for the public while offering back-end tools to urban forest managers that can connect the monitoring program to operational planning and budgeting.

Strategy 10: Trial innovative approaches to dryland urban forestry

Kelowna will explore ways to promote urban forest health in dry environments, including through selection of drought-adapted species and stock selection, installation of novel green infrastructure that conserves soil moisture like tree cocoons or bioinfiltration tree pits, and consider regulatory approaches to incentivize better water management like stormwater utility tax credits for tree canopy or carbon offsets that could be used to support tree planting and preservation. The City will also monitor outcomes from novel approaches and collaborate with the regional community to encourage knowledge sharing about successes and failures.

Case study: Green Infrastructure technologies for water conservation

The changing climate and densification of urban environments have necessitated new methods for planting trees and providing adequate growing space. Green infrastructure techniques can facilitate tree growth in urban areas, and they require low maintenance and are self-sustaining. Examples of green infrastructure for trees include the use of structural soils, bioswales, soil cells, and stormwater retention ponds or tanks. Structural soils, a mix of mineral and organic matter, allow for root growth while meeting engineering requirements. Soil cells, consisting of a modular system of “cells” filled with soil and placed under pavement, are deployed in higher-density areas to reduce soil compaction and increase soil volume for trees that are otherwise very limited. Bioswales and stormwater retention facilities can be incorporated into street design for passive irrigation and other ecosystem benefits like stormwater filtration. Bio-infiltration tree pits are compact bioretention systems that capture and filter the first flush of stormwater runoff with soil media within the tree pits, before releasing it into the sewer system. In some cases, multiple green infrastructure designs can be combined for optimal results. For example, the City of Stockholm has developed several models that integrate structural soil, biochar macadam, and rainwater gutter with aeration well that allows stormwater and gas exchange for improved tree health and stormwater management outcomes.

Case study: Soil amendments, biochar, & carbon

Soil amendments include conventional organic and inorganic fertilizers and mulches, as well as emerging applications like soil bacteria, mycorrhizal fungi inocula, and biochar. These amendments improve soil aeration, nutrients, and moisture retention. Soil amendments are being increasingly tested for their effectiveness. In Ontario, the City of Burlington is testing whether fungal and bacterial soil additives can improve transplant health. Other experiments have demonstrated good tree growth and long-term carbon sequestration benefits with the use of biochar. An increasing number of cities are implementing soil amendments for tree and plant health. For example, the City of Stockholm has introduced “Stockholm Model” planting bed designs that integrate the use of locally produced biochar to improve the growing space for trees.

9 ACTION & MONITORING PLANS

The Action Plan sets a 10-year road map for Kelowna's urban forest, identifying when work should start on each Action. The plan also assigns responsibility, estimated cost or budget impact, ease of implementation, and – importantly – the level of impact the action has on meeting its overall goal. The Monitoring Plan identifies performance indicators to track implementation progress.

9.1 Action Plan

The Action Plan includes 64 actions in total, 32 of which can be implemented using existing resources. It recommends the implementation of 25 actions in the short-term, 16 in the medium-term, and 9 in the long-term, while 14 actions will need to be ongoing during the Strategy's implementation.

Timeframe:

- Ongoing: actions that need to be addressed throughout the life of the plan
- Short 1-3 years – Implementation high impact, low cost
- Moderate 4-6 years – Implementation high impact, moderate cost
- Long – Implementation moderate impact or difficult to do, or can wait relative to other priorities

Responsibility:

- List of department(s) responsible for implementation

Cost:

- \$ - In staff time or already budgeted through another process
- \$\$ - <\$20,000
- \$\$\$ - \$20 - \$100,000
- \$\$\$\$ - > \$100,000 or new staff

Ease of doing:

- **Easy** – Change can be made by staff in one department, or would be part of a planned update process, or only involves exploring options
- **Moderate** – Change can be made with some support from other departments, is a moderate departure from current practice, and may require Council approval
- **Difficult** – Change requires extensive collaboration with other departments, would be a significant departure from current practice, and may require Council approval
- Dependency – will get implemented with another task

Impact on goal:

- **High** – Goal cannot be achieved without this action
- **Moderate** – Goal would be harder to achieve without this action
- **Low** – Is worth doing but goal could largely be achieved without the action

Goal 1: Protect, connect and expand the urban forest	Timeframe Short 1-3 yrs Med 4-6 yrs Long 7-10 yrs	Responsibility	Impact on Goal	Ease of Doing	Cost
Strategy 1: Strengthen policy, planning and implementation to protect, connect and expand tree canopy					
1. Require no-disturbance covenants (including tree covenants) to be submitted in a GIS file format, in order to have an inventory of the location of covenant areas.	Short	Information Services Development Planning	High	Easy	\$
2. Coordinate implementation of the SUFS with other related strategies such as the Climate Resilient Kelowna Strategy, Water Security and Responsibility Plan, Parks Master Plan, etc.	Ongoing	Parks Services Parks Planning Utility Services Climate Action & Environmental Stewardship	High	Moderate	\$
3. Revise canopy cover targets in the OCP, informed by the SUFS, to reflect goals for each Growth Strategy District due to the diverse challenges and opportunities in each.	Short	Parks Services Long Range Planning	High	Moderate	\$
4. Update the Zoning Bylaw 12375 to increase landscape island areas in parking lots to support sufficient tree soil volumes and assess impact of Zoning Bylaw changes for tree planting requirements to determine if minimum tree requirements can be increased for parking lots.	Short	Development Planning	High	Moderate	\$
5. Delegate minor variances to staff if mature on-site trees are being retained and covenanted. (Example: City of North Van Minor development variance permit).	Short	Development Planning	High	Moderate	\$
6. Develop a terms of reference for landscape plans to ensure tree protection areas and surveyed tree locations are included. ToR should also require identification of any public trees within 15 meters of the property line that will invoke Municipal Properties Tree Bylaw 8042.	Short	Development Planning	High	Moderate	\$

Goal 1: Protect, connect and expand the urban forest	Timeframe Short 1- 3 yrs Med 4-6 yrs Long 7-10 yrs	Responsibility	Impact on Goal	Ease of Doing	Cost
<p>7. Update Subdivision and Servicing Bylaw 7900, to:</p> <ul style="list-style-type: none"> a. Have soil volumes consistent with the Zoning Bylaw. b. Reinforce standard drawings for road cross-sections to separate trees and utility infrastructure, including standards where pavement/parking is reduced as necessary to support tree planting. c. Establish minimum boulevard soil volumes such as the following examples (unless using suspended pavement). <ul style="list-style-type: none"> • 1.5 m width for small trees on 8 m spacing (12m³ soil in a trench). • 1.8 m width for medium trees on 10 m spacing (18m³ soil in a trench). • 2.0 m width for larger trees on 12-15 m spacing (25 - 30 m³ soil in a trench). d. Reference a City tree planting, watering, and maintenance manual to ensure the right tree in the right place (see action 15). Examples include: Campbell River structural soil breakout, soil channel standard, RDNO standards, Surrey road sections. e. Consider requiring that any new installations of trees and tree friendly infrastructure (e.g. soil cells, pervious pavement, etc.) on public land be inventoried and uploaded into the City's GIS systems. 	Short	Bylaw 7900 Working Group Development Engineering Development Planning Parks Services Integrated Transportation and Information Services	High	Moderate	\$
<p>8. Establish an interdepartmental referral process to ensure that permit applications and capital infrastructure projects that could impact City trees or provide opportunities to expand tree canopy coverage are circulated to Urban Forestry in the initial planning & design stages to adhere to the following sequence of management actions for tree loss: avoid, mitigate, then compensate.</p>	Short	Development Planning Parks Services Infrastructure Delivery Infrastructure Operations Integrated Transportation Utility Services	High	Moderate	\$

Goal 1: Protect, connect and expand the urban forest	Timeframe Short 1- 3 yrs Med 4-6 yrs Long 7-10 yrs	Responsibility	Impact on Goal	Ease of Doing	Cost
9. Establish an inter-departmental working group to meet regularly to discuss progress and barriers to implementing the strategy, and explore opportunities to integrate implementation with other programs.	Short	Parks Services	High	Moderate	\$
10. Update Tree Protection Bylaw 8041 to: a. Expand the protected trees definition to include retained trees identified in a Development Permit. b. Update the hazardous tree definitions to be consistent with TRAQ (as per the International Society of Arboriculture).	Medium	Development Planning Climate Action & Environmental Stewardship	High	Moderate	\$\$
11. Investigate opportunities to collaborate with other organizations on the development and implementation of a natural environment management strategy to inform natural asset policy, future natural area land acquisitions, and updates to land use planning tools (e.g. covenant policy for environmentally sensitive areas (ESAs), riparian management area (RMA) widths, etc.).	Long	Capital Planning & Asset Management Climate Action & Environment Development Planning Parks Services	High	Moderate	\$\$\$
12. Update the Municipal Properties Tree Bylaw 8042 to include an equitable compensation approach for natural areas based on OCP Policy 14.5.7 no net loss of terrestrial habitat (example: Guelph tree technical manual Section 5).	Short	Parks Services	High	Moderate	\$\$\$

Goal 1: Protect, connect and expand the urban forest	Timeframe Short 1- 3 yrs Med 4-6 yrs Long 7-10 yrs	Responsibility	Impact on Goal	Ease of Doing	Cost
<p>13. Develop guidelines to support good planting practices and site design through a Landscape Plan Terms of Reference including:</p> <ul style="list-style-type: none"> a. Tree guidelines to clarify soil depths, proper installation and maintenance (example: Guelph tree technical manual Section 7). b. Tree protection plan for any trees to be retained. c. Tree protection guidelines for qualified professionals developing Tree Protection Plans that describe how to work around trees and what is needed in an arborist report and tree protection plan (example: Guelph tree technical manual Section 4). d. Guidelines for the use of suspended pavement systems (e.g., soil cells) to hold soil volume when open landscape areas are not large enough to hold the soil volume required per tree. e. Requiring a landscaping design that is climate resilient, FireSmart and biodiversity friendly. 	Short	Development Planning Parks Services Climate Action & Environmental Stewardship	Moderate	Easy	\$\$\$
<p>14. Amend the Institutional Development Permit Guidelines to strengthen the role of institutional lands as a leader in tree canopy expansion.</p>	Medium	Development Planning Parks Services Long Range Planning Climate Action & Environmental Stewardship	Moderate	Moderate	\$\$
<p>15. Develop a tree planting, watering, and maintenance manual that references City of Kelowna's Urban Tree Guide to support the right tree in the right place.</p>	Short	Bylaw 7900 working group Development Engineering Development Planning Parks Services	Moderate	Moderate	\$\$

Goal 1: Protect, connect and expand the urban forest	Timeframe Short 1-3 yrs Med 4-6 yrs Long 7-10 yrs	Responsibility	Impact on Goal	Ease of Doing	Cost
16. Develop a Landscape Standards Bylaw coordinated with Bylaw 7900 and Zoning Bylaw Landscape Requirements to support enforcement of the tree planting, watering and maintenance manual.	Short	Bylaw 7900 working group Development Engineering Development Planning Parks Services	Moderate	Moderate	\$\$
17. Consider expanding Tree Protection Bylaw 8041 to require a permit for tree removal outside of natural environment areas and/or those trees identified in a development permit as a way of tracking the rate of removals on private land. Consider automatic approvals, automated systems and new tree incentives to streamline the process.	Long	Development Planning Parks Services Climate Action & Environmental Stewardship	Moderate	Moderate	\$\$\$
Strategy 2: Expand the urban forest equitably in urban and core areas					
18. For public areas, identify, prioritize and plant locations with: a. Low tree equity (as per Figure 18 and 19). b. 'Vacant' boulevard planting sites. c. Locations to retrofit trees or pervious surfaces into under used or redundant streets. d. Trees in poor condition that will require replacement in the next 10 years. e. Park or open space locations for additional landscape tree planting. f. Project sponsorship or neighbourhood participation. g. Restoration of natural areas.	Ongoing	Parks Services Integrated Transportation	High	Easy	\$
19. Through urban centre and/or neighbourhood planning processes, require trees to be included as a requirement in the plans to improve tree canopy coverage in high vulnerability and low tree equity areas as identified in Figure 18 and Figure 19.	Ongoing	Long Range Planning Parks Services Climate Action & Environmental Stewardship	High	Easy	\$
20. Expand existing annual tree planting program by developing a 10-year urban tree planting strategy for priority planting areas (as identified in Action 18), funded in part from the Tree Reserve Fund.	Short	Parks Services	High	Moderate	\$\$\$\$

Goal 1: Protect, connect and expand the urban forest	Timeframe Short 1- 3 yrs Med 4-6 yrs Long 7-10 yrs	Responsibility	Impact on Goal	Ease of Doing	Cost
21. Formalize and expand the City's partnership tree program whereby residents of existing homes can request a City tree be planted in front of their property (if conditions are suitable), in exchange for input on species choice and watering support.	Short	Parks Services	Moderate	Easy	\$\$
22. Pursue funding opportunities through the capital budgeting process or external grant programs as they become available to fund street tree planting and maintenance in urban centres and the Core Area. Prioritize funding for trees in low equity parts of these areas as defined by Figure 18 and 19.	Ongoing	Capital Planning & Asset Management Partnership Office Parks Services Climate Action and Environmental Stewardship	Moderate	Moderate	\$
23. Expand the NeighbourWoods program to: a. Have more trees offered b. Target high vulnerability and low equity areas as outlined on Figure 18 and Figure 19. c. Investigate partnerships on institutional, commercial, industrial and multi-family properties and/or with other community organizations.	Short	Parks Services Communications	Moderate	Moderate	\$\$
Strategy 3: Improve the quality and suitability of trees being planted for the site and climate requirements					
24. Continue to update the City of Kelowna's Urban Tree Selection list to reflect current climate adaptation considerations, cultural and/or environmental factors.	Short	Parks Services	High	Easy	\$
25. Expand the City's bareroot nursery to improve establishment success, stock quality and reduce costs.	Short	Parks Services	High	Easy	\$\$

Goal 1: Protect, connect and expand the urban forest	Timeframe Short 1- 3 yrs Med 4-6 yrs Long 7-10 yrs	Responsibility	Impact on Goal	Ease of Doing	Cost
26. Explore approaches to procuring tree planting stock that would enable the City to influence the species, genetic material, quality, and suitability for Kelowna's future climate, including regional buying groups or entering a services agreement with a local nursery for a longer timeframe (e.g. five years).	Short	Parks Services	High	Moderate	\$
Goal 2: Maintain a healthy, safe and viable urban forest	Timeframe Short 1- 3 yrs Med 4-6 yrs Long 7-10 yrs	Responsibility	Impact on Goal	Ease of Doing	Cost
Strategy 4: Clarify City procedures and standards to improve efficiency and manage risk					
27. Develop a standard operating procedures document and distribute to City departments and affected organizations (e.g. Fortis) to create a common response to infrastructure conflicts, risk inspection, storm response, biomass utilization, etc.	Short	Parks Services	High	Moderate	\$
28. Formalize, update and implement public lands tree risk management policies to establish inspection guidelines, mitigation thresholds and actions, and responsibilities for tree risk assessments.	Short	Parks Services Risk Management	High	Moderate	\$
29. Continue and expand wildfire fuel mitigation in public spaces as outlined in the Community Wildfire Resiliency Plan to reduce wildfire risk as well as improve forest health.	Ongoing	Parks Service	Moderate	Easy	\$\$\$\$
Strategy 5: Transition from reactive to proactive maintenance of City trees					
30. Review levels of service for urban tree assets, including shifting to a 5-year tree pruning and inventory update cycle for inventoried street trees and a 10-year cycle for landscaped park trees, or a higher frequency where areas or species require regular clearance pruning.	Medium	Capital Planning & Asset Management Parks Services	High	Easy	\$\$\$

Goal 2: Maintain a healthy, safe and viable urban forest	Timeframe Short 1- 3 yrs Med 4-6 yrs Long 7-10 yrs	Responsibility	Impact on Goal	Ease of Doing	Cost
31. Review operational practices and recommend changes to maximize tree life expectancy, minimize maintenance requirements, and reduce the carbon footprint of urban forest operations (e.g., opportunities to reduce mowing, correct planting practices, increasing soil depth, or unnecessary tree staking etc.).	Medium	Parks Services	High	Moderate	\$
32. Establish average life expectancies for urban tree assets (residential street trees, urban centre street trees, park trees etc) to inform life cycle costing and replacement schedules for asset management planning.	Medium	Capital Planning & Asset Management Parks Services	High	Moderate	\$
33. Integrate field-based urban tree inventory and work order systems into asset management to track lifecycle costs, service levels, renewal timeframes, and vulnerabilities to better inform urban forest management budgeting and decision-making.	Medium	Capital Planning & Asset Management Parks Services	High	Moderate	\$\$\$
34. Develop an urban wood utilization plan* that defines the best utilization of urban wood categories and develops a process for wood utilization that supports carbon storage by directing waste wood to its highest and best use.	Long	Parks Services Climate Action & Environmental Stewardship Solid Waste	Moderate	Moderate	\$\$\$
Strategy 6: Ensure resourcing is sufficient to deliver levels of service that maximize urban forest benefits					
35. Update the tree reserve fund policy to support a wider range of tree planting and supportive tree activities .	Short	Financial Services Parks Services	High	Easy	\$

* An urban wood utilization plan is a strategy to manage and maximize the use of wood from urban trees that have been removed due to reasons such as storm damage, disease, or old age. The plan focuses on promoting sustainable practices for the collection, processing, and utilization of urban wood to maximize its value and minimize waste and store the carbon for longer. The goal of an urban wood utilization plan is to reduce the amount of wood waste generated from urban tree removals by diverting wood from landfills and promoting the use of wood products in local communities. The plan outlines strategies for salvaging wood, such as milling, drying, and storing, and identifies potential uses for wood products.

Goal 2: Maintain a healthy, safe and viable urban forest	Timeframe Short 1- 3 yrs Med 4-6 yrs Long 7-10 yrs	Responsibility	Impact on Goal	Ease of Doing	Cost
36. Develop an annual budget allocation amount per new tree, and per linear kilometer of trail or forest edge, that accounts for the increase in annual maintenance costs and supports desired service levels throughout the asset lifecycle. Review and align current operating budgets to the cost per tree, and prepare contingency budget plans for managing a major pest outbreak or recovery from a natural disturbance event.	Medium	Parks Services Capital Planning & Asset Management Financial Services	High	Moderate	\$
37. Apply for funding for tree planting, such as the 2 Billion Trees Program or other grant programs as they become available to support a stewardship program for more planting on private and public land.	Ongoing	Parks Services Partnership Office	High	Moderate	\$
38. Consider Sustainable Forest Initiative certification through the Urban and Community Standard.	Long	Parks Services	Moderate	Moderate	\$
39. Examining staffing levels and consider hiring new role(s) to: <ul style="list-style-type: none"> a. Address gaps in capacity to implement the Sustainable Urban Forest Strategy. b. Enforce developer obligations as they relate to landscape and boulevard requirements. c. Employ students and youth over the summer period to provide natural area stewardship capacity, update tree inventory information and complete other projects as needed (consider accessing external funding for student hires). 	Ongoing	Development Engineering Development Planning Parks Services	High	Moderate	\$\$\$\$

Goal 3: Involve people and organizations in urban forest management	Timeframe Short 1- 3 yrs Med 4-6 yrs Long 7-10 yrs	Responsibility	Impact on Goal	Ease of Doing	Cost
Strategy 7: Improve awareness of and participation in urban forest management					
40. Offer education and stewardship opportunities internally to City staff as a means of increasing their awareness, advocacy, and understanding of urban forestry in their daily work.	Short	Climate Action & Environment Development Planning Parks Services	High	Easy	\$

Goal 3: Involve people and organizations in urban forest management	Timeframe Short 1- 3 yrs Med 4-6 yrs Long 7-10 yrs	Responsibility	Impact on Goal	Ease of Doing	Cost
<p>4.1. Develop a communication and engagement plan, and associated resourcing requirements to guide the development of materials and stewardship programming, and include consideration of:</p> <ul style="list-style-type: none"> a. Developing a plan that supports multiple departments’ objectives for public education about urban forestry, wildfire, biodiversity and climate adaptation b. Existing programs that could support implementation, offered by RDCO and non-profit organizations c. Establishing formal partnerships with the stewardship sector and community groups to pursue grants and increase tree planting, tree care and community science activity d. Engaging equity seeking groups to understand barriers and opportunities for accessing urban forest benefits e. Supporting tree planting in neighbourhoods with low tree equity f. Encouraging FireSmart, and planting for biodiversity and climate adaptation g. Engagement with School District 23 to develop urban forest relevant curriculum, and to identify champion teachers and classrooms for future tree planting and natural restoration events h. Annual urban forest walks to improve people’s access to and understanding of Kelowna’s urban and park trees and forests i. Educational materials for the public and local nurseries that direct people to the City’s species selection tools and increase awareness about species to avoid due to invasiveness or forest health concerns such as fireblight, lilac borer and emerald ash borer j. Opportunities for private sector organizations to provide staff or funds for stewardship as part of their corporate social responsibility programs k. Educational materials for property management companies and stratas to aid in the management of larger boulevard landscape areas including trees. Model after other successful City programs to protect public infrastructure, such as Cross Connection Control annual notifications. 	<p>Medium</p>	<p>Climate Action & Environment Communications Parks Services Utility Services Kelowna Fire Department</p>	<p>High</p>	<p>Easy</p>	<p>\$\$\$</p>

Goal 3: Involve people and organizations in urban forest management	Timeframe Short 1- 3 yrs Med 4-6 yrs Long 7-10 yrs	Responsibility	Impact on Goal	Ease of Doing	Cost
42. Explore the potential for the City to provide water incentives or grants to residents who plant and maintain trees on private land, or who offer to water a 'partnership tree' in the boulevard for the first three years.	Long	Financial Services Parks Services Climate Action & Environmental Stewardship Partnership Office Utility Services	High	Moderate	\$\$\$
43. Pursue and maintain Tree Cities of the World status.	Long	Parks Services	Moderate	Easy	\$
44. When offering Qualified Water Efficient Landscaper (QWEL) courses integrate information on Kelowna's tree bylaws, tree protection standards, FireSmart, and best practices for urban forest management into training.	Medium	Climate Action & Environmental Stewardship Parks Services Utility Services Kelowna Fire Department	Moderate	Easy	\$
45. Update the City's website to include information about the implementation of the Sustainable Urban Forest Strategy update.	Short	Communications Parks Services Climate Action & Environmental Stewardship	Moderate	Easy	\$
46. Develop a regional network of urban forestry professionals including municipal staff, nurseries, consulting professionals and academics to share knowledge and work together to solve key issues, such as limitations in nursery stock or emerging forest health concerns.	Short	Parks Services	Moderate	Easy	\$
47. Establish working relationship with the Ministry of Transportation to increase tree planting in highway corridors.	Ongoing	Integrated Transportation Parks Services Roadways	Moderate	Moderate	\$

Goal 3: Involve people and organizations in urban forest management	Timeframe Short 1- 3 yrs Med 4-6 yrs Long 7-10 yrs	Responsibility	Impact on Goal	Ease of Doing	Cost
48. Increase engagement with Interior Health, School District 23, UBC Okanagan, FortisBC and other organizations for maintenance (e.g. pruning standards), protection and enhancement of Kelowna's urban forest canopy.	Ongoing	Development Engineering Development Planning Parks Services Climate Action & Environmental Stewardship	Moderate	Moderate	\$
49. Investigate options to require Qualified Water Efficient Landscaper (QWEL) certification for business licensing of tree services, landscaping, and irrigation companies.	Medium	Business Licensing Development Planning Climate Action & Environmental Stewardship	Moderate	Moderate	\$\$\$
50. Explore the potential for the City to fund grants to support maintenance of large, mature trees on private property.	Long	Financial Services Parks Services Climate Action & Environmental Stewardship Partnership Office	Moderate	Moderate	\$\$\$
Strategy 8: Build relationships with syilx/Okanagan communities, First Nations Governments and Indigenous peoples through urban forest management					
51. Engage and/or partner with the syilx/Okanagan people to: a. Develop species lists and/or planting sites that are culturally appropriate and consider climate adaptation b. Work towards respecting Indigenous knowledge and practices in urban forest programs, policy and operations	Ongoing	Cultural Services Parks Services Climate Action & Environmental Stewardship	High	Moderate	\$\$\$

Goal 4: Monitor and innovate to achieve our urban forest vision	Timeframe Short 1- 3 yrs Med 4-6 yrs Long 7-10 yrs	Responsibility	Impact on Goal	Ease of Doing	Cost
Strategy 9: Monitor change, report and adapt management to new information					
52. Continue to monitor the urban forest for different classes of pests and pathogens and update the City's Integrated Pest Management Plan as needed to respond to emerging pests and pathogens in a timely manner.	Ongoing	Parks Services	High	Easy	\$
53. Monitor City tree mortality and failure rates, and where there are repeat issues develop management responses.	Ongoing	Parks Services	High	Easy	\$\$
54. Explore partnering with Okanagan College, UBCO and other post-secondary institutions to open opportunities for applied internships, summer student positions, or limited student research projects to support stewardship and monitoring including: <ul style="list-style-type: none"> a. Assessing NeighbourWoods planting and survival b. Assessing private landscape (visible from street) permit outcomes for planting and survival c. Creating and updating inventories d. Restoration areas weeding, planting and watering e. Supporting stewardship programming and outreach 	Short	Parks Services	High	Easy	\$\$
55. Reassess canopy cover every two to five years using LiDAR or other accurate methods as technology advances. Examine canopy cover on private versus public lands to evaluate the need for more stringent regulations for tree removals.	Ongoing	Parks Services	High	Easy	\$\$\$
56. Develop an internal automated urban forest dashboard to track City metrics such as new and replacement tree planting rates, tree removals, trees pruned, tree permits issued, service request volume and response times, and operational costs.	Medium	Information Services Parks Services	High	Moderate	\$\$
57. At the time of re-assessing canopy coverage (see action 55), update the urban forest report card to evaluate program performance. Investigate options to collaborate with syilx Nation to obtain their perspective and direction on the report card.	Short	Climate Action & Environment Parks Services	High	Moderate	\$
58. Review and update the Sustainable Urban Forest Strategy every 10 years.	Long	Climate Action & Environment Long Range Planning Parks Services	High	Moderate	\$\$\$

Goal 4: Monitor and innovate to achieve our urban forest vision	Timeframe Short 1-3 yrs Med 4-6 yrs Long 7-10 yrs	Responsibility	Impact on Goal	Ease of Doing	Cost
Strategy 10: Trial innovative approaches to dryland urban forestry					
59. Trial planting smaller stock in boulevards (outside high traffic areas) and compare cost and establishment success relative to planting larger stock.	Medium	Parks Services	High	Easy	\$
60. In partnership with syilx/Okanagan people, regional local governments, land managers, and local nurseries, develop planting trials: <ul style="list-style-type: none"> a. For native species seedstock originating from similar elevation areas in the Okanagan Valley south of Kelowna and in the Similkameen Valley south of Keremeos, b. Disease and pest resistant cultivars of urban trees, and c. Non-invasive species adapted to warmer, drier climate conditions 	Medium	Parks Services	High	Moderate	\$\$
61. Explore the potential for stormwater harvesting and detention on private land (designed to meet source control targets), or in-street/park to be used for landscape irrigation to improve drought resilience, lower vegetation flammability (higher plant/soil moisture content), and reduce demand on potable water, considering whether new approaches can be incorporated in BL 7900 (form a standard) or incentivized to accelerate uptake.	Ongoing	Bylaw 7900 working group Development Engineering Utility Services Climate Action & Environmental Stewardship	High	Moderate	\$\$
62. Trial emerging practices to enhance forests such as planting into biodegradable 'tree cocoons' that retain water, soil amendments such as biochar, and the Miyawaki mini forests method.	Medium	Parks Services	High	Moderate	\$\$\$
63. Trial technologies for passive water infiltration into landscape areas on public land, such as curb cuts, biofiltration tree pits, Stockholm planting beds , trench drains, perforated pipe distribution, in areas that are moisture receiving (e.g, downslope or lowland areas), and monitor outcomes.	Long	Utility Services Park Services Climate Action & Environmental Stewardship	High	Difficult	\$\$\$
64. Continue to explore options to apply regulatory approaches or new tools as they become available, such as stormwater utilities, climate action development permit areas, and carbon offsets, that could be used to provide incentives to plant trees to achieve stormwater and climate action.	Ongoing	Utility Services Climate Action & Environmental Stewardship	Moderate	Easy	\$

9.2 Monitoring Plan

The Sustainable Urban Forest Strategy sets the canopy cover targets for Growth Strategy Districts. Table 8 provides additional performance indicators to guide implementation and help measure progress towards achieving the Strategy's goals.

Table 8. Targets and performance indicators monitoring

Targets + Performance indicators	Measure	Frequency	Method
Targets			
Percent Canopy Cover in Urban Centres	20%	2-5 years	LiDAR tree canopy data
Percent Canopy Cover in Core Area	20%	2-5 years	LiDAR tree canopy data
Percent Canopy Cover in Gateway	15%	2-5 years	LiDAR tree canopy data
Percent Canopy Cover in Suburban	25%	2-5 years	LiDAR tree canopy data
Percent Canopy Cover in Rural	25%	2-5 years	LiDAR tree canopy data
Performance indicators			
Percent canopy cover in equity priority areas	Increasing	2-5 years	LiDAR tree canopy data
New (non-replacement) tree planting annual rate (all programs) 5-year rolling average	3,100+	Annually	Tree planting records (all programs)
Documented replacement ratio for every public and private tree removal (where the bylaw applies)	1:1 or higher	Annually	Tree permit records and tree inventory
Percent of new subsurface green infrastructure inventoried in asset management system and provided a visible marker	100%	Annually	Work history; asset management records
Budget per new tree per linear kilometer of trail or forest edge	Based on service level	Annually	Budget, tree inventory
Young tree mortality (first five years)	<1.5%	Annually	Tree inventory
Pruning cycle: inventoried street trees	5 year cycle	Annually	Tree inventory; work history
Pruning cycle: inventoried park trees	10 year cycle	Annually	Tree inventory; work history
Species diversity ("10-20-30 Rule") for publicly owned trees	No species >10%, No genus >20%, No family >30%	Annually	Tree inventory
Community satisfaction/awareness of urban forestry	>50% satisfied, all services	5 years	Community survey

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City of Kelowna Phase 2 Engagement Summary

Sustainable Urban Forest Strategy Update

July 2024

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PROJECT BACKGROUND

Kelowna's urban forest is the total collection of trees and their growing environments found within our communities and their surrounding areas. This can include treed environments in public and privately owned lands and can be both cultivated and managed landscapes or completely natural areas within the City's municipal boundary.

In 2011, Kelowna adopted its first 10-year [Sustainable Urban Forest Strategy](#) (SUFS) with a vision to develop a sustainable and resilient urban forest resource that provides multiple benefits to all citizens of the City and complements the biodiversity values of the surrounding natural environment through integrated, ecosystem-based management.



Community and interested party engagement will help update this strategy to renew the direction and long-term vision for managing the City's urban forest as well as provide improved measurements of the urban forest and canopy cover extent.

ENGAGEMENT ACTIVITIES

The online survey for the SUFS was hosted on the Climate Resilient Kelowna Strategy's (CRKS) Get Involved page as both campaigns launched at the same time and relate to each other; the first part of the survey was dedicated to climate with the second half was focusing on the urban forest.

To give the opportunity for residents to meet and discuss the draft plans in person with City of Kelowna staff, two in-person open houses were hosted alongside CRKS - one on May 23 at the Parkinson Recreation Centre, and the other on June 6 at the Downtown Library. Educational boards were created to inform of the goals of the strategies to determine if we got them right according to the community. A virtual presentation and open house for just the Sustainable Urban Forest Strategy was held on the evening of May 29.

Limitations:

While a variety of tactics were used to reach a diverse range of citizens, results from open surveys such as those provided do not represent a statistically significant, random sample of all Kelowna citizens. Due to the opt-in and open nature of participation, results do not necessarily reflect the views of all Kelowna citizens. Advertising efforts spanned a number of channels, including a news release, social media, e-newsletters, and traditional media (see: promotion). Additional efforts were made to connect with harder-to-reach communities (lower-income, seniors etc.) via direct email as we understand that climate and the environmental issues more adversely affect these groups, however, under-represented groups and individuals remain under-represented in the overall results.

PROMOTION

As this was a city-wide engagement, a variety of tactics were used to reach residents to inform them of the opportunities to get involved, whether that was by attending an open house, completing the survey, or simply visiting the page to learn more.

A news release was launched at the beginning of the survey and was picked up by media outlets including Kelowna Capital News and Kelowna Now. Digital ads were created on Instagram, Facebook and Google. The combined reach of these ads was over 200,000 with more than 2,000 clicks back to the project page which housed the survey, <https://getinvolved.kelowna.ca/climatestrategy>. When there, participants interested in the SUFS plan were directed to visit a separate page to learn more about the strategy before returning to complete the survey. Banners were placed on Castanet throughout the campaign and to reach those who may not be online, ads in the Daily Courier were used as well to advertise both the online survey and open house opportunities.

The SUFS portion of the survey received 350 responses and the page had 789 visits, meaning almost 50 per cent of those who visited the page, were interested in further engagement by completing the survey.



WHO WE HEARD FROM

Overall, the City of Kelowna heard from 350 survey respondents and 68 open house attendees.

Survey Demographics

Among the 350 survey respondents:

- The most significant proportion was 46-69 years of age (45 per cent), with the 31-45 (26 per cent) and 70+ (16 per cent) age cohorts being the second and third most represented (Figure 1).
- The largest proportion of contributors had a household income over \$100,000 per year (38 per cent), followed by \$40,000-100,000 (33 per cent) and less than \$40,000 (7 per cent) (Figure 2).
- Most respondents felt they could easily understand the survey (67 per cent), believed they had sufficient information to participate meaningfully (69 per cent), and knew how their input would be used (70 per cent).

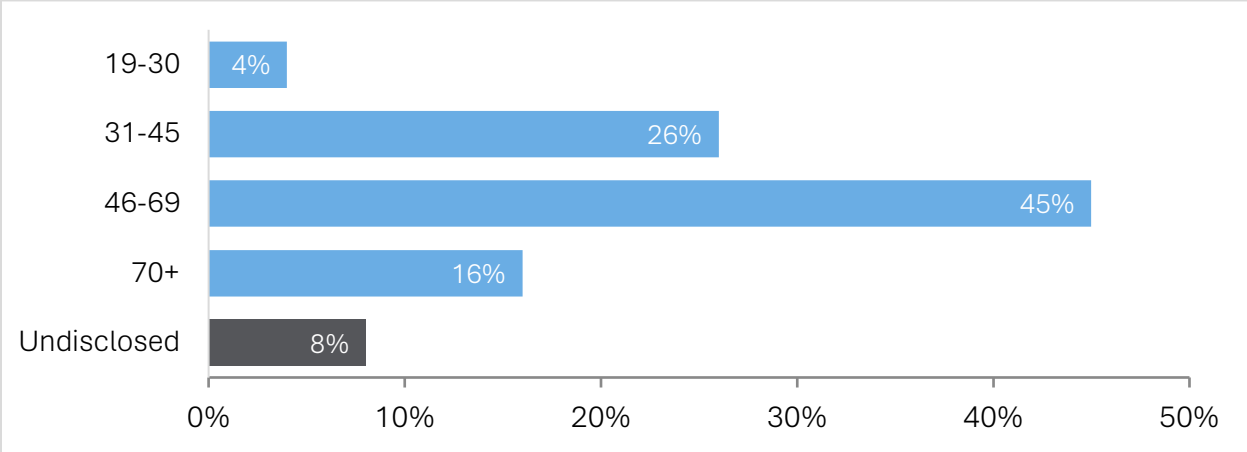


Figure 1. Age class distribution of survey respondents (Total Respondents: 348)

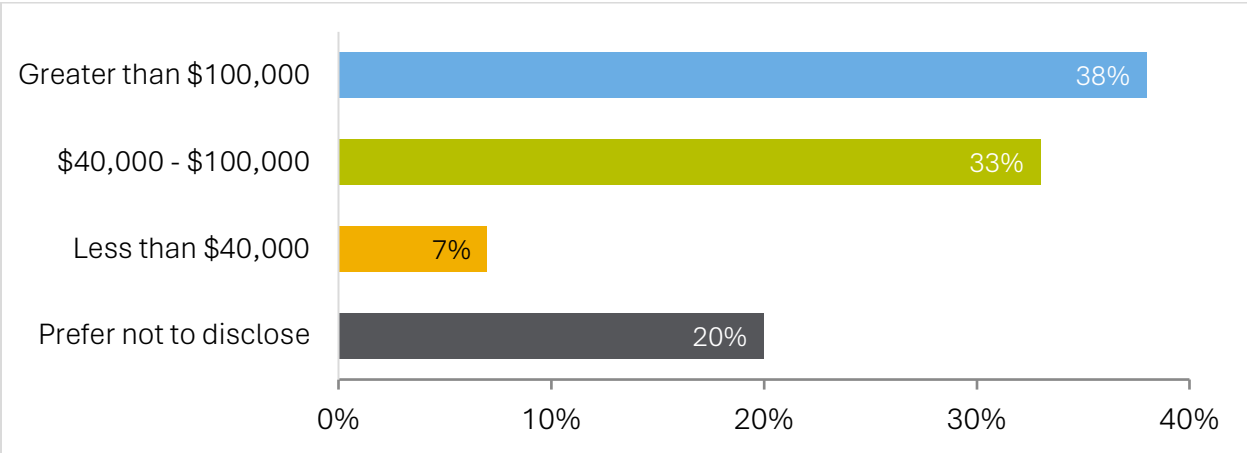


Figure 2. Household income of survey respondents (Total Respondents: 347)

WHAT WE HEARD

Key findings from the second phase of SUFS public engagement are summarized in this section for each type of engagement event:

- Online Survey
- Open Houses (two in-person and one online)

Detailed survey results for open-ended questions are available in Appendix A.

Open Houses

Two in-person open house events were hosted. Twenty-three (23) participants attended the first on May 23rd, and 31 participated in the second on June 6th. Many of the participants arrived informed about the SUFS to seek clarifications and supported the SUFS overall. Several attendees of the second open house suggested that a tree protection bylaw should be implemented rapidly. They also encouraged more public education and stewardship opportunities, such as tree walking tours and signage. Others wanted to see additional tree planting at schools and along streets and bike paths. Another participant supported planting trees that become larger at maturity. One participant suggested that the SUFS vision should be guided by a long-term perspective considering the next seven generations.

Fourteen (14) attendees participated in the online open house on June 6th. Participants asked clarifying questions on topics such as the canopy cover data, the value of ecosystem services, species diversity, the replacement of dead trees, and pests and diseases. Some participants wanted the City to target faster canopy cover gains, implement a private tree protection bylaw to prevent the removal of mature trees, increase species diversity and improve the suitability of species grown by nurseries, and provide more tree programs.

Online Survey

The survey was hosted on Get Involved Kelowna jointly with the survey on the draft Climate Resilient Kelowna Strategy. Questions specific to the SUFS sought feedback on its:

- Vision
- Canopy cover target
- Goals and strategies for implementation
- Actions respondents would be willing to take to steward the urban forest

Draft Vision

Kelowna's urban forest will continue to expand, connecting our green urban centres to our natural areas. Our urban forest will be managed to be a healthy, safe and viable natural asset that improves our livability and helps our community mitigate and adapt to a changing climate.

Survey respondents were asked how strongly they agreed or disagreed with Kelowna's draft SUFS vision statement (above). Most participants (78 percent) agreed with the draft vision, while 17 percent disagreed with it (Figure 3, below).

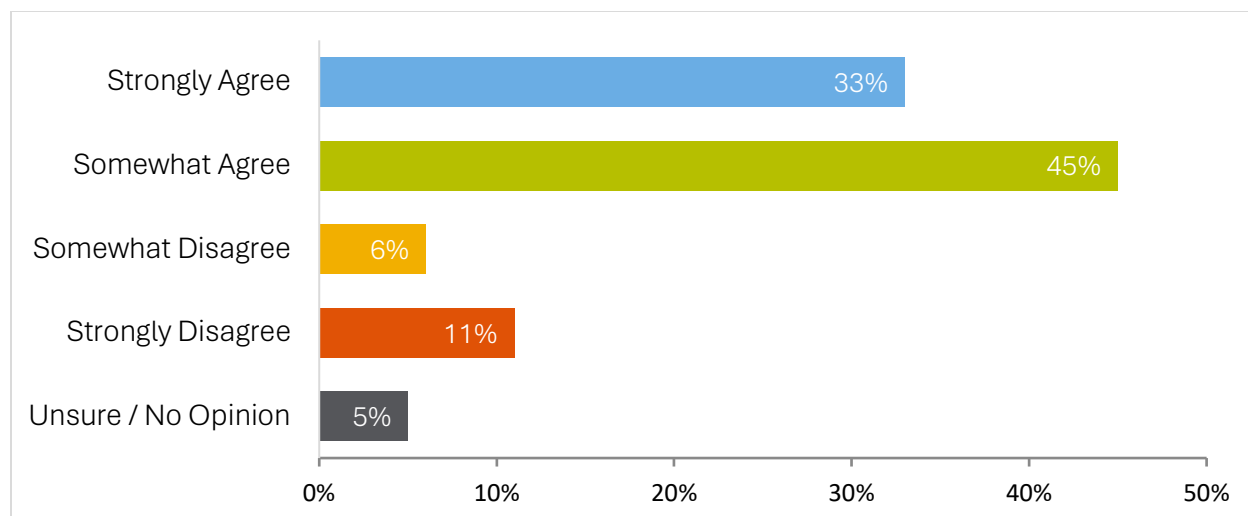


Figure 3. Respondents' level of agreement with the SUFS draft vision (Total respondents: 347)

Due to technical issues with the survey, participants who disagreed with the vision did not have a chance to provide additional feedback on the reason for their disagreement. However, a review of their other open-ended responses suggests that the most common responses from respondents who disagreed with the vision:

- Were supportive of the SUFS overall (12 mentions), but desired additional consideration of native, pollinator-friendly or drought-tolerant plants, including small trees and shrubs, as well as improved management of invasive species.
- Identified trade-offs (11 mentions) between expanding the urban forest and wildfires, water scarcity, housing prices or supply, and costs to citizens.

One respondent indicated a desire for the City to "leave natural as is" (1 mention) and another, alternatives to canopy cover targets to ensure the co-existence of the urban forest and high-density housing (1 mention).

"I think the strategy needs to start without delay. The downtown core is so hot and windy, it is reverting to a desert. Shrubs can do wonders too. All plants remove carbon and beautify the area as well as provide habitat for birds. More trees in the parks!"

- Online Survey Respondent

"I am generally in support of the plan to increase canopy but since it does not mention fire guards between forested area and suburban areas I cannot support it."

- Online Survey Respondent

Canopy Target

Respondents were asked if they supported the SUFS canopy cover targets proposed for the Growth Strategy Districts. The targets would update those currently included in Kelowna's Official Community Plan. Seventy-nine percent (79 per cent) of survey respondents agreed with the new District-level canopy targets (Figure 4).

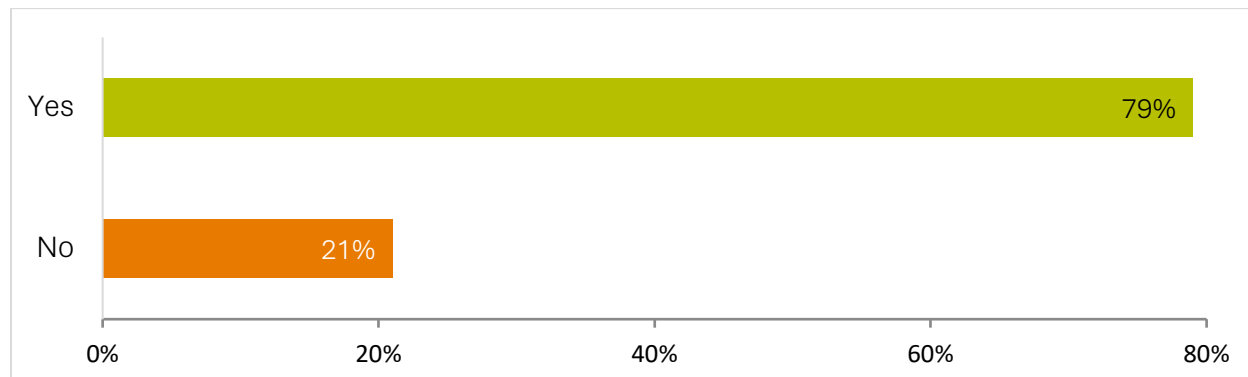


Figure 4. Agreement with the SUFS' proposed canopy cover targets (Total Respondents: 347)

Respondents who did not support the proposed targets (66) were asked to explain why and indicated they:

- Were too low (25 mentions), although some suggested they were too high (3 mentions).
- Did not adequately consider trade-offs (18 mentions), more specifically between canopy cover and wildfire safety (4 mentions), water scarcity (4 mentions), costs to citizens (4 mentions), housing prices (4 mentions), infrastructure damage (1 mention) or allergies caused by pollen (1 mention).
- Some would like improved tree maintenance and quality of site conditions to support long-term tree health (6 mentions)
- A few respondents also wanted to see greater support for a native and pollinator-friendly canopy specifically (4 mentions).

"I am sure the City has set realistic targets based on knowledge that I don't have, but I would like to challenge you to find opportunities to set higher targets."

- Online Survey Respondent

"An increase in trees on public property equals an increase in costs ultimately borne by the citizens. From maintenance to replacement to management and so on. Somewhere the costs need to be paid for. Residents/individuals ultimately pay for that."

- Online Survey Respondent

Strategies

The draft Sustainable Urban Forest Strategy identifies four goals supported by ten strategies. The four goals are:

- **Goal 1.** Protect, connect, and expand the urban forest
- **Goal 2.** Maintain a healthy, safe, and viable urban forest
- **Goal 3.** Involve people and organizations in urban forest management
- **Goal 4.** Monitor and innovate to achieve our urban forest vision

Respondents were asked about their level of support for each of the ten strategies. Every strategy was 'supported' or 'strongly supported' by at least 69 per cent of respondents (Figure 5).

The most strongly supported were those associated with Goals 1 and 2, notably with 69 per cent of respondents strongly supporting Strategy 3 to improve the quality and suitability of trees being planted for the site and climate requirements, 62 per cent strongly supporting Strategy 2 to strengthen policy, planning and implementation to protect, connect and expand canopy cover, and 61 per cent strongly supporting Strategy 6 to transition from reactive to proactive maintenance of City trees.

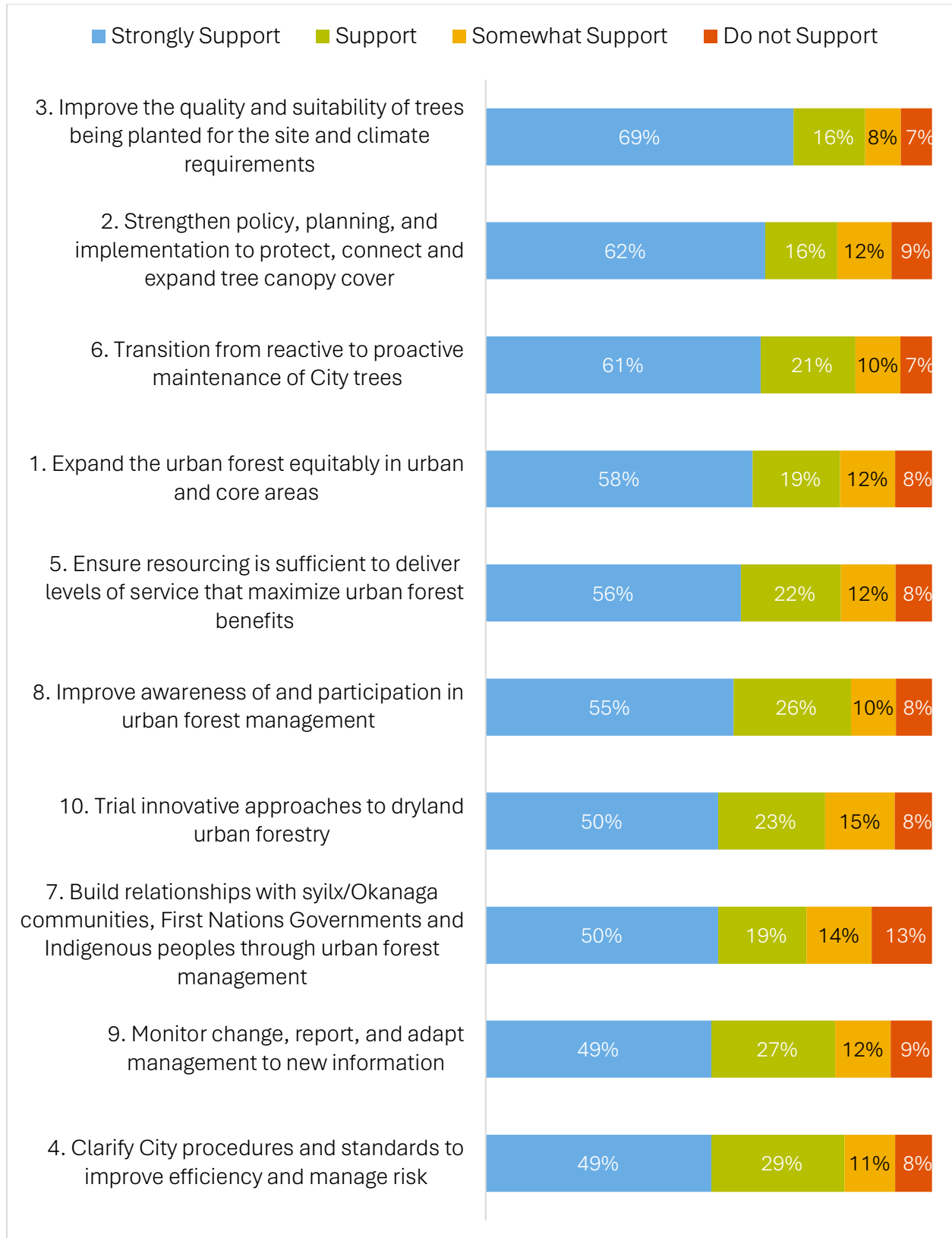


Figure 5. Level of support for ten strategies included in the draft SUFS, ordered from most to least supported (Total respondents: 348)

When asked if other goals or strategies should be considered in the SUFS, 54 per cent of respondents (332) answered yes. Their open-ended comments focused on the following themes, many of which are already reflected in the detailed actions of the plan:

1. **Tree Protection and Planting Incentives** (54 mentions), including:
 - Creating and enforcing a tree protection bylaw on private property (38 mentions).
 - Incentivizing tree planting and maintenance on private property (8 mentions).
 - Protecting mature trees, forests, and rare ecosystems (8 mentions).
2. **Tree Selection and Maintenance** (26 mentions), including:
 - Improving tree selection, maintenance, and growing conditions to achieve optimal tree health outcomes (26 mentions). Recommendations included selecting drought- or climate-appropriate trees, providing suitable growing spaces, and improving utility company pruning standards.
3. **Biodiversity and Ecosystem-Based Management** (26 mentions), including:
 - Planting native and pollinator-friendly species and removing invasive species (24 mentions).
 - Advocating for ecosystem-based management and incorporating non-tree vegetation into the SUFS (2 mentions).
4. **Canopy Cover and Urban Cooling** (10 mentions), including:
 - Increasing canopy cover targets (10 mentions) to help cool cities (6 mentions). Specific focus areas for tree planting and canopy cover included streets and parking lots (4 mentions), and near hospitals and schools (3 mentions).
5. **Public Education and Stewardship** (7 mentions), including:
 - Requesting education and stewardship opportunities (7 mentions) related to invasive species management and residential tree planting and selection for Kelowna's climate.
6. **Additional Considerations**
 - Increasing food forests and food security initiatives (4 mentions).
 - Supporting green infrastructure development (2 mentions).
 - Monitoring and innovating, including managing forests for Non-Timber Forest Products (NTFPs) (4 mentions).
 - Ensuring equitable distribution and access to the urban forest (3 mentions).

"[Create] a bylaw to protect trees on private land."

Online Survey Respondent

"How about a 'greener' grant on property taxes for businesses and residential property. This would inspire proactive activity in making Kelowna a greener, healthier city."

Online Survey Respondent

Stewardship Actions

Respondents were also asked to prioritize the top three actions they were most willing to take to steward Kelowna’s urban forest over the next five years (Figure 6).

The actions that respondents were **most likely** to take were:

- 1. Planting pollinator-friendly and native plants
- 2. Maintaining trees on their property
- 3. Planting one or more trees on their property

The actions that respondents were **least likely** to take were:

- 8. Watering street trees adjacent to their property
- 9. Volunteering at tree planting events
- 10. Doing nothing at all

These results suggest that respondents are more inclined to care for trees and plants on their own property than to participate in public stewardship activities. It also indicates a strong willingness among respondents to actively support the urban forest.

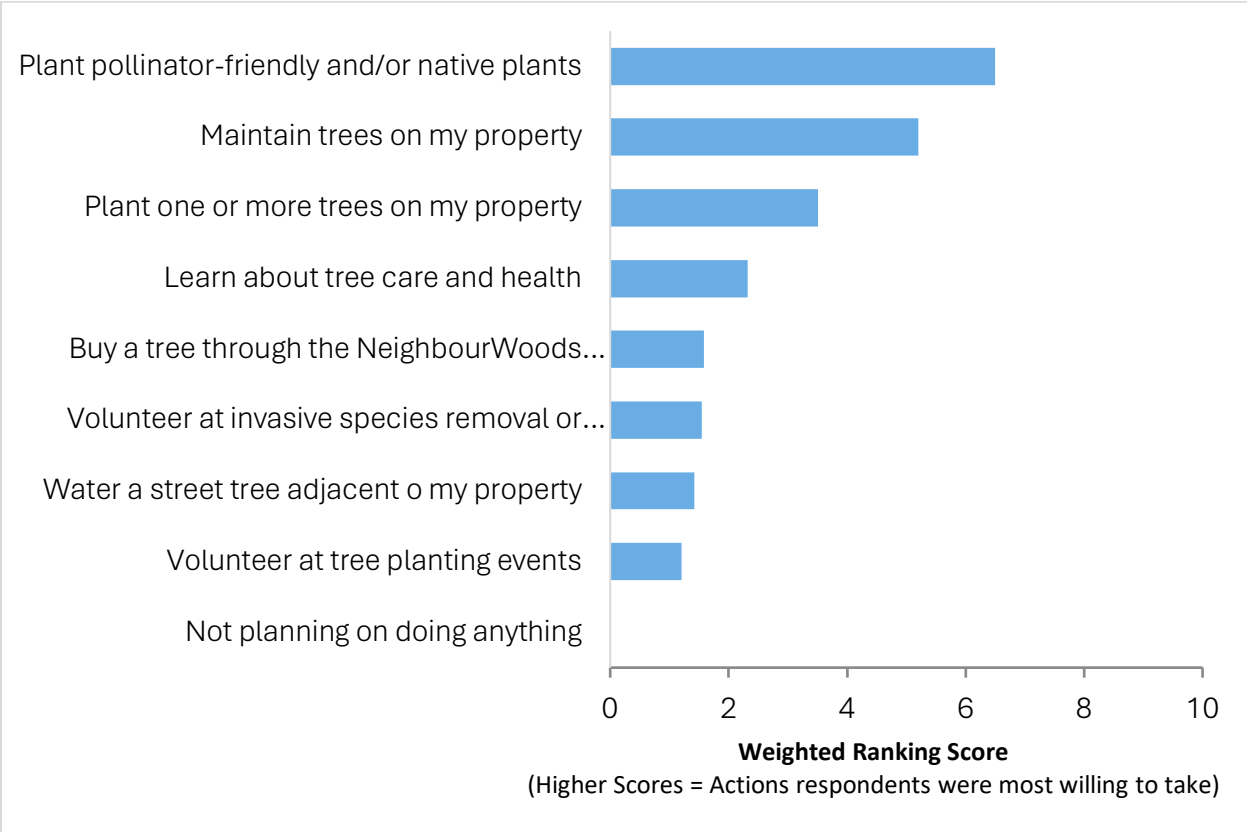


Figure 6. Respondents’ preferred actions to help Kelowna's urban forest (Total responses: 308)

"Supply more subsidised trees for planting by the community"

- Online Survey Respondent

Open Ended Feedback

Respondents were asked if they had any additional comments at the end of the survey. The 170 responses focused on the following themes:

- **Protecting the Urban Forest** (21 mentions), including:
 - Creating and enforcing a tree bylaw on private property (15 mentions).
 - Protecting mature trees, forests, and rare ecosystems (6 mentions).
- **Trade-offs Between Priorities** (19 mentions), including:
 - Expanding the urban forest at the expense of wildfire safety (9 mentions).
- **Education and Stewardship Opportunities** (14 mentions), including:
 - Increasing education and stewardship opportunities (14 mentions) and more stewardship opportunities for renters (3 mentions).
- **Species Selection, Maintenance & Growing Conditions** (13 mentions), including:
 - Improving species selection, maintenance, and growing conditions for urban trees (13 mentions), notably improved utility pruning, maintenance and soil volume standards, and selecting drought-tolerant species.
- **Increase Canopy Cover Targets** (15 mentions), including:
 - Emphasizing planting along boulevards (4 mentions) and for cooling (5 mentions).

Other less common themes from respondent feedback included general support for the strategy (9 mentions), native and pollinator-friendly plantings and invasive species management (7 mentions), and expansion or improvement of the NeighbourWoods program (6 mentions). A few respondents also suggested incorporating ecosystem-based management, including small trees and shrubs, into the scope of the SUFS (4 mentions), expanding the use of green infrastructure, such as green roofs and walls (4 mentions), planting food forests to improve food security (3 mentions), and greater policy integration with urban planning and climate change plans (2 mentions). Finally, a few respondents expressed the desire to rapidly implement the strategy (2 mentions), reduce impervious surface cover (2 mentions), establish a transparent budget (2 mentions), and conduct regular monitoring (1 mention).

"Please keep developers accountable for the trees they promise to plant. Insist on long-term canopy cover percentage, instead of number of trees. I'm seeing too many baby trees that will never grow big, and too many mature trees cut down to make space."

- Online Survey Respondent

"I would support the Neighbourwoods program if better choices in what's available were made in terms of what is suitable for the Okanagan climate."

- Online Survey Respondent

Synthesis of Feedback

Comments received during phase 2 engagement show overall satisfaction with the draft SUFS. These comments were compiled to inform final revisions to the draft SUFS. The following tables provides a synthesis of the input presented in this document with comments on how they will be considered for the SUFS finalization:

SUMMARY OF FEEDBACK FOR THE VISION

What we heard	How it will be considered
<ul style="list-style-type: none"> 78 percent of respondents agreed with the draft SUFS vision. Survey comments suggest that stronger support for the vision could be achieved by incorporating considerations for: <ul style="list-style-type: none"> The planting of native, pollinator-friendly, or drought-tolerant trees, including smaller trees and shrubs and invasive species management into the vision may increase support for the final statement. Addressing trade-offs between the urban forest and wildfires, water scarcity, housing prices or supply, and costs to citizens 	<ul style="list-style-type: none"> The SUFS discusses trade-offs between urban forests and wildfire (pages 27 and 42), water scarcity (pages 31 and 42), and costs to citizens (pages 5 and 6). Goal 2 (<i>Maintain a healthy, safe, and viable urban forest</i>) acknowledges the cost reduction to citizens using the language "...reduce overall costs of management." Actions included in the SUFS speak to managing forests and fuel mitigation within Parks. Specific actions related to wildfire mitigation will continue to occur beyond the scope of the SUFS in accordance with the Community Wildfire Resiliency Plan.

SUMMARY OF FEEDBACK FOR THE CANOPY COVER TARGET

What we heard	How it will be considered
<ul style="list-style-type: none"> 79 percent of survey respondents agreed with the proposed targets Comments from the survey and open house participants suggest that respondents who disagreed would like higher canopy targets or for the target to address potential trade-offs with other city priorities. 	<ul style="list-style-type: none"> The SUFS will provide more details about how the targets were chosen to clarify why they are not proposed to be higher.

SUMMARY OF FEEDBACK FOR GOAL 1: PROTECT, CONNECT, AND EXPAND THE URBAN FOREST

What we heard	How it will be considered
<ul style="list-style-type: none"> All the strategies proposed to help realize Goal 1 were in survey respondents' top 5 most strongly supported strategies. This suggests that this Goal is a high priority for most respondents. 	<ul style="list-style-type: none"> An action included in the SUFS addresses implementing amendments to extend tree protection regulations under the Tree Protection Bylaw No. 8041. An action included in the SUFS addresses expanding the existing annual tree planting program.

<ul style="list-style-type: none"> • Comments from the open house participants and survey respondents suggest that some participants would also like to see: <ul style="list-style-type: none"> ○ The creation of a tree protection bylaw on private property. ○ Increased planting of native and pollinator-friendly tree species and removal of invasive species – both for the City as well as stewardship actions for residents to undertake. • Additional tree planting along streets, bike paths, parking lots, and near schools and hospitals for cooling and health benefits. 	<ul style="list-style-type: none"> • The importance of biodiversity, which includes pollinators and native species, is highlighted in the SUFS action plan. • A tree protection bylaw on private property is not recommended for advancement at this time; however, the SUFS does promote additional regulatory tools that the City can use to influence tree cover on private property during development. • Tree planting programs are considered a high priority for implementation by the SUFS action plan.
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SUMMARY OF FEEDBACK FOR GOAL 2: MAINTAIN A HEALTHY, SAFE, AND VIABLE URBAN FOREST

What we heard	How it will be considered
<ul style="list-style-type: none"> • Two of the strategies proposed to help realize Goal 2 (Strategies 5 & 6) were among the top 5 most strongly supported strategies, suggesting that improved species selection, tree maintenance, and growing conditions are strong priorities for respondents. • Comments from the open house participants and survey respondents suggest support for making specific types of improvements to tree selection, maintenance, and growing conditions, including selecting drought- or climate-appropriate trees, improving utility company pruning standards, and providing larger growing spaces for larger trees. 	<ul style="list-style-type: none"> • The SUFS includes actions addressing species selection and maintenance improvements. The majority are assigned high priority for implementation.

SUMMARY OF FEEDBACK FOR GOAL 3: INVOLVE PEOPLE AND ORGANIZATIONS IN URBAN FOREST MANAGEMENT

What we heard	How it will be considered
<ul style="list-style-type: none"> • Although not in the top 5 most strongly supported strategies, the strategies under this goal gathered majority support from survey respondents. • Comments from the open house participants and survey respondents suggest support for more public education and stewardship opportunities, such as those related to invasive species management and residential tree planting and selection. 	<ul style="list-style-type: none"> • Actions included in the SUFS support the expansion of the NeighbourWoods program. • A communication and engagement plan is recommended to provide new opportunities for public education and stewardship. The SUFS explores the potential to incentivize urban forest stewardship on private property.

<ul style="list-style-type: none"> • Survey respondents indicated a willingness to undertake many stewardship actions and were more interested in caring for or planting trees on their property than doing so on public property. • Comments from survey respondents and open house participants suggest support for improving and expanding the NeighbourWoods program, including more, smaller, or climate-appropriate trees and making it easier to acquire trees without a vehicle. 	
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SUMMARY OF FEEDBACK FOR GOAL 4: MONITOR AND INNOVATE TO ACHIEVE OUR URBAN FOREST VISION

What we heard	How it will be considered
<ul style="list-style-type: none"> • Although not in the top 5 most strongly supported strategies, the strategies under this goal gathered majority support from survey respondents. • Comments from survey respondents and open house participants suggest support for food forests and food security, green infrastructure such as green roofs and green walls into the SUFS’ strategies and doing regular urban forest monitoring or innovation. 	<ul style="list-style-type: none"> • Actions included in the SUFS support testing innovative technologies to improve tree planting through the installation of novel green infrastructure (e.g., bio infiltration tree pits, tree cocoons).

NEXT STEPS

The project team will consider all comments, along with input from Council and staff, when finalizing the Sustainable Urban Forest Strategy. In the coming months, the updated SUFS will be presented to Council for adoption.

APPENDIX A - OPEN-ENDED SURVEY RESPONSES

Do you support the increase in canopy targets as outlined in the previous image?

Comments

20 to 25 is NOT enough
Adds to the cost of constructing new homes and buildings. Reduces the number of homes that can be built. Most of the province is forested already - enough with intrusive regulations!
An increase in trees on public property equals an increase in costs ultimately borne by the citizens. From maintenance to replacement to management and so on. Somewhere the costs need to be paid for. Residents/ individuals ultimately pay for that.
Arrest arsonists and stop following Agenda 2030. We are wide awake to the corruption here in Canada.
Ban use of cedar trees now that we know they are unsafe
City always complains about the cost of housing yet always adds more costs
Climate change is a hoax
Every time you pave or put asphalt over the tree roots, you limit their life. More must be done to support the pollinating species, not just provide shade in already congested city streets.
I am generally in support of the plan to increase canopy but since it does not mention fire guards between forested area and suburban areas I cannot support it.
I am sure the City has set realistic targets based on knowledge that I don't have, but I would like to challenge you to find opportunities to set higher targets.
I generally support the targets, but the city must ensure that boulevard trees occur on both sides of downtown streets. The rationale relating to local forests being more open is irrelevant, because urban forests are entirely different ecosystems.
I like all but the decrease in rural areas
I overlook Kelowna. The canopy has grown tremendously over the last 20 years without a bunch of bureaucrats making work for themselves
I think that Kelowna's design for growth should highlight native growth to support native species. It is too easy for landbuyers to tear down existing and historic Kelowna trees. Buying a property shouldn't include the right to destroy a biome.
I think the 2040 Urban Centre OCP should be 20per cent. We need to take quicker action on this. We don't have 20 years to wait for trees to grow large enough to have make a difference.
I think the percentages should be much higher. We know that Kelowna is so hot, and we know that green spaces help to reduce temperatures.
I think they should be increased by 5per cent more across the board
I would support increasing the targets.
I'm downtown with so many stunning streets where the trees are the star of the show. Bernard, Wilson etc. they are brag worthy and would change everything for me. Outside from downtown...please....whatever you want.
I'd support the plan if we stopped planting all male trees. If we are densifying pollen production such that allergies are going to get worse, then no. If we can diversify our "canopy" with non-pollen producing trees, then sure.
If it is a loose target and not a mandate, it's supportable. Some sites will have challenges meeting these targets - housing should take priority (i.e. obtain a reasonable # of trees for the site, but don't cripple housing development for this).

It appears the plan is to only allow public transport, take out existing parking making it so difficult to find a parking spot people will have no choice but to take public transit. Nice for everyone except no thought given to seniors who it so difficult
It should be greater. There should also be more vegetation in the urban core, not just trees on the street. More setback space with vegetation would be a big improvement.
Leave nature as is.
Leave the urban areas alone. No one wants to live in a City .More garbage more crowded ,less peace, less place for wild animals and birds. Just don't do it.
Let's keep the Okanagan Sun shining down on us!
More of our tax dollars going to fear climate propaganda
Need more trees. Targets too low
Need to balance increase in vegetation with drought resistant species to reduce water demands for need to irrigate any increase in vegetation. Water is a scarce in the Okanagan and this ecosystem needs to ensure adequate water available for agriculture.
NONE of you has ANY understanding of what a city plan is! You just make stuff up on the fly. Study the purpose of zoning. Read Christopher Alexander.
Not enough of increase in areas like Rutland increase to 30per cent for next step
PLANT DECIDUOUS TREES SHRUBS THAT ARE DROUGHT RESISTANT. STOP USING PINE MORE TREES PER HOUSE
Planting trees in a semi-arid desert requires lots of water. Do we have extra water? You want to plant trees but the forest industry is spraying trees with roundup; doesn't make sence
Seems no need to make any reduction, re: rural area
Seems too low. Also the current forester does not seem to attend to using native trees, nor fire resilient ones (where appropriate\$ so there is no way to tell if this is a good plan or not .
Suburban and gateway should be 25per cent and rural rural should be 30per cent, at least
Switch the road from pavement to concrete. It creates less heat is alot cooler. And needs a lot less maintenance
Take a look at pics of the 1900s you will see far less trees everywhere . Tree density is a major cause of the superfires Kelowna has suffered. Tree density must immediately be reduced
The per cent is not explained. Is it in relation to population growth? The canopy should me more according and incorporated to new buildings as an opportunity for green design and arquitecture.
The damage to infrastructure from tree roots is immense!
The downtown core could be a higher canopy cover target, moving from 20per cent to 25per cent
The natural landscape of this area is sagebrush, ponderosa pine, grassland type. Adding large trees increases water usage that we don't have any to spare. Plant native large shrubs and trees.
The percentage should be much higher since all the fires happened. It should be equal to what was lost in the fires.
The push towards densification is changing the landscape. Urban and rural life can coexist without these insane targets.
the targets are too low
The targets are too low. The effective cover may be the target but we need to aimHigher so that when trees die or fall the impact is mitigated. New trees need to be interspersed among established trees to "ladder" ages and coverage
The targets should be at least 5per cent higher
There needs to be better controlled canopies, as in too many trees are left unmaintained.
They are insufficient. More coverage =less climate impact. Homeowners should be incentivized to green their properties wisely

They are still too low...30per cent plus is quite achievable with more thought
They should all ne at 25per cent. Boulevards with asphalt should be changed to wild flowers or plants that are drought resistant.
This is a fake agenda being pushed down from politicians
Too much city staff cost and bureaucracy
WE ALLREADY have TOO MANY Pine & CEDAR trees in the city, TOO MANY DEAD TREES & Shrubs .. FIRE HAZARDS !!
We have a housing crisis and I saw 5 houses knocked down to make a park, you are loving nature over people instead of working with what you have. We live around forests, shade can be made with sails too
We have billions of trees in North America...a few hundred thousand more will have no impact.
We have millions of trees in BC and last time I checked, CO2 was plant food.
We need more canopy coverage, and it's not just quantity, it's quality. Plant better trees, AND more of them.
Why add more trees to areas at high risk of fire?
Why are you playing with the climate?? Geoengineering??
Why would the rural area go from 27per cent to 25per cent also are developer able to leave green spaces alone so replanting of green spaces don't need to necessarily happen
Would love to see higher percentage
You don'texplain where the aditional water will come from. No where do you talk about infrastructure like reservoirs. Maybe after coming up with your ideas you ask what will be the result.More veg more water where do you talk about building new reservours

Are there any other goals or strategies that should be considered in the Sustainable Urban Forest Strategy?

1. a focus on indigenous trees, 2. a refocus from lawns to indigenous plants for decoration
3 30 300
a bylaw to protect trees on private land; a fund to help look after trees on private land; education about cement (like the huge swaths of it at Strathcona and Pandosy Parks), developers who take down trees should be charged. Instead of buying benches for
A lot of trees in the city are either dead or damaged from the drought and extreme cold winter. a colder zone variety of trees and plants may be required.
a reduction of parking stalls in corporate retail lots for trees - shade, birds, asphalt heat absorption etc
A temporary halt to the unfettered issue of building permits. The rubber stamp philosophy by the building department conflicts with the urban forest. Kelowna is building high density ghettos ...SHAME!
Actively manage fire risks in all of the public parks!!
Address the conflict between urban densification and preservation of existing trees.
Although it is great to have so much farmland in our city, I worry that the city has very little say in the rules of the ALR, such as removing trees and drawing off more water that sustains people and trees in Kelowna.
Become proactive in locating and removing invasive species such as the Siberian Elm and Tree of Heaven
Build better roads
Bylaw protecting trees on private land. Monitoring and replanting of city trees for at least five years. Switch from car to e-bike or other would allow for more shade in parking lots. Heat island tax for all new unshaded asphalt & concrete.
Can developers stop clear cutting neighborhoods ie Kirschner Mtn, vs 80's built subdivisions in SE Kel off McCulloch rd near Gallagher Canyon golf course. Maintain established trees
Canopy trees are quickly disappearing as densification (4plexes) in the downtown residential area go up. These need to be replaced with a focus on increasing boulevard trees to both sides of residential streets.
City and Council need to have clear goals and regulations to follow and stand firm as developers and land owners are going to put everything they have into not meeting these goals and requirements.
City should not let developers have minimal setback that will only allow columnar trees or shrubs most of which will die because they do not have enough space.
Conserve the forest canopy throughout the City and surrounding areas and plant and encourage private planting of climate-appropriate trees and bushes, not species that are not suited to the arid Okanagan.
Consider new technologies and equipment for tracking forest health, wildfire risk, selective harvesting and carbonizer biochar - see Canadian company www.tigercat.com and engineer rep Robert Selby lives in Kelowna
Consider there are seniors and people with health problems who cannot walk long distances nor take public transportation. I suspect you would advocate MAID to all of us Seniors and non healthy people.
create a bylaw to protect large trees on private property
Creating a tree protection minimum of 25 cm diameter to help prevent loss of maturing trees. Require and enforce a 2 replacement trees to one removed tree bylaw.

Decrease Gateway coverage goals to 20per cent rather than cutting the previous 2040 goal in half. // Remove invasive species, plant native, and build soil health while forming partnerships, engaging volunteers, and prioritize regional impact over competition.
Developing other industries that support alternatives to forestry like a hemp industry for clothing, food, batteries, regenerative farming practice, eco system sustainability, water protection, preventing further eco degeneration sustainability of forests,
Discontinue the use of highly flammable vegetation such as cedars.
Discourage tree removal for aesthetic reasons from private property. Add bylaws requiring replacement of removed trees
Disease resistance of trees. Increase of canopy coverage beyond of what is proposed to cool down asphalt.
Drop the entire initiative
Drought resistant planting and ban cedar hedges
Drought resistant vegetation
Education in schools, bring back programs for residential tree planting , make it a much harder process for tree removal in residential areas and on private property for established trees.
Eliminate and do not plant Ponderosa Pine trees
Embrace the 3-30-300 framework to ensure equity with respect to greenspace and trees. No net loss is a worthy goal too.
Enhance existing efforts to eliminate non-native, invasive trees in favour of non-invasive and native trees.
Ensure large developments follow through with their landscape plans. Ensure there is enough soil volume to support treelings mature. Ensure canopy coverage initiatives apply to regular neighbourhoods and not just brand new developments and UC zones.
Ensure that new and existing trees are given the support they need to thrive-good quality and large quantity of soil, lots of root room and proper positioning
Ensuring proper variation and species are chosen based on what is natural to the area. Encourage natural/local vegetation instead of traditional lawns.
Equitable access regardless of socioeconomic status
Every infill housing project ends with multiple trees being cut down. Lots are fully covered by house(s) and parking with no room for trees. These policies will greatly reduce our tree canopy.
Expanding native plantings and pollinator gardens plus reducing monocultures and non-native turf-grass should go hand-in-hand with urban forest initiatives
Explore creating urban food forests including community gardens, emphasis should also be placed on planting native species and protecting mature forest ecosystems
Financial Cost!
Fire mitigation. Co-planning of fire breaks or natural rock alongside urban forests.
Fire smart trees and brush clearing and controlled burns which were stopped in the 70's which used to work
Fire smart. Great to have more trees but fire is a big problem. Also water usage
Firesmart all urban forests. Transition away from pine trees to fire safe varieties. Ensure that Kelowna Parks follow firesmart standards first before considering estetic landscape design objectives. Integrate resources so that all forested areas firesmar
Focus on native plants. Monitor and maintain planted areas, perhaps with neighbourhood participation.
For every tree cut down for development, another should be planted.

Give residents a tax break if they plant native trees in their yards. Burry all new electrical lines so Fortis can't ever again BUTCHER all the beautiful trees in Kelowna ever again. Such a travesty what has been done to trees on public and private land!
Goal 2 strategies only for city trees. 78per cent of canopy on private land. Need plans to nurture private canopy, especially for diseases & insects' threats – e.g. city arborist for consultation to address widespread issues.
have a private property tree bylaw, require developments to maintain trees at least along the edges of new build areas (stop bare land development), increase setbacks in all areas to allow for trees, reduce surface coverage in all areas, use treed medians
Have minimum requirements for urban canopy in large parking lots. They are very hot and also cause people to use more energy to cool down their vehicles in the hot summer months. There should also be an increased focus on downtown where people walk.
Help in reducing invasive species. It can be very costly to rid an Elm tree as an example
Help with the cost of adding trees on private property.
How about a 'greener' grant on property taxes for businesses and residential property. This would enspire proactive activity in making Kelowna a greener, healthier city.
I believe the area is mostly historically wetland and grassland, so I do wonder at the feasibility and health of additional trees, esp with regard to water requirements.
I don't know but the experts should not stop considering anything that is presented
I fully agree with the goals and ideas in bolstering urban forests. Just now I enquired about the tree program for my home but it's on hold. It's just too incomplete of a solution for it to be THE solution. I think it's an amazing PART of A solution.
I have witnessed many situations throught city related projects, where poor species selection (by others - Consultants) have been used) for example, too much water dependancy, INCORRECT SOIL TYPES BEING SPED'D for planting, etc
I wonder if you could consider if the trees being planted or maintained are native to the area.
If we increased the number of fruit trees specifically, we could also help localize the food supply and provide for food banks and the community at large. Hit two birds with one stone, so to speak.
In San Francisco, my grandmother belonged to a group called "Friends of the Urban Forests," and she adopted some trees on her street to water. She loved it.
Include smaller trees and tall bushes in your plan. Ban the sale of cedars and other water hogs/fire hazard trees.
Incorporate "green roofing" strategies, especially in the urban centre. Seek a mean to incorporate a green roof over Prospera Place and downtown parkades as well as near th airport. This can include low growth and drought tolerant plants such as phlox.
Increase minimum trees planted with new development
increase native planting
Increase protection of trees in all zones. Too often trees are the first thing to be removed in development of any site. The value of a mature is significantly larger than a new tree after redevelopment of a site.
Integrate jointly managed lands for both Agriculture and Forest health with consideration to recreation use as population increases demands on landbase will increase.
Integrating food production (eg. Fruit and nut trees) into the planning. What about involving public school grounds? Too many children go to school hungry, let's feed them. Bonus: children will learn about food production and connect with nature.

Integrating recreational facilities into green spaces where applicable. Kelowna has a serious lack of sports fields, tennis courts, etc.
Is there a way to use the forested land by the water to channel wind and cool air towards the city?
Keep oil and gas out of Kelowna. No Fortis
Kelowna needs to stop treating trees the way it does. Look about orchard park. And stop building condos 5 feet from roadways or in parking lots calling them the woods. This city plants trees then cuts them down showing an extreme level of stupidity.
Let's not burn in wildfires.
Maintain existing mature trees on development sites. Provide density bonusing or other incentive to developers to protect existing mature trees, which provide many more ecosystem services than smaller, new trees.
maintenance of plants/trees/canopy on building sites, i.e., developers should not be able to completely clear a site and then build a huge building. leave nature
make sure that future development of city lots keep the trees and urban tree canopy intact.
Manage/expand tree canopy using City Boulevards in urban areas.
Mission statement should include reference to long term economic benefit (to get those "fiscal conservatives" on board)
Monitoring of seedling success in drought conditions to ensure trees make it through periods of high stress. Monitoring and preventative measures to address insect attacks on trees; ie, mountain pine beetle
More deciduous trees near schools/ fields, food forest like japan, permaculture, community food gardens NO PESTICIDES encourage food gardens instead of grass,rainwater catchment on ALL houses for garden yard use.. bc is 50yrs behind. Bridges are needed
More education for homeowners regarding appropriate mixes of plantings, trees, etc. that are native, appropriate to our climate, and mitigate wildfire damage to homes
More trees
Most new residential does not have space for trees. Yards are tiny/steep/driveways. Imagine ... a door to door program that gives info on what trees/shrubs best fit the location and delivers, even plants by neighbourhood. Avoid loss to poor choice.
My answer "no" is because there is always more to do, but that's a good start
Native grass can be cut and watered less. Lawns are hungry
Native plants to support wildlife
Native species need priority. Must control invasive species, Must maintain new plantings. Get community to assist in watering new plantings where feasible
New building sites require more plantings less concrete site coverage
No planting of trees under power lines. BC Hydro/Fortis has decimated street trees last year with no regard to the health of the tree. Severely pruned and topped trees should be removed and replace with smaller maximal height trees, never to be topped
Not just having one layer of canopy, but creating tiered canopies to encourage a healthier ecology.
Not sure if wetlands fit into this, as some trees can grow in or very near them but wetland protection and growth if possible is vital in climate and environmental protection.
old growth tree should be left in the city and on private, home owners should be given property tax rebates for keeping trees or adding
Overhead powerlines are limiting the growth of tree canopy in many parts of the city, leading to aggressive pruning and often to tree death. Moving power lines underground will free up more space for trees.

Partnering with the private sector, home improvement, more planting initiatives
Permits for removal of trees on residential land. Too often property owners will remove perfectly fine and healthy trees for no good reason which is very damaging to our urban canopy. We also need more incentives to plant trees (e.g. maintenance rebates)
Plant more trees. Do not worry about reducing carbon emissions from human activity because Co2 is food for plants and trees. They love it.
plant trees that require little to no water
Plant, plant, plant....and then plant some more.
Planting native and cohabitating species of trees and flowering plants to support pollinators.
Prioritize the areas now having a deficite of tree canopy over other areas, incentivize tree protection/retension with a significant tree grants program (similar to the existing heritage home grants program) and penalize tree removals based on a monetary va
Protect existing healthy trees. Recommend appropriate trees for homeowners. Encourage/enforce removal of invasive trees (Tree of Heaven, Siberian Elm). Educate homeowners.
Protection of shoreline and rewilding of areas should potentially also be included in the plan as this will contribute to decarbonization, biodiversity, water quality and climate resiliency.
Provide free consultations for residents on increasing tree canopy on their property and in their Neighbourhoods
public/private partnerships
Putting the environment and community first over any form of profit. Better forest management and funding to keep yearly maintenance going
Quit modeling our urban forests on Toronto and Vancouver. Look at the city of Denver for a model that fits the intermountain West.
Removal of invasive trees and plants - including those allowed to be planted on private property in the city limits
Require private property owners to secure a permit to remove trees on their property. Encourage more residential planting.
Restoration of natural habitat in urban areas, development policy that necessitates native plant communities, incentives to remove lawn, restriction of residential water use for irrigation
Restrict or eliminate the use of extremely flammable trees such as cedars.
Review where there are currently no trees planted on cycle and walkways, and main streets, rutland road and Springfield in rutland are embarrassing for the lack of trees. Hwy 33 to blk men are also an embracing entry to kelowna. Plant more trees!
Rooftop gardening in dense areas. Promote planting of native plants rather than grass (suburban)
ROOFTOP gardens are NOT a substitute for providing 'community' treescapes and green space. QUIT allowing profiteering because of your lack of guts or some bullcrap 'money in lieu of' scheme.
Selective logging of all the mountains in Kelowna area must begin ASAP
speed up the process as i nt
stop all clear cut logging in community drinking watersheds
Stop any destruction of trees in the community.
STOP catastrophizing in your phoney climate fraud narrative. Institute audits of all public servants to ascertain bribes by assorted junk agencies and unelected entities. Understand no one trusts any of you or your junk narrative.
Stop lying about climate change and the false narative that it is CO2 driven; you just make yourself look stupid

Stop the government fires and chem trail. Stop pollution with all the chemicals that are destroying humans and our soil , air, and nature.
Street trees are being undervalued in the plan. Use street trees in traffic calming projects to provide visual narrowing. Use street trees to enhance neighbourhood character, hide building heights from the street level.
Strict bylaws and LARGE penalties for developers who "accidentally" cut down trees. Education around how far from electricity lines to plant. Consideration of mixed trees for beauty. Requirement of immediate sick tree removal on private prop
Strong deterrence for damaging or sabotaging the urban forest needs to be implemented. When bad actors kill trees today nothing happens. That is unacceptable. Give bylaw enforcement the tools to fight this. Fine offenders with new tree obligations
Strong focus on maintaining existing mature trees during land redevelopment instead of removing all mature trees and replacing with tiny decorative trees once redevelopment is complete
Studies show improved wellbeing from nature exposure. Prioritize expansion of urban canopy and gardens near health facilities to benefit patients and providers, also schools/uni for youth. Bury electric wiring to avoid butchering of trees by Fortis
Suburban development and requirements for private homeowners being rewarded for planting and maintaining canopy and penalized for cutting down trees and reducing canopy.
Supply more subsidised trees for planting by the community
Systematically and thoughtfully and continually communicate with the public concerning urban forest activities and strategies.
The city needs to do something about Fortis BC mutilating trees, as well as rogue arborist companies removing trees without replanting new ones. Fortis BC is a huge problem, they don't remove, but they raze the tree and cause it to die. And it looks BAD
The city plants boulevards and trees but then allows them to be overrun by weeds and under watered and sick. See academy way. Take care of the investment!!!
The goal of expanding tree canopy to the desired level should be tied to decisions on whether properties should be up-zoned in the core area.
The planting of indigenous trees and removal of invasive plants.
The report appears to be concerned with filling in the cracks of our city with trees. This is not satisfactory. We need to reduce the amount of wasted space that is taken up by parking lots. Remove parking mandates. Remove parking lots. ALSO NATIVE PLANTS
The true cost of all programs must be transparent,...what then comes off the budget table. This survey is misleading, all "wants", no
There seems to be a lot of boulevards that are dead grass, weeds, dirt or poorly managed plant material. Residents may not know they are responsible for the boulevard in front of there home or the city needs to manage these areas better.
This region contains the roughly 12per cent of the Palouse that remains intact. It isn't a place for "trials" or new problem species. It is incredibly rare, and any monies spent should be on restoration and habitat. That will bring millions of dollars to town
Tree preservation. Many older trees are cut down on new development properties but the property sits vacant for years! The trees could have been left. Priority to keep old trees.
Tree Protection Bylaw for trees on private property.
Use ecologically sound and evidence-based practices for management of urban forests. That is, stop removing vegetation because they are perceived as "weeds".
Use the Miyazaki approach for small, dense forested areas throughout the city. Make this a requirement in development proposals.

Water Harvesting
Water supply
What about a tax break or some support for properties that increase their canopy substantially and decrease their water consumption.
When replacing trees or planting new trees use trees that are already years old. Do not expect a one gallon potted tree to become a shade tree in a short time. We need to SAVE what we have.
Xerescaping, community gardening, reduction of heat sinks from concrete towers
You asked the question, "Do you support the increase in canopy targets". In the previous table, urban centers were the only area with a new, higher goal. One goal is even lower than current levels of coverage. Please aim to increase coverage in all areas
you talk about the number of trees that have been planted and how many trees need to be planted each year to reach the targets. But is tree survival going to be monitored? Not all young trees survive the planting process

Please provide any additional comments you have about the draft Urban Forest Strategy.

Action the fire smart strategy on city lands. Take a leadership role in evolution toward a safer wildfire environment. Look after Kelowna property and citizens before considering big picture objectives. If we can make Kelowna wildfire safe, we be an examp
Again, seems very urban focused. Agricultural lands can play an important role here
Again, the public education component is vital. Also need to link to the FireSmart program to get rid of highly flammable landscaping like cedars which also consume excessive water.
Already utilized Neighborwood tree program
Appreciate the tree canopy on Sunset Drive; protection of old, forest and trees important so these trees can reduce carbon emissions; protection of the orchards we have left, reducing build of high rises to decrease heat domes and protect birds and trees
Are there are any bushes that contribute to the Forest Strategy (large/increased green space)? We are limited in our ability to plant trees, but would love to know which bushes help with these aims!
Arrest arsonists and stop DEW.
Be sure to make clear how those of us who don't own property or who live in multi-unit dwellings can help.
Clearcut and build condos! Now that will make the reader of this explode. LOL
Climate change is a hoax
Contrary to the City's carbon reduction strategies, which are incidentally scientifically inconsistent with increasing the greening of the city, focus on the latter and you will actually achieve the former without increasing the cost of living.
Could solar panels be a factor in canopy size calculation?
Cover the tarmac with drought resistant canopy deciduous trees
Create an educational forest with signs that explain how the ecosystem works and how trees benefit the urban landscape.
Densify the forest will result in superfires destroying major parts of Kelowna just look at the pics of what it looked like 140 years ago when no superfires happened thats what the forest needs to look like.
Eliminate pavement roads and replace them with concrete and you will lower the city temperature by 10 to 15 degrees. Do not remove any trees. The trees are good as they are
Essential for kelowna to protect trees on private property
Evaluate implementation of Strategy through measurement of key performance indicators and semi annual reporting of results.
Every question should be answered "strongly agree" in my opinion.
Expand neighbourwoods program. Lots of demand.
First, provide ALL city affiliations with unelected entities and any rewards public servants receive for specific promotions.
Focus on preserving existing trees and stopping Fortis from destroying trees near power lines. They completely over cut hundreds of shade trees this past year
Get the fire department off its rear end. 2023 was a embarrassment of unpreparedness.
Grateful there's a plan in place - though the average citizen doesn't realize the carbon capture of trees and the benefits. EDUCATION is critical as well as reaching out to regular visitors of the area, eg Alberta, who've experienced severe fires as well

Have city workers like calgary that maintain roads, trees etc STOP CONTRACTING OUT. Do i get a tax break for planting 50 deciduous trees in my .4 yard? Or for donating produce too food bank. Grow food not lawns same goes for the city less shtty wineries
Having a question in whether you work with local Indigenous peoples should not be in this survey. It is offensive that folks are even given a choice. We live on stolen land.
How much will it cost a homeowner to have trees assessed on their property and then follow through . Suggesting planting a couple to trees in the place of one in certain neighborhoods is not sound policy. This is a well and good overview but the detahand
I am concerned that connecting Urban Forest to wildland forest could increase risk of wildfire having access to urban core.
I believe that Wilden properties were saved due to fire migration
I do not support the urban core areas haveing such a low percentage of canopy. These areas have much pavement and need the cooling effect of trees, not to mention the natural beautification trees provide .
I don't have a yard to plant trees, but am happy to help volunteer to plant or pull.
I live in a condo, so most of those options were not valid for me. Make climate change affordable. This is the biggest issues many of us have with a the climate action stuff. Why is no one looking into population control??
I stated earlier. The NeighbourWoods program is on hold until August?? I truly was a good canopy tree to provide shade from the sun hitting our front door and windows resulting in less cooling. Finding a native plants list took some time perhaps too mu
I support stronger bylaws to protect trees on private property. The value of trees for the community is very important.
I think our focus is too strong on forestry... could be directly more broadly with all vegetation and landscapes including regulating existing ones like parks, trails etc. I also think a support towards native species and protecting them (encouraging planting
I think street trees are being undervalued. They do a lot more for cities than just provide clean air and shade. They are a lot more useful than trees anywhere else as far as I can tell.
I think the strategy needs to start without delay. The downtown core is so hot and windy, it is reverting to a desert. Shrubs can do wonders too. All plants remove carbon and beautify the area as well as provide habitat for birds. More trees in the parks!
I think we are late to the party, hope to see real action right away
I want to plant to trees, and have done and extensive survey of utility lines. I'm confused about what I can plant
I would like to see private property tree protection bylaw.
I would love to have access to pine seedlings and other seedlings to plant around the area I live in. Mostly on unmaintained city owned greenways that had burnt during the 2003 fire.
I would support the Neighbourwoods program if better choices in what's available were made in terms of what is suitable for the Okanagan climate.
I'd like to learn more about volunteering for tree planting and removing invasive species - I would love to help and didn't know such opportunities existed!

I'd like to see an emphasis on drought resistance and low water needs given the current concerns for water usage in Kelowna.
I'm already doing most of (23). Neighbours, however, keep cutting down trees. Bylaw protecting trees on private property essential. Fortis excessive pruning must also be challenged, maybe fined under a heat island tax.
I'm [redacted] and I live in Kelowna - I manage western USA/Canada - our products are used for urban/interface forest projects - new Carbonizer product that captures carbon + makes biochar [redacted]
Implement rooftop gardens with native plants or succulents as well!
In our neighbourhood trees were planted in 2019 then left to their own devices, now variously scraggly or dead. Ditto the expensively planted median, now a weedy mess adorned with cigarette butts. Any strategy needs proactive monitoring & maintenance.
Incorporate pollinator plants in green rooftop and parkades.
Increasing urban forest is in direct contradiction to wanting to be water smart.
Invasive species need control. Native trees must be prioritized, No more red maples on residential streets.
It is all Virtue signalling and a waste of city funds.
It seems like it's going in the right direction
It seems not feasible with the amount of urban development occurring in the coming years
It strange, but trees seem to grow without an army of city workers
It won't work. Large trees damage foundations. You can't get green where the city has made it all concrete and trees along roads have to be properly cared for which means adequate water otherwise your dreams will be brown
It's a great strategy but I wonder how successful you will be getting the planning department on board. We are living in a time of panic re-zoning which doesn't bode well for such things as tree canopy and climate resilience. Short-sited and tragic.
Just really happy it is starting to be looked at as well I like the fact there's at least 3 easy Solutions that we can do to help.
Kelowna needs a Tree Protection Bylaw applicable to public AND private property
Leave Urban areas Urban.... Don't destroy it with more condos and traffic. Leave nature alone. The total strategies should be putting out fires faster instead of leaving them and destroying Communities.
Less than 12per cent of the entire Palouse (ID, OR, WA and BC) remains intact. Kelowna contains many locations perfect for rewilding and can create corridors to help species continue to mate, breed and migrate in this region.
Let neighbourhoods adopt planters on city property
Live in townhouse so can encourage the planting of more trees by strata
Look after nature and she will look after us.
Look at lessons from other large cities. The heat in Manhattan is oppressive in the summer.
Looks good
Looks good Sam
Lots of siberian elms in the Rutland/Ben Lee area. I think most of my neighbours aren't aware that they are not ideal and could/should be removed.

Make it much harder for the tree removal companies to cut down trees.
Make this strategy equitable and not just for brand new expensive developments.
Maybe it should include a way to encourage less paving of driveways and parking lots, using different materials like driveway pavers that allow grass to grow
more and better trees. stop Fortis BC - electricians shouldn't use chainsaws. They need to hire arborists.
More canopy is essential to liveability
More communication with residents about ways to help through events and volunteering
more trees and plants to use up so called excess carbon dioxide
Municipalities that over-prioritize trees end up stifling development (Districts of North and West Vancouver, for example). Trees are important, but maintain flexibility in policy so that they do not become crippling barrier to new development.
Need more trees to encourage people to walk more! In the summer it's very difficult to walk because it's so hot and there is barely any shade.
Need to consider landscape management as well to protect watersheds for future domestic water demands.
Need to take a closer look at Overhead Utility designs to safely to install further away from private property to insure no trees will compromise safe work practices Present design adapted is antiquated
Needs much more work to get to real actions.
Neighbourhoods program needs to focus on smaller trees that are suitable for the smaller setbacks in the downtown area. Larger trees do not fit on our properties.
NIL
No comment
No Ponderosa Pines
non
None
Not a homeowner so much less power to add to this myself
Not a priority, considering all of the other issues in our city
Not enough focus on native plants. Need a plan to transition away from grass. It's insane to cut grass to ensure it can't support any biodiversity like mice and bugs and then water it because you cut it. Grass is a big issue.
Not everyone wants a 40 ft tree in their yard. In your neighbourhood tree program include smaller trees.
Not planning on doing any of the things previously listed
Noted in previous survey. Include standards for soil volumes, irrigation, protection of infrastructure for long term success of mature trees.
Number 21 above is the same problem I had with number 12- not able to figure out how to move the ranking so, as was the case with number 12, I could not make any decision.
N'woods =can't transport tree. No tree at address. Cost of landscaper prohibitive. Removing 2 backyard invasive elms cost \$3000 with zero compensation. Have been trying last 3 years to find a solution to adding a tree to the yard without success.
piss off

Plant Food forest
Planting and caring for fruit trees on collective space together could not only improve food security but increase community connection.
Planting trees is always a great idea. They provide shade and habitat as well as beauty.
Please aim to increase canopy coverage universally. In one area the "new goal" is lower than levels of coverage in 2023. This is not sufficient for a "new goal".
Please do not cost Kelowna residents any money
Please keep developers accountable for the trees they promise to plant. Insist on long-term canopy cover percentage, instead of number of trees. I'm seeing too many baby trees that will never grow big, and too many mature trees cut down to make space.
Provide gardening consultations for optimal gardens in Kelowna with xeriscape options
said above -tell stratas to get rid of cedar trees
Species selection for locations and SOIL types, I believe are the 2 most important issues lacking
Street trees are very important for shade, beatification, tourism and mental health of residents, must be prioritized when development happens. Space for roots considered, watering and species choice: Why do we not plant native Ponderosa pines?
Support in principle.It's always about implementation. A beautiful, naturally occurring tree too close to a house can cause grief for residents (foundation/underground piping damage etc. Common sense, not political ideology.
Take back the boulevards and plant intensively with trees to create shady tree-lined streets
Thank you for prioritizing this.
Thank you for thinking about this. The Rutland area is very devoid of trees and shade, it is a heat island and walking anywhere in the summer is challenging due to lack of shade, rutland road, hwy 33, springfield rd do not have good sidewalks or tree cove
Thank you for updating the Urban Forest Strategy and providing the opportunity to comment. The only change I'd like to see is an increase in the tree canopy in urban areas, as I feel this could help cool these areas naturally.
Thank you, but I won't hold my breath.
the 2011 SUFS said that there were 3.3 million trees in Kelowna with a value of \$1.1 Billion. This report has no tree number but says they are worth \$9.8 Million. That tells me that we have fewer trees now than in 2011. Why is that? Developments?
the city is allowing excessive devlopment which prevents an urban forest so there is too much pavement - our goal should be a 'garden city" - even the new parks are constructed and a lot of these areas are paved. The new PRC plan results in loss of green
The city should do more, don't put the burden on residents. More trees on road ways
The time lines are too vaque and not measureable. Where is the Bylaw to protect trees on private property? 5 years to do another Lidar assessment?...too long. In my 'hood' there have been ~ 25 trees removed in the last month (HCA). Still lots of trees in
The UFS is a very good idea, and I had not heard of it until this survey was sent my way.
There are a lot of great ideas, enough to interest different groups of people and individuals, if we get half of the proposed items we will be able to make a difference

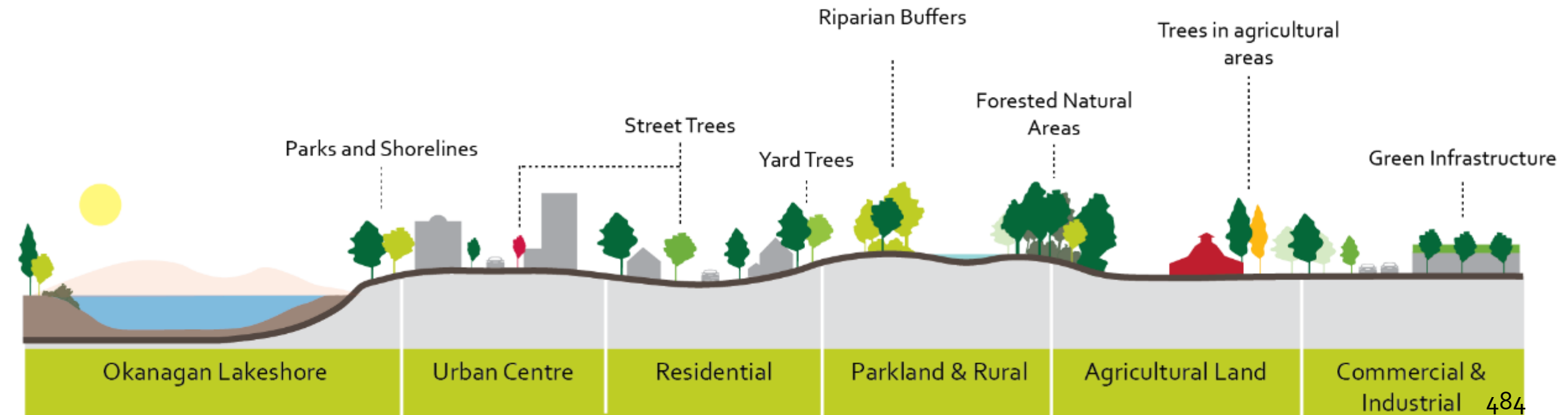
There are countries in the world where you have to get approval to remove trees on your property. I doubt that would work here though. There needs to be more communication with Fortis re tree planting and dealing with those close to electric lines.
Think there should be sn effort to grow the canopy in the air, using rooftops to build urban canopy and even urban beehives
This is virtue signalling. What a joke! China is killing the planet and we think that our tree initiative is going to help? Really?
This section is emotional, not logical.
This strategy as part of climate resilience plan ranks very highly, given other co-benefits of trees/nature. Tree vandals should face major penalties. Powerlines impede planting, growth, maint, safety of trees-pls bury lines wherever possible
This survey has many incomprehensible questions, mostly due to buzzwords. This diminishes the opportunity for civic engagement
Too general for meaningful comment. Incentivize good actions and punish choices that reduce canopy cover. Strongly target construction plans
Trees and plants live on CO2. What do we do when they die from lack of CO2
Unsure
Urban Forest Strategy can come cut down diseased and nuisance trees on my property.
Way to go on creating an Urban Forest Strategy! Please share it with other municipalities in the valley to motivate them to create one so there are plans for the entire valley.
We don't just need more trees, we need healthy, resilient, biodiverse ecosystems and communities. Remove invasive species, plant native, and build soil health while forming partnerships, engaging volunteers, and prioritize regional impact over competition
We need to remove wild fire 'fuel' where possible and plant 'firesmart' and deer resistant vegetation in urban areas. Remove dead trees and fine people for dumping their landscape clippings and branches - that become fire hazards.
What are all these strategies going to Cost and what effect do you think all these proposals will do to the world's environment? I now have a new bike lane on my street. The roadway is very narrow with many tire marks on the concrete barriers. Stupid plan
what is the NeighbourWoods program?
While the native forest in the okanagan is dry and not dense the reality is our urban areas are, and should be.
Wildfires.
With the infill housing, we have lost a lot of trees and green spaces in Kelowna -
Yet again, profiteers are reducing and/or NOT sufficiently replacing existing treescapes and you are letting them get away with it. 'Lose a tree', plant three trees of equal or larger size' should be the bare minimum--NOT 'money in lieu of' crap....'
Your survey contains what can only be described as propaganda! It should be mandatory to publish the cost of this survey!

Sustainable Urban Forest Strategy

August 26, 2024

What is the urban forest?

"All trees, forests, plants, soils, and associated ecosystem components located within the city."



Includes rural and urban, public & private

City forest



Private forest



Natural Forests

City tree



Private tree



Urban Trees

Trees face many challenges



Pests, diseases & invasives



Climate change and extreme weather



Development and urbanization



.... but provide many benefits



Shade and cooling



Beautification & sense of place

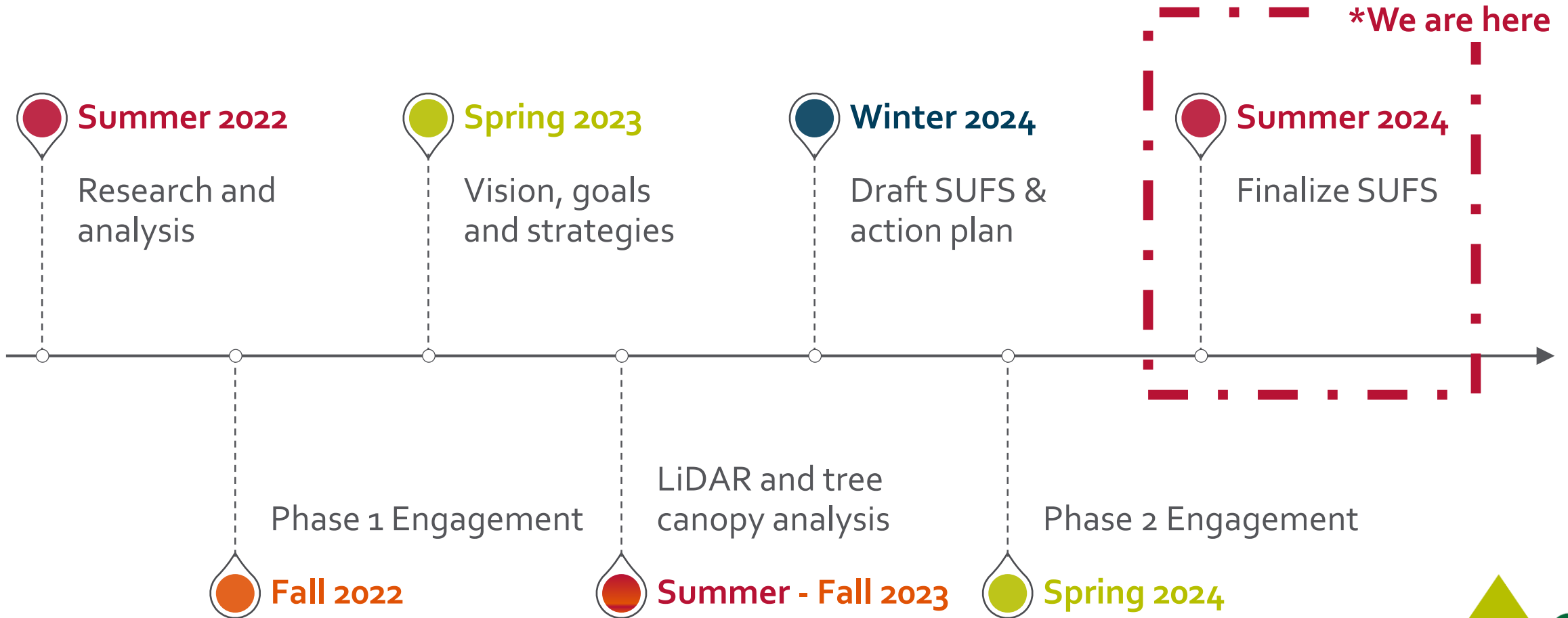


Food production & health



Habitat, air purification & water storage

Development of the Sustainable Urban Forest Strategy



Engagement – who we heard from

Phase 1 (Fall 2022)

- 347 survey respondents
- 48 mapping tool participants
- 22 open house attendees
- 25 workshop participants

Phase 2 (Spring 2024)

- 350 survey respondents
- 68 open house attendees

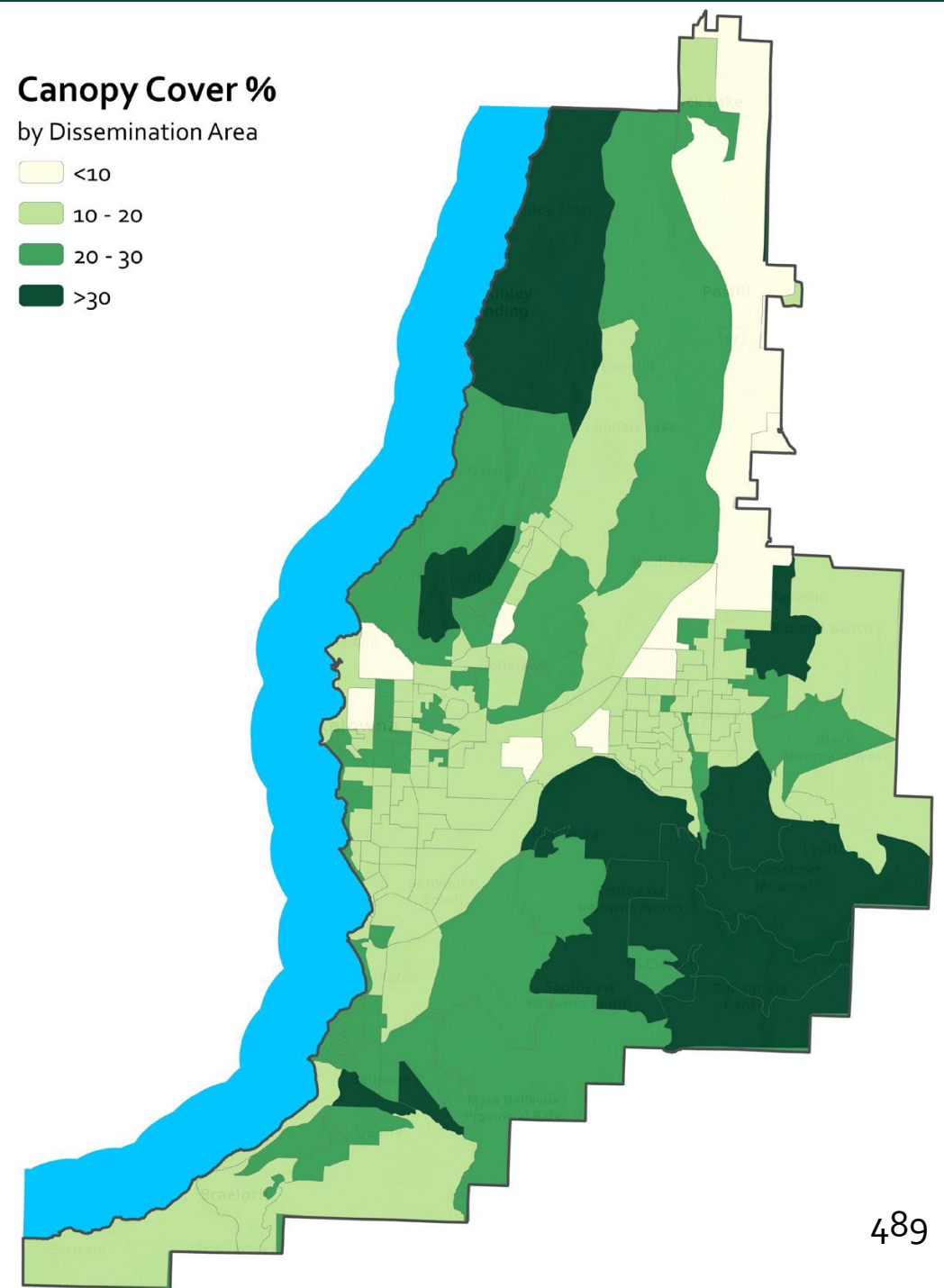
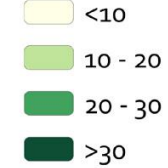


2023 Canopy Coverage Analysis

- ▶ **22%** canopy coverage average city-wide
 - ▶ Grassland cities average 20%-25%
- ▶ Tree Canopy Distribution
 - ▶ **78%** on private lands
 - ▶ **22%** on public lands
 - ▶ 15% managed by the City
 - ▶ 7% occurs on other public lands (schools, RDCO parks, etc.)

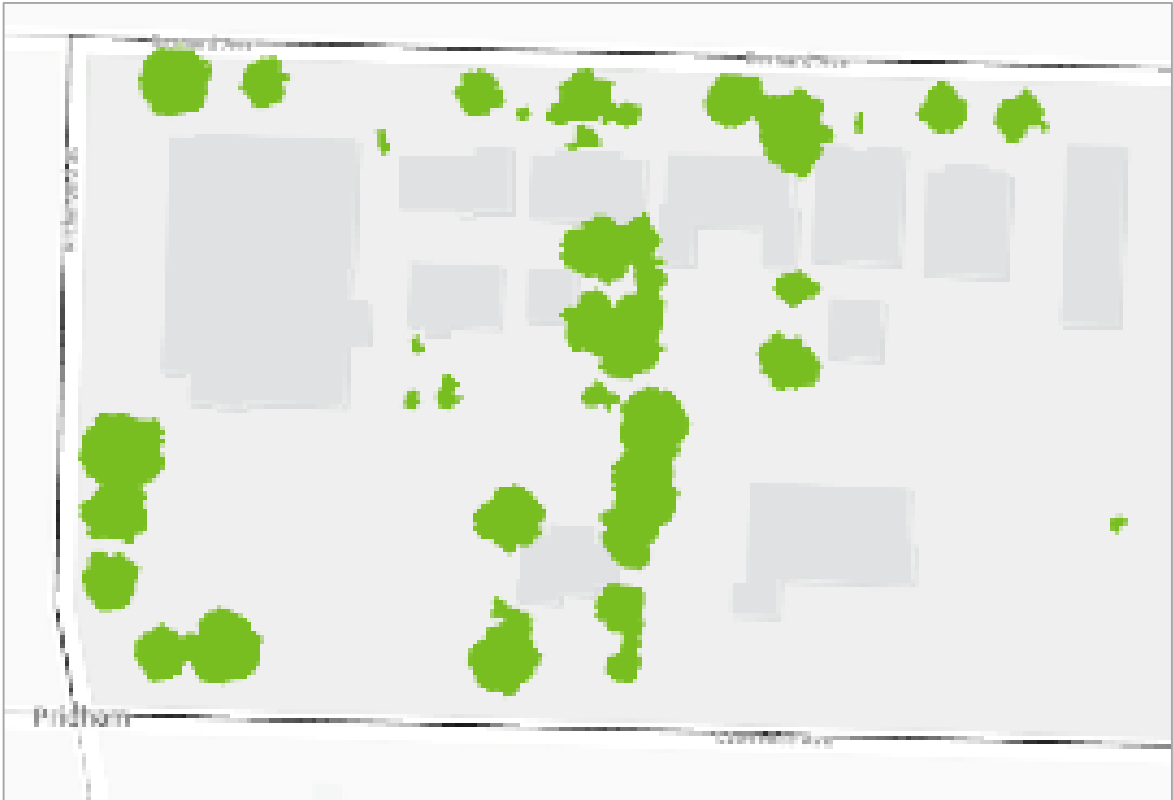
Canopy Cover %

by Dissemination Area



Canopy Coverage Examples

10%



Canopy Coverage Examples

20%

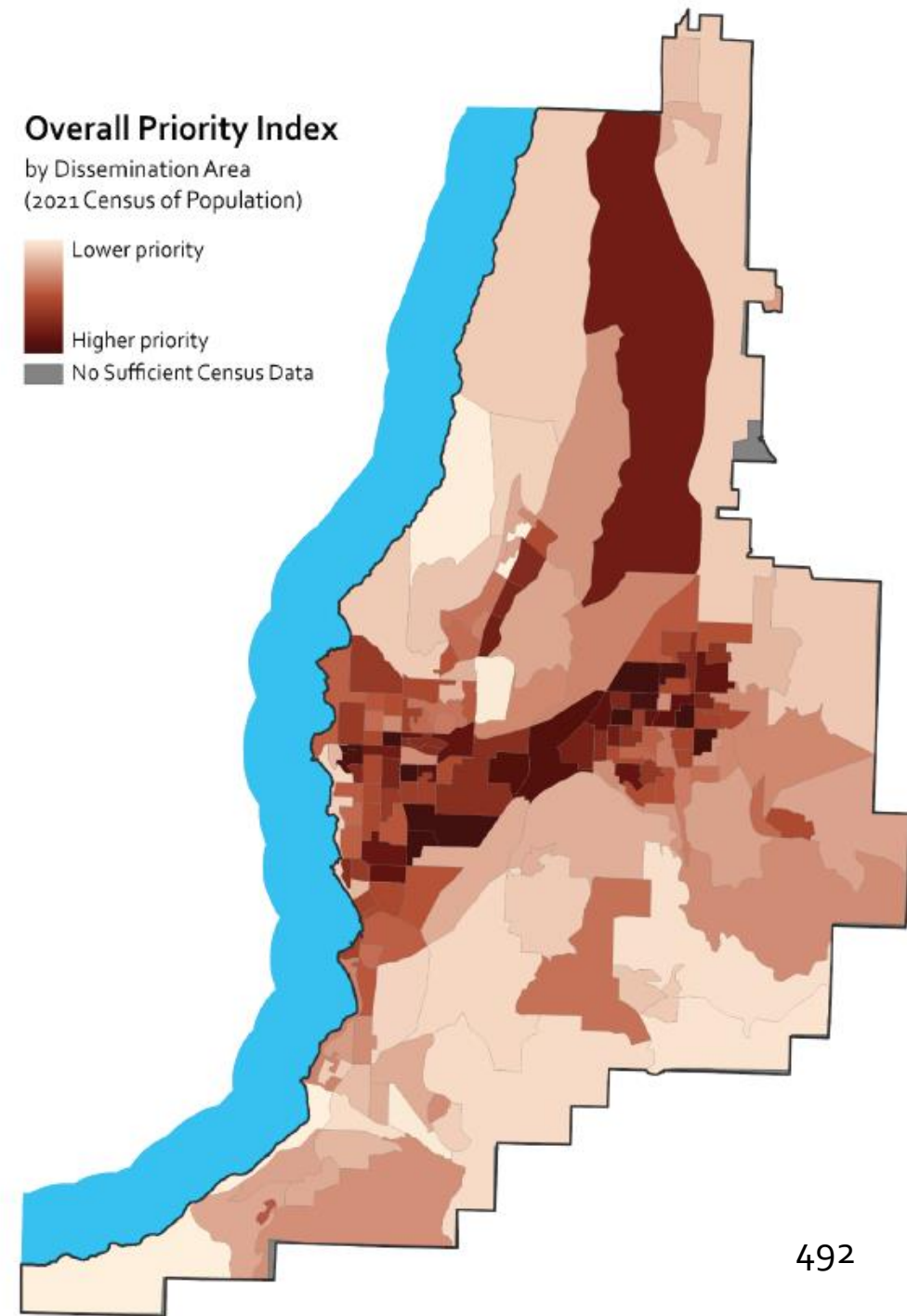
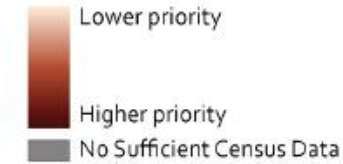


Tree Equity

- ▶ Equitable access to urban forest benefits is a crucial social issue
- ▶ Assessed by combining tree canopy coverage with social indicators including:
 - ▶ Temperature
 - ▶ Income
 - ▶ Unemployment
 - ▶ Age
 - ▶ Visible minorities
- ▶ Illustrates the need for additional planting in Urban Centres and Core Area

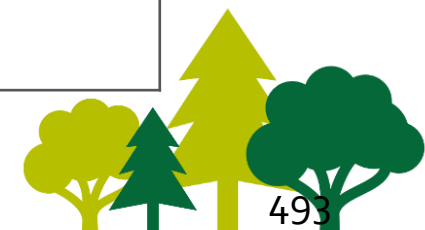
Overall Priority Index

by Dissemination Area
(2021 Census of Population)

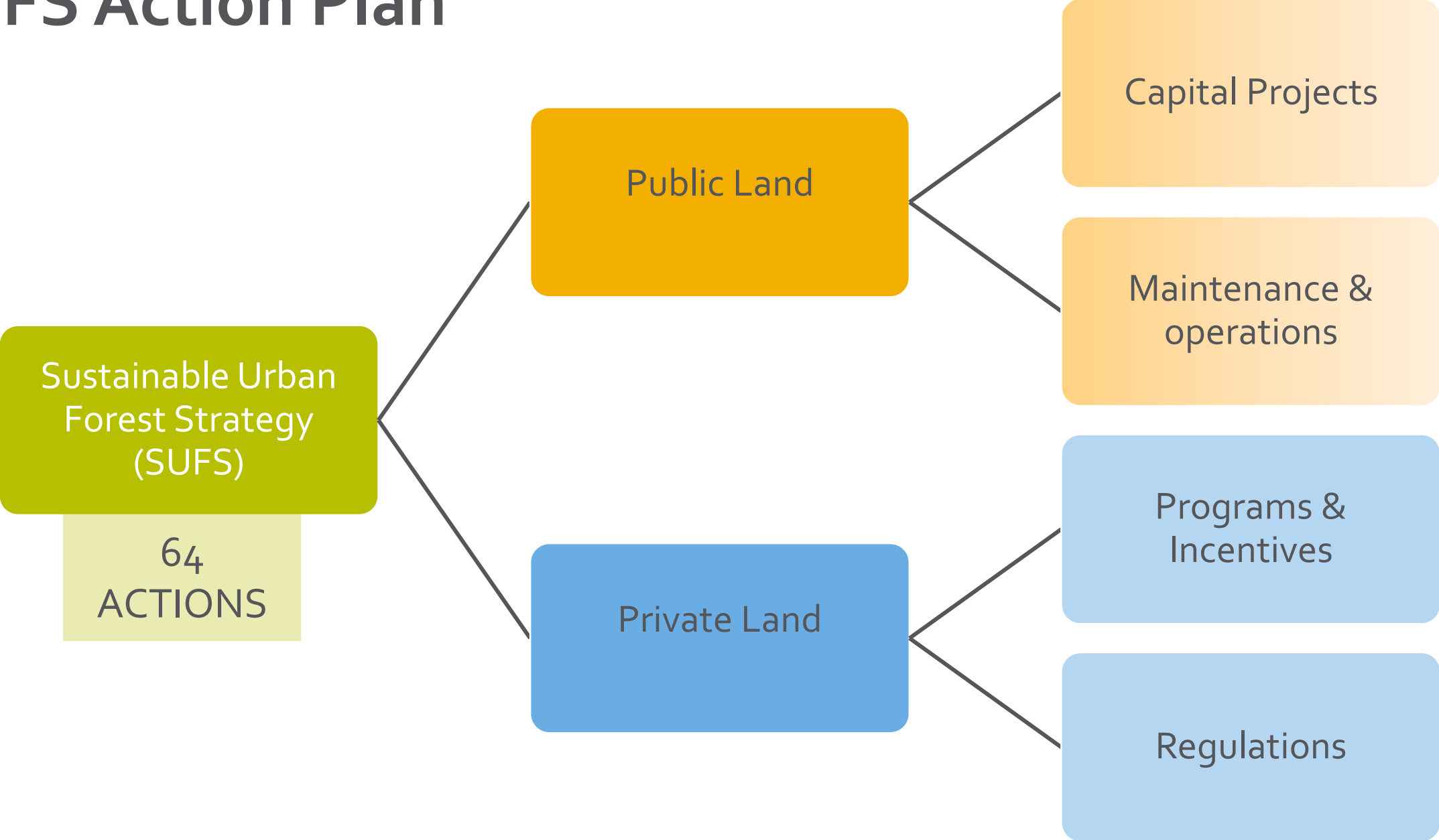


Proposed Canopy Targets

Growth Strategy District	2023 Canopy Coverage	Current Target 2040	Proposed New Targets 2050
Urban Centres	12%	12%	20%
Core Area	15%	20%	20%
Suburban	20%	25% (average over the three districts)	25%
Gateway	10%		15%
Rural	27%		25%



SUFS Action Plan



10 Key Strategies to Success

Protect, connect, and expand the urban forest

1. Strengthen policy, planning, and implementation to protect, connect and expand tree canopy
2. Expand the urban forest equitably in Urban and Core areas
3. Improve the quality and suitability of trees being planted for the site and climate requirements



Maintain a healthy, safe, and viable urban forest

4. Clarify City procedures and standards to improve efficiency and manage risk
5. Transition from reactive to proactive maintenance of City trees
6. Ensure resourcing is sufficient to deliver levels of service that maximize urban forest benefits



10 Key Strategies to Success con't

Involve people and organizations in management

7. Improve awareness of and participation in urban forest management
8. Build relationships with syilx/Okanagan communities, First Nations Governments and Indigenous peoples through urban forest management

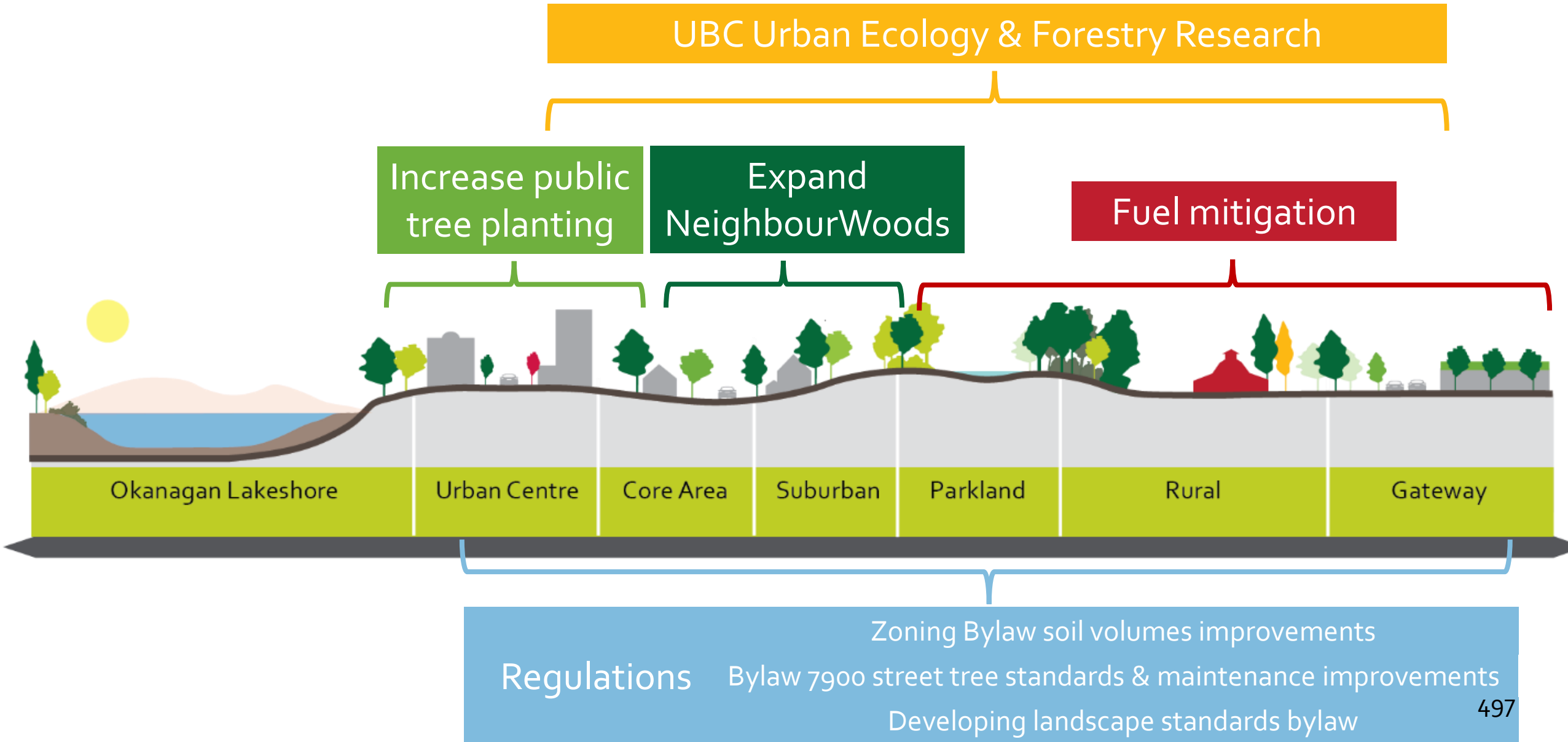


Monitor and innovate to achieve vision

4. Monitor change, report, and adapt management to new information
5. Trial innovative approaches to dryland urban forestry



Initial Actions

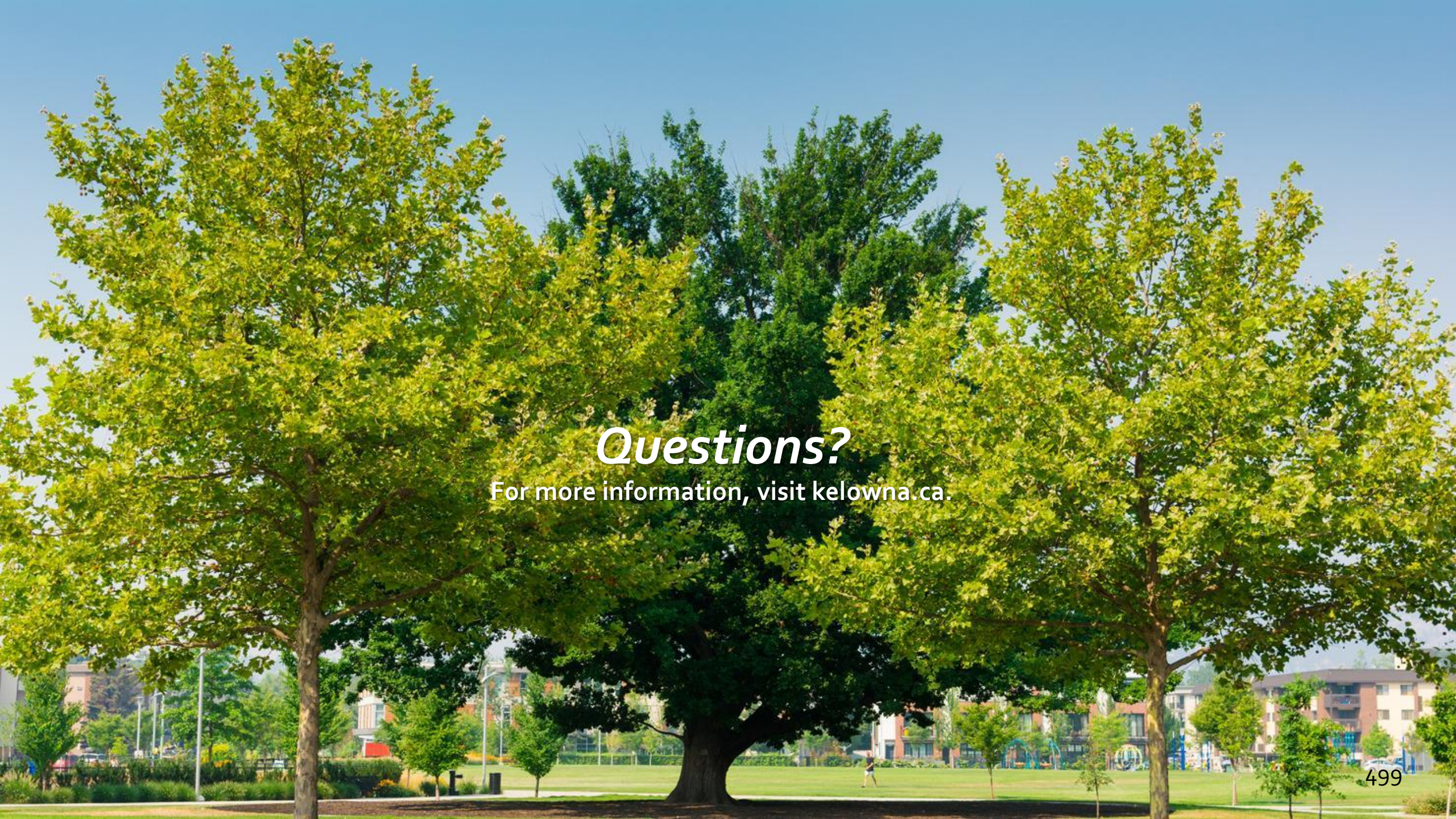


Recommendation

THAT Council receives the 2024 Sustainable Urban Forest Strategy.

AND THAT Council adopt the 2024 Sustainable Urban Forest Strategy.





Questions?

For more information, visit kelowna.ca.