SCHEDULE "H"

SUPPLEMENTARY SPECIFICATIONS, STANDARDS AND DETAIL DRAWINGS

The City of Abbotsford has adopted the Master Municipal Construction Documents – Volume II, Instructions to Tenderers – Part II, General Conditions, Supplementary General Conditions, Specifications, Supplementary Specifications, Standard Detail Drawings Platinum Supplemenatry Updates, published by The Master Municipal Construction Documents (MMCD) Association and printed in 2009 for use on all Engineering Department contracts. Development Works and Services shall be constructed in accordance with the MMCD Specifications and Standard Drawings as amended herein.

To bring these specifications into conformance with practices within the City, the following amended and additional clauses and Standard Drawings are to be considered part of the General Specifications and Standard Detail Drawings. These amendments take precedence over the Master Municipal Construction Documents.

Throughout these documents wherever the term "Contract Administrator" is used or referred to it shall read or be the same as "the Engineer" who is the General Manager, Engineering and Regional Utilities, for the City of Abbotsford or their designate.

SECTION 01 57 01S ENVIRONMENTAL PROTECTION

1.0	**GENERAL**		
1.2	**Temporary Erosion and Sediment Controls**	1.2.1.2	Replace with "Do not discharge water containing substances deleterious to fish, including suspended materials into water courses, sewer, or drainage systems."
		1.2.1.3	Replace with "Discharges to watercourses, sewer, or drainage systems must comply with municipal, Provincial and Federal requirements."
		Delete 1.2.2 and replace with the following	Delete and replace with "No permanent or temporary works are permitted within 30 m of the top-of-bank of a watercourse without appropriate approvals. Any proposed works within 30 m of the watercourse top-of-bank may require approval from municipal, provincial, or federal authorities and it is the responsibility of those proposing to undertake works to obtain appropriate approvals."
		Delete 1.2.3 and replace with the following	Delete and replace with "All works must be completed in accordance with the City of Abbotsford's Erosion and Sediment Control Bylaw (Bylaw No. 1980-2010)."
1.4	**Environmental Protection**	Amend 1.4.1.1	Delete "and burning of rubbish".
		Add 1.4.2.5	All works must be compliant with the federal *Migratory*

Bird Convention Act and the provincial *Wildlife Act* with respect to birds nests.

Amend 1.4.3.2 Replace with "Control emissions from equipment and plant to relevant regulatory agency emission requirements."

Add 1.4.4 Disposal of Wastes

.1 Do not bury rubbish and waste materials on site unless approved by Contract Administrator.

.2 Do not dispose of waste or volatile materials, such as mineral spirits, oil or paint thinner into watercourses, storm or sanitary sewers.

.3 Maintain the site in a neat and orderly condition. Rubbish accumulations to be removed promptly.

1.9 Chloraminated Water

Add 1.9.1 If working within 10 metres of any City of Abbotsford water mains, services connections, hydrants, etc. supplying water treated with chloramine, excluding Clearbrook Waterworks District, the Contractor shall maintain a minimum 22 kg supply of Sodium Thio-sulphate (brand names Penta, Hydrous) on site at all times and sufficient quantities of Vitamin C to remove ammonia. Treat all spillage or breakages with appropriate neutralizing dosage (7 gm per 1000 gallons). Contact the City's Water Department for recommended neutralizing procedures. Notify City immediately of all water main breaks."

2.0 PRODUCTS

3.0 EXECUTION

SECTION 01 58 01S PROJECT IDENTIFICATION

1.0 GENERAL

1.2 Temporary Project Identification

1.2.1 Delete.

2.0 PRODUCTS

3.0 EXECUTION

SECTION 03 30 20S CONCRETE WALKS, CURBS AND GUTTERS

1.0 GENERAL

1.4	**Measurement and Payment**	Delete 1.4.1	
		Delete 1.4.3 and replace with the following	Concrete curbs and gutters will be measured in lineal metres for the width indicated on the Contract Drawings. Payment will include granular base, concrete walks, wheelchair ramps and driveway crossings as shown on the contract drawings. Payment will also include any necessary excavation, subgrade fill, subgrade preparation, granular sub-base and saw cutting.
		Delete 1.4.5 and replace with the following	Concrete curbs and gutters will be measured in lineal metres. Payment will include granular base, concrete curbs and gutters, driveway and wheelchair letdowns as shown on the contract drawings. Payment will also include any necessary excavation, subgrade fill, subgrade preparation, granular sub-base, saw cutting and hand formed curbs.
		Delete 1.4.6 and replace with the following	Payment for driveway crossings will be measured in square meters as shown on contract drawings. Payment will include granular base as shown on standard detail drawing C7 for each specified thickness. Payment will also include any necessary excavation, subgrade fill, subgrade preparation, granular sub-base, hand formed curbs and culvert crossings.
1.5	**Inspection and Testing**	Append to 1.5.2	… One strength test will be required for each 500 lineal meters of sidewalk or curb and gutter placed, with not less than one test per day of placement.

2.0 PRODUCTS

3.0 EXECUTION

3.6	**Extruded Sections**	Add 3.6.1	Barrier curbs per standard detail drawing C4; Rollover curbs per standard detail drawing C4.

3.9	**Expansion Joints**	Delete 3.9.1 and replace with the following	Form transverse expansion joints at both ends and at the centre of curb returns and at a maximum spacing of 9 metres for Sidewalks, 9 metres for curb and gutter, at both ends of curb let downs, at all catch basins poured integrally with the curb, and at tangent points and/or every 15 metres in cul-de-sac turn- around.
3.10	**Control Joints**	Delete 3.10.1 and replace with the following	In sidewalks, construct control joints at maximum 1.5 metre intervals.

SECTION 03 30 53S CAST-IN-PLACE CONCRETE

1.0 GENERAL

1.6	**Inspection and Testing**	Add 1.6.4	One strength test will be required for each 500 lineal meters of Sidewalk or curb and gutter placed, with not less than one test per day of placement.

2.0 PRODUCTS

3.0 EXECUTION

SECTION 26 00 00S GENERAL ELECTRICAL & SCADA

1.0	**GENERAL**	Add 1.0.1	Section 26 00 00S refers to those portions of the works unique to general electrical requirements and SCADA in the City's infrastructure including but not limited to water or sewage pump stations, pressure reducing valve stations, and traffic signal controllers.
1.1	**Related Work**	Add 1.1.1	Roadway Lighting Section 26 56 01
		Add 1.1.2	Traffic Signals Section 34 41 13
		Add 1.1.3	Waterworks Section 33 11 01
		Add 1.1.4	City of Abbotsford's Development Bylaw, 2022, Bylaw No. 3260-2022 "Schedule F – Standards for the Design of Sanitary Pump Stations"

2.0 PRODUCTS

2.1	**Related Work**	Add 2.1.1 "Electrical Panels"	All new electrical panels, motor control centers and power distribution centers shall have arc flash rating label. If Arc flash rating is not applicable, it must be stated on the panel.

2.2	**Approved Products**	Add 2.2.1	For a list of approved products and materials, refer to the City of Abbotsford Approved Products List found on the City's website.

SECTION 26 56 01S ROADWAY LIGHTING

1.0	**GENERAL**		
1.4	**Electrical Energy Supply**	Add 1.4.4	Meet requirements of utility company for service installation.
1.10	**Inspection and Testing**	Add 1.10.2	Voltage to be tested at service panel(s) and street light poles. Luminance to be tested at sufficient locations to verify requirements for minimum lighting levels and maximum uniformity ratio. Results in lux to be reported by the electrical engineer to the Engineer. The illumination units shall be in “lux”.
2.0	**PRODUCTS**		
2.1	**General**	Append to 2.1.4	For a list of approved products and materials, refer to the City of Abbotsford Approved Products List found on the City’s website.
2.2	**Conduit**	Add 2.2.2.4	Only factory conduits bends acceptable.
		Add 2.2.2.5	Each standard length of pipe, coupling, adaptor, bend and fitting to bear CSA certification label.
		Add 2.2.6	Conduit to be 35 mm nominal size, with 42 mm outside and 35 mm inside diameters.
Delete “2.5 Concrete Junction Boxes” and replace with “2.5 Concrete Junction Boxes and Communications Vaults”		Add 2.5.2	Concrete junction boxes to have steel checker plate lids with 3/8" diameter x 1" long bonding stud welded to underside of lid. Steel lids to be hot dip galvanized marked “ELEC”.
		Add 2.5.3	Concrete communication boxes to have steel checker plate lids with 3/8” diameter x 1” long bonding stud welded to underside of lid. Steel lids to be hot dip galvanized and marked “COMM”.
2.7	**Poles and Anchor Bolts**	Delete 2.7.2 and replace with the following	Anchor bolts to conform to section 301 – Traffic Signals, Luminaire and Sign Pole Structures, BCMOT E&SMS V1 and to Standard Detail Drawings CE1.15, CE1.16, and CE 1.17, except for pedestrian/cyclist pushbutton posts, which require 3/4” diameter anchor bolts.
		Add 2.7.9	Poles to be supplied with galvanized finish or can be galvanized and powder-coated as approved by the

			Engineer.
		Add 2.7.10	Poles to be supplied with a Nova Pole Security Hand Hole Cover Kit or an equivalent anti-theft hand hole cover plate as approved by the Engineer.
		Add 2.7.11	Poles to be supplied with an anti-theft plate.
2.11	**Fuses and Fuse Holders**	Delete 2.11.2 and replace with the following	Fuse holders to be inline breakaway type fuse holders complete with 2 'L' type rubber insulating boots.
2.13	**Receptacles**	Add 2.13.3	Cover to be double spring door type for wet locations.
2.14	**Luminaires**		
		Add 2.14.6	Confirm service voltage prior to ordering luminaires.
		Add 2.14.7	The Consultant shall confirm with the Engineer on selection of luminaire.
		Add 2.14.8	Luminaire voltage, wattage, colour temperature and distribution type to be as specified on the drawings.
2.17	**Extruded Aluminium Signs**	Add 2.17.2.5	Type of reflective material used on sign faces as specified on Contract Drawings.
Add 2.19	**Paint**	Add 2.19.1	Paint colour and specifications, if required, as specified in Contract Documents.
3.0	**EXECUTION**		
3.6	**Poles and Related Equipment**	Append to 3.6.8	… The exposed thread of anchor bolts to be between 3 mm and 9 mm above the anchor nuts.
3.8	**Wiring**	Append to 3.8.1	… Conductor connections from the luminaire at pole hand holes to have a drip loop.
		Add 3.8.12	Leave 1.0 metres length of each conductor in junction boxes.

SECTION 31 11 01S CLEARING AND GRUBBING

1.0	**GENERAL**		
2.0	**PRODUCTS**		
3.0	**EXECUTION**	Add 3.0.2	Prior to clearing, take photographs as required to document pre-disturbance conditions. Provide full set

			in digital format to the Engineer.
3.4	**Grubbing**	Append to 3.4.1	… and within 3 metres of trench centreline.

SECTION 31 22 01S SITE GRADING

1.0 GENERAL

2.0 PRODUCTS

3.0 EXECUTION

3.1	**Stripping of Topsoil**	Add 3.1.3	Stripping of Topsoil to comply with City of Abbotsford Erosion and Sediment Control Bylaw (1989-2010).

SECTION 31 23 01S EXCAVATION, TRENCHING AND BACKFILLING

1.0 GENERAL

1.4	**Protection of Work Property and Public**	Delete 1.4.2 and replace with the following	Remove and replace with approved materials any asbestos cement (AC) water mains or vitrified clay sewers. Asbestos concrete pipe removal must follow Worksafe BC requirements.
1.8.1	**Limitations of Open Trench**	Append to 1.8.1	Where the trenching operations are within public road right of ways, the trench shall be backfilled at the end of the construction day to as close to end of pipe as feasible.
1.9	**Permits and Approvals**	Add 1.9.2	Examine site with the Engineer and obtain approval of previous work prior to commencing excavation.

2.0 PRODUCTS

3.0 EXECUTION

3.1	**Site Preparation**	Append to 3.1.2	Cuts may be made with diamond saws.
3.5	**Backfill and Compaction**	3.5.4.1	Delete “90%” and replace with “95%.”
		Add 3.5.5	Place and compact backfill under or adjacent to existing structures in a manner which will prevent damage to the structure from settlement. Under existing pipes, place backfill a minimum of 0.6 metres horizontally on each side of pipe up to the top of the pipe and slope down at 1.5 horizontal to 1 vertical.

3.6 Surface Restoration

Add 3.6.8 Landscape Restoration:

.1 Landscape Restoration to following sections:

.1 Topsoil and Finish Grading
Section 32 91 21

.2 Seeding
Section 32 92 20

.3 Hydraulic Seeding
Section 32 92 19

.4 Sodding
Section 32 92 23

.5 Planting of Trees, Shrubs, and Ground Covers
Section 32 93 01

.2 Restoration of planted areas, either in private or public places, to consist of restoration to original condition by replacement to original depth of approved topsoil (minimum 200 mm), seeding or sodding of grassed areas and replacement of any killed or removed plants or shrubs by ones of equal quality, type and maturity to originals. Should restored item fail to grow successfully either throughout the work area, or in patches, restore so that a successful regrowth is established over entire area.

.3 Plant replacement trees and shrubs at a suitable time of year in accordance with good horticultural practices, to provide minimum assurance or plant survival. If tree or shrub has died, or shows signs or dying, as a result of environmental disturbance, cutting roots, or other cause directly attributable to Contractor's work, close to but not actually within excavated area, replace with new tree or shrub of a similar variety, age and size, up to limits of maximum available size.

.4 Restoration in riparian areas is to consist of native riparian vegetation only and as approved by a Qualified Environmental Professional.

Add 3.6.9 Restoration acceptance: no restoration work to be considered satisfactory until acceptance by Contract Administrator and in case of properties not owned by Municipality, until a written and signed statement of

			release from property owner has been obtained by Contractor and provided to Contract Administrator.
Add **3.7**	**Maintenance**	3.7.1	Maintain all trench surfaces and working surfaces conforming to this Section until the project is accepted by the Engineer. Fill and regrade depressions, pot holes, and washboard conditions with suitable material as soon as they occur.

SECTION 31 24 13S ROADWAY EXCAVATION, EMBANKMENT AND COMPACTION

1.0 GENERAL

1.4	**Protection of Work Property and Public**	Add 1.4.2	Care should be taken in not damaging the existing AC water main or sewage forcemain. Construction procedures shall take into account that there is sufficient cover on the existing pipe and the use of appropriate compaction equipment. The repair of breakage of city mains and services (water, sewer and drainage) shall be done under the direct supervision of the City. The associated cost is the responsibility of the Contractor.
1.8	**Measurement and Payment**	Delete 1.8.5 and replace with the following	Payment for common excavation includes the removal and disposal of asphalt, concrete structures, sidewalks, curbs, gutters, manholes, catch basins, pipes, culverts, endwalls, retaining walls, handrails, poles and any other structures on surface or underground which are removed as part of the operation for common excavation.
		Delete 1.8.6	

2.0 PRODUCTS

3.0 EXECUTION

3.1	**General**	Add 3.1.4	Subsurface drainage:
		Add 3.1.4.1	Install weeping tile drains with 0.3 metres drain rock surround in the subgrade to intercept subsurface water. Direct and connect to a storm sewer main or ditch.
3.10	**Landscape Restoration**	Add 3.10.1	Grade and smooth all cuts and fills behind proposed curbs and gutters to slopes acceptable to the Engineer.

	Add 3.10.2	Restore lawns with topsoil and seed or sod to match existing lawn on private property and Roadway Boulevards.
	Add 3.10.3	Restore planted areas with topsoil, salvaged or new ground cover, and plants or shrubs to match existing on private property and Road Boulevards.
	Add 3.10.4	Restoration in riparian areas is to consist of native riparian vegetation only and as approved by a Qualified Environmental Professional.

SECTION 32 01 16.7S COLD MILLING

1.0 GENERAL

2.0 PRODUCTS

3.0 EXECUTION

3.2	**Preparation**	Add 3.2.4	Milling of asphalt surfaces for underground trenching works shall not exceed 100 lineal metres in advance of the trenching operations unless otherwise approved by the Engineer. Where the trenching operations have yet to be started or are suspended and where in the opinion of the Engineer that a safety hazard exists, the milled surfaces shall be patched flush with the original paved surface.
		Add 3.2.5	Milling of intersections shall not be permitted unless repaving works are to be scheduled within a twenty-four (24) hour period unless approved by the Engineer.

SECTION 32 11 23S GRANULAR BASE

1.0 GENERAL

1.4	**Measurement and Payment**	Append to 1.4.2	… Granular base will be measured in square metres of completed road base surface area. Payment will include: .1 site preparation, including removing or relocating fences and disconnecting overhead wiring; .2 imported embankment fill, granular sub-

			base, granular base as shown on the typical cross-section; and, .3 adjusting existing utility covers, valves, services, meter boxes, manhole covers, catch basins and any other existing surface features to finished grade.
2.0	**PRODUCTS**		
3.0	**EXECUTION**		
3.4	**Finish Tolerances**	Delete 3.4.1 and replace with the following	Ensure finished base surface within plus 2 mm or minus 10 mm of specified grade and cross-section but not uniformly high or low.
3.5	Delete and replace **"Proof Rolling"** with **"Inspection and Testing"**	Add 3.5.1	Falling Weight Deflectometer tests will be required at 10 metres spacing per Lane with staggered tests on adjacent Lanes. Seasonally adjusted results shall not exceed 2.6 mm for local Residential roads, 2.0 mm for collectors and Industrial roads, and 1.5 mm for Arterial Roads. If initial testing reveals deficient areas of granular base, the Contractor shall take all steps necessary to correct the deficiencies. Subsequent testing at Contractor's cost.

SECTION 32 12 13.2S ASPHALT PRIME

1.0	**GENERAL**		
2.0	**PRODUCTS**		
2.1	**Material**	Delete 2.1.1 and replace with the following	Asphalt material shall be CAN/CGSB-16.1 grade MC-70 unless otherwise approved by the Engineer.
3.0	**EXECUTION**		

SECTION 32 12 16S HOT-MIX ASPHALT CONCRETE PAVING

1.0	**GENERAL**		
1.5	**Measurement and Pavement**	Append to 1.5.1	… or as specified in Contract Documents.
2.0	**PRODUCTS**		
3.0	**EXECUTION**		

3.4	**Transportation of Mix**	Delete 3.4.5 and replace with the following	Deliver loads continuously in covered vehicles and immediately spread and compact. Deliver and place mixes at temperature within specified range. Temperature of mix upon placement shall not be less than 125° C and not more than 160° C.
3.5	**Placing**	Delete 3.5.4.2 and replace with the following	Lower course in layers not to exceed 75 mm and not less than 38 mm each.
		Delete 3.5.4.3 and replace with the following	Surface course in layers of maximum 60 mm and minimum 38 mm each.

SECTION 32 17 23S PAINTED PAVEMENT MARKINGS

1.0 GENERAL

2.0 PRODUCTS

2.1	**Materials**	Append to 2.1.1	For a list of approved products and materials, refer to the City of Abbotsford Approved Products List found on the City's website.
		Delete 2.1.6 and replace with the following	Flexible Chip Seal Markers (Temporary Raised Pavement Markers):
		Delete 2.1.6.1 and replace with the following	The marker body shall be made from 1.5 mm thick polyurethane.
		2.1.6.6	Delete.
		2.1.6.7	Delete.
		2.1.6.9	Delete.

3.0 EXECUTION

3.3	**Application**	Delete 3.3.1.3 and replace with the following	The temporary traffic line shall be placed to the following guidelines: .1 Broken Line: place two TRPMs per 2 m strip on 2 m center, with an 8 m gap; .2 Solid Line: place TRPMs 3 m on center for straight sections, 1.5 m on center for curved sections with radius over 291 m, or grades exceeding 6 degrees; .3 Double Solid Line: place two TRPMs

			separated by 100 mm side-by side using the spacing required for Solid Lines.
		3.3.1.4	Delete.
		Delete 3.3.1.5 and replace with the following	Temporary Raised Pavement Markers shall be removed when instructed or as specified in the Contract Documents.

SECTION 32 31 13S CHAIN LINK FENCES AND GATES

1.0	**GENERAL**	Delete 1.0.1 and replace with the following	Section 32 31 13 refers to those portions of the work that are unique to the supply and installation of chain link fences, gates and handrails. This section must be referenced to and interpreted simultaneously with all other sections pertinent to the works described herein.
2.0	**PRODUCTS**		
2.2	**Finishes**	Add 2.2.1.5	For Handrails: to CSA G164 table 1.
3.0	**EXECUTION**		
3.3	**Installation of Handrails**	Add 3.3.1	Handrail sections to be prefabricated, with electronically welded joints, in maximum 7 m sections, hot dipped galvanized, and installed as shown on Contract Drawings.

SECTION 33 01 30.1S CCTV INSPECTION OF PIPELINES

1.0	**GENERAL**	Delete 1.01 and replace with the following	Section 33 01 30.1S refers to those portion of the work that are unique to the requirements for inspecting new and existing sanitary, storm and combined sewer pipe and pipe culverts by closed circuit television. This section must be referenced to and interpreted simultaneously with all other sections pertinent to the works described herein. All work to be in conformance of all the specifications. Work deemed not in conformance of any of the specifications may at the discretion of the Owner be rejected.	
1.1	**Related Work**	Delete 1.1 and replace with the following	.1	Traffic Control, Vehicle Access and Parking Section 01 55 00S
			.2	Storm Sewers Section 33 40 01S
			.3	Pipe Culverts Section 33 42 13S

			.4 Manholes and Catchbasins Section 33 44 01S .5 Sanitary Sewers Section 33 30 01S .6 Sewage Forcemains Section 33 34 01S .7 Cleaning of Sewers Section 33 01 30.2S
1.2	**References**	Delete 1.2.2 and replace with the following	Reference standards, specification or publications. .1 WRC Manual of Sewer Condition Classification (MSCC), 3rd Edition, 1993 .2 NASSCO Pipeline Assessment Certification Program (PACP) .3 CSA Plus 4012-10, Technical Guide – Visual Inspection of Sewer Pipe, 2010
		Add 1.2.3	Nomenclature .1 CCTV Closed Circuit Television .2 JPG/JPEG Joint Photographic Experts Group .3 DVD Digital Video Disc .4 MSCC Manual of Sewer Condition Classification .5 CD Compact Disc .6 NTSC National Television Standards Committee .7 IEEE Institute of Electrical and Electronics Engineers .8 RETMA Radio-Electronics-Television Manufacturers' Association. Now Electronics Industries Association (EIA). .9 Batch CCTV Numerous sections of piping grouped by the City for CCTV assessment by one Contractor. .10 WRC Water Research Centre .11 NASSCO National Association of Sewer Service Companies .12 PACP Pipeline Assessment & Certification Program .13 LACP Lateral Assessment & Certification Program .14 CSA Canadian Standards Association
1.3	**Submission of Certification**	Delete 1.3.1 and replace with the following	Submit a copy of the CCTV operator's WRc, PACP, CSA or other certification certificate to the Contract Administrator with the sample report for batch contracts. For non-batch CCTV projects, the certification shall be included with each report.
1.4	**Work Regulations**	Add 1.4.1.7	WHMIS

		Delete 1.4.2 and replace with the following	Provide written confirmation to the Contract Administrator that workers have knowledge of confined space entry practices and of equipment required for confined space entry with the sample report for batch contracts. For non-batch CCTV projects, the certification shall be included with each report.
		Add 1.4.3	The Contractor shall notify residents prior to accessing easements and Statutory Right of Way adjacent to private property. When required, work shall be rescheduled so as to not disturb residents.
1.6	**Measurement for Payment**	Delete 1.6.1 and replace with the following	All units of measurement for payment will be as specified herein unless shown otherwise in Form of Tender Schedule of Quantities and Prices.
		Delete 1.6.2 and replace with the following	CCTV pipeline inspections will be measured in linear metres. Payment will be made at the unit price bid in Form of Tender. All required traffic management is considered incidental and is included in the unit price. The inspection will be deemed complete once the recorded DVD, a USB 2.0 compatible portable external hard drive, and binder containing hardcopy data of the CCTV inspection as well as digital PDF's are delivered to the Owner, inspected by the Owner and verified to meet all the contract requirements.
		Delete 1.6.5 and replace with the following	For sections of pipe with the, WRc, CSA or PACP condition code "camera underwater" that has a continuous distance greater than five (5) metres, the measurement above may be reduced by the distance in excess of the five (5) metres.
		Delete 1.6.6 and replace with the following	<u>If required and pre-approved</u> by the Contract Administrator, by-pass pumping for each situation, as described in the Form of Tender, Schedule of Quantities and Prices, will be paid per each setup. All required traffic management is considered incidental and is considered to be included in the unit price. By-pass pumping to only be considered once all alternatives as per 3.11 has been attempted.
		Add 1.6.7	On batch CCTV contracts, the Contractor is to submit, at the end of each calendar month, to the Contract Administrator for review, a completed monthly quantity progress in the <u>same</u> format as the Form of Tender Appendix 1 Schedule of Quantity and Prices.
		Add 1.6.8	On batch CCTV contracts, the Contractor is to submit, at the time of Substantial Performance to the Contract

			Administrator a complete backup USB 2.0 flashdrive in the same format as the original DVD's.
2.0	**PRODUCTS**		
2.1	**Equipment**	Delete 2.1.3.4 and replace with the following	Camera to be waterproof with a self-contained lighting system capable of being remotely adjusted. Lights to provide even distribution of light around pipeline perimeter without the loss of contrast or flare out or picture shadowing. Lighting shall illuminate the pipe a minimum of 2 metres ahead of the camera
		Delete 2.1.4 and replace with the following	All digital video editing shall be done with non-linear video editing software, and in no case shall edited digital files be recompressed. Digital video files shall conform to the following minimum requirements: Picture Size: NTSC 704 x 480 @ 29.97 frames per second. Data/Bit Rate:MPEG2 @ 5 M-bits/sec. Video capture equipment shall be capable of capture with no frame loss.
2.2	**Materials**	Delete 2.2.1 and replace with the following	Digital video files to be stored on new, unused DVD-R media that have at least a 30 year shelf life and a USB 2.0 compatible portable external hard drive.
		Delete 2.2.2 and replace with the following	Photographs to be colour, minimum image size 90 mm x 70 mm, minimum of 200 dpi (dots per inch) on premium glossy photograph paper.
		Delete 2.2.3 and replace with the following	Data storage to be on CD ROM, DVD-R and USB 2.0 portable external hard drive.
		Add 2.2.4	At the end of all Batch CCTV contracts the Contractor shall delivery external hard drive(s) containing all CCTV videos. Hard drive(s) shall be hi-speed USB 2.0 or better.
3.0	**EXECUTION**		
3.1	**CCTV Inspection**	Delete 3.1.1 and replace with the following	CCTV operator to have been certified by WRc, PACP or CSA or other accepted by the City of Abbotsford.

Delete 3.1.2 and replace with the following	Batch CCTV Contractors to submit sample of inspection report (at least 300 metres of the City sewer) and video in DVD format, and corresponding digital database file for review within one week of receipt of notice to proceed with contract. Non-batch Contractors to submit a sample report prior to conducting their first inspection, within each calendar year. Submission to satisfy all of the specifications contained herein and the accepted report submission will be used as a benchmark for subsequent inspection report submissions.
Delete 3.1.3	
Delete 3.1.4 and replace with the following	Flow in the pipeline during video inspection not to exceed approximately 1/3 of the pipe diameter. Contractor to notify the Contract Administrator of excessive flows prior to video inspection set-up and for the review and authorization of any by-pass pumping.
Delete 3.1.8 and Replace with the following	The inspections shall be captured in colour MPEG2 format (DVD and a USB 2.0 compatible portable external hard drive) from the live video source. All digital videos shall be first generation recordings. One complete single digital file shall be submitted for each inspection. The final file may be produced in one of three ways: .1 using a computer system and capture card, the original recording may be captured continuously, regardless of the progress of the inspection. Where inspection progress is not continuous, the original raw digital file shall be edited prior to submission to remove the pauses; .2 using a computer system and capture card, the original recording may be captured intermittently, where inspection progress is not continuous. The original raw digital files shall be combined to form one continuous file for submission; or .3 specialized video recording equipment, which is capable of pausing and resuming live recording, may be employed to produce one single file for submission.
Delete 3.1.9 and replace with the following	Set zero chainage with the pipe face of every manhole or on entrance into pipe in the periphery view. If not possible due to access (e.g. benching) set the chainage in the rocker pipe with attention to the focal length correction factor.
Delete 3.1.10 and replace with the following	Report and record all PACP or CSA or WRc MSCC 3rd edition conditions on full length of pipeline from inside face (interface) to inside face (interface) between

	manholes or outlet end of pipes and from one end of pipe culvert to the other.
Delete 3.1.12.1 and replace with the following	Pipe length reference number and manhole reference numbers.
Delete 3.1.12.9 and replace with the following	City of Abbotsford and contract number.
Delete 3.1.12.10 and replace with the following	Verbal description of all the above on screen information.
Delete 3.1.13.2 and replace with the following	Pipe length reference numbers and manhole numbers in order of direction of inspection.
Delete 3.1.13.5 and replace with the following	Display digital information such that it will not interfere with the video image on the screen and will contrast the background colour.
Delete 3.1.14 and replace with the following	Stop camera at each defect, change of condition of pipe and service connection to record the defect.
Delete 3.1.15 and replace with the following	Add code overlay to video at defects or connections in addition to continuously displayed data as per 3.1.13.
Delete 3.1.16 and replace with the following	Pan each service connection (junction) such that the camera looks down the centerline of the service, pause for a minimum of five (5) seconds and note condition of the joint and/or pipe/service interface. Any additional information available on the service pipe beyond the first joint must be entered in the remarks field or by using the code GO.
Delete 3.1.17 and replace with the following	Contractor must immediately notify the Contract Administrator of any major structural defects, deformation over 10%, blockage or obstruction that will not allow passage of survey equipment. Contractor is to evaluate the removal of such obstruction and immediately submit a removal quote, as per the schedule of quantities and prices, for review and approval prior to proceeding with survey.

Delete 3.1.18 and replace with the following	When blockage or obstruction is encountered and the removal quote is not accepted by the Contract Administrator restart inspection survey from the opposite end of the pipeline and continue the survey towards the obstruction as far as possible.
Add 3.1.19	Unknown identified manholes, cleanouts or pipelines discovered during the survey shall be identified using unique numbering.
Add 3.1.20	Development based CCTV inspections shall include the City of Abbotsford drawing number (i.e. SUB2154) in the contract number field in the header.
Add 3.1.21	The total length field in the header is to be completed in accordance with the PACP, CSA, and WRc MSCC 3rd edition. This is the total length between the exit of the start and entrance of the finish manholes. If this information is not available from the CCTV (i.e. survey abandoned) it shall be accurately measured along the ground surface. If this measurement is not available (i.e. buried manhole) the information shall be scaled from the drawings. If either the ground measurement or scaled measurement is used, the method should be noted in the “Further Details” field.
Add 3.1.22	The “JobNumber” field must be less than ten (10) characters in length. It shall also be unique between each report. Format to be: Use of Sewer (as per WRc or PACP code, 1 character), year (last two characters only), Contractor (maximum of three characters), report number (from 000 to 999) Example: Foul 2007 XY Ltd Report 010 Job Number Field = F07XYL-010 The xxx will be “Rxx”, where xx is the report number for your 10% quality control (i.e. Re-codes). For non-batch Contractors the dash”-“in the above format may be replaced with a letter, to allow submission from different clients to restart at report 001. If the above number format cannot be accommodated, an alternate method that provides unique numbering is to be submitted to the Contract Administrator for approval.

3.2 Recording Resolution	Delete 3.2.1 and replace with the following	At the beginning of each DVD and when a substitute camera is introduced, perform a recording resolution test with NTSC approved chart as per IEEE Standard 208-1995 (Measurement of resolution of Camera Systems, 1993 Techniques), Marconi, RETMA or other method approved by the Contract Administrator.
3.3 Site Coding Sheets	Delete 3.3.1 and replace with the following	Each pipeline length to be recorded according to the CSA, PACP, WRc MSCC 3rd edition or other method approved by the Contract Administrator.
	Delete 3.3.2	
3.6 Camera Position Chainage Device	Delete 3.6.1.4 and replace with the following	Provide audit form in excel showing dates and distances checked to meet both tolerance requirements. Chainage linear measurement to be checked by use of a cable calibration device or tape or electronic measurement between fixed points.
	Add 3.6.1.5	The chainage start point shall include correction for the camera focal length.
3.7 Photographs and/or Digital Images	Delete 3.7.1 and replace with the following	Photograph all major defects.
	Delete 3.7.2.5 and replace with the following	Defect code.
	Delete 3.7.3 and replace with the following	Capture photograph and alpha-numeric data as a digital image in a JPG format at an image resolution of at least 640 x 480 pixels.
	Delete 3.7.4 and replace with the following	Co-ordinate photographs with the written report by reference number and inserting into the report following the relevant section of pipeline inspected.
3.8 Inspection Reporting Hard Copies & Digital Format	Delete 3.8.1 and replace with the following	Submit reports and DVD's and USB 2.0 flash drives to Contract Administrator <u>within 10 working days</u> of completion of the field work on a continuous basis throughout the duration of the contract.
	Delete 3.8.2 and replace with the following	Present DVD format inspection reports and videos, as well as computer generated database reports and photos, according to the PACP, WRc MSCC 3rd edition, CSA or other method approved by the Contract Administrator and to the City of Abbotsford's format.

Delete 3.8.2.1 and replace with the following

Each binder to commence with an index of all survey inspection containing at least the following information:

eg.

DVD No.	Job Number	PLR	Start MH	Finish MH	Size (mm)	Inspected Length (m)	Total Length (m)	Inspection Direction
07-01	F07XYL-010	319C8	1235C8	1234C8	300	71.20	99.40	U

At the completion of the contract all binder index pages are to be re-submitted showing all of the "Survey Abandoned" inspections and cross referencing.

Delete 3.8.2.2 and replace with the following

Hard copy reports to be presented in tabular form in accordance with the PACP, CSA, WRc MSCC 3rd edition or other City approved format. Reports to be printed using a single dark coloured ink. Diagrams and drawings can be multi-coloured.

Delete 3.8.2.3 and replace with the following

Reports to be presented in sections or drainage areas and/or by pipeline type or as specified in the contract documents. Where a survey is abandoned and the reverse run completed, the reports for the entire run are to be compiled and presented consecutively, both on DVD's and USB 2.0 flashdrives and in the database.

Delete 3.8.2.4 and replace with the following

Computer database file to contain identical survey report information as the printed and DVD report exclusive of photographs.

Delete 3.8.2.5 and replace with the following

Digital database files to be presented in strict accordance with one of the following:

.1 The City Standard Digital File Format, as detailed in Appendix I of this specification. The relationship between the "Header" and "Condition Details" tables shall be through the "JobNumber" field.

The Contract Administrator will provide a blank database, in MS Access® format, for entry at no cost, if requested.

.2 Other formats approved by the City, WRc MSCC 3rd edition, Sewer.dat or Sewer1.dat format, NASSCO PACP Version 6.0 or higher.

Delete 3.8.2.6 and replace with the following

The digital photographs shall be provided on CD or DVD and USB 2.0 compatible portable external hard drive. Disc and hard drives to be labelled with the contract number.

Add 3.8.2.8

The video file name must start with the PLR followed by the job number (eg. PLR 319C8, S07XYL-001).

			Additional information may follow, for the Contractor's use.
		Delete 3.8.3 and replace with the following	Present report in 215 mm x 280 mm three ring (D type) binder.
		Delete 3.8.5 and replace with the following	Attach identical identification labels on the three ring binder spine, DVDs and CDs. The identification labels must include the following: .1 type of sewer (eg. Foul); .2 binder, DVD or CD number; .3 Contract Number (eg. 2007-07); and .4 Job Numbers (F07XYL-001 to -035).
		Delete 3.8.8 and replace with the following	The City of Abbotsford's index and identification numbering system is to be used.
		Delete 3.8.9 and replace with the following	For Batch CCTV contracts, the City of Abbotsford Project Evaluation Spreadsheet is to be submitted to the Contract Administrator on a Bi-weekly basis. City of Abbotsford will provide the Project Evaluation Spreadsheet format at the time of Notice to Proceed. Each submission will be used to provide an evaluation of the project status of each pipeline throughout the duration of the project and to confirm completion status of each item.
		Add 3.8.10	At the end of all Batch CCTV contracts the Contractor shall deliver USB 2.0 compatible external hard drive(s) containing all CCTV videos and digital PDF's of inspection reports.
3.9	**Flushing and Cleaning**	Delete 3.9.1 and replace with the following	.1 Flush all pipelines to Section 33 01 30.2 immediately prior to CCTV inspection survey, unless otherwise specified in the contract documents. Pipelines deemed to require cleaning must be brought to the attention of the Contract Administrator and approved before proceeding.
3.10	**Root Cutting and Removal**	Delete 3.10.1 and replace with the following	Remove roots to section 33 01 30.2 for condition codes RT and RM.
		Add 3.10.2	Remove Grease to section 33 01 30.2 for condition codes DEG >10%.
3.11	**Flow Reduction**	Delete 3.11.1 and replace with the following	Reduce flow in pipeline to at least 1/3 pipe diameter to allow CCTV inspection by the combination of the

			following and only upon approval by the Contract Administrator.
		Delete 3.11.3.1 and replace with the following	Plug or block flow at upstream manhole. .1 Plug designed to either plug all flow or impede flow to the at least 1/3 pipe diameter. Sewer plugs that tether to and are removable from the ground surface shall be used. .2 Obtain Contract Administrator's approval prior to plugging or impeding any flow. .3 Remove plug or blocks and slowly return flow to normal without surge or surcharging downstream pipeline.
		Delete 3.11.4 and replace with the following	Temporary by-pass shall pump enough of the existing flow around the inspection section of pipe, as per contract documents when required. This item is as per the schedule of Quantities and Prices and includes all required traffic management. Plug to be flow through with hoses and pump(s) sized for sufficient capacity to handle the peak flows. Hoses and couplings to be leak free. Flow to be pumped to downstream manhole on same system and operating as inspection is taking place. Obtain Contract Administrator's approval prior to setting up temporary bypass pump system.
		Add 3.11.5	Use the sewer cleaning equipment to lower the flow.
		Add 3.11.6	It shall be demonstrated that off peak work, plugging, sewer cleaning equipment, or a combination of methods cannot effectively reduce the flow levels to the specified maximum before the use of bypass pumping is required.
3.12	**Coding Accuracy**	Delete 3.12.2 and replace with the following	For Batch CCTV, the Contractor is to implement a formal coding accuracy verification system (Quality Control) at the onset of the work. Coding accuracy to be verified by the Contractor on a random basis on a minimum of 10% of the inspection reports. The Contract Administrator is to be entitled to audit the accuracy verification system through a quality assurance program. The frequency and magnitude of the Contract Administrators audits will be adjusted based on the results of previous audits.
		Add 3.12.5	Non-compliant inspection submissions shall be corrected and resubmitted within five (5) working days. The process shall be repeated until the inspection submissions are accepted by the Contract Administrator.

Delete 3.12.4 and replace with the following

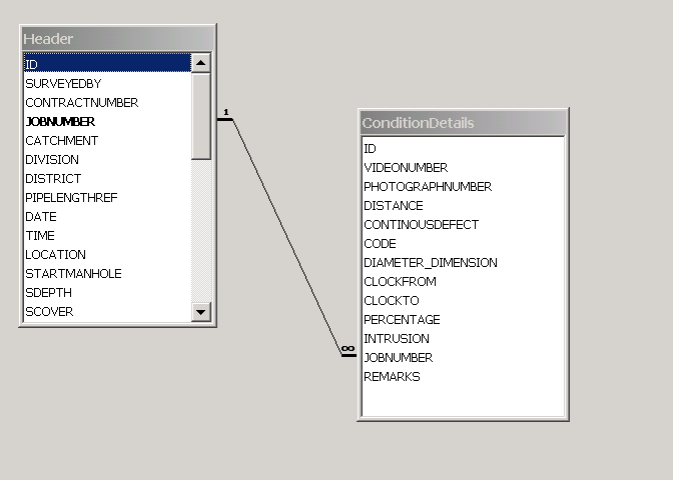
An operator failing to meet the accuracy requirements on two occasions will not be permitted to code on the remainder of the project until they have successfully attended and passed City of Abbotsford approved training. Working days may not, at the discretion of the Contract Administrator, be added to the contract.

FIELD NAME	DATA TYPE	FIELD PROPERTIES
ID	AutoNumber	
SURVEYEDBY	Text	12
CONTRACTNUMBER	Text	8
JOBNUMBER	Text	10
CATCHMENT	Text	10
DIVISION	Number	Byte
DISTRICT	Text	3
PIPELENGTHREF	Text	11
DATE	Date/Time	
TIME	Date/Time	
LOCATION	Text	50
STARTMANHOLE	Text	10
SDEPTH	Text	4
SCOVER	Number	Single
SINVERT	Number	Single
FINISHMANHOLE	Text	10
FDEPTH	Text	4
FCOVER	Number	Single
FINVERT	Number	Single
USESEWER	Text	1
DIRECTION	Text	1
SIZE1	Number	Integer
SIZE2	Number	Integer
SHAPE	Text	1
MATERIAL	Text	3
LINING	Text	3
PIPELENGTH	Number	Single
TOTALLENGTH	Number	Single
YEARLAID	Text	4
VIDEONUMBER	Text	5
COMMENTS	Text	50
PURPOSE	Text	1
SEWERCATEGORY	Text	1
PRECLEANING	Text	1
WEATHER	Text	1
LOCATIONCODE	Text	1
FURTHERDETAILS	Text	48

ID	AutoNumber	Long integer
VIDEONUMBER	Date/Time	hh:mm:ss
PHOTOGRAPHNUMBER	Number	Integer

DISTANCE	Number	Single
CONTINOUSDEFECT	Text	2
CODE	Text	4
DIAMETER_DIMENSION	Number	Integer
CLOCKFROM	Number	Integer, “00”
CLOCKTO	Number	Integer, “00”
PERCENTAGE	Number	Byte
INTRUSION	Number	Integer
JOBNUMBER	Text	10
REMARKS	Text	34

Database Relationship between “Header” and “Condition Details” table will be through the “JobNumber” field. This will establish a one to many relationship, as illustrated below:



SECTION 33 01 30.2S CLEANING OF SEWERS

1.0 GENERAL

Delete 1.0.1 and replace with the following

Section 33 01 30.2S refers to those portions of the work that are unique to the requirements for cleaning and flushing of new and existing sewers, culverts, manholes, catch basins and catch basin leads. The specification includes the removal of debris. Cleaning and Flushing is to be performed in accordance with all of the following specifications under section this section. Work deemed not in conformance of any of the specifications may at the discretion of the Owner be rejected.

Add 1.0.3

The term Cleaning means the removal of all debris, roots and grease.

Add 1.04

The term Flushing means to remove superficial forms of debris using a maximum of three (3) passes with jetting equipment.

1.1	**Related Work**	Delete 1.1.1 and replace with the following	Traffic Control, Vehicle Access and Parking	Section 01 55 00S
		Delete 1.1.2 and replace with the following	Storm Sewers	Section 33 40 01S
		Delete 1.1.3 and replace with the following	Pipe Culverts	Section 33 42 13S
		Delete 1.1.4 and replace with the following	Manholes and Catchbasins	Section 33 44 01S
		Delete 1.1.6 and replace with the following	Sewage Forcemains	Section 33 34 01S
		Delete 1.1.7 and replace with the following	CCTV Inspection of Pipelines	Section 33 34 01S
		Add 1.1.8	Environmental Protection	Section 01 57 01S
1.3	**Work Regulations**	Add 1.3.1.7		
		Add 1.3.2	Provide written confirmation to the Contract Administrator that workers have knowledge of confined space entry practices and of equipment required for confined space entry.	
1.4	**Scheduling of Work**	Add 1.4.5	The Contractor shall notify residents prior to accessing easements and Statutory Right of Way adjacent to private property. When required, work shall be rescheduled so as to not disturb residents.	
1.5	**Measurement for Payment**	Delete 1.5.2 and replace with the following	All required traffic management is considered incidental and is included in the unit or hourly price.	
		Delete 1.5.3 and replace with the following	Sewer flushing will be measured in lineal metres. Payment will be made at the unit price bid in Form of Tender. The Flushing will be deemed complete once the CCTV inspection is completed in accordance with Section 33 01 30.1S and accepted.	
		Delete 1.5.4 and replace with the following	Measurement for storm sewer flushing, cleaning or debris removal to be determined from plan distances	

and periodically confirmed by surface measured distances with a calibrated measuring device.

Add 1.5.5 Root and grease cutting will be measured in hours. Payment will be made at the unit price bid in Form of Tender. All required traffic management is considered incidental and is included in the unit price. Measurement will be determined from the difference in time between when the cutting tool is engaged at the face of the manhole to when it exits on completion of the root removal process.

Add 1.5.6 Cleaning will be measured in linear meters or hours, as per the unit price bid in Form of Tender. Payment will be made at the unit price bid in Form of Tender. All required traffic management is considered incidental and is included in the unit price. If hourly, measurement will be determined from the difference in time between when the cleaning tools are engaged at the face of the manhole, to when it exits on completion of the debris removal process.

Add 1.5.7 Measurement for payment for cutting of intruding services will be made per set-up, and for each intruding service connection cut thereafter. Payment will be made at the unit prices bid in the Form of Tender for set-up and cutting of intruding services. All required traffic management is considered incidental and is included in the unit price.

Add 1.5.8 Manhole cleaning will be included with sewer pipe cleaning or flushing.

Add 1.5.9 Catch basin cleaning will be measured on a unit basis and paid for at the contract unit price for “Catch Basin and Lead Cleaning”. Number of units to be paid for will be the total number of catch basins and leads cleaned in accordance with this specification.

Add 1 .5.10 Flow control will be included with sewer cleaning or flushing.

Add 1.5.11 The Contractor is to submit, at the end of each calendar month, to the Contract Administrator for review, a completed monthly quantity progress in excel using the same format as the Form of Tender Appendix 1.

2.0 PRODUCTS

3.0 EXECUTION

3.1 Sewer Cleaning

Delete 3.1.1 and replace with the following

Clean pipelines specified in contract documents. Clean sewers and manholes completely of debris including sludge, dirt, sand, gravel, rocks, bricks, grease and other solid and semi-solid materials from the sewer.

Delete 3.1.2 and replace with the following

Cleaning process to start from the upstream sewer in the system and proceed downstream. Clean all contributing catch basins and leads before proceeding with cleaning of mainline associated with the catch basins. Under no circumstances is the sewer cleaning process to proceed downstream until all contributing upstream sewers have been cleaned and flushed. All sewers to be cleaned in the direction of flow.

Delete 3.1.3 and replace with the following

Scour manhole walls and benching before cleaning the sewers downstream of manholes.

Delete 3.1.4 and replace with the following

Advise the Contract Administrator immediately when pipe material or backfill material is observed during the cleaning of a sewer. The Contract Administrator will direct one of the following operations be performed.

.1 Complete or attempt to complete cleaning of the sewer.

.2 Suspend cleaning operations and inspect the sewer.

.3 Simultaneously clean and inspect the sewer.

.5 Remove debris by vacuum pumping at manhole. Do not pass debris from manhole to manhole.

.6 Dispose of debris at an approved site in accordance with all environmental regulations and requirements.

.7 Comply with Environmental laws in regard to discharge of flushing water and debris and return decanted or dewatered liquid to the sewer of origin.

Add 3.1.5

Reverse set-up cleaning shall not been done. Provide the Contract Administrator with the following information for blockages.

.1 Location of the blockage indicated by a paint mark on the ground surface above the sewer and the distance from the nearest manhole.

.2 An inspection photograph, video recording or digital file of the blockage.

.3 The effect the blockage has on completion of the Work and the requirement for action to deal with the blockage such as an emergency sewer repair or scheduled maintenance.

Add 3.1.6 Catchbasin (CB) and CB lead cleaning to be performed as follows:

.1 Clean catch basins and leads completely of debris including sludge, dirt, sand, gravel, rocks, bricks and other solid and semi-solid materials.

.2 Continually track catch basin cleaning progress and observed condition such as missing hood, damaged frame or cover or broken barrel on a drawing provided by the Contract Administrator.

.3 Record discrepancies with existing catch basin information such as additional or missing catch basins or different locations than shown on the drawing provided.

.4 Provide the completed catch basin record drawing to the Contract Administrator at the completion of the Work.

Add 3.1.7 Solid Debris Cutting to be performed as follows:

1 Cut and remove excessive solid debris from the sewer for the limits identified by the Contract Administrator from the post cleaning sewer inspection. Grease will not be considered solid debris.

.2 Remove solid debris to within 25 millimetres of the inside surface of the pipe wall.

.3 Monitor the entire cutting operation and while the cutting equipment is traveling within the pipe to reach the work area by closed circuit television (CCTV).

.4 Inspect the entire sewer section in accordance with the City of Abbotsford Supplemental Specifications Section 33 01 30.1S after completion of solid debris cutting.

Add 3.1.8 Removal of Intruding Services to be performed as follows:

.1 Where an intruding service connection precludes passing of the camera during CCTV inspection, the Contractor shall notify the Contract Administrator who may require the intruding portion to be removed without damage to the system.

.2 Cut and remove intruding sewer services from the sewer at the locations identified by the Contract Administrator from the post cleaning sewer inspection.

.3 Leave intruding sewer services finished smooth and within 6 millimetres of the inside surface of the sewer.

.4 Monitor the entire intruding sewer service removal by CCTV.

.5 Inspect the entire sewer section in accordance with City of Abbotsford Supplemental Specifications

			Section 33 01 30.1S after completion of intruding sewer service removal.
3.2	**Water Supply**	Delete 3.2.1 and replace with the following	Water may be supplied from Municipal fire hydrants upon application for a Hydrant Use Permit. No fee will be charged for water consumed. The Contractor will plan work ahead of time to ensure that at least one day's work can be carried out making use of a single fire hydrant connection.
		Delete 3.2.2 and replace with the following	The Contract Administrator will be given at least one day's notice to arrange a connection at a fire hydrant for a specific day's use.
		Add 3.2.3	City of Abbotsford water is treated with chloramine, the Contractor shall maintain a supply of Sodium Thio-sulphate on site at all times. A minimum supply of 22 kg of Sodium Thio-sulphate (brand names Penta, Hydrous) shall be on site at all times. Treat all spillage or breakages with appropriate neutralizing dosage (7 gm per 1000 gallons).
		Add 3.2.4	Treat all flushing and cleaning water for work in storm sewers with appropriate neutralizing dosage (7 gm per 1000 gallons) after or during filling of the truck.
		Add 3.2.5	Only 1 hose/nozzle connection will be permitted per hydrant.
		Add 3.2.6	Two or more consecutive hydrants will not be permitted for water supply at the same time.
		Add 3.2.7	Only City of Abbotsford hydrants, not Clearbrook Waterworks District, shall be used for water supply.
		Add 3.2.8	Hydrants approved for use shall be considered to be "in the Contractor's control" from the time the City has installed the backflow prevention device and turned the hydrant on until the City has removed the backflow prevention device and turned the hydrant off.
		Add 3.2.9	Erect and maintain signage (bump signs) warning oncoming traffic of hose crossings to the satisfaction of the Contract Administrator. Construct ramps to the satisfaction of the Contract Administrator.
3.4	**Sewer Flushing**	Delete 3.4.1 and replace with the following	Flush pipelines specified in contract documents. Flush sewers and manholes of debris, sludge, dirt, sand, gravel, rocks, bricks, and other solid or semi-solid materials.

	Delete 3.4.2 and replace with the following	Flushing process shall start at the upstream sewer pipeline in the system and then proceed downstream in the direction of flow.
	Delete 3.4.3 and replace with the following	Scour manhole walls and benching before cleaning the sewers downstream.
	Delete 3.4.4 and replace with the following	Remove debris by vacuum pumping at manhole.
	Add 3.4.5	Remove grease deposits to 25mm of pip wall.
Add 3.5 Grease Removal	Add 3.5.1	Obtain Contract Administrator's approval prior to undertaking any grease cutting.
	Add 3.5.2	Run grease cutter through entire section of pipeline.
	Add 3.5.3	Use grease cutter head appropriately sized for the diameter of the pipeline.
Add 3.6 Flow Control	Add 3.6.1	Undertake flow control measures such as off peak work, plugging, use of sewer cleaning equipment to lower downstream flow levels or plugging and bypass pumping if sewer flows are hampering effective sewer cleaning.
	Add 3.6.2	Provide the Contract Administrator with at least 48 hours' notice and proposed method of flow control before undertaking flow control measures.
	Add 3.6.3	Use sewer plugs to stop or reduce sewer flow that tether to and are removable from the ground surface.
	Add 3.6.4	Monitor flow levels upstream of a plugged sewer at all times to ensure flooding of public or private property does not occur.
	Add 3.6.5	Demonstrate that off peak work, plugging, sewer cleaning equipment, or a combination of methods cannot effectively reduce the flow levels to the specified maximum before requesting the use of bypass pumping.
	Add 3.6.6	Provide the Contract Administrator with information on capacity of pumping equipment for review before setting up by-pass pumping.

		Add 3.6.7	Remove plugs placed in sewers and re-establish normal flow when directed to do so by the Contract Administrator.
		Add 3.6.8	Provide additional by-pass pumping equipment when directed to do so by the Contract Administrator.
		Add 3.6.9	Provide approved traffic ramps for by-pass pumping discharge hoses where crossing Roadways and traffic Lanes and locate where directed and approved by the Contract Administrator.
Add 3.7	**Resident Liaison**	Add 3.7.1	Notify the Contract Administrator of the location where sewer, manhole or catch basin cleaning will be 48 hours prior to starting the cleaning work at that location.
		Add 3.7.2	The Contractor shall deliver notices provided by the Contract Administrator to residents and businesses as directed by the Contract Administrator. .1 Deliver notices 48 hours prior to the use of equipment or as directed by the Contract Administrator. .2 Notices will explain the cleaning, flushing and/or inspection program and how it may affect residences as well as some precautions to take to prevent backup. .3 Notices will contain the phone numbers of the Contractor's 24-hour cleaning contact and City of Abbotsford's Engineering Department contact number during office hours.
		Add 3.7.3	Notify residents prior to entering private property or blocking resident vehicle access.
		Add 3.7.4	All resident complaints to be addressed by the Contractor's superintendent immediately upon acknowledgment.
		Add 3.7.5	Resident claims resulting from works being performed within the scope of this contract will be the responsibility of the Contractor.
Add 3.8	**Acceptance of Work**	Add 3.8.1	Submit required video inspections of sewer and manhole cleaning, solid debris cutting and intruding sewer service removal to the Contract Administrator for review and determination if work performed is acceptable. The Contract Administrator may review the inspection videos.

Add 3.8.2	The Contract Administrator may visually inspect catch basins or manholes to determine if cleaning is acceptable.
Add 3.8.3	Perform remedial work for sewer, manhole and catch basin cleaning, cutting of solid debris and removal of intruding sewer services and a re-inspection for the locations where the work was determined by the Contract Administrator as not being acceptable.

SECTION 33 11 01S WATERWORKS

1.0 GENERAL

1.7	**Scheduling of Work**	Delete 1.7.3 and replace with the following	Notify Contract Administrator, affected residences and businesses minimum of 72 h in advance of any interruption in service.

2.0 PRODUCTS

2.1	**General**	Append to 2.1.2	For a list of approved products and materials, refer to the City of Abbotsford Approved Products List found on the City's website.
		Add 2.1.4	All push on fittings to be Mechanical Joint complete with joint restraint where applicable.
2.2	**Mainline Pipe, Joints, and Fittings**	Append to 2.2.1.1	After "Contract Documents" add "with a minimum pressure class of 250."
		Delete 2.2.2.2 and replace with the following	Joints: It is mandatory that the push-on integrally thickened bell and spigot type conform to ASTM D3139 Clause 6.2 with single elastomeric gasket to ASTM F477.
		2.2.3.1.1	Delete "specified in Contract Document."
		Delete 2.2.4.4.	
		Delete 2.2.4.5	
		2.2.4.9.1	Delete "zinc plated to ASTM B633 or".
		2.2.4.9.2	Delete "zinc plated to ASTM B633 or".
		Amend 2.2.4.10.1	Replace "to be zinc plated to ASTM B633 or cadmium plated to ASTM B766" with "tie rods, nuts and couplings to be Cor-ten A to ASTM 242."

		Delete 2.2.4.10.3	
		Add 2.2.4.12.4	PVC coupling adapters to be complete with mechanical joint restraints.
2.3	**Valves and Valve Boxes**	Add 2.3.1.1.5	Main line valves to be size on size.
		Add 2.3.1.5	Valves to have flanges with Class 125 standard drilling or as specified on contract documents.
		2.3.2.1	Delete “solid wedge or double disc valves and”.
		Delete 2.3.2.2	
		Delete 2.3.3 and replace with the following	Mainline butterfly valves: Butterfly valves: to AWWA C504 Class 150B.
		Add 2.3.5.5	Air Release, Air/Vacuum and Combination Air Valves to be sized by the Consulting Engineer.
		Delete 2.3.6.1.1	
		Amend 2.3.6.1.1	To MR 6 style
		Add 2.3.6.3	Valve riser to be inserted into 150 mm sewer cap, drilled to just allow square nut of valve stem to stick through. Cap to rest on valve body and the PVC riser pipe shall be inserted into cap thus keeping the nut free from dirt and debris as well as centered within the riser pipe. See City of Abbotsford Standard Drawing No. CS-W-6.
		Amend 2.3.7	Replace “Service Valve Box” with “Meter Box”.
		Delete 2.3.7.1 and replace with the following	Meter boxes on 19 mm to 25 mm diameter service connections shall be installed at property lines and shall be concrete boxes c/w cast iron traffic cover as per CS-W-11 and CS-W-12.
		Delete 2.3.7.2 and replace with the following	Meter chambers on 38 mm to 50 mm diameter service connections shall be installed at property lines and shall be concrete boxes c/w cast iron traffic cover as per CS-W-12 and CS-W-21.
		Delete 2.3.7.3 and replace with the following	Meter boxes for connections larger than 50 mm shall be as specified on contract drawings as per CS-W-2.
		Delete 2.3.7.4	

		Delete 2.3.7.5	
2.4	**Valve and Large Meter Chambers**	2.4.1	Change 200 mm to 75 mm
		Add 2.4.1	Valve/meter chambers shall have aluminum, steel or reinforced fibreglass lids that lock open and closed and meet H20 static loading for landscaped areas or AASHTO H20 wheel loading with 30% impact allowance where located in the Roadway. Steel lids must have hydraulic lift assists.
		Add 2.4.10.1	Valve chambers to be equipped and sized for SCADA equipment as specified in contract documents and drawings. Radio Telemetry Units (RTU) shall be supplied by the City at the Developer's expense.
2.5	**Service Connections, Pipe, Joints and Fittings**	Delete 2.5.1 and replace with the following	Pipe diameter 19 mm to 75 mm to be Polyethylene to AWWA C901, Pressure Class 160 or Class 200 certified to CSA B137.1 or Polyethylene /Aluminum/Polyethene composite pipe certified to B137.9 or CSA B137.10.
		Delete 2.5.3.2.3 and replace with the following	Delete and replace "single" with "double".
		Add 2.5.4	Where service for a 75 mm connection is requested, a 100 mm tap shall be made using 100 mm valve then reduced to 75 mm.
		Delete 2.5.5 and replace with the following	38 mm and 50 mm connections to be as per standard detail drawing No. CS-W-15.
		Add 2.5.6	Meter setters for all service connections to be complete with dual check valves and to be full flow, full port, as specified in Contract Documents.
2.6	**Hydrants**	Add 2.6.1.6.2	Pump nozzle outlet to be "Storz".
		Delete 2.6.2 and replace with the following	Hydrant to be painted white with marine enamel.
2.7	**Underground Service Line Valves and Fittings**	Amend 2.7.2.1	Delete and replace "50 mm" with "25 mm".
		Add 2.7.2.1	All domestic services 18 mm – 50 mm to come with

			meter setters at the property line. From the property side of the meter extend a tail piece one meter beyond the meter box and install a curb stop valve.
		Add 2.7.5	For Corporation stops and Curb stops on services 19 mm – 25 mm and Meter Setters on services 18 mm – 50 mm, to be full flow, full port, as specified in Contract Documents.
3.0	**EXECUTION**		
3.6	**Pipe Installation**	Delete 3.6.6 and replace with the following	Do not exceed one half of the maximum joint deflection specified in the AWWA C 600. Joint deflection not permitted for PVC pipe. Deflections in PVC pipelines to be achieved using Restrained Certain Teed PVC High Deflection couplings complete with joint restraints. Add 3.6.7 In the event the pipe has been flooded with trench water, refer to AWWA standards for testing. Add 3.6.12 Also install temporary plug to stop trench water and small animals from entering the pipe.
			3.8.1 remove “cast in place” 3.8.2 Add Where a valve cannot be installed plumb over the opening, then a hole cored and an MR 6 valve box is installed plumb over the valve.
3.7	**Valve Installation**	Delete from 3.7.2	… “or pressure treated or end treated wood blocks,”
3.9	**Under-Crossing**	Append to 3.9.15	… carrier pipe to be joint restrained.
3.10	**Service Connection Installation**	Delete 3.10.5	
		Delete from 3.10.7	
		Delete 3.10.11	
		Add 3.10.13	Install meter box on all services. For services 75 mm and larger use Standard Drawing No. CS-W-2. For meters in underground vaults, use ductile iron, install to the requirements of clause 3.8 of this Section (Valve Chambers), with a minimum clearance from pipes and

			fittings of 0.5 metres to walls, 0.3 metres to floor and a maximum vertical chamber height of 2 metres. Set box plumb and adjust top at 2 % grade from curb.
		Add 3.10.14	Mark on adjacent curb, on alignemtn of service connection, the letter “W” (75mm high, 15mm deep).
3.13	**Thrust Blocks**	Delete	
3.14	**Corrosion Protection**	Add 3.14.2	Soil testing report to be submitted with design documents for City review and acceptance.
3.17	**General Procedure Flushing, Testing, and Disinfection**	Add 3.17.2	All tests be done by 3rd party with certification acceptable to the City.
		3.17.4	Delete “or drainage ditches.”
3.18	**Cleaning and Preliminary Flushing**	Append to 3.18.2	… Do not operate any existing valves unless given written consent form the City of Abbotsford waterworks representative. Only valves specified by the City of Abbotsford can be operated with this consent.
		Append to 3.18.3	… The City will supply a backflow prevention device with approval of the hydrant use permit.
		Amend 3.18.4	Delete “0.8 m/s” and replace with “1.5 m/s.” The Contractor shall provide a drawing to the City Water Works staff to show the discharge and flushing points for all test sections. Flushing must be done prior to disinfection.
3.19	**Testing Procedure**	Amend 3.19.2	Amend third sentence to read: “Submit pipeline to a test of 1.5 x working pressure applied at the highest elevation in each section with a minimum of 1380 kPa applied at the highest point of the test section.”
3.21	**Disinfection and Flushing Procedures**	Append to 3.21.8	… Prior to discharge to storm sewer or open channel, all chlorinated water shall be neutralized using Sodium Thio-sulphate in the appropriate manner and recommended dosage until the chlorine residual in the remaining water is less than 0.3 mg/l or equal to the City residual if greater than.
		Append to 3.21.9	Contractor to remove corporation stop and install brass plug under direct supervision of City Staff after acceptance by the City of the bacteriological tests.
		Add 3.21.10	Disinfection to be done using a continuous feed method using liquid hypochlorite at a rate not less than 25 mg/L. The chlorinated water shall be retained

			in the main(s) for a period of not less than 24 hours and not greater than 72 hours. The chlorine residual is to be 10 mg/L or greater after a minimum of 24 hours. Flushing of the chlorinated water will require de-chlorination with sodium thiosulphate. Monitoring of the flushed water shall be tested at regular intervals prior to entering the storm sewer or open channel.
		Add 3.21.11	Bacteriological Testing The Consulting Engineer shall identify water sample locations on the plans. The Consulting Engineer or the Consultant's inspector shall take water samples and deliver them to a certified lab accredited by the Ministry of Health. Water sampling and bacteriological tests (2X) shall be performed as per AWWA C651 with the following exceptions: the first sample to be taken a minimum of 16 hours after flushing is completed and the second sample to be taken a minimum of 24 hours after the first sample. The Consulting Engineer shall certify to the Engineer in writing, on the forms prescribed by this Bylaw, that the bacteriological tests have passed and such certification shall include copies of the test results and the name of the laboratory used. A record of all failed tests shall be provided to the Engineer. A connection of the new water main(s) to the existing water system may only be made upon the Engineer's acceptance of the Consulting Engineer's certification.
		Add 3.21.12	Should the new water main not be put into service as a result of the Contractors work, the City will require re-flushing, disinfection and bacteriological testing.
3.23	**Connections to Existing Mains**	Delete 3.23.1 and replace with the following	Connection to the City's water mains to be done by the Developer's Contractor at the Developer's expense, under direct supervision of C.O.A. Waterworks. Minimum 5 working day's notice, after successful completion of bacteriological test, shall be given to the City.
3.24	**Salvage of Water Main Fittings and Hydrants**	Add 3.24.1	All salvageable fittings and hydrants, whether noted or not on contract drawings, shall be disposed of by the Contractor.

SECTION 33 30 01S SANITARY SEWERS

1.0 GENERAL		
2.0 PRODUCTS		
2.0 PRODUCTS	Add 2.0.1	For a list of approved products and materials, refer to the City of Abbotsford Approved Products List found on the City's website.
2.1 Concrete Pipe	Delete 2.1.1	
	Delete 2.2.5	
2.2 Plastic Pipe, Mainline Smooth Profile		
	Delete 2.3.8.2	
2.3 Service Connections		
3.0 EXECUTION		
3.6 Pipe Installation	Delete 3.6.6	
3.8 Connections to Existing Mainline Pipes	Modify 3.8.2	Delete "or sawing".
	Delete 3.8.3 and replace with	For new connections to existing ribbed PVC or HDPE mainline sewers, drill hole in mainline to exact dimensions of new connections. Use insertable tee for connections more than two sizes smaller than mainline. Insertable tees may be used only for ribbed PVC or HDPE gravity mains provided insertable tee designed for applicable pipe thickness is used.
3.10 Service Connection Installation	Delete 3.10.4 and replace with the following	Mark on adjacent curb, on alignment of service connection, the letter "S" (75mm high, 15mm deep) and install an I.C. at the property line.
3.11 Cleaning and General	Delete 3.11.6 and replace with	Remove foreign material from pipe and related appurtenances by flushing with a combination flusher-vacuum truck. Main to be flushed until clean. Debris from flushing must not be allowed to enter downstream Municipal system. Vacuum debris and remove to appropriate facility.
3.12 Leakage Testing General	Add to 3.12.1	Tests for leakage to be either infiltration if the surface level of existing groundwater is 1 meter or more above the top of pipe over the test section or exfiltration test if less than 1 meter above.
3.18 Video Inspection	Delete 3.18.1	All sewer installations, including service connections,

		and replace with:	shall be inspected in accordance with City of Abbotsford specifications. Two inspections are required; Each inspection report, including the report video, binder and digital database, shall be submitted to the Engineer or the Contract Adminstrator for approval or issuance of a Certificate of Final Acceptance. The first inspection shall be done prior to connection to the City system. The second, Final Acception inspection shall be conducted and submitted at least ten (10) months after the issuance of the Engineer's Certificate of Substantial Completion and before the end of the one (1) year Warranty Period.
3.19	**Installation Standard**	Append to 3.19.5	In any case, mains with grades over 1.0%, no ponding is acceptable.
3.20	**Connections to Existing Main**	3.20.1 Delete and replace with:	All connections to existing mains shall be performed by the Contractor under the supervision of the City at the Developer's expense. Where tie-ins are at existing manholes or into concrete mains, the manhole barrel or main shall be cored. The Developer's Contractor may excavate and prepare the site and shall give a minimum of 72 hours notice to the City prior to the connection. Tie-ins to mains to be made by saddle, wye or or pre-manufactured wye with pre-approved couplers.

SECTION 33 34 01S SEWAGE FORCE MAINS

1.0	**GENERAL**		
2.0	**PRODUCTS**		
2.1	**General**	Append to 2.1.2	For a list of approved products and materials, refer to the City of Abbotsford Approved Products List found on the City's website.
		Add 2.1.3	Where Ductile Iron pipe is specified on Contract Drawings, a geotechnical/corrosion analysis will be required to evaluate the need for corrosion protection.
2.2	**Pipe, Joints and Fittings**	Delete from 2.2.2.1.1	"- ASTM D2241 (40 mm – 600 mm)"
		Delete from 2.2.5.1	"Where specified in Contract Documents"
		Delete 2.2.6	

		Delete from 2.2.9.1	"zinc plated to ASTM B633 or"
		Delete from 2.2.9.2	"zinc plated to ASTM B633 or"
		Append to 2.2.5.12.2	Plain end or transition couplings to be dresser style as specified in the contract drawings.
		Append to 2.2.5.12.3	Flanged couplings to be dresser style as specified on the contract drawings.
		Delete 2.2.5.13.9	
2.3	**Valves and Valve Boxes**	Append to 2.3.1.1	Main line valves to be size on size.
		Add 2.3.1.3	All Valves to have flanges with Class 125 standard drilling.
		Delete from 2.3.2.1	"solid wedge and"
		Delete 2.3.2.2	
		Add 2.3.2.7	All valves to come complete with stainless steel or Everdur non-rising stem.
		Delete 2.3.5.1.1	
		Amend 2.3.5.1.2	Delete and replace "as specified in contract drawings"
		Add 2.3.5.3	Valve riser to be inserted into 150 mm sewer cap, drilled to just allow valve stem to stick through 50 mm square nut to be re-attached after PVC cap is placed. Cap to rest on valve body and the PVC riser pipe shall be inserted into cap thus keeping the nut free from dirt and debris as well as centered within the riser pipe. See City of Abbotsford Standard Drawings No. CS-S-7.
2.4	**Valve Chambers**	Append to 2.4.8	… Valve chambers shall have aluminium lids that lock open. Lids shall withstand H20 highway dynamic loadings.
3.0	**EXECUTION**		
3.5	**Granular Bedding**	Delete 3.5.6 and replace with	Place ductile iron forcemain pipe in flat bottomed trench without bedding and backfill with imported material and compact as specified. Use hand tools to compact merial under 'haunch' area of pipe and around fittings and other materials.

3.6	**Pipe Installation**	Delete 3.6.6 and replace with the following	Do not exceed one half of the minimum joint deflection specified in the AWWA C600. Joint deflection not permitted for PVC pipe, Deflections in PVC pipelines to be achieved using Restrained Certain Teed PVC high deflection couplings. For HDPE pipe, cold bending allowed to a minimum radius of 50 times nominal pipe size without special fittings.
3.7	**Valve Installation**	Add 3.7.5	Valves to be restrained as cap.
3.9	**Thrust Blocks**	Delete	
3.15	**Pressure Testing Procedure**	Amend 3.15.2	... Pipeline to be submitted to a test of 1.5 x working pressure applied at the lowest elevation in each section or a minimum of 690 kpa, whichever is greater. …
3.16	**Connections to Existing Mains**	Delete 3.16.1 and replace with the following	Connections to existing Sanitary Sewer Systems shall be performed by the Contractor and supervised by City forces at the Developer's expense.

SECTION 33 40 01S STORM SEWERS

1.0	**GENERAL**		
1.6	**Measurement and Payment**	Add 1.6.12	Tie-ins shall be performed by the Contractor and supervised by the City at the Developer's expense.
2.0	**PRODUCTS**		
2.0	**PRODUCTS**	Add 2.0.1	For a list of approved products and materials, refer to the City of Abbotsford Approved Products List found on the City's website.
2.1	**Concrete Pipe**	Delete 2.1.1	
		Amend 2.1.2	Delete "900 mm diameter, strength class as shown on Contract Drawings" with "600 mm diameter Class III or better"
2.2	**PVC Pipe, Mainline Smooth Wall**	Delete 2.2.4	
2.6	**Service Connections**	Amend 2.6.1	Delete "100" and replace with "150".
		Delete from 2.6.2	"100 mm and"
		Delete from 2.6.3	"100 mm and"
3.0	**EXECUTION**		
3.8	**Connections to Existing Mainline Pipes**	Add to 3.8.1	After the word "saddles" insert "or pre-manufactured wyes spliced into the main with previously approved couplings for any material other than concrete.
		Amend 3.8.2	By deleting "where feasible" and "sawing or circular holes".
		Add 3.8.5	All connections to existing mains shall be performed by the Contractor under the supervision of the City at the Developer's expense. The Developer's Contractor may excavate and prepare the site and shall give minimum 72 hours' notice to the City prior to tie-in. Service connections to be made with saddle wye or pre-manufactured wye spliced into the main with previously approved couplings for any other than concrete.

3.10	**Service Connection Installation**	Delete 3.10.4 and replace with the following	Mark on adjacent curb, on alignment of service connection the letter “D” (75 mm high, 15 mm deep) and install an I.C at the P/L.
3.11	**Cleaning and Flushing**	Append to 3.11.3	… Prior to discharge to storm sewer or open channel, all chloraminated water shall be neutralized using Sodium Thio-sulphate in the appropriate manner and recommended dosage.
3.12	**Video Inspection**	Delete 3.12.1 and replace with the following	All sewer installations, including service connections, shall be inspected in accordance to the City of Abbotsford Supplementary Specification 33 01 30.1S, CCTV Inspection of Pipelines and 33 01 30.2S Cleaning of Sewers. Two inspections are required. Each inspection, including the report, video, binder and digital database, shall be submitted to the Engineer or the Contract Administrator for approval or issuance of Certificate of Final Acceptance as per Section 1, Subsection 5 (s) (i). The first inspection shall be done prior to connection to the City system. The second, Final Acceptance inspection shall be conducted and submitted at least ten (10) months after the issuance of the Engineer’s Certificate of Substantial Completion and before the end of the one (1) year Warranty Period expires. Assigned Asset ID numbers to be used for this Final CCTV inspection.
3.14	**Connections to Existing Mains**	Delete 3.14.1 and replace with the following	All connections to existing mains shall be performed by the Contractor under the supervision of the City at the Developer’s expense. Where tie-ins are at existing manholes, or into concrete mains the manhole barrel or main shall be cored. The Developer’s Contractor may excavate and prepare the site and shall give minimum 72 hours’ notice to the City prior to connection.

SECTION 33 42 13S PIPE CULVERTS

1.0 GENERAL

2.0 PRODUCTS

2.0	**PRODUCTS**	Add 2.0.1	For a list of approved products and materials, refer to the City of Abbotsford Approved Products List found on the City's website.
2.2	**Concrete Pipe**	Amend 2.2.2	Delete and replace "strength class as shown on Contract Drawings" with "Class III or better".
2.3	**Plastic Pipe, Smooth Profile**	Delete 2.3.4	

3.0 EXECUTION

SECTION 33 44 01S MANHOLES AND CATCHBASINS

1.0 GENERAL

2.0 PRODUCTS

2.1	**Materials**	Add to 2.1.7.3	Manhole frames shall be "Tall" frame and castings if installed on arterial or collector roads.
		Append to 2.1.8.5	Ladders to be designed to ANSI A 14.3-1992 for ladders-fixed safety requirements or the latest edition as approved by Worksafe BC.
		Delete 2.1.9	
		Amend 2.1.11	Delete "150 mm" and replace with "200 mm"
		Add 2.1.13.3	Catch basin trapping hoods to be Dobney A-10 or equivalent. Support pins to be 16 mm diameter hot-dipped galvanized reinforcing bar.
		Append to 2.1.16.3	On residential local streets use Turner Riser Rings or approved equal. Use construction adhesive to bond ring to frame.
		Delete 2.1.17	
		Delete 2.1.23	
		Add 2.1.24	Drain wells to be perforated 1200mm diameter concrete pipe to ASTM-C478 -08 with galvanized steel

			rungs and a sump.
		Add 2.1.25	Where street trees are incorporated in designs, all manholes, catch basins, inspection chambers and cleanouts within 1.5 metres of a tree root ball shall be protected using a “root barrier” product between the appurtenance and the tree side face.
		Add 2.1.26	For a list of approved products and materials, refer to the City of Abbotsford Approved Products List found on the City’s website.
3.0	**EXECUTION**		
3.3	**Manhole Installation**	3.3.12	Remove “Masonry &”.
		3.3.12.2	Remove “bricks”.
		Delete 3.3.12.5	Delete.

SECTION 34 41 13S TRAFFIC SIGNALS

1.0	**GENERAL**		
1.4	**Electrical Energy Supply**	Add 1.4.4	Meet requirements of utility company for service installation.
1.10	**Inspection and Testing**	Add 1.10.2	Voltage to be tested at service panel(s) and street light poles.
2.0	**PRODUCTS**		
2.1	**General**	Append to 2.1.3	For a list of approved products and materials, refer to the City of Abbotsford Approved Products List found on the City’s website.
2.2	**Conduit**	Add 2.2.2.4	Only factory conduits bends acceptable.
		Add 2.2.2.5	Each standard length of pipe, coupling, adaptor, bend and fitting to bear CSA certification label.
2.5	**Concrete Junction Boxes and Communications Vaults**	Add 2.5.2	Concrete junction boxes to have steel checker plate lids with 3/8” diameter x 1” long bonding stud welded to underside of lid. Steel lids to be hot dip galvanized and marked “ELEC”.
		Add 2.5.2	Concrete junction boxes to have steel checker plate lids with 3/8" diameter x 1" long bonding stud welded to underside of lid. Steel lids to be hot dip galvanized marked “ELEC”.

		Add 2.5.3	Concrete communication boxes to have steel checker plate lids with 3/8” diameter x 1” long bonding stud welded to underside of lid. Steel lids to be hot dip galvanized and marked “COMM”.
2.6	**Poles and Anchor Bolts**	Delete 2.6.2 and replace with the following	Anchor bolts to conform to section 301 – Traffic Signals, Luminaire and Sign Pole Structures, BCMOT E&SMS V1 and to Standard Detail Drawings CE1.15, CE1.16, and CE 1.17, except for pedestrian/cyclist pushbutton posts, which require 3/4” diameter anchor bolts.
		Add 2.6.9	Traffic signal poles to be supplied with galvanized finish.
2.7	**Conductors and Cables**	Append to 2.7.1	Traffic signal conductor colour coding as noted on Contract Drawings.
		Add 2.7.5	Multiconductor traffic signal cable to be stranded copper unless specified otherwise on Contract Drawings.
		Add 2.7.6	Shielded detector cable to meet IMSA 50-2 specification and be Ministry of Transportation approved product.
2.10	**Fuses and Fuse Holders**	Delete 2.10.2 and replace with the following	Fuse holders to be inline breakaway type fuse holders complete with 2 ‘L’ type rubber insulating boots.
2.14	**Receptacles**	Delete 2.14.1 and replace with the following	Receptacles: 15A-120V corrosion resistant spec grade duplex to CSA C22.2 No. 42.
2.16	**Traffic and Pedestrian Signals**	Add 2.16.3	Manufacturer and model as noted on Contract Drawings.
2.17	**LED Signal Modules**	Add 2.17.2	Manufacturer and model as noted on Contract Drawings.
2.19	**Signal Mounting Hardware**	Delete 2.19.1	Not a current standard CoA mounting method
		Delete 2.19.3	Not a current standard CoA mounting method
		Delete 2.19.4	Not a current standard CoA mounting method
		Delete 2.19.6	Not a current standard CoA mounting method

		Delete 2.19.7	Not a current standard CoA mounting method
2.20	**Audible Signals**	Add 2.20.2	Manufacturer and model as noted on Contract Drawings.
2.21	**Pedestrian / Cyclist Pushbuttons**	Add 2.21.9	Manufacturer and model as noted on Contract Drawings.
		Add 2.21.10	Bicycle pushbutton post installation to supplemental drawing CS-E-6.
2.22	**Luminaires**	Add 2.22.6	Luminaire voltage, wattage, colour temperature and distribution type to be as specified on Contract Drawings.
		Add 2.22.7	Confirm service voltage prior to ordering luminaires.
		Add 2.22.8	The consultant shall confirm with the Engineer on selection of luminaire.
2.23	**High Intensity Discharge Lamps**	Add 2.23.2	HID lamps to be non-cycling.
2.25	**Post Mount Flasher**	Delete 2.25.2 and replace with the following	Flasher post to be round 50mm diameter schedule 40 galvanized steel.
		Delete 2.25.3 and replace with the following	Flasher post concrete base installation to supplemental standard drawing CS-R-12. Complete with 27mm (1") RPVC to standard detail drawing CE1.18.
2.26	**NEMA Traffic Controllers**	Add 2.26.6	Traffic controller cabinet and base extension, as required shall be provided by the City at the Developer's cost.
2.32	**Extruded Aluminium Signs**	Add 2.32.2.5	Type of reflective material used on sign faces as specified on Contract Drawings.
3.0	**EXECUTION**		
3.3	**Concrete Bases**	Add 3.3.7	Traffic controller cabinet bases shall be 50mm above finished grade unless otherwise noted on Contract Drawings.
3.6	**Poles and Related Equipment**	Append to 3.6.10	… The exposed thread of anchor bolts to be between 3 mm and 9 mm above the anchor nuts.

3.7	**Traffic and Pedestrian Signal Head Mounting**	Delete 3.7.4 and replace with the following	Completely cover all traffic and pedestrian signal heads with dark coloured pre-manufactured signal cover bags from the time they are installed until system start-up. Signal cover bags to be Ministry of Transportation approved products.
3.12	**Electrical Service and Telephone Demarcation Panels**	Add 3.12.3	Install padlocks supplied by the City.
3.14	**Wiring**	Append to 3.14.1	… Conductor connections from the luminaire at pole hand holes to have a drip loop.
		Add 3.14.14	Leave 1.0 metres length of each conductor in junction boxes.
3.17	**Detector Loops**	Add 3.17.3	Detector loop splicing to supplemental drawing CS-E-4.

ENGINEERING STANDARD (ES) AND CONSTRUCTION STANDARD (CS) DESIGN DRAWINGS

1. GENERAL

(a) The following ES and CS Design Drawings shall typically be included on or be referred to on design drawings submitted for construction.

(b) All references to these ES and CS Design Drawings shall, in each instance, be understood to refer to the latest dated revision as issued by the City.

(c) These drawings take precedence over the Standard Detail Drawings in the Master Municipal Construction Documents.

(d) The user of the following ES and CS Design Drawings is responsible to ensure they are working with the latest and signed revision identified on each drawing.

General (G)
Typical Single Detached Location of City Service Connections ES-G-1
Typical Sewer Servicing ES-G-2
Typical Storm Servicing ES-G-3
Common Trench Installation ES-G-4

Drainage (D)
Rainfall Intensity Duration Curves (With Climate Change)..... ES-D-1
Historical Rainfall Intensity Duration Curves (For Baseline Conditions of Watershed Studies) ES-D-1.1
Drainage Analysis Sheet - Detention..... ES-D-2
Drainage Analysis Sheet - Detention/Infiltration ES-D-3
Drainage Analysis Sheet – Infiltration Trench Calculations..... ES-D-4
Storm Sewer Design Table ES-D-5

Sewer (S)
Hydraulic Element Chart ES-S-1
Peaking Factor for Sanitary Sewer Design (Babbitt Curve) ES-S-2

Roadway (R)
Typical Urban Cul-de-sac..... ES-R-1
Typical Urban Cul-de-sac-Offset Type ES-R-2
Typical Intersection – Curb Radii & Truncations..... ES-R-3
Urban Residential Access Lane (Centre drainage)..... ES-R-4
Urban Residential Access Lane (One way cross-fall) ES-R-5
Urban Highway Design Features, Signature Corridor..... ES-R-6
Urban Highway Design Features, Urban Regional Road..... ES-R-7
Urban Highway Design Features, Arterial Roads - Divided ES-R-8

Urban Highway Design Features, Arterial Roads - Undivided ES-R-9
Urban Highway Design Features, Collector Roads - Divided..... ES-R-10
Urban Highway Design Features, Collector Roads - Undivided..... ES-R-11
Urban Highway Design Features, Local Roads ES-R-12
Rural Highway Design Features, Rural Residential ES-R-13
Rural Highway Design Features, Rural Collector (2 lane with Left Turn Lane) ES-R-14
Rural Highway Design Features, Rural Collector (4 lane)..... ES-R-15

Rural Highway Design Features, Rural Regional Road (Fraser Hwy) ES-R-16
City-in-the-Country Plan lands CICP Industrial Road Cross Section
(applicable to infiltration rate greater than 50 mm/hr) ES-R-17
City-in-the-Country Plan lands CICP Industrial Road Cross section
Constant Cross-Slope, Swale on one Side (applicable to infiltration rate
greater than 50 mm/hr) ES-R-18
City-in-the-Country Plan lands CICP Industrial Road Cross Section
(applicable to infiltration rate less than 50 mm/hr) ES-R-19
City Centre Neighbourhood Plan – 34.0m Signature Corridor Cross Section ES-R-20
City Centre Neighbourhood Plan – 27.0m Arterial Street Cross Section..... ES-R-21
City Centre Neighbourhood Plan – 24.5m Major Collector Cross Section ES-R-22
City Centre Neighbourhood Plan – 22.5m Minor Collector Cross Section ES-R-23
City Centre Neighbourhood Plan – 20.0m Local Street Cross Section ES-R-24
Historic Downtown Neighbourhood Plan – Montrose Avenue (Clayburn Site) Cross Section
..... ES-R-25
Historic Downtown Neighbourhood Plan – Montrose Avenue (Transition) Cross SectionES-R-
26
Historic Downtown Neighbourhood Plan – Montrose Avenue (Retail) Cross Section
..... ES-R-27
Historic Downtown Neighbourhood Plan – Montrose Avenue (Transit) Cross Section
..... ES-R-28
Historic Downtown Neighbourhood Plan – Essendene Avenue Cross Section.... ES-R-29
Historic Downtown Neighbourhood Plan – South Fraser Way Cross Section..... ES-R-30
Historic Downtown Neighbourhood Plan – West Railway Street Cross Section... ES-R-31
Historic Downtown Neighbourhood Plan – McDougall Avenue Cross Section..... ES-R-32
Historic Downtown Neighbourhood Plan – McCallum Road Cross Section ES-R-33
UDistrict Neighbourhood Plan Local Street – Duke Avenue Cross Section ES-R-34
UDistrict Neighbourhood Plan Collector Street – King Connector Cross Section. ES-R-35
UDistrict Neighbourhood Plan Local Street – King Crescent Cross Section ES-R-36
UDistrict Neighbourhood Plan Collector Street King Road – McCallum Rd to University Way
Cross Section..... ES-R-37
UDistrict Neighbourhood Plan Collector Street King Road – University Way to McKenzie Rd
Cross Section..... ES-R-38
UDistrict Neighbourhood Plan Collector Street McCallum Road – (South of King Road) Cross
Section..... ES-R-39
UDistrict Neighbourhood Plan Local Street – Salton Road Cross Section..... ES-R-40
UDistrict Neighbourhood Plan Local Street – University Way (Cascades Plaza) Cross Section
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Flow Control Manhole (Without 100 year overflow) CS-D-3
Infiltration Trench for Roofwater Only CS-D-4
Typical Driveway Culvert with Sandbag Endwalls CS-D-5
Ditch Catch Basin Type 1 .....CS-D-6
Typical Catch Basin with Swale Construction.....CS-D-7
Ditch Catch Basin Type II CS-D-8
Ditch Catch Basin Type III for Lateral Ditches (Grades of 5% & less).....CS-D-9

Ditch Catch Basin Type IV for Lateral Ditches (Grades over 5%) CS-D-10
Trapping Hood CS-D-11
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Standard 600 x 1000 Catch Basin – No Curb and Parking Lot Application CS-D-13
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Standard Side Inlet Catch Basin CS-D-15
Side Inlet Catch Basin frame CS-D-16
Outlet Structure Safety Grill CS-D-17
Typical Lawn Basin CS-D-18
Bike Friendly Catch Basin CS-D-19
Curb Cut Detail CS-D-20
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Storm Sewer Inspection Chamber for Service Connection CS-D-22
Infiltration Catch Basin with Overflow CS-D-23
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Junction Box Details (Concrete) CS-E-2
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Detector Loop to Shielded Cable Splicing Details CS-E-4
Type B Base Post Mounted Sign and Flasher Adapter Detail CS-E-5
Bicycle Pushbutton Post CS-E-6
Opticom Detector CS-E-7

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Protection Details for Tree(s) CS-TP-5

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Main Trail CS-TR-2
Secondary Trail CS-TR-3
Nature Trail CS-TR-4

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Typical Sidewalk Widening around Obstructions CS-R-2
Concrete Sidewalk and Barrier Curb CS-R-3
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Walkway at Street Connection (Greater than 8% Grade) CS-R-5
Bicycle Baffle Anchor Bolt Detail CS-R-6
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Concrete Road End Barrier CS-R-8
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Stairway & Landing Details for Walkway Gradients Greater than 12% Slope CS-R-11
Street Sign Installation Detail CS-R-12
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Sanitary Sewer Cleanout Structure..... CS-S-3
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Typical Gate Valve Installation for Sanitary Forcemain..... CS-S-6
Nelson-Type Valve Box for Sanitary Forcemain Valves..... CS-S-7
Sanitary Sewer Cleanout Lid Details..... CS-S-8

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Electronic Water Meter and Chamber..... CS-W-2
Typical Hydrant Assembly..... CS-W-3
Typical Hydrant Island Installation Across Ditch/Raingarden..... CS-W-4
Typical Hydrant Island Installation Roadside of Ditch/Raingarden..... CS-W-5
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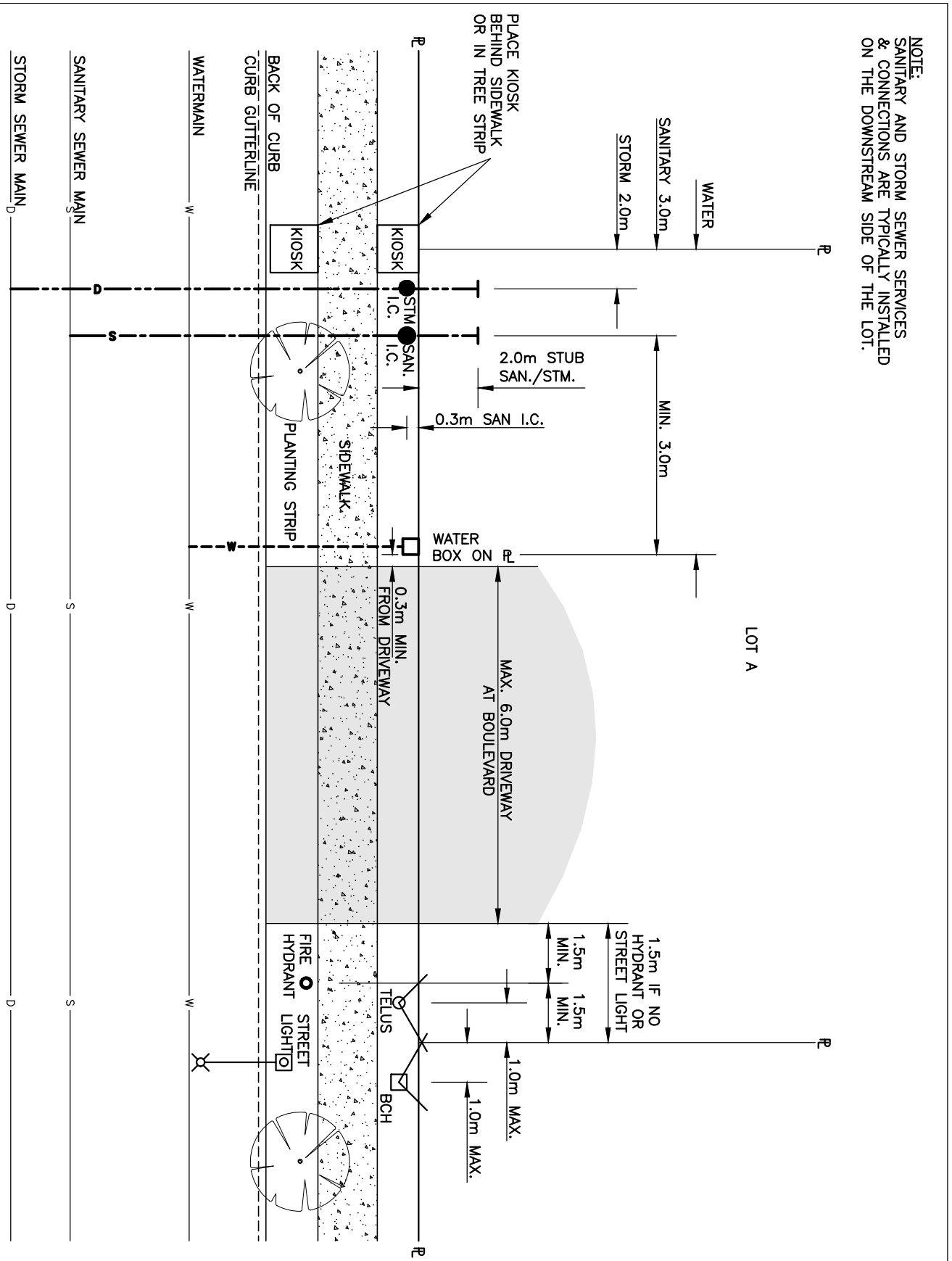
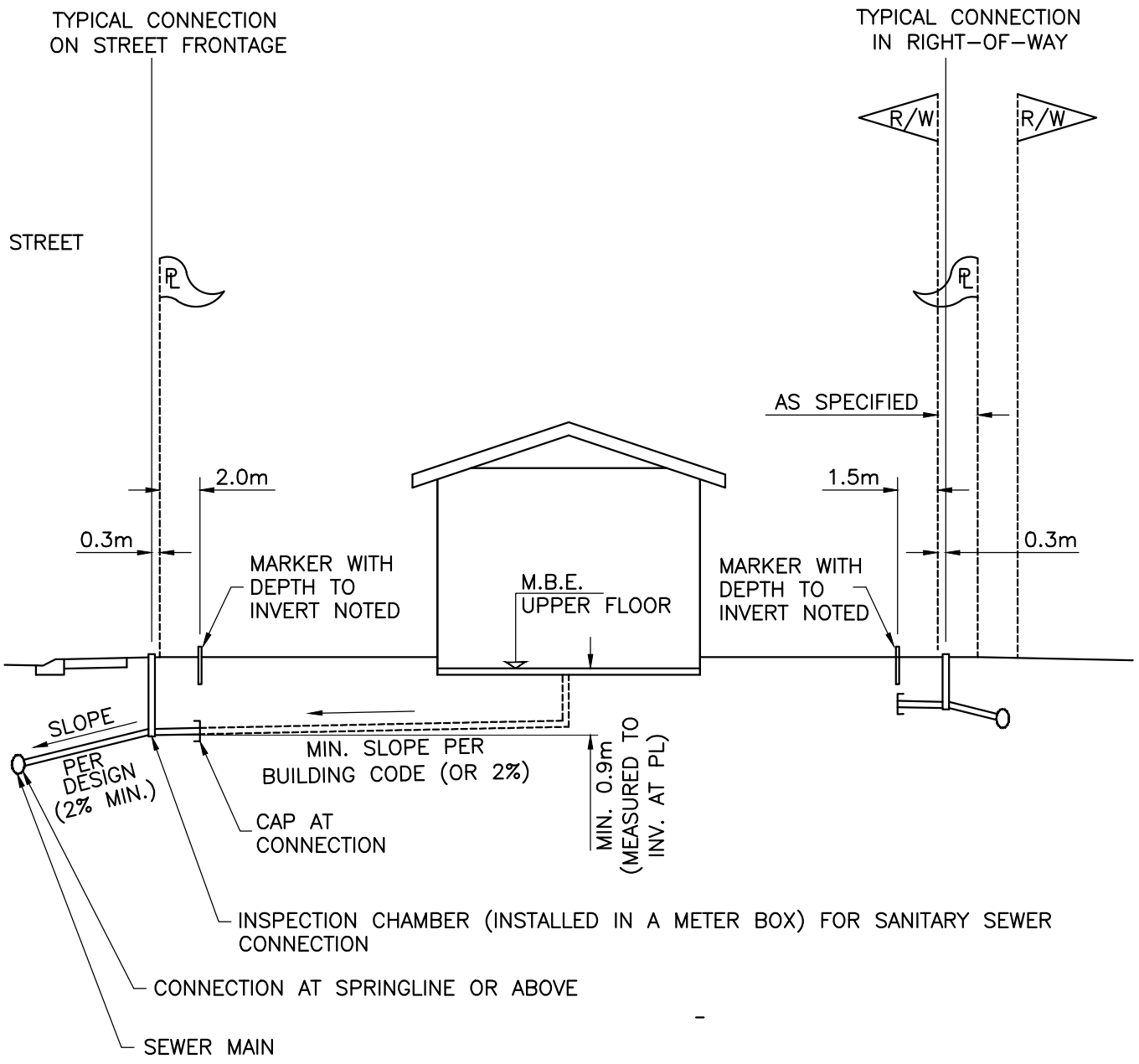


TYPICAL SINGLE DETACHED LOCATION OF CITY SERVICE CONNECTIONS

ABBOTSFORD

DRAWN:	1995 02 01
REVISED:	2021 09 09
APPROVED BY:	

ES - G - 1

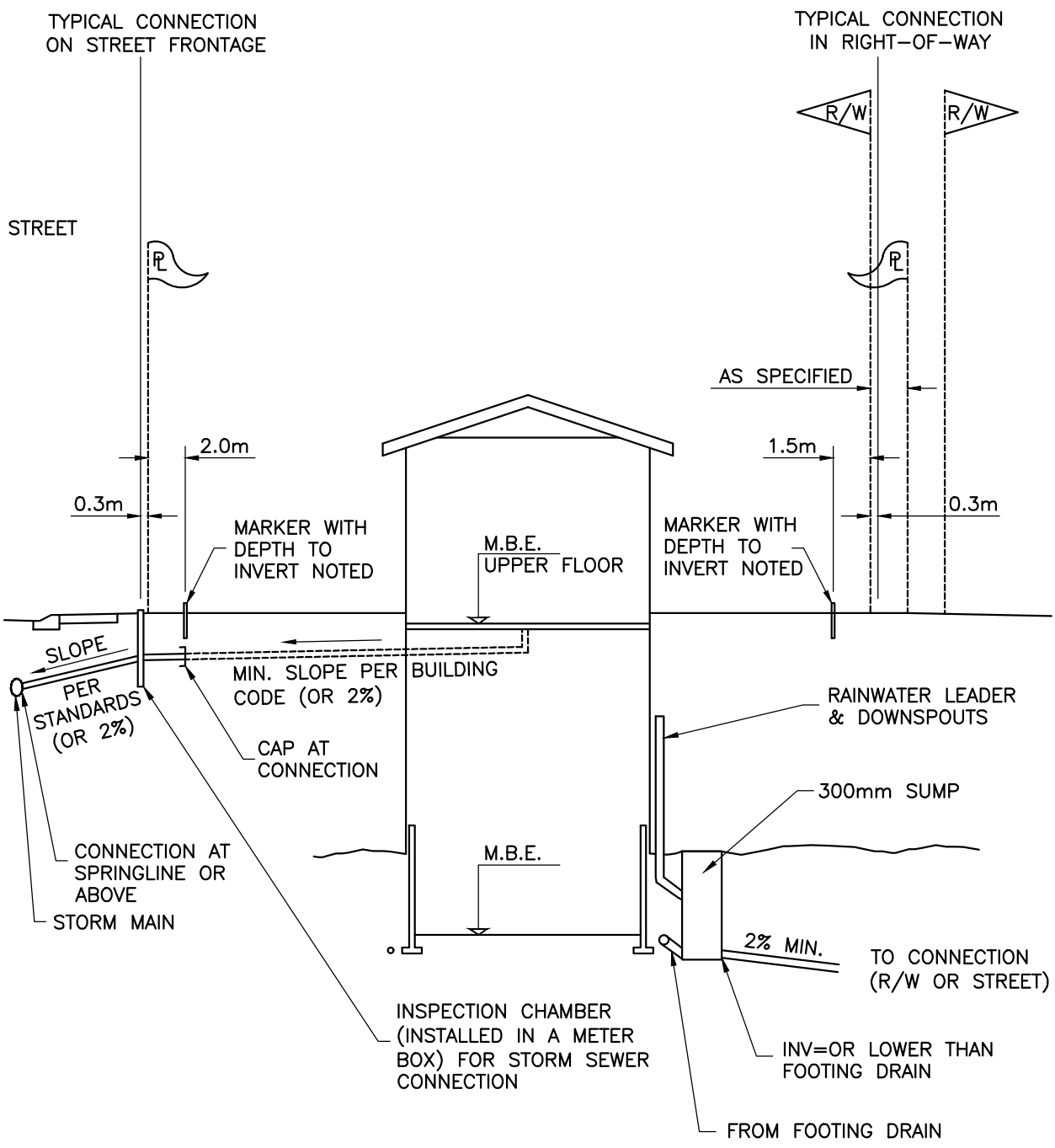


TYPICAL SEWER SERVICING

ABBOTSFORD

DRAWN:	1994 11 30
REVISED:	2021 09 09
APPROVED BY:	

ES - G - 2

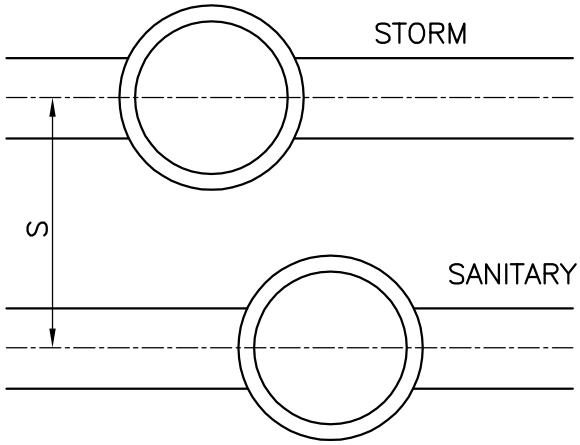


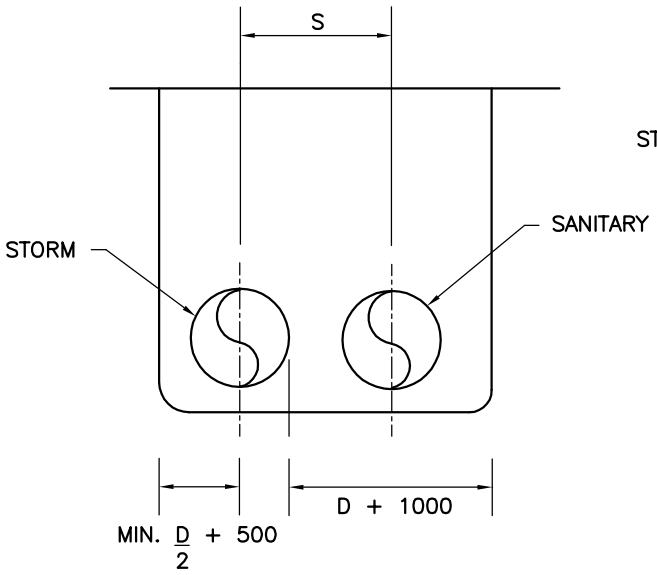
TYPICAL STORM SERVICING

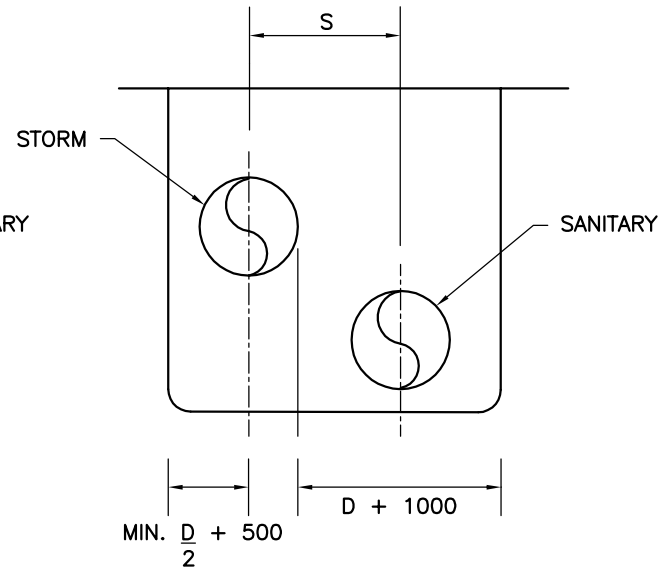
ABBOTSFORD

DRAWN:	1994 11 30
REVISED:	2021 09 09
APPROVED BY:	

ES - G - 3







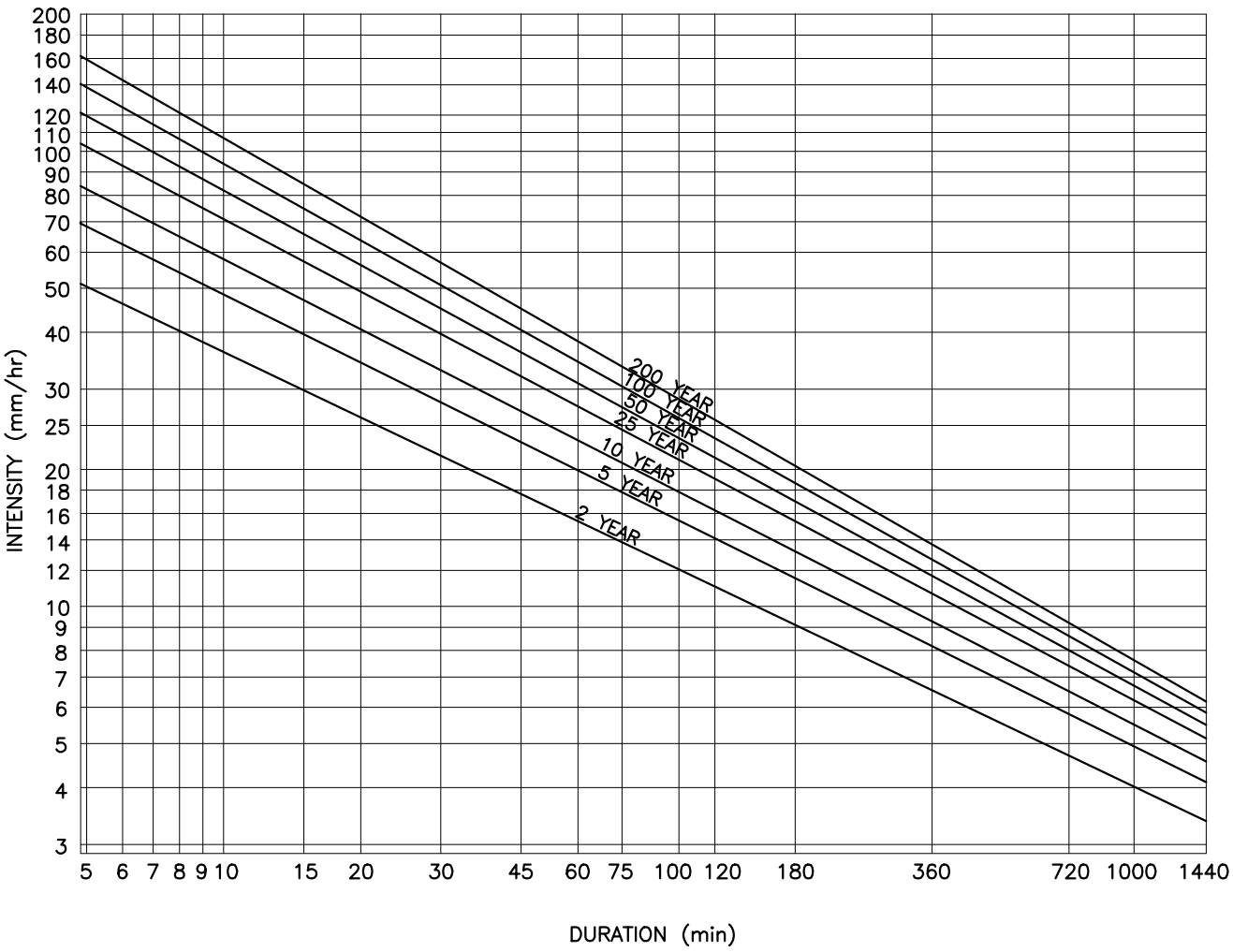
$$\text{MINIMUM SEPARATION (S)} = \left(\frac{\text{O.D. STORM MH} + \text{O.D. SAN MH}}{2}\right) + 500\text{mm}$$

COMMON TRENCH INSTALLATION

ABBOTSFORD

DRAWN:	1995 04 10
REVISED:	2005 11 01
APPROVED BY:	

ES - G - 4



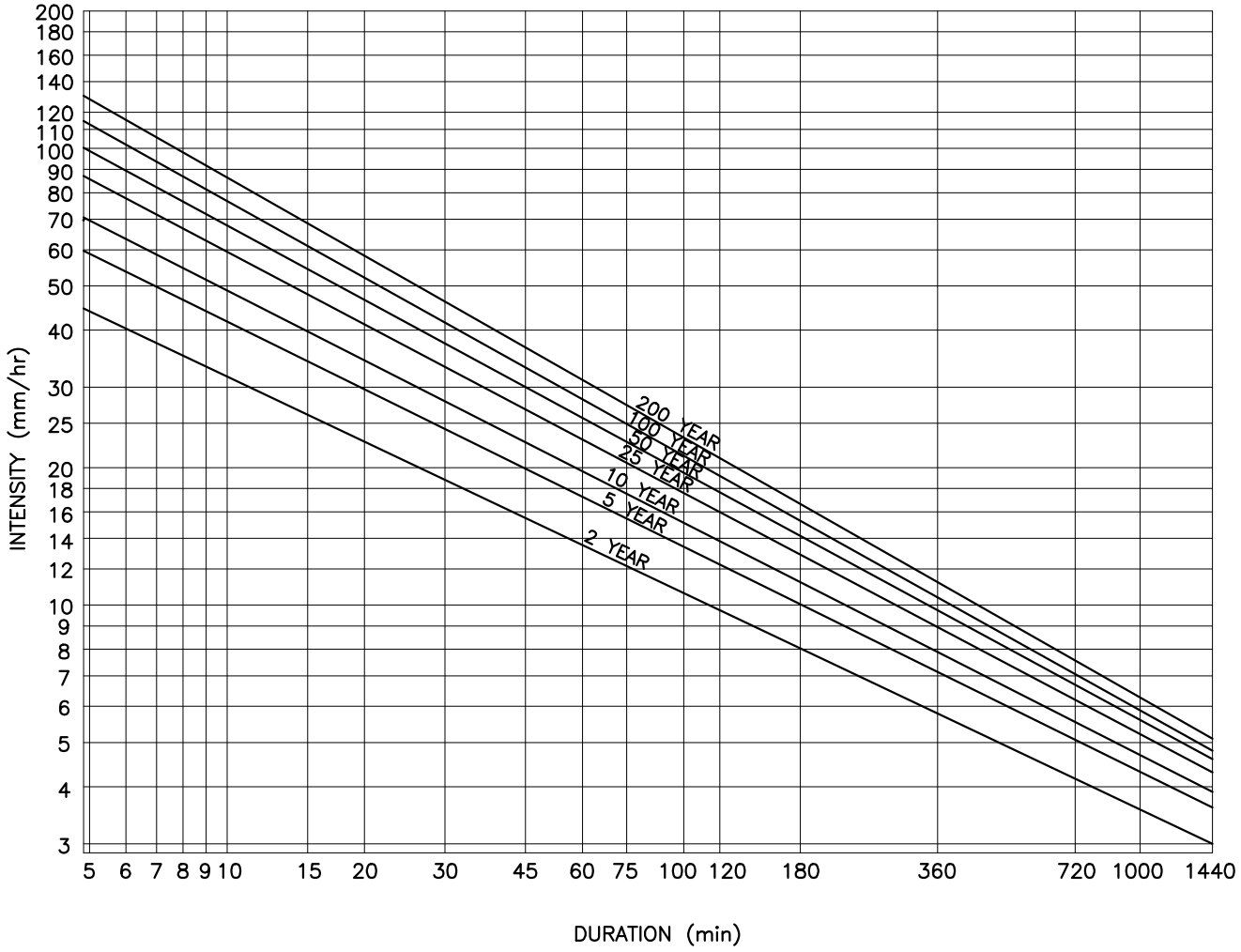
RETURN PERIOD	INTENSITY (I) DURATION (D) EQUATIONS
2	$LOG_{10}(I) = -0.4780\ LOG_{10}(D) + 2.0369$
5	$LOG_{10}(I) = -0.4961\ LOG_{10}(D) + 2.1813$
10	$LOG_{10}(I) = -0.5113\ LOG_{10}(D) + 2.2740$
25	$LOG_{10}(I) = -0.5294\ LOG_{10}(D) + 2.3799$
50	$LOG_{10}(I) = -0.5433\ LOG_{10}(D) + 2.4569$
100	$LOG_{10}(I) = -0.5589\ LOG_{10}(D) + 2.5313$
200	$LOG_{10}(I) = -0.5736\ LOG_{10}(D) + 2.6027$

RAINFALL INTENSITY DURATION CURVES (WITH CLIMATE CHANGE)

ABBOTSFORD

DRAWN: 1995 02 01
REVISED: 2021 09 09
APPROVED BY:

ES - D - 1



RETURN PERIOD	INTENSITY (I) DURATION (D) EQUATIONS
2	$LOG_{10}(I) = -0.4784\ LOG_{10}(D) + 1.9837$
5	$LOG_{10}(I) = -0.4967\ LOG_{10}(D) + 2.1233$
10	$LOG_{10}(I) = -0.5108\ LOG_{10}(D) + 2.2086$
25	$LOG_{10}(I) = -0.5296\ LOG_{10}(D) + 2.3099$
50	$LOG_{10}(I) = -0.5443\ LOG_{10}(D) + 2.3817$
100	$LOG_{10}(I) = -0.5593\ LOG_{10}(D) + 2.4506$
200	$LOG_{10}(I) = -0.5738\ LOG_{10}(D) + 2.5164$

HISTORICAL RAINFALL INTENSITY DURATION CURVES (FOR BASELINE CONDITIONS OF WATERSHED STUDIES)

ABBOTSFORD

DRAWN: 1995 02 01
REVISED: 2021 09 09
APPROVED BY:

ES - D - 1.1

Map No: _____ Zoning: _____ Date: _____

File: _____

Site Address: _____

Legal Description: _____

Consultant: _____ Phone: _____

Address: _____ Fax: _____

_____ P.C. _____

SITE INFORMATION

	Developed:	Undeveloped:
* Area:	_____ ha	* _____ ha
* Runoff Coefficient:	_____	* _____
* Time of Concentration:	_____ min	* _____ min
* Intensity:	_____ mm/hr	* _____ mm/hr

* Minor system peak flow upstream of detention facility: _____ cu m/sec
from developed land / area

* Major system peak flow: (developed area) _____ cu m/sec

From the above supplied information you may receive the following information from the City. OR you can provide the following for review and acceptance by the Engineer.

Required storage volume: _____ cu m

Allowable release rate: max. 5 LITRES/s/ha _____ cu m/sec

Orifice Sizing:

* Head: _____ m

Area: _____ sq mm

Dia: _____ mm

* _____ This information shall be supplied by the consulting engineer

_____

Accepted by the Engineer

Date: _____

DRAINAGE ANALYSIS SHEET DETENTION

ABBOTSFORD

DRAWN: 1995 01 11

REVISED: 2011 04 18

APPROVED BY:

ES - D - 2

Map No: _____ Zoning: _____ Date: _____

File: _____

Site Address: _____

Legal Description: _____

Consultant: _____ Phone: _____

Address: _____ Fax: _____

_____ P.C. _____

SITE INFORMATION

	Site	Roof
* Area:	_____ ha	* _____ m^2
* Intensity:	_____ mm/hr	

* Minor system peak flow upstream of detention/infiltration facility from developed area: _____ cu m/sec

* Major system peak flow from developed area: _____ cu m/sec

Percolation test results: _____ sec/in**

Infiltration test results: _____ m/sec**

Infiltration rate: _____ m/sec**

Dissipation rate: _____ cu m/sec**

Trench base area: _____ sq m**

Trench storage req'd: _____ cu m**

Trench Depth: (assuming 0.35 void ratio)

–allowable (Dmax) _____ m** (typ. 0.8

–provided (D) _____ m**

DETENTION SYSTEM–WITH INFILTRATION

* Contributing Area: _____ ha

* Allowable release rate: _____ cu m/sec

* Time of Concentration: _____ min

* Runoff Coefficient: _____

Required storage volume: _____ cu m

ORIFICE SIZING

* Head: _____ m

Area: _____ sq mm

Dia: _____ mm

_____

Accepted by the Engineer

Date: _____

* Calculation information supplied by the consulting Engineer

** Calculations based on ES–D–4

DRAINAGE ANALYSIS SHEET DETENTION / INFILTRATION

ABBOTSFORD

DRAWN: 1995 01 12

REVISED: 2005 11 01

APPROVED BY:

ES - D - 3

1. Determine infiltration rate: f m/sec

   a. For percolation test results:

      INFILTRATION RATE: f = 0.00423/t

      WHERE: t – is the precolation rate in sec/in. from test results;
      0.00423 – is derived from dividing a conversion & infiltraton area factor of 0.0127 by a safety factor of 3.

   b. For infiltration or permeability tests performed by a qualified soils testing firm:

      INFILTRATION RATE: f=t/3

      WHERE: t – (m/sec) is determined by soils testing firm;
      3 – is the safety factor applied

2. Determine rate of dissipation: Q cu m/sec

   DISSIPATION RATE: Q=(f)(A)

   WHERE: A – (sq m) is the bottom area of the trench;
   f – is from 'a' or 'b' above

2a. Use this "Q" as the allowable release rate in the Modified Rational Method to determine the required storage, S cu m, for the infiltration trench.

3. Determine depth of trench: a: allowed – Dmax
   b: provided – d

   a. Dmax = 86,400 (f)/Vr

      WHERE: Vr – is void ratio of the drain rock. (0.35)
      f – is from '1a' or 'b' above

   b. d = s/[(A)(Vr)]

      WHERE: S – is storage required;
      A – is area of the bottom of the trench;
      Vr – is void ratio of the drain rock.

NOTE: the depth cannot exceed Dmax which is dependent on the maxiumum permissible storage time of 24 hours, the percolation rate and the void ratio of the drain rock.

Adjust the area (A) of the bottom of the trench in 2, to achieve the optimum depth for construction.

DRAINAGE ANALYSIS SHEET INFILTRATION TRENCH CALCULATIONS

ABBOTSFORD

DRAWN:	1995 01 12
REVISED:	2011 04 18
APPROVED BY:	

ES - D - 4

STORM SEWER DESIGN TABLE

PROJECT: _____

STORM RETURN PERIOD_____ YEARS.

DESIGNED BY:_____

CHECKED BY: _____

SHEET ____ OF ____

CITY FILE NO. _____

DATE:_____

LOCATION				AREA hA.		FLOW RxAxI/360							PIPE DATA						DROP m			ELEVATIONS m			
Dwg. No.	Street or Line	From	To:	A	ΣA	Runoff Coef. R	effective area AxR Incr.	effective area AxR total	time of(mins) concentration Incr.	time of(mins) concentration total	Rainfall intesnity I mm/h	Design Flow (Q) m^3/s	Capacity m^3/s	n	Slope	Size mm	Velocity m/s	Pipe Length m	Slope	Other	Total Drop	Upstream ground	Upstream invert	Downstream ground	Downstream invert

ABBOTSFORD

ES - D - 5

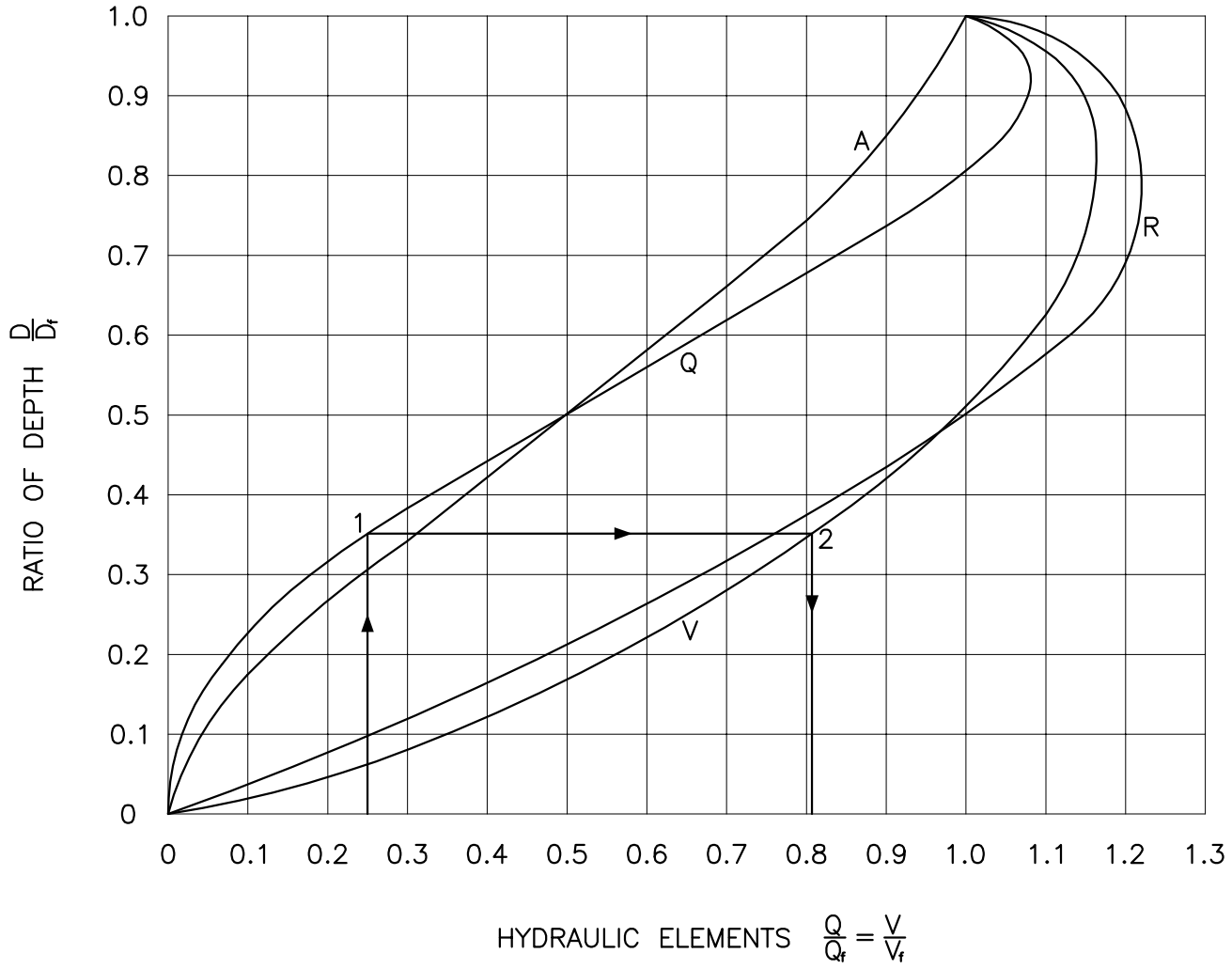
DRAWN: 2005 10 27

REVISED: 2005 10 27

APPROVED BY:

STORM SEWER DESIGN TABLE

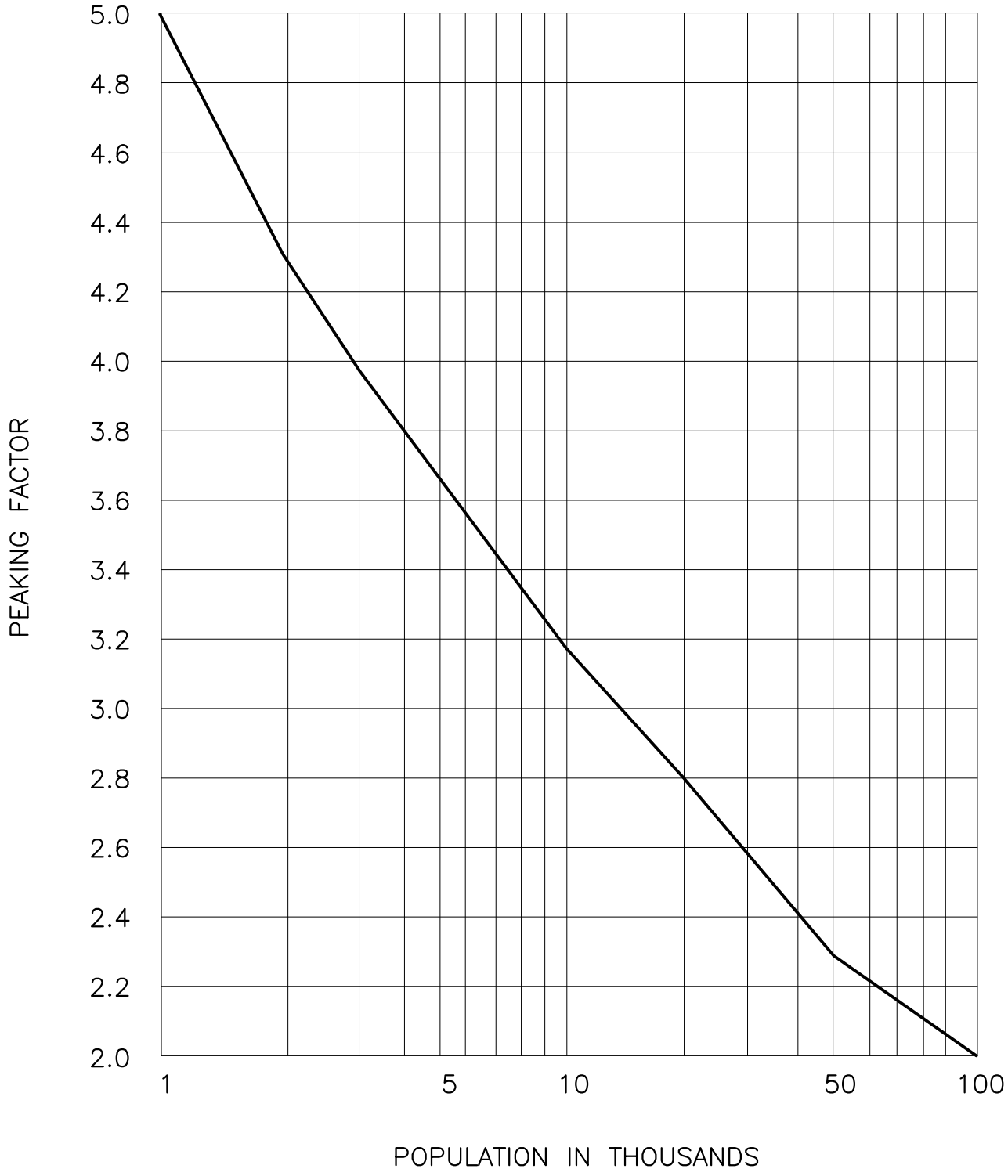
HYDRAULIC ELEMENT CHART



NOTES FOR USE:

- FOR EXAMPLE, CALCULATE $\frac{Q}{Q_f}$ AND ENTER CHART ON BOTTOM AXIS.
- INTERSECT Q LINE AT POINT 1, THEN PROJECT TO V LINE AT POINT 2.
- READ OFF FRACTIONAL VALUE OF V/V_f =0.82, THEREFORE, V = .82 V_f .

HYDRAULIC ELEMENT CHART	ABBOTSFORD	DRAWN: 1995 01 31 REVISED: 2005 03 01 APPROVED BY: ES - S - 1

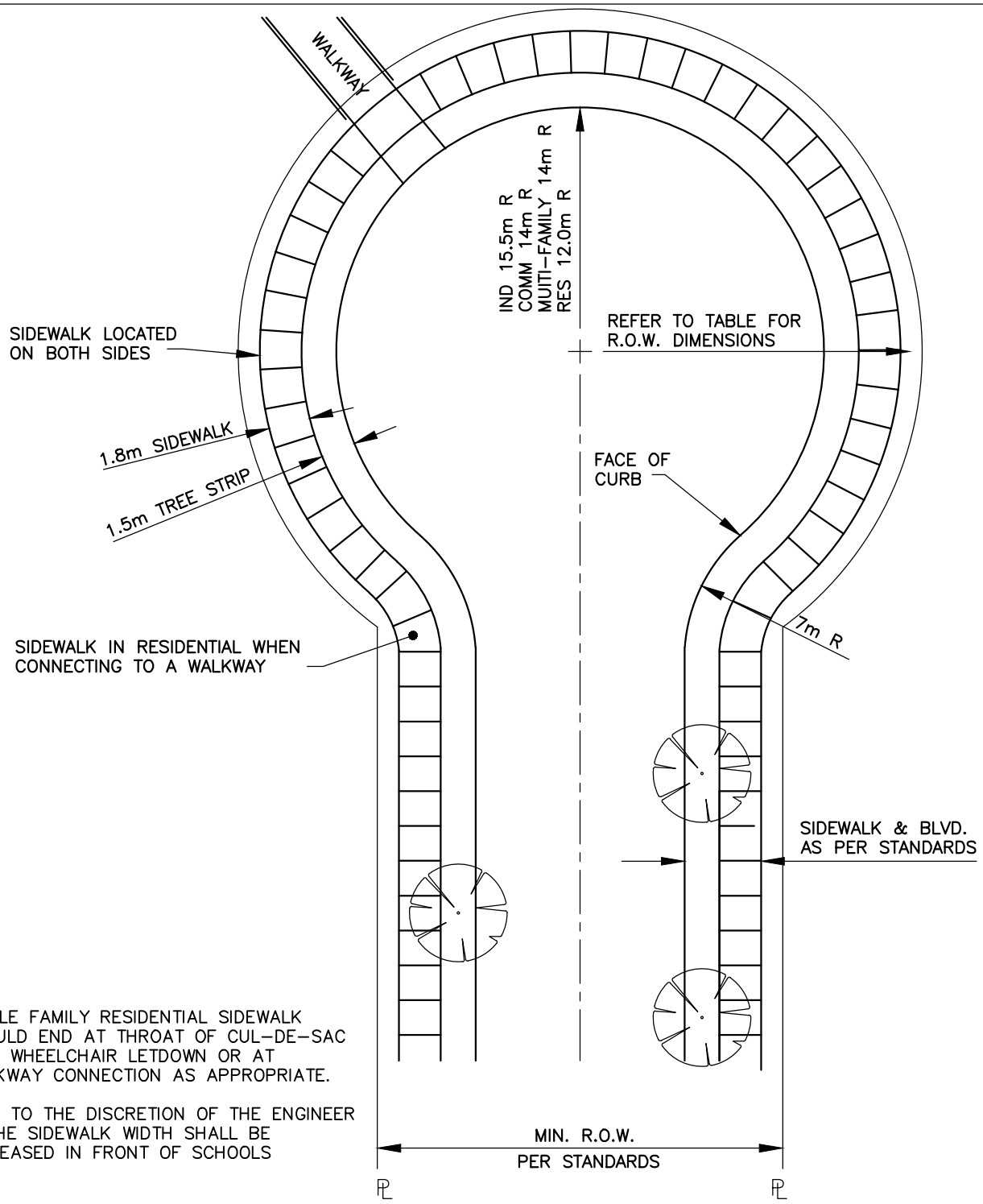


PEAKING FACTORS FOR SANITARY SEWER FLOW (BABBITT CURVE)

ABBOTSFORD

DRAWN:	1995 01 31
REVISED:	2006 03 27
APPROVED BY:	

ES - S - 2



NOTE

1. SINGLE FAMILY RESIDENTIAL SIDEWALK SHOULD END AT THROAT OF CUL-DE-SAC WITH WHEELCHAIR LETDOWN OR AT WALKWAY CONNECTION AS APPROPRIATE.
2. IT IS TO THE DISCRETION OF THE ENGINEER IF THE SIDEWALK WIDTH SHALL BE INCREASED IN FRONT OF SCHOOLS

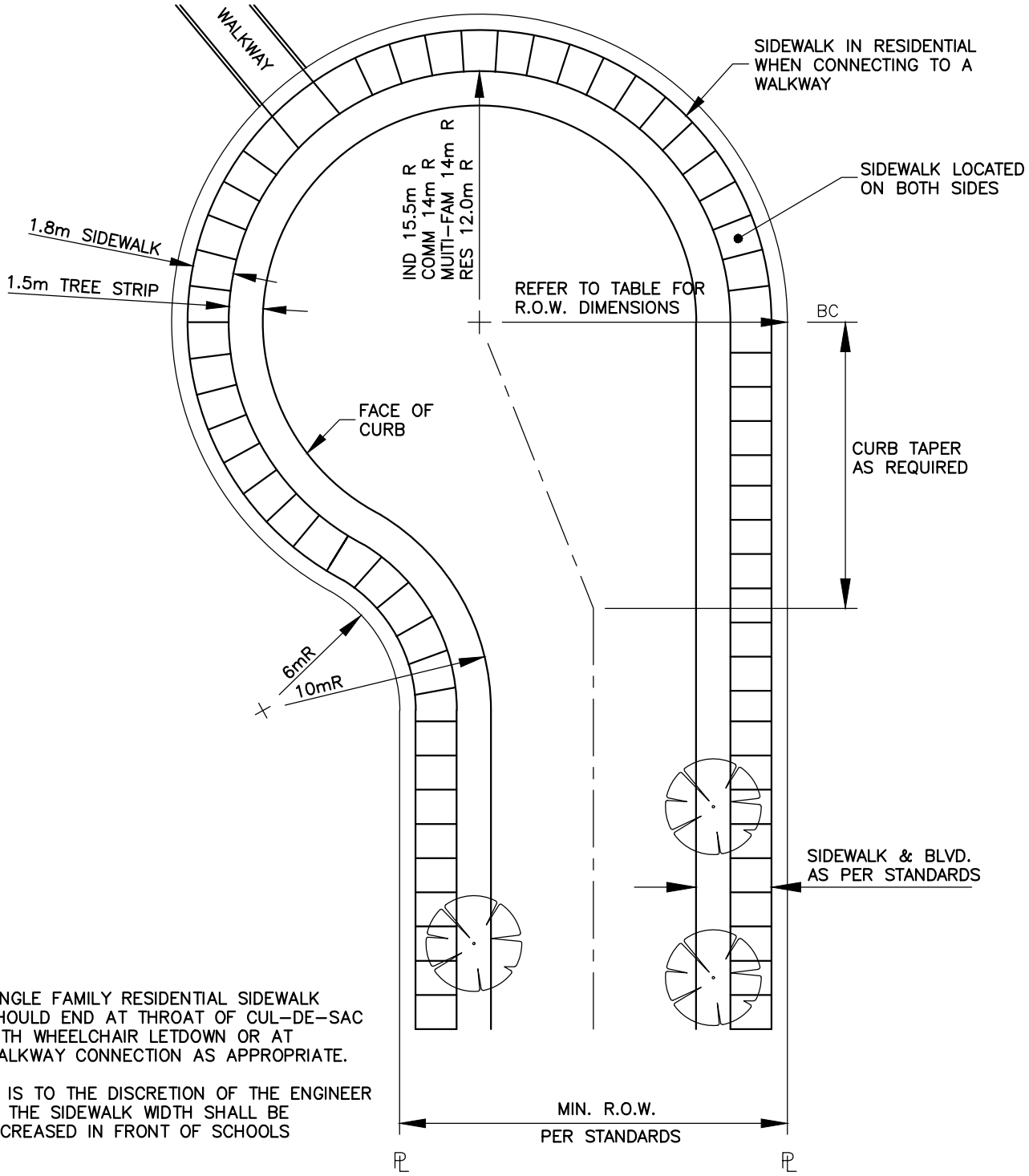
CLASSIFICATION	TRAVELLED PORTION RADIUS(m)	R.O.W. NO SIDEWALK RADIUS(m)	R.O.W. C/W 1.8m SIDEWALK RADIUS(m)	R.O.W. C/W 3.0m SIDEWALK RADIUS(m)
INDUSTRIAL	15.5		19.1	
COMMERCIAL	14		17.6	18.8
MULTI-FAMILY	14		17.6	---
RESIDENTIAL	12	13.65	15.6	---

TYPICAL URBAN CUL-DE-SAC

ABBOTSFORD

DRAWN: 1994 11 30
REVISED: 2021 09 09
APPROVED BY:

ES - R - 1



NOTE

1. SINGLE FAMILY RESIDENTIAL SIDEWALK SHOULD END AT THROAT OF CUL-DE-SAC WITH WHEELCHAIR LETDOWN OR AT WALKWAY CONNECTION AS APPROPRIATE.
2. IT IS TO THE DISCRETION OF THE ENGINEER IF THE SIDEWALK WIDTH SHALL BE INCREASED IN FRONT OF SCHOOLS

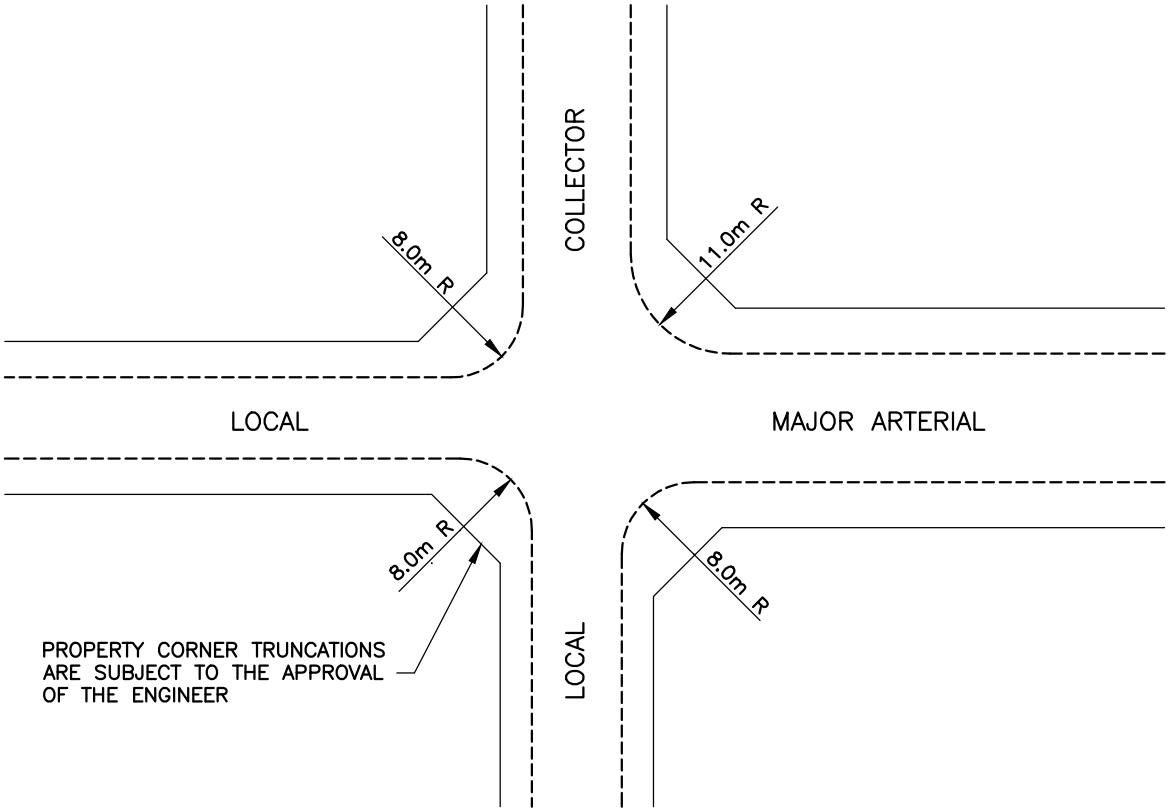
CLASSIFICATION	TRAVELLED PORTION RADIUS(m)	R.O.W. NO SIDEWALK RADIUS(m)	R.O.W. C/W 1.8m SIDEWALK RADIUS(m)	R.O.W. C/W 3.0m SIDEWALK RADIUS(m)
INDUSTRIAL	15.5		19.1	19.8
COMMERCIAL	14		17.6	18.8
MULTI-FAMILY	14		17.6	---
RESIDENTIAL	12	13.65	15.6	---

TYPICAL URBAN CUL-DE-SAC - OFFSET TYPE

ABBOTSFORD

DRAWN: 1994 11 30
REVISED: 2021 09 09
APPROVED BY:

ES - R - 2



INTERSECTING ROAD	TRUNCATION
ARTERIAL AND COLLECTOR ROAD TO ANY ROADWAY OR LANE	5.0m X 5.0m CORNER CUT
LOCAL ROAD TO LOCAL ROAD	3.0m X 3.0m CORNER CUT
LOCAL ROAD TO LANE	1.5m X 1.5m CORNER CUT
LANE TO LANE	5.5m X 5.5m CORNER CUT

NOTE:

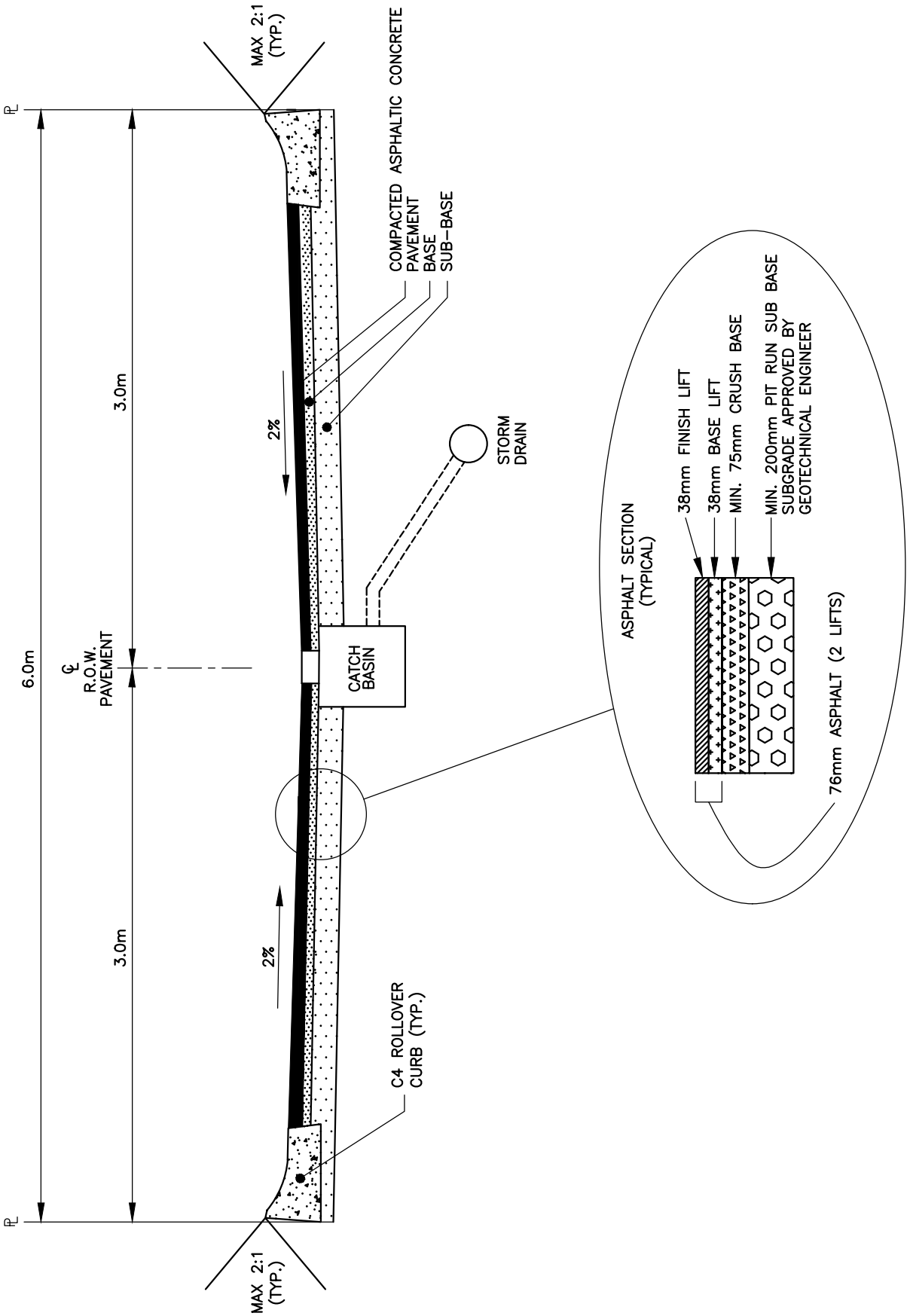
1. ALL CURB RADII ARE SET BY THE NARROWER STREET
2. DESIGN VEHICLE TO BE CONFIRMED WITH THE ENGINEER

TYPICAL INTERSECTION CURB RADII & TRUNCATIONS

ABBOTSFORD

DRAWN: 1995 02 09
REVISED: 2021 09 09
APPROVED BY:

ES - R - 3

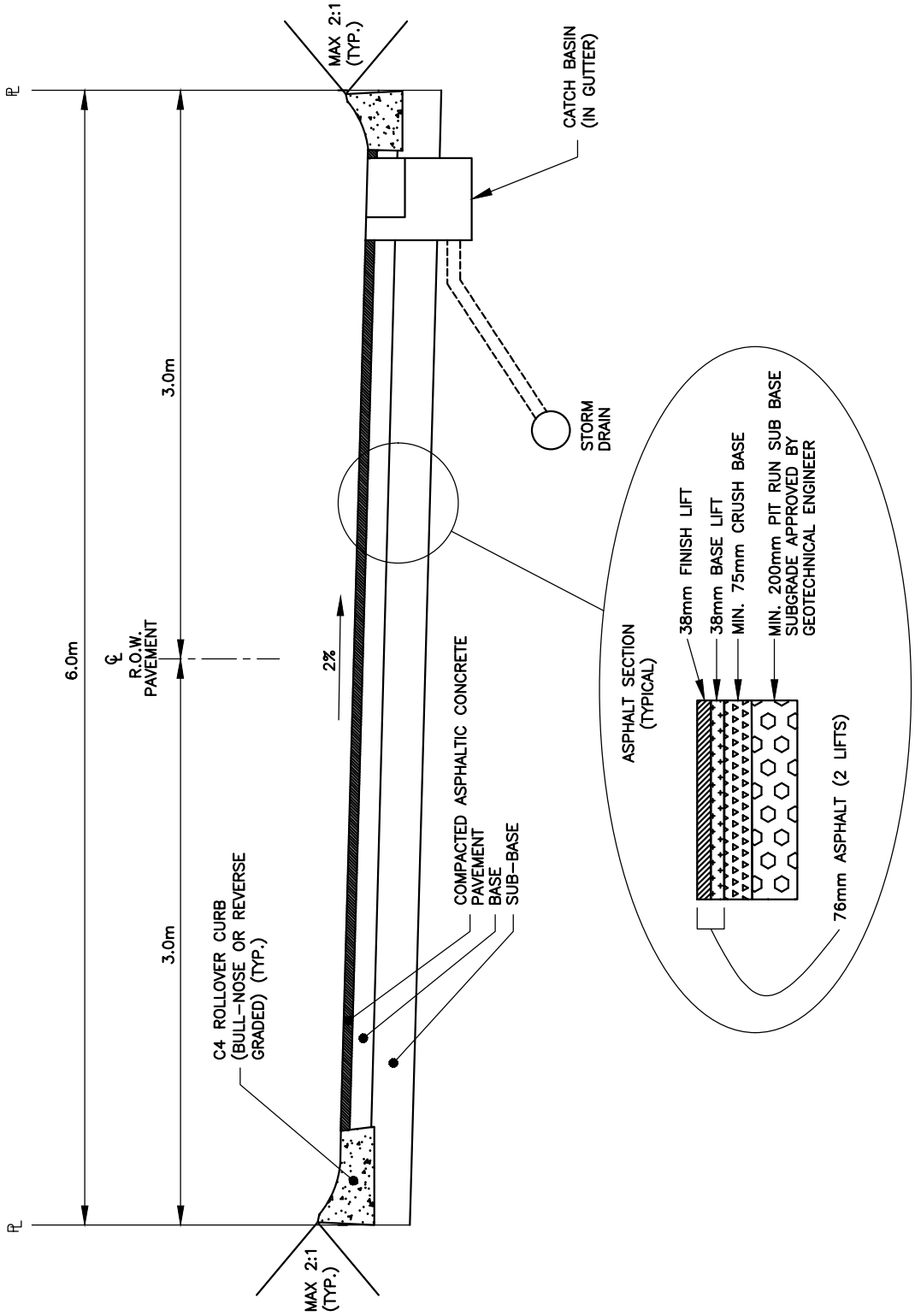


URBAN RESIDENTIAL ACCESS LANE (CENTRELINE DRAINAGE)

ABBOTSFORD

DRAWN:	1995 01 30
REVISED:	
APPROVED BY:	

ES - R - 4

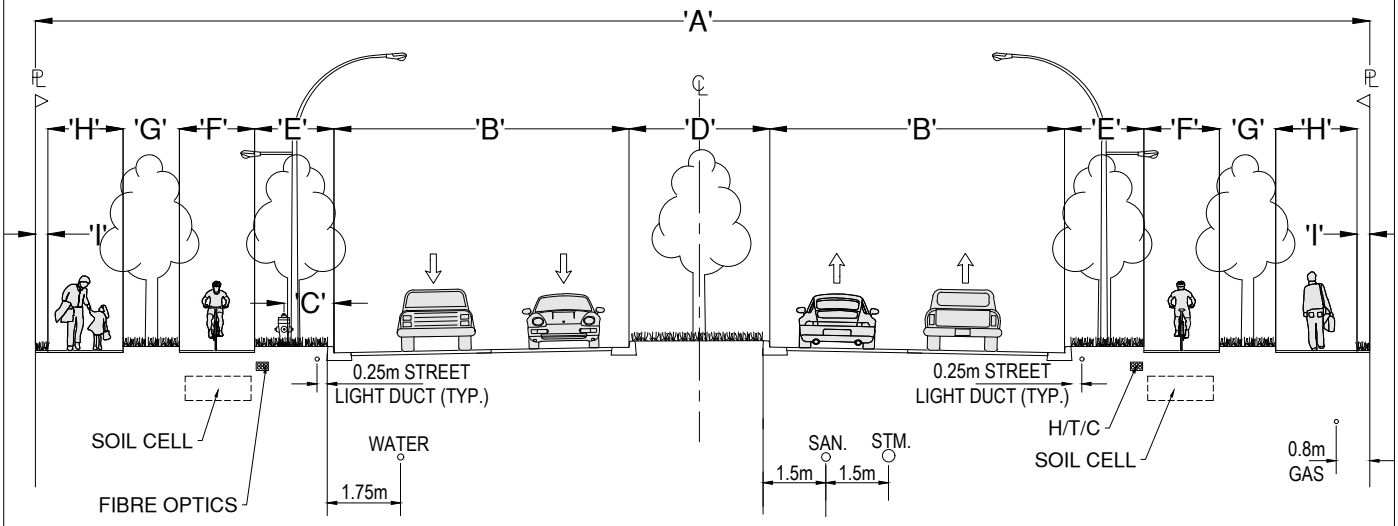


URBAN RESIDENTIAL ACCESS LANE (ONE WAY CROSS-FALL)

ABBOTSFORD

DRAWN:	1995 01 30
REVISED:	2006 03 27
APPROVED BY:	

ES - R - 5



ROW TYPES	ROAD ALLOWANCE	PAVEMENT	OFFSET FROM CURB	MEDIAN / TURNING LANE	BOULEVARD	BIKE PATH	SEPARATION	SIDEWALK	BOW TO PL	LANE CONFIGURATION
	'A'	'B'	'C'	'D'	'E'	'F'	'G'	'H'	'I'	WITHIN 'B'
SIGNATURE CORRIDOR (SFW)	34.0	6.6	1.2	4.2	2.1	2.0	1.5	2.7	-	(3.5m - 3.1m)x2

NOTES:

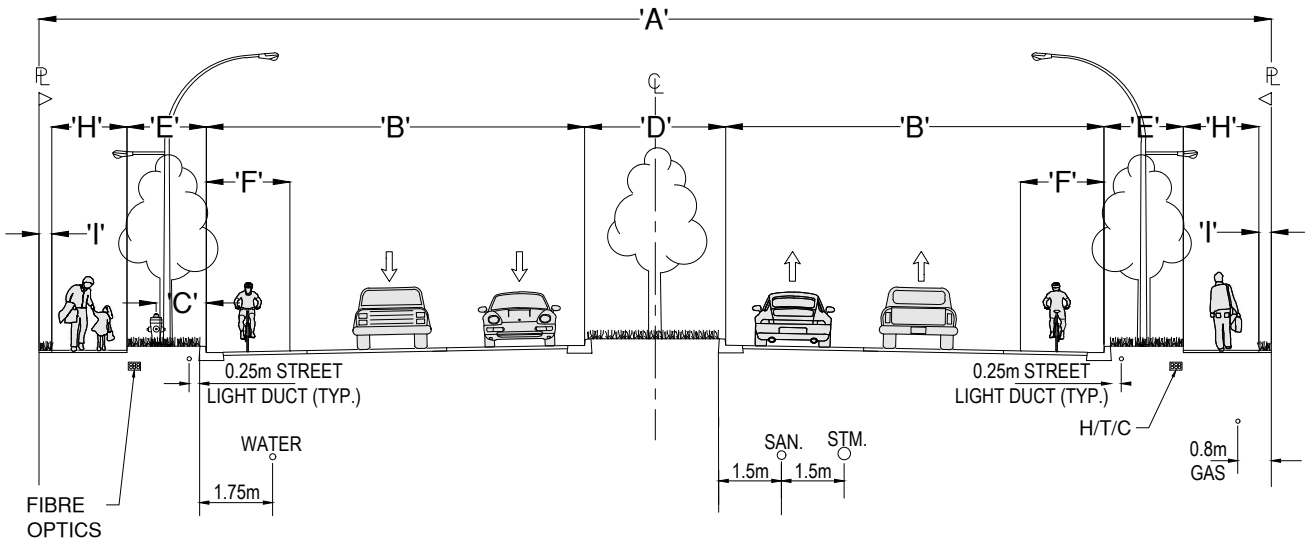
1. ALL CURBS ARE TO BE BARRIER CURB.
2. ALL RIGHT-OF-WAYS ARE SUBJECT TO THE APPROVAL OF THE ENGINEER.
3. SIGNATURE CORRIDOR TO INCLUDE SEPARATION BETWEEN SIDEWALK AND BIKE PATH FACILITY. VERTICAL SEPARATION OR ADDITIONAL ROW MAY BE REQUIRED AT THE DISCRETION OF THE ENGINEER.
4. LOCATION OF SHALLOW UTILITIES SHALL BE CONFIRMED BY THE ENGINEER.

URBAN HIGHWAY DESIGN FEATURES SIGNATURE CORRIDOR

ABBOTSFORD

DRAWN: 2020 03 02
REVISED:
APPROVED BY:

ES - R - 6



ROW TYPES	ROAD ALLOWANCE	PAVEMENT	OFFSET FROM CURB	MEDIAN / TURNING LANE	BOULEVARD	BIKE LANE (WITHIN 'B')	SIDEWALK	BOW TO PL	LANE CONFIGURATION
	'A'	'B'	'C'	'D'	'E'	'F'	'H'	'I'	WITHIN 'B'
URBAN REGIONAL ROAD (FRASER HIGHWAY)	30.6	9.45	1.0	4.2	1.65	2.0	1.8	0.3	(5.7m - 3.75m)x2 2m BIKE LANE 3.7m TRAVEL LANE 3.75m TRAVEL LANE

NOTES:

1. ALL CURBS ARE TO BE BARRIER CURB AND BIKE FRIENDLY WHERE APPLICABLE (REFER TO CS-D-19) .
2. ALL RIGHT-OF-WAYS ARE SUBJECT TO THE APPROVAL OF THE ENGINEER.
3. PROTECTED BICYCLE FACILITY. VERTICAL SEPARATION OR ADDITIONAL ROW MAY BE REQUIRED AT THE DISCRETION OF THE ENGINEER.
4. LOCATION OF SHALLOW UTILITIES SHALL BE CONFIRMED BY THE ENGINEER.

URBAN HIGHWAY DESIGN FEATURES, URBAN REGIONAL ROAD

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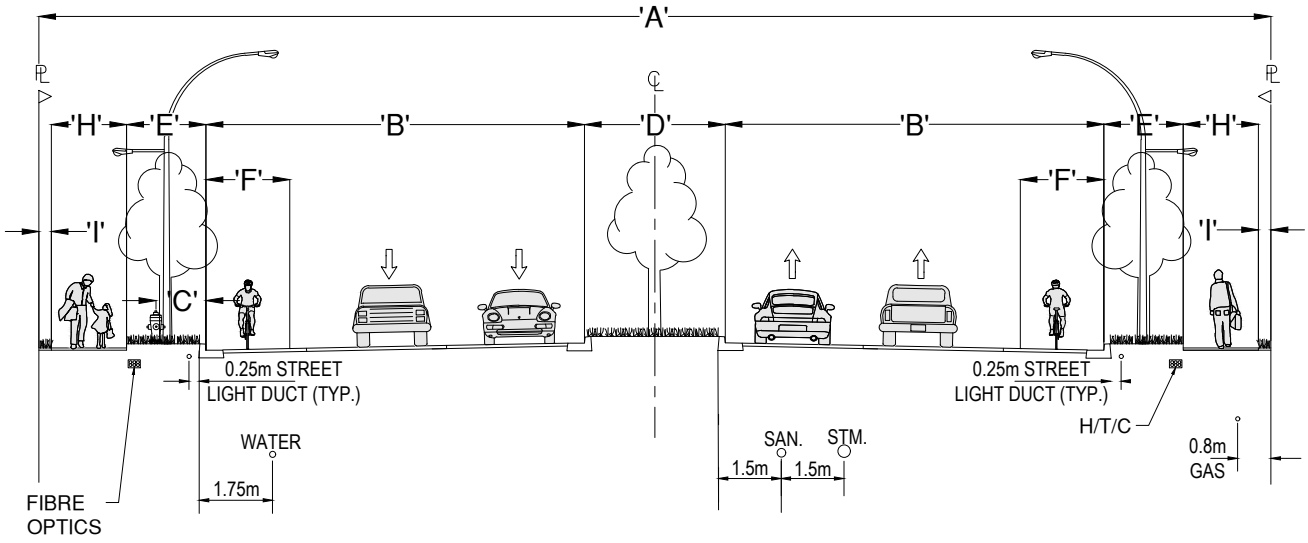

ROW TYPES	ROAD ALLOWANCE	PAVEMENT	OFFSET FROM CURB	MEDIAN / TURNING LANE	BOULEVARD	BIKE LANE (WITHIN 'B')	SIDEWALK	BOW TO PL	LANE CONFIGURATION
	'A'	'B'	'C'	'D'	'E'	'F'	'H'	'I'	WITHIN 'B'
URBAN ARTERIAL DIVIDED	27.0	8.25	1.0	3.6	1.65	1.8	1.8	-	(5.15m - 3.1m)x2 1.8m BIKE LANE 3.35m TRAVEL LANE 3.1m TRAVEL LANE

NOTES:

1. ALL CURBS ARE TO BE BARRIER CURBS AND BIKE FRIENDLY WHERE APPLICABLE (REFER TO CS-D-19) .
2. ALL RIGHT-OF-WAYS ARE SUBJECT TO THE APPROVAL OF THE ENGINEER.
3. PROTECTED BICYCLE FACILITY: VERTICAL SEPARATION OR ADDITIONAL ROW MAY BE REQUIRED AT THE DISCRETION OF THE ENGINEER.
4. LOCATION OF SHALLOW UTILITIES SHALL BE CONFIRMED BY THE ENGINEER.

URBAN HIGHWAY DESIGN FEATURES, ARTERIAL ROADS, DIVIDED

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DRAWN: 2020 03 02
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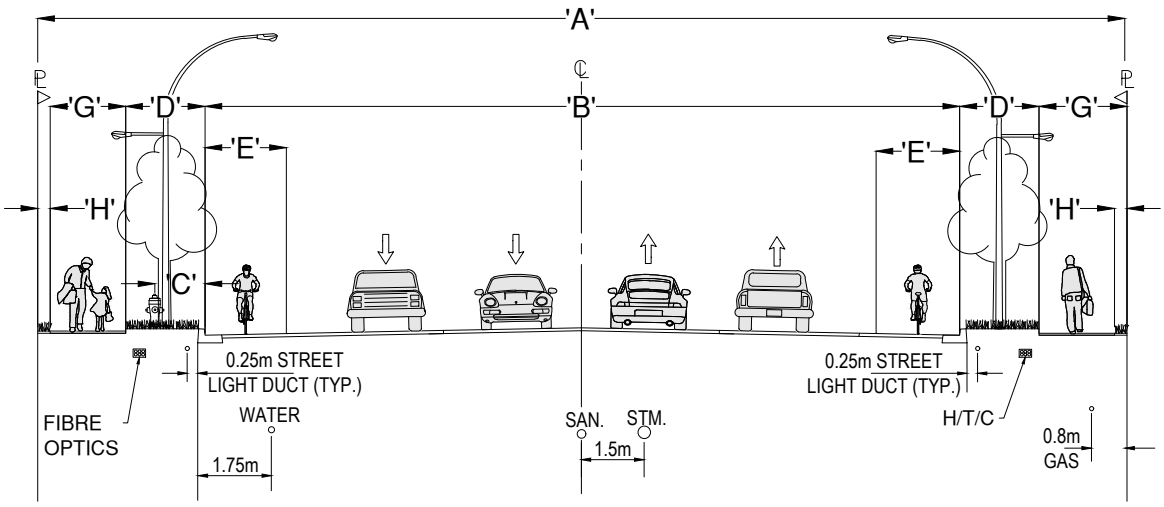

ROW TYPES	ROAD ALLOWANCE	PAVEMENT	OFFSET FROM CURB	BOULEVARD	BIKE LANE (WITHIN 'B')	SIDEWALK	BOW TO PL	LANE CONFIGURATION
	'A'	'B'	'C'	'D'	'E'	'G'	'H'	WITHIN 'B'
URBAN ARTERIAL UNDIVIDED	24.5	17.0	1.0	1.65	2.0	1.8	0.3	(5.4m - 3.1m)x2 2.0m BIKE LANE 3.4m TRAVEL LANE 3.1m TRAVEL LANE

NOTES:

1. ALL CURBS ARE TO BE BARRIER CURB AND BIKE FRIENDLY WHERE APPLICABLE (REFER TO CS-D-19) .
2. ALL RIGHT-OF-WAYS ARE SUBJECT TO THE APPROVAL OF THE ENGINEER.
3. PROTECTED BICYCLE FACILITY: VERTICAL SEPARATION OR ADDITIONAL ROW MAY BE REQUIRED AT THE DISCRETION OF THE ENGINEER.
4. LOCATION OF SHALLOW UTILITIES SHALL BE CONFIRMED BY THE ENGINEER.

URBAN HIGHWAY DESIGN FEATURES, ARTERIAL ROADS, UNDIVIDED

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DRAWN: 2020 03 02
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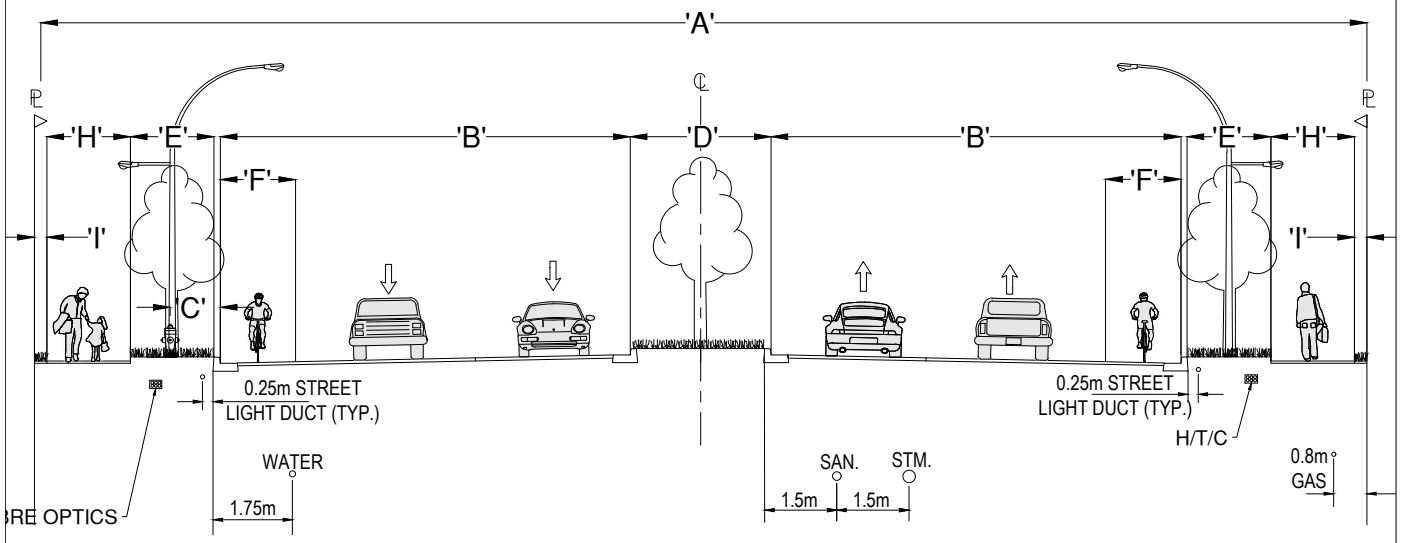

ROW TYPES	ROAD ALLOWANCE	PAVEMENT	OFFSET FROM CURB	MEDIAN/ TURNING LANE	BOULEVARD	BIKE LANE (WITHIN 'B')	SIDEWALK	BOW TO PL	LANE CONFIGURATION
	'A'	'B'	'C'	'D'	'E'	'F'	'H'	'I'	WITHIN 'B'
URBAN COLLECTOR DIVIDED	27.0	8.1	1.0	3.3	1.65	1.8	1.8	0.3	(5.1m - 3.0m)x2 1.8m BIKE LANE 3.3m TRAVEL LANE 3.0m TRAVEL LANE

NOTES:

1. ALL CURBS ARE TO BE BARRIER CURB AND BIKE FRIENDLY WHERE APPLICABLE (REFER TO CS-D-19) .
2. ALL RIGHT-OF-WAYS ARE SUBJECT TO THE APPROVAL OF THE ENGINEER.
3. PROTECTED BICYCLE FACILITY: VERTICAL SEPARATION OR ADDITIONAL ROW MAY BE REQUIRED AT THE DISCRETION OF THE ENGINEER.
4. LOCATION OF SHALLOW UTILITIES SHALL BE CONFIRMED BY THE ENGINEER.
5. ALLOCATIONS FOR PARKING MAY BE REQUIRED AT THE DISCRETION OF THE ENGINEER.

URBAN HIGHWAY DESIGN FEATURES, COLLECTOR ROADS, DIVIDED

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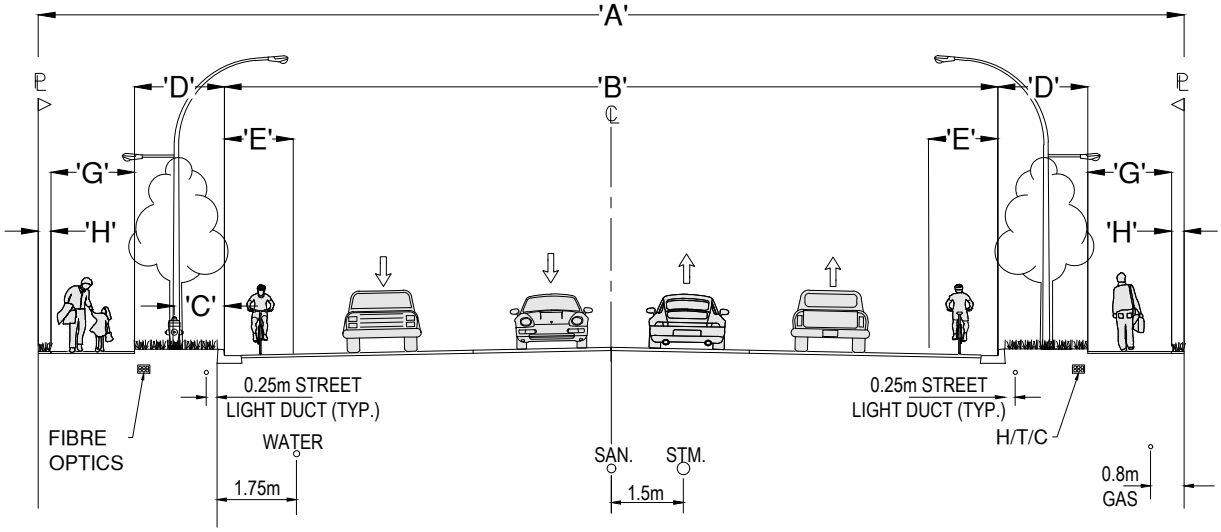

ROW TYPES	ROAD ALLOWANCE	PAVEMENT	OFFSET FROM CURB	BOULEVARD	BIKE LANE (WITHIN 'B')	SIDEWALK	BOW TO PL	LANE CONFIGURATION
	'A'	'B'	'C'	'D'	'E'	'G'	'H'	WITHIN 'B'
URBAN COLLECTOR UNDIVIDED	24.5	16.7	1.0	1.8	1.8	1.8	0.3	(5.25m - 3.1m)x2

NOTES:

1. ALL CURBS ARE TO BE BARRIER CURB AND BIKE FRIENDLY WHERE APPLICABLE (REFER TO CS-D-19) .
2. ALL RIGHT-OF-WAYS ARE SUBJECT TO THE APPROVAL OF THE ENGINEER.
3. PROTECTED BICYCLE FACILITY: VERTICAL SEPARATION OR ADDITIONAL ROW MAY BE REQUIRED AT THE DISCRETION OF THE ENGINEER.
4. LOCATION OF SHALLOW UTILITIES SHALL BE CONFIRMED BY THE ENGINEER.
5. ALLOCATIONS FOR PARKING MAY BE REQUIRED AT THE DISCRETION OF THE ENGINEER.

URBAN HIGHWAY DESIGN FEATURES, COLLECTOR ROADS, UNDIVIDED

ABBOTSFORD

DRAWN: 2020 03 02
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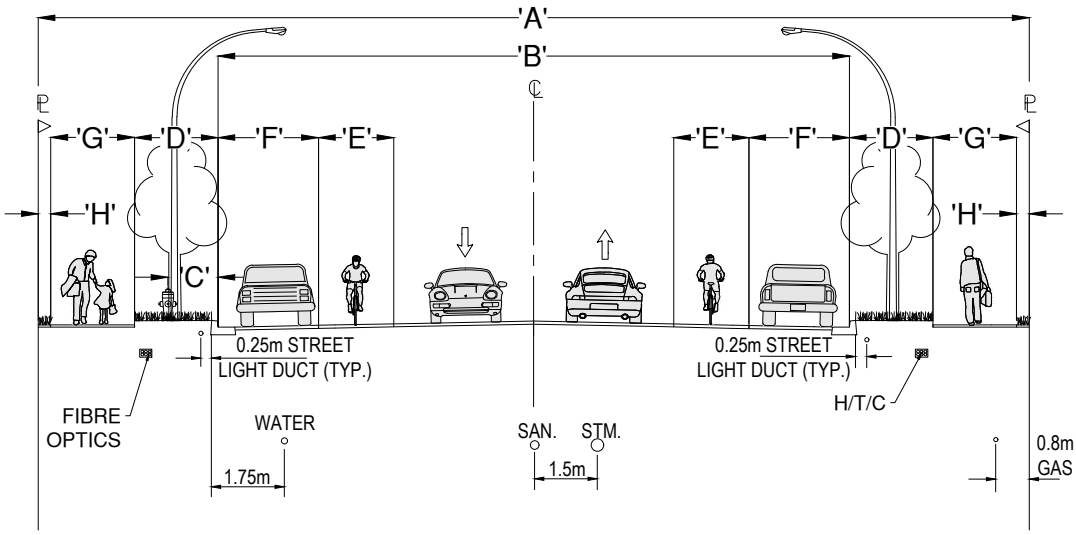

ROW TYPES	ROAD ALLOWANCE	PAVEMENT	OFFSET FROM CURB	BOULEVARD	BIKE LANE	PARKING LANE	SIDEWALK	BOW TO PL
	'A'	'B'	'C'	'D'	'E'	'F'	'G'	'H'
INDUSTRIAL LOCAL	20.0	11.4	1.0	1.65	-	2.4	1 - 1.8 ; 1 - 3.0	0.25
MULTI-FAMILY LOCAL	20.0	12.8	1.0	1.65	1.8	2.2	1.8	0.15
SINGLE-FAMILY LOCAL	17.0	8.8	1.0	2.0	-	2.2	1.8	0.3
SINGLE-FAMILY SINGLE LOADED LOCAL	13.5	8.5	1.0	2.0	2.1	2.4 ON ONE SIDE ONLY	2.0	1.0

NOTES:

1. ALL CURBS ARE TO BE BARRIER CURBS AND BIKE FRIENDLY WHERE APPLICABLE (REFER TO CS-D-19) .
2. ALL RIGHT-OF-WAYS ARE SUBJECT TO THE APPROVAL OF THE ENGINEER.
3. OUTSIDE TRAVEL LANES MAY BE ADJUSTED TO 3.4m TO ACCOMODATE FOR TRANSIT IN TRANSIT CORRIDORS.
4. INDUSTRIAL LOCAL ROADS TO INCLUDE A 1.8m SEPARATE SIDEWALK ON ONE SIDE OF THE ROAD AND A 3.0m MULTI-USE PATH ON THE OPPOSITE SIDE FOR PEDESTRIAN AND CYCLIST CONNECTIVITY.
5. SINGLE FAMILY SINGLE-LOADED LOCAL IS INTENDED FOR DEVELOPMENT THAT IS ONLY ADJACENT ON ONE SIDE OF THE ROAD. EACH ELEMENT LISTED IN THE TABLE SHOULD ONLY BE COUNTED ONCE.
6. CYCLISTS TO SHARE ROAD WITH VEHICLES ON SINGLE-FAMILY LOCAL ROADS.
7. LOCATION OF SHALLOW UTILITIES SHALL BE CONFIRMED BY THE ENGINEER.
8. IF THE PROPOSED ROAD WAS IDENTIFIED AS REQUIRING AAA FACILITIES, ADDITIONAL RIGHT-OF-WAY OR DEDICATION MAY BE REQUIRED.

URBAN HIGHWAY DESIGN FEATURES, LOCAL ROADS

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APPROVED BY:

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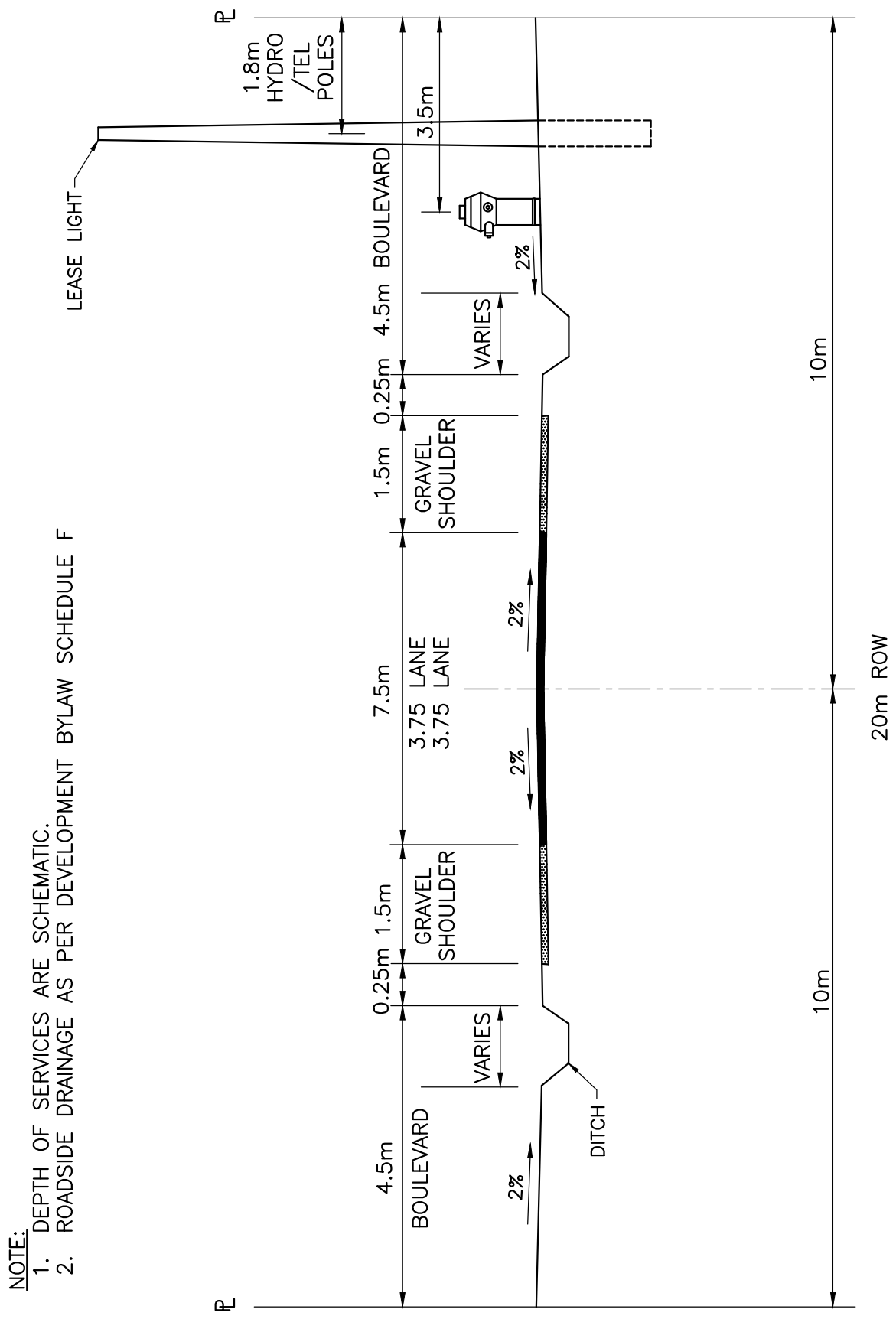

NOTE:
1. DEPTH OF SERVICES ARE SCHEMATIC.
2. ROADSIDE DRAINAGE AS PER DEVELOPMENT BYLAW SCHEDULE F

RURAL LOCAL
2 LANE

ABBOTSFORD

DRAWN:	1995 01 30
REVISED:	2021 09 09
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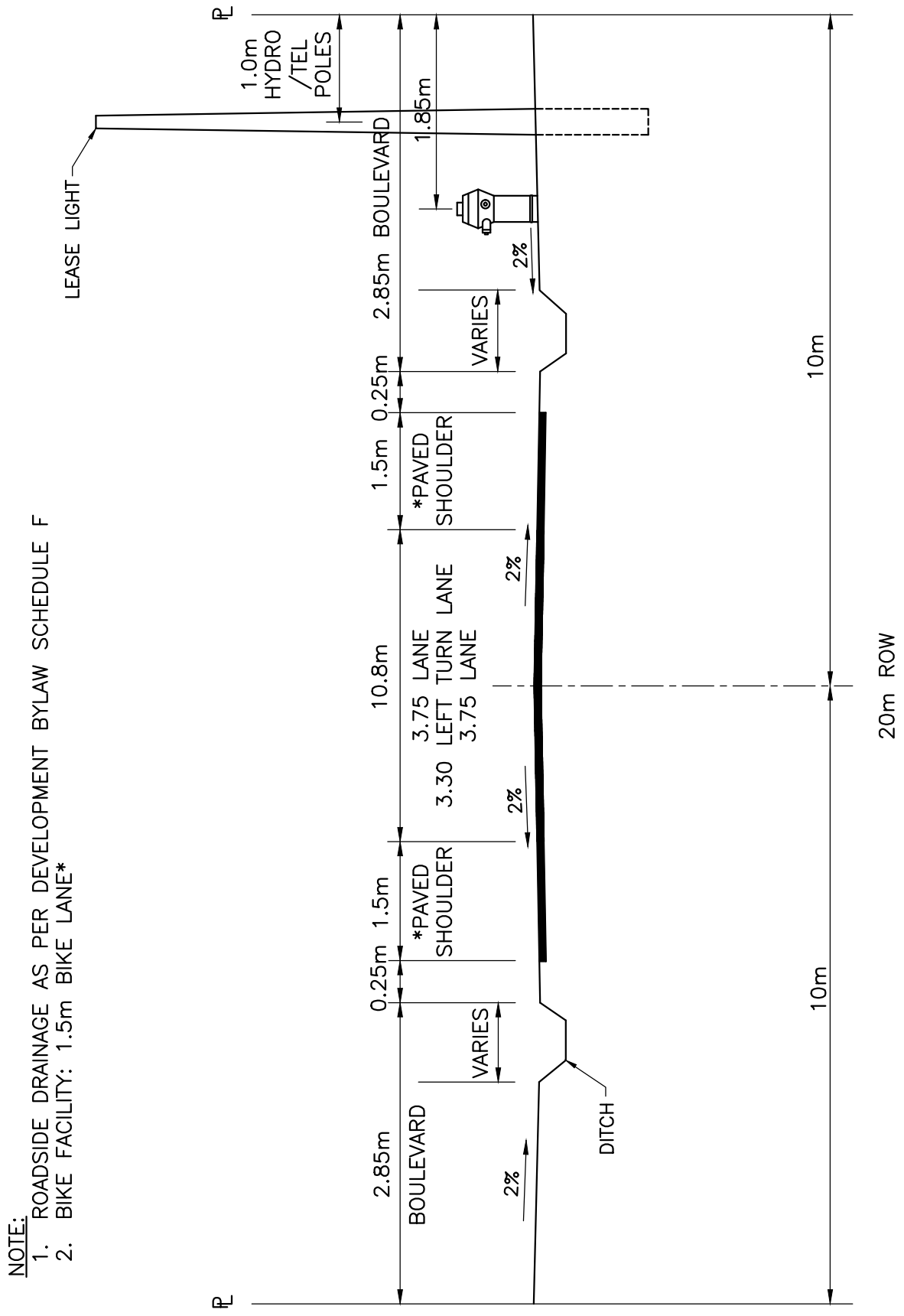

NOTE:
1. ROADSIDE DRAINAGE AS PER DEVELOPMENT BYLAW SCHEDULE F
2. BIKE FACILITY: 1.5m BIKE LANE*

RURAL COLLECTOR
2 LANE WITH LEFT TURN LANE

ABBOTSFORD

DRAWN:	1995 01 30
REVISED:	2021 09 09
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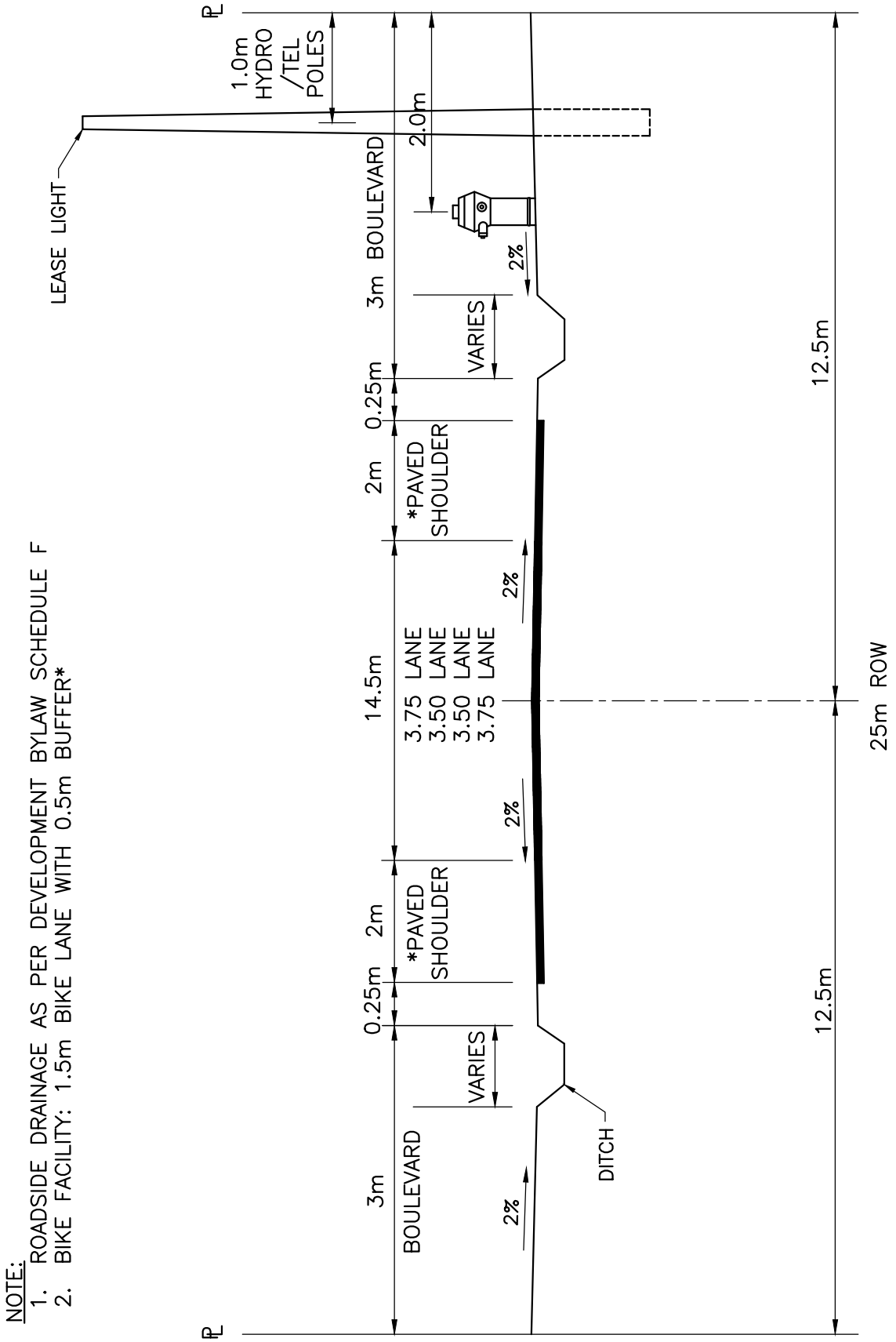

NOTE:
1. ROADSIDE DRAINAGE AS PER DEVELOPMENT BYLAW SCHEDULE F
2. BIKE FACILITY: 1.5m BIKE LANE WITH 0.5m BUFFER*

RURAL COLLECTOR
4 LANE

ABBOTSFORD

DRAWN:	1995 01 30
REVISED:	2021 09 09
APPROVED BY:	

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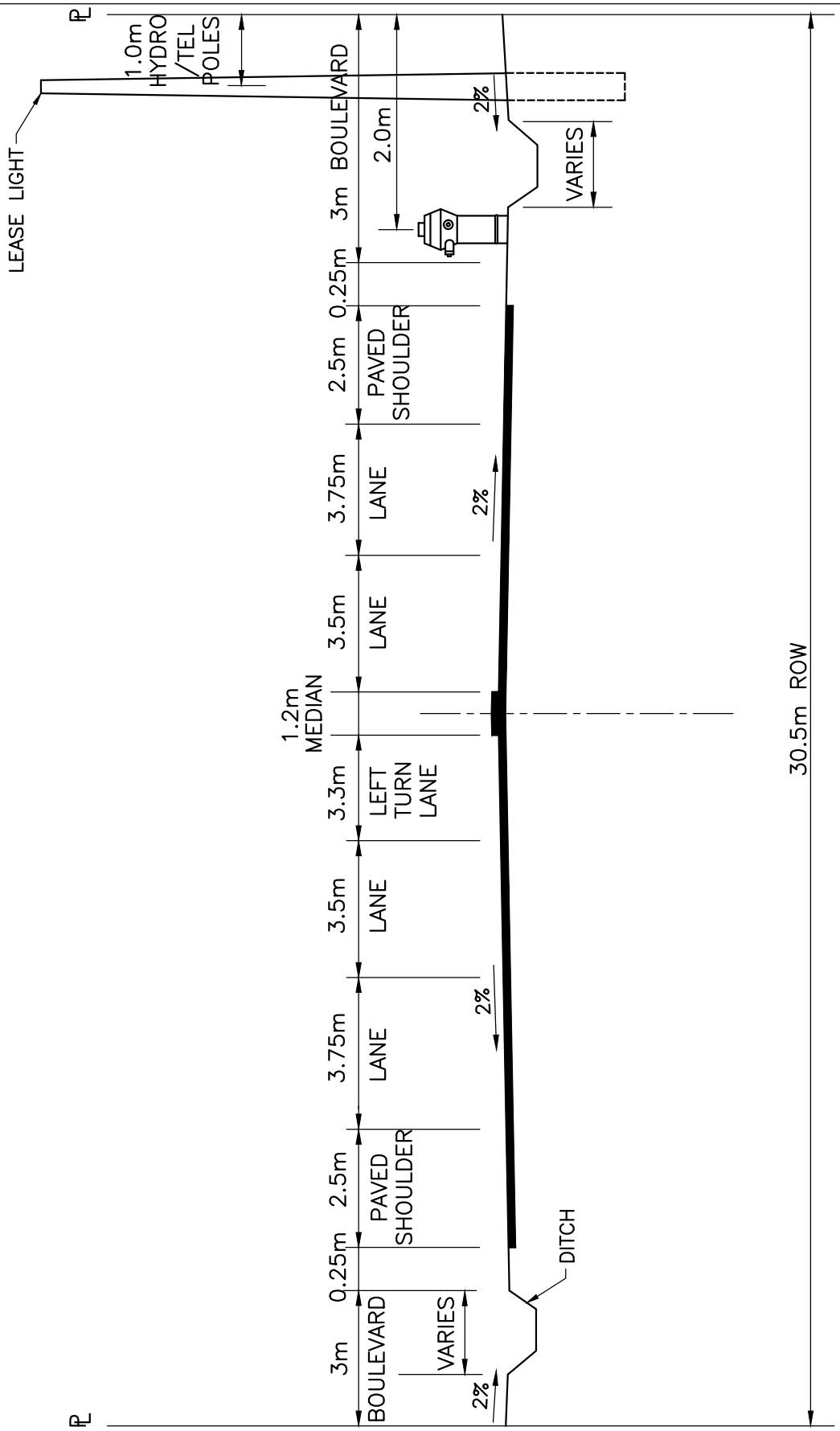

NOTE:
1. ROADSIDE DRAINAGE AS PER DEVELOPMENT BYLAW SCHEDULE F

RURAL REGIONAL ROAD (FRASER HWY)

ABBOTSFORD

DRAWN:	1995 01 30
REVISED:	2021 09 09
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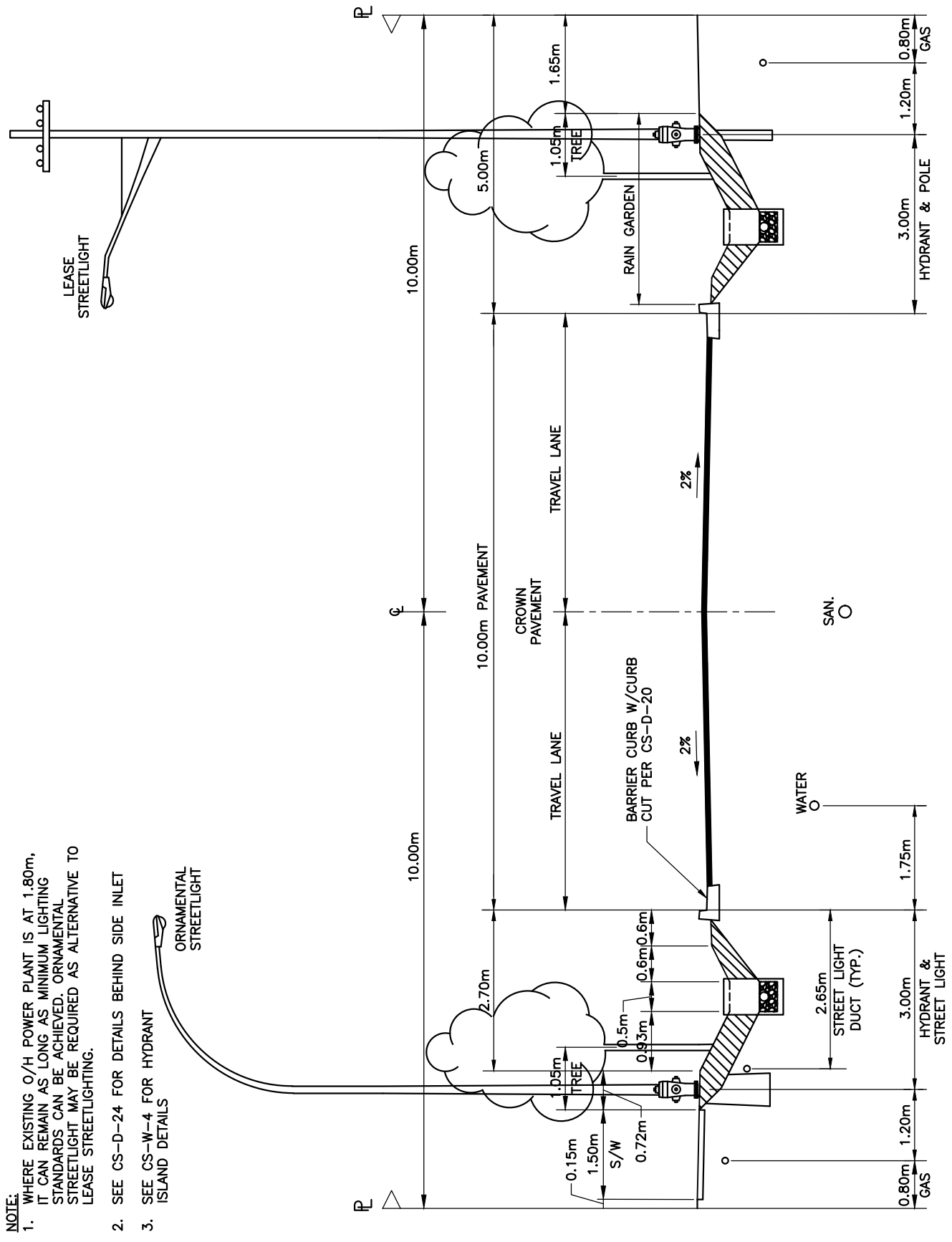

NOTE:
1. WHERE EXISTING O/H POWER PLANT IS AT 1.80m, IT CAN REMAIN AS LONG AS MINIMUM LIGHTING STANDARDS CAN BE ACHIEVED. ORNAMENTAL STREETLIGHT MAY BE REQUIRED AS ALTERNATIVE TO LEASE STREETLIGHTING.
2. SEE CS-D-24 FOR DETAILS BEHIND SIDE INLET
3. SEE CS-W-4 FOR HYDRANT ISLAND DETAILS

CITY IN THE COUNTRY PLAN LANDS
CICP INDUSTRIAL ROAD
CROSS SECTION
(APPLICABLE TO INFILTRATION RATE GREATER THAN 50 mm/hr)

ABBOTSFORD

DRAWN:	2011 04 18
REVISED:	2021 09 09
APPROVED BY:	

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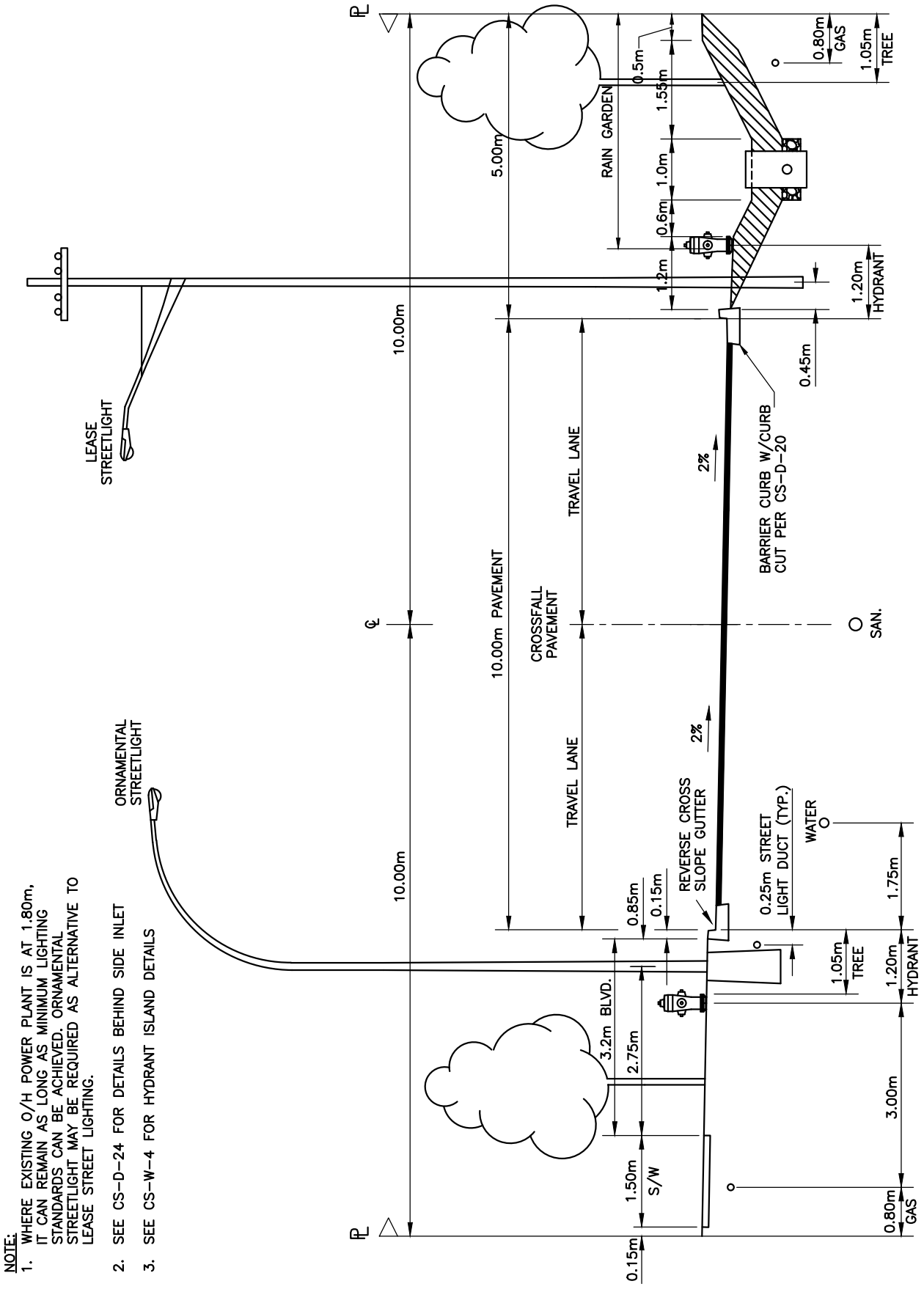


CITY IN THE COUNTRY PLAN LANDS CICP INDUSTRIAL ROAD CROSS SECTION CONSTANT CROSS-SLOPE, SWALE ON ONE SIDE

(APPLICABLE TO INFILTRATION RATE GREATER THAN 50 mm/hr)

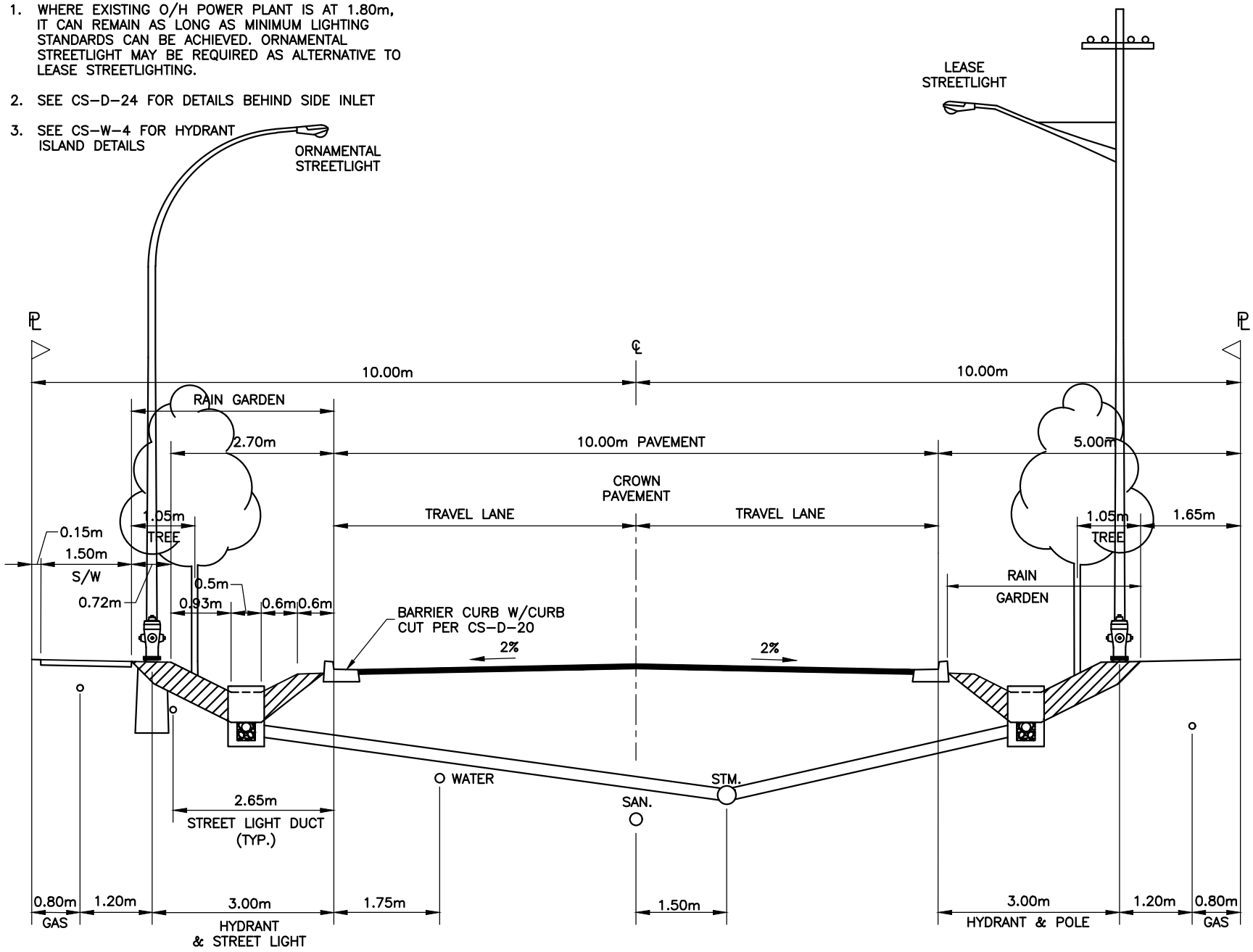
ABBOTSFORD

DRAWN:	2011 04 18
REVISED:	2021 09 09
APPROVED BY:	

ES - R - 18

CITY IN THE COUNTRY PLAN LANDS
CICP INDUSTRIAL ROAD
CROSS SECTION
(APPLICABLE TO INFILTRATION RATE LESS THAN 50 mm/hr)

NOTE:
1. WHERE EXISTING O/H POWER PLANT IS AT 1.80m, IT CAN REMAIN AS LONG AS MINIMUM LIGHTING STANDARDS CAN BE ACHIEVED. ORNAMENTAL STREETLIGHT MAY BE REQUIRED AS ALTERNATIVE TO LEASE STREETLIGHTING.
2. SEE CS-D-24 FOR DETAILS BEHIND SIDE INLET
3. SEE CS-W-4 FOR HYDRANT ISLAND DETAILS



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DRAWN:	2011 04 18
REVISED:	2021 09 09
APPROVED BY:	

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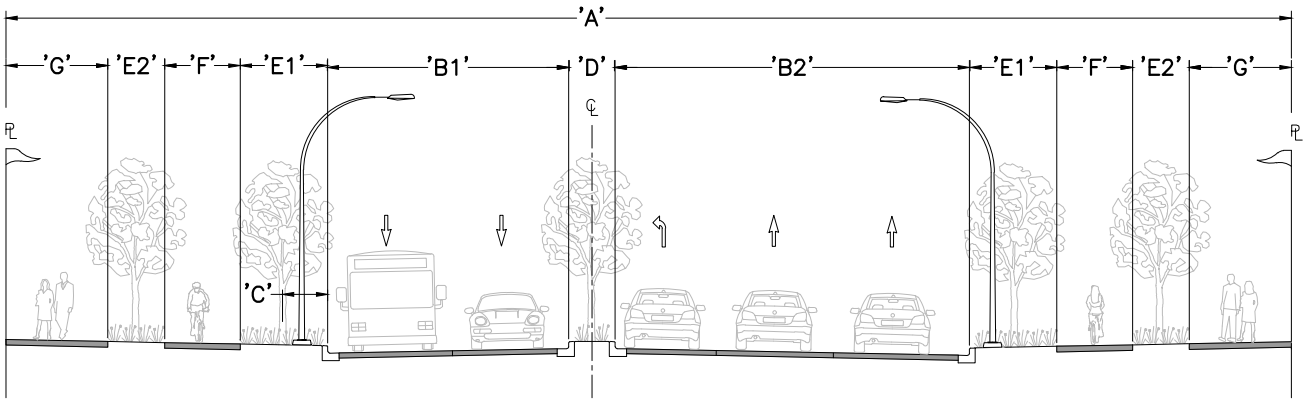

ROW TYPES	ROAD ALLOWANCE	PAVEMENT 1	PAVEMENT 2	OFFSET FROM CURB	MEDIAN/ LEFT TURN LANE	BOULEVARD 1	BOULEVARD 2	BIKE PATH	SIDEWALK	LANE CONFIGURATION
	'A'	'B1'	'B2'	'C'	'D'	'E1'	'E2'	'F'	'G'	WITHIN 'B1' AND 'B2'
34.0m SIGNATURE CORRIDOR	34.0	6.6	6.6–NO TURN LANE 9.9–WITH TURN LANE	1.2	4.2–NO TURN LANE 0.9 WITH 3.3m TURN LANE	2.1	1.5	2.0	2.7	'B1': 3.5m–3.1m 'B2': 3.5m–3.1m–3.3m (FROM BOULEVARD TO MEDIAN)

NOTES:

- WIDE SIDEWALKS ON BOTH SIDES
- BIKE PATH FRAMED AND BUFFERED BY A DOUBLE ROW OF STREET TREES/FURNISHING ZONE
- TWO VEHICLE TRAVEL LANES IN EACH DIRECTION
- MEDIAN TREE STRIP WITH A LEFT TURN LANE AT INTERSECTIONS
- STREETSCAPE STANDARDS TO INDICATE PUBLIC REALM TREATMENTS

CITY CENTRE NEIGHBOURHOOD PLAN

34m SIGNATURE CORRIDOR CROSS SECTION

ABBOTSFORD

DRAWN: 2020 03 09
REVISED:
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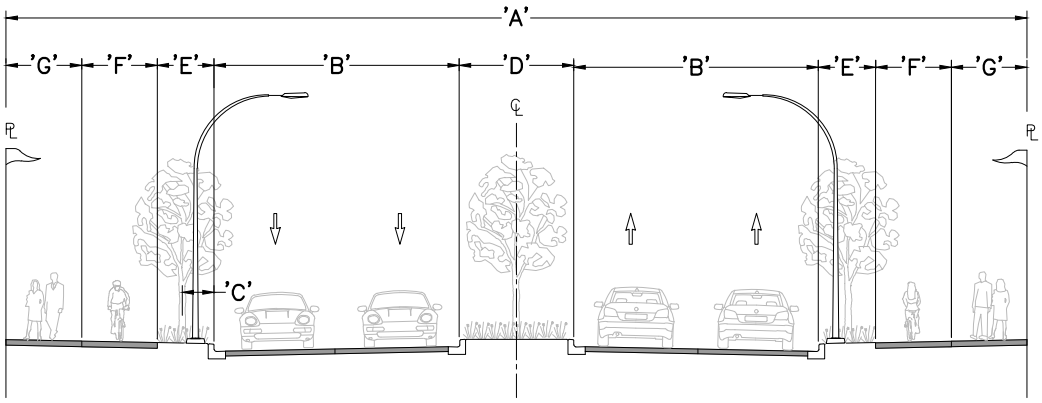
ES - R - 20



ROW TYPES	ROAD ALLOWANCE	PAVEMENT	OFFSET FROM CURB	MEDIAN/ LEFT TURN LANE	BOULEVARD	BIKE PATH	SIDEWALK	LANE CONFIGURATION
	'A'	'B'	'C'	'D'	'E'	'F'	'G'	WITHIN 'B'
27.0m ARTERIAL	27.0	6.6	0.8	3.3	1.65	1.8	1.8	(3.5m–3.1m)x2

NOTES:

- SIDEWALKS AND BIKE PATHS ON BOTH SIDES
- TREE STRIP/FURNISHING ZONES ON BOTH SIDES
- TWO VEHICLE TRAVEL LANES IN EACH DIRECTION
- MEDIAN TREE STRIP WITH A LEFT TURN LANE AT MAJOR INTERSECTIONS
- STREETSCAPE STANDARDS TO INDICATE PUBLIC REALM TREATMENTS

CITY CENTRE NEIGHBOURHOOD PLAN

27m ARTERIAL STREET CROSS SECTION

ABBOTSFORD

DRAWN: 2020 03 09

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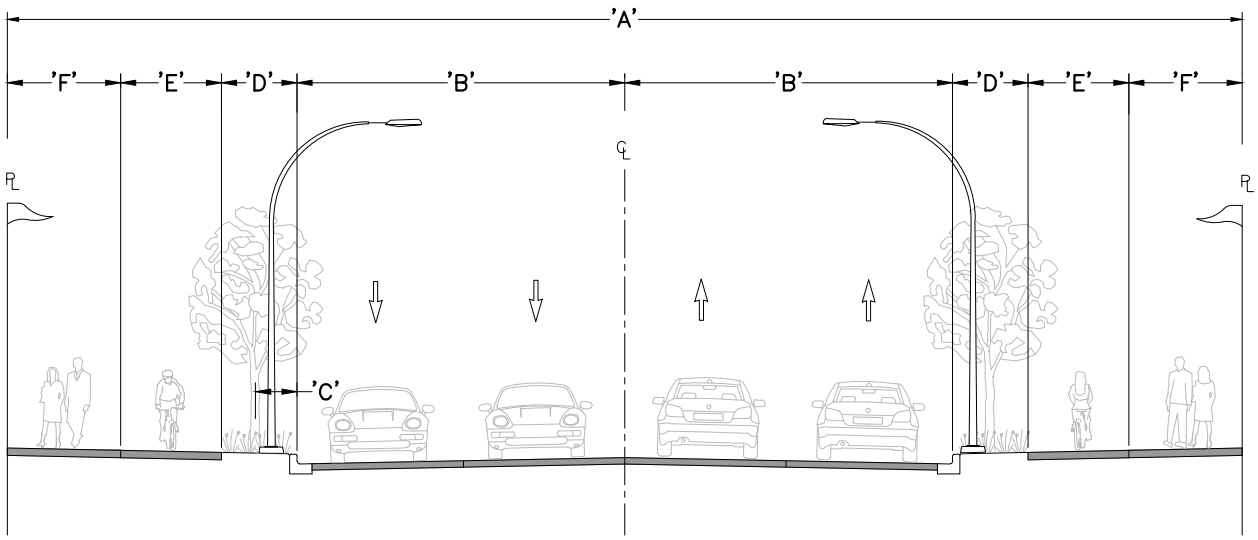

ROW TYPES	ROAD ALLOWANCE	PAVEMENT	OFFSET FROM CURB	BOULEVARD	BIKE PATH	SIDEWALK	LANE CONFIGURATION
	'A'	'B'	'C'	'D'	'E'	'F'	WITHIN 'B'
24.5m MAJOR COLLECTOR	24.5	6.6	0.8	1.65	2.0	2.0	(3.5m–3.1m)x2

NOTES:

- SIDEWALKS AND BIKE PATHS ON BOTH SIDES
- TREE STRIP/FURNISHING ZONES ON BOTH SIDES
- TWO VEHICLE TRAVEL LANES IN EACH DIRECTION
- STREETSCAPE STANDARDS TO INDICATE PUBLIC REALM TREATMENTS

CITY CENTRE NEIGHBOURHOOD PLAN

24.5m MAJOR COLLECTOR CROSS SECTION

ABBOTSFORD

DRAWN: 2020 03 09

REVISED:

APPROVED BY:

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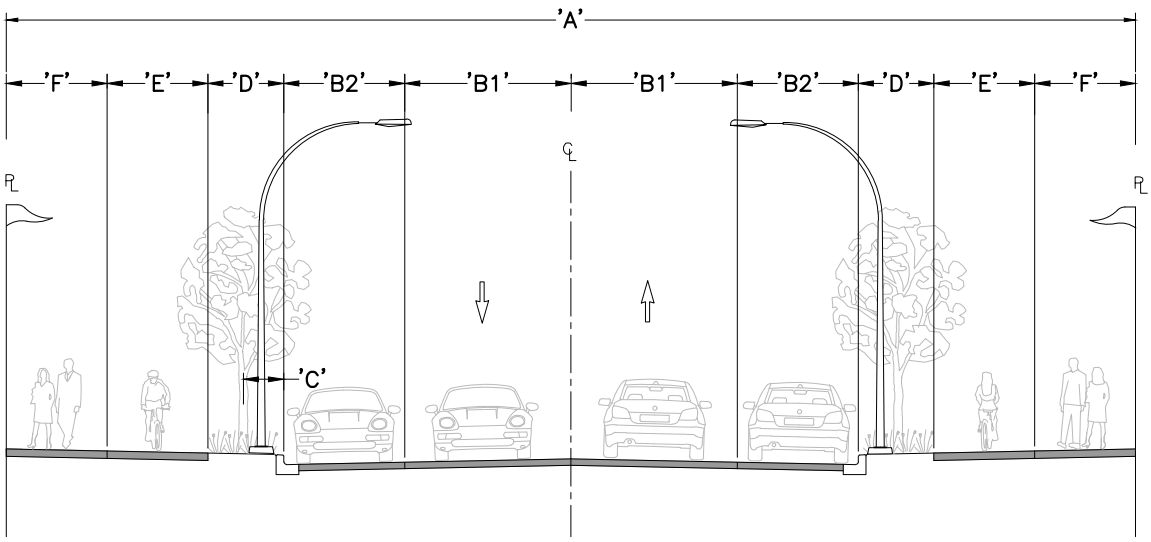

ROW TYPES	ROAD ALLOWANCE	PAVEMENT– VEHICLE LANE	PAVEMENT– PARKING LANE	OFFSET FROM CURB	BOULEVARD	BIKE PATH	SIDEWALK
	'A'	'B1'	'B2'	'C'	'D'	'E'	'F'
22.5m MINOR COLLECTOR	22.5	3.4	2.4	0.8	1.65	1.8	2.0

NOTES:

- SIDEWALKS AND BIKE PATHS ON BOTH SIDES
- TREE STRIP/FURNISHING ZONES ON BOTH SIDES
- PARKING LANES ON BOTH SIDES
- ONE VEHICLE TRAVEL LANE IN EACH DIRECTION
- STREETSCAPE STANDARDS TO INDICATE PUBLIC REALM TREATMENTS

CITY CENTRE NEIGHBOURHOOD PLAN

22.5m MINOR COLLECTOR CROSS SECTION

ABBOTSFORD

DRAWN: 2020 03 09

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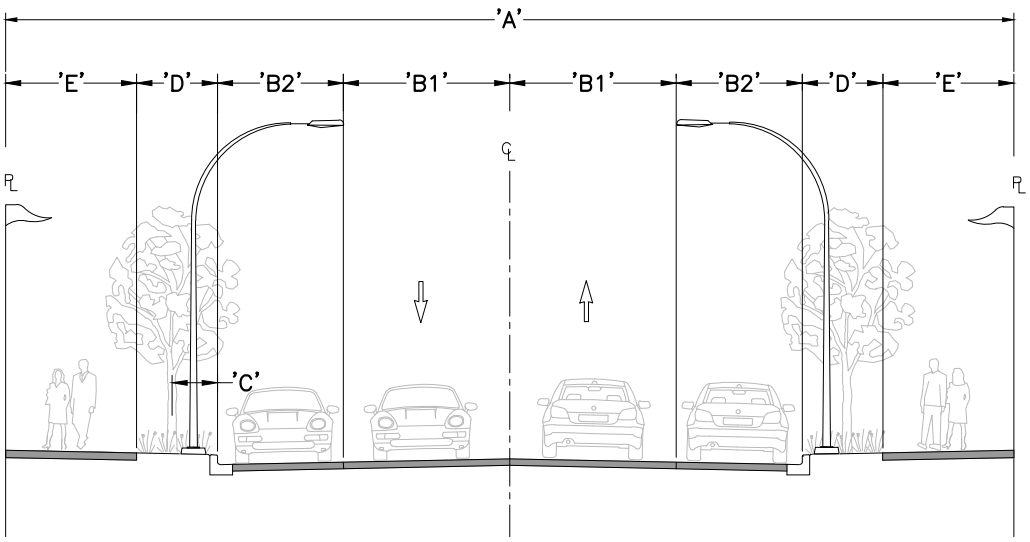

ROW TYPES	ROAD ALLOWANCE	PAVEMENT– VEHICLE LANE	PAVEMENT– PARKING LANE	OFFSET FROM CURB	BOULEVARD	SIDEWALK
	'A'	'B1'	'B2'	'C'	'D'	'E'
20.0m LOCAL STREET	20.0	3.3	2.4	0.9	1.8	2.4

NOTES:

- WIDE SIDEWALKS ON BOTH SIDES
- TREE STRIP/FURNISHING ZONES ON BOTH SIDES
- PARALLEL PARKING LANES ON BOTH SIDES
- ONE VEHICLE TRAVEL LANE IN EACH DIRECTION
- STREETSCAPE STANDARDS TO INDICATE PUBLIC REALM TREATMENTS
- BOULEVARD SHALL BE HARDSCAPED WHEN CONSTRUCTED AS A "COMMERCIAL" STREET PER OCP

CITY CENTRE NEIGHBOURHOOD PLAN

20m LOCAL STREET CROSS SECTION

ABBOTSFORD

DRAWN: 2020 03 09
REVISED:
APPROVED BY:

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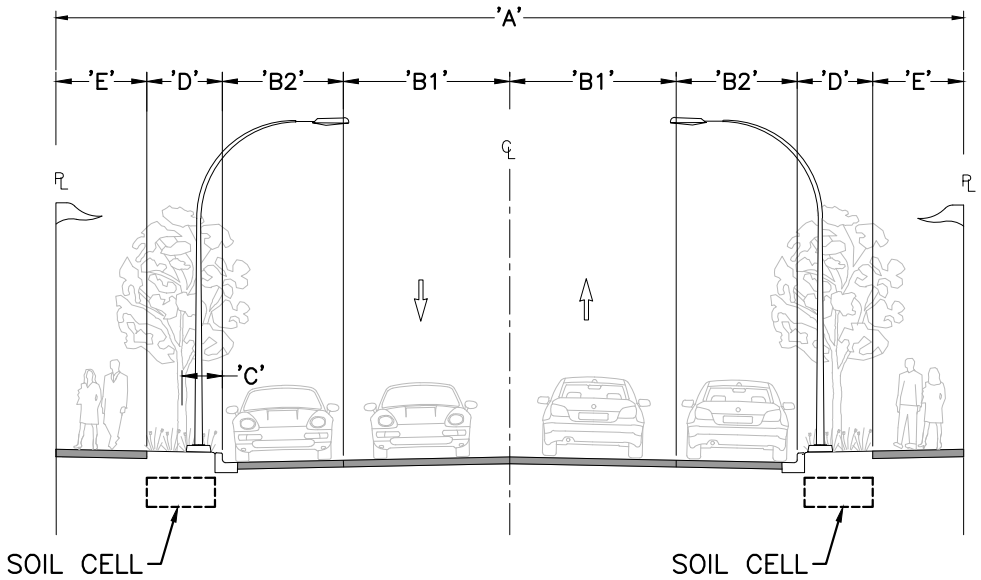

ROW TYPES	ROAD ALLOWANCE	PAVEMENT– VEHICLE LANE	PAVEMENT– PARKING LANE	OFFSET FROM CURB	BOULEVARD	SIDEWALK
	'A'	'B1'	'B2'	'C'	'D'	'E'
MONTROSE AVE (CLAYBURN SITE)	18.0	3.3	2.4	0.8	1.5	1.8

NOTES:

- FROM McCALLUM ROAD TO PINE STREET
- SIDEWALKS AND TREE STRIPS ON BOTH SIDES
- PARALLEL PARKING LANES ON BOTH SIDES
- ONE TRAVEL LANE IN EACH DIRECTION
- STREETSCAPE STANDARDS TO INDICATE PUBLIC REALM TREATMENTS

HISTORIC DOWNTOWN NEIGHBOURHOOD PLAN

MONTROSE AVENUE (CLAYBURN SITE) CROSS SECTION

ABBOTSFORD

DRAWN: 2020 03 09
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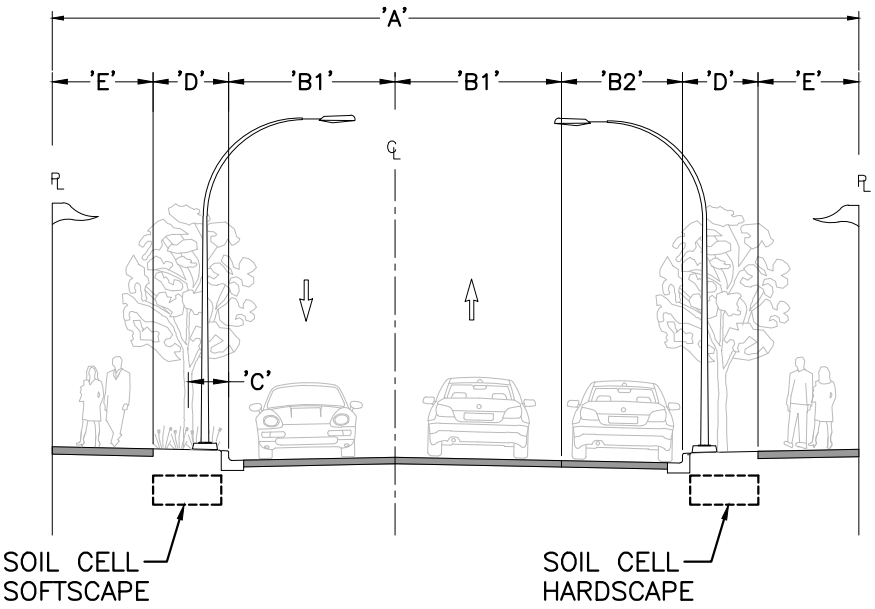


ROW TYPES	ROAD ALLOWANCE	PAVEMENT– VEHICLE LANE	PAVEMENT– PARKING LANE	OFFSET FROM CURB	BOULEVARD	SIDEWALK
	'A'	'B1'	'B2'	'C'	'D'	'E'
MONTROSE AVENUE (TRANSITION)	16.0	3.3	2.4	0.8	1.5	2.0

NOTES:

- ONE BLOCK FROM PINE STREET TO GEORGE FERGUSON WAY
- SIDEWALKS AND TREE STRIPS ON BOTH SIDES
- PARALLEL PARKING LANE ON EAST SIDE
- ONE VEHICLE TRAVEL LANE IN EACH DIRECTION
- STREETSCAPE STANDARDS TO INDICATE PUBLIC REALM TREATMENTS

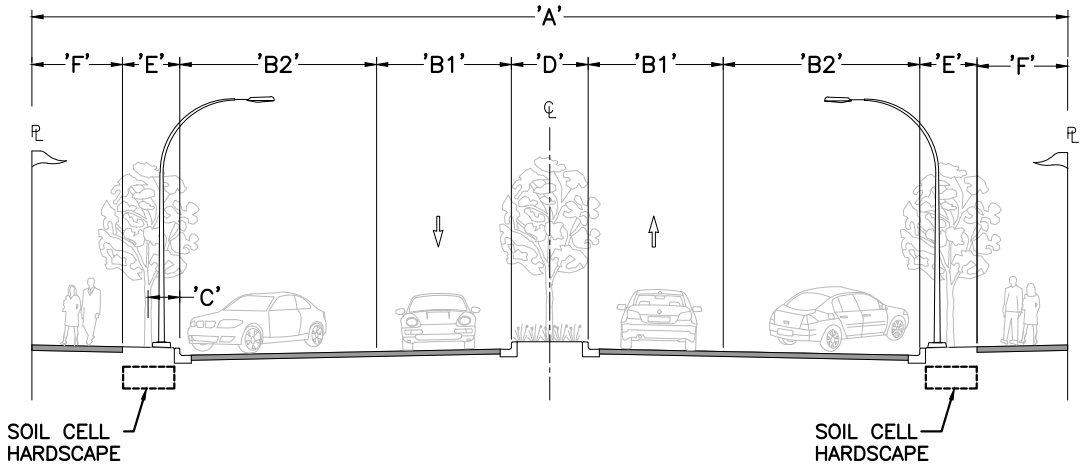
HISTORIC DOWNTOWN NEIGHBOURHOOD PLAN

MONTROSE AVENUE (TRANSITION) CROSS SECTION

ABBOTSFORD

DRAWN: 2020 03 09
REVISED:
APPROVED BY:

ES - R - 26



ROW TYPES	ROAD ALLOWANCE	PAVEMENT– VEHICLE LANE	PAVEMENT– ANGLED PARKING	OFFSET FROM CURB	MEDIAN	BOULEVARD	SIDEWALK
	'A'	'B1'	'B2'	'C'	'D'	'E'	'F'
MONTROSE AVENUE (RETAIL)	27.4	3.6	5.2	0.8	2.0	1.5	2.4

NOTES:

- TWO BLOCKS FROM GEORGE FERGUSON WAY TO SOUTH FRASER WAY
- SIDEWALKS AND TREE STRIPS ON BOTH SIDES
- ANGLED PARKINGS ON BOTH SIDES
- ONE TRAVEL LANE IN EACH DIRECTION WITH ADDED LEFT TURN BAY AT INTERSECTIONS
- CENTRAL BOULEVARD WITH TREES (WITHOUT BARRIER FENCING)
- STREETSCAPE STANDARDS TO INDICATE PUBLIC REALM TREATMENTS

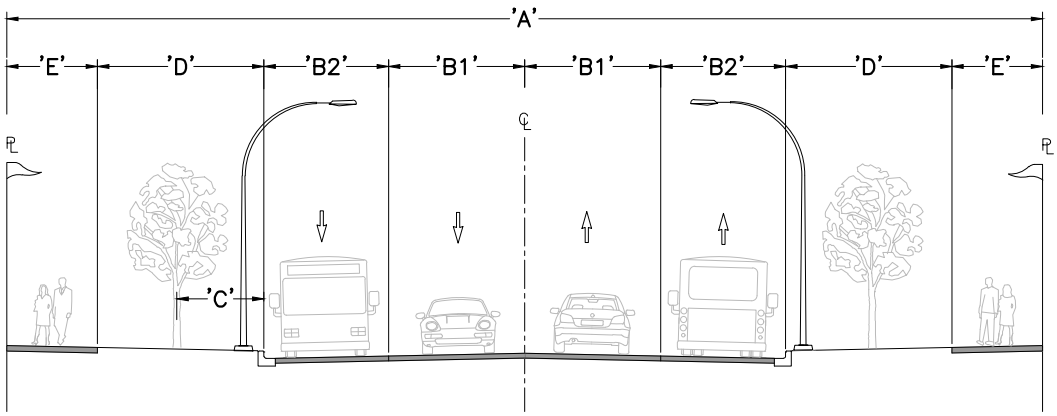
HISTORIC DOWNTOWN NEIGHBOURHOOD PLAN

MONTROSE AVENUE (RETAIL) CROSS SECTION

ABBOTSFORD

DRAWN: 2020 03 09
REVISED:
APPROVED BY:

ES - R - 27



ROW TYPES	ROAD ALLOWANCE	PAVEMENT– VEHICLE LANE	PAVEMENT– TRANSIT LANE	OFFSET FROM CURB	BOULEVARD	SIDEWALK
	'A'	'B1'	'B2'	'C'	'D'	'E'
MONTROSE AVENUE (TRANSIT)	27.4	3.6	3.3	2.3	4.4	2.4

NOTES:

- TWO BLOCKS FROM SOUTH FRASER WAY TO McDOUGALL AVENUE
- SIDEWALKS, TREE STRIPS, AND TRANSIT SHELTERS ON BOTH SIDES
- ONE BUS LANE IN EACH DIRECTION (SAWTOOTH OR STRAIGHT CURB)
- ONE VEHICLE TRAVEL LANE IN EACH DIRECTION
- STREETSCAPE STANDARDS TO INDICATE PUBLIC REALM TREATMENTS

HISTORIC DOWNTOWN NEIGHBOURHOOD PLAN

MONTROSE AVENUE (TRANSIT) CROSS SECTION

ABBOTSFORD

DRAWN: 2020 03 09
REVISED:
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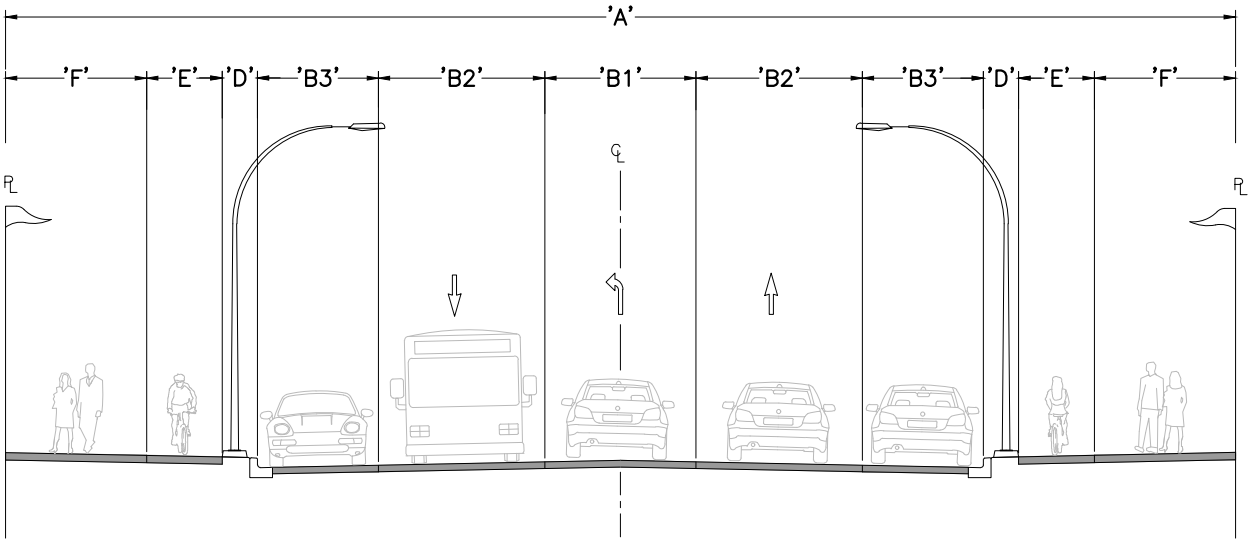

ROW TYPES	ROAD ALLOWANCE	PAVEMENT– SHARED TURN LANE	PAVEMENT– VEHICLE LANE	PAVEMENT– PARKING LANE	BOULEVARD	BIKE PATH	SIDEWALK
	'A'	'B1'	'B2'	'B3'	'D'	'E'	'F'
ESSENDENE AVENUE	24.4	3.0	3.3	2.4	1.1	1.8	2.1

NOTES:

- FROM SOUTH FRASER WAY TO CYRIL STREET
- SIDEWALKS AND BIKE PATH ON BOTH SIDES
- PARALLEL PARKING ON BOTH SIDES (WITH POSSIBLE TREE POCKETS)
- ONE TRAVEL LANE IN EACH DIRECTION
- LEFT TURN LANE AT INTERSECTIONS
- SEPARATION FOR BIKE LANE TO BE ACCOMMODATED WITHIN SIDEWALK
- STREETSCAPE STANDARDS TO INDICATE PUBLIC REALM TREATMENTS

HISTORIC DOWNTOWN NEIGHBOURHOOD PLAN

ESSENDENE AVENUE CROSS SECTION

ABBOTSFORD

DRAWN: 2020 03 09
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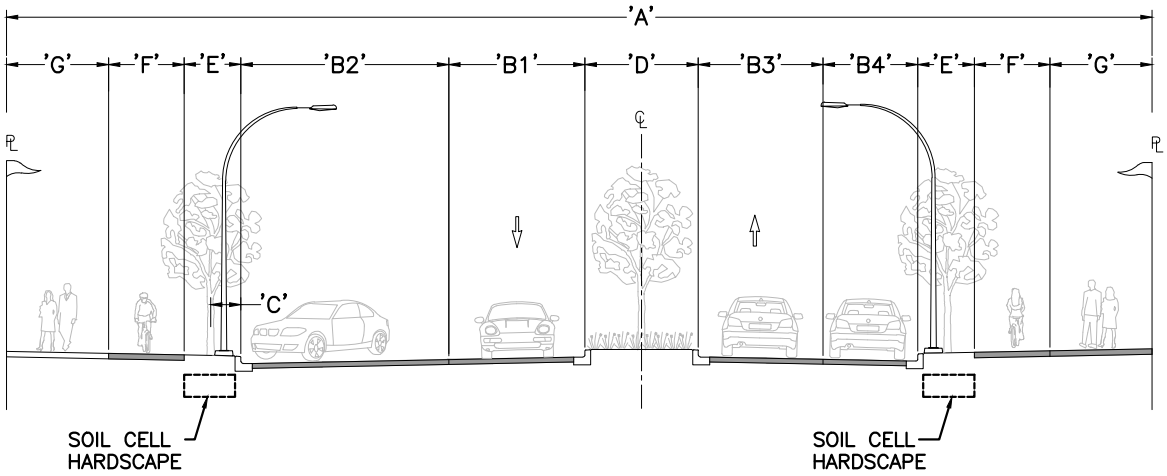

ROW TYPES	ROAD ALLOWANCE	PAVEMENT– VEHICLE LANE	PAVEMENT– ANGLED PARKING	PAVEMENT– VEHICLE LANE	PAVEMENT– PARKING LANE	OFFSET FROM CURB	MEDIAN/ LEFT TURN LANE	BOULEVARD	BIKE PATH	SIDEWALK
	'A'	'B1'	'B2'	'B3'	'B4'	'C'	'D'	'E'	'F'	'G'
SOUTH FRASER WAY	30.3	4.0	5.5	3.3	2.5	0.8	3.0	1.65	1.95	2.4

NOTES:

- FROM McCALLUM ROAD TO McDOUGALL AVENUE
- NORTH SIDE ANGLED PARKING, SOUTH SIDE PARALLEL PARKING
- ONE TRAVEL LANE IN EACH DIRECTION
- LEFT TURN LANE AT INTERSECTIONS (WITH CENTRAL BOULEVARD AND TREES BETWEEN INTERSECTIONS)
- FROM WEST OF MONTROSE AVENUE, SIDEWALK/BIKE LANE/ BOULEVARD ELEMENTS REDUCED IN WIDTH TO ACCOMMODATE CROSS SECTION WITHIN A 27.3m ROW
- PROTECTED BIKE LANE 0.15m SEPARATION INCLUSIVE FROM SIDEWALK
- STREETSCAPE STANDARDS TO INDICATE PUBLIC REALM TREATMENTS

HISTORIC DOWNTOWN NEIGHBOURHOOD PLAN

SOUTH FRASER WAY CROSS SECTION

ABBOTSFORD

DRAWN: 2020 03 09
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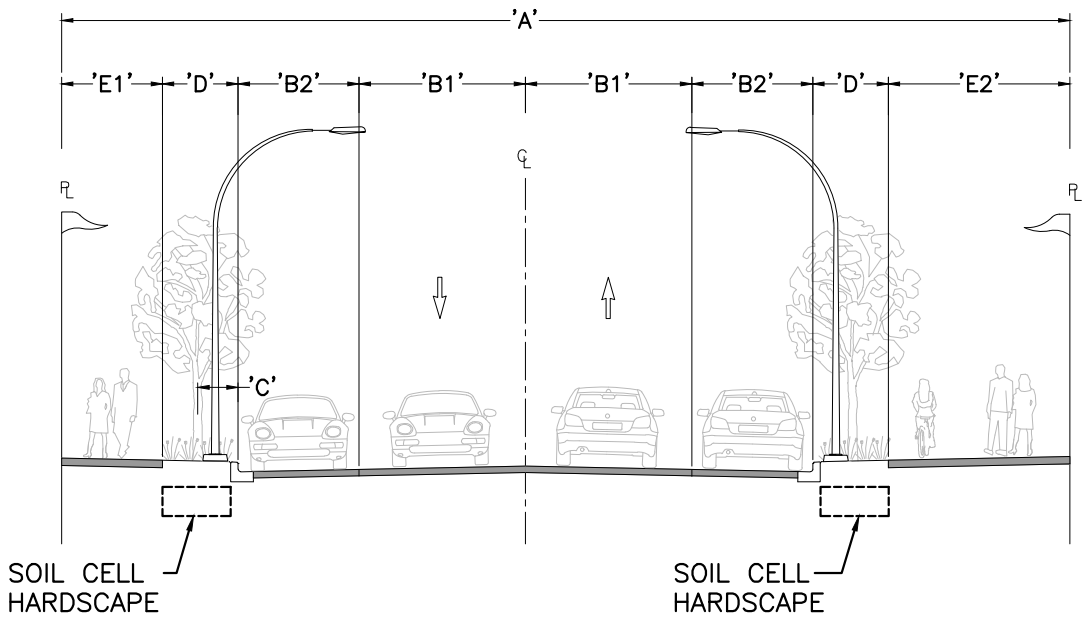

ROW TYPES	ROAD ALLOWANCE	PAVEMENT– VEHICLE LANE	PAVEMENT– PARKING LANE	OFFSET FROM CURB	BOULEVARD	SIDEWALK	MULTIUSE PATH
	'A'	'B1'	'B2'	'C'	'D'	'E1'	'E2'
WEST RAILWAY STREET	20.0	3.3	2.4	0.8	1.8	2.0	3.0

NOTES:

- FROM LAUREL STREET TO PINE STREET
- MULTIUSE PATH ON EAST SIDE, SIDEWALK ON WEST SIDE, TREE STRIPS ON BOTH SIDES
- PARALLEL PARKINGS ON BOTH SIDES
- ONE TRAVEL LANE IN EACH DIRECTION
- FROM NORTH OF GEORGE FERGUSON WAY, SIDEWALK/MULTIUSE PATH ELEMENTS REDUCED IN WIDTH AND ONE SIDE PARALLEL PARKING REMOVED TO ACCOMMODATE CROSS SECTION WITHIN A 17.5m ROW
- STREETSCAPE STANDARDS TO INDICATE PUBLIC REALM TREATMENTS

HISTORIC DOWNTOWN NEIGHBOURHOOD PLAN

WEST RAILWAY STREET CROSS SECTION

ABBOTSFORD

DRAWN: 2020 03 09
REVISED:
APPROVED BY:

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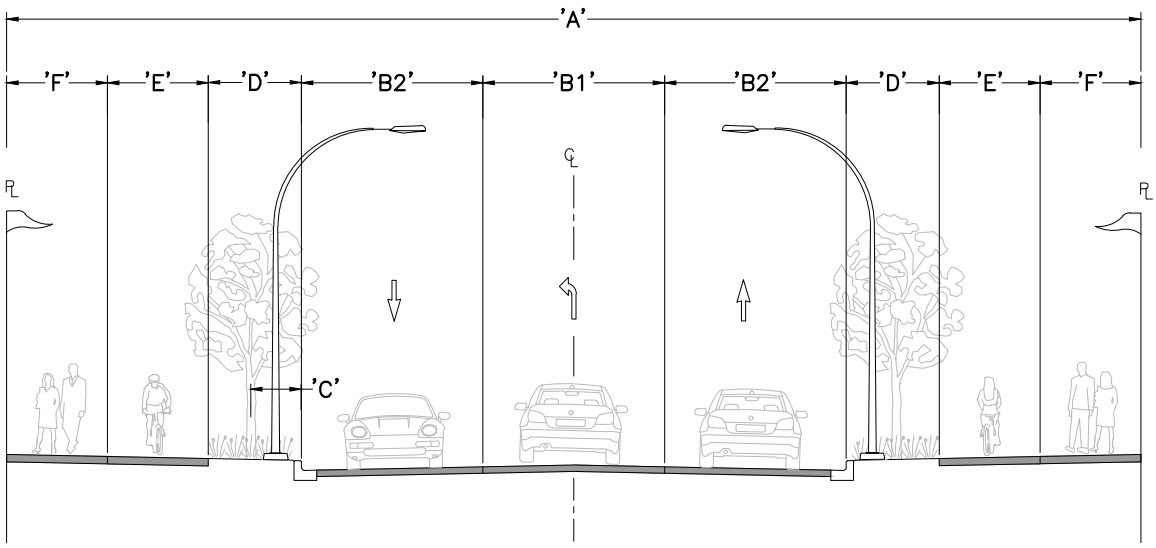


ROW TYPES	ROAD ALLOWANCE	PAVEMENT– LEFT TURN LANE	PAVEMENT– VEHICLE LANE	OFFSET FROM CURB	BOULEVARD	BIKE PATH	SIDEWALK
	'A'	'B1'	'B2'	'C'	'D'	'E'	'F'
McDOUGALL AVENUE	22.5	3.6	3.6	1.0	1.85	2.0	2.0

NOTES:

- FROM CANNON AVENUE TO SOUTH FRASER WAY
- SIDEWALKS, TREE STRIPS, AND AAA BIKE LANES ON BOTH SIDES
- ONE TRAVEL LANE IN EACH DIRECTION
- LEFT TURN LANE AT INTERSECTIONS
- STREETSCAPE STANDARDS TO INDICATE PUBLIC REALM TREATMENTS

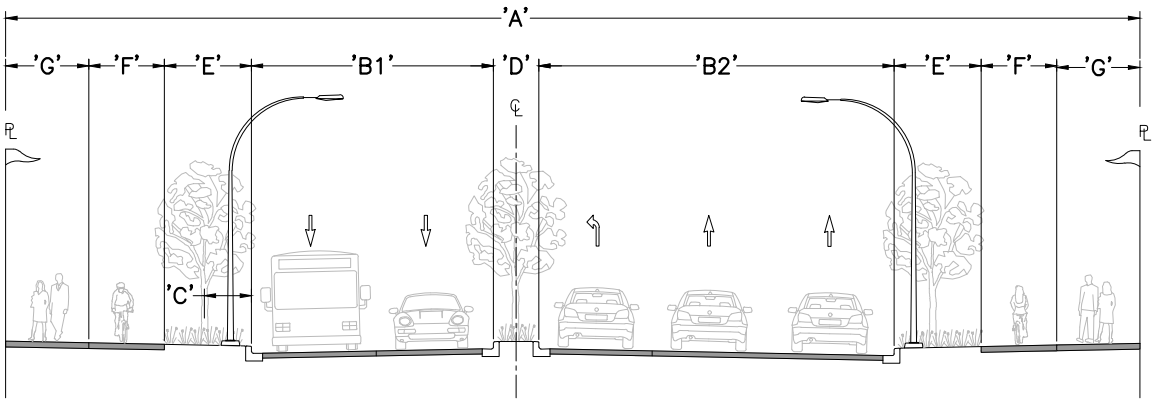
HISTORIC DOWNTOWN NEIGHBOURHOOD PLAN

McDOUGALL AVENUE CROSS SECTION

ABBOTSFORD

DRAWN: 2020 03 09
REVISED:
APPROVED BY:

ES - R - 32



ROW TYPES	ROAD ALLOWANCE	PAVEMENT 1	PAVEMENT 2	OFFSET FROM CURB	MEDIAN/ LEFT TURN LANE	BOULEVARD	BIKE PATH	SIDEWALK	LANE CONFIGURATION
	'A'	'B1'	'B2'	'C'	'D'	'E'	'F'	'G'	WITHIN 'B1' AND 'B2'
McCALLUM ROAD	30.0	6.6	6.6–NO TURN LANE 9.9–WITH 3.3m TURN LANE	1.2	0.9–WITH 3.3m TURN LANE 4.2–NO TURN LANE	2.3	2.0	2.0	'B1': 3.5m–3.1m 'B2': 3.5m–3.1m–3.3m (FROM BOULEVARD TO MEDIAN)

NOTES:

- FROM MARSHALL ROAD TO SOUTH FRASER WAY
- SIDEWALKS, TREE STRIPS, AND AAA BIKE LANES ON BOTH SIDES
- TWO TRAVEL LANES IN EACH DIRECTION
- MEDIAN TREE STRIP WITH A LEFT TURN LANE AT INTERSECTIONS (WITH CENTRAL BOULEVARD AND TREES BETWEEN INTERSECTIONS)
- STREETSCAPE STANDARDS TO INDICATE PUBLIC REALM TREATMENTS

HISTORIC DOWNTOWN NEIGHBOURHOOD PLAN

McCALLUM ROAD CROSS SECTION

ABBOTSFORD

DRAWN: 2020 03 09
REVISED:
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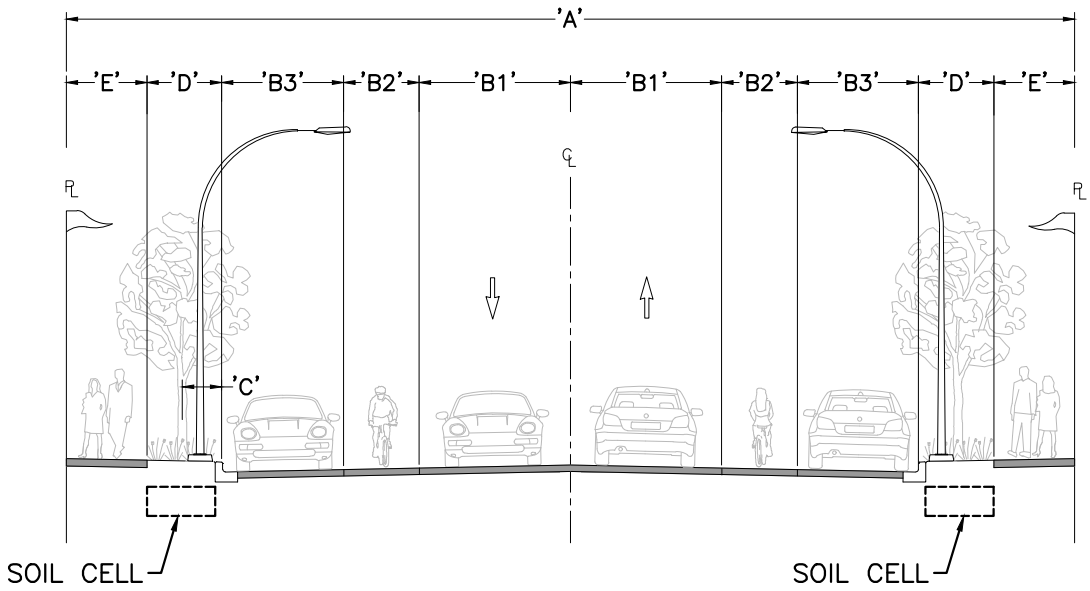


ROW TYPES	ROAD ALLOWANCE	PAVEMENT– VEHICLE LANE	PAVEMENT– BIKE LANE	PAVEMENT– PARKING LANE	OFFSET FROM CURB	BOULEVARD	SIDEWALK
	'A'	'B1'	'B2'	'B3'	'C'	'D'	'E1'
DUKE AVE. – LOCAL STREET	20.0	3.0	1.5	2.4	0.8	1.5	1.6

NOTES:

- STREET CLASSIFICATION: LOCAL (SPEED LIMIT 50 KM/HOUR)
- LANE CONFIGURATION: ONE TRAVEL LANE IN EACH DIRECTION AND PARKING POCKETS ON BOTH SIDES OF THE STREET
- BIKE LANE: OUTBOARD OF PARKING LANES ON BOTH SIDES OF THE STREETS
- FURNISHING ZONE: STREET TREES (PERSIAN IRONWOOD)/STANDARD STREET LIGHTS/ BENCHES AND WASTE/RECYCLING
- PEDESTRIAN MOVEMENT ZONE: SIDEWALKS ON BOTH SIDES OF THE STREET
- STREETSCAPE STANDARDS TO INDICATE PUBLIC REALM TREATMENTS

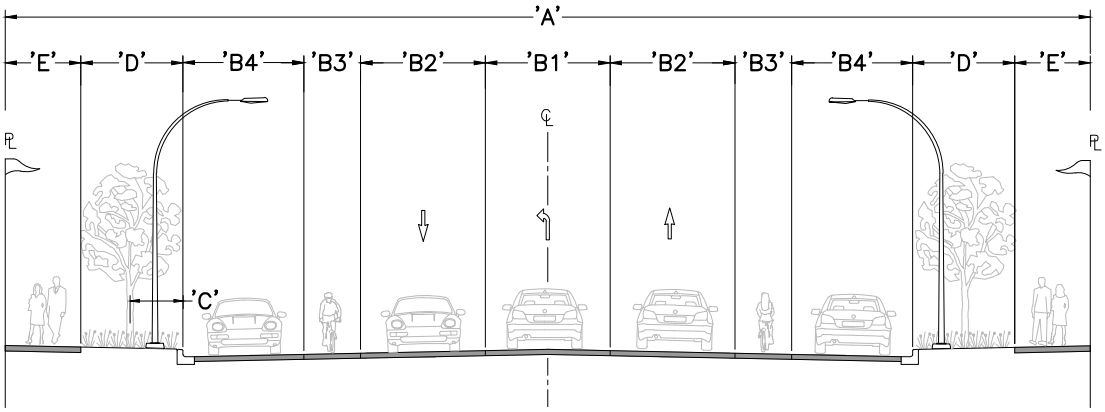
UDISTRICT NEIGHBOURHOOD PLAN
LOCAL STREET

DUKE AVENUE CROSS SECTION

ABBOTSFORD

DRAWN: 2020 03 09
REVISED:
APPROVED BY:

ES - R - 34



ROW TYPES	ROAD ALLOWANCE	PAVEMENT– LEFT TURN LANE	PAVEMENT– VEHICLE LANE	PAVEMENT– BIKE LANE	PAVEMENT– PARKING LANE	OFFSET FROM CURB	BOULEVARD	SIDEWALK
	'A'	'B1'	'B2'	'B3'	'B4'	'C'	'D'	'E'
KING CONNECTOR– COLLECTOR STREET	28.7	3.3	3.3	1.5	3.2	1.4	2.7	2.0

NOTES:

- STREET CLASSIFICATION: COLLECTOR (SPEED LIMIT 50 KM/HOUR)
- LANE CONFIGURATION: ONE TRAVEL LANE IN EACH DIRECTION, A TURN LANE, AND PARKING LANES ON BOTH SIDES OF THE STREET
- BIKE LANE: OUTBOARD OF PARKING LANES ON BOTH SIDES OF THE STREET
- FURNISHING ZONE: STREET TREES (SPECIES DETERMINED BY PRC)/STANDARD STREET LIGHTS/ BENCHES AND WASTE/RECYCLING
- PEDESTRIAN MOVEMENT ZONE: SIDEWALKS ON BOTH SIDES OF THE STREET
- PROTECTED BIKE LANES WITH 0.8m WIDE HATCHED SEPARATION
- STREETSCAPE STANDARDS TO INDICATE PUBLIC REALM TREATMENTS

UDISTRICT NEIGHBOURHOOD PLAN
COLLECTOR STREET

KING CONNECTOR
CROSS SECTION

ABBOTSFORD

DRAWN: 2020 03 09
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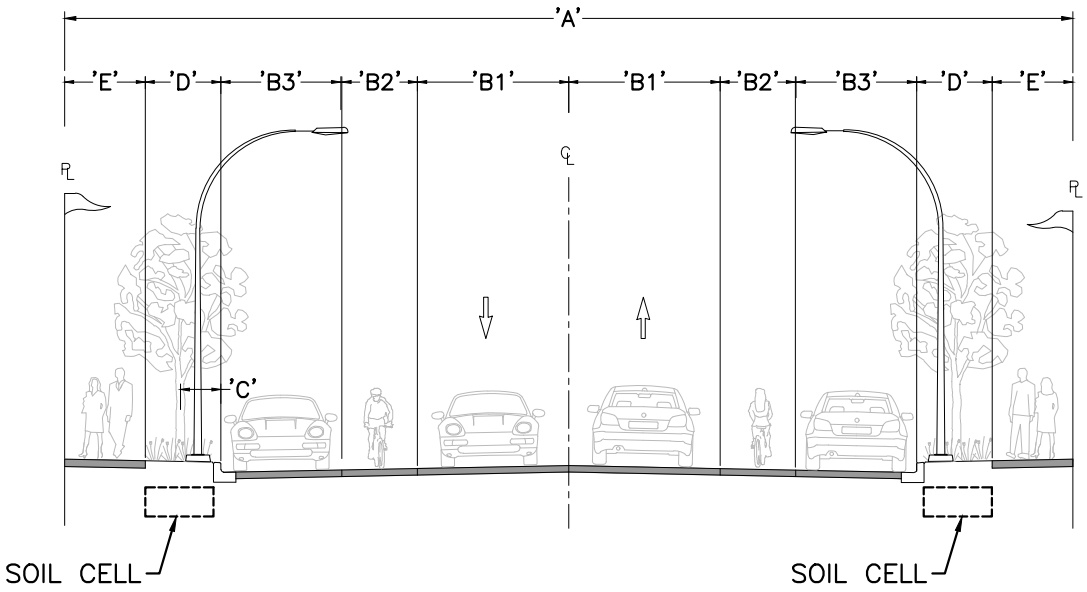

ROW TYPES	ROAD ALLOWANCE	PAVEMENT– VEHICLE LANE	PAVEMENT– BIKE LANE	PAVEMENT– PARKING LANE	OFFSET FROM CURB	BOULEVARD	SIDEWALK
	'A'	'B1'	'B2'	'B3'	'C'	'D'	'E'
KING CRESCENT– LOCAL STREET	20.0	3.0	1.5	2.4	0.8	1.5	1.6

NOTES:

- STREET CLASSIFICATION: LOCAL (SPEED LIMIT 50 KM/HOUR)
- LANE CONFIGURATION: ONE TRAVEL LANE IN EACH DIRECTION AND PARKING LANES ON BOTH SIDES OF THE STREET
- BIKE LANE: OUTBOARD OF PARKING LANES ON BOTH SIDES OF THE STREETS
- FURNISHING ZONE: STREET TREES (SPECIES DETERMINED BY PRC)/STANDARD STREET LIGHTS/ BENCHES AND WASTE/RECYCLING
- PEDESTRIAN MOVEMENT ZONE: SIDEWALKS ON BOTH SIDES OF THE STREET
- STREETSCAPE STANDARDS TO INDICATE PUBLIC REALM TREATMENTS

UDISTRICT NEIGHBOURHOOD PLAN
LOCAL STREET

KING CRESCENT
CROSS SECTION

ABBOTSFORD

DRAWN: 2020 03 09
REVISED:
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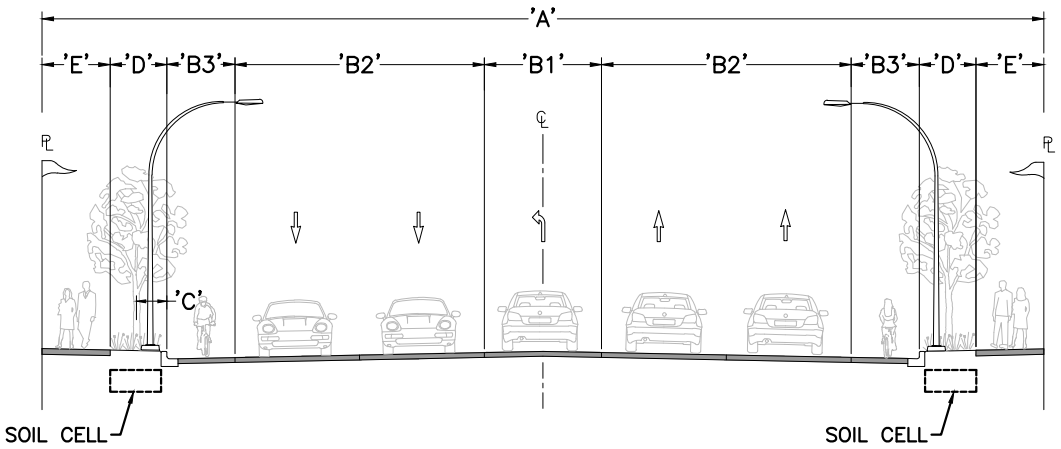
ES - R - 36



ROW TYPES	ROAD ALLOWANCE	MEDIAN/ LEFT TURN LANE	PAVEMENT– VEHICLE LANE	PAVEMENT– BIKE LANE	OFFSET FROM CURB	BOULEVARD	SIDEWALK
	'A'	'B1'	'B2'	'B3'	'C'	'D'	'E'
KING ROAD– COLLECTOR STREET	26.5	3.1	3.3x2	1.8	0.8	1.5	1.8

NOTES:

- STREET CLASSIFICATION: COLLECTOR (SPEED LIMIT 50 KM/HOUR)
- LANE CONFIGURATION: TWO TRAVEL LANES IN EACH DIRECTION AND A TURN LANE
- BIKE LANE: INBOARD OF TRAVEL LANES ON BOTH SIDES OF THE STREET
- FURNISHING ZONE: STREET TREES (SUNBURST HONEY LOCUST)/STANDARD STREET LIGHTS/ BENCHES AND WASTE/RECYCLING/ BUS SHELTERS*
- PEDESTRIAN MOVEMENT ZONE: SIDEWALKS ON BOTH SIDES OF THE STREET
- STREETSCAPE STANDARDS TO INDICATE PUBLIC REALM TREATMENTS

* In collaboration with BC Transit, bus shelters will be upgraded and will provide seating, lighting, bicycle racks, garbage/recycling receptacles, signage displaying transit schedules and route information and will provide covered protection from elements.

UDISTRICT NEIGHBOURHOOD PLAN
COLLECTOR STREET
KING ROAD -
McCALLUM RD TO UNIVERSITY WAY
CROSS SECTION

ABBOTSFORD

DRAWN: 2020 03 09
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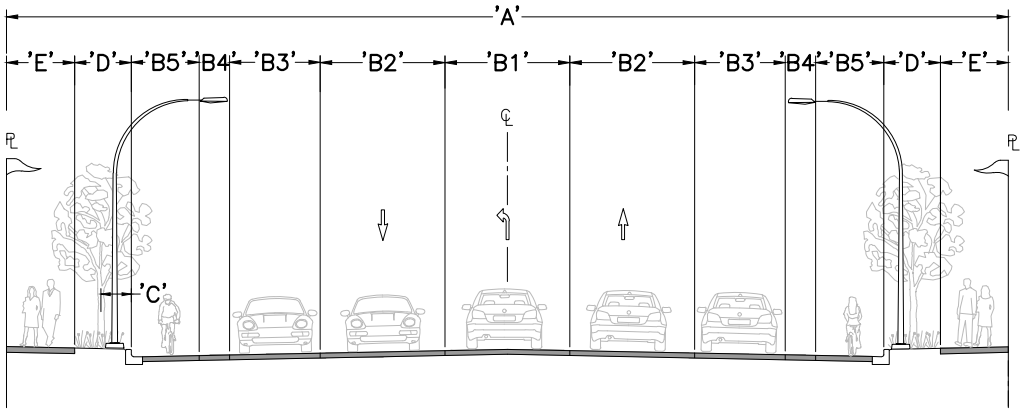
ES - R - 37



ROW TYPES	ROAD ALLOWANCE	PAVEMENT– LEFT TURN LANE	PAVEMENT– VEHICLE LANE	PAVEMENT– PARKING LANE	PAVEMENT– PAINTED BUFFER	PAVEMENT– BIKE LANE	OFFSET FROM CURB	BOULEVARD	SIDEWALK
	'A'	'B1'	'B2'	'B3'	'B4'	'B5'	'C'	'D'	'E'
KING ROAD– COLLECTOR STREET	26.5	3.3	3.3	2.4	0.8	1.5	0.8	1.8	1.8

NOTES:

- STREET CLASSIFICATION: COLLECTOR (SPEED LIMIT 50 KM/HOUR)
- LANE CONFIGURATION: TWO TRAVEL LANES IN EACH DIRECTION, A TURN LANE, AND PARKING LANES ON BOTH SIDES OF THE STREET
- BIKE LANE: INBOARD OF PARKING LANES WITH PAINTED BUFFERS ON BOTH SIDES OF THE STREET
- FURNISHING ZONE: STREET TREES (SUNBURST HONEY LOCUST)/STANDARD STREET LIGHTS/ BENCHES AND WASTE/RECYCLING
- PEDESTRIAN MOVEMENT ZONE: SIDEWALKS ON BOTH SIDES OF THE STREET
- STREETSCAPE STANDARDS TO INDICATE PUBLIC REALM TREATMENTS

UDISTRICT NEIGHBOURHOOD PLAN
COLLECTOR STREET
KING ROAD -
UNIVERSITY WAY TO McKENZIE RD
CROSS SECTION

ABBOTSFORD

DRAWN: 2020 03 09
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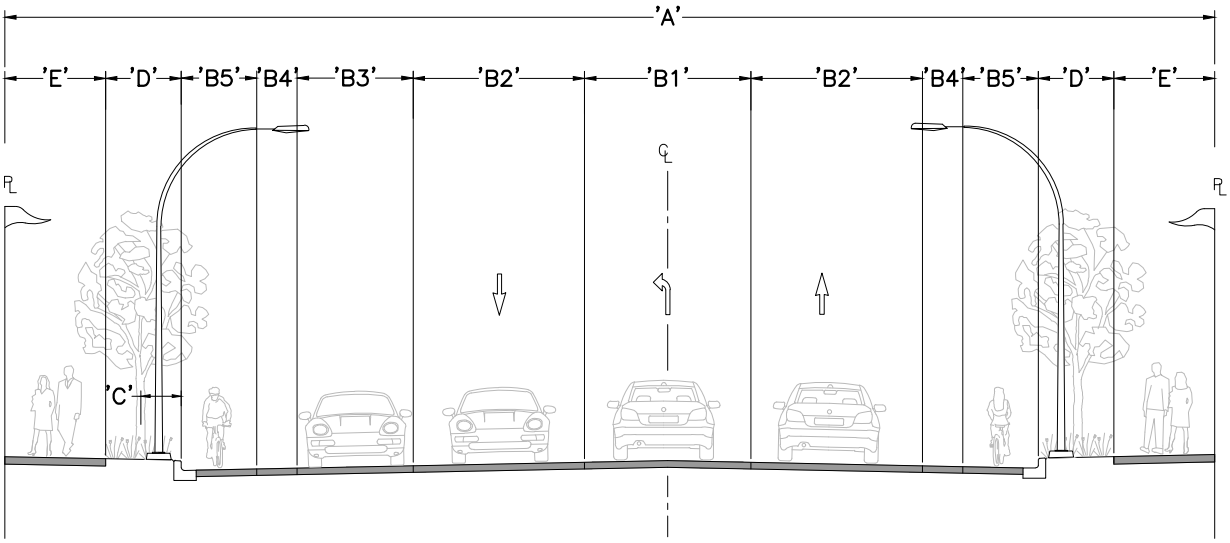
ES - R - 38



ROW TYPES	ROAD ALLOWANCE	PAVEMENT– LEFT TURN LANE	PAVEMENT– VEHICLE LANE	PAVEMENT– PARKING LANE	PAVEMENT– PAINTED BUFFER	PAVEMENT– BIKE LANE	OFFSET FROM CURB	BOULEVARD	SIDEWALK
	'A'	'B1'	'B2'	'B3'	'B4'	'B5'	'C'	'D'	'E'
McCALLUM ROAD– COLLECTOR STREET	24.0	3.3	3.4	2.3	0.8	1.5	0.8	1.65	1.85

NOTES:

- STREET CLASSIFICATION: COLLECTOR (SPEED LIMIT 50 KM/HOUR)
- LANE CONFIGURATION: ONE TRAVEL LANE IN EACH DIRECTION, A TURN LANE, AND A PARKING LANE ON THE EAST SIDE OF THE STREET
- BIKE LANE: INBOARD OF WEST PARKING LANE AND INBOARD OF EAST TRAVEL LANE WITH PAINTED BUFFERS ON BOTH SIDES OF THE STREET
- FURNISHING ZONE: STREET TREES (AUTUMN PURPLE ASH)/STANDARD STREET LIGHTS/ BENCHES AND WASTE/RECYCLING
- PEDESTRIAN MOVEMENT ZONE: SIDEWALKS ON BOTH SIDES OF THE STREET
- STREETSCAPE STANDARDS TO INDICATE PUBLIC REALM TREATMENTS

UDISTRICT NEIGHBOURHOOD PLAN
COLLECTOR STREET
McCALLUM ROAD
(SOUTH OF KING ROAD)
CROSS SECTION

ABBOTSFORD

DRAWN: 2020 03 09
REVISED:
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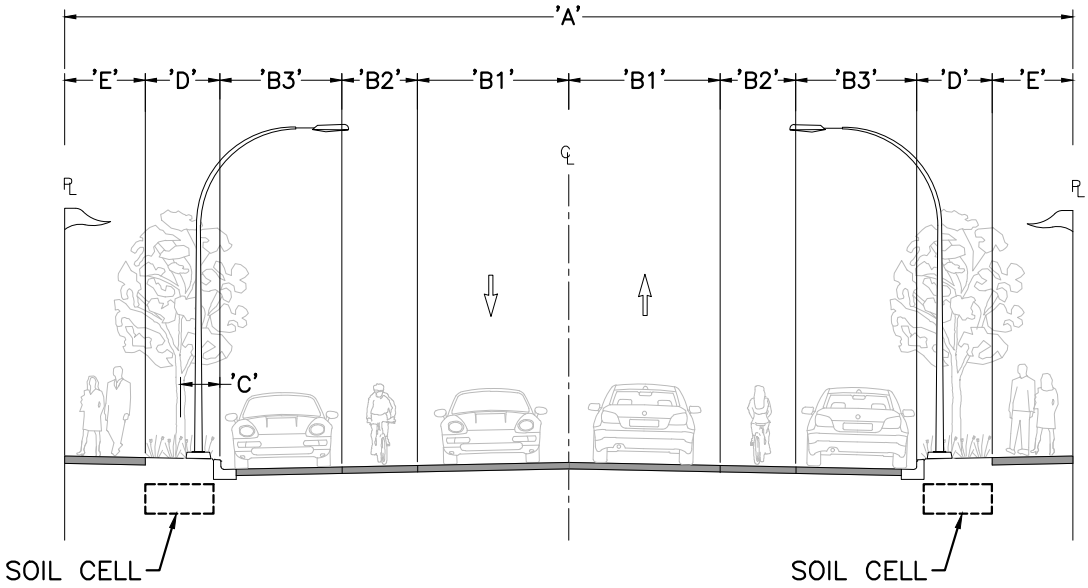
ES - R - 39



ROW TYPES	ROAD ALLOWANCE	PAVEMENT– VEHICLE LANE	PAVEMENT– BIKE LANE	PAVEMENT– PARKING LANE	OFFSET FROM CURB	BOULEVARD	SIDEWALK
	'A'	'B1'	'B2'	'B3'	'C'	'D'	'E1'
SALTON ROAD – LOCAL STREET	20.0	3.0	1.5	2.4	0.8	1.5	1.6

NOTES:

- STREET CLASSIFICATION: LOCAL (SPEED LIMIT 50 KM/HOUR)
- LANE CONFIGURATION: ONE TRAVEL LANE IN EACH DIRECTION AND PARKING LANES ON BOTH SIDES OF THE STREET
- BIKE LANE: OUTBOARD OF PARKING LANES ON BOTH SIDES OF THE STREETS
- FURNISHING ZONE: STREET TREES (SPECIES DETERMINED BY PRC)/STANDARD STREET LIGHTS/ BENCHES AND WASTE/RECYCLING
- PEDESTRIAN MOVEMENT ZONE: SIDEWALKS ON BOTH SIDES OF THE STREET
- STREETSCAPE STANDARDS TO INDICATE PUBLIC REALM TREATMENTS

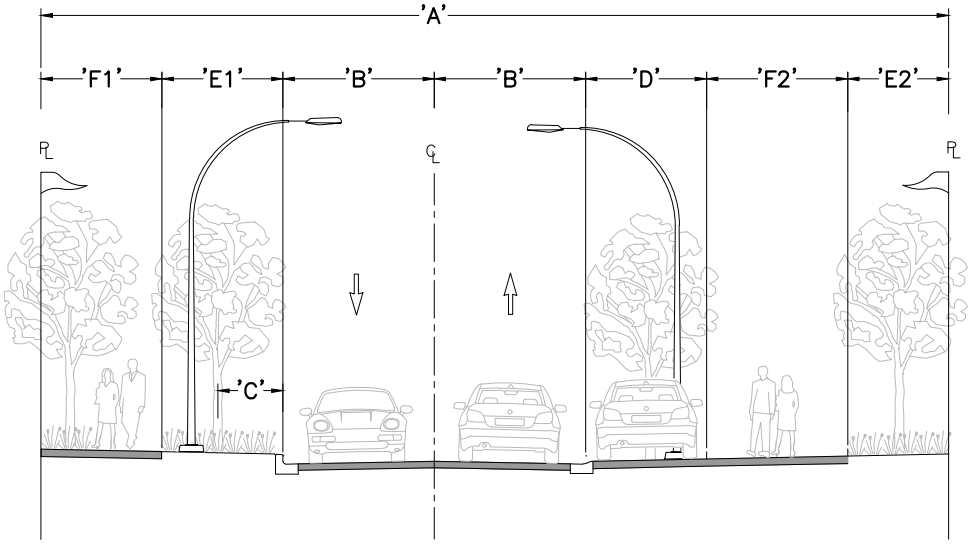
UDISTRICT NEIGHBOURHOOD PLAN
LOCAL STREET

SALTON ROAD CROSS SECTION

ABBOTSFORD

DRAWN: 2020 03 09
REVISED:
APPROVED BY:

ES - R - 40



ROW TYPES	ROAD ALLOWANCE	PAVEMENT–VEHICLE LANE	OFFSET FROM CURB	PARKING POCKET	BOULEVARD		SIDEWALK	
	'A'	'B'	'C'	'D'	'E1'	'E2'	'F1'	'F2'
LOCAL STREET–UNIVERSITY WAY NORTH	18.0	3.0	1.3	2.4	2.4	2.0	2.4	2.8

NOTES:

- STREET CLASSIFICATION: LOCAL (SPEED LIMIT 30 KM/HOUR)
- LANE CONFIGURATION: ONE TRAVEL LANE IN EACH DIRECTION AND PARKING POCKETS ON EAST SIDE OF THE STREET
- BIKE LANE: NO BIKE LANE
- FURNISHING ZONE: SEE SITE–SPECIFIC GUIDELINES (CASCADES PLAZA) FOR REQUIREMENTS
- PEDESTRIAN MOVEMENT ZONE: SEE SITE–SPECIFIC GUIDELINES (CASCADES PLAZA) FOR REQUIREMENTS
- STREETSCAPE STANDARDS TO INDICATE PUBLIC REALM TREATMENTS

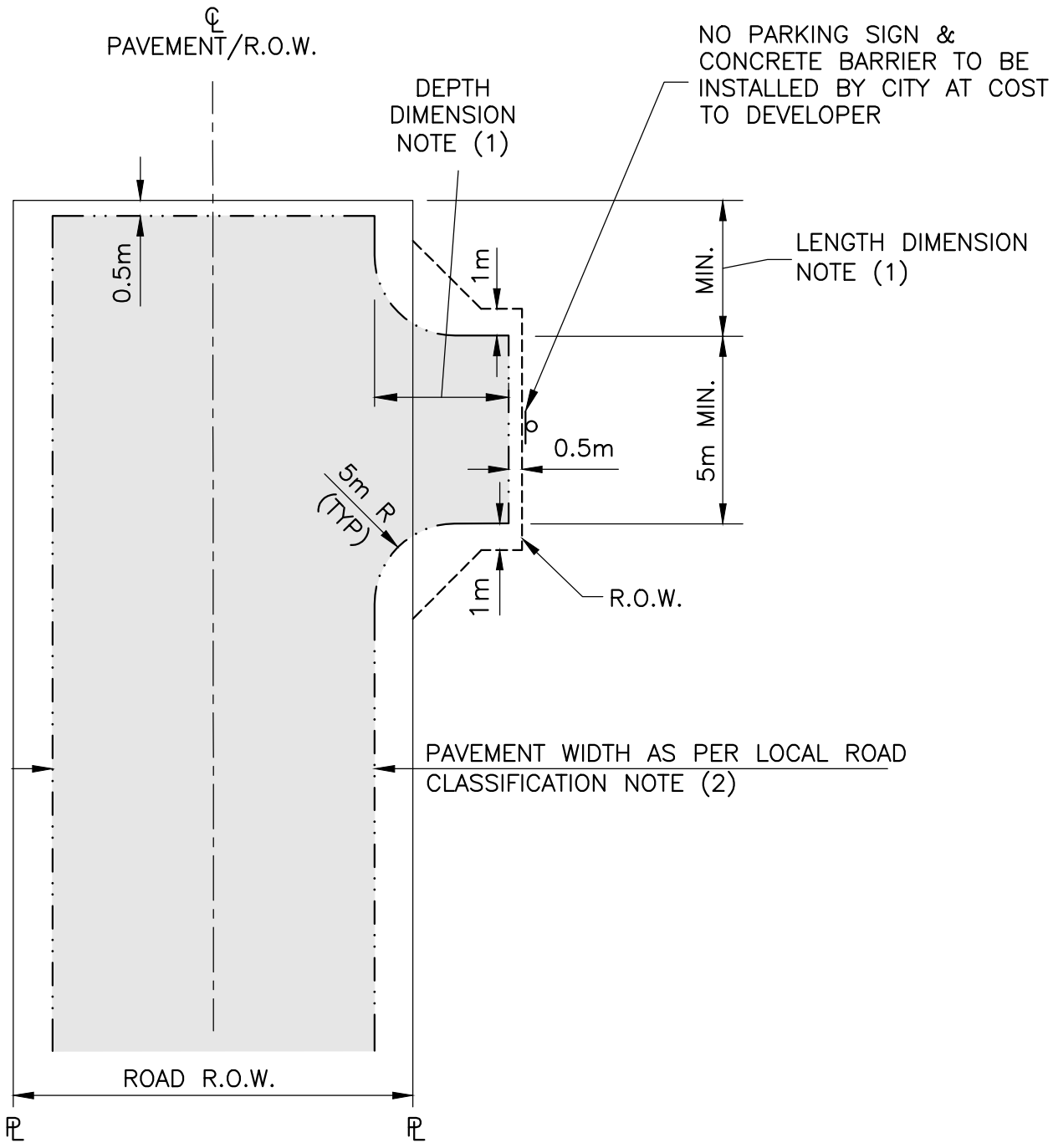
UDISTRICT NEIGHBOURHOOD PLAN
LOCAL STREET

UNIVERSITY WAY NORTH (CASCADES PLAZA) CROSS SECTION

ABBOTSFORD

DRAWN: 2020 03 09
REVISED:
APPROVED BY:

ES - R - 41



NOTES:

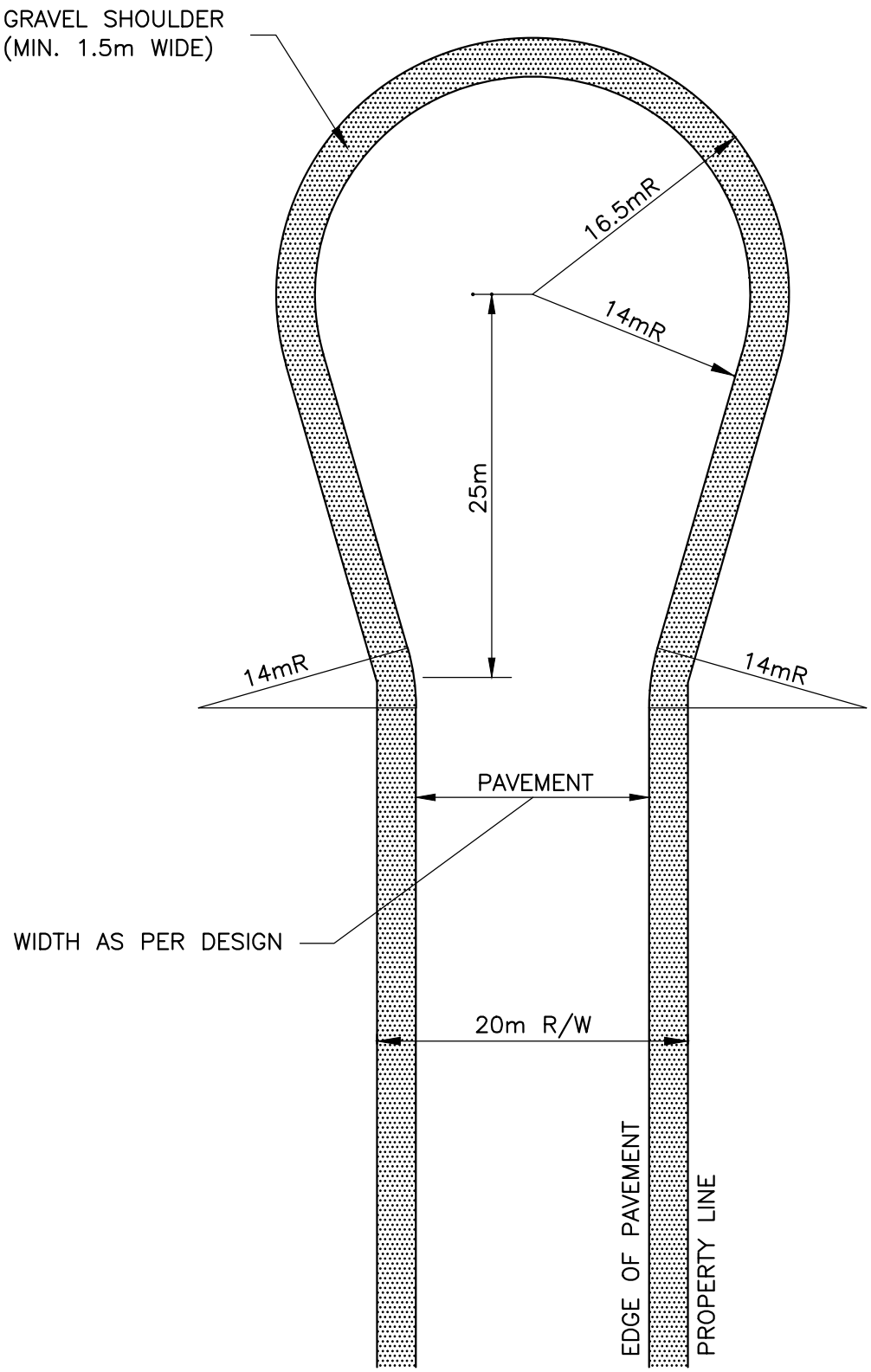
1. SU–9 DESIGN VEHICLE OR AS DIRECTED BY CITY ENGINEER
2. REFER TO LOCAL ROAD CLASSIFICATION ES–R–11

TYPICAL TEMPORARY HAMMERHEAD TURN AROUND RESIDENTIAL

ABBOTSFORD

DRAWN:	1995 02 09
REVISED:	2021 09 09
APPROVED BY:	

ES - R - 42

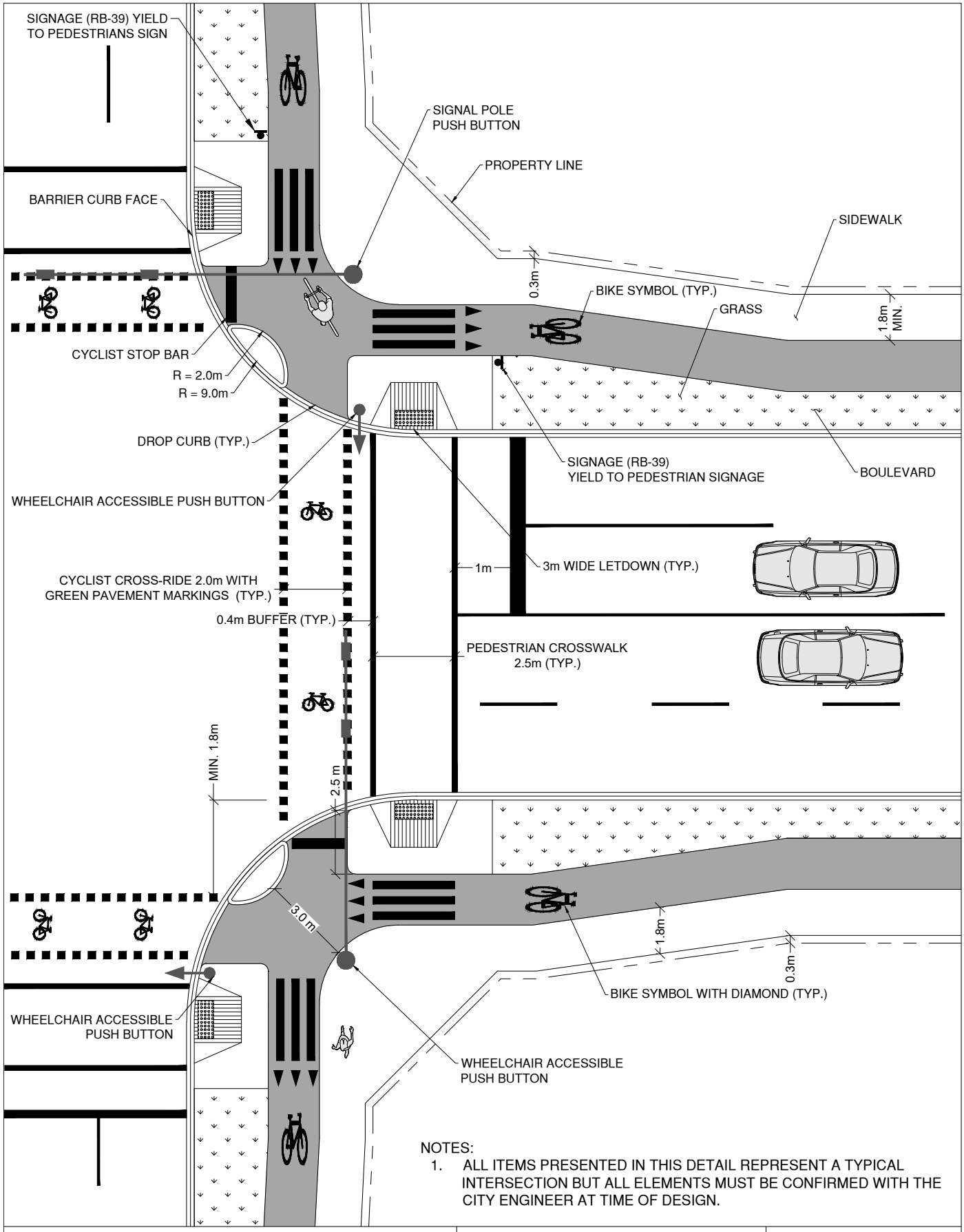


TYPICAL
RURAL CUL-DE-SAC

ABBOTSFORD

DRAWN:	1998 02 27
REVISED:	2021 09 09
APPROVED BY:	

ES - R - 43



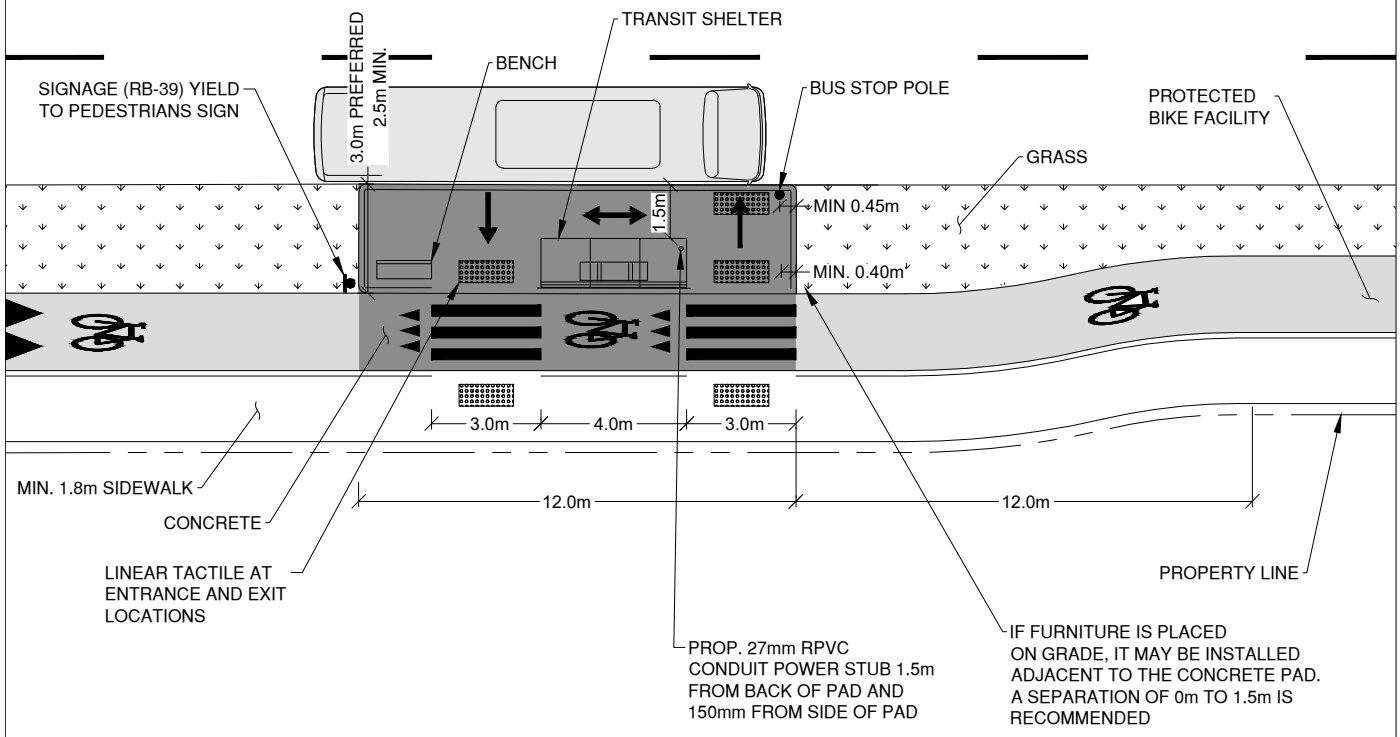
NOTES:

1. ALL ITEMS PRESENTED IN THIS DETAIL REPRESENT A TYPICAL INTERSECTION BUT ALL ELEMENTS MUST BE CONFIRMED WITH THE CITY ENGINEER AT TIME OF DESIGN.

PROTECTED BIKE LANES AT INTERSECTIONS

ABBOTSFORD

DRAWN:	2020 03 02
REVISED:	
APPROVED BY:	
	ES - R - 44



NOTES:

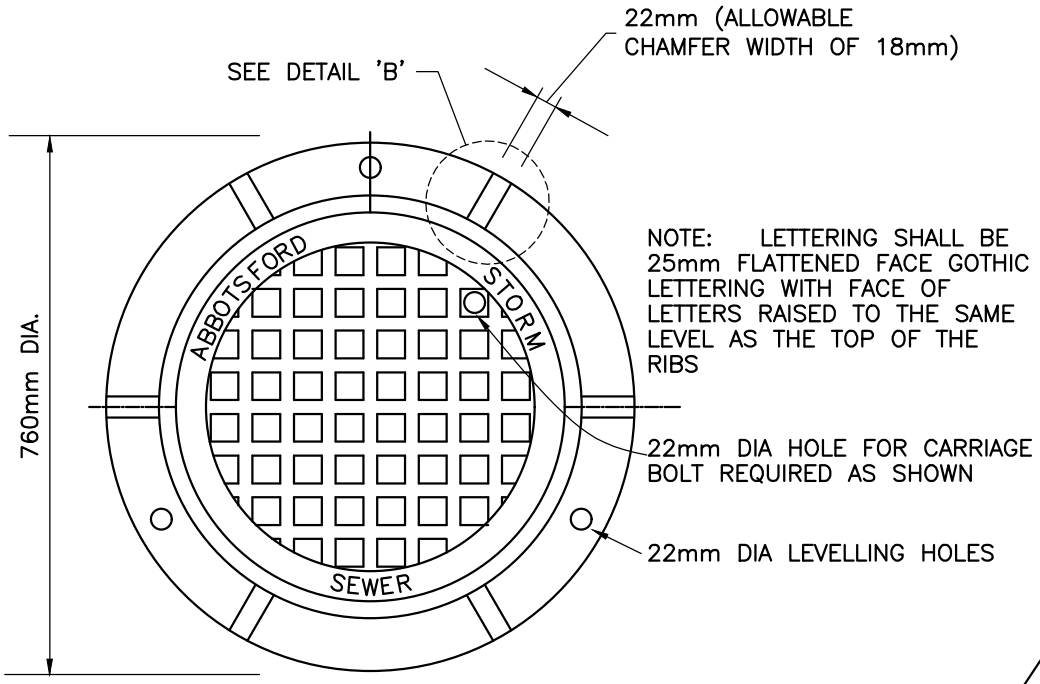
1. ALL TRANSIT STOPS MUST COMPLY WITH BC TRANSIT INFRASTRUCTURE DESIGN SUMMARY, BC TRANSIT, 2018.
2. PROVIDE MIN. OF 0.5m BETWEEN PROTECTED BIKE LANE AND ANY BUS STOP FURNITURE.
3. EXACT CONFIGURATION AND REQUIREMENTS OF THE BUS STOP/FURNITURE AND JUNCTION BOX SHALL BE CONFIRMED WITH THE ENGINEER AND IN CONJUNCTION WITH CS-R-16.

TYPICAL BUS STOP PLAN VIEW

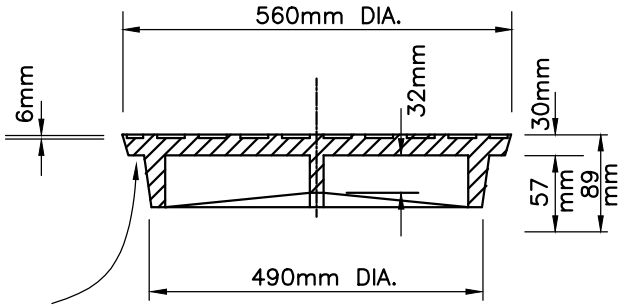
ABBOTSFORD

DRAWN:	2020 03 02
REVISED:	
APPROVED BY:	

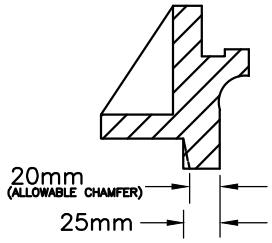
ES - R - 45



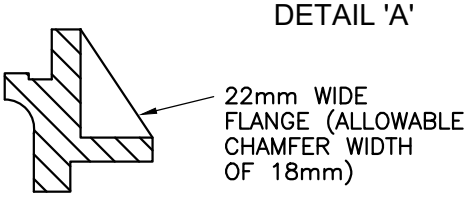
PLAN



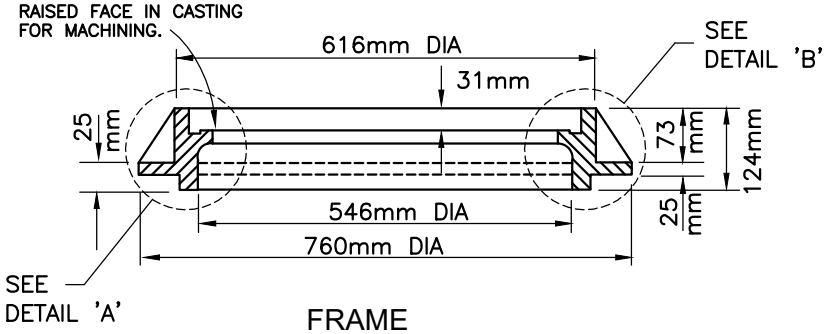
COVER



DETAIL 'A'



DETAIL 'B'



FRAME

TYPE – DOBNEY FOUNDRY NO. C–20 "TR" CASTINGS OR "K" EQUIVALENT.
APPROXIMATE WEIGHTS: COVER – 66 kg; FRAME – 84 kg

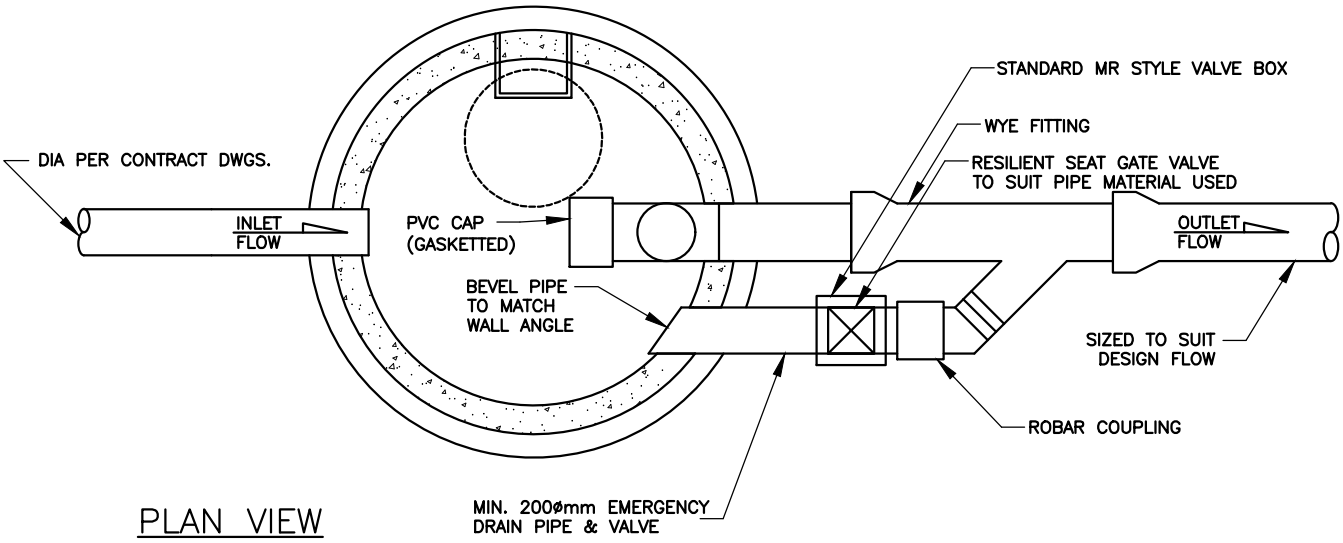
NOTES:
1. LOCAL ROADS: USE C20 FRAME AND CASTINGS
2. ARTERIAL/COLLECTOR ROADS OR WHERE HEAVY TRUCK TRAFFIC IS EXPECTED: USE TR18 (7 INCH TALL) FRAME AND CASTINGS

STORM SEWER MANHOLE COVER & FRAME

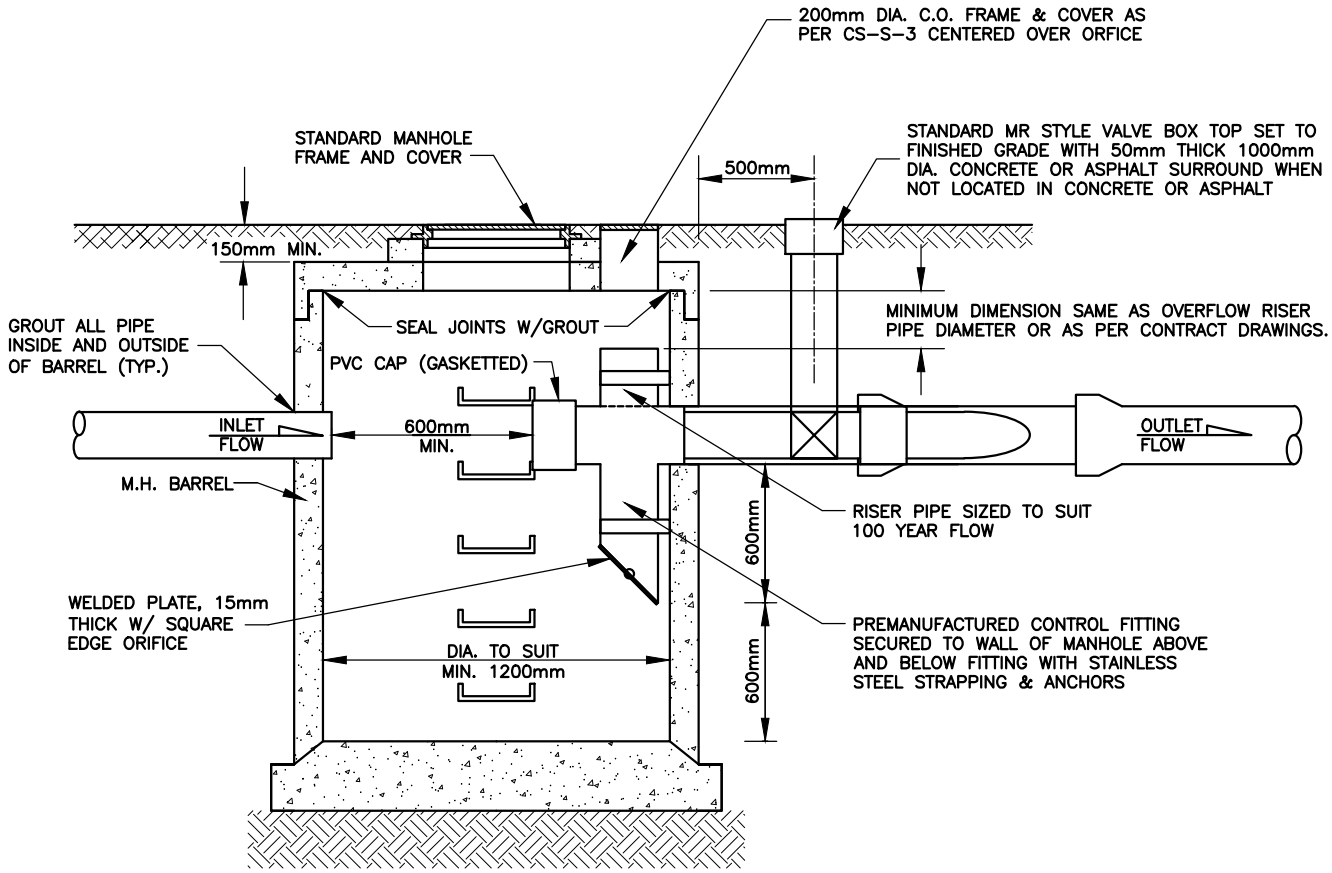
ABBOTSFORD

DRAWN: 1971 07 12
REVISED: 2021 09 09
APPROVED BY:

CS - D - 1



PLAN VIEW



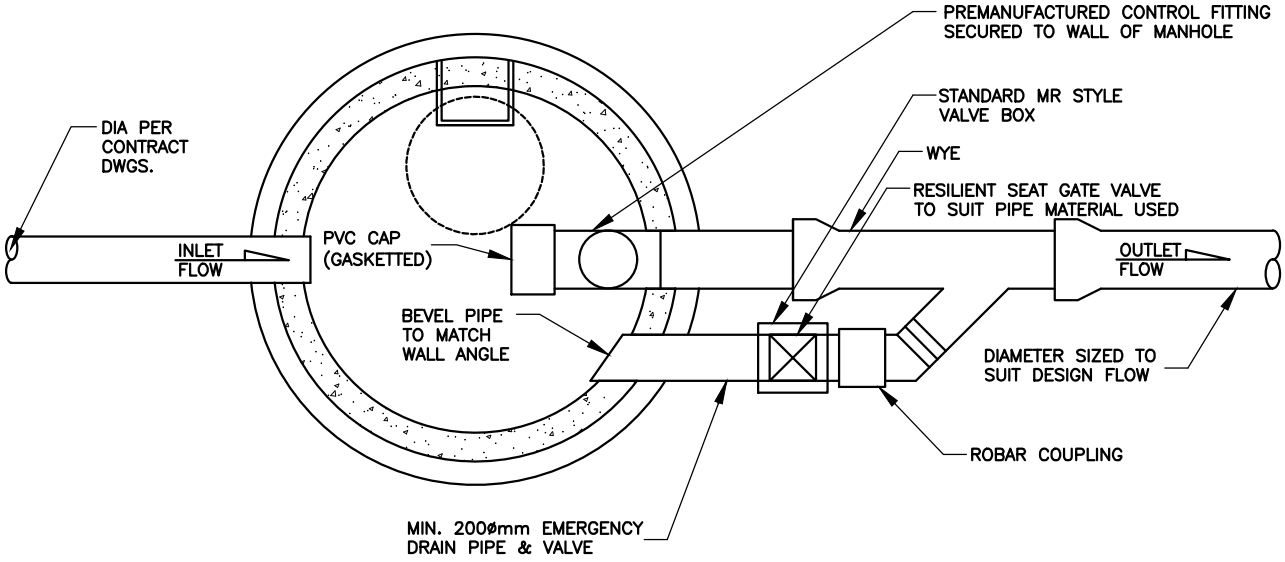
SECTION VIEW

FLOW CONTROL MANHOLE (WHERE 100 YEAR OVERFLOW IS IN MANHOLE)

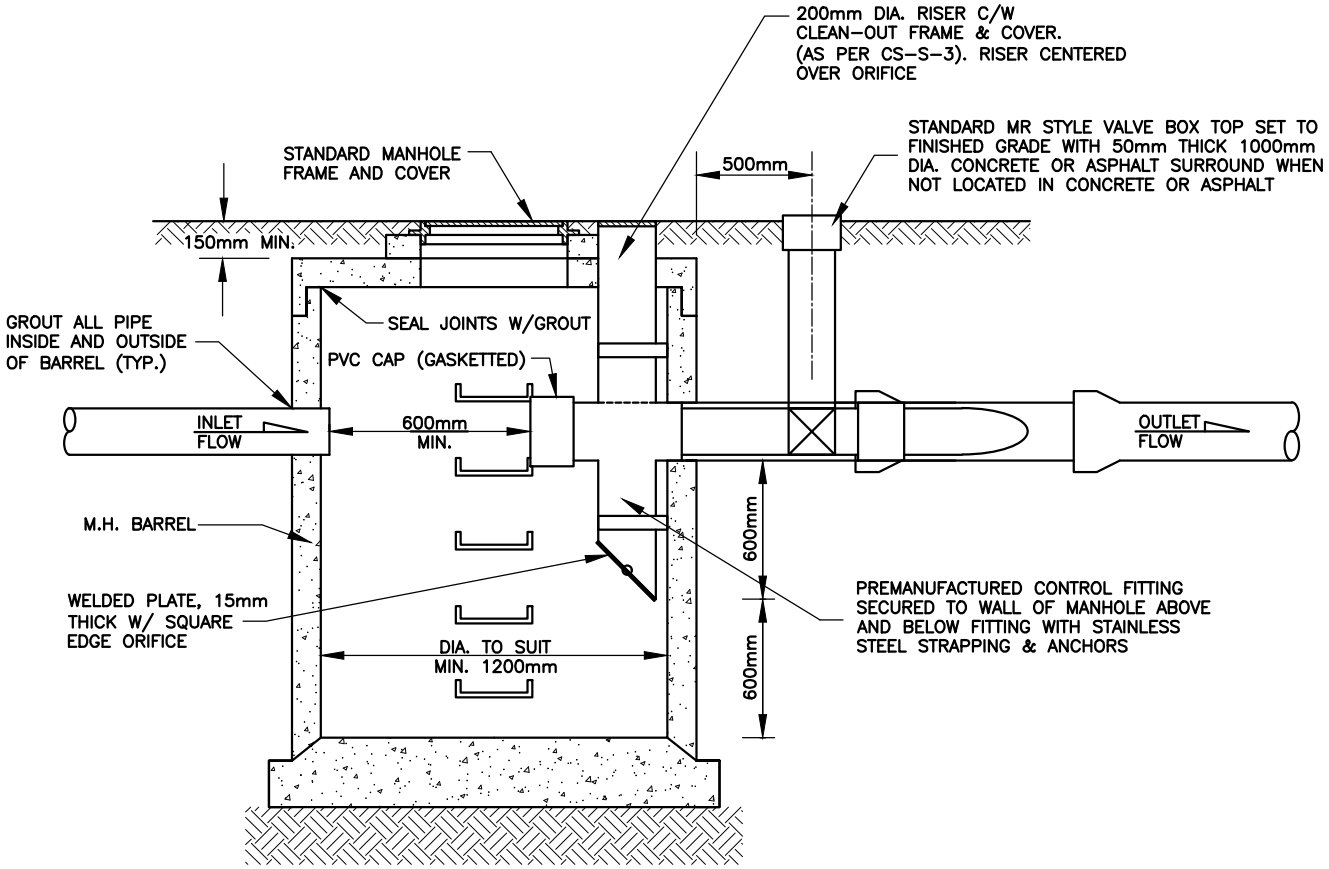
ABBOTSFORD

DRAWN:	2000 10 16
REVISED:	2021 09 09
APPROVED BY:	

CS - D - 2



PLAN VIEW



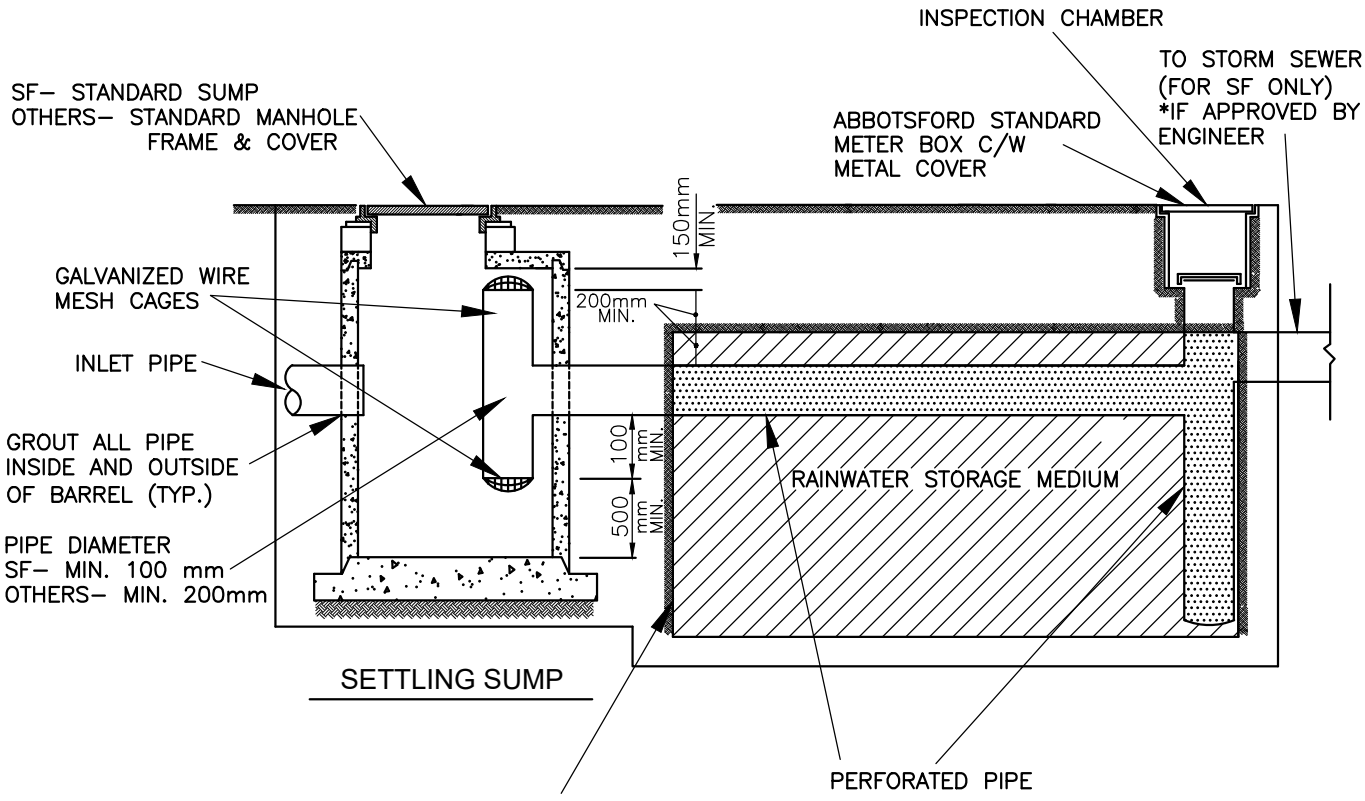
SECTION VIEW

FLOW CONTROL MANHOLE (WITHOUT 100YR OVERFLOW)

ABBOTSFORD

DRAWN:	2000 10 16
REVISED:	2021 09 09
APPROVED BY:	

CS - D - 3



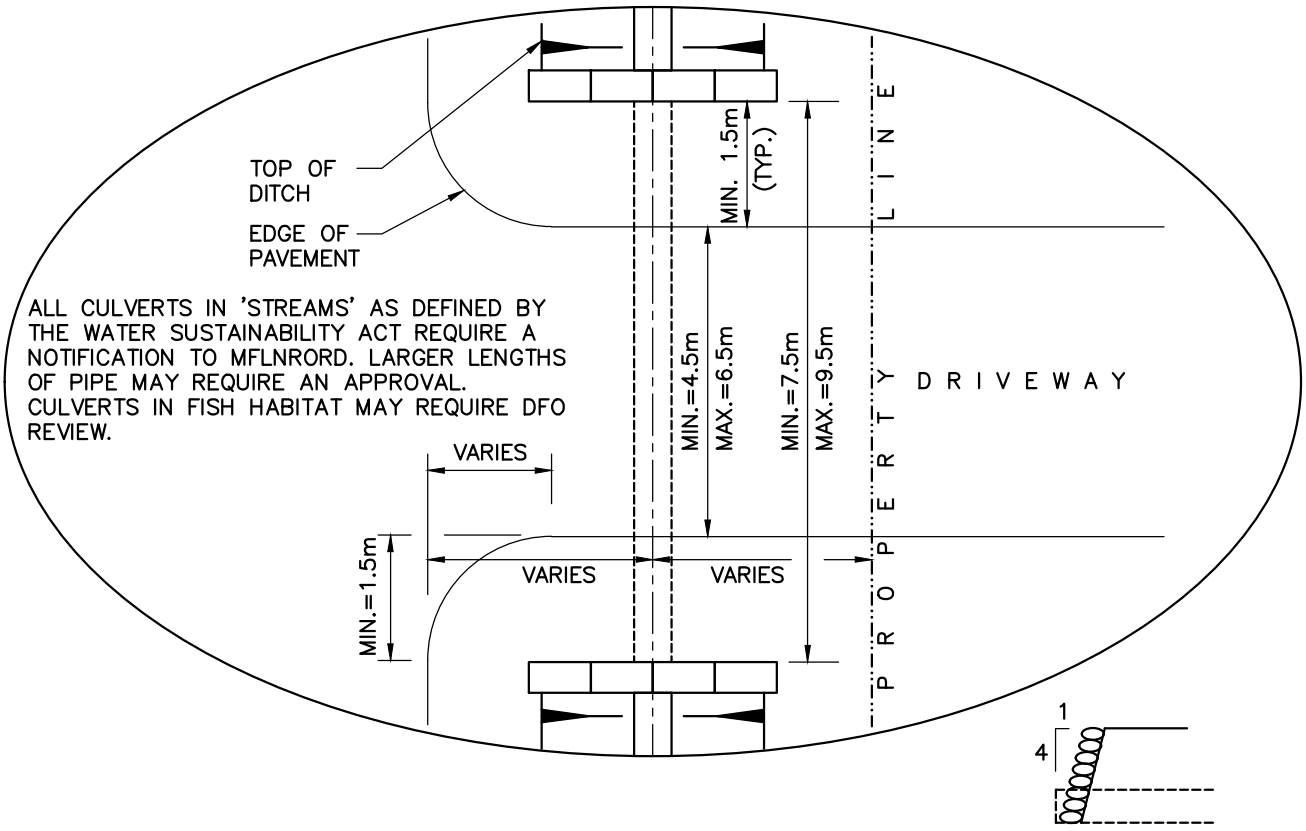
SF – SINGLE FAMILY RESIDENTIAL
OTHERS – ALL OTHER DEVELOPMENTS

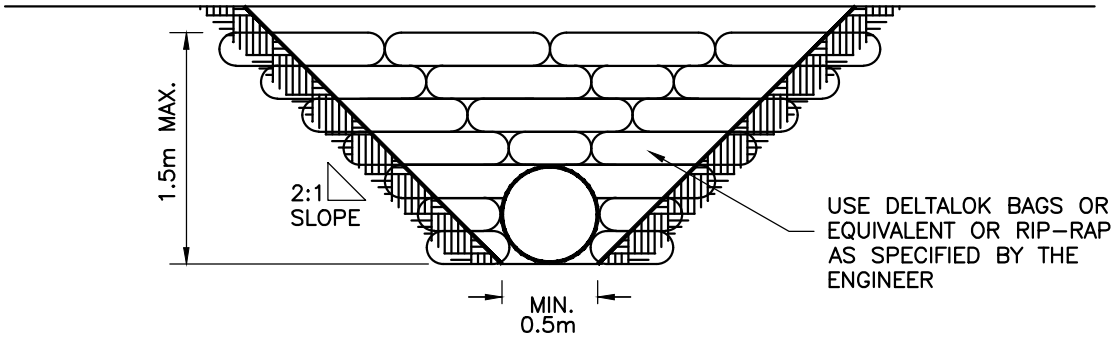
INFILTRATION TRENCH

ABBOTSFORD

DRAWN: 1995 01 31
REVISED: 2021 09 09
APPROVED BY:

CS - D - 4





NOTE:

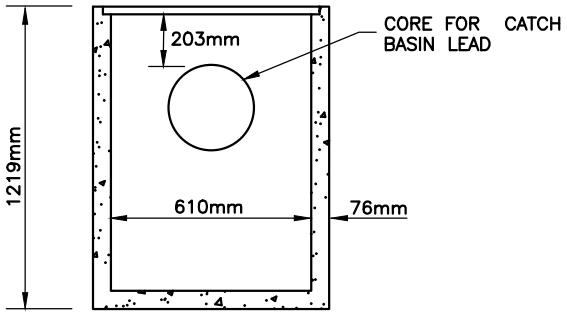
1. FILL BETWEEN ENDWALLS TO BE IMPORTED GRANULAR BACKFILL OR APPROVED NATIVE BACKFILL WITH 150mm GRANULAR BASE FILL.
2. SPIGOT END OF PIPE (WHERE APPLICABLE) TO FACE DOWNSTREAM AND TO BE CLEAR OF ENDWALLS.
3. REFER TO CONTRACT DRAWINGS FOR SITE SPECIFIC DIMENSIONS AND SECTION 33 42 13 FOR DETAILED SPECIFICATIONS.
4. ALL CULVERTS IN 'STREAMS' AS DEFINED BY THE WATER SUSTAINABILITY ACT REQUIRE A NOTIFICATION TO MFLNRORD. LARGER LENGTHS OF PIPE MAY REQUIRE AN APPROVAL. CULVERTS IN FISH HABITAT MAY REQUIRE DFO REVIEW.

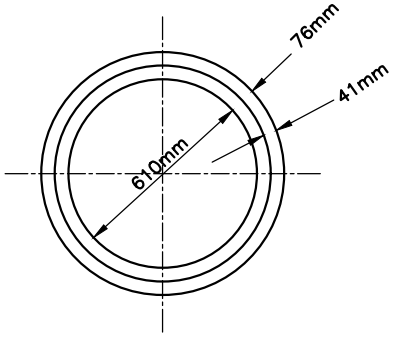
TYPICAL DRIVEWAY CULVERT WITH SANDBAG ENDWALLS

ABBOTSFORD

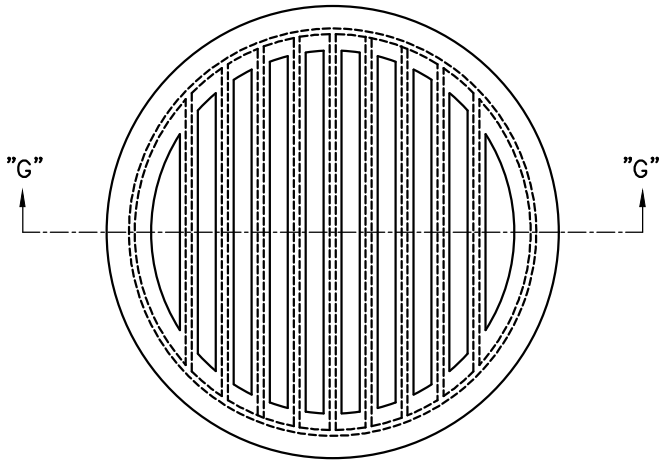
DRAWN:	1999 09 09
REVISED:	2021 09 09
APPROVED BY:	

CS - D - 5

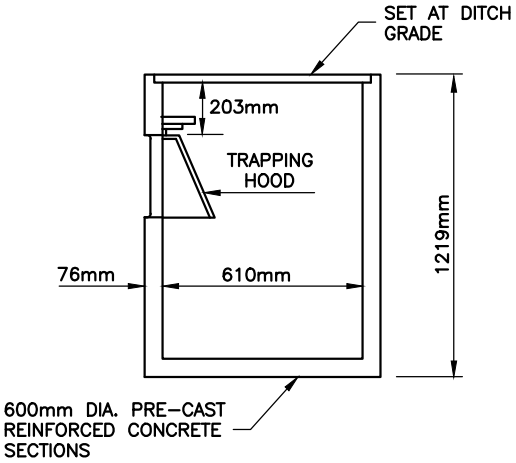




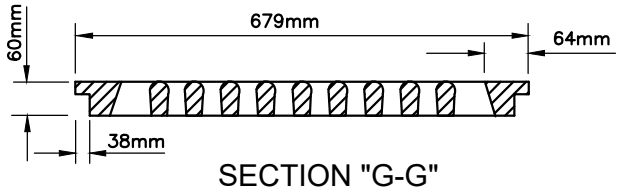
PLAN



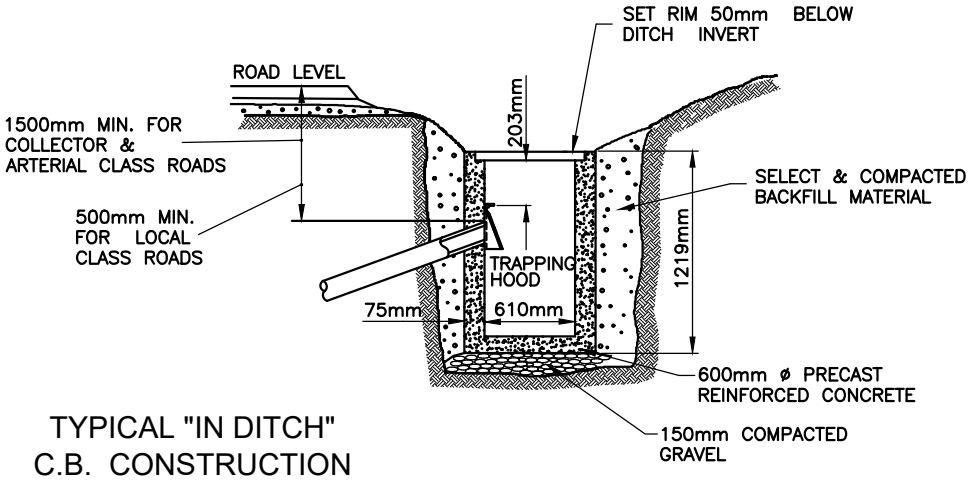
GRATE: DOBNEY FDRY NO. B–22 OR EQUIVALENT



SECTION



SECTION "G-G"



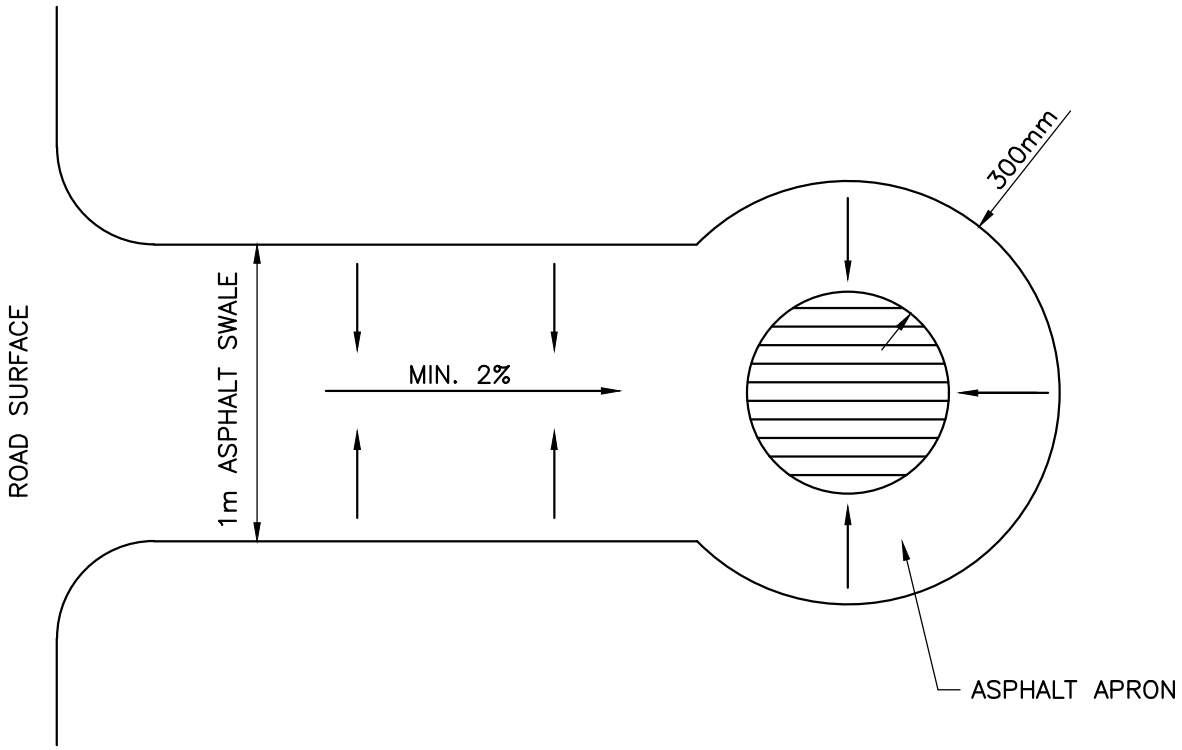
TYPICAL "IN DITCH" C.B. CONSTRUCTION

DITCH CATCH BASIN TYPE 1

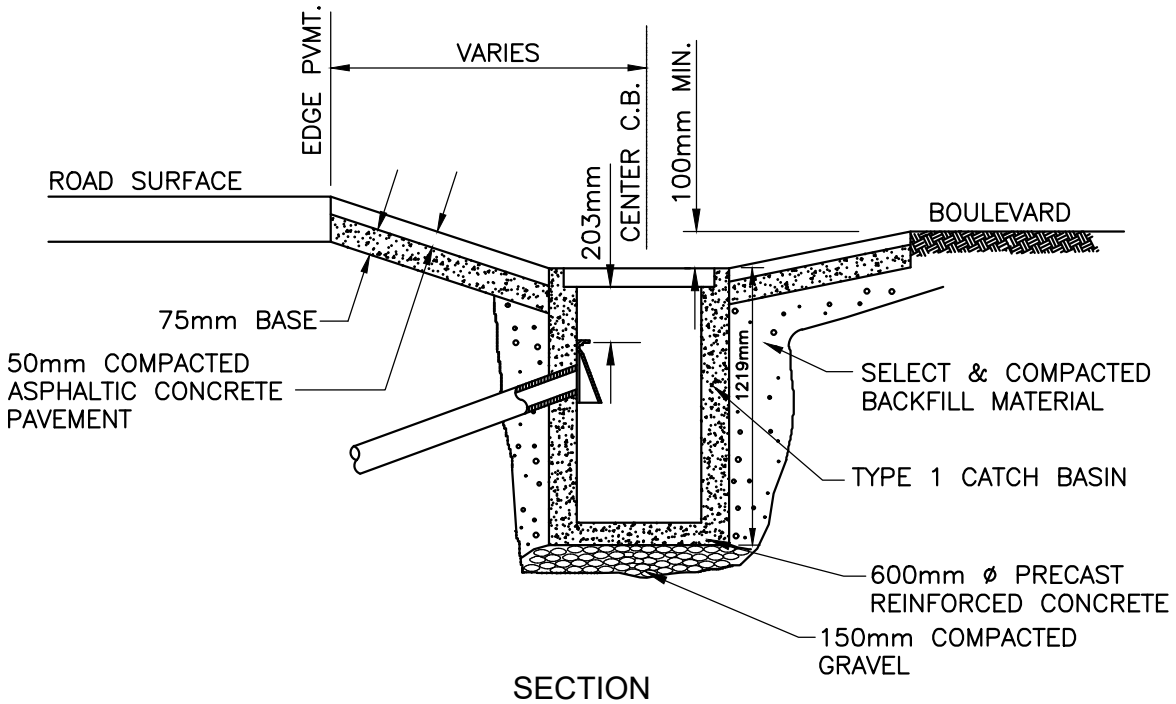
ABBOTSFORD

DRAWN:	1971 09 12
REVISED:	2011 04 18
APPROVED BY:	

CS - D - 6



PLAN

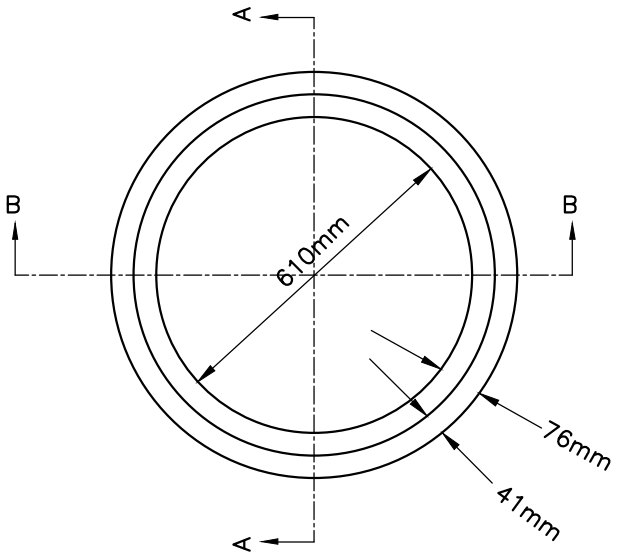


SECTION

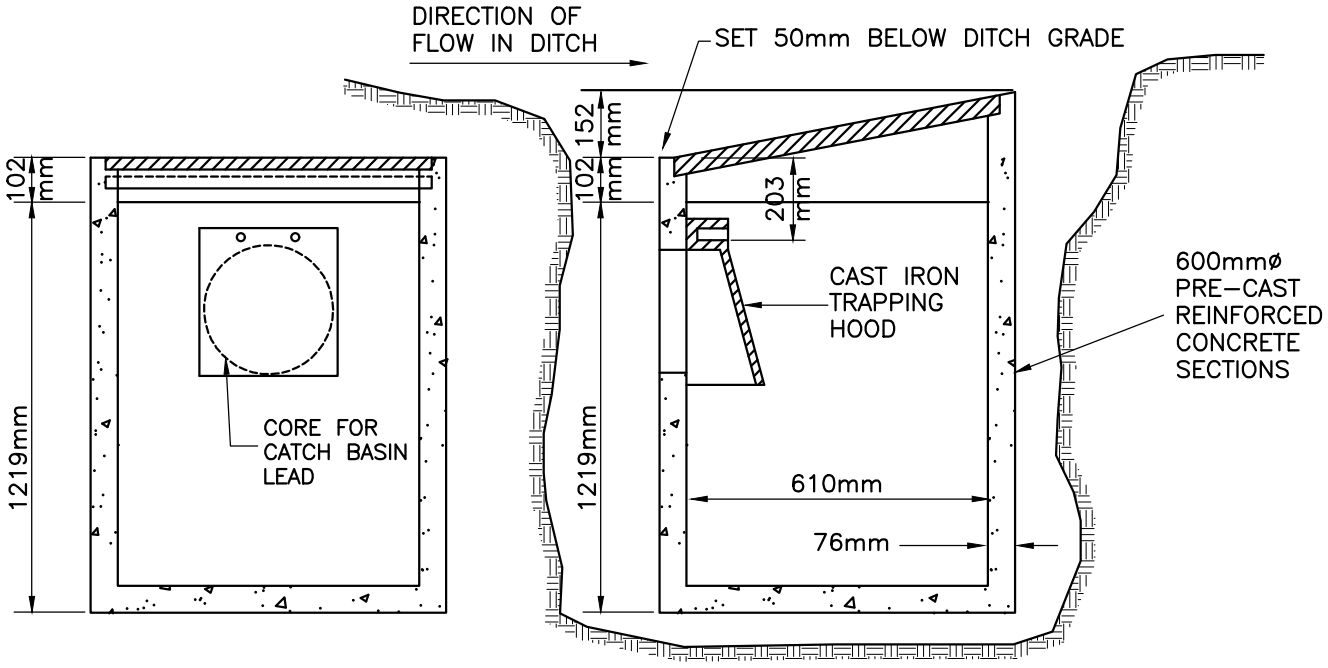
TYPICAL CATCH BASIN WITH SWALE CONSTRUCTION

ABBOTSFORD

DRAWN:	1971 09 12
REVISED:	2005 03 01
APPROVED BY:	
	CS - D - 7



PLAN



SECTION A-A

SECTION B-B

NOTE:
USE SAME GRATE AS FOR TYPE I C.B.'S – DOBNEY B–22 OR EQUIVALENT

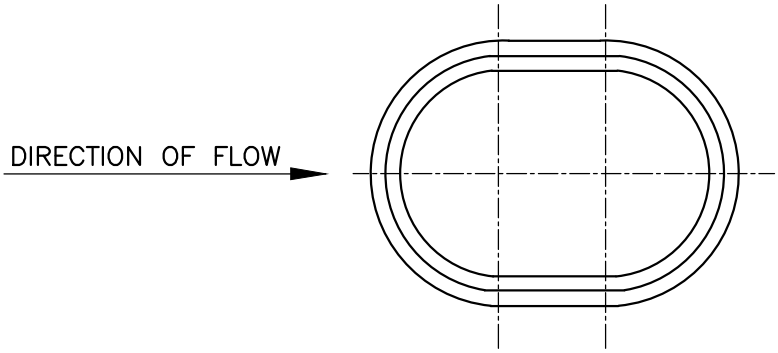
SEE CS–D–9 FOR INSTALLATION

DITCH CATCH BASIN TYPE II

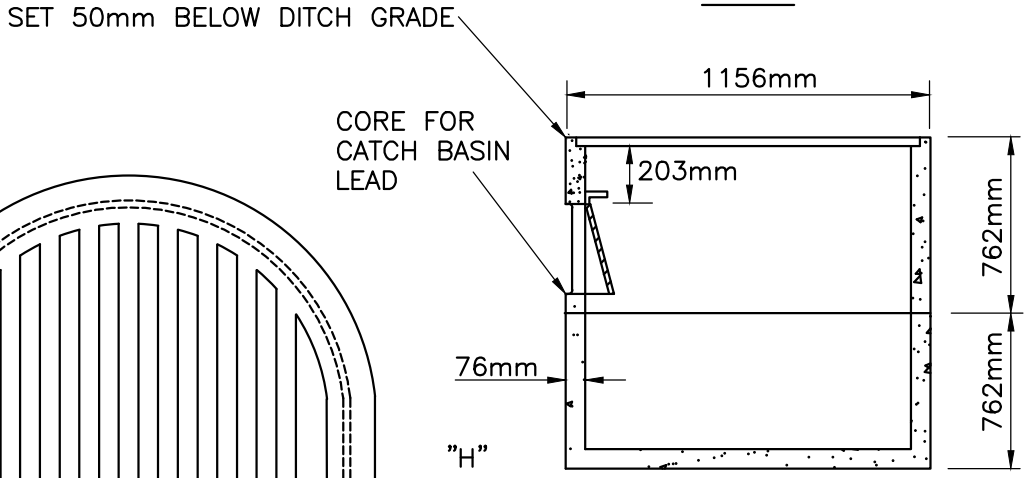
ABBOTSFORD

DRAWN:	1971 07 12
REVISED:	2011 04 18
APPROVED BY:	

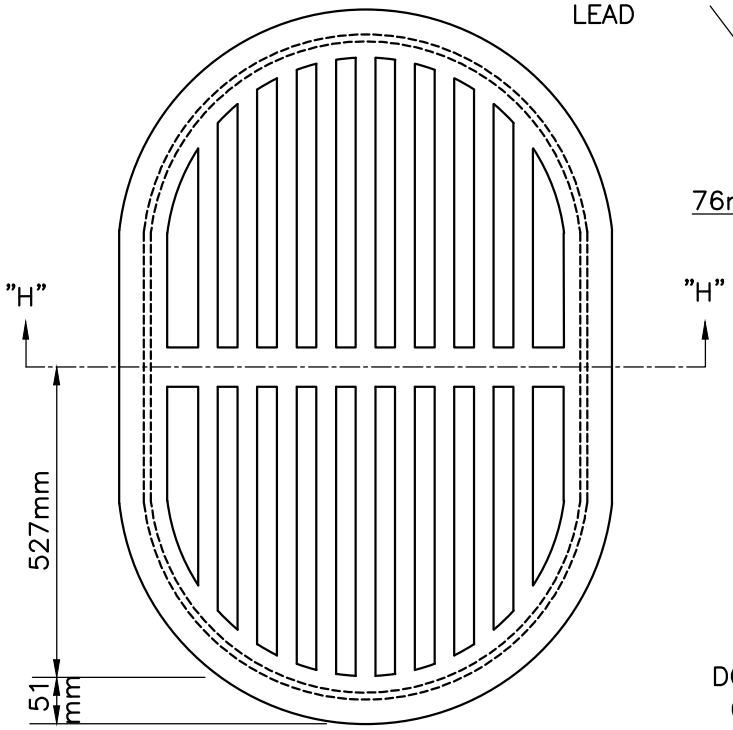
CS - D - 8



PLAN

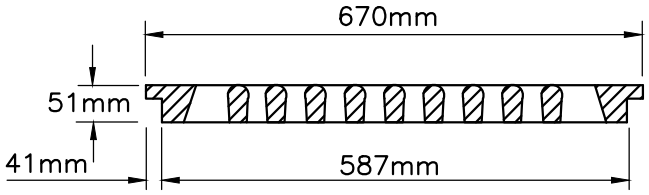


SECTION



GRATE FOR TYPE III CATCH BASINS

DOBNEY FDRY. B–17 OR EQUIVALENT SEE CS–D–9/10 FOR INSTALLATION DETAILS



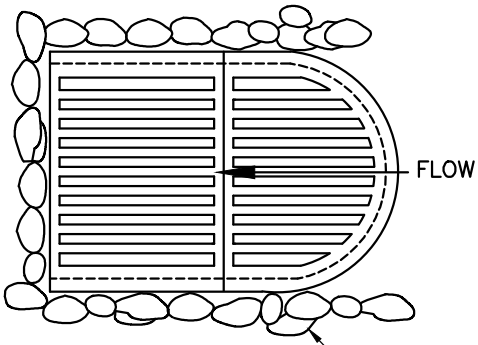
SECTION "H-H"

DITCH CATCH BASIN TYPE III FOR LATERAL DITCHES (GRADES OF 5% & LESS)

ABBOTSFORD

DRAWN:	1971 09 12
REVISED:	2011 04 18
APPROVED BY:	

CS - D - 9



PLAN

USE DELTALOK BAGS
OR EQUIVALENT

300mm
MIN.

DIA. AS PER
CONTRACT DWGS.

NO TRAPPING
HOOD HERE

OR VARYING HEIGHTS
OF SECTIONS AS DIRECTED

762mm

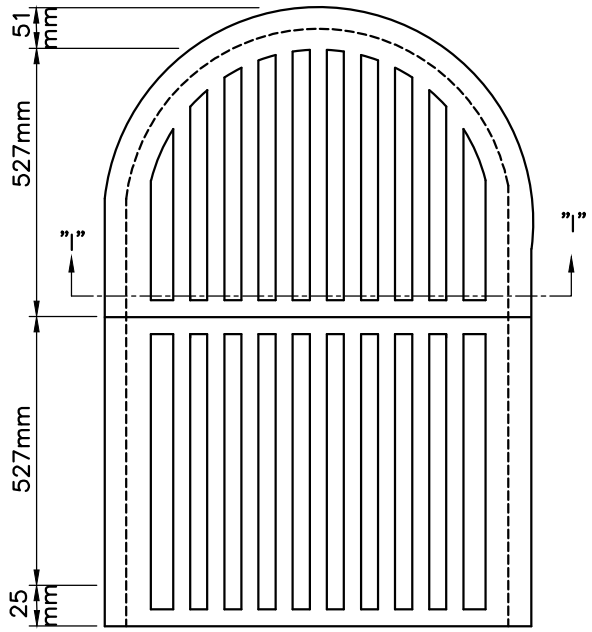
762mm

CB LEAD

76mm

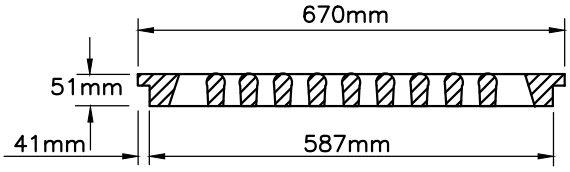
SECTION

SEE CS–D–9/10 FOR
INSTALLATION DETAILS



GRATE FOR TYPE IV
CATCH BASIN

DOBNEY FDRY. B–17 OR EQUIVALENT



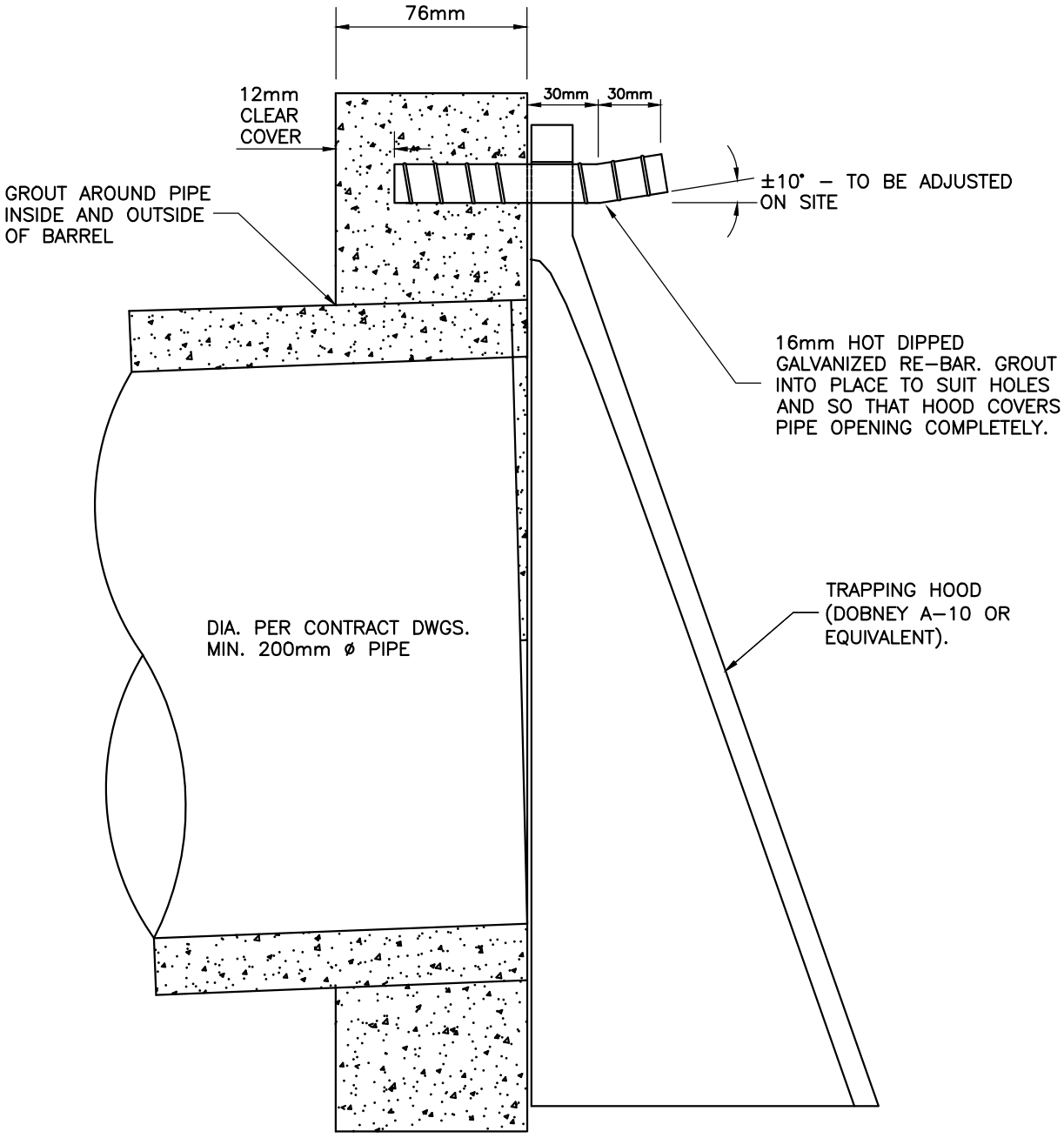
SECTION "I-I"

DITCH CATCH BASIN TYPE IV FOR LATERAL DITCHES (GRADES OVER 5%)

ABBOTSFORD

DRAWN:	1971 09 12
REVISED:	2021 09 09
APPROVED BY:	

CS - D - 10

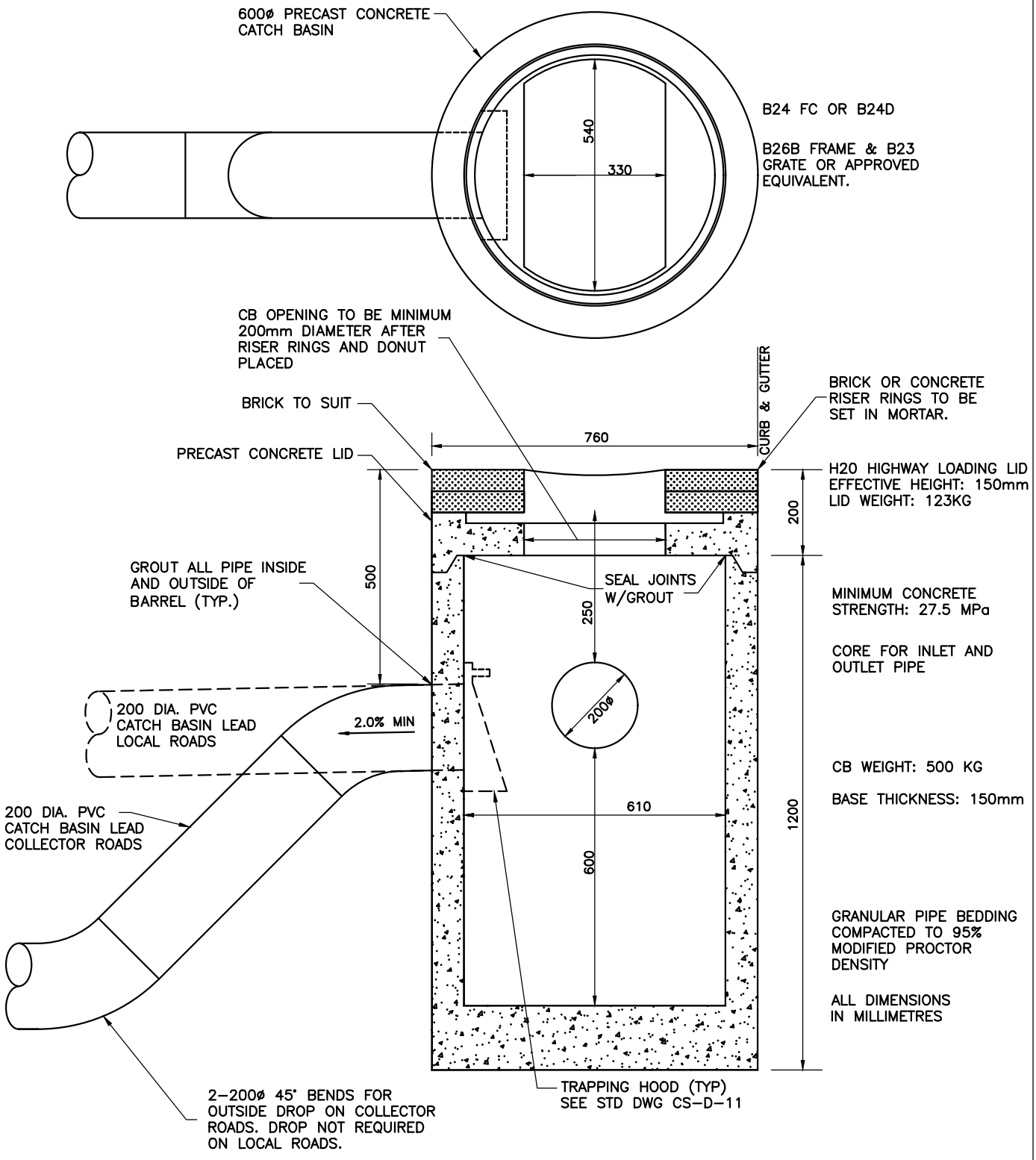


TRAPPING HOOD

ABBOTSFORD

DRAWN:	1978 09 27
REVISED:	2021 09 09
APPROVED BY:	

CS - D - 11

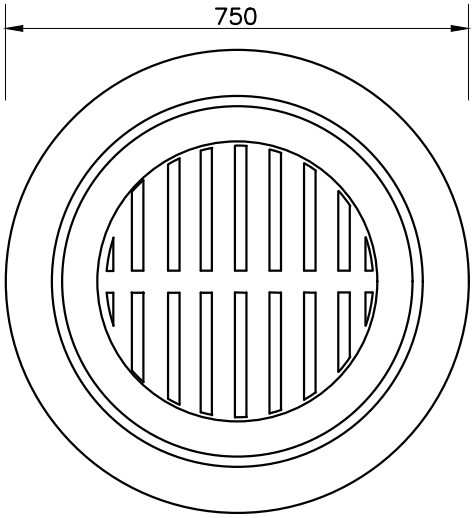


STANDARD TOP INLET 600mm x 1200mm CATCH BASIN

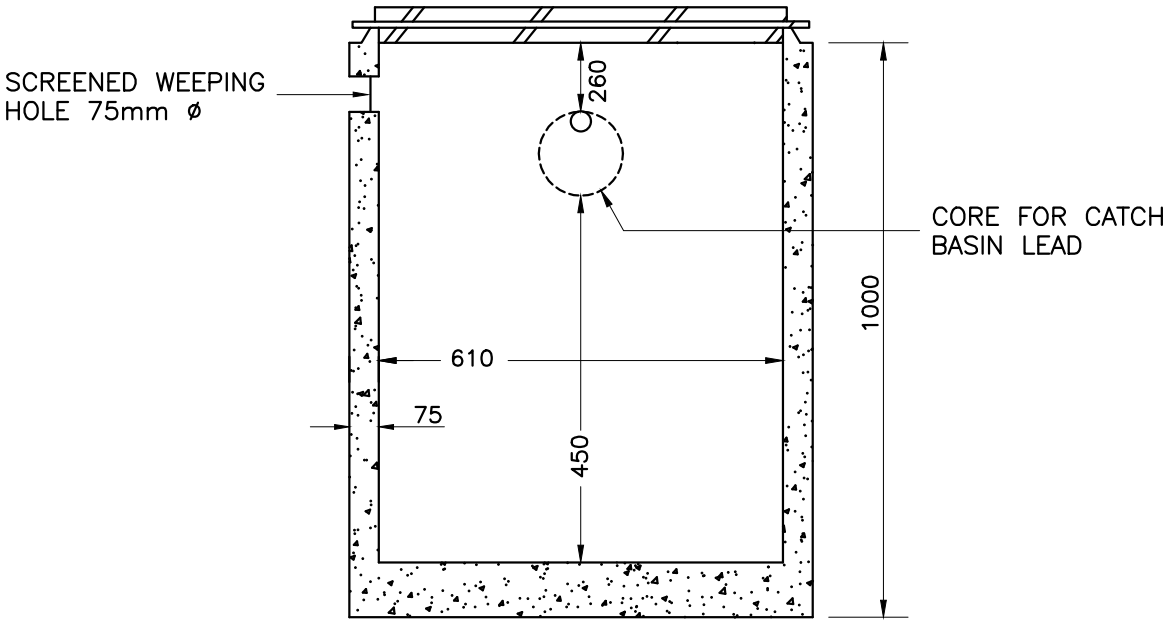
ABBOTSFORD

DRAWN:	1991 07 07
REVISED:	2021 09 09
APPROVED BY:	

CS - D - 12



LANGLEY BJ26B CONCRETE GROUP FRAME & GRATE SHOWN H20 LOAD RATING EFFECTIVE HEIGHT OF CASTING: 65mm OR EQUIVALENT



ALL DIMENSIONS IN MILLIMETRES

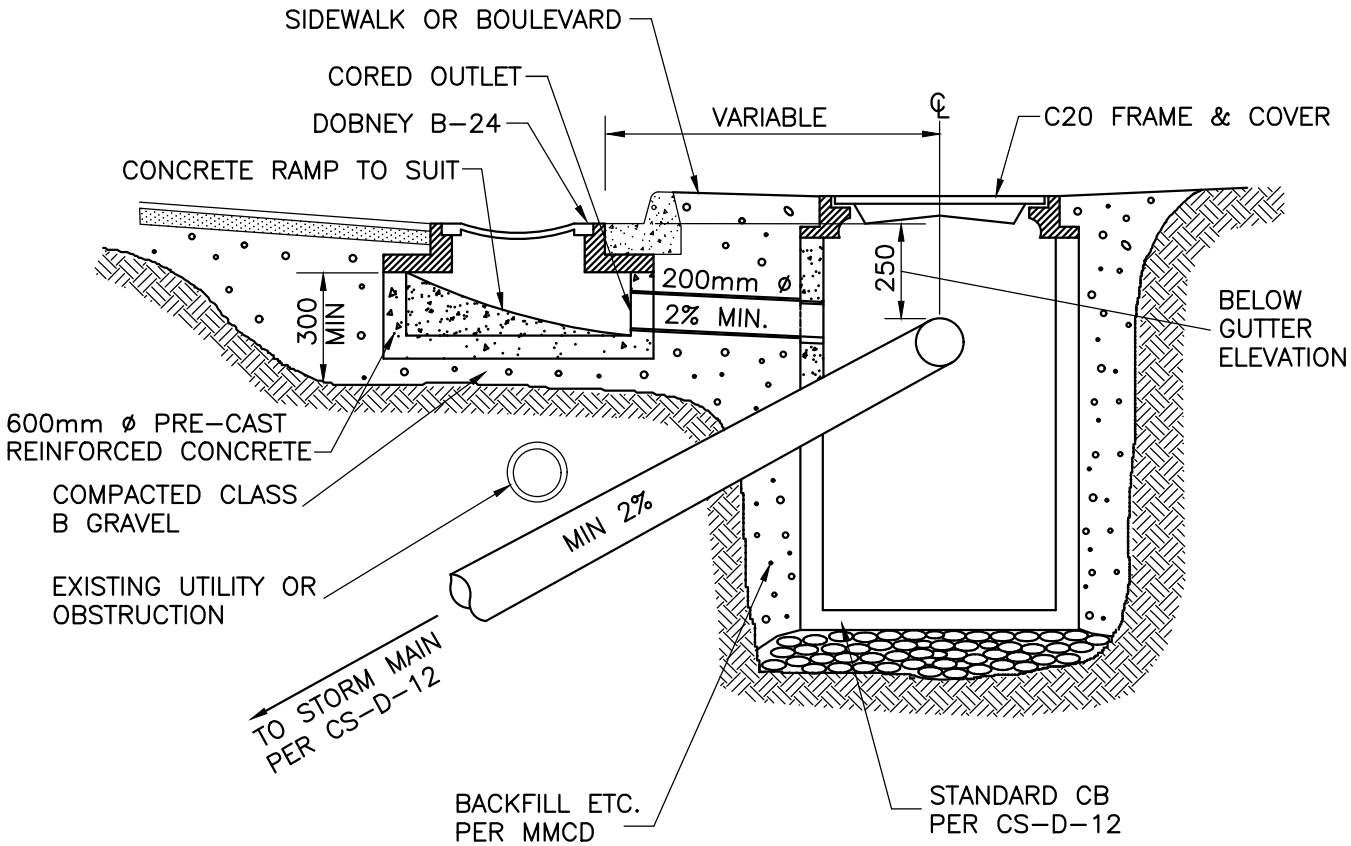
NOTES:
1. RECOMMENDED FOR PARKING LOT APPLICATIONS
2. MIN. CONCRETE STRENGTH: 27.5 MPa.
3. COMES WITH 150mm BASE, 200mm CORE, 75mm WEEPING HOLE.
4. APPROX. WEIGHT: 500 KG

STANDARD 600x1000mm (NOMINAL) CATCH BASIN NO CURB & PARKING LOT APPLICATION

ABBOTSFORD

DRAWN:	1991 07 07
REVISED:	2021 09 09
APPROVED BY:	

CS - D - 13



NOTE:

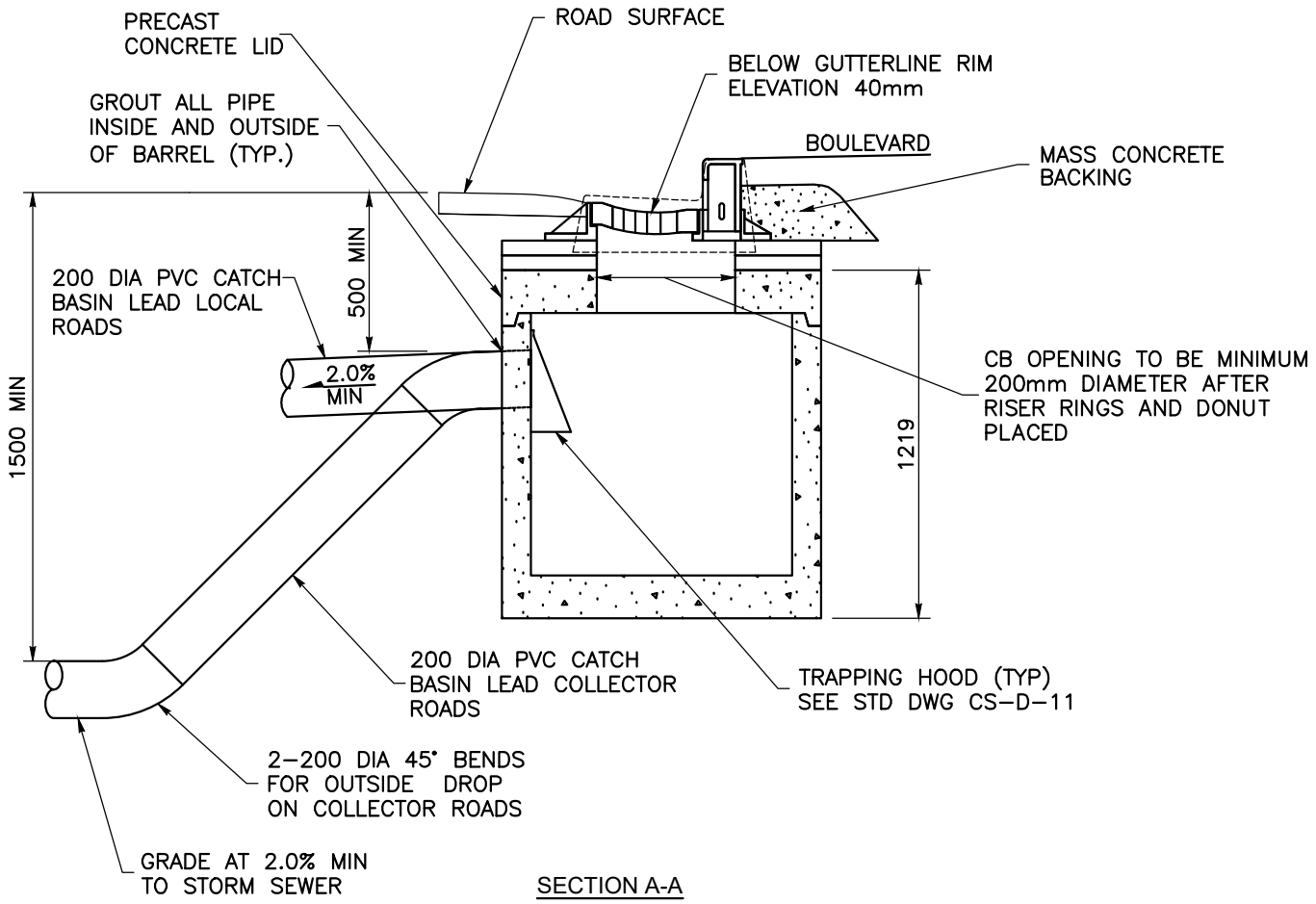
GROUT AL PIPE CONNECTIONS INSIDE AND OUTSIDE OF BARREL

TYPICAL CATCHBASIN CONSTRUCTION (WHERE SHALLOW C.B. IS REQUIRED)

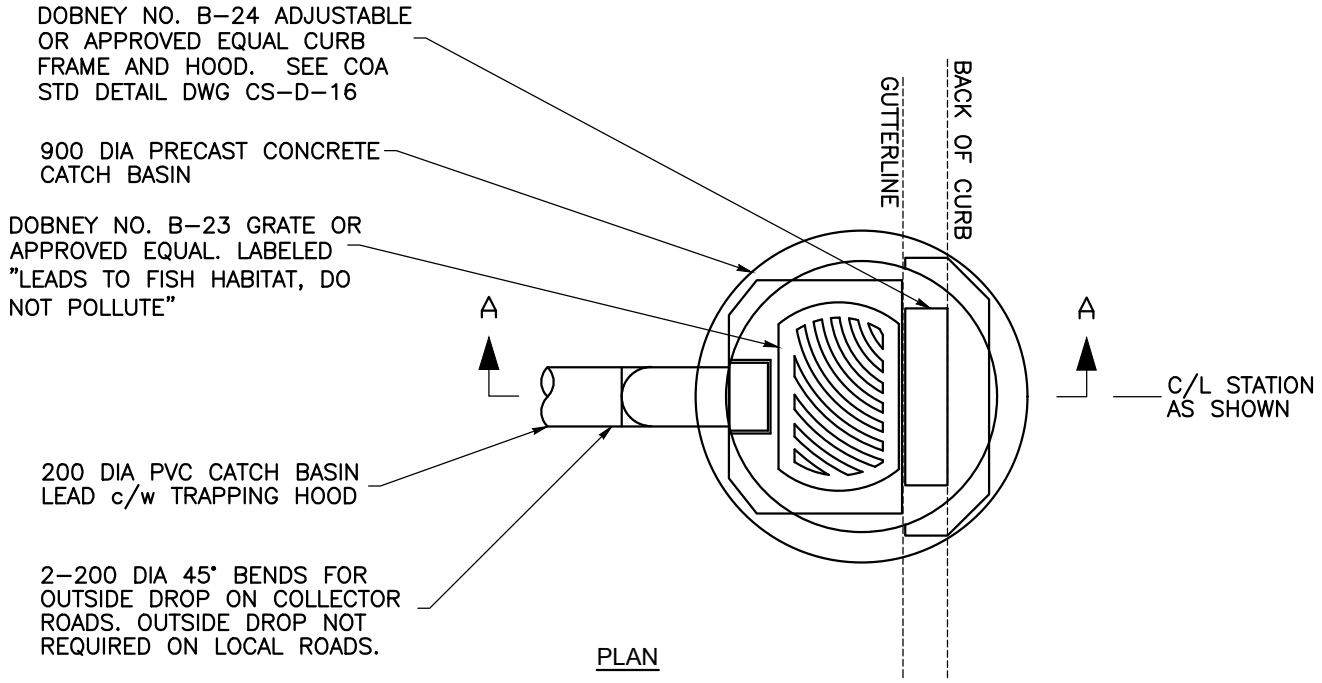
ABBOTSFORD

DRAWN:	1972 07 16
REVISED:	2021 09 09
APPROVED BY:	

CS - D - 14



SECTION A-A



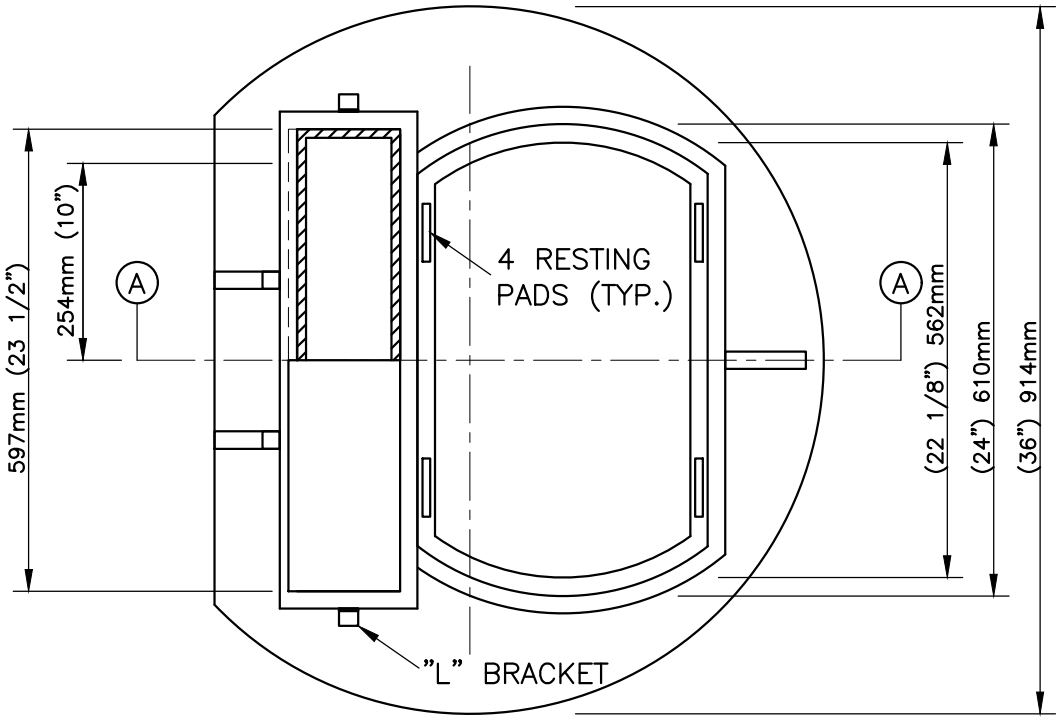
PLAN

STANDARD SIDE INLET CATCH BASIN

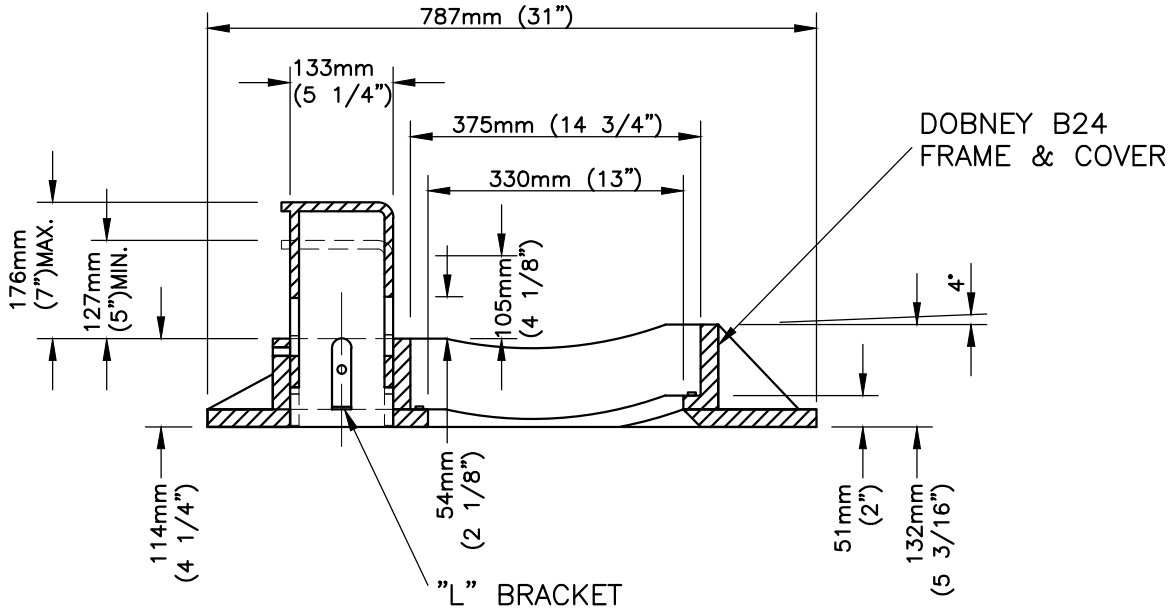
ABBOTSFORD

DRAWN:	1991 07 07
REVISED:	2021 09 09
APPROVED BY:	

CS - D - 15



TOP VIEW
Scale: N.T.S.



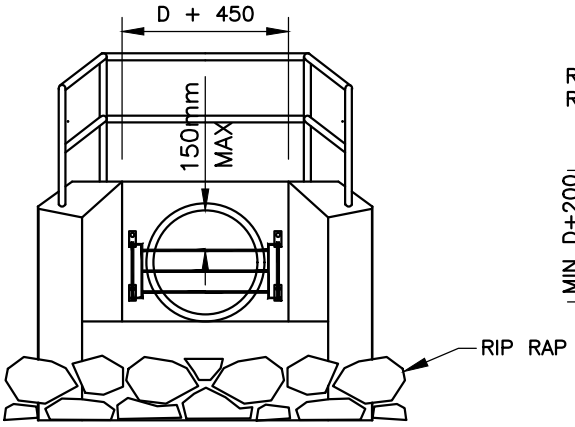
SECTION VIEW A–A
Scale: N.T.S.

SIDE INLET
CATCH BASIN FRAME

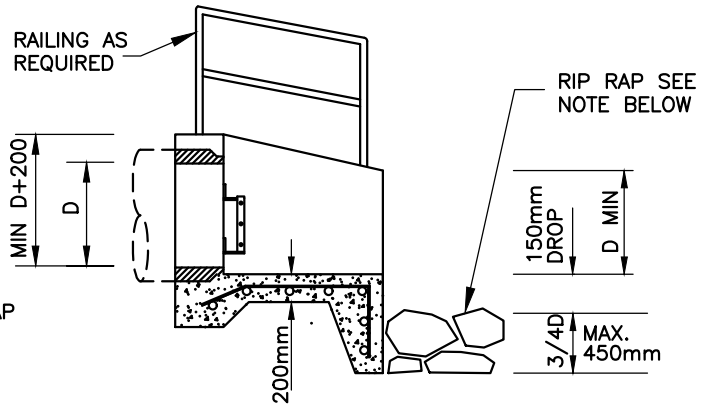
ABBOTSFORD

DRAWN:	2001 11 01
REVISED:	2011 04 18
APPROVED BY:	

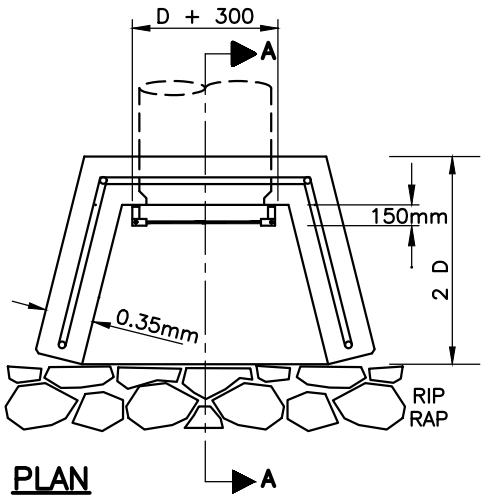
CS - D - 16



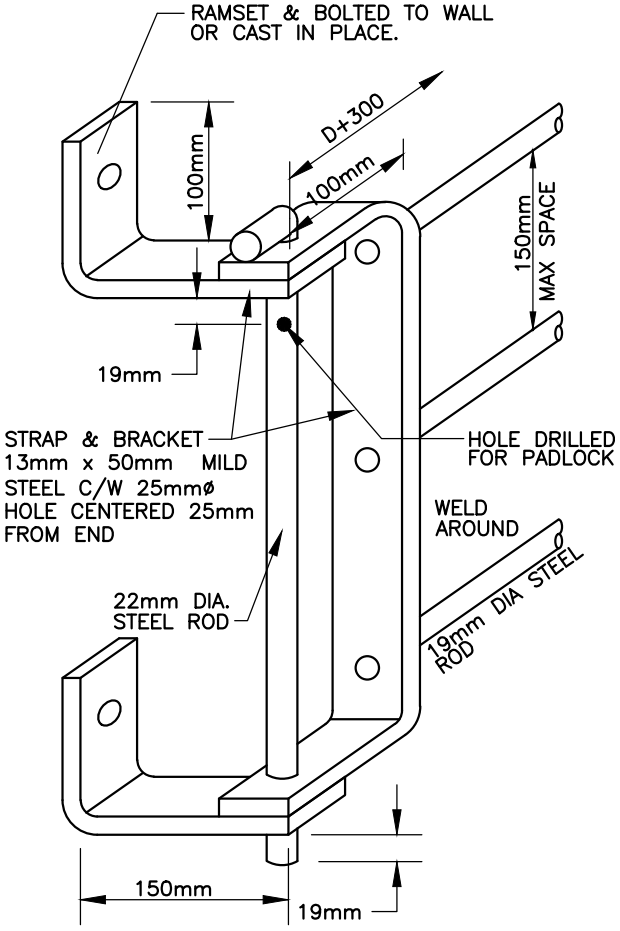
ELEVATION



SECTION A–A



PLAN



GRILL DETAIL

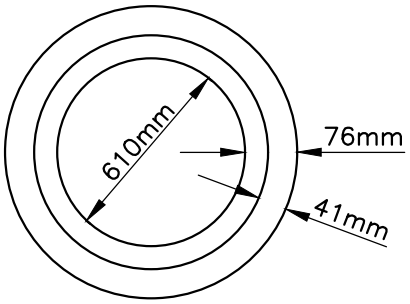
NOTES:

1. RIP RAP SUITABLY SIZED OR GABIONS C/W FILTER BED SHALL BE PLACED ON BOTTOM & SIDES TO DESIGN WATER LEVEL & DOWNSTREAM DISTANCE OF 1.5 TIMES THE DESIGN WATER VELOCITY (MIN. 1.0m).
2. PIPE SIZES LARGER THAN 1200mmø, WATER VELOCITIES GREATER THAN 2.13m/sec OR WALL HIGHER THAN 2.0m SHALL REQUIRE A SPECIAL DESIGN FOR THE STRUCTURE.
3. 10.0m REBAR @ 200mm BOTH WAYS & CENTER PLUS DESIGN FOR THE STRUCTURE.
4. CONCRETE TO BE 21 MPa @ 28 DAYS.
5. CHAMFER ALL EXPOSED CORNERS 25mm.
6. PLACE SUFFICIENT GRANULAR BACKFILL FOR DRAINAGE.
7. GRILLAGE NOT REQUIRED ON PIPE LESS THAN 375mmø.
8. ALL GRILLAGE MATERIAL TO BE GALVANIZED.

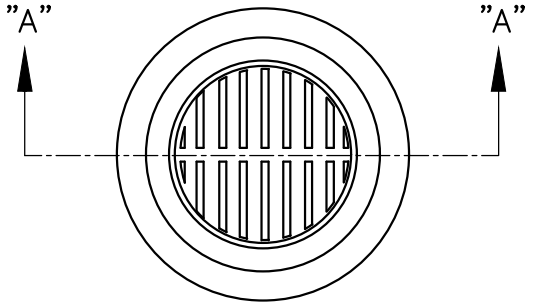
OUTLET STRUCTURE SAFETY GRILL

ABBOTSFORD

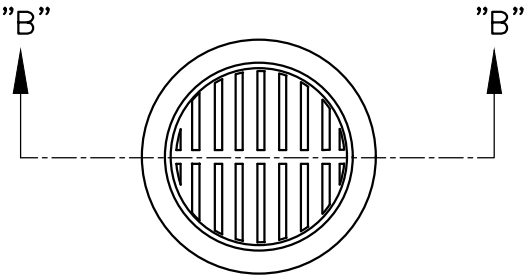
DRAWN:	1999 10 28
REVISED:	2021 09 09
APPROVED BY:	
	CS - D - 17



TOP VIEW – BARREL

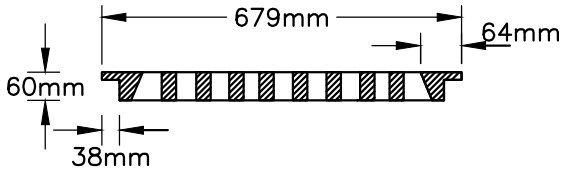


TOP VIEW – BARREL & GRATE



GRATE: DOBNEY FDRY NO. B–22 OR EQUIVALENT

TOP VIEW – GRATE



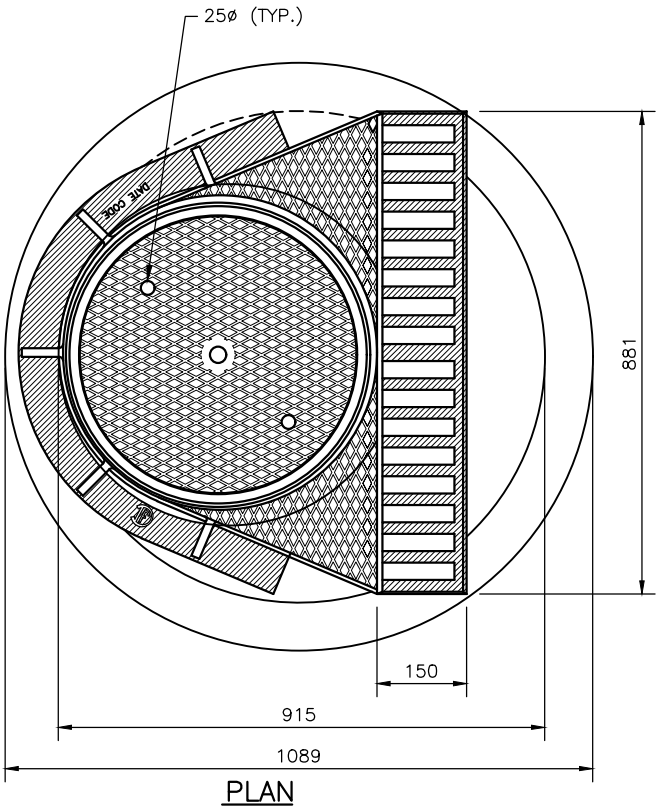
SECTION B–B

TYPICAL LAWN BASIN

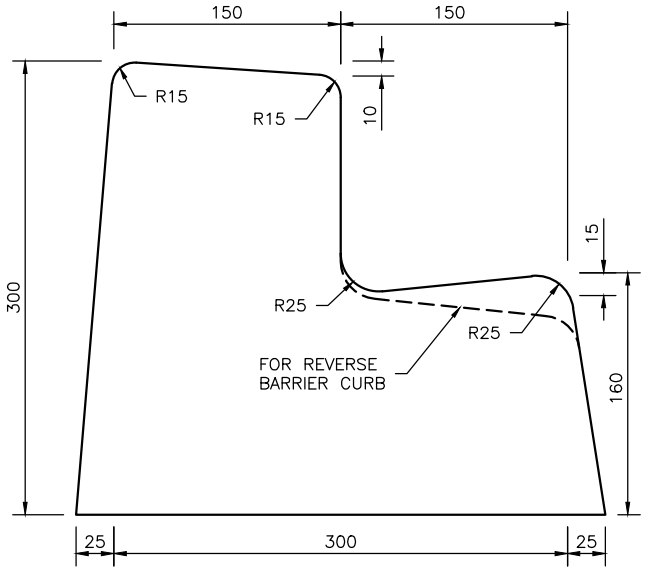
ABBOTSFORD

DRAWN:	1991 07 07
REVISED:	2005 11 01
APPROVED BY:	

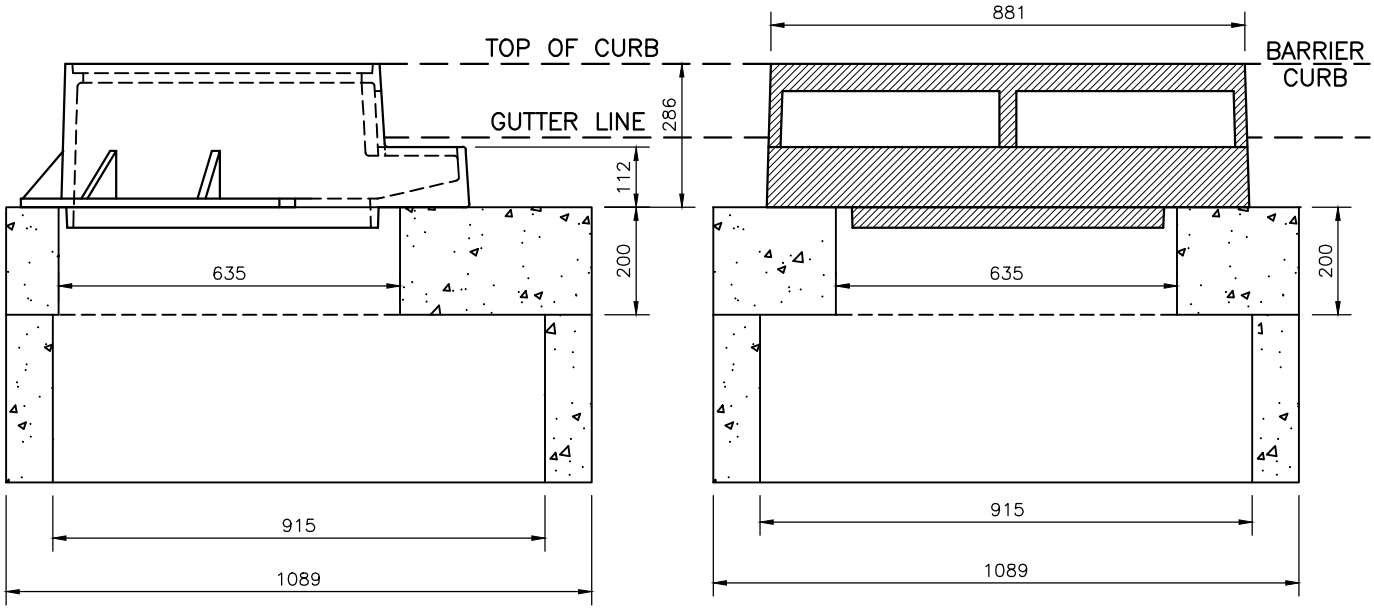
CS - D - 18



PLAN



BIKE FRIENDLY BARRIER CURB



SECTION

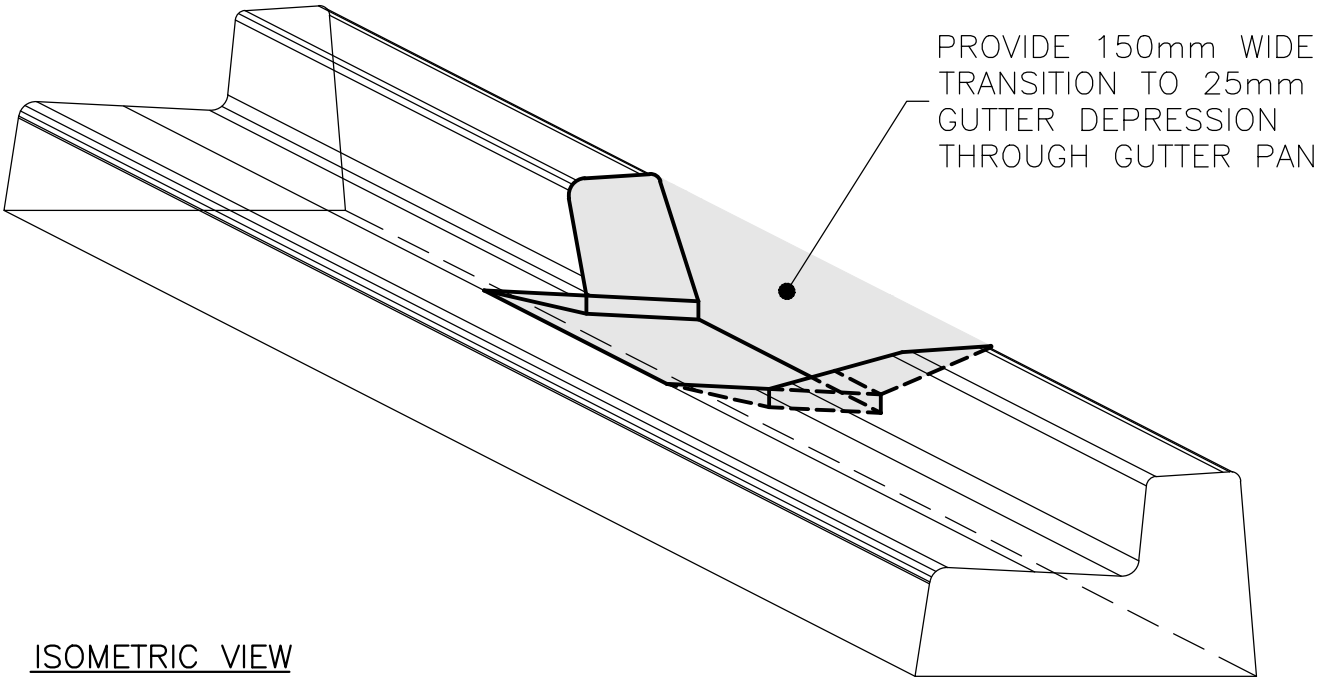
CURB VIEW

BIKE FRIENDLY CATCH BASIN

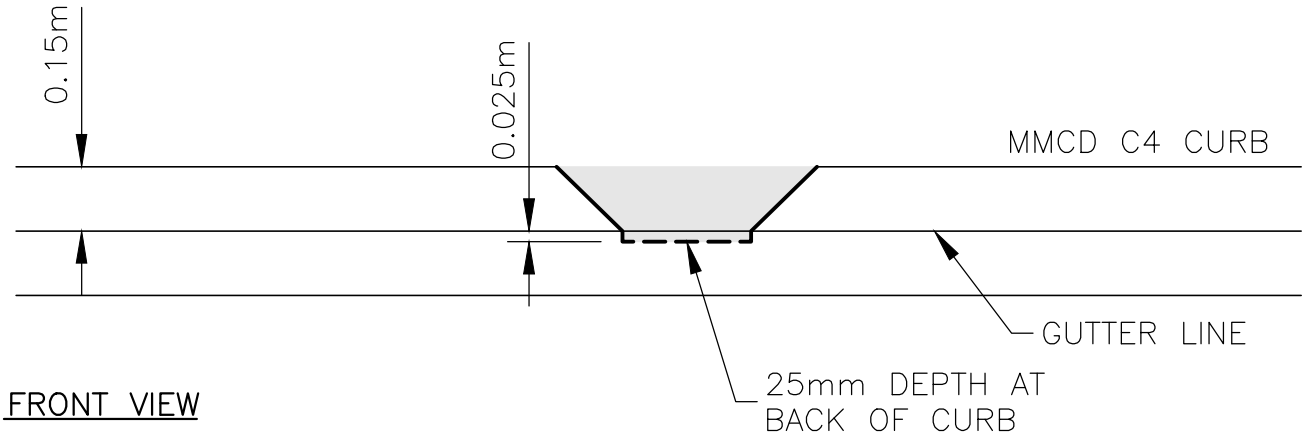
ABBOTSFORD

DRAWN:	2021 09 09
REVISED:	
APPROVED BY:	

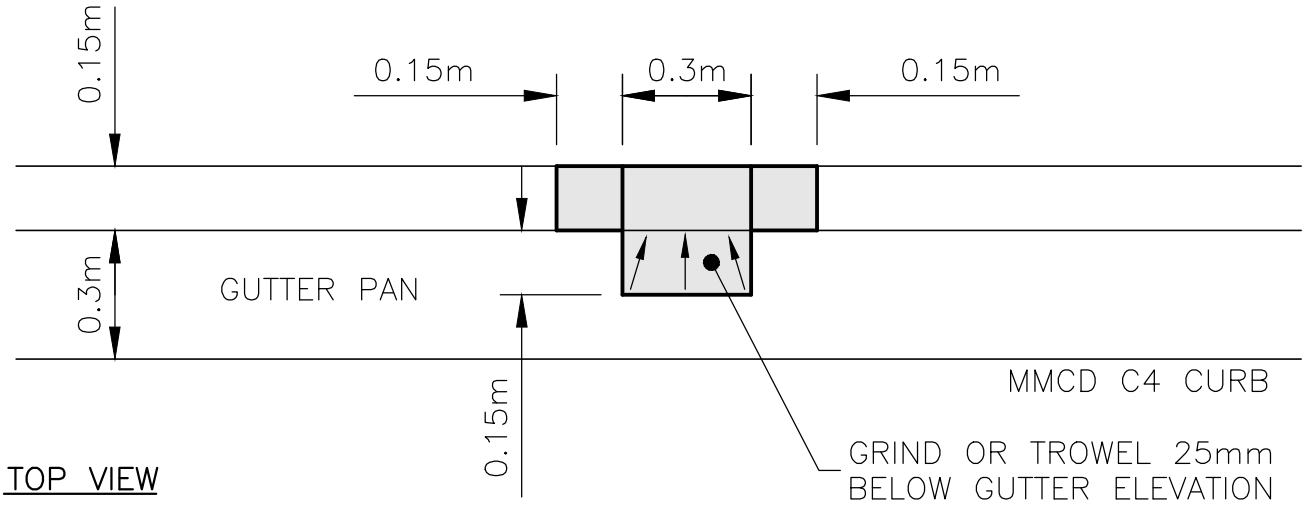
CS - D - 19



ISOMETRIC VIEW



FRONT VIEW



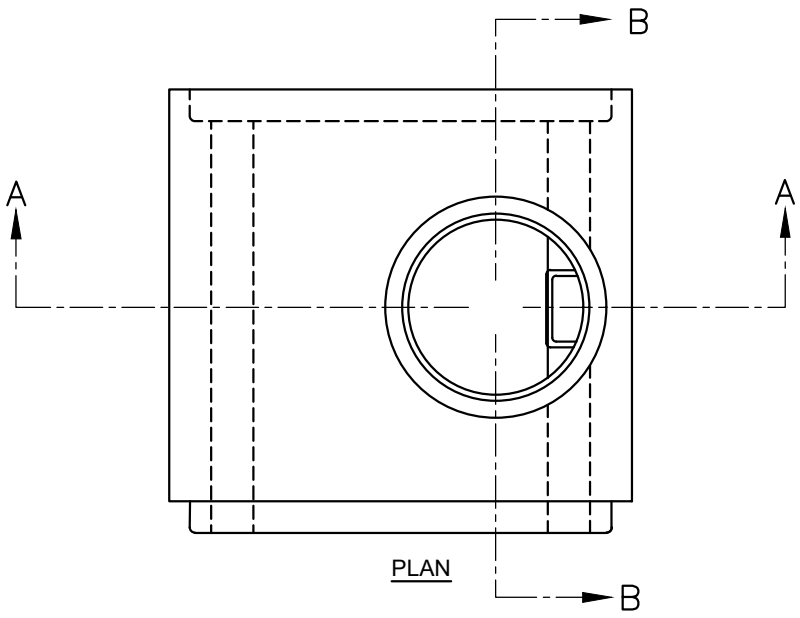
TOP VIEW

CURB CUT DETAIL

ABBOTSFORD

DRAWN:	2021 09 09
REVISED:	
APPROVED BY:	

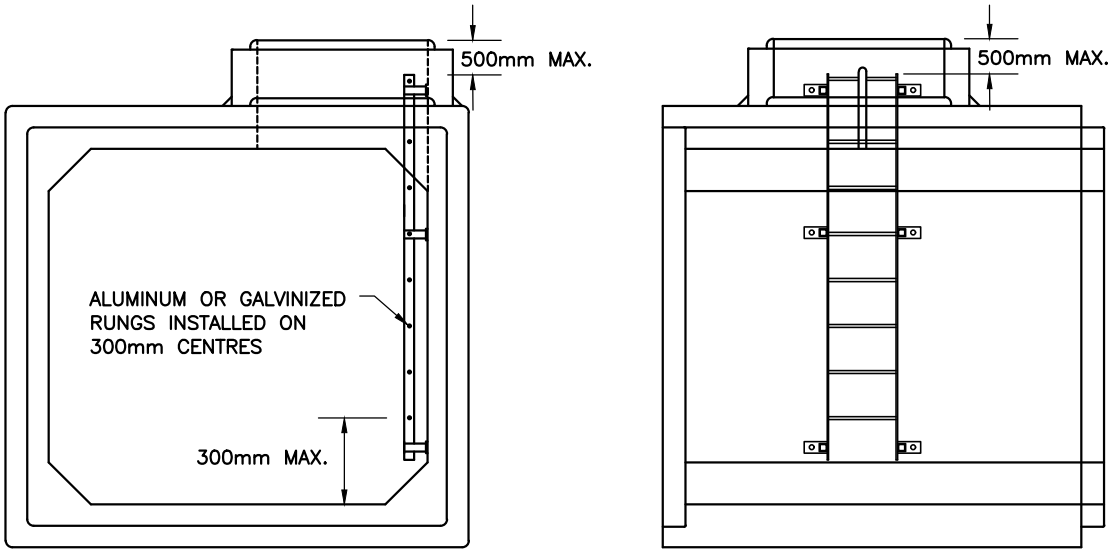
CS - D - 20



PLAN

STANDARD MANHOLE FRAME & COVER
– DOBNEY C–20 OR EQUIVALENT
– ON 1050mm DIA. BARREL MIN.

EXTRACTION MANHOLE FRAME & COVER
– DOBNEY C–22 OR EQUIVALENT
– 1200mm DIAMETER BARREL MIN.



SECTION A-A

SECTION B-B

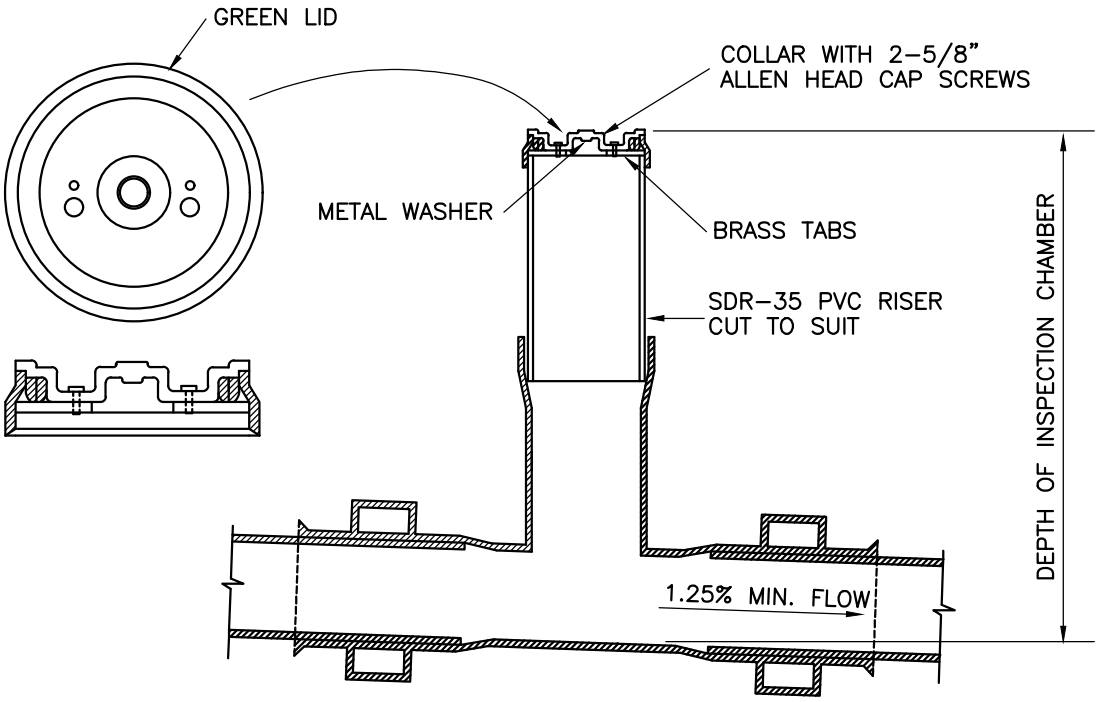
FOR EXTRACTION MANHOLE USE LADDER WITH
"LADDER–UP" APPARATUS OR EQUIVALENT.

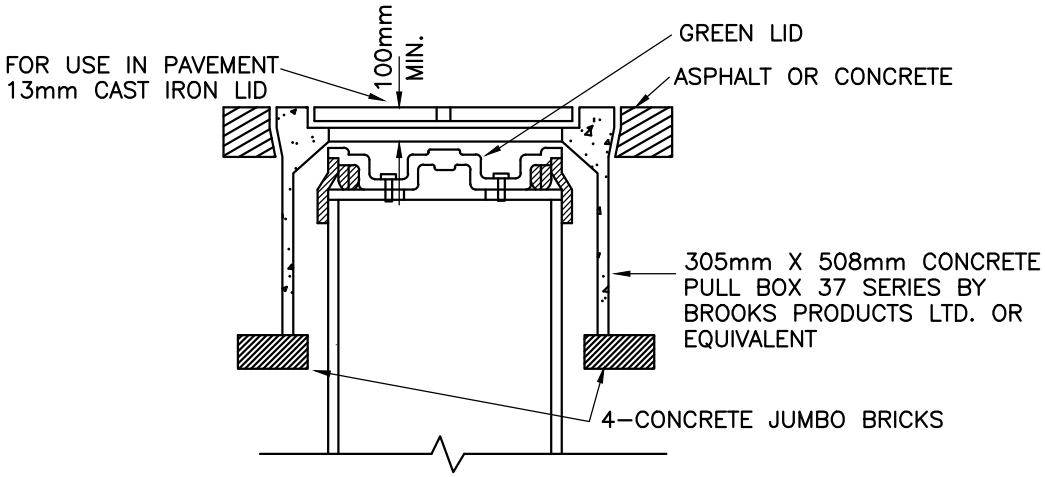
ACCESS MANHOLE IN STORM DETENTION TANK

ABBOTSFORD

DRAWN:	1995 02 14
REVISED:	2011 04 18
APPROVED BY:	

CS - D - 21





INSTALLATION OF INSPECTION CHAMBER
IN METER BOX AT P/L

NOTE:

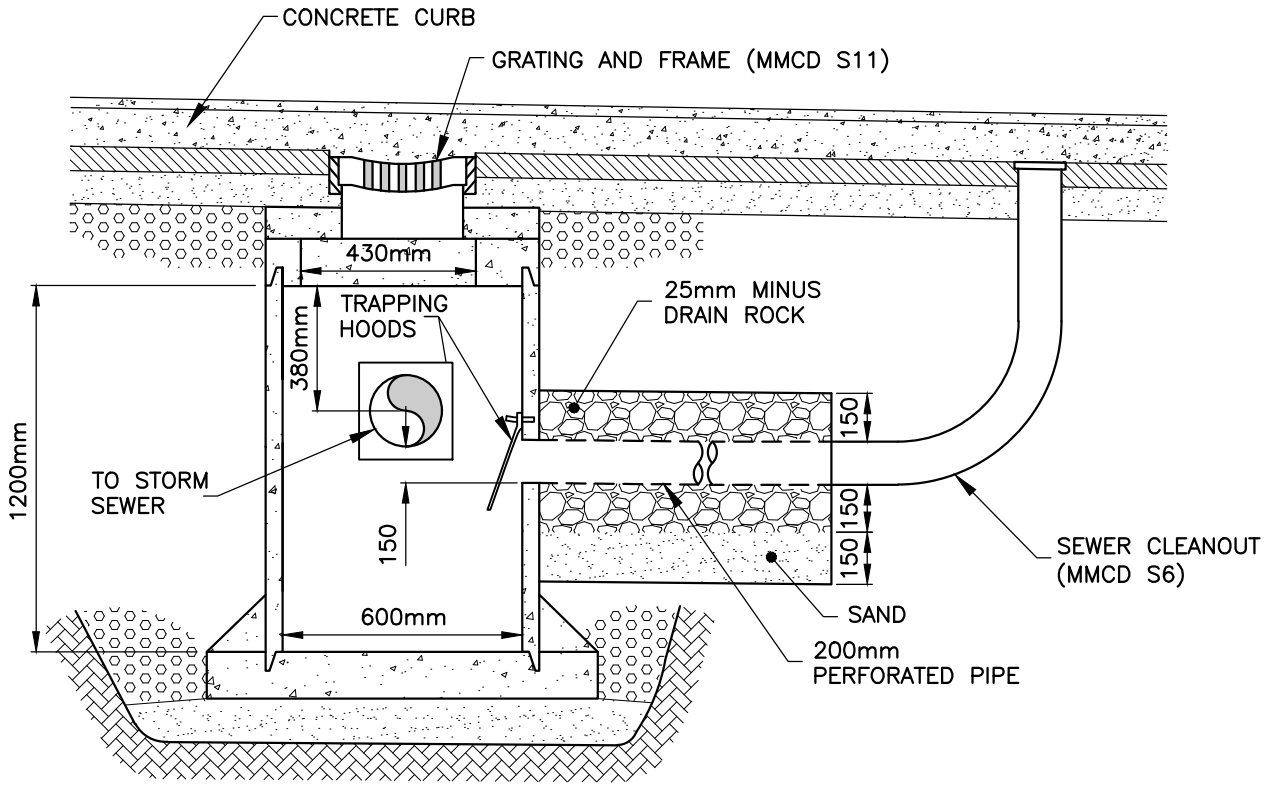
1. I.C. TO COME WITH ARROW INDICATING DIRECTION OF FLOW AND BE INJECTION MOLDED AS MANUFACTURED BY LERON PLASTICS OR GALAXY PLASTICS LTD OR EQUIVALENT.

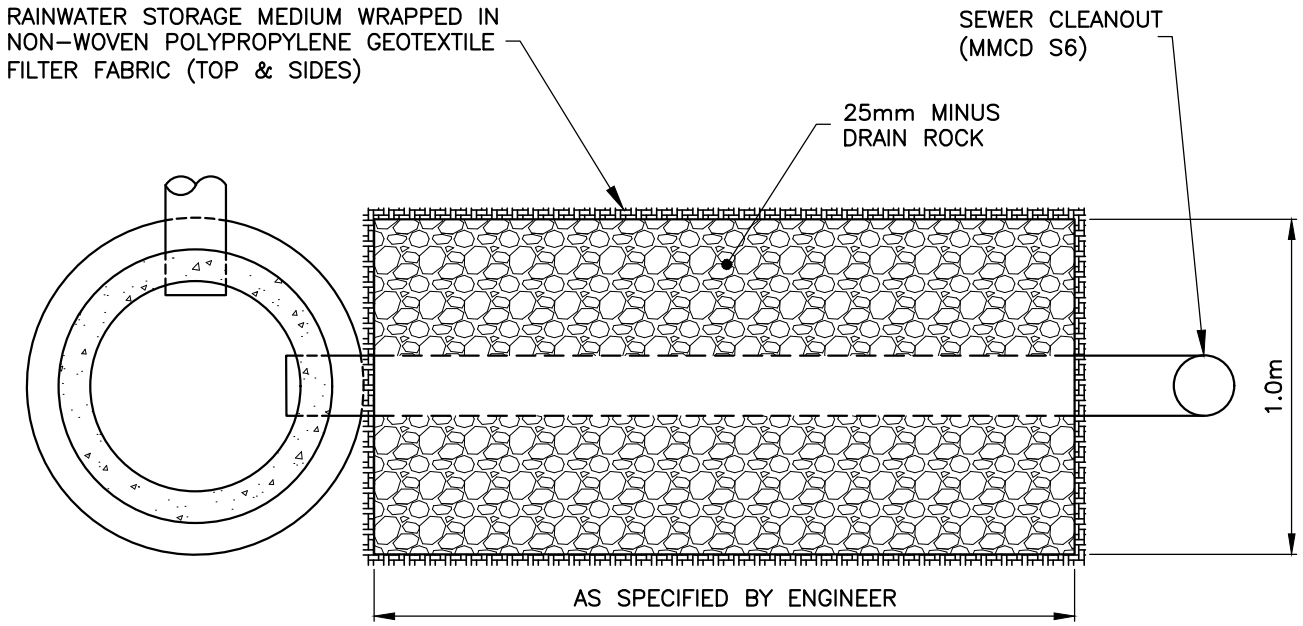
2. BACK FLOW PREVENTER SOCKET REQUIRED

STORM SEWER INSPECTION CHAMBER FOR SERVICE CONNECTION

ABBOTSFORD

DRAWN:	2011 04 18
REVISED:	2021 09 09
APPROVED BY:	
	CS - D - 22





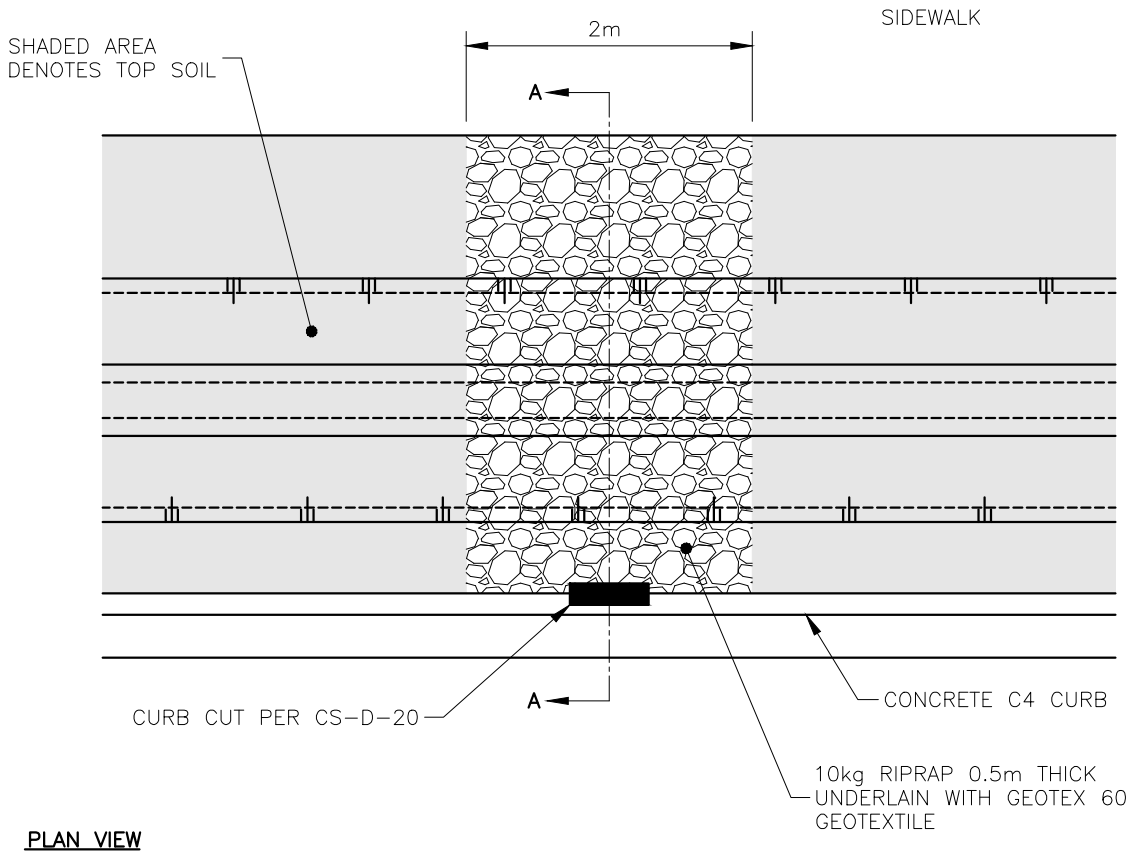
NOTE:

1. IN NEW DEVELOPMENTS, INFILTRATION PIPE TO BE PLUGGED AT CATCH-BASIN UNTIL TOP LIFT OF ASPHALT IS PLACED ON ROAD.
2. MANHOLE TO BE GROUTED BETWEEN PRECAST SECTION AND DONUT.

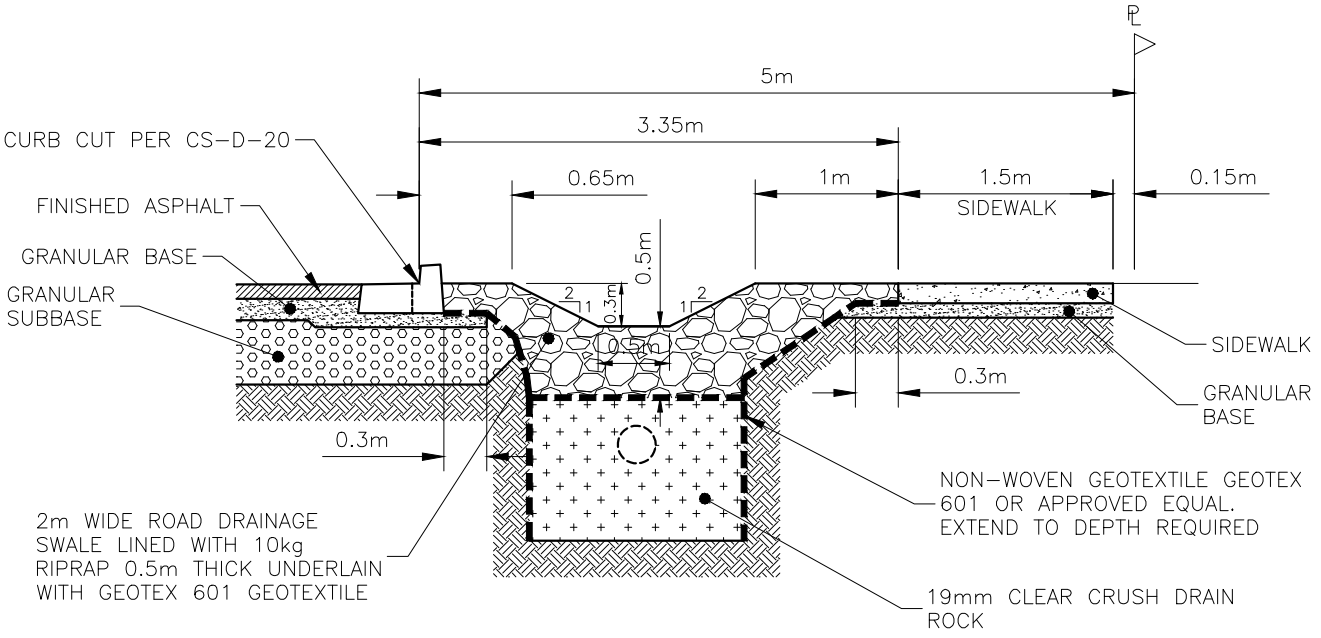
INFILTRATION CATCH BASIN WITH OVERFLOW

ABBOTSFORD

DRAWN:	2011 04 18
REVISED:	2021 09 09
APPROVED BY:	
	CS - D - 23



PLAN VIEW



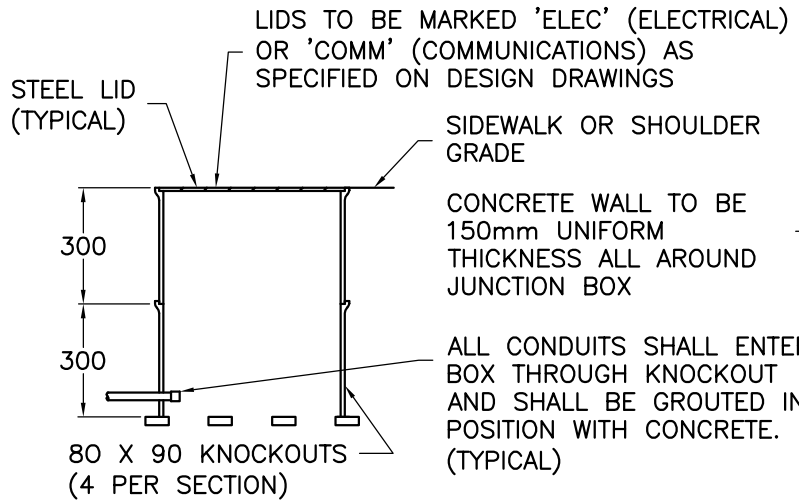
SECTION A-A

RAIN GARDEN / BIOSWALE INLET

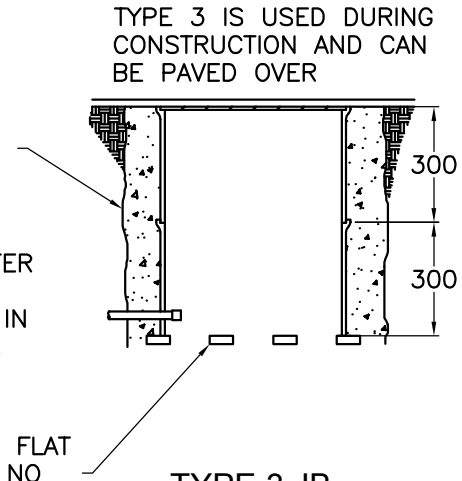
ABBOTSFORD

DRAWN:	2011 04 18
REVISED:	2021 09 09
APPROVED BY:	

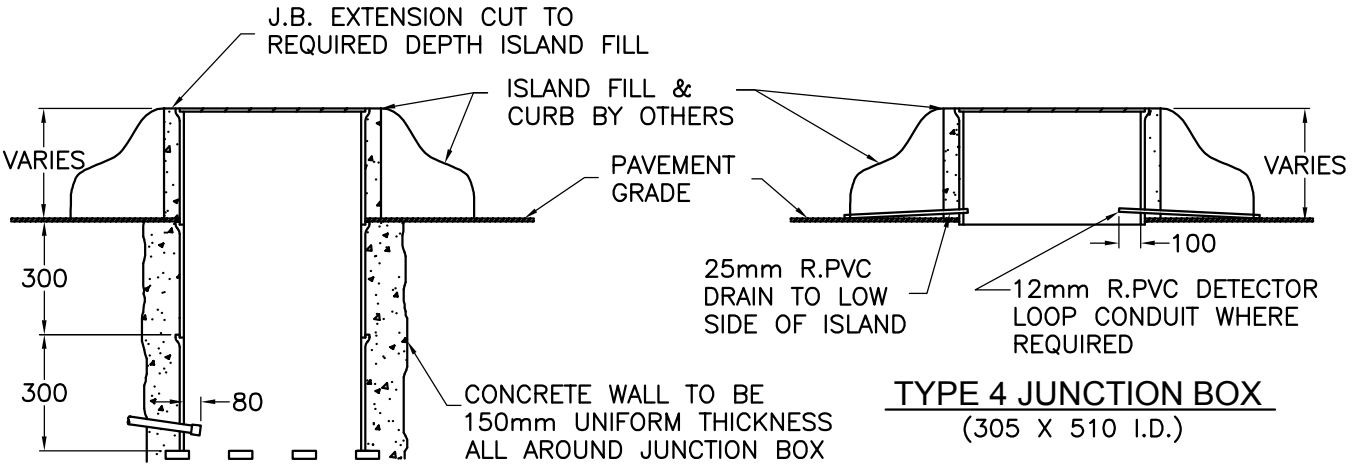
CS - D - 24



TYPE 1 JB
(305 X 510 I.D.)

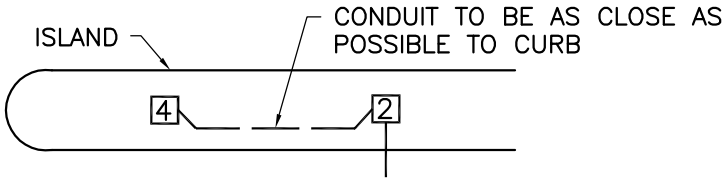


TYPE 3 JB
(305 X 510 I.D.)



TYPE 4 JUNCTION BOX
(305 X 510 I.D.)

TYPE 2 JUNCTION BOX
(305 X 510 I.D.)



DETAIL OF CONDUIT IN ISLAND

NOTE:

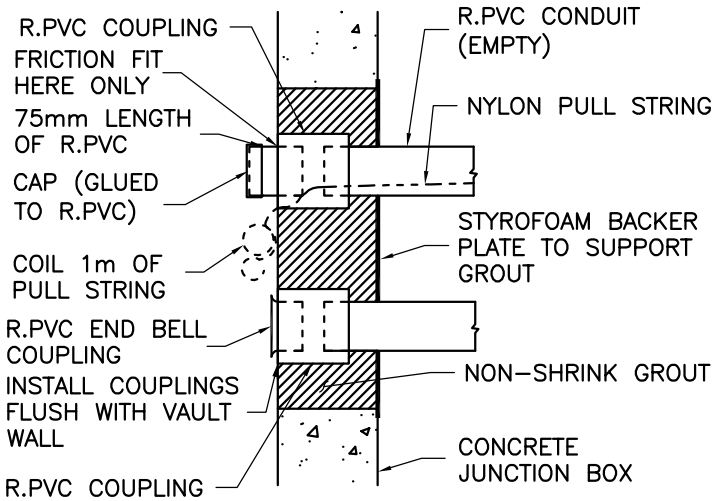
TYPES 1, 2, 3 & 4 J.B.'S SHALL BE A.E.
CONCRETE No.37 TYPE (OR APPROVED EQUAL)

JUNCTION BOX DETAILS OPEN BOTTOM (CONCRETE)

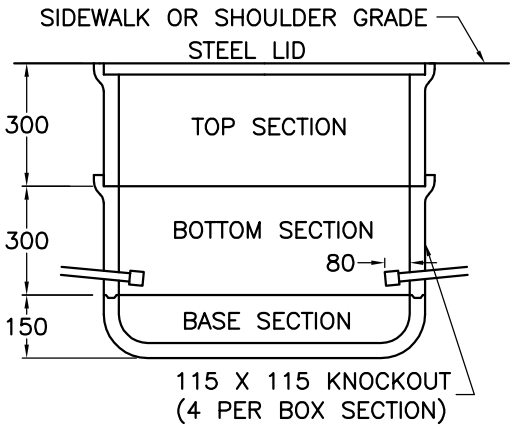
ABBOTSFORD

DRAWN:	2000 01 04
REVISED:	2006 03 27
APPROVED BY:	

CS - E - 1

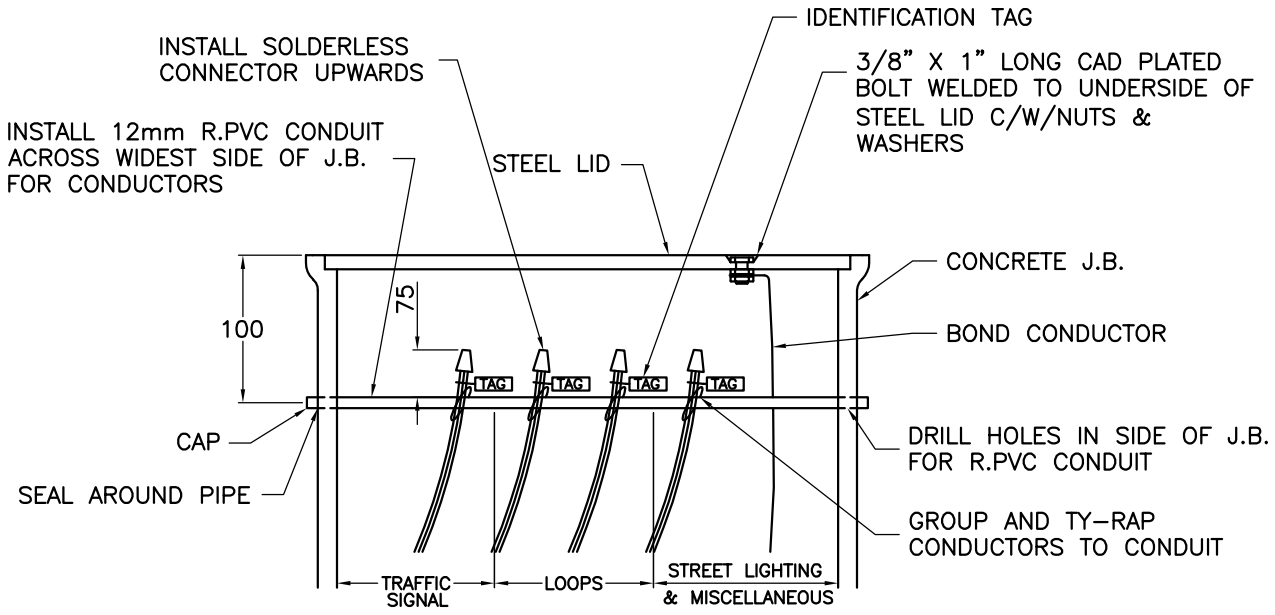


CONDUIT ENTRY TO J.B.



NOTE: TYPE 5 J.B. SHALL BE A.E. CONCRETE No.66 TYPE (OR APPROVED EQUAL)

TYPE 5 JUNCTION BOX
(430 X 760 I.D.)



CONDUCTORS IN J.B.'S

NOTE:

1. LEAVE 1.0m OF SLACK FOR ALL CONDUCTORS IN JUNCTION BOX.

2. GROUP & BUNDLE ALL CONDUCTORS SEPARATELY AS FOLLOWS:
   - DETECTOR LOOP CABLES
   - SIGNAL CONDUCTORS
   - LIGHTING & MISCELLANEOUS CONDUCTORS

3. IDENTIFICATION TAGS SHALL BE NEATLY MARKED WITH A BLACK INDELIBLE PEN.

4. CONDUCTOR SPLICES SHALL BE TAPED (6 WRAPS) AND DOUBLE DIPPED WITH 3M SCOTCHCOTE.

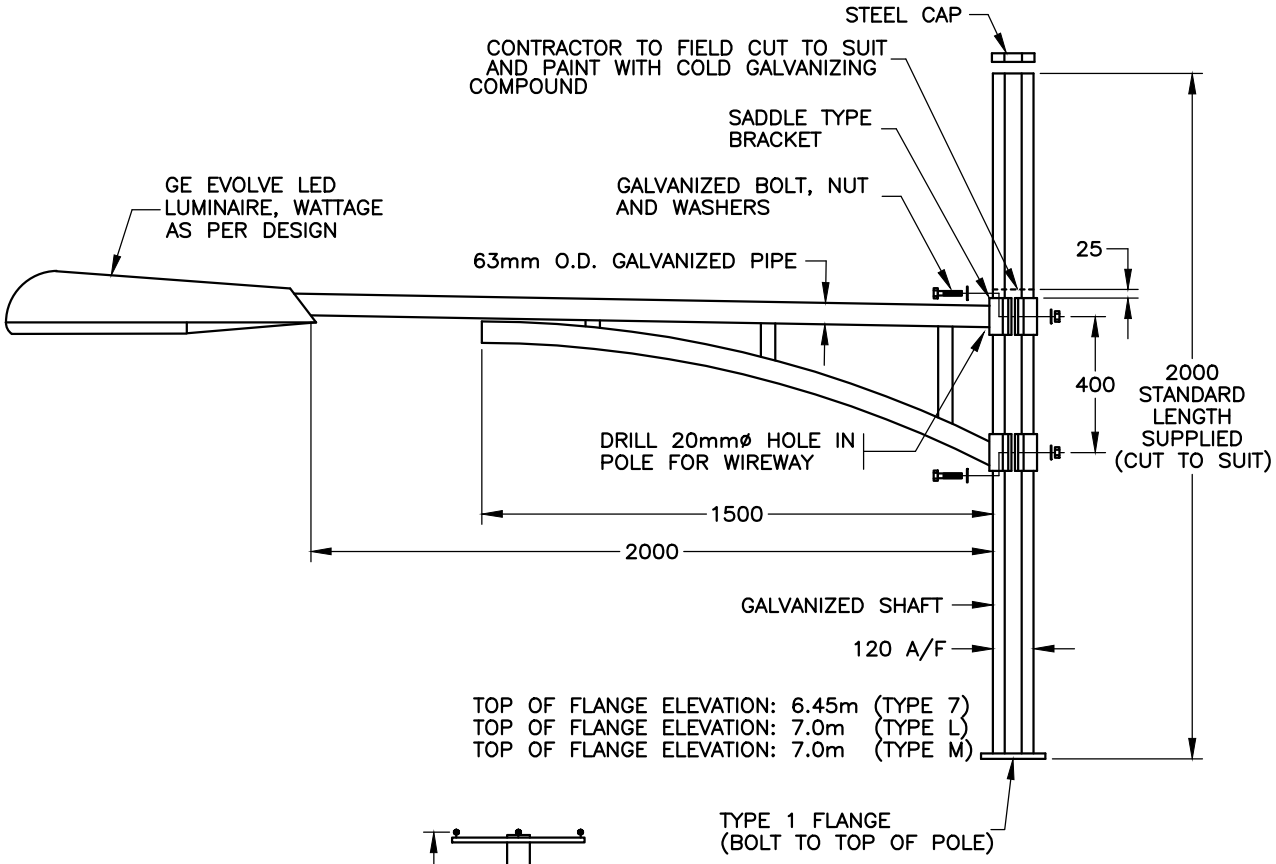
5. OFFSET R.PVC CONDUIT BAR 100mm FROM SIDE OF JUNCTION BOX.

JUNCTION BOX DETAILS (CONCRETE)

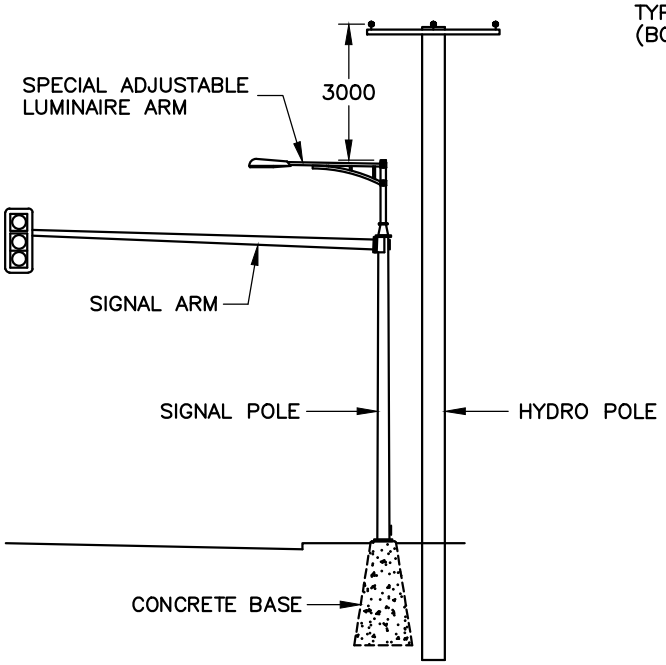
ABBOTSFORD

DRAWN:	2000 01 04
REVISED:	2005 11 01
APPROVED BY:	

CS - E - 2



SPECIAL ADJUSTABLE LUMINAIRE ARM



POLE ELEVATION

NOTE:

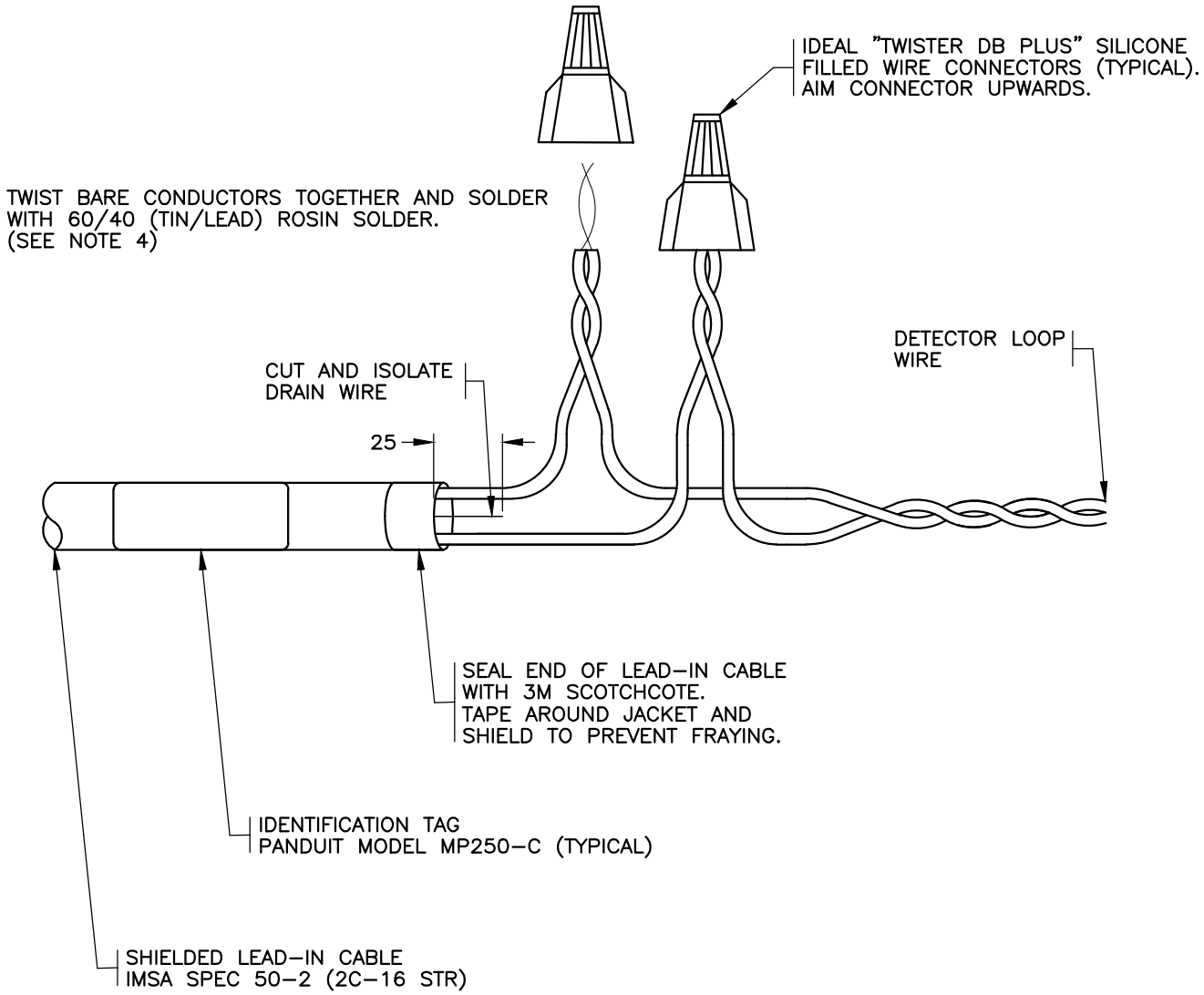
1. REFER TO CONTRACT DRAWINGS AND MMCD SECTION 26 56 01 FOR DETAILED SPECIFICATIONS.

SPECIAL LUMINAIRE ARM FOR HYDRO CONFLICTS

ABBOTSFORD

DRAWN:	2005 10 12
REVISED:	2021 09 09
APPROVED BY:	

CS - E - 3



NOTES:

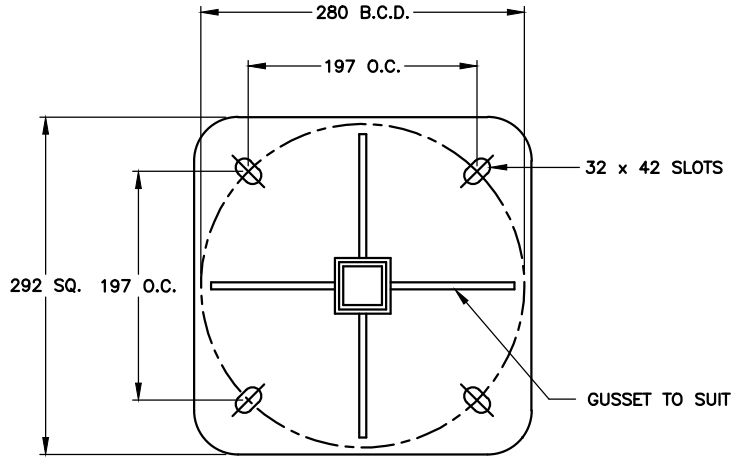
1. REFER TO CONTRACT DRAWINGS AND MMCD SECTION 34 41 13 FOR DETAILED SPECIFICATIONS.
2. ALL DIMENSIONS ARE IN MILLIMETRES.
3. TY-RAP SHIELDED LEAD-IN CABLE AND DETECTOR LOOP WIRES TO CONDUCTOR SUPPORT IN JUNCTION BOX.
4. IF ADDITIONAL FLUX IS REQUIRED USE ROSIN PASTE FLUX (EXAMPLE: KESTER ROSIN PASTE FLUX FORMULA SP-44). DO NOT USE ACID BASE FLUX.

DETECTOR LOOP TO SHIELDED CABLE SPLICING DETAILS

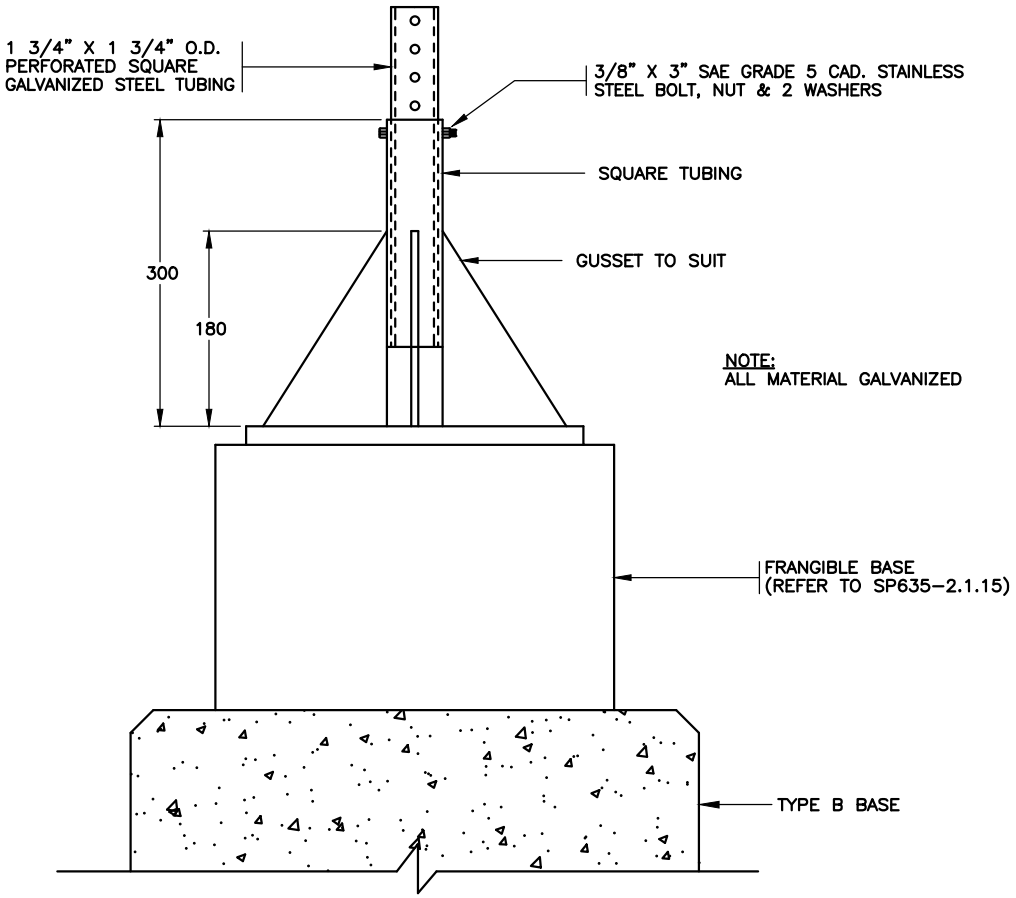
ABBOTSFORD

DRAWN:	2011 04 18
REVISED:	2021 09 09
APPROVED BY:	

CS - E - 4



TOP VIEW



SIDE VIEW

NOTES:

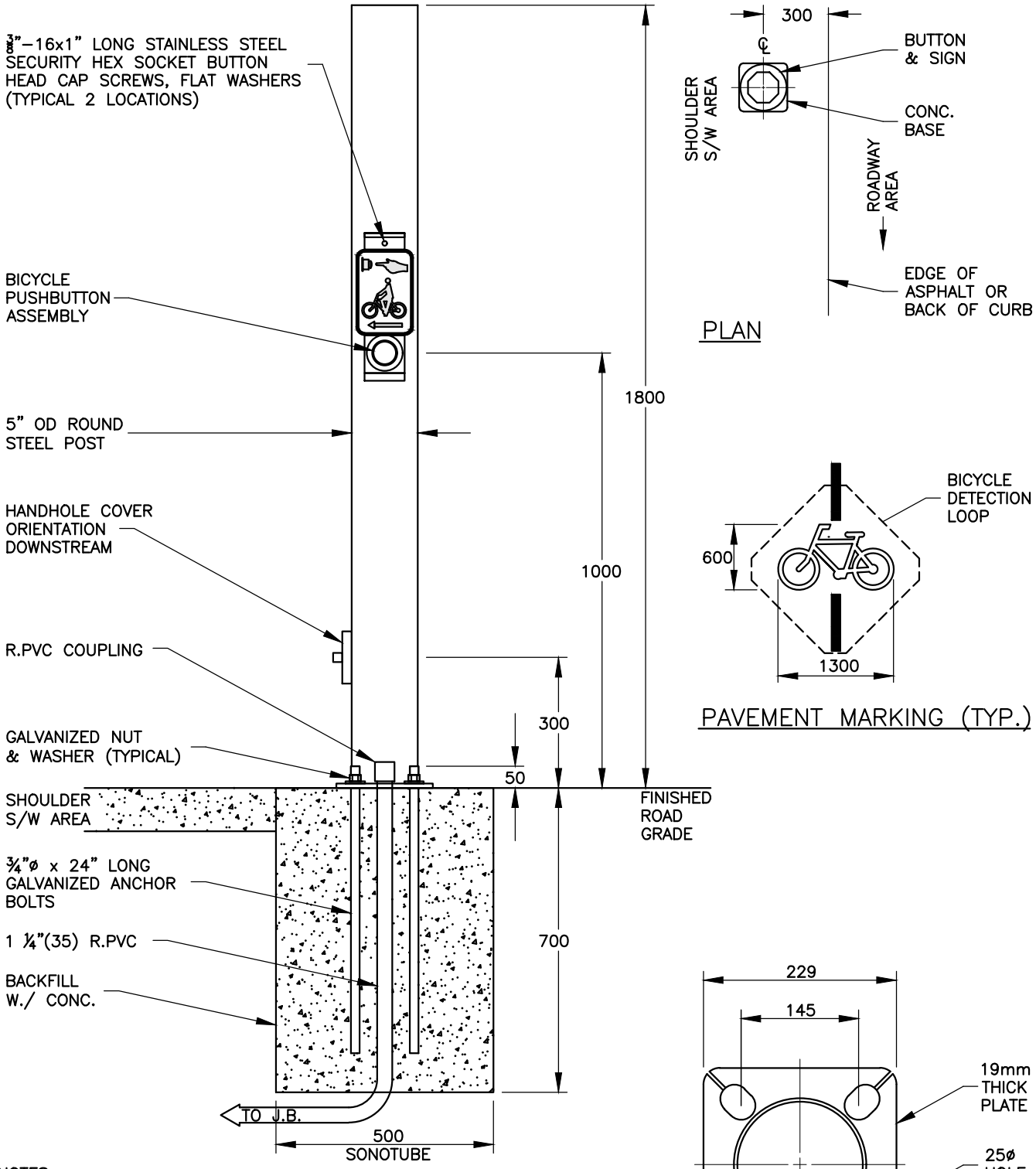
1. REFER TO CONTRACT DRAWINGS AND MMCD SECTION 26 56 01 AND 34 41 13 FOR DETAILED SPECIFICATIONS.

TYPE B BASE POST MOUNTED SIGN AND FLASHER ADAPTER DETAIL

ABBOTSFORD

DRAWN:	2021 09 09
REVISED:	
APPROVED BY:	

CS - E - 5



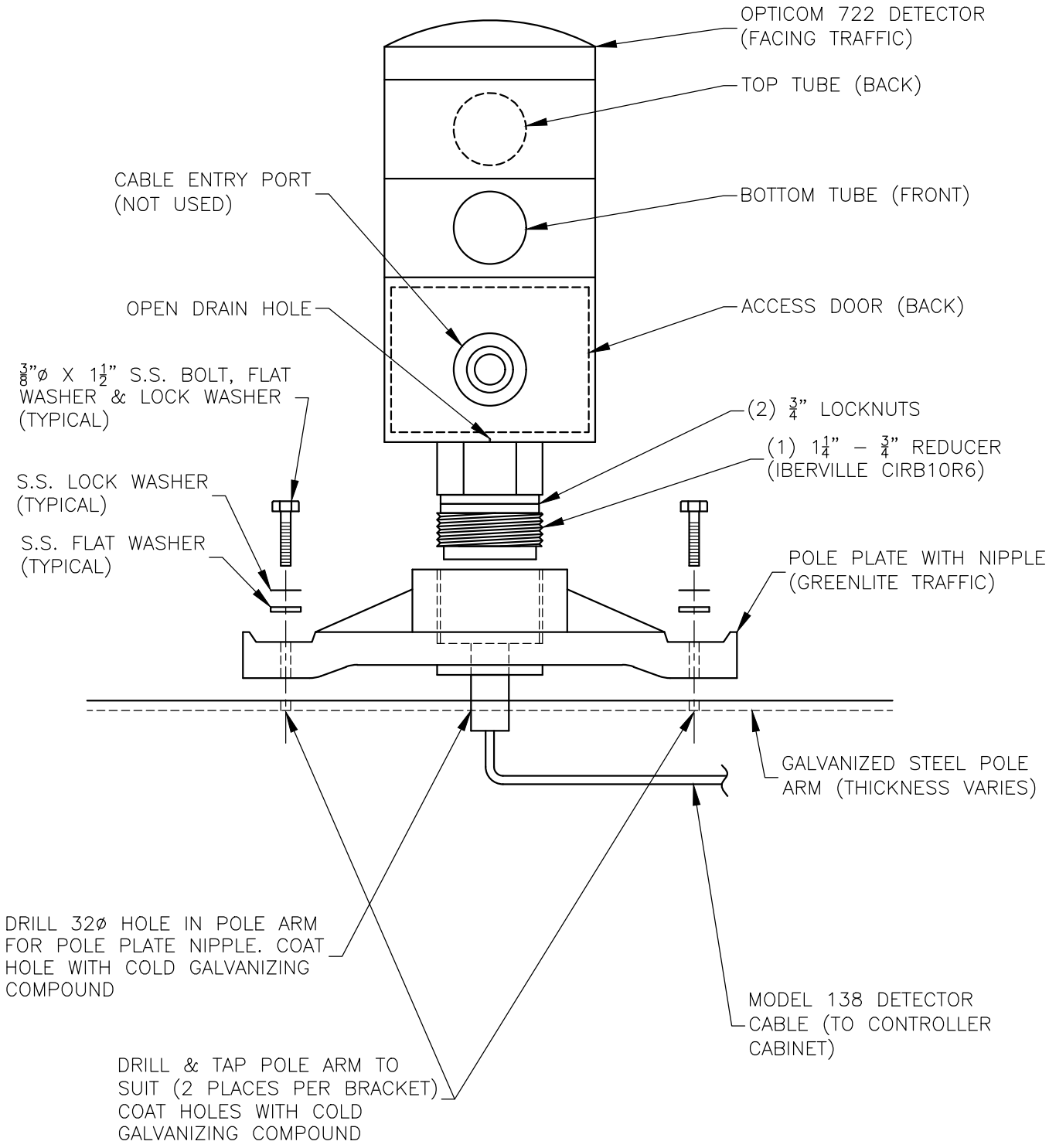
NOTES:

1. SEE STANDARD SPECIFICATIONS & SPECIAL PROVISIONS FOR ADDITIONAL INFORMATION.
2. ALL DIMENSIONS ARE IN MILLIMETRES UNLESS OTHERWISE NOTED.
3. POST TO BE HOT DIP GALVANIZED AFTER FABRICATION.
4. REFERENCE WCE DWG.7010–00–5003–01

BICYCLE PUSHBUTTON POST

ABBOTSFORD

DRAWN:	2021 09 09
REVISED:	
APPROVED BY:	
	CS - E - 6

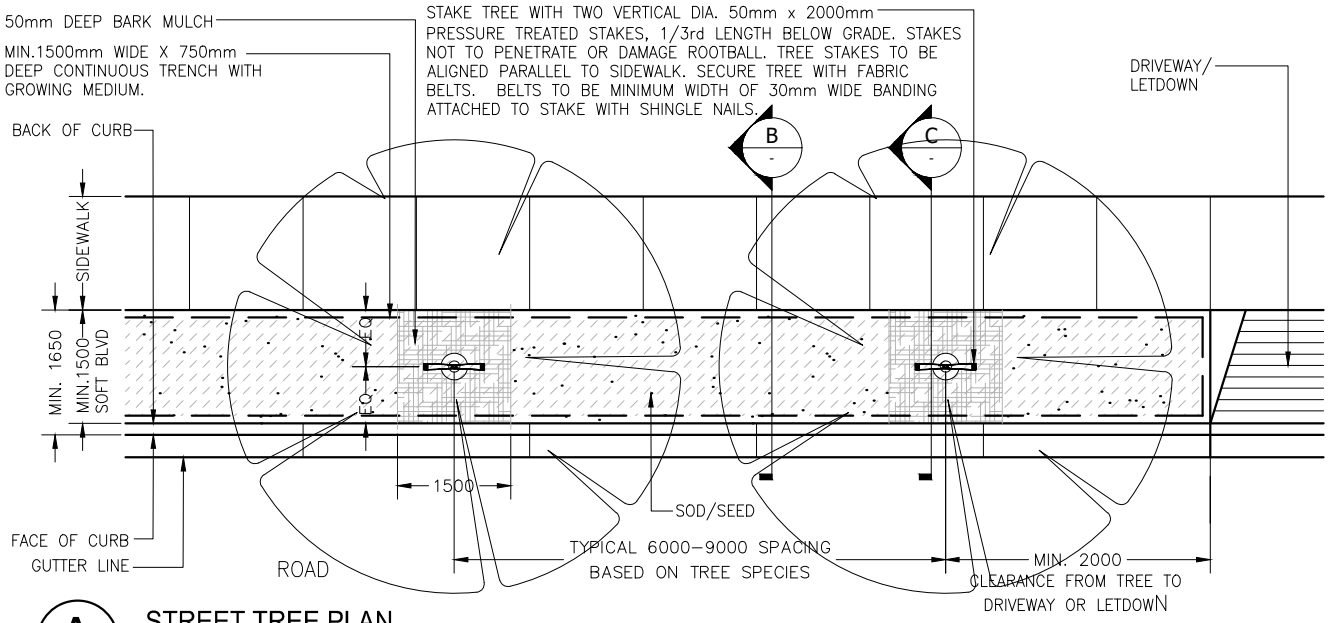


OPTICOM DETECTOR

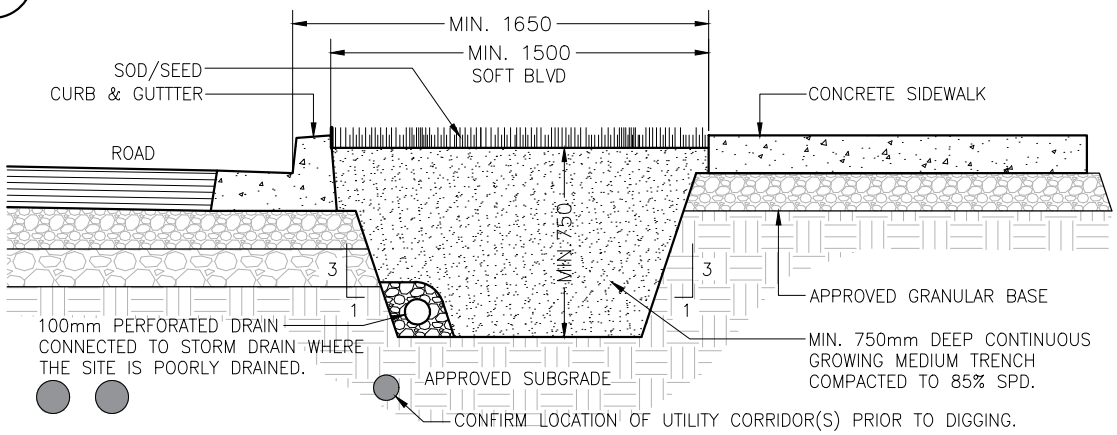
ABBOTSFORD

DRAWN:	2021 09 09
REVISED:	
APPROVED BY:	

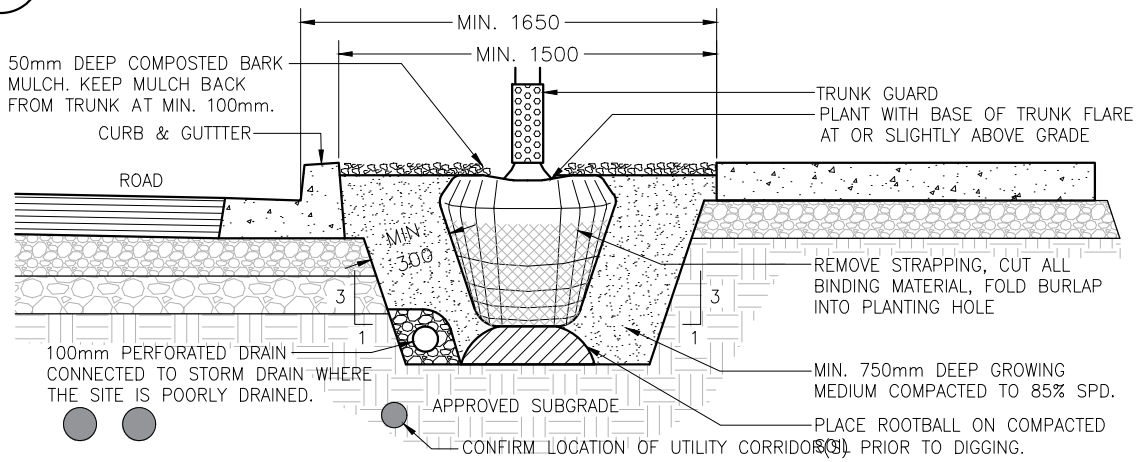
CS - E - 7



A STREET TREE PLAN



B SECTION THROUGH CONTINUOUS GROWING MEDIUM TRENCH

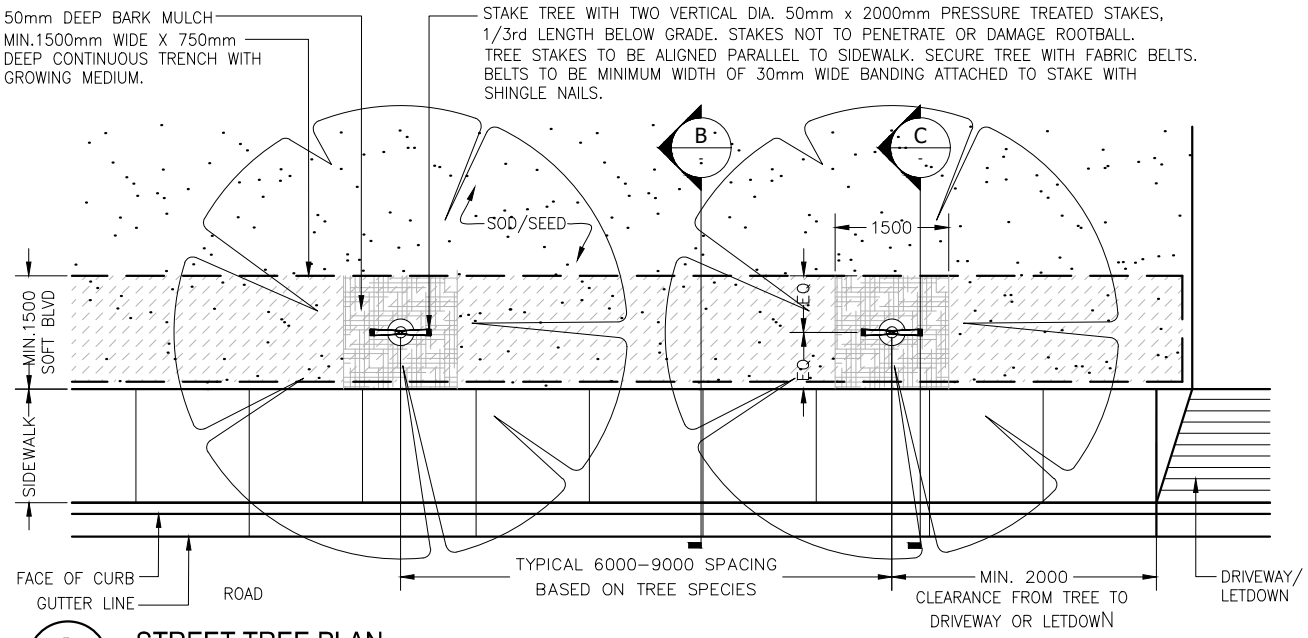


C SECTION THROUGH TREE LOCATION

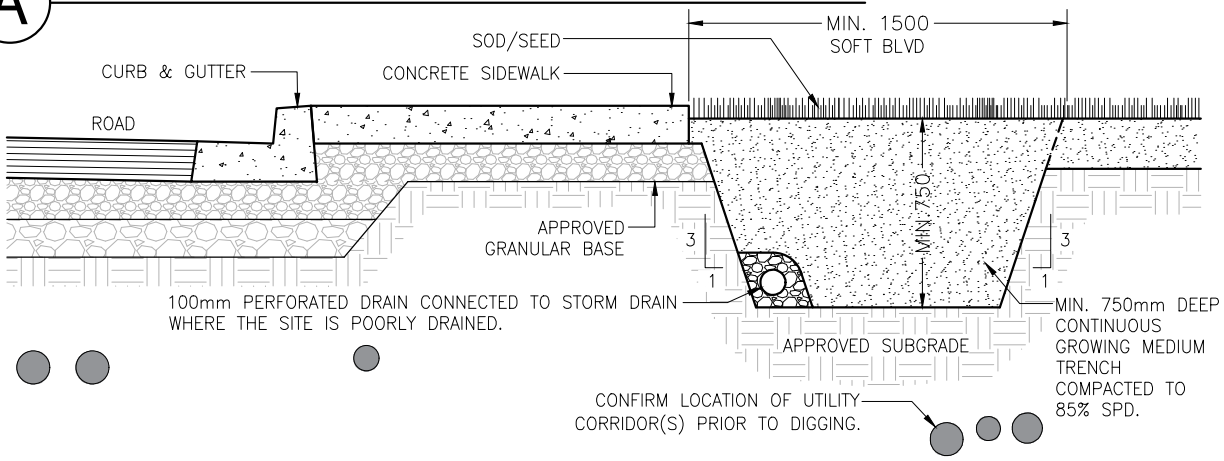
STREET TREE PLANTING SOFT BLVD FRONTAGE

ABBOTSFORD

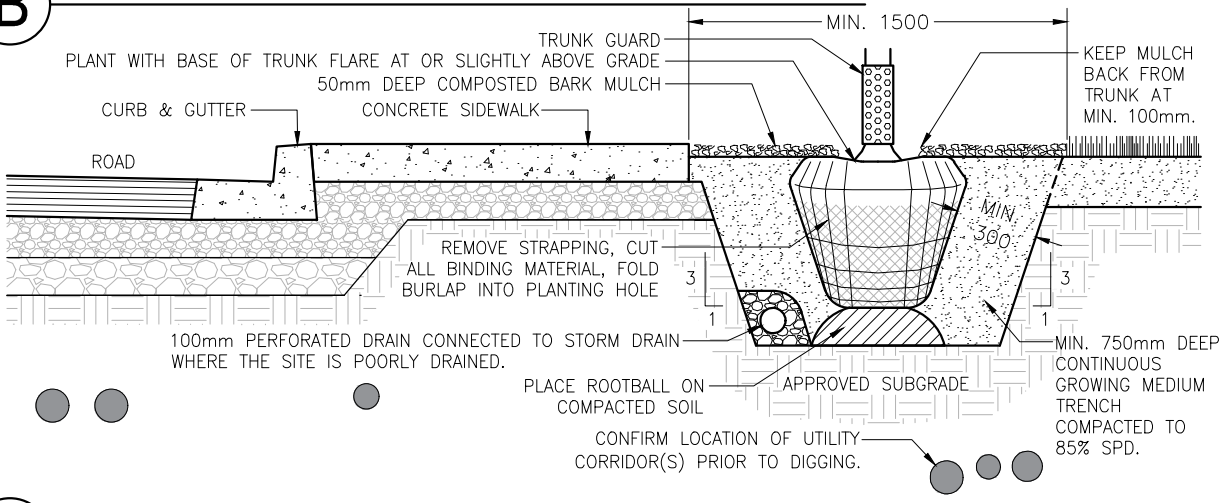
DRAWN:	2021 06 30
REVISED:	
APPROVED BY:	
	CS - TP - 1



A STREET TREE PLAN



B SECTION THROUGH CONTINUOUS GROWING MEDIUM TRENCH

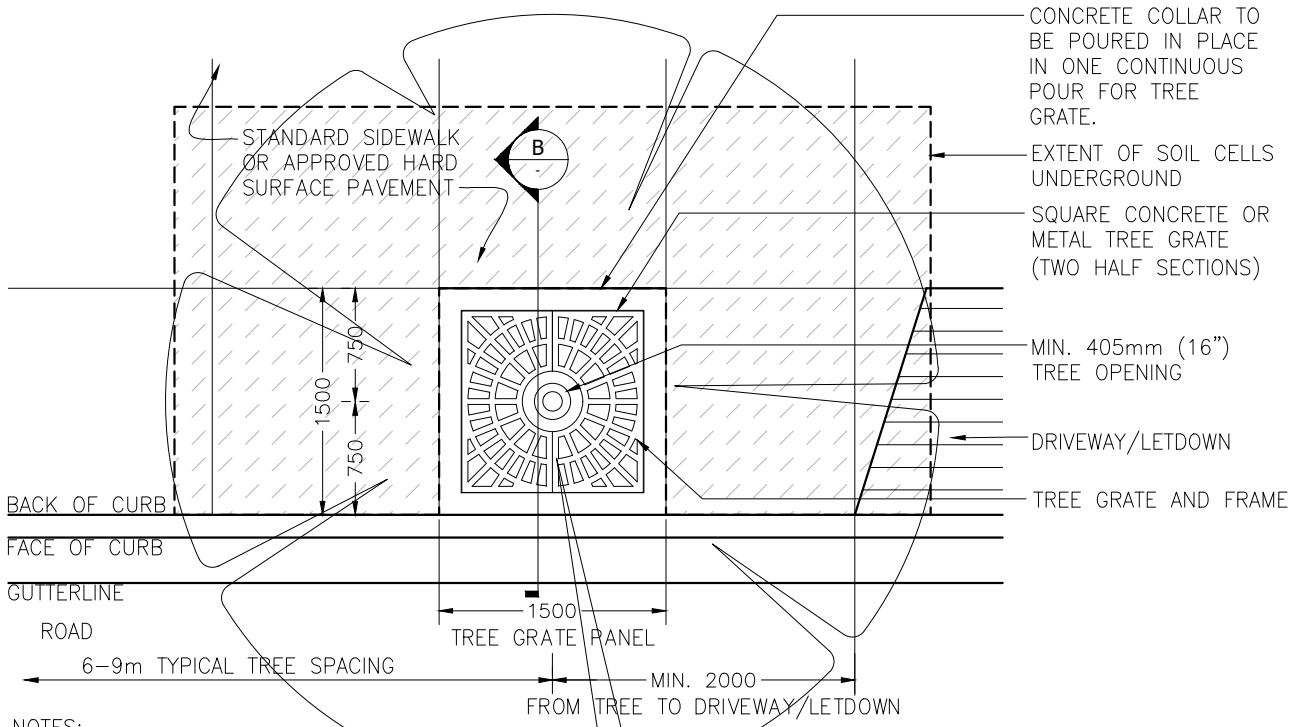


C SECTION THROUGH TREE LOCATION

STREET TREE PLANTING BEHIND SIDEWALK

ABBOTSFORD

DRAWN:	2021 06 30
REVISED:	
APPROVED BY:	
	CS - TP - 2



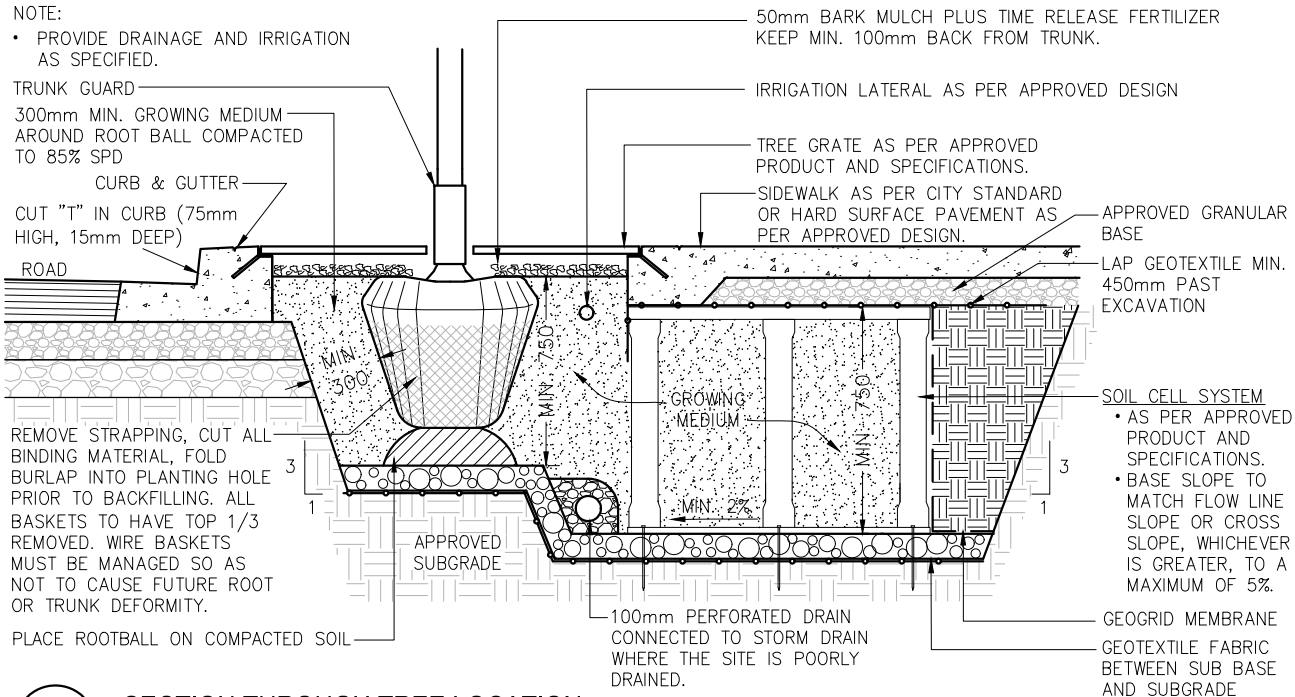
NOTES:

1. SOIL CELL SYSTEM IS REQUIRED FOR PLANTING TREES IN PAVED URBAN AREAS WITH SUFFICIENT SOIL VOLUME THAT PROMOTES TREE HEALTH WITHOUT DISTURBING THE PAVING STRUCTURES ABOVE.
2. PROVIDE CONTINUOUS SOIL CELLS AS REQUIRED TO ACHIEVE SPECIFIED SOIL VOLUME PER TREE.
   - MIN. $10m^3$ GROWING MEDIUM FOR A SMALL SIZE TREE
   - MIN. $16m^3$ GROWING MEDIUM FOR A MEDIUM SIZE TREE
   - MIN. $20m^3$ GROWING MEDIUM FOR A LARGE SIZE TREE

A STREET TREE PLAN

NOTE:

- PROVIDE DRAINAGE AND IRRIGATION AS SPECIFIED.

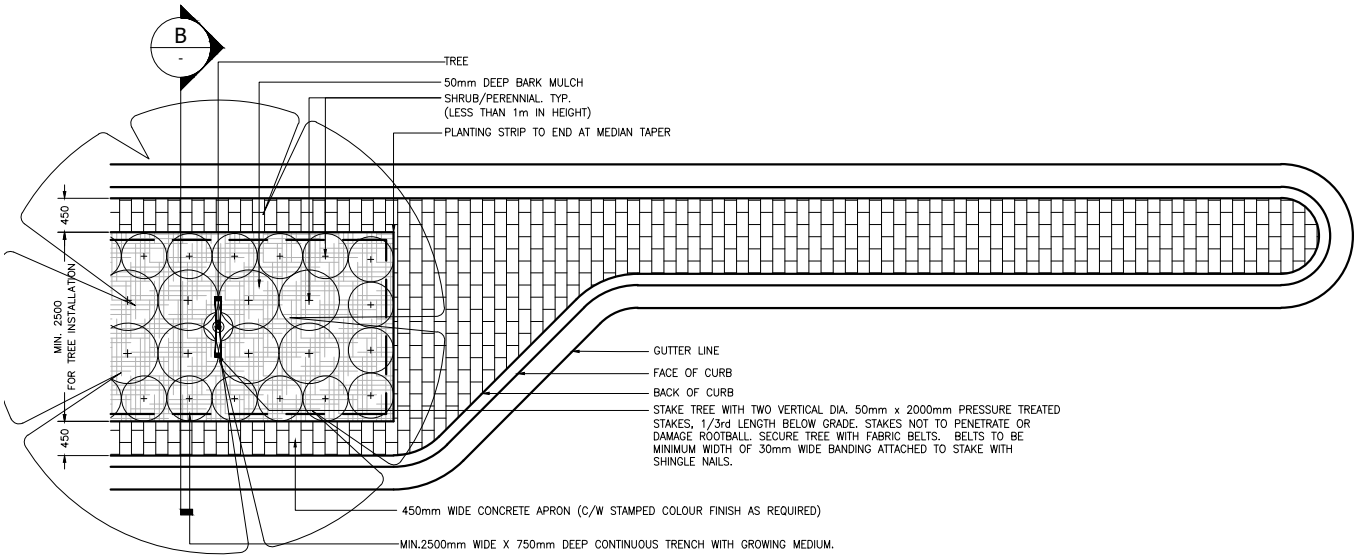


B SECTION THROUGH TREE LOCATION

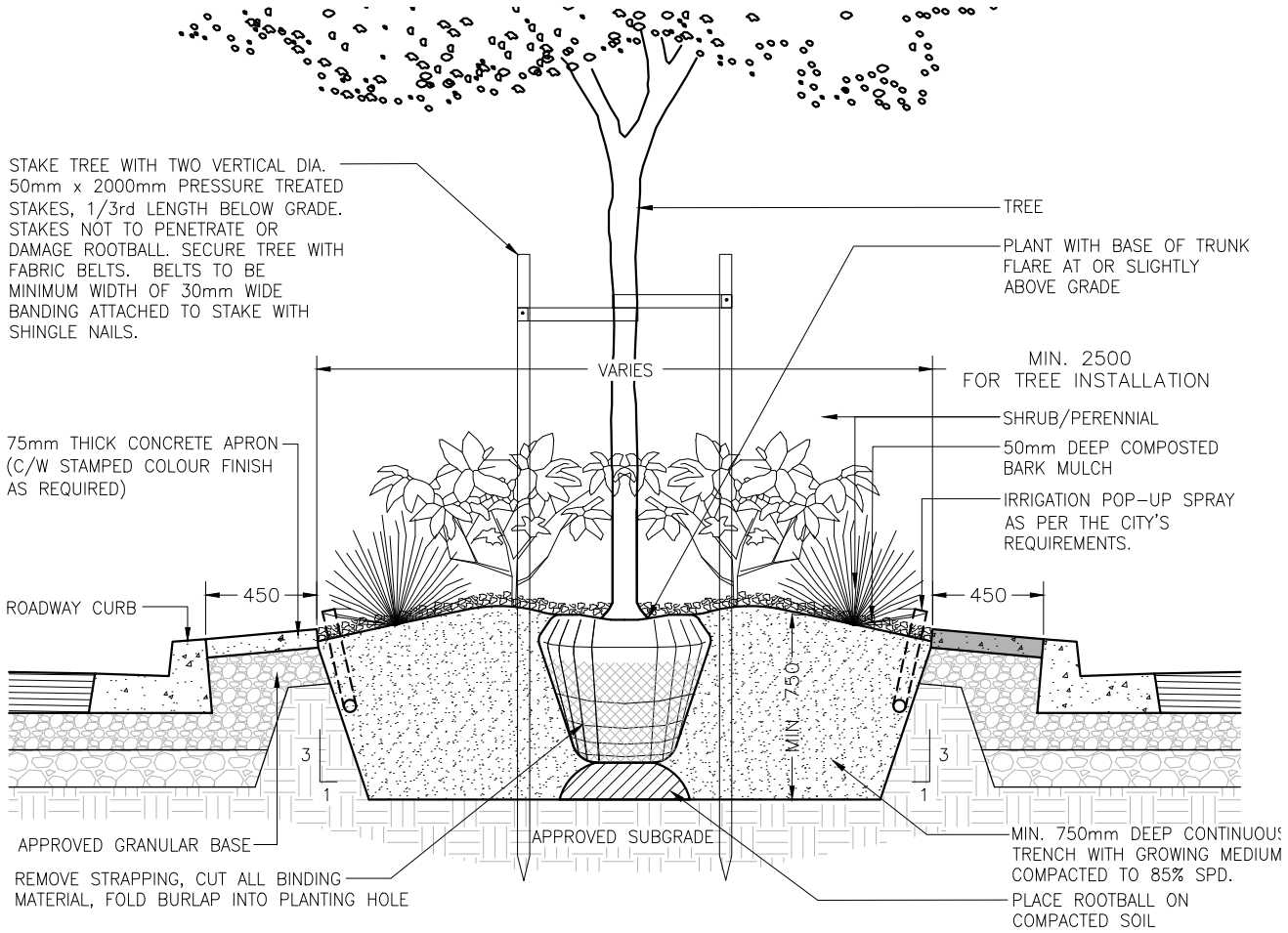
STREET TREE PLANTING WITH SOIL CELLS IN HARD SURFACE

ABBOTSFORD

DRAWN:	2021 06 30
REVISED:	
APPROVED BY:	
	CS - TP - 3



A MEDIAN TREE PLAN

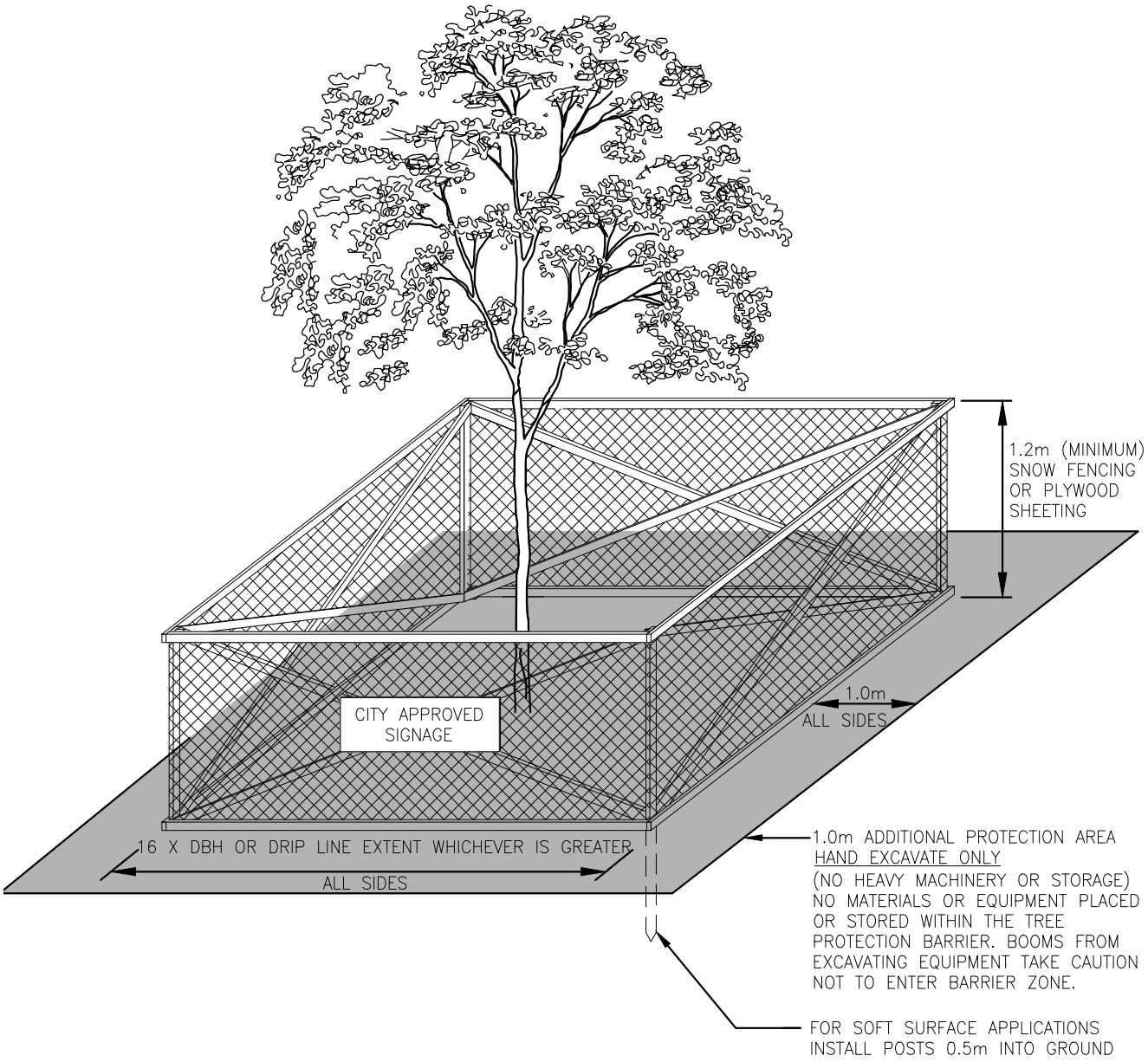


B SECTION THROUGH TREE LOCATION

MEDIAN TREE PLANTING WITH APRON

ABBOTSFORD

DRAWN:	2021 06 30
REVISED:	
APPROVED BY:	
	CS - TP - 4



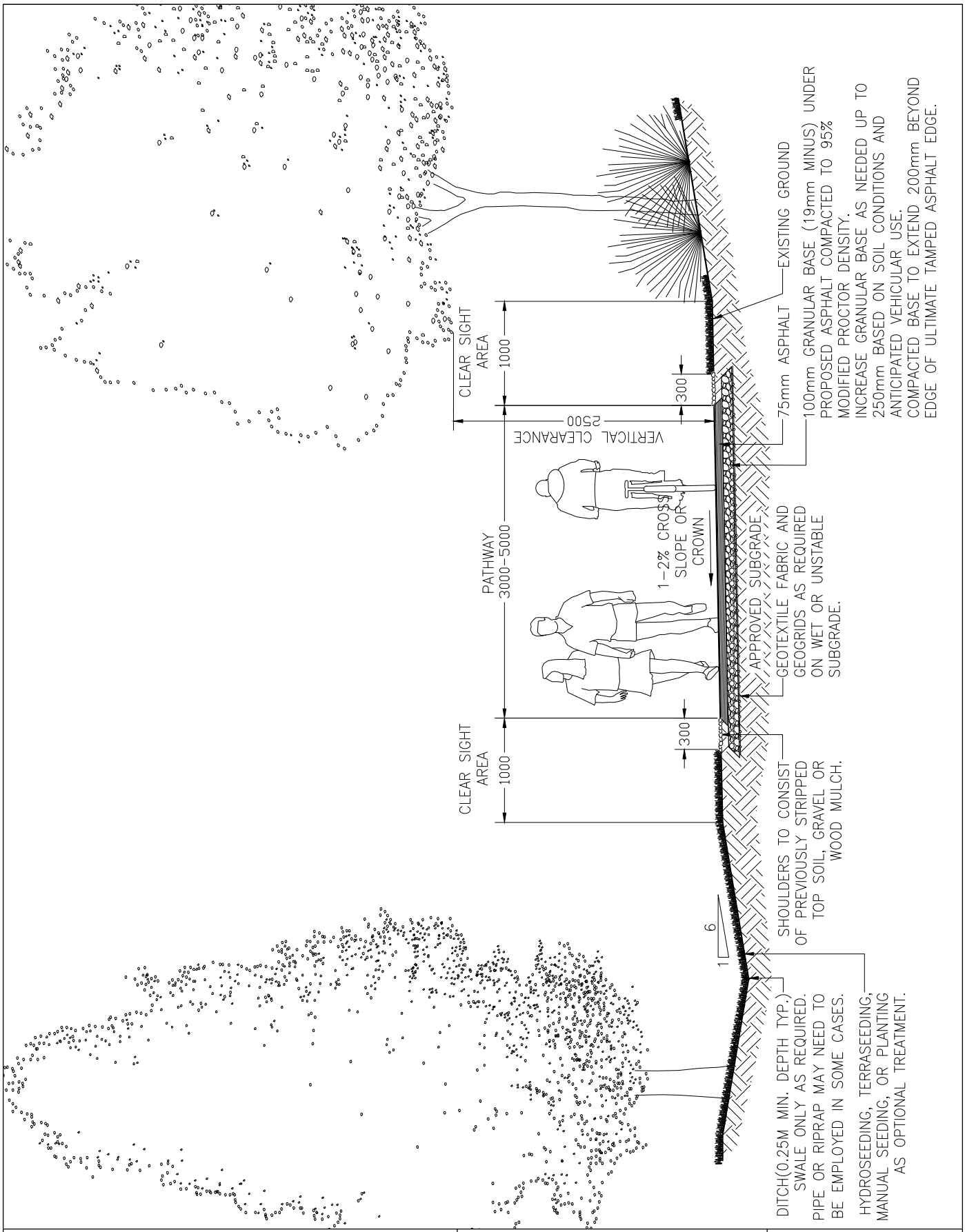
NOTES

1. USE SNOW FENCING OR AS DIRECTED BY THE CITY.
2. SNOW FENCING SHOULD BE SECURED TO 2" X 4" LUMBER FRAME.
3. FLAGGING TAPE MUST BE ATTACHED TO FENCE TO HIGHLIGHT PROTECTION ZONE.
4. ALL WEATHER SIGNAGE MUST BE POSTED ON FENCE.
5. FOR APPLICATIONS WHERE SQUARE IS NOT POSSIBLE, USE CIRCULAR FENCE FOLLOWING DISTANCE TO FENCE RATIO.

TREE PROTECTION BARRIER

ABBOTSFORD

DRAWN:	2019 05 06
REVISED:	2021 06 30
APPROVED BY:	
	CS - TP - 5

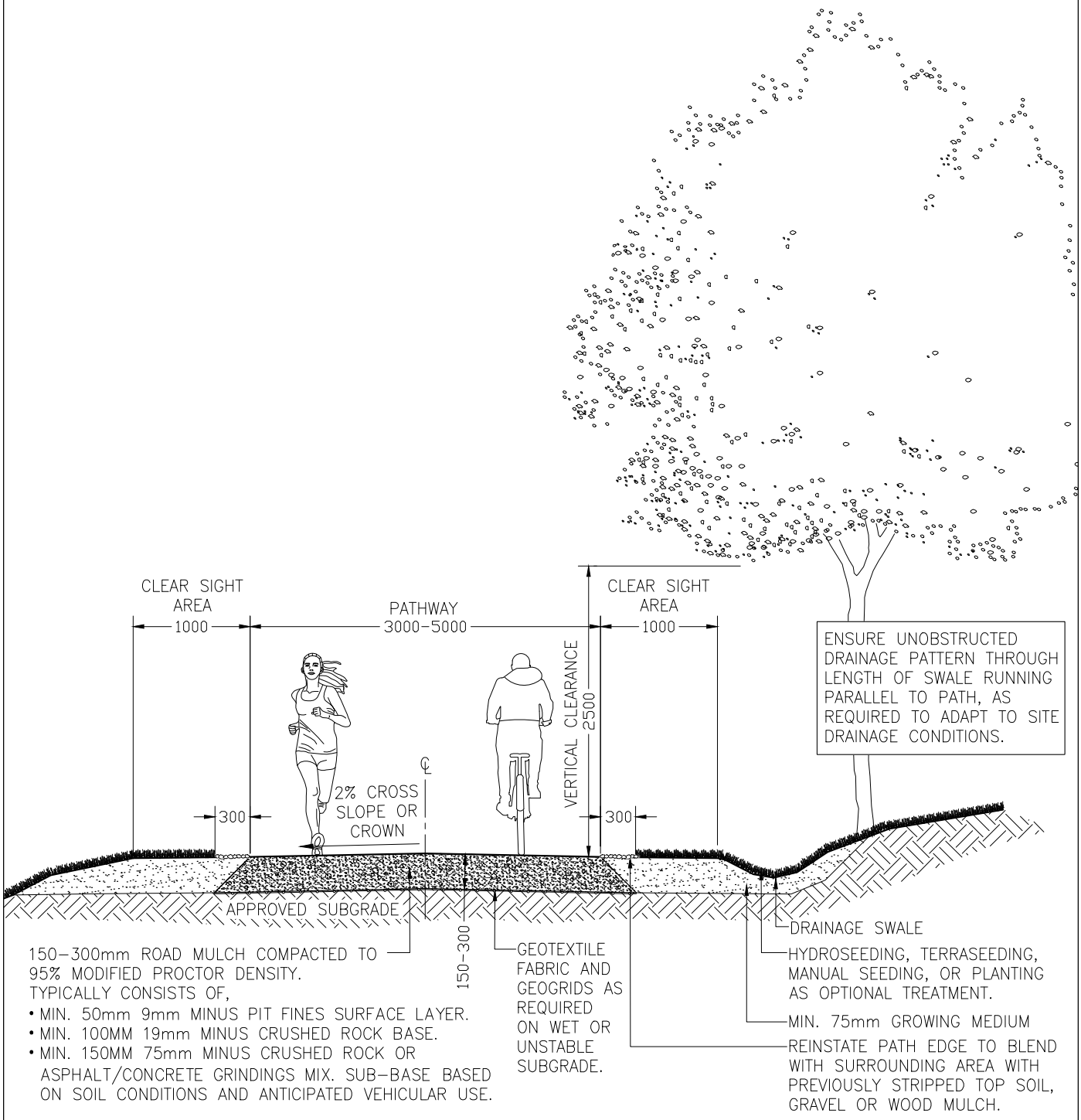


MULTI-USE TRAIL

ABBOTSFORD

DRAWN:	2021 06 30
REVISED:	
APPROVED BY:	

CS - TR - 1

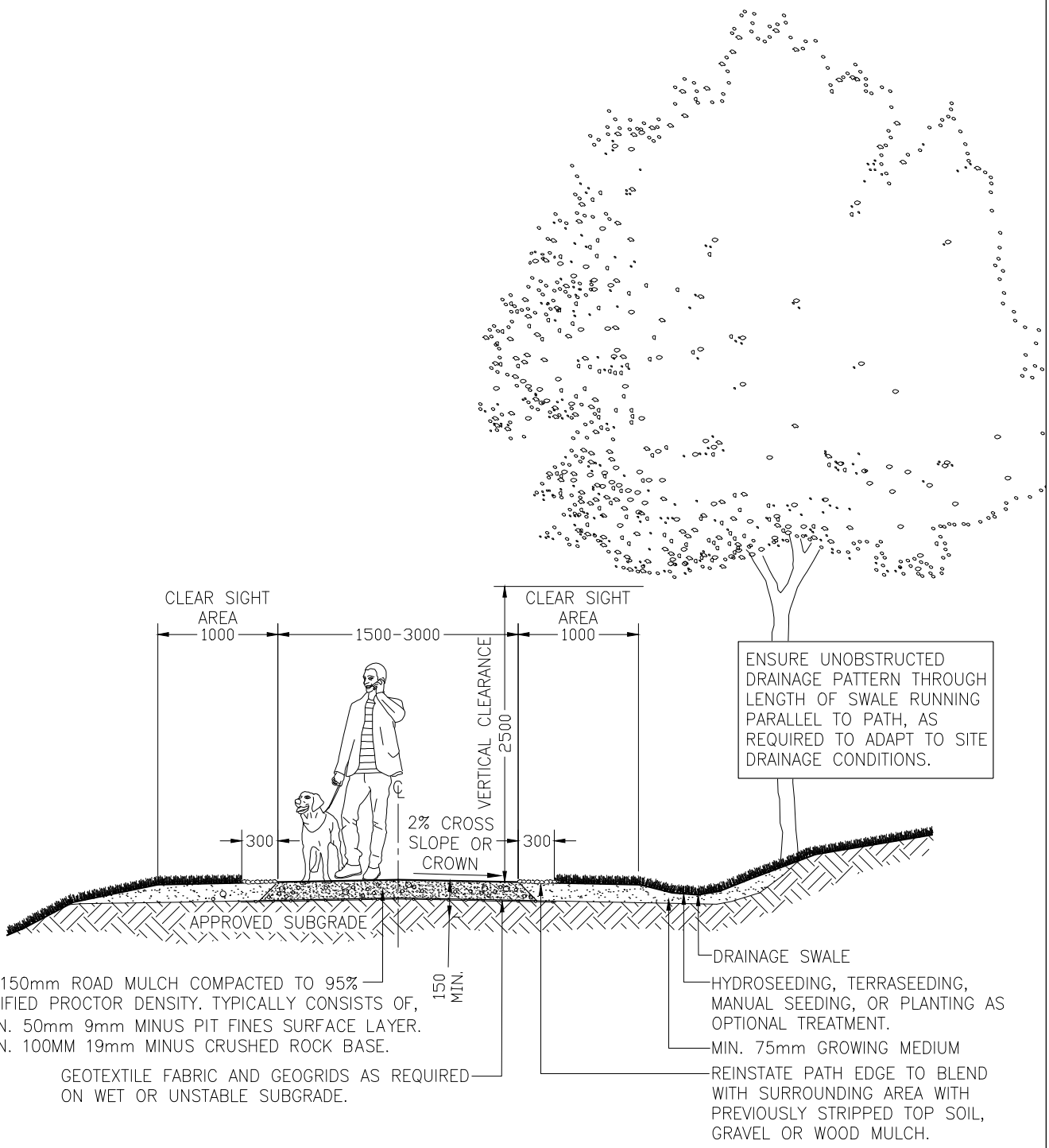


MAIN TRAIL

ABBOTSFORD

DRAWN:	2021 06 30
REVISED:	
APPROVED BY:	

CS - TR - 2

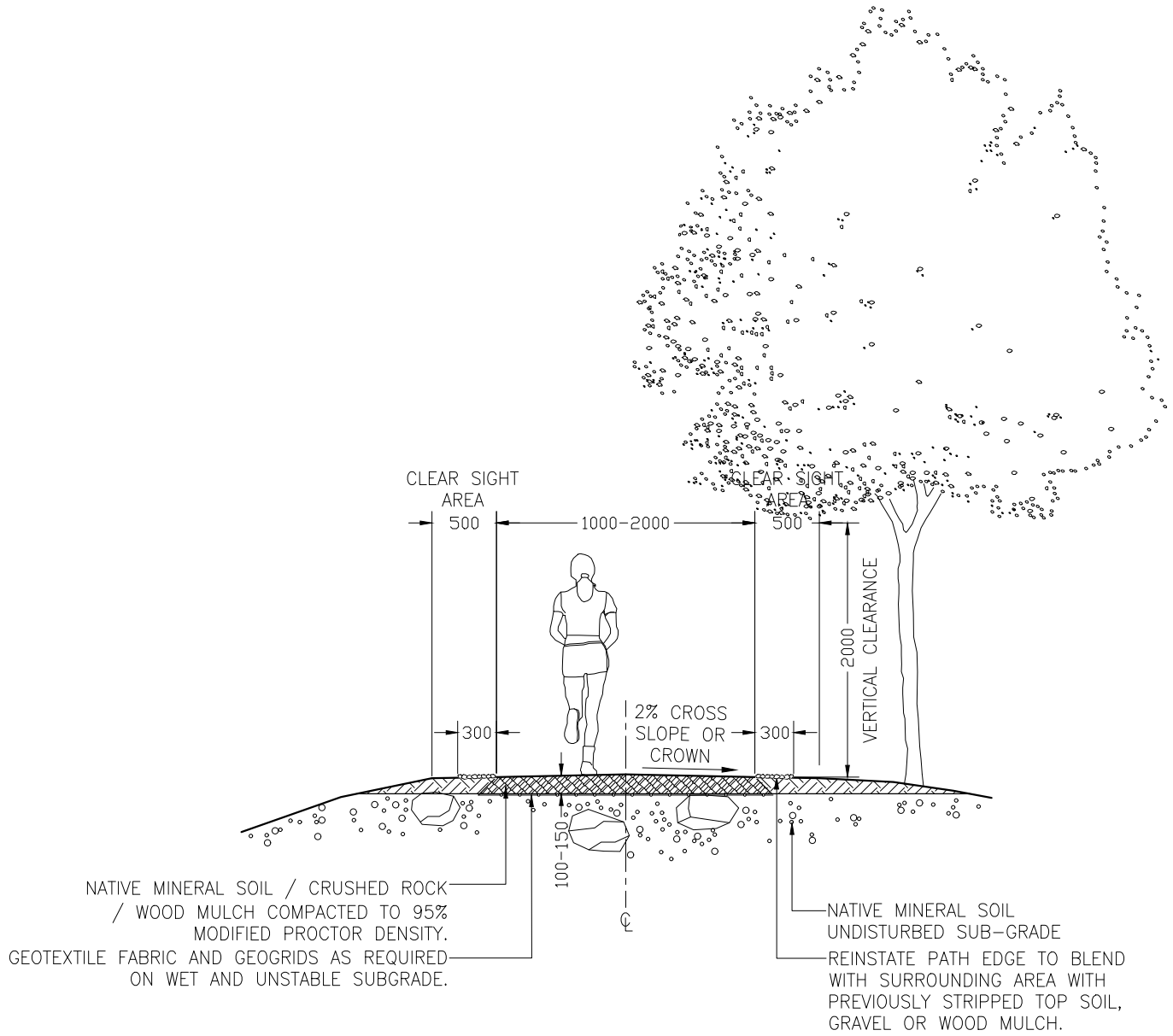


SECONDARY TRAIL

ABBOTSFORD

DRAWN:	2021 06 30
REVISED:	
APPROVED BY:	

CS - TR - 3



NATURE TRAIL

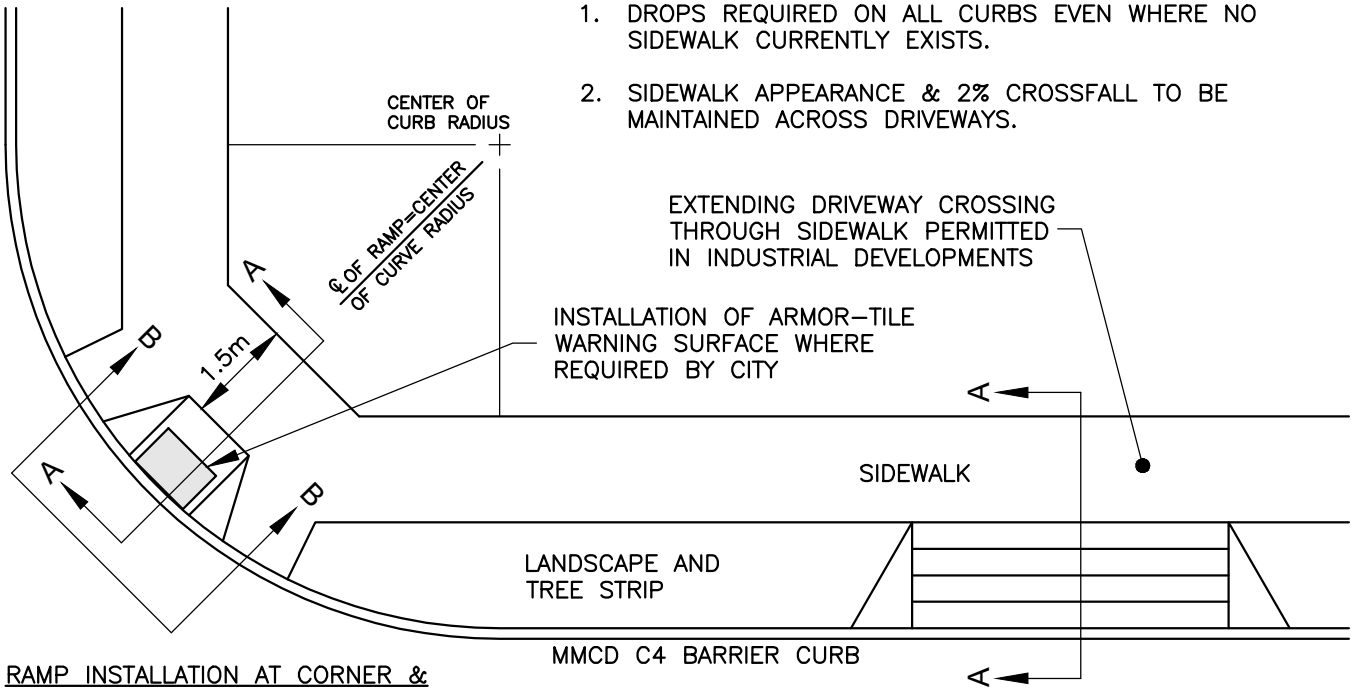
ABBOTSFORD

DRAWN:	2021 06 30
REVISED:	
APPROVED BY:	

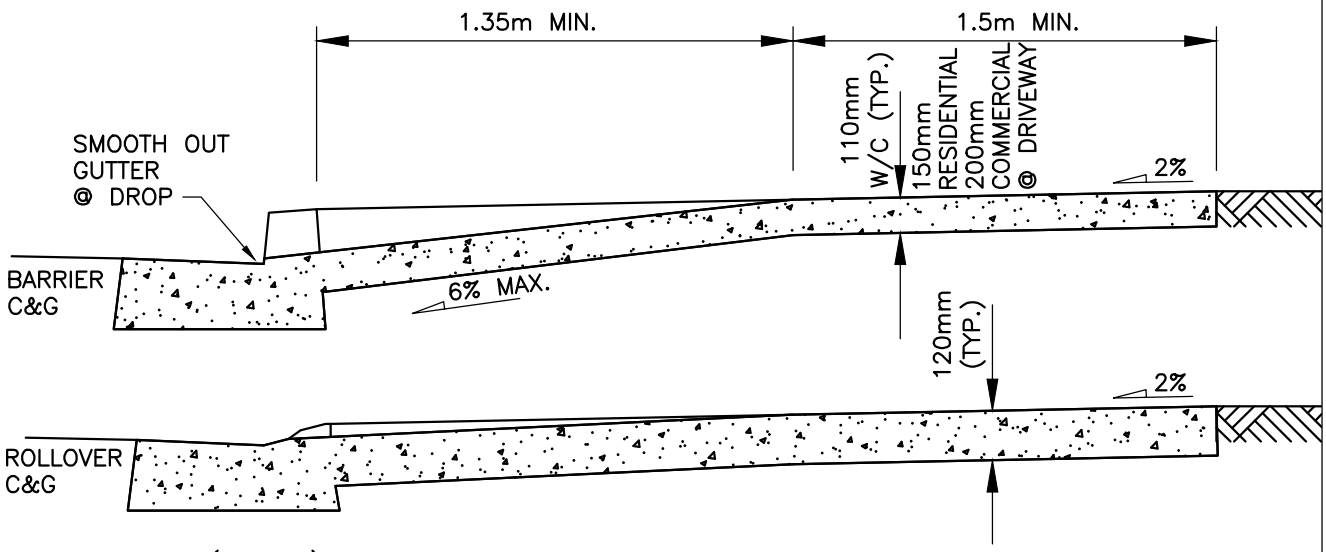
CS - TR - 4

NOTES

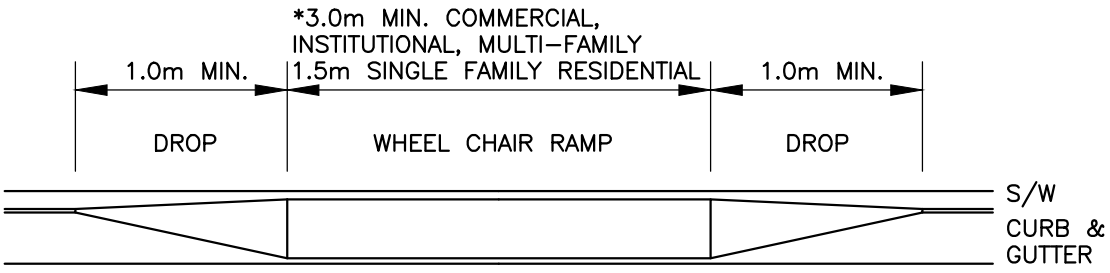
1. DROPS REQUIRED ON ALL CURBS EVEN WHERE NO SIDEWALK CURRENTLY EXISTS.
2. SIDEWALK APPEARANCE & 2% CROSSFALL TO BE MAINTAINED ACROSS DRIVEWAYS.



RAMP INSTALLATION AT CORNER & DRIVEWAY CROSSINGS (TYPICAL)



SIDE VIEW SECTION (TYPICAL)
Section A–A



*NOT FOR ACTIVE CROSSWALKS IN SFD AREAS

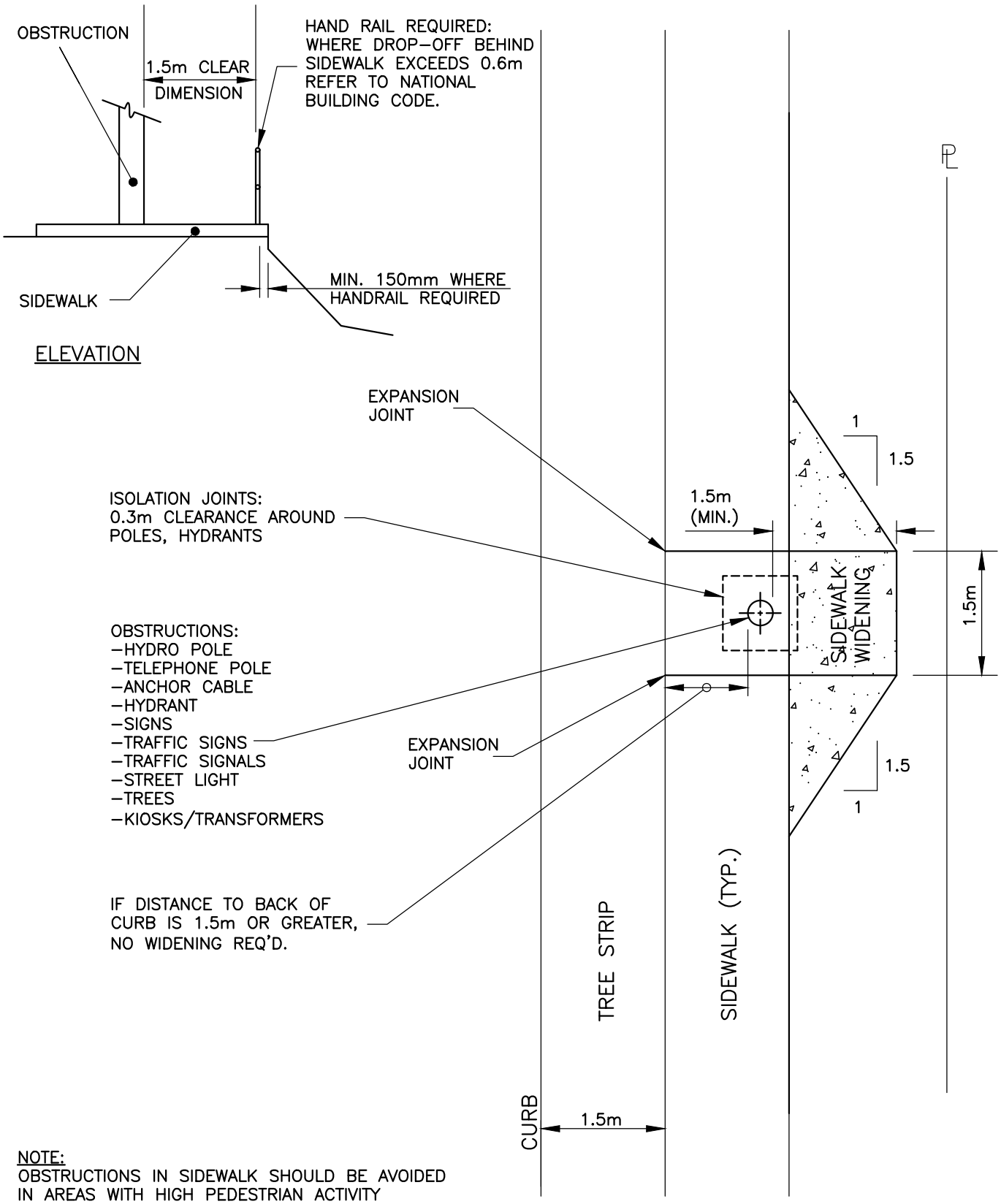
FRONT VIEW from ROAD (TYPICAL)
Section B–B

TYPICAL WHEEL CHAIR RAMP & DRIVEWAY CROSSING

ABBOTSFORD

DRAWN:	1976 07 01
REVISED:	2021 09 09
APPROVED BY:	

CS - R - 1



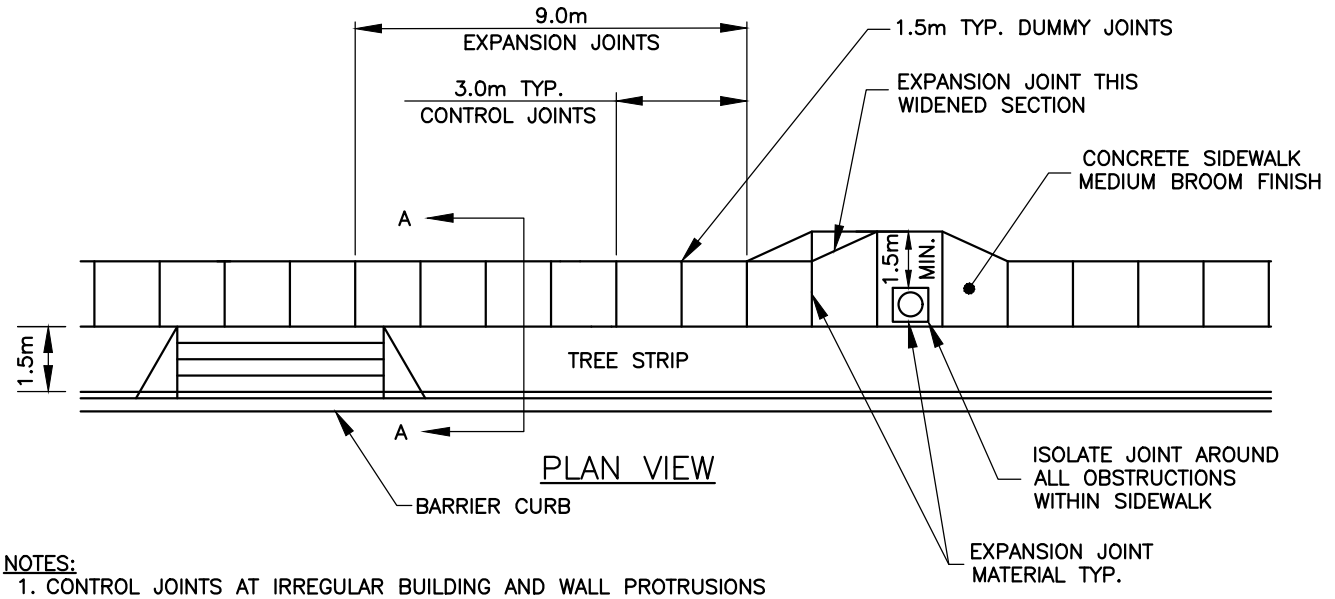
NOTE:
OBSTRUCTIONS IN SIDEWALK SHOULD BE AVOIDED IN AREAS WITH HIGH PEDESTRIAN ACTIVITY

TYPICAL SIDEWALK WIDENING AROUND OBSTRUCTIONS

ABBOTSFORD

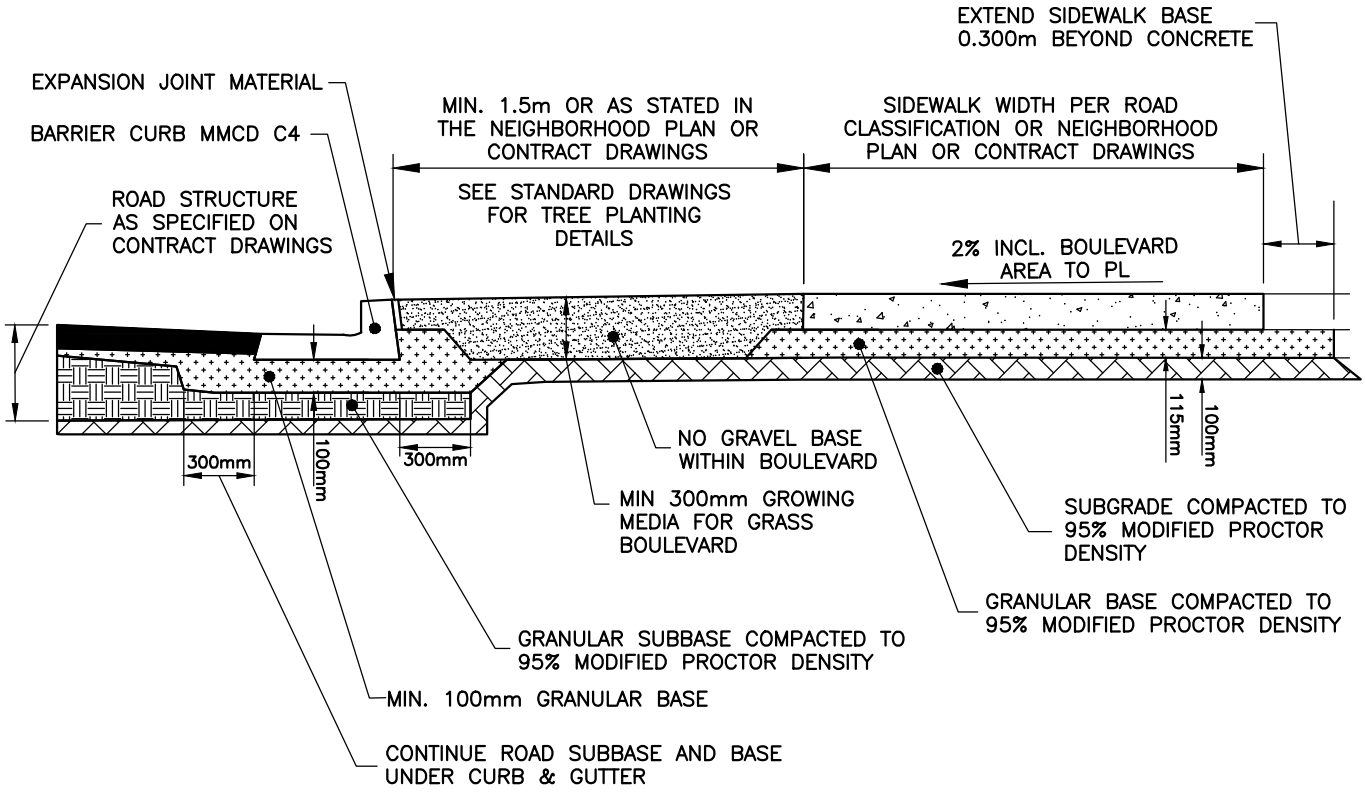
DRAWN:	1981 07 06
REVISED:	2021 09 09
APPROVED BY:	

CS - R - 2



NOTES:

1. CONTROL JOINTS AT IRREGULAR BUILDING AND WALL PROTRUSIONS
2. CONTROL JOINT AT EITHER CORNER OF TREE PIT/CELLS TO MITIGATE CRACKING
3. ANY SAWCUT PATTERNS AS SPECIFIED IN NP PLANS TO HAVE APPROPRIATE DEPTH SAWCUT SCORE LINES



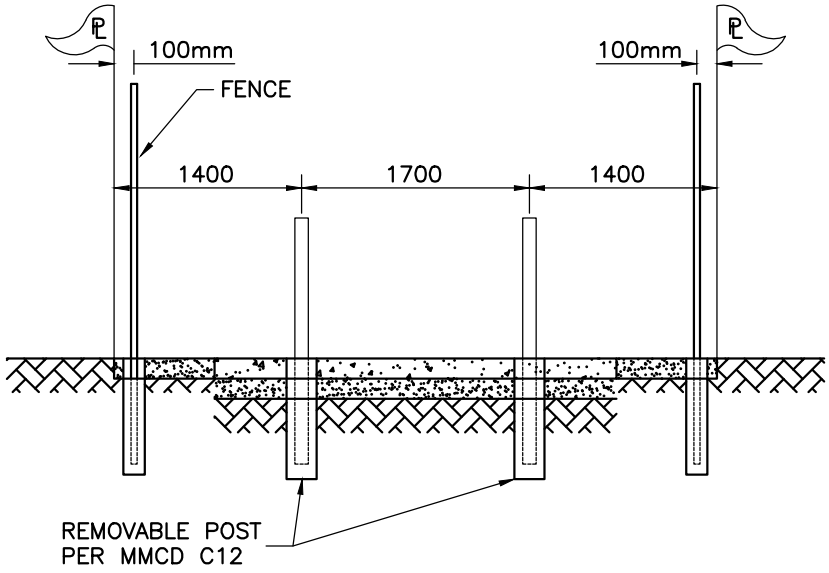
SECTION A–A

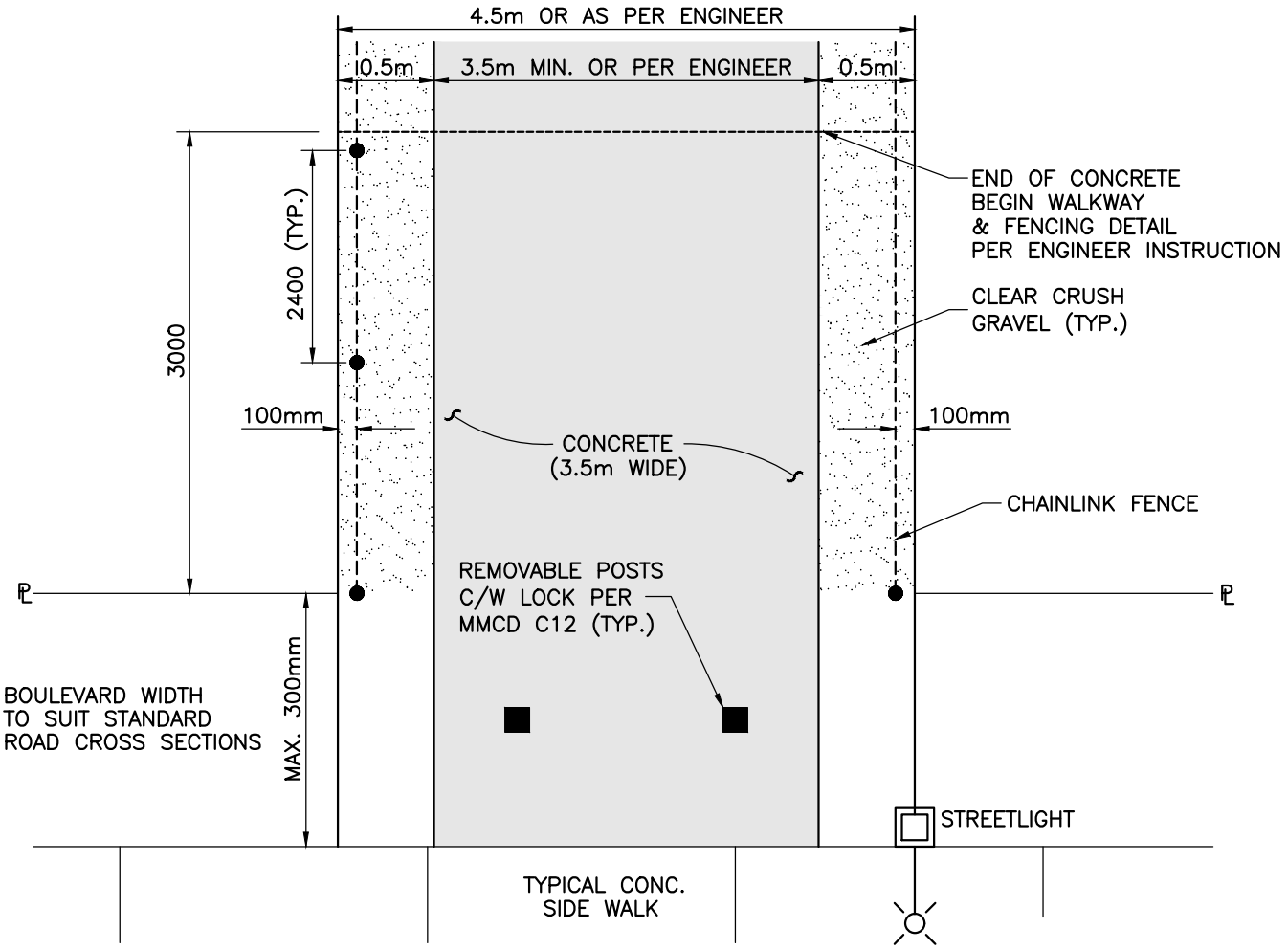
CONCRETE SIDEWALK AND BARRIER CURB

ABBOTSFORD

DRAWN:	1995 02 14
REVISED:	2021 09 09
APPROVED BY:	

CS - R - 3





NOTE:

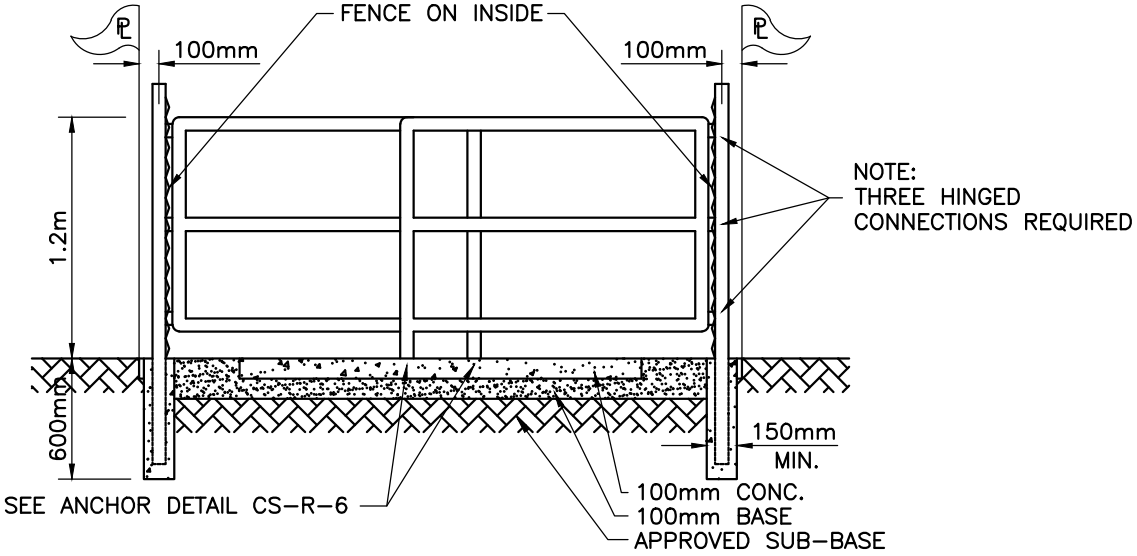
1. FENCING TO BE 9 GAUGE WIRE, VINYL COATED (BLACK ONLY) OR GALVANIZED AS SPECIFIED ON CONTRACT DRAWINGS
2. REPLACES MMCD–C10.

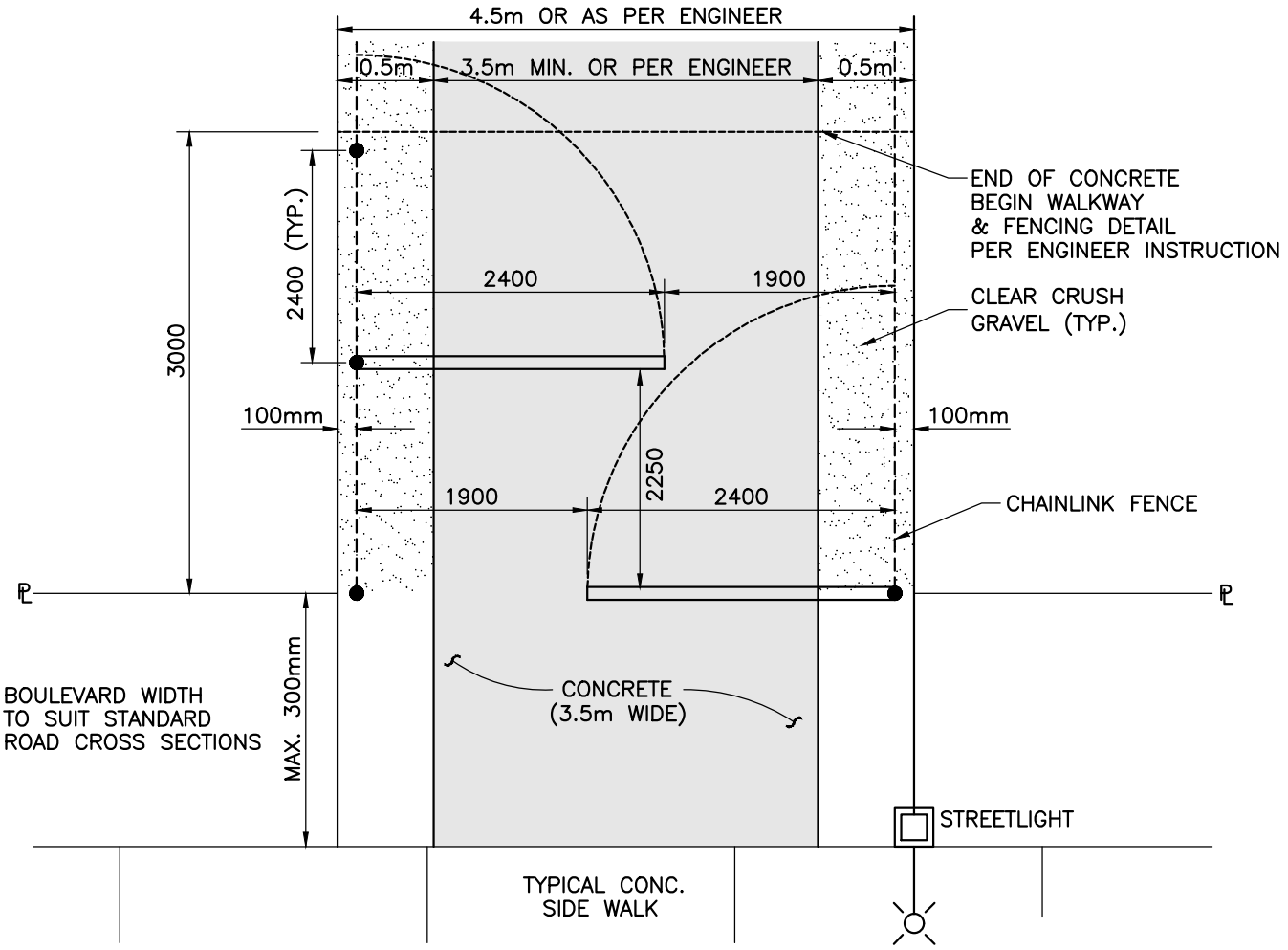
WALKWAY AT STREET CONNECTION (LESS THAN 8% GRADE)

ABBOTSFORD

DRAWN:	2021 09 09
REVISED:	
APPROVED BY:	

CS - R - 4





NOTE:

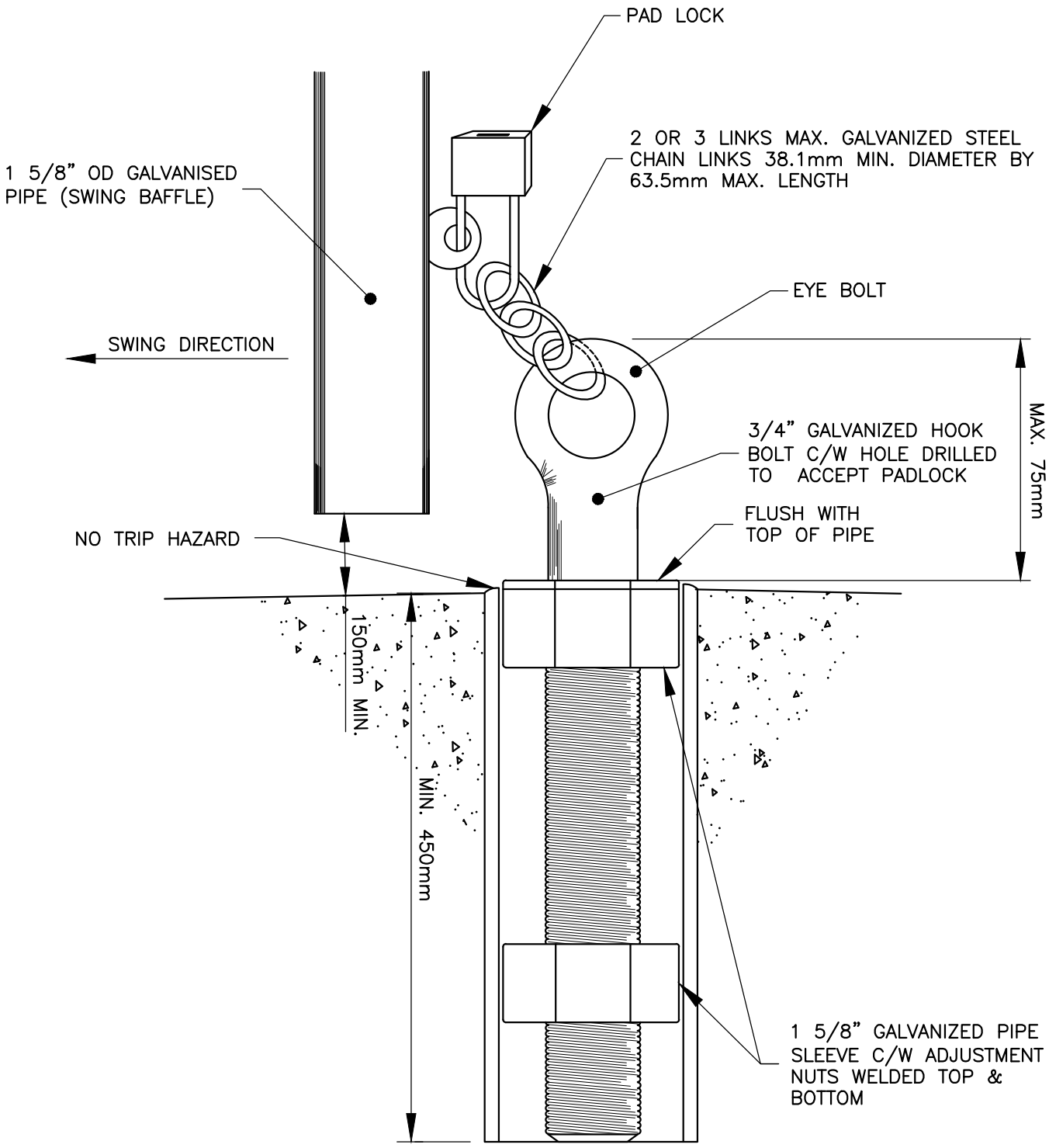
1. FENCING TO BE 9 GAUGE WIRE, VINYL COATED (BLACK ONLY) OR GALVANIZED AS SPECIFIED ON CONTRACT DRAWINGS
2. REPLACES MMCD-C10.

WALKWAY AT STREET CONNECTION (GREATER THAN 8% GRADE)

ABBOTSFORD

DRAWN:	1995 02 10
REVISED:	2021 09 09
APPROVED BY:	

CS - R - 5



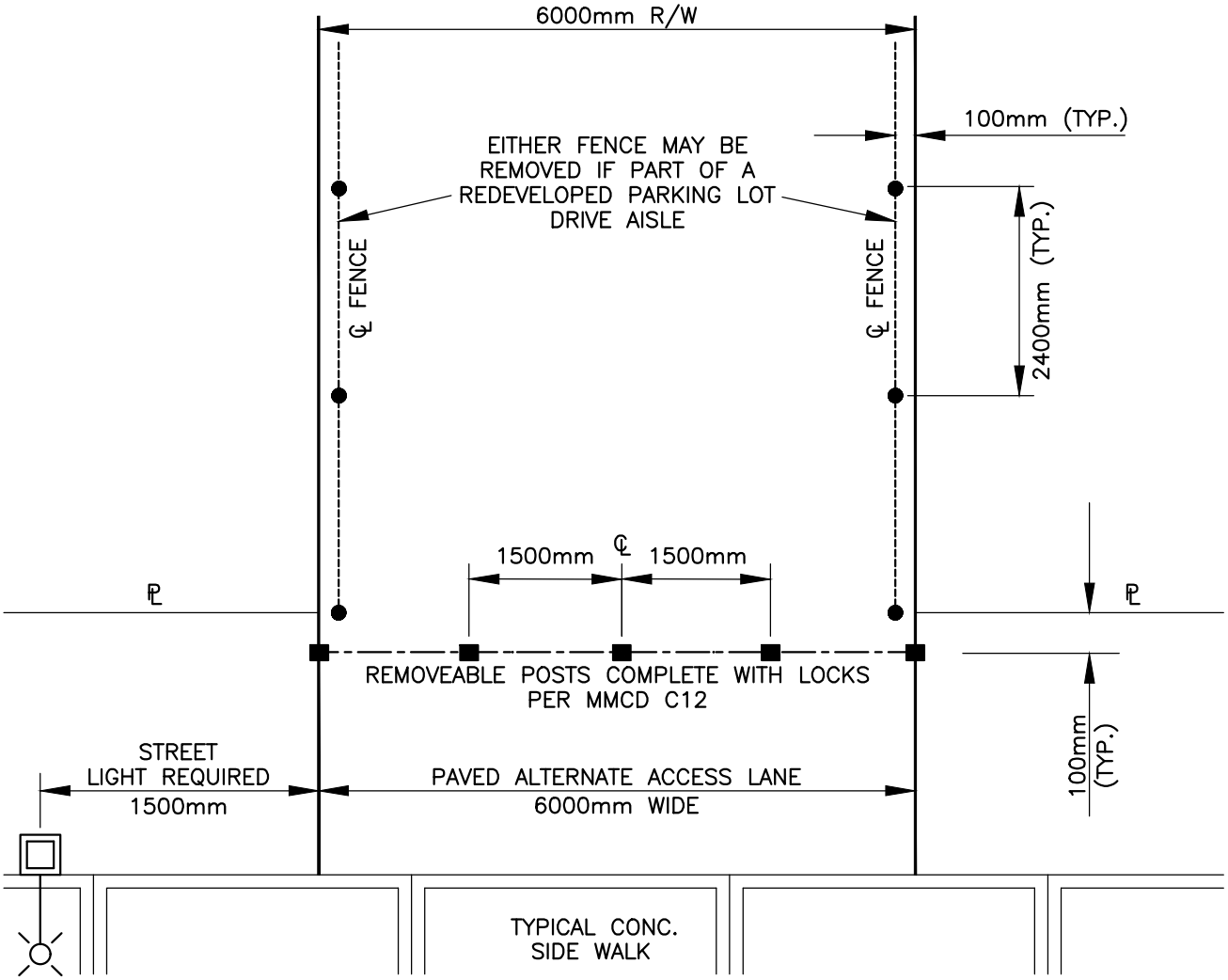
BICYCLE BAFFLE ANCHOR BOLT DETAIL

ABBOTSFORD

DRAWN:	1990 03 14
REVISED:	2005 03 01
APPROVED BY:	

CS - R - 6

FENCING:
- CHAINLINK PER MMCD
- VINYL COATED (BLACK ONLY) OR GALVANIZED AS SPECIFIED ON CONTRACT DRAWINGS.

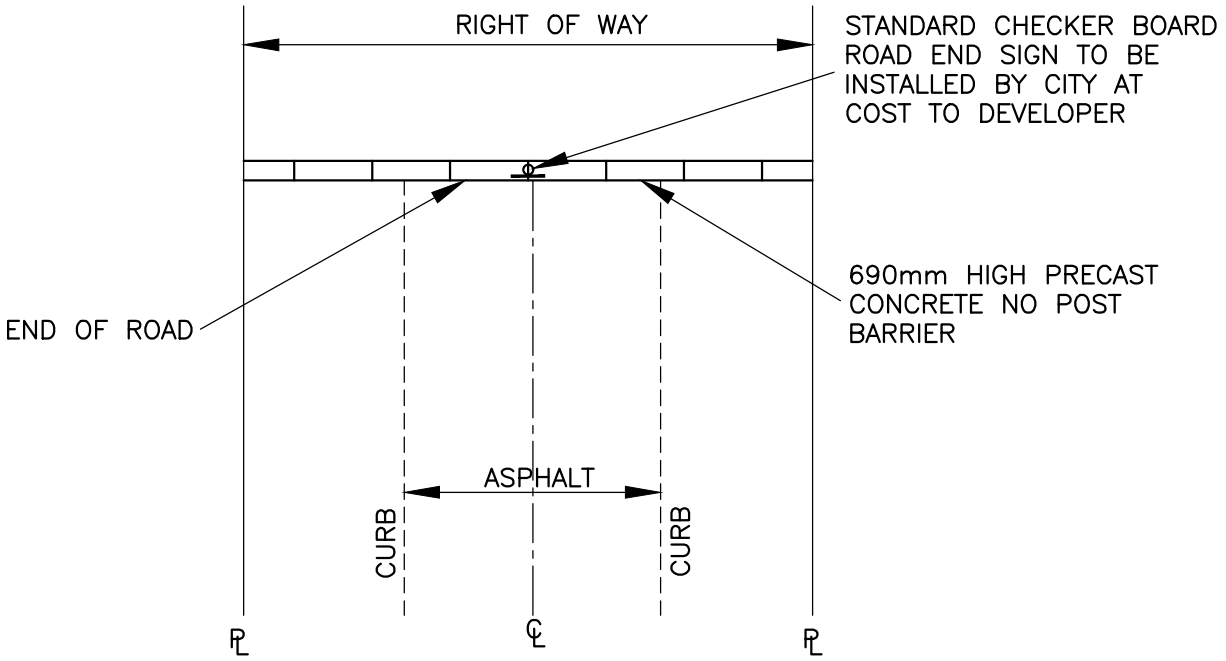


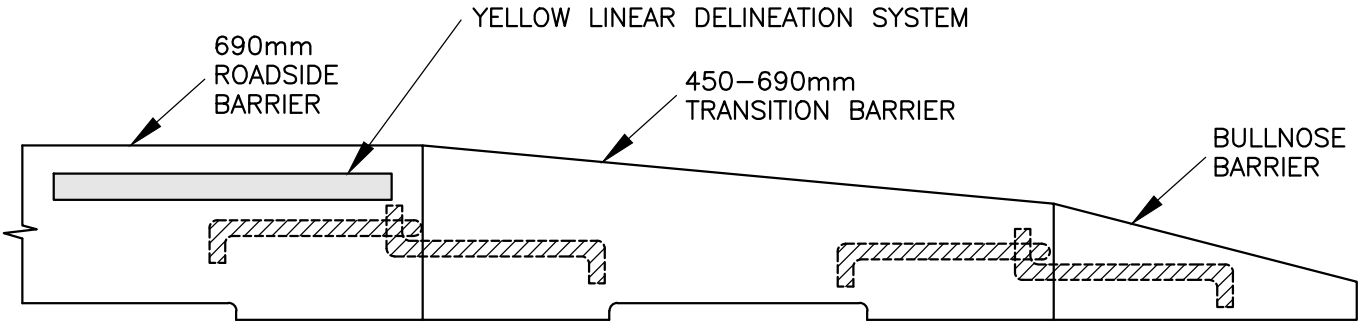
NOTE:
'EMERGENCY ACCESS ONLY' NO PARKING SIGNS TO BE INSTALLED BY CITY.
RB-52(EA6)L OR RB-52(EA6)R

ALTERNATE ACCESS FENCING & BARRICADE DETAIL
(IF TEMPORARY THEN DELETE FENCING)

ABBOTSFORD

DRAWN:	1994 11 30
REVISED:	2021 09 09
APPROVED BY:	
	CS - R - 7





NOTES:

1. BARRIERS TO BE IN INTERLOCKING SECTIONS. EACH END TO BE FINISHED OFF WITH A TRANSITION BARRIER AND BULLNOSE.

2. ATTACH ONE STRIP OF 3M BRAND YELLOW LINEAR DELINEATON SYSTEM TO THE FACE OF EACH BARRIER.

3. BARRIERS TO EXTEND ACROSS FULL WIDTH OF ASPHALT. WHERE GROUND DROPS OFF 1.0m OR MORE AT THE END OF ASPHALT, EXTEND BARRIERS ACROSS THE FULL RIGHT OF WAY.

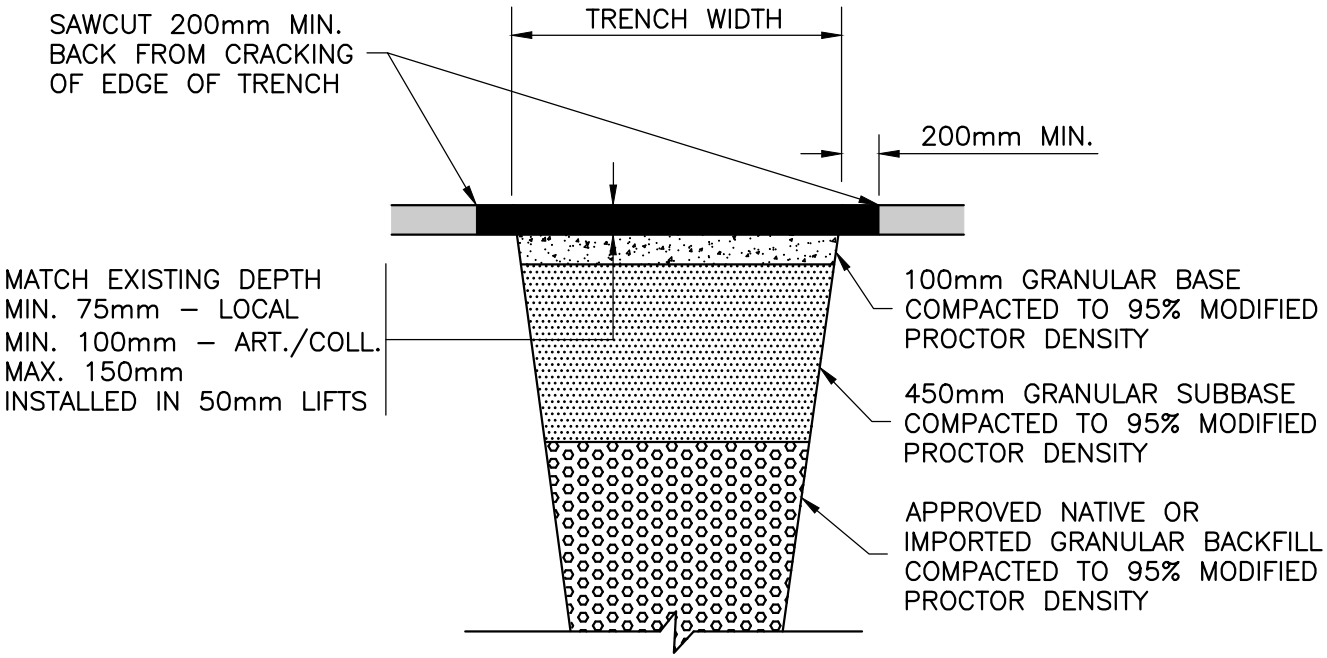
4. COMMENCE INSTALLATION WITH HOOK ON LEADING END. PLACE BULLNOSE SECTION FIRST. END OF BARRIER LINE IS A BULLNOSE SECTION WITH AN EYE CONNECTOR.

CONCRETE ROAD END BARRIER

ABBOTSFORD

DRAWN:	1978 09 28
REVISED:	2021 09 09
APPROVED BY:	

CS - R - 8



NOTES:

1. TEMPORARY PATCH MUST BE MAINTAINED FOR A MINIMUM 3 MONTHS TO ALLOW FOR SETTLEMENT OF TRENCH OR AS DIRECTED BY ENGINEER

2. TEMPORARY ASPHALT SURFACE MUST BE RESTORED TO SMOOTH CONDITION AND MATCH WITH GRADE OF ADJACENT PAVEMENT

3. DEVELOPER REQUIRED TO EFFECT REPAIRS TO TEMPORARY PAVEMENT RESTORATIONS WITHIN 7 DAYS FROM WRITTEN RECEIPT OF NOTICE FROM THE ENGINEER OR IMMEDIATELY IF THE ENGINEER CONSIDERS THE TEMPORARY PATCH TO BE A SAFETY RISK.

4. TEMPORARY PAVEMENT RESTORATIONS OPEN TO TRAFFIC MUST BE RESTORED WITH DEFLECTION TOLERANCES OF NOT MORE THAN 25mm UP OR DOWN, MEASURED WITH A 1m STRAIGHT EDGE

5. IF THE DEVELOPER FAILS TO MAINTAIN THE TEMPORARY ASPHALT RESTORATION TO THE ABOVE SPECIFICATIONS, THE CITY WILL REPAIR AT THE COST OF THE DEVELOPER.

6. REFER TO CS–R–16 FOR PERMANENT TRENCH PAVEMENT RESTORATION REQUIREMENTS

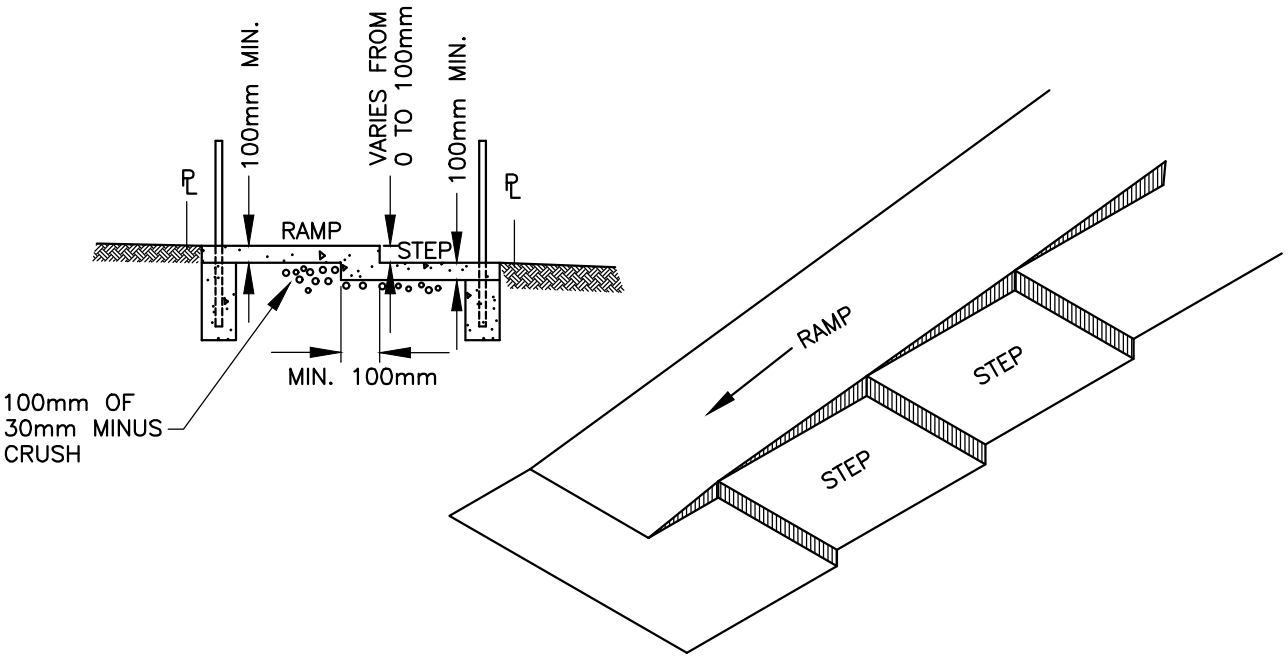
TEMPORARY UTILITY TRENCH PAVEMENT RESTORATION

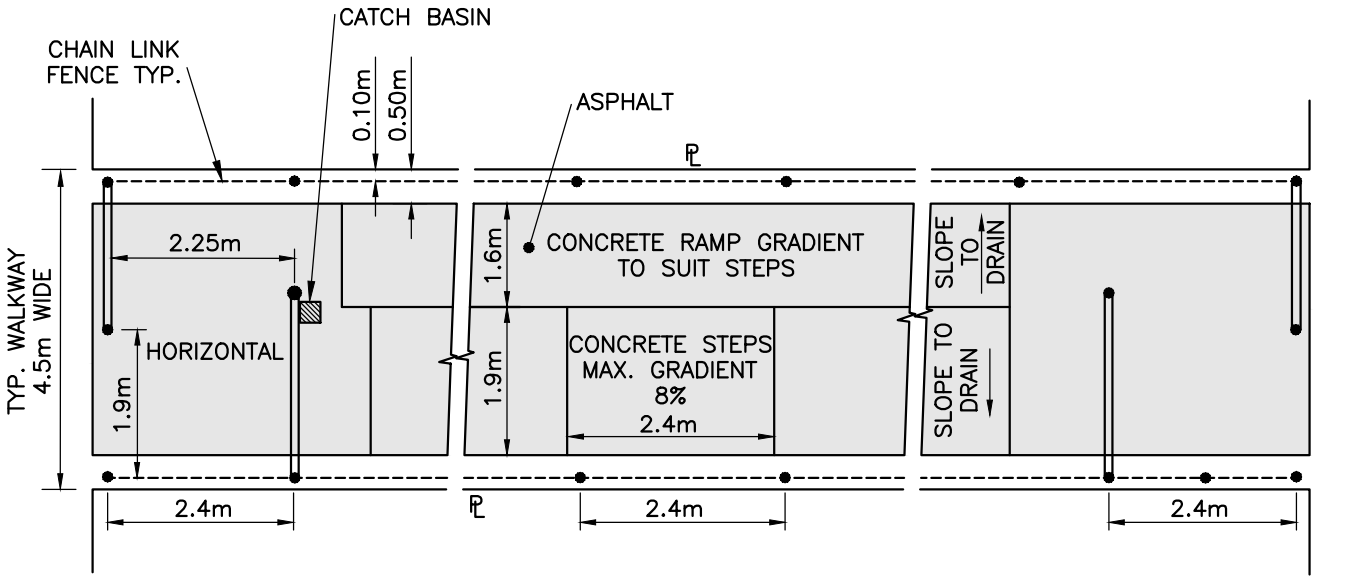
(LONGITUDINAL OR TRANSVERSE)

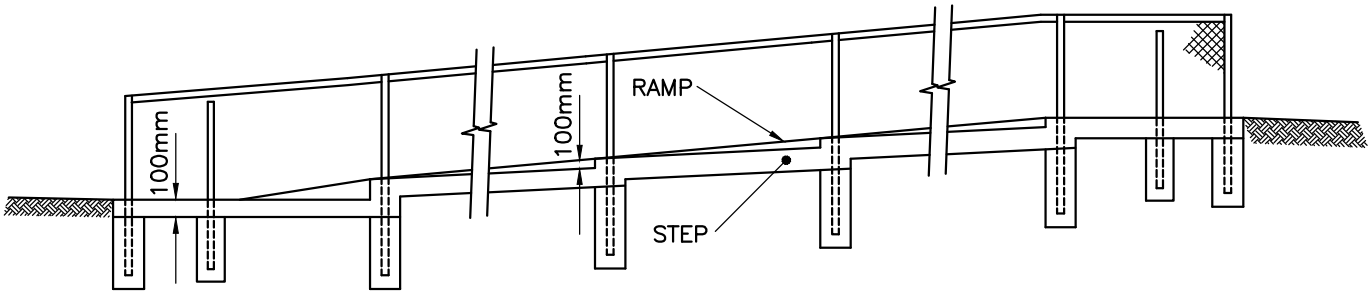
ABBOTSFORD

DRAWN:	1997 01 27
REVISED:	2021 09 09
APPROVED BY:	

CS - R - 9







NUMBER OF STEPS & LENGTH OF RAMP TO SUIT TERRAIN

TYPICAL STEPPED WALKWAY FOR GRADIENTS EXCEEDING 8% AND LESS THAN 12%

ABBOTSFORD

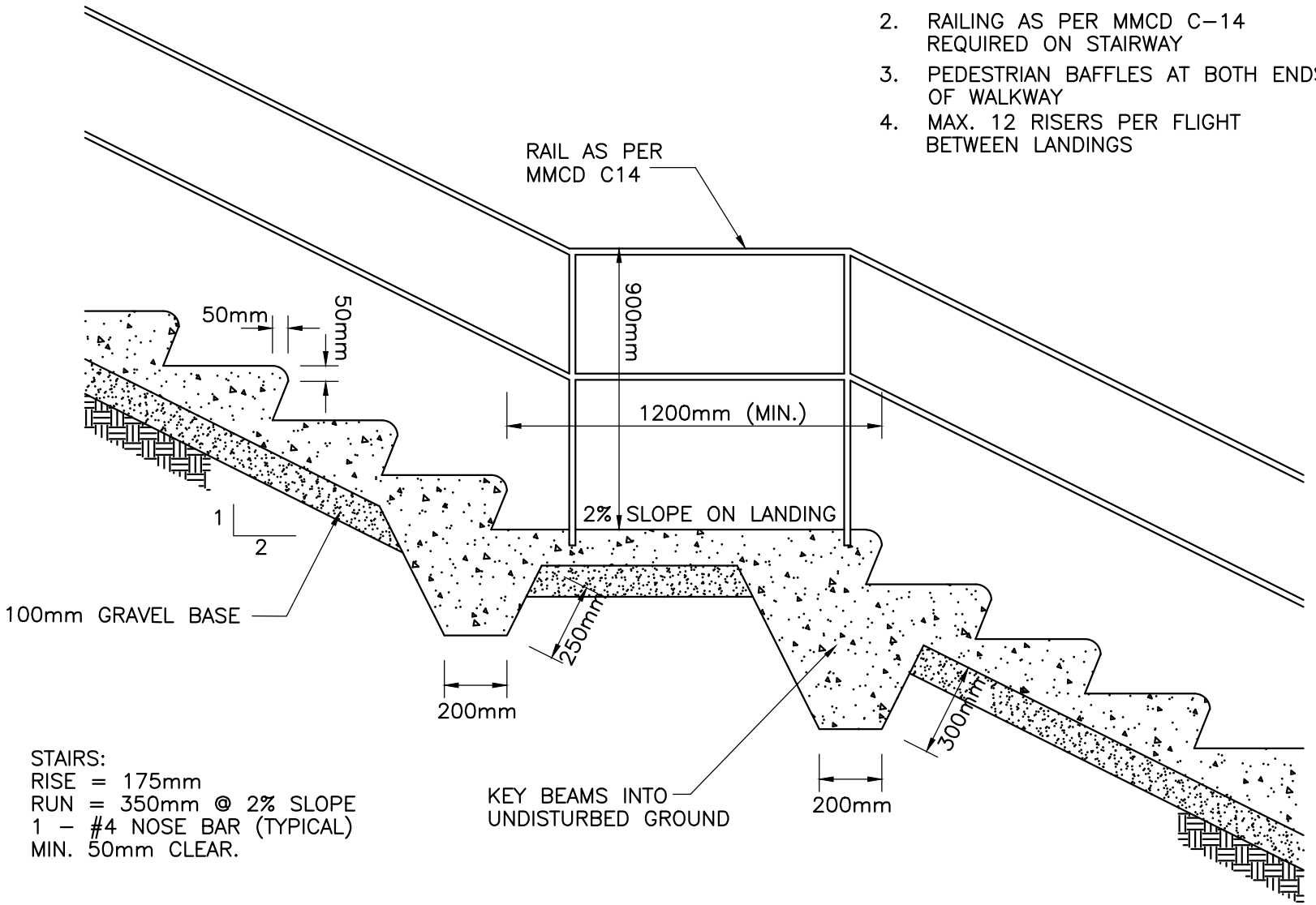
DRAWN:	1975 10 21
REVISED:	2021 09 09
APPROVED BY:	

CS - R - 10

STAIRWAY & LANDING DETAILS FOR WALKWAY GRADIENTS > 12% SLOPE

NOTE:

1. MAX. WALKWAY GRADIENT – 10%
2. RAILING AS PER MMCD C–14 REQUIRED ON STAIRWAY
3. PEDESTRIAN BAFFLES AT BOTH ENDS OF WALKWAY
4. MAX. 12 RISERS PER FLIGHT BETWEEN LANDINGS

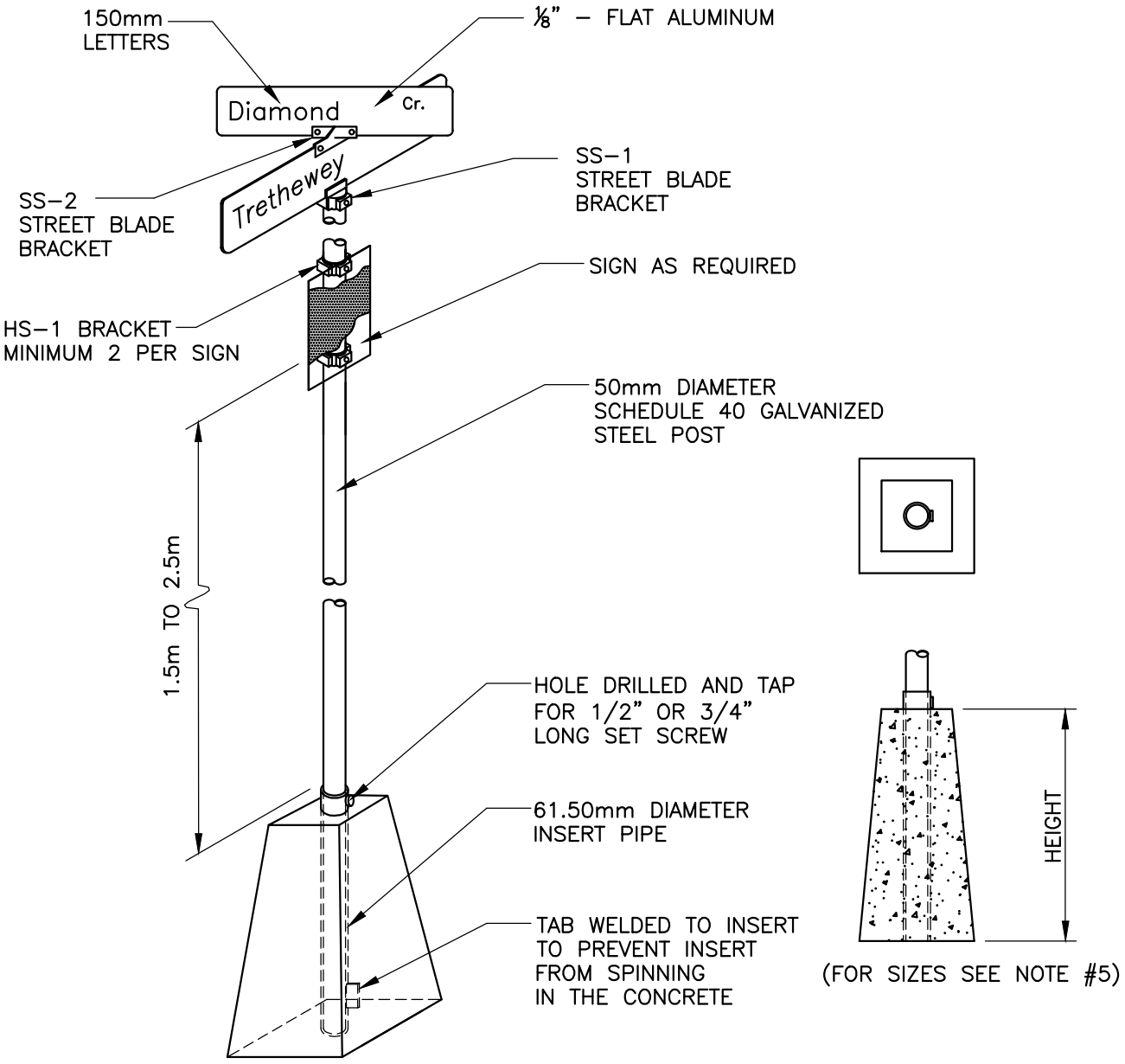


STAIRS:
RISE = 175mm
RUN = 350mm @ 2% SLOPE
1 – #4 NOSE BAR (TYPICAL)
MIN. 50mm CLEAR.

ABBOTSFORD

CS - R - 11

DRAWN: 1997 09 08
REVISED: 2021 09 09
APPROVED BY:



NOTES

1. STREET BLADES TO BE MOUNTED ABOVE ALL STOP OR YIELD SIGNS.
2. THE LENGTH OF THE STREET BLADE IS TO SUIT THE LENGTH OF THE STREET NAME.
3. STANDARD STREET BLADE SIGNS ARE TO BE BLUE WITH WHITE LETTERING.
4. ALL SIGN INSTALLATION LOCATIONS TO BE DETERMINED BY CITY OF ABBOTSFORD ENGINEERING DEPARTMENT.
5. PREMADE SLEEVES FOR SIGNS
   450mm X 450mm AND UNDER
   USE 37kg BASE
   17" HEIGHT

   PREMADE SLEEVES FOR SIGNS
   450mm X 450mm
   TO 600mm X 600mm
   USE 46kg BASE
   19" HEIGHT

   PREMADE SLEEVES FOR SIGNS
   OVER 600mm X 600mm
   USE 75kg BASE
   24" HEIGHT

STREET SIGN INSTALLATION DETAIL

ABBOTSFORD

DRAWN:	2002 09 23
REVISED:	2021 09 09
APPROVED BY:	
	CS - R - 12

BROKEN ROCK RIPRAP SPECIFICATIONS
HEAVY RIPRAP

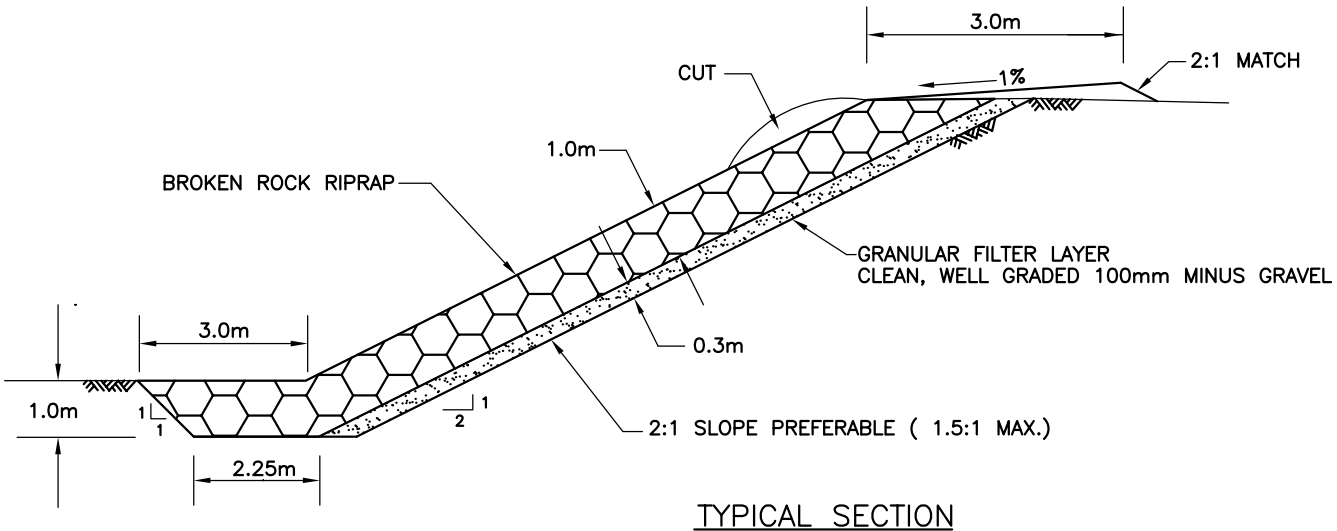
SI METRIC UNITS			IMPERIAL UNITS		
% BY WEIGHT FINER THAN	MASS (kg.)	APPROX. EQUIVALENT DIAMETER (mm)	% BY WEIGHT FINER THAN	MASS (lb.)	APPROX. EQUIVALENT DIAMETER (inches)
100	1100	900	100	2400	36
NOT MORE THAN 50	300	600	NOT MORE THAN 50	660	24
NOT MORE THAN 10	40	300	NOT MORE THAN 10	90	12

ROCK RIPRAP SHALL:

1. CONSIST OF DENSE, DURABLE, ROUGHLY EQUIDIMENSIONAL, ANGULAR PIECES.
2. BE CLEAN AND REASONABLY WELL GRADED COVERING THE COMPLETE ALLOWABLE SIZE RANGE FOR EVERY LOAD LEAVING THE QUARRY.
3. BE FREE FROM CRACKS, SEAMS, AND OTHER DEFECTS THAT WOULD TEND TO INCREASE UNDULY ITS DETERIORATION FROM NATURAL CAUSES.
4. BE FREE OF OBJECTIONABLE QUANTITIES OF DIRT, SAND, CLAY AND ROCK FINES.
5. BE SHAPED SUCH THAT NEITHER THE BREADTH NOR THICKNESS OF ANY INDIVIDUAL PIECE SHALL BE LESS THAN ONE THIRD OF ITS LENGTH. THIN, FLAT PIECES WILL NOT BE PERMITTED.

RIPRAP PLACEMENT:

1. ROCK RIPRAP SHALL BE PLACED IN SUCH A MANNER AS TO PRODUCE A REASONABLY WELL GRADED MASS OF ROCK WITH THE MINIMUM PRACTICABLE PERCENTAGE OF VOIDS.
2. NO ROCK SHALL PROTRUDE MORE THAN 300mm ABOVE THE LINES AND GRADES SHOWN.
3. THE FINISHED RIPRAP SHALL BE FREE FROM OBJECTIONABLE POCKETS OF SMALL STONES AND/OR CLUSTERS OF LARGER STONES.



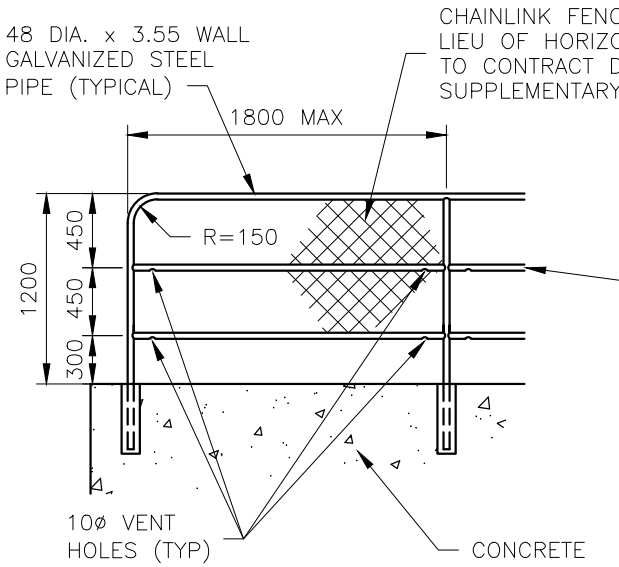
TYPICAL SECTION

BROKEN ROCK RIPRAP SPECIFICATIONS

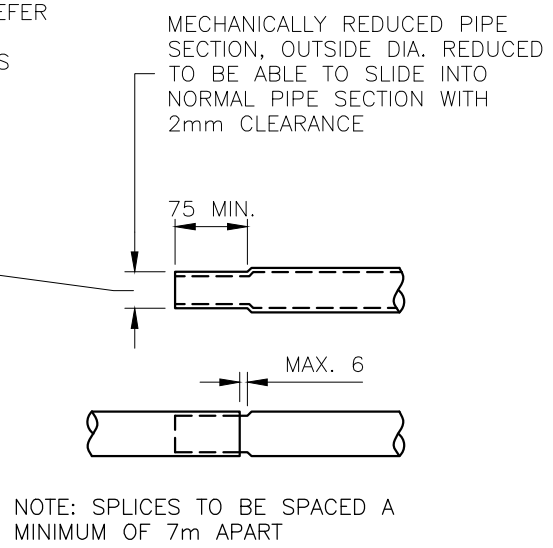
ABBOTSFORD

DRAWN: 1996 07 23
REVISED: 2005 10 07
APPROVED BY:

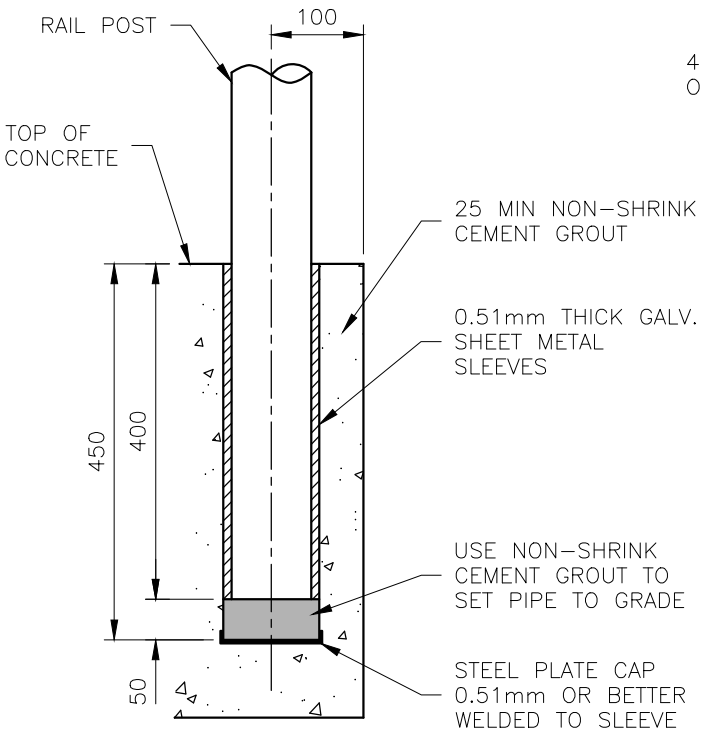
CS - R - 13



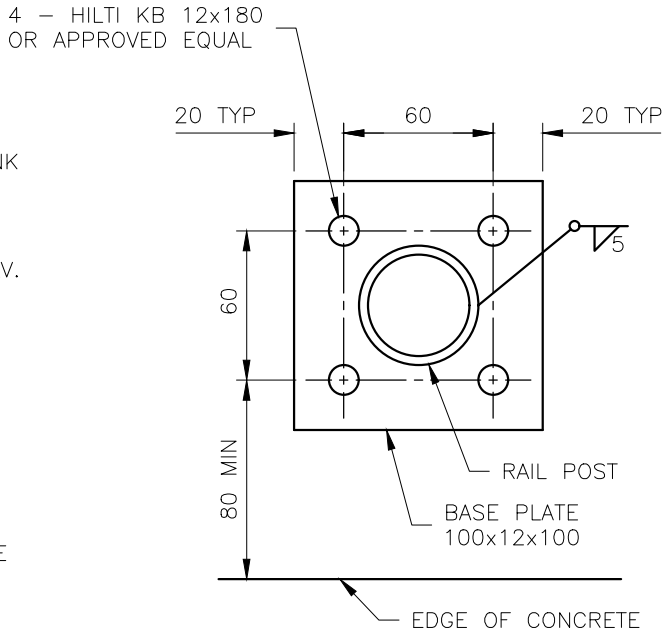
GENERAL ARRANGEMENT



SLIP–ON RAIL SPLICE



EMBEDDED MOUNTING – TYPICAL WALL DETAIL



ATTACHED MOUNTING – TYPICAL SIDEWALK DETAIL

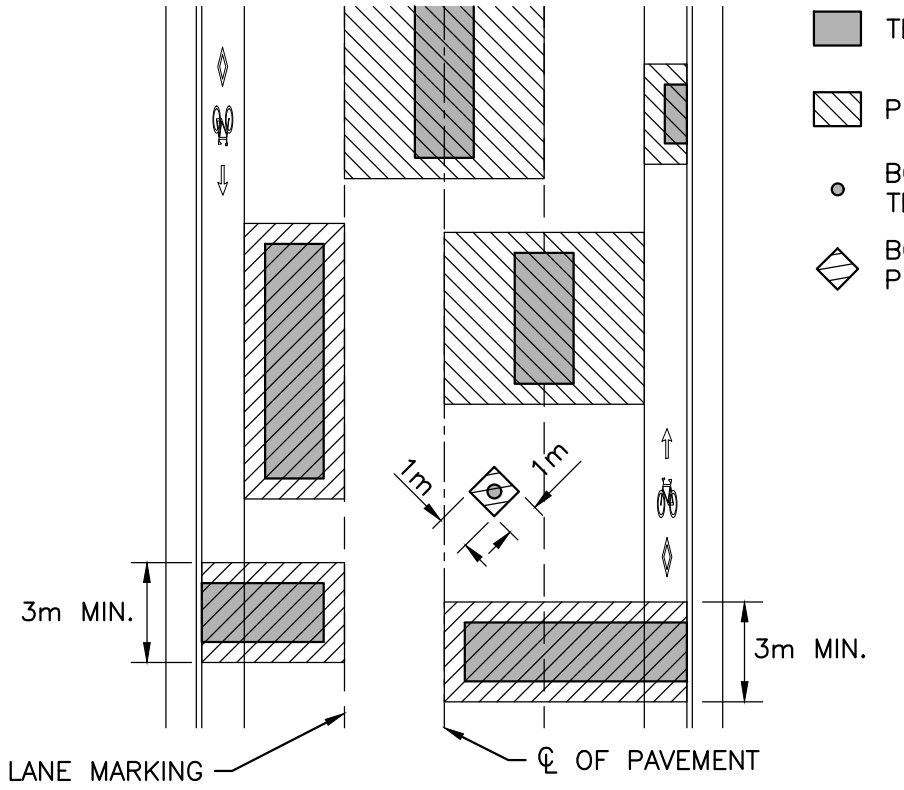
NOTES:

1. ALL JOINTS MITRED, WELDED ALL AROUND AND SMOOTHED.
2. ALL COMPONENTS TO BE HOT DIPPED GALVANIZED AFTER FABRICATION.
3. REFER TO CONTRACT DRAWINGS, MMCD SECTION 32 31 13 FOR DETAILED SPECIFICATIONS.

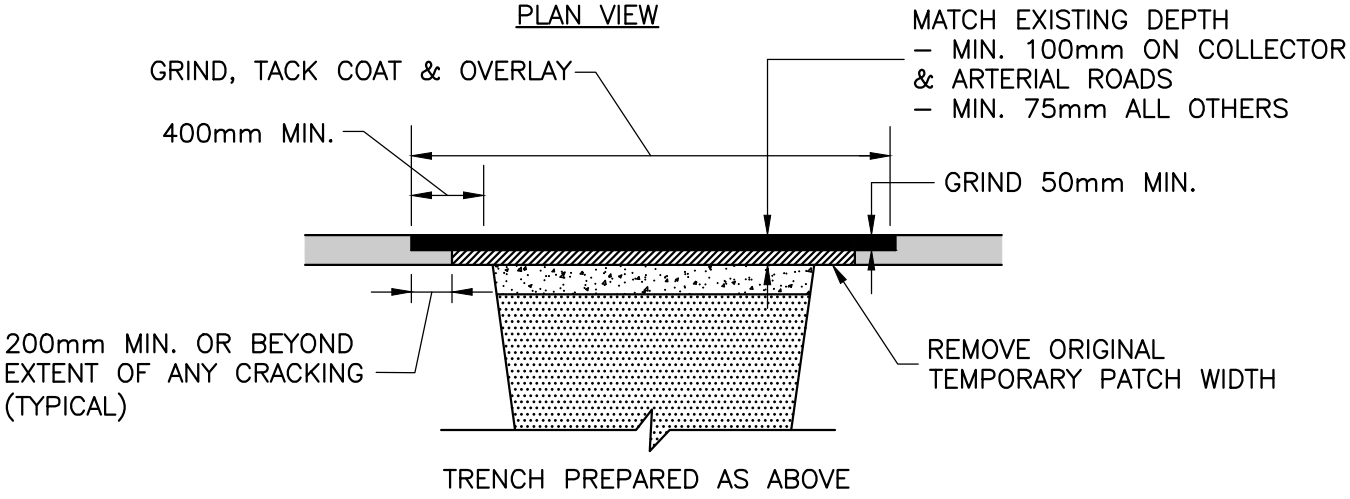
HANDRAIL FOR UNIT RATE TENDER

ABBOTSFORD

DRAWN:	2021 09 09
REVISED:	
APPROVED BY:	
	CS - R - 14



PLAN VIEW



CROSS SECTION

NOTES:

1. PERMANENT PAVEMENT RESTORATION AFTER 3 MONTHS OR AS DIRECTED BY ENGINEER
2. MINIMUM WIDTH OF TRANSVERSE PAVEMENT CUTS IS 3m
3. MINIMUM WIDTH OF LONGITUDINAL PAVEMENT CUTS DETERMINED BY PERMANENT PATCHING REQUIREMENTS
4. REFER TO CS–R–9 FOR TEMPORARY TRENCH PAVEMENT RESTORATION REQUIREMENTS
5. ANY TRANSVERSE PAVEMENT CUTS WITHIN 8m OF EACH OTHER SHALL BE INCORPORATED INTO ONE PATCH
6. BORE HOLES FOR GEOTECHNICAL WORKS SHALL BE PERMANENTLY PATCHED WITH HOT MIX AND PLACED IN A DIAMOND SHAPE.
7. REMOVE FULL DEPTH ASPHALT IN AREAS WITH CRACK AT THE DISCRETION OF THE ENGINEER.

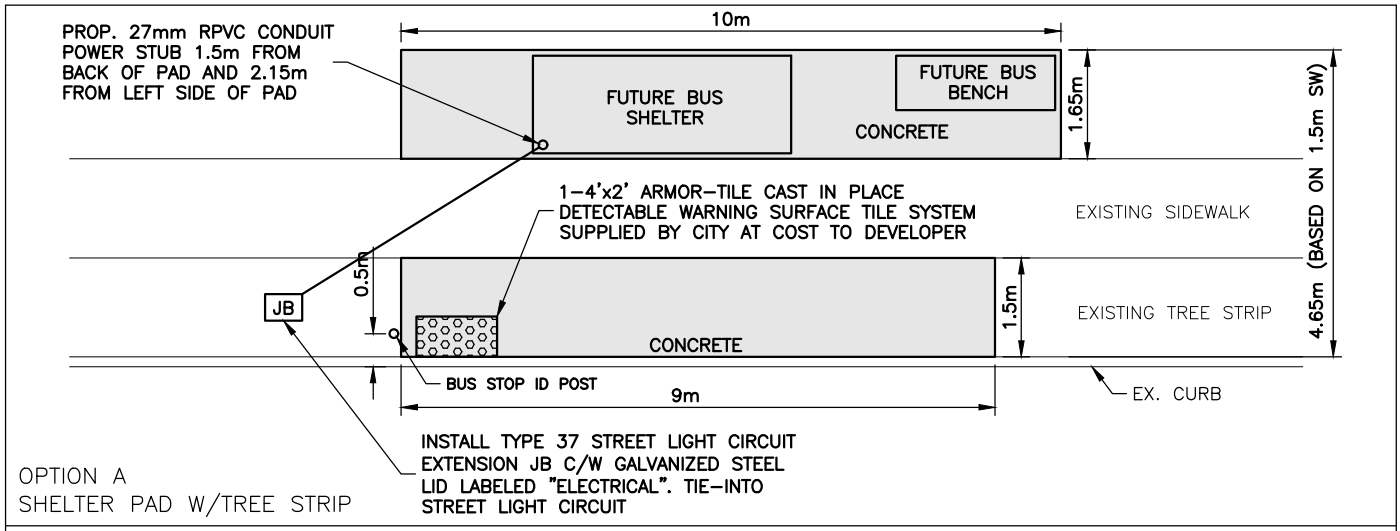
PERMANENT UTILITY TRENCH PAVEMENT RESTORATION

(LONGITUDINAL OR TRANSVERSE)

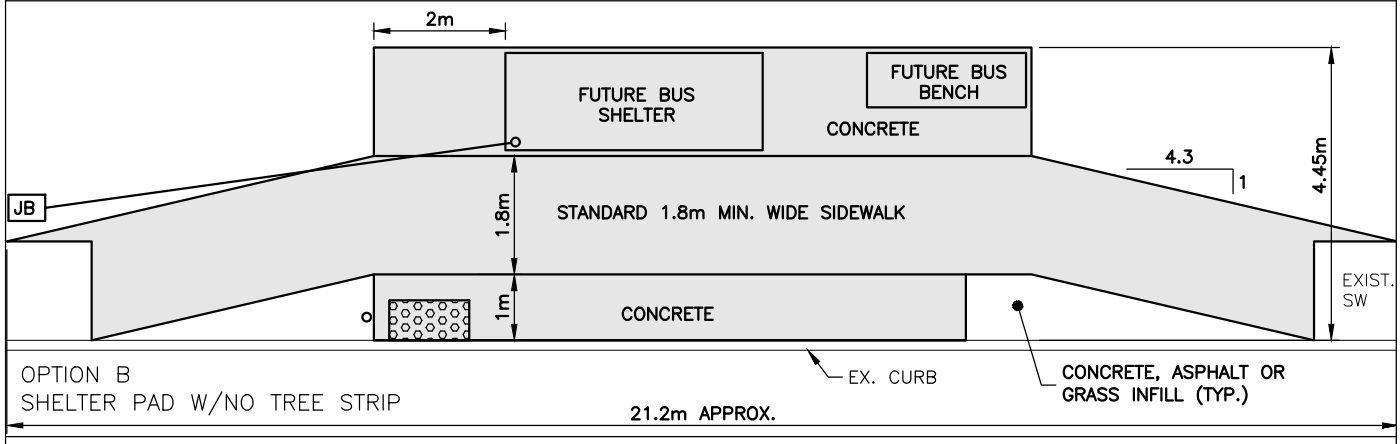
ABBOTSFORD

DRAWN:	2021 09 09
REVISED:	
APPROVED BY:	

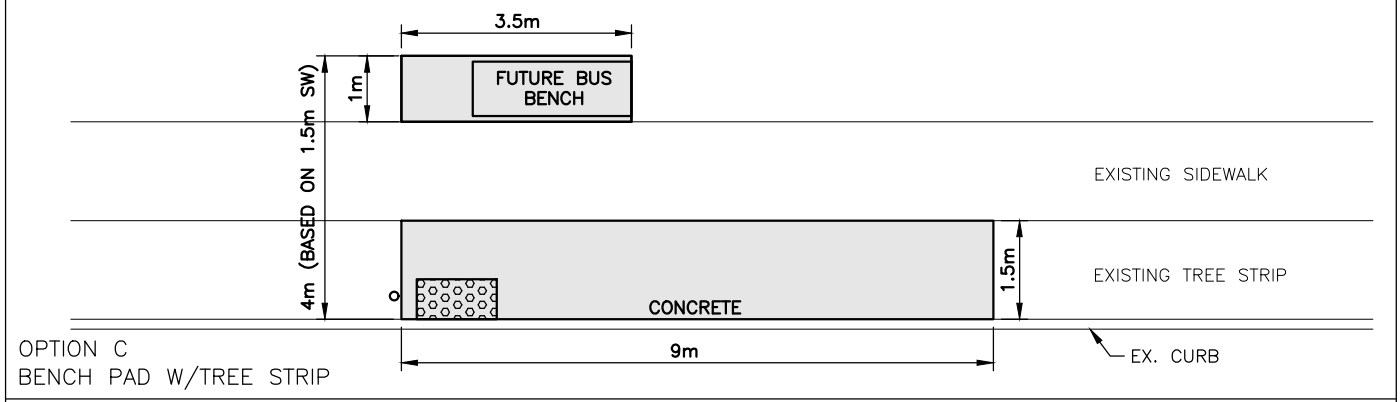
CS - R - 15



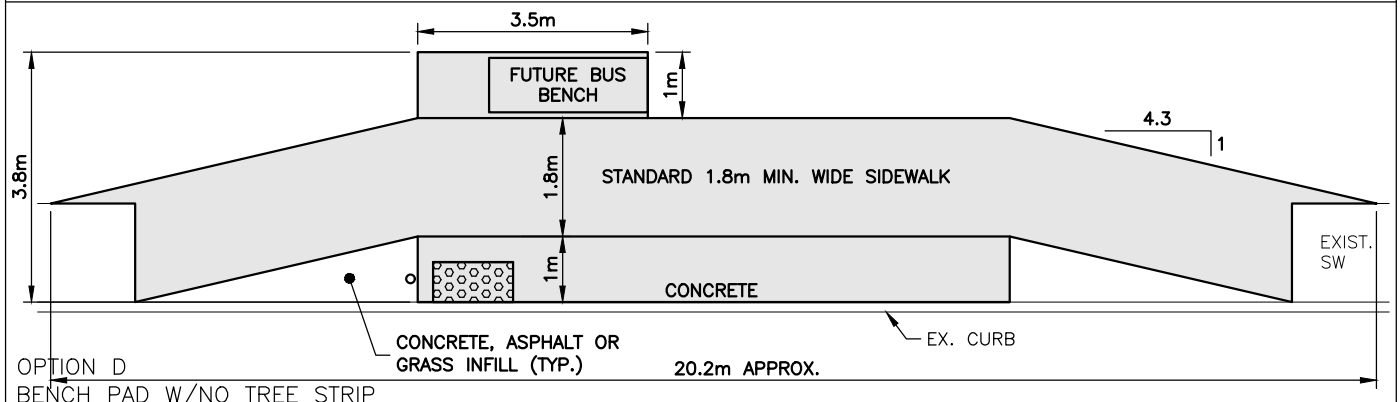
OPTION A
SHELTER PAD W/TREE STRIP



OPTION B
SHELTER PAD W/NO TREE STRIP



OPTION C
BENCH PAD W/TREE STRIP



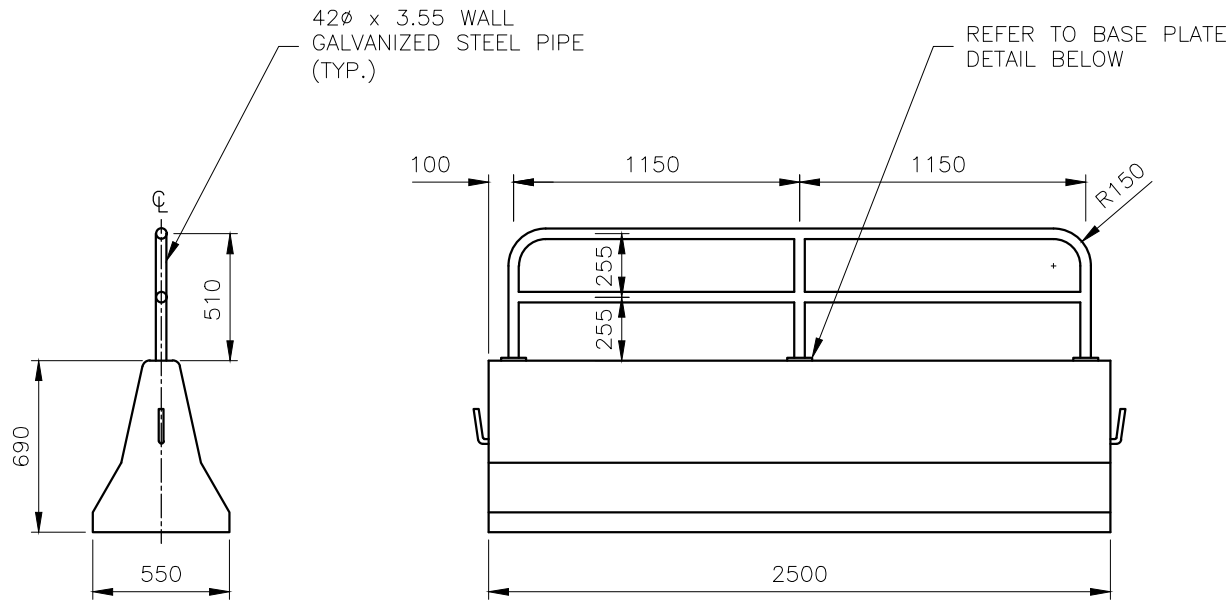
OPTION D
BENCH PAD W/NO TREE STRIP

URBAN TRANSIT STOP DETAILS

ABBOTSFORD

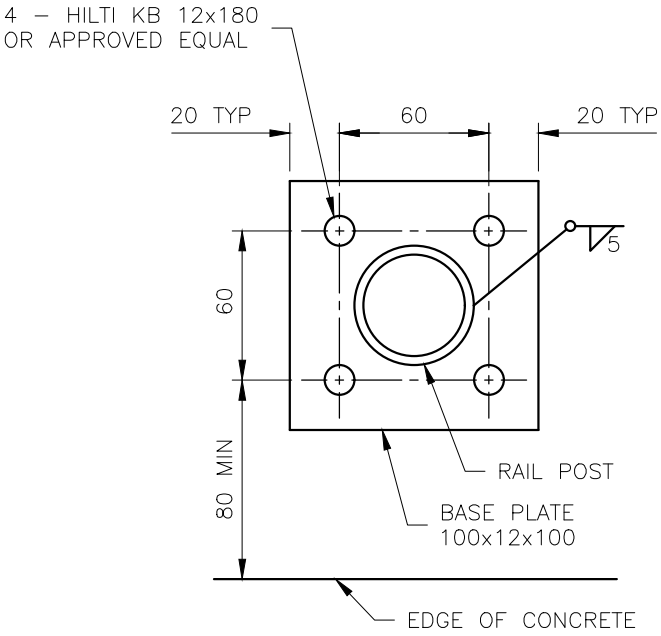
DRAWN:	2021 09 09
REVISED:	
APPROVED BY:	

CS - R - 16



END VIEW

SIDE VIEW



ATTACHED MOUNTING – TYPICAL
SIDEWALK DETAIL

NOTES:

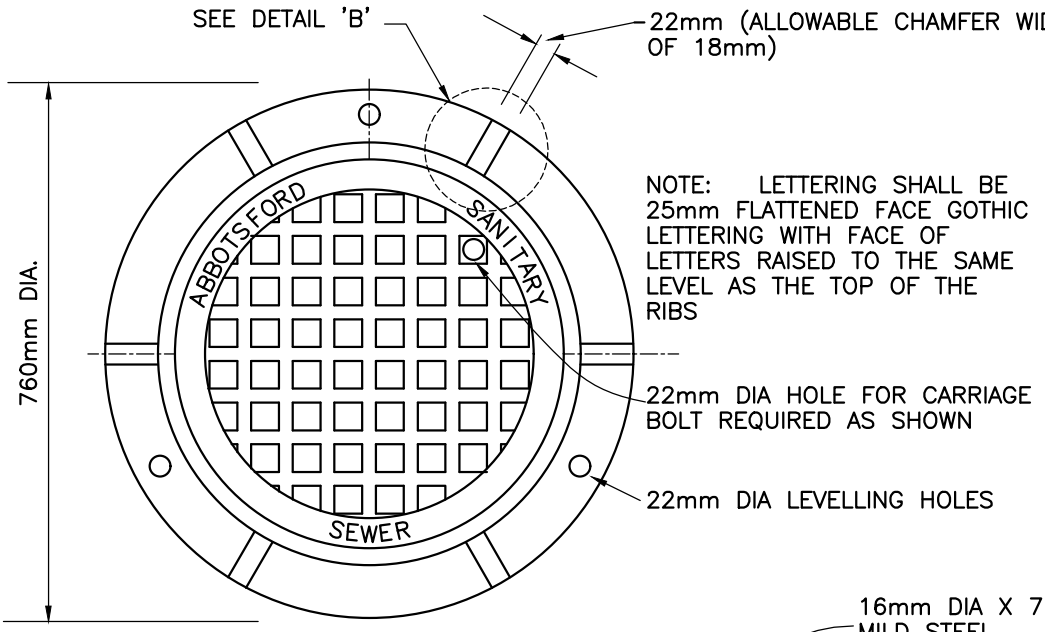
1. ALL JOINTS MITRED, WELDED ALL AROUND AND SMOOTHED.
2. ALL COMPENENTS TO BE HOT DIPPED GALVANIZED AFTER FABRICATION.
3. REFER TO MMCD SECTION 32 31 13 FOR DETAILED SPECIFICATION.

HANDRAIL
ON CONCRETE BARRIER

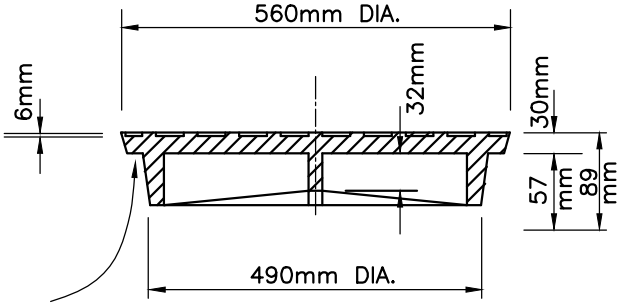
ABBOTSFORD

DRAWN:	2021 09 09
REVISED:	
APPROVED BY:	

CS - R - 17

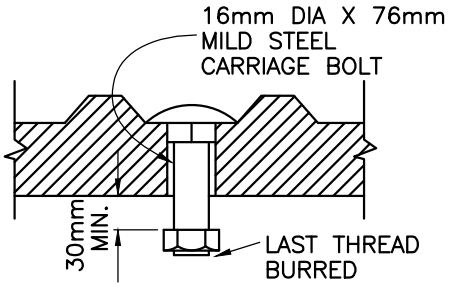


PLAN



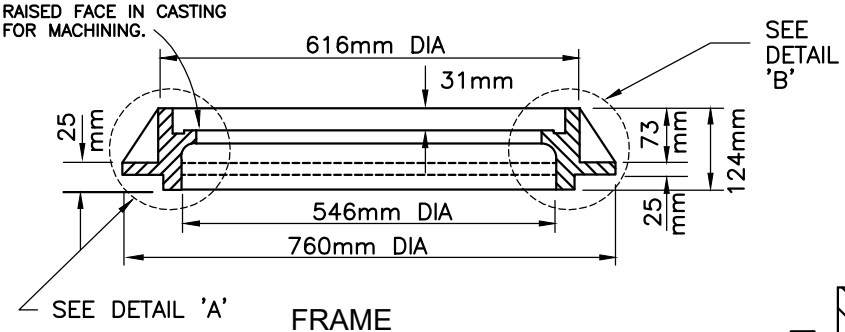
MACHINE SURFACE FOR NON ROCKING FIT IN ALL POSITIONS. ALLOW 2mm RAISED FACE IN CASTING FOR MACHINING.

COVER



CARRIAGE BOLT DETAIL

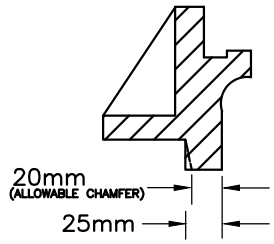
ALLOWABLE TOLERANCE OF DIMENSIONS:
0.5% ON LID & FRAME DIAMETERS,
5.0% ON ALL OTHER DIMENSIONS



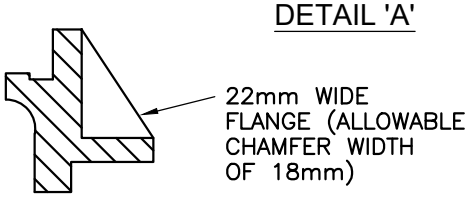
FRAME

TYPE – DOBNEY FOUNDRY
NO. C–20 "TR" CASTINGS OR "K" CASTINGS.

APPROXIMATE WEIGHTS
COVER – 66 kg
FRAME – 84 kg



DETAIL 'A'



DETAIL 'B'

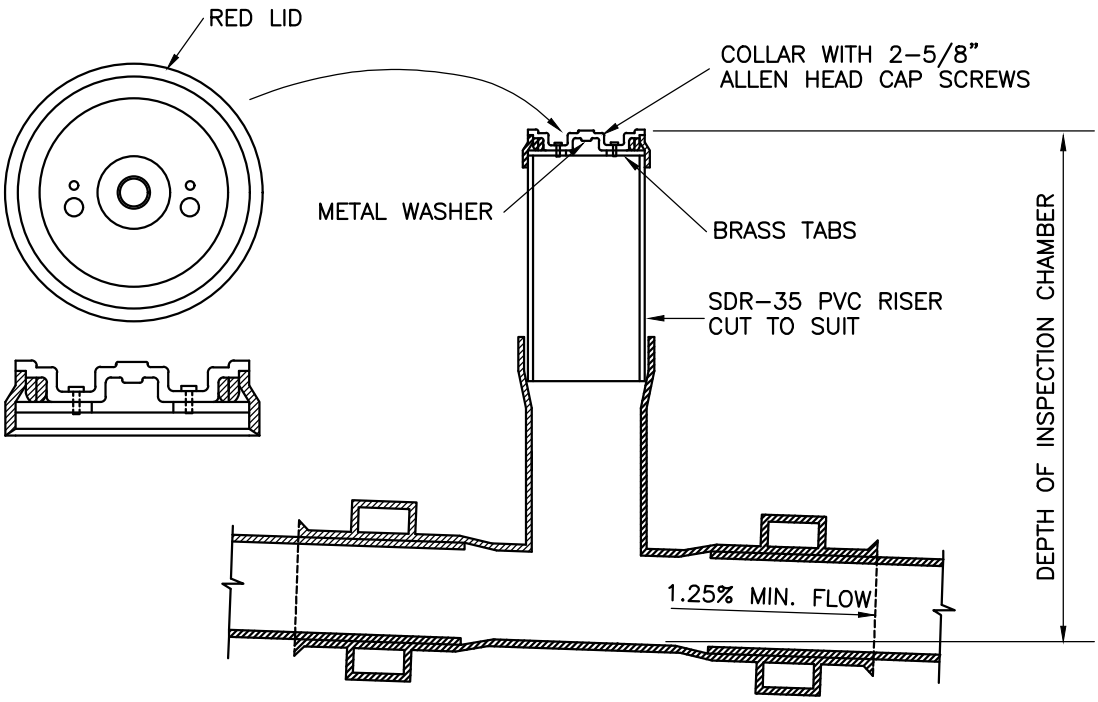
NOTES:
1. LOCAL ROADS: USE C20 FRAME AND CASTINGS
2. ARTERIAL/COLLECTOR ROADS OR WHERE HEAVY TRUCK TRAFFIC IS EXPECTED: USE TR18 (7 INCH TALL) FRAME AND CASTINGS

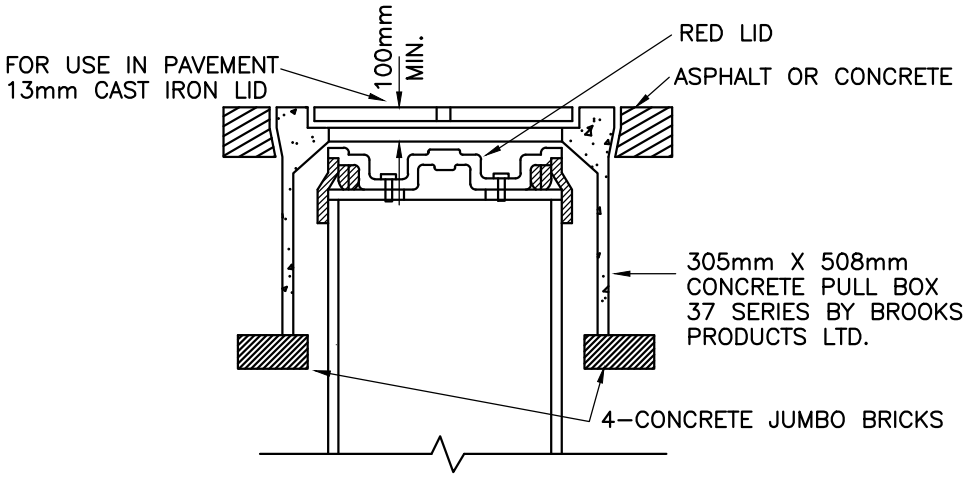
SANITARY SEWER MANHOLE COVER & FRAME

ABBOTSFORD

DRAWN:	1971 07 01
REVISED:	2021 09 09
APPROVED BY:	

CS - S - 1





INSTALLATION OF INSPECTION CHAMBER
IN METER BOX AT P/L

NOTE:

1. I.C. TO COME WITH ARROW INDICATING DIRECTION OF FLOW AND BE INJECTION MOLDED AS MANUFACTURED BY LERON PLASTICS OR GALAXY PLASTICS LTD. OR EQUIVALENT
2. BACK FLOW PREVENTOR SOCKET REQUIRED

SANITARY SEWER INSPECTION CHAMBER FOR SERVICE CONNECTION

ABBOTSFORD

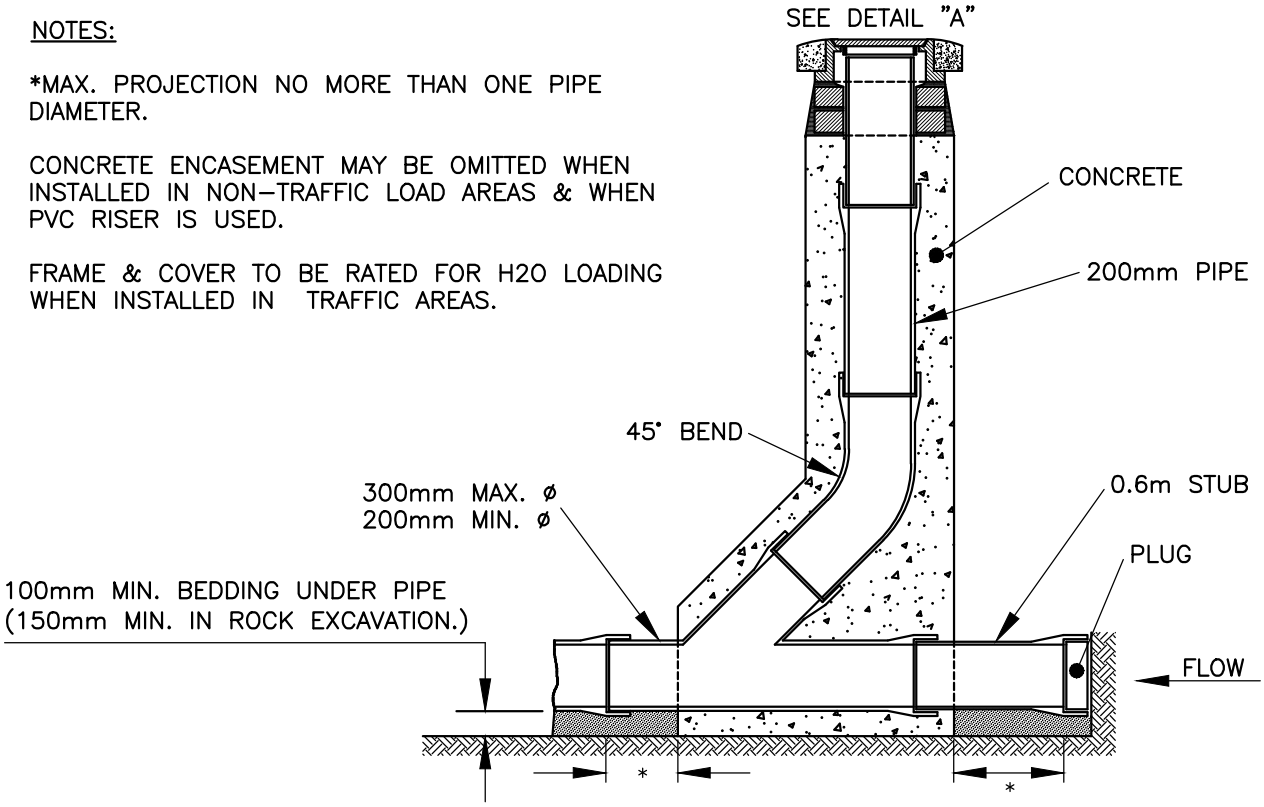
DRAWN:	1992 04 01
REVISED:	2021 09 09
APPROVED BY:	
	CS - S - 2

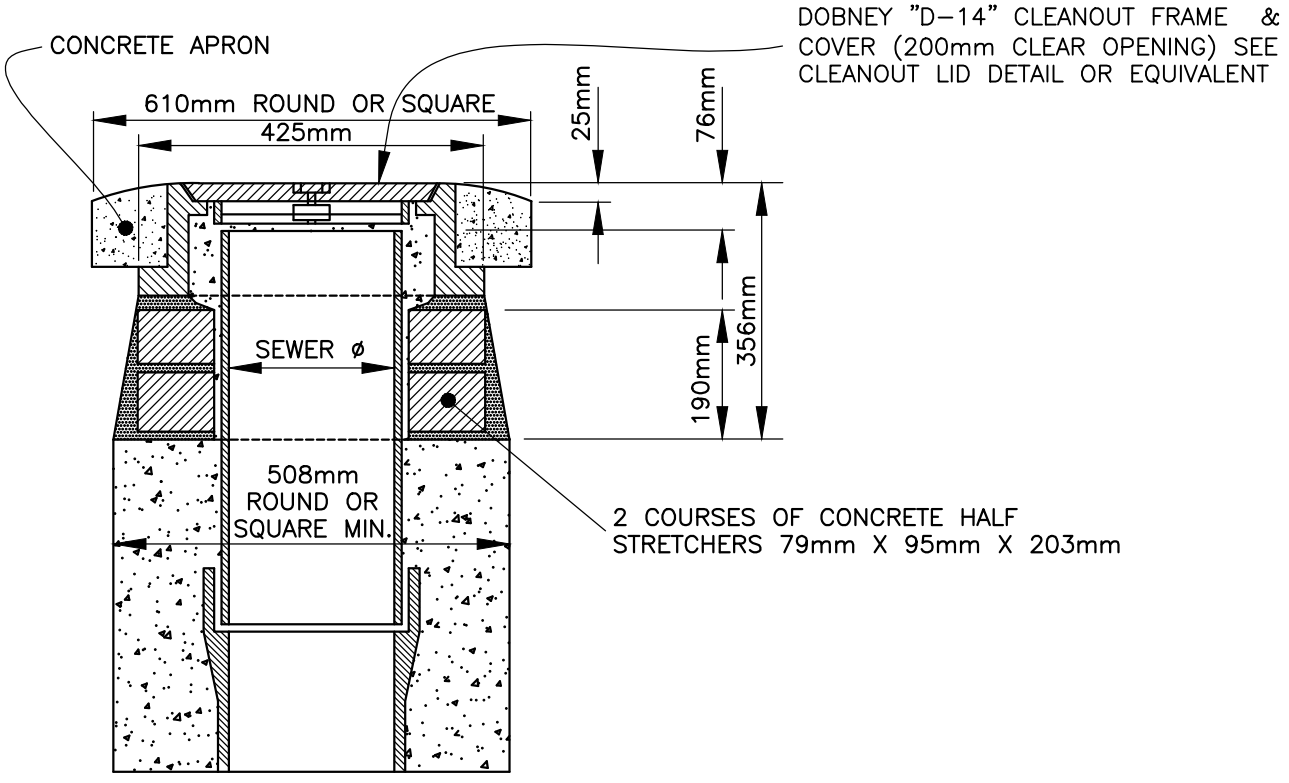
NOTES:

*MAX. PROJECTION NO MORE THAN ONE PIPE DIAMETER.

CONCRETE ENCASEMENT MAY BE OMITTED WHEN INSTALLED IN NON–TRAFFIC LOAD AREAS & WHEN PVC RISER IS USED.

FRAME & COVER TO BE RATED FOR H20 LOADING WHEN INSTALLED IN TRAFFIC AREAS.





COVER DETAIL "A"

(REPLACES MMCD–S6)

SANITARY SEWER CLEAN-OUT STRUCTURE

ABBOTSFORD

DRAWN:	1971 10 01
REVISED:	2021 09 09
APPROVED BY:	
	CS - S - 3

NOTICE

THIS FACILITY IS FOR DISPOSING OF RV SEWAGE ONLY WATER FOR FLUSHING & CLEANING PURPOSES ONLY

INSTRUCTIONS

CONNECT YOUR HOSE TO HOLDING TANK. PLACE OTHER END INTO DRAIN. FLUSH AWAY ANY SPILLAGE ON CONCRETE.

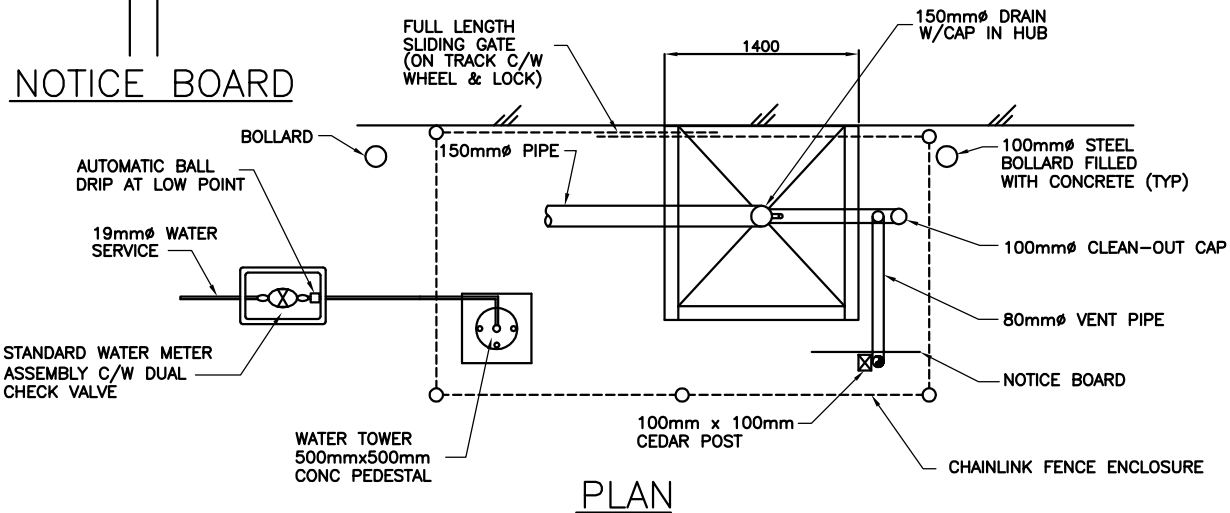
NOTICE BOARD

EDGE OF DRIVEWAY

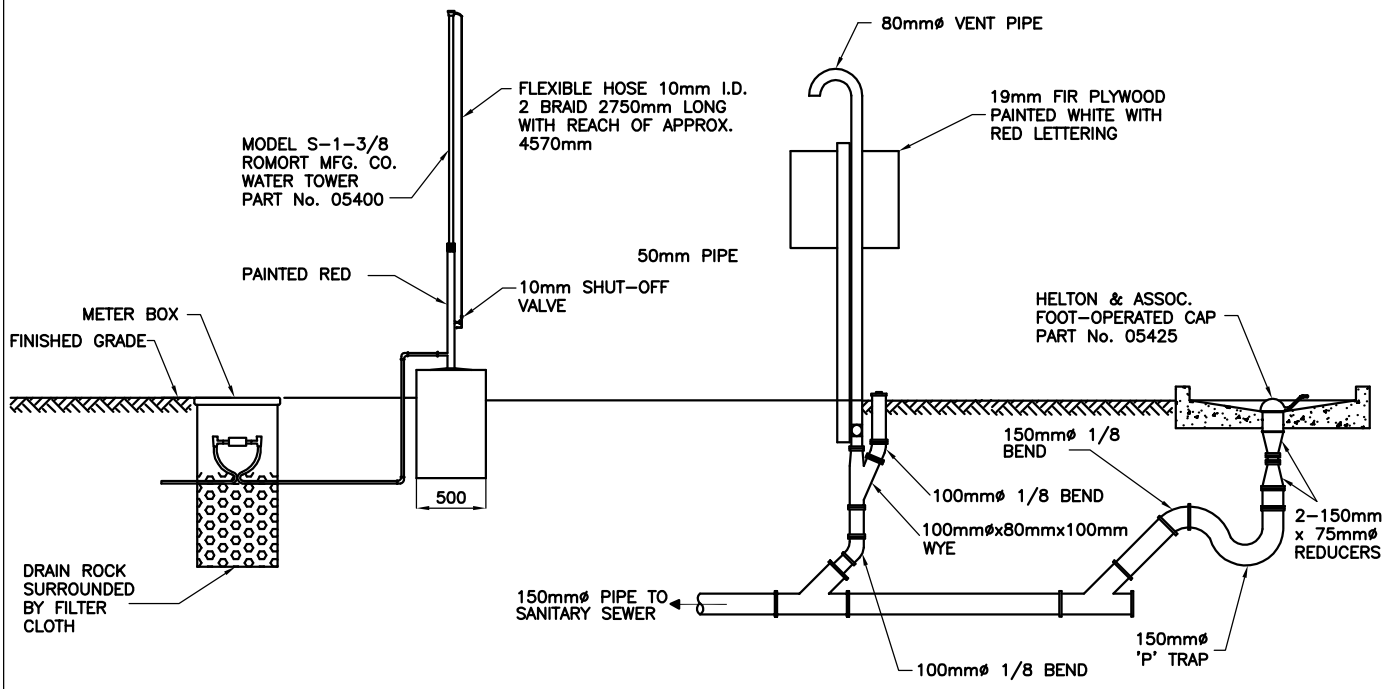
ASPHALT DRIVEWAY

NOTE:

- SURFACE WATER TO BE DIRECTED AWAY FROM SANI-DUMP
- LOCATION OF SANI-DUMP SHALL BE APPROVED BY THE ENGINEER



PLAN

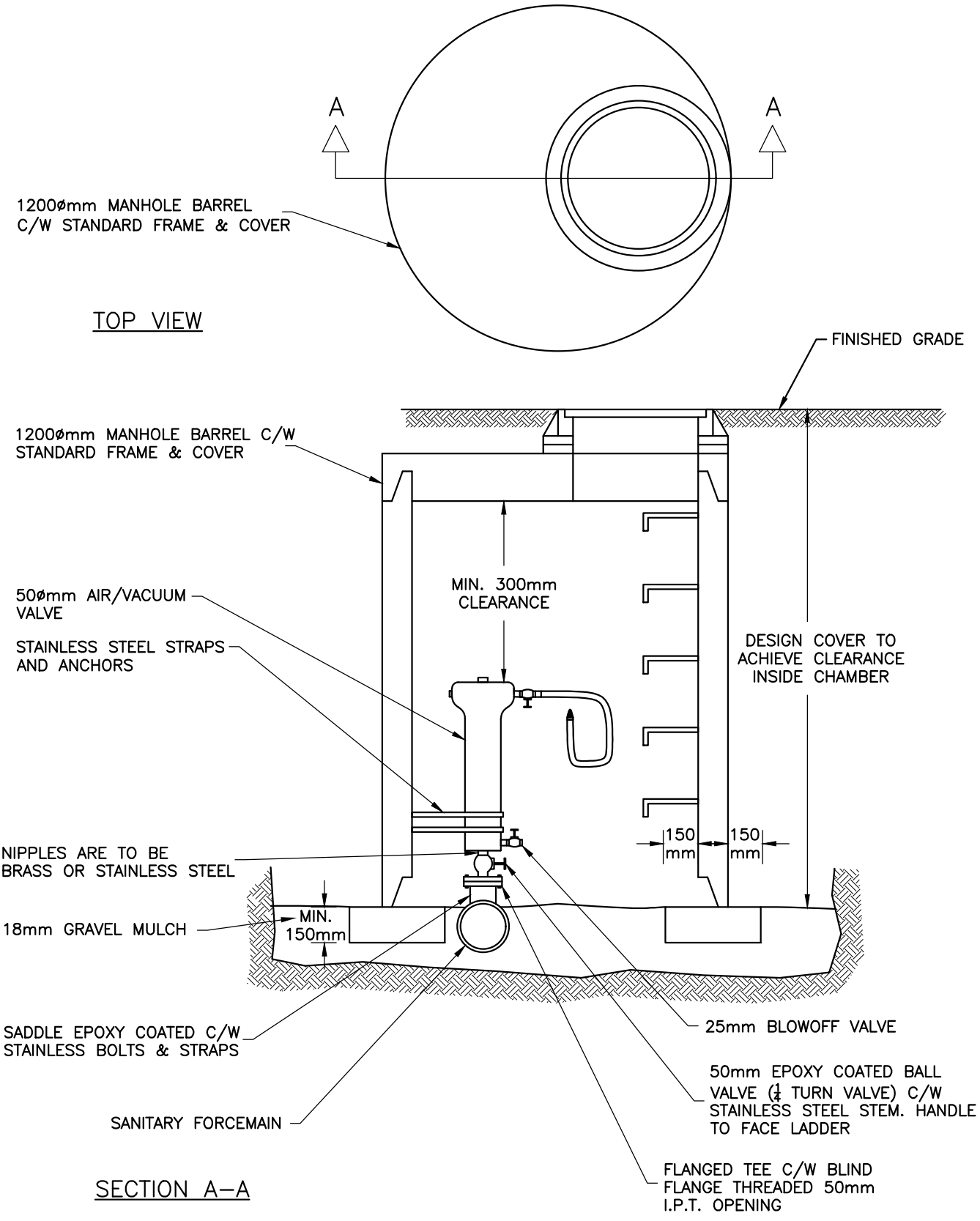


SECTION

R.V. SANI-DUMP STATION

ABBOTSFORD

DRAWN:	1995 02 13
REVISED:	2005 11 01
APPROVED BY:	
	CS - S - 4

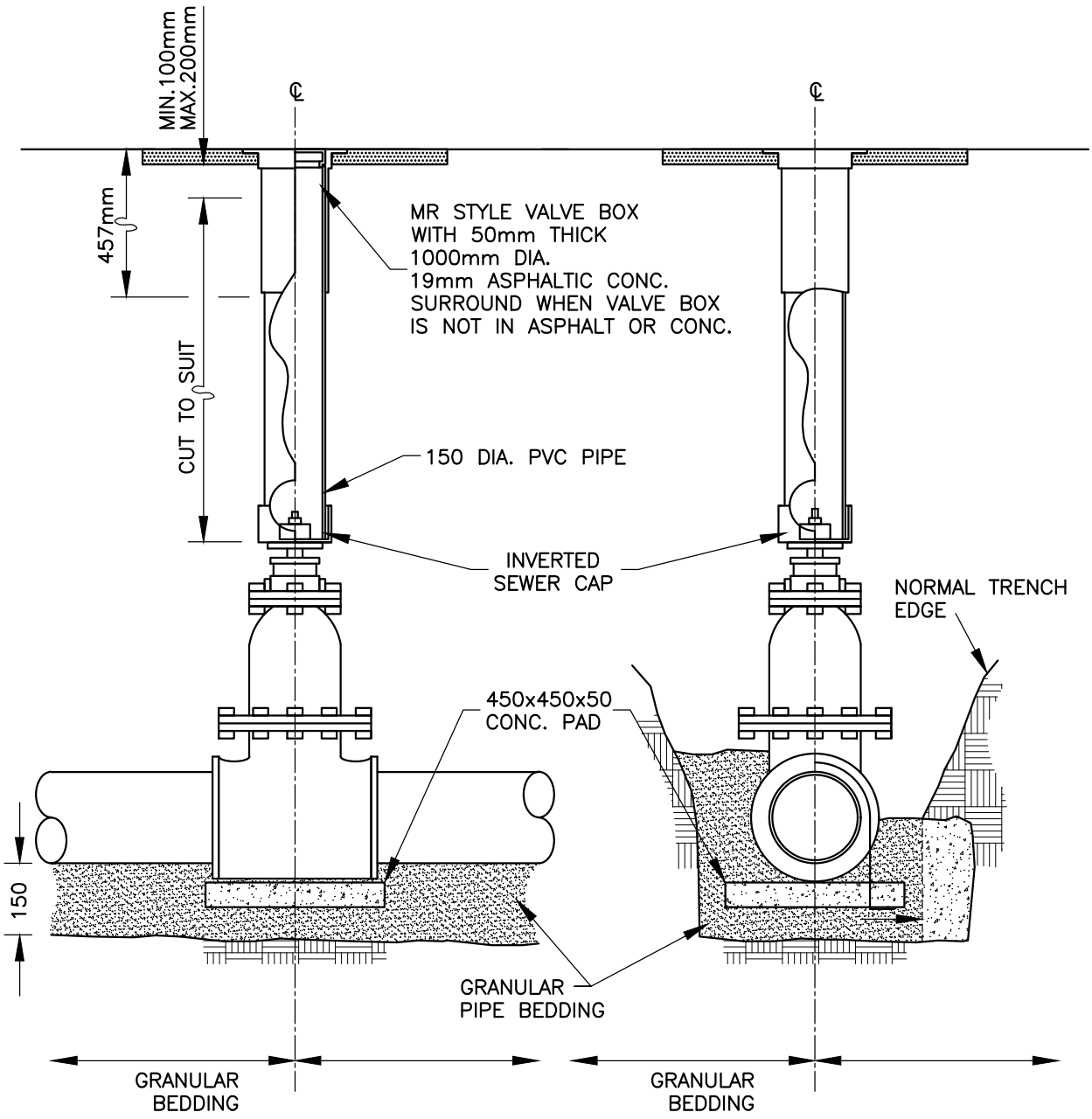


AIR VACUUM INSTALLATION ON SANITARY FORCEMAINS

ABBOTSFORD

DRAWN:	1978 09 29
REVISED:	2021 09 09
APPROVED BY:	

CS - S - 5



INSTALLATION PROCEDURES:

1. REMOVE 2" SQUARE OPERATING NUT;
2. DRILL CAP SLIGHTLY LARGER THAN SHAFT & PLACE OVER SHAFT;
3. RE–INSTALL 2" SQUARE OPERATING NUT;
4. INSERT P.V.C. RISER PIPE INTO CAP.

NOTE:

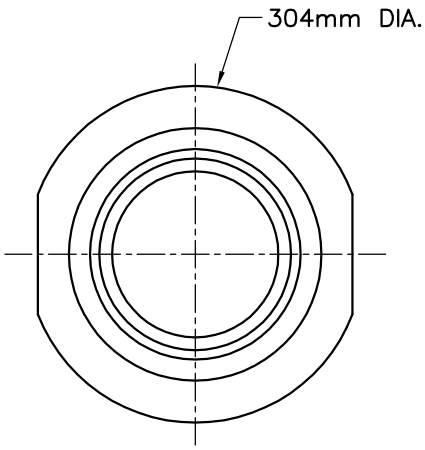
1. BLACKTOP AROUND COVERS APPLICABLE TO ALL VALVES ON BOULEVARDS AND PAVEMENTS.
2. VALVE BOXES MUST BE FLUSH AND LEVEL WITH FINISHED GRADE

TYPICAL GATE VALVE INSTALLATION FOR SANITARY FORCEMAIN

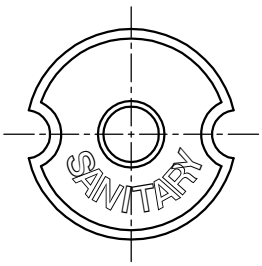
ABBOTSFORD

DRAWN:	1999 09 09
REVISED:	2021 09 09
APPROVED BY:	

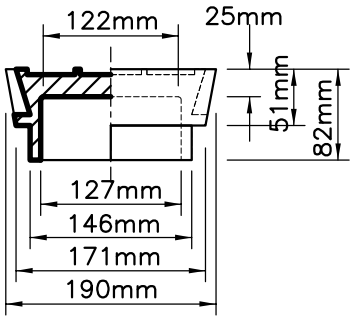
CS - S - 6



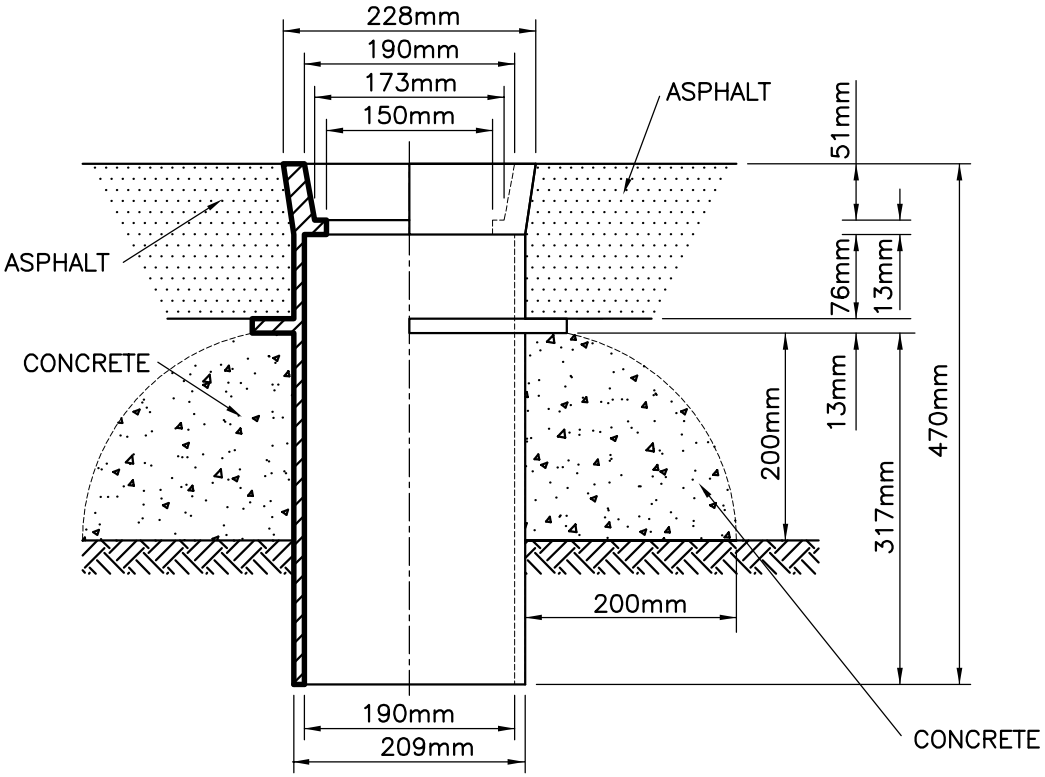
TOP VIEW OF VALVE BOX (w/o LID)



TOP VIEW OF VALVE LID



TOP VIEW OF VALVE LID



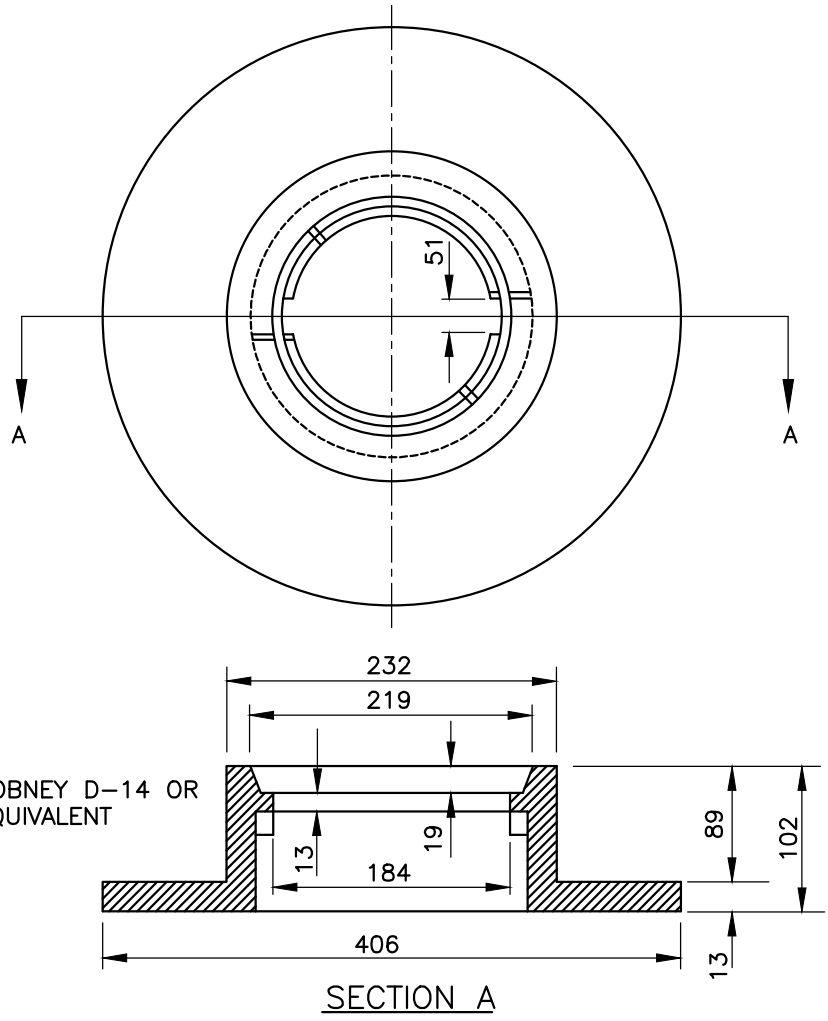
TOP VIEW OF VALVE BOX
(APPROX. WEIGHT 38KGS.)

ALSO AVAILABLE WITH LOCKING LID

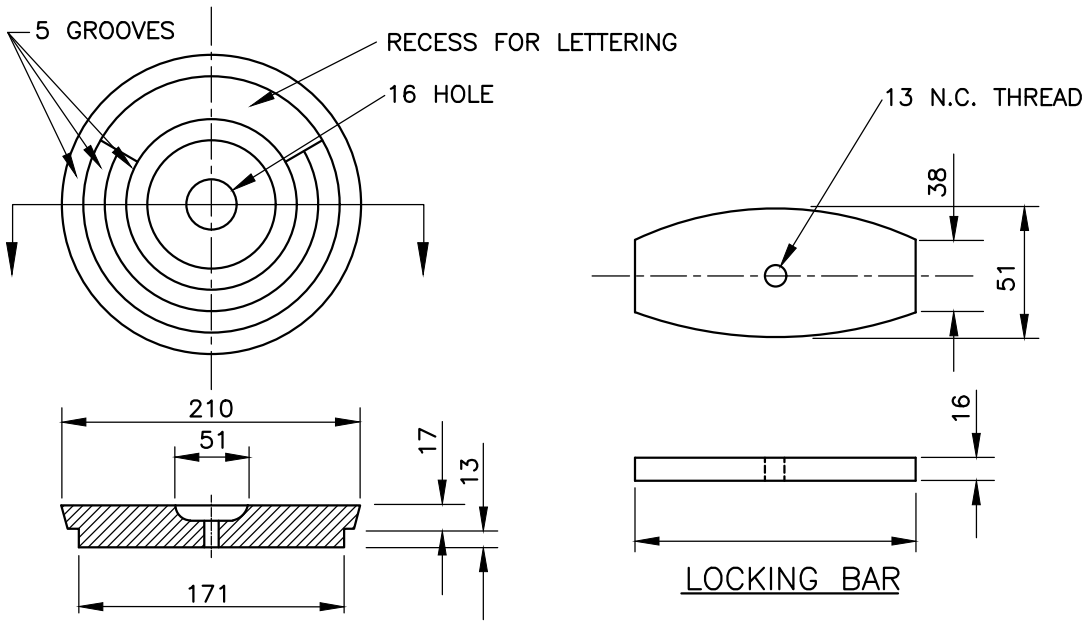
NELSON-TYPE VALVE BOX FOR SANITARY FORCEMAIN VALVES

ABBOTSFORD

DRAWN:	2000 11 01
REVISED:	2005 11 01
APPROVED BY:	
	CS - S - 7



SECTION A



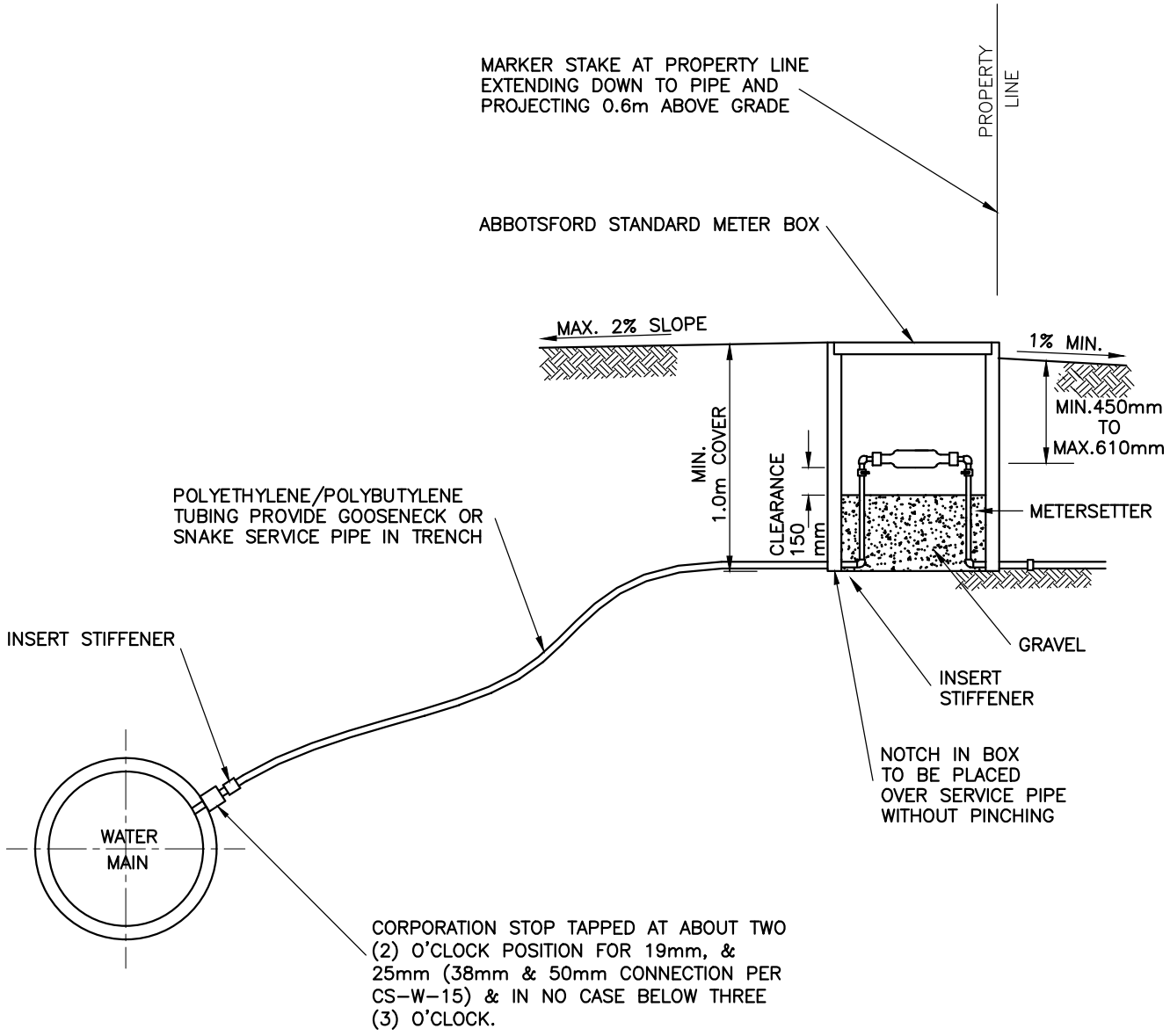
LOCKING BAR

SANITARY SEWER CLEAN-OUT LID DETAILS

ABBOTSFORD

DRAWN:	1971 10 01
REVISED:	2021 09 09
APPROVED BY:	

CS - S - 8



NOTE

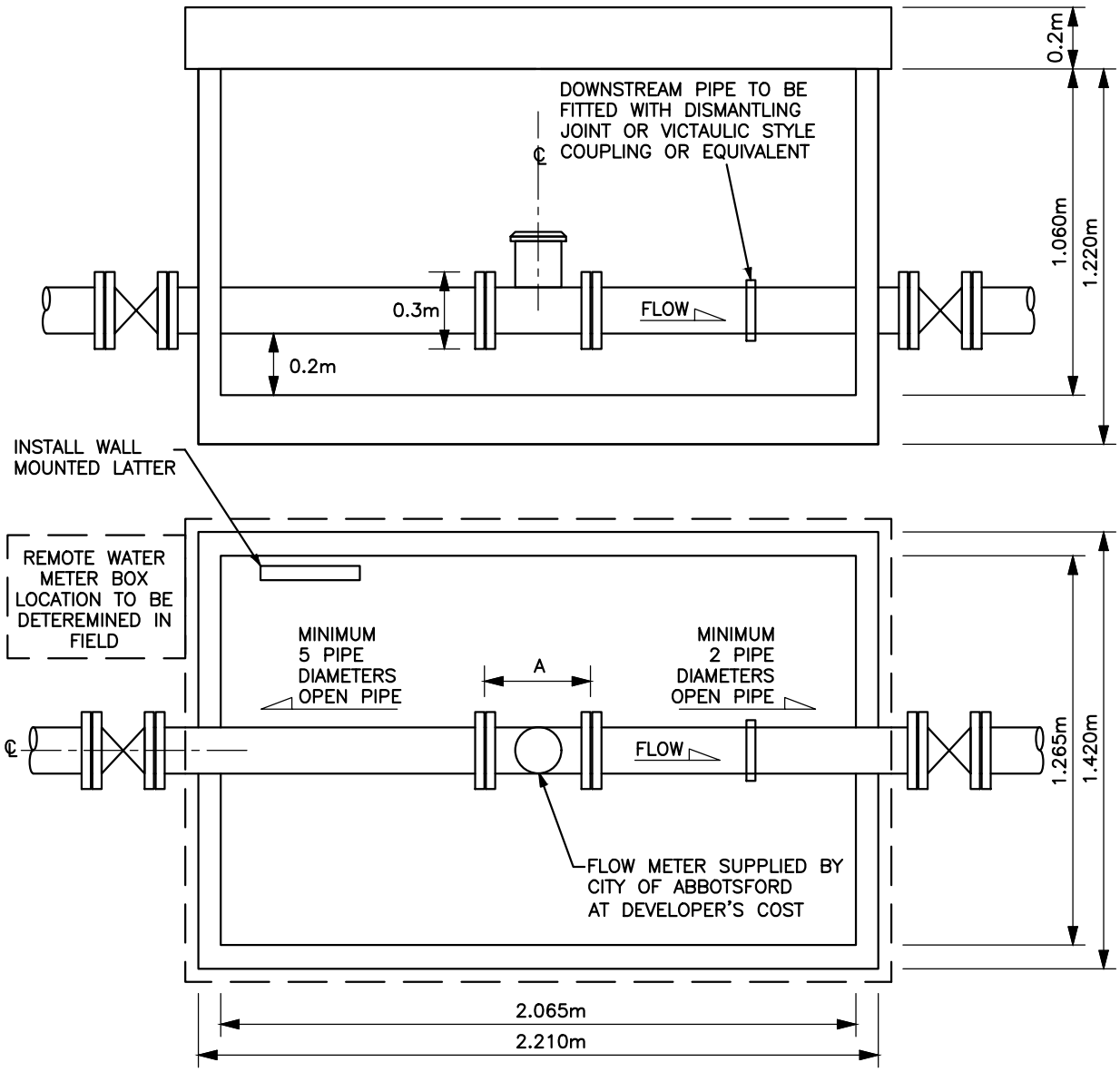
1. THE CITY RESERVES THE RIGHT TO SPECIFY THE SIZE AND TYPE OF METER FOR EACH APPLICATION.
2. ANY TRENCHLESS METHODS FOR INSTALLING WATER SERVICES MUST BE PREAPPROVED BY THE ENGINEER.

TYPICAL WATER SERVICE (19mm - 25mm) with METER BOX & SETTER

ABBOTSFORD

DRAWN:	1995 05 12
REVISED:	2021 09 09
APPROVED BY:	

CS - W - 1



NOTES:

1. VAULT TO BE A.E. CONCRETE MODEL 2121 OR EQUIVALENT SERVICE VAULT C/W LID ASSEMBLY AS SPECIFIED IN CURRENT DEVELOPMENT BYLAW

2. ALL PIPE INSIDE VAULT:
   - 100mmø OR LARGER SHALL BE DUCTILE IRON

3. FLANGES TO BE EBAA MEGA FLANGE OR APPROVED EQUIVALENT

4. CONNECTIONS ARE FLANGE CLASS 150

5. DRAIN VAULT TO STORM SEWER C/W CHECK VALVE

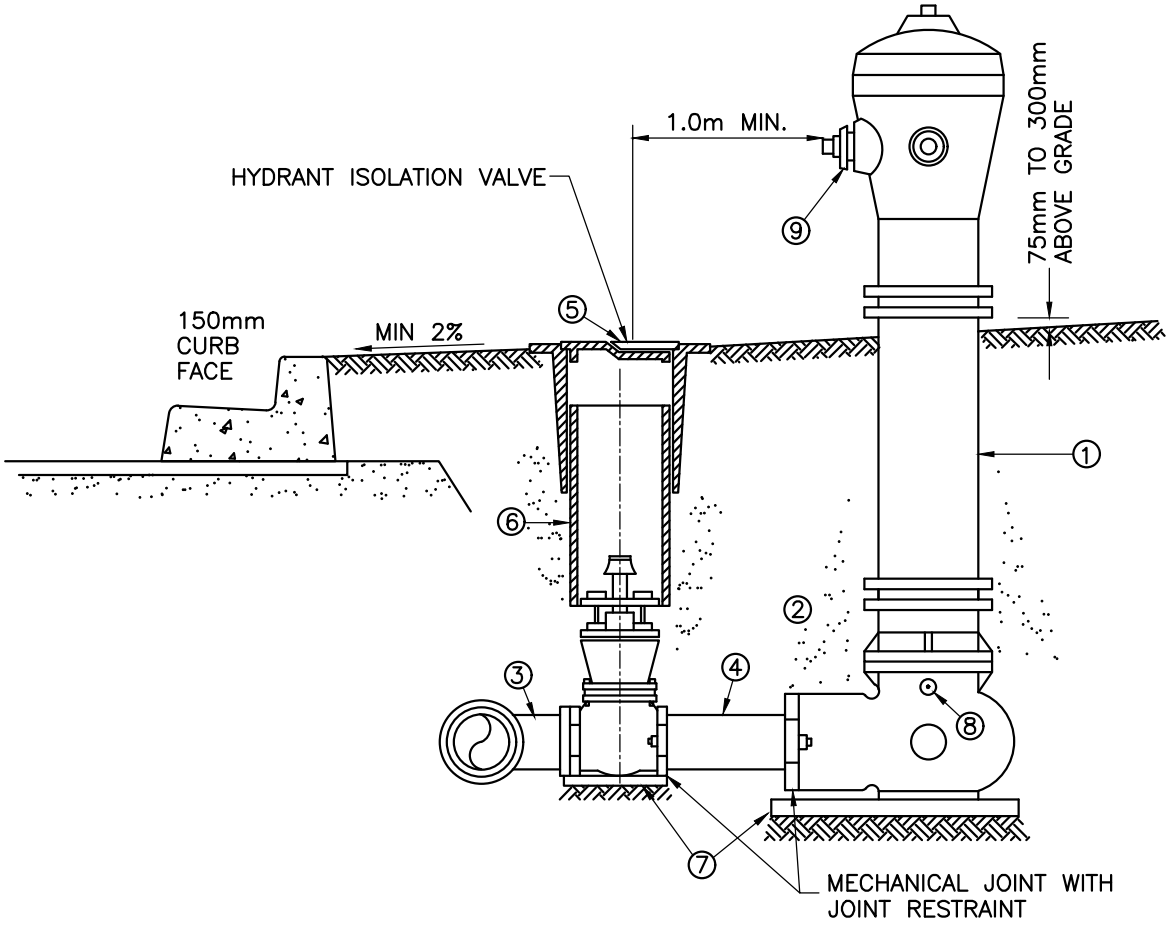
6. REMOTE WATER METER BOX:
   - INSTALL REMOTE BOX (AS PER CS-W-11) FLUSH AGAINST CHAMBER
   - INSTALL AN ANTENNA INSIDE REMOTE BOX AS PER CS-W-11
   - INSTALL CONDUIT CONNECTION BETWEEN CHAMBER AND REMOTE WATER METER BOX

ELECTRONIC WATER METER & CHAMBER

ABBOTSFORD

DRAWN:	2003 01 15
REVISED:	2021 09 09
APPROVED BY:	

CS - W - 2



NOTES:

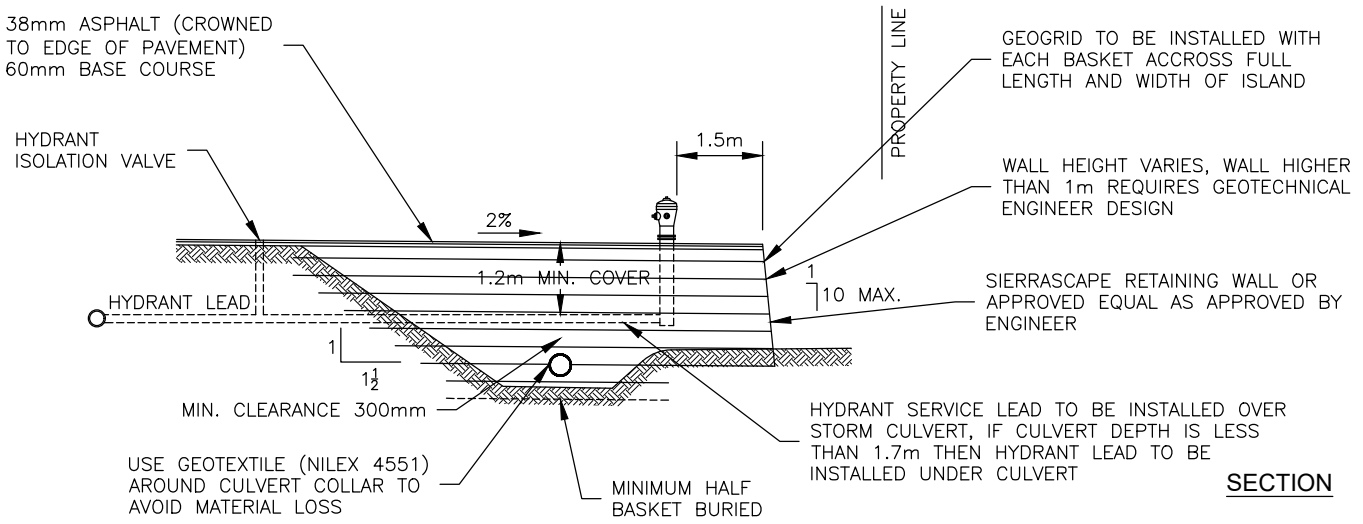
1. STANDARD 1.2m BURY HYDRANT – (MARINE ENAMEL WHITE)
2. 40mm DRAIN ROCK TO COVER HYDRANT BOOT MINIMUM 0.5 CU.M.
3. 150mm TEE C/W FLANGED RESILIENT SEAT GATE VALVE
4. 150mm DUCTILE IRON LEAD MINIMUM 1.0m. ADDITIONAL GATE VALVE MAYBE REQUIRED IF HYDRANT LEAD IS CROSSING ARTERIAL ROAD OR COLLECTOR.
5. MR STYLE VALVE BOX (CS–W–6)
6. 150mm VALVE BOX RISER C/W DRILLED INVERTED SEWER CAP OVER 50mm SQUARE NUT (CS–W–6)
7. CONCRETE SUPPORT BLOCK MINIMUM 150mmX300mmX50mm
8. DRAIN HOLE TO BE KEPT CLEAR
9. PUMP NOZZLE TO BE "STORZ"
10. ALL NEW HYDRANTS TO HAVE "OUT OF SERVICE" PLACARDS ON MAIN PORT, TO BE REMOVED BY CITY OF ABBOTSFORD STAFF AFTER FIRST SERVICE.
11. ALL RAISE KITS TO BE INSTALLED BY CITY OF ABBOTSFORD STAFF.
12. USE MECHANICAL JOINT FITTINGS WITH JOINT RESTRAINT.

TYPICAL HYDRANT ASSEMBLY

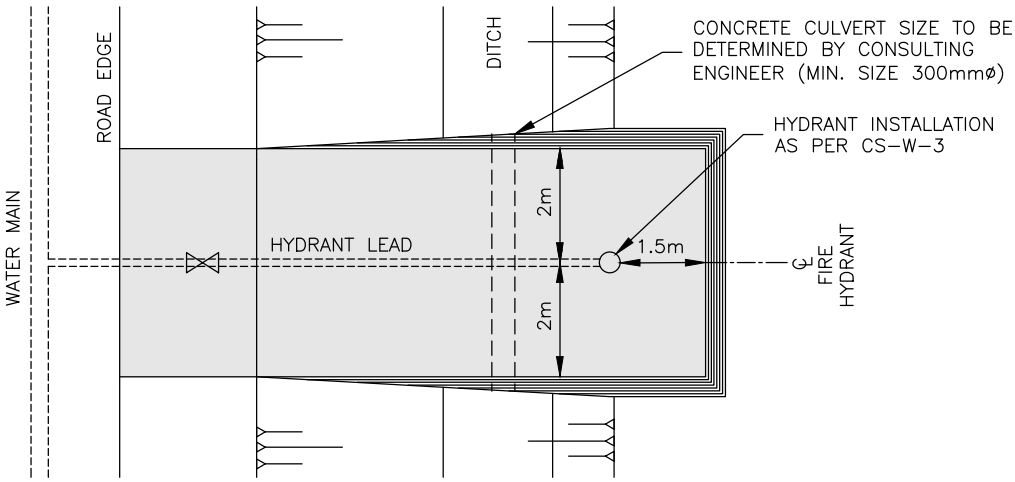
ABBOTSFORD

DRAWN:	1970 04 01
REVISED:	2021 09 09
APPROVED BY:	

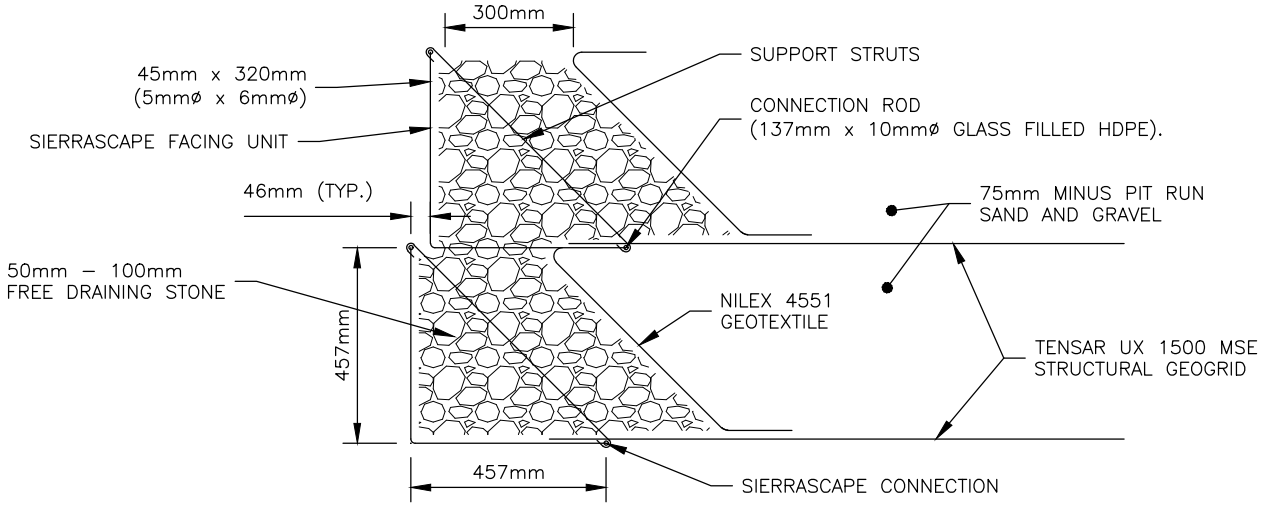
CS - W - 3



SECTION



PLAN



NOTES:

1. FACING TO CONSIST OF PREFABRICATED WWM 45mm x 320mm (5mmø x 6mmø) FORMS.
2. ALL FORMS SHALL BE GALVANIZED, ASTM 123, AFTER FABRICATION.
3. SUPPORT STRUTS SHALL BE FABRICATED WITH ELECTROPLATED WIRE.
4. OVERALL LENGTH OF WIRE FORMS IS 2.83m.
5. SUPPORTING RETAINING WALLS EXCEEDING A HEIGHT OF 600mm SHALL BE C/W A SAFETY HANDRAIL

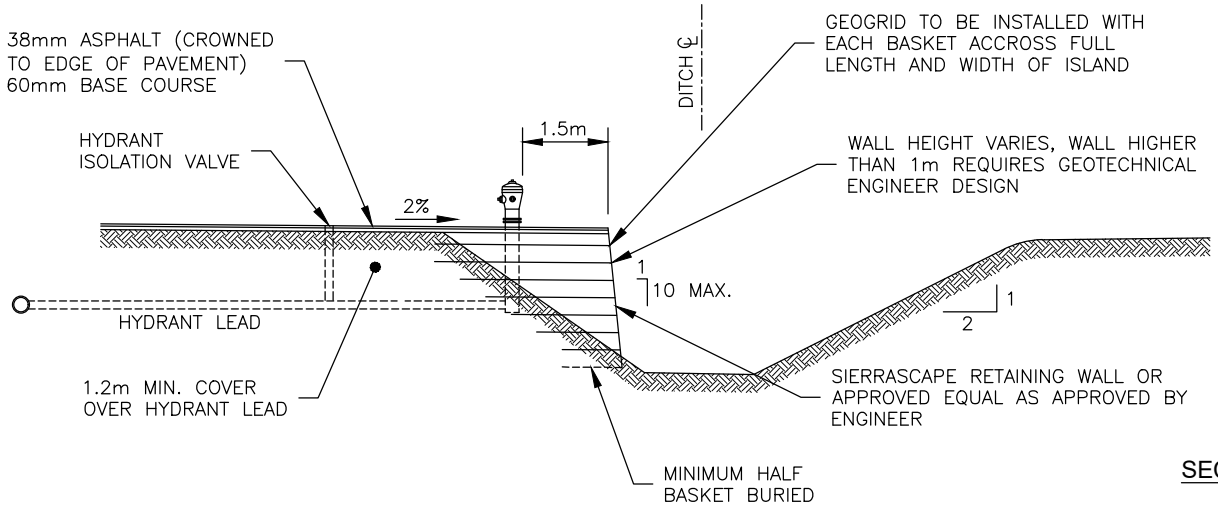
SIERRASCAPE BASKET WALL DETAIL

TYPICAL HYDRANT ISLAND INSTALLATION ACROSS DITCH/RAIN GARDEN

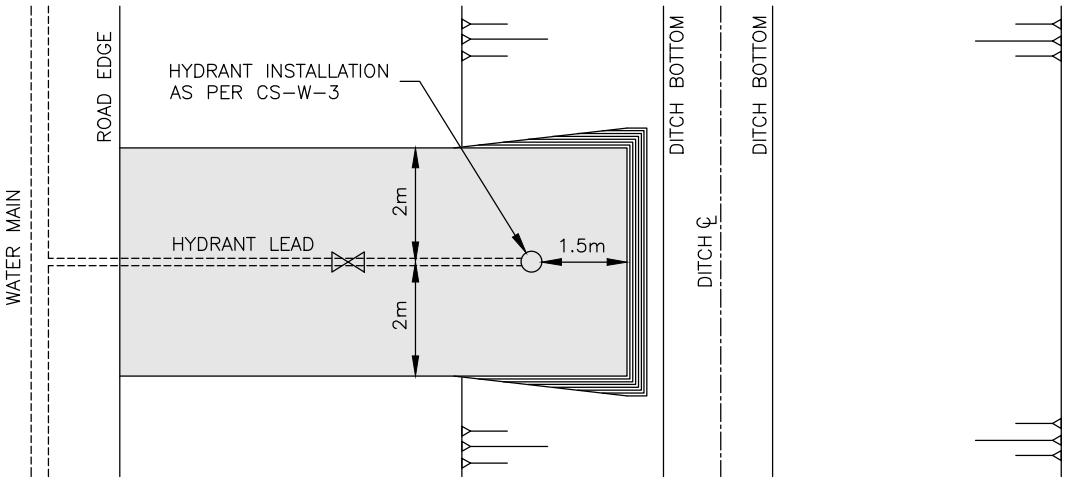
ABBOTSFORD

DRAWN:	1975 01 01
REVISED:	2021 09 09
APPROVED BY:	

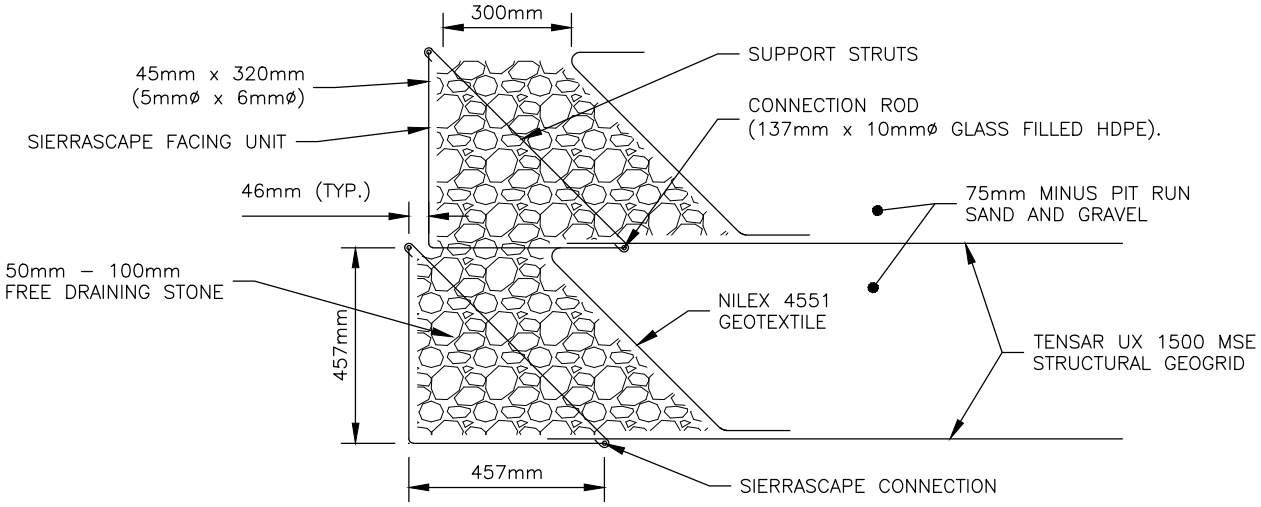
CS - W - 4



SECTION



PLAN



NOTES:

1. FACING TO CONSIST OF PREFABRICATED WWM 45mm x 320mm (5mmø x 6mmø) FORMS.
2. ALL FORMS SHALL BE GALVANIZED, ASTM 123, AFTER FABRICATION.
3. SUPPORT STRUTS SHALL BE FABRICATED WITH ELECTROPLATED WIRE.
4. OVERALL LENGTH OF WIRE FORMS IS 2.83m.

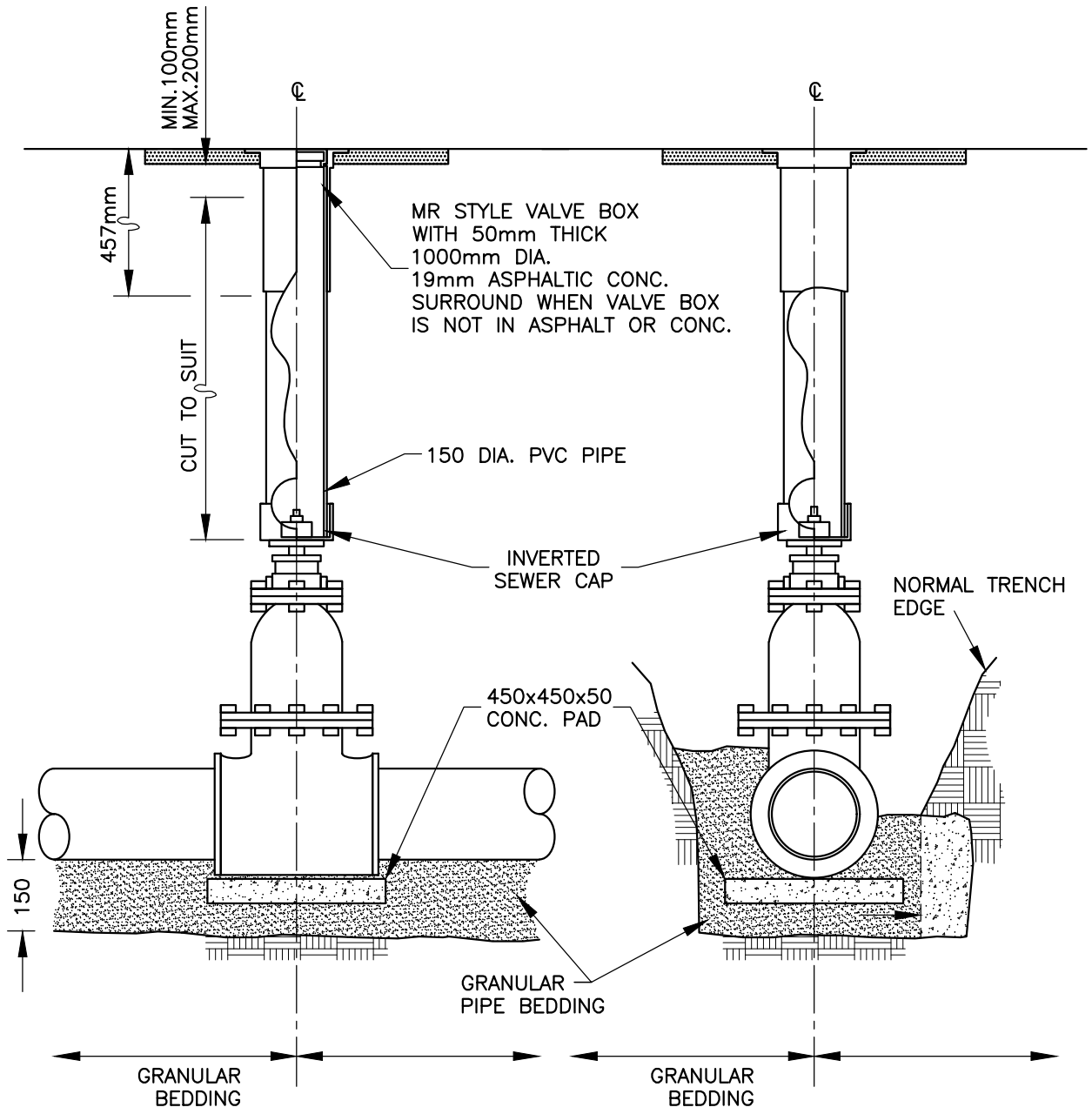
SIERRASCAPE BASKET WALL DETAIL

TYPICAL HYDRANT ISLAND INSTALLATION ROADSIDE OF DITCH/RAIN GARDEN

ABBOTSFORD

DRAWN:	1975 01 01
REVISED:	2021 09 09
APPROVED BY:	

CS - W - 5



INSTALLATION PROCEDURES:

1. REMOVE 2" SQUARE OPERATING NUT;
2. DRILL CAP SLIGHTLY LARGER THAN SHAFT & PLACE OVER SHAFT;
3. RE–INSTALL 2" SQUARE OPERATING NUT;
4. INSERT P.V.C. RISER PIPE INTO CAP.

NOTE:

1. BLACKTOP AROUND COVERS APPLICABLE TO ALL VALVES ON BOULEVARDS AND PAVEMENTS.
2. VALVE BOXES MUST BE FLUSH AND LEVEL WITH FINISHED GRADE

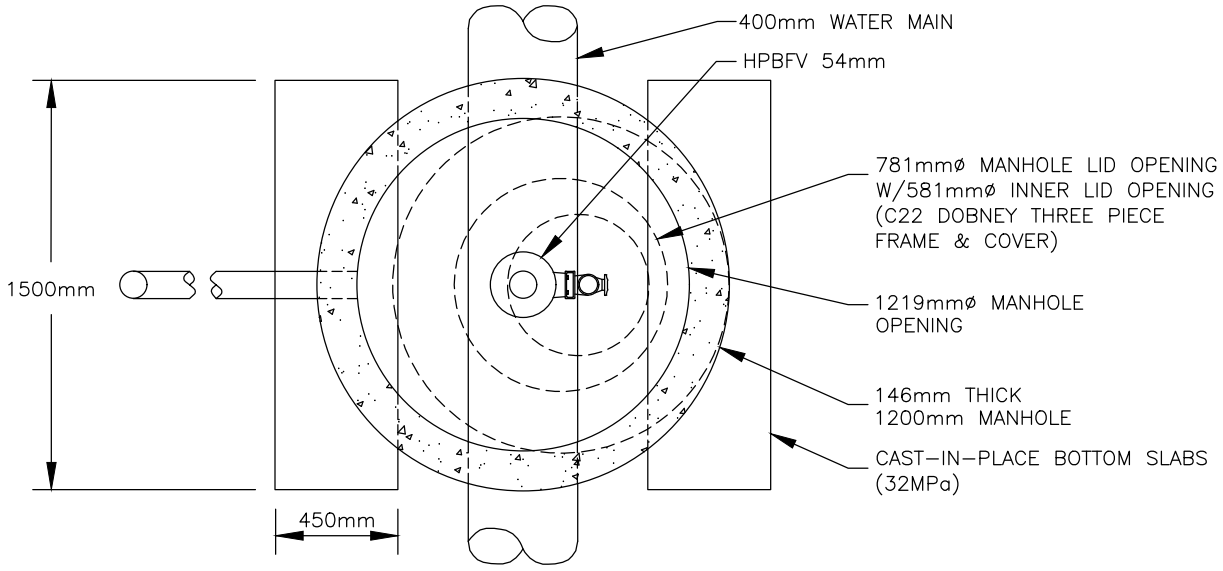
TYPICAL GATE VALVE INSTALLATION FOR WATERMAIN

ABBOTSFORD

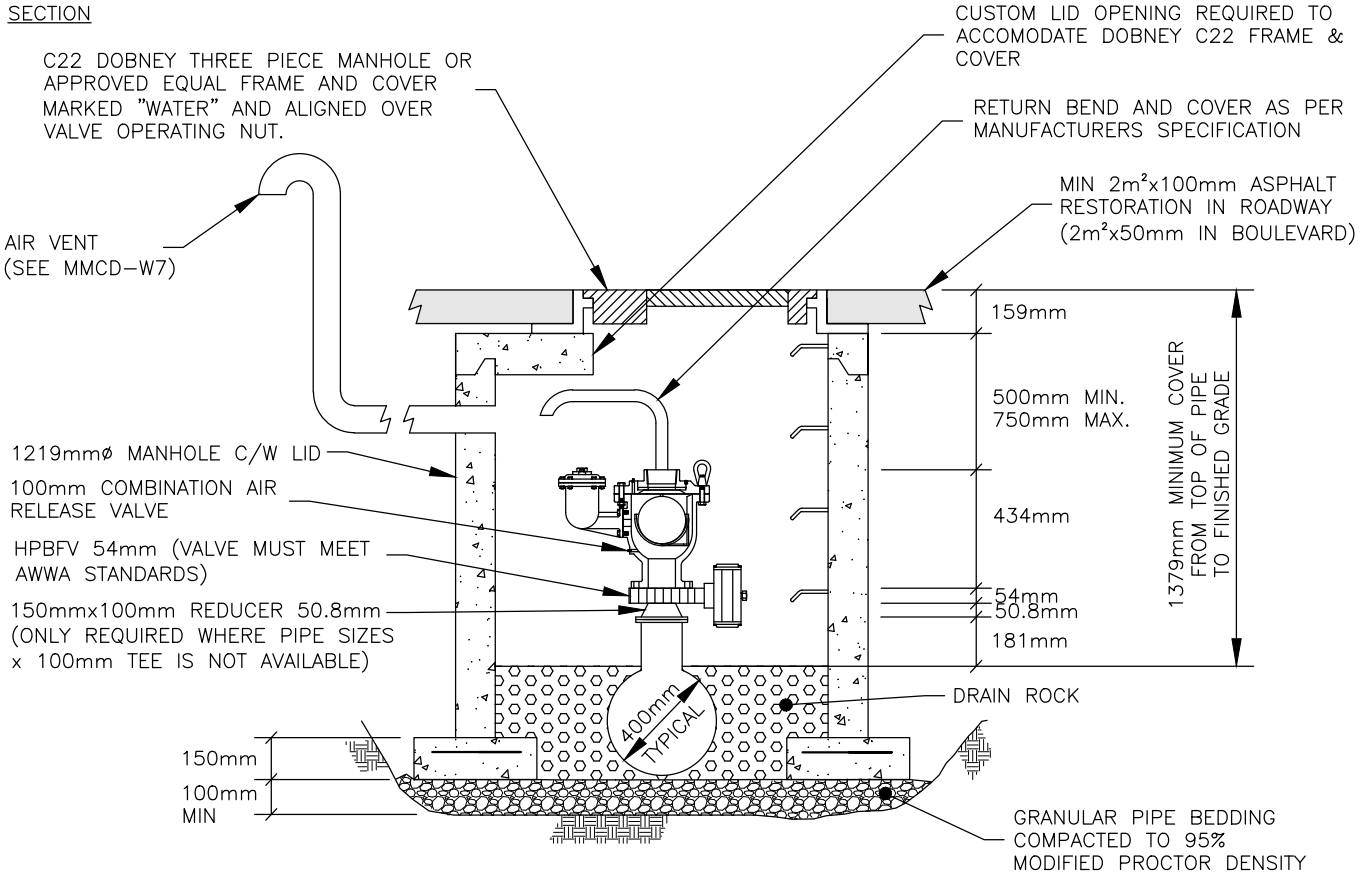
DRAWN	1999 09 09
REVISED	2021 09 09
APPROVED BY:	

CS - W - 6

PLAN



SECTION

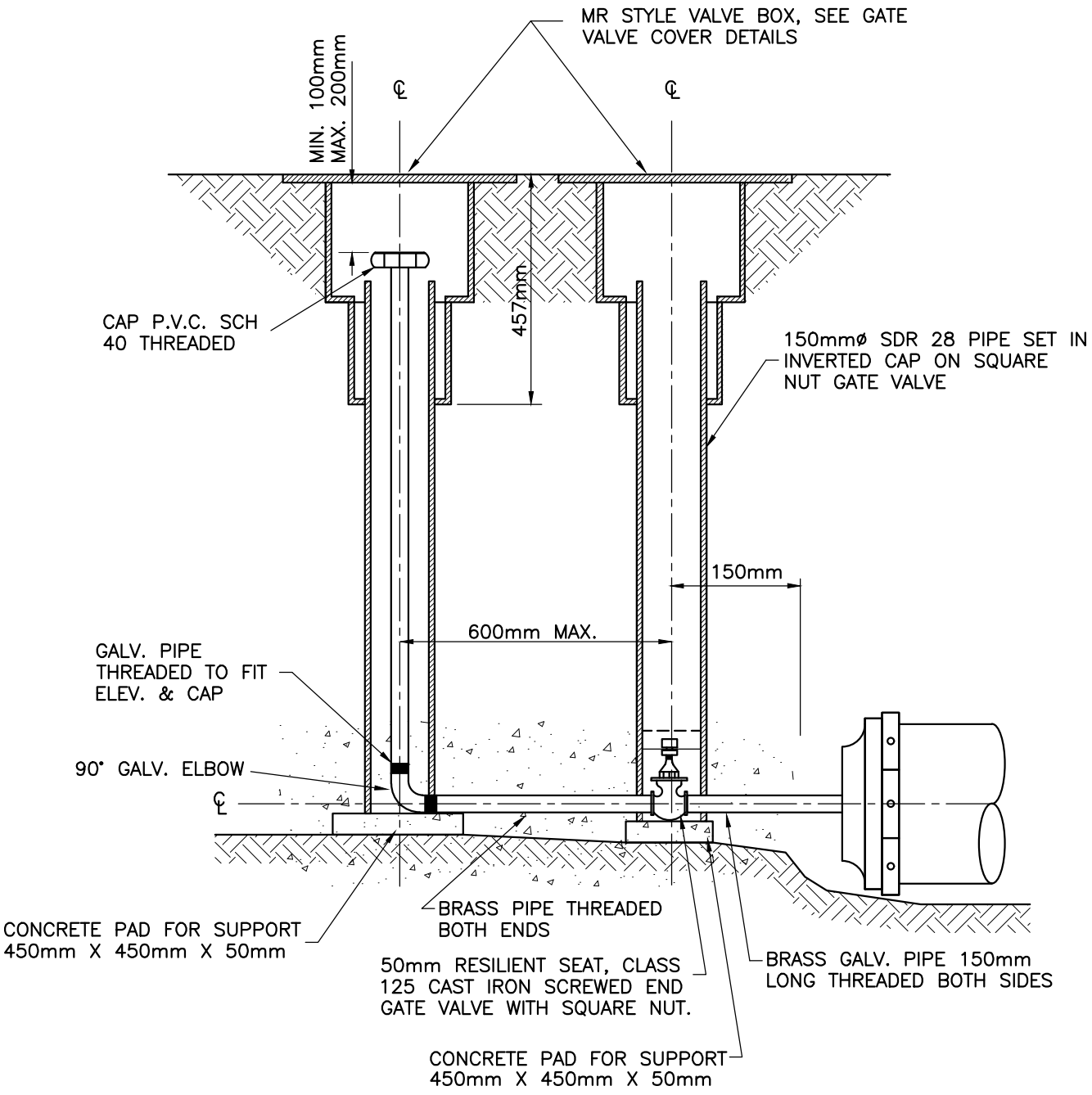


NOTES:
1. REFER TO CONTRACT DRAWINGS AND SECTION 33 11 01 FOR DETAILED SPECIFICATIONS.
2. DRAIN TO STORM (IF APPLICABLE)
3. FLEXIBLE FILLER BETWEEN PIPE AND MANHOLE KNOCKOUT SEE CS-W-17
4. REFER TO MMCD SECTIONS 03 30 20, 33 11 01, 03 30 53 & 03 40 01 FOR CAST-IN-PLACE BOTTOM SLAB SPECIFICATIONS

100mm AIR RELEASE VALVE

ABBOTSFORD

DRAWN:	2004 11 13
REVISED:	2021 09 09
APPROVED BY:	
	CS - W - 7



NOTES:

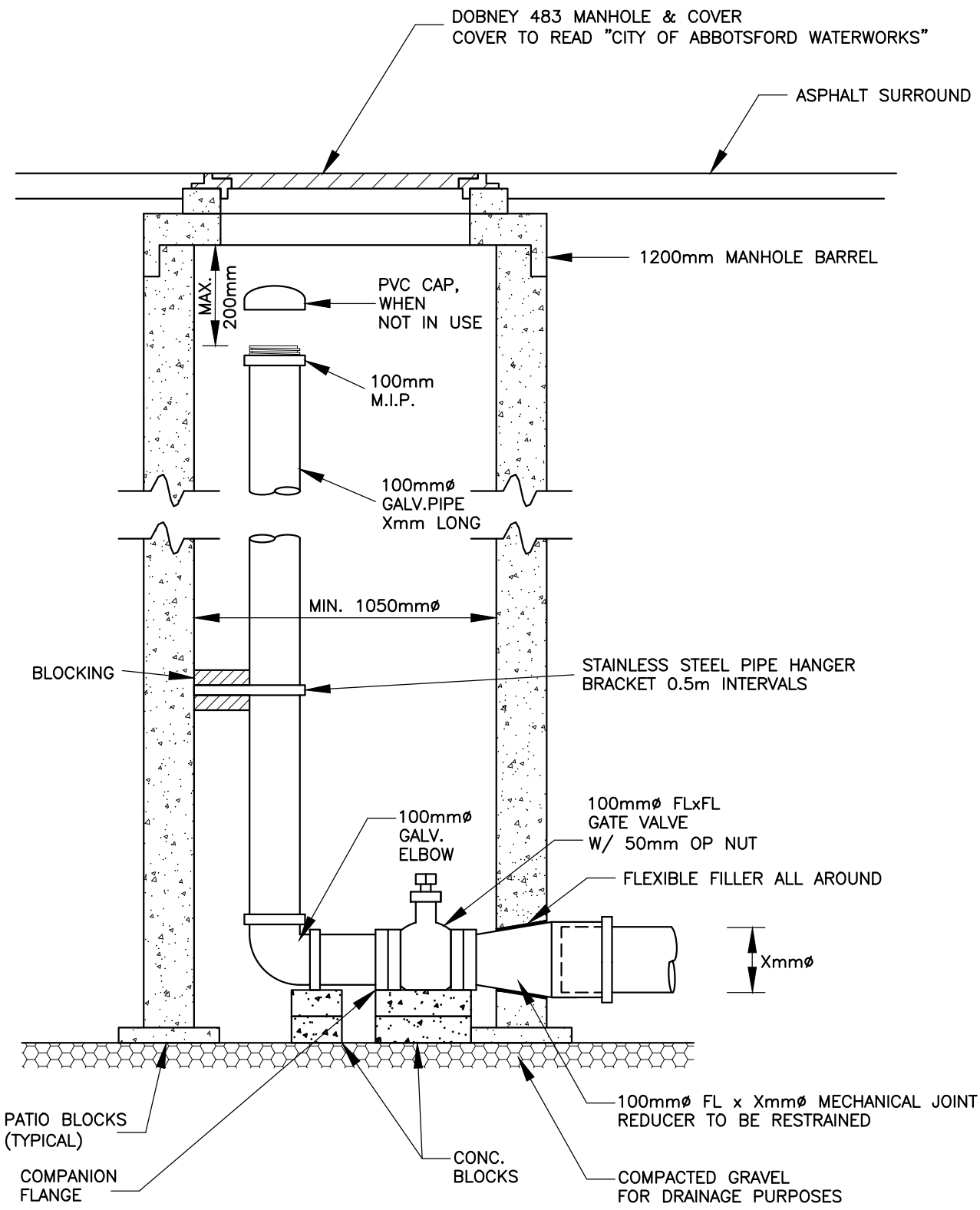
1. 50mmø BLOW-OFF PIPE FOR MAINS 200mmø AND LESS
2. SEE CS-W-9 FOR MAINS LARGER THAN 200ø
3. REPLACES MMCD-W8

50mm BLOW-OFF AT WATERMAIN END POINT (FOR MAINS 200mmØ & LESS)

ABBOTSFORD

DRAWN	1970 04 01
REVISED	2021 09 09
SCALE	NTS

CS - W - 8

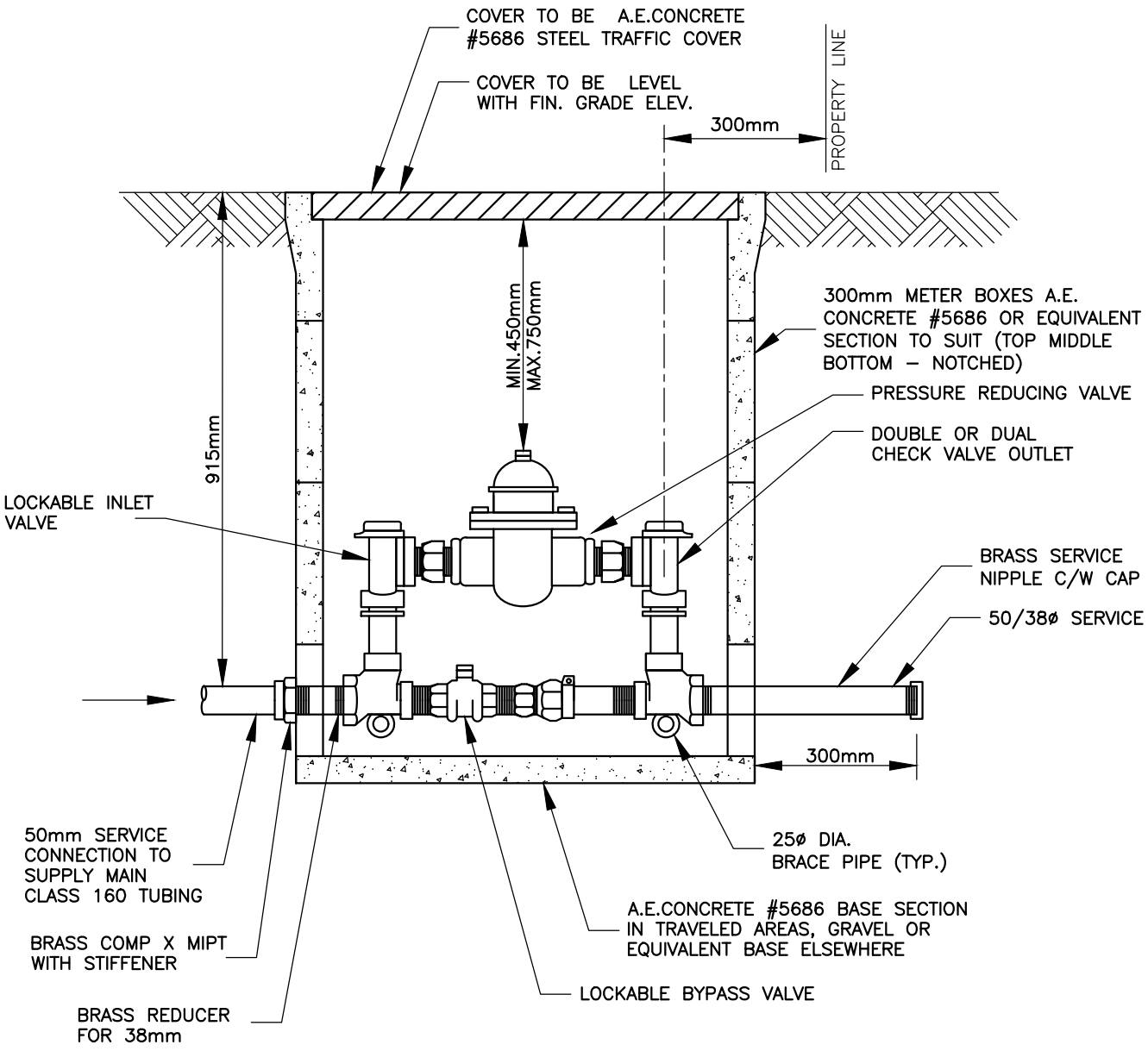


STANDARD
100mm BLOW-OFF

ABBOTSFORD

DRAWN:	2000 02 24
REVISED:	2021 09 09
APPROVED BY:	

CS - W - 9



NOTES

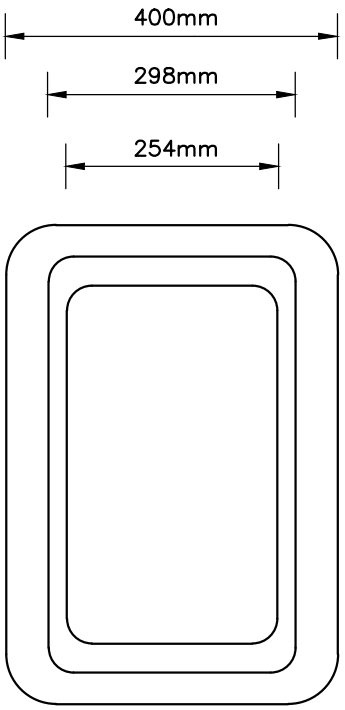
1. P.R.V. TO BE INSTALLED BY CITY.
2. SETTERS TO BE EQUIPPED WITH BYPASS, LOCKABLE INLET VALVE, LOCKABLE BYPASS VALVE, AND DOUBLE CHECK VALVE OUTLET.
3. REFER TO CONTRACT DRAWINGS AND SECTION 33 11 01 OF THE DEVELOPMENT BY–LAW SUPPLEMENTARY SPECIFICATIONS FOR DETAILED SPECIFICATIONS AND APPROVED MATERIALS SUPPLIERS.

P.R.V. INSTALLATION FOR 38mm & 50mm SERVICE CONNECTION

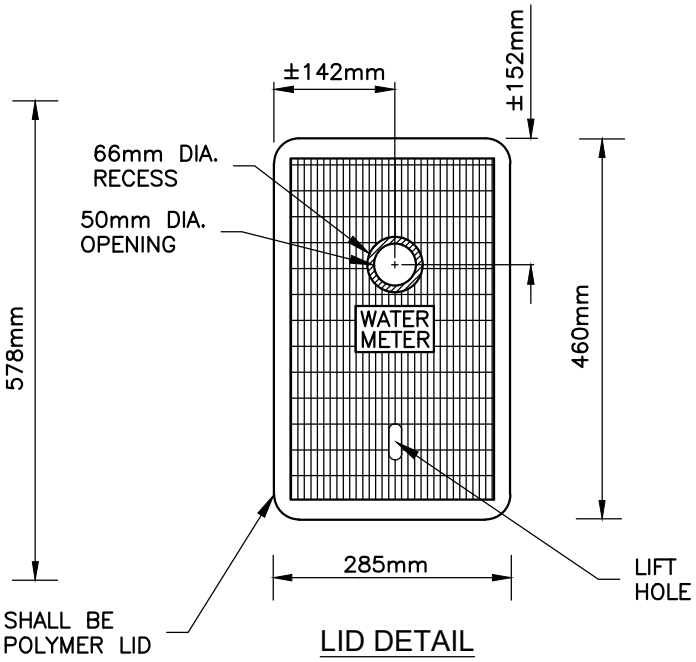
ABBOTSFORD

DRAWN:	2011 04 18
REVISED:	2021 09 09
APPROVED BY:	

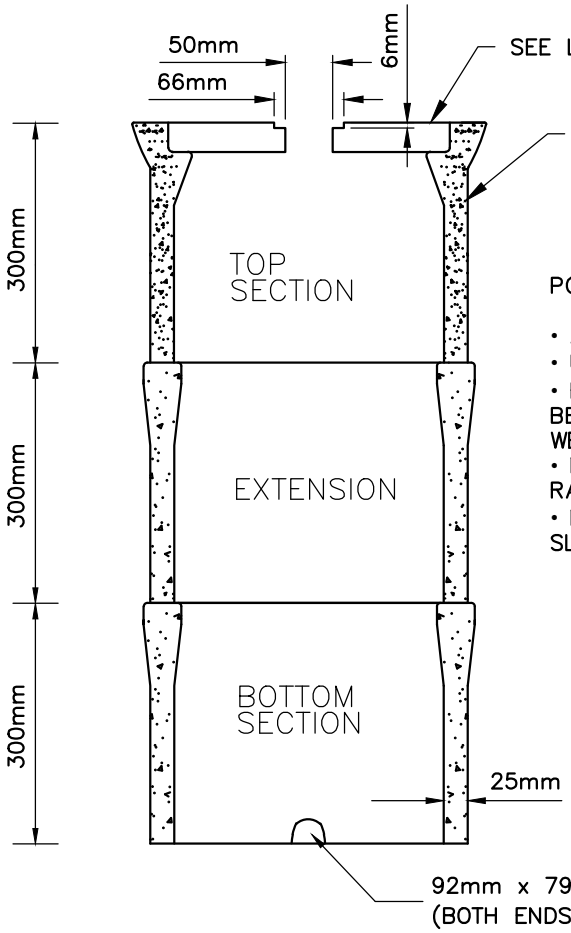
CS - W - 10



PLAN VIEW WATER METER BOX



LID DETAIL



POLYMER LID SPECS:

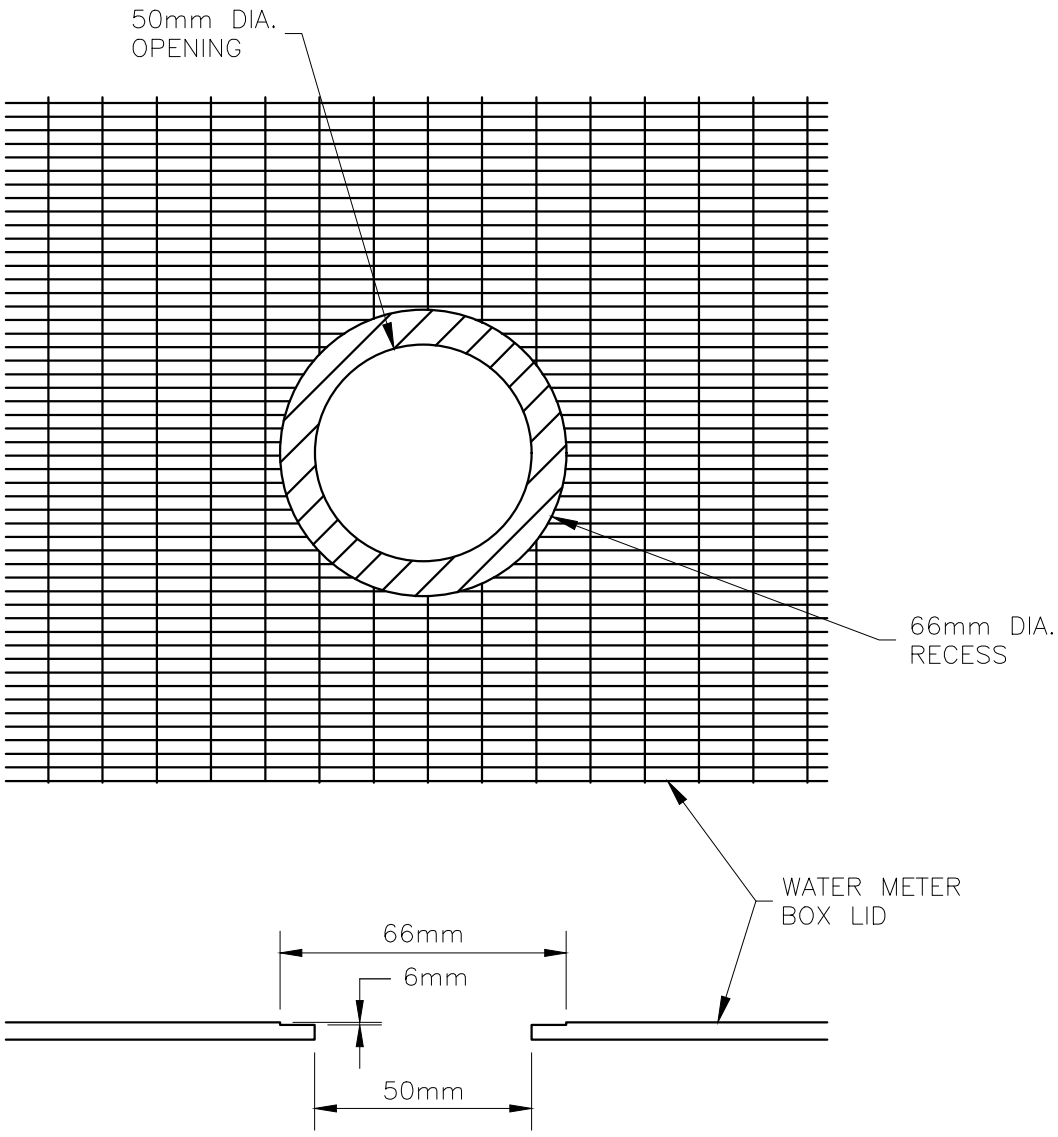
- ANSI TIER 15 LOAD RATED OR GREATER
- UV/CHEMICAL RESISTANT
- REBAR (OR OTHER METAL DETECTABLE MATERIAL) MUST BE ENCAPSULATED IN POLYMER TO AID IN LOCATING AND WEIGHING LID DOWN WHEN SUBMERGED IN WATER
- MUST MAINTAIN ALL PHYSICAL PROPERTIES FROM A RANGE OF −40C TO 80C
- MUST MEET AMERICANS WITH DISABILITIES ACT (ADA) SLIP RESISTANCE REQUIREMENTS.

19mm & 25mm WATER METER BOX TYPICAL

ABBOTSFORD

DRAWN:	1995 02 20
REVISED:	2021 09 09
APPROVED BY:	

CS - W - 11



NOTES:

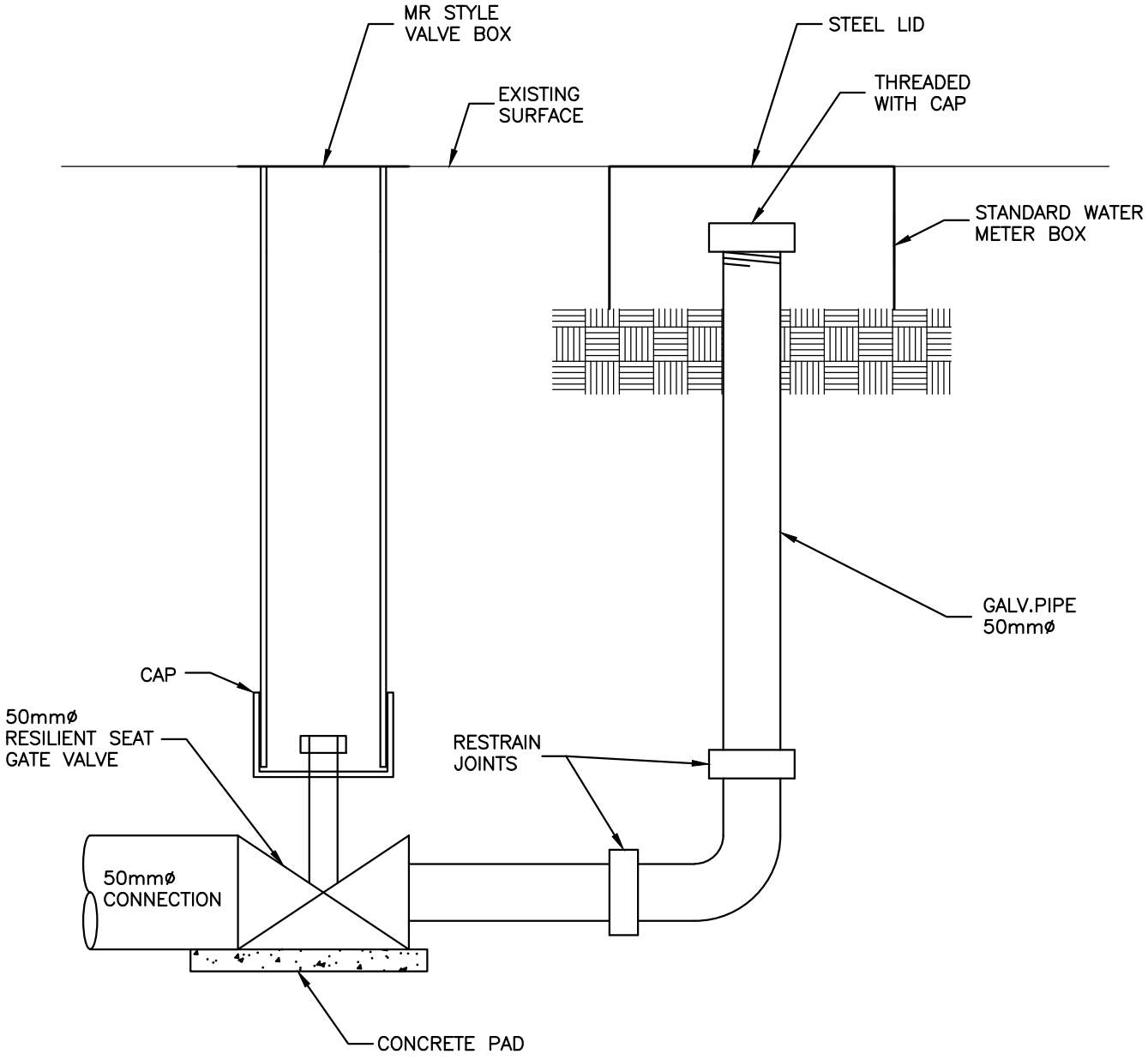
1. POLYMEYER METER BOX LID
2. RECEPTACLE NOT TO PROTRUDE ABOVE RECEPTACLE HOUSING.
3. RECEPTACLE AND HOUSING TO BE LOAD RATED FOR VEHICULAR TRAFFIC.

WATER METER BOX FLUSH MOUNT RECEPTACLE DETAIL

ABBOTSFORD

DRAWN:	1997 04 24
REVISED:	2021 09 09
APPROVED BY:	

CS - W - 12



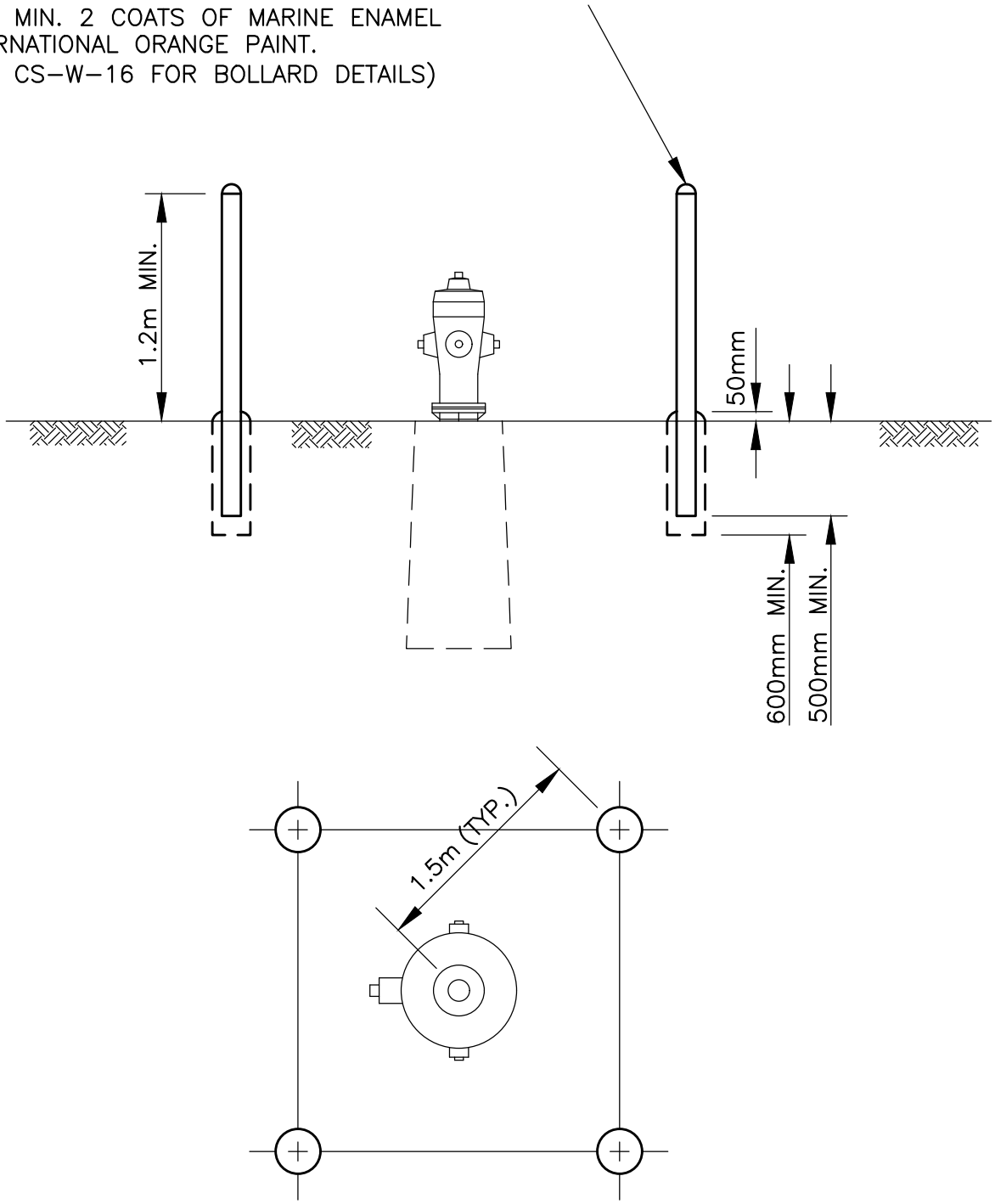
TYPICAL WATER SERVICE FOR DETENTION TANK CLEANING

ABBOTSFORD

DRAWN:	1998 06 08
REVISED:	2021 09 09
APPROVED BY:	

CS - W - 13

150mmø SCHEDULE 40 STEEL OR DUCTILE IRON PIPE FILLED WITH CONCRETE PRIMED & PAINTED WITH MIN. 2 COATS OF MARINE ENAMEL INTERNATIONAL ORANGE PAINT.
(SEE CS–W–16 FOR BOLLARD DETAILS)



NOTE:

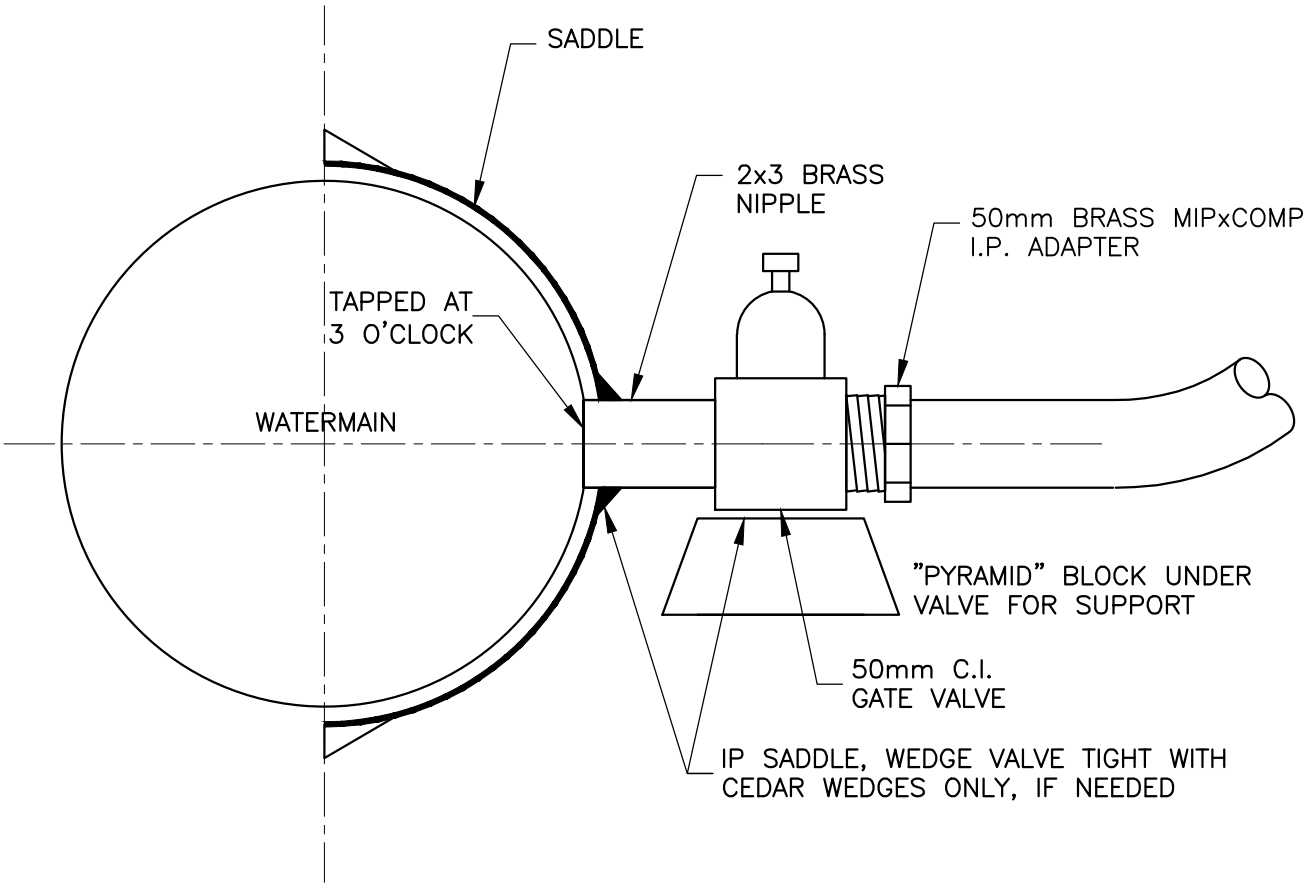
WHERE CURBING IS WITHIN 3m OF HYDRANT, BOLLARDS ONLY REQUIRED ON OPEN SIDE.

TYPICAL OPEN AREA HYDRANT PROTECTION

ABBOTSFORD

DRAWN:	1998 09 29
REVISED:	2021 09 09
APPROVED BY:	

CS - W - 14



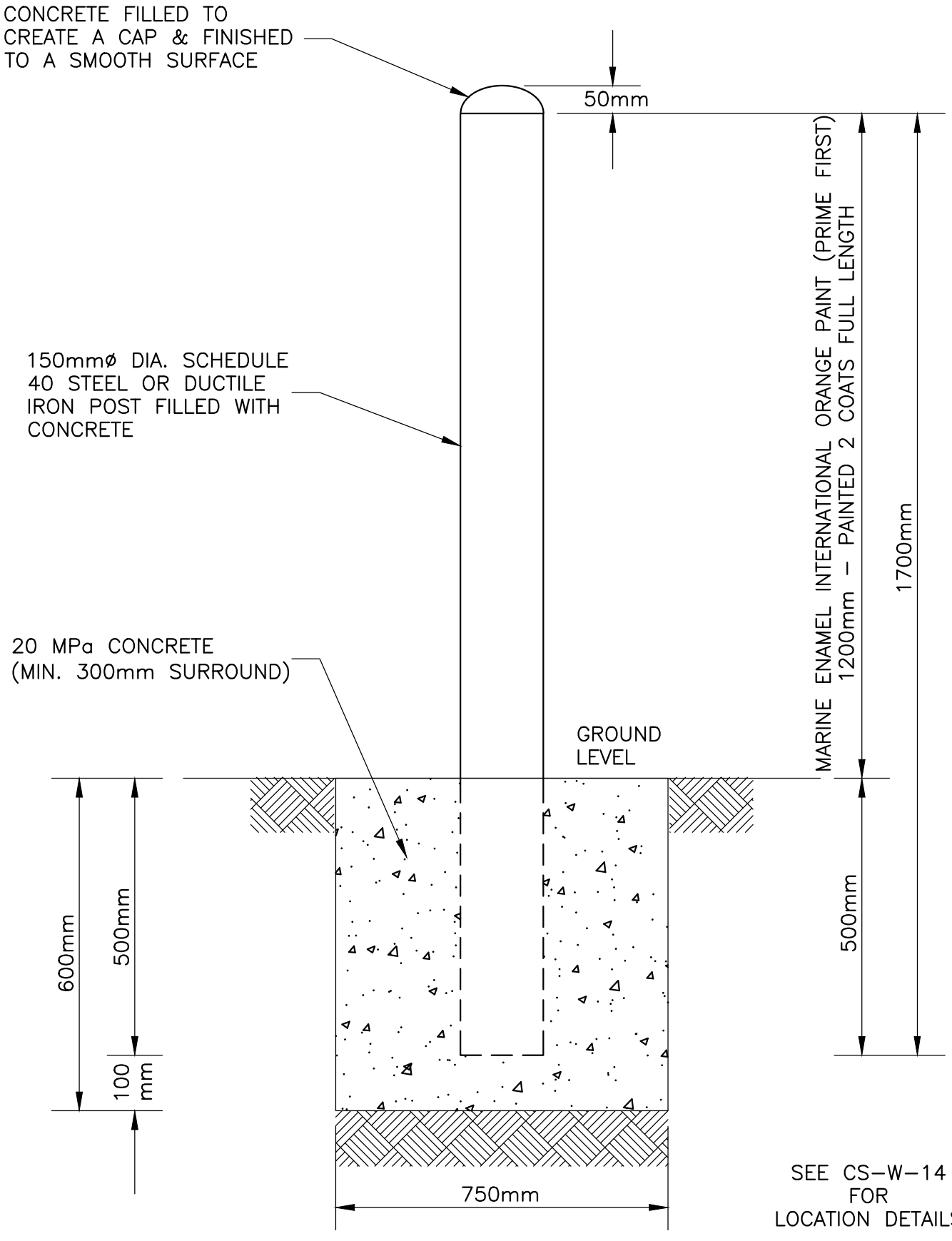
50mm WATER SERVICE C/W MR STYLE VALVE BOX AND RISER
REDUCE AT SETTER FOR 38mm
(TAP TO BE WITH 50mm BIT)

38mm & 50mm SERVICE CONNECTION AT WATERMAIN

ABBOTSFORD

DRAWN:	1999 12 23
REVISED:	2021 09 09
APPROVED BY:	

CS - W - 15

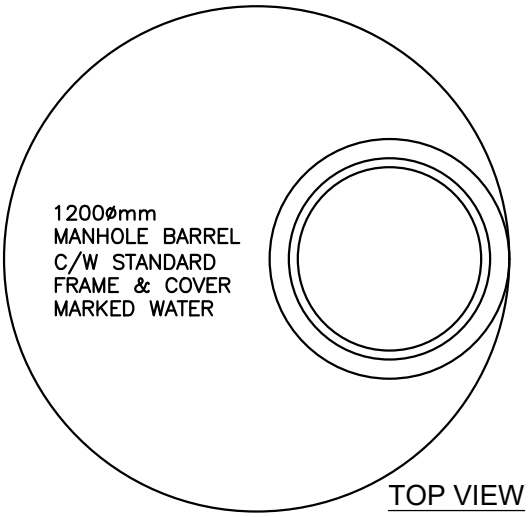


BOLLARD FILLED WITH CONCRETE

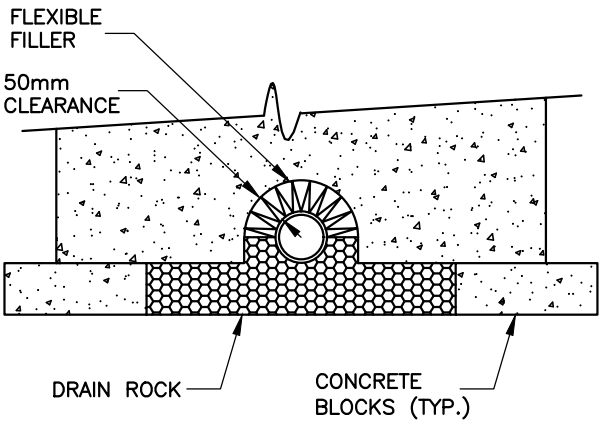
ABBOTSFORD

DRAWN:	1999 10 05
REVISED:	2021 09 09
APPROVED BY:	

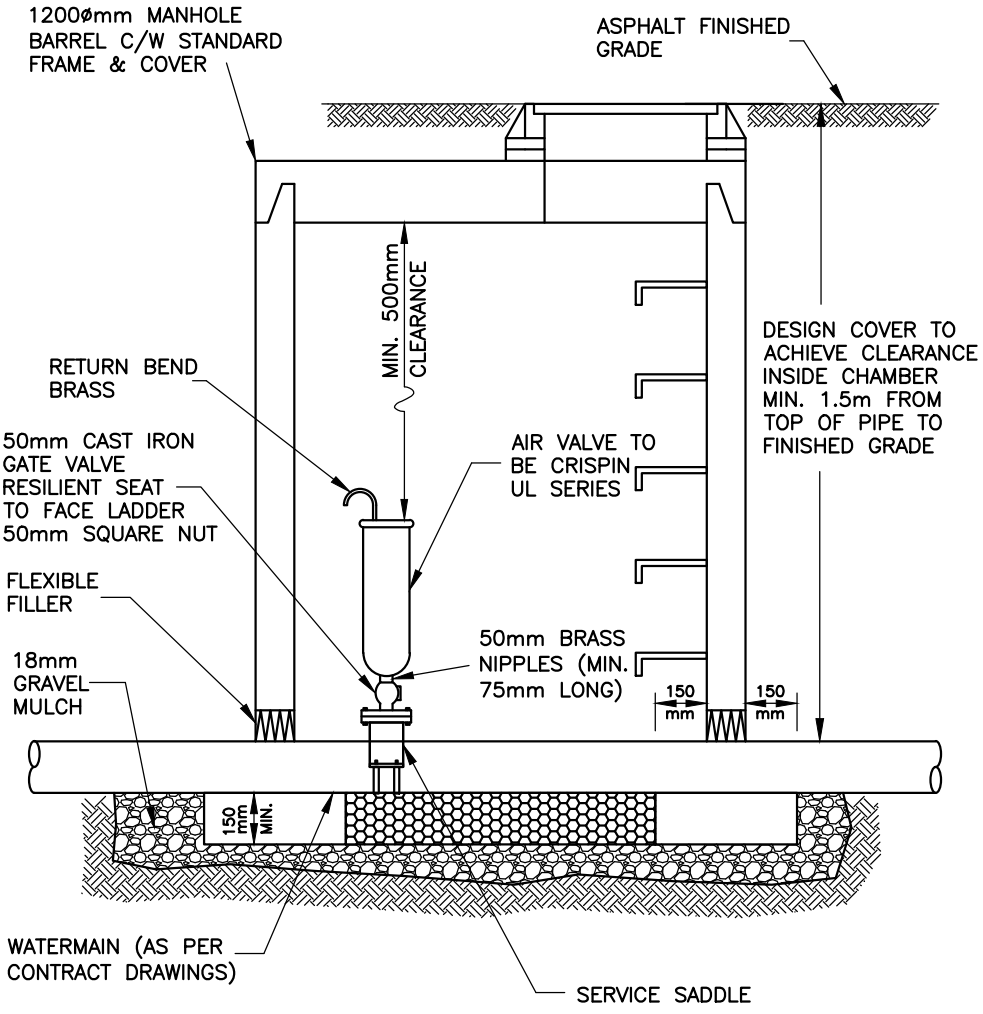
CS - W - 16



TOP VIEW



SIDE VIEW



SECTION VIEW

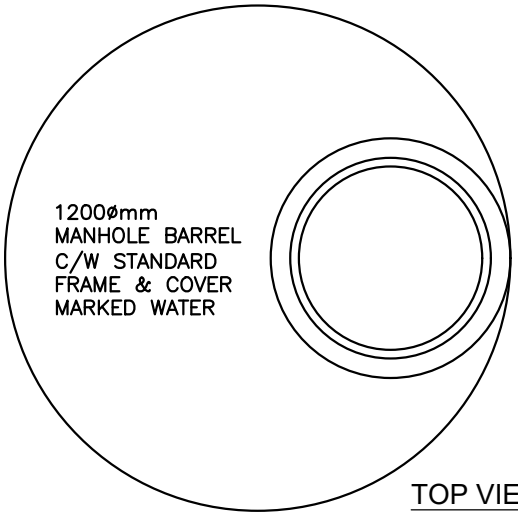
NOTES:

1. MANHOLE DRAIN REQUIRED IN HIGH GROUND WATER LEVEL AREAS

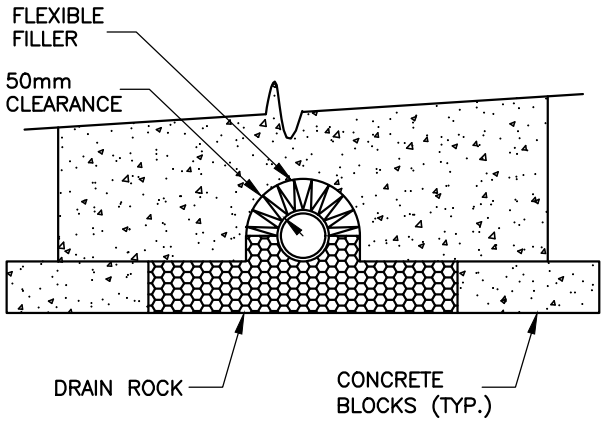
50mm AIR VALVE INSTALLATION ON WATERMAINS

ABBOTSFORD

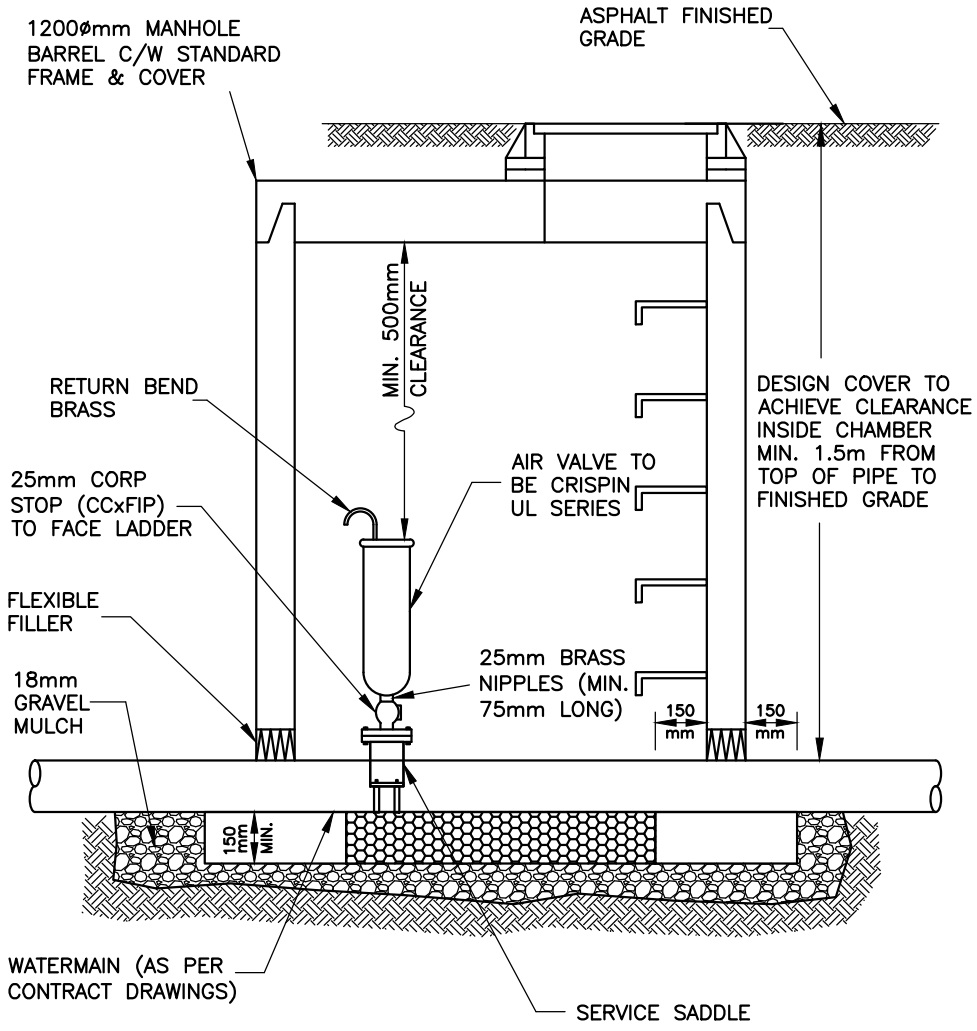
DRAWN:	1978 09 29
REVISED:	2021 09 09
APPROVED BY:	
	CS - W - 17



TOP VIEW



SIDE VIEW



SECTION VIEW

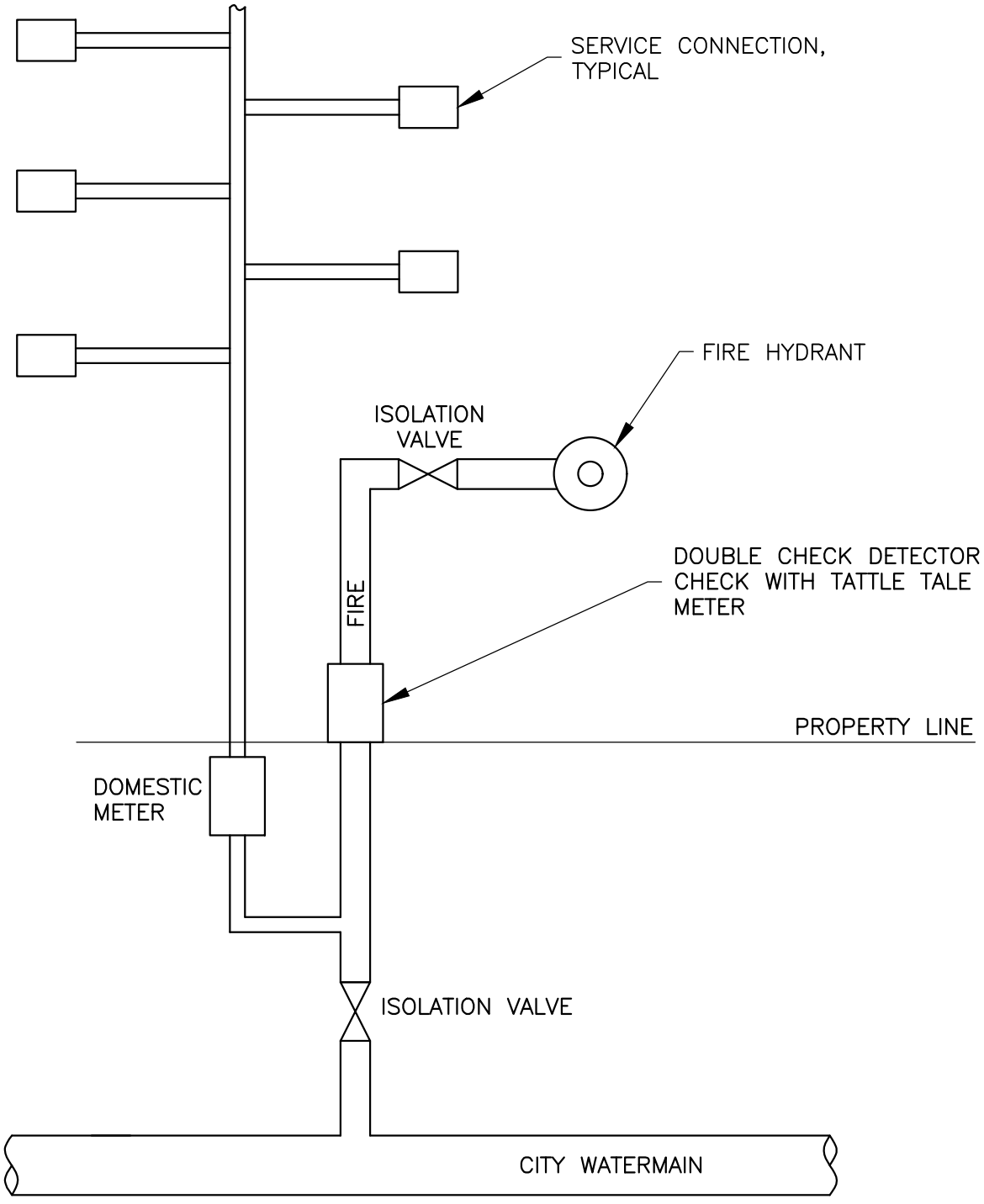
NOTE:

MANHOLE DRAIN REQUIRED IN HIGH GROUND WATER LEVEL AREAS

25mm AIRVALVE INSTALLATION ON WATERMAINS

ABBOTSFORD

DRAWN:	1978 09 29
REVISED:	2021 09 09
APPROVED BY:	
	CS - W - 18

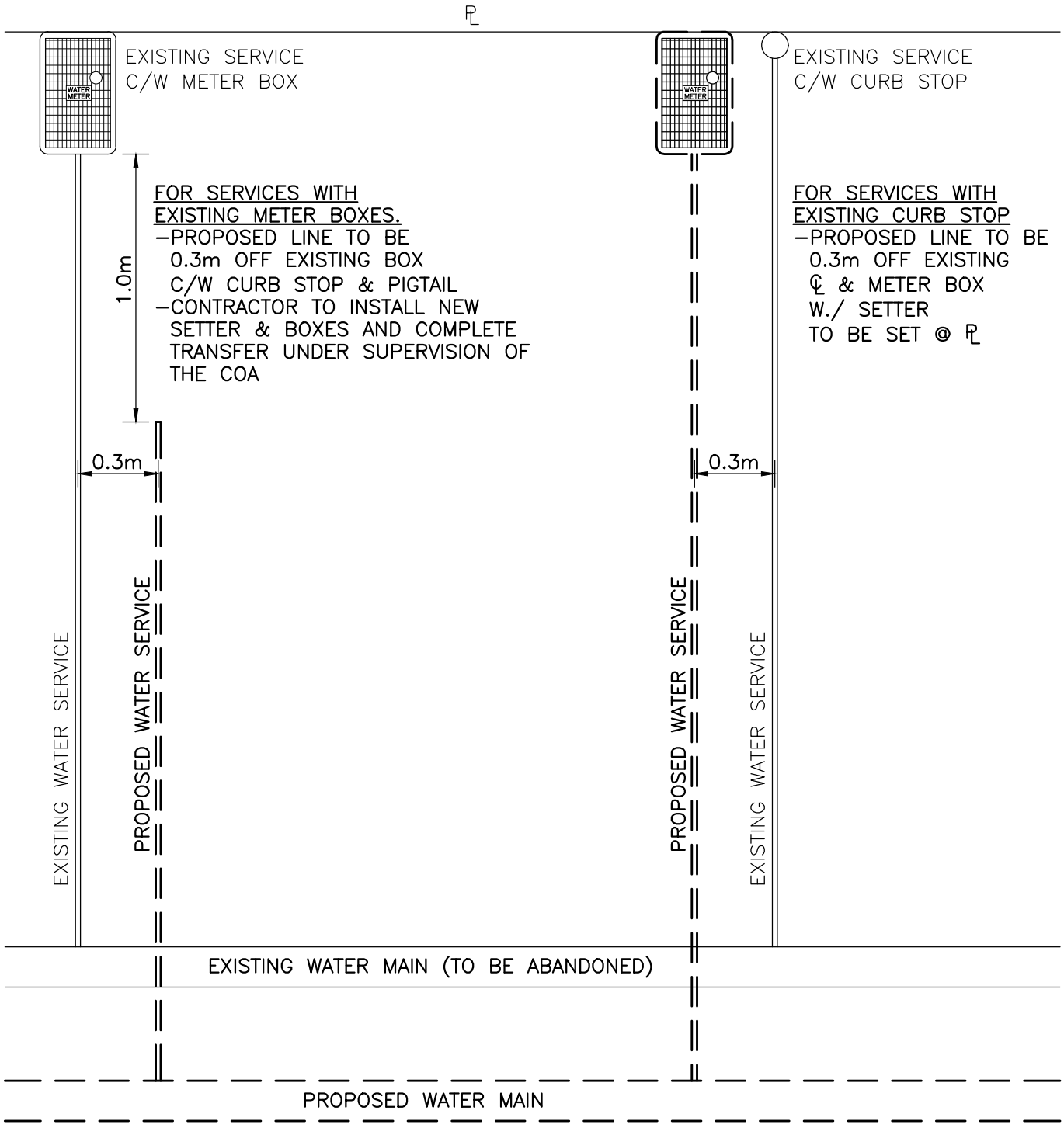


DOMESTIC & FIRE WATER SERVICE WITH METERS FOR STRATA / TOWNHOUSE / MULTIFAMILY - OPTION 1

ABBOTSFORD

DRAWN:	2021 09 09
REVISED:	
APPROVED BY:	

CS - W - 19

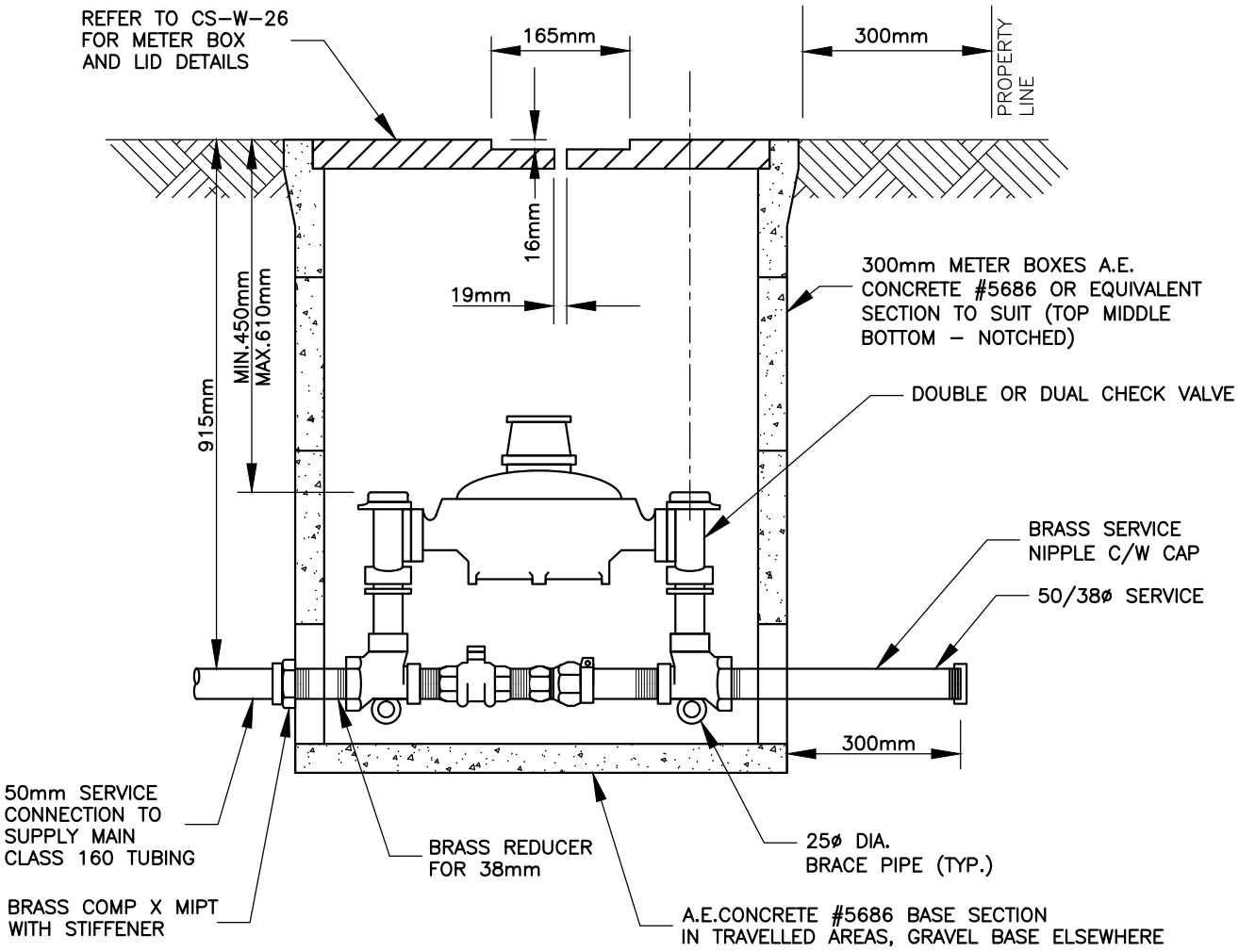


REPLACEMENT WATER SERVICE CONN. FOR UPGRADED / REPLACEMENT WATERMAINS

ABBOTSFORD

DRAWN:	2005 09 08
REVISED:	2021 09 09
APPROVED BY:	

CS - W - 20



NOTES:

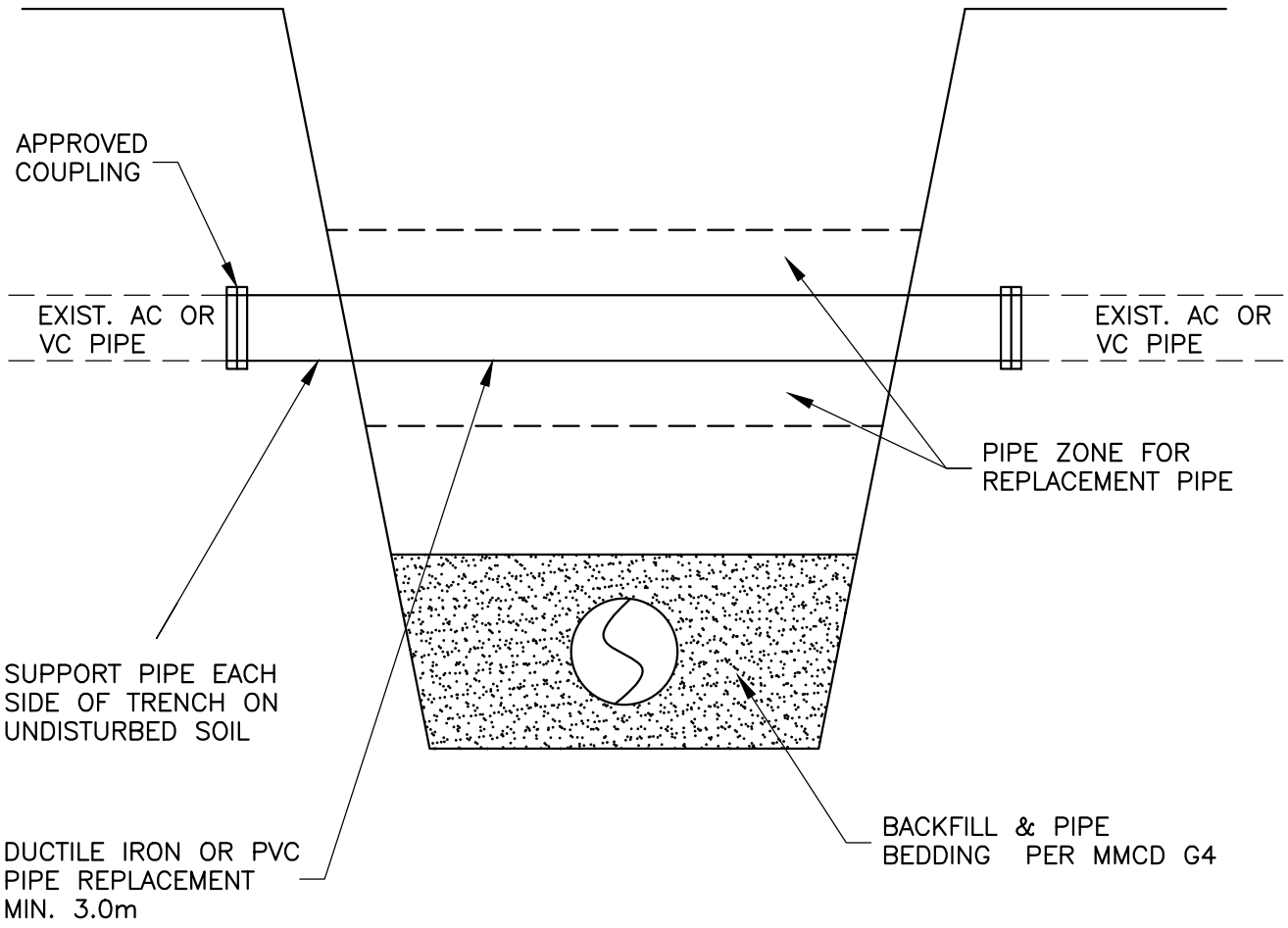
1. METER TO BE INSTALLED BY CITY
2. METER SETTERS TO BE FOR FLANGED METERS AND EQUIPPED WITH BYPASS, LOCKABLE INLET VALVE, LOCKABLE BYPASS VALVE, AND DOUBLE CHECK VALVE OUTLET
3. REFER TO CONTRACT DRAWINGS AND SECTION 33 11 01 FOR DETAILED SPECIFICATIONS
4. LOCATION OF METER BOX TO BE IN BOULEVARD NOT IN DRIVEWAY

METER INSTALLATION FOR 38mm & 50mm SERVICE CONNECTION

ABBOTSFORD

DRAWN:	2000 04 06
REVISED:	2021 09 09
APPROVED BY:	

CS - W - 21

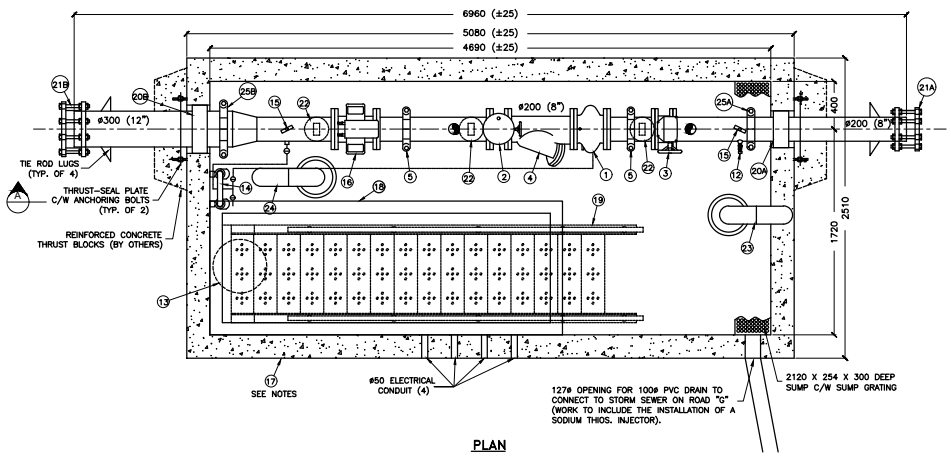


REPLACEMENT OF A.C./V.C. PIPE AT UTILITY TRENCH CROSSING

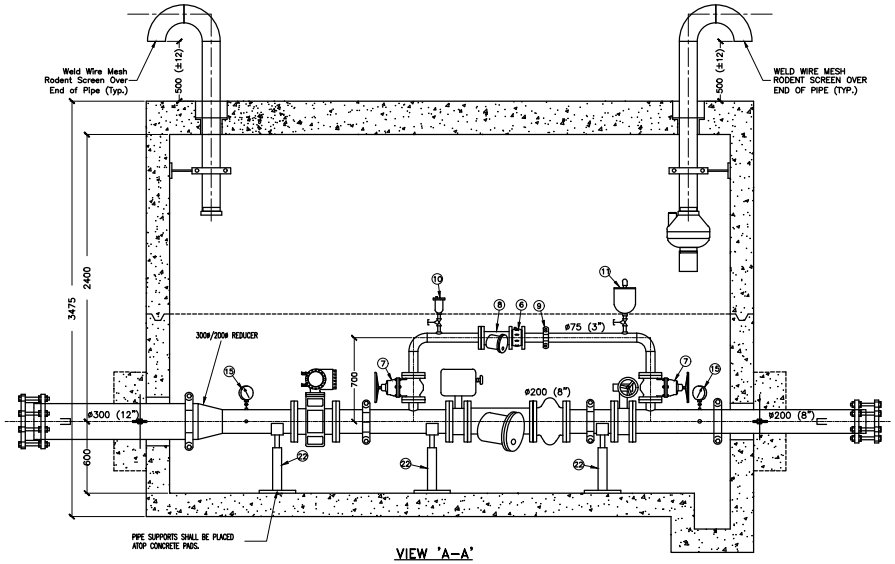
ABBOTSFORD

DRAWN:	2011 04 18
REVISED:	2021 09 09
APPROVED BY:	

CS - W - 22



PLAN



VIEW 'A-A'

BILL OF MATERIALS

ITEM	QTY	DESCRIPTION
1	1	200 (8") CLA-VAL or Singer Seal790-01YBS Pressure Reducing Valve – #150 Flgd
		---
2	1	200 (8") Butterfly Valve c/w Electric Actuator (Upstream) – #150 Flgd
3	1	200 (8") Butterfly Valve c/w Handwheel & Gear Operator – #150 Flgd
4	1	200 (8") Cast Iron Wye Strainer c/w Blowdown Valve – #125 Flgd
5	2	200 (8") VICTAULIC #07 Zeroflex Coupling
6	1	75 (3") CLA-VAL or Singer Seal790-01YBS Pressure Reducing Valve – Wafer Style
7	2	75 (3") NRS Gate Valve c/w Handwheel – #125 Flgd
8	1	75 (3") STAINLESS 316 Wye Strainer c/w Blowdown Valve – #125 Flgd
9	3	75 (3") VICTAULIC #07 Zeroflex Coupling
10	1	25 (1") Air Release Valve c/w Isolation Valve
11	1	25 (1") Combination Air Valve c/w Isolation Valve

12	1	19 (3/4") Hose Bib Assembly c/w Vacuum Breaker
13	1	Pilot Supply Sediment Tank
14	1	Wall Mounted Duplex Strainer
15	2	100 (4") Pressure Gauge/Transmitter Assembly c/w Isolation & Vent Valve
16	1	200 (8") Magnetic Flowmeter – #150 Flgd
17	1	Precast Chamber c/w White Interior & Black Exterior Sealant
18	1	900 x 2700 Aluminum Stairway Hatch
19	1	Aluminum Stairway c/w Removable Railing
20A	1	200 (8") Pipe Seal Assembly
20B	1	300 (12") Pipe Seal Assembly
21A	1	200 (8") ROBAR ST x DI Transition Coupling
21B	1	300 (12") ROBAR ST x DI Transition Coupling
22	3	Adjustable Galv. Steel Pipe Support
23	1	150 (6") Galv. Steel Vent Pipe System c/w FANTECH FR150 Exhaust Fan
24	–	150 (6") Galv. Steel Vent Pipe System
25A	1	200 (8") VICTAULIC #07 Zeroflex Coupling
25B	1	300 (12") VICTAULIC #07 Zeroflex Coupling

200 X 75 PRESSURE REDUCING VALVE WITH 8" FLOWMETER STATION

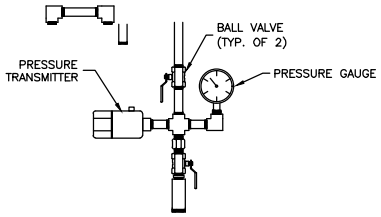
STANDARD FABRICATION & FINISHING SPECIFICATION

FABRICATED STEEL PIPE & FITTINGS TO BE SCHEDULE NO. 40 STEEL PIPE FOR SIZES TO 10", AND 3/8" WALL FOR 12" AND LARGER.

ALL, 3" LARGER PIPE, INSIDE WETTED SURFACES TO BE SANDBLASTED, EPOXY LINED AND COATED TO AWWA C-210 AND NSF-61 SPECIFICATION OR STAINLESS STEEL. FINISH COATING WILL BE BLUE ENAMEL.

NOTES:

1. CHAMBER #4712 (H-20 LOADING) INSIDE DIMENSIONS 4700mm L x 2120mm W x 1980mm H
2. CHAMBER WEIGHT:
   TOP.....12,500 Kg
   BOTTOM.....13,500 Kg
   : WEIGHTS ±10%
3. DATA RECORDING SHALL BE THROUGH SCADA OR ELECTRONIC DATA RECORDING EQUIVALENT



PRESSURE GAUGE/ TRANSMITTER DETAIL

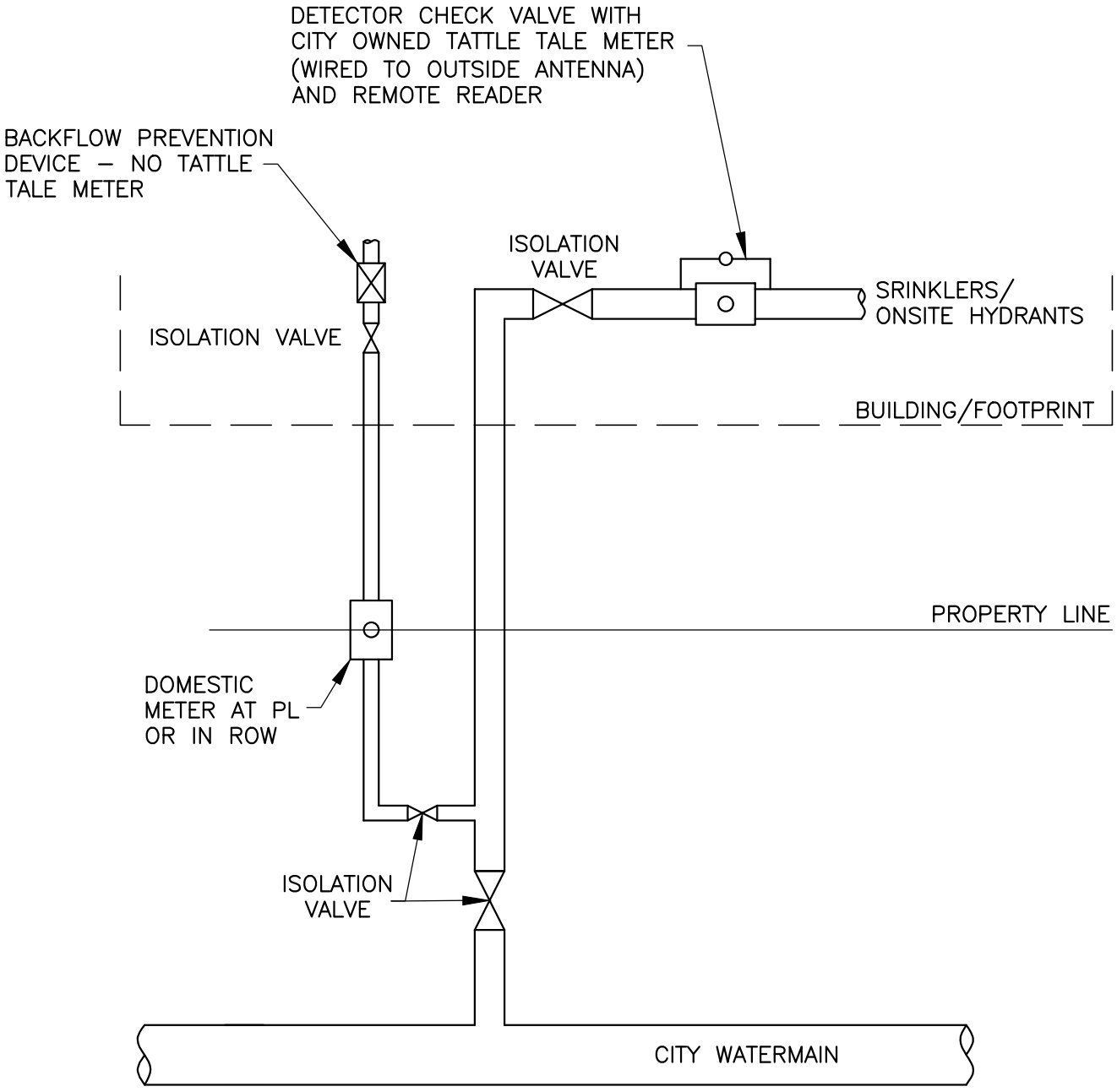
DRAWING FOR INFORMATION ONLY, ELECTRICAL AND MECHANICAL SHOP DRAWINGS TO BE PROVIDED TO CITY FOR REVIEW

PRV STATION DETAILS

ABBOTSFORD

DRAWN:	2011 04 18
REVISED:	2021 09 09
APPROVED BY:	

CS-W-23



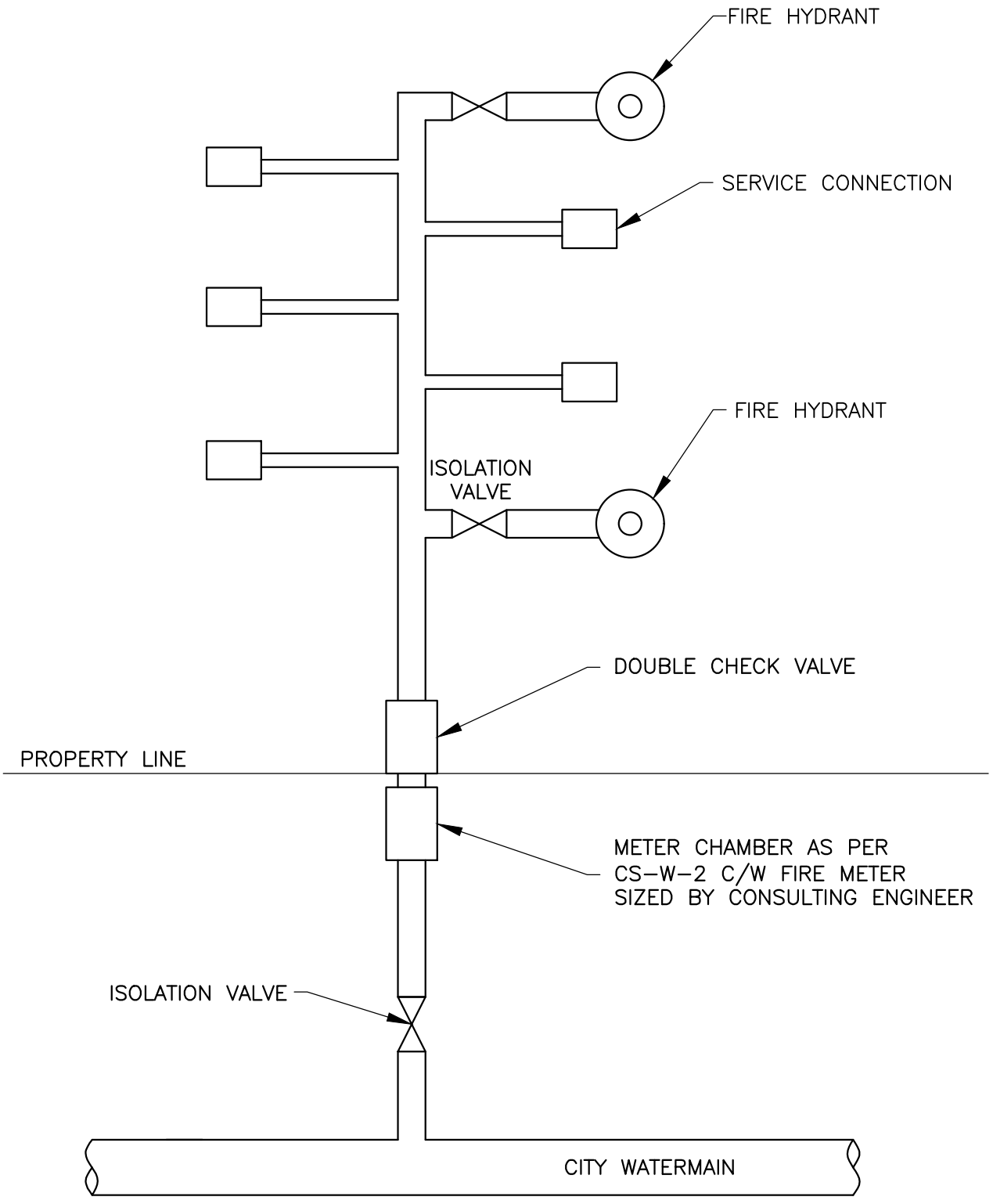
(ICI: INSTITUTIONAL, COMMERCIAL, INDUSTRIAL)

ICI & APARTMENT STYLE MULTIFAMILY DEVELOPMENTS SEPARATE DOMESTIC AND FIRE SERVICE

ABBOTSFORD

DRAWN:	2011 04 18
REVISED:	2021 09 09
APPROVED BY:	

CS - W - 24



DOMESTIC & FIRE WATER SERVICE WITH METERS FOR STRATA / TOWNHOUSE / MULTIFAMILY - OPTION 2

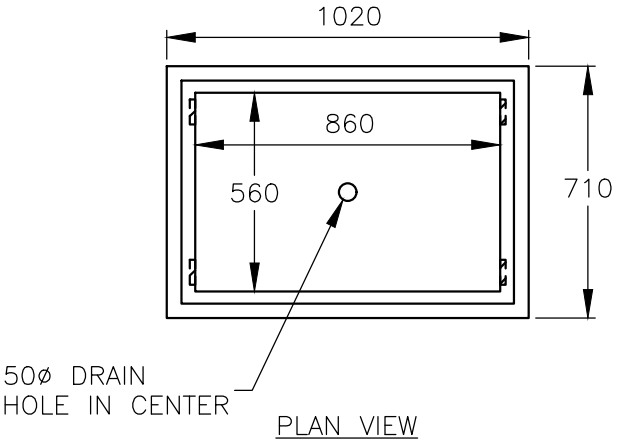
ABBOTSFORD

DRAWN:	2021 09 09
REVISED:	
APPROVED BY:	

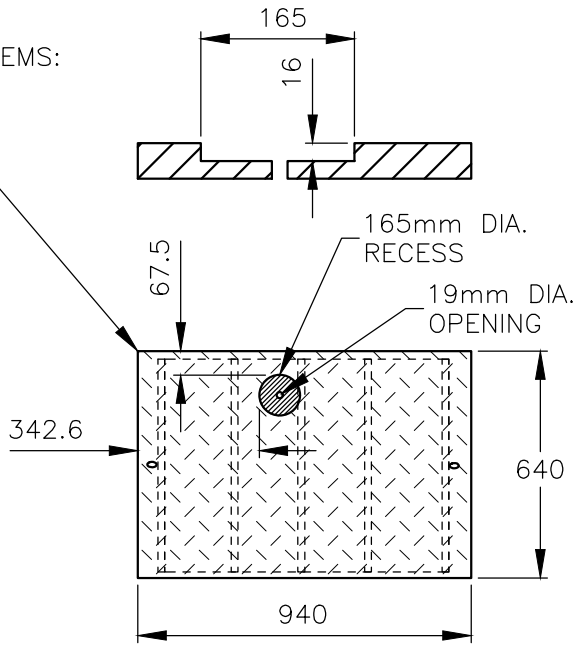
CS - W - 25

STEEL CHECKER PLATE LID OPTIONAL ITEMS:

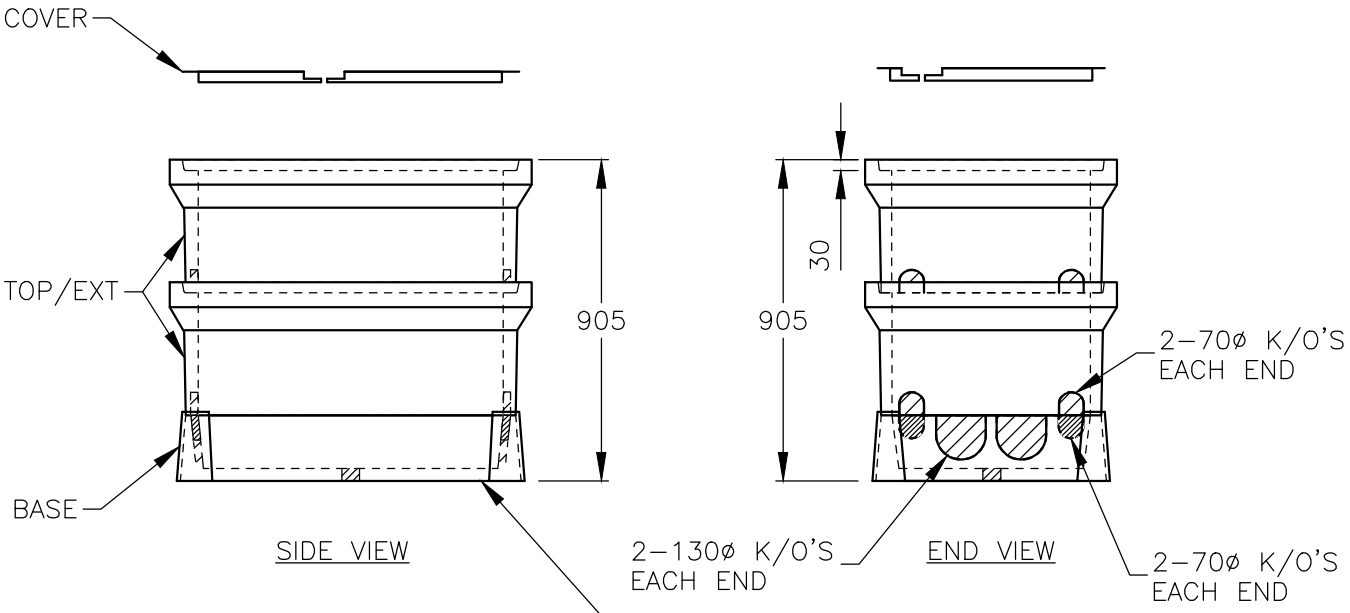
- GALVANIZING
- BOLT DOWN ASSY
- PAD–LOCK RECESS
- WELD MARKINGS – EG. "ELEC"
- 45Ø RR Hole



PLAN VIEW



PLAN VIEW – REMOTE READER LID



300mm METER BOXES A.E. OR EQUIVALENT CONCRETE #5686 SECTION TO SUIT (TOP MIDDLE BOTTOM – NOTCHED)

WEIGHTS:

STEEL COVER: 45 KGS / 100 LBS
TOP SECTION: 89 KGS / 195 LBS
BOTTOM SECTION: 89 KGS / 195 LBS
BASE SECTION: 79 KGS / 175 LBS

GENERAL NOTES:

- PRODUCTS MANUFACTURED IN ACCORDANCE WITH CSA A23.4
- DESIGNED FOR BOULEVARD (OFF–ROAD) USE – H–20 STATIC LOADING
- STEEL PRODUCTS MANUFACTURED UNDER CSA W47.1 IN ACCORDANCE TO CSA W59
- SITE INSTALLATION, BACKFILLING & SUITABILITY FOR USE IS THE RESPONSIBILITY OF OTHERS.

38mm & 50mm WATER METER BOX TYPICAL

ABBOTSFORD

DRAWN:	2021 09 09
REVISED:	
APPROVED BY:	
	CS - W - 26