

1. DRAWING SPECIFICATIONS



Victoria Subdivision and Development Servicing Bylaw

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1. DRAWING SPECIFICATIONS

1.1. General

- 1.1.1. The Drawing Specifications apply to the design of sanitary sewers, storm drains, waterworks, roadways, and street lighting, within the City of Victoria. They also apply to the location and coordination of the other utilities within the City of Victoria.
- 1.1.2. No departure from the Drawing Specifications shall be permitted without the prior written approval of the Director of Engineering.
- 1.1.3. Any information received from the City of Victoria about existing services shall be used as a guide only. The City of Victoria has no responsibility for the exactness of service information obtained from plates, drawings and information provided electronically. The Applicant should confirm underground locations with utility companies and should verify the locations and elevations of all existing services by actual survey.

1.2. Design Drawings

1.2.1. Electronic Drawings Standards

- 1.2.1.1. All design drawings shall be created using software which is compatible with AutoCAD, release 2004 or later.
- 1.2.1.2. Circulation submissions shall be on paper prints. Four copies of the final design submissions shall be in black, on paper, suitable for photocopying, signed and sealed by the Consulting Engineer. Sealed design drawings will be returned to the Consulting Engineer once they have been signed by the City of Victoria and sufficient copies have been made.
- 1.2.1.3. The City of Victoria will provide digital base plan information upon request, using the City's current drawing standards and layer conventions. The Consulting Engineer shall use the most recent version of the City of Victoria's drawing standards and conventions.

1.2.2. Sheet Sizes

- 1.2.2.1. Standard sheet size is A1 metric size 594 mm x 841 mm.

1.2.3. Plan/ Profile Layouts

- 1.2.3.1. Plan view shall be in the upper half of the sheet, with title block along the bottom edge of the sheet.
- 1.2.3.2. Profile view shall occupy the lower half of the sheet.
- 1.2.3.3. The use of plan on one sheet and profile on a second sheet is not acceptable.
- 1.2.3.4. A north arrow, generally orientated towards the top of the sheet, shall be shown on the design drawing.
- 1.2.3.5. Construction notes shall be confined to a separate “note” column, wherever possible, with numbered references in a plan or profile.

1.2.4. Scales

Normal:	Horizontal	1:200	Vertical	1:20
Details: *	Horizontal	1:100	Vertical	1:10
Cross Sections:	Horizontal	1:200	Vertical	1:20
Structural Details:	1:20			

*e.g.: a detail of piping around two closely spaced manholes

1.2.5. Proposed and Existing Services

- 1.2.5.1. Proposed construction and improvements shall be shown as heavy solid lines. Proposed future construction shall be shown as heavy dashed lines. Existing works and services shall be shown as solid lines and shall be screened to 60% or else drawn with very fine lines to create the same effect as screening.
- 1.2.5.2. Existing water mains, sanitary sewers, and storm drains (including all appurtenances), as well as ditches, pavement, curbs, sidewalks, underground wiring, gas, poles, trees, service connections and other underground utilities shall be indicated in plan and profile where applicable.
- 1.2.5.3. All services shall generally be shown on one plan with curbs (mountable or non-mountable), sidewalks, sewers, drains, gas, water and street lighting (underground wiring), fibre optics, BC Hydro and TELUS including poles identified as MC or NMC, S/W, S, D, G, W, L, FO, H, or T respectively. Other services shall be clearly designated on the drawing.

1.2.5.4. Dimensions of drawings shall be given from an existing monument or proposed iron pin or lot line. Road chainage shall be tied to a monument or iron pin from the start of construction. All chainage shall be positive values with 0+0 located adjacent to the left margin of the drawing sheet. Subsequent chainages shall increase from the left margin towards the right border of each drawing sheet. All proposed works and services shall be fully dimensioned.

1.2.5.5. Connections or alterations to existing water mains, sanitary sewers and storm drains by the City of Victoria shall be indicated on the design drawings.

1.2.5.6. Existing detail information shall include:

1.2.5.6.1. All surface and subsurface infrastructure and natural features within the road allowance or project site.

1.2.5.6.2. All surface and subsurface infrastructure and natural features outside the road allowance or project site that influences or may be impacted by the proposed work and services.

1.2.6. Elevations and Vertical Datum

1.2.6.1. Vertical control shall be shown in metric geodetic datum (mean sea level = 0). Bench mark numbers, locations and elevations can be obtained from Base Mapping & Geomatic Services Branch of the Integrated Land Management Bureau (ILMB) of the Ministry of Agriculture and Lands. The reference bench mark numbers and elevation shall be shown on the design drawings. Elevations below zero (0) metres geodetic shall be prefixed with a minus sign.

1.2.6.2. The design drawings shall show:

- the elevation, to the nearest centimetre,
- existing basement floors and,
- where the building site is less than 1m above the road level, any proposed basement floor elevation or entrance,
- Critical elevations at property lines i.e. Doorways and Driveways.

1.2.6.3. If a subdivision lot is proposed to be filled, the drawings shall show existing ground elevations at corners of the allowable building envelope or show a centre of lot profile, to indicate the extent of fill required. The placement of fill must be done under the direct supervision of Consulting Engineer and the Owner shall supply a signed and sealed report from the Consulting Engineer attesting to the suitability of the placed fill for building.

1.2.7. Requirements for Key Plan

- 1.2.7.1. A key plan shall be included on the design drawings for subdivisions or if the location of the works cannot be easily deduced from the detailed design plans.
- 1.2.7.2. A key plan, when required, shall be on the right side of the design drawings and shall include the following information:
- 1.2.7.3. Plan of adjacent streets and existing lots with streets named and legals of subject and adjacent lots given;
- 1.2.7.4. Civic address with the subject property being subdivided shown shaded;
- 1.2.7.5. North arrow;
- 1.2.7.6. If the subdivision is to be developed in stages, each proposed stage shall be clearly outlined and order of development indicated.
- 1.2.7.7. If a key plan is not required, the house number of existing houses shall be shown on the detailed design plan.

1.2.8. Rights of Way and Easements

- 1.2.8.1. All existing rights-of-way or easements must be verified with supporting documents and shall be shown lightly shaded on the design drawing. Registration numbers and boundaries of rights-of-way or easement shall be shown lightly shaded.
- 1.2.8.2. All proposed rights-of-way for new services are to be shown as a dashed line. These shall be tied to the iron pin in each lot, together with their width, permitted use, and the note “acquire” or “proposed”.

1.2.9. Subdivisions

- 1.2.9.1. The potential building envelope of each lot is to be indicated by shading.

1.2.10. Roads, Curbs and Sidewalk

- 1.2.10.1. Both plan and profile shall be tied to an iron pin or monument, preferable near or at 0+0 chainage. If the chainage exceeds 150 m, a second tie shall be shown.
- 1.2.10.2. Show all iron pins adjacent to the works and the existing ground elevation at each pin or proposed pins.
- 1.2.10.3. Show the road width, curb and sidewalk offsets and materials used measured from the property line. A typical cross-section shall also be shown on a separate drawing sheet.
- 1.2.10.4. Show actual location and dimensions of sidewalk drops, on a detail plan at 1:200.
- 1.2.10.5. Road profiles shall show centerline and gutter(s) or edge(s) of pavement elevation at 10 m intervals.
- 1.2.10.6. Gutter elevations of cul-de-sacs shall be shown on a detail plan at 1:200, at all BC's and EC's and at intervals of no more than 5 metres along the gutter line. A profile along the gutter line shall show how it is graded.
- 1.2.10.7. A typical cross sectional view of road construction shall be included where circumstances require special consideration. In all cases the standard drawing section shall be referenced on the drawing.
- 1.2.10.8. Cross-sections are required for drawings depicting new or rehabilitated roads and sidewalks.
- 1.2.10.9. For new road and sidewalk features, a 10 m interval cross-section is required.
- 1.2.10.10. For road works, cross-section elevations must span the full width of the road allowance. Cross-section elevations must include property lines, back of sidewalk, front of sidewalk, top of curb, gutter, ¼ pt of road width or edges of existing road and centerline of road. It must also illustrate changes and elevations of each break in the cross-section.
- 1.2.10.11. The new road works must be shown on each cross-section with bold lines that emphasize the finished surface. Elevations of the new road must be shown. Road measurements from centreline of the road allowance must also be illustrated.

- 1.2.10.12. The profile shall be shown at the true centreline length and provided in as close relationship as possible to the plan.
- 1.2.10.13. Locate catch basins by chainage to the centre.
- 1.2.10.14. Existing and proposed driveway locations shall be shown, as well as a profile of each driveway from the road centreline to the end of the driveway within the property.
- 1.2.10.15. Chainage of the BC and EC of horizontal curves shall be shown together with the internal angle, tangent length, arc and centreline radius. A table showing curve and curve return data is to be shown on the road drawings as shown in a sample below in Table 1.

CURVE DATA TABLE 1 (example)					
Curve	A	B	C	D	E
Radius	30.000m	10.000m	110.000m	6.000m	6.000
Angle	57°49'33"	8°21'00"	18°40'59"	71°37'15"	24°41'54"
Arc	30.278m	15.595m	35.869m	7.500m	2.586m
Tangent	16.523m	9.927m	18.095m	4.329m	1.314m
B.C.	0+00.00	0+30.280	0+50.380	0+86.250	0+93.746
E.C.	0+30.280	0+45.870	0+86.250	0+93.746	0+96.260

- 1.2.10.16. The centerline percent grade to two decimal places shall be shown on the profile together with the following information on vertical curves:
- 1.2.10.17. The chainage and elevations of BVC, EVC, and VPI;
- 1.2.10.18. The external value, 'e';
- 1.2.10.19. The 'K' value;
- 1.2.10.20. The length of the vertical curve;
- 1.2.10.21. The elevation and chainage of low points for sag curves.
- 1.2.10.22. The gutter(s) percent grade to two decimal places shall be shown on the profile together with the following:
- 1.2.10.23. Proposed gutter(s) elevations at 10m change stations.
- 1.2.10.24. Chainage and elevation of proposed gutter(s) BC, EC, BVC, EVC and CB's.
- 1.2.10.25. Horizontal curve radii to be designed to the nearest 1.0m

- 1.2.10.26. Pavement tapers are to be dimensioned to legal with length of taper and the offset to existing pavement.

1.2.11. Sewer and Drains

- 1.2.11.1. The following information shall be shown on the profile:

- 1.2.11.1.1. Size, type, class of pipe.
- 1.2.11.1.2. Percent grades to two decimal places.
- 1.2.11.1.3. Invert elevations at both inlet and outlet of manholes.
- 1.2.11.1.4. Details of vertical curves.
- 1.2.11.1.5. Existing utilities.
- 1.2.11.1.6. The following information shall be shown on the plan:
- 1.2.11.1.7. Details of horizontal curves;
- 1.2.11.1.8. Pipe offsets from property line;
- 1.2.11.1.9. Chainage or measurement from the downstream manhole of service connections. Offset to the nearest property corner of the end of the service connection.
- 1.2.11.1.10. Invert elevation at the property line and the grade of service connections from the upper end to the drop to the main, if other than two percent.

- 1.2.11.2. The following additional information shall also be shown on the appropriate part of the drawing:

- 1.2.11.2.1. Sanitary sewer manholes and cleanouts shall be identified by a capital "S" followed by a unique number.
- 1.2.11.2.2. Storm drain manholes, cleanouts and catchbasins shall be identified by a capital "D" followed by a unique number.
- 1.2.11.2.3. Structural detail of all manholes not covered by Municipal Standard Drawings or MMCD.

1.2.12. Water

- 1.2.12.1. Drawings shall indicate whether a water main passes over or under other underground services which it is crossing.

1.2.12.2. The following information shall be shown on the profile:

- 1.2.12.2.1. The size, type and class of pipe.
- 1.2.12.2.2. For mains 150mm and larger, profile grades to 2 decimal places.
- 1.2.12.2.3. The following information shall be shown on the plan:
- 1.2.12.2.4. The offset of main centreline from the property line.
- 1.2.12.2.5. The proposed elevation of the flange of hydrants.
- 1.2.12.2.6. Extent of work required of the City of Victoria in making the connection to the existing water main.

1.2.13. Street Lighting and Signal Design

- 1.2.13.1. Plot existing and proposed lamp and signal standards and show the measurement between them and their measurement from the proposed curb face.
- 1.2.13.2. Signal and Light pole design including design details and elevations including bases.
- 1.2.13.3. Indicate wattage of luminaries to meet standard lighting levels.
- 1.2.13.4. Plot and identify all existing and proposed street lighting and traffic signal operating devices such as:
 - Underground conduits;
 - Signal loops(wires);
 - Traffic counters and counting loops;
 - Traffic control boxes;
 - Pull boxes;
 - And other related street lighting infrastructure.

1.2.14. Other Utilities

- 1.2.14.1. Existing and design detail information for utilities such as Hydro, Telephone, Cable, Telecommunications and Gas shall be obtained from the appropriate utility company. The design drawing must be signed off by the utility company's representative.
- 1.2.14.2. The following information shall be shown on the design drawings:
 - 1.2.14.2.1. Existing utilities.

- 1.2.14.2.2. Utility offset from property line and/ or iron pin.
- 1.2.14.2.3. Lot connections and other appurtenances offset to the nearest property line.
- 1.2.14.2.4. Proposed poles shall be dimensioned from the pole's road face to property line and/ or pin.
- 1.2.14.2.5. Indicate how utility vaults will drain to the storm drain system and who will install the drain connection.
- 1.2.14.2.6. Underground BC Hydro, telephone, cable, telecommunications and etc infrastructure such as duct bank and vault outlines.

1.3. As-Constructed Record Drawings

1.3.1. Submission Sets

- 1.3.1.1. Within four weeks of completion of all services installed by the Applicant, the Consulting Engineer shall deliver "as-constructed" record drawings to the City of Victoria. These drawings shall include the following statement signed, sealed and dated by the Consulting Engineer:

"I [name and professional designation], certify that the following services (name them) were inspected during construction and to the best of my knowledge, were installed in accordance with the City of Victoria Specifications and as shown on this drawing. I further certify that the locations of all surface appurtenances of the various utility companies are shown correctly on this 'as built' drawing."

- 1.3.1.2. The first submission of as-constructed record drawings shall consist of one paper print of the approved design drawing with changes or corrections highlighted in colour.

- Sanitary Sewer – Purple
- Storm Drains – Green
- Water – Dark blue
- Gas – Yellow
- Power – Red
- Telecommunications – Orange
- Curb, sidewalk, road - Brown

- 1.3.1.3. After approval of the paper print submission, the original design revised as required to show services as –constructed, shall be submitted, using the latest version of AutoCAD. As-constructed drawings shall use the City's Current drawing standards and layer conventions.

1.3.2. Dimensioning

- 1.3.2.1. The as-constructed drawings shall clearly show the location of all construction, improvement and services as installed, using offsets from survey pins. The locations will be shown either by check-marking any original dimension on the drawing (if they are correct) or by showing the revised dimension beside the original dimension.

1.3.3. Tolerances

- 1.3.3.1. All horizontal dimensions shall be to the nearest 100mm. All vertical elevations shall be to the nearest 5mm, except that ground elevations and service connection inverts at property line shall be to the nearest 30mm;
- 1.3.3.2. Road horizontal locations shall be to the nearest 30mm;
- 1.3.3.3. Road vertical locations shall be to the nearest 15mm.

1.3.4. Roads Curb and Sidewalk

- 1.3.4.1. Locate the curbs, sidewalks and pavement.

1.3.5. Sewer and Drains

- 1.3.5.1. Show the location and extent of rock cuts and hardpan requiring blasting.
- 1.3.5.2. Show the invert elevation at both inlet and outlet of manholes.
- 1.3.5.3. Show as construct manholes, cleanouts and other appurtenances.
- 1.3.5.4. Locate catch basin leads at the main by measurement from the centre of the downstream manhole.
- 1.3.5.5. Locate service connections at property line showing distance from the nearest iron pin or property line and at the main by chainage from the centre of the downstream manhole.
- 1.3.5.6. Show ground and invert elevations of sewer and drain service connections at the property line or edge of right-of-way.

1.3.6. Water

- 1.3.6.1. Show domestic water services.

- 1.3.6.2. Show the location and extent of rock cuts and hardpan requiring blasting.
- 1.3.6.3. Show the profile for mains, 150mm diameter and larger indicating the invert elevations at 15 metre stations.
- 1.3.6.4. Tie the locations of fire hydrants to a main valve and to iron pins.

1.3.7. Street Lighting and Traffic Signals

- 1.3.7.1. Show the location and extent of rock cuts and hardpan requiring blasting.
- 1.3.7.2. Show all poles and light standards including details and elevations.
- 1.3.7.3. Show all street lighting and traffic signal operating devices such as:
 - Underground conduits;
 - Signal loops(wires);
 - Traffic counters and counting loops;
 - Traffic control boxes;
 - Pull boxes;
 - And other related street lighting and signalling infrastructure.

1.3.8. Other Utilities

- 1.3.8.1. Show service connections
- 1.3.8.2. Show the location, number and size of conduits and mains.
- 1.3.8.3. Show all surface appurtenances and infrastructure

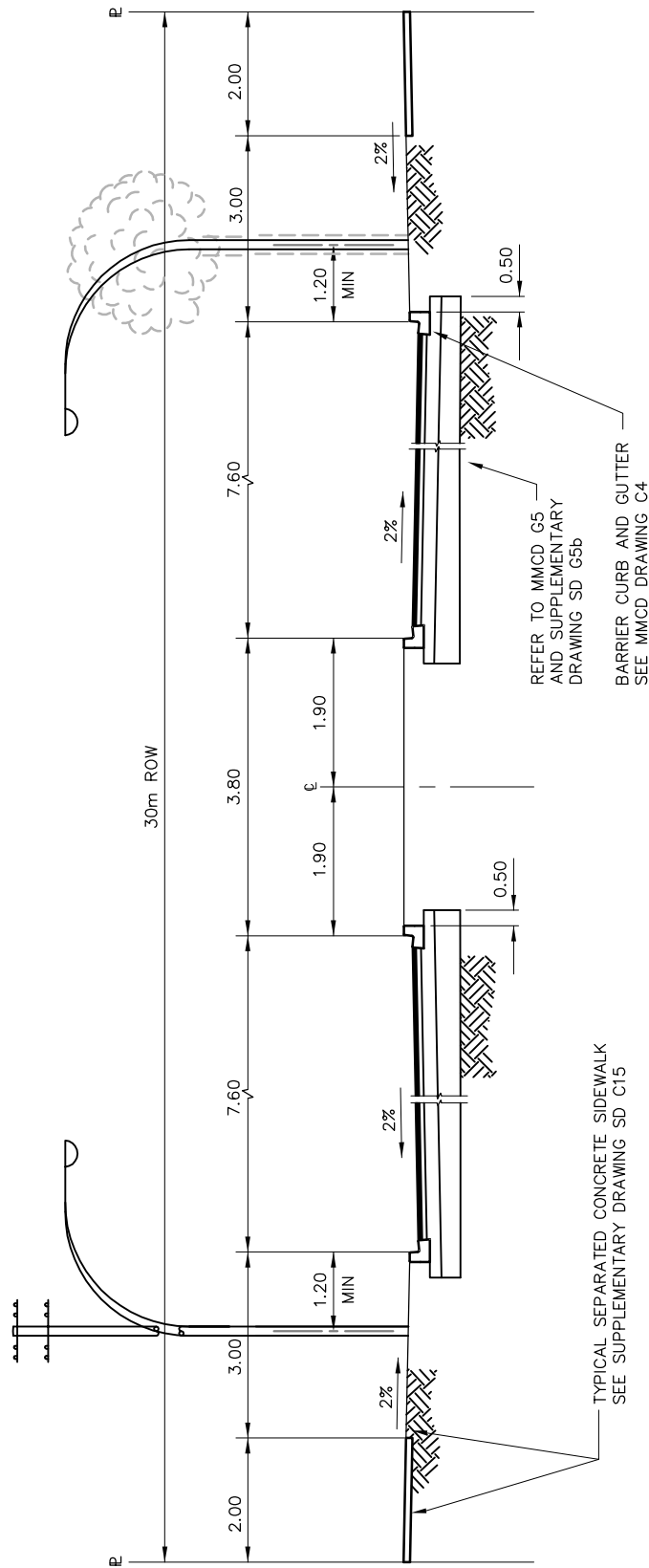
1.4. Road Cross Sections

- 1.4.1. Des 1 Typical Arterial Street
- 1.4.2. Des 2 Typical Secondary Arterial Street
- 1.4.3. Des 3 Typical Collector Street
- 1.4.4. Des 4 Typical Secondary Collector Street
- 1.4.5. Des 5 Typical Local Street
- 1.4.6. Des 6 Typical Lane



Victoria Subdivision and Development Servicing Bylaw

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NOTES:

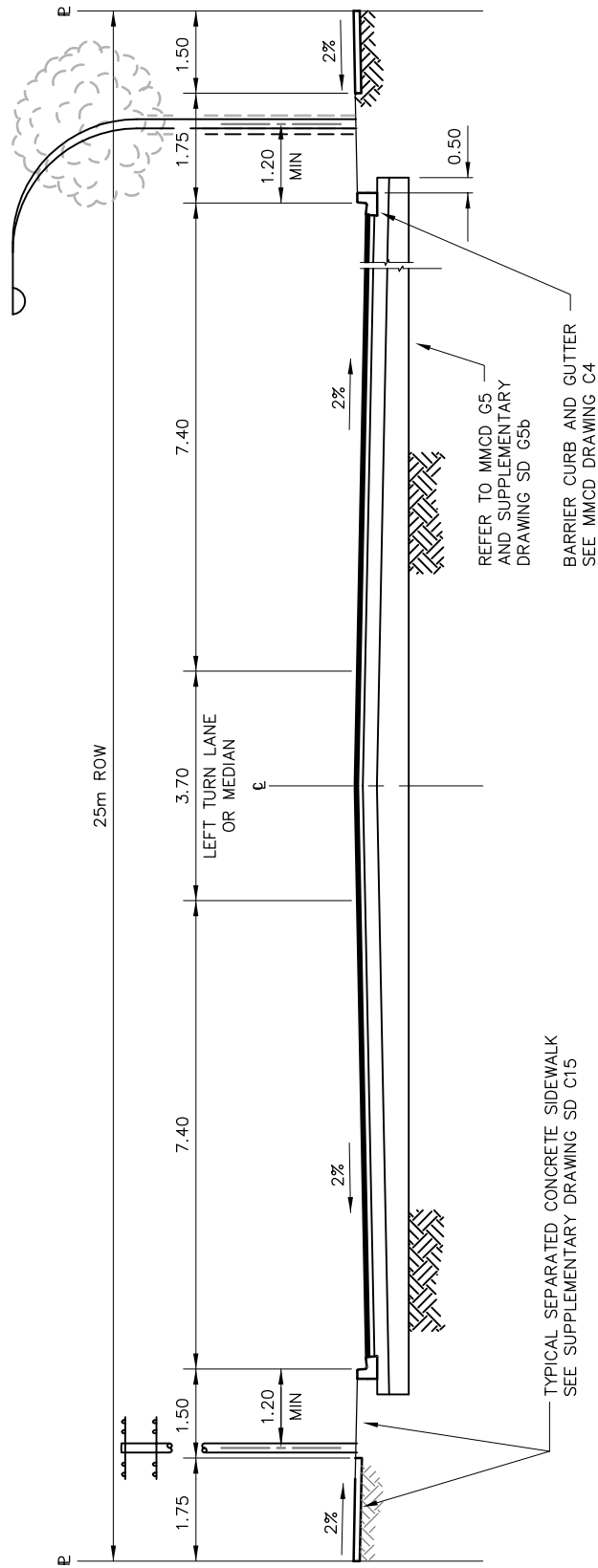
1. ALL DIMENSIONS IN METRES UNLESS NOTED OTHERWISE.
2. OVERALL DIMENSIONS AND ROW MAY VARY AT INTERSECTIONS.

TYPICAL ARTERIAL STREET

REVISIONS

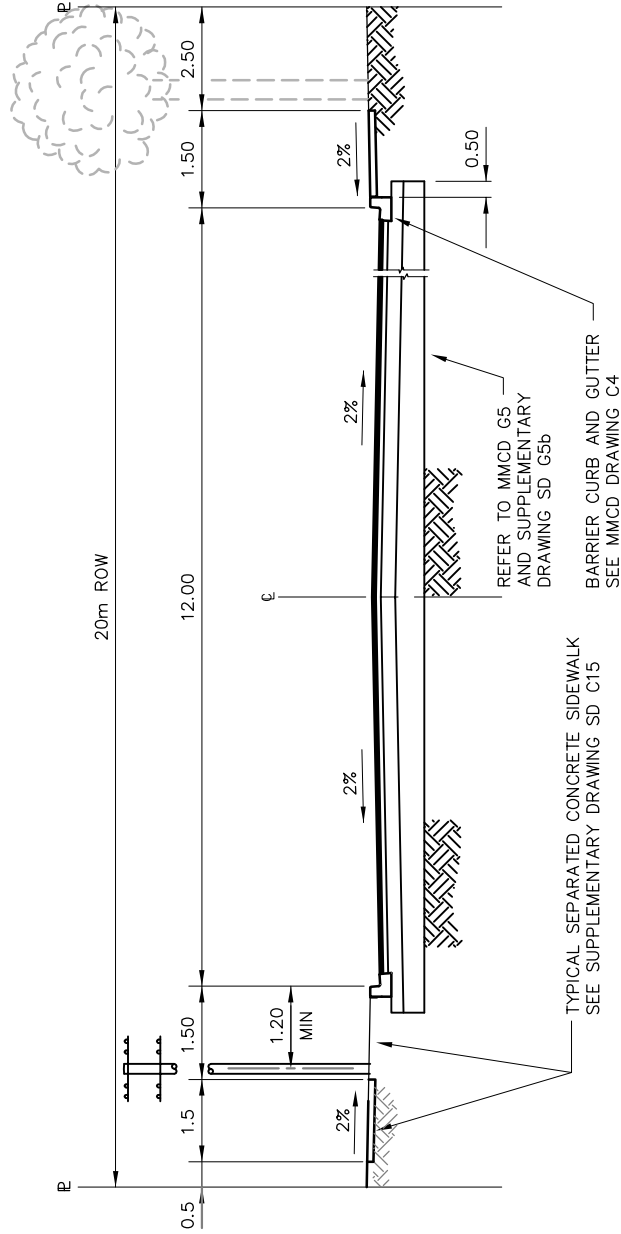
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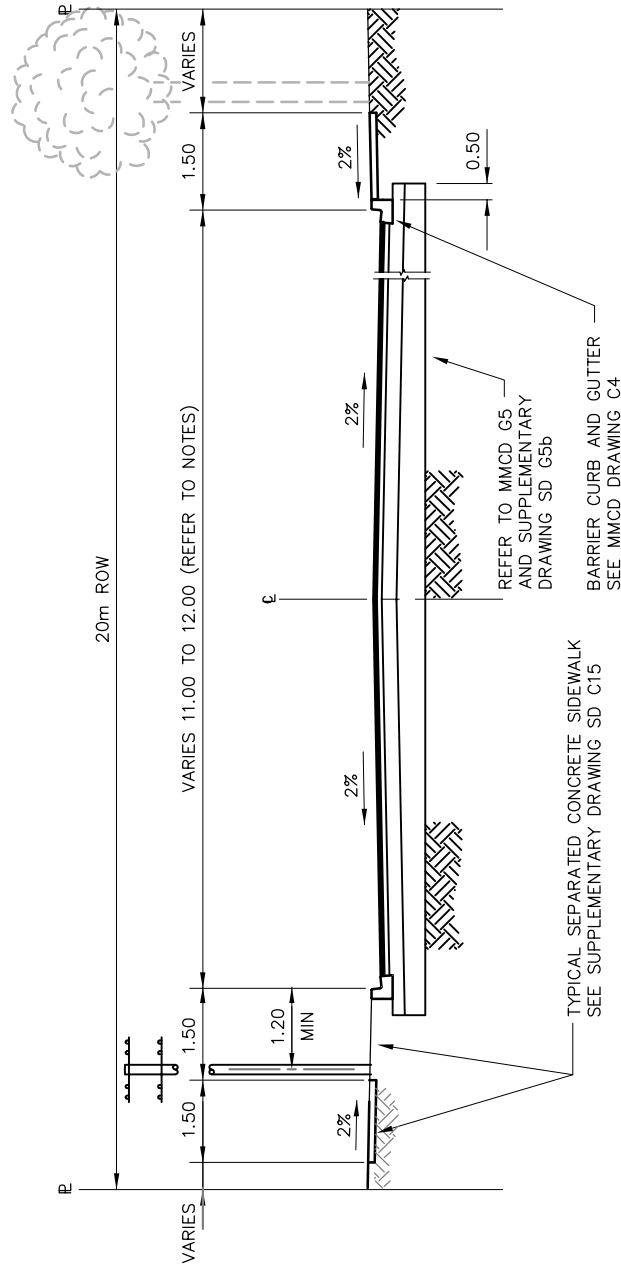
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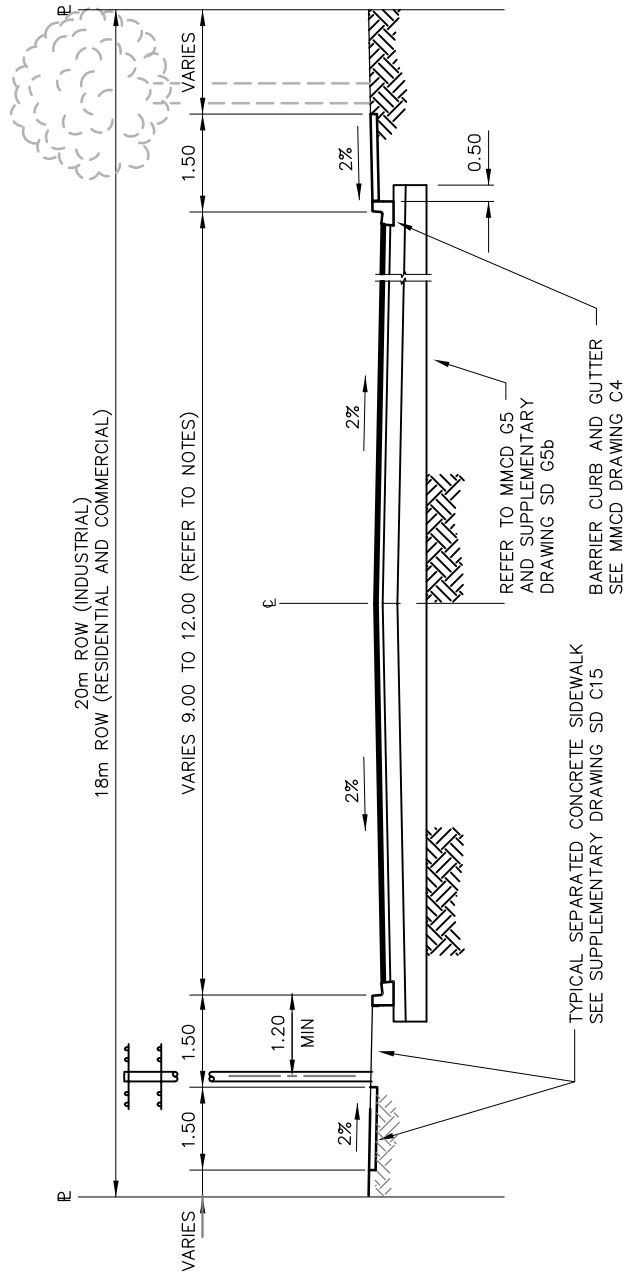
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NOTES:

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2. OVERALL DIMENSIONS AND ROW MAY VARY AT INTERSECTIONS.
3. PAVEMENT WIDTHS:
TRUCK AND BUS ROUTES 12m
OTHER 11m



NOTES:

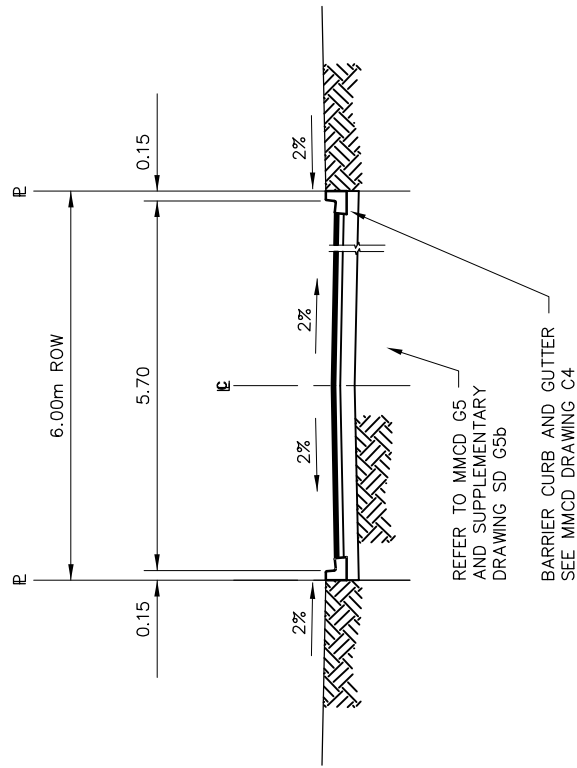
1. ALL DIMENSIONS IN METRES UNLESS NOTED OTHERWISE.
2. OVERALL DIMENSIONS AND ROW MAY VARY AT INTERSECTIONS.
3. PAVEMENT WIDTHS:
 SINGLE FAMILY TO LOW DENSITY TOWNHOUSE 9m
 HIGH DENSITY TOWNHOUSE TO LOW RISE APARTMENTS 10m
 AND NEIGHBOURHOOD COMMERCIAL CENTRES 11m
 HIGH RISE APARTMENTS AND REGIONAL COMMERCIAL CENTRES 12m
 INDUSTRIAL 12m

TYPICAL LOCAL STREET

REVISIONS

DRAWING NUMBER:

Des 5



- NOTES:**
1. ALL DIMENSIONS IN METRES UNLESS NOTED OTHERWISE.
 2. OVERALL DIMENSIONS AND ROW MAY VARY AT INTERSECTIONS.