

HALDIMAND COUNTY
DESIGN CRITERIA

SECTION G
ROADWAYS

Revised 2015

G 1.00 CLASSIFICATIONS

G 1.01 STREET CLASSIFICATION

All roadways in new developments shall be classified according to the traffic volume expected and the intended use of the roadway. For predominantly residential areas three classifications shall be noted as follows: Local, Minor Collector or Major Collector. For industrial areas the streets shall be classified Local or Collector dependent upon length of street, traffic volume expected and percentage of truck traffic. Arterial roadways shall be classified as divided or undivided. The proposed classification of all streets in the development shall be confirmed with Haldimand County prior to the commencement of the design.

The following table is presented as a guide to the determination of the street classification:

Roadway Classification Guidelines

	Arterial Road	Collector Road	Local Street
Traffic Service Function	Priority to traffic mobility	Traffic mobility and land access of equal importance	Priority to land access and urban environment
Typical Traffic Volumes (ADT)	5,000 to 30,000 vehicles per day	1,000 to 12,000 vehicles per day	Less than 3,000 vehicle per day
Typical Speed Limits	50 to 80 kph	50 to 60 kph	40 to 50 kph
Vehicle types	All types	May restrict heavy trucks in specific cases	Passenger and service vehicles
Connects to	Freeway, highway, arterial, collector, local	Highway, arterial, collector, local	Highway, arterial, collector, local
Typical Right-of-way width	30 to 36 metres	20 to 30 metres	18 to 20 metres

G 1.02 ROADWAY CROSS-SECTIONS:

<u>Type</u>	<u>Uses</u>
Local Rural Subdivision Road 20.0 metre road allowance (open ditch)	To be used in the Rural Residential Areas only if lot frontages are greater than 30 metres
Local Subdivision Road, 20.0 metre road allowance (Curb & Gutter) Where deemed appropriate, 18.0 metre road allowance (Curb & Gutter) may be considered for urban developments.	To be used in all Urban, Semi-urban and Hamlet Residential areas (9 metre road width minimum)
Collector Urban Subdivision Road, 20.0 to 30.0 metre road allowance (Curb & Gutter)	To be used in all Urban Areas (10 metre road width minimum)
Arterial 30-36m metre road allowance (Curb & Gutter)	To be used in all Urban Areas (11.5 metre road width minimum)

G 2.00 GEOMETRIC DESIGN ELEMENTS

G 2.01 RESIDENTIAL STREETS

Geometric Detail	Rural Open Ditch	Rural Residential / Local	Collector	Arterial
Minimum Right-of-way Width (metres)	20	18 - 20	20-30	30-36
Posted Speed/Design Speed (km per hour)	50/50	50/50	50/70	60/80
Minimum Safe Stopping Sight Distance on Wet Pavements (metres)	65	65	65/110	85/135
Minimum Sag Curve Parameter k (m)	8	8	12/25	18
Minimum Crest Curve Parameter k (m)	12	12	12/25	18/30

HALDIMAND COUNTY DESIGN CRITERIA
SECTION G – ROADWAYS

PAGE 4

Geometric Detail	Rural Open Ditch	Residential and Local	Collector	Arterial
*Minimum Sag Parameter in Illuminated Areas k (m)	5	5	5	8
Minimum Curve Radius (m)	90	90	90	130
* Based on comfort criteria - Use in illuminated areas only when stopping sight distance requirements are met.				
Pavement Width in metres (Urban - Face to Face of Curbs / Rural - E.P. to E.P.)	7.0 1.5m shoulders	8.5	10.0	11.0
Pavement Crossfall	2.0	2.0	2.0	2.0
Minimum Grade (per cent)	0.0	0.5	0.5	0.5
Maximum Grade (per cent)	6.0	6.0	6.0	6.0
Intersection Angle (degrees)	70-90	70-90	80-90	85-90
Minimum Tangent Length of Intersections (metres)	30	30	50	60
Minimum Tangent Length between Reverse Curves (metres)	10	10	50	60
Daylight/Visibility Triangles	9m x 9m	4.5m x 4.5m	9m x 9m	12m x 12m

G 2.02 INDUSTRIAL STREETS

Geometric Detail(for 50km speed zone)	Local	Collector
Minimum right of way width (metres)	20	26
Posted/Design Speed (km per hour)	50/50	60/80
Minimum Safe Stopping Sight Distance (metres)	65	85
Minimum Sag Curve Parameter k (m)	8	18
Minimum Crest Curve Parameter k (m)	8	15
Minimum Curve Radius (m)	90	130
Pavement Width (Face to Face of Curbs in metres)	10.0	10.0
Pavement Crossfall (percent)	2	2
Minimum Grade (percent)	0.5	0.5
Maximum Grade (percent)	6	6
Intersection Angle (degrees)	70-90	80-90
Minimum Tangent Length at Intersections (m)	30	60
Minimum Tangent Length Curves (m)between Reverse	30	60

G 2.03 ARTERIAL STREETS

Arterial streets, except for those roads under Provincial Jurisdiction, are a Haldimand County responsibility, and all geometric design elements should correspond to this criteria or the Provincial Geometric Design Criteria, whichever is more conservative.

G 3.00 DESIGN ELEMENTS

G 3.01 VERTICAL CURVES

All point of grade changes in excess of 1.5% shall be designed with vertical curves as outlined in the current Ministry of Transportation publications. The minimum visibility curves to be used are outlined in the geometric details for each roadway classification. The minimum tangent length of any road grade shall be 9 metres.

G 3.02 BACKFALL AT INTERSECTING STREETS

At all street intersections, the crown line of the minor street shall not interrupt the normal crossfall of the major street. A 1 to 2 percent backfall shall be

provided on the minor street at all street intersections. For the intersection of two equivalent roads, the backfall for both roadways shall be 0.5 percent. This backfall shall continue to the end of the curb return radii to facilitate proper drainage of the intersection.

G 3.03 CURB RETURN RADII AT INTERSECTIONS

The curb return radii at residential street intersections shall conform to the following minimum dimensions:

Pavement Width Street A	Pavement Width Street B	Curb Return Radii
8.5m	8.5m	8.0m
8.5m	10.0m	10.0m
8.5m	11.0m	10.0m
8.5m	14.0m	12.0m
10.0m	10.0m	12.0m
10.0m	11.0m	12.0m
10.0m	14.0m	15.0m
11.0m	11.0m	12.0m
11.0m	14.0m	15.0m
14.0m	14.0m	15.0m

G 3.04 DEAD ENDS, CUL-DE-SACS, AND BULBS

All dead ends shall be constructed as a cul-de-sac, complete with turning basin ("bulb" or "spatula" end). Subdivision street pattern designs should try to avoid the use of dead ends / cul-de-sacs.

Permanent cul-de-sacs shall be constructed in accordance with the details provided in the standard drawings. Any cul-de-sac greater than 106 m in length requires a secondary access. For urban cul-de-sacs, minimum gutter grades of 1% shall be maintained along the flow line of all gutters around the cul-de-sacs, the design road grade on the cul-de-sac and at the beginning of the bulb area where catchbasins are to be located. All cul-de-sacs, bulbs and intersections shall be detailed at a scale larger than the road plan. The details shall show gutter, crown and other grades sufficient to determine that the road will properly drain and shall be used as a basis for layout.

Islands in the center of Cul De Sacs / Bulbs shall be prohibited.

An area in between entrances within the cul de sac should be identified for a snow storage location. Snow storage areas require 10.0m between residential entrances, and must be upstream of a catch basin.

Urban roadside environments shall conform to Haldimand County Drawing G

10. Rural roadside environments shall conform to OPSD-500.01 Type "A" or "B" may be considered.

G 3.05 EMERGENCY ACCESS REQUIREMENTS

Emergency access roads shall be constructed of Granular 'B' material within a minimum 8.0 m wide easement, registered in favour of Haldimand County, and shall be passable and maintained, including snow and ice control, on a year-round basis.

Emergency access roads shall be a minimum 4.6 m wide, with 0.5 m shoulders along both sides. Any bends along the road shall have a minimum turning radius of 10.7 m. Crossfall shall be 2.0% for the driving surface, and 6.0 % for the shoulders. Subgrade crossfall shall be 3.0 %. Foreslope and backslope of ditches shall conform to standard grading cross-sections.

Emergency access roads shall be signed / identified as being for "Emergency Use Only", and have "knock-down" bollards placed at both ends to prevent casual usage. Bollard configuration shall be 3 bollards spaced at 1.2 m, with the centre bollard placed at centreline of the access road. Please refer to drawing G 12 at the end of this section for bollard details.

G 3.06 TEMPORARY TURNING CIRCLES

Temporary turning circles are to be built to the geometric standards of permanent cul-de-sac standards. And will only be considered whenever a road is to be continued in the future to an approved Plan of Subdivision. Details for the requirements of temporary turning circles are to be adequately detailed on the engineering drawings and are subject to the approval of the Engineering Manager. Temporary turning circles are to be considered only as a last option.

G 3.07 LOCATION OF UTILITIES

The location of all utilities within the road allowance shall be as detailed on the typical cross-section. Utility drawings shall be submitted to the Engineering Manager for approval. All utility wiring is to be constructed underground. Hydro transformers are to be housed in suitable enclosures and mounted on transformer pads installed at the final ground elevation. Bell telephone junction boxes may be mounted at the surface in approved standard enclosures.

G 4.00 PAVEMENT DESIGN

G 4.01 The minimum pavement design for all **local residential** roads in new subdivisions shall be 50mm of HL3, 50mm of HL8, 150mm of Granular 'A' and

300mm Granular 'B'. All urban road cross-sections shall have sub-drains located below the lowest elevation of granular material in the road base.

The **minimum** pavement design for **collector roads** shall be 50mm of HL3, 100mm of HL8, 150mm of Granular 'A' and 300mm Granular 'B'. All urban road cross-sections shall have sub-drains located below the lowest elevation of granular material in the road base.

The **minimum** pavement design for **arterial roads** shall be 60mm of HL3, 120mm of HL8, 150mm of Granular 'A' and 300mm Granular 'B'. All urban road cross-sections shall have sub-drains located below the lowest elevation of granular material in the road base.

The Developer shall engage a qualified Soils Consultant, to design a suitable pavement structure. Soil sampling shall be carried out in the presence of the Soils Consultant at intervals not exceeding 60 metres along the centreline of the subdivision road, to a minimum depth of 1.5 m. If an existing road is to be reconstructed as part of the development, the borehole should extend a minimum of 0.5 m into native subgrade.

The composition and design thickness of the pavement section shall be determined from:

1. Sub-grade soil classification with gradation analyses including hydrometer testing of material with more than 10% passing the 75um sieve;
2. Subgrade soil frost susceptibility;
3. Subgrade soil drainage; and
4. Traffic Volumes including the percentage of trucks based on a 20 year life cycle.

Pavement structure design shall be undertaken using empirical or mechanistic methodologies.

Copies of all test results and proposed road designs and supporting calculations shall be submitted with the Engineering Drawings. Pavement design not meeting the minimum standards, as indicated above for the particular road classification, will not be acceptable.

G 4.02 MATERIAL REQUIREMENTS

The source of supply and quality of all materials and supplies is subject to the approval of the County and by the Developer's Engineer. The

Consulting Engineer shall perform testing and approval of all granular materials at the designated pits and subsequent in-situ verification tests.

All granular materials shall meet the Haldimand and OPS specifications. OPSS aggregate specifications are modified through a Haldimand County special

provision that requires 100% crushed material. The Developer's Engineer shall submit physical testing results to the County for approval of each source.

Prior to the placement of asphalt pavement, the Consulting Engineer must submit the asphalt pavement mix designs to the Manager of Engineering for approval. The asphalt mix design shall meet the appropriate OPS specification.

G 5.00 CONCRETE CURB AND GUTTER

Concrete curb and gutter conforming to the O.P.S.D. 600.60 (semi-mountable) or 600.40 (barrier) are generally used as a standard on all new subdivision roadways. Alternates may be considered on a site by site basis. Where boulevard areas are less than 1.0 m in width, barrier style curb shall be used.

Adjustment and final setting of catchbasins frames shall be completed by pouring concrete, or using adjustable concrete riser units, immediately prior to the placement of the top lift of asphalt. Riser units shall be parged on the outside of the catchbasins only. Catchbasins shall be initially set to base asphalt elevation. Temporary asphalt curb shall be placed at catchbasins between the preliminary acceptance and final acceptance stages of the development. Rear yard Catch basins shall be avoided at all costs for new developments.

Driveway depressions, where barrier type curb is used, shall be formed in the curb according to the details and locations as shown on the engineering drawings. Should any driveway depressions be improperly located, then repairs shall be made by removing those sections and replacing them. The concrete capping of a depressed curb shall not be permitted. For private road entrances, multiple unit, commercial and industrial entrances, the existing curb and gutter shall be completely removed and replaced with a steel reinforced depressed curb section

In cases where the curb has been constructed prior to the establishment of an entrance, the curb shall be removed and replaced to a minimum of 0.5m beyond the depressed curb for the driveway. Exceptions may be made for single family residences on a site by site basis, allowing the curb to be formed by cutting down the back of the curb with a curb cutting machine, provided the existing section is free from cracks and other defects.

G 6.00 SIDEWALKS

The location requirements for sidewalks in new subdivision shall be as per the most current revision of the standard location cross-section drawing. This shall be confirmed with the Manager of Engineering prior to commencing the detailed design. In general, sidewalks are required on both sides of all urban arterial roadways and at least one side of all collector and minor collector streets, unless warranted on both sides. For local and collector roadways, the

locations of schools, parks, churches, commercial establishments, etc., the street length, expected traffic volume and the number of serviced dwelling units will be used as criteria in determining whether sidewalks are required on two sides of the street.

The sidewalk shall conform, in details and dimensions, to the current Ontario Provincial Standards and shall be installed at locations as shown on the typical road cross-sections. The minimum width of sidewalk for streets is 1.5 metres except on arterial roads where the minimum width will be 1.8 metres or as per the latest Ontario Provincial Standards

The sidewalks shall be increased in thickness at all driveway locations as shown on the Standard Drawings. In cases where the sidewalk has been constructed prior to the establishment of an entrance, the existing sidewalk shall be removed and replaced with a thickened sidewalk section. Exceptions may be made for single family residences on a site specific basis; providing the sidewalk is free of cracks and other defects, and the grading is within the limits of the design criteria. Sidewalk depth shall be transitioned at a slope of 10:1.

At street intersections the curb and the sidewalk shall be depressed to meet the roadway elevations as shown on the Ontario Provincial Standards drawings. Wheelchair ramps as per OPSD to be provided.

Sidewalk construction immediately adjacent to a curb will be generally avoided. If approved – sidewalk width must be 1.8m minimum, and curb must be barrier style OPSD 600.40

Multi residential post office box areas shall be identified on plans, and should be adjacent to a sidewalk – and a minimum of 1.5m from the curb.

G 7.00 DRIVEWAY APPROACHES

All driveway approaches shall be graded, gravelled and paved (asphalt, concrete or interlocking stone) from back of the curb to the property line.

Residential driveway approaches that are less than 0.5m in width shall be concrete when adjacent to Sidewalk.

Commercial or Industrial Driveway approaches that are less than 1.0m in width shall be concrete when adjacent to a sidewalk.

Concrete Approaches shall be the same depth as sidewalk.

G 7.01 MINIMUM DRIVEWAY DESIGN

The minimum consolidated depth requirements for driveways shall be as follows:

a) SINGLE FAMILY RESIDENTIAL

Asphalt – 50 mm HL3
Granular base – 150 mm Granular 'A'

b) COMMERCIAL, LIGHT INDUSTRIAL AND APARTMENTS

Asphalt - 50 mm HL3 surface course
- 50 mm HL8 base course
Granular base -150 mm Granular 'A'
-300 mm Granular 'B'

c) HEAVY INDUSTRIAL DRIVEWAYS

Asphalt - 50 mm HL3 surface course
- 100 mm HL8 base course

Granular Base - 150 mm Granular 'A'
- 300 mm Granular 'B'

d) AGRICULTURAL

Granular Base - 150 mm Granular 'A'
- 200 mm Granular 'B'

G 7.02 DRIVEWAY GRADES

The minimum grade for any driveway shall be 2%. The maximum permissible design grade for any driveway shall be 8%. This maximum grade is not recommended and should be employed only in exceptional cases where physical conditions prohibit the use of lesser grades.

The specified grades for driveways shall be directed away from the houses. The use of reverse fall driveways is not encouraged.

For industrial and commercial sites requiring site plan approval, a break in grade for driveways shall occur at the property line.

G 7.03 DRIVEWAY WIDTHS / CURB DEPRESSIONS

The width and location of the driveway depressions for apartment, commercial and industrial driveways shall be detailed on the engineering drawings. These driveways shall be designed to accommodate the anticipated vehicular traffic without causing undue interference with the traffic flow on the street.

Table: Driveway Requirements

Criteria	Access Classification		
	Single Family Residential	Commercial or Industrial	Agricultural
Number of Accesses Allowed (Note 1)	1	2	2
Min. Setback from signalized intersection (Note 2)	33	65	65
Min. Setback from non-signalized intersection (Note 2)	16	33	33

Criteria	Access Classification		
	Single Family Residential	Commercial or Industrial	Agricultural
Min. Setback from Adjacent Commercial Access (Note 3)	13	20	20
Min. Setback from Adjacent non-commercial Access (Note 3)	7	13	20
Min. Setback from Adjacent Agricultural Access (Note 3)	20	20	33
Driveway Width (Note 4)	Single 3.0 max Double 6.0 max	6.7 min 9.0 max	9.0 min 15.0 max

Notes:

1. Need must be demonstrated when additional accesses are requested, and may be approved on a site specific basis
2. Minimum dimension shall be measured from centreline of access to property line abutting an intersection roadway.
3. Minimum dimension shall be measured from centreline of access to centreline of adjacent access
4. Dimension shall be measured from throat of property.

Minimum driveway radii shall be determined by the appropriate design vehicle turning template. Haldimand County requires the use of the following design vehicles;

- commercial / industrial driveway - WB15 (16.7m overall length)
- apartment / condominium complex – B10 (10.6m overall length)

Driveway widths (throats at property line) shall be 6.7 m (min) to 9.0 m (max) unless divided by an appropriate concrete median for Commercial/ Industrial developments. *The width of any driveway depression for commercial, apartment or industrial driveways shall be width + 2R (Example: 6.7 + 2(4.5) = 15.7 metres).* Alternative widths may be considered on a site specific basis.

All apartment, commercial and industrial driveways shall be provided with barrier curbs constructed to blend into the roadway curb and gutter as per OPSD 350.010.

Driveway widths (throats at property line) shall be 3.0m for single and 6.0m for double (max) for residential (singles, semis, towns) developments. The width of any driveway depression for residential driveways shall be throat width + 0.5m.

Roadway curb & gutter shall be continuous across the entire width of any entrance.

G 7.04 DRIVEWAY APPROACHES WITH OPEN DITCHES

The Developer is responsible for the grading, gravelling and paving of all driveways (except agricultural) from the edge of the pavement of the roadway to the property line. The minimum consolidated depth requirements for the granular base in driveways shall be 250mm Granular A.

The minimum length of each HDPE or C.S.P. driveway culvert shall be 9.0 metres (for a single width entrance) and the minimum diameter shall be 400mm

providing minimum coverage can be placed as per OPS Specifications. All Pipe must be new. The maintenance and repair of such culverts shall remain the responsibility of the Developer until such time as the County has assumed the works.

The construction of driveway headwalls at each end of the driveway culvert will not be permitted.

Driveway shall be designed and installed in accordance with OPSD-301.010, 301.020, 301.030.

G 8.00 BOULEVARDS

All boulevard areas are to be graded between 2% and 8% to the satisfaction of the County. In order to minimize construction problems for the other utility companies, the grade of the boulevard shall be constant from the back of the curb to the property line. Terracing or embankments within the road allowance on new subdivision streets shall not be permitted.

All debris and construction materials shall be removed from the boulevard area upon completion of the initial stage of road construction and the boulevards shall be maintained in a clean state until the roadway section is completed.

Clean, weed free topsoil shall be placed on all boulevard areas prior to sodding. The minimum depth of topsoil shall be 150mm.

All boulevards shall be sodded to the right-of-way limit.

G 9.00 STAGING OF CONSTRUCTION

The construction of all roads in new subdivisions shall be staged in order that the completion of the roadway coincides with the completion of the development of the surrounding lands. The initial stage of construction shall provide roadways of adequate quality for building construction, traffic movement and land access. Dust control measures shall be maintained during all phases/stages of construction. All roadway catchbasins shall be protected as to prevent the accumulation of deleterious materials. Roads shall be periodically cleaned and maintained by the developer in such a way that no debris shall accumulate on the road. The second stage of construction shall complete the roadway to the final design cross-section.

The second stage of roadway construction shall not commence in any area until all of the following conditions are met:

- (1) A minimum period of two years, from Preliminary Acceptance of the underground works and roadway, including base asphalt, has expired;
- (2) 50% of the dwellings with frontage or flankage on the street are

completed to the fine grading and topsoil stage (or three-year period);

- (3) All undeveloped lots are rough graded in accordance with the approved lot grading plan;
- (4) All service connections for multiple family, commercial, institutional or other blocks are installed;
- (5) Written approval of the Manager of Engineering is obtained; and
- (6) All conditions of the subdivision pre-servicing agreement are met for Final Acceptance.

G 9.01 RURAL RESIDENTIAL ROADWAYS WITH OPEN DITCHES

For rural residential roadways with open ditches, the initial stage of road construction shall consist of the grading (to the full cross sectional width as shown on the Standard Detail Drawings), the complete granular base, the base course of asphalt, topsoiling and sodding/seeding of all boulevards and ditches. Ditches shall have a minimum of three rows of sod lining the ditch bottom and the remainder of the slopes may be seeded.

The second stage of road construction shall comprise the surface course of asphalt, final adjustment to grade of all utilities and all other work necessary to complete the roadway to the final design cross section.

G 9.02 RURAL RESIDENTIAL, LOCAL RESIDENTIAL AND MINOR COLLECTOR ROADWAYS

For rural residential, local residential and minor collector roadways, the initial stage of construction shall consist of the grading to the full cross sectional width as shown on the Standard Detail Drawing, the complete granular base, curb and gutter and the base course of asphalt. Manholes, valves, and catchbasins are to be set to base asphalt elevation. Standard Cross sections are shown at the back of this section.

The second stage of road construction shall comprise the sidewalk, the grading, topsoiling and seeding/sodding of all boulevards, the grading and gravelling of all driveway approaches, the completion of the surface courses of asphalt, the final adjustment to grade of all utilities, the installation of pavement marking as per OTM Book 11 and all other work necessary to complete the roadway to the final design cross section, including boulevard tree plantings. Ditches in open ditch cross-sections shall be cleaned to design grades and re-sodded/reseeded as per Section G 9.01.

G 9.03 COLLECTOR, AND ARTERIAL ROADWAYS

For these roadways, the initial stage of construction shall comprise all work necessary to complete the roadway to the final design cross section with the exception of the surface asphalt, the boulevard sodding and the driveway approach paving. The curb and gutter and sidewalk are to be completed as part of the Stage 1 construction for these roadway classifications. Manholes, valves, and catchbasins are to be set to base asphalt elevation.

The second stage of construction shall include the surface asphalt, the boulevard seeding/sodding, the driveway approach paving, the final adjustment to grade of all utilities and all other work necessary to complete the roadway to the final design cross section, including boulevard tree plantings. Ditches in open ditch cross-sections shall be cleaned to design grades and re-sodded/reseeded as per Section G 9.01.

G 10.00 CONSTRUCTION REQUIREMENTS**G 10.01 CLEARING AND GRUBBING AND AREA ROUGH GRADING**

The road allowance shall be cleared of all trees and shrubs not to be included in final landscaping, and of all other obstructions for such widths as are required for the proper installation of roads, services, and other works.

Rough grading shall be done to bring the travelled portion of the road to the necessary grade, in conformity with the cross-section shown on the drawings. Rough grading of all lots and easements must be performed prior to the placement of granular materials in the roadways.

In all cases, topsoil shall be stripped for the complete width of the road allowance and stockpiled at locations approved by the Consulting Engineer. For any excess fill removed to a disposal site classified as swamp, ravine, floodplain or lake, the Developer must receive prior written permission from the local Conservation Authority.

The sub-grade for all roads shall be properly shaped and compacted to 95% Standard Proctor Maximum Dry Density (SPMDD), prior to any application of granular base course materials. The finished sub-grade shall be proof rolled in the presence of the geotechnical consultant and certified as being acceptable.

G 10.02 ROAD SUB-DRAINS

Sub-drains are required on all urban cross-section roads, and will be installed after subgrade cross-section is established.

All sub-drains are to be a minimum of 150mm refer to OPSD

G 10.04 OTHER REQUIREMENTS

Whenever it is necessary to cut through an existing County road, the Developer's Contractor will be responsible for properly restoring the surface pavement to its original conditions **or better** immediately upon completion of backfilling operations. All such road cuts require a road cut permit and shall be restored as per the requirements of the permit. Subdrains under the curbs must be restored to ensure their operation. The placement of unshrinkable fill should not extend above subgrade level.

At the time that the initial stage of construction is given Preliminary Acceptance and the warranty period has commenced, the developer shall place signs at all entry points to the development indicating "Unassumed Road".

Prior approval is required from the County for any proposed detours. A detailed Traffic Control Plan to the Ontario Traffic Manual Book 7 standard shall be submitted for review. Where the proposed route utilizes roads that are not part of the County road system, approval from the appropriate road authority will also be necessary. Haldimand County shall be notified of any proposed road closures a minimum of 48 hours in advance of the closure. Haldimand County shall supply a Road Closure Notification to the Developer. The Developer shall be responsible to provide notification to the contacts on the Road Closure Notification a minimum of 24 hours in advance of the closure.

Note: For proposed road closures, the standard Road Closure Form shall be submitted to the Road Authority. The following information is to be supplied to Emergency Management Services (EMS):

- Location of closure
- 911 house numbers located on either side of the closure
- period of closure

All work will be done in accordance with ordinances and by-laws of Haldimand County.

G 10.05 Multi-Residential Developments on Existing Roadways

Where developers are planning to construct residential developments on existing County Roadways and site plans are required, the following design requirements are expected:

1. Sidewalks

- a. Where existing sidewalks are over 15 years old, full replacement of the sidewalks to the extent of the plan shall be included to ensure proper drainage.
- b. Where existing sidewalks are under 15 years old, replacement

of all sidewalks within the driveways, and any cracked or otherwise defective sidewalks within the plan area shall be included.

- c. Where no sidewalks exist – the County may require the installation of new sidewalks as part of the plan.

2. Curbs

- a. Where existing curbs are over 15 years old, full replacement of the curbs to the extent of the plan shall be included to ensure proper drainage.
- b. Where existing curbs are under 15 years old, replacement of all curbs within the driveways, and any cracked or otherwise defective curbs within the plan area shall be included.
- c. Where no curb exists – the County may require the installation of new curbs as part of the plan.

3. Roadway

- a. Where multiple road cuts are required on a roadway with less than 10.0 meters in between, the road cuts shall be repaired as per the road cut permit with the exception of the final grade pavement (50mm HL3), which shall be one single full road width cut – the entire length of the development.

4. Illumination

- a. Where existing illumination does not meet current RP-8 standards full replacement of the illumination to the extent of the plan shall be included.
- b. Where no illumination exists – the County may require the installation of new streetlights as part of the plan.

5. Storm

- a. New Catch basins may be required to ensure proper drainage.

6. Permits

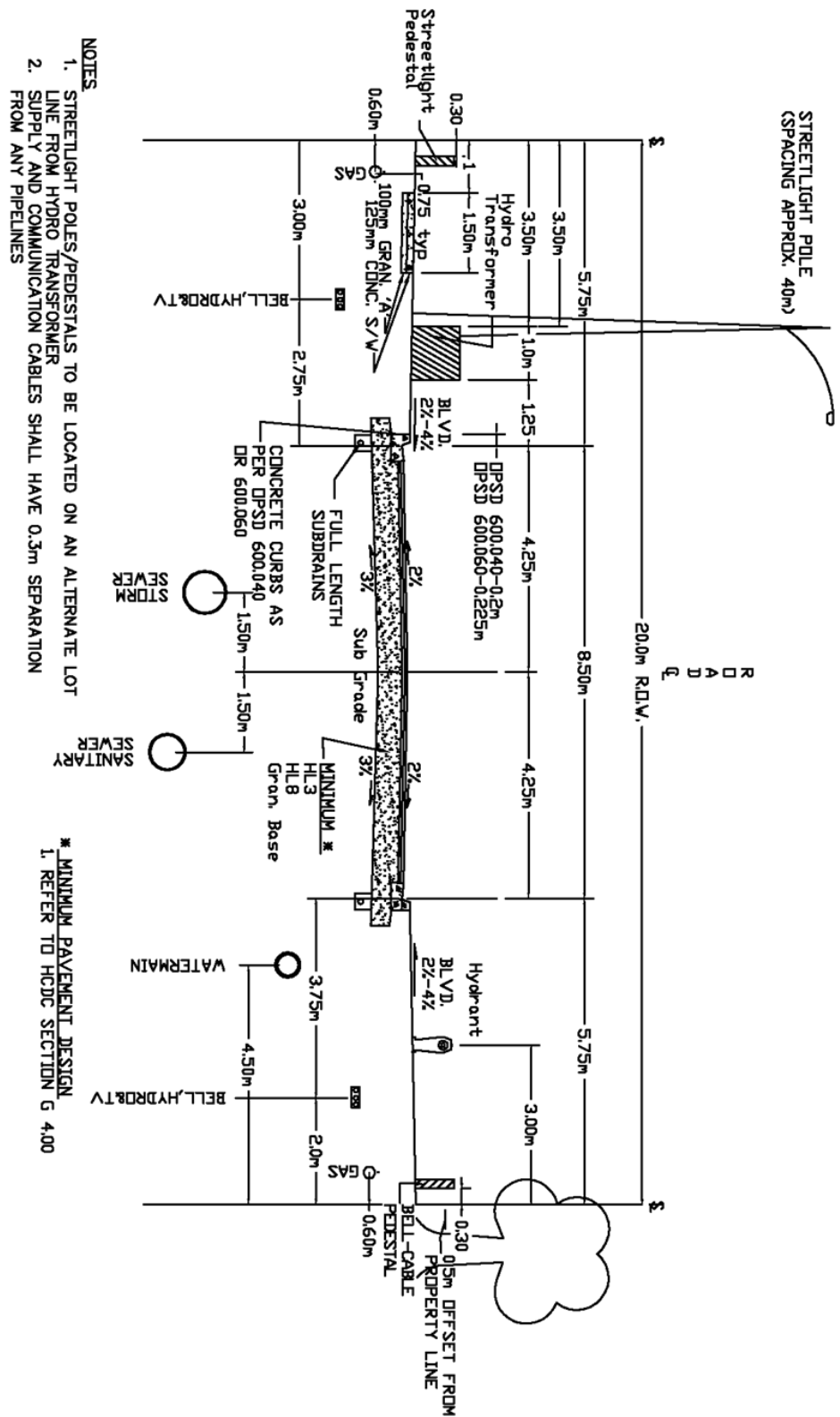
a. Entrance

- i. Each Entrance requires a separate entrance permit
- ii. Each entrance is subject to the requirements in the design criteria

b. Excavation

- i. Each servicing to the each property requires an excavation permit
- ii. All work within the Right of Way requires an excavation permit





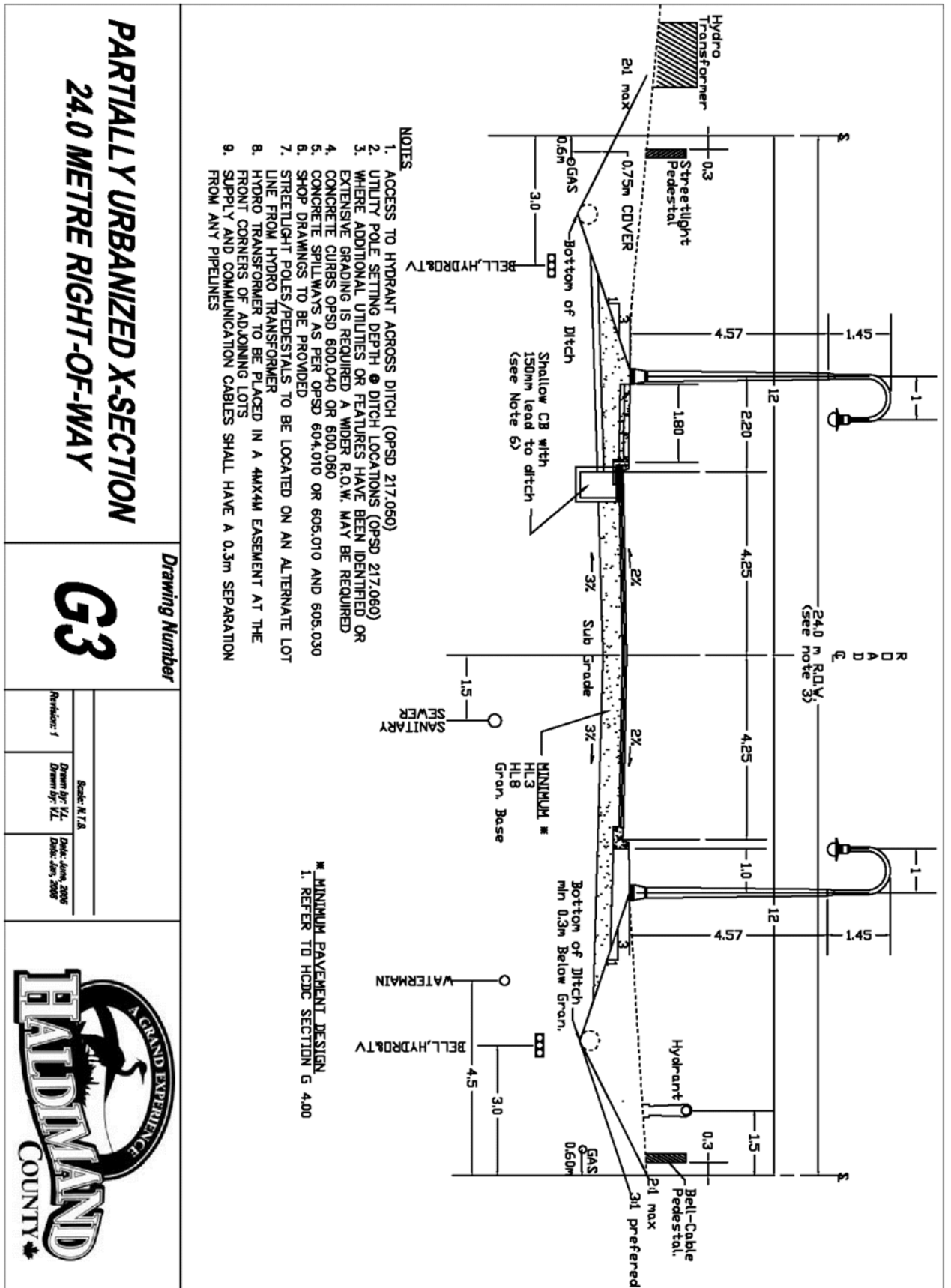
**URBAN ROAD X-SECTION
20.0 METRE RIGHT-OF-WAY**

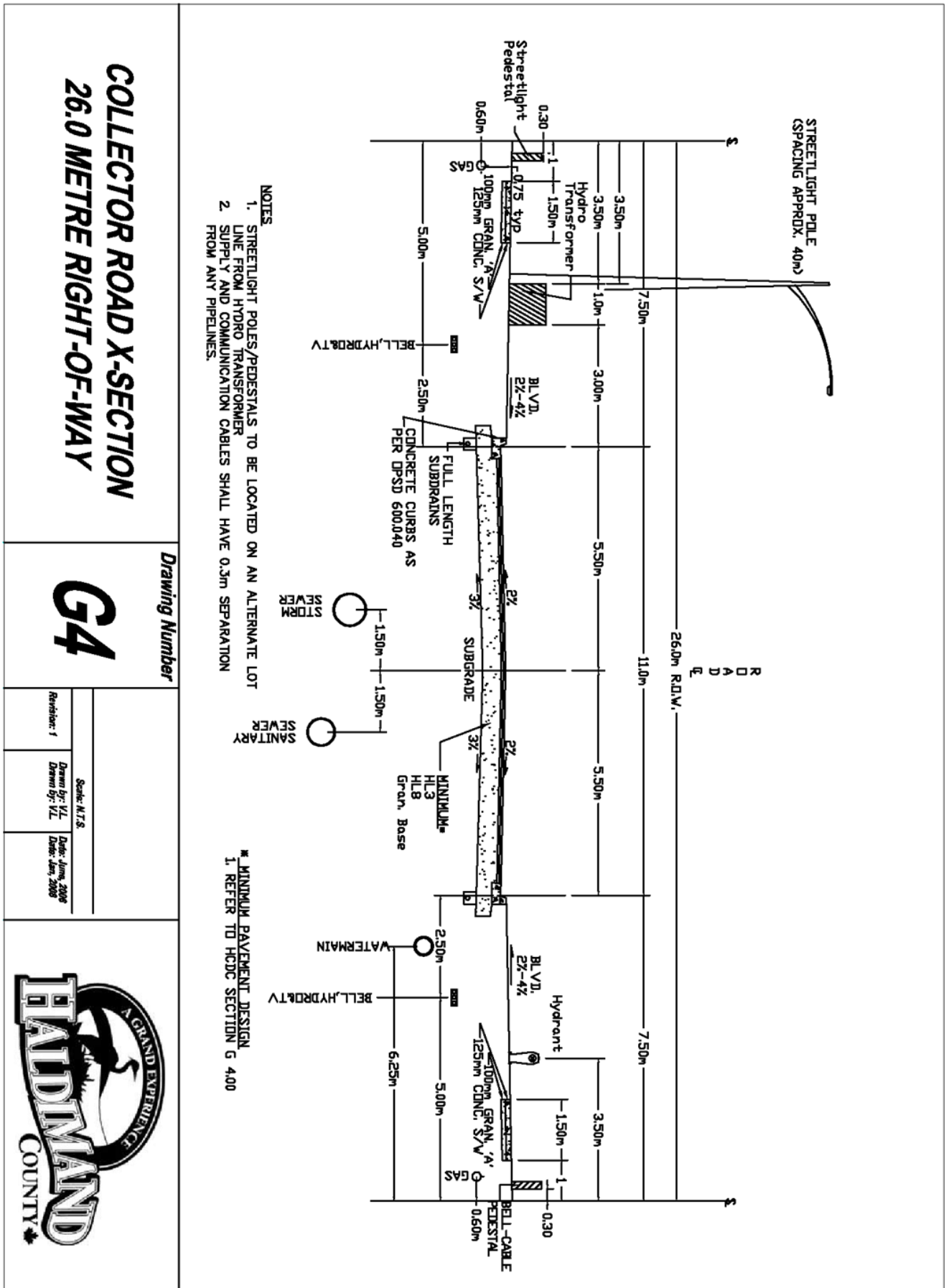
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Revision: 1	Date: Dec. 2002
Revision: 2	Date: June, 2005
Revision: 3	Date: June, 2006
Revision: 4	Date: Jan, 2008





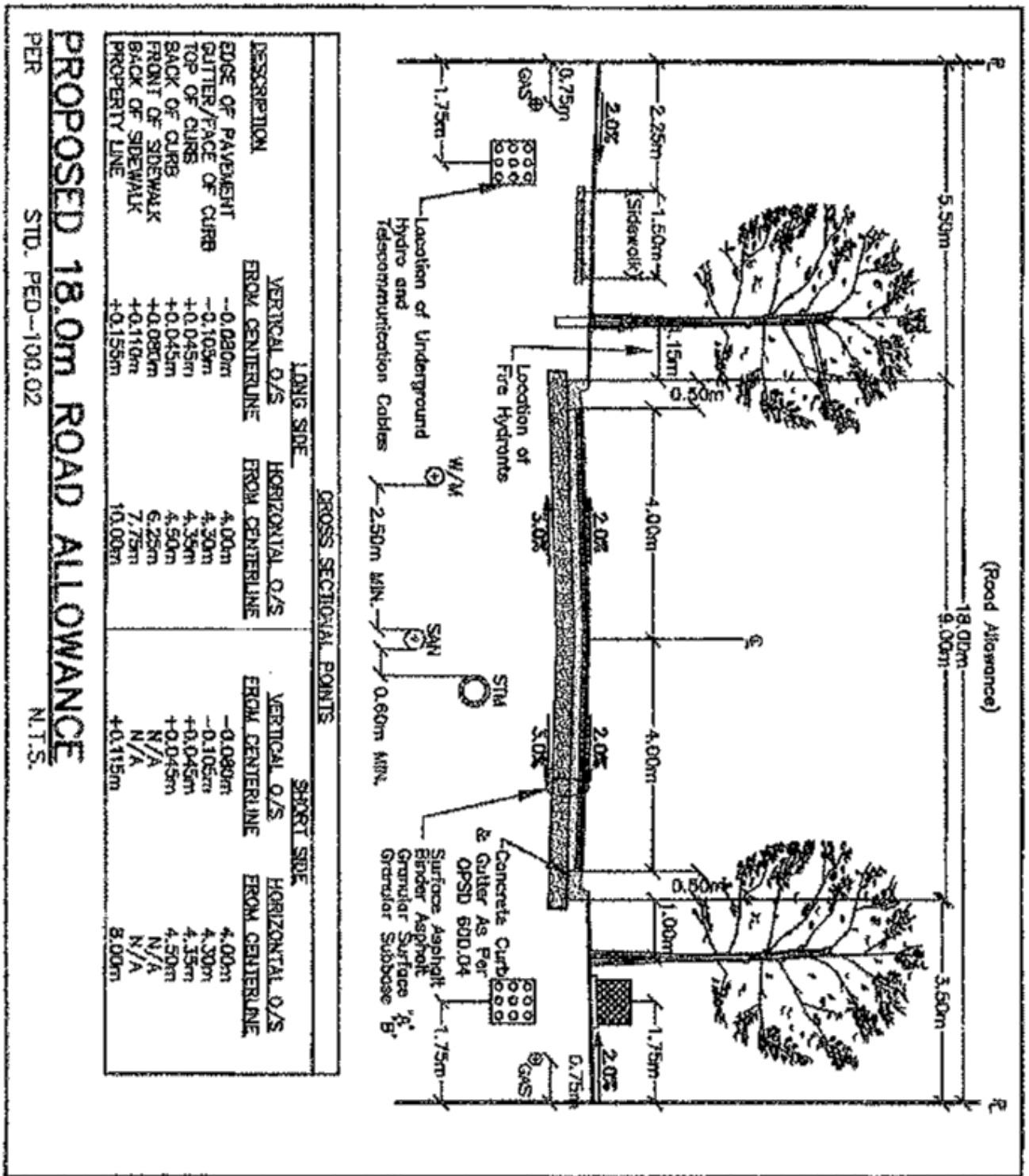


COLLECTOR ROAD X-SECTION
26.0 METRE RIGHT-OF-WAY

Drawing Number
G4

Scale: N.T.S.
Drawn by: V.L.
Date: June, 2006
Reviewed by: V.L.
Date: Jan, 2007





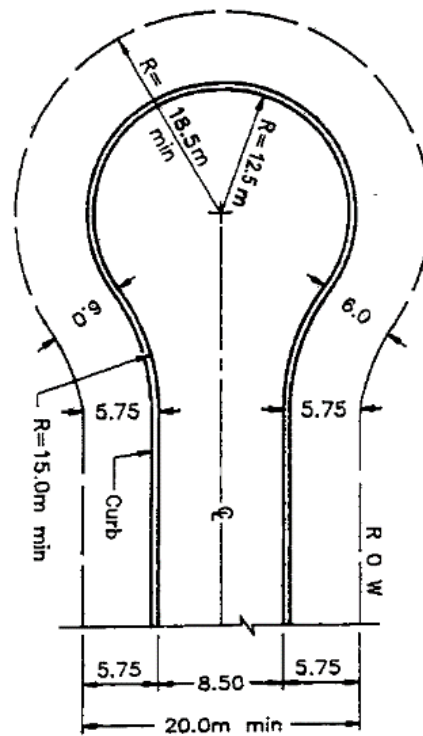
**TURNING BASINS
FOR TERMINATED URBAN
RESIDENTIAL ROADWAYS**

Drawing Number

G10

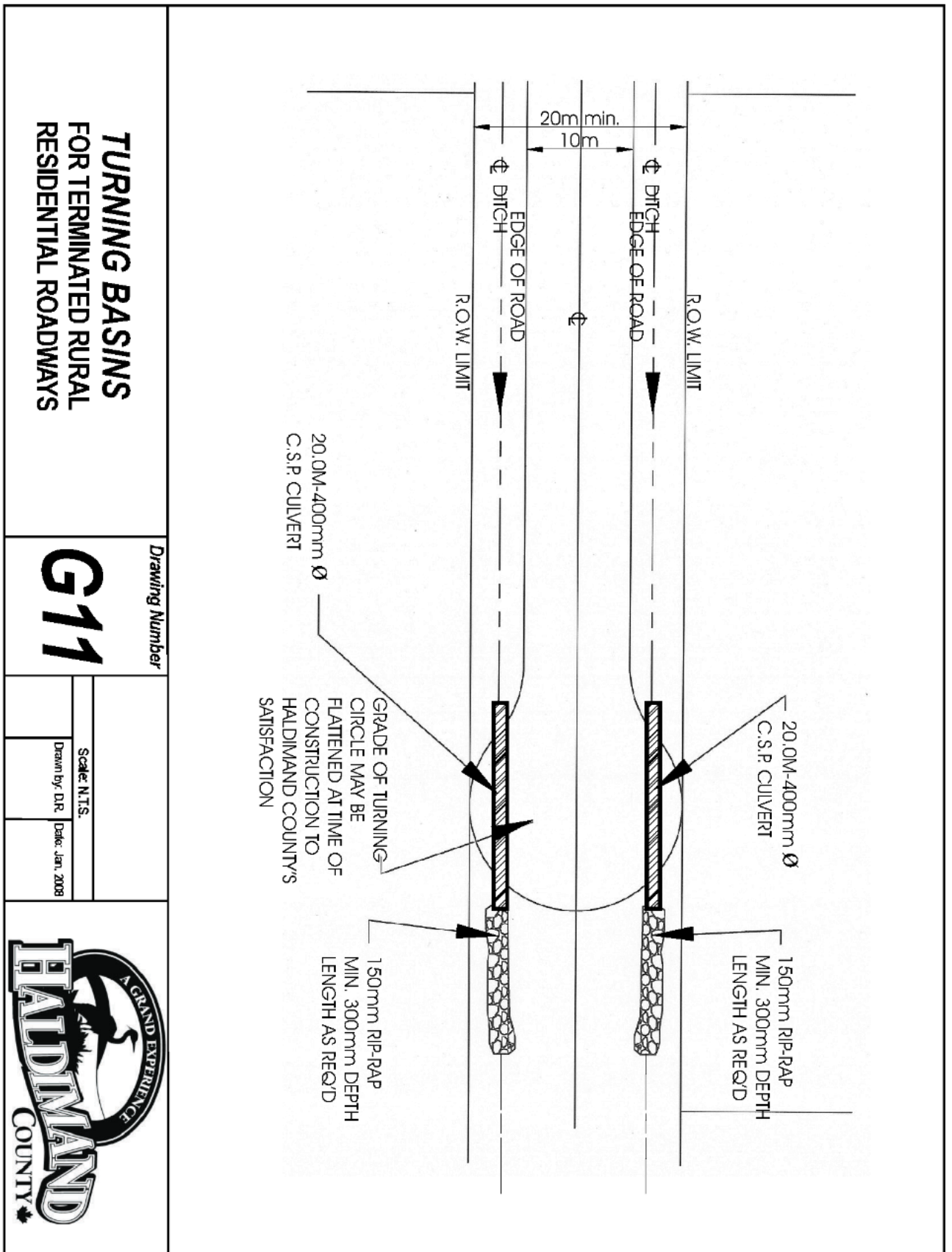
Revision: 1
Revision: 2

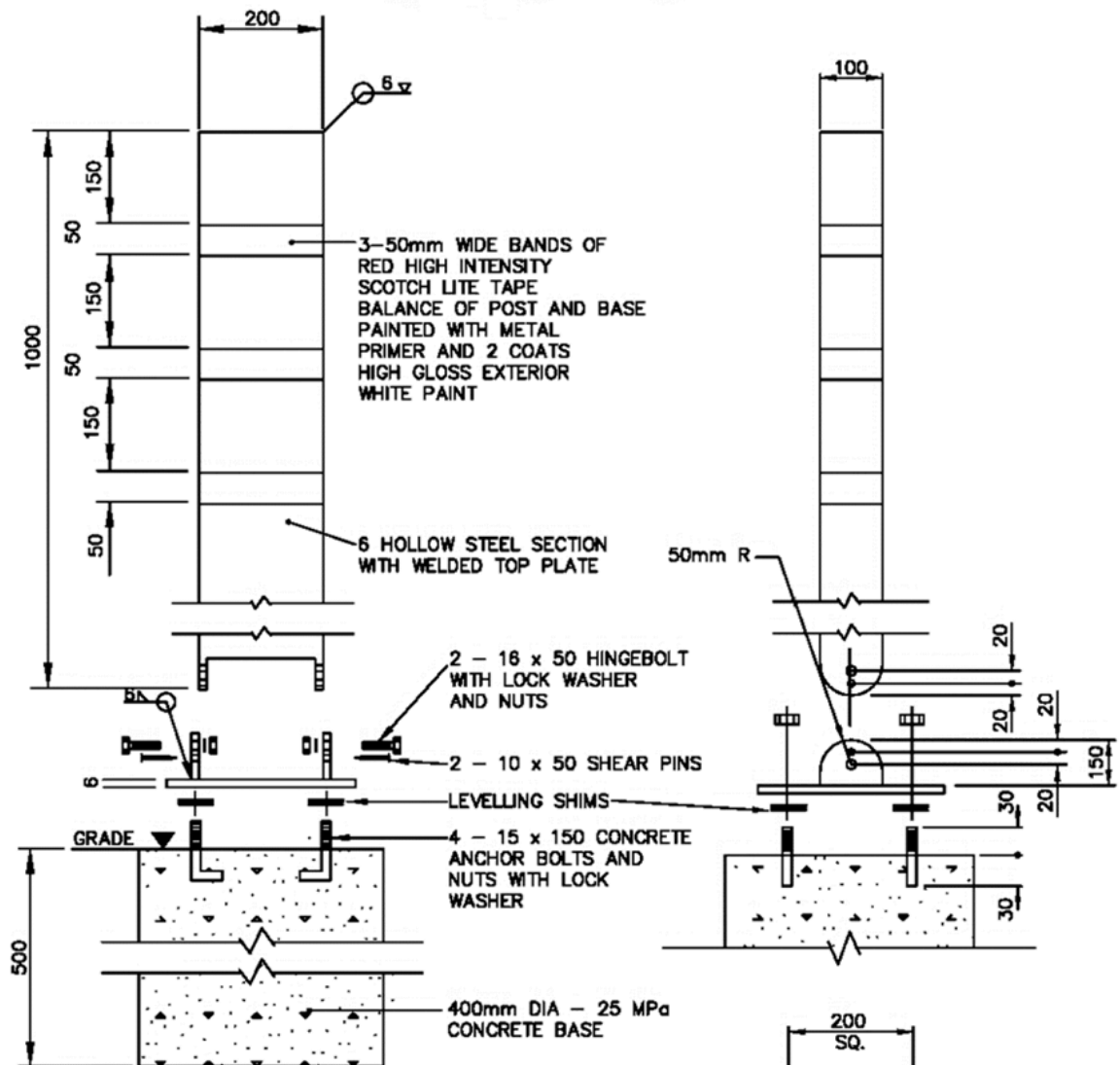
Scale: N.T.S.
Drawn by: DR
Date: June 2005
Date: Jan 2006



NOTES:

- 1 All dimensions are in metres unless otherwise shown.
- 2 This drawing is a modified version of OPSD 500.02





NOTE:

1. ALL DIMENSIONS IN MILLIMETRES UNLESS OTHERWISE NOTED
2. MULTIPLE KNOCKDOWN POSTS SHALL BE PLACED AT A MAXIMUM OF 1.5 m CENTRE TO CENTRE
3. CONSIDERATION TO COLOURS OTHER THAN WHITE MAY BE GIVEN AT THE DISCRETION OF THE CITY ENGINEER

BOLLARD DETAIL

Drawing Number

G12

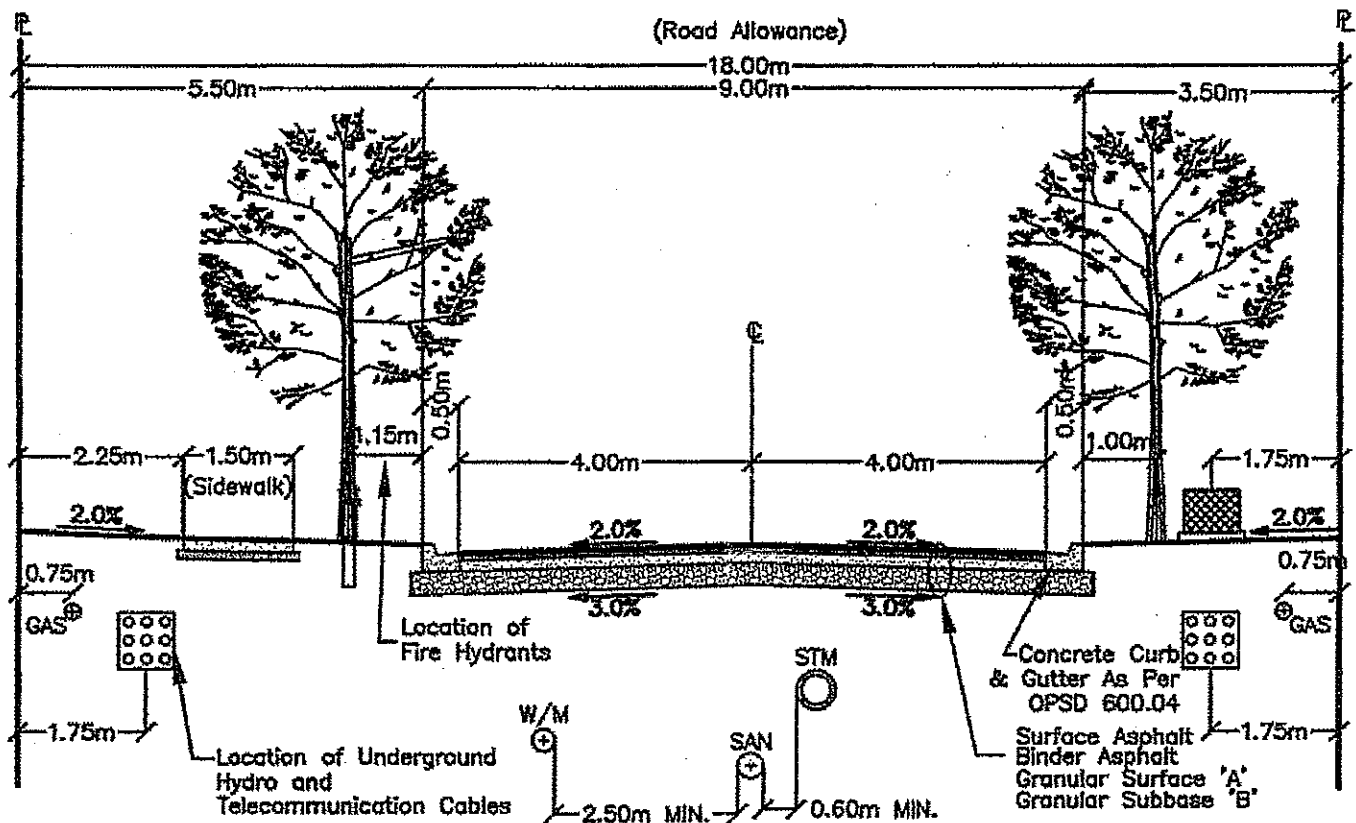


Scale: N.T.S.

Revision: 1

Drawn by: D.R.

Date: Jan, 2008



CROSS SECTIONAL POINTS

DESCRIPTION	LONG SIDE		SHORT SIDE	
	VERTICAL O/S FROM CENTERLINE	HORIZONTAL O/S FROM CENTERLINE	VERTICAL O/S FROM CENTERLINE	HORIZONTAL O/S FROM CENTERLINE
EDGE OF PAVEMENT	-0.080m	4.00m	-0.080m	4.00m
GUTTER/FACE OF CURB	-0.105m	4.30m	-0.105m	4.30m
TOP OF CURB	+0.045m	4.35m	+0.045m	4.35m
BACK OF CURB	+0.045m	4.50m	+0.045m	4.50m
FRONT OF SIDEWALK	+0.080m	6.25m	N/A	N/A
BACK OF SIDEWALK	+0.110m	7.75m	N/A	N/A
PROPERTY LINE	+0.155m	10.00m	+0.115m	8.00m

PROPOSED 18.0m ROAD ALLOWANCE

PER

STD. PED-100.02

N.T.S.