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| MoTI Section | 1400 | TAC Section | Not Applicable |
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**1400 SUBDIVISION ROADS CHAPTER**

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**1400 SUBDIVISION ROADS CHAPTER**

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| MoTI Section | 1410 | TAC Section | Not Applicable |
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## 1410 SUBDIVISION ROAD CONSTRUCTION SPECIFICATIONS

Where there are existing agreements between the Ministry of Transportation & Infrastructure and other parties, or as provided for by local government Subdivision Servicing Bylaw, those agreements or bylaws shall prevail. Where excerpts from the *Design Build Standard Specifications for Highway Construction* or from the *BC Supplement to TAC Geometric Design Guide* are different from the said current version, the current publications shall prevail. A Subdivision Design Criteria Sheet should be used to establish the geometric design parameters.

Exceptions to these standards or design criteria shall be directed through the District Manager, Transportation to the appropriate Engineering Director(s) and, for major exceptions, to the Chief Engineer.

### 1410.01 GENERAL

1. All construction practices and procedures shall conform to the **current** edition of the ministry's [Design Build Standard Specifications for Highway Construction](#) book unless specified otherwise in the text below or by the Ministry Representative\*. Special Provisions shall take precedence over the *Design Build Standard Specifications*. Excerpts from the *Design Build Standard Specifications* have been included in an attempt to provide a more comprehensive handout.
2. Roadways might not be accepted:
  - a) If road construction has been undertaken during periods of snow, heavy rains, freezing, or other such unsuitable weather conditions.
  - b) If granular aggregate has been placed upon a frozen, wet, muddy, or rutted subgrade or base course.
  - c) Without a ministry accepted design plan.

\* This and all further references to the Ministry Representative include the District Manager, Transportation.

#### 1410.01.01 Right-of-Way Width

Right-of-Way shall be of sufficient width to include the road fill, ditches and backslopes, plus a minimum 3 metres on each side or as directed by the Ministry Representative. For all subdivision roads other than lanes, frontage roads and

pedestrian facilities, the minimum Right-of-Way width shall be 20 metres.

#### 1410.01.02 Engineering

Any works that fall within the scope of “engineering” under the Engineers and Geoscientists Act will be performed by a Professional Engineer.

##### 1410.01.02.01 Engineer of Record

The developer is responsible to ensure the ministry’s Engineer of Record and Field Review Guidelines ([Technical Circular T-06/09](#)) are followed. This includes the requirement for a Coordinating Professional Engineer when there is more than one Engineer of Record. Appendix 2 of the guideline outlines ‘Assurance of Field Reviews and Compliance’ for 3rd party delivered projects.

##### 1410.01.02.02 Geotechnical Design

The developer of a subdivision is responsible for all aspects of the geotechnical design for that subdivision. Any geotechnical design completed for a subdivision must be completed by a Qualified Professional, registered with the Association of Professional Engineers and Geoscientists of BC, in accordance with the [Geotechnical Design Specifications for Subdivisions](#).

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### 1410.01.03 Other Regulating Agencies

The developer shall comply with any and all statutory regulations and bylaws and all applicable Federal, Provincial, Regional District, and Improvement District regulations during construction work.

### 1410.01.04 Miscellaneous

All roads shall be slope staked as requested by the Ministry Representative. The Ministry Representative may also request that all utilities be staked when the project is greater than 100 metres in length.

### 1410.02 CLEARING AND GRUBBING

Clearing and grubbing shall be carried out over the area shown on the drawings, or as directed by the Designer, or as directed by the Ministry Representative, or the default shall be the full Right-of-Way width. Trees, stumps, roots, brush and embedded logs, and all debris shall be grubbed to a depth of 600 mm or such deeper depth as may be required by the Designer and shall be disposed of in accordance with Section 200 of the *Design Build Standard Specifications*. No debris shall be buried within the fill.

*NOTE: Inspection of clearing and grubbing by the Ministry Representative may be required prior to proceeding with sub-grade construction. See 1410.12.*

### 1410.03 ROADWAY AND DRAINAGE EXCAVATION

**Description:** Roadway and Drainage Excavation shall include all necessary excavation and the construction of all embankments required for the formation of the roadbed and associated drainage works and additional work as outlined in subsection 201.01 of the *Design Build Standard Specifications*.

### 1410.04 EARTH EMBANKMENTS

Subsections 201.37 and 201.38 of the *Design Build Standard Specifications* will apply. The entire roadway including the roadbed, slopes and ditches shall be neatly finished and trimmed to the designed cross section. Density tests shall be the responsibility of the developer. See 1410.12.

### 1410.05 ROCK EMBANKMENTS

Rock embankments shall be in accordance with Subsection 201.36 of the *Design Build Standard Specifications*.

### 1410.06 SPECIAL SLOPE TREATMENT

Slopes shall be treated in accordance with Drawing SP201-01 in the *Design Build Standard Specifications*. The Ministry Representative may request hydroseeding, which shall be done in accordance with Section 757 of the *Design Build Standard Specifications*, or other slope protection measures.

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## 1410.07 GRANULAR SURFACING, BASE AND SUB-BASES

### 1410.07.01 Aggregate Quality

Aggregate quality shall conform to Subsection 202.04 of the *Design Build Standard Specifications*.

### 1410.07.02 Pavement Design Standards

Pavement structure shall be designed by a Registered Member of APEGBC with appropriate qualifications in geotechnical design. [Technical Circular T-01/15](#) "Pavement Structure Design Guidelines" shall be used by the pavement designer as a guide.

Four Design Standards, based on general roadway classification, are used to categorize British Columbia's provincial road network. Twenty (20) year design Equivalent Single Axle Loads (ESALs) are the primary criteria used for selection of the appropriate standard with additional subgrade material criteria applied to low volume roads and subdivision roads. These are summarized as follows:

NOTE: one ESAL = one standard axle load = 8,165 kg (18,000 lb.)(i.e. Benkelman Beam Truck)

| STANDARD TYPE | ROADWAY DESIGNATION                | 20 YEAR DESIGN ESAL CRITERIA |
|---------------|------------------------------------|------------------------------|
| TYPE "A"      | HIGH VOLUME ROADS                  | > 20,000,000                 |
| TYPE "B"      | MEDIUM to HIGH VOLUME ROADS        | 100,000 to 20,000,000        |
| TYPE "C"      | LOW VOLUME & SUBDIVISION ROADS     | < 100,000                    |
| TYPE "D"      | LOW VOLUME SEALCOAT or GRAVEL ROAD | < 100,000                    |

#### TYPE "A"

##### HIGH VOLUME ROADS: > 20,000,000 ESAL's

Minimum 150 mm A.P.  
150 mm of 25 mm C.B.C.  
150 mm of either 25 mm, 50 mm, or 75 mm C.B.C.  
S.G.S.B. (See 1410.07.03)

#### TYPE "B" (See Figure 1420.B)

##### MEDIUM to HIGH VOLUME ROADS 100,000 to 20,000,000 ESAL's

75 mm – 150 mm A.P.  
150 mm of 25 mm C.B.C.  
150 mm of either 25 mm, 50 mm, or 75 mm C.B.C.  
S.G.S.B. (See 1410.07.03)

#### TYPE "C" (See Figure 1420.C)

##### LOW to MEDIUM VOLUME and SUBDIVISION ROADS < 100,000 ESAL's

**Infrequent Use by Heavy Commercial Vehicles**  
50 mm – 75 mm A.P.  
225 mm of 25 mm C.B.C.  
S.G.S.B. (See 1410.07.03)

#### TYPE "D" (See Figure 1420.D)

##### LOW VOLUME and SUBDIVISION ROADS < 100,000 ESAL's

**Infrequent Use by Heavy Commercial Vehicles**  
Graded Aggregate Seal or  
100 mm of High Fines Surfacing Aggregate  
225 mm of 25 mm C.B.C.  
S.G.S.B. (See 1410.07.03)

A.P. = Asphalt Pavement  
C.B.C. = Crushed Base Course  
S.G.S.B. = Select Granular Sub Base

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**1410.07.03 Aggregate Gradation and Surfacing**

The Ministry Representative, in consultation with a ministry Geotechnical and Materials Engineer, may specify alternative designs than stated below in consideration of local soils and climatic conditions (e.g. potential for frost heave and seasonally higher ground water conditions). Granular surfacing, base and sub-bases shall be in accordance with Section 202 of the *Design Build Standard Specifications*.

There are typically three gravel courses:

1. The lower course, Select Granular Sub Base (S.G.S.B.), shall consist as follows:
  - A minimum thickness of 300 mm of S.G.S.B. shall be applied over fine-grained subgrade (Unified Soils Classification System – ML/CL/OL/MH/CH/OH/PT). A geosynthetic separator is required on fine-grained subgrades (see 1410.07.04 for specifications).
  - A minimum thickness of 150 mm of S.G.S.B. shall be applied over coarse-grained subgrade (Unified Soils Classification System – GW/GP/GM/GC/SW/SP/SM/SC) where ground water does not pose a drainage problem and frost penetration does not affect the structure.
  - A minimum 150 mm S.G.S.B. shall be applied over rock.
  - No S.G.S.B. is required in exceptional circumstances where the following criteria has been met:
    - Structural Design Criteria is satisfied and
    - Subgrade material consists of clean granular deposits that satisfy the S.G.S.B. gradation and construction criteria of the *Design Build Standard Specifications* - Section 202 “Granular Surfacing, Base and Sub-Bases”.

*NOTE: All leveling materials applied directly to blasted rock cuts shall be of S.G.S.B. quality.*

2. The mid course shall consist of 150 mm of 25 mm, 50 mm or 75 mm Well Graded Base in

accordance with Subsection 202.05 of the *Design Build Standard Specifications*.

3. The upper course shall consist of up to 225 mm of 25 mm Well Graded Base.

High Fines Surfacing Aggregate gradation used for surfacing gravel roads is defined in Table 202-C of the *Design Build Standard Specifications*.

Gravel depths are the compacted measurements. Subject to local conditions, the Ministry Representative may request additional gravel depths.

Roadways shall be graded and compacted with crossfall for road drainage as follows:

- a) For paved roads – 0.02 m/m crossfall (normal crown) on tangents and appropriate superelevation as specified on curves.
- b) For gravel roads – 0.04 m/m crossfall on tangents and appropriate superelevation as specified on curves.

Gravel shall be spread and compacted in lifts not exceeding 150 mm in depth or as specified by the Ministry Representative. Water may be applied during gravel compaction to achieve 100% of the laboratory density obtained by the current ASTM test method D 698 as described in the *Design Build Standard Specifications* Sections 202.25 and 202.26.

The owner/contractor shall hire a qualified inspector (see 1410.12) to provide written confirmation of compliance with Section 202 of the *Design Build Standard Specifications*.

*NOTE: The ministry may perform on-site sampling and testing as a function of the ministry’s quality audit. Any ministry quality testing shall not relieve the developer of responsibility for providing quality control and quality assurance.*

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**1410.07.04 Geotextile and Geogrid Specifications**

| Minimum Geotextile Specifications |            | Woven                 | Non-woven             |
|-----------------------------------|------------|-----------------------|-----------------------|
| Grab Strength                     | ASTM D4632 | 1100 N                | 700 N                 |
| Puncture Strength                 | ASTM D6241 | 2200 N                | 1375 N                |
| Tear Strength                     | ASTM D4533 | 400 N                 | 250 N                 |
| Permittivity                      | ASTM D4491 | 0.2 sec <sup>-1</sup> | 0.2 sec <sup>-1</sup> |
| Maximum Apparent Opening Size     | ASTM D4751 | 0.25 mm               | 0.25 mm               |

| Minimum Polypropylene Biaxial Geogrid Specifications <sup>(b)</sup> – Base Reinforcement |            |               |
|--|------------|---------------|
| Minimum Tensile Strength @ 5% Strain Machine Direction <sup>(a)</sup>                    | ASTM D6637 | ≥ 8.5 kN/m    |
| Minimum Tensile Strength @ 5% Strain Cross Machine Direction <sup>(a)</sup>              | ASTM D6637 | ≥ 12.5 kN/m   |
| Maximum Aperture Size  |            | 50 mm         |
| Minimum Aperture Size  |            | 15 mm         |
| Flexural Stiffness <sup>(a)</sup>  | ASTM D5732 | ≥ 250 g-cm    |
| Roll Width   |            | 4.0 m ± 0.1 m |

Notes:

- a. Minimum Average Roll Values
- b. Mill Certificates Required

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## 1410.08 CONSTRUCTION

All cut and fill slopes shall be designed by a registered member of APEGBC or Limited Licensee practicing in that scope of engineering. The following guidelines shall be considered:

1. Back (cut) slopes shall be 1.5:1 or flatter, except in sand or similar material which shall be 2:1 or flatter, unless otherwise specified by the Designer and accepted by the Ministry Representative. For rock ditches refer to **Figure 1420.D**.
2. All embankment (fill) slopes shall be 2:1 or flatter. Slopes up to 1.5:1 shall be considered by the Ministry Representative upon request and the appropriate documentation from the Designer. The Ministry Representative must approve slopes steeper than 2:1 prior to construction.
3. All embankment materials and gravel base courses shall be laid in 150 mm lifts. The contractor should use the appropriate equipment required to obtain the compaction as specified in the *Design Build Standard Specifications for Highway Construction*. Watering shall be carried out as required to provide optimum water content during compaction. Grades containing soft spots will not be accepted until such sections have been excavated and backfilled with suitable material and compacted. Other methods of compaction will be considered by the Ministry Representative upon request and must be approved by the Ministry Representative prior to implementation.

## 1410.09 STORM DRAINAGE

### 1410.09.01 General

This guideline is intended for the use of personnel competent to evaluate the significance and limitations of its content and recommendations, and who will accept responsibility for the application of the material it contains. The ministry disclaims any or all responsibility for the application

of the stated guidelines and for the accuracy of the material contained herein.

Drainage shall be adequate to the satisfaction of the Ministry Representative. All ditches and storm drainage pipes are to be carried to a natural drainage course. The original drainage pattern for the site shall not be altered without permission of the Ministry responsible for the Water Sustainability Act.

Drainage easements or statutory Rights-of-Way may be required. Drainage easements shall be a minimum of 6 metres in width or as determined by the Ministry Representative.

1. Only ministry approved Corrugated Steel, Concrete, PVC or High Density Polyethylene pipe may be used for storm sewers.
2. The minimum size driveway culvert shall be 400 mm diameter with a minimum required cover of 300 mm. The minimum size culvert for a frontage road or collector (network) road shall be 500 mm diameter (some areas may require a 600 mm minimum) with a minimum cover of 450 mm. See Section 1040.02 for a discussion on height of cover requirements. The minimum height of cover dimensions may be increased at the discretion of the Ministry Representative.
3. Culvert grade shall be a minimum of 0.5% unless otherwise approved by the Ministry Representative.
4. Culverts shall be bedded and backfilled within the subgrade zone with a fine graded gravel free of rock over 25 mm.
5. The ditch invert grade shall be a minimum of 150 mm below the bottom of select granular sub-base but shall be deep enough to ensure adequate cover, regardless of pipe size.
6. All cul-de-sacs must be drained and all drainage across private property shall be carried on registered easements or statutory Rights-of-Way.
7. The inlet and/or outlet of culverts subject to erosion shall have sandbags or a headwall

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respecting clear zone principles and shall not introduce a further hazard.

### 1410.09.02 Requirements for Drainage Design

When information is presented in two locations or publications, difficulties can arise if both are not synchronized for changes. Rather than run that risk, Drainage Design is discussed as part of **Chapter 1000, Hydraulics and Structures** of the *BC Supplement to TAC*.

The ministry's design philosophy for subdivision storm drainage is such that all storm drainage facilities be designed according to the major/minor storm drainage concept.

The Subdivision Development Drainage Plan must provide sufficient information to allow the reviewer to understand the developer's objectives and to thoroughly assess the hydraulic impacts of the development.

### 1410.09.03 Hydrology and Design Flow Calculations

For Hydrology and Design Flow Calculations see **Section 1020** of the *BC Supplement to TAC*.

*NOTE: Inspection and approval of drainage and subgrade construction are required prior to gravelling, (see 1410.12). Drainage construction shall comply with environmental best practices.*

### 1410.10 HAMMERHEADS/CUL-DE-SACS

Cul-de-sac turnarounds shall be constructed on all rural dead end roads and dead end roads that cannot be further extended. Construction shall be in accordance with Section 1420.05.04. In general, most cul-de-sacs are locals, except design standards for Commercial or Industrial subdivisions may be considered collectors as per 1420.02.03

*NOTE: Hammerhead and temporary turnarounds shall be considered instead of cul-de-sacs in rural situations where it is reasonable to expect a road extension within five years. Dimensions and widths*

*shall be in accordance with 1420.05.04. Where temporary turnarounds cannot be constructed within standard Right-of-Way, a statutory Right-of-Way plan to encompass the additional width is recommended.*

### 1410.11 PAVING

The decision to pave shall be at the discretion of the Ministry Representative.

Considerations for paving are as follows:

- When leaving a paved road.
- More than four lots under 2 ha (5 acres) each.
- Proximity to the batch plant.
- Availability of materials.

1. All gravel surfaces shall be primed prior to paving in accordance with subsection 502.21 of the *Design Build Standard Specifications*.
2. A minimum 50 mm asphalt pavement thickness may be adequate in certain situations where traffic volumes are low and there is very little heavy truck traffic. As determined by the Pavement Designer, a 75 mm asphalt pavement thickness may be warranted in situations where traffic volumes, in particular heavy truck traffic, is high.
3. In rural areas, other methods of hard surfacing (such as seal coat) may be considered by the Ministry Representative.
4. Prior to paving, the developer shall contact the Ministry Representative to ensure that on-site inspection will take place before and during paving operations.
5. Upon completion of paving, shoulders will consist of either 19 mm Shouldering Aggregate or 25 mm Well Graded Base Course. Compaction of the shouldering material shall be in accordance with the *Design Build Standard Specifications*.

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### 1410.12 INSPECTIONS (Quality Audit)

The term “Quality Audit” defines those activities that the ministry performs to provide confidence that the Quality Control and Quality Assurance processes and resulting products satisfy the ministry's requirements.

The level of quality audit testing and/or inspections may vary depending on the complexity of the road works.

Scheduled inspections shall be carried out by the Ministry Representative upon completion of each of the following stages of construction:

- a) Clearing and Grubbing, and Subgrade Slope Staking.
- b) Stripping Operations.
- c) Roadway and Drainage Excavation, and Subgrade Construction\* Slope Stakes.
- d) Select Granular Sub-Base Construction\* and Slope Stakes for Surface Course Construction.
- e) Paving (when required).

\* NOTE: A truck having a 9 tonne single axle dual tire or 17 tonne tandem axle group with dual tires with a pressure of 600 kPa is to be provided for proof rolling to prove subgrade and aggregate stability (rutting or displacement) in accordance with *Design Build Standard Specifications* sections 202.05.02, 202.22, and 202.29..

“Inspections” carried out by the Ministry Representative may include reviewing material testing records as part of the Quality Audit process as well as field observations.

The developer shall give a minimum of one (1) week's notice prior to completion of each stage to allow for the scheduling of inspections. If required notice is not given, the roadways might not be accepted.

Testing and/or inspections by the Engineer of Record, or by staff under his supervision, is required to meet the obligation for Quality Assurance in accordance with [Technical Circular T-06/09](#).

In addition, quality audit testing and/or inspections by an independent testing agency with Professional Engineer or ASCT registration may be requested, at the developer's expense, by the Ministry Representative.

*NOTE: The ministry may perform on-site sampling and testing as a function of the ministry's quality audit. Any ministry quality testing shall not relieve the developer of responsibility for providing quality control and quality assurance.*

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# 1420 SUBDIVISION ROAD DESIGN PARAMETERS

## 1420.01 CONSIDERATIONS

A Road Network Plan is based on a hierarchy of streets that is related to the amount and type of traffic served. It takes into account such factors as public transit, shopping and community facilities, and other land uses. The changing nature of the area over time is also a major factor. For example, a rural area may change into an urban one in the course of time. The future requirements for the entire road network are considered when a development application is evaluated.

- Municipal and Regional District Major Road Network plans must be checked to ensure that the major roads are protected by the proposed subdivision.
- New developments should have at least two connections to the existing road network in case of emergency. For each type of road classification, the desirable maximum length between the connecting roads and maximum number of dwellings served is shown in the following table. The lengths between connecting roads may be increased at the discretion of the ministry.

| Road Classification | Desirable Max. Length Between Connections to Network Roads | Max. Dwellings Served |
|---------------------|--|-----------------------|
| Cul-de-sac          | 150 m  | 25                    |
| Local Roads         | 360 m *  | 50 *                  |
| Collector Roads     | 400 m  | n/a                   |

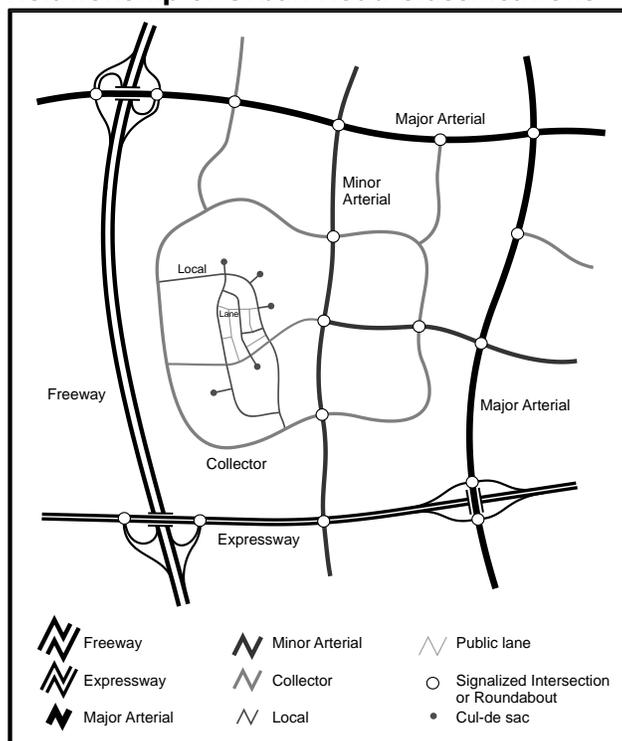
\* Assumes approximately one-half the traffic in each direction. If road pattern suggests that more traffic will be on one end of the road than the other, the maximum length should be reduced to 210 metres and maximum number of dwellings served reduced to that similar for a cul-de-sac.

- Pedestrian and cyclist volumes should be considered and walkways provided where considered necessary.

## 1420.02 ROAD CLASSIFICATION

Roads are classified according to the service they provide to the public. Higher order roads focus on mobility while lower order roads are meant for access to property.

### Relationship of Urban Road Classifications



(from TAC Geometric Design Guide for Canadian Roads)

### 1420.02.01 Arterial

A general term denoting a road primarily for through traffic usually on a continuous route. May also be known as a primary route. Direct access to abutting land is not a priority. Freeways and expressways are forms of arterial routes; however, no access to land is a primary consideration for these two classifications. Arterial roads will not be discussed in this chapter.

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### 1420.02.02 Collector

A road that provides for traffic movement between arterials and local streets with some direct access to adjacent property.

### 1420.02.03 Local

A road primarily for access to residences, businesses, or other abutting property.

*Note: Local streets intended for commercial or industrial development are considered as collector roads for design purposes.*

### 1420.02.04 Cul-de-Sac

A road termination providing a U-turn area of constant radius.

### 1420.02.05 Frontage Road / Backage Road

A local road that parallels the major through road and that provide access to property or business.

## 1420.03 PLANS

The developer shall submit metric road design plans to the ministry which include:

- 1. Location Plan:** Scale 1:500 or 1:1000 showing horizontal alignment, lot lines, legal description of lots, proposed subdivision, cross section limits (i.e. toes for top of cut and base of fill), proposed right-of-way, signing, existing and proposed culvert locations and proposed drainage pattern.
- 2. Profile:** Scale 1:1000 horizontal and 1:100 vertical, showing the existing ground line and proposed finished road grade.
- 3. Laning Drawings:** Same scale as plan drawings, pavement edge, road markings, location and type of warning, regulatory, directional, and if necessary, special signs to be installed.
- 4. Cross Sections** when required by the Ministry Representative.

## 5. Typical Cross Sections: as required.

The developer will commence road construction only after the Ministry Representative has accepted the road design.

Subdivision Design Drawing Checklists are provided at the end of this chapter as an aid for Development Approvals staff when reviewing the developer's drawings.

## 1420.04 ACCOMMODATING CYCLISTS

### Local Roads

It is recognized by the nature of most roads within a subdivision, that cyclists will use these roads for travel within the subdivision and to connect to collectors and the general roadway system. As such, cycle traffic simply shares the roadway with motorized traffic.

### Collector Roads

Typically, collector roads will have higher speeds and higher traffic volumes than local roads. On these roads, consideration should be given to paved shoulders for bikes, a marked bike lane, or a separate pathway for cyclists. For guidance, refer to TAC Geometric Design Guide, Chapter 5 - Bicycle Integrated Design. Regional District Official Community Plans should be consulted with respect to their objectives and network plans with respect to cycling.

## 1420.05 ALIGNMENT

(A sample Subdivision Design Criteria Sheet is provided at the end of this chapter. The design criteria process has been developed to aid in reaching agreement on the geometric design parameters to be used for each project.)

The Ministry Representative will provide developers with the appropriate geometric design parameters for each subdivision road applicable to each development. The developer must use the

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| MoTI Section | 1420 | TAC Section | Not Applicable |
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geometric design parameters pre-approved by the Ministry Representative. Developers cannot develop reduced requirements in isolation and expect the Ministry Representative to approve them when submitting a design. The basic design element dimensions must be summarized in a Design Criteria Sheet and approved. Justification for all design exceptions must be listed on this sheet.

The developer shall complete all road designs within the design speed range of 30 km/h to 80 km/h. The design speed shall be shown on the completed Design Criteria Sheet and is based on the road classification. Typically, local roads shall be designed to a 50 km/h design speed; however, when selecting a design speed, the ultimate road classification must be considered (e.g. if a dead end road will be extended as a through road in the future, it should be designed to the ultimate classification).

Vertical curves shall be standard parabolic curves. The length of vertical curve (in metres) should not be less than the design speed (in km/h).

The developer shall demonstrate that every reasonable effort has been made to minimize the road grades. Short pitches (less than 150 m) of grades up to 2% steeper may be acceptable on tangent sections, provided the overall grade is less than the appropriate maximum desirable grade shown in **Table 1420.A.1** or **1420.A.2**.

Minimum parameters for various design speeds shall be as shown in **Table 1420.A.1** and **1420.A.2**. The developer shall consult with the local Maintenance Contractor to ensure that road maintenance equipment can manoeuvre within the proposed parameters. Design speeds of 40 km/h should typically be limited to lot access roads that do not perform a collector function. The developer must submit written justification when proposing roads with 30 km/h design speeds.

### 1420.05.01 Arterials

Arterials are generally network roads which are built and maintained by the ministry and shall not be discussed in this chapter.

### 1420.05.02 Collectors (Network Roads)

The maximum length between connections to network roads is 400 m.

#### Open Shoulder

The Right-of-Way shall be 25 metres wide or the cross section width, plus 3 metres on each side, whichever is greater.

- Minimum finished top: 10 metres.
- Minimum paved top: 7.0\* metres.
- Gravel Shoulder: 1.5\*\* metres, see **Figure 1420.C** and **Table 1420.E**.

\* The needs of cyclists should be considered in selecting the width of paved top.

\*\* Shoulder may be reduced to no less than 0.5 m but minimum top width must be maintained.

#### Curb and Gutter

The desirable minimum Right-of-Way width is 25 metres, or the cross section width plus 3 metres on each side, whichever is greater.

- Minimum finished top: 10.4 metres.
- Minimum paved top: 8.2 metres to leading edge of curb (parking one side).
- Gravel Shoulder: 0.5 metres behind curb, see **Figure 1420.B** and **Table 1420.E**.

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**Table 1420.A.1 – Collector Road Design Parameters**

| Speed (km/h)  | 60      | 70       | 80       |
|---|---------|----------|----------|
| Minimum Radius, (metres) <sup>[1]</sup>               | 120     | 190      | 250      |
| Minimum stopping sight distance, SSD (metres)         | 85      | 105      | 130      |
| Decision Sight Distance, DSD (metres) <sup>[2]</sup>  | 95 -170 | 115 -200 | 140 -230 |
| Min. K value, crest vertical curves, taillight height | 11      | 17       | 26       |
| Min. K value, sag vertical curves, headlight control  | 18      | 23       | 30       |
| Minimum overhead clearance, (metres)                  | 5.0     | 5.0      | 5.0      |
| Maximum desirable grade in percent <sup>[1]</sup>     | 8       | 8        | 8        |

Collector parameters for minimum radius based on:

**TAC Table 3.2.9 Superelevation Rate for Urban Designs, e<sub>max</sub>: 0.06 m/m**

normal crown: -0.02 m/m.

For speeds ≥ 60 km/h, the proposed Design Criteria Sheet should be reviewed by your Regional Design office.

**Table 1420.A.2 – Local Road Design Parameters<sup>[3]</sup>**

| Speed (km/h)  | 30    | 40     | 50     |
|---|-------|--------|--------|
| Minimum Radius, (metres) <sup>[1]</sup>                           | 30    | 65     | 80     |
| Superelevation that radius is based on (%)                        | RC    | RC     | 4      |
| Minimum stopping sight distance, SSD (metres)                     | 35    | 50     | 65     |
| Decision Sight Distance, DSD (metres) <sup>[2]</sup>              | 35-85 | 55-115 | 70-145 |
| Min. K value, crest vertical curves, taillight height             | 2     | 4      | 7      |
| Min. K value, sag vertical curves, headlight control              | 6     | 9      | 13     |
| Min. K value, sag vertical curves, comfort control <sup>[4]</sup> | 3     | 5      | 7      |
| Minimum overhead clearance, (metres)                              | 5.0   | 5.0    | 5.0    |
| Maximum desirable grade in percent <sup>[1]</sup>                 | 10    | 10     | 10     |

Local parameters for minimum radius based on:

**TAC Table 3.2.8 Superelevation Rate for Urban Designs, e<sub>max</sub>: 0.04 m/m**

RC = reverse crown: +0.02 m/m, normal crown: -0.02 m/m

[1] Avoid the combined use of maximum grade and minimum radius. Maximum grades are to be reduced by 1% for each 30 metres of radius below 150 metres.

[2] Lower DSD values are appropriate at intersections within a subdivision, while the higher values should be used at more complex intersections. DSD along numbered highways may even be higher.

[3] This includes cul-de-sacs, frontage roads, and backage roads.

[4] Comfort control may be used where there is good street lighting.

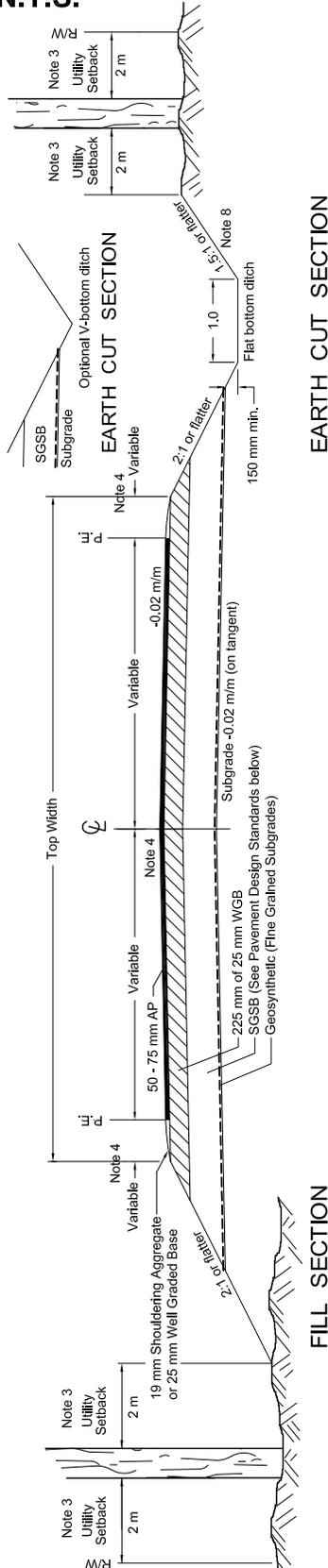
SSD, DSD, and K values are based on 2011 AASHTO “A Policy on Geometric Design of Highways and Streets”

- SSD derived from Table 3-1, Height of Eye = 1.08 m, Object Height (Taillight) = 0.6 m
- DSD derived from Table 3-3, the range is based on Avoidance Maneuver A and Avoidance Maneuver C
- K values derived from Table 3-34, Table 3-36, and Equation 3-51



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| MoTI Section | 1420 | TAC Section | Not Applicable |
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Figure 1420.C Two-Lane Open Shoulder Asphalt Subdivision Road N.T.S.



PAVEMENT DESIGN STANDARDS - Structure shown above is for "Equivalent Single Axle Loads (ESAL's)" <100,000. See 1410.07.02

**MINIMUM SGSB THICKNESSES**

- 150 mm SGSB on Coarse Grained Subgrades with USCS of GW/GP/GM/GC/SW/SP/SM/SC and BR (bedrock).
- 300 mm SGSB on Fine Grained Subgrades with USCS of ML/CL/OL/MH/CH/OH and PT, and must include a suitable geosynthetic separator (see 1410.07.04).
- No SGSB is required in exceptional circumstances where the following criteria have been met:  
Structural Design Criteria  
and

Subgrade material satisfies SGSB gradation and construction criteria (i.e. rutting criteria) in accordance with the latest version of B.C. MoTI Design Build Standard Specifications for Highway Construction - Section 202 "GRANULAR SURFACING, BASE AND SUB-BASES"

- All levelling materials applied directly to blasted rock cuts shall be of SGSB quality.
- Pavement structure designs deemed to be governed by adverse groundwater or frost concerns must be reviewed by a Ministry Geotechnical and Materials Engineer.
- Any variance proposed to decrease base course thicknesses, or use a CBC other than WGB, or eliminate geosynthetic from the typical above must be reviewed by a Ministry Geotechnical and Materials Engineer.
- A Geotechnical Engineer (P.Eng.) registered with APEGBC must certify that the minimum base course thicknesses provided above are satisfactory for the traffic volumes, traffic loading and the soil, groundwater and frost susceptibility conditions at the site. Any changes to base course thicknesses requires P.Eng. certification and is to be reviewed by a Ministry Geotechnical and Materials Engineer. The certification is to be based on a site specific geotechnical investigation. Refer to 1410.01.02.01 for Engineer of Record guidelines.

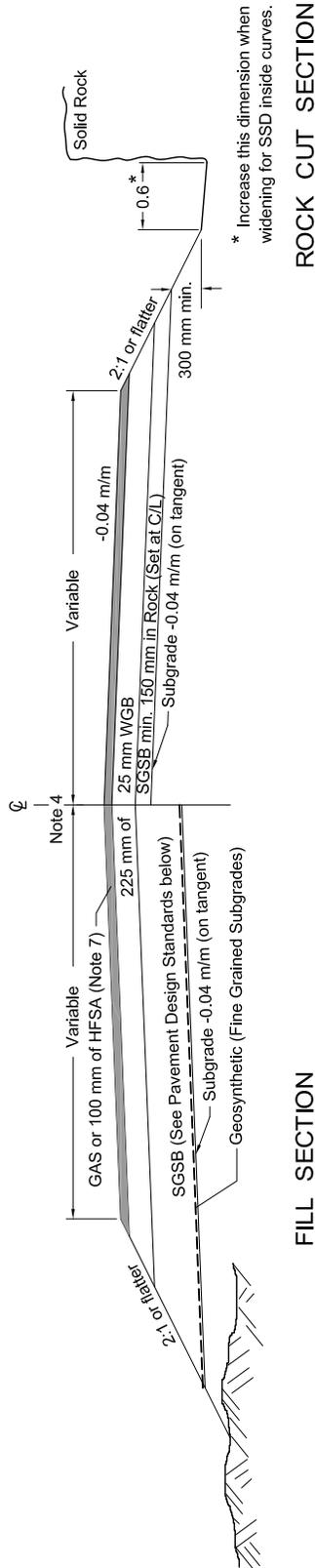
- Notes:**
1. For bikeway design, see Section 430 and TAC
  2. For roadside barrier and drainage curb details, see Section 440
  3. Utility setback is 2 m from the base of fill/top of cut slope or 2 m from property boundary, whichever gives the greater offset from the road
  4. For variable shoulder and top widths, refer to Table 1420.E
  5. For typical curbs see SP582-01.01 to SP582-01.03 in the Design Build Standard Specifications
  6. For rock ditches, see Section 440
  7. A flat bottom ditch is preferred for handling design flows and providing snow storage
  8. Depending on the type of soil, back-slopes will usually need to be flatter than 1.5:1

**Abbreviations:**

- AP Asphalt Pavement
- CBC Crushed Base Course
- SGSB Select Granular Sub-Base
- USCS Unified Soils Classification System
- WGB Well Graded Base

|              |      |             |                |
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| MoTI Section | 1420 | TAC Section | Not Applicable |
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**Figure 1420.D Two-Lane Two-Way Gravel Subdivision Road N.T.S.**



PAVEMENT DESIGN STANDARDS - Structure shown above is for "Equivalent Single Axle Loads (ESAL's)" <100,000. See 1410.07.02

**MINIMUM SGSB THICKNESSES**

- 150 mm SGSB on Coarse Grained Subgrades with USCS of GW/GP/GM/GC/SW/SP/SM/SC and BR (bedrock),
- 300 mm SGSB on Fine Grained Subgrades with USCS of ML/CL/OL/MH/CH/OH and PT, and must include a suitable geosynthetic separator (see 1410.07.04).

- No SGSB is required in exceptional circumstances where the following criteria have been met:  
Structural Design Criteria  
and

Subgrade material satisfies SGSB gradation and construction criteria (i.e. rutting criteria) in accordance with the latest version of B.C. MoTI Design Build Standard Specifications for Highway Construction - Section 202 "GRANULAR SURFACING, BASE AND SUB-BASES"

- All levelling materials applied directly to blasted rock cuts shall be of SGSB quality.
- Pavement structure designs deemed to be governed by adverse groundwater or frost concerns must be reviewed by a Ministry Geotechnical and Materials Engineer.
- Any variance proposed to decrease base course thicknesses, or use a CBC other than WGB, or eliminate geosynthetic from the typical above must be reviewed by a Ministry Geotechnical and Materials Engineer.
- A Geotechnical Engineer (P.Eng.) registered with APEGBC must certify that the minimum base course thicknesses provided above are satisfactory for the traffic volumes, traffic loading and the soil, groundwater and frost susceptibility conditions at the site. Any changes to base course thicknesses requires P.Eng. certification and is to be reviewed by a Ministry Geotechnical and Materials Engineer. The certification is to be based on a site specific geotechnical investigation. Refer to 1410.01.02.01 for Engineer of Record guidelines.

**Notes:**

1. For bikeway design, see Section 430 and TAC
2. For roadside barrier and drainage curb details, see Section 440
3. Utility setback is 2 m from the base of fill/top of cut slope or 2 m from property boundary, whichever gives the greater offset from the road
4. For variable shoulder and top widths, refer to Table 1420.E
5. For typical curbs see SP582-01.01 to SP582-01.03 in the Standard Specifications
6. For rock ditches, see Section 440
7. A double-pass GAS is commonly used as an all-weather hard surface and HFSA is used for gravel surfacing of lower-volume roads.

**Abbreviations:**

- CBC Crushed Base Course
- GAS Graded Aggregate Seal
- HFSA High Fines Surfacing Aggregate
- SGSB Select Granular Sub-Base
- USCS Unified Soils Classification System
- WGB Well Graded Base

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| MoT Section | 1420 | TAC Section | Not Applicable |
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### 1420.05.03 Locals

The maximum length between connections to network roads is 360 m. The maximum number of dwellings served is 50.

#### Open Shoulder

The Right-of-Way width is 20 metres, or the cross section width plus 3 metres on each side, whichever is greater.

- Minimum finished top: 8 metres\*, \*\*.
- Minimum paved top: 7.0 metres\*, \*\*.
- Ditch inverts:
  - earth cut - minimum 150 mm below subgrade, see **Figure 1420.C**;
  - rock cut – minimum 300 mm below subgrade, see **Figure 1420.D**
- Gravel shoulder: 0.5 metres.

\*Add 1 metre per side snow storage when requested by the Ministry Representative.

\*\*Add 1 metre per side for pedestrian walkway in high volume, low speed tourist areas when requested by the Ministry Representative. Sidewalks may be a considered option where the minimum sidewalk width would be 1.5 metres.

For Two-Lane Two-Way asphalt & gravel surfaces, see **Figures 1420.C & 1420.D**.

### Curb and Gutter

The Right-of-Way width is 20 metres, or the cross section width plus 3 metres on each side, whichever is greater.

- Curb and gutter:
  - Finished top – 12.2 metre top, 10.0 paved, on-street parking on both sides.
  - Finished top – 10.4 metre top, 8.2 paved, on-street parking on one side.
- Ditch inverts: minimum 150 mm below subgrade, see **Figure 1420.C**
- Gravel shoulder: 0.5 metres behind curb, see **Figure 1420.B**.

### 1420.05.04 Cul-de-Sac

The desirable maximum length is 150 m. The maximum number of dwellings served is 25. The desirable maximum grade is 4%.

#### Open Shoulder:

15 metre radius finished top  
 14.5 metre radius paved top  
 0.5 metre gravel shoulder,  
 see **Figures 1420.F and 1420.G**

#### Curb and Gutter:

15.2 metre radius finished top  
 14.1 metre radius paved top  
 0.6 metre curb width  
 0.5 metre gravel shoulder,  
 see **Figures 1420.H and 1420.I**

**Offset Cul-de-Sac** - see **Figure 1420.J**

**Hammerhead Cul-de-Sac** - see **Figures 1420.K and 1420.L**

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| MoTI Section | 1420 | TAC Section | Not Applicable |
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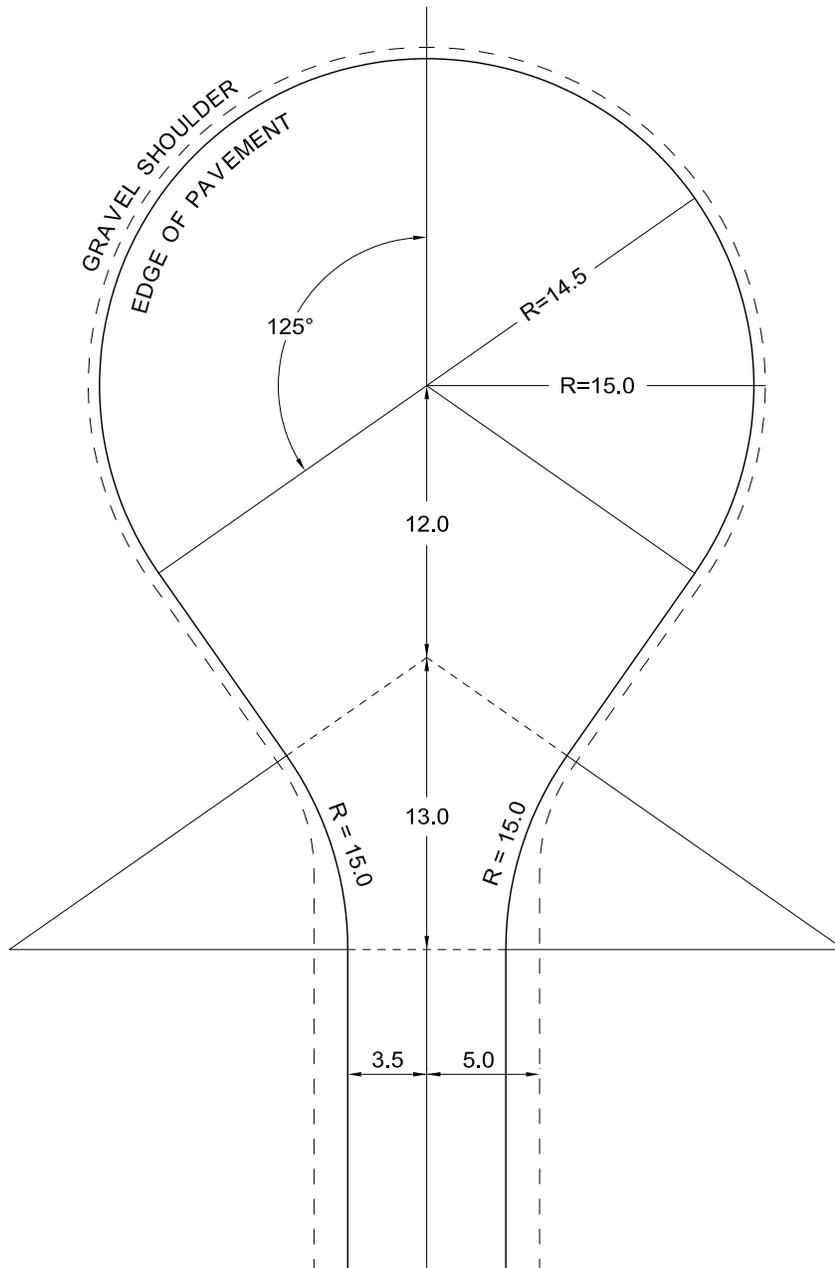
**Table 1420.E – Finished Top and Shoulder Widths**

| <b>Collector</b>                                  |                               |  |             |            |
|---|-------------------------------|--|-------------|------------|
| <b>Open Shoulder<sup>a</sup></b><br>(Fig. 1420.F) |                               | <b>Curb &amp; Gutter</b><br>(Fig. 1420.H)        |             |            |
| Min. Top Width                                    | Min. Paved Width              | Top Width  | Paved Width | Parking    |
| 10.0  | 7.0                           | 10.4   | 8.2         | one side   |
| 1.5 gravel shoulder                               |                               | 0.6 curb plus 0.5 gravel shoulder                |             |            |
| <b>Local</b>                                      |                               |  |             |            |
| <b>Open Shoulder<sup>a</sup></b><br>(Fig. 1420.G) |                               | <b>Curb &amp; Gutter</b><br>(Figs. 1420.H and I) |             |            |
| Min. Top Width                                    | Min. Paved Width <sup>b</sup> | Top Width  | Paved Width | Parking    |
| 8.0   | 7.0                           | 12.2   | 10.0        | both sides |
|   |                               | 10.4   | 8.2         | one side   |
| 0.5 gravel shoulder                               |                               | 0.6 curb plus 0.5 gravel shoulder                |             |            |

- a) For open shoulder roadways, the minimum top and paved widths may be increased to suit district preferences. In conjunction with increased paved widths, gravel shoulder widths may be reduced but may be no less than 0.5 m wide. The specified top width must be maintained.
- b) In some circumstances, a paved width less than 7.0 m may be allowed at the discretion of the Ministry Representative. In conjunction with decreased paved widths, gravel shoulder widths must be increased to maintain the specified top width.

|              |      |  |             |                |
|--------------|------|--|-------------|----------------|
| MoTI Section | 1420 |  | TAC Section | Not Applicable |
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**Figure 1420.F Collector - Open Shoulder Cul-de-Sac  
N.T.S.**

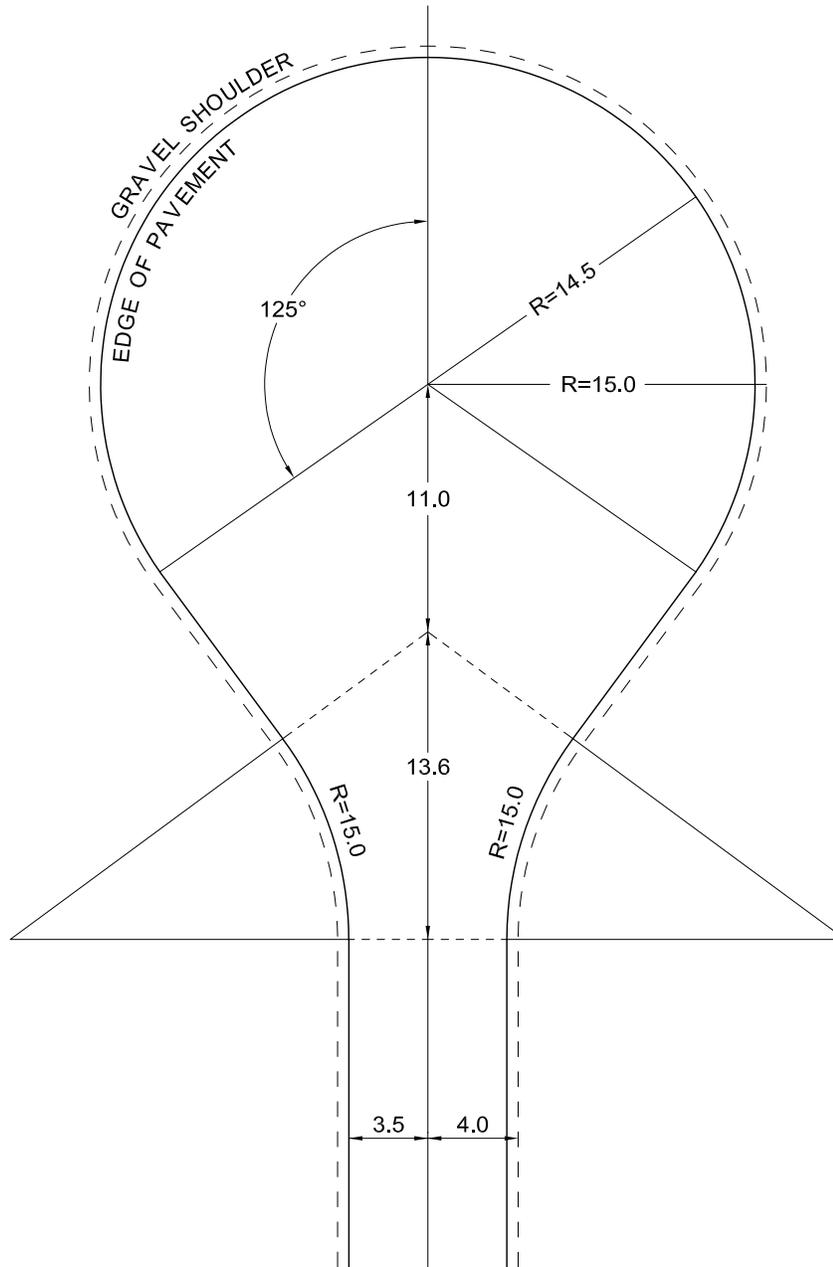


Note:

The distance from centreline of the intersecting road to the radius point of the Cul-de-Sac is maximum 150 metres.

|              |      |  |             |                |
|--------------|------|--|-------------|----------------|
| MoTI Section | 1420 |  | TAC Section | Not Applicable |
|--------------|------|--|-------------|----------------|

**Figure 1420.G Local - Open Shoulder Cul-de-Sac  
N.T.S.**

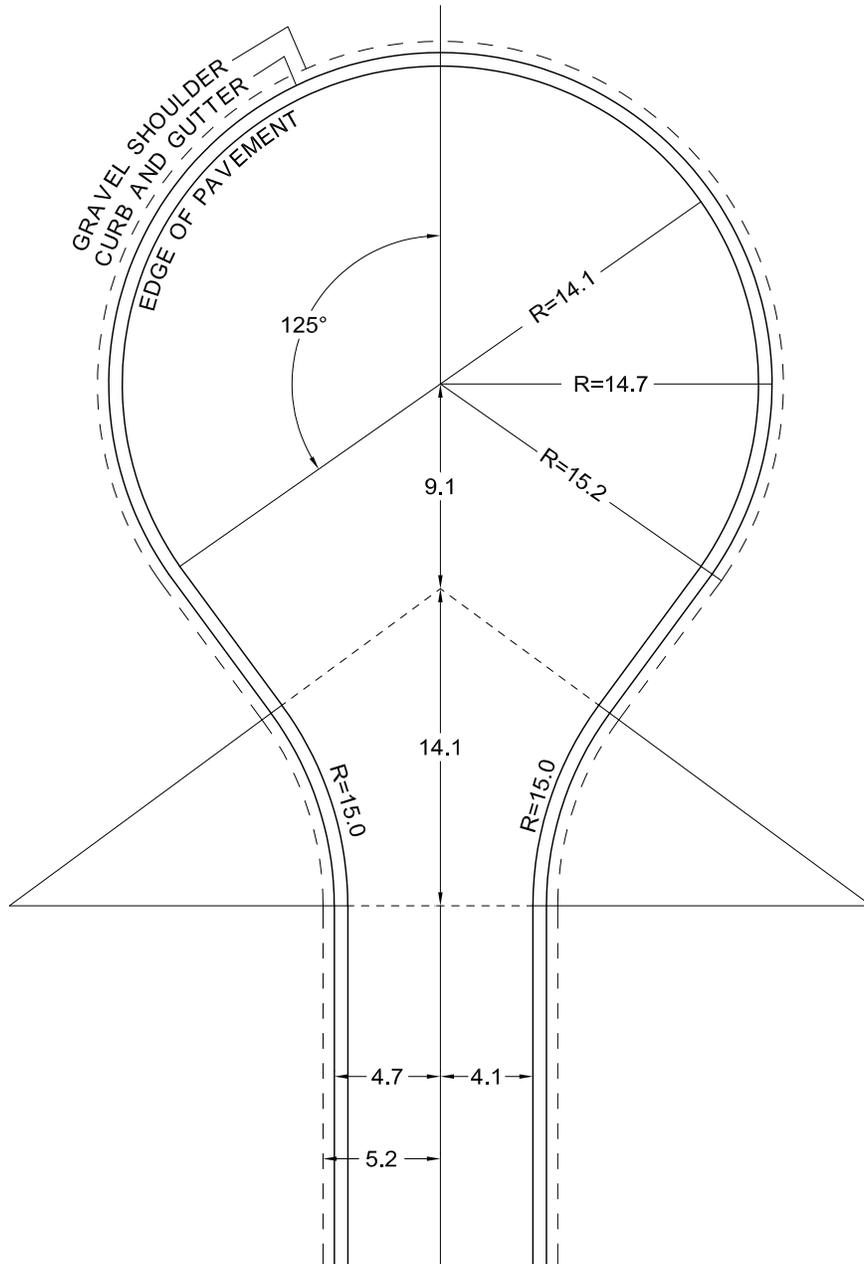


**Note:**

This is a local open shoulder road with Cul-de-Sac; therefore, the distance from the centreline of the intersecting road to the radius point of the Cul-de-Sac is variable. Maintain shoulder dimensions for gravel roads.

|              |      |             |                |
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| MoTI Section | 1420 | TAC Section | Not Applicable |
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**Figure 1420.H Collector/Local - Curb & Gutter Cul-de-Sac (Parking on One Side)  
N.T.S.**

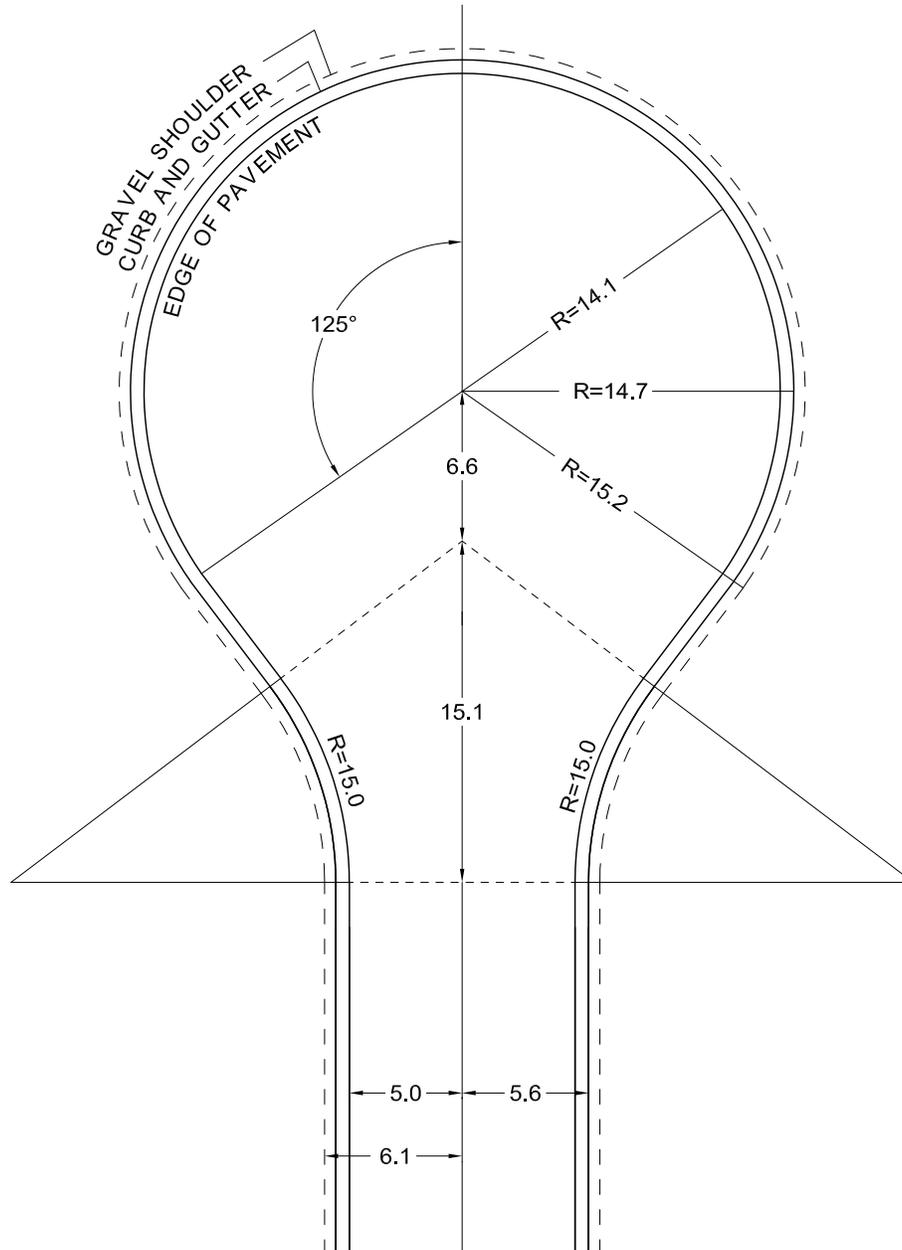


**Note:**

The distance from centreline of the intersecting road to the radius point of the Cul-de-Sac is maximum 150 metres.

|              |      |             |                |
|--------------|------|-------------|----------------|
| MoTI Section | 1420 | TAC Section | Not Applicable |
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**Figure 1420.I Local - Curb & Gutter Cul-de-Sac (Parking on Both Sides)**  
**N.T.S.**

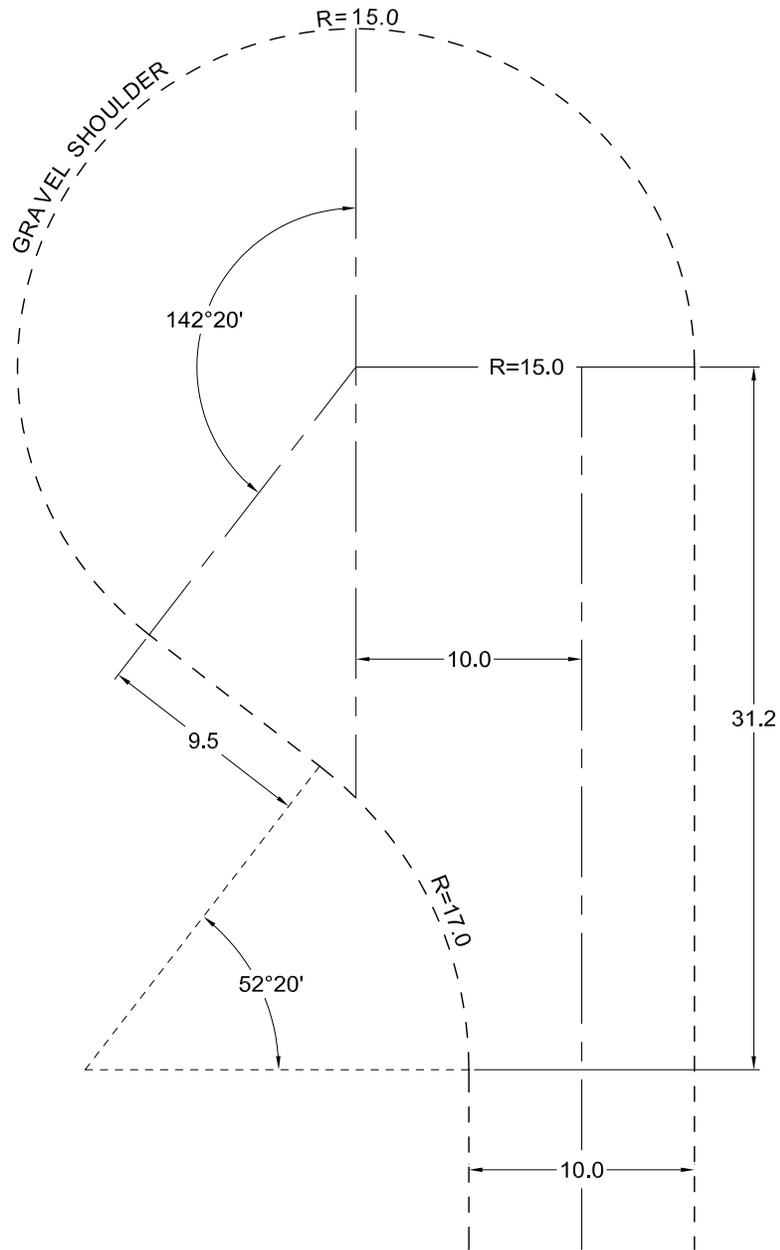


Note:

The distance from centreline of the intersecting road to the radius point of the Cul-de-Sac is maximum 150 metres.

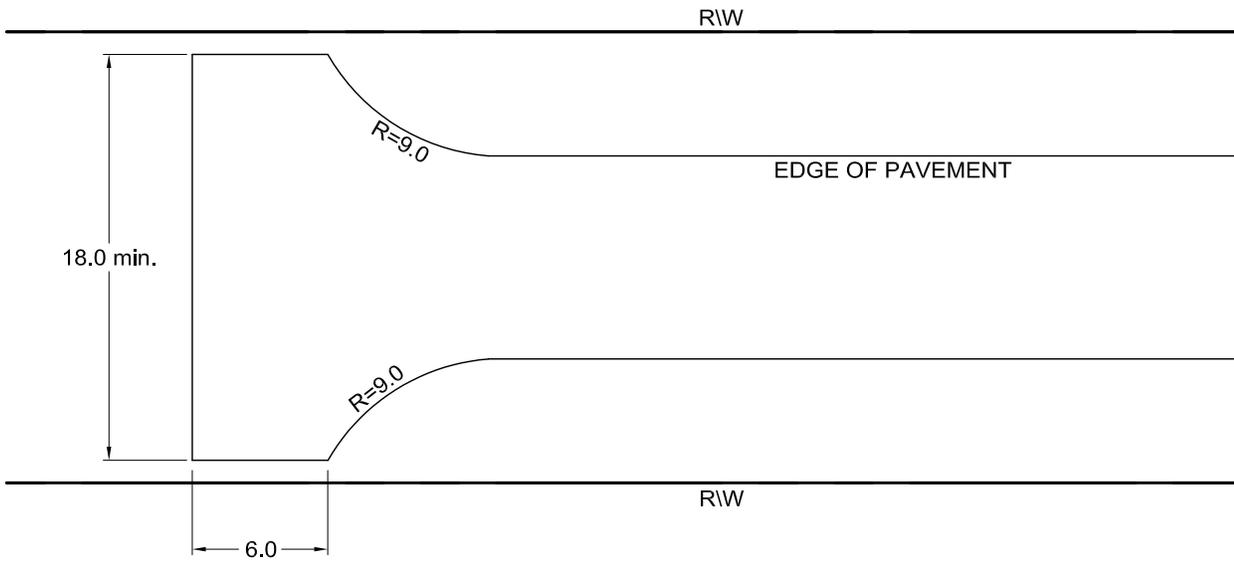
|              |      |  |             |                |
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| MoTI Section | 1420 |  | TAC Section | Not Applicable |
|--------------|------|--|-------------|----------------|

**Figure 1420.J Offset Cul-de-Sac  
N.T.S.**

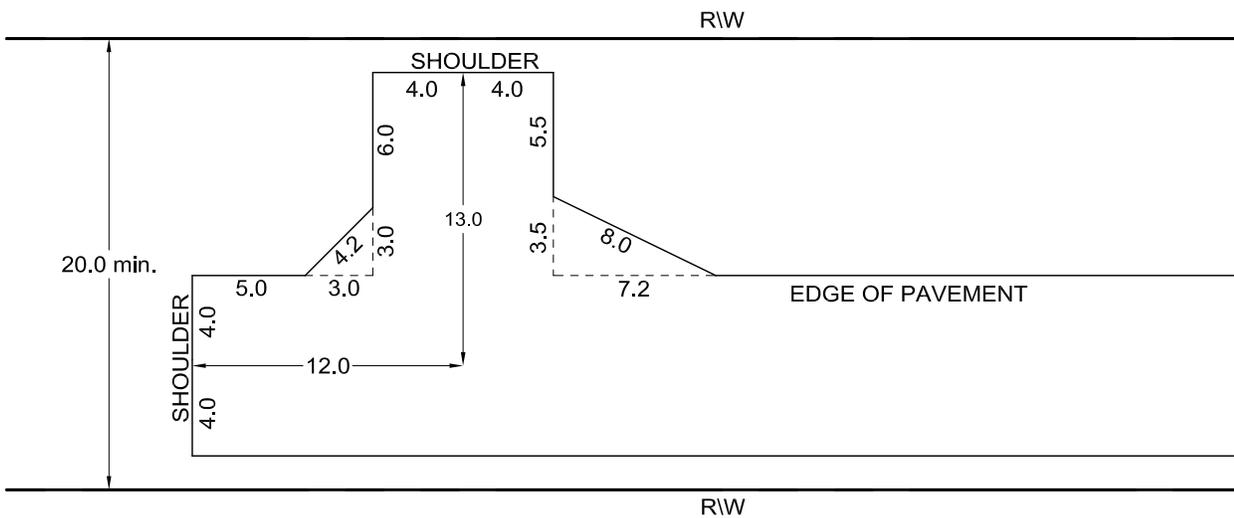


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|--------------|------|--|-------------|----------------|
| MoTI Section | 1420 |  | TAC Section | Not Applicable |
|--------------|------|--|-------------|----------------|

**Figure 1420.K Typical Hammerhead  
N.T.S.**



**Figure 1420.L Modified Hammerhead**



|              |      |             |                |
|--------------|------|-------------|----------------|
| MoTI Section | 1420 | TAC Section | Not Applicable |
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### 1420.05.05 Frontage Roads

The Right-of-Way width shall be 15 metres or the cross section width plus 3 metres, whichever is greater. (This is additional to the through road requirements.) Ensure sufficient setback at intersections to accommodate turn slots, etc., thus ensuring a bulbed connection is necessary at all frontage road intersections.

### 1420.05.06 Backage Roads

For these standards, backage roads shall be considered local roads.

### 1420.05.07 Cross Slopes

All roadways shall be constructed using a centreline crown and shall be graded and compacted with the following crossfall to ensure road drainage:

- Normal cross slopes shall be 2% for paved roads and 4% for gravel roads.

### 1420.05.08 Superelevation

Superelevation is generally not applied on local subdivision roads or cul-de-sacs; reverse crown is usually maintained in  $\leq 800$  metre radius curves with speeds  $\leq 50$  km/h. Rural roads of a continuous nature that provide access to a subdivision would be better classified as Low-Volume Roads and should be superelevated accordingly. Refer to the Low-Volume Road Chapter of the BC Supplement to TAC. When the decision has been made to superelevate curves, a maximum rate of 0.04 m/m shall be used for local urban street systems. This is appropriate for design speeds up to 70 km/h and where surface icing and interrupted traffic flow are expected. Superelevation rates of 0.04 m/m and 0.06 m/m are applicable for design of new urban streets in the upper range of the classification system where uninterrupted flow is expected and where little or no physical constraints exist.

### 1420.06 INTERSECTIONS/ACCESSES

Intersections shall be as near as possible to right angles. The minimum skew angle of the

intersection shall be 70 degrees and the maximum skew angle shall be 110 degrees.

### 1420.07 UTILITY SETBACK

Utility poles or signs should be within 2 metres of the property boundary or a minimum 2 metres beyond the toe of the fill or top of cut, whichever gives the greater offset from the road. See **Figure 1420.C**.

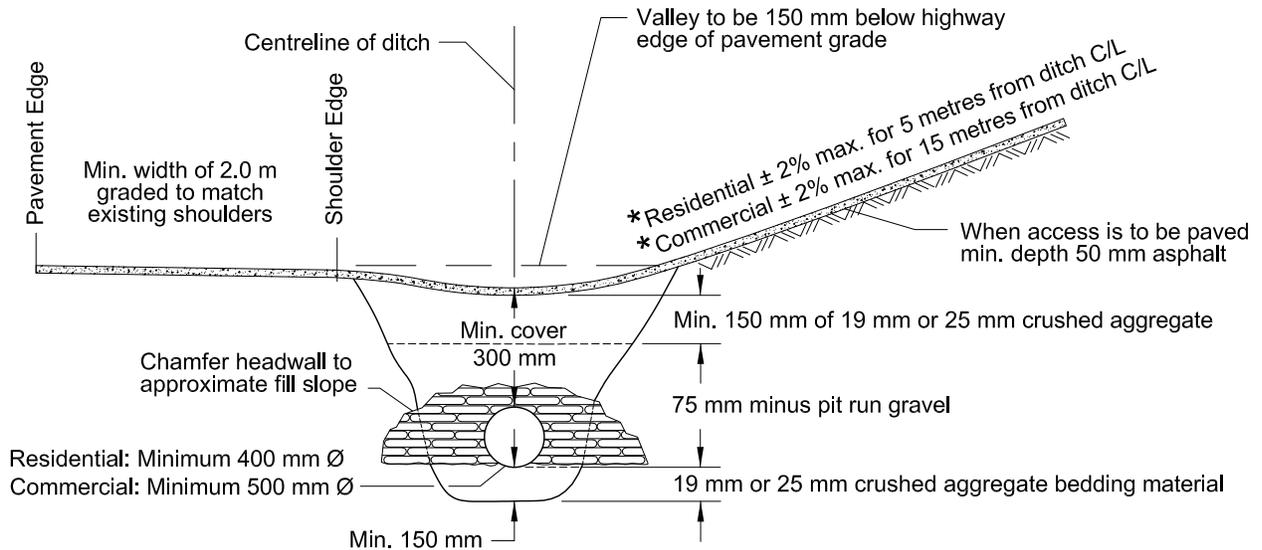
The setback in an urban environment with curb and gutter is the greater of the following clearances: 2.0 m from the face of the curb or 0.3 m beyond the sidewalk. See **Figure 1420.B**.

### 1420.08 DRIVEWAYS

1. Acceptance of driveway locations and spacing shall be at the discretion of the Ministry Representative.
2. The first 5 metres (measured from the ditch centreline) of all residential driveways shall be constructed at or near a right angle ( $70^\circ$  to  $110^\circ$ ) to the road and at a maximum  $\pm 2\%$  grade.
3. All open shoulder driveways with a level or rising grade are to be constructed with a "valley" or "swale" over the ditch line to ensure surface water enters the ditch and does not enter the road. See **Figure 1420.M**.
4. Driveway grades shall not exceed 8% within the Right-of-Way.
5. Driveway radius and widths (see **Figure 1420.O**):
  - Residential/Farm – 6 metre radius and minimum width
  - Logging/Commercial – 9 metre radius and minimum width
  - If a driveway will have right turning traffic  $\geq 5$  vph, consideration should be given to using an access type in accordance with Section 730 Private Accesses.
6. All lots with cuts or fills greater than 1.8 metres shall have engineered drawings when requested by the Ministry Representative.

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| MoTI Section | 1420 | TAC Section | Not Applicable |
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**Figure 1420.M Culvert Installation**  
N.T.S.

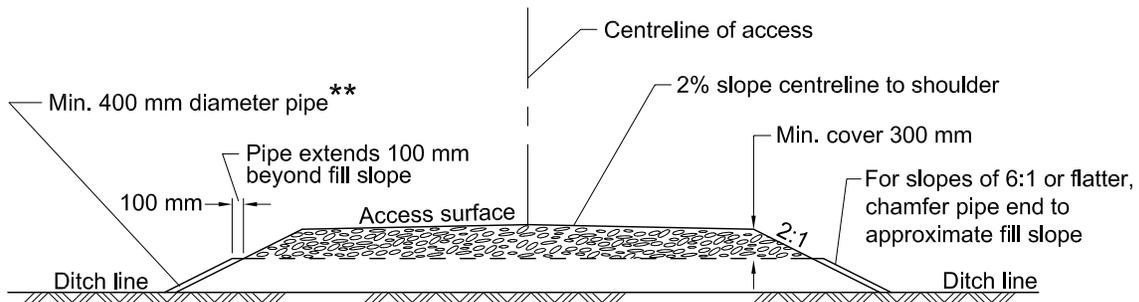


\* Note: For roads with a Curb and Gutter profile: Residential ± 2% max. for 5 metres measured from back of curb  
Commercial ± 2% max. for 15 metres measured from back of curb

Notes:

- Refer to Chapter 1000 and Standard Specifications Section 303 for comprehensive bedding and backfill details
- Minimum pipe size may be increased at the discretion of the Ministry Representative.
- Minimum cover shall dictate invert elevation.
- Inlet and/or outlet of culverts subject to erosion shall have sandbags or headwall respecting clear zone principles and shall not introduce a further hazard.

**Figure 1420.N Driveway Cross Section**



Driveway Culvert Installation: See Figures 1420.M, 1420.N, and 1420.O

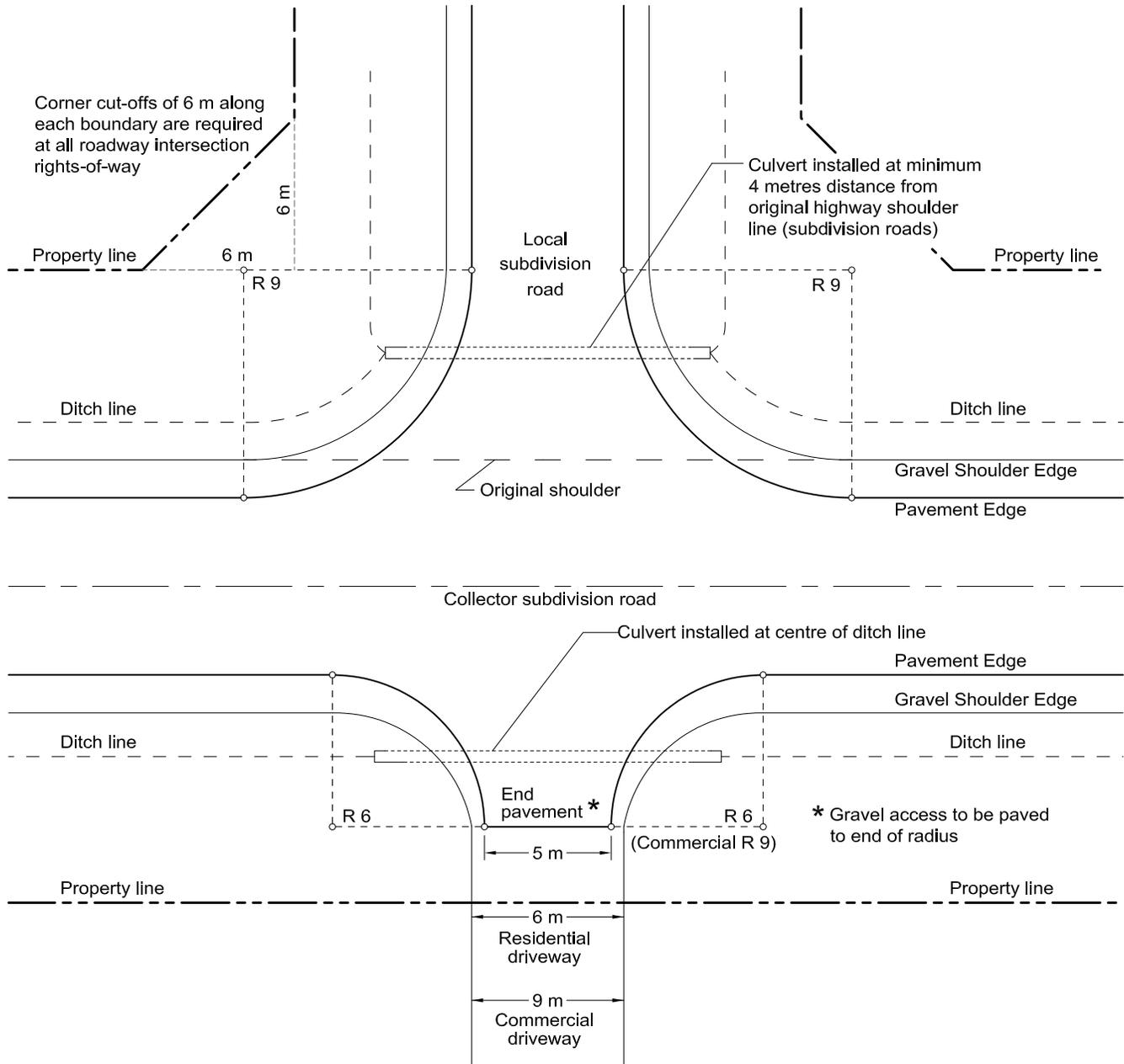
Residential Driveways: All driveway culverts shall be a minimum 400 mm diameter but may be increased at the discretion of the Ministry Representative.

Commercial Driveways: Cross and side culverts require a 500 mm minimum diameter.

\*\* Hydraulic requirements may necessitate larger diameter culverts.

|              |      |             |                |
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| MoTI Section | 1420 | TAC Section | Not Applicable |
|--------------|------|-------------|----------------|

**Figure 1420.O Driveway and Culvert Installation Layout  
N.T.S.**



Residential Driveway: Minimum 6 metre width at property line.  
 Logging/Commercial Driveway: Minimum 9 metre width at property line.

Turning Radius: Residential/Farm Min. 6 metres  
 Logging/Commercial Min. 9 metres

|              |      |  |             |                |
|--------------|------|--|-------------|----------------|
| MoTI Section | 1420 |  | TAC Section | Not Applicable |
|--------------|------|--|-------------|----------------|

### 1420.09 BRIDGES/STRUCTURES

All culverts with a span  $\geq 3$  m, bridges, and retaining walls must be designed and constructed to ministry bridge standards. Design shall be by a Professional Engineer who is registered in British Columbia and is experienced in bridge design. Prior to proceeding with the design, the bridge design criteria must be obtained from a ministry regional bridge engineer. The design must be reviewed and accepted by a ministry regional bridge engineer. The Professional Engineer shall provide stamped letters of assurance in accordance with ministry [Technical Circular T-06/09](#).

If proprietary structures are proposed, only those listed in the ministry's Recognized Products List shall be used unless otherwise accepted by a ministry regional bridge engineer.

### 1420.10 SIGNING/SPEEDS

All unregulated/unposted roads in unorganized territory in British Columbia are limited to a maximum speed of 80 km/h ( Motor Vehicle Act 146.1); therefore, all roads designed at less than 80 km/h should be posted accordingly.

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| MoTI Section | 1420 |  | TAC Section | Not Applicable |
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| MoTI Section | 1420 | TAC Section | Not Applicable |
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Sample Subdivision Design Criteria Sheet (page 1 of 2)



**BRITISH COLUMBIA**

Ministry of Transportation and Infrastructure

**SUBDIVISION DESIGN CRITERIA SHEET**

Project:  
eDAS File #:  
Your File #:

| Design Element   |   |        | Present Conditions |    | MoTI Guidelines Criteria |       | Proposed Project Criteria |    | Achieved Project Criteria |    | Comments / Notes * |
|--|---|--------|--------------------|----|--------------------------|-------|---------------------------|----|---------------------------|----|--------------------|
| Road Classification  |   |        |                    |    | Local                    |       |                           |    |                           |    |                    |
| Posted Speed   |   |        | km/h               |    | 50 km/h                  |       | km/h                      |    | km/h                      |    |                    |
| Design Speed   |   |        | km/h               |    | 50 km/h                  |       | km/h                      |    | km/h                      |    |                    |
| Curb & Gutter or Open Shoulder   |   |        |                    |    | Open Shoulder            |       |                           |    |                           |    |                    |
| Basic # of Lanes   |   |        |                    |    | 2                        |       |                           |    |                           |    |                    |
| Minimum Horiz. Curve Radius  |   |        | m                  |    | 80 m                     |       | m                         |    | m                         |    |                    |
| Min K Factor   | Crest VC  | Sag VC | C:                 | S: | C: 7                     | S: 13 | C:                        | S: | C:                        | S: |                    |
| Maximum Grade  |   |        | %                  |    | 10%                      |       | %                         |    | %                         |    |                    |
| Maximum Superelevation   |   |        | %                  |    | 4%                       |       | %                         |    | %                         |    |                    |
| Minimum Stopping Sight Distance  |   |        | m                  |    | 65 m                     |       | m                         |    | m                         |    |                    |
| Finished Top Width   |   |        | m                  |    | 8.0 m                    |       | m                         |    | m                         |    |                    |
| Paved Width  |   |        | m                  |    | 7.0 m                    |       | m                         |    | m                         |    |                    |
| Gravel Shoulder Width  |   |        | m                  |    | 0.5 m                    |       | m                         |    | m                         |    |                    |
| Cul-de-sac or Hammerhead (Fig. 1420.F – L)   |   |        |                    |    | Cul-de-sac               |       |                           |    |                           |    |                    |
| Clear Zone - Offset Width  |   |        | m                  |    | 4 m                      |       | m                         |    | m                         |    |                    |
| Side Slope (X:1)   |   |        | :1                 |    | 2:1                      |       | :1                        |    | :1                        |    |                    |
| Minimum Right-of-Way Width   |   |        | m                  |    | 20 m                     |       | m                         |    | m                         |    |                    |
| Catchment Width in Rock Cuts   |   |        | m                  |    | 0.6 m                    |       | m                         |    | m                         |    |                    |
| AADT/SADT (20xx Design Year)   |   |        |                    |    |                          |       |                           |    |                           |    |                    |
| Truck Volume   |   |        | %                  |    | %                        |       | %                         |    | %                         |    |                    |
| Design Vehicle   |   |        |                    |    | I-BUS                    |       |                           |    |                           |    |                    |
| Intersection Type (Local, Collector, Arterial, T Intersection, Protected T) (Fig. 710.D – H) |   |        |                    |    | Local                    |       |                           |    |                           |    |                    |
| Driveway Access Type   | Residential or Commercial                                   |        |                    |    | Commercial               |       |                           |    |                           |    |                    |
|  | Fig. 1420.O or BC Supplement Sect. 730. Type 1A, 1B, 2A, 2B |        |                    |    | Type 1B                  |       |                           |    |                           |    |                    |

\* - Justification for deviation from guidelines and proposed mitigation must be referenced by footnote number and documented on the following page(s).

MoTI CRITERIA: District Development Approvals: \_\_\_\_\_ Date: \_\_\_\_\_  
(Print Name)

PROPOSED CRITERIA: Engineer of Record: \_\_\_\_\_ Date: \_\_\_\_\_  
(if proposed or achieved criteria is different than MoTI criteria)  
(Print Name)

ACCEPTED BY: Sr. Eng. Mgr, Highway Design Services: \_\_\_\_\_ Date: \_\_\_\_\_  
(for exceptions to standards)  Prop.  Achvd  
(Signature)

ACCEPTED BY: Chief Engineer: \_\_\_\_\_ Date: \_\_\_\_\_  
(for major exceptions to standards)  
(Signature)

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| MoTI Section | 1420 | TAC Section | Not Applicable |
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**Sample Subdivision Design Criteria Sheet (page 2 of 2)**

|  |
|--|
| Project:<br>eDAS File #:<br>Your File #: |
|--|

**Comments / Notes:**

SAMPLE

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**Subdivision Design Drawing Checklists**

|   |   |                                       |  |      |      |
|---|---|---------------------------------------|--|------|------|
| <b>Project Description</b>                        |   |                                       |  |      |      |
| <b>Project Number</b>                             |   |                                       |  |      |      |
| <b>Engineer of Record</b>                         | Name  | Date                                  | <b>Reviewed by</b>                     | Name | Date |
| <b>Consulting Company Name and Address</b>        |   |                                       |  |      |      |
| <b>Design Criteria</b><br>[MoTI Accepted?]<br>(✓) | <input type="checkbox"/> Yes                | <input type="checkbox"/> No           |  |      |      |
| <b>Quality Control Stage</b> (✓)                  | <input type="checkbox"/> 30% - 50% complete | <input type="checkbox"/> 90% complete | <input type="checkbox"/> 100% complete |      |      |

**GENERAL**

CALCULATIONS - SEE SEPARATE SHEETS.

Verify that all mathematical calculations have been checked and transferred correctly to the drawings.

| <b>DRAWINGS</b>   | <b>Yes or No or n/a</b> | <b>Original Work by:</b> | <b>Checked By:</b> | <b>Date:</b> |
|---|-------------------------|--------------------------|--------------------|--------------|
| <b>KEY PLAN</b>   |                         |                          |                    |              |
| Location Map: Shows site, nearest town names, land marks, etc. and North arrow  |                         |                          |                    |              |
| Key Map: Alignments, Station ticks (500 m), Limits of Construction with stations, gravel sources, disposal sites, relevant names, roads, rivers, lakes, etc., scale, legal boundaries where feasible, North arrow, sheet layout with plan numbers |                         |                          |                    |              |
| Standard title layout from BC Supplement to TAC   |                         |                          |                    |              |
| Appropriate Signing Authority block   |                         |                          |                    |              |
| Complete Symbol Legend (may be on separate sheet if too large)  |                         |                          |                    |              |
| Plan Index  |                         |                          |                    |              |
| Consultant's name   |                         |                          |                    |              |
|   |                         |                          |                    |              |
| <b>COMMENTS:</b>  |                         |                          |                    |              |
|   |                         |                          |                    |              |
|   |                         |                          |                    |              |

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| <b>DRAWINGS</b>  | Yes or No or n/a | Original Work by: | Checked By: | Date: |
|--|------------------|-------------------|-------------|-------|
| <b>PLANS</b>   |                  |                   |             |       |
| Standard drawing format as per BC Supplement to TAC  |                  |                   |             |       |
| Sheets laid out in orderly sequence (intersections not broken up between sheets where possible, interchanges easily defined, etc.) |                  |                   |             |       |
| Chainage runs left to right  |                  |                   |             |       |
| North arrows   |                  |                   |             |       |
| Toes shown and labeled C or F (Cut or Fill)  |                  |                   |             |       |
| Limits of Construction shown for all alignments  |                  |                   |             |       |
| Cross-referencing where required   |                  |                   |             |       |
| Right-of-way layout in respect to toes   |                  |                   |             |       |
| Right-of-way matches at join lines   |                  |                   |             |       |
| Legal Descriptions shown   |                  |                   |             |       |
| Required Easements (construction, slope, etc.) shown   |                  |                   |             |       |
| Clearing and Grubbing limits correctly defined with areas boxed and sheet summaries  |                  |                   |             |       |
| Removals and adjustments shown (culverts, manholes, valves, houses, pavement, etc.)  |                  |                   |             |       |
| Urban Projects: Curb & Gutters, Sidewalks, Stairs, Storm Sewers, etc., if applicable   |                  |                   |             |       |
| Structures identified  |                  |                   |             |       |
| All required chainages, curve data, co-ordinates and azimuths shown  |                  |                   |             |       |
| Detours shown if applicable (may be separate drawings)   |                  |                   |             |       |
| All work items identified and boxed with leader lines to item where required.  |                  |                   |             |       |
| Coherent drafting (no overlapping lines, text, etc.)   |                  |                   |             |       |
| Text sizes readable when drawings half-sized   |                  |                   |             |       |
| Contours, elevations (5's, 10's 15's, etc.) labeled and easy to find   |                  |                   |             |       |
| Scale Bar  |                  |                   |             |       |
|  |                  |                   |             |       |
| <b>COMMENTS</b>  |                  |                   |             |       |
|  |                  |                   |             |       |
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| <b>DRAWINGS</b>  | <b>Yes or No or n/a</b> | <b>Original Work by:</b> | <b>Checked By:</b> | <b>Date:</b> |
|--|-------------------------|--------------------------|--------------------|--------------|
| <b>PROFILES</b>  |                         |                          |                    |              |
| Standard drawing format  |                         |                          |                    |              |
| Existing ground line shown   |                         |                          |                    |              |
| Design Speed shown   |                         |                          |                    |              |
| Stationing of alignments (B.C., E.C., T.S., S.C., etc.) coincides with plans   |                         |                          |                    |              |
| K-values for stopping sight distance shown   |                         |                          |                    |              |
| Vertical curve lengths (standards)   |                         |                          |                    |              |
| Vertical & Horizontal alignments integrated (aesthetics)   |                         |                          |                    |              |
| Correct superelevations (and spiral lengths if used). Superelevation runoff: 60% on tangent, 40% on circular curve.                      |                         |                          |                    |              |
| Method of superelevation transition shown when there is insufficient tangent length between two curves for runoff. (stations/S.E. rates) |                         |                          |                    |              |
| Limits of construction shown   |                         |                          |                    |              |
| All proposed and important existing culverts shown   |                         |                          |                    |              |
| Existing affected utilities (storm, sanitary, gas, etc.) shown   |                         |                          |                    |              |
| Rivers, creeks, bridge sites and structures identified, abutment stationing and bridge end fills shown                                   |                         |                          |                    |              |
| Crossing roads, intersections, etc., identified by station, elevation and name   |                         |                          |                    |              |
| Free from unnecessary irregularities or roller coaster effect in the grades (aesthetics)   |                         |                          |                    |              |
| Impact on drainage (level grades, where adverse crown removed at low point on V.C., etc.)  |                         |                          |                    |              |
| Have separate Storm Sewer profiles been produced?  |                         |                          |                    |              |
|  |                         |                          |                    |              |
| <b>COMMENTS:</b>   |                         |                          |                    |              |
|  |                         |                          |                    |              |
|  |                         |                          |                    |              |
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| <b>DRAWINGS</b>  | Yes or No or n/a | Original Work by: | Checked By: | Date: |
|--|------------------|-------------------|-------------|-------|
| <b>TYPICAL SECTIONS</b>  |                  |                   |             |       |
| For completeness, covering all variations required for the project (e.g. minimum median, wide median, wall one side, etc.) |                  |                   |             |       |
| Correct pavement structure   |                  |                   |             |       |
| Constructability   |                  |                   |             |       |
| Gravel depths measured at the correct hinge points?  |                  |                   |             |       |
| Subgrade crossfall correct (from geotechnical recommendations)   |                  |                   |             |       |
| Any obvious errors in the dimensions?  |                  |                   |             |       |
| Has stationing been shown covering the location of design requirements?  |                  |                   |             |       |
| Has subgrade crossfall transition treatment for curves been shown?   |                  |                   |             |       |
| Appropriate ground lines used.   |                  |                   |             |       |
| Has utility setback been met as per BC Supplement to TAC?  |                  |                   |             |       |
|  |                  |                   |             |       |
| <b>COMMENTS:</b>   |                  |                   |             |       |
|  |                  |                   |             |       |
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| <b>DRAWINGS</b>   | Yes or No or n/a | Original Work by: | Checked By: | Date: |
|---|------------------|-------------------|-------------|-------|
| <b>GEOMETRICS AND LANING</b>  |                  |                   |             |       |
| Design Speed(s) and Design Vehicle(s)   |                  |                   |             |       |
| Compliance with BC Supplement to TAC specifications and guidelines?               |                  |                   |             |       |
| Intersection/ /access spacing, where applicable                                   |                  |                   |             |       |
| Configuration improvement possibilities   |                  |                   |             |       |
| Meets minimum traffic island dimensions   |                  |                   |             |       |
| Wheel chair ramps employed  |                  |                   |             |       |
| Maximum radii (11 m) criteria for stop sign installations without islands         |                  |                   |             |       |
| Correct access types and locations (no accesses on Accel/Decel lanes, etc.)       |                  |                   |             |       |
| North arrow   |                  |                   |             |       |
| Lateral sight distance (stopping/avoidance) checked                               |                  |                   |             |       |
| Curb and Gutter, Asphalt and Concrete drainage curb limits                        |                  |                   |             |       |
| Roadside and Median Barrier, Sta. to Sta. limits and summary of materials, Flares |                  |                   |             |       |
| Various alignments numbered (L100, L200, etc.)                                    |                  |                   |             |       |
| Tapers shown (stations, start/stop)   |                  |                   |             |       |
|   |                  |                   |             |       |
| <b>COMMENTS</b>   |                  |                   |             |       |
|   |                  |                   |             |       |
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| <b>DRAWINGS</b>  | <b>Yes or No or n/a</b> | <b>Original Work by:</b> | <b>Checked By:</b> | <b>Date:</b> |
|--|-------------------------|--------------------------|--------------------|--------------|
| <b>DRAINAGE</b>  |                         |                          |                    |              |
| Work items boxed   |                         |                          |                    |              |
| Enclosed Drainage Systems: poor layout, obvious errors, C.B. spacings, pipe and M.H. sizes, A.S.T.M. No. and class, wall thickness, material selection (P.V.C. vs. C.S.P. vs. Concrete vs. HDPE), drainage profiles produced?, etc |                         |                          |                    |              |
| Correct rain fall intensity for calculations   |                         |                          |                    |              |
| What return period was the facility designed for?  |                         |                          |                    |              |
| Elevations shown for proposed extra ditching   |                         |                          |                    |              |
| Ditch block details (vertical sandbags pose a hazard in clear zone - must have 6:1 slope facing oncoming traffic)  |                         |                          |                    |              |
| Perforated pipe layout, details & location of cleanouts  |                         |                          |                    |              |
| Invert elevations for all pipes shown  |                         |                          |                    |              |
| All affected existing items addressed (removals, adjustments, abandon, extensions, relocations, etc.)?   |                         |                          |                    |              |
| Reference notes to other drawings  |                         |                          |                    |              |
| Culverts, Inlet Structures, C.B.'s, M.H.'s, etc., adequately described as to location, elevation, diameter, materials, wall thickness, etc.  |                         |                          |                    |              |
| Calculations done for enclosed system  |                         |                          |                    |              |
| Check for conflicts with other utilities, e.g. electrical, etc.  |                         |                          |                    |              |
| Rip Rap details shown  |                         |                          |                    |              |
|  |                         |                          |                    |              |
| <b>COMMENTS:</b>   |                         |                          |                    |              |
|  |                         |                          |                    |              |
|  |                         |                          |                    |              |

| <b>DRAWINGS</b>   | <b>Yes or No or n/a</b> | <b>Original Work by:</b> | <b>Checked By:</b> | <b>Date:</b> |
|---|-------------------------|--------------------------|--------------------|--------------|
| <b>UTILITIES</b><br>(may be combined with Drainage drawings if clarity permits) |                         |                          |                    |              |
| Layout and location (avoidance of the travelled roadway prism where possible)   |                         |                          |                    |              |
| All affected utilities contacted and dealt with?                                |                         |                          |                    |              |
| All agreements in place?  |                         |                          |                    |              |
| All work items boxed?   |                         |                          |                    |              |
| Clear descriptions noted where required?  |                         |                          |                    |              |
| References to other drawings and specifications                                 |                         |                          |                    |              |
| Any special crossing drawings required?   |                         |                          |                    |              |
|   |                         |                          |                    |              |
| <b>COMMENTS:</b>  |                         |                          |                    |              |
|   |                         |                          |                    |              |
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| MoTI Section | 1420 | TAC Section | Not Applicable |
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| <b>DRAWINGS</b>   | Yes or No or n/a | Original Work by: | Checked By: | Date: |
|---|------------------|-------------------|-------------|-------|
| <b>RETAINING WALLS</b>  |                  |                   |             |       |
| Layout offsets shown  |                  |                   |             |       |
| Sufficient dimension and elevations for construction  |                  |                   |             |       |
| Type of wall selected suits installation location regarding aesthetics, soil conditions, cost-effectiveness and constructability? |                  |                   |             |       |
| Subdrains where required  |                  |                   |             |       |
| Foundation excavation and structure backfill limits   |                  |                   |             |       |
| Typical Section(s)  |                  |                   |             |       |
| Plans   |                  |                   |             |       |
| Profiles  |                  |                   |             |       |
| Shown on working cross-sections?  |                  |                   |             |       |
| Railing or Barrier required?  |                  |                   |             |       |
| Wall finish   |                  |                   |             |       |
|   |                  |                   |             |       |
|   |                  |                   |             |       |
| <b>COMMENTS:</b>  |                  |                   |             |       |
|   |                  |                   |             |       |
|   |                  |                   |             |       |

| <b>DRAWINGS</b>  | Yes or No or n/a | Original Work by: | Checked By: | Date: |
|--|------------------|-------------------|-------------|-------|
| <b>GEOTECHNICAL</b>  |                  |                   |             |       |
| Has draft geotechnical report been produced?                       |                  |                   |             |       |
| Have all material horizons been identified?                        |                  |                   |             |       |
| Has pavement structure been confirmed?                             |                  |                   |             |       |
| Has depth of stripping been determined?                            |                  |                   |             |       |
| Have all cut and fill slope rates been set?                        |                  |                   |             |       |
| Has all information required for existing pavements been obtained? |                  |                   |             |       |
| Have all soil issues been addressed?                               |                  |                   |             |       |
| Has final report been produced?                                    |                  |                   |             |       |
|  |                  |                   |             |       |
| <b>COMMENTS:</b>   |                  |                   |             |       |
|  |                  |                   |             |       |
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| <b>DRAWINGS</b>   | Yes or No or n/a | Original Work by: | Checked By: | Date: |
|---|------------------|-------------------|-------------|-------|
| <b>SIGNING &amp; PAVEMENT MARKINGS PLAN (USING LANING BASE)</b>       |                  |                   |             |       |
| Are all warning, regulatory and guide signs shown?                    |                  |                   |             |       |
| Is all sign information illustrated correctly?                        |                  |                   |             |       |
| Are sign bridges or cantilever signs required and bases shown?        |                  |                   |             |       |
| Has roadside barrier protection been reviewed for sign bridges, etc.? |                  |                   |             |       |
|   |                  |                   |             |       |
|   |                  |                   |             |       |
| <b>COMMENTS:</b>  |                  |                   |             |       |
|   |                  |                   |             |       |
|   |                  |                   |             |       |

| <b>DRAWINGS</b>  | Yes or No or n/a | Original Work by: | Checked By: | Date: |
|--|------------------|-------------------|-------------|-------|
| <b>ENVIRONMENTAL</b>   |                  |                   |             |       |
| Have environmental agencies been contacted? (List in comments)         |                  |                   |             |       |
| Have environmental issues been identified and included in design work? |                  |                   |             |       |
| Have approvals been obtained from environmental agencies?              |                  |                   |             |       |
|  |                  |                   |             |       |
| <b>COMMENTS:</b>   |                  |                   |             |       |
|  |                  |                   |             |       |
|  |                  |                   |             |       |

| <b>DRAWINGS</b>   | Yes or No or n/a | Original Work by: | Checked By: | Date: |
|---|------------------|-------------------|-------------|-------|
| <b>BRIDGES</b>  |                  |                   |             |       |
| R/W, Horizontal and Vertical alignments to be compatible with grade design  |                  |                   |             |       |
| Clear distinct separation of quantity take off (from road construction)     |                  |                   |             |       |
| Separate Quality Audit done by Bridge Section                               |                  |                   |             |       |
| Barrier connected to roadside barrier (also shown on Laning and Geometrics) |                  |                   |             |       |
|   |                  |                   |             |       |
| <b>COMMENTS:</b>  |                  |                   |             |       |
|   |                  |                   |             |       |
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