SECTION 6

Roads

6.0 ROADS

6.1 General

Road form guidelines are an integral component of the overall design guidelines for the City. The guidelines are intended to encourage safe and efficient movement for all modes of travel, while at the same time influencing the overall form and character of development. Flexibility is built into these guidelines in order that multi-modal and safety considerations can be incorporated into the design, while meeting the required functionality of the road system.

In addition to these guidelines, road designs are to give consideration to the following plans and guidelines and conform where applicable:

- City of Kamloops Access Management Guidelines;
- City of Kamloops Road Classification Map;
- City of Kamloops Bicycle Master Plan;
- City of Kamloops Pedestrian Master Plan;
- City of Kamloops Network Classification Strategy;
- City of Kamloops Emergency Vehicle Access Requirements;
- Transportation Association of Canada (TAC) - Geometric Design Guide for Canadian Roads;
- TAC - Pavement Design and Management Guide;
- TAC - Manual of Uniform Traffic Control Devices for Canada (MUTCD);
- TAC - Canadian Guide to Neighbourhood Traffic Calming;
- City of Kamloops by-laws;
- *Local Government Act* (BC);
- *Community Charter* (BC);
- *Motor Vehicle Act* (BC);
- BC Transit Infrastructure Design Guidelines;
- U.S. Department of Transportation - Roundabouts: An Information Guide;
- TAC - Canadian In-service Road Safety Reviews;
- TAC - Canadian Road Safety Audit Guide; and
- British Columbia MOTI (Ministry of Transportation and Infrastructure) - Manual of Standard Signs and Pavement Markings.

General road locations, layouts and standards should conform to applicable community plans.

Road layouts in new developments should provide for the continuation or projection of existing roads in the surrounding areas unless topographical conditions, parent parcel configuration or neighbourhood planning objectives make such continuation impractical.

The retrofit of an existing road or intersection should include a review of the collision history to determine how collision risk can be minimized.

Consideration must also be given to local planning and land use documents that contain reference to street enhancements such as street trees, enhanced sidewalk requirements, green streets, etc. for the purpose of determining road and road allowance configurations.

6.1.1 General Configuration of Roads

Proposed road configuration in new development must recognize the hierarchical nature of road classification and is to accommodate appropriate functions in the layout of the road system. Interconnection of roads within a proposed development is required as a basis for road layout design. Topographical constraints will be considered in determining final road alignments. The provision of cul-de-sac roads will not be approved unless these topographic considerations or parent parcel configuration dictate that consideration is warranted. At the sole discretion of the City Engineer, traffic calming measures may be included in the road design process.

6.1.2 Transportation Impact Assessment

Transportation impact assessments may be required where the new development is anticipated to generate in excess of 100 vehicle trips for the peak hour as determined through preliminary City assessment or in any other circumstance deemed necessary at the absolute discretion of the City Engineer.

6.1.3 Design Review Process

The Road Design guidelines are intended to provide direction on the typical elements of the road design. Guidance on the design process as outlined in Table 6.1, complete with Design Engineer and City checklists, is also provided in order to encourage an efficient design process that addresses all aspects of road design. Critical to this process is the early establishment of design criteria and functional requirements. A pre-design meeting with City staff is strongly recommended in addition to the processes identified.

Table 6.1 Design Process Steps

Step	Responsibility	Description
1. Review project objectives	City staff: Project Evaluation Team process	• Review the project objectives that the design shall strive to achieve.
2. Determine functional requirements (major projects)	Design Engineer	• Determine road classification and determine if required function is best met by classification • Complete Functional Checklist - Appendix B to best match design components with required function
3. Review functional requirements	City Staff: Transportation/ Engineering Development	• Review Functional Checklist - Appendix B
4. Determine standard design elements	Design Engineer	• Determine design elements based on road classification, consider any design constraints, and complete draft of Design Criteria Form - Appendix C
5. Undertake preliminary detailed design	Design Engineer	• Undertake preliminary detailed design based on Functional Checklist - Appendix B and design criteria
6. Review preliminary detailed design	City Staff: Engineering Development	• Review preliminary detailed design based on Functional Checklist and design criteria
7. Complete detailed design	Design Engineer	• Complete the detailed design incorporating any issues arising from preliminary design review and checklists.
8. Submit detailed design	Design Engineer	• Utilize and complete **Design Submission Checklist** - Appendix D to review detailed design prior to submission for approval
9. Review and approve detailed design	City Staff: Engineering Development	• Review and approve detailed design based on compliance with the Functional Checklist and Design Criteria, and a review of the Design Submission Checklist and Road Form Checklist.

Road safety audits may be part of the design process, depending on the scope of the project. Audits may be undertaken at one or all of the following stages:

- Preliminary Design;
- Detailed Design; and
- Construction Completion.

6.2 Road Classifications

In most communities, road networks are based upon road classifications such as arterials, collectors, and local roads. These road classifications are intended to maintain road network hierarchy to facilitate mobility and ensure each road meets its intended function, recognizing the importance of matching each road's form to its function. The road network system is based on an expanded classification set that improves the ability to characterize the road class and develop standards that meet the intended function.

The City of Kamloops network classification system consists of the following road classes:

Major Arterials	Planned and designed to carry large volumes of through traffic from one area of the City to another. These roadways are often longer, continuous corridors supporting long-distance travel at medium-to-high speeds between the collector and highway road system as well as major areas. Access to a major arterial impacts safety and mobility and is generally not permitted or is limited to major traffic generating land uses only. Support for transit, pedestrians, and cyclists is provided through dedicated facilities as much as possible.
Minor Arterials	Also designed and planned to carry large volumes of through traffic unrelated to an area and serves a distribution function to get traffic to and from the collector and local road systems. Access to adjacent land uses will be limited and concentrated on several fixed locations, which should be shared between properties wherever possible. Support for transit, pedestrians and cyclists is provided through dedicated facilities as appropriate.
Downtown Arterials	Intended to carry large volumes of traffic within the commercial districts of the City that are primarily generated in the area itself. Consistent with the goals for a vibrant commercial district, these arterial roadways will support significant pedestrian, cyclist and transit activity and provide access for commercial vehicles. In this regard, vehicle speeds along downtown arterials are generally very low, allowing for access and circulation throughout the corridor, as well as integration of pedestrians and cyclists.
Major Collectors	Intended to provide traffic service and land access service for a range of areas including commercial, residential and office uses. The traffic service function of this type of roadway is to carry moderate volumes of traffic between local roads and the arterial road system. Access to adjacent uses is important along Major Collectors. Proposed access is to conform to access management guidelines.

Minor Collectors	Intended to provide traffic service and land access, primarily to smaller residential areas - where traffic volumes are generally lower and familiar with the community. The traffic service function of this type of roadway is to carry low volumes between local roads and the arterial road system. Access to adjacent residential uses is also essential along minor collectors. Pedestrian and cyclist activity will be moderately high along minor collector streets in which specific measures will be taken to manage vehicle conflicts.
Hillside Collectors	Unique to Kamloops due to topographic conditions. Hillside Collectors are intended to support moderate-to-high traffic volumes between key hillside areas and other parts of the City. Depending on the length of the roadway and scale of development served by the area, Hillside Collectors may be two or four lanes and some access restrictions may apply. Although walking and cycling may be modest in these areas, dedicated facilities are needed to support goals for safety and enhanced mobility.
Local Roads	In urban and rural areas are intended to provide land access, particularly in residential areas. Therefore, local roads are designed to carry low volumes of traffic that originates from or is destined to adjacent uses. It is anticipated that the local road system will support significant pedestrian and cyclist activity. Local residential roads should be designed such that low-speed traffic will be encouraged and road use by through traffic will be discouraged. Traffic calming measures should be included where required by the City Engineer.
Industrial Local Roads	Designed to support a moderate volume of traffic, largely consisting of commercial vehicles and other business traffic. Although some access restrictions may apply, the industrial roads typically link surrounding area properties with the arterial road system.

6.2.1 Guided Flexibility

As part of the guided flexibility concept that the City is promoting, road classifications have been expanded to incorporate all of the required functions of a particular roadway while tailoring the road cross-section to reflect the required elements. This produces a roadway that only takes up the land necessary to facilitate the determined function of that particular roadway.

Flexibility is provided in several components of the road cross-section, including the provision of parking, accommodation of cyclists, provision of a centre median, separation of the sidewalk, and the number of travel lanes. Not all road classes, however, have flexibility in each component. Table 6.2 provides a choice of values where flexibility is allowed.

While an expanded road classification system improves the ability to better match the design characteristics of each road class to its required functionality, flexibility within the design process can improve the ability of the design to meet other community and environmental goals. Although the setting and character of the area, the values of the community, and the needs of the road users produce challenges and opportunities that are unique for each road design, the flexibility that is provided within these guidelines is intended to encourage design consistency throughout the City. In this manner the overall objective of designing a safer facility, that meets the needs of both the road user and the community, is achieved.

Appendix A provides guidance on the areas of flexibility. Decision matrices provide direction to an appropriate choice based on the functionality that is expected to be required. In many cases, the choice selected will result in a number of issues that should be considered. The main issues are highlighted to prompt the consideration of other design elements that should be addressed due to the choice of design components.

6.3 Design Vehicle

The Design Engineer must select a design vehicle that is appropriate for the type a traffic anticipated to use the proposed road. All turning movements should be considered for this design vehicle. Additionally, the Design Engineer should consider the ability of the design to accommodate vehicles that are more restrictive than the design vehicle (e.g. the ability of a WB-20 truck to maneuver on a local road).

6.4 Urban Cross-section Elements

Recommended road cross-section elements are shown in Table 6.2. Guided flexibility is provided in each of the elements identified in the shaded cells. Section 6.2.1 - Guided Flexibility describes the process to determine the functional requirements, and the appropriate values to use for the shaded areas.

Unless otherwise directed by the City Parks, Recreation, and Cultural Services Department, boulevards having a width of 2 m or greater and medians having a width of 4 m or greater shall be soft landscaped. Boulevards and medians having widths less than these dimensions may be hard surfaced. Surface types are to consist of stamped concrete, brick, or exposed aggregate finish as approved by the City Engineer.

Curbs on all arterials, industrial, hillside and major collectors shall be barrier type; curbs on minor collectors and local roads shall be rollover type unless directed otherwise by the City Engineer.

Table 6.2
Urban Road Cross-Section Elements
Dimension Characteristics

	Minimum Border	Sidewalk	Boulevard	Parking Lane	Bike Lane	Travel Lane	Travel Lane	Median	Travel Lane	MWC Lane	Parking Lane	Boulevard	Sidewalk	Minimum Border
Major Arterial	1.0	2.0	3.0	N/A	1.8	3.5 to 3.7	3.5 to 3.7	2.0 to 6.0	3.5 to 3.7	4.3 to 4.5	N/A	3.0	2.0	1.0
Minor Arterial	1.0	2.0	3.0	N/A	1.5 to 1.8	3.5	3.5	2.0 to 4.5	3.5	4.3 to 4.5	N/A	3.0	2.0	1.0
Downtown Arterial	0.3	2.4	2.0	2.4	1.5 to 1.8	3.3 to 3.5	3.3 to 3.5	2.0 to 4.5	3.3 to 3.5	4.3 to 4.5	2.4	1.5	2.4	0.3
Major Collector	1.0	1.5	3.0	2.6	1.5 to 1.8	N/A	3.3 to 3.5	2.0 to 4.5	3.3 to 3.5	4.3 to 4.5	2.6	3.0	1.5	1.0
Minor Collector	0.3	1.5	3.0	2.4	N/A	N/A	3.3 to 3.5	2.0 to 4.5	N/A	4.3	2.4	3.0	1.5	0.3
Hillside Collector	0.3	1.5	3.0	2.6	1.5 to 1.8	3.3 to 3.5	3.3 to 3.5	2.0 to 4.5	3.3 to 3.5	4.3 to 4.5	2.6	3.0	1.5	0.3
Local	0.3	1.5	3.0	2.4	N/A	N/A	3.0 to 3.5	N/A	3.0 to 3.5	N/A	2.4	3.0	1.5	0.3
Industrial Local	0.3	1.5	2.0	2.8	1.5 to 1.8	N/A	3.5 to 3.7	N/A	3.5 to 3.7	4.3 to 4.5	2.8	3.0	N/A	0.3
Lane	0 to 1.5	N/A	N/A	N/A	N/A	N/A	6.0 to 7.0	N/A	N/A	N/A	N/A	N/A	N/A	0 to 1.5

Note: Shaded cells denote Guided Flexibility provided - see 6.2.1 Guided Flexibility

- Not all of the above elements may be required in certain circumstances at the discretion of the City Engineer. Refer to Appendix A: Decision Matrices in conjunction with the above table.
- The Design Engineer is responsible to ensure total road dedication provides for all required cross-sectional elements including private utilities such as hydro, telephone, cable, and gas.
- Above noted dimensions are edge of asphalt to edge of asphalt.
- The concrete apron of curbing may be considered in the dimensions for local road parking lanes at the absolute discretion of the City Engineer.

Standard road cross-sections shall conform to this criteria and Appendix F: Design Guideline drawings.

Table 6.3
Rural Road Cross-section Elements

	Paved Shoulder	Travel Lane	Travel Lane	Paved Shoulder
Major Arterial	2.00	3.65	3.65	2.00
Minor Arterial	2.00	3.65	3.65	2.00
Major Collector	1.50	3.50	3.50	1.50
Minor Collector	1.50	3.50	3.50	1.50
Hillside Collector	1.50	3.50	3.50	1.50
Local	1.50	3.30	3.30	1.50
Industrial Local	2.00	3.65	3.65	2.00

Parking may be provided beyond the paved shoulder on all collector, hillside, and local rural roads.

6.5 Rural Road Cross-sections

Rural road cross-sections are applicable for those areas designated by the City. Note that guided flexibility is not applicable to the rural cross-sections. The applicable cross-sectional elements of the road classifications in rural areas are included in Appendix: Design Guideline drawings.

6.6 Alignments

Alignment guidelines should be generally in accordance with the TAC Geometric Design Guide, except where superseded by the numerical guidelines as summarized in Table 6.4.

6.6.1 Grades

Maximum grades are as shown in Table 6.4. Minimum road grades to be 0.5%.

Use of the maximum grades should be restricted to cases where:

- Desirable grade cannot be obtained due to topographical constraints;
- The geometric design of intersections can be improved by increasing grade on the minor street to avoid compromising design of the major street; and
- In order to eliminate a cul-de-sac, the City Engineer will give consideration to adjusting the road grade to accommodate a connection creating a crescent.

6.6.2 Vertical Curves

Vertical curves may be omitted where the algebraic difference in grades does not exceed 2% for local roads and 1% for all other roads. These criteria shall not be used to avoid proper design where vertical curves should be used or where short tangents would be used.

Vertical curve limits, as shown on Table 6.4, are defined by the "K-value" which is the ratio of the curve length in metres to the algebraic difference in grades (percent).

Use of K-values below the desirable limits shown on Table 6.4 should be restricted to cases justified by topographical constraints and subject to approval by the City Engineer.

6.6.3 Cross-slopes

Standard roadways shall have a 2% centreline crown.

Under adverse topographical conditions, the Design Engineer may provide rational and with the approval of the City Engineer, off-set crown or cross fall may be used. The location of off-set crowns is to be approved by the City Engineer.

Super-elevation should be used as indicated in Table 6.4 and the TAC Geometric Design Guide.

At intersections, the cross fall of the minor street should be varied to suit the profile of the major street. The maximum rate for changing cross fall at intersections is as follows:

- Arterial: 3% in 30 m
- Collector: 4% in 30 m
- Local: 6% in 15 m

6.6.4. Transitions to Existing Pavements

Where transition of pavement width is necessary the following minimum tapers apply:

- Local and collector roads: 20:1
- Arterial roads: 30:1

The Design Engineer is to determine if these minimums are adequate for specific conditions.

Table 6.4
Alignment Guidelines

Classification	Design Speed (km/h)	Max Super-Elevation (%)	Min Radius (m)	Max Grade[A] (%)	K Values [F]			
					Crest Curve		Sag Curve	
					Min	Desirable	Min	Desirable
Major Arterial	60 - 80	4	190[B]	8	20	25	15	25
Minor Arterial	60 - 70	4	190[B]	8	20	25	15	25
Downtown Arterial	50	4	110[B]	8	7	10	7	12
Major Collector	60	4	110[B]	9	7	10	7	12
Minor Collector	60	4	110[B]	9	7	10	7	12
Hillside Collector	60	4	110[B]	10	7	10	7	12
Local	50	-	80[C]	10[DE]	7	10	6	10
Industrial Local	60	-	110[B]	8[D]	7	10	7	12
Lane	30	-	65	10	4	-	4	-

[A] Maximum grades approaching intersections 2% less than indicated. Reduction applies for length equal to Stopping Sight Distance.

[B] Minimum centerline radii approaching intersections within the decision sight distance range should be 400 m radius for arterials and 250 m radius for collectors/hillside/industrial. See Section 6.7.5.

[C] Minimum centreline radii on local roads and lanes may be reduced to 30 m subject to specific conditions and at the sole discretion of the City Engineer.

[D] Avoid the use of maximum grade and minimum radius. Maximum grades should be reduced by 1% for each 30 m of radius below 150 m.

[E] Maximum grade for downhill cul-de-sacs to be 8% with 6% through the bulb.

[F] K Values may be reduced per the TAC Geometric Design Guidelines based upon roadway design speed.

6.7 Intersections

6.7.1 Intersections General

Intersections should be as close as possible to right angles. The maximum variation is 20 degrees.

The minimum spacing between intersections is as follows:

Road Classification	**Minimum Intersection Spacing (m)**
Major Arterial*	400 (desirable) 200 (minimum non-signalized)
Minor Arterial	200
Downtown Arterial	200
Major Collector	60
Minor Collector	60
Hillside Collector	150
Local	60
Industrial Local	60

* Note: For intersections where future signal coordination is expected, minimum spacing should be 400 m.

6.7.2 Curb Returns

Minimum curb return radii are as follows:

	Intersection with: **Local/Frontage**	**Collector**	**Arterial**
Lanes	3 m	With 3:1 flare to property corners	
Locals	9 m	9 m	11 m
Industrial Local	9 m	11 m	11 m
Collectors	9 m	11 m	11 m
Arterials	11 m	11 m	11 m

*Context sensitive reductions in these minimums may be considered.

6.7.3 Corner Cuts

Corner cuts should be sufficient to provide a minimum 4 m distance from curb face to property line. Minimum corner cuts are as follows:

Intersection Type	**Corner Cut**
Arterial and Collector	5 m x 5 m
All other roadway intersections	3 m x 3 m
Lane to Lane	5 m x 5 m
Lane to Arterial	3 m x 3 m
Residential Lane to all other roads	As required
Commercial/Industrial lane to any road	3 m x 3 m

6.7.4 Left Turn Channelization

Warrants for left turn channelization are to be in accordance with the Ministry of Transportation and Infrastructure Left Turn Lane Warrants. For signalized intersections, left turn bays shall be determined by detailed traffic analysis. Left turn bays shall be opposing.

Provisions for a channelized right turn lane may be required for buses and trucks and/or when right turn warrants are met at the discretion of the City Engineer. Guidance for design of the right turn slip lane shall be in accordance with the TAC Geometric Design Guide.

6.7.5 Sight Distances

A range of decision sight distances has been adapted from the TAC Geometric Design Guide as shown in the table below. The range recognizes the variation in complexity that may exist at various sites; however, minimum stopping sight distances should be available to drivers at all times.

Design Speed (km/h)	Minimum Stopping Sight Distance (m)	Minimum Decision Sight Distance (m)	Desirable Decision Sight Distance (m)
50	65	140	190
60	85	170	230
70	110	200	270
80	140	240	320

Note: Does not account for the effect of grades.

Sight distance for intersection approaches should be based on the decision sight distance. If it is not feasible to provide these distances because of horizontal or vertical curvature, special attention should be given to the use of traffic control devices for providing advance warning of the conditions to be encountered. The Design Engineer is to provide recommended variations for consideration by the City Engineer.

Sight distances for intersection departures should be determined by turning sight distance values and crossing sight distance values in accordance with the TAC Geometric Design Guide.

6.7.6 Curb Extensions

Curb extensions, also known as bulges or bulbs, should be considered for speed reduction, reduced pedestrian crossing distance and improved pedestrian visibility or as required by the City Engineer.

6.7.7 Roundabouts

Roundabouts may be considered or required by the City as an alternative to other types of intersection traffic control. Roundabout geometric design should be in accordance with US Department of Transportation - Roundabouts: An Information Guide.

6.8 Railway Grade Crossings

Locations and details of railway grade crossings are subject to requirements included in TAC Geometric Design Guide and references noted therein.

Approvals from all regulatory bodies are required.

6.9 Traffic Control Devices

Traffic control devices, signs, and pavement markings should be in accordance with MUTCD. Traffic signals should be in accordance with Section 8.0 of this manual. Where the TAC Manual is deficient the most recent edition of the BC Ministry of Transportation Catalogue of Standard Traffic Signs and pavement markings and other applicable BC Ministry of Transportation manuals may apply unless otherwise specified.

6.10 Cul-de-sac

The use of cul-de-sacs to serve multi-family developments and the design parameters of such are at the discretion of the City Engineer.

The maximum road length for a cul-de-sac serving a maximum of 30 units, as measured from the edge of the intersecting through road to the centre of the cul-de-sac bulb, is 200 m. Turnaround areas are to be circular and have a radius of 11.5 m minimum. Sidewalk is to be provided on one side of the cul-de-sac terminating at the bulb unless providing access to walkways within the bulb.

The City Engineer may consider cul-de-sacs up to 300 m in length in terrain where the above maximum road length cannot be achieved, and subject to the following conditions:

- Parking provided on both sides of roadway; and
- Serving a maximum of 40 units.

Cul-de-sacs exceeding 300 m in length are not permitted except at the sole discretion of the City Engineer. Emergency access will be required as directed by the City Engineer and consideration will be given to provision of increased road width, mid-block turnarounds, or other parameters as required.

Guidelines for emergency access roads at long cul-de-sacs include the following:

- Maximum grade: 10%;
- Adjusting the emergency access grade will be considered at the discretion of the City Engineer;
- Minimum right-of-way and pavement width: 6.0 m;
- Gates to prevent access by non-emergency vehicles;
- Gravel structure equivalent to local road complete with pavement if used for walkway; and
- Shared use as pedestrian walkway and bikeway at the discretion of the City Engineer.

6.11 Traffic Barriers

Traffic barriers should be placed where warrants exist in accordance with the BC Ministry of Transportation Guidelines (nomograph).

6.12 Sidewalks and Walkways

The requirement for sidewalks is as shown in Table 6.2. The cross-slope for sidewalks shall be 2%, except at driveways and wheelchair ramps where the maximum cross-slope shall be 10%. The sidewalks shall drain towards the gutter.

Where separated sidewalks are proposed on roads with mountable curb, a thicker profile may be required at the discretion of the City Engineer.

Wheelchair ramps from sidewalks, medians, and traffic islands to crosswalks shall be provided at intersections and walkways.

6.13 Bikeways

Cycling facilities will be required as part of roadway design as identified in the Bicycle Master Plan and in consultation with the City Engineer. Design requirements for cycling facilities will be determined in consultation with the City Engineer and TAC Guidelines.

6.14 Transit Facilities

The requirement for transit facilities will be established by the City Engineer.

Bus bay locations should be established in co-operation with the City Engineer. Bus bay details should be in accordance with the bus stop facilities section of the BC Transit Infrastructure Design Guideline.

6.15 Driveways

6.15.1 Residential Access to Arterial and Major Collector Roads

Residential driveway access to an arterial or major collector road is not permitted unless alternate access is not possible. Wherever physically possible, alternate local road access should be dedicated to preclude residential driveways accessing directly onto arterial roads.

6.15.2 Number of Driveways

a) Residential zones:

- One driveway per lot;
- Second driveway permitted for corner lot if driveway not on an arterial or major collector road;
- Second driveway permitted at the discretion of the City Engineer on lots abutting additional road frontage; and
- Where a residential lot abuts roads of different classifications, the principal driveway should access the road of the lower classification.

b) Commercial, Industrial, Institutional, Comprehensive, and Multi-family developments:

- Upon demonstrated need, the City Engineer may approve more than one access.

6.15.3 Driveway Location and Width

Subject to compatibility with City by-laws, use the following dimensions:

a) Residential zones: Driveways located on corner lots shall be located no closer than 5 m from the property line of the adjoining roadway. Provision of adequate sight distance shall be considered in accordance with TAC Geometric Design Guidelines and Section 6.7.5 of this manual.

Minimum width of an urban residential driveway access should be 4.5 m.

Maximum width of an urban residential driveway should be 7.3 m, but may be increased to 8.1 m based on zoning and at the discretion of the City Engineer. In all cases, a minimum of 40% of the street frontage the driveway faces shall be landscaped.

b) Commercial, Industrial, Institutional, Comprehensive and Multi-family developments:

Driveways to corner lots on local and minor collector roads should be located no closer than 12 m from the property line of the adjoining road. For Major Collectors or Arterial Roads, the driveway location is to be determined in consultation with the City Engineer. Provision of adequate sight distance shall be considered in accordance with TAC Geometric Guidelines and Section 6.7.5 of this manual.

The minimum width of a driveway to a property having one or more accesses is 4.5 m for one way access and 7.3 m for two way access with a maximum width of 11 m. Where a corner lot adjoins roads of different classifications, the principal driveway should access the road of a lower classification, except for commercial sites where access may be provided from both roads, subject to the City Engineer's approval.

6.15.4 Driveway Grades

Driveway access grades should be designed to permit the appropriate vehicular access for the zone, without "bottoming-out" or "hanging-up". From the edge of pavement to the property line, the driveway should follow proper boulevard slope to drain towards the road.

For driveways longer than 15 m from the road edge or back of sidewalk, the maximum driveway grade is 10% and is subject to approval of the City Engineer.

6.15.5 Access Management

In addition to the above driveway guidelines, access management techniques, including driveway consolidation, medians and turn restrictions should be applied in accordance with the guidelines in the City of Kamloops Access Management Strategy, as well as any detailed corridor Access Management Plans that the City of Kamloops has developed.

All existing driveways not being used shall be removed at the Applicant's expense.

Parking stalls shall not be designed to back out onto roadways (except lanes). Existing non-conforming stalls are to be removed at the Applicant's expense if required as part of development.

6.15.6 Queuing Storage

Minimum queuing storage at parking lot accesses measured from the access/entrance to closest parking stall or aisle should be as follows:

Number of Parking Stalls	Length of Storage (m)
0 to 100	6
101 to 150	12
151 to 200	18
Over 200	24

Within 50 m of signalized intersections, especially at parking lot driveways, queuing storage from driveway exit to closest parking stall or aisle must be approved by the City Engineer.

Where a drive-thru is proposed, a traffic analysis may required to ensure there are no conflicts with queuing storage.

6.16 Clear Zone Requirements

In urban areas, designers should review NCHRP Report 612: "Safe and Aesthetic Design of Urban Roadside Treatments" to determine proper clear zones. Design recommendations should be submitted for review and discussion with the City Engineer.
In rural areas, clear zone requirements should be determined using Section 620 of the BC Ministry of Transportation and Infrastructure's Supplement to the TAC Geometric Design Guidelines.

6.16.1 Aerial Utilities

Clearance to aerial utilities is subject to requirements and approvals from all regulatory bodies as required.

6.17 Pavement Structures

6.17.1 General

Pavement design shall be based on one or more of the following methods:

a) Road classification.
b) Standards and specifications.
c) Design method covered in the TAC Pavement Design and Management Guide.

Pavement design is to include consideration of the subgrade soil type, frost susceptibility, moisture conditions and subgrade drainage provisions.

Minimum design life for all classifications of roads is 20 years. The Design Engineer is to provide confirmation the roadway is designed to meet the criteria taking into consideration soil conditions, existing and future bus traffic, commercial traffic, etc.

Appendix A: Decision Matrices

Provision of Parking

BACKGROUND

Depending on the road's function and the demand for on-street parking, the provision of parking can enhance or detract the level of road safety and mobility. On-street parking can cause safety and congestion problems on higher order roadways as drivers suddenly stop and reverse into on-street parking spots. In addition, on-street parking creates safety issues with cyclists as doors are opened without due care and attention, and to pedestrians as the parked vehicles impede visibility between the approaching motorist and the pedestrian.

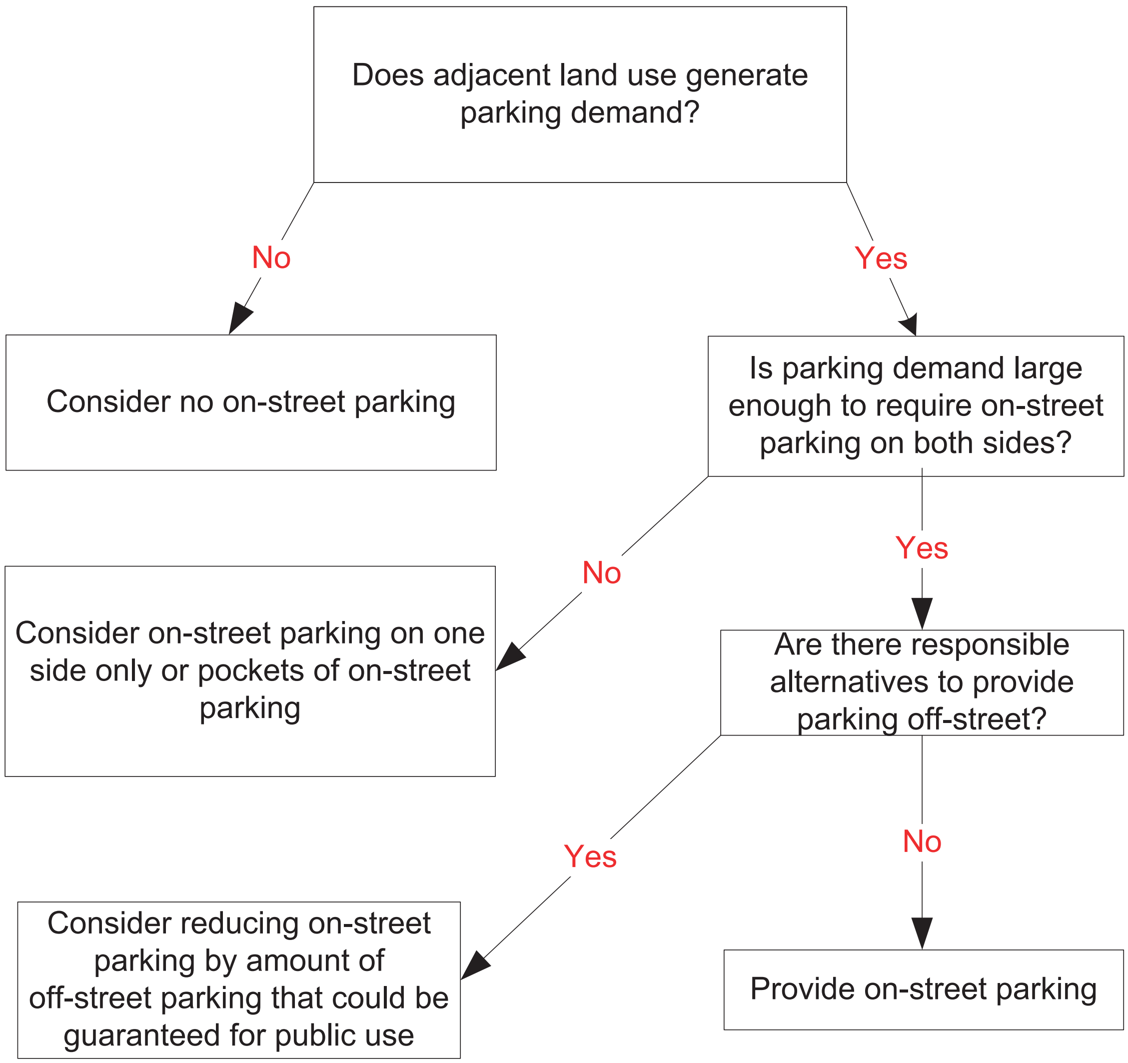
On lower order streets providing on-street parking where there is not a significant parking demand creates wider roads that encourage higher traffic speeds and aggressive overtaking maneuvers. The provision of curb extensions assists in reducing the visual signal of a widened roadway, while at the same time reducing the road width for pedestrians to cross.

It is important to understand, therefore, the function of the road and whether a demand for parking will be present.

ROAD CLASS

Flexibility exists on the design of all classifications of roads, except for major and minor arterials and major collectors.

Parking Decision Matrix



ISSUES TO CONSIDER

When considering the removal of parking from one or both sides of the street, special consideration is required on the following issues:

- Is there an adequate place for snow storage?
- Are sightlines compromised from driveways?
- Is there adequate separation of travel lane from pedestrians?
- Is there an adequate clear zone from the travel lane?
- Is sufficient room left for safe maintenance of the road and utilities?

Accommodation of Cyclists

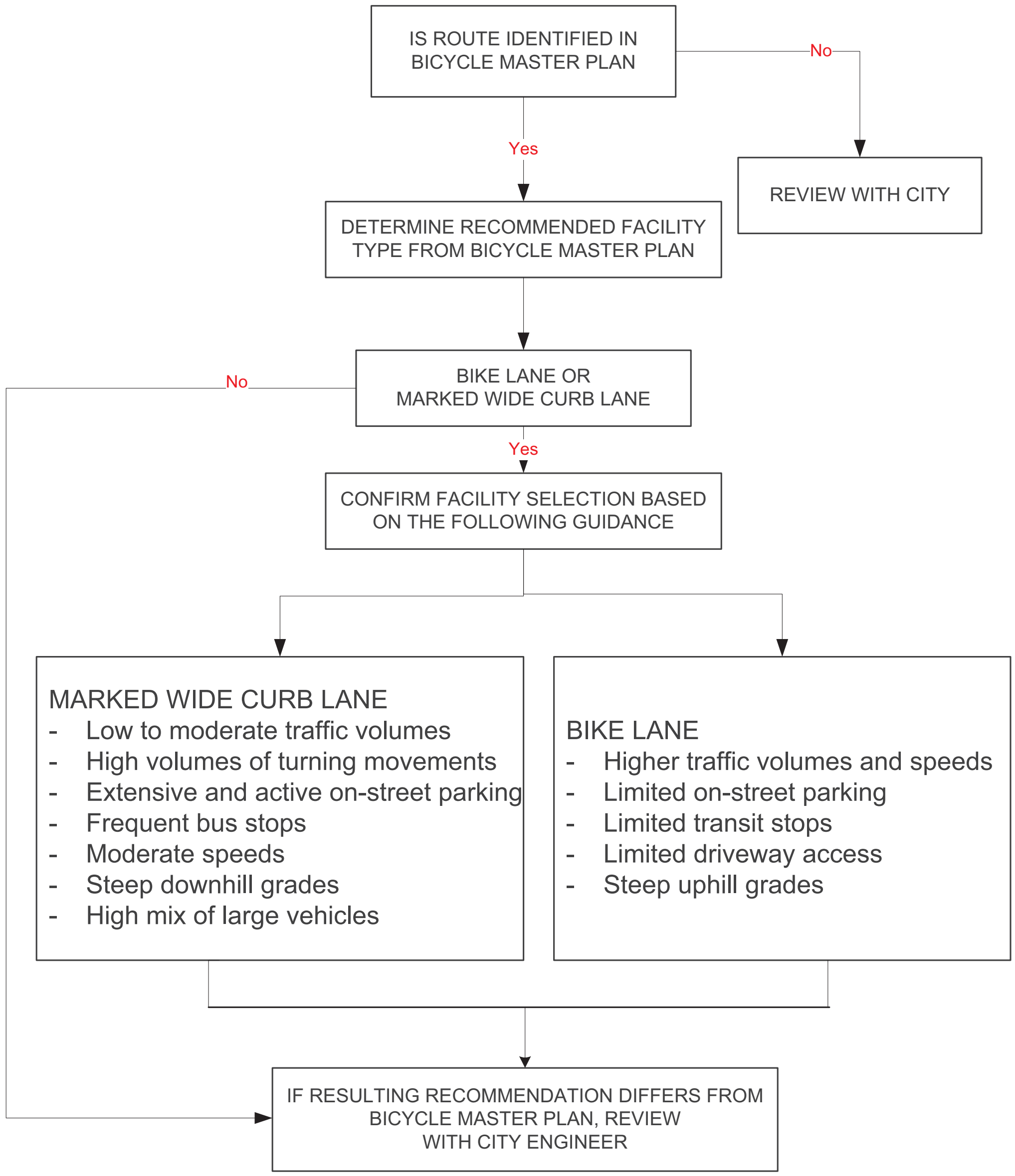
BACKGROUND

Cyclists should be expected on every road in the City except on those prohibited by regulatory signage due to an adjacent cycling facility. Road standards should accommodate the cyclists, and specific facilities should be in place for those routes anticipating high cycling demand.

ROAD CLASS

Flexibility between a bike lane and a marked wide curb lane is available on major, minor, and downtown arterials; major collectors; and hillside and industrial roads.

Cyclist Decision Matrix



<u>ISSUES TO CONSIDER</u>

In addition to the guidance provided in considering the type of bicycle facility, the following issues should be addressed when accommodating cyclists:

- Is the transition between the provision of a bicycle facility and none visible and understood?
- Does the bicycle facility encourage cycling traffic to a location unsafe for cyclists?

Provision of Median

BACKGROUND

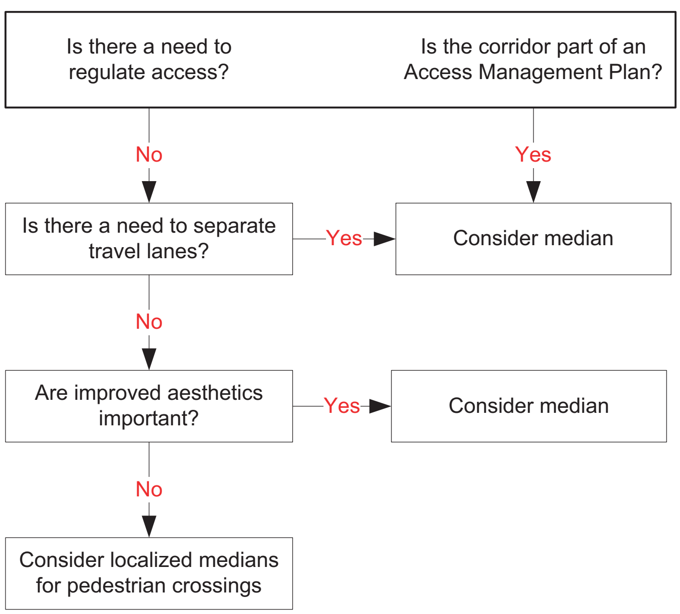
The inclusion of a center median on a road has numerous benefits. Medians provide comfort and safety by separating the opposing streams of traffic, reducing headlight glare, and allowing for left turn bays at intersections. Medians can regulate access by eliminating left-in and left-out turns. From a pedestrian viewpoint, raised medians provide a central refuge for crossing busy roads. These benefits all result in a reduced potential for head-on and rear-end type collisions. Medians can be flush (painted) or raised. Raised medians offer the greatest safety for all road users, but painted medians provide room for emergency service vehicles, safer maintenance, and space for police road checks.

Engineering judgment is required on each specific median installation to determine the appropriate median treatment for the location.

ROAD CLASS

Flexibility on the installation of medians exists on minor arterials, downtown arterials, major, minor, and hillside collectors.

Median Decision Matrix



ISSUES TO CONSIDER

When designing a corridor with a median, consider the consequences beyond the design corridor due to a possible increase in circulating traffic.

Provision of Sidewalks on Both Sides of Minor Collector Roadways

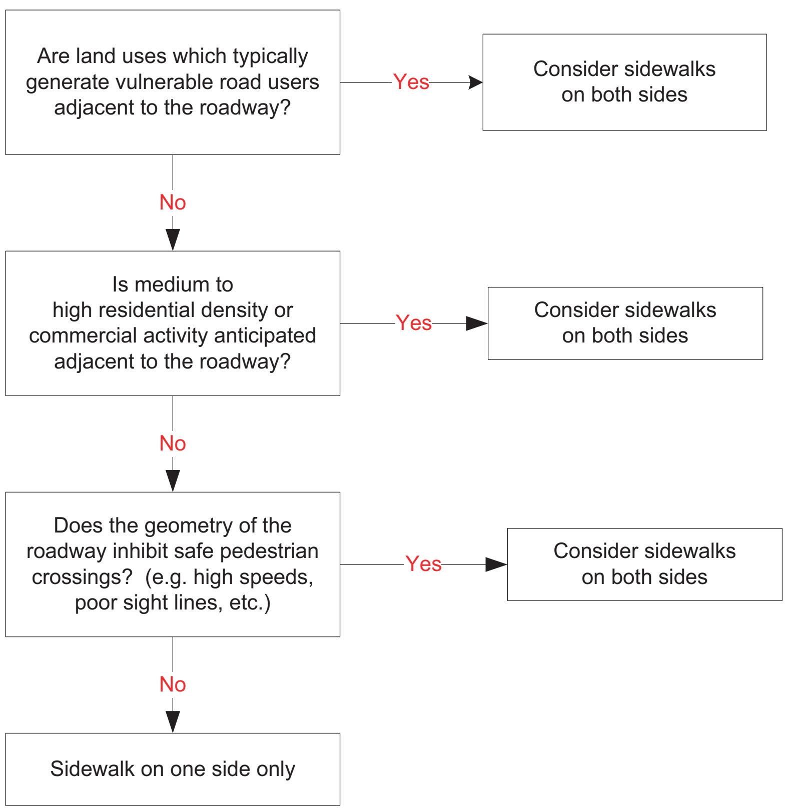
BACKGROUND

Sidewalks are key components for moving pedestrians throughout the transportation network. However, recognizing the cost impacts that sidewalks have on both the taxpayer and developer, the City has looked at ways to minimize the construction of unnecessary sidewalks. For this reason, the City generally requires sidewalks on both sides of Arterial and Major Collector roadways whereas sidewalks are generally only required on one side of local roadways.

Minor collectors function as both collector and local roads. Therefore, these roadways were included in the guided flexibility section of this document to determine sidewalk requirements.

ROAD CLASS

This section on guided flexibility is intended for use on Minor Collector roadways.



Separation of Sidewalk

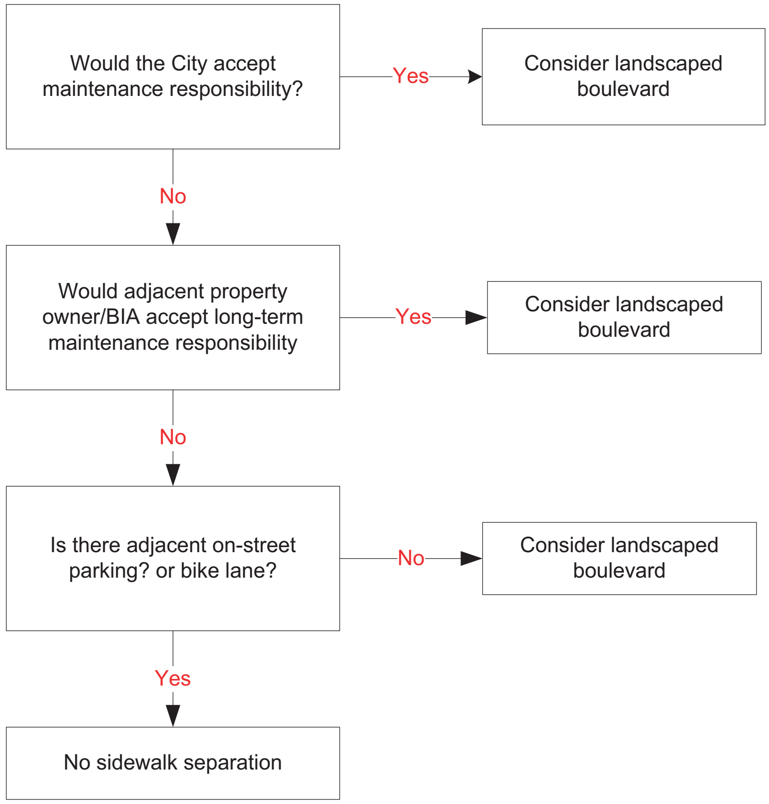
<u>BACKGROUND</u>

It is preferable to separate sidewalks from the road surface for a number of safety benefits. A boulevard area reduces the probability of a vehicle/pedestrian collision, increases the safety for pedestrians and children at play, and provides a space for snow storage thus allowing the sidewalks to remain usable for pedestrians. The increased comfort level for pedestrians can lead to an increase in pedestrian activity and support travel demand management concepts.

Improved neighbourhood aesthetics can be achieved with landscaping of the boulevards, however trees located in the boulevards should not restrict sightlines, signs or street lighting. The expectancy of proper maintenance on boulevards has to be considered prior to landscaping. While adjacent individual residential properties may not provide the expectancy of continued maintenance, maintenance adjacent to commercial or strata developed properties can be pursued through maintenance agreements. Alternatively, hard landscaping could also be achieved through such efforts as stamped concrete, thus providing a differentiation between sidewalk and boulevard.

ROAD CLASS

Flexibility exists for all road classes for the provision of separated sidewalks.



ISSUES TO CONSIDER

Special care is required with landscaped boulevards so as to not affect sightlines from intersections and driveways. Also, design of the adjacent developments should consider the irrigation requirements of a landscaped boulevard.

Appendix B: Functional Checklist

Road: ____________________ from __________________ to __________________

Road Classification: ________________________________

	Option	Details
Parking	☐ No Parking ☐ Parking One Side ☐ Parking Two Sides	 Parking Lane Width _____ m Parking Lane Widths __ m
	☐ As per standard ☐ Justification provided for removal of parking	
Accommodation of Cyclists	☐ Shared Lane ☐ Marked Wide Curb Lane ☐ Bike Lane ☐ Multi-use Pathway	 MWCL Width ____ m Bike Lane Width _______ m
	☐ As per standard ☐ As per Bicycle Master Plan ☐ Guided decision (justification attached)	
Access Control	☐ No Median ☐ 2 m Median or greater ☐ 4 m Median or greater	
	☐ As per standard ☐ As per access management plan ☐ For separation of lanes ☐ For aesthetics	
Pedestrian Buffer	☐ Boulevard ☐ No Boulevard	Boulevard width ____ m Border width_____ m
	☐ As per standard ☐ Maintenance issue - hard surface boulevard ☐ Maintenance issue - separation obtained in other ways	
Travel Lanes	☐ 1 travel lane per direction ☐ 2 travel lanes per direction ☐ 3 travel lanes per direction ☐ Two-way left turn lane	 10 year ADT ___ vpd 20 year ADT ___ vpd
	☐ As per standard ☐ Calculated capacity requirement	

Appendix C: City of Kamloops - Design Criteria Form

Road: ______________________________

Location: ______________________________

Length: ______________________________

Criteria	Selection
Road Classification	
Design Speed	
Design Vehicle	
Traffic Design Year	
Minimum Radius	
K Factor - Sag	
K Factor - Crest	
Maximum Grade	
Maximum Super Elevation	
Minimum Stopping Sight Distance	
Decision Sight Distance	
Crossing Sight Distance	
Turning Sight Distance	
ROW Width	
Pavement Width (including median)	
Median Width	
Number of Travel Lanes	
Number of Parking Lanes	
Number of Sidewalks	
Sidewalk Width	
Boulevard Width	
Border Width	
Curb Type	

Appendix D: Design Submission Checklist

This checklist should be used by the Designer Engineer during the preparation of design submissions. The Design Engineer should confirm that the issues listed have been complied with and that the various design elements satisfy the appropriate design standards or guidelines. Where violations of the design standards or guidelines occur, these should be noted in the appropriate column and/or cross-referenced to the comments sheet at the back of this Appendix where full details should be provided.

Project Name: ______________________________

Project Location: ______________________________

Project Number: ______________________________

Reviewed by: ____________________ Date: ______________

Approved by: ____________________ Date: ______________

A. Speed

	Description	Y/N	Note
1.	Is the design speed in accordance with the City's design guidelines and logical with respect to the topography and traffic environment?		
2.	Are design speed changes consistent and logical?		
3.	Have operating speeds for facility been predicted?		
4.	Have posted speed limits been checked to ensure they are appropriate for the conditions and adequate for each curve?		
5.	Are posted speeds consistent with speed limits on similar roads?		

B. Cross-section/Parking/Sightlines

	Description	Y/N	Note
1.	Are cross-section elements in accordance with the City's design guidelines for the road classification and design speed, including: • number of lanes and lane width? • shoulders and shoulder width? • medians and median width? • sidewalks? • boulevards and borders?		
2.	Has the cross-section been checked to confirm it is suitable for the ultimate requirements of the road (i.e. future expansion)?		
3.	Does lane width accommodate larger vehicles such as emergency vehicles, school buses and trucks?		
4.	Have all turning movements been checked with the design vehicle templates?		
5.	Is on-street parking provided and if so, is it in accordance with the City's design guidelines?		
6.	Has sight distance been checked: • on horizontal and vertical curves? • at intersections? • at accesses?		
7.	Has visibility been checked where signs, poles, bridge abutments, snow storage, buildings, controller boxes, and on-street parking, etc. may obstruct sightlines?		
8.	Have stopping sight distances been confirmed where median and roadside barriers are used?		

C. Cyclists and Pedestrians

	Description	Y/N	Note
1.	Have all pedestrian requirements been addressed (e.g. along the road and across the road), and are routes complete and do they facilitate all users?		
2.	Does sidewalk width address special cases (e.g. high pedestrian volume areas, crosswalks, bus stops, schools, etc.)		
3.	Has the visibility to and from pedestrian crossing locations been checked?		
4.	Have boulevards and border areas been provided?		
5.	Has snow accumulation/storage been considered?		
6.	Is there a requirement to provide for cyclists? If so, does provision for cyclists meet City guidelines?		
7.	Are cyclist facilities clearly identified (e.g. does pavement marking and signing meet guidelines)?		

D. Transit

	Description	Y/N	Note
1.	Have transit requirements been addressed, including: • Bus bay/pull outs? • Locations (e.g. on far side of intersections and crosswalks)? • Space for waiting transit users (e.g. widened sidewalk area)?		
2.	Has snowfall accumulation been considered in the design?		

E. Roadside Safety

	Description	Y/N	Note
1.	Have clear zone requirements been achieved?		
2.	Has the location of all service and utility poles, signal poles, and fixed objects been considered in terms of safety?		
3.	Has consideration been given to locating utilities underground and relocating fixed object hazards to where they are less likely to be hit?		
4.	Have breakaway devices been provided where it is impossible to locate poles, signs, etc. outside of the clear zone?		
5.	Have barrier warrants been checked?		
6.	Does barrier placement meet City standards and/or guidelines, and are barrier treatments consistent throughout?		
7.	Is landscaping in accordance with the appropriate design standards?		
8.	Has landscaping design been checked to ensure clearances and sightlines are not restricted?		

Comments:

Appendix E: Road Form Checklist

This checklist should be used by City staff when reviewing and approving design submissions prepared either in-house or by external resources.

Project Name: ______________________________

Project Location: ______________________________

Project Number: ______________________________

Reviewed by: ______________________ Date: __________

Approved by: ______________________ Date: __________

A. Speed

	Description	Y/N	Note
1.	Is design speed logical with respect to topography and consistent with the road function as perceived by the driver?		
2.	Has the continuity of the design speed and the posted speed been checked?		
3.	Have operating speeds for facility been predicted?		
4.	Does expected operating speed meet driver expectations (i.e. consistent to similar types of road elsewhere across the network)?		
5.	Are posted speed limits appropriate to the traffic environment and likely to be perceived as reasonable by the motorist?		
6.	Is posted speed reasonably consistent with speed limits on similar roads across the network (and in neighbouring jurisdictions)?		

B. Cross-Section/Parking/Sightlines

	Description	Y/N	Note
1.	Are design parameters consistent (e.g. in cross-section, alignment and at intersections)?		
2.	Are design standards consistent with adjacent road network, especially at tie-ins?		
3.	Has the cross-section been checked to confirm it is suitable for the ultimate requirements of the road, including: • classification • design speed • level of service/peak service volume?		
4.	Can adjustments in dimensions be made for future expansion possibilities?		
5.	Is the lane width sufficient for design speed, classification, and all vehicle types? Have emergency vehicles, school buses, and trucks been considered?		
6.	Is the number of lanes appropriate for the roadway function?		
7.	Has consideration been given to the impact of lane width on cyclists?		
8.	Are shoulder widths adequate for all vehicle and road users?		
9.	Is shoulder treatment appropriate for road classification?		
10.	Are shoulders continuous along the roadway, and are they clearly identified from travelled lanes?		
11.	Is sufficient pavement width provided along curves where off-tracking characteristics of vehicles are expected?		
12.	Is type of median chosen appropriate? (e.g. for classification and for width available)		
13.	Does median width allow for future inclusion of left turn lanes?		

	Description	Y/N	Note
14.	Does median width provide adequate pedestrian refuge, particularly where large crossing volumes are anticipated?		
15.	Are slopes of grass median adequate?		
16.	Are median barrier offsets in the correct range of values?		
17.	Have off-street parking opportunities been explored?		
18.	Have measures been taken to address potential speeding when on-street parking spaces are unused (i.e. resulting from "wide road" appearance)?		
19.	Has parking been removed on approaches to crosswalks, intersections, and near school entrances?		
20.	Are all sight distances adequate for all movements and road users?		
21.	Are there any upstream or downstream features which may affect safety? (i.e. "visual clutter", parking, high volume driveways)		
22.	Could sight lines be temporarily obstructed by parked vehicles, snow storage, seasonal foliage, etc.?		
23.	Has snow fall accumulation been considered in the design? (i.e. storage, sight distance around snow banks, impact on usable lane width, parking width and sidewalk widths, pedestrian access, etc.)		
24.	Does the combination of cross-section elements make the road self-explaining and complement driver expectations?		

C. Cyclists and Pedestrians

	Description	Y/N	Note
1.	Are pedestrian routes complete throughout the scheme, and do they facilitate all users (e.g. visually impaired and mobility handicapped)?		
2.	Has a boulevard been provided to separate pedestrians from motor vehicles?		
3.	Does sidewalk width address special cases (e.g. high pedestrian volume areas, bus stops, intersection areas, crosswalks, specific locations such as schools, parks, hospitals, seniors' homes, and recreational facilities)?		
4.	Does sidewalk width consider snow accumulation/storage?		
5.	Has consideration been given to providing an off-road path in rural areas (instead of a shoulder)?		
6.	Has the visibility to and from pedestrian crossing locations been checked?		
7.	Have curb extensions been considered where pedestrians cross?		
8.	Is provision for cyclists consistent with similar facilities across the road network? Is treatment consistent with adjacent road system (i.e. at interfaces)?		
9.	Are shoulders wide enough to accommodate cyclists/pedestrians where required?		
10.	Are bike lanes clearly identified?		
11.	Has allowance been made for cyclists passing parked, or parking, vehicles?		
12.	Have shared lane or bike lane widths been widened on steep grades to allow for "wobble"?		

D. Transit

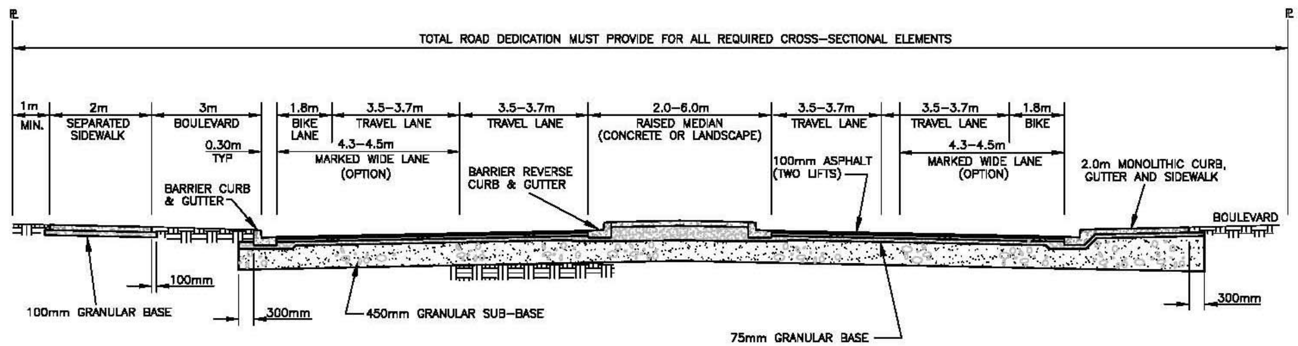
	Description	Y/N	Note
1.	Are bus stops located on the far side of intersections and crosswalks?		

E. Roadside Safety

	Description	Y/N	Note
1.	Is the clear zone of adequate dimensions, and have site-specific locations been addressed?		
2.	Are there non-traversable or fixed object hazards (temporary or permanent) within the clear zone?		
3.	Have breakaway devices been provided where it is impossible to locate poles, signs, etc. outside of the clear zone?		
4.	Has the location of all service and utility poles, signal poles, and fixed objects been considered in terms of safety? Can they be relocated to where they are less likely to be hit (e.g. in the border area)?		
5.	Can utilities be located underground?		
6.	Is adequate protection provided where required? (e.g. barriers)		
7.	Has consideration been given to minimizing the number of poles by combining usage, or increasing pole spacing?		
8.	Are sight lines obstructed by signs, poles, bridge abutments, buildings, etc.		
9.	Are required clearances and sight distances restricted due to landscaping elements? (consider also future plant growth)		
10.	Are barrier treatments consistent throughout?		
11.	Are barrier offsets adequate?		
12.	Does barrier obstruct sight lines?		
13.	Has an explicit evaluation of alternative roadside design options been completed (e.g. use of crash prediction and cost effectiveness models)?		
14.	Has consideration been given to safe access and servicing arrangements for signals, street furniture, public utility equipment, etc.?		
15.	Are curb types appropriate for this facility and design speed?		

Comments:

Appendix F: Design Guideline Drawings - Roads



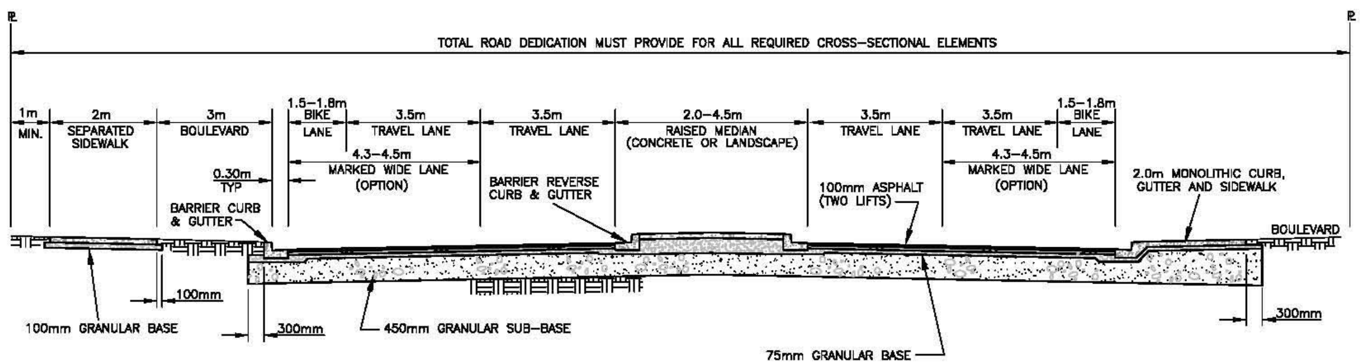
For Specifications refer to:
- Current MMCD.
- City of Kamloops Supplementary Specifications to MMCD.
- City of Kamloops Design Guideline Manual – Road Section

NO.	DATE	REVISION DESCRIPTION	BY	APP

MAJOR URBAN ARTERIAL
DESIGN GUIDELINE
DRAWING

CITY OF KAMLOOPS

DWN. BY: DAR	CHK'D BY: J.Dx		SCALE: N.T.S.	DATE: 2012 JAN 06	DWG. NO.: DGR1	REV.:



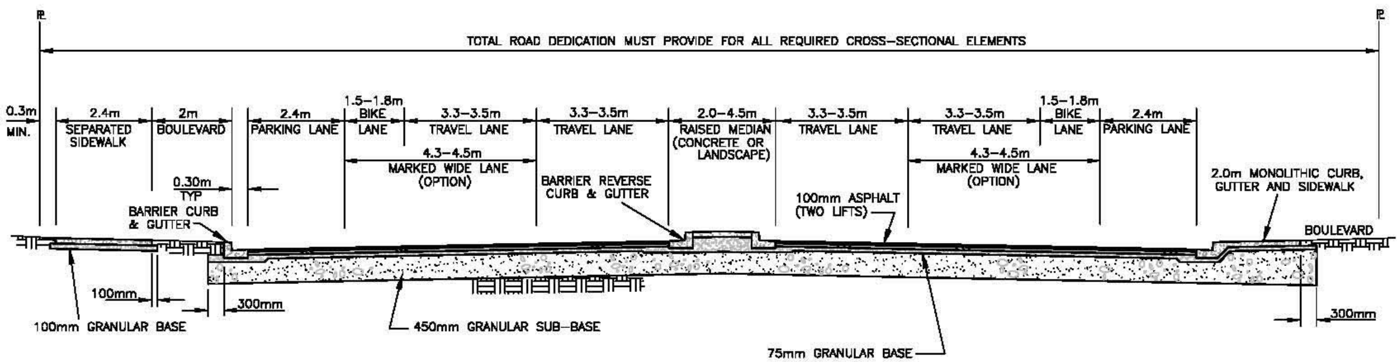
For Specifications refer to:
- Current MMCD.
- City of Kamloops Supplementary Specifications to MMCD.
- City of Kamloops Design Guideline Manual – Road Section

NO.	DATE	REVISION DESCRIPTION	BY	APP

MINOR URBAN ARTERIAL
DESIGN GUIDELINE
DRAWING

CITY OF KAMLOOPS

DWN. BY: DAR | CHK'D BY: J.Dx | SCALE: N.T.S. | DATE: 2012 JAN 25 | DWG. NO.: DGR2 | REV.:



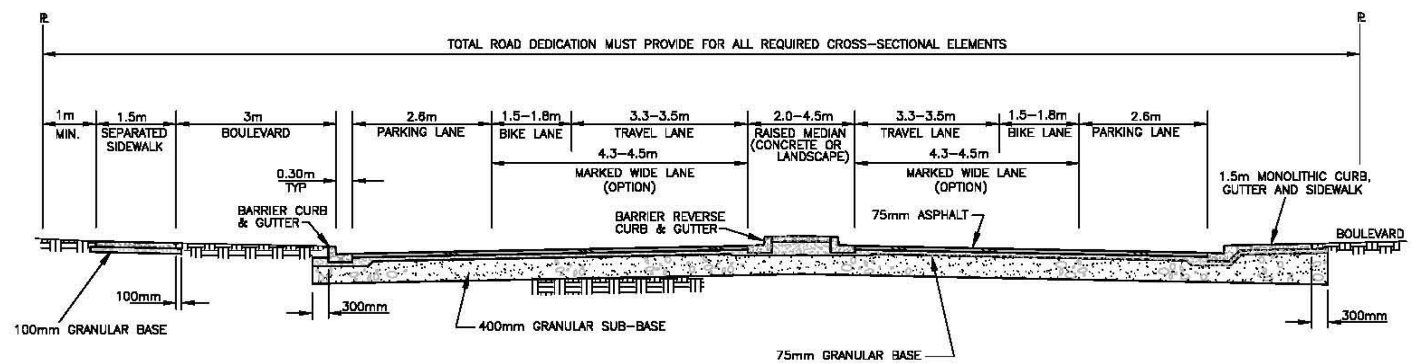
For Specifications refer to:
- Current MMCD.
- City of Kamloops Supplementary Specifications to MMCD.
- City of Kamloops Design Guideline Manual – Road Section

NO.	DATE	REVISION DESCRIPTION	BY	APP

DOWNTOWN ARTERIAL DESIGN GUIDELINE DRAWING

CITY OF KAMLOOPS

DWN. BY: DAR	CHK'D BY: J.Dx		SCALE: N.T.S.	DATE: 2012 JAN 06	DWG. NO.: DGR3	REV.:



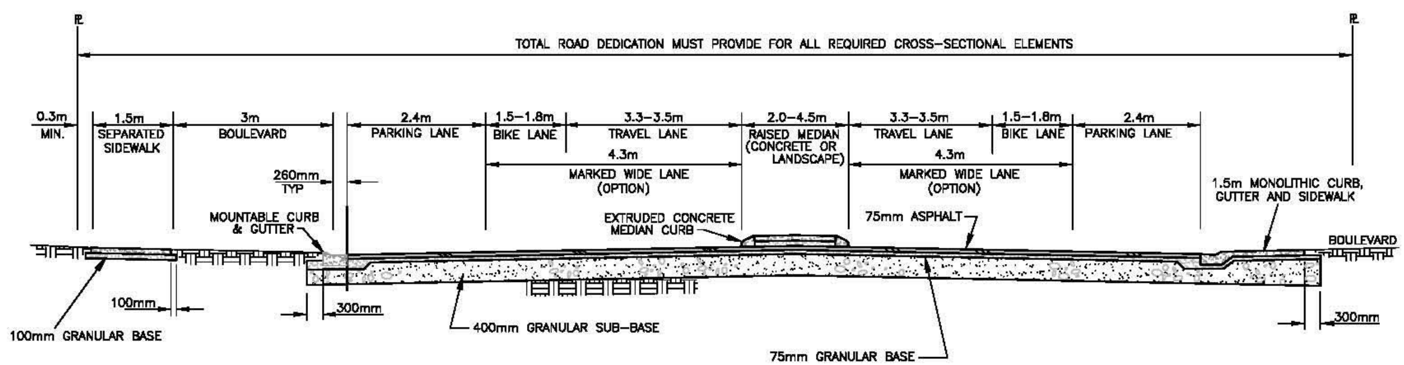
For Specifications refer to:
- Current MMCD.
- City of Kamloops Supplementary Specifications to MMCD.
- City of Kamloops Design Guideline Manual – Road Section

NO.	DATE	REVISION DESCRIPTION	BY	APP

MAJOR URBAN COLLECTOR DESIGN GUIDELINE DRAWING

CITY OF KAMLOOPS

DWN. BY: DAR	CHK'D BY: J.Dx		SCALE: N.T.S.	DATE: 2012 JAN 06	DWG. NO.: DGR4	REV.:



For Specifications refer to:
- Current MMCD.
- City of Kamloops Supplementary Specifications to MMCD.
- City of Kamloops Design Guideline Manual – Road Section

NO.	DATE	REVISION DESCRIPTION	BY	APP

MINOR URBAN COLLECTOR DESIGN GUIDELINE DRAWING

CITY OF KAMLOOPS

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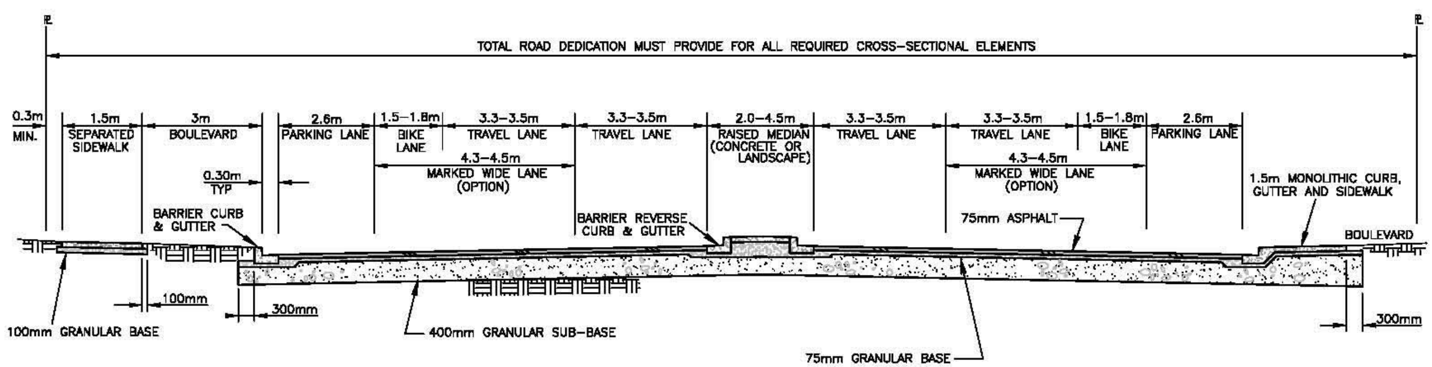

For Specifications refer to:
- Current MMCD.
- City of Kamloops Supplementary Specifications to MMCD.
- City of Kamloops Design Guideline Manual – Road Section

NO.	DATE	REVISION DESCRIPTION	BY	APP	HILLSIDE URBAN COLLECTOR DESIGN GUIDELINE DRAWING	CITY OF KAMLOOPS
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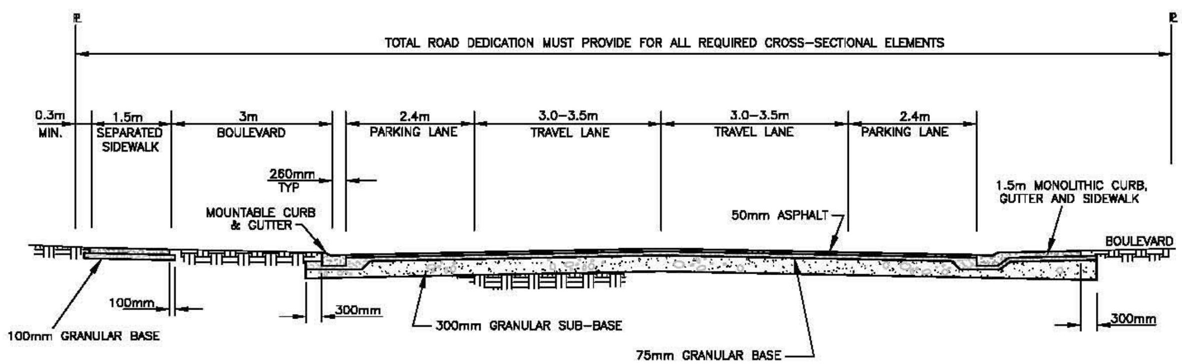

For Specifications refer to:
- Current MMCD.
- City of Kamloops Supplementary Specifications to MMCD.
- City of Kamloops Design Guideline Manual – Road Section

NO.	DATE	REVISION DESCRIPTION	BY	APP	URBAN LOCAL DESIGN GUIDELINE DRAWING	CITY OF KAMLOOPS
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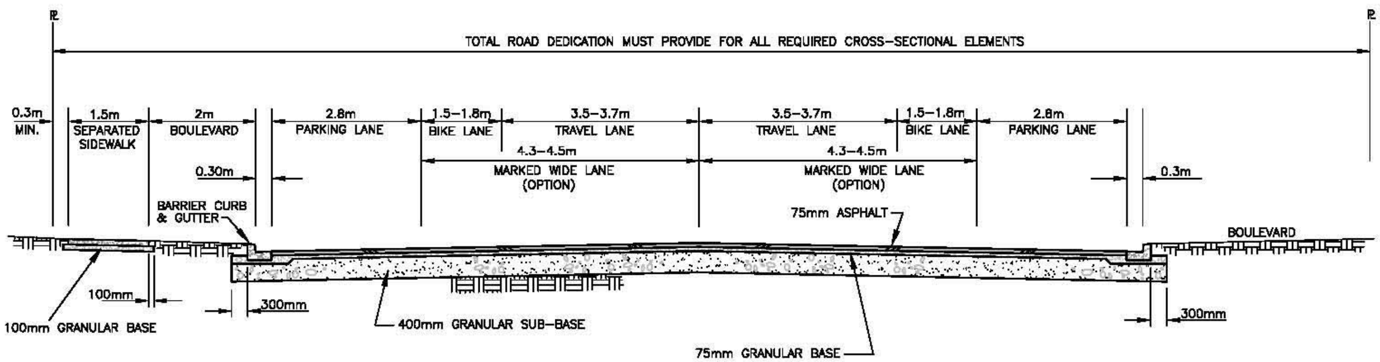

For Specifications refer to:
- Current MMCD.
- City of Kamloops Supplementary Specifications to MMCD.
- City of Kamloops Design Guideline Manual – Road Section

NO.	DATE	REVISION DESCRIPTION	BY	APP	URBAN INDUSTRIAL LOCAL DESIGN GUIDELINE DRAWING	CITY OF KAMLOOPS
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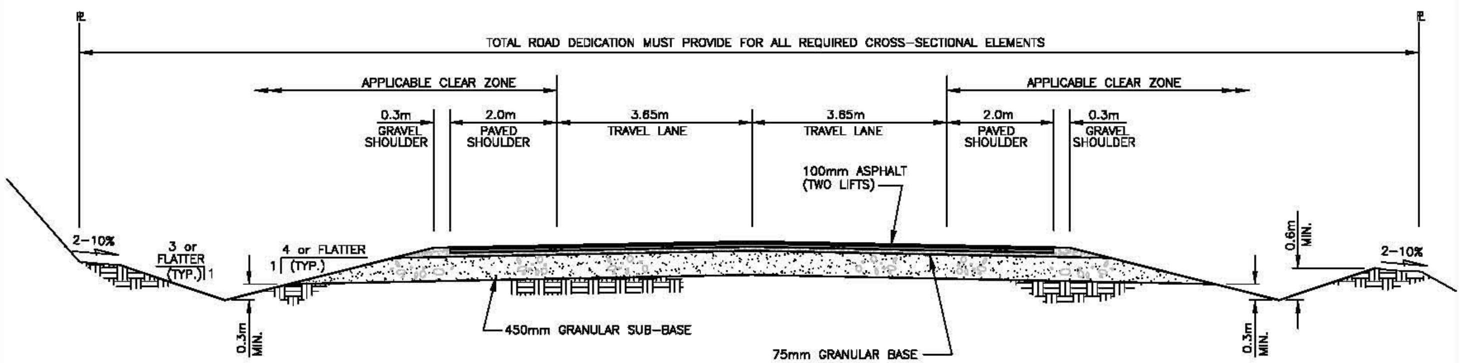


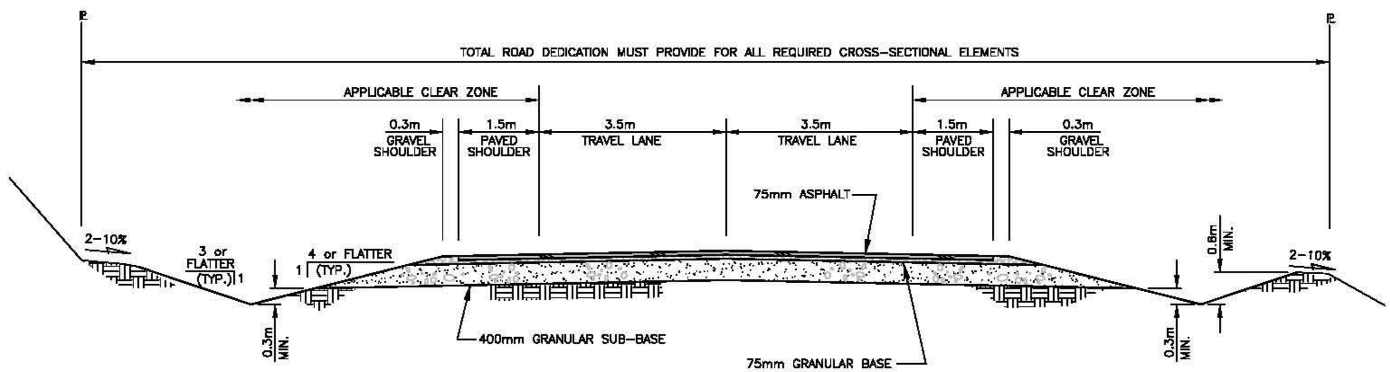
For Specifications refer to:
- Current MMCD.
- City of Kamloops Supplementary Specifications to MMCD.
- City of Kamloops Design Guideline Manual – Road Section

NO.	DATE	REVISION DESCRIPTION	BY	APP

RURAL ARTERIAL DESIGN GUIDELINE DRAWING

CITY OF KAMLOOPS

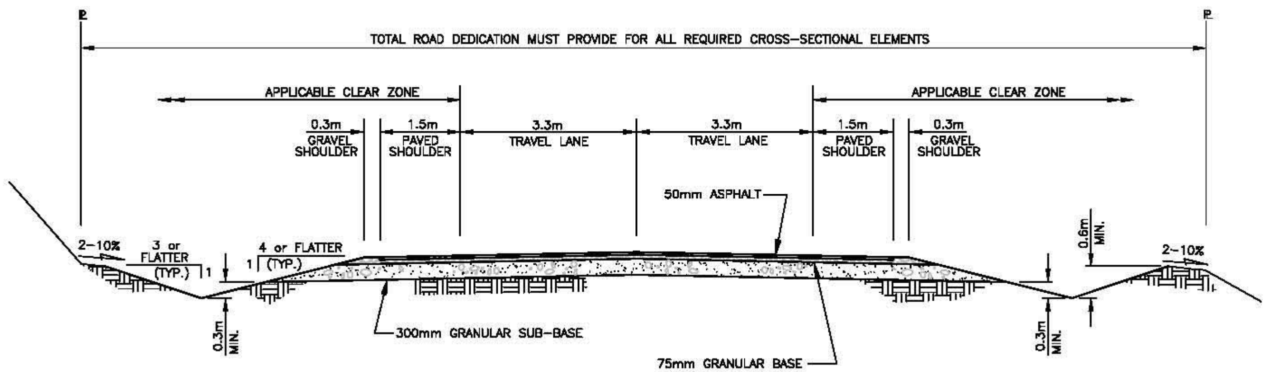
DWN. BY: DAR	CHK'D BY: J.Dx		SCALE: N.T.S.	DATE: 2012 JAN 10	DWG. NO.: DGR9	REV.:



For Specifications refer to:
- Current MMCD.
- City of Kamloops Supplementary Specifications to MMCD.
- City of Kamloops Design Guideline Manual – Road Section

NO.	DATE	REVISION DESCRIPTION	BY	APP	RURAL COLLECTOR DESIGN GUIDELINE DRAWING	CITY OF KAMLOOPS

DWN. BY: DAR	CHK'D BY: J.Dx		SCALE: N.T.S.	DATE: 2012 JAN 10	DWG. NO.: DGR10	REV.:



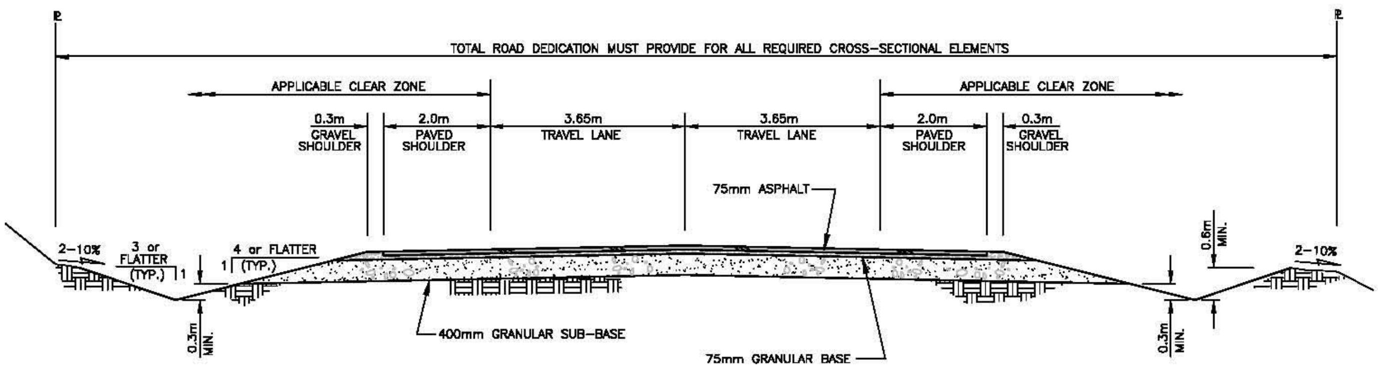
For Specifications refer to:
- Current MMCD.
- City of Kamloops Supplementary Specifications to MMCD.
- City of Kamloops Design Guideline Manual – Road Section

NO.	DATE	REVISION DESCRIPTION	BY	APP

RURAL LOCAL
DESIGN GUIDELINE
DRAWING

CITY OF KAMLOOPS

DWN. BY: DAR	CHK'D BY: J.Dx		SCALE: N.T.S.	DATE: 2012 JAN 10	DWG. NO.: DGR11	REV.:



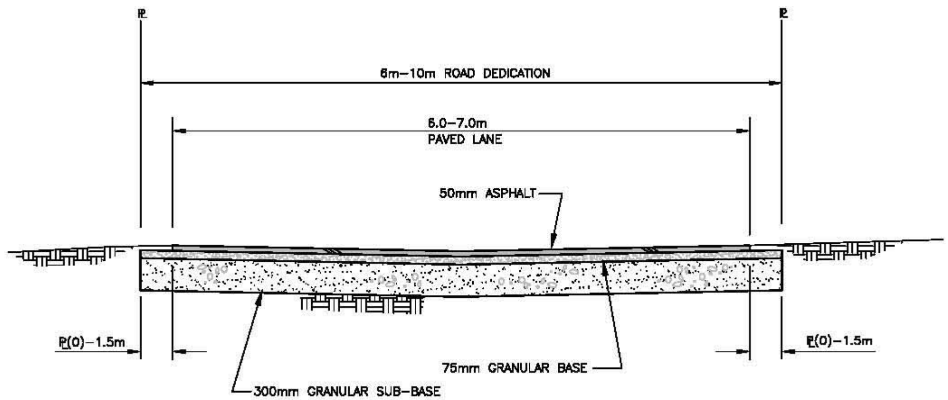
For Specifications refer to:
- Current MMCD.
- City of Kamloops Supplementary Specifications to MMCD.
- City of Kamloops Design Guideline Manual – Road Section

NO.	DATE	REVISION DESCRIPTION	BY	APP

RURAL INDUSTRIAL LOCAL
DESIGN GUIDELINE
DRAWING

CITY OF KAMLOOPS

DWN. BY: DAR	CHK'D BY: J.Dx		SCALE: N.T.S.	DATE: 2012 JAN 10	DWG. NO.: DGR12	REV.:



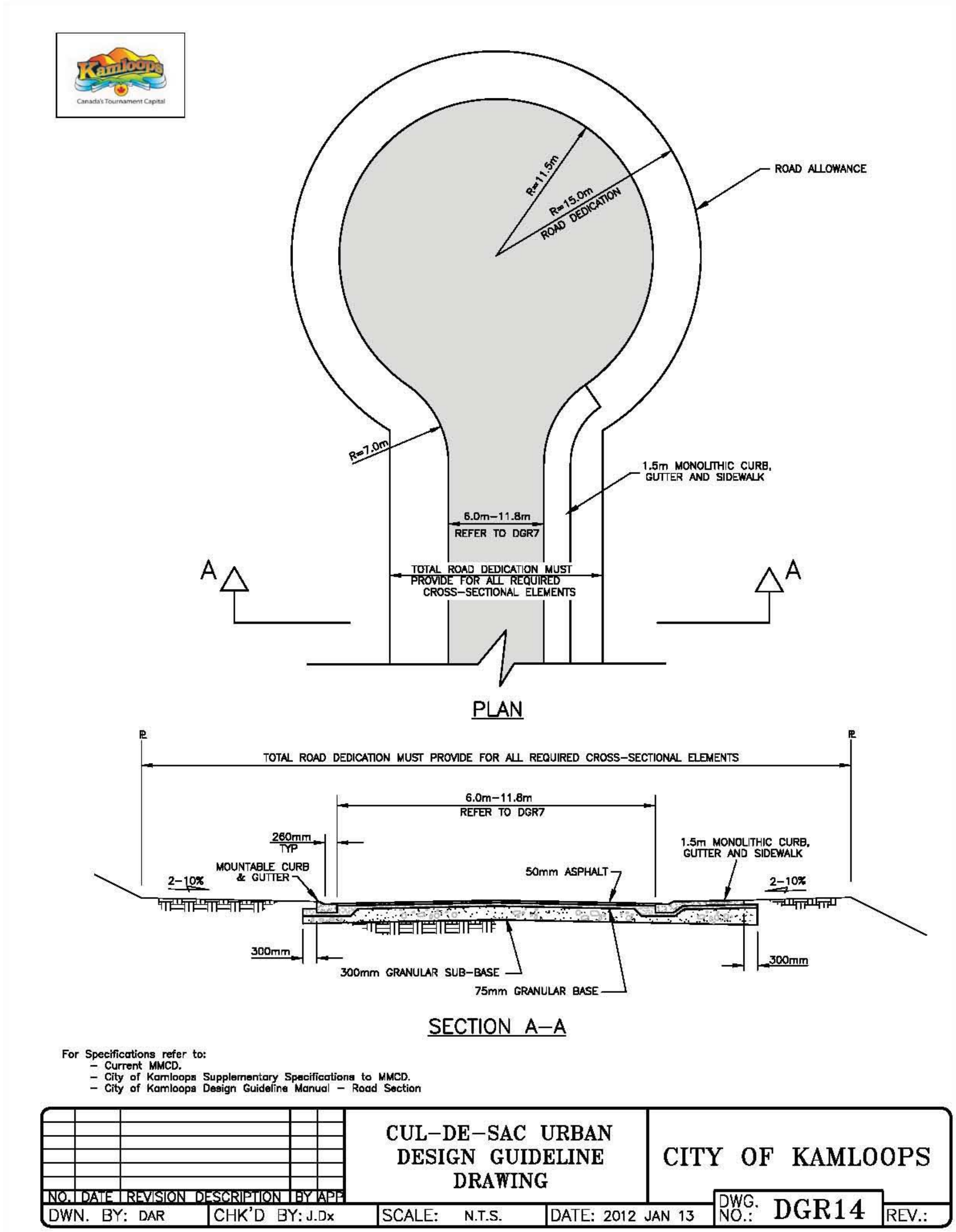
For Specifications refer to:
- Current MMCD.
- City of Kamloops Supplementary Specifications to MMCD.
- City of Kamloops Design Guideline Manual – Road Section

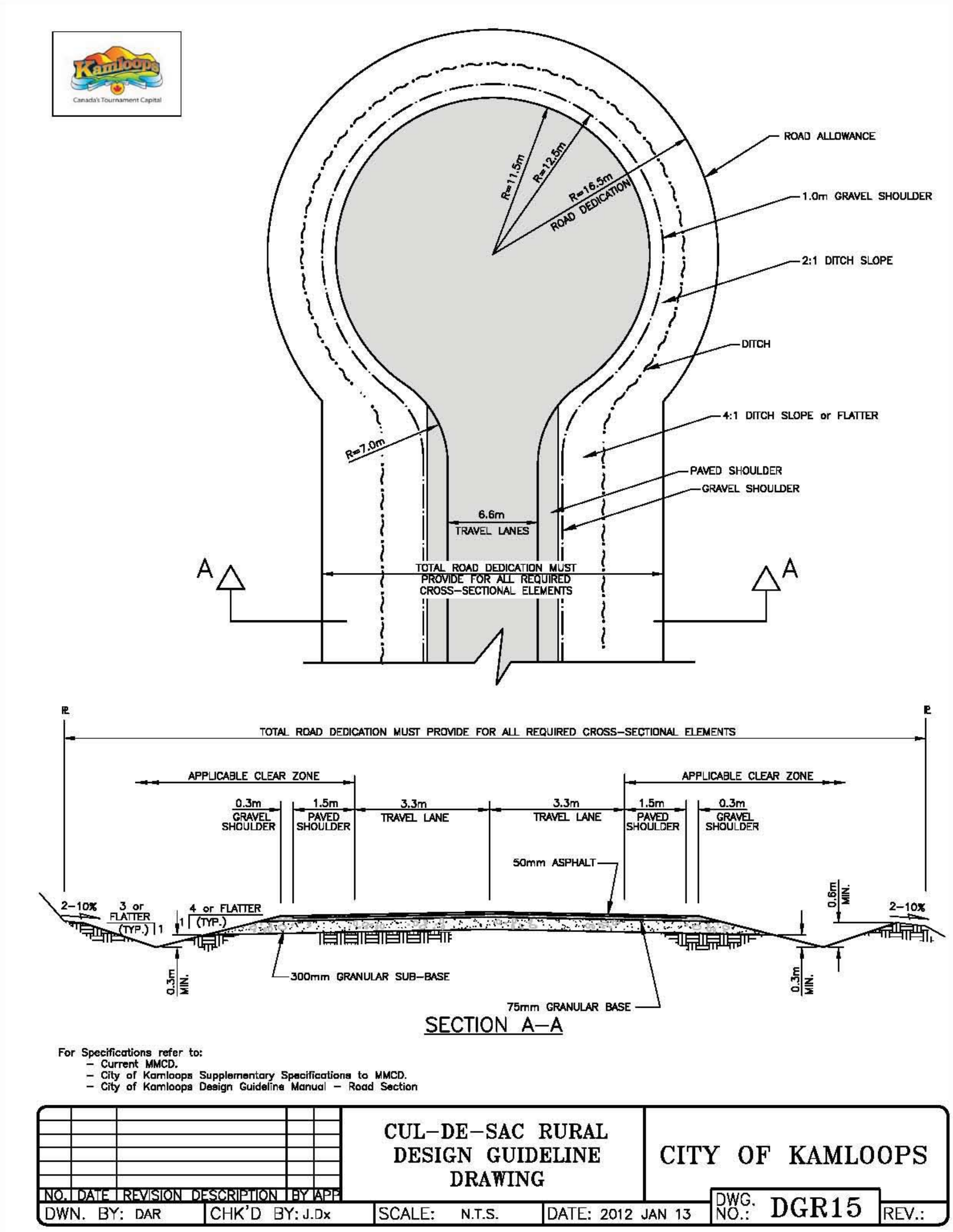
NO.	DATE	REVISION DESCRIPTION	BY	APP

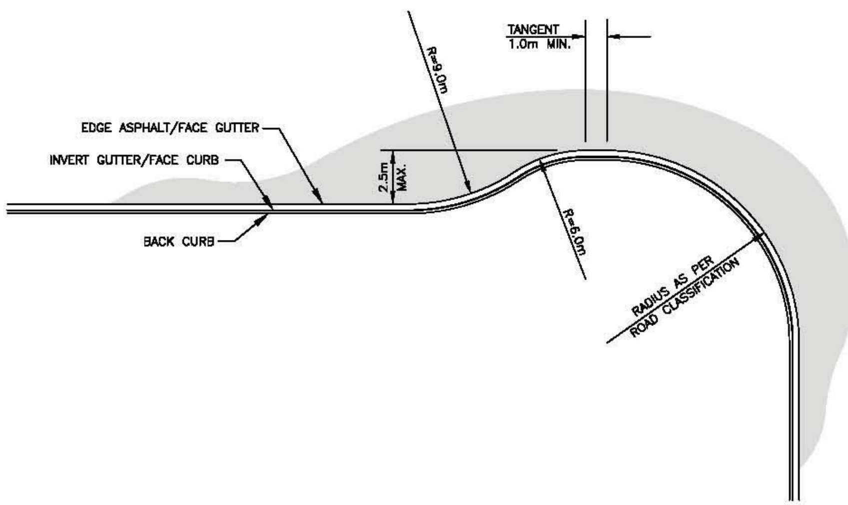
PAVED LANE URBAN
DESIGN GUIDELINE
DRAWING

CITY OF KAMLOOPS

DWN. BY: DAR | CHK'D BY: J.Dx | SCALE: N.T.S. | DATE: 2012 JAN 10 | DWG. NO.: DGR13 | REV.:


Kamloops
Canada's Tournament Capital
R=11.5m
R=15.0m
ROAD DEDICATION
ROAD ALLOWANCE
R=7.0m
1.5m MONOLITHIC CURB, GUTTER AND SIDEWALK
6.0m–11.8m
REFER TO DGR7
TOTAL ROAD DEDICATION MUST PROVIDE FOR ALL REQUIRED CROSS–SECTIONAL ELEMENTS
A
A
PLAN
TOTAL ROAD DEDICATION MUST PROVIDE FOR ALL REQUIRED CROSS–SECTIONAL ELEMENTS
6.0m–11.8m
REFER TO DGR7
260mm TYP
MOUNTABLE CURB & GUTTER
2–10%
50mm ASPHALT
1.5m MONOLITHIC CURB, GUTTER AND SIDEWALK
2–10%
300mm
300mm GRANULAR SUB–BASE
75mm GRANULAR BASE
300mm
SECTION A–A
For Specifications refer to:
– Current MMCD.
– City of Kamloops Supplementary Specifications to MMCD.
– City of Kamloops Design Guideline Manual – Road Section
NO. DATE REVISION DESCRIPTION BY APP
CUL–DE–SAC URBAN DESIGN GUIDELINE DRAWING
CITY OF KAMLOOPS
DWN. BY: DAR
CHK'D BY: J.Dx
SCALE: N.T.S.
DATE: 2012 JAN 13
DWG. NO.: DGR14
REV.:


Kamloops
Canada's Tournament Capital
ROAD ALLOWANCE
1.0m GRAVEL SHOULDER
2:1 DITCH SLOPE
DITCH
4:1 DITCH SLOPE or FLATTER
PAVED SHOULDER
GRAVEL SHOULDER
R=11.5m
R=12.5m
R=16.5m ROAD DEDICATION
R=7.0m
6.6m TRAVEL LANES
TOTAL ROAD DEDICATION MUST PROVIDE FOR ALL REQUIRED CROSS-SECTIONAL ELEMENTS
A
A
TOTAL ROAD DEDICATION MUST PROVIDE FOR ALL REQUIRED CROSS-SECTIONAL ELEMENTS
APPLICABLE CLEAR ZONE
APPLICABLE CLEAR ZONE
0.3m GRAVEL SHOULDER
1.5m PAVED SHOULDER
3.3m TRAVEL LANE
3.3m TRAVEL LANE
1.5m PAVED SHOULDER
0.3m GRAVEL SHOULDER
50mm ASPHALT
2-10%
3 or FLATTER (TYP.) 1
4 or FLATTER 1 (TYP.)
0.6m MIN.
2-10%
0.3m MIN.
300mm GRANULAR SUB-BASE
0.3m MIN.
75mm GRANULAR BASE
SECTION A-A
For Specifications refer to:
– Current MMCD.
– City of Kamloops Supplementary Specifications to MMCD.
– City of Kamloops Design Guideline Manual – Road Section
CUL-DE-SAC RURAL DESIGN GUIDELINE DRAWING
CITY OF KAMLOOPS
NO. DATE REVISION DESCRIPTION BY APP
DWN. BY: DAR
CHK'D BY: J.Dx
SCALE: N.T.S.
DATE: 2012 JAN 13
DWG. NO.: DGR15
REV.:



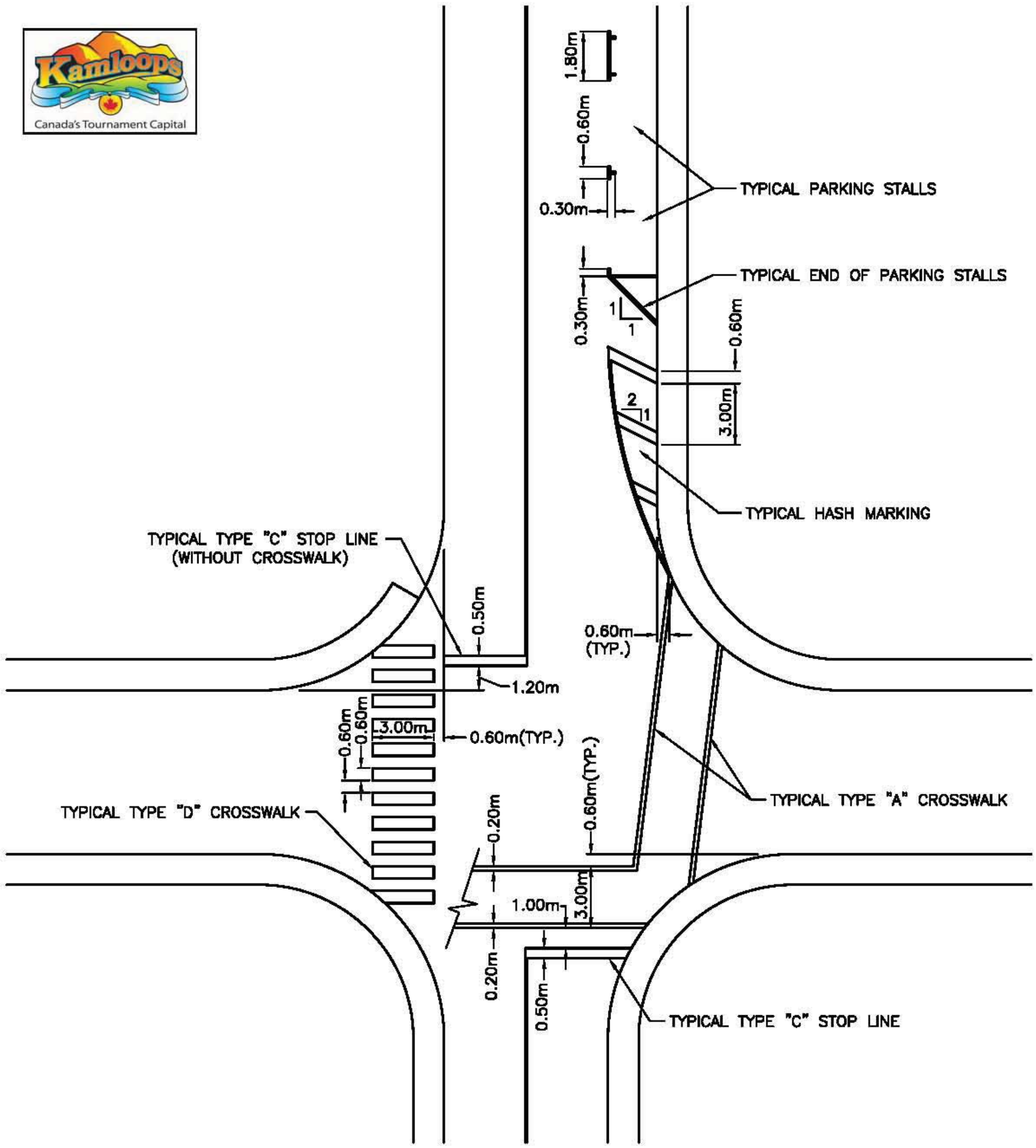
For Specifications refer to:
- Current MMCD.
- City of Kamloops Supplementary Specifications to MMCD.
- City of Kamloops Design Guideline Manual – Road Section

NO.	DATE	REVISION DESCRIPTION	BY	APP

CURB EXTENSION
DESIGN GUIDELINE
DRAWING

CITY OF KAMLOOPS

DWN. BY: DAR | CHK'D BY: J.Dx | SCALE: N.T.S. | DATE: 2012 JAN 10 | DWG. NO.: DGR16 | REV.:



For Specifications refer to:
- Current MMCD.
- City of Kamloops Supplementary Specifications to MMCD.
- City of Kamloops Design Guideline Manual – Road Section

NO.	DATE	REVISION DESCRIPTION	BY	APP	PAINT MARKING TYPE "A" & "D" CROSSWALKS, TYPE "C" STOP LINE DESIGN GUIDELINE DRAWING	CITY OF KAMLOOPS

DWN. BY: DAR	CHK'D BY: J.Dx	SCALE: N.T.S.	DATE: 2012 JUL 20	DWG. NO.: DGR17	REV.: