

3 Roadway Systems

3.1 GENERAL

This guideline covers the general design and construction of roads, lanes, curbs, gutters, sidewalks, boulevards, and accessories to be built or re-built in the Town of Lamont. Drawings relating to roadway design and construction are provided in the Municipal Development Standard Drawings.

3.2 TRAFFIC & TRANSPORTATION

These requirements and standards are the minimum basis for roadway and walkway facilities. Changes in the design values may be considered, provided that the changes are justified and added benefits are provided by the Developer to the Town's satisfaction.

Roadway capacity and safety can be affected by the following factors:

- Roadway Geometrics - Road right-of-way, road width, lane width, storage turnbay lengths and geometrics, grade and curvature, intersection configuration, etc.;
- Traffic Characteristics - Traffic volume, speed, traffic composition, traffic fluctuations, saturation flow, etc.;
- Road "Frictions" - Traffic control measures, parking conditions, access locations and numbers, driver sight distance, street furniture, etc.

3.3 ROAD CLASSIFICATION AND GEOMETRIC STANDARDS

The classification and designation of roads and walks shall be undertaken during the subdivision design stage, commencing with the Outline Plan, in order that roads and walks, utility, and right-of-way requirements can be coordinated, established and approved in the design stages of subdivision development.

3.3.1 General

- Roads are classified in a functional hierarchy. The road classifications are local, collector, and arterial;
- The design standards for roads shall be in accordance with the geometric design standards outlined in the latest edition of the "Geometric Design Guide for Canadian Roads" by the Transportation Association of Canada;
- Typical cross-sections are provided in Municipal Development Standard Drawings.

3.3.2 Arterial Road

Arterial roads generally serve as line-haul facilities carrying traffic between activity centres - connecting with collectors, other arterials, and freeways, but not local streets. On-street parking is not normally permitted on this type of facility in the Town of Lamont.

3.3.3 Collector Road

A Collector road is to provide local access to frontage developments, collect traffic from several local streets or from an industrial area and channel it towards the arterial system. A collector street can connect with local streets, other collectors or with arterial roadways; however, their location should minimize the potential use as a short-cut between arterial roadways. Parallel and angle parking may be allowed on these streets.

3.3.4 Local Road

A Local road is intended solely to provide access to individual properties. This street should only be permitted to connect with similar type facilities or with collector streets. All sites should provide sufficient on-site parking to meet demands and service no industrial bus routes. School buses may be permitted.

3.4 PAVEMENT STRUCTURES

A geotechnical investigation and independent pavement design is required for all developments and shall be based on a 20-year design life for insitu conditions and projected traffic volume.

Pending the results of the geotechnical investigation, additional pavement structure strengths and/or materials testing may be required in areas with poor subgrade materials. This would include areas with heavy industrial applications. Where road use is mixed (i.e. commercial and residential) the pavement structure shall meet the higher load criteria.

Roadways in all urban subdivision developments shall be surfaced with asphaltic concrete pavement (hot mix asphalt).

Good roadway industry construction practices and techniques shall be employed.

In no case shall the total pavement thickness be less than 100 mm on a local road and 120 mm on a collector road. The pavement shall be placed in two (2) separate lifts. The first lift shall be designed to withstand the expected loads due to construction activity in the first two (2) years and must be placed prior to Construction Completion Certificate being issued by the Town. The second lift being placed after a two (2) year period and prior to Final Acceptance Certificate being issued by the Town.

3.5 ROAD CONSTRUCTION REQUIREMENTS

3.5.1 General

Roadway construction must be in accordance with the plans and design approved by the Town. The work shall be carried out at all times in an efficient manner with approved equipment and capable personnel. The Town or an appointed representative shall at all times have access to the site and will promptly be provided with all test results and all information necessary to assess the Contractor's performance.

3.5.2 Temporary Roads and Access

Plans for temporary roads, access, and detours shall be approved by the Town. All weather type construction will be required and the Developer is responsible for all maintenance of temporary roads, access, and detours.

All signing, channelization, detours, closures, etc. shall be in accordance with the Manual of Uniform Traffic Control Devices as published by the Transportation Association of Canada.

3.5.3 Dust Control, Street Cleaning and Snow Removal

The Developer shall be solely responsible for dust control and debris and mud removal from sidewalks, curb, gutter, and boulevards within the subdivision for the duration of the Warranty Period. The Developer shall also be solely responsible for ensuring silt and debris cannot enter into catch basins within the new development and directly adjacent to the new development.

The Town shall be responsible for snow removal and street cleaning once the first lift of asphalt has been installed and a Construction Completion Certificate has been executed.

3.5.4 Maintenance of Existing Facilities

The Developer is responsible to ensure that existing infrastructure, such as sewer mains, watermains, roadways, and landscaped areas, are not disturbed or become inoperable as a result of actions by the Developer, his agents or Contractors. Existing services shall not be exposed to loadings beyond their design capacities. Existing services shall continuously be maintained and cleaned by the Developer where his actions are cause for additional maintenance. The existence

and location of underground utilities indicated on the plans that have been determined from the Town's records are not guaranteed.

3.5.5 Staged Construction

Staged construction shall meet the approval of the Town. The Developer is responsible for all maintenance of partially completed works which have been opened for use. All partially completed works shall be properly restored prior to commencing with the next stage of construction. The Developer is required to place a temporary turnaround on dead end streets to accommodate garbage trucks and school buses.

3.6 MATERIALS

3.6.1 General

Materials used in roadway construction shall be from sources approved by the Town of Lamont. Manufactured goods shall meet the standard manufacturer's specifications and the approved roadway specifications. Under no circumstances shall defective, rejected or substandard materials be used in the construction of roadways.

3.6.2 Subgrade and Fill materials and Granular Road Base

Subgrades under the roadway structure shall be constructed of suitable soils, free from organic and frost susceptible materials. Subgrade preparation shall typically include scarification to a depth of 300mm, condition of the soil, and replacement of the material compacted to 100% Standard Proctor Density (at optimum moisture content). Granular Road Base Materials shall be conditioned and installed in suitable depths to meet compaction requirements to 100% Standard Proctor Density.

3.6.3 Concrete

Concrete for roadways, including sidewalks, walkways and structures, shall be to a C-2 exposure classification (CSA-A23.1), have a minimum compressive strength of 30 MPa in 28 days (20 MPa in 7 days), be Type HS (unless specified differently) 5% to 8% air content, have a nominal maximum size coarse aggregate of 14.0-20.0 mm, a maximum water/cement ratio of 0.45, and use a curing compound.

3.6.4 Asphalt

Asphalt surface shall not be laid prior to the base course meeting the required testing. See Section 9.2.

Asphalt materials, mixing, spreading and rolling shall conform to good practice. A tack coat shall be applied to all horizontal and vertical surfaces prior to paving. The required densities shall be as follows in Table 3.2:

Table 3.2

<i>Minimum Density</i>	<i>Type of Paving</i>
98%	New paving and all stages in staged paving except 2 nd stage residential mat 40 mm thick or less.
96%	Second stage residential mat 40 mm thick or less
97%	Lane paving.
97%	Rehabilitation overlay more than 40 mm thick.
96%	Rehabilitation overlay 40 mm thick or less.
96%	Paved walkway and bikeways

3.7 TRAFFIC CONTROL DEVICES, STREET SIGNS, AND PAVEMENT MARKINGS

Traffic control devices, street signs, and pavement markings shall be installed by the Developer and shall be in accordance with the latest edition of the Manual of Uniform Traffic Control Devices for Canada, issued by the Transportation Association of Canada.

Highly reflective engineer grade street name signs and traffic control high density signs shall be mounted on a 4x4 pressure treated post to the satisfaction of the Town. Street sign blades are to be extruded aluminum street blades, blue in colour, 150mm x 400mm. Mounting hardware is to be bracket #ID-30B 6" as supplied by Alberta Traffic Supply. Stop signs are to be a minimum size of 600mm x 600mm. Diamond grade reflective signs are required for all signage.

Pavement markings, including lane markings, stop lines and pedestrian crossings, shall be provided by the Developer at his own expense. Pavement marking shall be painted on the top lift of asphalt both at interim and Final Acceptance Certificate lift at the time of construction.

3.8 ROADWAY ILLUMINATION

The Developer shall provide plans for street lights in accordance with IES – Illumination Engineering Society.

Street lights shall be provided for each internal park area that does not abut onto a lighted street. A street light shall be located at the point where each walkway opens out onto the park area.

Street lights shall be placed at locations not interfering with proposed driveways and water and sewer services and in general shall be located in line with the extension of common property lines between two lots.

The location and density of the street lights shall be in accordance with the Transportation Association of Canada's "Guide for the Design of Roadway Lighting".

3.9 SWALES

In general, the following design standards should be followed for swales required to facilitate drainage

3.9.1 Grass Swales

- Minimum 2.0 m of right of way;
- 150mm depth, with 4:1 maximum side slopes;
- Minimum Slope of 1.50%.

3.9.2 Concrete Swales

- Minimum 500mm Width;
- 75mm depth;
- Minimum Slope of 0.70%

Asphalt swales will not be permitted in new developments.

3.10 LANES

In general, the following design standards should be followed:

- Minimum 6.0 m of right-of-way;
- Where lane traffic is expected to be high, such as for certain commercial developments, a wider surface width and right-of-way may be required, as determined by the Town;
- Road structure shall be as per geotechnical investigation;
- "Dead-end" lanes must be terminated with a means to turn around;
- Maximum length of lane between streets shall not exceed 350 m. Lane layout should not encourage possible short cutting between streets;
- Maximum length of drainage in lanes shall be 350 m cumulative to any one catch basin;
- Maximum lane grade shall be 6.0%;
- Minimum lane grade shall be 1.0%.

3.11 DEAD-END ROADS

In residential subdivisions, all dead-end roads shall be provided with a cul-de-sac or turnaround consistent with the requirements outlined in the Standard Drawings and the Transportation Association of Canada manual. The maximum length of dead end roads that service residential lots shall be 200 m.

3.12 APPROACHES AND DRIVEWAYS (URBAN)

Urban approaches and driveways shall be in accordance with the Transportation Association of Canada Geometric Design Guide for Canadian Roads and as modified herein.

3.12.1 Private Driveways

All driveways shall be constructed to provide a minimum 1.5 m clearance from any structure such as hydrants, light-standards, service pedestals, transformers, manholes and catch basins. Driveways on corner lots shall be located to provide a minimum of 8.0 m clearance from the lot property line adjacent to the intersection.

3.12.2 Commercial/Industrial Driveways

Intersection spacing shall be at a minimum horizontal distance of 10 m from the edge of driveway to the end of the curb return, and must be designed to accommodate the types of vehicles the business/industry will generate.

The maximum driveway width of any commercial/industrial lot shall be 60% of the frontage of lot. Deviation from this standard will require written approval from Infrastructure Services.

3.13 PEDESTRIAN PATHWAYS

3.13.1 Urban Sidewalks

Concrete sidewalks measuring 1.2 m in width will be required in the following instances:

- On both sides of arterial roads where there is no parallel service road with sidewalk (separate walk on one side and multi-purpose 2.5 m Asphalt path on other side);
- On the same side as street lights on Collector roads;
- On the same side as street lights on Local roads;
- Where there is a possibility of a requirement to provide continuity of sidewalk to future development;
- Where linkage is required to maintain continuity of pedestrian network;
- Cul-de-sacs see Standard Drawings.

Refer to Standard Drawings for typical layouts and dimensions.

Curb ramps shall be provided on sidewalks at all roadway intersections and at all pedestrian crossings in accordance with the Standard Drawings.

3.13.2 Trails

Pedestrian trails shall be 2.5 m wide in accordance with the Standard Drawings.