



— Township of —

SEVERN

ENGINEERING STANDARDS

Roadways



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1 Introduction

The purpose of this section is to outline the minimum requirements for the design and construction of roadways within the Township. These requirements are intended to provide guidance and minimum expectations, but this shall not relieve the practitioner of the responsibility of ensuring a completed product demonstrating competent engineering and full compliance with all applicable legislation.

In general, all roadways within the Township shall be designed to maximize the safety of all users, including vehicles, cyclists, and pedestrians.

2 Other Applicable Acts, Codes, Standards, Legislation, Design Guidelines

Practitioners must be fully familiar and ensure compliance with other applicable acts, codes, standards, legislation, and design guidelines when carrying out transportation design.

Practitioners are fully responsible for obtaining all approvals and permits necessary for the project from the relevant approval authorities.

3 Deviation from Standards

If the practitioner deems that a deviation from these standards is required, they must make a formal request to Township, complete with a memorandum identifying the proposed deviation along with an explanation of the rationale behind the requirement and how it will be of benefit. The Township may approve or reject any/all requests and the practitioner must comply with that decision. If a deviation is approved, a copy of the written approval must be included with any submissions to the Township.

4 Roadway Classification

All roadways within the Township shall be classified based on their characteristics, function, use, and the volume of traffic they are expected to convey.

The following table provides a general guide to the determination of a road's classification:

Table 4-1: Urban Road Classifications (as per Transportation Master Plan)

Criteria	Urban Road Classification		
	Local	Collector	Arterial
Traffic and Land Services	Traffic movement secondary consideration;	Traffic movement and land access	Traffic movement primary consideration;

Criteria	Urban Road Classification		
	Local	Collector	Arterial
	Land access primary consideration	equal importance	Land access secondary consideration
Range of Average Annual Daily Traffic (AADT)	Not Applicable	1,000 – 2,000	5,000 – 50,000
Traffic Flow	Interrupted Flow	Interrupted Flow	Uninterrupted Flow except at signals and crosswalks
Average Operating Speed (off-peak)	40-60 km/h	40-70 km/h	60-90 km/h
Design Speed	60-80 km/h	60-90 km/h	80-110 km/h
Typical ROW Width	15-20	26	30

*ROW widths may vary and shall be confirmed with the Township. All new local roads shall have a 20 m ROW.

Table 4-2: Rural Road Classifications (as per Transportation Master Plan)

Criteria	Rural Road Classification		
	Local	Collector	Arterial
Traffic and Land Services	Traffic movement secondary consideration; Land access primary consideration	Traffic movement and land access equal importance	Traffic movement primary consideration; Land access secondary consideration
Range of Average Annual Daily Traffic (AADT)	Not Applicable	200 – 10,000	1,000 – 20,000
Traffic Flow	Interrupted Flow	Interrupted Flow	Uninterrupted Flow except at signals/stops
Average Operating Speed (off-peak)	50-80 km/h	60-90 km/h	70-100 km/h
Design Speed	60-80 km/h	60-100 km/h	80-110 km/h
Typical ROW Width	20	26	30

Roadway classifications may change based on strategic master plans and the Township's Official Plan. Further, as the design criteria for a roadway is dependent upon its

classification, practitioners are advised to confirm the road classification with the Township prior to the commencement of any design.

5 Pavement Structure

Pavement structure design shall be completed by a qualified geotechnical practitioner and documented within a geotechnical investigation report.

In general, the pavement structure design will be a function of many factors, including but not limited to:

- Local conditions such as soil type and/or water table;
- Drainage and frost susceptibility;
- Anticipated traffic loading, including truck traffic for any haul routes; and
- To ensure there will be no half load restrictions on collector, arterial, or industrial roadways.

5.1 Pavement Service Life

The minimum pavement service life for new roads is to be 15 years for arterial and collector road classifications and 20 years for local road classifications.

5.2 Pavement Design Performance Criteria

The following design criteria shall be used in preparing the recommended pavement structure design.

Table 5-1: Pavement Structure Design Criteria by Road Classification

Criteria	Road Classification		
	Local	Collector	Arterial
Reliability Level	75%	85%	90%
Terminal IRI (smoothness)	9 m/km	6 m/km	5 m/km
Alligator cracking	35%	20%	10%
Rut Depth	15 mm	11 mm	9 mm

5.3 Minimum Pavement Structure (New Roads)

Notwithstanding the above, the following provides the Township's minimum pavement structure requirements for new roads.

Table 5-2: Minimum Pavement Structure Requirements by Road Classification

Road Classification	Granular 'B'	Granular 'A'	Base Asphalt (HL4, HL8, or SP 19.0)	Surface Asphalt (HL3 or SP 12.5)
Local	300 mm	150 mm	50 mm	40 mm
Local – Rural Low Volume	300 mm	150 mm	0 mm	50 mm
Collector	400 mm	150 mm	80 mm	40 mm
Arterial	450 mm	150 mm	100 mm	40 mm
Industrial	450 mm	150 mm	100 mm	40 mm

The above is a minimum requirement. Pavement structure recommendations are to be provided as part of a geotechnical investigation and the more stringent recommendation is to be followed.

The Township will not accept increased base or sub-base granular equivalence in lieu of thinner asphalt.

Asphalt cement shall be PGAC 58-34 as per OPSS.MUNI 1101. Allowable reclaimed asphalt pavement (RAP) percentages shall be in accordance with OPSS.MUNI 1150 (or OPSS.MUNI 1151 for Superpave), with the exception that RAP will not be permitted in the surface course asphalt mixes.

The Township may consider alternative design products such as geogrid or other reinforcing products as a component of the pavement design strategy in specific cases with supporting design documentation provided by a qualified geotechnical practitioner.

5.4 Pavement Rehabilitation and Reconstruction

For rehabilitation and reconstruction designs, the previous pavement history and required design criteria should be obtained from the Township in advance of undertaking any geotechnical investigation. Additional service life options and cost-benefit analysis may be required in this case.

During pavement rehabilitation and reconstruction, if it is necessary to cut through an existing Township road, proper compaction of backfill material and restoration of the pavement structure to its original conditions must be completed.

For joints between existing and new asphalt, a minimum 1.0 m wide mill and overlay shall be completed. In specific cases, the Township may permit the use of a bituminous joint sealant product.

6 Geometric Design

All horizontal and vertical alignment design shall be undertaken in accordance with the latest revision of the Transportation Association of Canada (TAC) Geometric Design Guide for Canadian Roads in conjunction with the Ministry of Transportation Ontario Geometric Design Supplement.

The following requirements shall be applied for all designs, unless otherwise approved by the Township.

Table 6-1: Geometric Design Criteria by Road Class

Road Class	ROW Width	Speed		No. of Lanes	Roadway Width ¹	Min. Sidewalk Width	Min./ Max Grade
		Posted	Design				
Local – Urban	15-20 m	50 km/h	60 km/h	2	8.0 m	1.5 m ²	0.5 – 5% ³
Local – Semi Urban/Rural	20 m	50 km/h	60 km/h	2	6.6 m	N/A	0.5 – 6%
Collector – Urban	26 m	50 – 60 km/h	60 – 70 km/h	2 – 3	8.0 m	2.0 m	0.5 – 5% ³
Collector – Rural	26 m	60 – 80 km/h	70 – 100 km/h	2	7.5 m	N/A	0.5 – 6%
Arterial – Urban	30 m	50 – 60 km/h	60 – 70 km/h	2 – 4	7.5 – 14.0 m	2.0 m	0.5 – 5%
Arterial – Rural	30 m	60 – 80 km/h	70 – 100 km/h	2 – 4	7.5 – 14.0 m	N/A	0.5 – 6%
Industrial – Urban	20-26 m	50 – 60 km/h	60 – 70 km/h	2	8.0 m	N/A	0.5 – 5%
Industrial – Rural	20-26 m	60 – 80 km/h	70 – 100 km/h	2	7.5 m	N/A	0.5 – 6%

Notes:

1. Roadway widths are measured from edge of pavement to edge of pavement and do not include paved shoulders or active transportation.
2. Where sidewalk is immediately adjacent the curb, the sidewalk width shall be 2.0 m.
3. Preferred maximum is 5%, but a 1% variance may be permitted in specific cases, with approval by the Township.

Further to the above, the following minimum standards shall also apply for all roadways:

- Minimum cross-fall shall be 2%.

- All changes in centreline grade in excess of 1% shall be designed with vertical curves.
- The minimum gutter grades for cul-de-sacs, elbows, and other horizontal curvature shall be 1.0%.

One-way roads are not permitted. Any other special roadways that do not meet Township criteria/standards must be approved by the Township.

7 Intersection Design

7.1 General

Intersection designs, including required controls, lane configurations, vehicle storage details as well as pedestrian and cyclist crossing facilities shall be determined through the completion of an intersection analysis prepared by a qualified traffic practitioner.

7.2 Geometry and Grading

The following table provides general guidance on intersection design requirements:

Road Class	Intersecting Road Class	Min. Daylighting Requirement	Min. Curb Radii	Max. Grade for Through Road
Local	Local	5	10	3.5%
	Collector	5	10	3.0%
	Arterial	10	10	3.0%
Collector	Local	5	10	3.0%
	Collector	10	12	2.0%
	Arterial	15	15	2.0%
Arterial	Local	10	10	3.0%
	Collector	15	15	2.0%
	Arterial	15	18	2.0%
Industrial	All Classes	15	18	2.0%

Curb radii may need to be increased or compound curves may be required and should be confirmed using turning movement diagrams for the pre-determined design vehicle, based on the specific road characteristics (i.e. truck route, bus route, etc.). Turning movement diagrams should also be used to ensure movements can be maintained and are not impeded by intersection elements such as medians, when present.

Sizing of daylighting triangles at intersections is a function of many factors. The practitioner shall submit detailed calculations for sizing of daylighting triangles at intersections to

confirm the above is sufficient for their specific project. The above noted values may not be reduced, despite the detailed calculations provided.

Intersection design must also accommodate the requirements of other road authorities such as the MTO, County of Simcoe, etc., where applicable.

7.3 Traffic Signals

Where deemed to be warranted, traffic signals are to be designed in accordance with the latest version of the TAC Geometric Design Guide for Canadian Roads, OTM Book 12, OPSS, and OPSD, as applicable. All electrical work shall be subject to an inspection by the Electrical Safety Authority and tests on electrical wiring and materials shall conform to the Canadian Electrical Code Part 1 unless otherwise specified.

Signalized intersection design shall include pedestrian and cyclist requirements and shall be AODA compliant.

The signal mast arms shall be mounted so that traffic signal head clearances above the roadway are 5.0 m.

Traffic signal controllers must conform to the NEMA TS2 Type 2 Standard, shall be pad mounted, and in a location that is accessible, but not visually distracting.

A separate power pedestal is to be provided and the power supply is to be metered.

Loop detectors shall be placed in the base asphalt.

The requirement for emergency vehicle pre-emption shall be confirmed with the Township on a project specific basis.

7.3.1 Materials

Traffic signal heads are to be Fortran's Polycarbonate Model P3LH_00 Signal, 12-12-12 Red, Amber, Green w/Cowl Visor or approved equivalent.

Accessible Pedestrian Signals are to be Polara Engineering Incorporated, Model EN25BNO-PY with Belden Inc., #8720 series stranded, #14 gauge, twisted pair cable with shielding (Beldfoil) and polyethylene insulation or an approved equivalent.

7.4 Roundabouts

The use of roundabout intersection control must be approved by the Township. If approved, the design must be completed in accordance with the latest version of the TAC Canadian Roundabout Design Guide and good engineering practices.

The design vehicle must be selected based on the characteristics of the respective roads. Emergency vehicles shall be accommodated without use of any portion of the central island, including aprons, for collector and arterial roadways.

Pedestrian and cyclist movements must be accommodated through the roundabout.

8 Cul-de-Sacs

The Township's preference is to avoid the use of permanent cul-de-sacs, whenever possible.

Where specifically approved by the Township, permanent cul-de-sacs shall be a maximum of 400 m in length and shall be in accordance with OPSD 500.010, 500.020, and 500.030 with a minimum grade of 1% from the centre to the edge of pavement. Central islands within cul-de-sacs are not permitted.

For urban cul-de-sacs, minimum gutter grades of 1% shall be maintained around the full perimeter. Drainage shall be directed away from the end of the cul-de-sac to catchbasins located at the junction of the bulb and the normal road cross-section. Where this is not feasible, a double catchbasin shall be installed at the low point and a suitable overland flow outlet shall be provided, which may require an easement.

9 Temporary Turning Circles

Temporary turning areas will only be considered whenever a roadway is proposed to be continued in the future. The Township's preference is for a full cul-de-sac to be provided in this situation to avoid the need for reversing of vehicles; however, a hammerhead or "T" turnaround may be considered in specific circumstances. Details for the requirements of temporary turning areas are provided in the Standard Drawings.

10 Driveways and Entrances

10.1 General

All driveways and entrances shall conform with the Township's Zoning By-Law and Driveway Entrance By-Law.

10.2 Location

All driveways and entrances shall conform with zoning setback requirements.

Residential driveways shall not be located within 1.5 m of a property line, fire hydrant, streetlight/hydro pole, utility structure, tree, or other aboveground appurtenance. For semi-urban or rural lots where there is a driveway culvert, the end of the culvert shall not be located within 1.5 m of the projection of the property line.

For corner residential lots, the driveway shall be located a minimum of 3 m from the end of the daylighting triangle, or more as required, to ensure a parked car does not interfere with the sightlines of the intersection.

For additional separation requirements between driveways as well as setbacks of driveways from intersections, refer to the latest version of the TAC Geometric Design Guide for Canadian Roads.

Curb depressions for residential driveways shall be placed when the concrete curb and gutter is initially poured and not cut in afterward. The location and width for curb depressions shall be as detailed on the Standard Drawings with particular attention being placed on the location of the garage and the direction of traffic flow.

Curb depressions for medium and high density residential, commercial, and industrial driveways shall be as detailed on the Standard Drawings and as per OPSD 350.010. These driveways shall be designed to accommodate the anticipated vehicular traffic without causing undue interference with the traffic flow on the street.

10.3 Driveway Width

Within the municipal right-of-way, the minimum width for a residential driveway shall be 3.0 metres. The maximum width shall be 8.0 metres or 50.0 per cent (%) of the lot frontage, whichever is less, and provided there are no conflicts with services, utilities, and other aboveground features. The driveway width on private property may be expanded to accommodate multi-vehicle garages and other uses.

A secondary driveway entrance will only be permitted for estate residential lots with frontages exceeding 36 metres with the provision that the total driveway width of both driveways does not exceed 50% of the total lot frontage.

No entrances are permitted so as to provide access to the exterior flankage of a corner lot unless the flankage of the property is more than 100 metres.

No entrances are permitted so as to provide access to the rear of a through lot unless the frontage of the lot is greater than 40 metres and the flankage is greater than 100 metres.

Access ramps and driveways accessing a parking area or parking lot shall be a minimum of 3.0 metres in width for one-way traffic and a minimum of 6.0 metres in width for two-way traffic.

For a commercial, industrial, institutional or municipal parking lot, a minimum width of 9.0 metres shall be provided.

10.4 Driveway Grading

Urban driveway grading shall be in accordance with the Standard Drawings.

Driveways within the Township's road allowance shall be designed with a minimum grade of 2% and a maximum grade of 5%. On private property, the range may be extended to between 1% and 7% in specific cases where physical conditions prohibit the use of 2% - 5% grades.

For urban driveways, the maximum change in grade where a driveway meets a sidewalk is 3%.

Reversed or negative slope residential driveways are actively discouraged and will only be considered under special circumstances. Where negative sloping residential driveways are

permitted by the Township, a positive slope of at least 2% must be maintained from the garage over a minimum distance of 7.0 metres. Drainage plans and calculations may be required to support the design.

Ramps to elevated or underground parking shall have a maximum 10% grade if unheated and a maximum 15% grade if heated. All ramps are to be designed with a minimum 6 m transition area at the top and bottom of no more than 6%.

10.5 Driveway Pairing and Sharing

Practitioners are cautioned that pairing of driveways is not the same as sharing of driveways.

Pairing of driveways is the practice of locating driveways for adjacent properties near a common property line in order to increase the available space in the boulevard for aboveground features as well as allow space for on-street parking, where permitted.

Pairing of driveways is preferred for single residential lots with a frontage of less than 14.0 m and where the road grade does not exceed 2.5%.

Sharing of driveways between two separate lots or units shall not be permitted. Driveways must be delineated by physical means that extend from the garage to the roadway, such as grass. In higher density situations, the delineation may be hard surface, if approved by the Township. For drainage and maintenance purposes, the delineation shall be essentially flush with the adjacent driveway surfaces and similarly graded. Refer also to the Standard Detail Drawings.

10.6 Pavement Structure (Driveways)

The minimum pavement structure for driveways shall be as follows.

Table 10-1: Minimum Pavement Structure by Driveway Type

Driveway Type	Granular 'B'	Granular 'A'	Base Asphalt (HL4 or HL8)	Surface Asphalt (HL3)
Low-Density Residential	-	150 mm	-	50 mm
Urban Medium to High Density Residential	225 mm	150 mm	50 mm	40 mm
Commercial/Institutional/Light Industrial	225 mm	150 mm	50 mm	40 mm
Heavy Industrial	300 mm	150 mm	75 mm	40 mm

The above is a minimum requirement. Driveway pavement structure recommendations are to be provided as part of a geotechnical investigation and shall take into consideration fire

routes and other factors. The greater of the above or the geotechnical investigation recommendation is to be provided.

Alternate types of driveways (i.e. paving stones, concrete pads, etc.) will be subject to approval by the Township.

10.7 Medians and Decorative Treatments

The use of medians or islands at driveways and entrances/exits for access control or aesthetics will be considered by the Township on a project specific basis.

Concrete curb and gutter along driveways and entrances is permitted for commercial, industrial, and institutional use. For residential driveways, raised edging using concrete curbing or other decorative treatment is not permitted within the Township's road allowance, but may be constructed on private property, provided it meets the Township's Zoning By-Law and entrance permit requirements.

10.8 Driveway Culverts

Driveway culverts are to be CSP or 320 KPa polyethylene to OPSS 1840.

The minimum diameter for a residential driveway culvert shall be 300 mm. Practitioners are required to provide culvert sizing calculations to support the proposed sizing.

The minimum length of a residential driveway culvert shall be 7.0 m, or longer as required to permit maximum of 3:1 grading without the need for headwalls. Driveway headwalls will not be permitted, unless otherwise approved by the Township.

For fire hydrant access driveways, a 3.0-metre-wide platform area shall be constructed in the ditch fronting each fire hydrant. A minimum 300 mm diameter culvert, with a minimum length of 7.0 metres, and minimum cover of 300 mm shall be provided.

11 Parking

In general, all parking and parking space design shall be in accordance with the requirements of the Township's Zoning By-law.

11.1 On-Street Parking

Designated on-street parking will only be permitted where approved by the Township. Generally, on-street parking will not be permitted on arterial roads.

Where on-street parking is permitted, the design must include for access and accessibility to the adjacent land uses, including curb depressions and sidewalk, as well as signage and pavement markings.

Angled parking will be considered on a case-by-case basis.

11.2 Parking Lots

At a minimum, parking lot design must demonstrate adequate vehicle and pedestrian circulation, turning movements for delivery and emergency vehicles, accessibility, and snow storage areas.

Signage and line painting must be completed in accordance with OTM and Township standards.

12 Mailboxes

12.1 Urban Community Mailboxes

In general, urban community mailboxes shall be located on local roadways and shall have direct sidewalk access, where sidewalk is present. Community mailboxes shall be located a minimum of 15.0 m from any intersection and shall preferably be on the projection of a property line or a lot flankage. Consideration shall also be given to placement in relation to other aboveground features. At the Township's discretion, a lay-by lane is to be included for access to the community mailbox.

All locations and design must conform with the latest version of Canada Post's Standard Drawings and Specifications.

12.2 Rural Mailboxes

Rural mailboxes shall conform with the latest version of Canada Post's Rural Mailbox Guidelines.

In general, rural mailboxes shall be erected on the right-hand side of the road in the direction of vehicular travel. The mailbox(es) shall be erected using direct buried posts of sufficient structural size, depth, and strength. Posts shall not be encased in concrete. The posts shall be placed in a location that does not conflict with any other underground infrastructure, such as utilities, and such that no post is located closer than 1.5 metres to the edge of pavement in order to ensure safe winter maintenance operations. The bottom of the mailbox(es) shall be set at 1.1 m above the ground.

13 Curb and Gutter

Unless approved otherwise, all new Township roadways shall be constructed to an urban cross-section, with barrier curb and gutter to OPSD 600.040. For collector, arterial, and industrial roads with posted speeds of greater than 60 km/h, curb selection should be modified.

Concrete curb and gutter shall be in accordance with OPSS.MUNI 353, with the exception that all concrete shall be supplied in accordance with the "Performance Specification Alternative" of OPSS.MUNI 1350 and shall meet the requirements of CSA A23.1, Exposure Class C-2, with a minimum compressive strength of 32 MPa at 28 days.

A minimum of 300 mm of Granular 'B' material compacted to 98% Standard Proctor Density will be required as a base for all curb installations.

Curb ramps and tactile walking surface indicator plates (truncated dome type), as per OPSD 310.039, shall be provided at all locations where a sidewalk intersects with the curb line.

14 Subdrain

150 mm diameter perforated subdrains shall be constructed along both sides of all roadways with curb and gutter as per OPSD 216.021. Subdrains shall connect into catchbasin locations or other available stormwater outlets.

15 Pedestrian and Cyclist Ways

15.1 Sidewalk

Sidewalks shall comply with the Accessibility for Ontarians with Disabilities Act, 2005 (AODA) and its regulations.

The requirement and location for sidewalks on any project shall be confirmed with the Township prior to commencing any design.

In general, sidewalks are required on both sides of all arterial and collector roadways and on at least one side of all local roadways. For local roadways, the locations of schools, parks, churches, commercial establishments etc., the length of street, traffic volume expected and the number of dwelling units serviced will be used as criteria in determining whether sidewalks are required on one or two sides of the street. Where there are no other determining factors dictating location, sidewalks shall generally be placed on north and east sides of the roadway. Street light poles, should be located on the same side as the sidewalk to provide illumination.

As noted under the roadway geometric design requirements, the minimum sidewalk width shall be 1.5 m for local roadways and 2.0 m for collector and arterial roadways. Wider sidewalks may be required in areas with high pedestrian volumes.

Sidewalks shall be constructed through all driveways and entrances, as per OPSD 310.010, including increased thickness at driveway locations.

The Township's preference is to maintain a boulevard area between the curb and sidewalk. However, for specific cases where a sidewalk is permitted adjacent to a curb, it shall be in accordance with OPSD 310.020 with a 2.0 m width. It shall also be located with a minimum 0.5 m offset from any aboveground features such as streetlights/hydro poles, utility structures, fire hydrants, trees, etc.

Where a sidewalk is adjacent to a ditch or a slope, a minimum offset of 1.0 m must be provided. Practitioners must also review the need for a pedestrian barricade in this case.

The preferred maximum longitudinal grade for a sidewalk shall be 5% and crossfall shall be between 2 – 4%.

All sidewalks shall be constructed according to OPSS 351 with the exception that all concrete shall be supplied in accordance with the “Performance Specification Alternative” of OPSS.MUNI 1350 and shall meet the requirements of CSA A23.1, Exposure Class C-2, with a minimum compressive strength of 32 MPa at 28 days.

A minimum of 150 mm of Granular A material compacted to 98% Standard Proctor Density will be required as a base for all sidewalk installations.

15.2 Trails and Pathways

The requirement for and location of any trail or pathway shall be confirmed with the Township prior to commencing any design. In general, pathways will be required adjacent to parkland and may be required to connect adjoining parallel roads through walkway or servicing easements, to link together local points of interest, open space amenities, civic institutions and connect to Township-wide or regional trail networks. To the extent possible, the route should utilize public open spaces, unopened right-of-ways, blocks and easements away from roadways. In the event trails are located along roadways, additional right-of-way width may be required by the Township.

Trails and pathways shall generally be in accordance with the Standard Drawings with a minimum width of 3.0 m. To maximize mobility, trails and pathways within urban areas shall generally be paved unless approved otherwise by the Township. In other areas, with consideration for the adjacent land use, the Township may permit trails and pathways constructed of limestone screenings.

The minimum and maximum grades permitted for trails and pathways are 1.5% and 5%, respectively unless the pathway is located around a SWM facility, in which case the requirements listed in the Township’s Storm System Standards shall apply.

Entrance points to the trail system shall be marked with signage and a gate or bollard(s).

15.3 Cycling Facilities

The requirement for and location of cycling facilities, which may include shared or separated facilities as well as bicycle parking facilities, shall be confirmed with the Township prior to commencing any design.

In general, the design of all cycling facilities shall be completed in accordance with the latest version of the Ontario Traffic Manual (OTM) Book 18.

Where cycling facilities are proposed, additional right-of-way width may be required by the Township.

16 Utilities and Lighting

16.1 Utilities

The location of all existing utilities is to be shown on all drawings. At a minimum, this information is to be obtained through completion of:

- a) Quality Level D Subsurface Utility Engineering (SUE) Investigation, which includes information from existing records obtained through a request for markups from the various utilities; and
- b) Quality Level C Subsurface Utility Engineering (SUE) Investigation, which includes information obtained by surveying visible above-ground utility features and using professional judgment to correlate this information to the Quality Level D information.

At the Township's discretion, a higher level of investigation, including a Quality Level B and A SUE investigation may also be required.

The location of all planned or future utilities must also be established. All proposed utilities shall generally be underground following the locations shown on the typical road cross-sections, and shall be shown on all drawings.

It is the qualified practitioner's responsibility to coordinate with all utilities, follow all respective utility design requirements, ensure that any utility relocations required to facilitate the proposed design are coordinated appropriately; and all required approvals are secured.

Compaction of backfill for utility trenches shall be 95% Standard Proctor within boulevards and 100% for driveways and road crossings.

16.2 Lighting

In general, all roadways, intersections, sidewalks/walkways, cycling facilities, and parking areas in the Township are to be lit, unless otherwise directed by the Township.

All lighting systems are to be designed by a qualified practitioner in accordance with the latest version of ANSI/IES RP-8 (Recommended Practice: Lighting Roadway and Parking Facilities) and Transportation Association of Canada (TAC) Guide for the Design of Roadway Lighting.

All assumptions with regards to roadway classification, pedestrian activity levels, etc must be confirmed with the Township prior to commencing any design.

Where there is existing lighting that is being replaced, the existing lighting must remain in operation until the new lighting system is operational.

16.2.1 Street Light Locations

Where possible, pole locations are to be placed on the projection of lot lines and in areas where they will not cause obstruction.

Spacing of poles shall be dictated by the illumination requirements.

Staggered arrangement of poles is not acceptable.

On curves, poles are to be placed on outer radii, where possible.

Lights at signalized intersections should be combined with traffic signal poles, wherever possible.

16.2.2 Poles

Poles are to be direct-buried type, tapered round, Class "B" spun concrete with standard mold finish and natural concrete grey colour. Poles are to be complete with aluminium tapered elliptical arms, as per the standard detail drawing.

Poles shall be affixed with an identification plate containing manufacturer's name, class, pole height, date of manufacture, and a CSA stamp.

16.2.3 Luminaires

All luminaires shall comply with all applicable requirements of CSA Standard C22.2 No. 9, "General Requirements for Luminaires" and must be "Dark Sky" compliant, with a correlated colour temperature of 3000K and colour rendering index of 70+.

Luminaires shall be a minimum 53 Watt CREEXPS1 Type II LED light (101 Watt at intersections), GE ERL Series, or approved equivalent.

Light source for roadway lighting shall have a minimum service life of 100,000 hours.

A light loss factor of 0.8 shall be applied.

All LED luminaires and components must be provided with a minimum 10-year manufacturer's warranty certificate confirming that the luminaire housing and all of its internal components, including but not limited to LED drivers and light engines shall be covered against defective workmanship, material, and premature light source failures. A manufacturer's certificate indicating that the service life of the LED luminaires is 100,000 hours of operation or greater must also be provided.

Each luminaire shall be controlled by a dusk to dawn photo electric cell.

16.2.4 Power Supply

Power supply pedestals shall be comprised of a base mounted metal enclosure, rated for outdoor use and manufactured from galvanized sheet metal in green powder coat finish and located adjacent to a hydro transformer. Installation to meet current Ontario Hydro Guidelines.

Pedestal Solutions SMT model to be used for roadway lighting and PP-39 model to be used for parks lighting, or approved equivalents.

16.2.5 Approval and Construction

Approval of street lighting design must be obtained from the Township as the road authority. Where the project includes or is in proximity to a County or Provincial roadway, approval from those agencies may also be required.

Any attachments to hydro poles must have Hydro Authority approval.

The installation of the street lighting system shall be in compliance with ESA, CSA, Hydro requirements, OPS, as well as the manufacturer's installation instructions.

For electrical work in general, construction shall be as per OPSS.MUNI 106. Otherwise, the following applies:

- a) installation of ducts and cables, construction shall be as per OPSS.MUNI 603 and 604.
- b) installation of a grounding system, construction shall be as per OPSS.MUNI 609.
- c) removal of electrical equipment, construction shall be as per OPSS.MUNI 610.
- d) installation of power supply, construction shall be as per OPSS.MUNI 614.
- e) installation of roadway luminaires, construction shall be as per OPSS.MUNI 617.

16.2.6 Decorative Street Lighting

Decorative street lighting may be considered on a project-specific basis at the Township's discretion.

17 Transit Requirements

Bus bays, landing pads, shelters, and related signage shall be provided in accordance with County of Simcoe requirements, as required, to accommodate transit.

18 Traffic Calming

Where required by the Township, traffic calming measures shall be designed in accordance with the TAC Canadian Guide to Traffic Calming as well as relevant Ontario Traffic Manuals.