

2.0 ROADWAYS

2.1 Road Classification

2.1.1 Standard Drawing Classification

All Road Widths and Road Allowances shall be designed in accordance with the most recent Town of New Tecumseth Standards:

TNT.SD 102	Urban Local	(8.5m Road on 20.0m Right-of-Way)
TNT.SD 103	Minor Collector	(10.0m Road on m Right-of-Way)23.0m
TNT.SD 104	Major Collector	(11.5m Road on m Right-of-Way)26.0m
TNT.SD 105	4-Lane Arterial	(15.7m Road on 30.0m Right-of-Way)
TNT.SD 106	5-Lane Arterial	(19.7m Road on m Right-of-Way)36.0m
TNT.SD 107	Industrial	(10.0m Road on 23.0m Right-of-Way)
TNT.SD 108	Rural	(m Road on 20.0m Right-of-Way)7.0m

TNT.SD 110 Typical Local Cul-de-Sac 20.0m Road Allowance
 TNT.SD 111A Road 'Elbow' Design

TNT.SD 112 Temporary Turning Circle (see Mattamy detail)
 TNT.SD 113 Temporary Road connecting Parallel Streets
 TNT.SD 114 Typical Temporary Road Cross-Sections

TNT.SD 115 Curb and Subdrain Detail
 TNT.SD 116 Direct Buried – Joint Use Trench
 TNT.SD 117 Typical Bus Shelter and Landing Pad
 TNT.SD 118 Typical Walkway Cross-Section
 TNT.SD 119 Walkway Gate Detail
 TNT.SD 120 Temporary Construction Access Detail
 TNT.SD 121 Privacy Fence Detail
 TNT.SD 122 Acoustic Fence Detail

NOTE: Any development proposal that will incorporate non-standard road widths and/or road allowances shall be reviewed by the Town's Engineering Department prior to first engineering submission.

2.1.2 Temporary Roadways

Temporary roadways will be required where a secondary access to the subdivision will not be available until additional development occurs. The maximum number of units serviced by a single access shall be 40.

In cases where parallel streets temporarily terminate at a subdivision limit property line (until development of the adjacent land(s) occurs), the streets shall be connected by a temporary roadway. All temporary roadways are to be designed and constructed in accordance with TNT.SD 113 and TNT.SD 114. The pavement structure is to be consistent with that of an urban road based on Town minimum standards or as per geotechnical recommendations (whichever is more onerous), with the exception that final course asphalt (HL3) is not required.

In addition to such cases, the watermain on the parallel streets are to be looped via this temporary roadway. The minimum watermain size for the looping shall be 100mm (4") Ø for plastic, subject to verification of system performance under fire flow conditions.

2.2 Road Pavement Design

All pavement designs shall be supported by a Geotechnical report prepared by a Professional Engineer. The report shall include results from soil testing of the existing sub-grade and recommend a pavement design required to support the anticipated traffic loading in accordance with the Transportation Association of Canada publication "A Guide to the Structural Design of Flexible and Rigid Pavements in Canada".

The following tables provide the Town of New Tecumseth's minimum pavement structure requirements by road classification and driveway class. Where the minimum recommended pavement design indicated in the Geotechnical report exceeds the minimum requirements in the table below, the designer shall specify the higher strength pavement structure. Where asphaltic treatment is not warranted (e.g., gravel roads), the pavement structure to be specified by a geotechnical engineer.

50mm
HL3?

Road Classification	O.P.S.S. Granular 'B' Sub-base (mm depth)	O.P.S.S. Granular 'A' Base (mm depth)	HL8 Asphalt Base Course (mm depth)	HL3 Asphalt Surface (Top) Course (mm depth)
Urban Local	300	150	80	40
Minor Collector	350	150	100	40
Major Collector	400	150	100	40
Arterial	450	150	100	40
Industrial	450	150	100	40
Rural	350	150	80	40

Confirm w/
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two lifts?

Driveway Class	O.P.S.S. Granular 'B' Sub-base (mm depth)	O.P.S.S. Granular 'A' Base (mm depth)	HL8 Asphalt Base Course (mm depth)	HL3 Asphalt Surface Course (mm depth)
Residential	N/A	150	50	25 (HL3)
Light Industrial, Commercial, Apartment, Residential / Condo	300	150	75	40
Heavy Industrial	400	150	100	40

All construction practices and materials shall conform to the latest Ontario Provincial Standard Specifications (O.P.S.S.). Granular 'A' and Granular 'B' materials are most commonly used for road construction in the Town of New Tecumseth. However, designs utilizing 20mm and 50mm crusher-run limestone, substituting Granular 'A' and Granular 'B', respectively, may be considered during wet seasons where moisture content and subgrade stability are of significant concern.

The Base course asphalt on the roads must be in place for a minimum of two (2) winter seasons and as approved and directed by the Town of New Tecumseth before the Top course asphalt is applied. The top course asphalt for residential driveways shall not be placed until the base course asphalt has been in place for one (1) winter season and the top stage of curbs have been placed and accepted by the Town.

2.3 Geometric Road Design

The geometric road design for new roads shall adhere to the following minimum criteria table:

	Urban Local	Minor Collector	Major Collector	Arterial	Industrial	Rural
Design Speed (km/hr)	50	60	70	90	60	80
Minimum Sight Stopping Distance (m)	65	85	110	170	85	65
K-Sag Min. (m)	11	12	18	40	11	11
K-Crest Min. (m)	7	15	22	55	15	7
Minimum Centreline Radii	90	115	250	400	115	90
Minimum Grade	0.5%	0.5%	0.5%	0.5%	0.5%	0.5%
Desired Maximum Grade	5.0%	5.0%	5.0%	5.0%	5.0%	5.0%
Maximum Grade for Through roads at intersections	3.5%	3.0%	3.0%	2.0%	3.0%	3.5%
Road Width (m)	8.5	10.0	11.5	4-Lane: 15.7 5-Lane: 19.7	10.0	6.7
Right-of-Way Width (m)	20.0	23.0	26.0	4-Lane: 30.0 5-Lane: 36.0	23.0	20.0
Intersection Angle	85°-90°	85-90°	85°-90°	90°	80°-90°	80°-90°
Minimum Tangent Length for Intersection Approaches (from CL) (m)	40.0	45.0	50.0	75.0	50.0	40.0

All grade changes in excess of 1.5% shall be designed with a vertical curve. The minimum tangent length prior to a grade change of up to 1.0% is 6m, and between 1.0% and 1.5% is 9m. The concrete curb gutter on cul-de-sac's and bends is to maintain a minimum grade of 0.70%.

The typical road allowance cross-section shall be designed and constructed as per the appropriate standard drawings. Details shall be provided for any special provisions required due to unique physical conditions on site or for existing or future design conditions. Such conditions include retaining walls, slope protection, culverts, bridges or special cross fall conditions.

Road widening/tapering at the intersection of industrial and/or collector roads with arterial roads may be required depending on the findings and conclusions of the Traffic Report. If a widening/tapering is required at the intersection, then a minimum of 1.5m width of pavement will be constructed in addition to the standard pavement width. The straight run and taper length for this additional pavement strip shall be determined by the Town of New Tecumseth in conjunction with the Traffic Report. In such cases, the boulevard width shall be maintained.

Temporary turning circle road terminations, as per Standard TNT.SD 112, are required where a road will be continued in the future and shall have complete services to the street line. Land easements within the subdivision must be deeded to the Town to facilitate, if necessary.

2.4 Geometric Intersection Design

ROAD CLASSIFICATION	INTERSECTING ROAD CLASS	DAYLIGHTING TRIANGLE DIMENSIONS (m)	CURB RADII (m)
& LOCAL	LOCAL	3.0	10.0
	MINOR COLLECTOR	4.5	10.0
	MAJOR COLLECTOR	7.5	10.5
	INDUSTRIAL	7.5	10.5
	ARTERIAL	15	10.5
MINOR COLLECTOR	/LOCAL MINOR COLLECTOR	4.5	10.0
	COLLECTOR	7.5	10.5
	MAJOR COLLECTOR	9.5	10.5
	INDUSTRIAL	9.5	14.0
	ARTERIAL	15	14.0
MAJOR COLLECTOR	/LOCAL MINOR COLLECTOR	7.5	10.5
	MINOR COLLECTOR	9.5	10.5
	MAJOR COLLECTOR	12	10.5
	INDUSTRIAL	12	14.0
	ARTERIAL	15	15.0
INDUSTRIAL	/LOCAL MINOR COLLECTOR	7.5	10.5
	COLLECTOR	9.5	14.0
	MAJOR COLLECTOR	12	14.0
	INDUSTRIAL	12	14.0
	ARTERIAL	15	15.0
ARTERIAL	/LOCAL MINOR COLLECTOR	15	10.5
	COLLECTOR	15	14.0
	MAJOR COLLECTOR	15	15.0
	INDUSTRIAL	15	15.0
	ARTERIAL	15	18.0

2.5 Roadside Ditches and Culverts

For design guidelines, refer to Town of New Tecumseth Standard Drawing TNT.SD 108.

All ditches are to be protected from erosion by placing a minimum of 150mm of topsoil and No. 1 nursery sod. Other erosion protection methods (e.g. erosion mats, etc.) accompanied by hydro seed may be considered as an alternative, however, this must undergo the Town's approval. In addition, all ditches are to be constructed with the elevation of the invert 0.15m below the granular sub-base of the road. If this is not possible, then perforated sub-drains wrapped in filter cloth are to be installed (refer to Section 2.10) and must have a positive outlet.

All entrance culverts to be a minimum 400mm in diameter and be constructed with minimum 1.6mm gauge Corrugated Steel Pipe (CSP). All road crossing culverts to be a minimum 600mm in diameter and be constructed with 2.0mm gauge Corrugated Steel Pipe (CSP). If required All culverts to be supplied with headwall end protection constructed of interlocking wall systems and/or concrete as approved by the Town of New Tecumseth, to a maximum elevation that is flush with the top surface of the driveway.

Notwithstanding the specification of minimum sizes, culverts are to be designed to convey the minor storm peak flow rate in accordance with the provisions of Section 4 – Storm Drainage System.

2.6 Sidewalks & Walkways

The following guidelines shall be used to determine the sidewalk construction within new subdivision developments, unless determined otherwise by the Town:

1. Sidewalks shall be installed on one side of, Local and Industrial roads.
2. Sidewalks shall be installed on both sides of Collector and Arterial roads.
3. Sidewalks are not required on Cul-De-Sacs unless 25 or more Units front onto the roadway and/or the road terminates at an amenity (i.e., park, school, commercial, open space block, etc.).
4. In general, sidewalks should be located on the north and east sides of the street.

All sidewalks to be 1.5m wide and constructed in accordance with OPSD 310.010. All concrete and works shall conform to OPSS 351. The sidewalk subgrade shall be graded to the specified tolerances and compacted to 95% Standard Proctor Density. A 150mm minimum thickness of Granular 'A' bedding compacted to 95% Standard Proctor Density shall be provided for all sidewalks.

All sidewalks shall have a minimum cross fall of 2.0% and shall have no steps allowed.

Sidewalks to be continuous through industrial, commercial and institutional driveways. The minimum thickness of the concrete sidewalk shall be 150mm, except when crossing such driveways the minimum thickness shall be 200mm.

Where walkways are required between lots, blocks or parkland, the walkway shall be constructed in accordance with TNT.SD 118 and TNT.SD 119. All concrete and works shall conform to OPSS 351 and **Division 13?**

2.7 Boulevards

All boulevard areas, with the exception of driveway locations, shall be fine graded and treated with a minimum of 150mm topsoil and No. 1 Nursery sod (as classified by the Nursery Sod Growers Association of Ontario). In industrial areas and open space blocks, hydro-seeding of the boulevards on a minimum of 150mm topsoil may be permitted at the discretion of the Town.

The allowable grading of all boulevards shall be a minimum of 2% and a maximum of 5%.

2.8 Driveways

Driveway grades shall be minimum 2.0% and maximum 7.0% in accordance with Section 8.3.1.4. The maximum grade is not recommended and should be used in exceptional cases where conditions prohibit the use of lesser grades.

All residential driveways shall be paved from the curb to the garage face. The pavement structure shall be composed of a minimum of 50mm base asphalt topped with a minimum of 25mm top asphalt on a base of a minimum of 150mm Granular 'A' or 20mm crusher-run limestone. The paving of the driveway is to be undertaken in two separate phases. Phase 1, being the placement of base asphalt, is to be completed at the time of sodding while Phase 2, being the placement of top asphalt, is to be completed at the time of top course asphalt pavement on roadway. The minimum pavement structure may be increased based on site specific geotechnical recommendations

The width of the depressed curb at driveways shall conform to the Zoning By-Law for each development and shall generally be as follows:

- Single Driveway - 3.0m max plus 0.3m slopes
- Double Driveway - 6.0m max plus 0.3m slopes

A minimum 1.0m separation between adjacent driveways shall be provided. Driveway locations at cul-de-sacs and at bends shall be shown on the Draft Plan of Subdivision and engineering drawings.

Driveways should generally be perpendicular to the curb where possible and shall be straight run from the garages to curb. Exceptions to this may be proposed in unusual circumstances, subject to approval from the Town.

The minimum clear distance between the edge of a driveway and any above ground utility structure shall be in accordance with Section 3.1.4.

Driveways for industrial, commercial and institutional entrances shall conform to OPSD 350.01. Asphalt thickness as per Section 2.2.

2.9 Curbs and Gutters

Curb and gutter shall be constructed in two stages except in areas with no residential frontage (e.g. parks, schools, SWM blocks, open space blocks, single loaded roads, etc.) where single stage (full curb) is permitted. Two stage curb shall conform to TNT SD. Xxx and single stage curb shall conform to OPSS 600.010. All concrete and works to conform to OPSS 353. A minimum of 300mm Granular 'B' material compacted to 98% Standard Proctor Density will be required as a base for all curb and gutter installations.

Driveway depressions are to be formed and finished when the top curb for two stage construction is poured or when single stage curb construction is poured.

Curb depressions are required at each intersection for sidewalks and pedestrian road crossings.

2.10 Subdrains

Continuous 100mm diameter polyethylene perforated subdrains wrapped with filter fabric in conformance with OPSS 405 shall be provided for all roads on both sides below the concrete curb, except for rural roads where the ditch is minimum 0.15m lower than the road subgrade. In areas with sandy soils, the subdrain may be eliminated subject to approval by the Geotechnical Engineer and the Town of New Tecumseth.

The subdrain shall be connected to catchbasins or other suitable outlets and plugged with a manufactures plug at high points where there is no catchbasin. The trench for the subdrain shall be a minimum 300mm below the road subgrade and there shall be a minimum of 50mm of bedding below the subdrain. The bedding material shall be Granular 'A' or as specified by the Geotechnical Engineer.

2.11 Utility Locations

The utility design shall be performed by a qualified Electrical Engineering Consultant and the location of above ground utilities shall conform to the Town's Standard Road Cross-Section Drawings. Joint Use Trench for Tele-Communications/CATV/Hydro-Electric/Gas to be considered for all standard road sections and shall conform to Standard TNT.SD 116.

2.12 Bus Bays

Bus bays, landing pads and shelters shall be provided as required by the Town and shall conform to TNT.SD 117.

2.13 Construction of Top Works

The construction of all top works shall generally correspond to the following completion timelines:

1. The building construction is to be at least 75% complete.
2. The base curb is to be cleaned and inspected by the engineering consultant and the Town inspector. Any deficient base curb (crushed, cracked, missing rebar, etc.) is to be removed and replaced.
3. Top curb is to be poured complete with formed and finished curb driveway depressions.
4. All proposed sidewalks are to be installed upon the appropriate granular base.
5. All completed lots are to be fine graded as per approved site plans and topsoiled and sodded.
6. Road manhole frame and grates and road catchbasin frame and grates are to be raised and the rims painted with fluorescent paint for driver visibility. Warning signs are to be placed at all access points to the subdivision indicating that there are raised manholes and catchbasins ahead.
7. Provide asphalt padding and/or repair all deficiencies to base asphalt.
8. Flush and sweep base asphalt surface and apply tack coat.
9. Place and compact top course asphalt pavement.