Policy: Municipal Services Specifications

Date Originally Approved: August 31, 1995

Motion: "That on recommendation of Council Committee, Council adopt the standards and specifications for local roads as presented on August 17, 1995." Motion carried

Date Amended: May 28, 2009

Motion: "That Council approves the addendum to the Standard Specifications for the design and construction of Municipal Services (August 1995) as presented."

Standard Specifications for the

Design & Construction

of Municipal Services in Colchester County

August 1995

municipality of the
County of Colchester

Guidelines for the Design & Construction of Municipal Services

Municipality of the County of Colchester

August 1995

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Standard Specifications for the Design & Construction of Municipal Services

Municipality of the County of Colchester

Part 1: Purpose

The purpose of this manual is to define standards and specifications for the design and installation of municipal services in the County of Colchester. For greater clarity, these specifications shall apply to:

- sanitary sewer systems
- water distribution systems
- storm drainage systems
- sidewalks, curbs, gutters, and ramps
- utilities
- local roads

Part 2: Minimum Requirements for all Services

2.1 Unless otherwise specified under these guidelines or as provided for by written approval of the Municipal Engineer, the design and construction of all services contained herein shall:

2.1.1 comply with the supply, installation, inspection, and testing procedures set out in the Nova Scotia Road Builders, **Standard Specifications for Municipal Services,** latest edition and the Department of Transportation's **Standard Specification - Metric Edition**;

2.1.2 bear the stamp and signature of a Registered Professional Engineer in the Province of Nova Scotia;

2.1.3 be subject to the issuance of a **Permit to Construct a Central Sewer or Water System** by the Nova Scotia Department of Environment prior to construction;

2.1.4 be subject to the issuance of a **Permit to Operate a Central Sewer or Water System** by the Nova Scotia Department of Environment following the completion of construction;

2.1.5 utilize all applicable techniques and procedures set out in the Department of Environment's **Erosion and Sedimentation Control Handbook for Construction Sites** and the **Environmental Construction Practice Specifications.**

2.1.6 comply with all provisions of the **Safety Council Standards for Job Sites.**

2.2 Any survey plan prepared in conjunction with the provision of municipal services shall bear the stamp and signature of a Registered Land Surveyor in the Province of Nova Scotia.

2.3 Where there is a conflict between these guidelines and a standard identified elsewhere, the more stringent requirement shall prevail unless as otherwise provided for in writing by the Municipal Engineer.

2.4 The design and construction of any municipal service contained herein shall be subject to the approval of the Municipal Engineer and Council's acceptance of any such service. These guidelines do not relieve the owner, contractor, or his/her agent from complying with any Federal or Provincial Legislation that may pertain to the provision of such services.

2.5 The area under construction shall be kept in a neat and tidy condition at all times. Upon completion of the project, the site shall be cleaned to its preconstruction state to the satisfaction of the Municipal Engineer

Part 3: Requirements for Engineering Drawings

Plan Requirements

3.1 All engineered drawings shall be of an appropriate scale and size that clearly illustrates the work proposed. Wherever possible, such drawings shall:

3.1.1 Measure 22" x 40" (560 mm x 1040 mm)

3.1.2 Scaled for plan views at 1" = 40' (1:500)

3.1.3 Scaled for vertical views at 1" = 4' (1:50)

3.2 All engineered drawings shall contain the following information:

3.2.1 A title block containing the project title, drawing number, date, scale, name of the Engineer or Engineering Firm, Engineer's stamp, and revisions;

3.2.2 A location map at a scale not less than 1:10,000 (such scale to be shown on map).

3.2.3 North Arrow

3.2.4 The street right of way as determined by survey showing all lot boundaries abutting the street.

3.2.5 All elevations referred to a geodetic datum with monument numbers and datum specified.

3.2.6 Elevations labelled along the left margin at either 1 metre or 10 foot intervals.

3.2.7 Station numbers labelled along the lower margin at either 20 metre or 100 foot intervals.

3.2.8 Two points of known chainage on the centre line of the street tied to the Nova Scotia Co-ordinate System.

3.2.9 At least one point of known chainage aligned vertically in plan and profile.

Servicing Detail Requirements

3.3 Where a new local street or road is proposed, one copy of the centre line plan and profile drawings shall be submitted to the Municipal Engineer for review and approval. In addition to the above requirements, such drawings shall show the following information:

3.3.1 A profile of the existing topography along the centre line of any proposed street with spot elevations indicated at either 50 ft. or 10 metre intervals. Such profiles shall be extended a minimum of 200 ft. (60 metres) beyond the limits of the proposed street.

3.3.2 The centre line profile of all proposed streets with grades indicated.

3.3.3 Spot elevations of any watercourse, prominent rock formation, areas subject to flooding, and other natural features within or immediately adjacent to the proposed street right of way.

3.3.4 The location and description of all existing municipal services to be connected to including invert and street surface elevations at the point of connection.

3.4 Proposed street drawings shall show all details including connections to existing streets, type of storm water removal proposed as well as any easements outside of the street right of way, existing or proposed, to accommodate such.

3.5 Engineered drawings for any municipal services shall show all details of the proposed service including:

3.5.1 connections to existing services;

3.5.2 finished landscaping where required;

3.5.3 easements or rights of way necessary to carry out the proposed work;

3.5.4 lot laterals with service elevations at the building line (determined by land use bylaw or building code requirements)

3.6 For sanitary sewer systems, calculations shall be shown in tabular form on the plan to indicate depths and velocities at minimum, average, and maximum daily waste flow for all sizes of sewers proposed.

3.7 Proposed storm water drainage systems shall include calculations in tabular form, indicating the depths and velocities for the specified design storm.

3.8 Proposed central water distribution systems shall include calculations in tabular form for the peak

water demand flow for all sizes of water systems proposed.

"As Built" Drawing Requirements

3.9 Where municipal services have been proposed and constructed in accordance with the above requirements, one copy of the "as built" drawings shall be submitted to the Municipal Engineer within 90 days of the final inspection of any municipal service.

3.10 All "as built" drawings shall be completed on an appropriate reproducible material showing the details of all services requirements of Sections 3.1 and 3.2 above.

3.11 All servicing details shall be plotted accurately showing direct tie measurements to at least two survey markers.

3.12 Complete details shall be shown for all point components of the servicing system.

3.13 All approved revisions shall be noted and dated in tabular form in the title block of drawings.

3.14 Where drawings are prepared on a Computer Assisted Design (CAD) system, the Developer may submit, in addition to the requirements above, diskettes containing similar information.

Part 4: Sanitary Sewage Systems

Design Criteria

4.1 A sewer system, or an extension thereto, shall be designed to handle the peak anticipated sewage flow at full capacity.

4.2 Grades

4.2.1 All sewers shall have a uniform grade between manholes and constructed to give a minimum mean velocity of 0.5 metres / second to a maximum mean velocity of 4 metres / second.

4.2.2 In no case shall the slope of a sanitary sewer main be less than 0.5% unless otherwise approved by the Municipal Engineer.

4.2.3 Where higher velocity sewers are unavoidable, such shall be subject to special design requirements specified by the Municipal Engineer.

4.3 Manholes shall be installed at all changes in grade or direction, at all intersections and at an average maximum spacing of 100 metres (328 ft.).

4.4 All sanitary sewer mains shall have a straight alignment between manholes.

4.5 The sanitary sewer main shall have a minimum depth of 2 metres (6.5 ft.) measured from finished grade to the top of the pipe.

4.6 All sanitary sewers shall be located in a separate trench and, unless otherwise approved by the

Municipal Engineer, follow the centre line of the street.

4.7 Sanitary sewer laterals shall have a minimum depth of 1.7 metres (5.5 ft.) at the property line.

4.8 Sanitary sewer laterals shall have a uniform grade of not less than 1% to the point of connection with the sewer main.

4.9 The sanitary Sewer lateral shall be connected to the sanitary sewer main at 90 degrees or less to the direction of flow.

Materials

4.10 Sanitary sewer mains and all fittings shall be constructed of gasketed Polyvinyl Chloride Pipe (PVC) having a minimum diameter of 200 mm (8 in.).

4.11 Sanitary sewer laterals and all fittings shall be constructed of gasketed Polyvinyl Chloride Pipe (PVC) having a minimum diameter of 100 mm (4 in.).

4.12 Manholes shall be precast concrete rings with gaskets having a diameter of 1040 mm (42 in.) with a top diameter of 670 mm (26 in.).

4.13 Manhole bases shall be of precast concrete with PVC connections.

4.14 Manhole covers shall be 600 mm (24 in.) round frame and top.

4.15 Bedding material and initial backfill material shall consist of crushed stone or gravel meeting the requirement of ASTM Designation C33, Gradation 67 (Class A).

4.16 Final backfill material may consist of the excavated material provided it contains no organic material or rock with a dimension larger than 150 mm (6 in.).

Installation

4.17 All non-gasketed joints shall be grouted to prevent infiltration.

4.18 All sanitary sewer components shall be bedded and backfilled in accordance with the Standard Specifications for Municipal Services.

4.19 Asphalt topped roads shall have manhole covers placed flush with the finished grade. Gravel topped roads shall have manhole covers placed 25 mm (1 in.) below the finished grade.

Testing & Inspection

4.20 The developer shall arrange for and pay all costs of tests which shall be carried out in the presence of the Municipal Engineer or his/her designate.

4.21 All tests shall be carried out in accordance with the Standard Specifications for Municipal Services and shall include a Closed Circuit Television Inspection.

4.22 The Developer shall notify the Municipal Engineer of testing dates at least 48 hours in advance.

4.23 Upon completion of all inspections and tests, the Developer shall provide the Municipal Engineer with written certification from a professional engineer that the system is complete, operational and meets all standards referenced herein.

Part 5: Central Water Distribution Systems

Design Criteria

5.1 Water systems shall be designed for water demand peak flows in the area to be serviced by a central water distribution system.

5.2 Water systems shall be designed in such a manner as not to create any dead ends.

5.3 Water mains shall be located in a separate trench and, unless otherwise provided for by the Municipal Engineer, be 3 metres (9.8 ft.) offset and parallel to the centre line of the street.

5.4 Water mains and laterals shall have a minimum depth of 1.7 metres (5.5 ft.) measured from finished grade to the top of the pipe.

5.5 Water laterals shall be connected to the water main at 90 degrees.

5.6 Fire hydrants shall be installed at 150 metre (500 ft.) intervals.

5.7 Water mains shall be equipped with valves at 300 metre (984 ft.) intervals and on all sides of intersections.

5.8 Curb stops shall be installed within the street right of way 150 mm (6 in.) from the property line.

5.9 Fire hydrants shall be installed within the road right of way at locations approved by the Municipal Engineer.

5.10 Where applicable, water systems shall incorporate standards and specifications from Cross Connection Control manual, American Water Works Association, Western Canada Section.

Materials

5.11 Water mains shall be constructed of materials approved by the Municipal Engineer and the American Water Works Association and shall have a minimum diameter of 150 mm (6 in.).

5.12 Water laterals and fittings shall be Type 'K' Copper having a diameter of 19 mm (3/4 in.).

5.13 Laterals shall have a brass curb stop, complete with rod and standpipe to finish grade.

5.14 Water main valves shall be resilient seat valves c/w valve boxes to finish grade.

5.15 Bedding material and initial backfill material shall consist of crushed stone or gravel meeting the requirement of ASTM Designation C33, Gradation 67 (Class A).

5.16 Final backfill material may consist of the excavated material provided it contains no organic material or rock with a dimension larger than 150 mm (6 in.).

5.17 Fire hydrants shall be McAvity M-67.

Installation

5.18 Water mains shall be installed in a separate trench.

5.19 All components of the water system shall be bedded and backfilled in accordance with the Standard Specifications for Municipal Services.

5.20 Asphalt topped roads shall have valve covers placed flush with the finished grade. Gravel topped roads shall have valve covers placed 25 mm (1 in.) below the finished grade. Curb stops shall be placed 25 mm (1 in.) above finished grade.

5.21 Fire hydrant Barrels shall be plugged in poorly drained soils.

Testing, Disinfection, & Flushing

5.22 The developer shall arrange and pay all costs associated with the testing, disinfection and flushing of the water system which shall be carried out in the presence of the Municipal Engineer or his/her designate.

5.23 All tests, disinfection, and flushing shall be carried out in accordance with the Standard Specifications for Municipal Services.

5.24 The Developer shall notify the Municipal Engineer of testing dates at least 48 hours in advance.

5.25 Upon completion of all inspections and tests, the Developer shall provide the Municipal Engineer with written certification from a professional engineer that the system is complete, operational and meets all standards referenced herein.

Part 6: Drainage Systems

General Design Criteria

6.1 Drainage systems shall be designed on the following basis:

Major Drainage System means the system that drains water from a subwatershed area. These include naturally established waterways (eg. rivers, streams, brooks, ponds, lakes, marshes, etc.). The design of a major drainage system shall be based on the 1 in 100 year storm frequency.

Minor Drainage System means the system that collects and stores storm water from roadside tributaries. These include off take and diversion ditches, retention and sedimentation ponds, chutes and down drains, dispersion ditches, storm sewer mains, etc. The design of minor drainage systems shall be based on the 1 in 10 year storm frequency.

Roadside Drainage System means the system that drains surface water from roads and adjacent properties. These are generally composed of small ditches and driveway culverts, and "in-line" storm sewers. The design of roadside drainage systems shall be based on the 1 in 5 year storm frequency.

6.2 Drainage systems shall be designed for the entire tributary area to be served by the system and account for any future development potential that may result in the watershed area.

6.3 Drainage systems shall be designed to handle the peak estimated flows for the specified storm frequency.

6.4 The Developer shall submit, in acceptable form, calculations indicating the expected volumes and flow rates for the storm sewer system based on the 1 in 10 year storm.

6.5 All storm water shall be directed to a major drainage system and not to a smaller system.

6.6 Where appropriate, drainage systems may be a combination of piped and open systems.

6.7 Minor drainage systems located outside of the road right of way shall be constructed entirely within a right of way, easement, or dedicated parcel of land that has a minimum width of 10 metres (33 ft.) and unobstructed access to a public road.

6.8 An area of land that corresponds with a major drainage system shall be deeded to the Municipality, free of encumbrances, with frontage on a public road. The Municipal Engineer shall determine the width of the land to be deeded which will be based on adequate serviceability of the system.

Design Criteria - Piped Storm Sewer System

6.9 Generally, water from roof, foundation, floor, and driveway drains shall be collected and discharged on-site. The Municipal Engineer may allow connections to storm sewer mains in situations where no other suitable alternative exists.

6.10 Storm sewer mains shall have a uniform alignment between manholes with a minimum slope of 0.5%.

6.11 Where topographic conditions warrant, storm sewer mains shall be installed at a depth sufficient to accommodate laterals for foundation drains to abutting properties.

6.12 Manholes shall be required at all changes in grade or direction and at all intersections at a minimum

spacing of 100 metres (328 ft.).

6.13 The storm sewer main shall be installed in a separate trench and, unless otherwise provided for by the Municipal Engineer, follow the centre line of the street offset by 3 metres (9.8 ft.).

6.14 Catch basins shall be installed at each corner of an intersection, on both sides at the entrance of a cul-de-sac and at a minimum spacing of 100 metres (328 ft.).

6.15 Catch basins shall be located at the gutterline of the road.

6.16 The lead connection from the catch basin to the storm sewer main shall be made with a manhole.

6.17 Storm sewer laterals shall be installed at 90 degrees or less to the flow of direction of flow to the storm sewer main.

6.18 Storm sewer laterals shall be installed at a uniform grade to the main and have a minimum slope of 1%.

6.19 Pipe outfalls shall be covered with a 75 mm (3 in.) 12 gauge wire mesh.

6.20 Outfall areas shall incorporate design standards identified in the Department of Environment's Erosion and Sedimentation Control Handbook**.**

6.21 Where a storm sewer system is designed to drain surface water only, the Municipal Engineer may approve an "in-line" storm sewer system. In no case shall an in-line storm sewer system exceed 300 metres (984 ft.) in length and shall be contained within a local drainage area.

6.22 All components of the "in-line" storm sewer system shall be designed as indicated above and connections between Catch basins made with 200mm (8 in.) non-gasketed concrete pipe.

6.23 "In-line" storm drainage systems shall be located along the gutterlike of the street and at a minimum depth of 0.5 m.

Design Criteria - Open Drainage Systems

6.24 Roadside open ditches shall be designed in accordance with the Standard Design Details 95-2, 95-3, and 95-4.

6.25 Each lot shall be provided with a corrugated metal or concrete driveway culvert that shall be rip rapped at both ends and shall not be smaller than any upstream culvert.

6.26 Roadside ditches shall have an uniform grade with a minimum slope of 2%.

6.27 Roadside ditches shall be contained within the road right of way.

6.28 The grade of all open drainage systems shall correspond with the Channel Velocity Chart below at full capacity.

6.29 Alterations to a major drainage system to accommodate the design capacity shall be subject to all regulations and guidelines of the Department of Environment.

6.30 Culvert inlet and outlet designs shall provide for protection of erosion of the channel.

6.31 Banks along a minor drainage system shall not exceed a slope of 3:1.

6.32 The open drainage system shall incorporate appropriate design techniques identified in the Department of Environment's Handbook on Erosion and Sedimentation Control.

Materials for All Drainage System Types

6.33 Storm sewer mains shall be constructed of non-gasketed concrete pipe having a minimum diameter of 300 mm (12 in.) (except where the possibility of ground water contamination warrants the use of gaskets).

6.34 Storm sewer laterals shall be constructed of Polyvinyl Chloride Pipe (PVC) having a diameter of 100 mm (4 in.).

6.35 Connections to Catch basins shall be constructed of non-gasketed concrete pipe having a minimum diameter of 200 mm (8 in.) (except where the possibility of ground water contamination warrants the use of gaskets).

6.36 Bedding material and initial backfill material for storm sewer mains, laterals and lead connections to Catch basins shall consist of crushed stone or gravel meeting the requirements of ASTM Designation C33, Gradation 67 (Class A).

6.37 Final backfill material may consist of the excavated material provided it contains no organic material or rock with a dimension larger than 150 mm (6 in).

6.38 Manholes shall be non-gasketed precast concrete rings having a minimum diameter of 1050 mm (42 in.) (except where the possibility of ground water contamination warrants the use of gaskets).

6.39 Manhole grade rings shall be precast concrete having a diameter of 670 mm (26 in.).

6.40 Manhole bases may be either precast or poured in place concrete.

6.41 Manhole frames and covers shall be 600 mm (24 in.) in diameter and constructed of cast iron.

6.42 Catch basins shall be two piece non-gasketed precast concrete squares measuring 600 mm (24 in.) (except where possible ground water contamination warrants the use of gaskets).

6.43 Catch basin frames and covers shall be IMP #S36I or equivalent.

6.44 Culverts shall be sized according to the design requirements but in no case shall a culvert have a smaller diameter than 500 mm (20 in.) for roadways and 500 mm (20 in.) for driveways with a minimum length of 6 meters.

6.45 Culverts shall be constructed of reinforced concrete pipe or asphalt coated corrugated steel as per the Department of Transportation's **Standard Specification - Metric Edition.**

6.46 With reference to the maximum permitted grades of any open drainage system, the following materials may be used for channel lining:

Channel Material	***Mean Channel Velocity (fps)***
Fine Sand	1.5
Coarse Sand	2.5
Fine Gravel	6.0
Earth - Sandy Silt	2.0
Earth - Silt Clay	3.5
Earth - Clay	4.0
Bermuda Grass / (150 mm soil) Sandy Silt	6.0
Bermuda Grass / (150 mm soil) Silt Clay	8.0
Kentucky Blue Grass / (150 mm soil) Sandy Silt	5.0
Kentucky Blue Grass / (150 mm soil) Silt Clay	7.0
Poor Rock (Sedimentary)	10.0
Soft Sandstone	8.0
Soft Shale	3.5
Good Rock (Metamorphic or Igneous)	20.0

6.47 Culverts shall be covered with a minimum of 300 mm (15 in.) of suitable common material topped with 100 mm (4 in.) of Class "A" gravel.

6.48 Where rock or gravel is used to line a drainage system, it shall be of a sufficient size to prevent erosion and subject to the recommendation of the Department of Environment.

Installation of All Drainage System Types

6.49 Lateral connections to the storm sewer main shall be made by a saddle fitting or a grouted break in connection.

6.50 Catch basin covers shall be installed 50 mm (2 in.) below the normal gutter grade with an even slope extending 600 mm (24 in.) from the front and side of the Catch basin cover.

6.51 Manhole covers shall be placed flush with the finished grade of an asphalt topped road.

6.52 The installation of all drainage system components shall comply with the requirements and recommended practices of the Department of Transportation's Standard Specification - Metric Edition, the Department of Environment's Erosion and Sedimentation Control Handbook, and the Standard Specification for Municipal Services.

Testing and Inspection of All Drainage System Types

6.53 The developer shall arrange for and pay all costs of tests which shall be carried out in the presence of the Municipal Engineer or his/her designate.

6.54 Testing of piped storm sewer systems shall be carried out in accordance with the Standard Specifications for Municipal Services and may include a Closed Circuited Television Inspection.

6.55 The Developer shall notify the Municipal Engineer of testing dates at least 48 hours in advance.

6.56 Upon completion of all inspections and tests, the Developer shall provide the Municipal Engineer with written certification from a professional engineer that the system is complete, operational and complies with all the standards referenced herein.

Part 7: Curbs, Gutters, Sidewalks

Design Criteria

7.1 Sidewalks shall be parallel to the centre line of the street as per Standard Design Detail 95-1.

7.2 Sidewalks shall have a minimum thickness of 100 mm (4 in.). Where a driveway ramp intersects with the sidewalk the minimum thickness shall be 150 mm (6 in.).

7.3 Sidewalks, curbs, and gutters shall follow the grade of the centre line of the street.

7.4 The minimum slope across a sidewalks shall be 1.5%.

7.5 The minimum width of a sidewalk shall be 1.5 metres (5 ft.).

7.6 The minimum width of a curb cut for a driveway shall be 3.5 metres (11.5 ft.) and not more than 9 metres (29.5 ft.).

7.7 Driveway ramps shall have a maximum slope of 10% from the curb to where it abuts the sidewalk.

7.8 At least one ramp shall be provided for each lot on which the sidewalk fronts.

7.9 Pedestrian ramps with a minimum width of 1.5 metres (5 ft.) shall be provided at all road intersections.

Materials

7.10 All sidewalks shall be constructed of either concrete or asphalt.

7.11 All curbs and gutters shall be constructed of concrete.

7.12 Boulevards shall be covered with a minimum of 100 mm (4 in.) of topsoil and then sodded upon project completion.

7.13 Concrete mix shall meet the CSA CAN3-A23.1-M standard.

7.14 Asphalt mix shall meet the Department of Transportation's standard for Type C Mix.

Installation

7.15 The supply and installation of curbs, gutters, sidewalks, and surface drainage systems shall be in accordance with the Standard Specifications for Municipal Services.

7.16 Curbs and gutters shall be poured as a single unit and as an integral part of the Catch basin assembly.

7.17 All exposed soil surfaces shall be stabilized in such a manner to prevent erosion and sedimentation. Sodding shall immediately follow the placement of topsoil in designated areas.

Testing and Inspection

7.18 The Developer shall provide the Municipal Engineer with written certification that the sidewalks, curbs and gutters meet all applicable tests and requirements set out in the Standard Specifications for Municipal Services.

Part 8: Utilities

Design Criteria

8.1 The design and installation of any utility shall be carried out in accordance with the requirements of the individual utility.

8.2 Where utility poles are to be installed in a road right of way that contains curbs or curbs and gutter, such shall be centred in the boulevard.

8.3 Where utility poles are to be installed in a road right of way that is serviced by open ditches, such shall be located behind the ditch and 0.5 metres (1.6 ft.) from any property line.

8.4 Overhead service wires shall have a minimum clearance of 5.5 metres (18 ft.) from the finished grade of all streets and sidewalks.

Materials

8.5 All materials used in establishing any utility shall be CSA approved.

Installation

8.6 All utilities shall be tested and inspected in accordance with the requirements of the individual utility.

8.7 The Utility shall submit to the Municipal Engineer written conformation that all applicable tests have been carried out, that the system conforms to the design requirements and that the Utility has accepted full ownership and responsibility of the system.

Part 9: Local Roads

Design Criteria

9.1 All local roads shall be designed to the requirements of this Specification. For further clarification and guidance, reference should be made to the **Manual of Geometric Design Standards for Canadian Roads**, latest edition.

9.2 Local roads constructed under this specification shall be classified as one of the following:

Municipal Roads

Area 1 (as defined by the Subdivision Bylaw)

Class 1 Road - Roads with paved surfaces, complete with curb, gutter, and piped drainage systems. (see Standard Design Detail 95-1 and Appendix D)

Class 2 Road - Roads with paved surfaces and open drainage systems. (see Standard Design Detail 95-2 and Appendix D)

Area 1 (as defined by the Subdivision Bylaw), outside of defined sewer districts.

Class 3 Road - Roads with gravel surfaces and open drainage systems. (see Standard Design Detail 95-3 and Appendix D)

Area 2 (as defined by the Subdivision Bylaw)

Class 3 Road - Roads with gravel surfaces and open drainage systems. (see Standard Design Detail 95-3 and Appendix D)

Private Roads

Area 2 (as defined by the Subdivision Bylaw)

Class 4 Road - Private roads created under the Subdivision Bylaw with gravel surface and open drainage systems. (see Standard Design Detail 95-4 and Appendix D)

9.3 Roads built to specifically access a commercial or industrial development shall designed and constructed to the Class 1 Road above and shall be of an "all-weather" standard.

9.4 Road designs should recognize and/or incorporate natural topographical features such as watercourses, wet areas, habitats, rock outcrops, steep slopes, etc.

9.5 Curvilinear road design shall be encouraged as opposed to grid iron patterns.

9.6 Where a local road intersects with a Public Highway owned and maintained by the Province of Nova Scotia, the intersection must be approved by the Nova Scotia Department of Transportation. The distance minimum between the intersection of local roads with Provincial roads shall be as follows:

Provincial Local Roads	100 metres
Provincial Collector Roads	150 metres
Provincial Arterial Roads	300 metres

9.7 All local roads shall be based on a design speed of 50 km/hr.

9.8 All local roads shall be contained within the designed right of way for that class of road. All slopes (either in cuts or fills) which will not be eventually eliminated by changes in lot elevation, shall be included in the right of way.

9.9 The centre line of a local road shall be concentric with the centre line of the right of way.

9.10 Roads shall intersect at 90 degrees unless otherwise provided for by the Municipal Engineer.

9.11 The minimum distance between offset intersections within a subdivision shall be 60 metres (197 ft.) measured between centre lines.

9.12 Road extensions to abutting properties shall be provided at a distance no greater than 400 metres (1312 ft.) in areas serviced by public sewer and 600 metres (1968 ft.) in all other areas measured between centre lines. These shall be designed and deeded to the Municipality.

9.13 The use of cul-de-sacs shall be approved when compatible with traffic circulation patterns. All permanent dead end streets shall have a cul-de-sac provided as illustrated in Standard Design Detail 95-5. Temporary dead end streets shall be designed to provide an adequate turning area (see Standard Design Detail 95-6).

9.14 Cul-de-sacs shall not exceed 230 metres (754 ft.) in length measured from the centre line to the midpoint of the turning circle.

9.15 There shall be no more than four road approaches to any intersection.

9.16 Grades at intersections shall not exceed 2% for a distance of 15 metres measured from the closest shoulder of the intersected road.

9.17 Local roads shall have a minimum grade of 0.5% to a maximum grade of 8%. Where topographic conditions warrant, the Municipal Engineer may, upon written approval, allow up to a 10% grade.

9.18 Sight distances shall be determined from Tables 1 and 2 (see Appendix A) and shall apply to all intersections and entrances.

9.19 The minimum length of road that may be approved shall be 150 meters or
a) such length as may be required to complete a previously approved tentative plan of subdivision
or
b) such length as may be required to complete an extension to an adjoining piece of property or
c) as approved by the Municipal Engineer.

9.20 There shall be no maximum road length in sewer serviced areas. The maximum length of road that may be approved shall be 400 meters in unserviced areas or

a) such length as may be required to complete a previously approved tentative plan of subdivision or

b) such length as may be required to complete an extension to an adjoining piece of property or

c) as approved by the Municipal Engineer.

In the case of an existing subdivision that is being extended, lots representing 50% of the frontage shall have been sold before an extension will be permitted.

Materials

9.21 All materials referenced in this Specification are generally based on standards and design procedures set out in the Department of Transportation Standard Specification - Metric Edition, the Asphalt Institute, and the American Society for Testing and Materials (ASTM).

9.22 Required signs, guardrails, culverts, and any other appurtenance shall be supplied as per the **Standard Specification for Municipal Services** and the **Uniform Traffic Control Devices for Canada,** latest edition.

9.23 Aggregates used for road construction shall be supplied in accordance with Appendix B.

9.24 Asphalt concrete shall be supplied in accordance with Appendix C.

Installation

9.25 All components of the roadway system shall be installed in accordance with this Specification, the Department of Transportation **Standard Specification - Metric Edition** and the **Standard Specification for Municipal Services**.

9.26 Clearing of the right of way shall be carried out in a manner that protects streams and brooks from silt and other contaminants. All useable wood shall be salvaged.

9.27 Unless provided for by the Municipal Engineer the entire right of way shall be grubbed of all roots, stumps, embedded logs and all organic materials shall be disposed of outside the right of way. With the approval of the Municipal Engineer, areas covered with more than 1.5 metres of fill or outside slopes may not be grubbed.

9.28 Any swamp material encountered under roadways shall be removed to sound bottom.

9.29 All topsoil shall be removed from the right of way and stored for future use. Upon project completion all exposed earth shall be covered with topsoil and sodded or stabilized by a method approved by the Municipal Engineer.

9.30 The road subgrade shall be formed from stable subsoil and compacted in uniform layers to maximum density. If additional material is required to bring the subgrade to final profile, suitable borrow may be imported for that purpose.

9.31 Any weak, unstable material, or wet areas in the subgrade shall be removed and grade restored with acceptable material and uniformly compacted.

9.32 A uniform crown of 150 mm shall be maintained at all stages of installation to ensure proper drainage.

9.33 Uniform layers of base and surface gravels shall be spread on the subgrade and compacted to maximum density.

9.34 Asphalt concrete pavement shall be spread over surface gravels by power spreaders and rolled to the lines, graded, and compacted as specified. The Municipal Engineer may require an asphalt prime coat be applied to the fine graded road surface prior to paving.

9.35 All work shall be carried out in a professional manner and the site shall be maintained in a neat and tidy condition at all times.

9.36 To ensure safety, barriers shall be maintained to prohibit unauthorized entry to the work.

Testing & Inspection

9.37 The Developer shall arrange for and pay all costs associated with testing of the road.

9.38 The Developer shall provide the Municipal Engineer with written certification from a Professional Engineer that the road construction has been inspected at the below indicated intervals and that it meets or exceeds the minimum standards referenced herein.

1. After Clearing (preconstruction)
2. After Grubbing (pre-culvert and drains)
3. Prior to Any Gravels Being Applied
4. Prior to Paving (where applicable)
5. Final Inspection Upon Project Completion

The Municipal Engineer or a representative may carry out inspections prior to gravels being applied and prior to paving. Notification shall be given to the Municipal Engineer at least 24 hours in advance.

9.39 A photographic record of the work may be requested be the Municipal Engineer at intervals identified in Section 9.36.

9.40 The results of field density tests of the subgrade shall be submitted to the Municipal Engineer to ensure that 95% Proctor Density has been achieved.

9.41 The results of field density tests of successive layers shall be submitted to the Municipal Engineer to ensure that a 98% Proctor Density has been achieved.

Part 10: Agreements for Municipal Services

10.1 The “Maintenance Agreement” shall apply to all roads approved by the County. It shall be signed by both the Developer and the County prior to final approval. (See Appendix E).

Part 11: Definitions

APPROVAL means the approval of the Municipal Engineer. The Municipal Engineer's decision is final unless otherwise provided for herein.

ASPHALT INSTITUTE means the standards and specifications as set out by the Asphalt Institute.

ASTM means the standards and specifications established by the American Society for Testing and Materials.

BASE COURSE means the crushed rock or aggregate which is placed immediately on the subgrade in successive layers.

BUILDING LINE means the line, established by a land use bylaw or the Department of Transportation, regulating the closest positioning of a building to a lot line.

COUNCIL means the Council of the Municipality of the County of Colchester.

CSA means the standards and specifications of products bearing a seal of approval by the Canadian Standards Association.

DEPARTMENT OF TRANSPORTATION means the Nova Scotia Department of Transportation and Communications.

DEPARTMENT OF ENVIRONMENT means the Nova Scotia Department of Environment.

INSPECTION means field inspection by the Municipal Engineer or his/her designate at various stages of construction.

MUNICIPAL ENGINEER means the Municipal Engineer of the County of Colchester

MUNICIPALITY means the Municipality of the County of Colchester

MUNICIPAL STREET OR ROAD means any street or road created under this Specification and ownership and maintenance of which is vested with the Municipality.

PEAK WATER DEMAND FLOW means the largest water volume required at a given point within an average 24 hour period.

PEAK ANTICIPATED SEWAGE FLOW means the largest sewage flow at a given point within an average 24 hour period.

PROFESSIONAL ENGINEER means a Professional Engineer who is a member in good standing with the Association of Professional Engineers of Nova Scotia.

PRIVATE STREET OR ROAD means any street or road created under this Specification, ownership and maintenance of which remains with the developer, subdivider, or abutting landowners.

PROVINCIAL STREET OR HIGHWAY means any public street or highway owned and controlled by the

Department of Transportation and includes local, collector, and arterial roads.

ROADBED means that portion of the roadway extending from shoulder line to shoulder line where the subgrade and shoulders are considered as a single unit.

ROAD RIGHT OF WAY means the land which is reserved for use in constructing the roadway and its appurtenances, the boundaries being determined by the Municipal Engineer.

ROAD TYPES:

ARTERIAL means a road intended to move a relatively large volume of traffic at medium to high speeds where traffic movement is the primary consideration and land access secondary.

COLLECTOR means a road intended to collect traffic from local streets and move it to arterial roads, used where traffic movement and land access are of equal importance.

LOCAL means a road which has the main function of providing land access.

ROADWAY means the portion of the road right of way included between the outside lines of gutters, or side ditches and including all the appertaining structures, and all slopes, ditches, channels, waterways, culverts, and pipes necessary for proper drainage.

STORM FREQUENCY means the largest volume of precipitation associated with a single storm over a specified number of years.

SUBDIVIDER means the owner or owners of any area of land proposed to be subdivided and includes anyone acting with his/her written consent.

SUBDIVISION means the division of any area of land into two or more parcels, and includes a re-subdivision or a consolidation of two or more parcels.

SUBGRADE means that portion of the roadbed upon which the base course is to be applied.

SURFACING means the crushed rock or aggregate which is placed on the base course to provide a smooth riding surface or the surface of the road paved with asphaltic concrete.

SURVEYOR means a registered member, in good standing, of the Association of Nova Scotia Land Surveyors.

TRIBUTARY AREA / DRAINAGE AREA means the area of land that, by virtue of its topography, contributes to a single drainage basin or the area served by a drainage system receiving storm and surface water.

UTILITY means any public or private system, works, plant, equipment or services which furnishes services at approved rates to or for the use of the general public.

Appendix A
Stopping Sight Distance

STOPPING SIGHT DISTANCES - IN METRES
TABLE 1 - POSITIVE GRADES

APPROACH SPEED (km/h)	0%	+1%	+2%	+3%	+4%	+5%	+6%	+7%	+8%	+9%	+10%
30	30	30	30	29	29	29	29	29	29	28	28
35	37	37	36	36	36	36	35	35	35	35	34
40	44	44	44	43	43	42	42	42	41	41	41
45	53	52	52	51	51	50	50	49	49	49	48
50	62	61	61	60	59	59	58	58	57	57	56
55	72	71	70	70	69	68	67	67	66	65	65
60	83	82	81	80	79	78	77	76	75	75	74
65	96	94	93	91	90	89	88	87	86	85	84
70	109	107	105	104	102	101	99	98	97	96	95
75	122	120	118	116	115	113	111	110	108	107	105
80	137	137	132	130	128	126	124	122	120	119	117
90	169	165	162	159	156	154	151	149	146	144	142

EYE HEIGHT = 1.05m
OBJECT HEIGHT = 150mm - FOR INTERSECTIONS, COMMERCIAL & INSTITUTIONAL LOTS
= 600mm - RESIDENTIAL PROPERTIES

STOPPING SIGHT DISTANCES - IN METRES
TABLE 2 - NEGATIVE GRADES

APPROACH SPEED (km/h)	0%	-1%	-2%	-3%	-4%	-5%	-6%	-7%	-8%	-9%	-10%
30	30	30	30	31	31	32	32	32	33	33	34
35	37	37	38	38	39	39	39	40	40	41	42
40	44	45	45	46	46	47	47	48	49	50	50
45	53	53	54	55	55	56	57	58	59	60	61
50	62	63	64	65	66	67	68	69	70	71	73
55	72	73	74	75	77	78	79	81	82	84	86
60	83	85	86	87	89	91	92	94	96	98	101
65	96	97	99	101	103	105	107	109	112	114	117
70	109	111	113	115	118	120	123	126	129	133	136
75	122	125	127	130	133	136	139	143	146	151	155
80	137	140	142	146	149	153	156	161	165	170	176
90	169	173	176	181	185	190	195	201	208	214	222

EYE HEIGHT = 1.05m
OBJECT HEIGHT = 150mm - FOR INTERSECTIONS, COMMERCIAL & INSTITUTIONAL LOTS
= 600mm - RESIDENTIAL PROPERTIES

Appendix B
Gravel Specifications
Class E Gravel

Class E Gravel shall be natural or crushed material from approved pits or quarries meeting the following requirements:

Soundness:	Loss of not over 20% when tested according to ASTM C88 (soundness of aggregate using Sodium Sulfate)		
Abrasion:	Percent wear not over 45% when tested according to ASTM C135 Grading A (Los Angeles Abrasion).		
Grading:	ASTM C117 & C136 (CAN/CGSB-8.2-M88)		
	Passing the	112 000	100%
		14 000	50%
		80	10%
Compaction:	98% of Standard Proctor (corrected for oversize)		

Class C Gravel

Class C Gravel shall be crushed material from approved pits or quarries meeting the following requirements:

Soundness:	Loss of not over 20% when tested according to ASTM C88 (soundness of aggregate using Sodium Sulfate)		
Abrasion:	Percent wear not over 40% when tested according to ASTM C135 Grading A (Los Angeles Abrasion).		
Grading:	ASTM C117 & C136 (CAN/CGSB-8.2-M88)		
	Passing the	56 000	100%
		28 000	60% - 80%
		5000	25% - 45%
		160	0% - 10%
Compaction:	98% of Standard Proctor (corrected for oversize)		

Class A Gravel

Class A Gravel shall be crushed material from approved pits or quarries meeting the following requirements:

Soundness:	Loss of not over 15% when tested according to ASTM C88 (soundness of aggregate using Sodium Sulfate)		
Abrasion:	Percent wear not over 35% when tested according to ASTM C135 Grading A (Los Angeles Abrasion).		
Grading:	ASTM C117 & C136 (CAN/CGSB-8.2-M88)		
	Passing the	20 000	100%
		14 000	60% - 80%
		5000	25% - 45%
		160	0% - 10%
		80	0% - 7%
Compaction:	98% of Standard Proctor (corrected for oversize)		

Appendix C

Asphaltic Concrete Specifications

Asphaltic concrete mixes shall meet the following Marshall Design Criteria:

Test Property	***Min.***	***Max.***	***Notes:***
Stability at 60c KN	4.5		50 blows to each face of specimen.
Marshall Flow mm	2	4	Measured at point of maximum stability.
Air Voids %	3	5	Absorption shall be allowed for.
V.M.A. %	15		Cal. using ASTM Bulk Specific Gravity

Gradation of Aggregates - Type C Mix

Passing the	20,000 sieve	100%
	14,000 sieve	95% - 100%
	5000 sieve	45% - 70%
	2500 sieve	25% - 55%
	315 sieve	5% - 10%
	80 sieve	2% - 9%

Quality of Aggregates

Abrasion: Loss not over 35% when tested according to ASTM C131-76 (Los Angeles Abrasion)

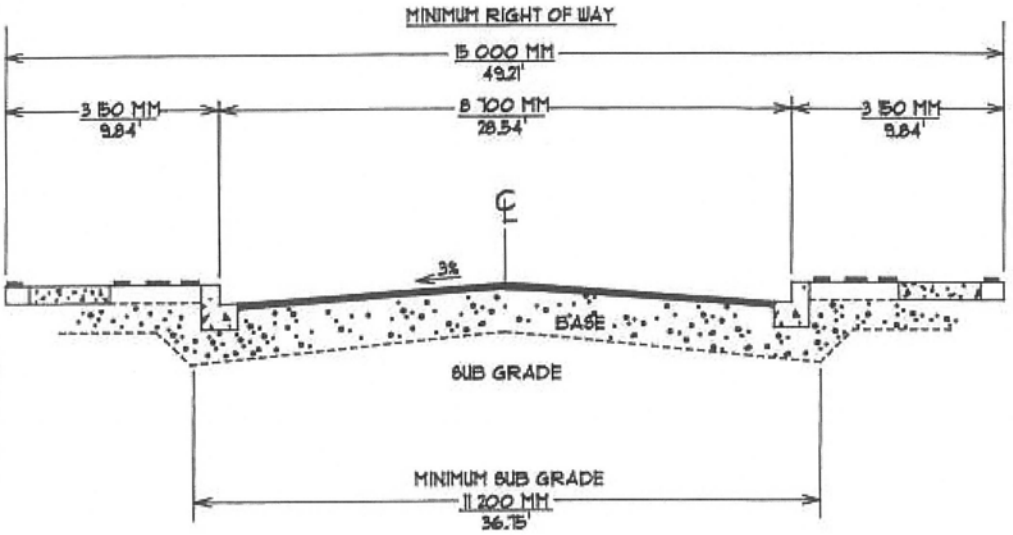
Soundness: Loss not more than 15% when tested according to ASTM C88-76 (Soundness of aggregate by Sodium Sulfate or Magnesium Sulfate)

Appendix D

Table 3 - Road Specifications

Feature	*Class 1 Road*	*Class 2 Road*	*Class 3 Road*	*Class 4 Road*
Surface Type	Paved	Paved	Gravel	Gravel
Travel Surface Width*	8700 mm* (28.5 ft.)	6000 mm (19.7 ft.)	10 000 mm (32.8 ft.)	6000 mm (19.7 ft.)
Curb & Gutter	Yes	No	No	No
Storm Drainage Type	Piped	Open Ditches	Open Ditches	Open Ditches
Sidewalks	Optional	Optional	No	No
Boulevard	Optional	No	No	No
Right of Way Width (Minimum)	15 metres (49.2 ft.)	15 metres (49.2 ft.)	20 metres (65.6 ft.)	20 metres (65.6 ft.)
Gravel Requirements	200 mm Class C (8 in.)	200 mm Class C (8 in.)	150 mm Class C (6 in.)	100 mm Class C (4 in.)
	100 mm Class A (4 in.)	100 mm Class A (4 in.)	100 mm Class A (4 in.)	50 mm Class A (2 in.)
Asphalt Type "C" (Minimum)	75 mm (3 in.)	75 mm (3in.)	N/A	N/A

* NOTE: The Municipal Engineer may consider a reduced Travel Surface Width of 6000 mm (19.7 ft) for a Class 1 Road where:
- crescents do not exceed 350 metres 1148 ft. in length;
- cul-de-sacs do not exceed 230 metres (755 ft.) in length; and
- internal connector streets do not exceed 230 metres (755 ft.) in length.



NOT TO SCALE

NOTES: * 15 M RIGHT OF WAY IS MINIMUM ADDITIONAL MAY BE REQUIRED DUE TO TERRAIN

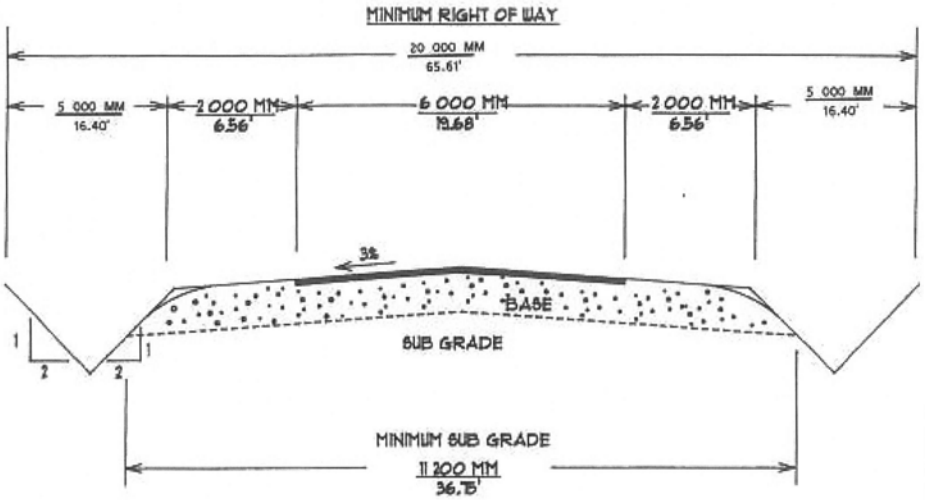
* MINIMUM STRUCTURAL REQUIREMENTS AS SHOWN IN TABLE 3

• DITCH CROSS SECTION MAY BE V SHAPED OR TRAPEZOIDAL SHAPED AS DEEMED NECESSARY TO CARRY FLOWS

MUNICIPALITY OF COLCHESTER

CLASS 1 STREET
TYPICAL CROSS SECTION

DATE:	APPROVED:	NUMBER
		95-1



NOT TO SCALE

NOTES: * 15 M RIGHT OF WAY IS MINIMUM ADDITIONAL MAY BE REQUIRED DUE TO TERRAIN

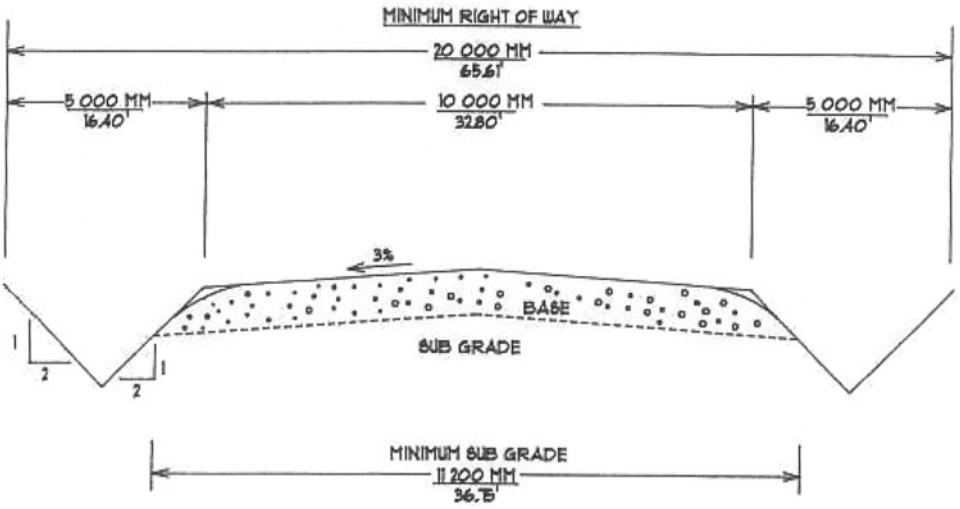
* MINIMUM STRUCTURAL REQUIREMENTS AS SHOWN IN TABLE 3

• DITCH CROSS SECTION MAY BE V SHAPED OR TRAPEZOIDAL SHAPED AS DEEMED NECESSARY TO CARRY FLOWS

MUNICIPALITY OF COLCHESTER

CLASS 2 STREET
TYPICAL CROSS SECTION

DATE	APPROVED	NUMBER
		95-2



NOT TO SCALE

NOTE: * RIGHT OF WAY SHOWN IS MINIMUM ADDITIONAL MAY BE REQUIRED DUE TO TERRAIN

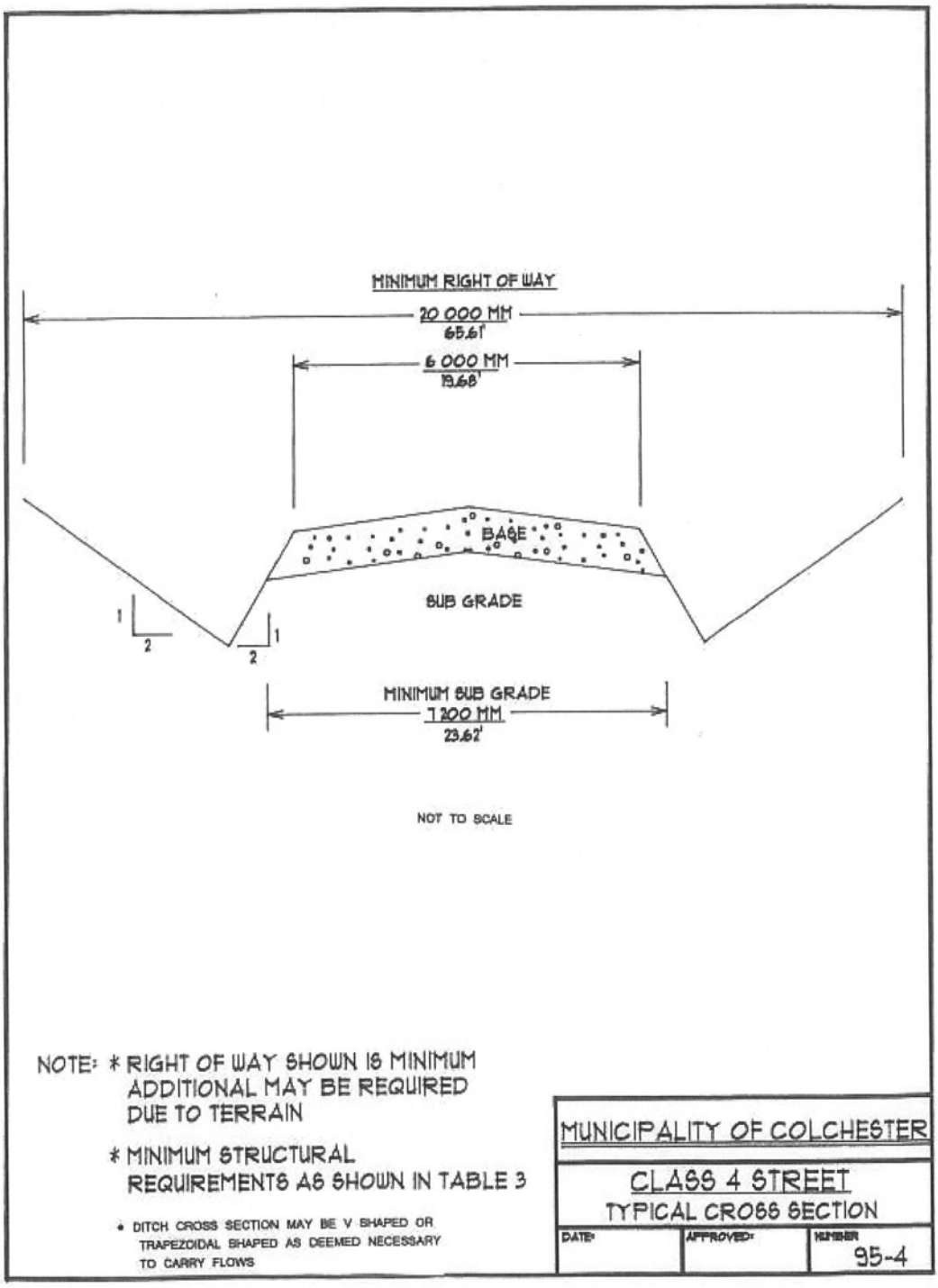
* MINIMUM STRUCTURAL REQUIREMENTS AS SHOWN IN TABLE 3

* DITCH CROSS SECTION MAY BE V SHAPED OR TRAPEZOIDAL SHAPED AS DEEMED NECESSARY TO CARRY FLOWS

MUNICIPALITY OF COLCHESTER

CLASS 3 STREET
TYPICAL CROSS SECTION

DATE:	APPROVED:	NUMBER
		95-3



NOTE: * RIGHT OF WAY SHOWN IS MINIMUM ADDITIONAL MAY BE REQUIRED DUE TO TERRAIN

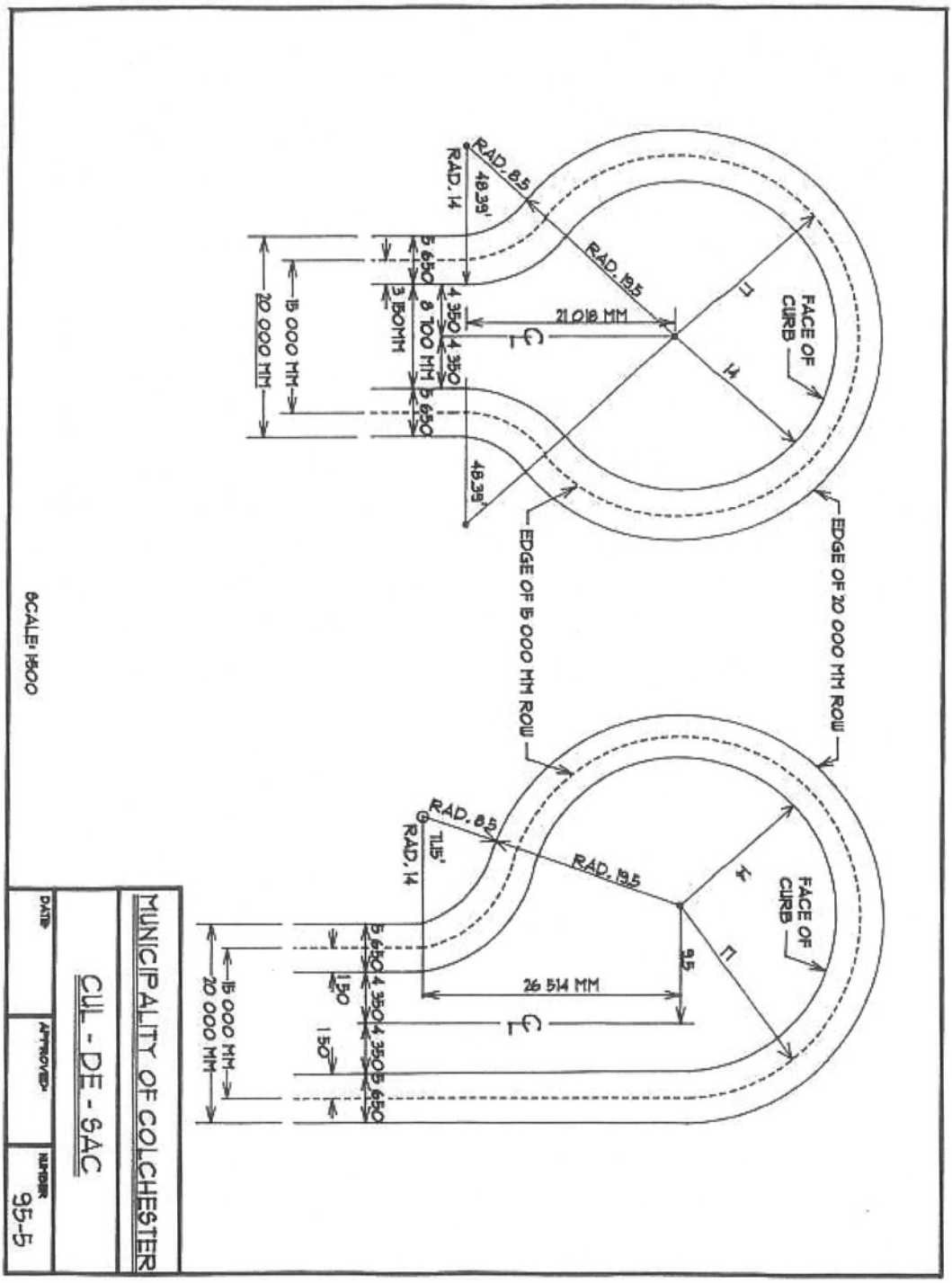
* MINIMUM STRUCTURAL REQUIREMENTS AS SHOWN IN TABLE 3

• DITCH CROSS SECTION MAY BE V SHAPED OR TRAPEZOIDAL SHAPED AS DEEMED NECESSARY TO CARRY FLOWS

MUNICIPALITY OF COLCHESTER

CLASS 4 STREET
TYPICAL CROSS SECTION

DATE:	APPROVED:	NUMBER
		95-4


RAD. 8.5
RAD. 14
48.39'
RAD. 19.5
FACE OF CURB
14
21 018 MM
5 650
4 350
8 700 MM
3 150MM
15 000 MM
20 000 MM
EDGE OF 20 000 MM ROW
EDGE OF 15 000 MM ROW
SCALE: 1:500
MUNICIPALITY OF COLCHESTER
CUL - DE - SAC
DATE
APPROVED
NUMBER
95-5

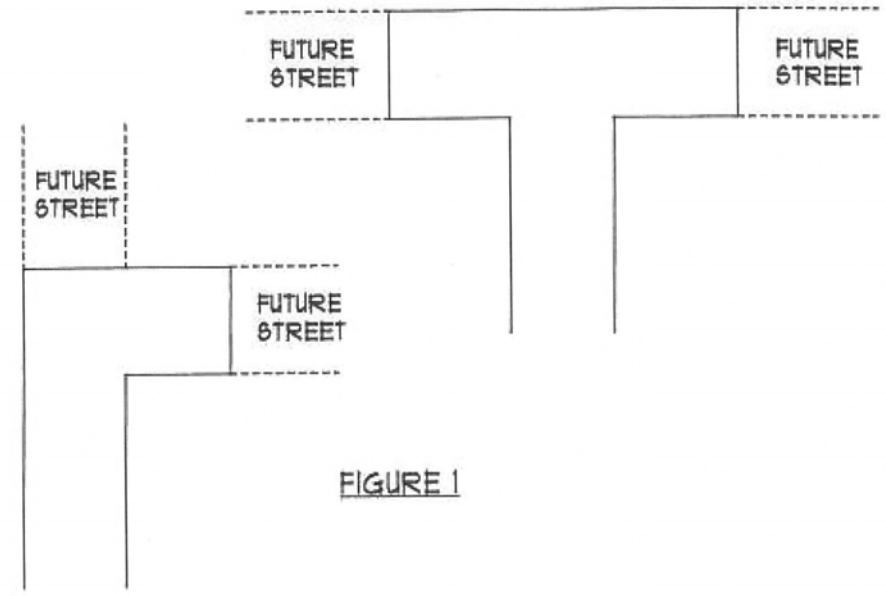


FIGURE 1

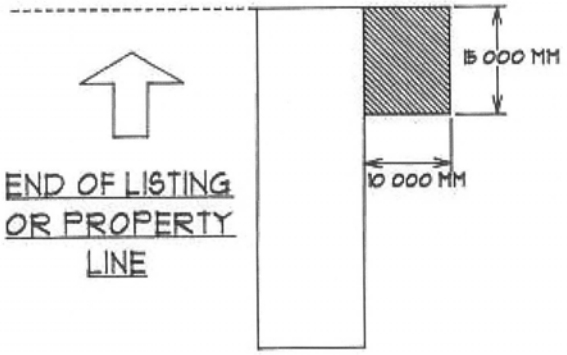


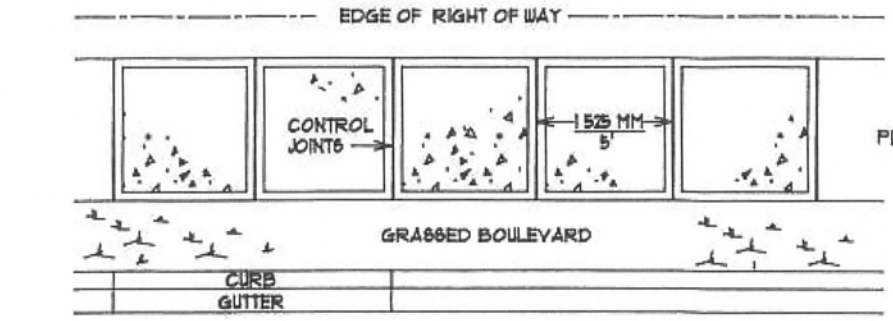
FIGURE 2

(NOT TO SCALE)

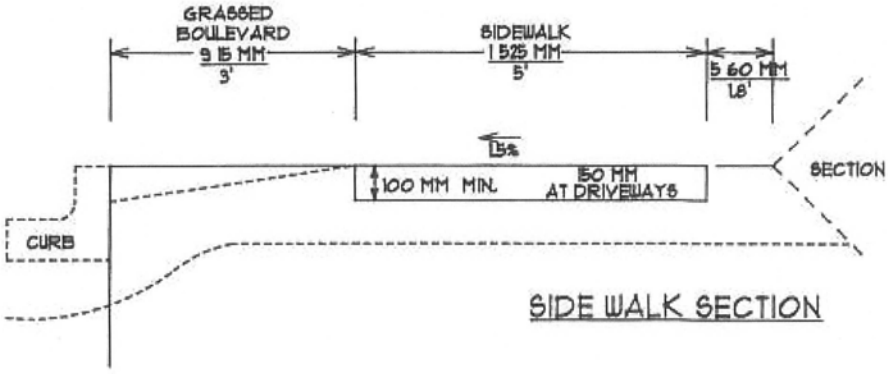
MUNICIPALITY OF COLCHESTER

TEMPORARY TURNING AREAS

DATE:	APPROVED:	NUMBER:
		95-6



SIDE WALK PLAN

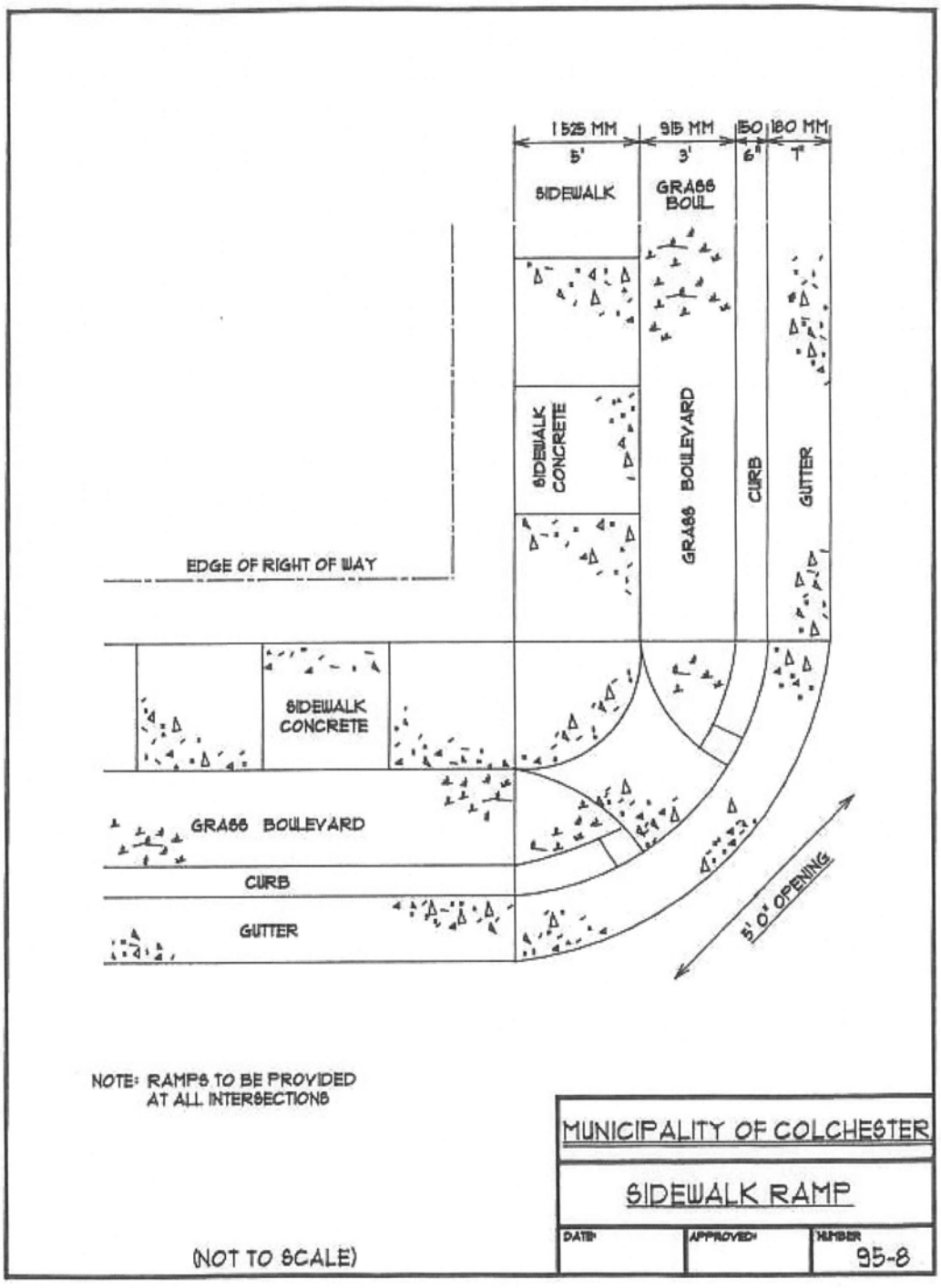


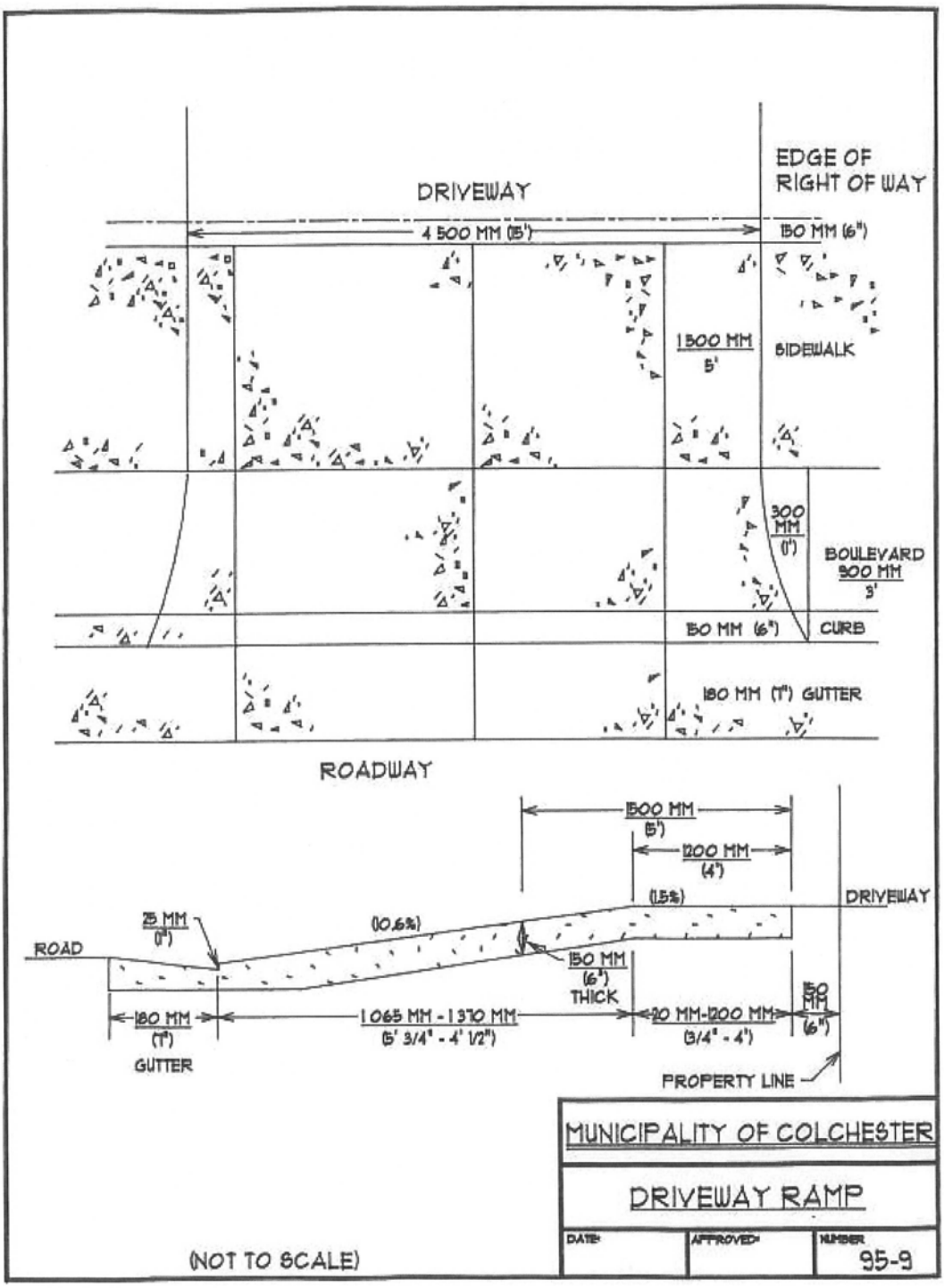
SIDE WALK SECTION

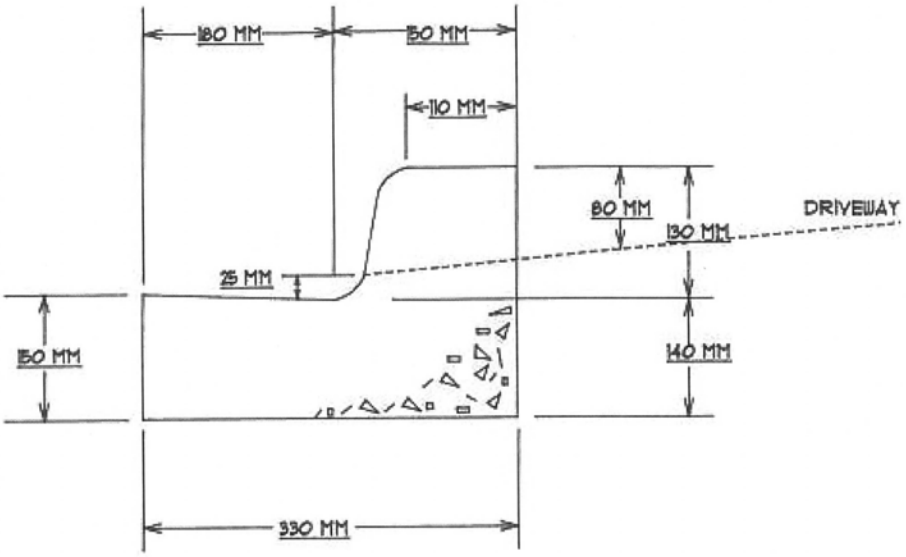
NOTES: 1. CROSS SLOPE MAY BE ADJUSTED TO SUIT DRIVEWAYS
2. CLASS "A" EXPOSURE CONCRETE
3. 150 MM COMPACTED GRANULAR BASE
4. RAMPS TO BE PROVIDED

(NOT TO SCALE)

MUNICIPALITY OF COLCHESTER		
CONCRETE SIDEWALK DETAIL		
DATE:	APPROVED:	NUMBER: 95-7


1525 MM
5'
915 MM
3'
50
6"
180 MM
7"
SIDEWALK
GRASS BOUL.
SIDEWALK CONCRETE
GRASS BOULEVARD
CURB
GUTTER
EDGE OF RIGHT OF WAY
SIDEWALK CONCRETE
GRASS BOULEVARD
CURB
GUTTER
5'0" OPENING
NOTE: RAMPS TO BE PROVIDED AT ALL INTERSECTIONS
(NOT TO SCALE)
MUNICIPALITY OF COLCHESTER
SIDEWALK RAMP
DATE
APPROVED
NUMBER
95-8

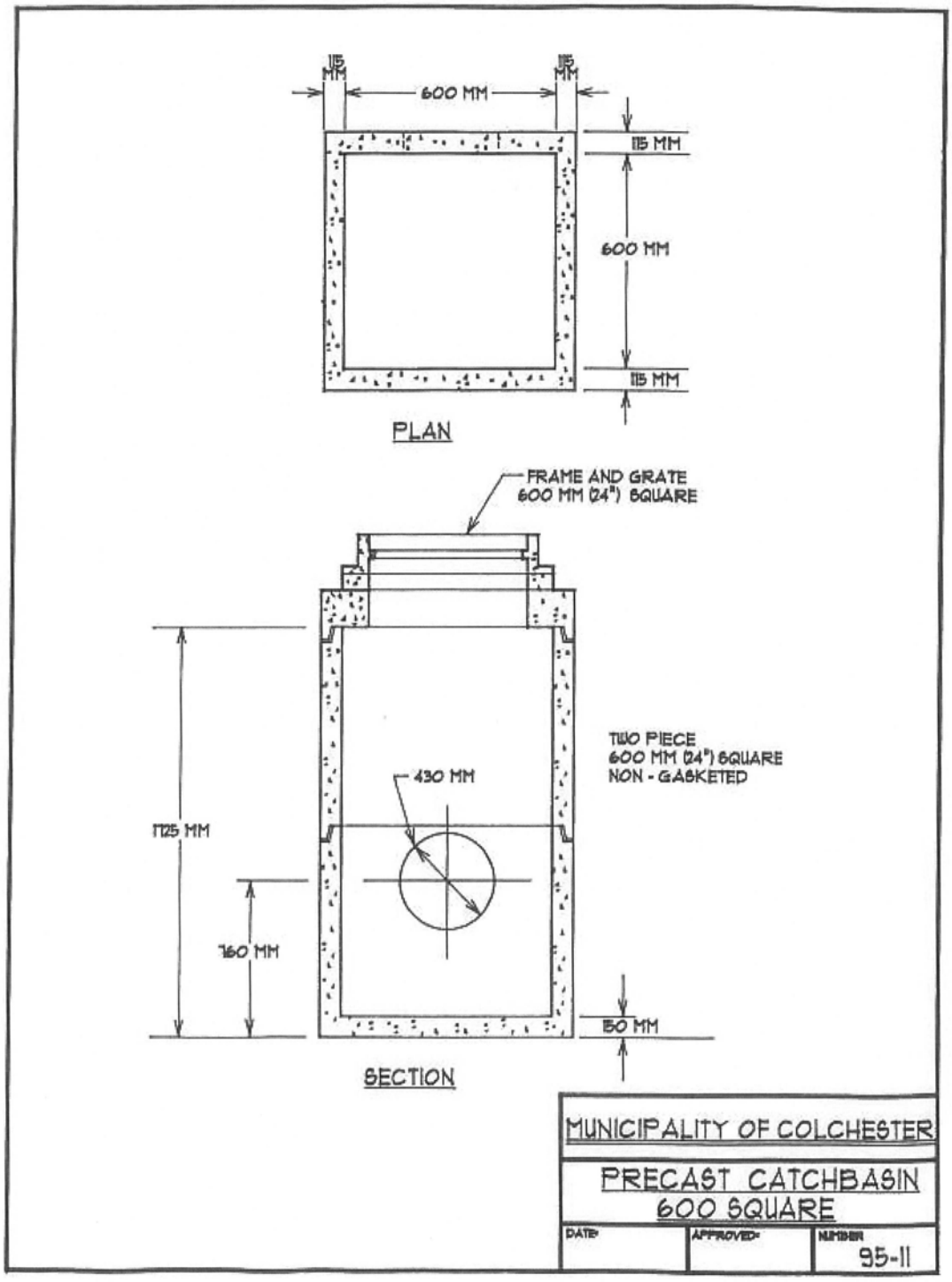

EDGE OF
RIGHT OF WAY
DRIVEWAY
4 500 MM (15')
150 MM (6")
1 500 MM
5'
SIDEWALK
300
MM
(1')
BOULEVARD
900 MM
3'
150 MM (6")
CURB
180 MM (7") GUTTER
ROADWAY
1500 MM
(5')
1200 MM
(4')
(1.5%)
DRIVEWAY
25 MM
(1")
(10.6%)
ROAD
150 MM
(6")
THICK
180 MM
(7")
GUTTER
1 065 MM - 1 370 MM
(5' 3/4" - 4' 1/2")
20 MM-1200 MM
(3/4" - 4')
150
MM
(6")
PROPERTY LINE
MUNICIPALITY OF COLCHESTER
DRIVEWAY RAMP
DATE:
APPROVED:
NUMBER
95-9
(NOT TO SCALE)



NOTES: 1. 150 MM MINIMUM COMPACTED GRANULAR BASE REQUIRED
2. CLASS 'A' EXPOSURE CONCRETE

(NOT TO SCALE)

MUNICIPALITY OF COLCHESTER		
CONCRETE CURB DETAIL		
DATE:	APPROVED:	NUMBER: 95-10


115 MM
600 MM
115 MM
115 MM
600 MM
115 MM
PLAN
FRAME AND GRATE
600 MM (24") SQUARE
TWO PIECE
600 MM (24") SQUARE
NON - GASKETED
430 MM
1125 MM
760 MM
150 MM
SECTION
MUNICIPALITY OF COLCHESTER
PRECAST CATCHBASIN
600 SQUARE
DATE:
APPROVED:
NUMBER
95-11

Addendum #1

Standard Specifications for the

Design and Construction

of Municipal Services in Colchester County

May 2009

Municipality of the
County of Colchester

This addendum forms an integral part of the Standard Specifications for the Design and Construction of Municipal Services in Colchester County, dated August 1995 and is intended to modify, clarify and/or to amend clauses of the Standard Specifications referenced in this addendum.

Part 1: Purpose

No Changes.

Part 2: Minimum Requirements for All Services

Article 2.2: Any survey plan prepared in conjunction with the provisions of municipal services shall bear the stamp and signature of a Registered Land Surveyor in the Province of Nova Scotia. Detailed design shall be based on survey data collected via total station, and shall not be based on a GPS survey.

Part 3: Drawings

Article 3.2.8: Two points of known chainage on the centre line of the road, tied to two (2) separate Provincial monuments of the Nova Scotia Coordinate System.

Add Article 3.2.10: Contours with a contour interval of 0.25 metres shall be provided on all plan views along the existing and/or proposed right-of-way. Such contours shall be generated using Total Station survey data and shall extend to a minimum of 3 metres on each side beyond the right of way boundary. Contours for all other areas within the watershed/subdivision shall be provided at an interval of 1 metre and may be collected using a GPS unit with accuracy of +/- 0.25 metres.

Add Article 3.3.5: Drawings shall include crossections of the proposed road at a 20 metre intervals, showing the entire right-of-way width, existing and proposed grades, as well as location of existing and proposed services.

Article 3.5.4: lot laterals with service elevations at the edge of the right-of-way.

Part 4: Sanitary Sewage Systems

Article 4.3: Manholes shall be installed at all changes in grade or direction, at all intersections, and at an average maximum spacing of 100 metres (328 ft.). Where an inlet has an invert elevation equal to or greater than 600 mm above the invert of the manhole, the inlet shall be baffled.

Article 4.6: All sanitary sewers shall be located in a separate trench and, unless otherwise approved by the Municipal Engineer, follow the centreline of the street. All manholes shall be located such that there is a minimum asphalt apron surface of 2m X 2m around the manhole cover.

Article 4.7: Sanitary sewer laterals shall have a minimum depth of 1.7 metres (5.5 ft) at the property line. Invert of the sewer lateral at the property line shall be noted on the drawings and location of the service lateral at the property line shall be tied to at least two property pins in plan.

Article 4.8: Sanitary sewer laterals shall have a uniform grade of not less than 2% to the point of connection with the sewer main. Unless required to connect to the main sewer line, vertical bends shall not be installed along a sewer lateral. Cleanouts shall be placed at all locations where sewer lateral changes direction and at every 30 metres interval along a straight alignment.

Part 5: Central Water Distribution Systems

Article 5.6: Fire hydrants shall be installed at 150 metre (500ft) intervals measured along the centreline of the road.

Part 6: Drainage Systems

Article 6.26: Roadside ditches shall have a uniform grade with minium slope of 0.5%."

Article 6.45: Culverts shall be constructed of reinforced concrete pipe, plastic or corrugated steel as per the Department of Transportation's Standard Specification, latest edition.

Part 7: Curbs, Gutters and Sidewalks

No Changes

Part 8: Utilities

No Changes

Part 9: Local Roads

Article 9.7: All local roads shall be based on a design speed of 50 km/hr and shall be designed in accordance with the TAC Geometric Design Guide for Canadian Roads, Latest Edition.

Article 9.14: Cul-de-sacs shall not exceed 230 metres (754 ft) in length measured from the centre line of the intersection to the midpoint of the turning circle. The minimum length of a cul-de-sac shall be 60 metres measured from the centreline of the intersection to the midpoint of the turning circle.

Article 9.15: There shall be no more than four road approaches to any

intersection. The right turn radius measured from the centre of the curve to the edge of asphalt or face of curb at any intersection shall be the higher of 9.0 m or the value calculated in accordance with TAC Geometric Design Guide for Canadian Roads, Latest Edition.

Article 9.18: Sight distances shall be determined based on the standards presented in the TAC Geometric Design Guide for Canadian Roads, latest edition and shall apply to all intersections and entrances.

Part 10: Agreements for Municipal Services

Article 10.1: Maintenance and easement agreements shall apply to all roads and services approved by the County and shall be signed by both the Developer and the County prior to final approval.

Part 11: Definitions

DEPARTMENT OF TRANSPORTATION: means the Nova Scotia Department of Transportation and Infrastructure Renewal.

Appendix D

Modify Table-3 (Road Specifications) Column 3 (Class-2 Road) Row 8. Change Right-of-way Width (minimum) from 15 metres (49.4 ft) to 20 metres (65.6 ft).

Standard Details

95-2: Redraw required right-of-way to 20 metres, and not 15 metres as shown.

Add Note: Ditch crossection may be V shaped or trapezoidal shaped, as deemed necessary to carry flows.

95-3 Add Note: Ditch crossection may be V shaped or trapezoidal shaped, as deemed necessary to carry flows.

95-4 Add Note: Ditch crossection may be V shaped or trapezoidal shaped, as deemed necessary to carry flows.