Oxford County Design Guidelines | 3 | Engineering Drawings and CAD Standards

TABLE OF CONTENTS

LIST OF FIGURES

3 DRAWING STANDARDS

3.1 GENERAL REQUIREMENTS

a) A complete set of drawings shall consist of separate drawings of some or all of the following:

- Title Page
- Site plan
- Plan and profile for roads, drainage and storm sewers
- Plan and profile for sanitary sewers and watermains
- Plan and profile for sanitary and storm sewers for common trench designs
- Plan of proposed street lighting, hydro, telephone, cablevision and gas
- Plan of proposed signage and pavement markings
- Additional plans showing any special detail and cross-sections (i.e. removals, grading, temporary watermain plan, etc.)

b) Full sized drawings to be ANSI D 22” x 34” (559mm x864mm). Reduced drawings are to be 11” x 17” (279mm x 432mm).

c) The County of Oxford contract drawings and AutoCAD standards are based on the current versions of the industry standard software by Autodesk: AutoCAD and Civil 3D Design. All drawings submitted to the County of Oxford must be in DWG format using Autodesk AutoCAD support versions 2018 or higher .

d) Drawings scales and dimensions shall be shown on all drawings.

e) The drawings shall be neat and legible with adequate clearance margins between the drawing information and the title block border. Notes and text shall locate and describe the proposed work in sufficient detail to facilitate construction. Limits of construction and match lines shall be clearly marked on the drawing.

f) Plan and profile drawings shall be drawn with the profile on the bottom of the drawing sheet lined up under the plan if possible. Center line stations, utilities, inverts, material and grade information shall be located across the bottom of the profile.

g) North arrow shall be oriented in the two northerly quadrants, if possible.

h) Lettering shall be to Leroy metric heights and widths. Vertical upper case lettering is preferred. Lettering shall be unobstructed by linework and other drawing information. Conflicts between linework, symbols, dimensioning or text shall be removed.

i) Construction notes shall be located around the perimeter of the drawing, tagged to the drawing feature.

j) All elevations shown on the drawings shall be metric geodetic datum. The source and location of the datum shall be clearly noted on each drawing.

k) The drawing title block shall be the County of Oxford Standard Title Block and shall include the project name, project location, type of drawing (i.e. site Plan) and Engineer's name and/or company name and logo, Engineering File No. and the County of Oxford drawing number and key plan

l) Plan profile drawings shall conform to scales: 1:250 or 1:500 horizontal, 1:50 vertical.

m) Standard details such as manholes, catch basins, hydrants, etc., that are shown and described in the County of Oxford Design Guidelines and Supplemental Specifications for Municipal Services need not be shown in detail on the drawings; the standard Drawing No. shall be quoted on the plan for reference. Standard symbols, abbreviations, materials, and hatch patterns shall be used. Any additional symbols, abbreviations, materials, and hatch patterns shall be included in the County of Oxford standard legend.

n) All drawings shall bear the dated stamp/seal and signature of the professional engineer responsible for the design.

o) Provisions shall be made on all drawings for the insertion of the County of Oxford drawing number in the space provided labeled "Drawing No." The County of Oxford will provide the number for insertion on the drawing. Consultant drawing number will be placed immediately above in the space labeled for that purpose.

p) Numerical values on the construction drawings shall be shown to two (2) decimal places unless accuracy warrants otherwise.

q) Line work for all constructed works shown on the drawings shall retain the thicker line density (as for proposed works) for ease of determining the extent of works covered by the drawings. Existing elements shall be shown in grey line work.

3.2 SITE PLAN AND KEY PLANS

a) The site plan of the construction works shall be scaled as: 1:500.

b) The following existing and proposed information shall be shown on the Site Plan:

- Existing watercourse
- Pavement, curbs
- Ditches, culverts, storm sewers, manholes cleanouts, inlet/outlet structures and catch basins
- Sanitary sewers, manhole, cleanouts
- Watermains, valves, hydrants, chambers, blowoffs
- All pertinent property, right-of-way and easements
- Road allowance and easement dimensions
- Lot numbers and existing legal plan numbers
- One meter contour lines for slopes greater than 10% existing and proposed
- Power and telephone and street light poles
- Plan and profile drawing reference numbers

- Gas mains, underground hydro, telephone, street lights and cable and their related appurtenances
- Site Benchmarks
- Routing of all major storm flows including the 100-year storm

c) A Key Plan to a small scale, (e.g., 1:10000), showing the location of the works in relation to major streets, shall be provided in the upper right-hand section of the drawing sheet.

d) A drawing index shall be provided and include the drawing titles, sheet numbers, and the County drawing number.

3.3 PLAN AND PROFILE DRAWINGS - GENERAL

Each base plan and profile shall show but not be limited to the following information:

a) All cadastral information including property lines, right-of-ways, easement lines and dimensions in sufficient detail to relate design to surrounding and adjacent properties shall be included on all drawing submissions.

b) Legal description and civic addresses of existing properties.

c) Road allowance dimensions.

d) Existing pavement curbs, sidewalks, ditches, driveways, lanes, retaining walls, buildings, trees and shrubs within the right-of-way. Note significant trees on and within 5 metres of the right of way.

e) All existing underground and surface utilities and services (with offsets, elevations, size, age and material type and as-built references) including but not limited to the following:

- Sanitary sewers, storm sewers, watermains and appurtenances
- Street light poles, conduit and appurtenances
- Hydro poles and underground wiring ducts and appurtenances
- Telephone poles, underground wiring ducts and appurtenances and fibre optic cables
- Gas mains and appurtenances
- Cable television ducts and appurtenances
- Traffic control devices, poles, conduits, signs and painting
- Irrigation systems

f) All relevant topographic information. For slopes greater than 10 percent, one (1) meter contour lines are required.

g) Autodesk Project name, drawing and layout name in the bottom left hand corner of the title block.

h) Benchmark elevation, identification number and location shall be shown in the appropriate section of each title block.

i) Right-of-way and/or road centreline stationing shall be to metric standards (0+000) at 20 metre intervals and shall be related geometrically to legal property lines or survey monuments. Stationing shall run left to right where possible and upstream on gravity pipes.

j) Where possible, plan views shall be horizontal across the drawing sheet, and shall be aligned vertically by centre line stationing with the profile view below.

k) Profile elevations shall be placed at both sides of the profile. Split profiles must show elevations on both sides of the break.

3.4 ROADS

The following shall be shown in addition to the information required in Section 3. Plan and Profile Drawings – General:

a) All proposed roadworks, complete with offsets from road centerline, including: pavement, curbs, sidewalks and poles.

b) Stations of the BC & EC of road centreline and curb return horizontal curves together with the curve information including delta angle, radius, tangent length and arc length.

c) Details of intersections with spot elevations at all critical points including grades and elevations of curb returns.

d) Catchbasin rim elevations and stations related to road centerline chainage. To include lead locations to main, lead diameters and material in a table.

e) Existing ground profile and finished pavement profile along the pavement centerline with elevations at 20 metre intervals.

f) Crossfall or crown information with gutter elevations at change points.

g) Proposed road centreline grade.

h) Stations and elevations of BVC, EVC, and VPI.

i) Vertical curve information including the length of curve and sag or crest K value, where K equals the length of the vertical curve in metres divided by the algebraic difference in grades, percent.

j) Elevations along the vertical curve at ten (10) metre intervals.

k) Elevation and station of low and high spots of vertical curves.

l) Where the slope of existing ground is greater than 10% across the right-of-way, cross-sections shall be shown at intervals not exceeding twenty (20) metres.

m) Where there is an elevation difference of more than 1.2 m from the design road centre line to a suitable building site on the adjacent parcel, driveway grades and profiles shall be shown on the drawings.

n) Where only a half road is being constructed, full width design cross-sections shall be provided as required to ensure the design suits the future development of adjacent properties.

o) Typical road cross-section showing right-of-way width, proposed road design structure, pavement width, sidewalks, curbs, underground utilities, hydro, power and street light poles, hydrants and their related offsets.

p) Proposed and existing monument with label (note: no monuments shall be destroyed during construction).

q) Additional design details as required.

r) Refer to Figure 2.2 for a plan and profile sample drawing.

3.5 STORM AND SANITARY SEWERS

The following shall be shown in addition to the information required in Section 3. Plan and Profile Drawings – General:

a) Include common trench designs on the same construction drawing.

b) All proposed storm and sanitary works including manholes, drop pipes, cleanouts, catchbasins, inlet/outlet structures, pipe work, ditches, culverts, inspection chambers, services and wyes, complete with offsets, rim elevations, stations related to the road centreline, and pipe inverts at manholes and pipe grade breaks.

c) Existing ground profile and finished ground or pavement profile along the centerline of the proposed sewer.

d) Distance between manholes with proposed grade of pipe.

e) Stations and elevations of the BC, and EC of all horizontal curves with the curve information including delta angle, radius, tangent length and arc length.

f) Stations and elevations of BVC, EVC and VPI.

g) Vertical curve information including the length of vertical and maximum pipe deflection.

h) Elevations along vertical curves at ten (10) metre intervals.

i) Size, material type and class of pipe.

j) Existing or proposed pipe crossings to be shown in profile and to include pipe inverts.

k) Proposed inverts and offset locations to property line of service connections at property lines.

l) Location of existing buildings on properties served by storm and sanitary sewers.

m) Additional design details as required.

n) Refer to Figure 2.2 for plan and profile sample drawing.

o) Materials, types, size, inverts and flow direction to be shown for all proposed and existing culverts.

3.6 WATER

The following shall be shown in addition to the information required in Section 3. Plan and Profile Drawings – General:

a) All proposed waterworks including size, material type and class of pipe, hydrants, valves, joint restraints, fittings and all related appurtenances with offsets and stationing related to road centreline.

b) Locations of proposed service connections including an offset distance from a survey marker or lot corner.

c) Existing ground profile and finished ground or pavement profile, and invert profile along the centerline of the proposed watermain.

d) All other service crossings to be shown in profile (e.g., sewer mains, gas mains, etc.).

e) Extent of work required in making the connection to existing watermains.

f) If the proposed watermain alignment or profile varies from the road centreline, the following shall be provided:

- Stations of the BC and EC of horizontal curves together with curve information including delta angle, radius, tangent length and arc length
- Stations and elevations of the BVC, EVC and VPI of vertical curves together with curve information including curve length and maximum pipe deflection required

- Elevations along vertical curve at ten (10) metre intervals
- Proposed grades

g) Pipes requiring joint restraints shall be shaded, labeled and dimensioned from adjacent fitting showing the length of pipe requiring restraint.

h) Additional design details as required.

i) Refer to Figure 2.2 plan and profile sample drawing.

3.7 STREET LIGHTING AND TRAFFIC CONTROL SIGNALS

The following shall be shown in addition to the information required for plan view in Section 3. Plan and Profile Drawings – General.

Should traffic signals be required, a separate Signal Wiring Plan; and Signalized Intersection Plan showing location of all poles and mounted hardware, handholes, ducts/cables, the controller, and full turn lanes (storage and taper). The plans shall be submitted at a scale of 1:250. PHM-125 record drawings are required for all traffic signal drawings. The following is also required:

a) Pole, conduit and appurtenances locations with offsets and stationing related to road centreline

b) Size, type, class of conduits

c) Schematics of wiring details for street lights and traffic signals

d) Details of detector loops and all other wiring circuit on traffic signals

e) Street lights shall be numbered and pertinent information

3.8 SIGNAGE AND PAVEMENT MARKINGS

a) A separate plan shall be prepared in all cases for road surface works. This plan shall detail eradications, alterations, additions and new regulatory and advisory signage and line painting.

The design shall conform to Ministry of Transportation Installation Guidelines.

The following information shall be shown:

- Dimensions, lengths and colour of proposed lane or curb markings, medians, and crosswalks
- Lane widths, median radii and taper ratios

- Dimensioned location and type of new or relocated signs. Type of new, removed or relocated signs, including a sign inventory table
- A signs materials list indicating pavement markings shall be arranged in table format
- For drawing clarity show curb locations only. Do not show subsurface/overhead utilities, legal information or addresses

3.9 DETAIL SHEET AND CROSS-SECTIONS

a) Where there is not sufficient room on the plan and profile drawings, design details for the particular drawing may be provided on a separate sheet.

b) Scale shall be determined by the designer to suit the design detail, and shall be included on the detail drawing.

c) Where road cross-sections are required they may be provided on a separate sheet.

d) Cross-sections shall be to a scale of 1:250 (H) to 1:100 (V) unless otherwise approved.

e) Starting at the lower left hand corner of the drawing sheet, cross-sections shall be placed up the sheet in order of increasing stationing. Grid elevations shall be shown at the left hand side of each cross-section and stationing shall be shown above each cross-section. Adequate space shall be left between cross-sections so as to ensure clarity.

f) Cross-sections shall include:

- Design road cross-section within the right-of-way
- Existing ground cross-section extending into the adjacent properties as required
- Existing and proposed sub-surface utilities
- Significant objects/structures located within existing and proposed right-of-way

3.10 AS-BUILT SUBMISSIONS

a) Drawings shall include all information as specified elsewhere for the construction drawings, but shall be corrected upon completion of construction to note all works removed during construction.

b) All dimensions shown shall reflect the As-Built conditions of the construction and all references to “Proposed” ,”Install”, etc. shall be removed. As-Built drawings shall be to scale in accordance with the As-Built dimensions shown. The revision table shall be completed indicating the drawings are As-Built.

c) All As-Built features shall be surveyed and survey points imported into the digital drawing. The As-Built drawing shall reflect the true elevation and location of all constructed features, in both the plan and profile views. Tolerance for moving features in drawings will be >0.5m (e.g. manholes installed less than 0.5m from design location do not need to be shifted on the digital as-builts/drawings).

d) The As-Built drawings shall be submitted in the following digital formats:

- Supported Acrobat PDF
- "AutoCAD Etransmit" Autodesk: AutoCAD Supported format or equivalent method to ensure transfer of all reference files, pen tables (ctb files) and text and dimension styles.

e) Line work for all constructed works shown on the drawings shall retain the thicker line density (as for proposed works) for ease of determining the extent of works covered by the drawings.
Proposed construction for future phases of the project shall not be shown on the As-Built drawings.

f) All As-Built drawings shall include the following information as well as the required asset information as listed below:

- The location and elevation of all existing utilities and services encountered in the construction operation
- The location and invert elevation at property line of all individual service connections, and the wye Chainage, at the main for all constructed and existing works
- A note on each drawing describing the type of trench material (sand, gravel, clay, hard pan, etc.) encountered during construction and the location and profile of all rock
- Complete Sanitary and Water Service Record Sheets for each lot
- Complete Storm Service Record Sheet for lots where a Storm Service exists. Newly developed areas do not have Storm Services, and Oxford County will investigate existing storm services and remove them if feasible. In areas where it is better to maintain an existing storm service rather than have it removed, a Record Sheet shall be filled out and kept within the As-Built drawings.

Fig 3.01

Growing stronger together

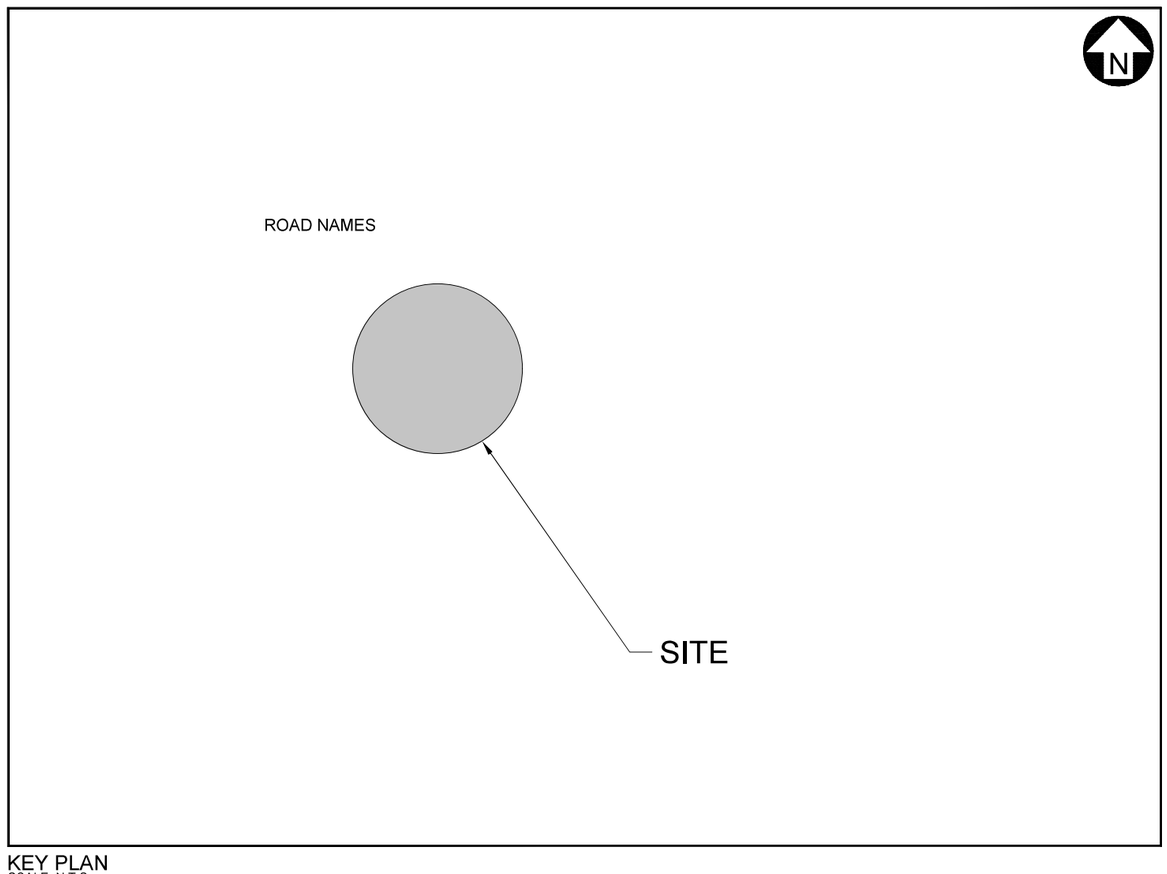
OXFORD ROAD/STREET RECONSTRUCTION

ROAD NAME TO ROAD NAME

CITY/TOWN/MUNICIPALITY, ONTARIO

CONTRACT NO. 9300##-2024

ISSUED FOR REVIEW/TENDER



KEY PLAN
SCALE: N.T.S.

DRAWING NUMBER	DRAWING INFORMATION
00	COVER SHEET
CIVIL DRAWINGS	
C01	NOTES, LEGEND, AND DETAILS
C02	TRAFFIC DETOUR PLAN
C02	REMOVALS - STATION 1+000 TO 1+220
C02	PLAN AND PROFILE - STATION 1+000 TO 1+220
C02	RESTORATION, LINE MARKINGS, AND GRADING - STATION 1+000 TO 1+220
C02	TYPICAL CROSS SECTIONS
TRAFFIC SIGNALS AND STREET LIGHTING	
E00	REMOVALS - STATION 1+000 TO 1+220
STRUCTURAL	
SS00	REMOVALS - STATION 1+000 TO 1+220

COUNTY DRAWING INDEX NO: RSW-####-00-YYYY

DWG NO. 00

Fig. 3.02

MAJOR ROAD NAMES
MINOR ROAD NAMES

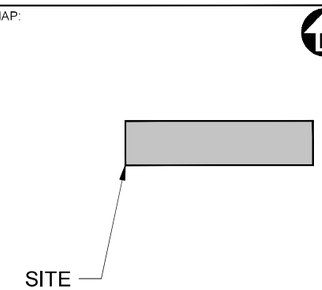
FOR CONTINUATION - SEE DRAWING XX

FOR CONTINUATION - SEE DRAWING XX

298	298
297	297
296	296
295	295
294	294
293	293
292	292
291	291
290	290
STATION	STATION
ROAD PROFILE	ROAD PROFILE
TOP OF WATERMAIN	TOP OF WATERMAIN
STORM SEWER INVERT	STORM SEWER INVERT
SANITARY SEWER INVERT	SANITARY SEWER INVERT

Oxford County
Growing stronger together

KEY MAP:



DRAWING LEGEND:

AREA MUNICIPALITY:

NAME

CONSULTANT:

NAME

SEAL(S):

NO.	DESCRIPTION	DD/MM/YYYY	BY:
01	ISSUED FOR XXXXXX	00/00/2000	X.X.X

DESIGN BY: X.X.X. DRAWN BY: X.X.X. APPROVED BY: X.X.X.

OXFORD COUNTY RD./ST.
RECONSTRUCTION PROJECT

DRAWING TYPE
PLAN AND PROFILE
REMOVALS

STATION: XX+XXX TO STATION: XX+XXX

HOR. SCALE: 1:250 VERT. SCALE: 1:50 DWG NO.

CONTRACT NO:

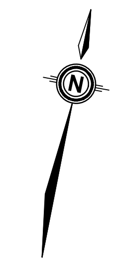
COUNTY DRAWING INDEX NO: RSW-####-01-YYYY 01

files: C:\Users\smclaren\AppData\Local\Temp\AcPublish_31104\Unsaved Drawing.dwg
layout: Layout1 plotted: Oct 06, 2025 09:11 user: smclaren

LEGEND

HIGHWAY SIGNAL HEAD (30 cm RED) WITH BACKBOARD AND MAST ARM	STANDARD SIGNAL HEAD WITH MAST ARM, WITHOUT BACKBOARD	ACCESSIBLE PEDESTRIAN PUSH BUTTON WITH AUDIBLE TONE	TRAFFIC CONTROLLER CABINET
HIGHWAY SIGNAL HEAD (30 cm RED) WITH BACKBOARD AND OVERHEAD CABLE	BICYCLE SIGNAL HEAD	VEHICLE PASSAGE LOOP & OR COUNT LOOP DETECTOR	TRAFFIC CONTROLLER CABINET WITH UNINTERRUPTIBLE POWER SUPPLY
OVERSIZE HIGHWAY SIGNAL HEAD WITH BACKBOARD AND MAST ARM (ALL 30 cm LENSES)	PEDESTRIAN SIGNAL HEAD	DIAMOND LOOP DETECTOR	UNINTERRUPTIBLE POWER SUPPLY CABINET
SPECIAL HEAD WITH ARROW INDICATION AND BACKBOARD (EXAMPLE SHOWS TYPE (2) HEAD)	PEDESTRIAN SIGNAL HEAD WITH COUNT DOWN	VEHICLE LOOP DETECTOR	TRAFFIC SIGN
SPECIAL HEAD WITH BACKBOARD AND ONE OR MORE PROGRAMMABLE LENSES (EXAMPLE SHOWS TYPE (2) HEAD)	PEDESTRIAN PUSH BUTTON	DUPLEX LOOP DETECTOR	TRAFFIC SIGN WITH FLASHING BEACON
STANDARD SIGNAL HEAD WITH BACKBOARD AND MAST ARM (ALL 20 cm LENSES)	ACCESSIBLE PEDESTRIAN SHORT POLE	NON-INTRUSIVE DETECTION ZONE	ILLUMINATED TRAFFIC SIGN
	TRAFFIC SIGNAL POLE	EMERGENCY VEHICLE PRE-EMPTION DETECTOR	TC-54
	CURB RAMP (1.22 m WIDTH) PROVIDING ACCESS TO SINGLE CROSSWALK	TACTILE PLATES	TEMPORARY CONCRETE BARRIER

REVISIONS DATE	ANALYST	DESCRIPTION OF REVISIONS	RECOMMENDED BY
CONTRACT NO. INFORMATION			



PHASE SEQUENCE DIAGRAM

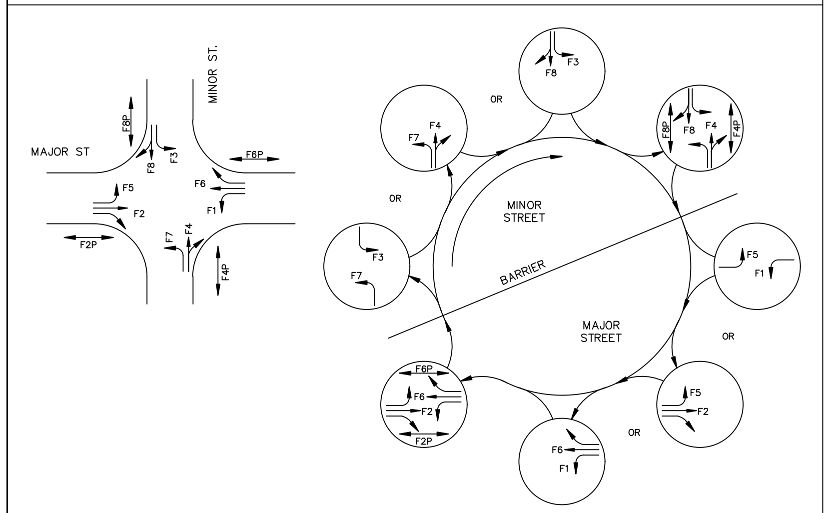


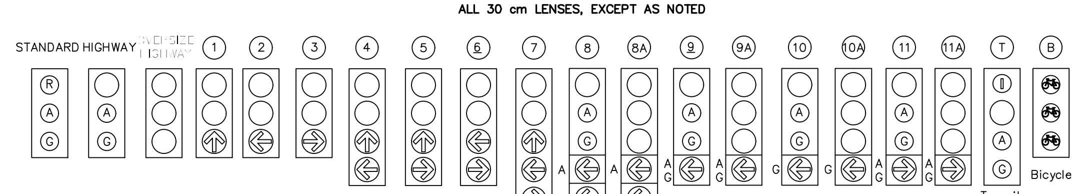
Fig. 3.03

5m 0 10m

CLASSIFICATION OF ROADWAY	TRAFFIC SIGNAL HEADS				LOCATION	
		TYPE	SIZE	BACKBOARD	MOUNTING HT.	OFFSET FROM POLE
MAJOR ROADWAY		PRIMARY				
------------------------------		SECONDARY				
------------------------------		AUXILIARY				
------------------------------	SEPARATE LT.TURN ARROWS	PRIMARY				
------------------------------	SEPARATE LT.TURN ARROWS	SECONDARY				
MINOR ROADWAY		PRIMARY				
------------------------------		SECONDARY				
------------------------------		AUXILIARY				
------------------------------	SEPARATE LT.TURN ARROWS	PRIMARY				
------------------------------	SEPARATE LT.TURN ARROWS	SECONDARY				

TRAFFIC CONTROL SIGNAL HEADS

ALL 30 cm LENSES, EXCEPT AS NOTED



(8) (9) AMBER ARROW MUST BE USED IN A PROTECTED/PERMISSIVE SIMULTANEOUS LEFT TURN OPERATION.

NOTE: –FOR SPECIAL ARROW HEADS (8), (9), (10) AND (11), 20 cm AMBER BALL AND 20 cm GREEN BALL LENSES SHOULD BE USED.
–BICYCLE SYMBOL IN ACCORDANCE TO O. REG. 626 H.T.A.

Oxford County
Growing stronger together

P.O. Box 1614, 21 Reeve Street
Woodstock, Ontario N4S 7Y3
Phone: 519-539-9800
Fax: 519-421-4711
www.oxfordcounty.ca

MUNICIPALITY ______________________________

INTERSECTION ______________________________

____

DATE ____________________ SCALE ____________________

RECOMMENDED BY ______________________________

MUNICIPAL OFFICIAL (MUNICIPAL INSTALLATION)
REGIONAL TRAFFIC REPRESENTATIVE (MINISTRY INSTALLATION)

SIGNALS WARRANTED:

SIGNAL DESIGN RECOMMENDED FOR APPROVAL:

SIGNAL INSTALLATION APPROVED AS PER SECTION 144 (31) H.T.A.:

APPROVAL DATE:

MODIFIED:

DRAWING NAME: