



London
CANADA

The Corporation of the City of London
P.O. Box 5035
300 Dufferin Avenue
London, ON N6A 4L9

Chapter 18

Drafting and Design Requirements

Design Specifications & Requirements Manual

October 2003

Updated January 2025

City of London

Design Specifications and Requirements Manual

The design information contained in this manual is intended to provide guidance beyond legislative and standard design practices for use in the City of London (the City). There will be site specific situations where the design will depart from these practices as it is not possible nor is it the intention of the City to anticipate every situation. The City intends to review and revise the Manual from time to time. The City also acknowledges that other references such as the 'Standard Contract Documents for Municipal Construction Projects' are to be used in conjunction with this manual. The 2012 update of this manual incorporates design information from the City's former 'Subdivision & Development Guide Manual' to provide consistent and current design information for development projects.

The City of London maintains its right to accept or refuse any design submissions and requires an acceptable design for any given circumstance.

Index

Chapter 1	Introduction
Chapter 2	Transportation
Chapter 3	Sanitary Sewer Collection System
Chapter 4	Sewage Pumping Stations
Chapter 5	Storm Sewer Collection System
Chapter 6	Stormwater Management Requirements
Chapter 7	Water Distribution System
Chapter 8	Water Pumping Stations
Chapter 9	Grading
Chapter 10	Erosion and Sediment Control
Chapter 11	Parks and Open Space
Chapter 12	Tree Planting and Protection Guidelines
Chapter 13	Material Substitutions for City of London Projects
Chapter 14	Contact Information
Chapter 15	Installation, Inspection of Water and Sewer Works
Chapter 16	Noise Attenuation Measures
Chapter 17	Trenchless Technologies (for New Construction)
Chapter 18	Drafting and Design Requirements
Chapter 19	Development Compliance Procedure
Chapter 20	Area-Specific Streetscape Standards

Contents

18	Drafting and Design Requirements	18-1
18.1.	Basic Drawing Requirements	18-1
18.1.1.	Transportation Drawing Requirements.....	18-1
18.1.2.	Sewer Design.....	18-2
18.1.3.	General	18-3
18.1.4.	Urban Forestry	18-4
18.1.5.	Parks Planning & Design Division	18-4
18.1.6.	Other Nonstandard Drawing Requirements	18-4
18.2.	Other Agency Approvals	18-6
18.2.1.	Utilities Coordinating Committee (U.C.C.).....	18-6
18.2.2.	Board of Education.....	18-6
18.2.3.	Conservation Authority	18-6
18.3.	Temporary Measure Design Requirements.....	18-6
18.3.1.	Temporary Turning Circles (Subdivision Specific).....	18-6
18.3.2.	Dead-End Street (Subdivision Specific)	18-6
18.3.3.	Work on Existing City Streets.....	18-7
18.4.	Erosion Measures.....	18-7
18.5.	Planning Related Design Requirements.....	18-7
18.5.1.	Road Geometrics / Design	18-7
18.5.2.	Minimum Lot Frontages	18-8
18.5.3.	Noise Barrier Walls General.....	18-8
18.5.4.	Noise Study/Report	18-8
18.5.5.	Noise Wall Location	18-8
18.5.6.	Minimum Height	18-9
18.5.7.	Material Density	18-9
18.5.8.	Materials	18-9
18.5.9.	Noise Wall/Retaining Wall Combined.....	18-9
18.5.10.	Site Lines	18-9
18.5.11.	Return End Walls	18-10
18.5.12.	Gaps/Holes	18-10
18.5.13.	Drainage	18-10
18.5.14.	Overland Flow Routes Through Noise Barrier Walls.....	18-10
18.5.15.	Details	18-10
18.6.	Storm Culvert.....	18-10
18.7.	Storm Channels	18-10

18.8. Storm Ditches	18-10
18.9. Narrow Lot Servicing	18-11
18.9.1. Narrow Lot Servicing Standard	18-11
18.9.2. Site Plan Requirements	18-11
18.9.3. Deviations	18-11
18.10. Site Alteration Applications.....	18-11
18.10.1. Environmental Protection Measures	18-12
18.10.2. Grading & Earthworks	18-12
18.10.3. Drainage and Stormwater Management	18-12
18.10.4. Erosion & Sediment Controls	18-13
18.10.5. Conservation Authority Lands	18-13
18.11. Standard Drawings for Drafting and Design	18-13
Figure 18.1 Narrow Lot Servicing (SW-7)	18-14
Figure 18.2 Cover Sheet	18-15
Figure 18.3a Area Plans and Design Sheets (Master Plan of Services).....	18-16
Figure 18.3b Area Plans and Design Sheets (Storm Area Plan)	18-17
Figure 18.3c Area Plans and Design Sheets (Storm Design Sheet).....	18-18
Figure 18.3d Area Plans and Design Sheets (Sanitary Area Plan).....	18-19
Figure 18.3e Area Plans and Design Sheets (Sanitary Design Sheet).....	18-20
Figure 18.3f Area Plans and Design Sheets (Water Distribution Plan).....	18-21
Figure 18.4a Grading Plan (Sheet 1).....	18-22
Figure 18.4b Grading Plan (Sheet 2).....	18-23
Figure 18.5a Plan and Profile (Sheet 1)	18-24
Figure 18.5b Plan and Profile (Sheet 2)	18-25
Figure 18.6 Park Plan.....	18-26

Tables

Table 18.1	Nonstandard design elements and drawing requirements	18-5
------------	--	------

18 Drafting and Design Requirements

Except where identified as a specific requirement pertaining to subdivision or site plan, all drafting and design requirements noted herein are required for development submissions.

18.1. Basic Drawing Requirements

Drawings are to contain the following details:

- a) A list of “Construction Notes for Engineering Drawings”. Note, all required reports associated with the design and as per Council Conditions, Approval Authority Conditions and Ontario Municipal Boards Conditions are to be listed onto the details drawings;
- b) A general list of most common standards used [Ontario Provincial Standard Drawings (OPSD) & City of London]; and
- c) A typical road and sewer trench cross-section detail identifying road, boulevard, sidewalk, curb & gutter, subdrains, watermain, forcemain sanitary & storm sewers, trench zones/slopes, bedding, together with all applicable dimensions and construction notes for the above.

18.1.1. Transportation Drawing Requirements

- a) Road Plan Profiles

Road plan profiles are required for all roads constructed within or in conjunction with a plan of subdivision. As well, additional road profiles are required as follows:

60m Road Plan Profile of Adjoining Existing Street:

To ensure proper drainage is maintained and/or evaluated a profile extending into the existing subdivision is required.

120m Road Plan Profile of Adjoining Future Street:

To review future alignment extensions of existing ground and proposed finished ground.

- b) Typical Road Cross-section Detail

A typical road cross-section detail, identifying recommended pavement structure and subgrade information (minimum to City of London standards, and as recommended by a Geotechnical Engineer) is required in conjunction with the

typical sewer trench cross-section detail. Curb & gutter cross-sections to be incorporated into the typical combined road and sewer trench cross-section detail.

c) Driveway Locations (Subdivision Specific)

Driveway locations are to be identified where non-standard cul-de-sacs and curves in the roads are designed, adjacent to walkways, CICBs and the last lot on dead end streets.

d) Cul-de-sac Roads (Subdivision Specific)

- **General:** Minimum curb & gutter road grade around a cul-de-sac is 0.5%, and maximum road grade within the cul-de-sac is 3%.
- **Residential:** As per City of London Drawing Standard SR-5.0.
- **Industrial:** As per City of London Drawing Standard SR-5.1

e) Ultimate Road Profile

To achieve proper road design parameters on future/proposed major road networks. Limitations and designs are to be reviewed and accepted by Transportation Division.

Note: Existing abutting road plan & profiles are required for the full frontage of subdivision.

18.1.2. Sewer Design

a) Connections to Future Subdivisions

Sanitary and Storm sewers are to be extended to the edge of the subdivision limit for future servicing connections.

Note: All active sewers/stubs require a maintenance hole. If sewer/stub is not active, then maintenance hole is not required.

b) Plan & Profile Details

A plan & profile drawing is required for all sewer designs. A typical sewer trench cross-section and details are also required. This may be done in conjunction with the road cross section, if applicable and required when.

- For poured maintenance holes
- Unusual benching configurations within the maintenance holes

Note: Trench construction to be in accordance with the latest specifications regarding trench widths (Occupational Health and Safety Act – Regulation 213/91).

c) Steep Grades of Sewers

Note: Anchoring or concrete encased sewers are required for steep grades and/or velocities.

- d) Consultants shall provide a table demonstrating adequate crossing clearances between services (sanitary/storm/water) on the engineering drawings for site plan applications or when otherwise requested by the City. All crossings clearances shall be in accordance with City standards, to the satisfaction of the City. The table shall generally conform to the example as provided below:

Example of sewer crossing chart

Sewer Crossing Chart						
CID	Pipe Under	Elev.	Pipe Over	Elev.	Clearance required (m)	Clearance provided (m)
C1	300 STM	XXX.XXX	50 WM	XXX.XXX	0.XX	0.XXX
C2	300 SAN	XXX.XXX	200 STM	XXX.XXX	0.XX	0.XXX
C3	100 WM	XXX.XXX	600 STM	XXX.XXX	0.XX	0.XXX

18.1.3. General

a) Drafting Standards

All capital and subdivision drawings and calculations are to be completed in metric units and shall adhere to the City of London's Engineering Record Drawings - Drafting Standards (Revised February 2018) and templates (including title blocks, font sizes, and linetypes). Drawings submitted as part of the review process prior to record drawings, to be shown in colour. Refer to section 18.11, Standard Drawings for Drafting and Design for examples

b) Layout Information

For all fire hydrants, maintenance holes, catch basins, etc., layout information is required or alternatively a note indicating the use of UTM Coordinates

c) Temporary Measures

Temporary measures (i.e. DICB, ditches, maintenance holes, turning circles, grading, barricades, easements, etc.) may apply to some designs depending on the planning and future connections of the development, and where applicable, these guidelines are to be adhered to, unless otherwise approved by the City Engineer.

d) Example Drawings

Refer to section **18.11, Standard Drawings for Drafting and Design**

Note: Details for the above should be provided on all pertinent drawings.

18.1.4. Urban Forestry

The following are to be shown on plan and profile drawings on existing streets and on the Tree Planting plan for new streets, as required by Urban Forestry:

- a) Tree planting;
- b) Tree preservation; and
- c) Tree removal.

18.1.5. Parks Planning & Design Division

The following are to be shown on lot grading plans, tree preservation plans and/or detail drawings within lots/blocks and open space areas, as required by Parks Planning & Design Division:

- a) Tree planting;
- b) Tree preservation;
- c) Tree removal;
- d) Park grading;
- e) Pedestrian system;
- f) Park design; and
- g) Landscaping plan.

18.1.6. Other Nonstandard Drawing Requirements

For more complex requirements, details drawings are required for the following:

Table 18.1 Nonstandard design elements and drawing requirements

Design Elements	Drawing Requirements
Stormwater Management Details and Notes	<ul style="list-style-type: none"> • Longitudinal and lateral cross-sections of the stormwater management pond and sediment forebay and details; • Inlet/outlet cross-section and details; • Perforated riser cross-section and details; • Maintenance/pedestrian access cross-section and details; • Outlet swale/ditch plan & profile and cross-section details; • Orifice plate cross-section and details • 100-year & 250-year flood elevations
Poured Maintenance Hole Chambers	<ul style="list-style-type: none"> • Plan & profile; and • Frequent cross-sections and details
Noise Barrier Wall Details and Notes	<ul style="list-style-type: none"> • Typical profile view of noise barrier wall and footings; • Cross-section view of noise barrier wall and footings; • Cross-section view of brick pillars and footings; and • Cross-section view of wood posts and footings
Noise Barrier Berms	<ul style="list-style-type: none"> • Plan & profile; and • Frequent cross-sections, details and notes.
Retaining Wall Details and Notes	<ul style="list-style-type: none"> • Typical profile view of retaining wall and footings; • Profile required for relatively high (1.0m or greater) and long retaining walls; and • Cross-sections views of retaining wall.
Headwall Details	<ul style="list-style-type: none"> • A plan & profile detail is required for all headwall designs together with all pertinent details.
Traffic Calming Measures Details and Notes	<ul style="list-style-type: none"> • Plan & cross-section views of type of traffic calming measures and details; and • Curb cross-section details.
Access Roads Details and Notes	<ul style="list-style-type: none"> • Plan & profile of access road; and • Cross-section view of access road and details.
Abutting an existing or proposed major road	<ul style="list-style-type: none"> • Required where the common property line of the proposed development plan abuts an existing or proposed major road, as per City of London Standard “Grading Along Major Roads” (See Chapter 9 Figure 9.1.).
Construction Roads	<ul style="list-style-type: none"> • Plan & profile of construction road; and • Cross-section view of construction road.
Pedestrian Pathway Systems Details and Notes	<ul style="list-style-type: none"> • Plan & profile drawing and details; and • Cross-section view of pedestrian pathway systems.
Erosion & Sediment Control Measures	<ul style="list-style-type: none"> • Plan & profile of attenuation and sedimentation measures (i.e., basins, check dams, etc.); and • Cross-section of all pertinent measures
Other Non-standard Works or Services	<ul style="list-style-type: none"> • Plan & profile; and • Cross-section details; as required by the City Engineer.

18.2. Other Agency Approvals

18.2.1. Utilities Coordinating Committee (U.C.C.)

- a) Works on Existing Assumed Streets:
U.C.C. is to be advised about all works on existing assumed streets other than lateral connections.
- b) Non-Standard Service Locations:
U.C.C. approval is to be obtained for all proposed services which are to be constructed in non-standard locations on new or existing streets.
- c) Sub-Standard Boulevard Widths and/or Non-Standard Road Widths:
Consultant is to notify all utilities regarding sub-standard boulevard widths, non-standard R.O.W. widths and utility easements required adjacent to sub-standard boulevards through U.C.C.

18.2.2. Board of Education

Board of Education approval is required for all services which are constructed on their lands. As well their approval is required for proposed services to a proposed/existing school block.

18.2.3. Conservation Authority

Review and approval from the local conservation authority is required, prior to the construction, of works, services and Erosion & Sediment Control measures within floodplain areas and in or adjacent to open watercourses, ravines and natural areas under the jurisdiction of the local conservation authority.

18.3. Temporary Measure Design Requirements

18.3.1. Temporary Turning Circles (Subdivision Specific)

Temporary turning circles are required if no intersecting street is within 45.0m of a dead end street as per City of London Drawing Standard SR-5.2.

18.3.2. Dead-End Street (Subdivision Specific)

If a temporary turning circle is not warranted, then a dead-end barricade is required, as per OPSD-973.130.

Note: A driveway for maintenance vehicles must be provided on the last lot of the dead-end street, but not adjacent to the development limit. Sufficient snow storage area must be provided at the end of a dead-end street without a temporary turning circle.

18.3.3. Work on Existing City Streets

When proposed works from a development are to extend and/or be constructed on existing City Streets, the following is required:

- a) limits of construction;
- b) sawcut/milling/steep milled joint;
- c) backfill & compaction specifications; and
- d) restoration details.

Note: Steeped milled joint is required for all proposed road widenings, and where proposed asphalt designs meet existing asphalt designs, as per City of London Drawing Standard SR-13.1.

18.4. Erosion Measures

See Chapter 6 Section 6.5.8, Erosion Measures. For temporary sediment and erosion control measures, see **Chapter 10 – Erosion and Sediment Control** for details.

18.5. Planning Related Design Requirements

18.5.1. Road Geometrics / Design

- a) Road Widening

Where a development abuts an existing City street, road widening may be required for future or present improvements to these streets. The City's Official Plan Transportation Map and the City of London's Zoning By-law Z-1 classifies roads throughout the City as Rapid Transit Boulevard, Urban Thorough, Civic Boulevard, Urban Thoroughfare/Civic Boulevard in Primary Transit Area, Main Street, Rural Thoroughfare or Neighbourhood Connector. All other roads are considered to be Neighbourhood Streets.

- b) 0.3 metre Reserves (Blocks)

0.3 meter reserves along block frontages and at the rear and/or flankage of lots which are adjacent to major roads, where applicable (outside of right-of-way) and are also required at the dead end of proposed road networks which abut future proposed road networks and where roads in a subdivision abut lands outside the subdivision.

18.5.2. Minimum Lot Frontages

In most cases the zoning by-law adequately satisfies requirements for minimum frontages for single-family and semi-detached lots. However, where bends in streets occur or on cul-de-sacs, lots must be designed such that when side lot lines are projected to the fronting curb, an adequate frontage is provided at the curb line to avoid conflicting driveway locations. These minimum frontages at the curb line are as follows:

- Single-family, 6.7m
- Semi-detached, 9.0m

18.5.3. Noise Barrier Walls General

Noise barrier walls are required for residential developments which back onto or flank major roads, or as otherwise required in accordance with the draft plan of subdivision conditions and City practices.

All noise barrier wall designs are to comply with the accepted Noise report and meet the minimum requirements and specifications of the Ministry of Transportation noise barrier wall guidelines (MTO Environmental Guide for Noise).

Note: Noise barrier walls for uses other than along major roads are to comply with Ministry of the Environment “[Environmental Noise Guideline - Stationary and Transportation Sources - Approval and Planning \(NPC-300\)](#)” (Aug 2013, or as otherwise amended) requirements and approved by Development Services.

18.5.4. Noise Study/Report

Required when the proposed subdivision or development is situated within certain design setbacks from a Provincial Highway or Railway, as per the Ministry of the Environment “[Environmental Noise Guideline - Stationary and Transportation Sources - Approval and Planning \(NPC-300\)](#)” (Aug 2013) and/or as indicated in the draft plan conditions and/or subdivision agreement, all approved by Development Services.

All recommendations and details from noise barrier wall studies/reports are to be reflected on the servicing drawings.

18.5.5. Noise Wall Location

Major Roads:

- a) Masonry/Concrete:

Wall, posts and brick pillars are to be located on City property within the proposed 0.3m reserve and maintained by the City.

- b) Wooden:
Wall, posts and brick pillars are to be located entirely on private property and maintained by the owner.
- c) Other Situations:
Locations as per the approved Noise Study (i.e. berms/walls adjacent to railways, etc.).

18.5.6. Minimum Height

2.4m above ultimate centerline road profile design or as required by an accepted Noise Study.

18.5.7. Material Density

Ministry of Environment Criteria - Minimum surface density of 20 kg/sq.m (4lbs/sq.ft).

18.5.8. Materials

- a) Masonry/Concrete:
Constructed of a concrete material with a surface density of 20kg/sq.m. (4lbs/sq.ft.). Previously accepted masonry/concrete walls: Durisol and bricked.
- b) Wooden:
Constructed of a wood material with a surface density of 20kg/sq.m. (4lbs/sq.ft). Previously accepted wooden walls: Western Red Cedar, Red Wood and Yellow Cyprus.

18.5.9. Noise Wall/Retaining Wall Combined

Where the property line along the road undulates requiring the use of retaining walls, the standard 2.4m wall can be reduced to a minimum of 1.1m wall in hill sections.

Note: the overall combined noise wall and retaining wall height, must be 2.4m above the ultimate centerline road profile design or as required in the accepted Noise Study.

18.5.10. Site Lines

Site lines to be maintained in accordance with Section 4.24 of Zoning By-Law Z-1.

18.5.11. Return End Walls

Required at the end of all proposed noise barrier walls which terminate at an abutting property which does not have an existing noise barrier wall present or where an opening is required (e.g. at a walkway).

18.5.12. Gaps/Holes

To be free of any holes or gaps within and at the bottom of all proposed noise barrier walls.

18.5.13. Drainage

Proper surface drainage to and away from the noise barrier wall is required for all proposed designs.

18.5.14. Overland Flow Routes Through Noise Barrier Walls

In exceptional situations, an adequately designed opening in the wall is required to allow overland flow route to pass through the wall, in conjunction with a toe wall or berm behind the opening in the wall to provide a supplemental noise attenuation measures at the opening.

18.5.15. Details

A typical profile view of the noise wall/footings is required together with cross-sections and details for any pertinent brick pillars/footings and wooden posts/footings, which are to comply with the Ontario Building Code.

18.6. Storm Culvert

Refer to Chapter 6 **Section 6.5.5 – Storm Culverts** for details

18.7. Storm Channels

Refer to Chapter 6 **Section 6.5.6 – Storm Channels** for details

18.8. Storm Ditches

Refer to Chapter 6 **Section 6.5.7 – Storm Ditches** for details

18.9. Narrow Lot Servicing

In cases where the [Zoning By-law](#) permits for narrow freehold lots (e.g., Residential R4 Zone), the minimum frontage shall be 6.7 metres.

18.9.1. Narrow Lot Servicing Standard

The Narrow Lot Servicing Standards **Figure 18.1**, is intended, primarily, for use with street townhomes and shall be considered an applicable servicing strategy where the following criteria has been met:

- Dwelling and lot frontage are parallel to the property line and along a straight segment of the road.
- Narrow Lot Servicing Standard detail has been included within the drawing set.
- Drawings show each individual service to each narrow lot within the site.
- Setbacks are in accordance with current applicable zoning by-laws and are dimensioned on the drawings.
- All overland flow routes, rear-yard catch basin leads, utilities, hydrants, streetlights, etc. are adequately accommodated and will not be impacted by future excavation of the individual services (e.g., maintenance/repair).

18.9.2. Site Plan Requirements

If undertaking narrow lot servicing through the Subdivision process for lots that are subject to Site Plan Approval, the applicant shall initiate the Site Plan Application process prior to subdivision drawing acceptance to ensure that unit configurations are not required to change.

18.9.3. Deviations

Any deviation from the Narrow Lot Servicing Standard above will be subject to further examination through the drawing review process for adherence to all applicable standards.

18.10. Site Alteration Applications

The following information is provided to assist designers in preparing drawings to be submitted in conjunction with Site Alteration applications.

18.10.1. Environmental Protection Measures

- Indicate the location of all Environmental Protection Areas, as defined in the by-law, located on or adjacent to the site, and delineated with appropriate fencing.
- Show the location of all trees and shrubs, including the species, size of caliper, and any protection measures required in accordance with an accepted Tree Protection Plan.
- Refer to **Chapter 12, Tree Planting and Protection Guidelines**.
- Show any buffers or setbacks required in accordance with an accepted Environmental Impact Study, and include a box note on all drawings stating, **“No materials are to be placed within the buffer.”**

18.10.2. Grading & Earthworks

- Show the proposed rough grade elevations of the site.
- Show all lotting details in zero line weight (ghost lines) if using the subdivision draft plan as the underlying plan.
- Indicate the location of all cut/fill areas.
- Where fill is involved, provide a description of the proposed fill.
- Where fill is involved, provide the proposed final elevations and drainage system to be used upon completion of the filling operation.
- Indicate the location and dimensions of all proposed land disturbing activities, including construction access road(s).
- Indicate the location and dimensions of all temporary soil or dirt stockpiles.

18.10.3. Drainage and Stormwater Management

- Indicate the location and dimensions of any existing and proposed stormwater drainage systems associated with the rough grading and natural drainage patterns on and within a minimum of thirty 30 metres beyond the site boundary.
- Indicate directions of existing, interim, and proposed (post-earthworks) overland flow routes.
- Include provisions for specific controls in locations where flows exit the site (e.g., rock check dams, sediment basins, etc.).
- Areas where future LIDs are proposed should be protected and isolated during construction using applicable fencing/barriers.
- Refer to **Chapter 6, Stormwater Management Requirements**.

18.10.4. Erosion & Sediment Controls

- Indicate the location, dimensions, design details and maintenance provisions for all dust suppressant, and erosion and sediment control measures necessary to meet the requirements of the City Engineer.
- Refer to **Chapter 10, Erosion and Sediment Control**.

18.10.5. Conservation Authority Lands

Acceptance of Site Alterations plans by the City of London does not include any lands regulated by the local Conservation Authority. Where the scope of the proposed site alteration works include or are directly adjacent to regulated lands, the following shall be included on all drawings:

- A boxed note shall be provided stating **“Site Alteration acceptance by the City of London excludes Conservation Authority lands. Any proposed works shown within Conservation Authority regulated lands are subject to Section 28 approval.”**
- Limit of the regulated lands shall be clearly labeled and delineated.
- The regulated lands shall be shaded/hatched to be visually distinct.

18.11. Standard Drawings for Drafting and Design

Figure 18.1 Narrow Lot Servicing (SW-7)

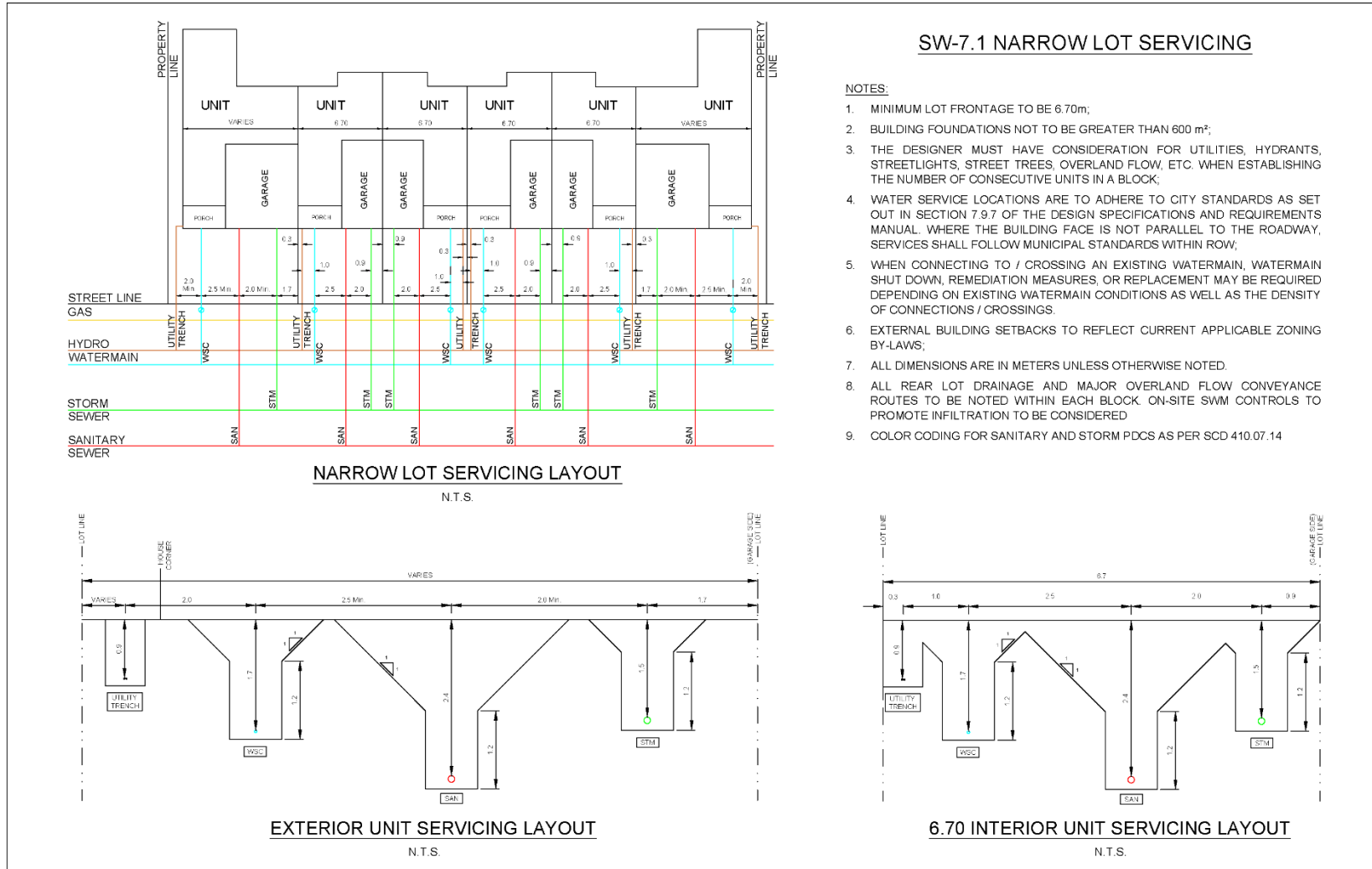


Figure 18.2 Cover Sheet

Note: This drawing has been provided as an example to convey typical drafting layout information to designers. Refer to the appropriate sections of this manual for the City's full design standards and requirements.

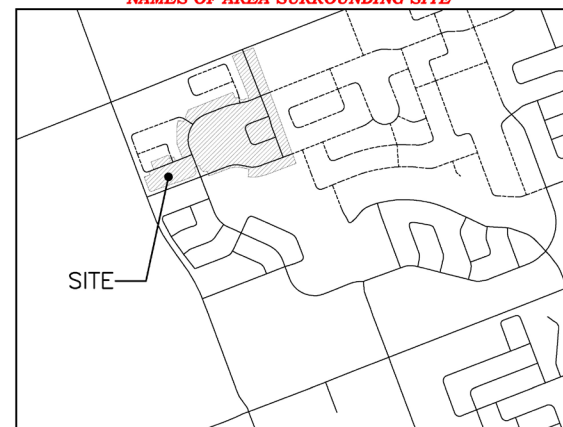
PROJECT TITLE
PHASE NUMBER
CLIENT NAME

LIST OF DRAWINGS

SHEET No.	DESCRIPTION
01	GENERAL NOTES AND DETAILS
02	MASTER PLAN OF SERVICES
03	STORM AREA PLAN
04	STORM DESIGN SHEET
05	SANITARY AREA PLAN
06	SANITARY DESIGN SHEET
07	WATER DISTRIBUTION PLAN
08	GRADING PLAN No. 1
09	STREET A FROM 1+000 TO STA. 1+500
10	MISCELLANEOUS DETAILS
11	PAVEMENT MARKINGS
12	SEDIMENT AND EROSION CONTROL PLAN
13	TRAFFIC MANAGEMENT PLAN
14	TYPICAL SECTIONS
15	STREET LIGHTING

EXAMPLE DRAWING SET

SHOW EXISTING STREETS & STREET NAMES OF AREA SURROUNDING SITE



KEY PLAN
N.T.S.

FILE NUMBER
DATE OF SUBMISSION
CONSULTANT FILE NUMBER



Figure 18.3a Area Plans and Design Sheets (Master Plan of Services)

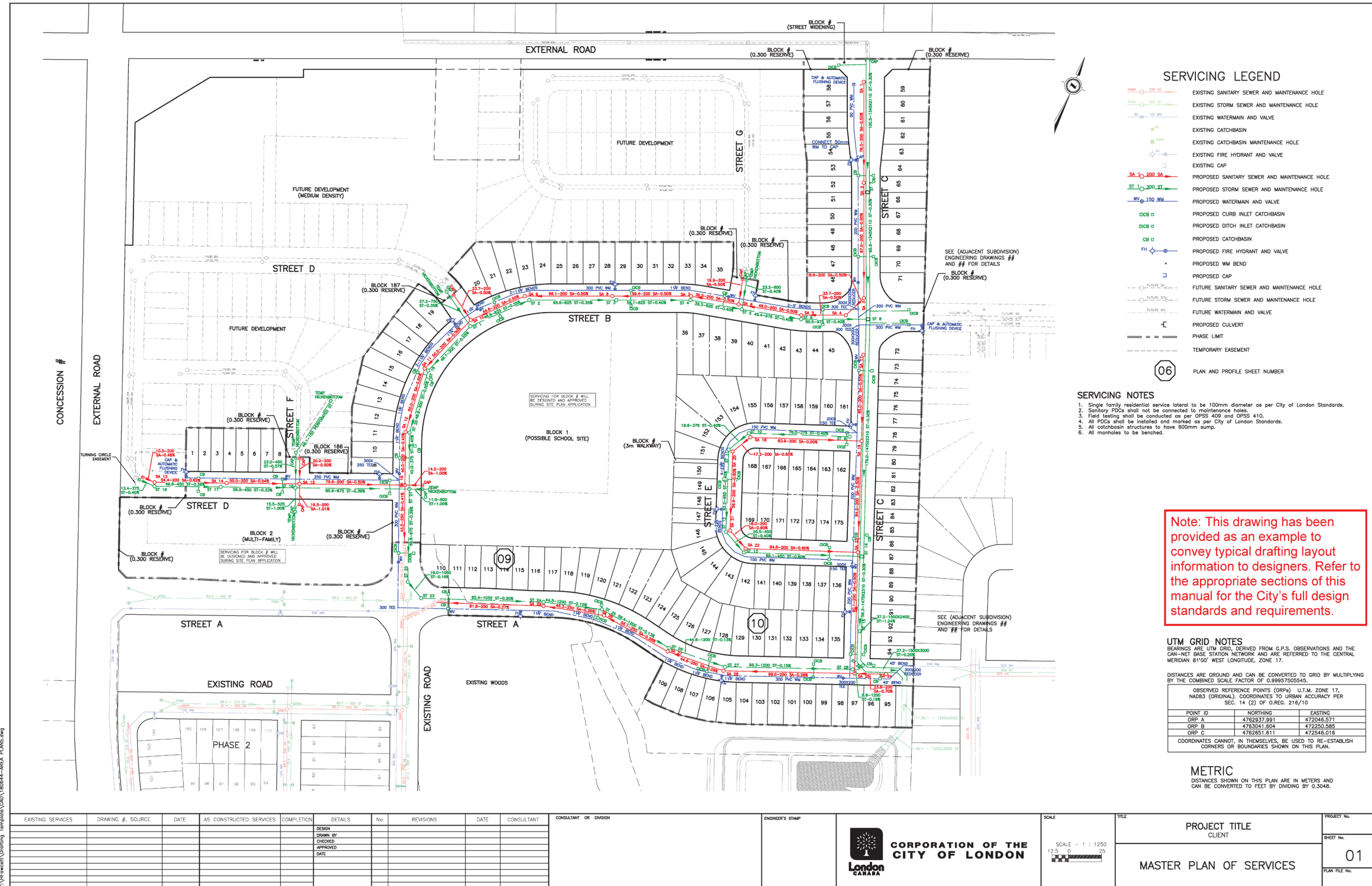


Figure 18.3b Area Plans and Design Sheets (Storm Area Plan)

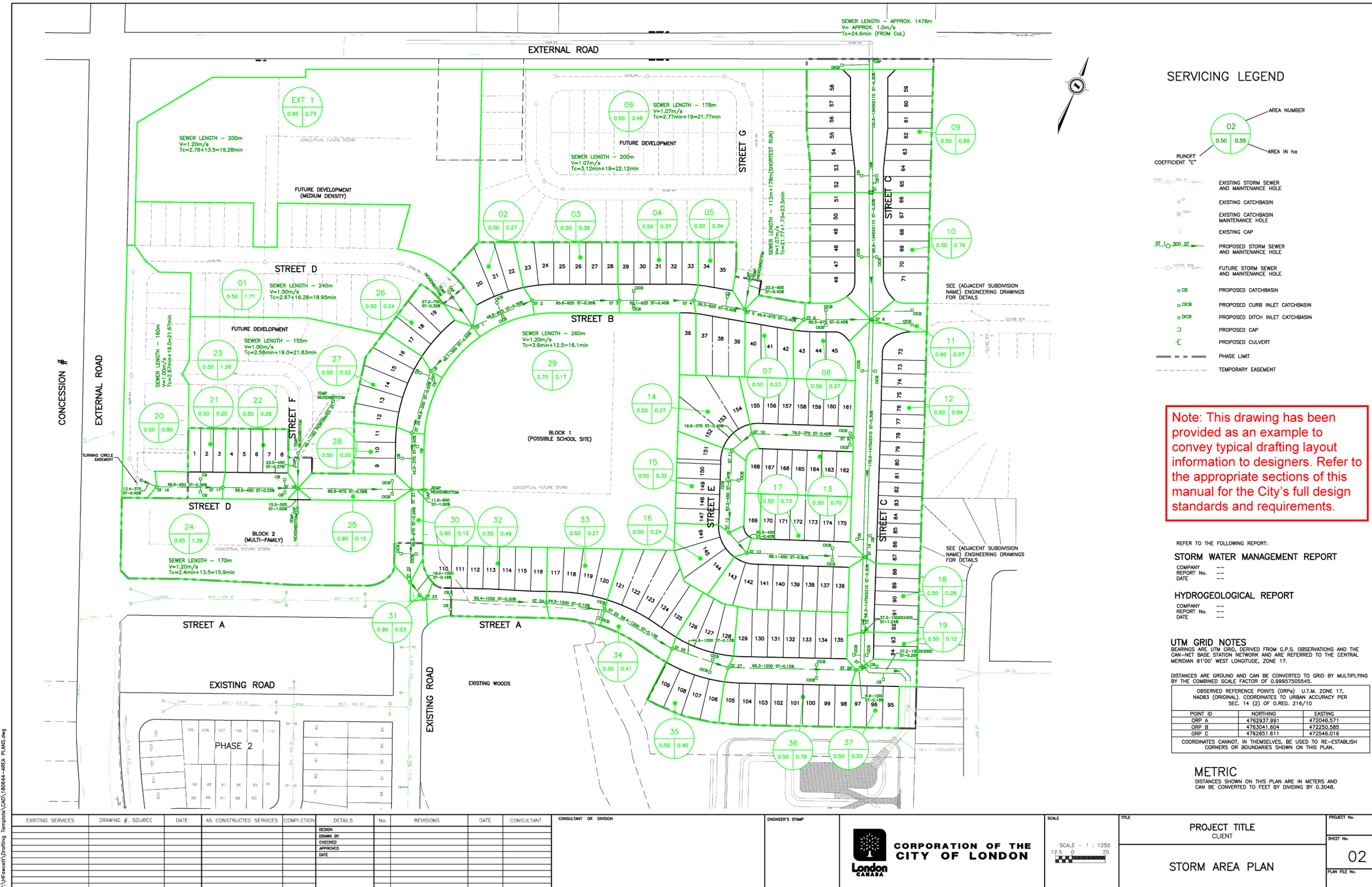


Figure 18.3c Area Plans and Design Sheets (Storm Design Sheet)

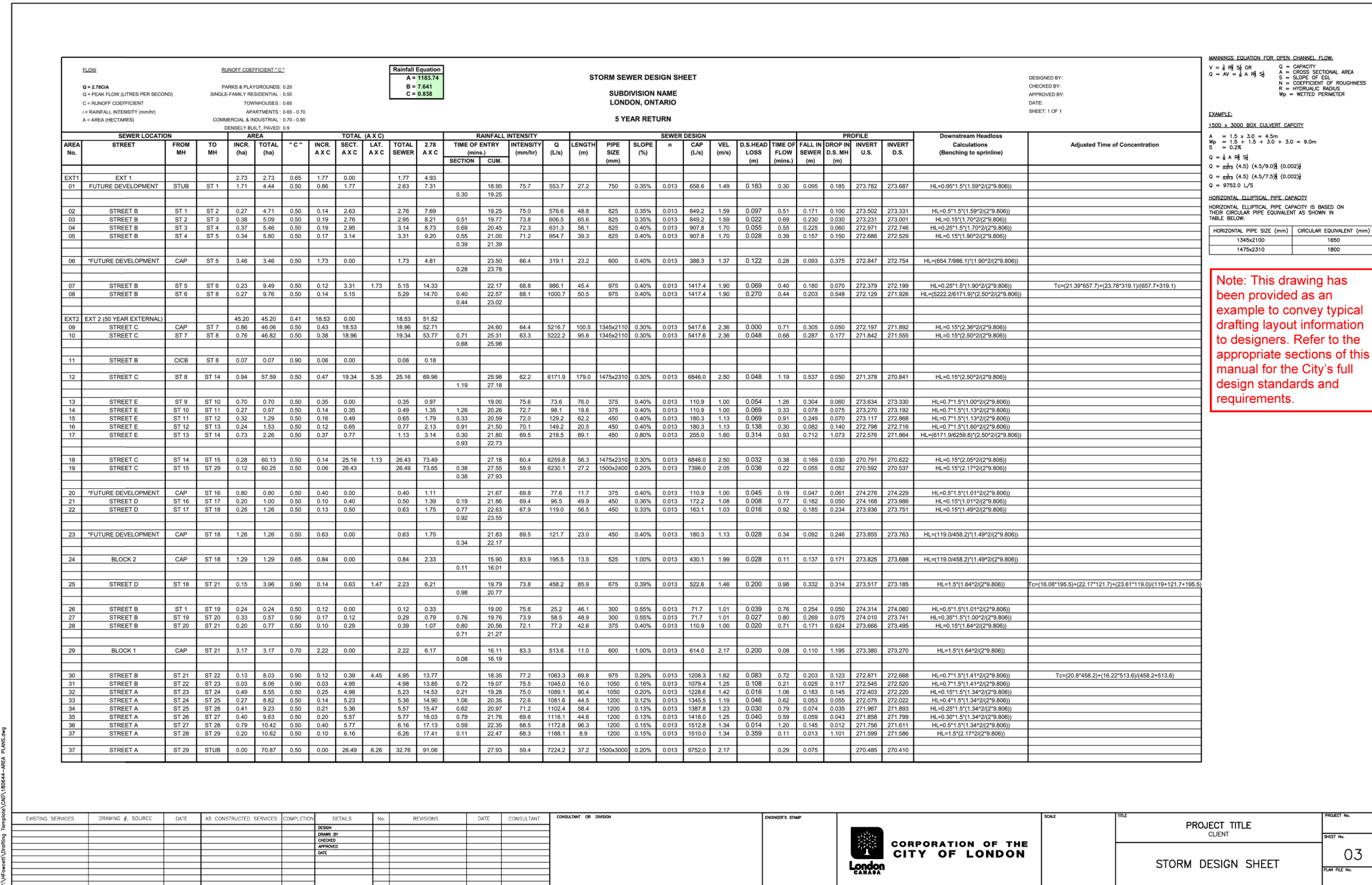


Figure 18.3d Area Plans and Design Sheets (Sanitary Area Plan)

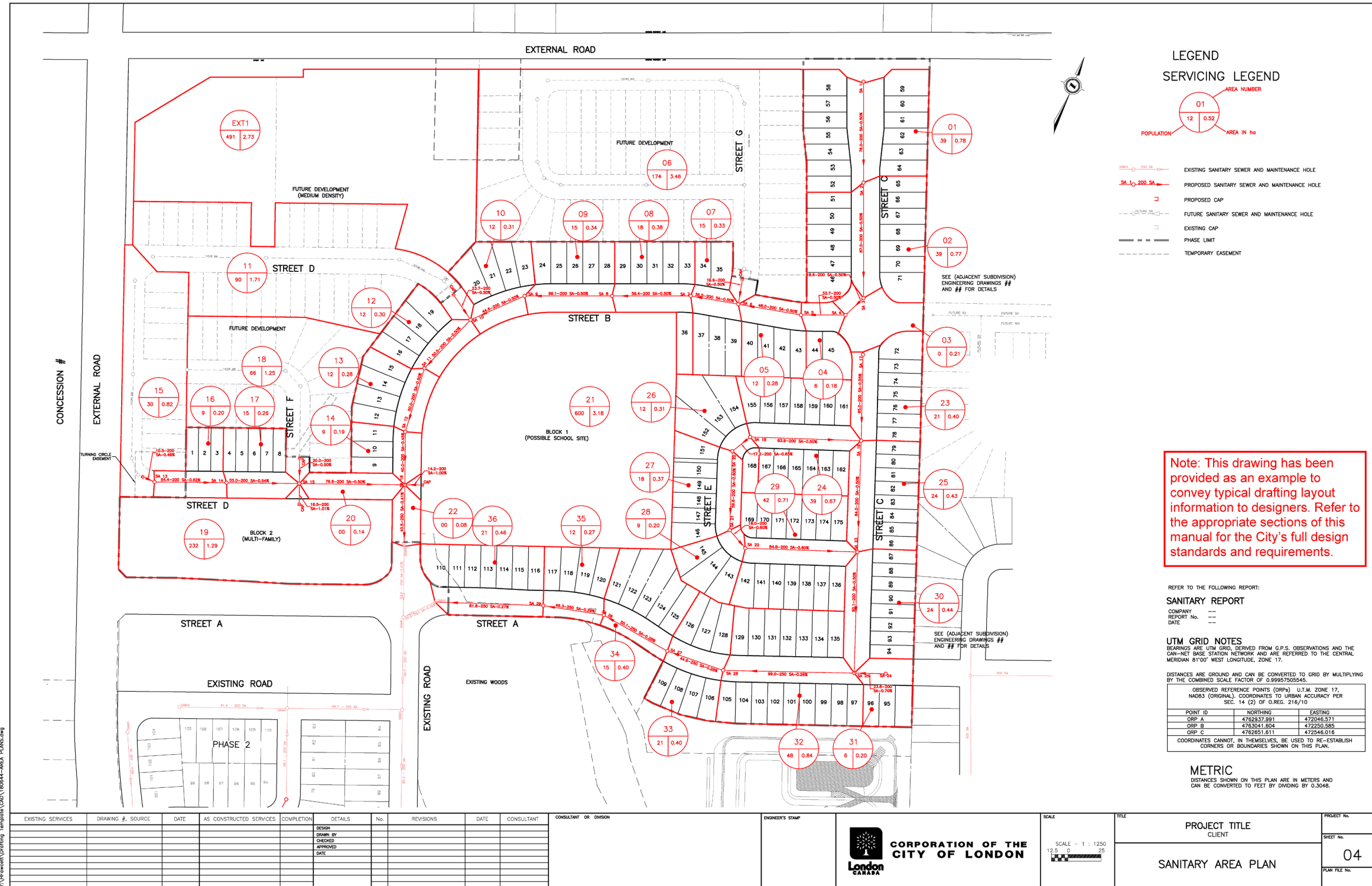


Figure 18.3e Area Plans and Design Sheets (Sanitary Design Sheet)

POPULATION DENSITIES										DESIGN CRITERIA																
LOW DENSITY (SINGLE FAMILY / SEMI DETACHED)					= 30 UNITS / HA @ 3 PP / UNIT					INDUSTRIAL DEVELOPMENT ALLOWANCE					= 2500 L / HA / DAY											
MEDIUM DENSITY (TOWNHOUSE / ROWHOUSE)					= 75 UNITS / HA @ 2.4 PP / UNIT					SEWAGE					= 230 L / HA / DAY											
HIGH DENSITY (APARTMENTS)					= 150-300 UNITS / HA @ 1.6 PP / UNIT					INFILTRATION					= 8640 L / HA / DAY											
COMMERCIAL / INSTITUTIONAL					= 600 PP / HA					UNCERTAINTY FACTOR					= 1.1											
ELEMENTARY SCHOOL					= 600 PP					PEAKING FACTOR					DATE:											
SECONDARY SCHOOL					= 1500 PP					$M = 1 + \frac{14}{4 + P^{0.5}}$					SHEET 1 of 1											
SCHOOL CONSUMPTION					= 100 30 / PP / DAY FOR 8HRS / DAY					<p style="text-align: center;">SANITARY SEWER DESIGN SHEET</p> <p style="text-align: center;">PROJECT NAME LONDON, ON</p>																
AREA No.	LOCATION	LOCATION		AREA		POPULATION				SEWAGE FLOW				SEWER DESIGN				PROFILE								
		FROM MH	TO MH	NET or GROSS (ha)	INCR. AREA (ha)	TOTAL (ha)	PER ha	PER LOT	# of LOTS	SUM POP	TOTAL POP	PEAKING FACTOR	INFILT. (L/s)	SEWAGE (L/s)	TOTAL (L/s)	LENGTH (m)	PIPE SIZE (mm)	SLOPE (%)	n	CAP (L/s)	VEL (m/s)	D.S. HEAD LOSS (m)	FALL IN SEWER (m)	DROP IN D.S. MH (m)	INVERT U.S.	INVERT D.S.
01	STREET C	SA 1	SA 2	0.78		0.78		3	13	39	39	4.34	0.08	0.54	0.62	76.0	200	0.50%	0.013	23.19	0.74		0.380	0.050	273.762	273.382
02	STREET C	SA 2	SA 3	0.77		1.55		3	13	39	78	4.27	0.16	1.06	1.22	87.0	200	0.50%	0.013	23.19	0.74		0.435	0.050	273.332	272.997
03	STREET C	SA 3	SA 4	0.21		1.76		3	0	0	78	4.27	0.18	1.06	1.24	18.6	200	0.50%	0.013	23.17	0.74		0.093	0.050	272.847	272.754
04	STREET B	SA 4	SA 5	0.18		1.94		3	2	6	84	4.26	0.19	1.14	1.34	33.7	200	0.50%	0.013	23.16	0.74		0.168	0.050	272.704	272.536
05	STREET B	SA 5	SA 6	0.28		2.22		3	4	12	96	4.25	0.22	1.30	1.52	48.0	200	0.50%	0.013	23.19	0.74		0.240	0.050	272.486	272.246
06	FUTURE DEVELOPMENT	CAP	SA 6	3.46		3.46		3.0	58	174	174	4.17	0.35	2.31	2.66	19.9	200	0.50%	0.013	23.24	0.74		0.100	0.050	272.346	272.246
07	STREET B	SA 6	SA 7	0.33		6.01		3	5	15	285	4.09	0.60	3.72	4.32	36.5	200	0.50%	0.013	23.16	0.74		0.182	0.050	272.196	272.014
08	STREET B	SA 7	SA 8	0.38		6.39		3	6	18	303	4.08	0.64	3.94	4.58	59.4	200	0.50%	0.013	23.23	0.74		0.298	0.050	271.964	271.666
09	STREET B	SA 8	SA 9	0.34		6.73		3	5	15	318	4.07	0.67	4.13	4.80	66.1	200	0.50%	0.013	23.17	0.74		0.330	0.050	271.616	271.286
10	STREET B	SA 9	SA 10	0.31		7.04		3	4	12	330	4.06	0.70	4.27	4.98	44.6	200	0.50%	0.013	23.20	0.74		0.223	0.050	271.236	271.013
EXT 1	EXT 1 (MEDIUM DENSITY)			2.73		2.73		75	2.4		491	4.91														
11	FUTURE DEVELOPMENT	CAP	SA 10	1.71		4.44		3.0	30	90	581	3.94	0.44	7.31	7.75	23.7	200	0.50%	0.013	23.29	0.74		0.119	1.600	272.682	272.563
12	STREET B	SA 10	SA 11	0.30		11.78		3	4	12	923	3.82	1.18	11.26	12.44	50.5	200	0.50%	0.013	23.20	0.74		0.253	0.050	270.963	270.710
13	STREET B	SA 11	SA 12	0.28		12.06		3	4	12	935	3.82	1.21	11.39	12.60	50.0	200	0.50%	0.013	23.19	0.74		0.260	0.050	270.660	270.410
14	STREET B	SA 12	SA 16	0.19		12.25		3	3	9	944	3.82	1.23	11.50	12.72	40.0	200	0.50%	0.013	23.19	0.74		0.200	0.105	270.360	270.160
15	FUTURE DEVELOPMENT	CAP	SA 13	0.82		0.82		3	10	30	30	4.35	0.08	0.42	0.50	10.5	200	0.48%	0.013	22.61	0.72		0.050	0.058	272.900	272.850
16	STREET D	SA 13	SA 14	0.20		1.02		3	3	9	39	4.34	0.10	0.54	0.64	54.4	200	0.62%	0.013	25.88	0.82		0.339	0.036	272.792	272.453
17	STREET D	SA 14	SA 15	0.26		1.28		3	5	15	54	4.31	0.13	0.74	0.87	55.0	200	0.54%	0.013	24.18	0.77		0.299	0.040	272.417	272.118
18	FUTURE DEVELOPMENT	CAP	SA 15	1.25		1.25		3.0	22	66	66	4.29	0.13	0.90	1.03	20.0	200	0.50%	0.013	23.19	0.74		0.100	0.392	272.570	272.470
19	BLOCK 2	CAP	SA 15	1.29		1.29		75	2.4		232	4.12	0.13	3.05	3.18	16.5	200	1.00%	0.013	32.85	1.05		0.166	0.392	272.635	272.470
20	STREET D	SA 15	SA 16	0.14		3.96		3	0	0	352	4.05	0.40	4.55	4.94	79.6	200	0.50%	0.013	23.10	0.74		0.395	1.628	272.078	271.683
21	BLOCK 1	CAP	SA 16	3.18		3.18					600	3.93	0.32	7.53	7.84	14.3	200	1.00%	0.013	32.80	1.04		0.142	0.105	270.302	270.160
22	STREET B	SA 16	EX. SA	0.08		19.47		3	0	0	1897	3.60	1.95	21.80	23.75	43.5	250	0.41%	0.013	38.13	0.78		0.179	0.000	270.055	269.876
23	STREET C	SA 17	SA 19	0.40		0.40		3	7	21	21	4.38	0.04	0.29	0.33	65.0	200	0.55%	0.013	24.31	0.77		0.357	0.050	272.277	271.920
24	STREET E	SA 18	SA 19	0.67		0.67		3	13	39	39	4.34	0.07	0.54	0.61	83.9	200	0.50%	0.013	23.19	0.74		0.420	0.600	272.890	272.470
25	STREET C	SA 19	SA 23	0.43		1.50		3	8	24	84	4.26	0.15	1.14	1.29	84.0	200	0.50%	0.013	23.19	0.74		0.420	0.143	271.870	271.450
26	STREET E	SA 18	SA 20	0.31		0.31		3	4	12	12	4.41	0.03	0.17	0.20	17.2	200	0.65%	0.013	26.47	0.84		0.112	0.060	272.717	272.605
27	STREET E	SA 20	SA 21	0.37		0.68		3	6	18	30	4.35	0.07	0.42	0.48	59.6	200	0.60%	0.013	25.41	0.81		0.358	0.060	272.545	272.187
28	STREET E	SA 21	SA 22	0.20		0.88		3	3	9	39	4.34	0.09	0.54	0.63	18.0	200	0.60%	0.013	25.41	0.81		0.108	0.060	272.127	272.019
29	STREET E	SA 22	SA 23	0.71		1.59		3	14	42	81	4.27	0.16	1.10	1.26	84.8	200	0.60%	0.013	25.41	0.81		0.509	0.143	271.959	271.450
30	STREET C	SA 23	SA 25	0.44		3.53		3	8	24	189	4.16	0.35	2.51	2.86	91.3	200	0.50%	0.013	23.20	0.74		0.457	0.031	271.307	270.850
31	STREET A	SA 24	SA 25	0.20		0.20		3	2	6	6	4.43	0.02	0.08	0.10	23.8	200	0.70%	0.013	27.47	0.87		0.167	0.421	271.407	271.240
32	STREET A	SA 25	SA 26	0.84		4.57		3	16	48	243	4.12	0.46	3.19	3.65	99.0	250	0.28%	0.013	30.30	0.82		0.257	0.041	270.819	270.562
33	STREET A	SA 26	SA 27	0.40		4.97		3	7	21	264	4.10	0.50	3.45	3.95	44.6	250	0.28%	0.013	31.73	0.85		0.127	0.030	270.521	270.394
34	STREET A	SA 27	SA 28	0.40		5.37		3	5	15	279	4.09	0.54	3.64	4.18	55.1	250	0.28%	0.013	31.54	0.64		0.155	0.038	270.364	270.209
35	STREET A	SA 28	SA 29	0.27		5.64		3	4	12	291	4.08	0.66	3.79	4.36	46.3	250	0.29%	0.013	31.87	0.65		0.133	0.030	270.171	270.038
36	STREET A	SA 29	EX. SA	0.46		6.10		3	7	21	312	4.07	0.61	4.05	4.66	61.8	250	0.36%	0.013	35.64	0.73		0.222		270.008	269.786

Note: This drawing has been provided as an example to convey typical drafting layout information to designers. Refer to the appropriate sections of this manual for the City's full design standards and requirements.

Y:\Projects\Sanitary\Temp\183e\183e44-0001_Plan.dwg

EXISTING SERVICES	DRAWING #, SOURCE	DATE	AS CONSTRUCTED SERVICES	COMPLETION	DETAILS	No.	REVISIONS	DATE	CONSULTANT	CONSULTANT OR DESIGN	ENGINEER'S STAMP	SCALE	TITLE	PROJECT TITLE	CLIENT	PROJECT No.	SHEET No.	PLAN FILE No.
												SCALE - 1 : 1250	SANITARY DESIGN SHEET				05	

Figure 18.3f Area Plans and Design Sheets (Water Distribution Plan)

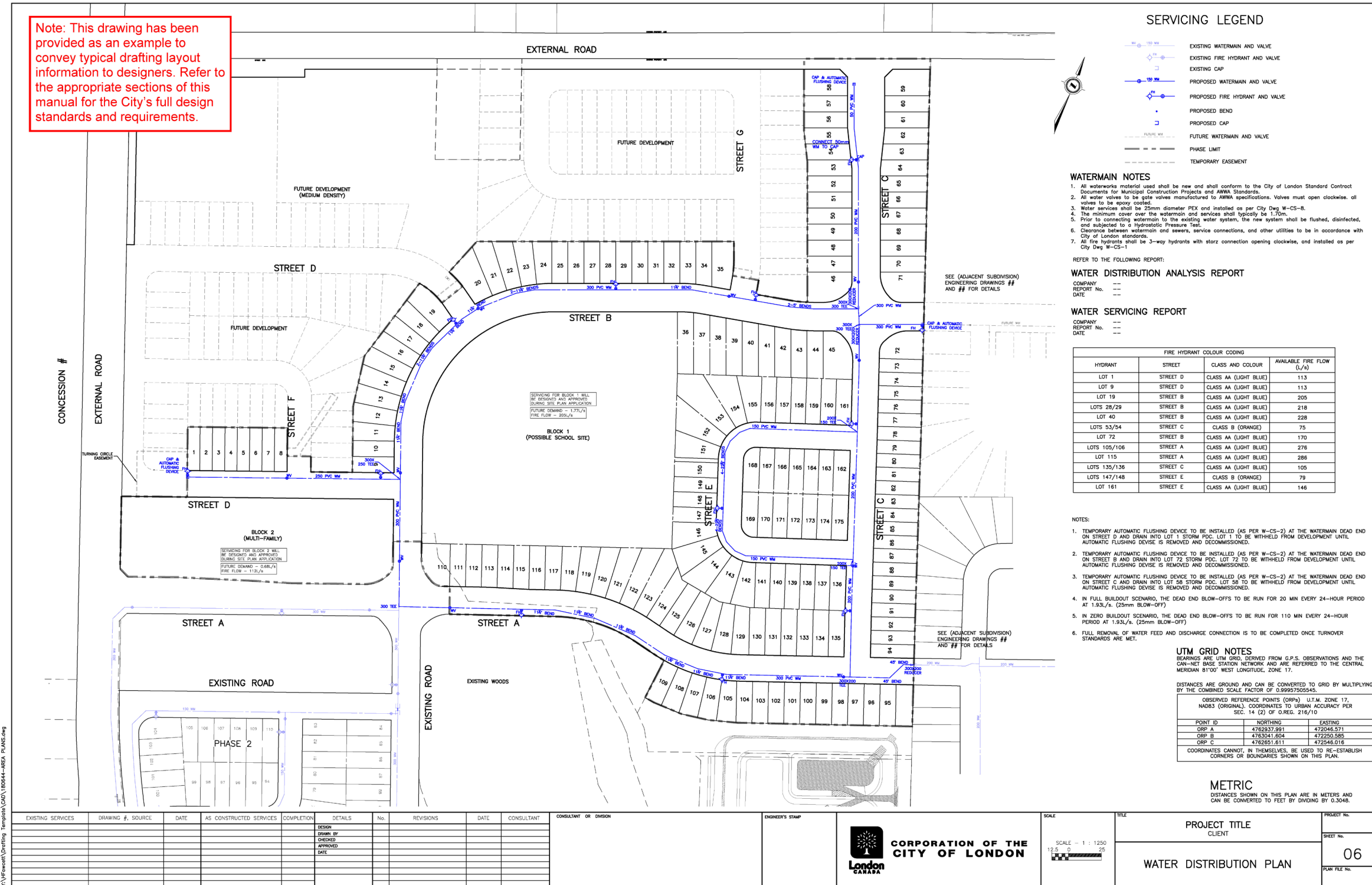


Figure 18.4a Grading Plan (Sheet 1)

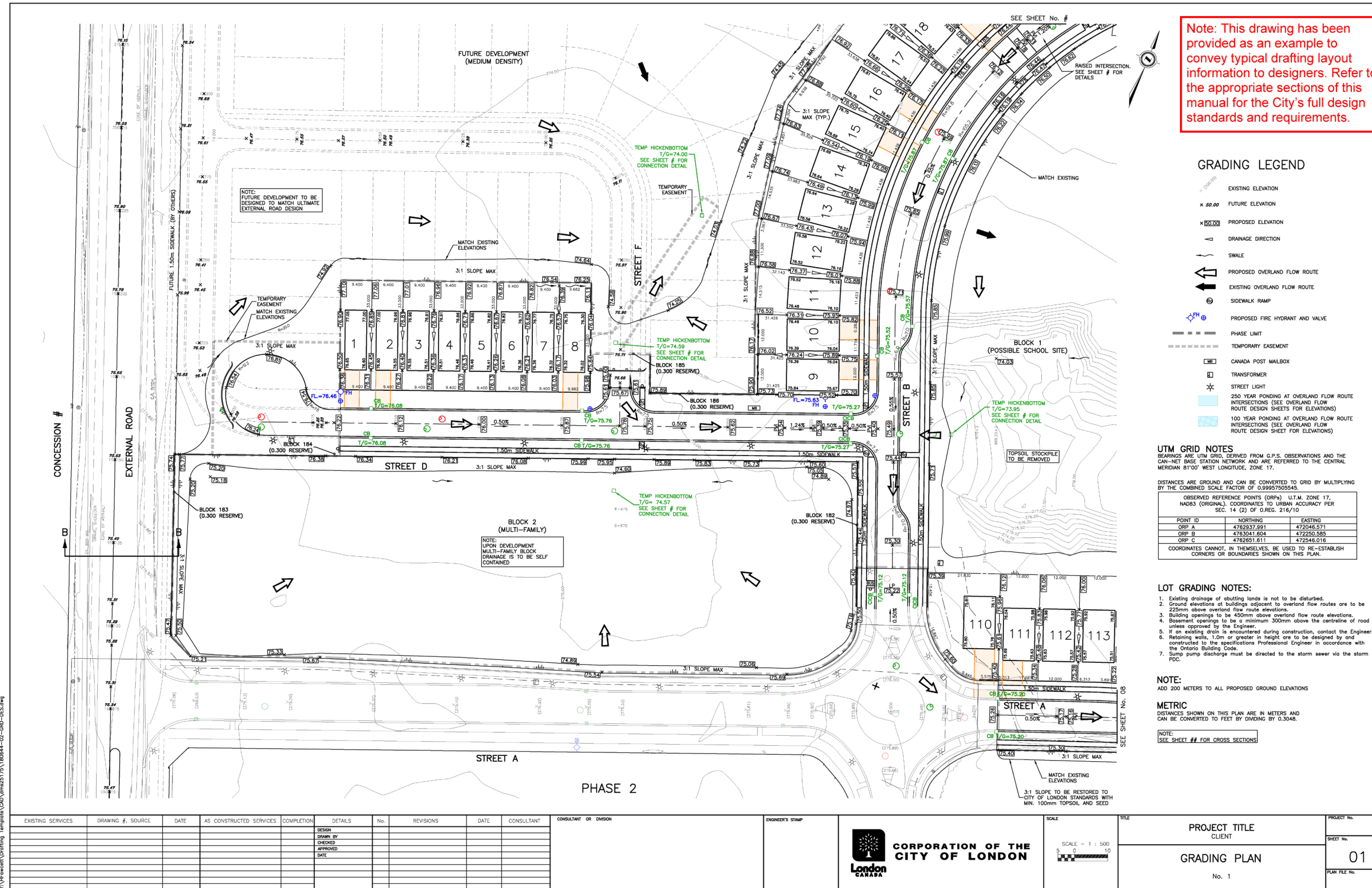


Figure 18.4b Grading Plan (Sheet 2)

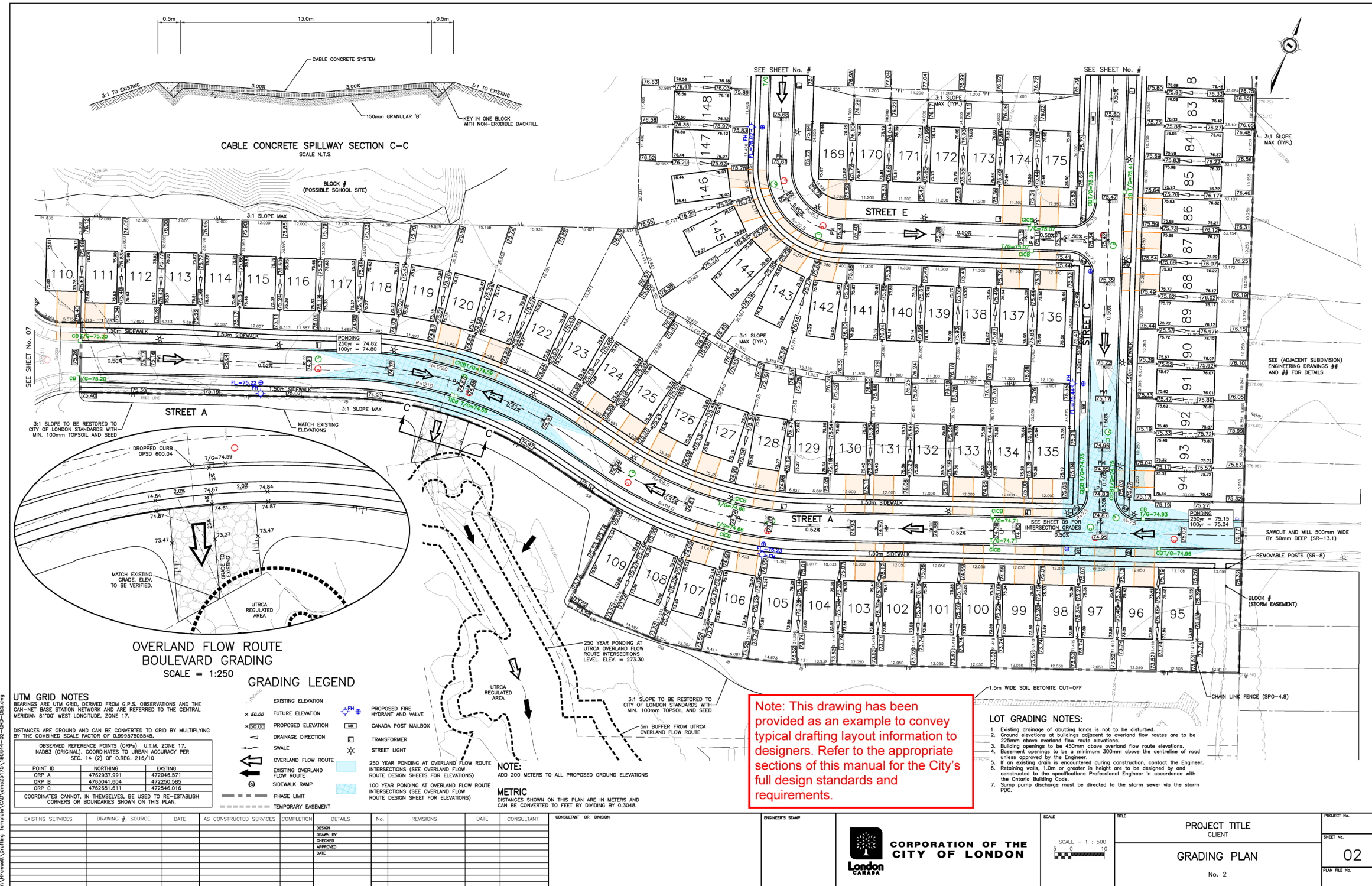


Figure 18.6 Park Plan

