

23 February 2026

SBM-21-0466

Royal Premier Homes  
509 Commissioners Road West #425  
London, ON NKA 1J5

Attn: Mr. Farhad Noory, President

**Re: Servicing Feasibility Study  
Fanshawe Park Midrise  
517-525 Fanshawe Park Road East & 1536 Geary Avenue, London, Ontario**

## 1. INTRODUCTION

This Servicing Feasibility Study (Study) has been prepared by Strik, Baldinelli, Moniz Ltd. (SBM) for Royal Premier Homes to address the servicing feasibility for the proposed residential development located at 517-525 Fanshawe Park Road East and 1536 Geary Avenue, London, Ontario (Subject Site), and the City's Pre-Application Consultation comments dated September 15<sup>th</sup>, 2025.

The area of the site is approximately 0.78 ha. The Subject Site consists of four (4) single-family lots located along the south side of Fanshawe Park Road East and at the southeast corner of the intersection with Geary Avenue. The site abuts the Fanshawe Park Road East Right-Of-Way (ROW) to the north, the Geary Avenue ROW to the west, and single-family residential lands to the south and east. The proposed development includes an 8-storey apartment building with 299 units and an underground parking garage. Please refer to the proposed Site Plan by Zedd Architecture dated February 17, 2026, appended to this Study.

This Study is to determine the adequacy of the existing City services in support of a Zoning By-Law Amendment (ZBA) for the proposed development.

Design requirements have been based on the City of London Design Specifications & Requirements Manual (DS&RM), updated January 2025.

## 2. WATER SERVICING

As per the City's record drawings WD136S5 dated April 5, 1965 and WD136S6 dated May 3, 1965, and the Record of Pre-Application Consultation comments dated September 15, 2025, there is an existing 400 mm cast iron watermain in the Fanshawe Park Road East ROW and a 150 mm cast iron watermain in the Geary Avenue ROW. The existing water services for 517, 521, and 525 Fanshawe Park Road East, and 1536 Geary Avenue will need to be located on site, and at the time of construction, these services are required to be decommissioned at the main.

### 2.1 Domestic Water Demand

The domestic water supply can be provided via either the existing 400 mm cast iron watermain in the Fanshawe Park Road East ROW or the existing 150 mm cast iron watermain in the Geary Avenue ROW. The maximum hour and maximum day

domestic demands as per the DS&RM for the site's occupancy load of 479 people (299 units at 1.6 people per unit) are 11.03 L/s and 4.95 L/s, respectively. See the attached domestic water demand calculations.

## 2.2 *Water Demand for Fire Protection*

The proposed building will have a sprinkler system installed, therefore fire-fighting demand was determined as per NFPA-13, as outlined in the OBC, Section A-3.2.5.7. The proposed development contains an underground parking garage which has a hazard classification of "Ordinary Group (2)" per NFPA 13. As such, the development has conservatively been taken to require the "Ordinary Hazard (Group 2)" flow rate of 600 USGP (2,271 L/min).

Section 7.3.1 of the DS&RM requires the minimal residual pressure in a fire flow scenario plus domestic demand to be not less than 140 kPa (20 psi) at any hydrant lateral or fire service connection.

A hydrant flow test at 420 Fanshawe Park Road East, dated June 13, 2023 and a system pressure of 301.8m were obtained from the City of London and are provided attached. At the required fire flow + maximum day demand rate of 2568 L/min, the residual pressure at the building would be approximately 65.84 psi which exceeds the minimum required 20 psi in fire-flow scenarios. Please refer to the calculations attached to this Study.

Under the fire flow + maximum day demand rate of 2568 L/min, this would result in a velocity of 2.42m/s within the 150mm watermain on Geary Ave. As this is a minor exceedance of the allowable velocity, a water service connection to the 150mm watermain located on Geary Avenue is considered feasible. The watermain connection will be confirmed during detailed design for SPA with the City of London. A water connection to the existing 400mm watermain on Fanshawe Park Road East is also feasible and would result in a peak velocity below 2.4m/s. Based on the current Ontario Building Code (OBC) requirements, a fire hydrant should be located 45 m from the fire departments connection. There is an existing municipal hydrant on Geary Avenue, approximately 10 m from the Subject Site. As the location of the fire departments connection is not know at this time, a new site hydrant may be required at the time of detailed design. The location of both the fire-fighters' connection and hydrant will be determined through detailed design for Site Plan Approval application.

## 2.3 *Water Supply Conclusions*

As shown in the attached Domestic and Fire-Flow Water Servicing Calculations (considering maximum day domestic demand combined with the NFPA-13 flow demand requirements for sprinkler systems), the water pressure at the proposed watermain connection will be approximately 65.84 psi. It can be concluded that adequate water supply is available for the proposed development with the residual pressures greater than the minimum requirement of 140 kPa (20 psi) and less than the maximum requirement of 550 kPa (80 psi).

The site's proposed water service can feasibly connect to either the existing 400mm watermain in the Fanshawe Park Road East ROW or the existing 150mm watermain in the Geary Avenue ROW with the size and alignment to be confirmed at the time of detailed design for Site Plan Approval.

## 3. **SANITARY SERVICING**

As per the City's record drawing 4421 dated August 1974 and the Pre-Application Consultation comments, the Subject Site is tributary to the existing 200 mm sanitary sewer in the Geary Avenue ROW. The 521 and 525 Fanshawe Park Road East residences are serviced via the existing 200 mm sanitary sewer in the Fanshawe Park Road East ROW and the 517 Fanshawe Park Road East and 1536 Geary Avenue residences are serviced via the existing 200 mm sanitary sewer in the Geary Avenue ROW. All four (4) sanitary services are required to be decommissioned at the time of construction.

A sanitary capacity study was conducted to assess the downstream capacity of the 200 mm diameter sewer and confirm that surplus capacity exists up to sanitary manhole SB202, as shown on the City of London Locates Sanitary Catchment Area Review Map attached. The following information was used to prepare the sanitary sewer design sheet: catchment areas were obtained from record drawing 5018S1, dated February 1977 and record drawing 12415, dated March 1990, and the sanitary geometry (sizes and slopes) were obtained from record drawing 4421, dated August 1974 and record drawings 5008-5009, 5012-5014, dated February 1977. Please refer to the Sanitary Sewer Design Sheet by SBM attached and Record Drawings 12,415 and 5018 which are to be read in conjunction.

The proposed flows from the Subject Site are shown on the Sanitary Sewer Design Sheet appended to this Study. Using a flow of 230 L/capita/day as per the DS&RM for the site's occupancy load of 479 people (299 units at 1.6 people per unit), the anticipated peak sanitary flow for the proposed development is 5.59 L/s. When combined with infiltration, this results in a total peak flow of 5.67 L/s. As shown in the Sanitary Sewer Design sheet, it was determined that at the study limit (MH SB202), the downstream total peak flow is 21.18 L/s based on a total area of 34.2ha and population of 1663 persons. The downstream sewer is a 200 mm diameter sewer with a slope of 7.72% has a capacity of 91.18 L/s. Therefore, the existing downstream sewer in the Geary Avenue ROW has sufficient capacity for the proposed development without any exceedances of capacity in any of the sanitary sewers within the Study Limits.

The sanitary catchment area drawing (Record Drawing 5018) was further reviewed against the current City of London Locates mapping to confirm the extent of the tributary sanitary sewer catchment area and study limits. As shown in the "City of London Locates Sanitary Catchment Area Review Map" provided attached, the extent of the study limits catchment area has an area of ~27.1ha, contains 126 single family homes (excluding the Subject Site) and would result in a population of 378 people. This indicates that based on existing conditions, the area and population tributary to sanitary manhole SB202 as shown in the Sanitary Sewer Design Sheet provided attached is considered to be conservative.

#### 4. STORM SERVICING AND STORMWATER MANAGEMENT

As per the City's record drawing 12414 dated March 1990 and the Pre-Application Consultation Comments, the Subject Site is not tributary to the 450 mm storm sewer in the Fanshawe Park Road East ROW which only conveys the road runoff. It is proposed to connect a storm PDC from the Subject Site to the existing 450 mm storm sewer on Geary Avenue to convey storm flows from the development at a rate that matches existing peak flows from the 2 through 100-year return period storms.

Under pre-development conditions, the Subject Site has a runoff coefficient (C-value) of 0.36. The SWM calculations attached to this Study show that the post-development C-value of 0.79 for the entire site is greater than the pre-development C-value of 0.36. Therefore, storm water management quantity controls are proposed for this development to reduce/match existing peak flows from the 2 through 100-year return period storms and safely convey up to the major storm event including control of external drainage areas.

As shown in the SWM calculations provided attached, based on the pre-development peak flow rates, the allowable flow rates from the development are 38.27 L/s and 91.21 L/s for the 2 year and 100-year design storms, respectively. As shown in the architectural drawing Catchment Area A202 Markup attached, catchment area A202 represents the rooftop of the proposed building and is calculated to have a potential storage volume of 132.80 m<sup>3</sup>. Preliminary calculations indicate that 10 flow-controlled roof drains releasing a total flow of 15 L/s can store up to 132.80 m<sup>3</sup>. The rooftop can attenuate the required 31.56 m<sup>3</sup> and 117.32 m<sup>3</sup> of storage under the 2 year and 100-year design storms respectively. As shown in the architectural drawing Catchment Area A203 Markup attached, catchment area A203 represents the ground level of the site including the surface level parking area. The parking lot area is calculated to have an estimated storage volume of approximately 132.55 m<sup>3</sup>. An orifice will be used to restrict pipe outflows from the site to 38.27 L/s and will be specified during detailed design. The parking lot can attenuate the required 32.68 m<sup>3</sup> and 56.67 m<sup>3</sup> of storage under the 2 year and 100-year design storms respectively. As shown in the SWM calculations, the Subject Site provides enough storage to attenuate post-development flows to pre-development levels under the 2-year and 100-year design storm. Detailed site design and stormwater management design will be completed during SPA.

Stormwater management quality controls demonstrating compliance with the SWM criteria and environmental targets identified will be addressed to the standards of the Ministry of the Environment, Conservation and Parks (MECP) (quality control of 80% TSS removal). An Oil & Grit Separator (OGS) unit is proposed to provide quality control for the proposed development (80% TSS removal). Further details on the design of the OGS will be provided as part of the detailed engineering design.

## 5. SUMMARY

Based on the above, the City's existing sanitary sewer and water distribution infrastructure have sufficient capacity to accommodate the proposed development. The proposed development can reduce/match existing peak flows from the 2 through 100-year return period storms and feasibly connect to the existing 450mm storm sewer located on Geary Ave.

## 6. LIMITATIONS

This Study was prepared by SBM for Royal Premier Homes and the City of London. Use of this Study by any third party, or any reliance upon its findings, is solely the responsibility of that party. SBM accepts no responsibility for damages, if any, suffered by a third party as a result of decisions made or actions undertaken as a result of this Study. Third party use of this Study, without the express written consent of the Consultant, denies any claims, whether in contract, tort, and/or any other cause of action in law, against the Consultant.

All findings and conclusions presented in this Study are based on site conditions as they appeared in the information presented to SBM and related to in this document. This Study is not intended to be exhaustive in scope, or to imply a risk-free development. It should be recognized that the passage of time may alter the opinions, conclusions, and recommendations provided herein, as well as any changes in the layout of the development.

The design was limited to the documents referenced herein and SBM accepts no responsibility for the accuracy of the information provided by others. All designs and recommendations presented in this Study are based on the information available at the time of the review.

This document is deemed to be the intellectual property of SBM in accordance with Canadian copyright law.

## 7. CLOSURE

We trust this Study meets your satisfaction. Should you have any questions or require further information, please do not hesitate to contact us.

Respectfully submitted,

**Strik, Baldinelli, Moniz Ltd.**

Planning • Civil • Structural • Mechanical • Electrical



Kurtis Caron, P.Eng.  
Civil Project Lead, Eng II



Mariana Rodriguez Chiquiza  
Civil Engineering Trainee I

Encl: Site Plan/1<sup>st</sup> Floor Plan & L1 Level Drawings by Zedd Architecture dated February 17, 2026  
City of London record drawing WD136S5 dated April 5, 1965  
City of London record drawing WD136S6 dated May 3, 1965  
Domestic Water Demand Calculations  
Hydrant Flow Test No.23-24 dated June 13, 2023  
City of London HGL Confirmation Email  
Fire-Fighting Flow (NFPA-13) Flow Demand & Demand Requirements  
Fire-Fighting Flow (NFPA-13) Calculations  
City of London record drawing 4421 dated August 1974  
City of London record drawing 5018S1, 5008, 5009, 5012-5014 dated February 1977  
City of London record drawing 5018 dated Feb 1977 (Sanitary Catchment Area Drawing)  
City of London record drawing 12415 dated March 1990 (Sanitary Catchment Area Drawing)  
City of London Locates Sanitary Catchment Area Review Map  
Sanitary Service Design Sheet  
City of London record drawing 12414 dated March 1990  
SWM Catchment Plans (Catchment Area A201-A203)  
SWM Calculations

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Scale : As indicated

20-052

RPH - Fanshawe Park\_Revised

517, 521, 525 Fanshawe Park Rd. E & 1536  
Geary Ave

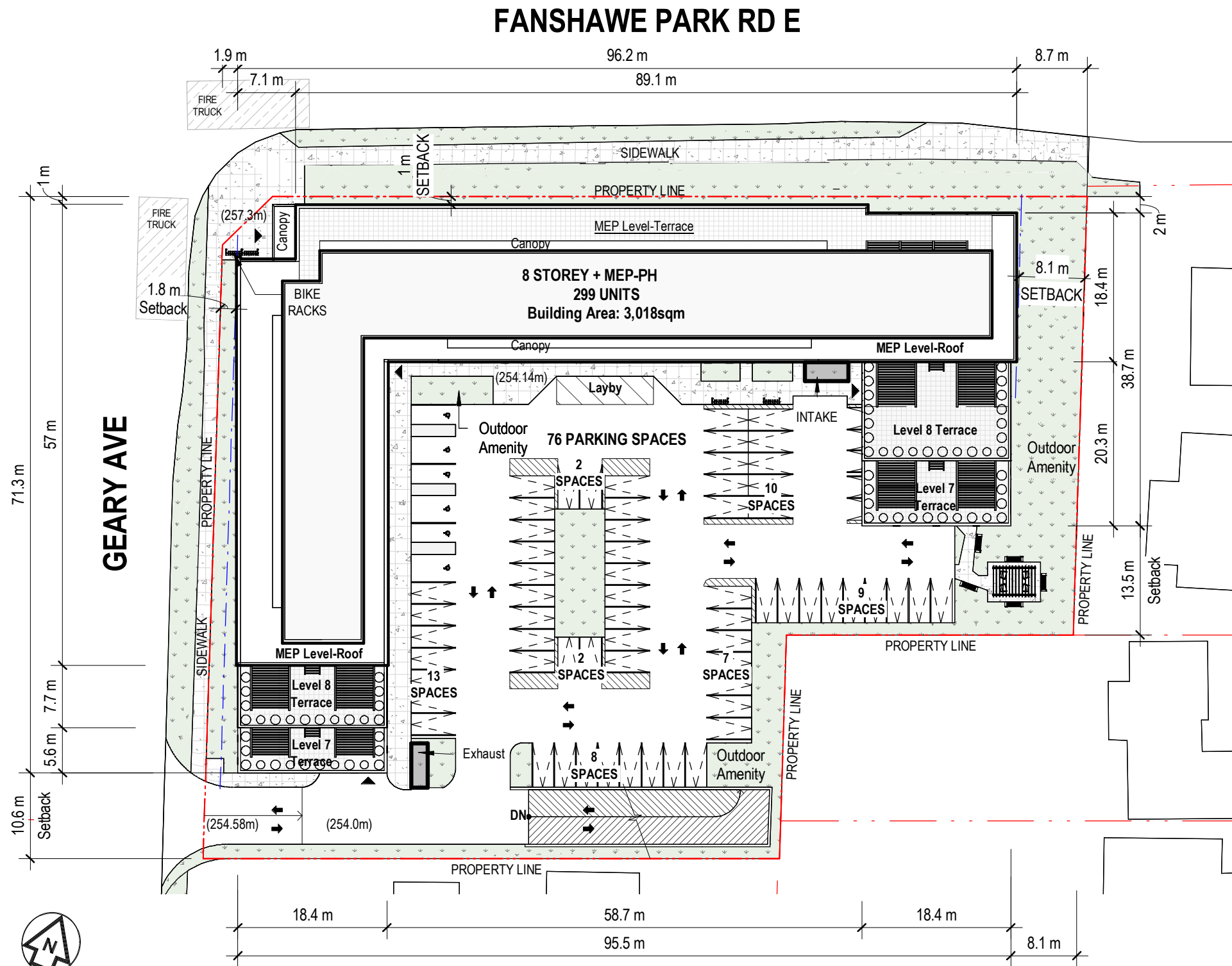
Site Plan

2026.02.17

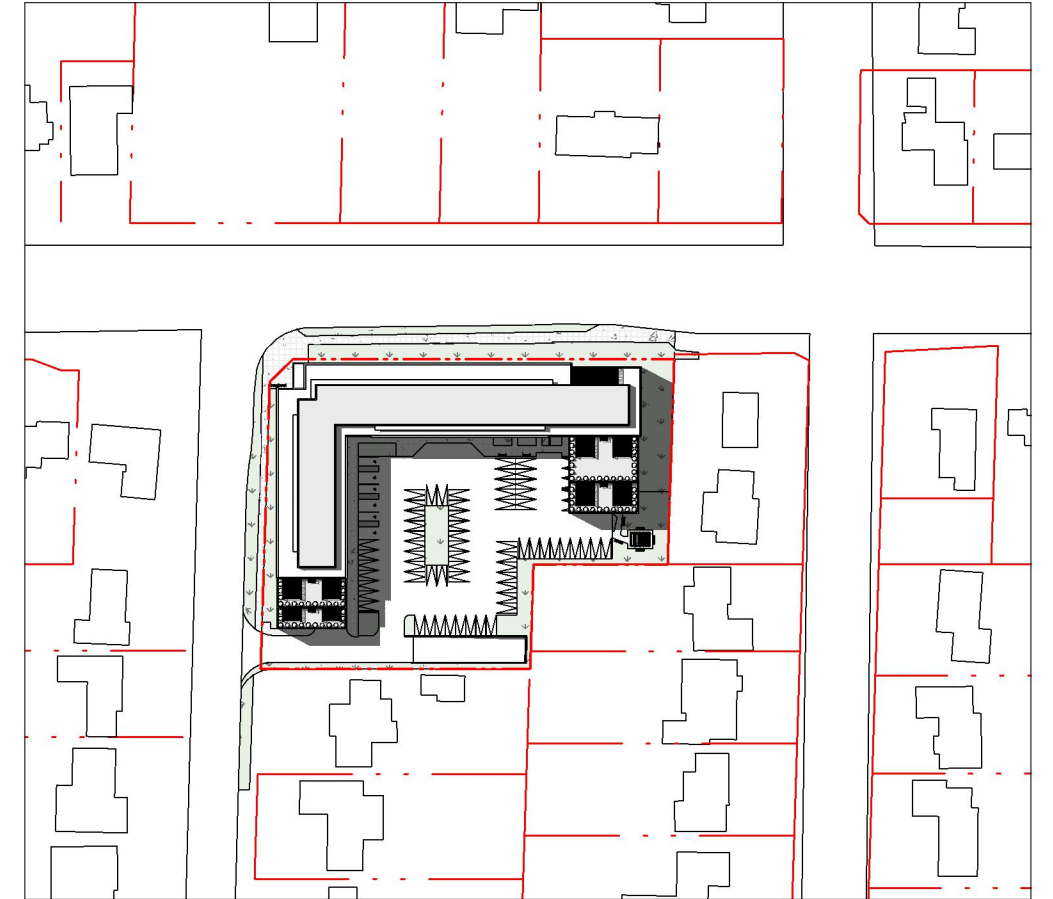
SD1.1

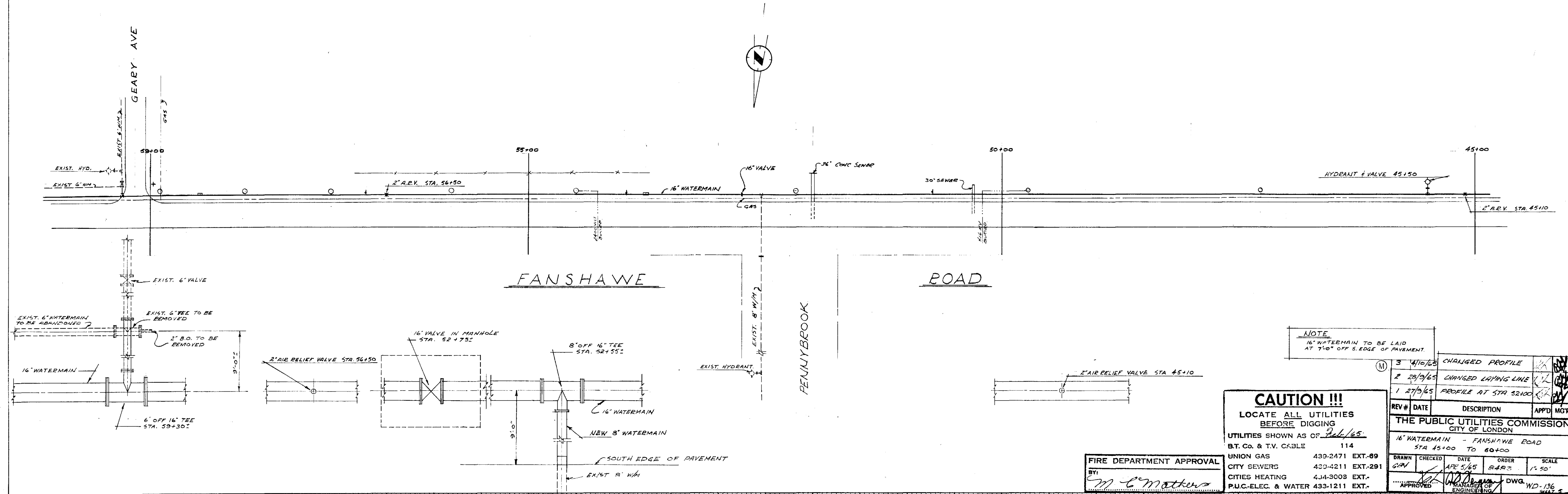
zedd  
ARCHITECTURE

Z-627 maitland street london ontario N6Y 2V7 519 518 9333  
www.zeddarchitecture.com info@zeddarchitecture.com



Contextual Plan





NOTE  
16\"/>

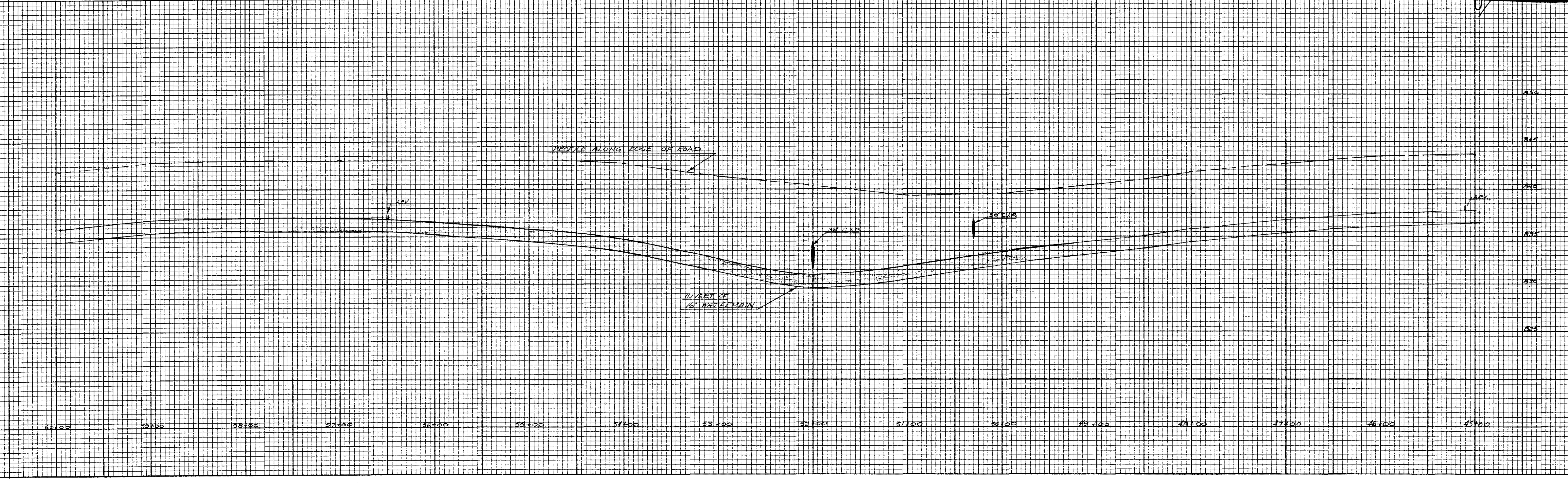
**CAUTION !!!**  
LOCATE ALL UTILITIES  
BEFORE DIGGING  
UTILITIES SHOWN AS OF Feb/65.  
B.T. Co. & T.V. CABLE 114  
UNION GAS 439-2471 EXT.-69  
CITY SEWERS 439-4211 EXT.-291  
CITIES HEATING 434-3003 EXT.-  
P.U.C.-ELEC. & WATER 433-1211 EXT.-

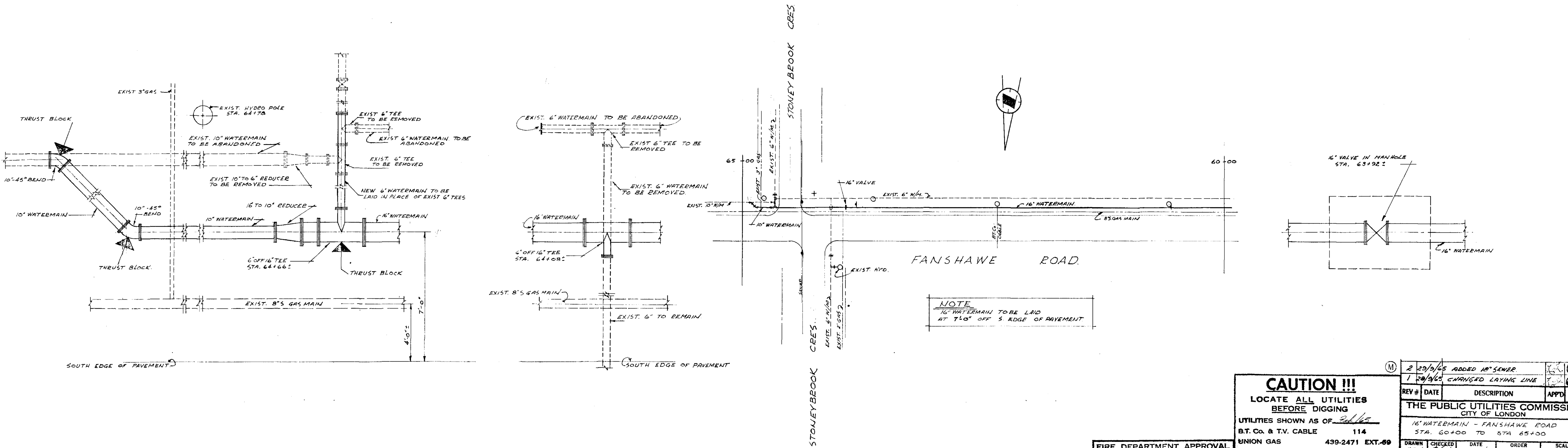
FIRE DEPARTMENT APPROVAL  
BY: *M. C. Mathers*

| REV # | DATE    | DESCRIPTION          | APP'D | MG'D |
|-------|---------|----------------------|-------|------|
| 3     | 4/10/65 | CHANGED PROFILE      |       |      |
| 2     | 28/9/65 | CHANGED LAYING LINE  |       |      |
| 1     | 27/9/65 | PROFILE AT STA 52100 |       |      |

THE PUBLIC UTILITIES COMMISSION  
CITY OF LONDON

16\"/>



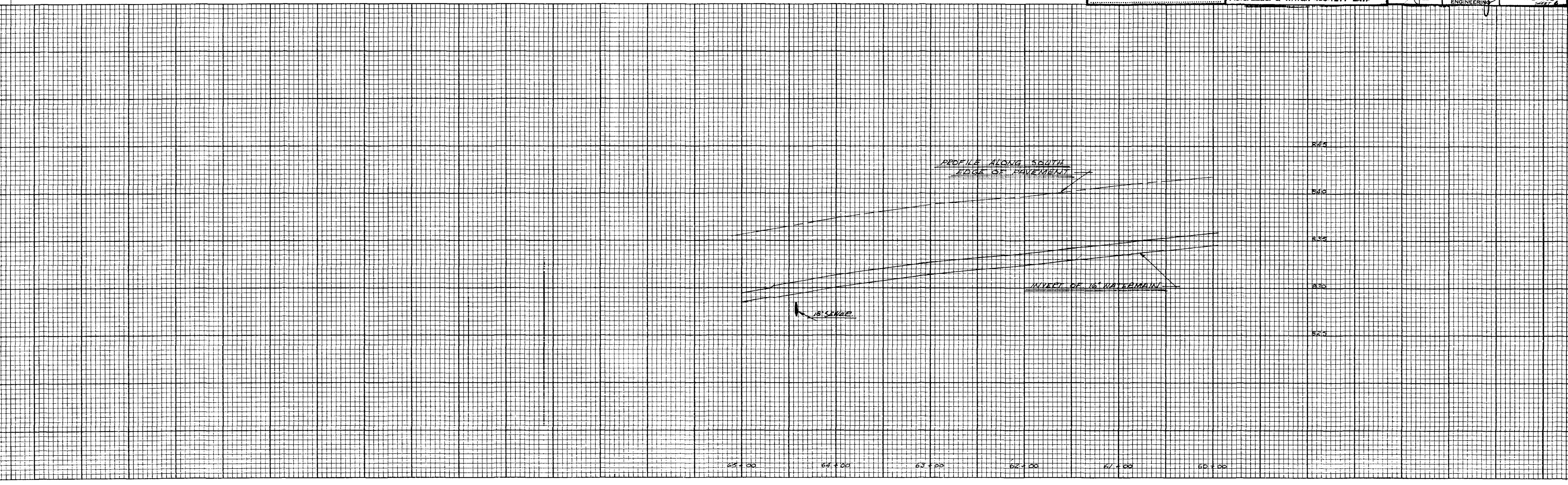


NOTE  
16\"/>

FIRE DEPARTMENT APPROVAL  
BY: *M. E. Mathers*

**CAUTION !!!**  
LOCATE ALL UTILITIES  
BEFORE DIGGING  
UTILITIES SHOWN AS OF: *2nd/65*  
B.T. CO. & T.V. CABLE 114  
UNION GAS 439-2471 EXT. 69  
CITY SEWERS 439-4211 EXT. 291  
CITIES HEATING 434-3003 EXT.  
P.U.C. ELEC. & WATER 433-1211 EXT.

|                                                           |         |                        |        |              |
|-----------------------------------------------------------|---------|------------------------|--------|--------------|
| 2                                                         | 29/9/65 | ADDED 18" SEWER        | 6      | 04           |
| 1                                                         | 20/9/65 | CHANGED LAYING LINE    | 7      | 04           |
| REV #                                                     | DATE    | DESCRIPTION            | APP'D  | MGT          |
| THE PUBLIC UTILITIES COMMISSION<br>CITY OF LONDON         |         |                        |        |              |
| 16" WATERMAIN - FANSHAWE ROAD<br>STA. 60+00 TO STA. 65+00 |         |                        |        |              |
| DRAWN                                                     | CHECKED | DATE                   | ORDER  | SCALE        |
| W.D.                                                      | W.D.    | MAY 3/67               | R.R.P. | 1" = 50'-0"  |
| APPROVED                                                  |         | MANAGER OF ENGINEERING |        | DWG. W.D-136 |



## DOMESTIC WATER DEMAND, VELOCITY, AND TURNOVER CALCULATION

DATE: February 17, 2026  
JOB NO.: SBM-21-0466

Client: Royal Premier Homes  
Project: Fanshawe Park Midrise  
Location: 517-525 Fanshawe Park Road East & 1536 Geary Avenue

### DEMAND CALCULATION

Avg. Day Demand = 255 L/day/cap  
Avg. Day Demand = 0.002951389 L/s/cap  
Max. Day Peaking Factor = 3.5  
Max. Hour Peaking Factor = 7.8  
High Density Residential = 1.6 p/unit

|                          | Units/Area | Population | Avg. Day (L/s) | Max. Hour (L/s) | Max. Day (L/s) |
|--------------------------|------------|------------|----------------|-----------------|----------------|
| High Density Residential | 299        | 479        | 1.41           | 11.03           | 4.95           |
| Total                    |            |            | <b>1.41</b>    | <b>11.03</b>    | <b>4.95</b>    |

### VELOCITY CALCULATION

| Diameter (mm) | Demand (L/s) | Velocity (m/s) |
|---------------|--------------|----------------|
| 150           | 11.03        | 0.624          |
| 200           | 11.03        | 0.351          |

Maximum allowable velocity of 1.5 m/s under maximum hour domestic flow conditions as per Section 7.3.6 of the City of London Design Specifications and Requirements Manual.

**CITY OF LONDON**  
**WATER OPERATIONS FLOW TEST**

|                |                                                                                                                                                                                                                        |                    |                         |                              |                          |                                             |           |
|----------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------|-------------------------|------------------------------|--------------------------|---------------------------------------------|-----------|
| DATE:          | Tuesday, June 13, 2023                                                                                                                                                                                                 |                    |                         | FLOW TEST No.                |                          |                                             | 23-24     |
| TIME:          | 9:00 AM                                                                                                                                                                                                                |                    |                         | HYDRANT ID                   |                          |                                             | H4224     |
| OPERATOR:      | Private Fire Flow Company                                                                                                                                                                                              |                    |                         | CHLORINE RESIDUAL mg/L       |                          |                                             | 0.82      |
| OPERATOR:      | Joshua Semeniuk                                                                                                                                                                                                        |                    |                         | WATER QUALITY<br>AFTER TEST  | POOR                     | GOOD                                        | EXCELLENT |
| REQUESTED BY:  | Justin Doyle - Vipond Inc                                                                                                                                                                                              |                    |                         |                              |                          | ✓                                           |           |
| LOCATION:      | 420 Fanshawe Park Rd E                                                                                                                                                                                                 |                    |                         | TIME USED FOR FLUSHING       |                          |                                             |           |
| TEST<br>NUMBER | <div>FLOW HYDRANT<br/>STATIC: 65 PSI</div> <div>Discharge Coefficient:<br/><input type="checkbox"/> 0.70   <input checked="" type="checkbox"/> 0.80   <input type="checkbox"/> 0.90   <input type="checkbox"/> 1</div> |                    |                         |                              |                          | <div>RESIDUAL HYDRANT<br/>STATIC: PSI</div> |           |
|                | NO. OF<br>OUTLETS                                                                                                                                                                                                      | OUTLET SIZE<br>IN. | PITOT READING<br>P.S.I. | INDIVIDUAL<br>FLOW U.S.G.P.M | TOTAL FLOW<br>U.S.G.P.M. | RESIDUAL PRESSURE P.S.I.                    |           |
| 1              | 1                                                                                                                                                                                                                      | 2-1/2"             | 45                      | 999                          | 999                      | 64                                          |           |
| 2              | 2                                                                                                                                                                                                                      | 2-1/2"             | 35/35                   | 907/907                      | 1814                     | 63                                          |           |

Readings taken by Vipond - See Reverse for Report



Information contained in this report is representative of flows and pressure losses at the time of the test and depends on reservoir levels, pump operation and customer water demand. Results will vary throughout the day and time of year. Available pressure at other times should be based on a design hydraulic grade line for the pressure zone in which the hydrants are located. By issuing this information report, neither the City nor any of its employees makes any warranty, express or implied, concerning the location, type or extent of services described in this report. Furthermore, neither the City nor any of its employees shall be liable in any manner for any personal injury or property damage or loss of any kind arising from or connected with this information or incomplete information.

## Michelle Alegria

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**From:** Karpovich, Daniel <dkarpovi@london.ca>  
**Sent:** Thursday, December 18, 2025 10:19 AM  
**To:** Michelle Alegria  
**Cc:** Kurtis Caron; Kyle Kane  
**Subject:** RE: 517-525 Fanshawe Park Road East & 1356 Geary Avenue Hydrant Flow Test  
**Attachments:** FT\_H4224\_1.pdf

Good morning, Michelle,

Please see attached. These are the nearest Flow Test we have on file for 517-525 Fanshawe Park Rd. As for 1356 Geary Ave, Im having trouble locating that address, is it possible there is an error?

The HGL for this area is 301.8m.

Thank you,



**Daniel Karpovich**  
Technologist II  
Water Operations  
City of London

663 Bathurst St, London ON N5Z 1P8  
P: 519.661.CITY(2489) x 5541  
[dkarpovi@london.ca](mailto:dkarpovi@london.ca) | [www.london.ca](http://www.london.ca)

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**From:** Michelle Alegria <MAlegria@sbmltd.ca>  
**Sent:** Wednesday, December 17, 2025 4:22 PM  
**To:** Karpovich, Daniel <dkarpovi@london.ca>  
**Cc:** Kurtis Caron <kcaron@sbmltd.ca>; Kyle Kane <kkane@sbmltd.ca>  
**Subject:** [EXTERNAL] 517-525 Fanshawe Park Road East & 1356 Geary Avenue Hydrant Flow Test

Hello Daniel,

I hope this email finds you well. SBM is working on a project at 517-525 Fanshawe Park Road East & 1356 Geary Avenue. I am wondering if there are any recent hydrant flow tests done within the area. As well, what is the HGL for this area?  
Thank you!

Regards,

**Michelle Alegria, EIT**  
Civil Engineering Trainee I  
P: 519-471-6667 x 202  
E: [malegria@sbmltd.ca](mailto:malegria@sbmltd.ca)

## NFPA # 13 FLOW DEMAND REQUIREMENTS

| HAZARD      | SPRINKLER FLOW                                         | HYDRANT ALLOWANCE | TOTAL FLOW |
|-------------|--------------------------------------------------------|-------------------|------------|
| Light       | 175 GPM                                                | 100 GPM           | 275 GPM    |
| Ordinary 1  | 250 GPM                                                | 250 GPM           | 500 GPM    |
| Ordinary 2  | 350 GPM                                                | 250 GPM           | 600 GPM    |
| Extra 1     | 750 GPM                                                | 500 GPM           | 1250 GPM   |
| Extra 2     | 1000 GPM                                               | 500 GPM           | 1500 GPM   |
| Warehousing | Varies too much to come up with a generic water demand |                   |            |

The pressures range on each of these flows and would be generally be 35 PSI - 80 PSI Requirements,  
but this information can't truly be given until final layouts and calculations are complete

the occupancy hazards of potential tenants and their likely storage needs.

The short period response parameter,  $S_p$ , is defined in 3.3.198. Additional information about  $S_p$  is provided in 18.5.9.

The intent of Section 4.2 is to provide the owner's certificate for all new systems and where there is a change of occupancy and/or building use. [See Figure A.28.1(b).]

**A.4.2(4)** Recycled or reclaimed water used in a sprinkler system should not have contaminants in the water that are combustible or that will have a detrimental effect on the sprinkler system performance or the life of the sprinkler system.

**A.4.3** Occupancy examples in the listings as shown in the various hazard classifications are intended to represent the norm for those occupancy types. Unusual or abnormal fuel loadings or combustible characteristics and susceptibility for changes in these characteristics, for a particular occupancy, are considerations that should be weighed in the selection and classification.

The light hazard classification is intended to encompass residential occupancies; however, this is not intended to preclude the use of listed residential sprinklers in residential occupancies or residential portions of other occupancies.

**A.4.3.1.4** Miscellaneous storage is intended to be storage that is ancillary to the primary function of the building. One example is a manufacturing facility where storage on the manufacturing floor is limited.

**A.4.3.2** Light hazard occupancies include occupancies having uses and conditions similar to the following:

- (1) Animal shelters
- (2) Churches
- (3) Clubs
- (4) Eaves and overhangs, if of combustible construction with no combustibles beneath
- (5) Educational
- (6) Hospitals, including animal hospitals and veterinary facilities
- (7) Institutional
- (8) Kennels
- (9) Libraries, except large stack rooms
- (10) Museums
- (11) Nursing or convalescent homes
- (12) Offices, including data processing
- (13) Residential
- (14) Restaurant seating areas
- (15) Theaters and auditoriums, excluding stages and prosceniums
- (16) Unused attics

Note that it is not the committee's intent to automatically equate library bookshelves with ordinary hazard occupancies or with library stacks. Typical library bookshelves of approximately 8 ft (2.4 m) in height, containing books stored vertically on end, held in place in close association with each other, with aisles wider than 30 in. (750 mm) can be considered to be light hazard occupancies. Similarly, library stack areas, which are more akin to shelf storage or record storage, as defined in NFPA 232, should be considered to be ordinary hazard occupancies.

**N A.4.3.3** Class I, Class II, Class III, and Class IV commodities are considered to have moderate rates of heat release, while Group A plastics are considered to have high rates of heat release.

Stockpiles are considered to include display merchandise (e.g., mercantile stockpiles) and arrangements of combustibles ancillary to operations within the occupancy as opposed to dedicated storage areas where the fire loading is generally more severe.

**Δ A.4.3.3.1** Ordinary hazard (Group 1) occupancies include occupancies having uses and conditions similar to the following:

- (1) Automobile showrooms
- (2) Bakeries
- (3) Beverage manufacturing
- (4) Canneries
- (5) Dairy products manufacturing and processing
- (6) Electronic plants
- (7) Glass and glass products manufacturing
- (8) Laundries
- (9) Restaurant service areas
- (10) Porte cocheres
- (11) Mechanical rooms

**Δ A.4.3.3.2** Ordinary hazard (Group 2) occupancies include occupancies having uses and conditions similar to the following:

- (1) Agricultural facilities
- (2) Automobile parking garages
- (3) Barns and stables
- (4) Cereal mills
- (5) Chemical plants — ordinary
- (6) Confectionery products
- (7) Distilleries
- (8) Dry cleaners
- (9) Exterior loading docks (Note that exterior loading docks only used for loading and unloading of ordinary combustibles should be classified as OH2. For the handling of flammable and combustible liquids or hazardous materials, or where utilized for storage, exterior and interior loading docks should be protected based upon the actual occupancy and the materials handled on the dock, as if the materials were actually stored in that configuration.)
- (10) Feed mills
- (11) Horse stables
- (12) Leather goods manufacturing
- (13) Libraries — large stack room areas
- (14) Machine shops
- (15) Metal working
- (16) Mercantile
- (17) Paper and pulp mills
- (18) Paper process plants
- (19) Piers and wharves
- (20) Plastics fabrication, including blow molding, extruding, and machining; excluding operations using combustible hydraulic fluids
- (21) Post offices
- (22) Printing and publishing
- (23) Racetrack stable/kennel areas, including those stable/kennel areas, barns, and associated buildings at state, county, and local fairgrounds
- (24) Repair garages
- (25) Resin application area
- (26) Stages
- (27) Textile manufacturing
- (28) Tire manufacturing
- (29) Tobacco products manufacturing

- (30) Wood machining
- (31) Wood product assembly

**A.4.3.4** Extra hazard (Group 1) occupancies include occupancies having uses and conditions similar to the following:

- (1) Aircraft hangars (except as governed by NFPA 409)
- (2) Combustible hydraulic fluid use areas
- (3) Die casting
- (4) Metal extruding
- (5) Plywood and particleboard manufacturing
- (6) Printing [using inks having flash points below 100°F (38°C)]
- (7) Rubber reclaiming, compounding, drying, milling, vulcanizing
- (8) Saw mills
- (9) Textile picking, opening, blending, garnetting, or carding, combining of cotton, synthetics, wool shoddy, or burlap
- (10) Upholstering with plastic foams

**A.4.3.5** Extra hazard (Group 2) occupancies include occupancies having uses and conditions similar to the following:

- (1) Asphalt saturating
- (2) Flammable liquids spraying
- (3) Flow coating
- (4) Manufactured home or modular building assemblies (where finished enclosure is present and has combustible interiors)
- (5) Open oil quenching
- (6) Plastics manufacturing
- (7) Solvent cleaning
- (8) Varnish and paint dipping
- (9) Car stackers and car lift systems with 2 cars stacked vertically

**Δ A.4.3.7** Other NFPA standards contain design criteria for fire control or fire suppression (*see 4.3.7 and Chapter 2*). While these can form the basis of design criteria, this standard describes the design, installation, fabrication, calculation, and evaluation methods of water supplies that should be used for the specific design of the system.

Other NFPA standards contain sprinkler system design criteria for fire control or suppression of specific hazards. These other standards are referenced in Chapter 27.

**A.4.4.1(3)** Pipe schedule — 25,000 ft<sup>2</sup> (2320 m<sup>2</sup>).

**A.4.4.6** Buildings adjacent to a primary structure can be protected by extending the fire sprinkler system from the primary structure. This eliminates the need to provide a separate fire sprinkler system for small auxiliary buildings. Items that should be considered before finalizing fire sprinkler design should include the following:

- (1) Actual physical distance between adjacent structures
- (2) Potential for the property to be split into separate parcels and sold separately
- (3) Square footage of both the primary and auxiliary structures
- (4) Difficulties in providing a separate water supply to the auxiliary structure
- (5) Occupancy/hazard of the auxiliary structure
- (6) Ability of emergency response personnel to easily identify the structure from which waterflow is originating

**A.4.5.1.1** Alternative means of determining available water supplies should be considered where drought or other concerns are present.

**A.4.6** Bacterial inhibitors and other chemicals that are listed and used for the prevention and mitigation of MIC and that do not adversely affect the fire-fighting properties of the water or the performance of the fire sprinkler system components are not prohibited.

**A.4.8** Non-system components can adversely affect the operation and longevity of the fire sprinkler system. Objects connected to the sprinkler system can displace sprinkler system piping, causing obstruction to the spray pattern of sprinklers, delay the activation of a sprinkler, or cause chemical compatibility problems that can cause the failure of sprinkler system components.

**A.4.9.1** The provisions of 4.9.1 do not require inherently noncombustible materials to be tested in order to be classified as noncombustible materials. [5000:A.7.1.4.1]

**A.4.9.1.1(1)** Examples of such materials include steel, concrete, masonry and glass. [5000:A.7.1.4.1.1(1)]

**A.4.9.2** Material subject to increase in combustibility or flame spread index beyond the limits herein established through the effects of age, moisture, or other atmospheric condition is considered combustible. (*See NFPA 259 and NFPA 220.*) [5000:A.7.1.4.2]

**A.5.1.3** For typical combined domestic/fire sprinkler demands, systems with 4 in. (100 mm) pipe or larger typically do not need to include the domestic demand in the calculations because it is such a small fraction of the total flow that it does not make a significant difference in the results. But for situations where 4 in. (100 mm) pipe is used for the combined domestic/fire sprinkler systems and the domestic demand is considerable, then the domestic demand should be included in the calculations. Generally, pipe that is 6 in. (150 mm) or larger can carry combined domestic/fire protection demand without any consideration for domestic demand being necessary.

**A.5.1.4** Evaluation of the water supply and environmental conditions does not necessarily require a water sample analysis by a laboratory. Instead, general knowledge of the long-term condition of sprinkler systems with similar piping materials in similar environments on the same water supply can be a sufficient evaluation.

There are several options to address the effects of MIC on sprinkler systems. Some types of sprinkler pipe such as CPVC have not shown to be affected by MIC. Other types of pipe are being manufactured with a biofilm that resists the effects of MIC.

Where water supplies are treated with bacterial inhibitors, evaluation of the effects of the bacterial inhibitor on sprinkler system components (pipe, fittings, sprinklers, gaskets, valves, and seals) is just as important as evaluating the effect the bacterial inhibitor has on the organisms. Where water treatment is selected as the method to deal with MIC, all water entering the system during testing or flushing needs to be treated so that the organisms do not get a chance to establish themselves.

Since all of the conditions that can affect the growth of MIC are unknown, a plan to sample randomly selected interior positions in the system can be effective. The frequency and location

## Fire-Fighting Flow NFPA#13

Date: February 17, 2026  
Job No: SBM-21-0466

Client: Royal Premier Homes  
Project: Fanshawe Park Midrise  
Location: 517-525 Fanshawe Park Road East & 1536 Geary Avenue

**Table 1. NFPA#13 Flow Demand Requirements**

| Hazard     | Sprinkler Flow (USGPM) | Hydrant Allowance (USGPM) | Total Flow (USGPM) |
|------------|------------------------|---------------------------|--------------------|
| Light      | 175                    | 100                       | 275                |
| Ordinary 1 | 250                    | 250                       | 500                |
| Ordinary 2 | 350                    | 250                       | 600                |
| Extra 1    | 750                    | 500                       | 1250               |
| Extra 2    | 1000                   | 500                       | 1500               |

Required Supply Flow Rate (Table 1) = 600 USGPM

Required Supply Flow Rate = 2271 L/min

Maximum Day Demand, L/min = 4.95 L/s (Refer to attached Domestic Water Demand calculation)

297 L/min

**Required Supply Fire Flow + Maximum Day Demand, L/min = 2568**

Provided Supply Flow Rate @

65.00

\*psi (448.16 kPa) =

0

\*L/min (0 USGPM)

64.00

\*psi (441.26 kPa) =

3782

\*L/min (999 USGPM)

63.00

\*psi (434.37 kPa) =

6867

\*L/min (1814 USGPM)

Using linear interpolation, residual pressure at hydrant = 64.28

psi (443.23 kPa) =

2568

L/min (678 USGPM)

Pressure Drop = 0.72

psi (4.93 kPa)

Largest Pressure Drop (most conservative) = 0.72 psi

Pressure Drop = 0.50 m head

\*\*HGL from DS&RM (Low Level System) = 301.8 m head

Total Head Under Fire Flow Conditions = 301.30 m head

Approximate Elevation of Proposed Connection to Watermain = 255.00 m

Water Pressure at service entrance Under Firefighting Conditions = 46.30 m head (65.84 psi, 453.93 kPa)

**Therefore, water supply pressure at the proposed property under fire flow conditions accounting for losses = 65.84 psi, 453.93 kPa**

\* Please refer to Hydrant Flow Test - 420 Fanshawe Park Road East Hydrant (H4224) Flow Test - 23-24

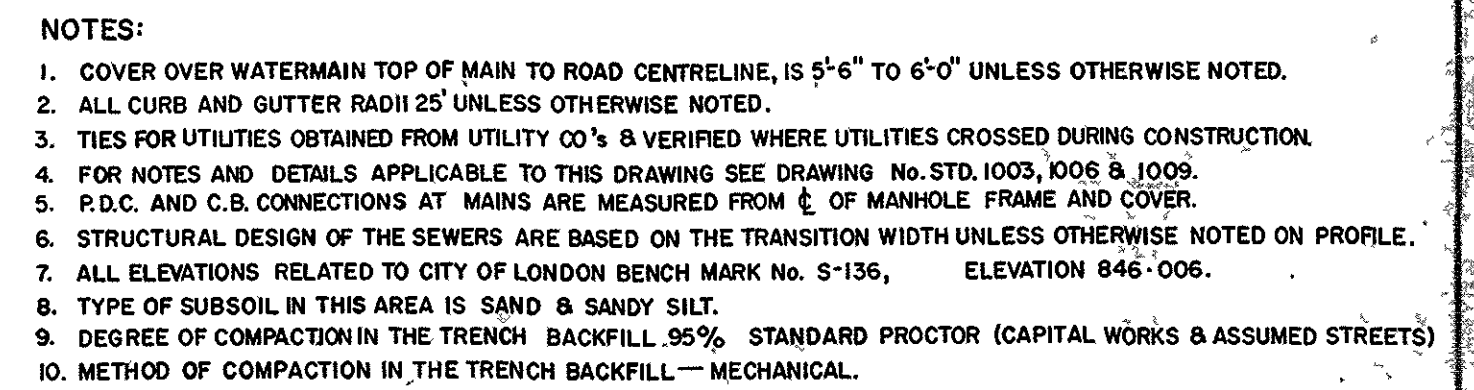
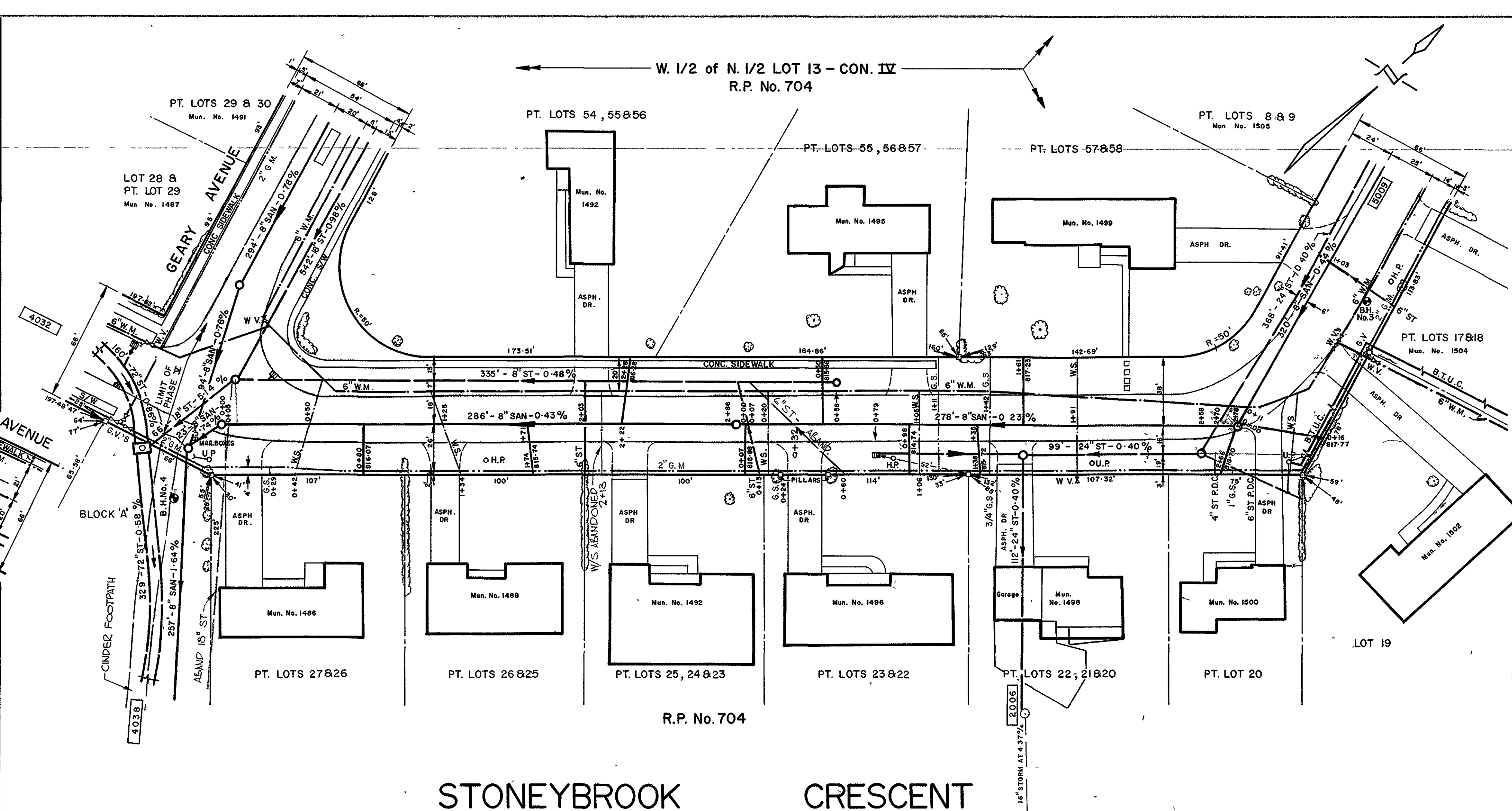
\*\* City's low-level service area

**Table 1. Water Velocity Calculation**

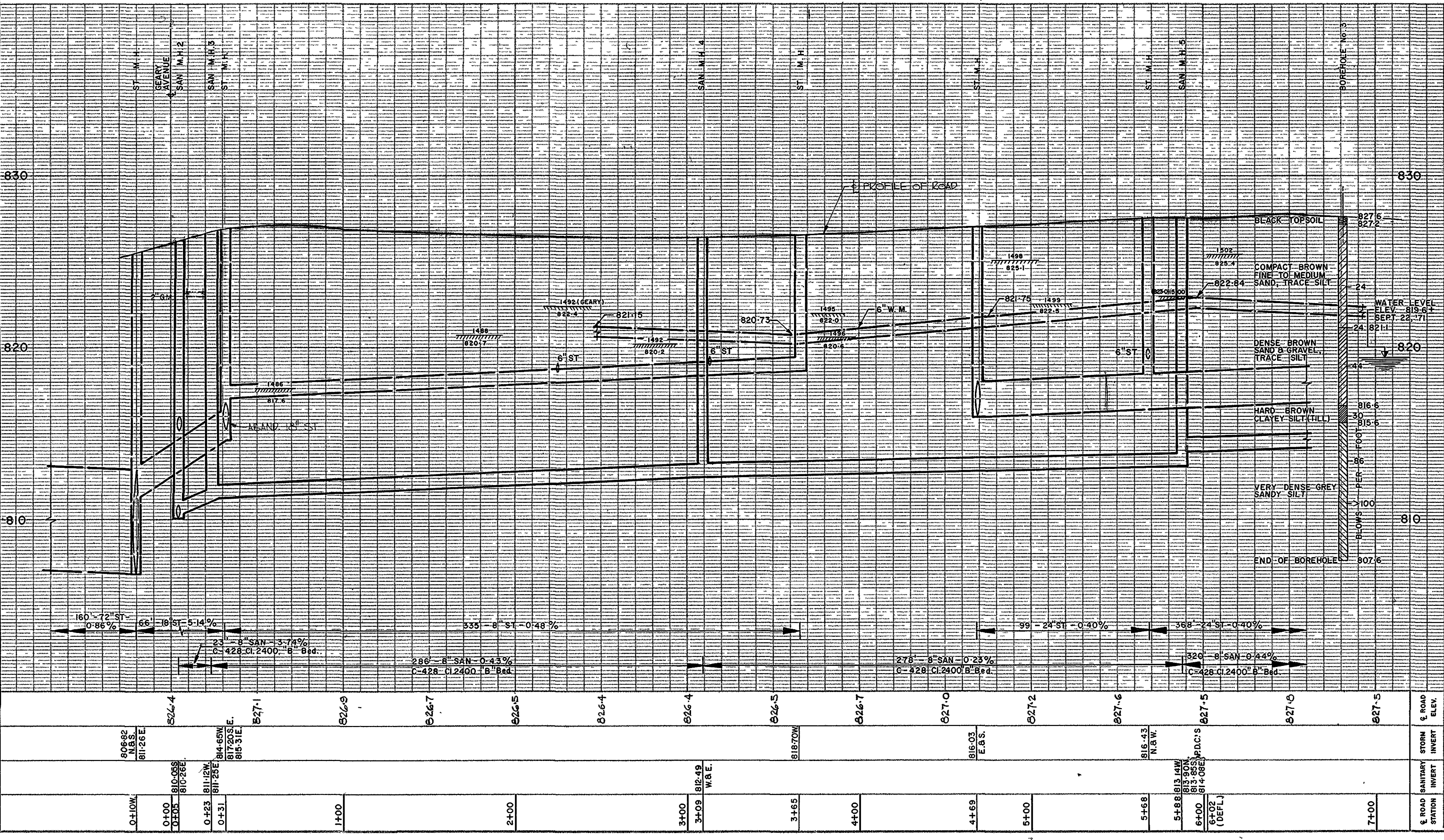
| Diameter (mm) | Demand (L/min) | Velocity (m/s) |
|---------------|----------------|----------------|
| 150           | 2568           | 2.422          |

Maximum allowable velocity of 2.4 m/s under fire flow conditions as per Section 7.3.6 of the City of London Design Specifications and Requirements Manual





| SERVICES                                        | COMPLETION | CONTRACTOR         |
|-------------------------------------------------|------------|--------------------|
| SANITARY SEWERS P.D.C.'s & M.H.'s               | MAY 1972   | M.J.MOL CONST. LTD |
| STORM SEWERS P.D.C.'s, M.H.'s & C.B.'s          |            |                    |
| WATERMANS & WATER SERVICES                      |            |                    |
| 6" GRAN. 'A' ROAD BASE COARSE (OILED BY C of L) | MAY 1972   | M.J.MOL CONST'LTD  |
| CURB & GUTTER                                   |            |                    |
| SIDEWALKS                                       |            |                    |
| PAVING                                          |            |                    |



|                                                                                       |                                                             |           |      |    |
|---------------------------------------------------------------------------------------|-------------------------------------------------------------|-----------|------|----|
|  | <p style="text-align: center;">"AS CONSTRUCTED DRAWING"</p> |           |      |    |
|                                                                                       |                                                             |           |      |    |
|                                                                                       | NO.                                                         | REVISIONS | DATE | BY |

|                                           |          |           |          |                     |
|-------------------------------------------|----------|-----------|----------|---------------------|
| PROFESSIONAL ENGINEER'S STAMP             |          |           |          |                     |
| CITY OF LONDON                            |          |           |          |                     |
| STONEBROOK AREA SANITARY SEWERS           |          |           |          |                     |
| PHASE III                                 |          |           |          |                     |
| EASEMENT (CITY OWNED LAND)                |          |           |          |                     |
| STONEBROOK                                | CRESCENT | TO 400' ± | SOUTH OF | STONEBROOK CRESCENT |
| &                                         |          |           |          |                     |
| STONEBROOK CRESCENT                       |          |           |          |                     |
| GEARY AVENUE TO 600' EAST OF GEARY AVENUE |          |           |          |                     |

|                                   |                                     |
|-----------------------------------|-------------------------------------|
| DESIGN BY : K.W. HODGES           | FIELD BOOK : 7-195                  |
| DRAWN BY : M.B. SHUTE & K. HUGHES | SCALE : HORIZ. 1"=40', VERT. 1"= 4' |
| CHECKED BY : H.K. GRUND           | DATE : FEB. 1977                    |

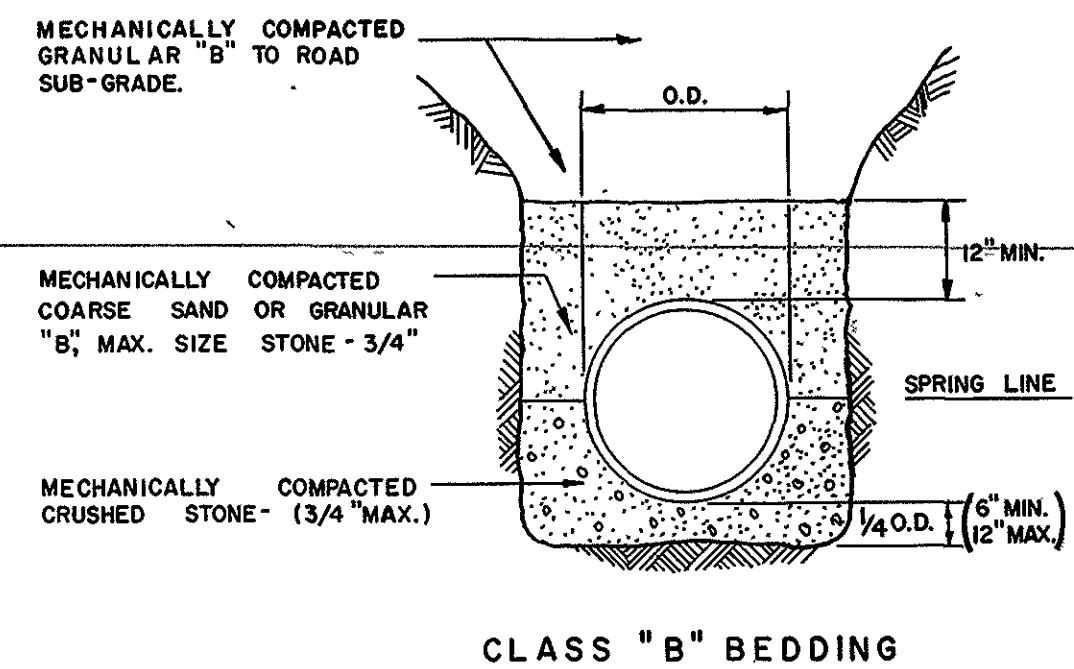
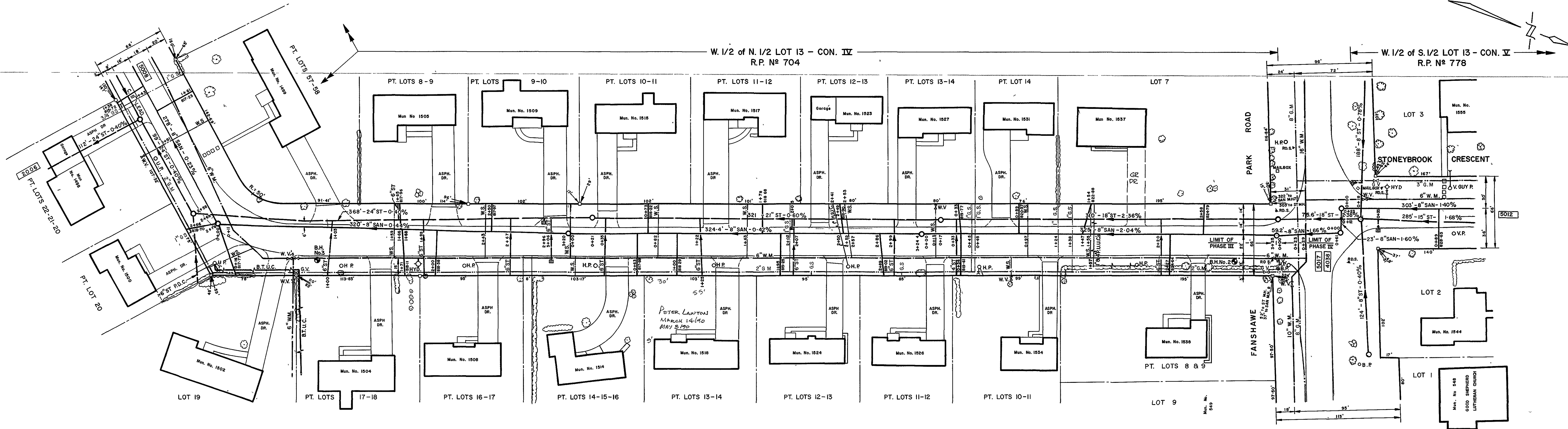
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|--------------------------------------------------------------|---------------|---------------------------------------------------------------------------------------------------------------------------------------------|
| <b>De Leuw Cather</b><br>[CONSULTING ENGINEERS AND PLANNERS] | APPROVED BY : | CITY ENGINEER'S<br>DEPARTMENT<br>PROJECT NO. : 77-5019-B III<br>DRAWING NO. :<br><div style="font-size: 2em; font-weight: bold;">5008</div> |
|                                                              | SECTION HEAD  |                                                                                                                                             |

|                         |
|-------------------------|
| PROJECT No. : 07-222-01 |
| DRAWING No. : 1         |

|                        |
|------------------------|
| CITY ENGINEER<br>_____ |
|------------------------|



- NOTES:
1. COVER OVER WATERMAIN TOP OF MAIN TO ROAD CENTRELINE, IS 5'-6\"/>
  2. ALL CURB AND GUTTER RADI 25' UNLESS OTHERWISE NOTED.
  3. YES FOR UTILITIES OBTAINED FROM UTILITY CO.'S & VERIFIED WHERE UTILITIES CROSSED DURING CONSTRUCTION.
  4. FOR NOTES AND DETAILS APPLICABLE TO THIS DRAWING SEE DRAWING NO. STD. 1003, 1006 & 1009.
  5. P.D.C. AND C.B. CONNECTIONS AT MAINS ARE MEASURED FROM C OF MANHOLE FRAME AND COVER.
  6. STRUCTURAL DESIGN OF THE SEWERS ARE BASED ON THE TRANSITION WIDTH UNLESS OTHERWISE NOTED ON PROFILE.
  7. ALL ELEVATIONS RELATED TO CITY OF LONDON BENCH MARK NO. 8-136, ELEVATION 846-006.
  8. TYPE OF SUBSOIL IN THIS AREA IS SAND & SANDY SILT.
  9. DEGREE OF COMPACTION IN THE TRENCH BACKFILL - 95% STANDARD PROCTOR (CAPITAL WORKS & ASSUMED STREETS).
  10. METHOD OF COMPACTION IN THE TRENCH BACKFILL - MECHANICAL.

II. ROADWAY RESTORATION:  
SEE BELOW

|     |                      |      |       |          |       |       |         |                   |
|-----|----------------------|------|-------|----------|-------|-------|---------|-------------------|
| 12. |                      | SIZE | SLOPE | STRENGTH | MAT'L | JOINT | BEDDING | MANUFACTURER      |
|     | SAN. P.D.C.s         | 4"   | 1-00% | 1500     | A.C.  | R.G.  | C       | JOHN'S - MANVILLE |
|     | ST. P.D.C.s          |      |       |          |       |       |         |                   |
|     | C.B. CONNECTIONS     |      |       |          |       |       |         |                   |
|     | PRE-CAST CONC. M.H.s | 48"  |       | 3000     | CONC. | R.G.  | N/A     | J.D.OAKS          |

| SERVICES                                          | COMPLETION | CONTRACTOR          |
|---------------------------------------------------|------------|---------------------|
| SANITARY SEWERS P.D.C.'s & M.H.'s                 | MAY 1972   | M.J.MOL CONST. LTD. |
| STORM SEWERS, P.D.C.'s, M.H.'s & C.B.'s           |            |                     |
| WATERMANS & WATER SERVICES                        |            |                     |
| 6" GRAN. 'A' : ROAD BASE COARSE (OILED BY C.O.L.) | MAY 1972   | M.J.MOL CONST. LTD. |
| CURB & GUTTER                                     |            |                     |
| SIDEWALKS                                         |            |                     |
| PAVING                                            |            |                     |



| NO. | REVISIONS | DATE | BY |
|-----|-----------|------|----|
|     |           |      |    |

## CITY OF LONDON

STONEBROOK AREA SANITARY SEWERS  
PHASE III

STONEBROOK CRESCENT

FANSHAW PARK ROAD TO 600' EAST OF GEARY AVENUE

DESIGN BY : K.W. HODGES  
DRAWN BY : M.B. SHUTE & K. HUGHES  
CHECKED BY : H.K. GRUND

FIELD BOOK : 7-155  
SCALE : HORIZ. 1"=40', VERT. 1"=4'  
DATE : FEB. 1977

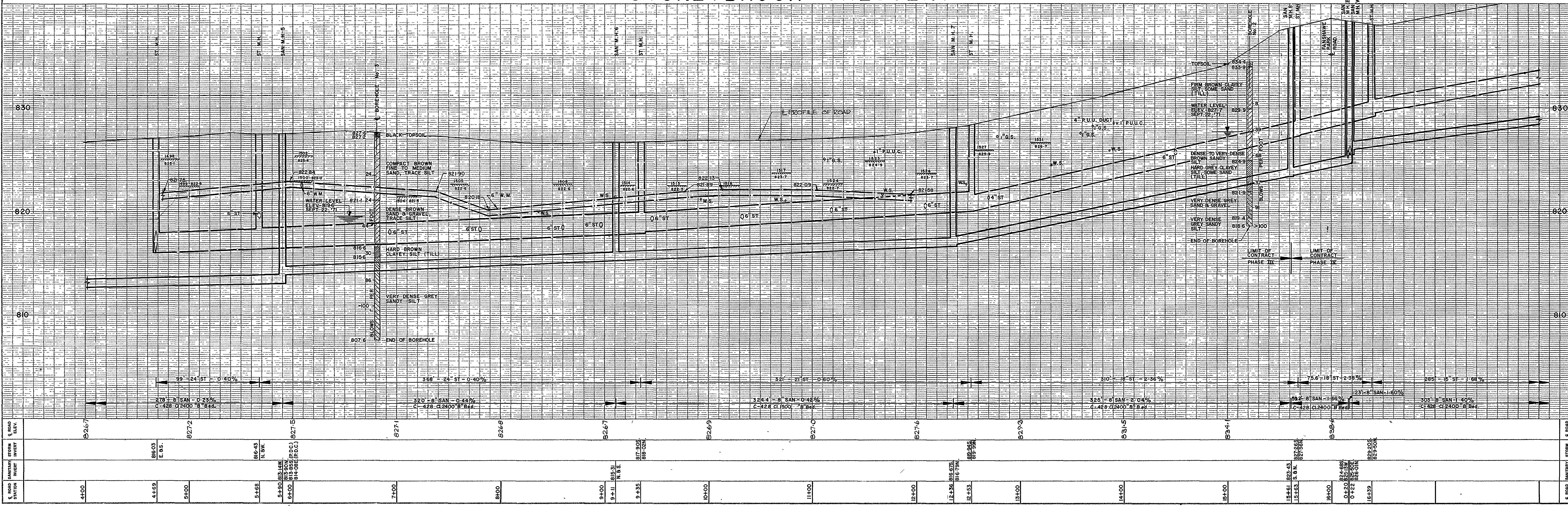
**De Leuw Cather**  
(CONSULTING ENGINEERS AND PLANNERS)

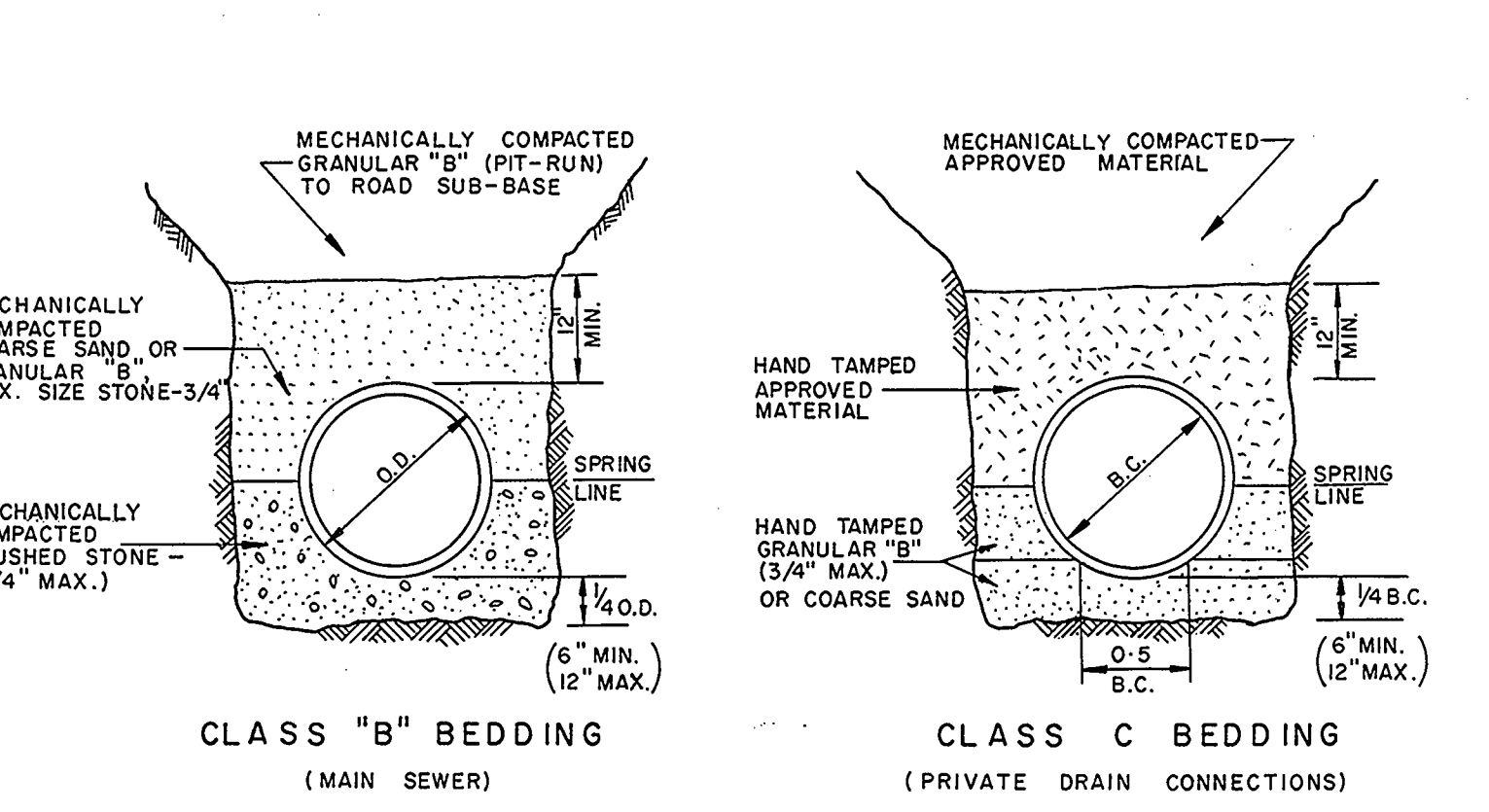
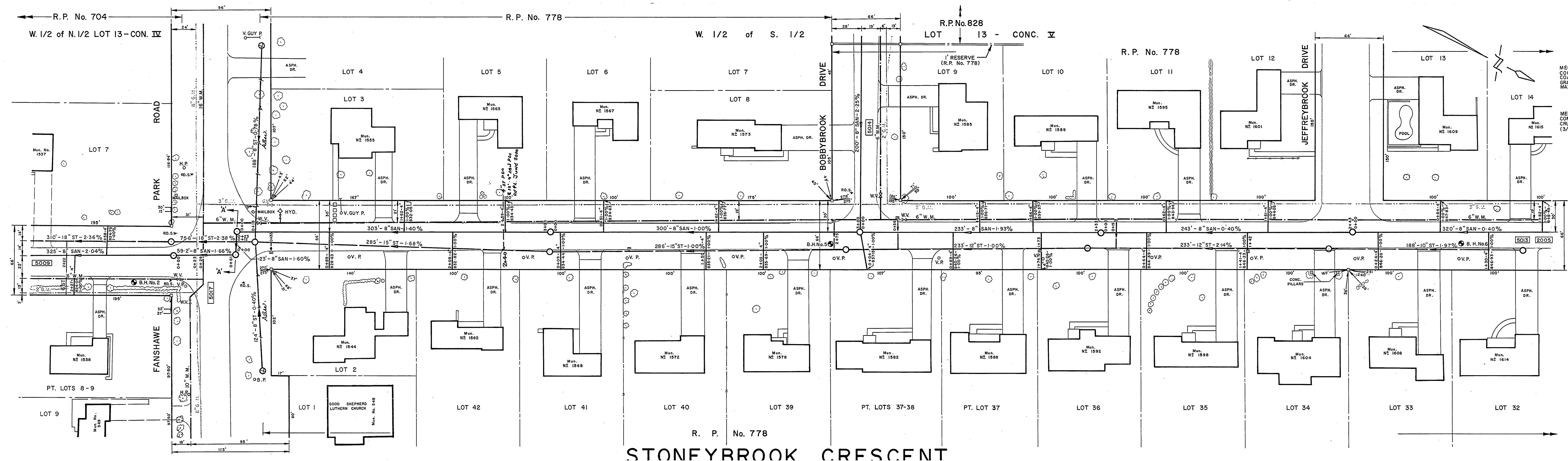
APPROVED BY :  
  
SECTION HEAD  
CITY ENGINEER

PROJECT NO. : 07-222-01  
DRAWING NO. : 2

CITY ENGINEER'S DEPARTMENT  
PROJECT NO. : 71-SC19-8-III  
DRAWING NO. : 5009

## STONEBROOK CRESCENT





CLAYEY SILT, SAND, SOME GRAVEL. 846-006.

MECHANICAL. 95

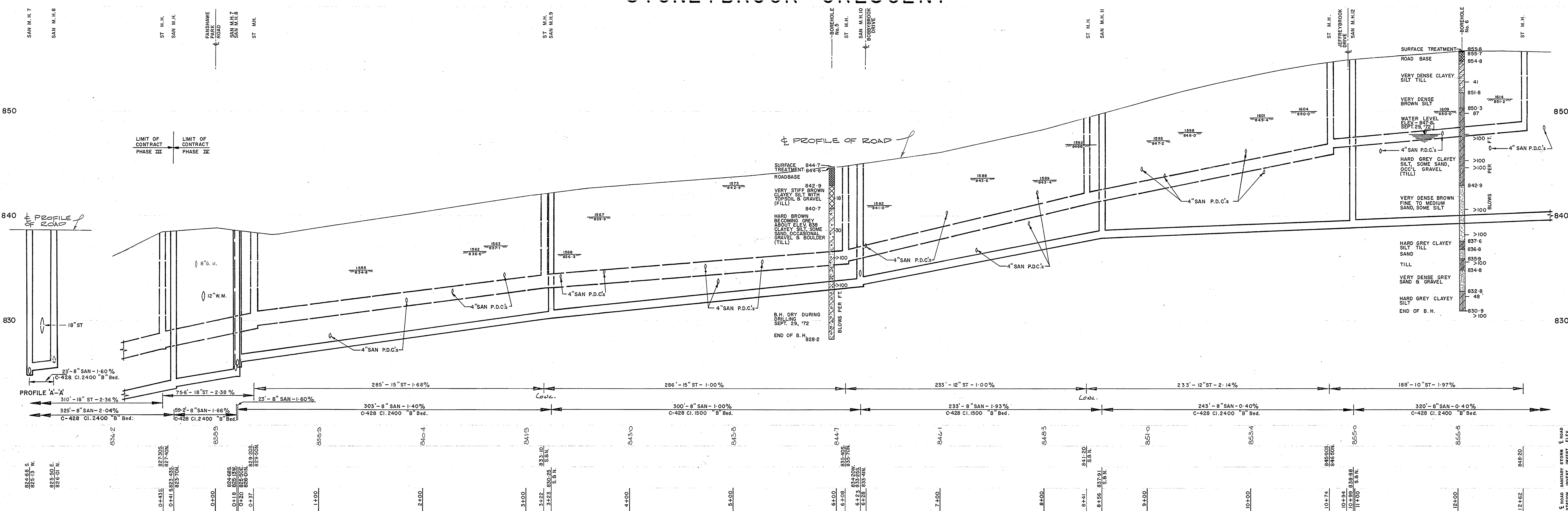
IF THE FOLLOWING CITY OF LONDON STANDARDS WERE USED ON THIS PROJECT: STD. 1006 TO 1009.

| SAN SEWERS | 8" | 1000' | A.C. | R.G. | B | ATLAS    |
|------------|----|-------|------|------|---|----------|
|            |    |       |      |      |   | ASBESTOS |

PRESTON PRE-CAST CONCRETE

SEPT. 1973 MARCO CONSTRUCTION WALKERTON INC. FEB. 1968 See Div # 2006

14. ROAD REINSTATEMENT WITHIN TRENCHES ACROSS FANSHAW PARK ROAD CONSISTS OF:-  
6" GRANULAR "A" BASE COURSE  
5" H. L. 6 ASPHALT BASE  
1 1/2" H. L. 3 ASPHALT SURFACE.



STONEYBROOK AREA SANITARY SEWERS  
PHASE III

STONEYBROOK CRESCENT  
200' NORTH OF JEFFREYBROOK DRIVE TO FANSHAW PARK ROAD

K.W. HODGES  
D. MAGUIRE & K. HUGHES  
H. K. GRUND

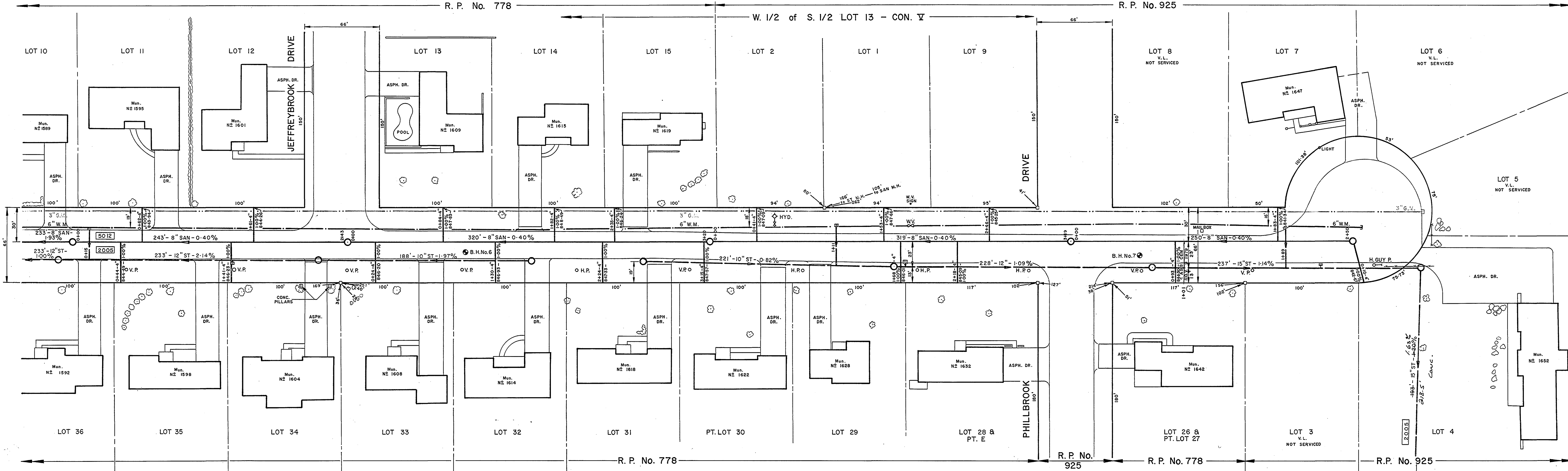
De Leuw Cather  
(CONSULTING ENGINEERS AND PLANNERS)

PROJECT No. 07-222-11

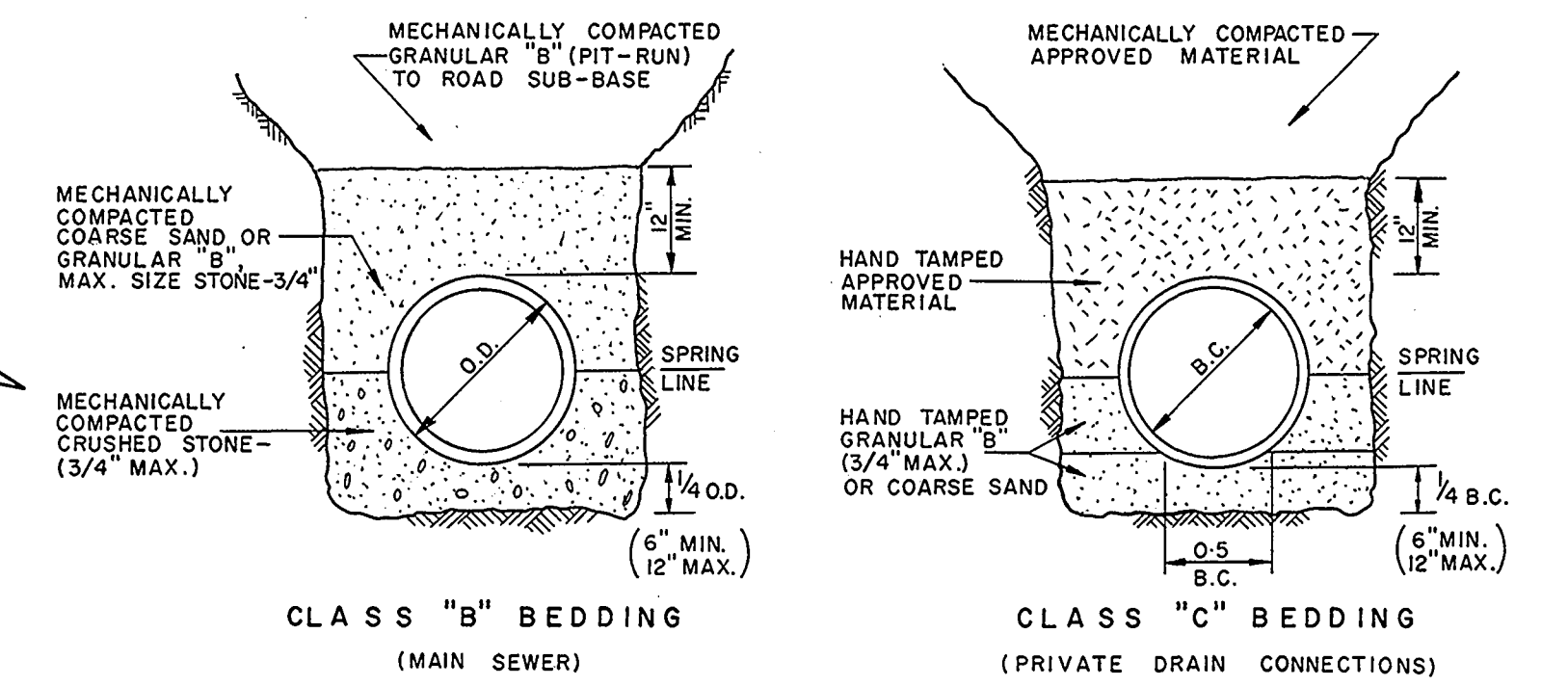
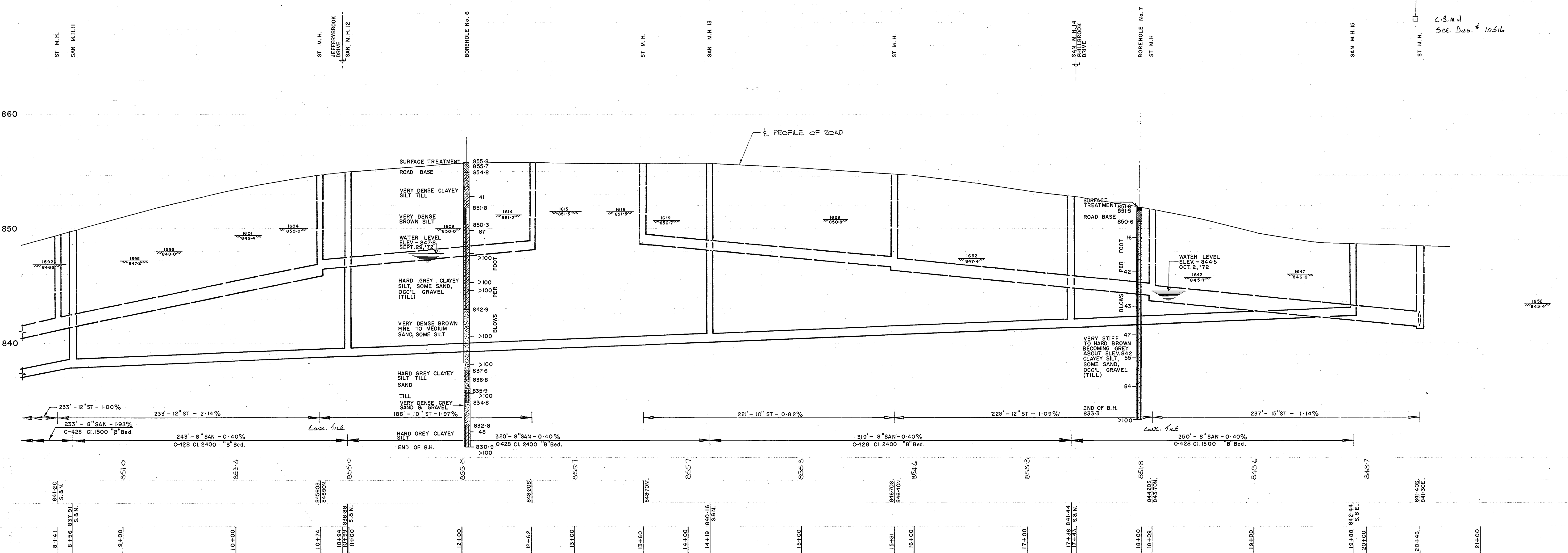
DRAWING No. 2

72-SC19-811

5012



STONEYBROOK CRESCENT



S-136, 846-006.  
CLAYEY SILT, SAND, SOME GRAVEL.  
95  
MECHANICAL.  
II. THE FOLLOWING CITY OF LONDON STANDARDS WERE USED ON THIS PROJECT: STD. 1006 TO 1009.

|            |    |      |   |      |      |   |                              |
|------------|----|------|---|------|------|---|------------------------------|
| SAN SEWERS | 8" | 1500 | 8 | A.C. | R.G. | B | } ATLAS<br>ASBESTOS          |
|            |    | 2400 |   |      |      |   |                              |
|            |    |      |   |      |      |   | PRESTON PRE-CAST<br>CONCRETE |

SEPT. 1973  
FEB. 1974  
K.W. HODGES  
D. MAGUIRE & K. HUGHES  
H.K. GRUND  
De Leuw Cather  
PROJECT No. 07-222-II  
DRAWING No. 3

STONEYBROOK AREA SANITARY SEWERS  
PHASE II

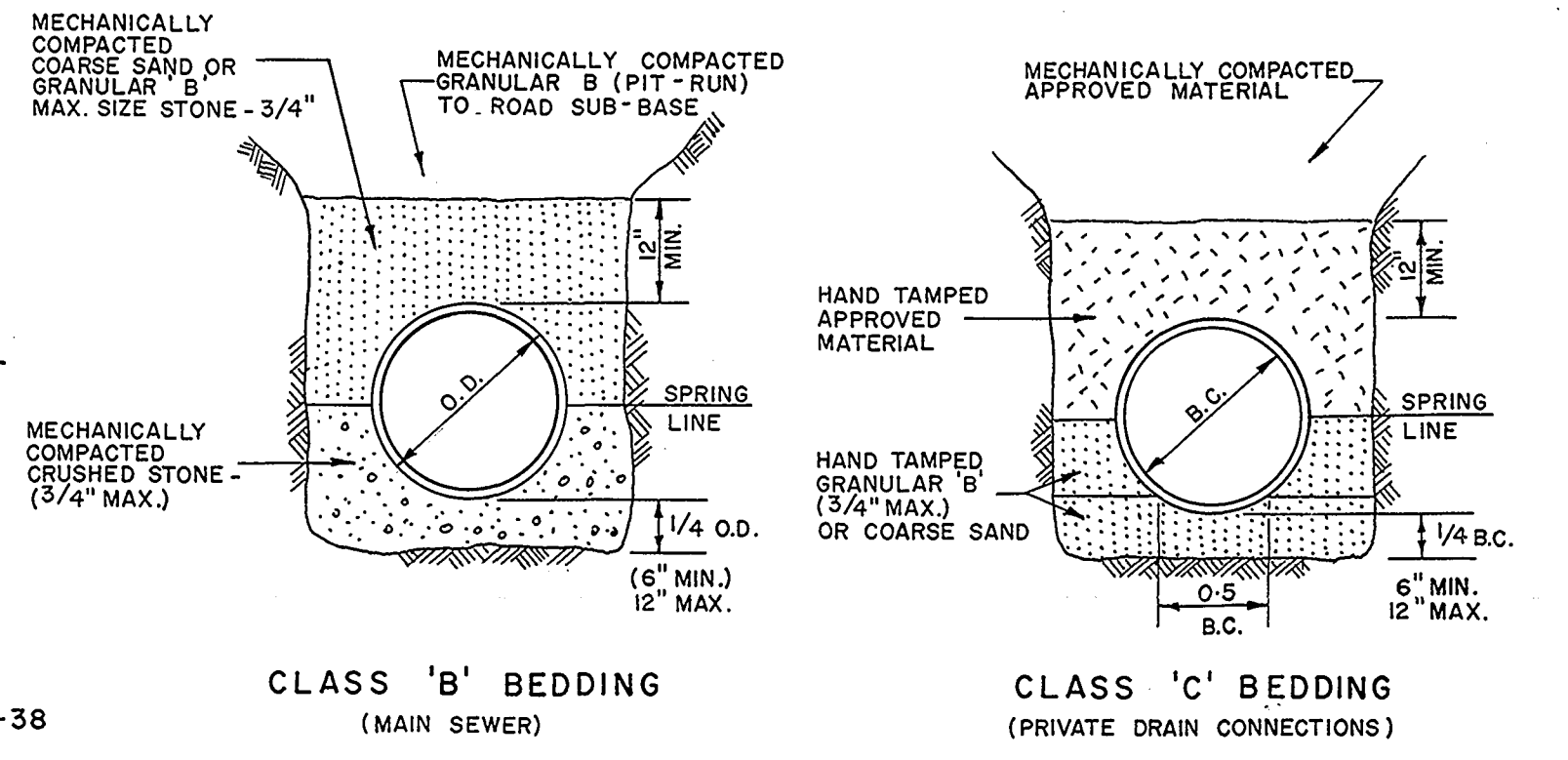
STONEYBROOK CRESCENT  
210' NORTH OF PHILLBROOK DRIVE TO 200' SOUTH OF JEFFREYBROOK DRIVE

K.W. HODGES  
D. MAGUIRE & K. HUGHES  
H.K. GRUND  
De Leuw Cather  
PROJECT No. 07-222-II  
DRAWING No. 3

7-166  
HORIZ.: 1" = 40', VERT.: 1" = 4'  
FEB. 1977

72 - SC19-BIX

5013



S-136  
CLAYEY SILT, SAND, SOME GRAVEL.  
95  
MECHANICAL.

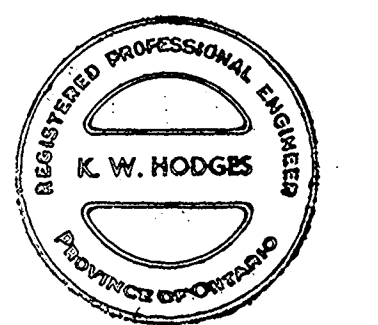
846-006

II. THE FOLLOWING CITY OF LONDON STANDARDS WERE USED ON THIS PROJECT: STD. 1006 to 1009.

SAN SEWERS 8" 1500 & 2400 A.C. R.G. B } ATLAS ASBESTOS

PRESTON PRE-CAST CONCRETE

SEPTEMBER 1973 MARCO CONSTRUCTION WALKERSON INC.  
JUL 1962 SEE DWG. #1317



STONEBROOK AREA SANITARY SEWERS  
PHASE III

BOBBYBROOK DRIVE  
PENNYBROOK BOULEVARD TO STONEYBROOK CRESCENT

K.W. HODGES  
D. MAGUIRE & K. HUGHES  
H. K. GRUND

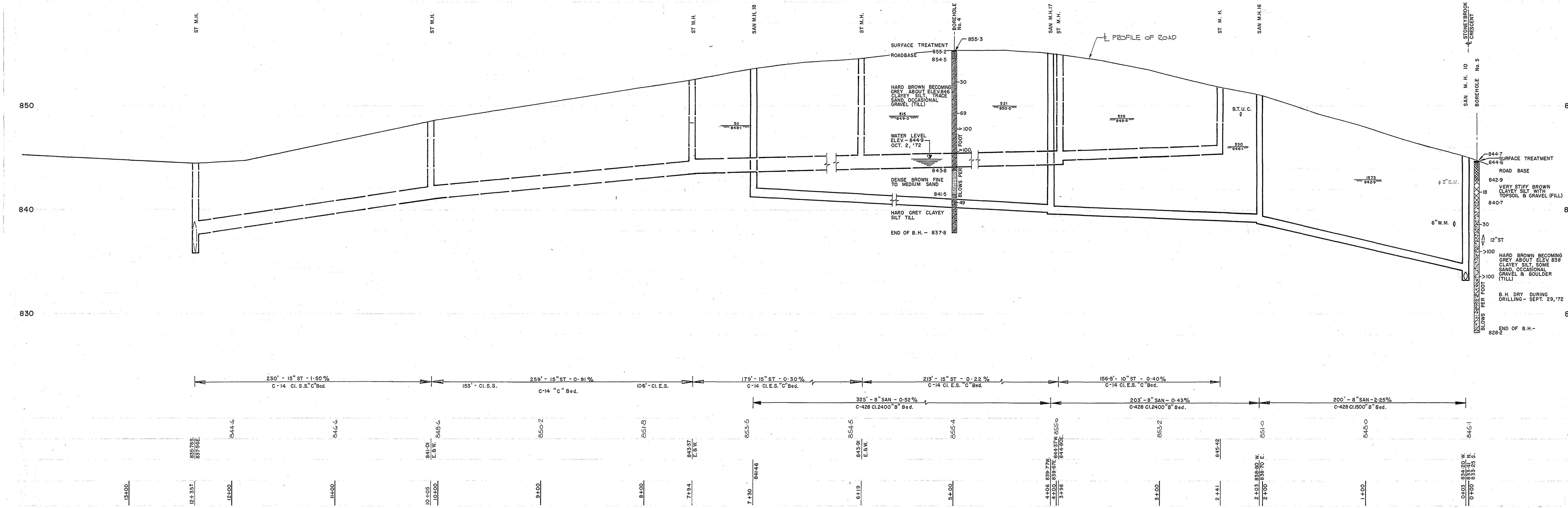
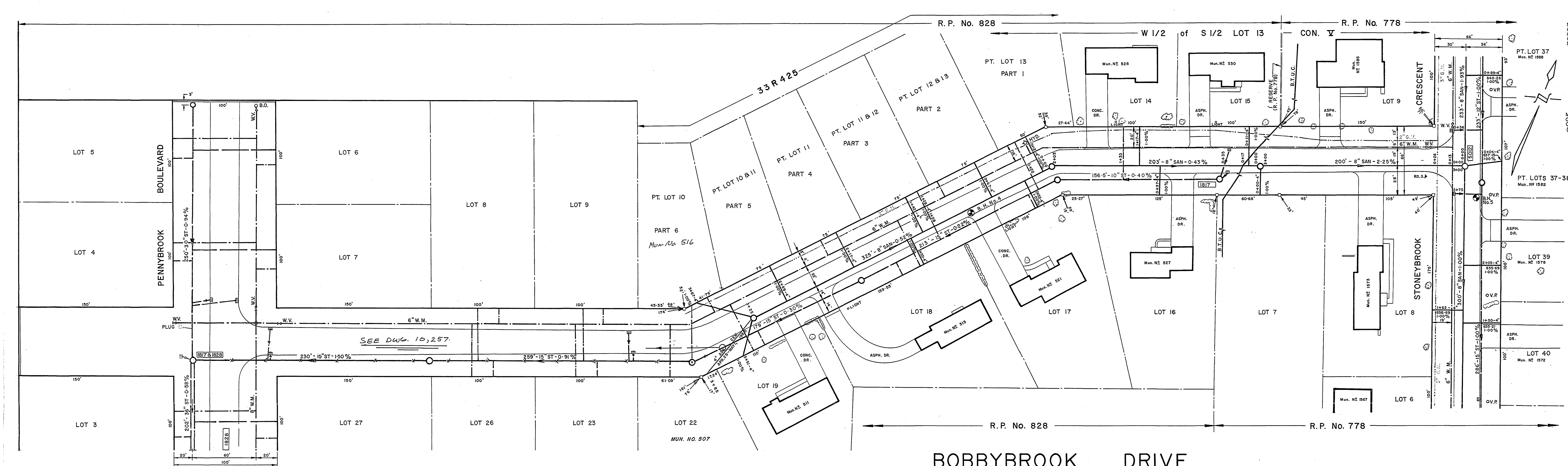
De Leuw Cather  
CONSULTING ENGINEERS AND PLANNERS

PROJECT No.: 07-222-II

7-166  
HORIZ. 1"=40', VERT. 1"=4'  
FEB. 1977

DRAWING No.: 4

72-SC19-812

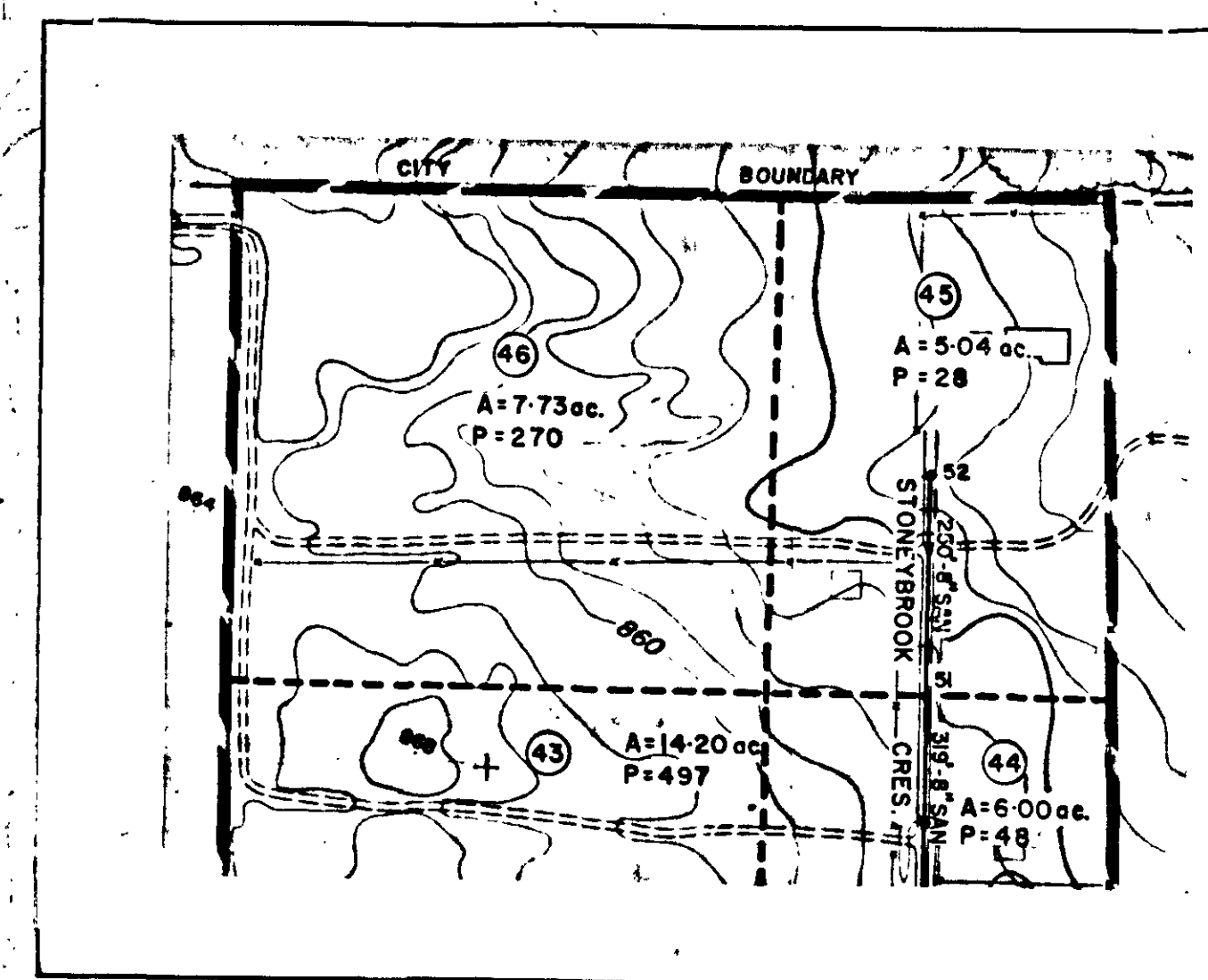


Catchment Area 46 only contains Phillbrook Cr. and does not contain this entire area and population. Refer to "City of London Locates Sanitary Catchment Area Review Map" for details.

Sanitary Catchment area 43 is not tributary to Stoneybrook Cres. Refer to "City of London Locates Sanitary Catchment Area Review Map" for details.

Catchment Area 63 Replaced with Catchment Areas A1, A2, and A3 per record drawing 12,415

Subject Site

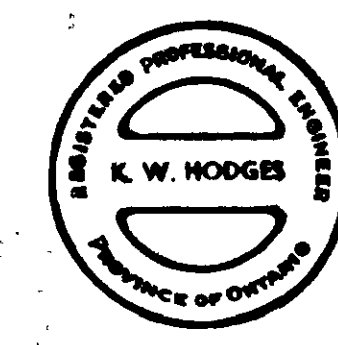


LEGEND:

- SANITARY SEWER
- SANITARY MANHOLE
- SANITARY AREA BOUNDARY

BENCH MARKS:

ALL ELEVATIONS RELATED TO CITY OF LONDON BENCH MARKS No. C.P.-30, ELEV. 822.585, S-2, -ELEV. 838.002, S-136, -ELEV. 846.006 & S-208, -ELEV. 829.291.



"AS CONSTRUCTED DRAWING"

| NO. | REVISIONS | DATE | BY |
|-----|-----------|------|----|
|-----|-----------|------|----|

CITY OF LONDON

STONEYBROOK AREA SANITARY SEWERS  
PHASES I to III

COMPILED SANITARY SEWER  
DRAINAGE AREA PLAN AND DESIGN SHEET

DESIGN BY: K.W. HODGES  
DRAWN BY: D. MAGUIRE  
CHECKED BY: H.K. GRUND

FIELD BOOK: 07-222  
SCALE: 1" = 200'  
DATE: FEB 1977

De Leuw Cather  
CONSULTING ENGINEERS AND PLANNERS

APPROVED BY:

CITY ENGINEER'S  
DEPARTMENT

PROJECT NO: 07-222-01 to 16

SECTION HEAD

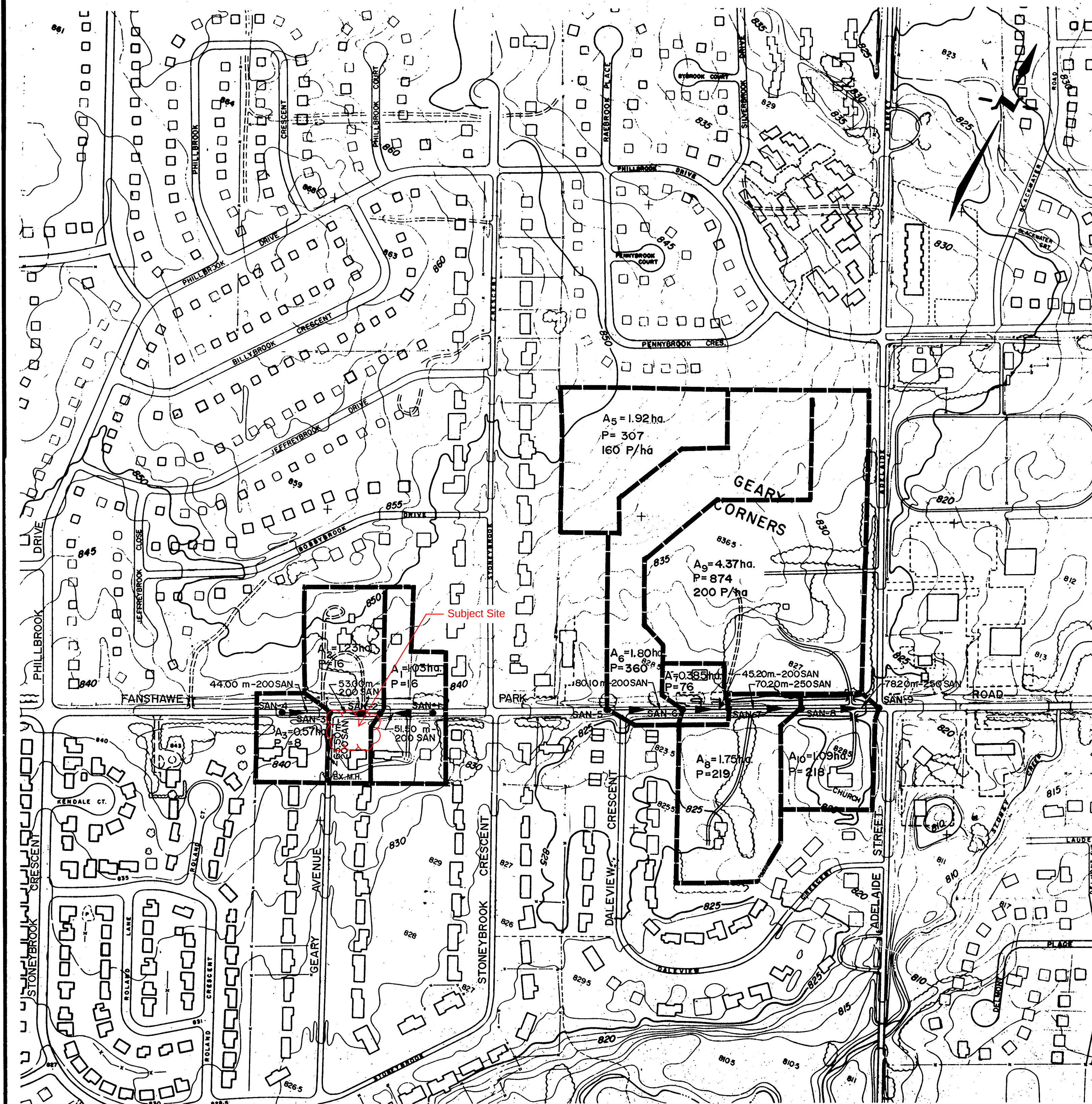
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69-SC19-8  
71-SC19-8 III  
72-SC19-8 III  
73-610/S/8 III  
75-610/S/8 III

DRAWING NO: 1A

CITY ENGINEER

DRAWING NO: 5018

5018  
(1-2)

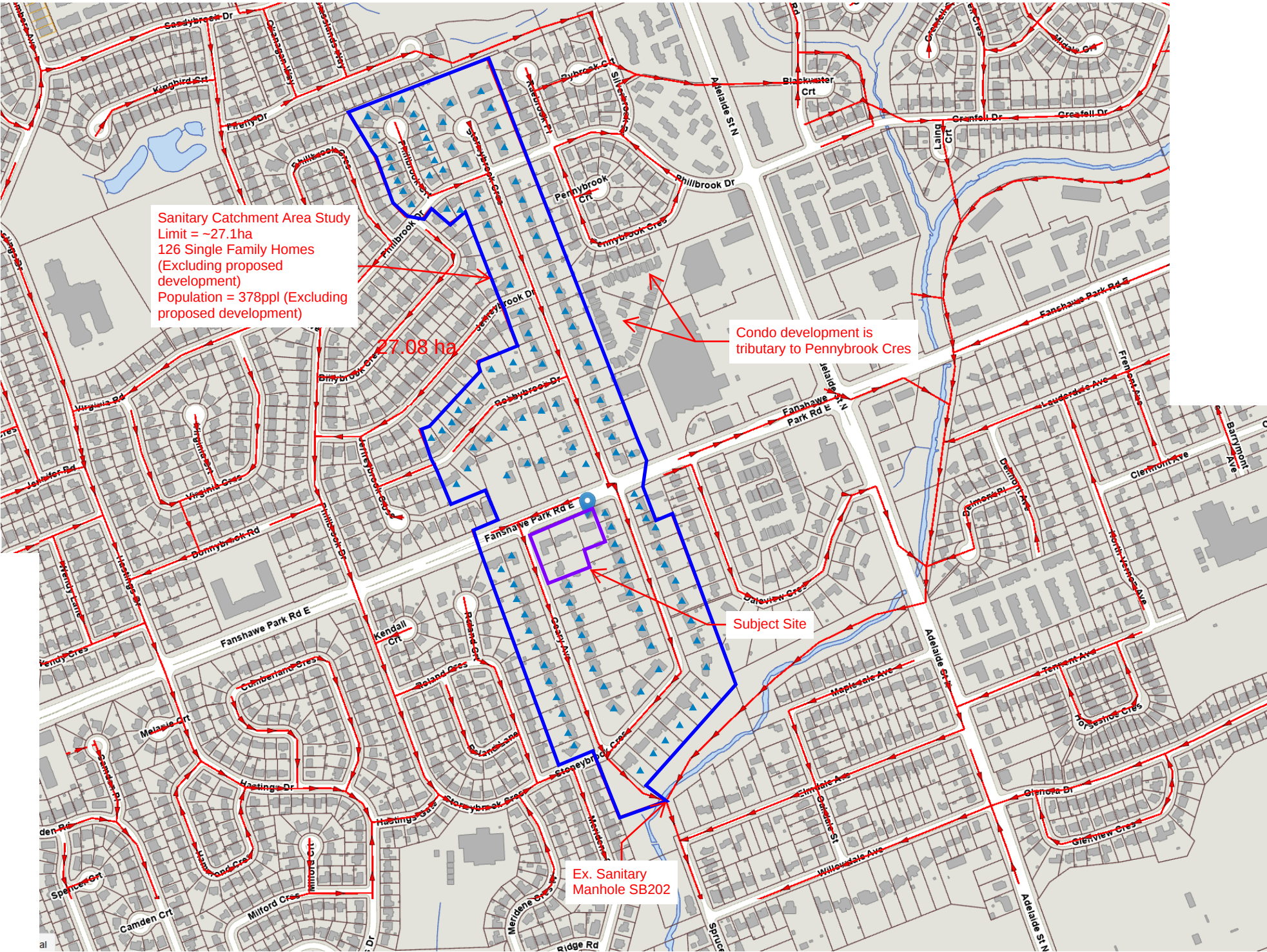


SANITARY SEWER DESIGN SHEET

| AREA NO. | STREET       | FROM LN. | TO LN. | GROSS TRIBUTARY AREA (HECTARES) |            |            |       | TOTAL AREA | POPULATION |             |         |       | ACCUMULATED SEWAGE FLOW |             |        |        | SEWER DESIGN |              | SLOPE (%) | n       | VEL. (m/sec) | CAPACITY (l/sec) | LENGTH (m) | LOSS (m) | FALL (m)                                                  | PROFILE                                                     |                                                                | FROM MANHOLE | TO MANHOLE | AVE. DEPT. | APPURTENANCES     |                   |
|----------|--------------|----------|--------|---------------------------------|------------|------------|-------|------------|------------|-------------|---------|-------|-------------------------|-------------|--------|--------|--------------|--------------|-----------|---------|--------------|------------------|------------|----------|-----------------------------------------------------------|-------------------------------------------------------------|----------------------------------------------------------------|--------------|------------|------------|-------------------|-------------------|
|          |              |          |        | RESIDENTIAL                     | COMMERCIAL | INDUSTRIAL | TOTAL |            | PER HA     | NO. OF LOTS | PER LOT | INCR. | TOTAL                   | RESIDENTIAL | COMM.  | IND.   | INFIL.       | PEAK (l/sec) |           |         |              |                  |            |          |                                                           | DIV. (l/sec)                                                | UPSTREAM INVERT                                                |              |            |            | DOWNSTREAM INVERT | TO INVERTMANHOLES |
| A1       | FANSHANE RD. | SAN-1    | SAN-2  | 1,030                           | 1,030      | 0.000      | 0.000 | 0.000      | 1,030      | 4           | 1       | 16    | 16                      | 2,000       | 1,200  | 3,200  | 200          | 0.71         | 0.015     | 0.873   | 27,441       | 59,000,000       | 0.349      | 252,709  | 252,748                                                   | SAN-1 (APPROX. 103.4 m E. OF CENTRLINE OF GEARY AVE.)       | SAN-2 (APPROX. 51.4 m E. OF CENTRLINE OF GEARY AVE.)           | 3.8          | 1          | 2-150 PDC  |                   |                   |
| A2       | FANSHANE RD. | SAN-2    | SAN-3  | 1,230                           | 1,230      | 0.000      | 0.000 | 0.000      | 1,230      | 4           | 1       | 16    | 32                      | 2,000       | 1,200  | 3,200  | 200          | 0.71         | 0.015     | 0.873   | 27,441       | 59,000,000       | 0.349      | 252,709  | 252,748                                                   | SAN-2 (APPROX. 51.4 m E. OF CENTRLINE OF GEARY AVE.)        | SAN-3 (APPROX. 0.6 m W. OF CENTRLINE OF GEARY AVE.)            | 4.6          | 1          | 3-150 PDC  |                   |                   |
| A3       | FANSHANE RD. | SAN-3    | SAN-4  | 0,570                           | 0,570      | 0.000      | 0.000 | 0.000      | 0,570      | 32          | 2       | 8     | 8                       | 2,000       | 1,200  | 3,200  | 200          | 1.00         | 0.015     | 1.044   | 32,798       | 64,000,000       | 0.428      | 253,197  | 253,769                                                   | SAN-3 (APPROX. 46.6 m W. OF CENTRLINE OF GEARY AVE.)        | SAN-4 (APPROX. 0.6 m W. OF CENTRLINE OF GEARY AVE.)            | 4.4          | 1          | 3-150 PDC  |                   |                   |
| A4       | FANSHANE RD. | SAN-3    | EX.HH. | 0,230                           | 0,230      | 0.000      | 0.000 | 0.000      | 0,230      | 0           | 0       | 0     | 40                      | 2,000       | 1,200  | 3,200  | 200          | 0.55         | 0.013     | 0.842   | 26,443       | 63,000,000       | 0.428      | 252,198  | 251,787                                                   | SAN-4 (APPROX. 55.0 m S. OF CENTRLINE OF FANSHANE PARK RD.) | EX. H.H. (APPROX. 55.0 m S. OF CENTRLINE OF FANSHANE PARK RD.) | 5.2          | 1          |            |                   |                   |
| A5       | EASEMENT     | SAN-5    | SAN-6  | 0.000                           | 0.000      | 0.000      | 0.000 | 0.000      | 0.000      | 0           | 0       | 0     | 0                       | 2,000       | 1,200  | 3,200  | 200          | 0.77         | 0.013     | 0.916   | 28,780       | 6,000,000        | 0.000      | 250,000  | 250,000                                                   | SAN-5 (APPROX. 16.4 m W. OF CENTRLINE OF DALEVIEW CRES.)    | SAN-6 (APPROX. 63.2 m E. OF CENTRLINE OF DALEVIEW CRES.)       | 3.5          | 1          | 1-200 PDC  |                   |                   |
| A6       | EASEMENT     | SAN-5    | SAN-6  | 1,920                           | 1,920      | 0.000      | 0.000 | 0.000      | 1,920      | 160         | 0       | 4     | 307                     | 307         | 5,513  | 6,713  | 200          | 0.77         | 0.013     | 0.916   | 28,780       | 6,000,000        | 0.000      | 250,000  | 250,000                                                   | SAN-6 (APPROX. 16.4 m W. OF CENTRLINE OF DALEVIEW CRES.)    | SAN-6 (APPROX. 63.2 m E. OF CENTRLINE OF DALEVIEW CRES.)       | 3.5          | 1          |            |                   |                   |
| A7       | FANSHANE RD. | SAN-6    | SAN-7  | 1,920                           | 1,920      | 1,800      | 1,800 | 0.000      | 3,720      | 200         | 0       | 4     | 360                     | 667         | 11,481 | 12,681 | 200          | 0.74         | 0.013     | 0.916   | 28,780       | 6,000,000        | 0.000      | 249,835  | 249,835                                                   | SAN-6 (APPROX. 16.4 m W. OF CENTRLINE OF DALEVIEW CRES.)    | SAN-7 (APPROX. 108.2 m E. OF CENTRLINE OF DALEVIEW CRES.)      | 3.5          | 1          |            |                   |                   |
| A8       | FANSHANE RD. | SAN-7    | SAN-8  | 1,750                           | 3,670      | 0.000      | 2,180 | 0.000      | 5,850      | 125         | 0       | 4     | 219                     | 962         | 16,148 | 15,701 | 200          | 0.68         | 0.013     | 0.861   | 27,015       | 45,400,000       | 0.278      | 249,208  | 249,208                                                   | SAN-7 (APPROX. 108.2 m E. OF CENTRLINE OF DALEVIEW CRES.)   | SAN-8 (APPROX. 72.5 m W. OF CENTRLINE OF ADELAIDE ST.)         | 4.5          | 1          | 1-200 PDC  |                   |                   |
| A9       | FANSHANE RD. | SAN-7    | SAN-8  | 3,670                           | 4,370      | 6,550      | 5,000 | 0.000      | 10,220     | 200         | 0       | 4     | 874                     | 1832        | 29,232 | 30,102 | 200          | 0.54         | 0.013     | 0.898   | 34,102       | 70,200,000       | 0.349      | 247,563  | 248,040                                                   | SAN-8 (APPROX. 108.2 m E. OF CENTRLINE OF DALEVIEW CRES.)   | SAN-9 (APPROX. 3.5 m E. OF CENTRLINE OF ADELAIDE ST.)          | 4.5          | 1          |            |                   |                   |
| A10      | FANSHANE RD. | SAN-8    | SAN-9  | 3,670                           | 1,090      | 7,640      | 0.000 | 0.000      | 11,310     | 200         | 0       | 4     | 218                     | 2054        | 32,362 | 33,695 | 200          | 0.54         | 0.013     | 0.898   | 34,102       | 70,200,000       | 0.349      | 247,563  | 247,563                                                   | SAN-9 (APPROX. 72.5 m W. OF CENTRLINE OF ADELAIDE ST.)      | SAN-9 (APPROX. 3.5 m E. OF CENTRLINE OF ADELAIDE ST.)          | 4.1          | 1          |            |                   |                   |
| A11      | FANSHANE RD. | SAN-9    | EX.HH. | 3,670                           | 1,090      | 7,640      | 0.000 | 0.000      | 11,310     | 1,332       | 33,695  | 250   | 0.54                    | 0.013       | 0.898  | 34,699 | 16.9         | 0.044        | 0.048     | 247,563 | 247,563      | 0.000            | 247,563    | 247,563  | EX. H.H. (APPROX. 16.3 m E. OF CENTRLINE OF ADELAIDE ST.) |                                                             | 3.8                                                            | 1            |            |            |                   |                   |

| AS CONSTRUCTED NOTES                      |  |  |  | AS CONSTRUCTED SERVICES |  |  |                               | COMPLETION | NO | REVISIONS | DATE          | BY | CONSULTANT OR DIVISION                                             | DELT'S STAMP                                                                         | CORPORATION OF THE CITY OF LONDON                                                                                                                                                                                 |                                                   | SCALE                                  | FANSHAWE PARK ROAD WIDENING |            | PROJECT No. |
|-------------------------------------------|--|--|--|-------------------------|--|--|-------------------------------|------------|----|-----------|---------------|----|--------------------------------------------------------------------|--------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------|----------------------------------------|-----------------------------|------------|-------------|
| 1 SEE DRAWING No. FOR FURTHER DETAIL.     |  |  |  |                         |  |  | DESIGN                        | RE./M.F.   |    |           |               |    | <div>DELCAN</div> <div>ENGINEERS<br/>PLANNERS<br/>ARCHITECTS</div> | <div>REGISTERED PROFESSIONAL ENGINEER<br/>K. W. HODGES<br/>PROVINCE OF ONTARIO</div> | <div></div> <div>CORPORATION OF THE CITY OF LONDON</div> <div>.....<br/>DESIGN HEAD</div> <div>.....<br/>CITY ENGINEER</div> | <div>30 0 50 m</div> <div>Horizontal 1:2500</div> | SANITARY DRAINAGE AREAS & DESIGN SHEET |                             | 90/TS 1341 |             |
| 2 SEE DRAWING TRANSITION WITH OR AS NOTED |  |  |  |                         |  |  | CHECKED                       | R.P.       |    |           | SHEET No.     |    |                                                                    |                                                                                      |                                                                                                                                                                                                                   |                                                   |                                        |                             |            |             |
| 3 REFERENCE B.S. No. ELAVATION            |  |  |  |                         |  |  | APPROVED                      | K.W.H.     |    |           | DRAWING No. 2 |    |                                                                    |                                                                                      |                                                                                                                                                                                                                   |                                                   | PLAN FILE No. 12,415                   |                             |            |             |
| 4                                         |  |  |  |                         |  |  | DATE MARCH, 1990              |            |    |           |               |    |                                                                    |                                                                                      |                                                                                                                                                                                                                   |                                                   |                                        |                             |            |             |
| 5                                         |  |  |  |                         |  |  | DELCAN<br>PROJECT No. 07-1742 |            |    |           |               |    |                                                                    |                                                                                      |                                                                                                                                                                                                                   |                                                   |                                        |                             |            |             |

# City of London Locates Sanitary Catchment Area Review Map





## City of London

**(A) Area Basis**

= 30 Units/hectare @ 3 people/unit  
= 75 Units/hectare @ 2.4 people/unit  
**= 150-300 Units/hectare @ 1.6 people/unit**

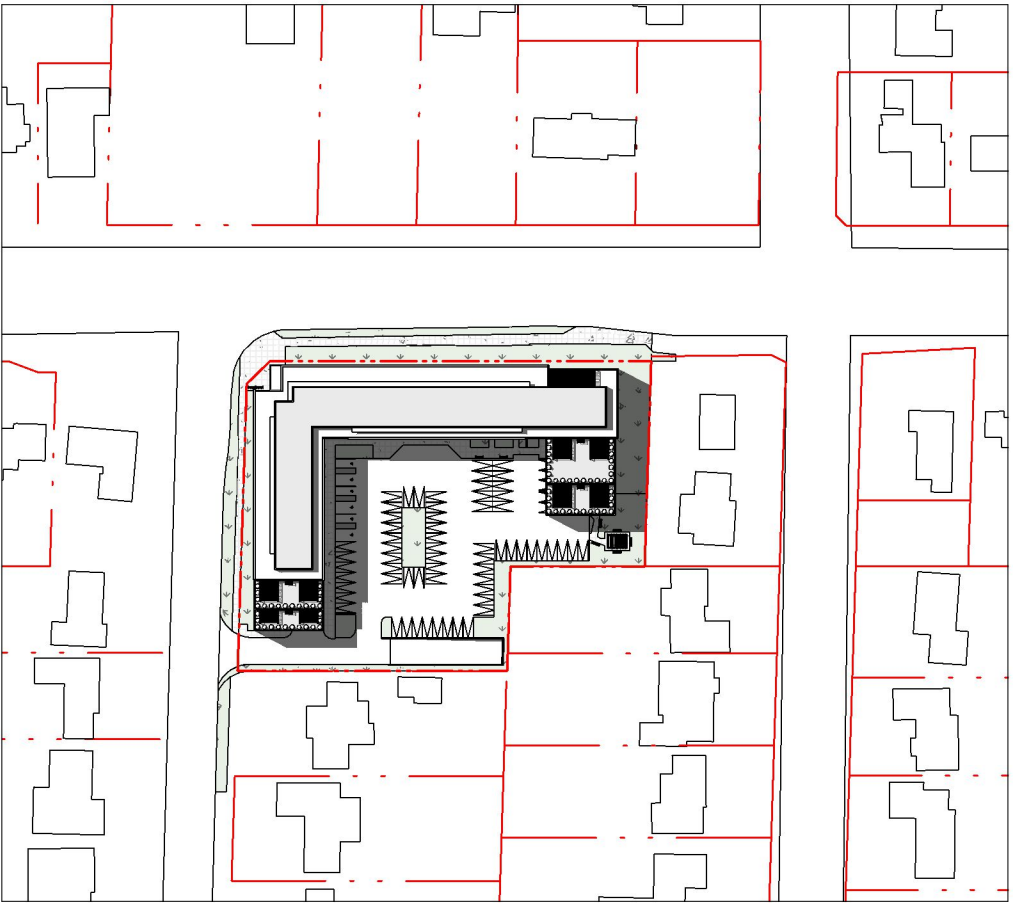
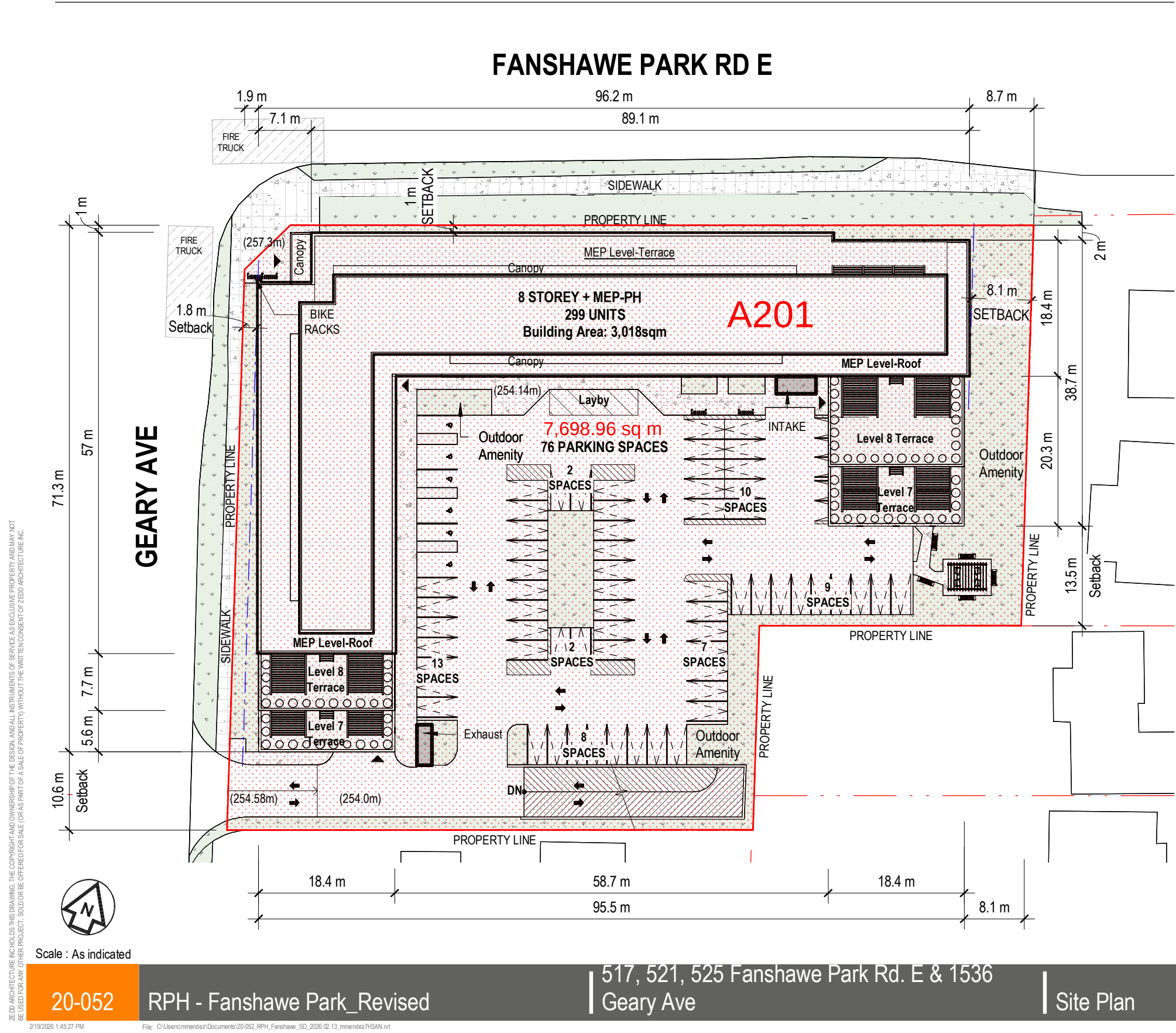
Daily Flow (L/cap/day) 230  
Sewage Infiltration (Litres/hectare/day) 8640  
Harmon Formula (Peaking Factor)  
 $M = (1 + 14/(4 + P^{0.5}))$   
Uncertainty Factor 1.1

Designed By: MF  
Reviewed By: KC

Refer to Site Plan prepared by Zedd Architecture, dated February 2026  
Design Parameters obtained from Section 3.8 in the City of London DS&RM  
\*Upstream conditions based on City of London as-constructed drawing titled Sanitary Drainage Areas & Design Sheet (As-built drawing Plan File No. 12415), prepared by Delcan, dated March 1990  
\*\*Downstream conditions and Upstream conditions (Area 46-34) based on City of London as-constructed drawings 501851, prepared by De Leuw Cather, dated February 1977 and 4421, prepared by A. M. Spriet & Associated Ltd., dated August 1974  
\*\*\* Sewer Design based on City as-constructed drawings 5008-5009, 5012-5014 prepared by De Leuw Cather, dated February 1977  
\*\*\*\* Refer to SBM markups on Compiled Sanitary Sewer Drainage Area Plan and Design Sheet Record Drawing 5018

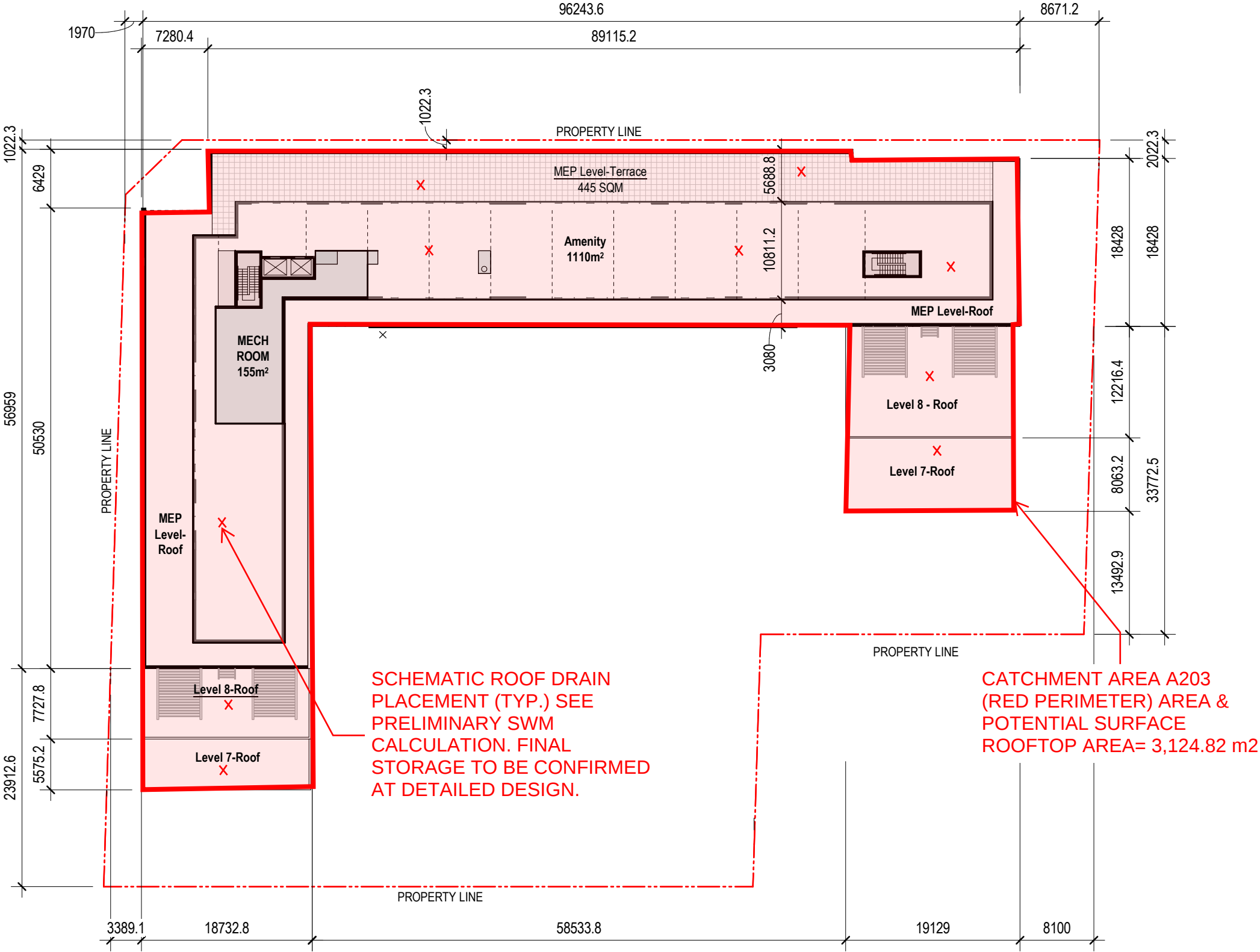


| AS CONSTRUCTED NOTES |                                             | AS CONSTRUCTED SERVICES |                                                                                                                 | COMPLETION  | NO. | REVISIONS | DATE | BY | CONSULTANT OR DIVISION                                | DIST'S STAMP                                                                          | SCALE                                                                                                                             | FANSHAWE PARK ROAD WIDENING         |                                                | PROJECT NO.<br>90/TS 1341 |
|----------------------|---------------------------------------------|-------------------------|-----------------------------------------------------------------------------------------------------------------|-------------|-----|-----------|------|----|-------------------------------------------------------|---------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------|-------------------------------------|------------------------------------------------|---------------------------|
| 1                    | SEE DRAWING NO. FOR FURTHER DETAIL.         |                         | DESIGN                                                                                                          | P.E./M.F.   |     |           |      |    | <b>DELSCAN</b><br>ENGINEERS<br>PLANNERS<br>ARCHITECTS |  | <br><b>CORPORATION OF THE CITY OF LONDON</b> | 30 m 0 50 m<br>Horizontal<br>1:2500 | <b>STORM DRAINAGE AREAS &amp; DESIGN SHEET</b> | SHEET NO.                 |
| 2                    | OTHER DESIGN TRANSMISSION NOTED OR AS NOTED |                         | DRAWN                                                                                                           | S.M.        |     |           |      |    |                                                       |                                                                                       |                                                                                                                                   |                                     |                                                |                           |
| 3                    | REFERENCE S.M. NO. ELEVATION                |                         | CHECKED                                                                                                         | R.P.        |     |           |      |    |                                                       |                                                                                       |                                                                                                                                   |                                     |                                                |                           |
| 4                    |                                             |                         | APPROVED                                                                                                        | K.W.H.      |     |           |      |    |                                                       |                                                                                       |                                                                                                                                   |                                     |                                                |                           |
| 5                    |                                             |                         | DATE                                                                                                            | MARCH, 1990 |     |           |      |    |                                                       |                                                                                       |                                                                                                                                   |                                     |                                                |                           |
|                      |                                             |                         | <br>PROJECT NO.<br>07-1742 |             |     |           |      |    |                                                       |                                                                                       |                                                                                                                                   |                                     | DRAWING NO. 1                                  | PLAN FILE NO.<br>12,414   |



Contextual Plan

CATCHMENT AREA A202



AREA CALCULATION

MEP LEVEL  
Floor Area : 1307 m²



Scale : 1 : 500

20-052

RPH - Fanshawe Park\_Revised

517, 521, 525 Fanshawe Park Rd. E & 1536  
Geary Ave

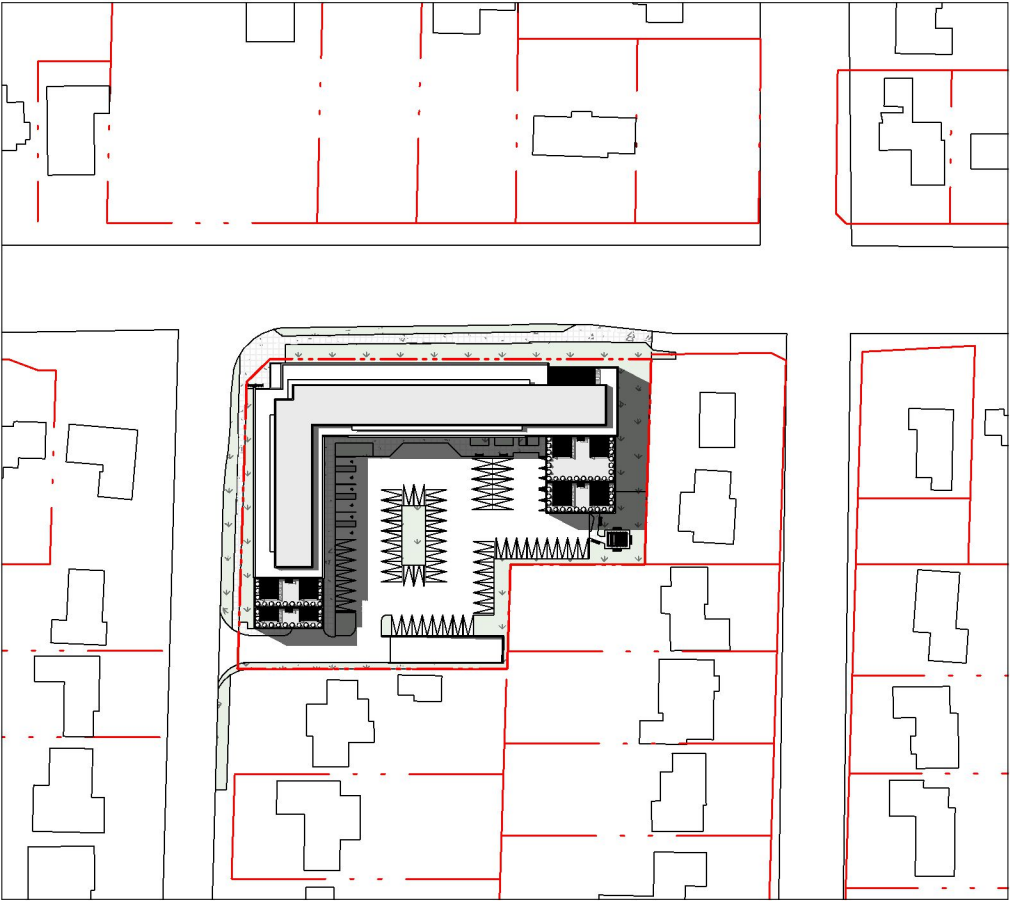
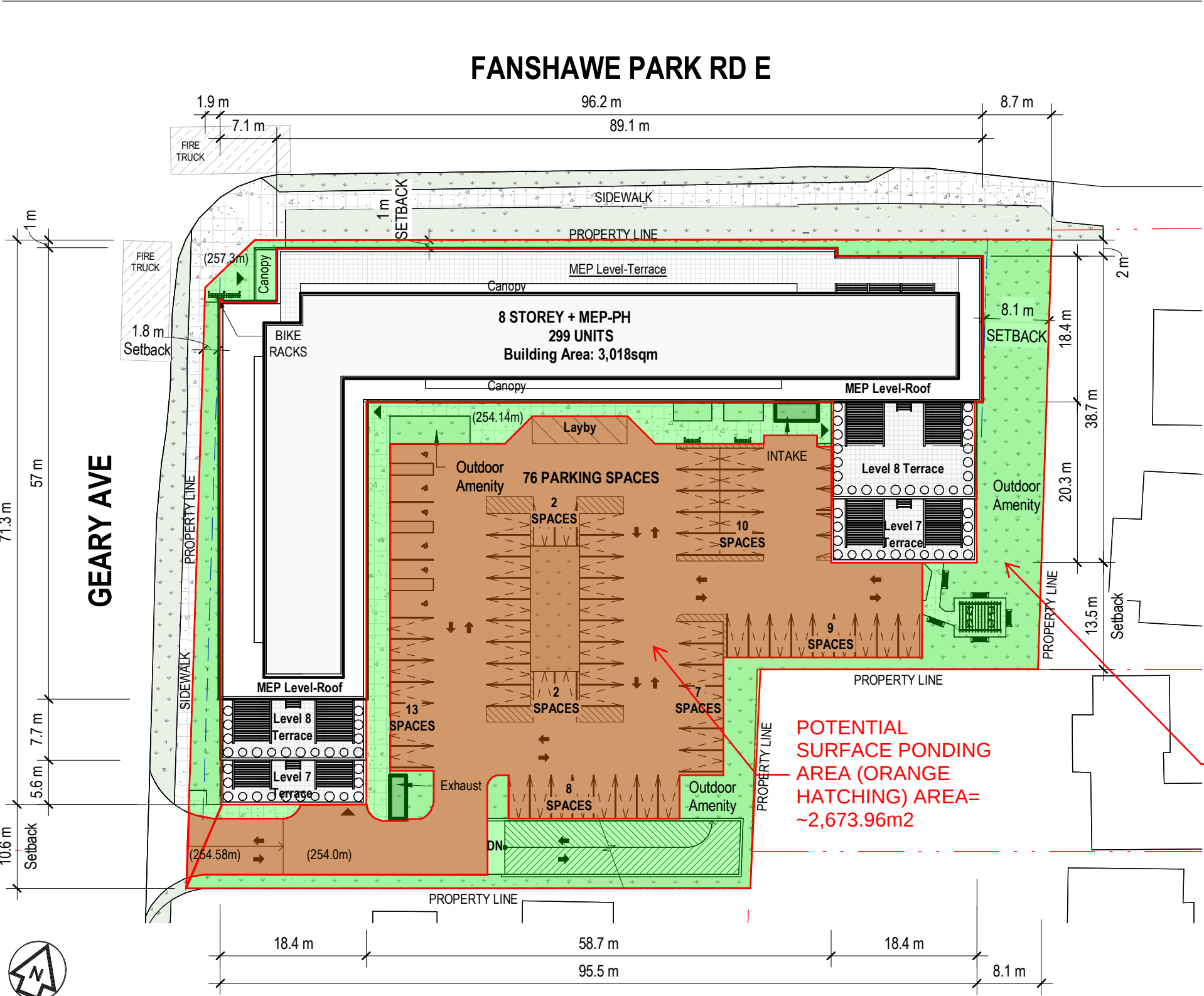
Floor Plan - Level MEP-PH

2026.02.17

SD2.7

zedd  
ARCHITECTURE

Z-627 maitland street london ontario N5Y 2V7 519 518 9333  
www.zeddarchitecture.com info@zeddarchitecture.com



Contextual Plan



Scale : As indicated

20-052 | RP - Fanshawe Park\_Revised

517, 521, 525 Fanshawe Park Rd. E & 1536  
Geary Ave

Site Plan

2026.02.17 | SD1.1

**zedd**  
ARCHITECTURE

Z-627 maitland street london ontario N5Y 2V7 519 518 9333  
www.zeddarchitecture.com info@zeddarchitecture.com

| 2 Yr Srm Event     |                          | Inflow, Q <sub>i</sub><br>2.78°C*°A<br>(L/s) | Volume In<br>Qt*°60/1000<br>(m³) | Roodrain Outflow,<br>Q <sub>o</sub><br>(L/s) | Scupper Outflow<br>Q <sub>u</sub><br>(L/s) | Allowable Total Release,<br>Q <sub>a</sub><br>(L/s) | Volume Out<br>Q <sub>u</sub> *°60/1000<br>(m³) | Difference/<br>Storage<br>(m³) |
|--------------------|--------------------------|----------------------------------------------|----------------------------------|----------------------------------------------|--------------------------------------------|-----------------------------------------------------|------------------------------------------------|--------------------------------|
| Duration<br>(min.) | Intensity "I"<br>(mm/hr) |                                              |                                  |                                              |                                            |                                                     |                                                |                                |
| 10                 | 79.80                    | 62.39                                        | 37.43                            | 15.00                                        | 0.00                                       | 15.00                                               | 9.00                                           | 28.43                          |
| 15                 | 64.03                    | 50.06                                        | 45.06                            | 15.00                                        | 0.00                                       | 15.00                                               | 13.50                                          | 31.56                          |
| 30                 | 41.39                    | 32.36                                        | 58.24                            | 15.00                                        | 0.00                                       | 15.00                                               | 27.00                                          | 31.24                          |
| 60                 | 25.33                    | 19.81                                        | 71.30                            | 15.00                                        | 0.00                                       | 15.00                                               | 54.00                                          | 17.30                          |
| 120                | 15.01                    | 11.73                                        | 84.47                            | 11.73                                        | 0.00                                       | 11.73                                               | 84.47                                          | 0.00                           |
| 180                | 10.95                    | 8.56                                         | 92.42                            | 8.56                                         | 0.00                                       | 8.56                                                | 92.42                                          | 0.00                           |
|                    |                          |                                              |                                  |                                              |                                            |                                                     | Max. Storage Volume (m³) =                     | 31.56                          |

| 100 Yr Stm Event                        |                          | Inflow, Q <sub>i</sub><br>2.78°C*I*A<br>(L/s) | Volume In<br>Qt**60/1000<br>(m <sup>3</sup> ) | Roofdrain Outflow,<br>Q <sub>r</sub><br>(L/s) | Scupper Outflow<br>Q <sub>s</sub><br>(L/s) | Allowable Total Release,<br>Q <sub>a</sub><br>(L/s) | Volume Out<br>Q <sub>a</sub> **60/1000<br>(m <sup>3</sup> ) | Difference/<br>Storage<br>(m <sup>3</sup> ) |
|-----------------------------------------|--------------------------|-----------------------------------------------|-----------------------------------------------|-----------------------------------------------|--------------------------------------------|-----------------------------------------------------|-------------------------------------------------------------|---------------------------------------------|
| Duration<br>(min.)                      | Intensity "I"<br>(mm/hr) |                                               |                                               |                                               |                                            |                                                     |                                                             |                                             |
| 10                                      | 181.39                   | 141.81                                        | 85.09                                         | 15.00                                         | 0.00                                       | 15.00                                               | 9.00                                                        | 76.09                                       |
| 15                                      | 149.56                   | 116.93                                        | 105.24                                        | 15.00                                         | 0.00                                       | 15.00                                               | 13.50                                                       | 91.74                                       |
| 30                                      | 99.36                    | 77.68                                         | 139.83                                        | 15.00                                         | 0.00                                       | 15.00                                               | 27.00                                                       | 112.83                                      |
| 60                                      | 60.87                    | 47.59                                         | 171.32                                        | 15.00                                         | 0.00                                       | 15.00                                               | 54.00                                                       | 117.32                                      |
| 120                                     | 35.32                    | 27.61                                         | 198.81                                        | 15.00                                         | 0.00                                       | 15.00                                               | 108.00                                                      | 90.81                                       |
| 180                                     | 25.28                    | 19.76                                         | 213.45                                        | 15.00                                         | 0.00                                       | 15.00                                               | 162.00                                                      | 51.45                                       |
| Max. Storage Volume (m <sup>3</sup> ) = |                          |                                               |                                               |                                               |                                            |                                                     |                                                             | 117.32                                      |

| 130% of 100 Yr Stm Event                |                          | Inflow, Q <sub>i</sub><br>2.78°C*I*A<br>(L/s) | Volume In<br>Qt**60/1000<br>(m <sup>3</sup> ) | Roofdrain Outflow,<br>Q <sub>r</sub><br>(L/s) | Scupper Outflow<br>Q <sub>s</sub><br>(L/s) | Allowable Total Release,<br>Q <sub>a</sub><br>(L/s) | Volume Out<br>Q <sub>a</sub> **60/1000<br>(m <sup>3</sup> ) | Difference/<br>Storage<br>(m <sup>3</sup> ) |
|-----------------------------------------|--------------------------|-----------------------------------------------|-----------------------------------------------|-----------------------------------------------|--------------------------------------------|-----------------------------------------------------|-------------------------------------------------------------|---------------------------------------------|
| Duration<br>(min.)                      | Intensity "I"<br>(mm/hr) |                                               |                                               |                                               |                                            |                                                     |                                                             |                                             |
| 10                                      | 235.80                   | 184.36                                        | 110.61                                        | 15.00                                         | 0.00                                       | 15.00                                               | 9.00                                                        | 101.61                                      |
| 15                                      | 194.43                   | 152.01                                        | 136.81                                        | 15.00                                         | 0.00                                       | 15.00                                               | 13.50                                                       | 123.31                                      |
| 30                                      | 129.17                   | 100.99                                        | 181.77                                        | 15.00                                         | 12.21                                      | 27.21                                               | 48.97                                                       | 132.80                                      |
| 60                                      | 79.13                    | 61.87                                         | 222.72                                        | 15.00                                         | 9.98                                       | 24.98                                               | 89.91                                                       | 132.80                                      |
| 120                                     | 45.91                    | 35.90                                         | 258.45                                        | 15.00                                         | 2.45                                       | 17.45                                               | 125.65                                                      | 132.80                                      |
| 180                                     | 32.86                    | 25.69                                         | 277.49                                        | 15.00                                         | 0.00                                       | 15.00                                               | 162.00                                                      | 115.49                                      |
| Max. Storage Volume (m <sup>3</sup> ) = |                          |                                               |                                               |                                               |                                            |                                                     |                                                             | 132.80                                      |

#### Available Rooftop Storage

| Location    | Area (m <sup>2</sup> ) | Max Depth (m) | Volume (m <sup>3</sup> )* |
|-------------|------------------------|---------------|---------------------------|
| Roof Drains | 3124.82                | 0.15          | 132.80                    |

\*15% reduction to account for mechanical items stored on roof.

|                           |        |
|---------------------------|--------|
| Required 2 Year Storage   | 31.56  |
| Required 100 Year Storage | 117.32 |

|                                               |        |
|-----------------------------------------------|--------|
| Rooftop Storage Available (m <sup>3</sup> ) = | 132.80 |
| 130% of 100 Year Storage (m <sup>3</sup> ) =  | 132.80 |

Roof storage drawdown time at 15L/s release rate:

|                   |        |                                     |
|-------------------|--------|-------------------------------------|
| 2 year:           | 2103.7 | seconds (35.1 minutes, 0.58 hours)  |
| 100 year:         | 7821.3 | seconds (130.4 minutes, 2.17 hours) |
| 130% of 100 year: | 8853.3 | seconds (147.6 minutes, 2.46 hours) |

Therefore, sufficient storage is provided to reduce peak flow rates on the roof to 15.00 L/S during 2-year and 100-year storm events.

#### POST-DEVELOPMENT CALCULATIONS FOR AREA A203 STORAGE

#### POST-DEVELOPMENT CONTROLLED AREA (A203)

|                                            | Area (m <sup>2</sup> ) | C   | A°C      |
|--------------------------------------------|------------------------|-----|----------|
| Total Area:                                | 4572.64                |     |          |
| Building Area:                             | 0.00                   | 0.9 | 0        |
| Concrete/Asphalt:                          | 3361.33                | 0.9 | 3025.197 |
| **Landscaped/Open Above Parking Structure: | 293.31                 | 0.4 | 117.324  |
| Landscaped/Open:                           | 1024.82                | 0.2 | 204.964  |
| Totals:                                    | 4572.64                |     | 3347.485 |
| C <sub>eq</sub> = Σ(A°C)/Σ(A) =            | 0.73                   |     |          |

#### FLOW RESTRICTOR CALCULATIONS

Orifice diameter is based on Bernoulli's equation, Q=C<sub>d</sub>\*A\*(2gH)<sup>0.5</sup>

Rearranging, A= Q/[C<sub>d</sub>\*(2gH)<sup>0.5</sup>], where:

Restricted Flow Rate, Q = 38.27 L/s

An orifice will be used to restrict pipe outflows from the site to 38.27 L/s and will be specified during detailed design.

#### RAINFALL DATA

#### STORAGE CALCULATIONS

Rainfall Data - London Rainfall Intensity Duration

| 2 Yr Stm Event                          |                          | Total Inflow<br>Q <sub>i</sub> + FCRD's<br>(L/s) | V <sub>i</sub><br>Q <sub>i</sub> **60/1000<br>(m <sup>3</sup> ) | Restricted Outflow<br>Q <sub>orifice</sub><br>(L/s) | Max Allowable Surface Outflow<br>Q <sub>surface</sub><br>(L/s) | Allowable Total Release,<br>Q <sub>a</sub><br>(L/s) | V <sub>a</sub><br>Q <sub>a</sub> **60/1000<br>(m <sup>3</sup> ) | Difference/<br>Storage<br>(m <sup>3</sup> ) |
|-----------------------------------------|--------------------------|--------------------------------------------------|-----------------------------------------------------------------|-----------------------------------------------------|----------------------------------------------------------------|-----------------------------------------------------|-----------------------------------------------------------------|---------------------------------------------|
| Duration<br>(min.)                      | Intensity "I"<br>(mm/hr) |                                                  |                                                                 |                                                     |                                                                |                                                     |                                                                 |                                             |
| 10                                      | 79.80                    | 89.26                                            | 53.56                                                           | 38.27                                               | 0.00                                                           | 38.27                                               | 22.96                                                           | 30.59                                       |
| 15                                      | 64.03                    | 74.59                                            | 67.13                                                           | 38.27                                               | 0.00                                                           | 38.27                                               | 34.45                                                           | 32.68                                       |
| 30                                      | 41.39                    | 53.51                                            | 96.33                                                           | 38.27                                               | 0.00                                                           | 38.27                                               | 68.89                                                           | 27.44                                       |
| 60                                      | 25.33                    | 38.58                                            | 138.87                                                          | 38.27                                               | 0.00                                                           | 38.27                                               | 137.78                                                          | 1.09                                        |
| 120                                     | 15.01                    | 28.96                                            | 208.54                                                          | 28.96                                               | 0.00                                                           | 28.96                                               | 208.54                                                          | 0.00                                        |
| 180                                     | 10.95                    | 25.19                                            | 272.01                                                          | 25.19                                               | 0.00                                                           | 25.19                                               | 272.01                                                          | 0.00                                        |
| Max. Storage Volume (m <sup>3</sup> ) = |                          |                                                  |                                                                 |                                                     |                                                                |                                                     |                                                                 | 32.68                                       |

| 100 Yr Stm Event                        |                          | Total Inflow<br>Q <sub>i</sub> + FCRD's<br>(L/s) | V <sub>i</sub><br>Q <sub>i</sub> **60/1000<br>(m <sup>3</sup> ) | Restricted Outflow<br>Q <sub>orifice</sub><br>(L/s) | Max Allowable Surface Outflow<br>Q <sub>surface</sub><br>(L/s) | Allowable Total Release,<br>Q <sub>a</sub><br>(L/s) | V <sub>a</sub><br>Q <sub>a</sub> **60/1000<br>(m <sup>3</sup> ) | Difference/<br>Storage<br>(m <sup>3</sup> ) |
|-----------------------------------------|--------------------------|--------------------------------------------------|-----------------------------------------------------------------|-----------------------------------------------------|----------------------------------------------------------------|-----------------------------------------------------|-----------------------------------------------------------------|---------------------------------------------|
| Duration<br>(min.)                      | Intensity "I"<br>(mm/hr) |                                                  |                                                                 |                                                     |                                                                |                                                     |                                                                 |                                             |
| 10                                      | 181.39                   | 183.80                                           | 110.28                                                          | 38.27                                               | 52.94                                                          | 91.21                                               | 54.73                                                           | 55.55                                       |
| 15                                      | 149.56                   | 154.18                                           | 138.76                                                          | 38.27                                               | 52.94                                                          | 91.21                                               | 82.09                                                           | 56.67                                       |
| 30                                      | 99.36                    | 107.46                                           | 193.43                                                          | 38.27                                               | 52.94                                                          | 91.21                                               | 164.18                                                          | 29.25                                       |
| 60                                      | 60.87                    | 71.64                                            | 257.92                                                          | 38.27                                               | 33.37                                                          | 71.64                                               | 257.92                                                          | 0.00                                        |
| 120                                     | 35.32                    | 47.87                                            | 344.64                                                          | 38.27                                               | 9.59                                                           | 47.87                                               | 344.64                                                          | 0.00                                        |
| 180                                     | 25.28                    | 38.53                                            | 416.07                                                          | 38.27                                               | 0.25                                                           | 38.53                                               | 416.07                                                          | 0.00                                        |
| Max. Storage Volume (m <sup>3</sup> ) = |                          |                                                  |                                                                 |                                                     |                                                                |                                                     |                                                                 | 56.67                                       |

| 130% of 100 Yr Stm Event                |                          | Total Inflow<br>Q <sub>i</sub> + FCRD's + Scupper<br>Outflow<br>(L/s) | V <sub>i</sub><br>Q <sub>i</sub> **60/1000<br>(m <sup>3</sup> ) | Restricted Outflow<br>Q <sub>orifice</sub><br>(L/s) | Max Allowable Surface Outflow<br>Q <sub>surface</sub><br>(L/s) | Allowable Total Release,<br>Q <sub>a</sub><br>(L/s) | V <sub>a</sub><br>Q <sub>a</sub> **60/1000<br>(m <sup>3</sup> ) | Difference/<br>Storage<br>(m <sup>3</sup> ) |
|-----------------------------------------|--------------------------|-----------------------------------------------------------------------|-----------------------------------------------------------------|-----------------------------------------------------|----------------------------------------------------------------|-----------------------------------------------------|-----------------------------------------------------------------|---------------------------------------------|
| Duration<br>(min.)                      | Intensity "I"<br>(mm/hr) |                                                                       |                                                                 |                                                     |                                                                |                                                     |                                                                 |                                             |
| 10                                      | 235.80                   | 234.44                                                                | 140.66                                                          | 38.27                                               | 80.30                                                          | 118.57                                              | 71.14                                                           | 69.52                                       |
| 15                                      | 194.43                   | 195.93                                                                | 176.34                                                          | 38.27                                               | 80.30                                                          | 118.57                                              | 106.72                                                          | 69.62                                       |
| 30                                      | 129.17                   | 147.41                                                                | 265.33                                                          | 38.27                                               | 80.30                                                          | 118.57                                              | 213.43                                                          | 51.90                                       |
| 60                                      | 79.13                    | 98.61                                                                 | 355.01                                                          | 38.27                                               | 60.34                                                          | 98.61                                               | 355.01                                                          | 0.00                                        |
| 120                                     | 45.91                    | 60.18                                                                 | 433.28                                                          | 38.27                                               | 21.91                                                          | 60.18                                               | 433.28                                                          | 0.00                                        |
| 180                                     | 32.86                    | 45.58                                                                 | 492.29                                                          | 38.27                                               | 7.31                                                           | 45.58                                               | 492.29                                                          | 0.00                                        |
| Max. Storage Volume (m <sup>3</sup> ) = |                          |                                                                       |                                                                 |                                                     |                                                                |                                                     |                                                                 | 69.62                                       |

#### Available Surface Storage (Preliminary)

| Location                   | # of Area Drains | Area (m <sup>2</sup> ) | Ponding Limit (m <sup>3</sup> ) | Average Depth (m) | Volume (m <sup>3</sup> ) |                                                                                                                              |
|----------------------------|------------------|------------------------|---------------------------------|-------------------|--------------------------|------------------------------------------------------------------------------------------------------------------------------|
| Floor Plan L-1 Area Drains | 4                | 2,651.01               | 1,325.51                        | 0.30              | * 132.55                 | * 50% reduction applied to available surface storage volume (Surface storage volume to be determined during detailed design) |

|                                                       |        |
|-------------------------------------------------------|--------|
| Total Storage Available (m <sup>3</sup> ) =           | 132.55 |
| Required 2 Year Storage (m <sup>3</sup> ) =           | 32.68  |
| Required 100 Year Storage (m <sup>3</sup> ) =         | 56.67  |
| Required 130% of 100 Year Storage (m <sup>3</sup> ) = | 69.62  |

Surface storage drawdown time at 38.27L/s release rate:

|                   |        |                                    |
|-------------------|--------|------------------------------------|
| 2 year:           | 854.0  | seconds (14.2 minutes, 0.24 hours) |
| 100 year:         | 1480.7 | seconds (24.7 minutes, 0.41 hours) |
| 130% of 100 year: | 1819.0 | seconds (30.3 minutes, 0.51 hours) |