

# Functional Servicing Report 192-196 Central Avenue, London City of London

---

# Document Control Page

---

<b>CLIENT:</b>	Farhi Holding Corporations
<b>PROJECT NAME:</b>	192-196 Central Avenue, London
<b>REPORT TITLE:</b>	Functional Servicing Report 192-196 Central Avenue, London City of London
<b>IBI REFERENCE:</b>	139153
<b>VERSION:</b>	1
<b>DIGITAL MASTER:</b>	<a href="https://ibigroup.sharepoint.com/sites/Projects2/139153/Internal/Documents/6.0_Technical/6.04_Civil/03_Reports/FSR/CTR_FSR_192-196 CentralAve_2023-07-12.docx">https://ibigroup.sharepoint.com/sites/Projects2/139153/Internal/Documents/6.0_Technical/6.04_Civil/03_Reports/FSR/CTR_FSR_192-196 CentralAve_2023-07-12.docx</a> 2023-08-25
<b>ORIGINATOR:</b>	Isabella Biondi, EIT
<b>REVIEWER:</b>	Mohammad Meqdad, P.Eng.
<b>AUTHORIZATION:</b>	Arcadis IBI Group
<b>CIRCULATION LIST:</b>	
<b>HISTORY:</b>	First Submission

# Table of Contents

---

<b>1</b>	<b>Introduction</b> .....	<b>1</b>
1.1	Site Description and Zoning.....	1
1.2	Proposed Development .....	2
<b>2</b>	<b>Existing Conditions</b> .....	<b>2</b>
2.1	Existing Topography .....	2
2.2	Existing Servicing.....	2
2.2.1	Storm.....	2
2.2.2	Sanitary .....	3
2.2.3	Water System.....	3
2.3	Utilities.....	3
<b>3</b>	<b>Proposed Development</b> .....	<b>3</b>
3.1	Proposed Roads and Pedestrian Access .....	4
3.2	Proposed Grading .....	4
3.3	Proposed Sanitary Servicing.....	4
3.4	Proposed Water Supply and Fire Protection .....	5
3.5	Proposed Stormwater Servicing .....	6
3.6	Proposed Utilities .....	6
<b>4</b>	<b>Erosion and Sediment Control</b> .....	<b>6</b>
<b>5</b>	<b>Summary</b> .....	<b>6</b>

# List of Appendices

---

## **APPENDIX A**

- Site Plan
- Topographical Plan of Review

## **APPENDIX B**

- Drawings Prepared by Development Engineering
- Drawings Prepared by Stantec

## **APPENDIX C**

- Existing Conditions and Removals Plan
- Functional Site Grading & Servicing Plan
- Stormwater Management Report
- Sanitary Sewer Calculations
- Water Demand Calculations
- Fire Flow Calculations

# 1 Introduction

Arcadis IBI Group was retained by Farhi Holdings Corporation (FHC) to complete a Functional Servicing Report for the proposed development at 192 and 196 Central Avenue herein referred to as 'the Site' in the City of London in support of the Zoning By-Law Amendment (ZBA) Applications. The development is proposed on two Impark parking lots to be demolished at municipal addresses 192 and 196 Central Avenue.

The purpose of this report is to support the Zoning By-Law Amendment (ZBA) submission. This will be accomplished by reviewing the opportunities and constraints for the subject property with respect to servicing, and grading; reviewing the requirements of the City of London; describing the development concept; and demonstrating the functional serviceability of the property.

## 1.1 Site Description and Zoning

The Site encompasses an area of 0.185 ha of developed lands. The Site is bounded by Central Avenue to the south and by single-family residential from all other sides. For the exact location of the Site refer to **Figure 1.0** below.



**Figure 1.0 – Site location**

## 1.2 Proposed Development

The proposed development for the Site includes the construction of a 13-storey residential building complete with two underground parking levels, bicycle storage, in-building amenity spaces, and landscape areas. Access to the Site is proposed via one entrance off Central Avenue.

Refer to **Appendix A** for the proposed Site Plan.

## 2 Existing Conditions

### 2.1 Existing Topography

Existing topographic information was obtained from a detailed survey completed by Callon Dietz in April 2023. In the existing condition of the Site, surface runoff generally drains from the north boundary toward Central Avenue.

The Site generally falls from the north boundary from an elevation of about 251.00m south towards Central Avenue to an elevation of about 250.25m. The elevation difference from east to west is about 0.75m over a span of about 37.0m. The average slope of the Site over this span is approximately 2%. The topographic survey shows that there is an area along the north boundary falls toward the north. It is anticipated that storm runoff from this area drains uncontrolled toward the northeast toward an existing gravel access which connects to Hyman Street. For more information about the topography and existing conditions of the site, refer to survey completed by Callon Dietz included in **Appendix A**.

### 2.2 Existing Servicing

Servicing information for the site and neighbouring areas was obtained from the on-site survey completed by Callon Dietz in April 2023, and the site servicing plan for 192 Central Ave prepared by Development Engineering in November 2016. Additionally, Arcadis IBI Group has obtained record drawings from the City of London GIS online data. Drawings numbered 16810, 16815 and WS427S2 are included in **Appendix B**.

For more information about the existing services refer to **Appendix B** for Sheet C01 - Existing Conditions and Removals Plan.

#### 2.2.1 Storm

Under existing conditions, runoff from the site area generally drains from the north boundary toward Central Avenue. There is an existing 450mm diameter storm sewer on Central Avenue flowing west. The on-site survey completed by Callon Dietz and the site servicing plan by Development Engineering show one existing catch basin located in the southeast section of the existing parking lot and is connected to the existing 450mm diameter storm sewer on Central Avenue.

Record drawing number 16810 – Central Avenue Plan and Profile and the site servicing plan by Development Engineering show that there are two storm sewer laterals; the lateral on the east side of the site is a 300mm diameter pipe up to the property line then turns into a 150mm diameter which connects to the catch basin, and the lateral on the west side of the site is of unknown size and is connected to the existing storm manhole (STMHC3).

Record drawing number 16814 – Central Avenue Storm Area Plan and Design Sheet shows the site is within sub-catchment area A1 and A2 and is tributary to the existing storm manhole (STMHC2). The storm design sheet shows that the site has an existing design runoff coefficient

allocation of 0.90. The estimated existing minor storm flow (2-years) design allocation for the site is about  $0.185 \text{ ha} \times (131.4 \text{ L/s} + 466.2 \text{ L/s}) / (0.35 \text{ ha} + 1.03 \text{ ha}) = 80.11 \text{ L/s} = 0.08011 \text{ m}^3/\text{s}$ .

Record drawing number 16810, 16814, and the site servicing plan are included in **Appendix B**.

There are no other known storm sewers, quantity, or quality controls on or around the site.

### 2.2.2 Sanitary

Under the existing condition, there is a 250mm diameter sanitary sewer on Central Avenue draining west at a slope of 0.34%. Record drawing number 16810 and the site servicing plan by Development Engineering show that there are two sanitary sewer laterals; the lateral on the east side of the site is a 200mm diameter pipe and the lateral on the west side of the site is of an unknown size.

Record drawing number 16815 – Central Avenue Sanitary Area Plan and Design Sheet shows the site is within sanitary catchment area A2 and is tributary to the existing sanitary manhole (SANMHC4). The existing sanitary design density for area A2 is 123 people/ha. The existing site has an allocated population of  $0.185 \text{ ha} \times 123 \text{ people/ha} = 24 \text{ people}$ . The estimated existing sewage flow design allocation for the site is about  $24 \text{ people} \times 7.17 \text{ L/s} / (270 \text{ people} + 75 \text{ people}) = 0.49 \text{ L/s}$ .

### 2.2.3 Water System

There is an existing 200mm diameter watermain and an abandoned 100mm diameter watermain on Central Avenue. Record drawings 16810, WD427S2, and the site servicing plan by Development Engineering show that there is a 50mm diameter water service leading to the site and is connected to the existing 200mm diameter watermain on Central Avenue.

The nearest municipal hydrant is located on the north side of Central Avenue at the northwest corner of the intersection with Richmond Street about 50m from the southeast corner of the site.

Record drawing number 16810, water record drawing number WD427S2, and the site servicing plan are included in **Appendix B**.

## 2.3 Utilities

Electric, natural gas, and telecommunication services exist within close proximity to the subject development on Central Avenue and Richmond Street.

# 3 Proposed Development

In the proposed development, the existing parking lots at 192 and 196 Central Avenue will be redeveloped. Additionally, as part of this development, hardscaped areas, service connections and infrastructure for the site will be removed as shown in Sheet C01 - Existing Conditions and Removals Plan, included in **Appendix B**.

A 13-storey residential building with 126 residential units. The proposed building will have two levels of underground parking with a total of 68 parking spaces.

The following sections describe the functional design of the area grading and municipal servicing for the proposed development. The purpose of the functional design is to demonstrate the feasibility of the development, outlining the general strategy for the grading, and municipal servicing.

### 3.1 Proposed Roads and Pedestrian Access

The proposed development will have vehicular access from Central Avenue to the underground parking. The area on the west side of the proposed building is proposed to be covered by a porch.

A separate Traffic Impact Study may be required to review the impacts and requirements of the proposed development in terms of improvements needed on the existing adjacent roads and entrances.

### 3.2 Proposed Grading

The proposed development will construct a building fronting to Central Avenue. The proposed buildings underground footprint will be approximately 13.2% of the subject site area.

A minimum of 0.5% and a maximum of 5% slope will be used on all hard surfaces for vehicular and pedestrian access routes to ensure accessibility, except for the parking garage ramp which will have a maximum slope of 10%. A minimum of 2% and a maximum of 33% (3:1) slope will be used for landscaped areas.

The footprint of the building and the underground parking cover the majority of the site area. Runoff from the roof area and the porch on the west side of the building are proposed to be directed toward the existing 450mm storm sewer. The grading of the site will direct majority of the drainage from land surrounding the building towards Central Avenue by sheet flow, with the grading matching property line elevations. A swale is proposed along the north side to convey and collect minor storm runoff in proposed storm area drains.

A retaining wall is proposed starting from the northeast corner of the site extending south approximately 5.5m and extending west approximately 26.0m. This is proposed ensure that proposed grades on the north and east side of the building are within allowable.

Refer to **Appendix B** for Sheet C02 – Functional Site Grading and Servicing Plan.

### 3.3 Proposed Sanitary Servicing

The development is proposed to have 126 residential units. Using the City's engineering guidelines, the proposed population for the development is  $126 \times 1.60 = 202$  people and the total sewage design flow is estimated to be 2.46

L/s.

As discussed previously in Section 2.2.2., the existing sanitary design density for area A2 is 123 people/ha. The existing site has an allocated population of  $0.185 \text{ ha} \times 123 \text{ people/ha} = 24$  people. The estimated existing sewage flow design allocation for the site is about  $24 \text{ people} \times 7.17 \text{ L/s} / (270 \text{ people} + 75 \text{ people}) = 0.49 \text{ L/s}$ .

Under the proposed conditions, the population is calculated at  $126 \text{ units} \times 1.6 \text{ people/unit} = 202$  people. The estimated total design flow is about 2.46 L/s. For more information, refer to the sanitary design sheet included in **Appendix C**.

It is clear that the proposed site shows an intensification of population of about 202 people – 24 = 178 people. The incremental sewage flow is estimated to be  $2.46 \text{ L/s} - 0.49 \text{ L/s} = 1.97 \text{ L/s}$ .

Arcadis IBI Group proposes a 150mm diameter sanitary connection at a 1% slope to connect to the existing 250mm diameter sanitary sewer. The theoretical capacity of the receiving 250mm diameter sanitary sewer on Central Avenue, at its existing 0.34% slope, is 34.68 L/s. The estimated total sewage flow from the proposed site, including contributions from upstream areas as per the design conditions and allocations presented in record drawing 16815, is estimated at about 18.36 L/s. As shown in the sanitary design sheet included in **Appendix A**, analysis was



completed to existing downstream MH2A (SANMHC4) adjacent to the site. It is clear that there is sufficient capacity in the analyzed section and the proposed sewage flow including the existing design sewage ( $2.46 \text{ L/s} + 2.368 \text{ L/s} + 4.63 \text{ L/s} = 9.458 \text{ L/s}$ ) flows are less than the capacity of the existing 250mm sanitary sewer (34.68 L/s).

It should be noted that the sanitary capacity of the downstream system will need to be confirmed to have the surplus capacity to provide sanitary service for the proposed site. Refer to **Appendix B** for Sheet C02 – Functional Site Grading and Servicing Plan and refer to **Appendix C** for sanitary flow and sewer capacity calculations.

### 3.4 Proposed Water Supply and Fire Protection

The proposed development includes a 13-storey residential tower and will be serviced via the 200mm municipal watermain on Central Avenue. One water service lateral is proposed to service the site from the 200mm municipal watermain on Central Avenue.

Calculations of the water demand for the proposed development have been determined using the guidelines outlined within the City of London Design Specifications and Requirements Manual, March 2022, and the Ministry of the Environment, Conservation and Parks (MECP) Design Guidelines for Drinking-Water Systems, May 2019.

Using the City's population density per unit type (1.60 persons per unit for apartments), the calculated total population for the proposed development is 202 persons.

In order to convert the average daily demands into maximum daily and peak hourly flows, a peaking factor was applied. The peak factor was in accordance with Table 3-1 of the MECP design guidelines, resulting in a peak factor of 2.75 for maximum daily demand and a peak factor of 4.13 for peak hourly demand for populations in the range of 500 - 1000.

Using the City of London's peaking factors and per capita water demand for apartments, the proposed development has the following water demand (refer to Appendix B for calculations):

- Daily average water demand of 51,510 L/day (0.60 L/s);
- Maximum daily water demand of 141,653 L/day (1.64 L/s);
- Peak hour water demand of 8,864.01 L/hour (2.46 L/s).

Analysis was also completed to determine the required fire flow for the proposed development. Using the method outlined in the Fire Underwriters Survey (FUS), Part II it was determined that the maximum fire flow requirement for both the proposed mixed-use building including the commercial space is anticipated to be 61 L/s.

As outlined in the MOE Design Guideline for Drinking Water Systems 2008 in section 3.4.1, the total site demand is greater than the peak hour demand which is 2.46 L/s and max day demand plus fire flow which is ( $1.64 \text{ L/s} + 61 \text{ L/s} = 62.64 \text{ L/s}$ ). In both cases the governing demand is maximum day plus fire flow; 62.64 L/s for the proposed residential building.

An existing fire hydrant is located east of the site at the intersection of Richmond Street and Central Avenue. The fire hydrant is connected to the 200mm diameter municipal watermain.

A new fire hydrant will be required to service the proposed development. The proposed fire hydrant will be located north of the existing sidewalk on Central Avenue and east of the proposed parking lot entrance. A hydrant flow test will be required for the existing fire hydrant located to the east of the site at the intersection of Richmond Street and Central Avenue. A Fire Flow Analysis Report will be required to confirm the flow and assist with determining the flow requirements of the proposed fire hydrant.

Water Demand and FUS calculations are included in **Appendix C**.

### 3.5 Proposed Stormwater Servicing

The Stormwater Management (SWM) criterion for this development is based on the requirements of the City of London. The requirements include stormwater quantity and quality control, and infiltration.

Arcadis IBI Group proposes to utilize one storm service to connect the proposed 300mm diameter storm service at a 1.00% slope to the existing 450mm diameter storm sewer on Central Avenue. For areas surrounding the building, proposed swales with area drains are proposed to capture and direct minor and major storm runoffs toward Central Avenue. For the area north of the building, it is proposed that the major overland flows from the landscaped area on the north boundary, will drain uncontrolled toward the north.

As discussed previously in Section 2.2.1. the estimated existing minor storm flow (2-years) design allocation for the site is about 80.11 L/s = 0.08011 m<sup>3</sup>/s. This is proposed to be the target storm flow rate for the proposed site and to provide post- to pre-development control. Need to include discussion about the storm and roof discharge.

For more information about the Stormwater Management (SWM) for the proposed site, refer to the stand-alone report prepared by Arcadis IBI Group on August 25, 2023.

### 3.6 Proposed Utilities

Considering the adjacent developed areas, it is reasonable to assume there are existing hydro, gas, and telecommunication services in the vicinity of the site which can be extended to the development to provide service. Servicing of the development by various utilities will be provided by the extension of these facilities. It is anticipated that each of these utilities will, as required, identify their specific requirements through the standard application circulation, review, and design process.

## 4 Erosion and Sediment Control

During construction, erosion and sediment control measures will be required for the site area and will be designed and provided by others. The following are required during construction:

- Protect adjacent areas from the migration of sediment in overland flow.
- Minimize the amount of sediment transported off-site via construction vehicles; and,
- Stabilization of all disturbed areas as quickly as possible to minimize erosion.

## 5 Summary

This Functional Servicing Report outlines the proposed site grading and municipal servicing design for the proposed development at 192 and 196 Central Avenue, London, Ontario. It demonstrates that the development is feasible and can be designed and constructed in accordance with municipal standards.

The following summarizes the components of the design:

- The site grading will achieve gentle gradients between 0.5% to 5% for all vehicular and pedestrian areas, with the exception of the parking garage ramp which will have a maximum slope of 10%. Landscaped areas will have gradients between 2% and 33%;

- The existing 250mm diameter municipal sanitary sewer infrastructure on Central Avenue will provide sanitary service to the proposed building;
- The existing 200mm diameter watermain on Central Avenue will provide potable water for the site. Fire protection will be provided via a proposed hydrant located in front of the site on Central Avenue; and
- The existing 450mm diameter municipal sanitary sewer infrastructure on Central Avenue will provide storm service to the proposed building;

We trust the foregoing is satisfactory to support the development application. Should there be any questions or if further information is required, please do not hesitate to contact the undersigned.

All of which is respectfully submitted.

Yours truly

**ARCADIS IBI GROUP**



Isabella Biondi, EIT  
Engineer-in-Training  
Tel: 519-585-2255 ext 61992  
Email: [Isabella.Biondi@ibigroup.com](mailto:Isabella.Biondi@ibigroup.com)



Mohammad Meqdad, P.Eng.  
Project Engineer  
Tel: 519 585 2255 ext 63018  
Email: [Mohammad.Meqdad@ibigroup.com](mailto:Mohammad.Meqdad@ibigroup.com)