

**CAPITOL THEATRE DEVELOPMENT
IN FORT EDMONTON PARK
SERVICING ASSESSMENT REPORT**

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SECTION 1.0 CURRENT SITUATION ASSESSMENT

1.0 INTRODUCTION

It is proposed to re-create a historic Edmonton theatre (Capitol Theatre) east of the Selkirk Hotel which is located at the northeast corner of the intersection of 1905 Street and 1920 Street in Fort Edmonton Park. The front of the building will be on the north side of 1920 Street. The north and east walls of the building will be immediately adjacent to a proposed 6.0 m wide proposed easement for a future alley and utilities. This easement was recommended in the Selkirk Hotel EIA report prepared by Gibbs and Brown Landscape Architects in 2002.

Refer to Drawing C-01 herein showing the proposed location of the Capitol Theatre relative to the Selkirk Hotel and Blatchford Hanger. The approximate separation between the Selkirk Hotel and the Capitol Theatre is 23.7 meters. Refer also to the following photographs which show the site of the proposed theatre.



Photo #1 – Looking N across 1920 Street



Photo #2 – Looking N across 1920 Street

Refer to the main floor plan Figure A2.1, the longitudinal and transverse sections Figure A3.0 and the south and west elevation views Figure A4.0. The footprint of the building is 951.66 square meters (22.86 m x 41.63 m).

The Capitol Theatre will be a 225 seat, multi-purpose facility who's primary function will be to serve as a performance venue for local theatrical, dance and musical organizations. Theatre seats will be portable and storable, to accommodate table and chair set up. The Capitol will feature an elaborate lobby space with a concession, a seating balcony, a sprung stage floor, backstage dressing rooms, a full-size screen, state-of-the-art audio and both 35mm and digital projection capability. The usable floor area of the building will be approximately 11,000 square feet.

1.1 STUDY SCOPE

The scope of this study is limited to sanitary sewerage, stormwater drainage, domestic water and fire protection systems required to support the development of the Capitol Theatre in Fort Edmonton Park.

1.2 STUDY METHODOLOGY

This study has been completed by Brian Thompson, P.Eng., as a Subconsultant to EIDOS Consultants Incorporated. EIDOS are acting on behalf of the City of Edmonton Community Services Department and are responsible for an environmental

review of the project, which review includes a review of the water and sewer servicing requirements.

In 2002, a similar study was completed by the same Engineer to assess the impact of the Selkirk Hotel on the sanitary, stormwater and water systems in Fort Edmonton Park. In 2004, another similar study was completed by the same Engineer to assess the impact of the Exhibition and Midway development on the same systems.

As a result of recent conversations with Ron Wheeler of Community Services and Denis Hillier of AMPW Drainage Services, Operations, we have learned that no significant changes or upgrades, other than the service connections for the Selkirk Hotel and the Midway, have been made to the sanitary sewer mains, lift station and forcemain, or to the storm sewer mains or watermains in Fort Edmonton Park during the last 10 years. However, both the 2002 and 2004 studies had recommended the following upgrades to the sanitary system:

- 2002 – That a storage chamber of 5 cubic meter volume be added to the sanitary lift station to protect the Fort Edmonton Park sanitary system from any deterioration due to the addition of the Selkirk Hotel, and to provide for shutdowns and emergencies equivalent to a volume of 4 hours peak dry flow from the Hotel.
- 2004 – That a storage chamber of 13 cubic meter volume be added to the sanitary lift station to protect the Fort Edmonton Park sanitary system from any deterioration due to the addition of both the Selkirk Hotel and the 1920's Midway, plus possible future developments within Fort Edmonton Park.

Both the 2002 and 2004 study reports provide a very complete description of the existing sanitary, stormwater drainage and water systems. Rather than repeat the description in this report, we are providing copies of the two previous reports as appendices to this report. Appendix A is the 2002 Selkirk Hotel report and Appendix B is the 2004 Midway report.

Denis Hillier of Asset Management and Public Works, Drainage Services, Operations has advised that the pumps in the sewage lift station are nearing the end of their service life, so consideration should be given to replacing them soon. He also advises that as a result of the restaurant in the Selkirk Hotel, the lift station maintenance staff have noticed that grease balls have been forming in the wet well of the lift station.

1.3 ASSESSMENT OF SANITARY SEWERAGE

1.3.1 Description of Existing System

Refer to either Appendix A or Appendix B for a description of the existing sanitary system.

1.3.2 System Capacities and Sewage Quantities

Refer to Appendix A and Appendix B for an analysis of the capacity of the existing sanitary system.

The proposed Capitol Theatre will have a seating capacity of 225 persons, plus performers will presumably use restroom facilities in the theatre, so the total contributing population for sanitary sewage generation should be in the order of 250 persons.

City of Edmonton Design Standards for Drainage, Chapter 3, Table A2 provides a guide for commercial / institutional and industrial sanitary flow generation factors on the basis of land use. For places of assembly, such as Churches, Schools, Libraries and Theatres, it recommends designing on the basis of 24 Litres/day/s.m. of floor area.

For the 1022 sq. m. Capitol Theatre, this would be 24,525 Litres/day or 24.5 cubic meters per day. The equivalent population at 350 L/C/d would be 70 people. Note that this is approximately the same or less than the theoretical volume generated by the Selkirk Hotel.

This means that the implementation of the recommended 13 cubic meter storage vault as per the 2004 recommendation would adequately take care of the Selkirk Hotel, the Capitol Theatre and the 1920s Midway, and reduce the risk of overflows to the North Saskatchewan River. If there are any other proposed additions to Fort Edmonton Park in the near future, then it would be prudent to consider an even larger diameter storage manhole be added to the lift station.

1.3.3 Historical Performance of Existing System

Refer to Appendices A and B for notes on the historical performance of the existing sanitary system.

Other than taking note of Denis Hillier's comments about aging sewage pumps and the increasing incidents of grease balls in the wet well, it is important to note that the historical problems with the system have been related to wet weather flows, not to dry weather flows.

1.4 ASSESSMENT OF STORMWATER DRAINAGE

Refer to Appendices A and B for a description of the existing stormwater drainage system.

The existing ground at the proposed location of the Capitol Theatre is quite flat, in the range of elevation 626.5 to elevation 627.6. The general slope of the ground is towards the west, aided by a drainage swale parallel to and north of the boardwalk, as illustrated in Photos #3, #4 and #5 below.



Photo #3 – Swale slopes towards Selkirk Hotel



Photo #4 – Culvert at end of swale under Boardwalk



Photo #5 – Catchbasin receiving runoff from ditch and culvert

At some point in the future, it is proposed to develop an urban cross-section for 1920 Street, including the intersection with 1905 Street. This proposed urbanization will necessarily impact the proposed grading of the Capitol Theatre development. The floor elevation for the Selkirk Hotel was set so as to accommodate this proposed urbanization for 1920 Street. It is reasonable to assume that the top of rail profile for the streetcar tracks will not significantly change whenever this roadway urbanization occurs. Therefore the relative elevation of the tracks and the floor for the Selkirk Hotel should be the same for the Capitol Theatre. The floor elevation for the Selkirk Hotel is 627.530, which is 0.134 m higher than the average elevation of the north set of tracks in front of the Hotel. To maintain that same difference, the floor elevation of the Capitol Theatre ticket booth should be set at 627.640. The theatre stage and the floor of the rooms at the rear of the building are 300 mm lower than the floor of the rooms at the front of the building, so the rear floor elevation will be set at 627.340.

A stormwater retention area has been developed to the east of the Capitol Theatre site south of Blatchford Hangar, as illustrated in the following photographs.



Photo #6 – Depressed area south of Blatchford Hangar



Photo #7 – Catchbasin in stormwater retention area

Both the 900 mm storm pipe along the south side of 1920 Street (22.5 meters south of the south face of the building) and the stormwater retention area are potential recipients for stormwater discharges from the new Capitol Theatre development.

Assuming that the roof of the Capitol Theatre building is flat, then stormwater management could be utilized on the roof through the use of controlled flow roof drains. Generally, in the Edmonton area, roof structures designed for snow loads are structurally capable of storing the 100 year storm volume on the roof. If the flow off the 951.66 square meter roof area is restricted to 3.33 Litres per second, then it would be equivalent to the pre-development flow off the site.

1.5 ASSESSMENT OF WATER SYSTEM

Refer to Appendices A and B for a description of and assessment of the Fort Edmonton Park water system.

The deficiencies in the Fort Edmonton Park water system are of long standing. The (old) Fort Edmonton Park Master Plan sets out deficiencies in the fire protection system in Section 4 a) iv) Fire Protection Requirements. These documented deficiencies relate to hydrant accessibility, hydrant spacing and sprinkler systems in buildings.

The Fort Edmonton Park watermain and the hydrants cannot provide the level of fire protection that would be expected in the downtown area of the City, but it can provide adequate protection to the Selkirk Hotel and to the Capitol Theatre if they are stand-alone buildings with no other immediately adjacent buildings.

The approximate separation between the two buildings will be 32.5 meters. Any infill building proposed for that zone will trigger a requirement for a significant upgrade to the Fort Edmonton Park water distribution system.

Photo #2 on a previous page illustrates two existing fire hydrants which are well positioned to provide protection to the proposed Capitol Theatre, one on the north side and one on the south side of 1920 Street.

SECTION 2.0

RECOMMENDED SERVICING FOR CAPITOL THEATRE DEVELOPMENT

2.0 INTRODUCTION

In Section 1, sewer, water and drainage servicing constraints relating to the potential development of the Capitol Theatre in Fort Edmonton Park have been documented. Given those constraints, this Section sets out some alternatives for providing an appropriate level of service for this development.

2.1 SERVICING ALTERNATIVES

2.1.1 Sanitary Service Option #1 – Gravity Connection

A 150 mm diameter service connection could be installed across 1920 Street connecting directly into the existing 250 mm sanitary sewer. This connection would have to be installed under the two sets of streetcar tracks along the centre of the street. In order to minimize disturbance to the existing surface and to Park operations and users, it would be appropriate to install this service connection by auguring or coring techniques. Excavated working pits would be required at each side of the street. The distance between the south face of the building and the 250 mm sewer is 24 meters.

2.1.2 Sanitary Service Option #2 – Pumped Connection

A small lift station could be built to provide sanitary service to the theatre only. It could be located outside and beside the theatre, or it could be located in a crawl space under the building. Duplex pumps would pump sewage across the street to the existing 250 mm sewer via a 100 mm forcemain connection. This connection would have to be installed by auguring or coring techniques similar to the gravity connection.

The wet well of this dedicated lift station could be sized to provide a certain amount of storage volume. This opportunity to store sewage could be used to advantage during wet weather events, which tend to overload the main lift station. This would be one way of ensuring that this development does not exacerbate an existing problem.

2.1.3 Storm Service Option #1 – Direct Connection to Storm Sewer

A 250 mm or 200 mm diameter service connection could be installed across 1920 Street connecting directly into the existing 900 mm storm sewer to convey the drainage from the roofs to the sewer. This 22.5 meter long connection would have to be installed under the two sets of streetcar tracks along the centre of the street. In order to minimize disturbance to the existing surface and to Park operations and users, it would be appropriate to install this service connection by augering or coring techniques. Excavated working pits would be required at each side of the street.

Roof runoff water could be directly connected through this connection, or alternatively it could be discharged to the surface near the building where it could be directed to a catchbasin or catchbasins connected to the storm service.

2.1.4 Storm Service Option #2 – Surface Discharge

It is possible, that by carefully designing the grading of the area, most or all of the runoff from the building roof and adjacent roadways could be directed either towards the storm retention area near Blatchford Hangar or to the system which serves the area east of the hotel. This would eliminate the need for a direct connection to the 900 mm sewer, but it would likely require some ditching and culvert installation works in the vicinity of the wooden walkway to Blatchford Hangar.

If this option is adopted, it would still be prudent to restrict the rate of flow off the roof through the use of weirs or orifices at the discharge points (similar to using controlled flow roof drains).

2.1.5 Water Service Option #1 – Connection to Existing 1920 Street Main

The service connection to the Capitol Theatre from the existing 200 mm watermain in 1920 Street (length = 10 meters) will provide for both domestic supply and sprinkler system supply. This dual-purpose service connection would likely be a 150 mm diameter pipe, and there would be a valve on the service line.

Due to the high pressures in the watermain in this area, the Mechanical Designers should give due consideration to the matter of providing a pressure reducing valve to protect the building plumbing from the high pressures.

There is an existing fire hydrant on the north side of 1920 Street, approximately 20 meters east of the east wall of the Capitol Theatre, so that hydrant should be well

positioned to provide protection for the building. As a back-up, there is another hydrant across 1920 Street east of Sun Drug Store.

2.2 PROPOSED MITIGATION MEASURES

2.2.1 Mitigation Measure 1 – Water System

Install a standard water service connection to the existing 200 mm watermain in 1920 Street to service the Capitol Theatre.

Initiate preliminary Engineering studies for upgrading the Fort Edmonton Park water system, so that it will have the capability to deliver a fire flow of 300 litres per second at such time as the contemplated infill building, the Windsor Hotel, is constructed.

2.2.2 Mitigation Measure 2 – Stormwater Drainage

Institute on-roof stormwater management for the Capitol Theatre in order to minimize the impact of the development. If the flows from the roof can be limited to 3.33 litres per second, then the pre-development condition will be protected.

Install a direct connection for the roof drainage system to the existing 900 mm storm sewer in 1920 Street.

2.2.3 Mitigation Measure 3 – Sanitary Sewerage

Concurrent with the Capitol Theatre project, construct a 13 cubic meter (or larger) storage chamber at the sanitary lift station to accommodate the increased sanitary flows from the Capitol Theatre, the Midway, and the Selkirk Hotel. This measure will reduce the likelihood of wet weather overflows from the lift station to the North Saskatchewan River. At the same time, consider replacing the aging pumps in the Lift Station, which will also serve to improve reliability of the station under high flow conditions where there is risk of overflow to the river.

Install a direct sanitary connection from the Capitol Theatre to the existing 250 mm sanitary sewer in 1920 Street.