CITY OF OTTAWA

LANSDOWNE PARK EVENT CENTRE OTTAWA, ON

SERVICING REPORT

SEPTEMBER 13, 2024
REVISION 1

LANSDOWNE PARK EVENT CENTRE
OTTAWA, ON

SERVICING STUDY

CITY OF OTTAWA

PROJECT NO.: CA0033920.1056
DATE: SEPTEMBER 13, 2024

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September 13, 2024

City of Ottawa

Attention: Sean Moore

Dear Sir:

Subject: Lansdowne 2.0 Event Centre Development for Site Plan Control Application

We are pleased to deliver this enclosed servicing report in support of the application for Site Plan Control for the subject Lansdowne 2.0 Phase 1 – New Event Centre. This report details the water and sanitary demands for the proposed development in coordination with the existing site and future phased works.

Should there be any questions or comments regarding this report, please do not hesitate to contact the undersigned.

Yours sincerely,

Winston Yang, P.Eng.
Lead Engineer – Technical Lead
Land Development & Municipal
Engineering, Ontario

WSP ref.: CA0033920.1056

SIGNATURES

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September 13th, 2024

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Date

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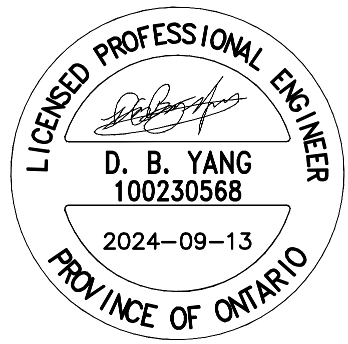

September 13th, 2024

Winston Yang, P.Eng., PMP
Lead Engineer – Technical Lead

Date

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1 GENERAL

1.1 EXECUTIVE SUMMARY

Following the Zoning By-Law Amendment submission in September 2023, the Lansdowne Park redevelopment project (Lansdowne 2.0) entered the Site Plan Control Application stage. WSP was again retained by the City of Ottawa to provide servicing, grading and stormwater management design services for the phase 1 (Event Centre) development of the project for Site Plan Control Application.

The Lansdowne site is home to many commercial, residential, and leisure facilities. This includes TD place Stadium, Aberdeen Pavilion, Horticultural Building, mixed-use retail/office/residential, and a subsurface parking lot. The overall site is approximately 15.4 ha, and borders Bank Street to the west, Holmwood Ave to the north, and Queen Elizabeth Drive to the south and east.

The overall proposed redevelopment of Lansdowne Park is divided into 3 phases: Phase 1 includes a new event centre and landscaping/south stands modifications, Phase 2 involves the reconstruction of the north stands and Grand Stairs, and Phase 3 is for a future commercial/residential block containing probably two residential towers and retail space. This report pertains to the overall infrastructure upgrades except watermain due to Lansdowne 2.0 redevelopment and specifically to Phase 1, the design of the Event Centre, Great Lawn, and other landscaping modifications. See Appendix A for the architectural design upon which this report is based.

The site is located in the City of Ottawa per the Topographic Sketch of Lansdowne Park dated June 2024 and completed by Stantec Geomatics Ltd. Based on the topographic survey, the site slopes from the existing berm to the great lawn and the swale on the south side of the site. The existing Lansdowne site has been previously developed to convey flow to various underground tanks and the existing Great Lawn for detention. The private storm network eventually discharges to a 1050mm storm sewer on O'Connor Street. And runoff will drain overland to the Queen Elizabeth Drive exceeding 100 year event.

Design of a drainage and stormwater management system in this development must be prepared in accordance with the following documents:

- Sewer Design Guidelines, City of Ottawa, October 2012;
- Stormwater Management Planning and Design Manual, Ministry of the Environment, March 2003; and
- Stormwater Management Facility Design Guidelines, City of Ottawa, April 2012

This report was prepared utilizing servicing design criteria obtained from the City of Ottawa and outlines the design for water, sanitary wastewater, and stormwater facilities, including stormwater management.

The format of this report matches that of the servicing study checklist found in Section 4 of the City of Ottawa's Servicing Study Guidelines for Development Applications, November 2009.

It is proposed that:

- On-site stormwater management systems, employing underground storage will be provided to attenuate flow rates leaving the site area to be redeveloped. Existing drainage patterns, previously established controlled flow rates and storm sewers will be maintained.
- The on-site storm and sanitary pipes will be re-routed around the proposed Event Centre and previously established conveyance patterns will be maintained.

1.2 DATE AND REVISION NUMBER

This version of the report is the second issue, dated September 13th, 2024.

1.3 LOCATION MAP AND PLAN

The proposed development is located at 1015 Bank Street, Ottawa, Ontario at the location shown in Figure 1-1 below.

Figure 1-1 Lansdowne Site Location

1.4 ADHERENCE TO ZONING AND RELATED REQUIREMENTS

The proposed property use will be in conformance with zoning and related requirements prior to approval and construction and is understood to be in conformance with current zoning.

1.5 PRE-CONSULTATION MEETINGS

Outstanding comments from the ZBLA stage and updated engineering comments were provided July 26, 2024. These comments are provided in Appendix A for reference.

1.6 HIGHER LEVEL STUDIES

The review for servicing has been undertaken in conformance with, and utilizing information from, the following documents:

- Ottawa Sewer Design Guidelines, Second Edition, Document SDG002, October 2012, City of Ottawa including:
    - Technical Bulletin ISDTB-2012-4 (20 June 2012)
    - Technical Bulletin ISDTB-2014-01 (05 February 2014)
    - Technical Bulletin PIEDTB-2016-01 (September 6, 2018)
    - Technical Bulletin ISDTB-2018-01 (21 March 2018)

- Technical Bulletin ISDTB-2018-04 (27 June 2018)

- Ottawa Design Guidelines – Water Distribution, July 2010 (WDG001), including:
  - Technical Bulletin ISDTB-2014-02 (May 27, 2014)
  - Technical Bulletin ISTB-2018-02 (21 March 2018)

- Stormwater Management Planning and Design Manual, Ontario Ministry of the Environment and Climate Change, March 2003 (SMPDM).

- Functional Servicing and Stormwater Management Report for Lansdowne Live Ottawa Sports and Entertainment Group, Project No. 09-378, January 2012, by DSEL.

- Stormwater Management Design Report for Lansdowne Urban Park, February 2012, by Stantec Consulting Ltd.

- Functional Servicing and Stormwater Management Study for Lansdowne Park Redevelopment 2.0, Project No. CA0000286.1662, September 2023, by WSP.

- Geotechnical Investigation – Proposed Event Centre Lansdowne Park Redevelopment, Report No. PG6655-1, May 2024, by Patterson Group.

- Fire Underwriters Survey, Water Supply for Public Fire Protection (FUS), 2020.

1.7 STATEMENT OF OBJECTIVES AND SERVICING CRITERIA

The objective of the site servicing is to meet the requirements for the proposed modification of the site while adhering to the stipulations of the applicable higher-level studies and City of Ottawa servicing design guidelines. The current phase of the site plan includes a new Event Centre building, a modified Great Lawn and south stands and other landscape features.

1.8 AVAILABLE EXISTING AND PROPOSED INFRASTRUCTURE

The site is currently serviced by a network of watermain, storm, and sanitary sewers constructed during the Lansdowne 1.0 redevelopment project completed between 2012 and 2015. The Sport and Entertainment Group provided an as-built services and grading plan after its completion, contained in Appendix A.

Based on the previous design information by DSEL and Stantec, portable water supply is available within the site, and there should be adequacy fire protection supply. The existing Lansdowne Park has a peak dry weather flow of 42.1 L/s and wet weather flow of 45.3 L/s. The existing minor storm system has been designed to convey all storms up to and including a 5-year storm event and detention up to and including a 100-year storm event has also been designed and provided on site with the use of existing subsurface tank and surface ponding within the existing Great Lawn.

Due to the placement of the Event Centre building and the modification to the Great Lawn area, it is proposed to internally reroute the on-site storm, sanitary and watermain infrastructure around the Event Centre footprint to service the redevelopment. In addition, it is proposed to flatten the Great Lawn in Lansdowne 2.0 and introduced a large new underground chamber that will be interconnected to the existing underground chamber to provide additional stormwater storage in place of the Great Lawn to accommodate the increased of imperviousness due to Lansdowne 2.0 redevelopment.

1.9 ENVIRONMENTALLY SIGNIFICANT AREAS, WATERCOURSES AND MUNICIPAL DRAINS

Rideau Canal is south to the Lansdowne site. From the previous design or the existing condition before Lansdowne 1.0 development, an outlet to the Rideau Canal exist. But the outlet to the Canal is no longer in used as per the current finding. And this outlet will be completely abandoned and removed to accommodate the changes for the proposed

Lansdowne 2.0 redevelopment. Thus the proposed changes to the site will not require any additional approvals or amendments to approvals pertaining to environmentally significant areas, watercourses or municipal drains.

1.10 CONCEPT LEVEL MASTER GRADING PLAN

As the design is being submitted for site plan approval, the grading plan has been developed for the Phase 1 modifications. The existing and proposed grading are shown on drawing C04 (Grading Plan). Existing grading information is based on the topographic survey of the site completed in June 2024. No changes in grading are proposed beyond the redevelopment area boundaries. The proposed grading plan confirms the feasibility of the proposed stormwater management system, drainage, soil removal and fills. The geotechnical investigation was completed in 2024 by Patterson Group. The grading along the redevelopment extents is proposed to meet the existing grade.

1.11 IMPACTS ON PRIVATE SERVICES

There are no existing domestic private services (septic system and well) located on the site. There are no neighbouring properties using private services.

The existing on-site storm, sanitary and watermain services will be re-routed around the Event Centre and connect back into the existing on-site systems just south of the Aberdeen Pavilion. The overall site drainage system will remain unaffected. The drainage areas around the modified Great Lawn will be modified based on the proposed grading and addition of a new underground storage chamber. Ultimately, all of the flows will still be conveyed through the same downstream on-site storm sewer system.

1.12 DEVELOPMENT PHASING

As previously mentioned, the redevelopment of Lansdowne 2.0 will be completed in 3 phases. This report focuses on phase 1 (New Event Centre, modified Great Lawn and surrounding landscaped areas). However, the civil design of storm conveyance, stormwater management and wastewater take into consideration the ultimate design/demands (i.e. all 3 phases are taking into account). Upgrading the existing watermain network for phase 1 and 2 is not anticipated since the domestic water demand for New Event Centre and New North Side Stands are pretty much the same compared to existing condition, and the fire flow is less than existing. For phase 3, hydraulic analysis for the watermain network might be considered depending on the detail design of future residential and commercial development.

1.13 GEOTECHNICAL STUDY

A geotechnical investigation report was previously prepared by Patterson Group. on May 30, 2024. No additional geotechnical information was required for the design of the modified site services, including paving. This geotechnical report will be included with the contract documents to be issued for construction, and the recommendations of the reports will be referenced in the construction specifications. The geotechnical study specifies a design recommendation based on a maximum groundwater elevation of 60.78m.

1.14 DRAWING REQUIREMENT

The engineering plans submitted for site plan approval will be in compliance with City requirements.

2 WATER DISTRIBUTION

2.1 CONSISTENCY WITH MASTER SERVICING STUDY AND AVAILABILITY OF PUBLIC INFRASTRUCTURE

Lansdowne Park resides within the City of Ottawa 1W Pressure Zone. Water supply is delivered to the subject property through existing 300mm on Bank Street, 400mm on Holmwood Ave and 200mm on Fifth Ave.

The existing on site 200mm watermain is proposed to be rerouted around the new addition (Event Centre) since it lays in the new addition's footprint. The Event Centre building's services (2 services will be required since the average day demands are greater than 50 m^3/day) are proposed to connect to the on-site 200mm watermain. The new Event Centre will be protected with a fully supervised and automatic fire protection system sprinkler system. The fire department connection is located near the main entrance on the north side of the building.

No changes are required to the existing City water distribution system to allow servicing for this property.

The Ottawa Sports and Entertainment Group have completed fire hydrant testing on site in September 2022. Table 2-1 summarizes the results of the hydrant testing. The associated hydrant testing results are located Appendix B.

Table 2-1: Fire Hydrant Testing Results

Hydrant Location	Color Code	Static Pressure (psi)	Dynamic Pressure (psi)	Pitot Pressure (psi)	Measured Flow (Gallons/min L/s)	Available Fire Flow at 20 psi (Gallons/min L/s)
Apartment Facing Field	Blue	68	62	39	875/55.0	2689/169.7
Back Entrance	Blue	70	62	44	929/58.6	2499/157.7
Behind Apartment (Bank St)	Blue	70	61	41	897/56.6	2264/142.8
Behind Apartment (Parkway)	Blue	70	62	38	863/54.5	2323/146.6
Box Office	Blue	68	62	42	908/57.3	2790/176.0
Cattle Castle	Blue	70	62	38	863/54.5	2323/146.6
Cineplex	Blue	66	61	38	863/54.5	2739/172.8
Filed Entrance*	Blue	70	60	39	875/55.2	2086/131.6
On Field*	Blue	70	62	43	918/57.9	2471/155.9
Goodlife	Blue	67	60	37	852/53.8	2382/150.3
Milestones	Blue	67	62	34	817/51.5	2739/172.8

Sporting Life	Blue	65	58	41	897/56.6	2450/154.6

*Fire hydrants proposed to meet the fire flow demands of the Event Centre.

2.2 SYSTEM CONSTRAINTS AND BOUNDARY CONDITIONS

The existing water supply network is shown on As-Built Site Servicing Plan C01003 by DSEL. Boundary condition from the Lansdowne 1.0 post development is summarized below. A conservative estimate for the required fire supply of 9,000 L/min (150 L/s) was used for the analysis. Table 2-2 summarizes the anticipated water demands and boundary conditions under existing conditions.

Table 2-2: Water Demand and Boundary Conditions Existing Conditions from DSEL's analysis

Design Parameter	Existing Demand (L/s)	Boundary Condition (Hydraulic m/kPa)
Average Daily Demand	11.8	115.6/481.7
Max Day + Fire Flow	19.9+150=169.9	106.4/391.4
Peak Hour	38.0	103.1/359.0

*Boundary conditions supplied by the City of Ottawa during Lansdowne 1.0. Assumed ground elevation 65.50m.

This report will mainly focus on Phase 1 and Phase 2 watermain conditions. Due to the lack of information for Phase 3, a hydraulic check should be conducted at the beginning of Phase 3 design to determine if modification to the existing watermain network is required.

A boundary request for the proposed Lansdowne 2.0 development for Phase 1 and 2 have been submitted to the City on September 5, 2024, based on the recent fire flows and domestic demands for the New Event Centre and North Side Stands. The purpose of this exercise is to ensure the pre and post water pressure are consistence from the existing water network.

Table 2-3 summarizes the anticipated Water Demand and Boundary Conditions under proposed conditions.

Table 2-3: Water Demand and Boundary Conditions Proposed Conditions

Design Parameter	Proposed Demand (L/s)	Boundary Condition 1 (Hydraulic m/kPa)	Boundary Condition 2 (Hydraulic m/kPa)
Average Daily Demand	12.3	114.6/481.4	114.6/465.7
Max Day + Fire Flow	20.8+150=170.8	107.7/413.7	106.3/383.3
Peak Hour	39.3	105.7/394.1	105.6/377.5

*Boundary conditions supplied by the City of Ottawa. Assumed ground elevation 65.50m at Connection 1 and 67.10m at Connection 2. See Appendix B for detail boundary condition.

As demonstrated in Table 2-2 and 2-3, the pressure range is similar during Maximum Day plus Fire Flow as well as Peak Hour demands. Therefore, the existing water supply is available per the design requirement and conforms to all relevant City Guidelines and Policies.

2.3 CONFIRMATION OF ADEQUATE DOMESTIC SUPPLY AND PRESSURE

Water demands are based on Table 4.2 of the Ottawa Design Guidelines – Water Distribution and existing information that was used in Lansdowne 1.0. A water demand calculation sheet is included in Appendix B, and the total water demands for the Event Centre and North Side Stands, and the ultimate condition are summarized as shown in Table 2-4, Table 2-5 and Table 2-6. Refer to Appendix B for detail existing demands calculation provided by DSEL and proposed demands calculation by WSP.

Table 2-4: Existing Water Demands and FUS for Civil Centre and North Stands

	Avg Day (L/s)	Max Day (L/s)	Peak HR (L/s)	FUS (L/s)
Ex. Civil Centre	1.9	2.9	5.2	150
Ex. North Stands	2.8	4.2	7.6	150

Table 2-5: Proposed Water Demands and FUS for New Event Centre and New North Stands

	Avg Day (L/s)	Max Day (L/s)	Peak HR (L/s)	FUS (L/s)
Event Centre*	2.6	3.9	7.0	83
New North Stands**	2.8	4.2	7.6	100

*7 L/s Maximum hourly flow for Event Centre as per Mechanical Recommendation.
**Domestic demands as per existing Lansdowne Park Building Service Summary by DSEL (Appendix B).

Table 2-6: Existing and Proposed Water Demands and FUS for Phase 1 and Phase 2.

	Avg Day (L/s)	Max Day (L/s)	Peak HR (L/s)	FUS (L/s)
Building A, B, C, D, G1, G2, H, I, J, J Salon, K, North Stands, South Stands, Civil Center, Aberdeen, Horticulture	11.8	19.9	38.0	150
Building A, B, C, D, G1, G2, H, I, K, **New North Stands**, South Stands, **Event Center**, Aberdeen, Horticulture	12.3	20.8	39.3	150***

***FUS as per existing Lansdowne Park Building Service Summary by DSEL (Appendix B) to be conservative.

The 2010 City of Ottawa Water Distribution Guidelines stated that the preferred practice for design of a new distribution system is to have normal operating pressures range between 345 kPa (50 psi) and 552 kPa (80 psi) under maximum daily flow conditions. Other pressure criteria identified in the guidelines are as follows:

Minimum Pressure	Minimum system pressure under peak hour demand conditions shall not be less than 276 kPa (40 psi)
Fire Flow	During the period of maximum day demand, the system pressure shall not be less than 140 kPa (20 psi) during a fire flow event.
Maximum Pressure	Maximum pressure at any point the distribution system shall not exceed 689 kPa (100 psi). In accordance with the Ontario Building/Plumbing Code, the maximum pressure should not exceed 552 kPa (80 psi). Pressure reduction controls may be required for buildings where it is not possible/feasible to maintain the system pressure below 552 kPa.

To demonstrate the proposed service connections are able to provide the required building fire sprinkler and peak hour demand, conservative approach has been taken into account that the watermain analysis would not be looped or interconnected. The residual pressure for the proposed building is calculated by subtracting the total headloss from the residual pressure measured on the two connections on Holmwood Ave and Bank Street from City Boundary Condition.

The flow capacity of a water pipe is commonly modelled by the Hazen-Williams equation to confirm the physical properties of the pipe and the pressure drop caused by friction:

$$V = 0.849 * C_{hw} * R^{(0.63)} * S^{(0.54)}$$

Where: V is Velocity

C_{hw} is the Hazen-Williams friction coefficient

R is the hydraulic radius

S is the slope of the energy line (head loss per length of pipe)

Residual pressure and pipe sizing check are summarized as shown in Table 2-7 and Table 2-8 in respect to the provided boundary condition. Refer to Appendix B for detail water services sizing and pressure analysis.

Table 2-7: Fire Service Pipe Sizing and Pressure Check for Event Centre and North Side Stand

	Event Centre		North Side Stand	
Boundary Condition	Connection 1	Connection 2	Connection 1	Connection 2
Max Day + Fire Flow (l/s)	87	87	104.2	104.2
Existing Residual Pressure (kPa)	414	383	414	383
Length (m)	395	415	360	125
Total Headloss (kPa)	189	182	223	81
Residual Pressure for Site (kPa)	225	201	190	303

Table 2-8: Domestic Service Pipe Sizing and Pressure Check for Event Centre and North Side Stand

	Event Centre		North Side Stand	
Boundary Condition	Connection 1	Connection 2	Connection 1	Connection 2
Peak Hour (l/s)	7	7	7.6	7.6
Existing Residual Pressure (kPa)	394	378	394	378
Length (m)	395	415	360	125
Total Headloss (kPa)	19	4	7	5
Residual Pressure for Site (kPa)	375	374	388	372

The minimum water pressure inside the building at the connection is determined with the minimum HGL condition, resulting in a pressure of 374 kPa for Event Centre and 372 kPa for North Side Stand which exceed the minimum requirement of 276 kPa per the guidelines.

Fire flow pressure at building connection is determined with the max day + fire HGL condition resulting in a pressure of 201 kPa for Event Centre and 190 kPa for North Side Stand which exceed the minimum requirement of 140 kPa during a fire flow event.

And based on the on-site hydrant flow test, the residual pressures of both hydrants that will be used to service the Event Centre (Field Entrance and On Field) are 414 kPa and 427 kPa, respectively. Thus, the hydrants meet the requirements for minimum system pressure. The measured hydrant flow at 20 psi were 2086 gpm (131.6 l/s) and 2471 gpm (155.9 l/s), respectively, which is greater than the existing hydrant maximum rating of 95 L/s.

2.4 CONFIRMATION OF ADEQUATE FIRE FLOW PROTECTION

The fire flow rate has been calculated using the Fire Underwriters Survey (FUS) method. The method takes into account the type of building construction, the building occupancy, the use of sprinklers and the exposures to adjacent structures.

Assuming fire resistive construction for North Side Stands and Event Centre and a fully supervised sprinkler system, the following have been determined: Fire flow demand of 6,000 l/min (100 l/s) for the North Side Stands and fire flow demand of 5,000 l/min (83 l/s) for the Event Centre. Copies of the FUS calculation sheets are included in Appendix B.

The existing available fire flow for the nearby private hydrants at 140 kPa range from 131.6 l/s to 176.0 l/s. Each proposed building can be serviced by two or more existing fire hydrants. The combined available fire flow exceeds the required fire flow by FUS for each proposed building.

And the boundary condition for Maximum Day and Fire Flow results from Table 2-7 in a pressure of 199 kPa at the ground floor level for Event Centre and 190 kPa for North Side Stand. In the guidelines, a minimum residual pressure of 140 kPa must be maintained in the distribution system for a fire flow and maximum day event. As a pressure of 199 kPa and 190 kPa is achieved, the fire flow requirement is exceeded.

The existing fire hydrants that will be used to meet the required fire flow demand of 5,000 l/min (83 l/s) are located at the Field Entrance and On Field as listed on Table 2-1. These two hydrants are proposed to be slightly shifted to accommodate the new Event Centre footprint and the proposed rerouted servicing. These 2 hydrants can provide up to 95 l/s with a combined total of 190 l/s which is greater than the FUS demand for the Event Centre. Therefore, the watermain system will have adequate capacity to service the new Event Centre and North Side Stand.

2.5 CHECK OF HIGH PRESSURE

High pressure is not a concern.

Water pressure at building connection (at average day) check:

Max. HGL – Finished floor elevation = 114.6m – 67.3m = 47.3m = 463.7 kPa

The maximum water pressure inside the Event Centre at the connection is determined with the maximum HGL condition, resulting in a pressure of 463.7 kPa which is less than the 552 kPa threshold in the guideline in which pressure control is required. Based on this result, pressure control is not required for the building.

2.6 PHASING CONSTRAINTS

There will be three different phases for the Lansdowne 2.0 redevelopment. Phase 1 and 2 will be the new Event Centre and North Side Stand. Phase 3 will be the Air Rights residential tower and commercial podium. The design condition for Phase 1 and 2 is used for design consideration on this report. No on site and off-site upgrade is required. For the ultimate condition include the future residential tower and commercial area, further hydraulic analysis is recommended.

2.7 RELIABILITY REQUIREMENTS

Existing shut off valves will remain as per existing conditions. Additional shut off valves have been provided on the domestic services connecting to the Event Centre.

2.8 NEED FOR PRESSURE ZONE BOUNDARY MODIFICATION

There is no need for a pressure zone boundary modification.

2.9 CAPABILITY OF MAJOR INFRASTRUCTURE TO SUPPLY SUFFICIENT WATER

The capability of the major infrastructure to supply sufficient water is confirmed.

2.10 DESCRIPTION OF PROPOSED WATER DISTRIBUTION NETWORK

The existing on-site network is proposed to be rerouted around the Event Centre and will be connected back onto the existing on-site watermain. New domestic services connecting to the on-site watermain is proposed to connect to the new Event Centre. Two private hydrants will be slightly shifted to accommodate the Event Centre footprint and watermain rerouting. The overall site will continue to be serviced through existing 400mm and 200mm diameter watermains on Holmwood Avenue and Bank Street.

2.11 OFF-SITE REQUIREMENTS

No off-site improvements to watermains, feedermains, pumping stations, or other water infrastructure are required to maintain existing conditions and service the adjacent developments.

2.12 CALCULATION OF WATER DEMANDS

Water demands were calculated as described in Sections 2.3 and 2.4 above.

2.13 MODEL SCHEMATIC

The water works for phases 1 and 2 consist only a dual building services, the proposed condition are exactly the same as existing, a model schematic is not required for this development.

3 WASTEWATER DISPOSAL

3.1 DESIGN CRITERIA

In accordance with the City of Ottawa's Sewer Design Guidelines, the following design criteria have been utilized in order to predict wastewater flows generated by the subject site and complete the sewer design.

• Minimum Velocity	0.6 m/s
• Maximum Velocity	3.0 m/s
• Manning Roughness Coefficient	0.013
• Total est. hectares commercial and residential use	15.4
• Average residential daily flow	280 L/cap/day
• Average sanitary flow for institutional use	28,000 L/Ha/day
• Commercial/Institutional Peaking Factor	1.5
• Infiltration Allowance (Total)	0.33 L/Ha/s
• Minimum Sewer Slopes – 200 mm diameter	0.32%

The area of 15.4 ha represents the lot area of the Lansdowne Park. This is the sanitary collection area that is being considered to contribute to the existing 600mm trunk sanitary sewer along Holmwood Ave.

3.2 CONSISTENCY WITH MASTER SERVICING STUDY

The outlet for the sanitary service from the proposed buildings is the 375 mm diameter private sewer. The Ottawa Sewer Design Guidelines provide estimates of sewage flows based on residential development.

The criteria to determine anticipated actual peak flow based on site used as described in Ottawa Sewer Design Guidelines Appendix 4-A are described in the sanitary sewer design sheet in Appendix C.

The contributing flows for the north stands, south stands and the Event Centre are based on the DSEL sanitary design sheet and Building Service Summary for Lansdowne Park (also found in Appendix C). The new Event Centre is assumed to provide 5.2 l/s of sanitary flow.

The proposed Lansdowne 2.0 increases the peak dry weather flow from 42.1 l/s to 48.92 l/s. Under wet weather flow condition, the peak discharge is also increased from 45.3 l/s to 53.54 l/s.

3.3 REVIEW OF SOIL CONDITIONS

There are no specific local subsurface conditions that suggest the need for a higher extraneous flow allowance. Soil conditions have been reviewed by Patterson Group. Bedding and backfill will be provided as recommended, conventional sewer materials will be utilized, and dewatering will be undertaken as necessary in accordance with the geotechnical recommendations and conditions encountered. The geotechnical study specifies a design recommendation based on a maximum groundwater elevation of 60.78m. Therefore, groundwater should not be an issue for the sanitary network.

3.4 DESCRIPTION OF EXISTING SANITARY SEWER

The subject site lies within the Rideau River Interceptor catchment. The existing development is serviced by a 600mm diameter sanitary trunk sewer on Holmwood Street. The existing peak wastewater flow rates have been determined employing City guidelines based on building type and usage. The anticipated dry weather peak wastewater discharge from the site is 42.1 l/s while the wet weather peak is 45.3 l/s. The peak discharge from the development assumes that both the retail and stadium will be operating at maximum capacity. The existing sanitary design sheet is found in Appendix C.

3.5 VERIFICATION OF AVAILABLE CAPACITY IN DOWNSTREAM SEWER

The capacity of the downstream 375 mm diameter private sewer from existing sanitary manhole 7 to existing sanitary manhole 6 has 67.91 l/s capacity with slope at 0.15%, which is adequate for the flow assumptions from the proposed addition as noted above. The servicing pipe capacity is capable to handle the estimated peak sanitary flow rate of 53.54 l/s for the site include both existing and proposed. Please refer to sanitary sewer design sheet in Appendix C.

3.6 CALCULATIONS FOR NEW SANITARY SEWER

The new sanitary network consists of varying pipe sizes and slopes. The downstream pipe size that conveys all the combined wastewater flows from the site is a 375 mm diameter sewer at a minimum slope of 0.15%. This size and slope of sewer provides a capacity of 67.91 l/s.

For the subject area, the post-development sanitary peak flow is calculated at a total flow of 53.54 l/s. Both the proposed and existing sanitary sewers will have adequate capacity to convey this flow. Refer to Appendix C for the sanitary design sheet for details.

3.7 DESCRIPTION OF PROPOSED SEWER NETWORK

The proposed sanitary sewer network on site will consist of a sanitary network of varying sized pipes ranging from 250mm to 375mm and ten 1200mm maintenance holes. The proposed sanitary network function to reroute the existing sanitary network around the Event Centre footprint and eventually connect back into the existing network.

3.8 ENVIRONMENTAL CONSTRAINTS

There are no previously identified environmental constraints that impact the sanitary servicing design in order to preserve the physical condition of watercourses, vegetation, or soil cover, or to manage water quantity or quality.

3.9 PUMPING REQUIREMENTS

The proposed development will have no impact on existing pumping stations and will not require new pumping facilities.

3.10 FORCEMAINS

There are no sanitary forcemains proposed on this site.

3.11 EMERGENCY OVERFLOWS FROM SANITARY PUMPING STATIONS

No sanitary pumping stations are proposed on this site.

3.12 SPECIAL CONSIDERATIONS

There is no known need for special considerations for sanitary sewer design related to existing site conditions.

4 SITE STORM SERVICING

4.1 EXISTING CONDITION

The existing conditions on the Lansdowne site are as designed in the Stantec Stormwater Management Design Report – Lansdowne Urban Park (2012). The primary site stormwater outlet is to the storm sewer on O'Connor Street, which discharges to a combined sewer at the intersection with Fifth Street. During large storm events (i.e. exceeding 100-year return period) runoff is directed to the Rideau Canal through an overflow pipe and overland.

The existing stormwater management system consists of two subsurface storage tanks, surface storage on the Great Lawn, outlet controls, and quality control structures. The two underground storage tanks provide 600 m^3 in Basin 1 and 2200 m^3 in Basin 2, with 700 m^3 provided in pipe storage (total of 3500 m^3 subsurface storage). A minimum storage volume of 3000 m^3 is also provided on the surface of the Great Lawn.

Based on the design criteria identified in the Stantec 2012 report (as per the OSDG 8.3.7.2 design criteria), the allowable release rate has been set to 616 l/s to O'Connor Street for all events from the 2-year to the 100-year return period.

4.2 ANALYSIS OF AVAILABLE CAPACITY IN PUBLIC INFRASTRUCTURE

As the allowable release rate from the site will be unchanged and was determined in conjunction with the design of the public infrastructure, there are no concerns related to the adequacy and available capacity of the downstream network. Capacity in the minor system is not a concern.

4.3 DRAINAGE DRAWING

Drawing C105A/C105B shows the detailed site sewer network. Drawings C104 provides proposed grading and drainage and includes existing grading information. Drawing C07 provides post-development drainage areas. Site sub-area information is also provided on the storm sewer design sheet attached in Appendix C. Drainage patterns and storm sewers outside of the study limits are to remain per the existing condition.

4.4 WATER QUANTITY CONTROL OBJECTIVE

Refer to the Stormwater Management Report for the water quantity objective for the site.

4.5 WATER QUALITY CONTROL OBJECTIVE

On-site quality control measures are expected for the proposed development per the previous studies. Stormwater shall be treated to MOE enhanced protection (80% TSS removal of suspended solids). The 80% TSS removal will be provided from the Stormtech chamber via an OGS unit at STMH201. Most of the runoff from the redeveloped area going to the chambers comes from grassed areas, Event Centre roof, and other pedestrian/landscaped areas and thus the runoff is considered clean.

4.6 DESIGN CRITERIA

The stormwater system was designed following the principles of dual drainage, making accommodation for both major and minor flow.

Some of the key criteria include the following:

• Design Storm (minor system)	1:5-year return (Ottawa)
• Rational Method Sewer Sizing	
• Initial Time of Concentration	10 minutes
• Runoff Coefficients	
o Landscaped Areas	C = 0.20
o Asphalt/Concrete	C = 0.90
o Traditional Roof	C = 0.90
• Pipe Velocities	0.80 m/s to 6.0 m/s
• Minimum Pipe Size	250 mm diameter (200 mm CB Leads and service pipes)

4.7 PROPOSED MINOR SYSTEM

Under proposed conditions the majority of the site land use remains as it is under existing conditions, except for the new Event Centre with a traditional roof. The new event centre requires some rerouting of storm sewers and encroaches on the surface storage previously provided in the Great Lawn. The proposed design involves routing storm sewers south of the new Event Centre and installing subsurface storage beneath the Great Lawn to account for the additional storage required from the change in land use and elimination of storage available on the surface.

The subject site will be serviced by a storm sewer system designed in accordance with the amendment to the storm sewer and stormwater management elements of the Ottawa Design Guidelines. The minor system has been designed to convey the 5-year storm without ponding on the surface. Storm sewer design sheets are included in Appendix C.

The site outlets remain the same as they are in existing conditions. The primary outlet is to O'Connor Street to the north. During large storm events exceeding 100-year, runoff is directed to the Rideau Canal overland.

The major system will remain similar to how it is in existing conditions. The site is graded toward the Great Lawn where catch basins and trench drain around the perimeter will intercept overland runoff and direct it to the proposed underground storm chamber under the Great Lawn. Runoff within the Great Lawn will also be first intercepted by the subdrain along the perimeter, excess runoff that absorbed by the grass medium will also be intercepted by the weeper of the underground chamber down at the bottom, and ultimately directed to the piping system. Emergency overland flow is directed toward the Rideau Canal during extreme events exceeding the 100-year design storm.

4.8 STORMWATER MANAGEMENT

Refer to the Stormwater Management Report.

4.9 INLET CONTROLS

Refer to the Stormwater Management report.

4.10 ON-SITE DETENTION

Refer to the Stormwater Management report.

4.11 WATERCOURSES

There will be no modification to watercourses as a result of this proposed site plan.

4.12 PRE AND POST DEVELOPMENT PEAK FLOW RATES

Pre and post development peak flow rates have been noted in the Stormwater Management Report.

4.13 DIVERSION OF DRAINAGE CATCHMENT AREAS

There will be no diversion of existing drainage catchment areas arising from the proposed work described in this report.

4.14 DOWNSTREAM CAPACITY WHERE QUANTITY CONTROL IS NOT PROPOSED

This checklist item is not applicable to this development as quantity control is provided.

4.15 IMPACTS TO RECEIVING WATERCOURSES

No significant negative impact is anticipated to downstream receiving watercourses due to proposed quantity and quality control measures.

4.16 MUNICIPAL DRAINS AND RELATED APPROVALS

There are no municipal drains on the site or associated with the drainage from the site.

4.17 MEANS OF CONVEYANCE AND STORAGE CAPACITY

The means of flow conveyance and storage capacity are described in Sections 4.7, 4.8, 4.9 and 4.10 above.

4.18 HYDRAULIC ANALYSIS

Hydraulic calculations for the site storm sewers are provided in the storm sewer design sheet.

4.19 IDENTIFICATION OF FLOODPLAINS

There are no designated floodplains on the site of this development.

4.20 FILL CONSTRAINTS

There are no known fill constraints applicable to this site related to any floodplain. The site is generally being raised higher relative to existing conditions.

5 SEDIMENT AND EROSION CONTROL

5.1 GENERAL

During construction, existing storm sewer system can be exposed to sediment loadings. A number of construction techniques designed to reduce unnecessary construction sediment loadings will be used including:

- Silt sacks will remain on open surface structures such as manholes and catchbasins until these structures are commissioned and put into use.
- Installation of silt fence, where applicable, around the perimeter of the proposed work area.
- The installation of straw bales within existing drainage features surround the site.
- Bulkhead barriers will be installed in the outlet pipes.

During construction of the services, any trench dewatering using pumps will be fitted with a “filter sock.” Thus, any pumped groundwater will be filtered prior to release to the existing surface runoff. The contractor will inspect and maintain the filter sock as needed including sediment removal and disposal.

All catchbasins, and to a lesser degree, manholes, convey surface water to sewers. Consequently, until the surrounding surface has been completed, these structures will be covered to prevent sediment from entering the minor storm sewer system. These measures will stay in place and be maintained during construction and build-out until it is appropriate to remove them.

During construction of any development both imported and native soils are placed in stockpiles. Mitigative measures and proper management to prevent these materials entering the sewer system are needed.

During construction of the deeper watermains and sewers, imported granular bedding materials are temporarily stockpiled on site. These materials are however quickly used up and generally placed before any catchbasins are installed.

Refer to the Erosion and Sedimentation Control Plan (drawing C06) provided in Appendix D.

6 APPROVAL AND PERMIT REQUIREMENTS

6.1 GENERAL

The proposed development is subject to site plan approval.

No approvals related to municipal drains are required.

No permits or approvals are anticipated to be required from the Ontario Ministry of Transportation, National Capital Commission, Parks Canada, Public Works and Government Services Canada, or any other provincial or federal regulatory agency.

7 CONCLUSION CHECKLIST

7.1 CONCLUSIONS AND RECOMMENDATIONS

It is concluded that the proposed development can meet all provided servicing constraints and associated requirements. It is recommended that this report be submitted to the City of Ottawa in support of the application for site plan approval.

7.2 COMMENTS RECEIVED FROM REVIEW AGENCIES

The outstanding comments from the ZBLA stage and preliminary review have been addressed. Further comments will be provided after the complete review. This is the revision 1 of the report.

APPENDIX

A

- CITY AND NCC COMMENTS
- LANSDOWNE CIVIL DRAWINGS - STANTEC
- CONCEPTUAL ARCHITECTUAL PLAN
- AS-BUILT DRAWINGS
- TOPOGRAPHICAL SURVEY PLAN

ZBLA/OPA Comments to be Addressed During Site Plan Control Application

1. In addition to the above comment please see the previous comment from the ZBLA/OPA review regarding the underground storm water storage facility.

   Geotechnical comments Section 5.8 states the following "It is understood that an underground stormwater infiltration tank system will be included as part of the proposed development. The tank is expected to be founded on a combination of in-situ, undisturbed silty sand/sandy silt and sandy fill. Based on the above, a bearing resistance value for the proposed structure may be considered to be 120 kPa (SLS) and a factored bearing resistance value at ULS of 180 kPa may be considered for the system and associated infrastructure/structures."

   Please provide rational to how the subsurface soil data was determined. Based on the City guidelines we believe that an additional borehole be performed to determine the bearing capacity for the proposed storage tank.

   The above comment remains outstanding, please revise the report to include information addressing the foundation design of the under-ground storm storage cistern. The geotechnical design should include discussion regarding the elevation of ground water table in relation to the underside of footing of the storage facility and how this may affect the design.

   It is understood that the Great Lawn subsurface profile includes contaminated soil, the geotechnical report should speak to the contamination and any potential mitigation measures that may be required to ensure that migration of the contamination does not enter the underground storage facility.

2. Outstanding comments from ZBLA/OPA

   a. Storm Water Management Modeling:

      Please see comments from City of Ottawa Asset Management Branch regarding the storm water management model reviewed during the ZBLA and OPA. Comments were not addressed at the ZBLA and OPA, it is assumed that comments would be addressed during SPC.

      In summary, the modeling approach appears overly generalized as it lacks detailed consideration of the primary system. Assumptions are made regarding the flow being directed solely into the minor storage system, without sufficient clarity on the management of overland drainage. Potential issues arising from overland drainage remain unaddressed. While the approach is conservative regarding the minor system's storage and release rates, certain key factors are overlooked.

Of note, external areas draining onto the site, as evidenced by the GIS Stream Builder snapshot provided, are not accounted for. Additionally, the current design indicates flow into the canal during a 5-year storm event, contrary to the presented model. It's worth noting that our authorization allows for controlled releases into the canal up to a specified rate, as outlined in the previous report. Leveraging this authorization could be beneficial.

Further detailed comments are available below. It may be prudent to arrange a meeting with the consultant to articulate these concerns effectively.

Existing model

a) There are IDs for the storm network based on city sources. Please use appropriate storm IDs and info to reflect the existing system. This will give us ease to review model files and documents.

b) Storage node at Great lawn can be defined by a storage curve as opposed to a constant value of 8150. Not sure where does it come from?

c) CB contributions in many areas are missing. Please consider CB captures where appropriate. For example, A3 subcatchment at TD place stadium– there are CBs within it, require assigning all CB captures to the minor system, and then excess runoff will travel to further downstream, similarly for A2, A4 etc.

d) All underground storage areas need to be clearly shown on a map/drawing or in the model. At basin2 node for underground storage, DICB needs to be included. Also confirm the existence of 450 mm dia backflow preventor. I don't see any orifice control at that location as per drawing. Also, not sure how DICB, orifice and underground reservoir are connected to what?

e) Area or catchbasin capture should be assigned at the beginning of the node, otherwise the system will lose its actual contributions, for example OPGG and Great lawn area/TD place stadium areas etc.

f) At J19 node, this is used as a ponding location but no area is being assigned to that.

g) Excess flow to Rideau Canal operating level at El 64.1 during a 5 year is 480 l/s (DSEL) after surcharging on-site, but WSP shows a 0.0 l/s during a 5 year (WSP). Appears to be quite different than previous findings. Please explain.

h) Some external area (from the area in between of Clarey and Holmwood) for overland flow contribution may require including in the model and eventually drains to the Great lawn area as per city streambuilder.

i) Please show the extent of ponding in the Great Lawn area.

j) Major system modelling is kind of unclear. The major systems were modelled by weir, looks like everything is drained to the minor system first before overflowing to the next segment. Should be other way around, yes/no?

k) As per Stantec schematic, 2x900 mm overflow from Basin 2 is connected to Great lawn area. This is not reflected in the existing model.

Proposed New Arena

l) The proposed system for the new arena was not properly modelled as per functional drawing. Also, the drawing info in the Great Lawn area is not clear or labelled to follow the model files.

m) The proposed pipe segment that connects to the existing outlet pipe to Rideau Canal should be included in the model.

n) Basin 1 connecting to J32 was modelled a bit differently though the pre and post remains the same. What’s the reason behind it where water comes in and out of Basin1 node in the proposed condition?

o) The existing system (C8, C9, C11, C12) model should be in the proposed model as pipe storage as well unless these are proposed to be retired as per functional drawing. Please confirm

p) Flow releasing to Rideau Canal was controlled by a orifice plate. This is not found in the existing model or in the drawing. Please confirm or show on a drawing for consistency.

q) What size of underground storage facility is required instead of surface storage at Great lawn (basin3 node) if it is for recreational use? Modeling this storage node should be consistent with other underground storage curves. How many CBs are required to immediate capture flows to the proposed underground system to avoid ponding ? Require to include in the model as well.

Additional modeling comments post meeting on Monday 22nd 2024

3. WSP to confirm in the body of the servicing report that external flow from neighboring properties will not spill onto the Lansdowne property during the 100year event and below.
4. The major system needs to be included in the model to confirm flooding on the street.
5. Please provide pipe loss coefficients to the model.
6. My idea is that the **Rideau canal outlet** functions as an emergency flow. If the proposed great lawn storage is popped up by chance for the 100 year storm and above, then you may need an emergency exit. Please confirm the feasibility of decommissioning the Rideau Canal outfall. Note that this has been there for many years.
7. At node 40 linked to Basin2, please check the flow continuity at these locations.
8. Assuming the existing perforated system will be replaced by Great Lawn storage tank, still you may need some catch basins to capture local flows to the tank.

Comments:

9. Stormwater Management Quantity and Quality Criteria

   It is assumed that the stormwater management criteria for the subject site, is to follow the recommendations of the Functional Servicing and Stormwater

Management Study prepared by WSP May 25, 2023, which was based on the design criteria as identified in the Stantec Stormwater Management Design Report – Lansdowne Urban Park (2012) as per OSDG 8.3.7.2. Design criteria are as follows:

a. Peak flow rate of 616 L/s to O'Connor Street sewer for all events from the 2-year to the 100-year return period

b. Stormwater shall be treated to MOE "enhanced" standard (80% TSS removal)

c. The "first flush" (i.e. 10mm event) shall be directed to the O'Connor Street sewer for the entire site drainage area.

d. The 600mm pipe to the Rideau Canal may be used as an overflow, with a peak flow of 480 L/s once the water level is above the operating level of the canal (64.08 m).

e. Outflow to O'Connor Street Sewer will be restricted if the downstream system surcharges and will be cut off when the receiving sewer HGL is higher than the onsite HGL.

f. Minor system shall be design for a 5-year level of service with minimal surface ponding.

g. Major system shall provide a 100-year level of service while minimizing outflow to the canal.

h. The 5-yr storm event using the IDF information derived from the Meteorological Services of Canada rainfall data, taken from the MacDonald Cartier Airport, collected 1966 to 1997.

i. For separated sewer system built pre-1970 the design of the storm sewers are based on a 2 year storm.

j. The pre-development runoff coefficient or a maximum equivalent 'C' of 0.5, whichever is less (§ 8.3.7.3).

k. A calculated time of concentration (Cannot be less than 10 minutes).

l. Flows to the storm sewer in excess of the 5-year storm release rate, up to and including the 100-year storm event, must be detained on site.

10. Deep Services (Storm, Sanitary & Water Supply)

a. Provide existing servicing information and the recommended location for the proposed connections. Services should ideally be grouped in a common trench to minimize the number of road cuts.

b. Connections to trunk sewers and easement sewers are typically not permitted.

c. Provide information on the monitoring manhole requirements – should be located in an accessible location on private property near the property line (ie. Not in a parking area).

d. Review provision of a high-level sewer.

e. Sewer connections to be made above the springline of the sewermain as per:

   i. Std Dwg S11.1 for flexible main sewers – connections made using approved tee or wye fittings.

   ii. Std Dwg S11 (For rigid main sewers) – lateral must be less that 50% the diameter of the sewermain,

   iii. Std Dwg S11.2 (for rigid main sewers using bell end insert method) – for larger diameter laterals where manufactured inserts are not available; lateral must be less that 50% the diameter of the sewermain,

   iv. When the connection is to rigid main sewers where the lateral exceeds 50% the diameter of the sewermain connection via Maintenance hole is required. – Connect obvert to obvert with the outlet pipe.

   v. No submerged outlet connections.

11. Water Boundary condition requests must include the location of the service (map or plan with connection location(s) indicated) and the expected loads required by the proposed development, including calculations. Please provide the following information:

Location of service

Type of development and the amount of fire flow required (as per FUS).

Average daily demand: ___ l/s.

Maximum daily demand: ___l/s.

Maximum hourly daily demand: ___ l/s.

Please **review Technical Bulletin ISTB-2018-02**, maximum fire flow hydrant capacity is provided in Section 3 Table 1 of Appendix I. A **hydrant coverage**

figure shall be provided and **demonstrate there is adequate fire protection for the proposal**.

[*Fire flow demand requirements shall be based on* ***ISTB-2021-03***] *Exposure separation distances shall be defined on a figure to support the FUS calculation and required fore flow (RFF).*

Hydrant capacity shall be assessed to demonstrate the RFF can be achieved. Please identify which hydrants are being considered to meet the RFF on a fire hydrant coverage plan as part of the boundary conditions request.

12. An MECP Environmental Compliance Approval **[Industrial Sewage Works or Municipal/Private Sewage Works]** will be required for the proposed development. Please contact the Ministry of the Environment, Conservation and Parks, Ottawa District Office to arrange a pre-submission consultation:

    a. Charlie Primeau at (613) 521-3450, ext. 251 or Charlie.Primeau@ontario.ca

    b. Emily Diamond at (613) 521-3450, ext. 238 or Emily.Diamond@ontario.ca

13. Water

    As per ISTB-2021-03, Industrial, commercial, institutional service areas with a basic day demand greater than 50 m^3/day and residential areas serving 50 or more dwellings shall be connected with a minimum of two watermains, separated by an isolation valve, to avoid the creation of a vulnerable service area. Individual residential facilities with a basic day demand greater than 50 m3/day shall be connected with a minimum of two water services, separated by an isolation valve, to avoid the creation of a vulnerable service area.

14. Sewer (sanitary and storm)

    a. Sanitary sewer capacity, Please provide the new Sanitary sewer discharge and we confirm if sanitary sewer main has the capacity.

    b. Sanitary sewer monitoring maintenance hole is required to be installed at the property line (on the private side of the property) as per City of Ottawa Sewer-Use By-Law 2003-514 (14) *Monitoring Devices*.

    c. A storm sewer monitoring maintenance hole is required to be installed at the property line (on the private side of the property) as per City of Ottawa Sewer-Use By-Law 2003-514 (14) *Monitoring Devices*.

15. Stormwater

a. Underground Storage: Please note that the Modified Rational Method for storage computation in the Sewer Design Guidelines was originally intended to be used for above ground storage (i.e. parking lot) where the change in head over the orifice varied from 1.5 m to 1.2 m (assuming a 1.2 m deep CB and a max ponding depth of 0.3 m). This change in head was small and hence the release rate fluctuated little, therefore there was no need to use an average release rate.

   When underground storage is used, the release rate fluctuates from a maximum peak flow based on maximum head down to a release rate of zero. This difference is large and has a significant impact on storage requirements. **We therefore require that an average release rate equal to 50% of the peak allowable rate shall be applied to estimate the required volume. Alternatively, the consultant may choose to use a submersible pump in the design to ensure a constant release rate.**

   In the event that there is a disagreement from the designer regarding the required storage, The City will require that the designer demonstrate their rationale utilizing dynamic modelling, that will then be reviewed by City modellers in the Water Resources Group.

   Provide information on type of underground storage system including product name and model, number of chambers, chamber configuration, confirm invert of chamber system, top of chamber system, required cover over system and details, interior bottom slope (for self-cleansing), chart of storage values, length, width and height, capacity, entry ports (maintenance) etc. UG storage to provide actual 2- and 100-year event storage requirements.

   In regard to all proposed UG storage, ground water levels (and in particular HGW levels) will need to be reviewed to ensure that the proposed system does not become surcharged and thereby ineffective.

   Modeling can be provided to ensure capacity for both storm and sanitary sewers for the proposed development by City's Water Distribution Dept. – Modeling Group, through PM and upon request.

b. **If rooftop control** and storage is proposed as part of the SWM solutions sufficient details (Cl. 8.3.8.4) shall be discussed and document in the report and on the plans. Roof drains are to be connected downstream of any incorporated ICDs within the SWM system and not to the foundation drain system. Provide a **Roof Drain Plan** as part of the submission.
c. Please note that the minimum orifice dia. for a plug style **ICD is 83mm and the minimum flow rate from a vortex ICD is 6 L/s** in order to reduce the likelihood of plugging.
d. Quality Control Stormwater shall be treated to MOE "enhanced" standard (80% TSS removal)

e. The “first flush” (i.e. 10mm event) shall be directed to the O’Connor Street sewer for the entire site drainage area.

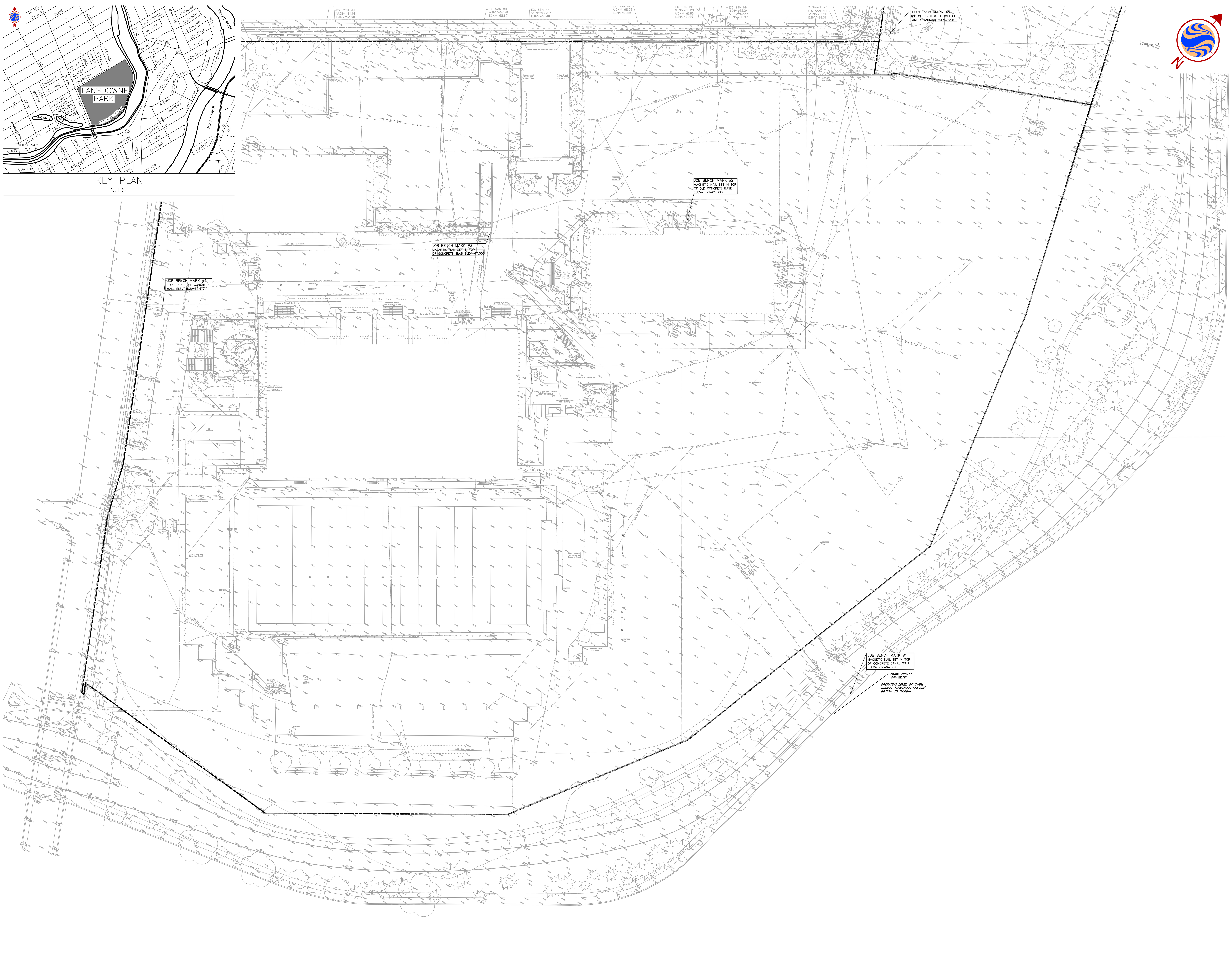
f. Document how any foundation drainage system will be integrated into the servicing design and show the positive outlet on the plan. Foundation drainage is to be independently connected to sewer main unless being pumped with appropriate back up power, sufficient sized pump and back flow prevention. **It is recommended that the foundation drainage system be drained by a sump pump connection to the storm sewer to minimize risk of basement flooding as it will provide the best protection from the uncontrolled sewer system compared to relying on the backwater valve.**

16. Grading

Post-development site grading shall match existing property line grades to minimize disruption to the adjacent residential properties. A **topographical plan of survey** shall be provided as part of the submission and a note provided on the plans.

r) Are these extracted values from the model shown in Table 4-3? Please explain. Also, for comparison available storage can be added in the table.

s) Detailed info in the model should be laid on a drawing to follow, for example J30, J31 and so on. Also, show a separate drawing sheet for post development condition only for clarity.



CLIENT PARTNERSHIP

Ottawa

OSEG
Ottawa Sports and Entertainment Group

CONSULTANT TEAM

CANNONDESIGN
AN IDEAS BASED PRACTICE

CORUSH SUNDERLAND WRIGHT

DSEL
david schaeffer engineering ltd
SMART SUBDIVISIONS

GreenbergFarrow

Stantec

PHILLIPS FAREVAAG SMALLENBERG
PLANNING + URBAN DESIGN
LANDSCAPE ARCHITECTURE

REVISIONS

No.	Date	Details	By
1	2011-11-21	ISSUED TO CITY FOR REVIEW	JVG
2	2011-12-12	REVISED AS PER CITY COMMENTS	JVG
3	2012-01-11	REVISED AS PER COORDINATION WITH DSEL	JVG
4	2012-01-26	REVISED AS PER CITY COMMENTS	JVG

0 6 18 30m
1:600

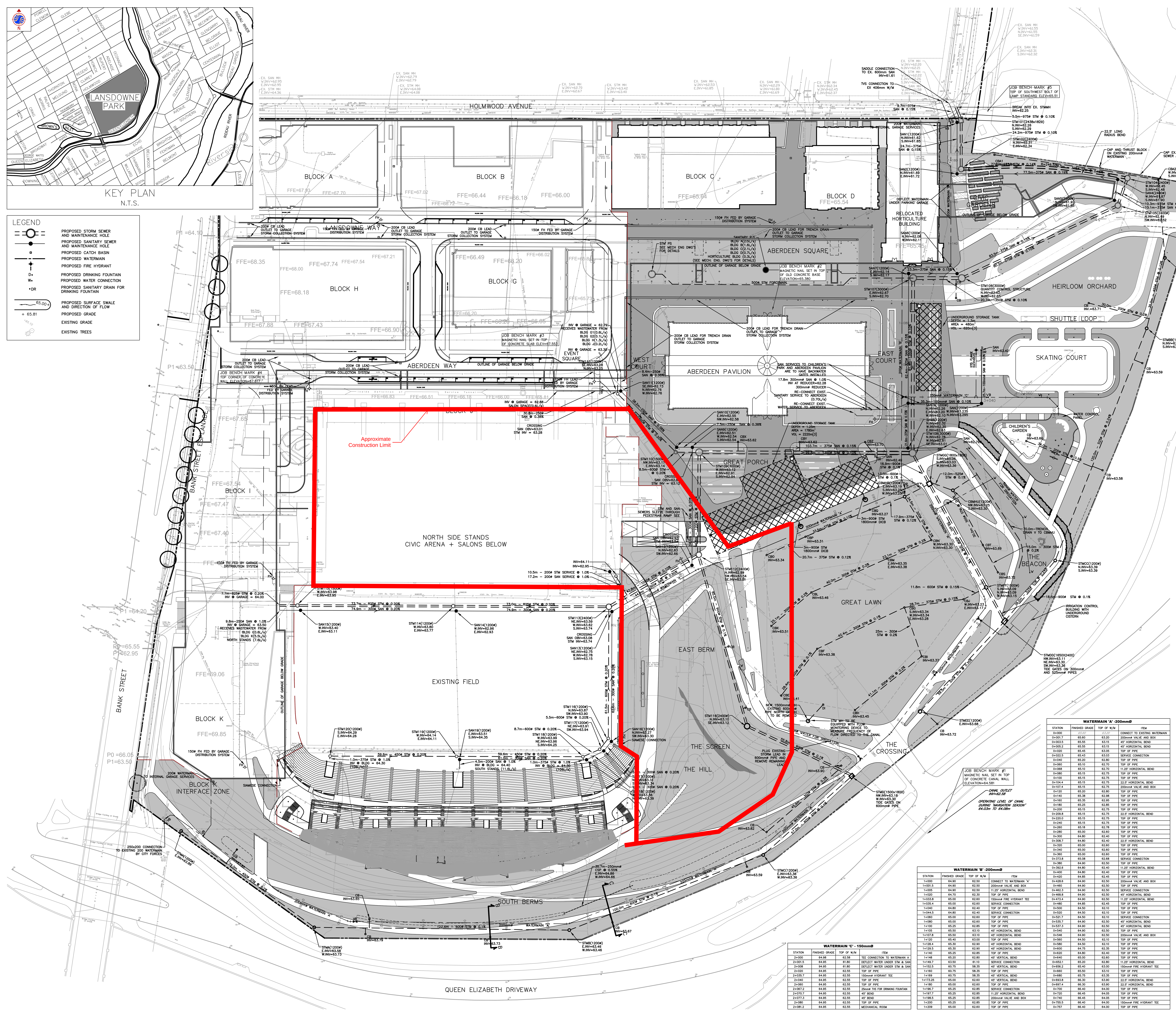
PROJECT

Lansdowne
THE TRANSFORMATION OF LANSDOWNE PARK
LA TRANSFORMATION DU PARC LANSDOWNE

DRAWING TITLE

EXISTING CONDITIONS PLAN

DATE Oct. 13, 2011	DRAWING No.
SCALE 1:600	EX01
REVISION # 4	



WATERMAIN 'A' -200mmØ			
STATION	FINISHED GRADE	TOP OF W/M	ITEM
0+000	65.60	63.20	CONNECT TO EXISTING WATERMAIN
0+001.7	65.60	63.20	200mmø VALVE AND BOX
0+003.5	65.55	63.15	45° HORIZONTAL BEND
0+005.2	65.55	63.15	45° HORIZONTAL BEND
0+020	65.45	63.05	TOP OF PIPE
0+022.5	65.43	63.03	SERVICE CONNECTION
0+040	65.20	62.80	TOP OF PIPE
0+060	65.10	62.70	TOP OF PIPE
0+068	65.10	62.70	11.25° HORIZONTAL BEND
0+080	65.15	62.75	TOP OF PIPE
0+100	65.15	62.75	TOP OF PIPE
0+104.4	65.15	62.75	22.5° HORIZONTAL BEND
0+107.4	65.15	62.75	200mmø VALVE AND BOX
0+120	65.20	62.80	TOP OF PIPE
0+140	65.38	62.98	TOP OF PIPE
0+160	65.35	62.95	TOP OF PIPE
0+180	65.25	62.85	TOP OF PIPE
0+200	65.15	62.75	TOP OF PIPE
0+209.8	65.15	62.75	22.5° HORIZONTAL BEND
0+220.0	65.15	62.75	TOP OF PIPE
0+240	65.15	62.75	TOP OF PIPE
0+260	65.18	62.78	TOP OF PIPE
0+280	65.00	62.60	TOP OF PIPE
0+300	64.80	62.40	TOP OF PIPE
0+308.7	64.80	62.40	22.5° HORIZONTAL BEND
0+320	65.00	62.60	TOP OF PIPE
0+340	65.00	62.60	TOP OF PIPE
0+360	65.00	62.60	TOP OF PIPE
0+373.8	65.08	62.68	SERVICE CONNECTION
0+380	64.90	62.50	TOP OF PIPE
0+392.6	64.80	62.40	11.25° HORIZONTAL BEND
0+400	64.80	62.40	TOP OF PIPE
0+420	64.85	62.45	TOP OF PIPE
0+428.6	64.90	62.50	200mmø VALVE AND BOX
0+460	64.90	62.50	TOP OF PIPE
0+462.3	64.90	62.50	SERVICE CONNECTION
0+468.8	64.90	62.50	45° HORIZONTAL BEND
0+473.4	64.90	62.50	11.25° HORIZONTAL BEND
0+480	64.85	62.45	TOP OF PIPE
0+500	64.50	62.10	TOP OF PIPE
0+520	64.50	62.10	TOP OF PIPE
0+521.7	64.50	62.10	SERVICE CONNECTION
0+535.7	64.90	62.50	45° HORIZONTAL BEND
0+537.3	64.90	62.50	45° HORIZONTAL BEND
0+540	64.90	62.50	TOP OF PIPE
0+546	64.90	62.50	200mmø VALVE AND BOX
0+560	64.50	62.10	TOP OF PIPE
0+580	64.50	62.10	TOP OF PIPE
0+600	64.75	62.35	TOP OF PIPE
0+620	64.80	62.40	TOP OF PIPE
0+640	65.00	62.60	TOP OF PIPE
0+652.1	65.20	62.80	11.25° HORIZONTAL BEND
0+656.2	65.40	63.00	150mmø FIRE HYDRANT TEE
0+660	65.50	63.10	TOP OF PIPE
0+680	65.75	63.35	TOP OF PIPE
0+693.8	66.30	63.90	22.5° HORIZONTAL BEND
0+697.4	66.30	63.90	22.5° HORIZONTAL BEND
0+700	66.40	64.00	TOP OF PIPE
0+720	66.45	64.05	TOP OF PIPE
0+740	66.45	64.05	TOP OF PIPE
0+755.5	66.40	64.00	150mmø FIRE HYDRANT TEE
0+757	66.40	64.00	TOP OF PIPE

WATERMAIN 'B' -200mmØ			
STATION	FINISHED GRADE	TOP OF W/M	ITEM
1+000	64.90	62.50	CONNECT TO WATERMAIN 'A'
1+001.5	64.90	62.50	200mmø VALVE AND BOX
1+005	64.90	62.50	11.25° HORIZONTAL BEND
1+020	64.70	62.30	TOP OF PIPE
1+033.8	65.00	62.60	150mmø FIRE HYDRANT TEE
1+035.4	65.00	62.60	SERVICE CONNECTION
1+040	64.80	62.40	TOP OF PIPE
1+044.5	64.80	62.40	SERVICE CONNECTION
1+060	65.00	62.60	TOP OF PIPE
1+080	65.00	62.60	TOP OF PIPE
1+100	65.25	62.85	TOP OF PIPE
1+105	65.50	63.10	45° HORIZONTAL BEND
1+107.8	65.50	63.10	45° HORIZONTAL BEND
1+120	65.40	63.00	TOP OF PIPE
1+128.4	65.30	62.90	45° HORIZONTAL BEND
1+129.5	65.30	62.90	45° HORIZONTAL BEND
1+140	65.25	62.85	TOP OF PIPE
1+148	65.20	62.80	45° VERTICAL BEND
1+149.7	63.50	61.10	SERVICE CONNECTION
1+152.5	60.75	58.35	45° VERTICAL BEND
1+160	60.75	58.35	TOP OF PIPE
1+169	60.75	58.35	45° VERTICAL BEND
1+173.25	65.00	62.60	45° VERTICAL BEND
1+180	65.00	62.60	TOP OF PIPE
1+196.7	65.25	62.85	SERVICE CONNECTION
1+197.7	65.25	62.85	11.25° HORIZONTAL BEND
1+198.5	65.25	62.85	200mmø VALVE AND BOX
1+200	65.25	62.85	TOP OF PIPE
1+209	65.00	62.60	TOP OF PIPE

WATERMAIN 'C' - 150mmØ			
STATION	FINISHED GRADE	TOP OF W/M	ITEM
2+000	64.98	62.58	TEE CONNECTION TO WATERMAIN A
2+001.5	64.95	61.80	DEFLECT WATER UNDER STM & SAN
2+008	94.95	61.80	DEFLECT WATER UNDER STM & SAN
2+020	64.95	62.55	TOP OF PIPE
2+035.7	64.95	62.55	150mmø HYDRANT TEE
2+040	64.95	62.55	TOP OF PIPE
2+060	64.95	62.55	TOP OF PIPE
2+067.2	64.95	62.55	25mmø TVS FOR DRINKING FOUNTAIN
2+070.7	64.95	62.55	45° BEND
2+077.3	64.95	62.55	45° BEND
2+080	64.95	62.55	TOP OF PIPE
2+081.2	64.95	62.55	MECHANICAL ROOM

CLIENT PARTNERSHIP

Ottawa

OSEG

CONSULTANT TEAM

CANNONDESIGN

CORUSH SUNDERLAND WRIGHT

DSEL david schaeffer engineering ltd

GreenbergFarrow

Stantec

PHILLIPS FAREVAAG SMALLENBERG PLANNING + URBAN DESIGN LANDSCAPE ARCHITECTURE

Do not scale drawings. This drawing shall not be used for construction.

REVISIONS

No.	Date	Details	By
1	2011-11-21	ISSUED TO CITY FOR REVIEW	JVG
2	2011-12-12	REVISED AS PER CITY COMMENTS	JVG
3	2012-01-11	REVISED AS PER COORDINATION WITH OSEG	JVG
4	2012-01-26	REVISED AS PER CITY COMMENTS	JVG

1:600

PROJECT

Lansdowne — THE TRANSFORMATION OF LANSDOWNE PARK — LA TRANSFORMATION DU PARC LANSDOWNE

DRAWING TITLE

SITE SERVICING PLAN

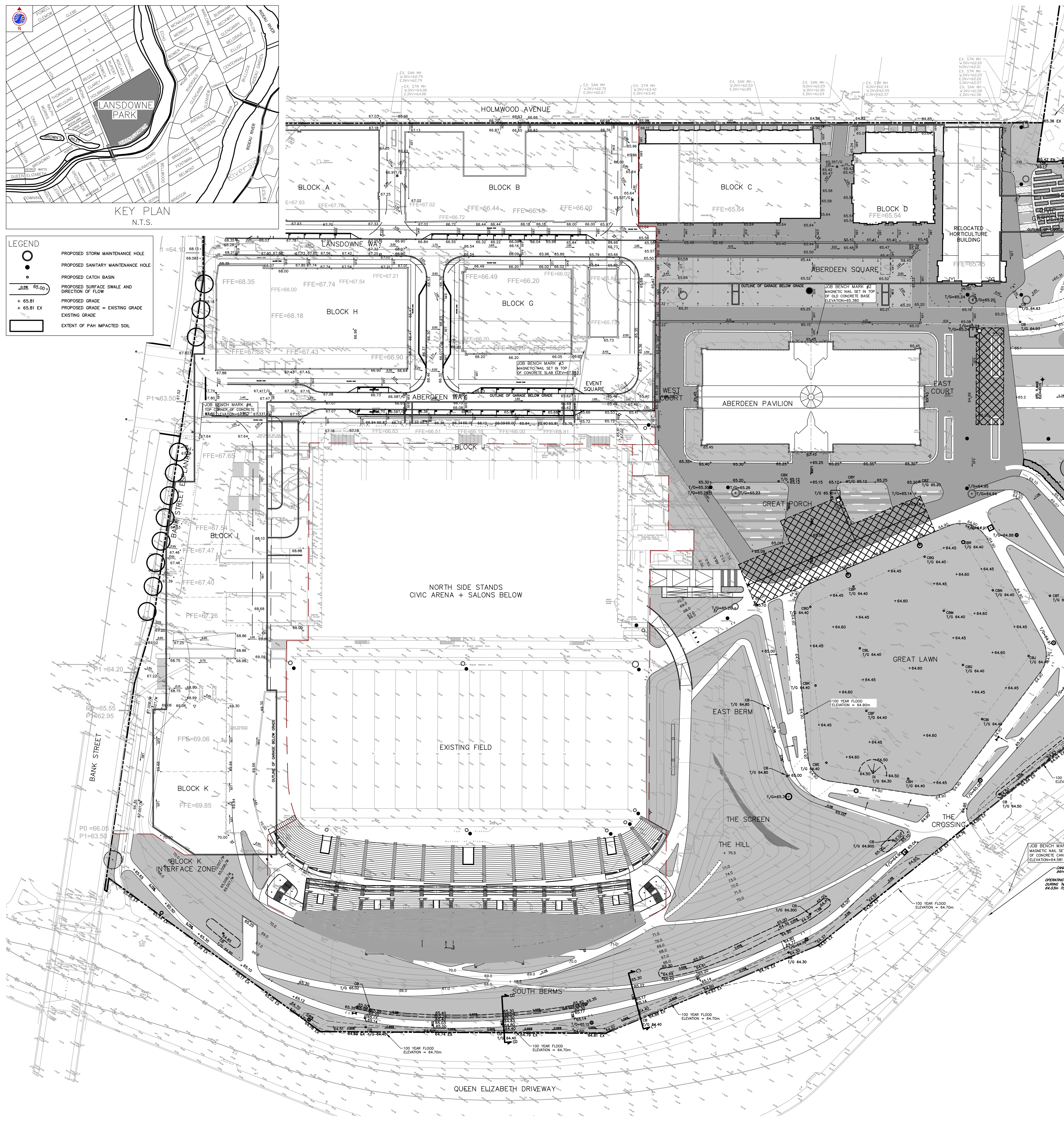
DATE Oct. 13, 2011

SCALE 1:600

REVISION # 4

DRAWING No. C01

V:\01-634\active\1604_00832_Lansdowne Park Competition\design\drawing\160400832 CVI Stantec.dwg Feb06, 2012 – 3:05pm



SITE GRADING

1 ALL GRANULAR BASE & SUB BASE COURSE MATERIALS SHALL BE COMPACTED TO 100% STANDARD PROCTOR MAX. DRY DENSITY.

2 ALL DISTURBED GRASSED AREAS SHALL BE RESTORED TO ORIGINAL CONDITION OR BETTER, WITH SOD ON MIN. 100mm TOPSOIL. THE RELOCATION OF TREES AND SHRUBS SHALL BE SUBJECT TO APPROVAL BY THE PROJECT LANDSCAPE ARCHITECT OR ENGINEER.

3 PAVEMENT CONSTRUCTION AS PER DETAILS ON DRAWING No. C07

4 ALL BARRIER CURBS AND SIDEWALKS TO BE CONSTRUCTED PER CITY OF OTTAWA STANDARD DRAWING SC1 AND SC8 UNLESS OTHERWISE NOTED OR DETAIL PROVIDED.

5 INSPECTIONS: ALL WORK ON THE MUNICIPAL RIGHT OF WAY AND EASEMENTS TO BE INSPECTED BY THE MUNICIPALITY PRIOR TO BACKFILLING. ALL WORK RELATING TO WATERMAINS AND SEWERS TO BE INSPECTED BY THE MUNICIPALITY WHEN REQUIRED.

6 REFER TO ARCHITECTURAL SITE PLAN FOR DIMENSIONS AND SITE DETAILS.

7 CONTRACTOR TO OBTAIN A ROAD OCCUPANCY PERMIT 48 HOURS PRIOR TO COMMENCING ANY WORK WITHIN THE MUNICIPAL ROAD ALLOWANCE IF REQUIRED BY THE MUNICIPALITY.

8 PARKING AREA PONDING DEPTH TO BE 0.30m (MAXIMUM).

9 EMBANKMENTS TO BE SLOPED AT MIN. 3:1, UNLESS OTHERWISE SPECIFIED.

10 ALL PAVEMENT MARKING, LINE PAINTING, DIRECTIONAL LINES/ARROWS ETC. SHALL BE PLACED IN ACCORDANCE WITH THE ARCHITECTURAL SITE PLAN OR THE OWNER'S TRAFFIC ENGINEERING CONSULTANT'S DRAWINGS. LINE PAINTING AND DIRECTIONAL SYMBOLS SHALL BE APPLIED WITH A MINIMUM OF TWO COATS OF ORGANIC SOLVENT BASED PAINT.

11 THE CONTRACTOR SHALL PROVIDE TO THE ENGINEER 1 (ONE) SET OF AS CONSTRUCTED SITE SERVICING, GRADING, AND SITE ELECTRICAL DWGS.

12 SITE SIGNAGE TO BE INSTALLED AS PER ARCHITECTURAL SITE PLAN.

13 ALL NECESSARY CLEARING AND GRUBBING SHALL BE COMPLETED BY THE CONTRACTOR. REVIEW WITH ARCHITECT AND THE CITY OF OTTAWA PRIOR TO TREE CUTTING.

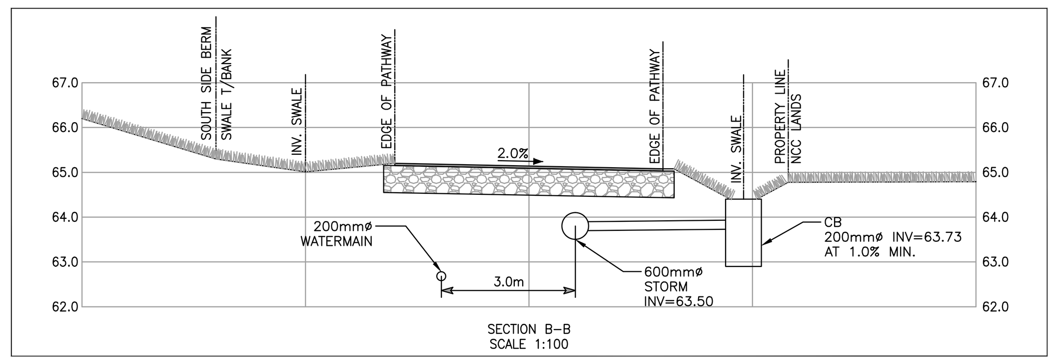
14 SUB-EXCAVATE SOFT AREAS & FILL WITH GRANULAR 'B' COMPACTED IN 0.15m LAYERS.

15 FOR ALL LANDSCAPING FEATURES (ie. TREES, WALKWAYS, PARK DETAILS, NOISE BARRIERS, FENCES etc.) REFER TO LANDSCAPE ARCHITECT PLAN.

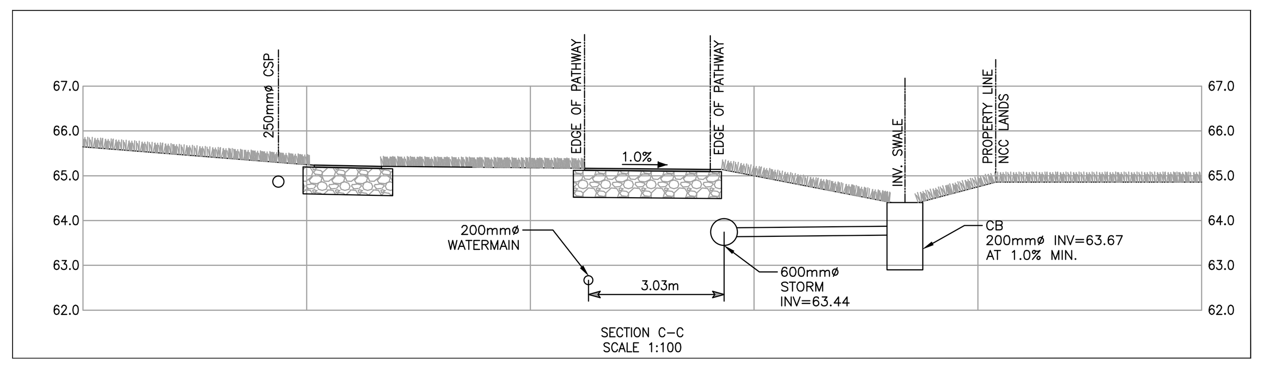
16 ROUGH GRADING FOR LANDSCAPED ISLANDS TO BE LEFT 150mm BELOW CURB AND COMPACTED TO 95%.

17 WHERE APPLICABLE THE CONTRACTOR IS TO SUBMIT SHOP DRAWINGS FOR RETAINING WALLS (INCLUDE RAILINGS IF APPLICABLE) TO THE ENGINEER FOR APPROVAL PRIOR TO CONSTRUCTION. SHOP DRAWINGS MUST BE SITE SPECIFIC, SIGNED AND SEALED BY A LICENSED STRUCTURAL ENGINEER. THE CONTRACTOR WILL ALSO BE REQUIRED TO SUPPLY STRUCTURAL AND GEOTECHNICAL CERTIFICATION OF THE AS-CONSTRUCTED RETAINING WALL TO THE ENGINEER PRIOR TO FINAL ACCEPTANCE.

18 ALL SWALES LESS THAN 0.50% SHALL INCLUDE A 250mmø PERFORATED SUBDRAIN AS PER CITY STANDARD S29.



SECTION B-B
SCALE 1:100



SECTION C-C
SCALE 1:100

CLIENT PARTNERSHIP

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Ottawa Sports and Entertainment Group

CONSULTANT TEAM

CANNONDESIGN
AN IDEAS BASED PRACTICE

CORUSH SUNDERLAND WRIGHT

DSEL
david schaeffer engineering ltd

GreenbergFarrow

Stantec

PHILLIPS FAREVAAG SMALLENBERG
PLANNING + URBAN DESIGN
LANDSCAPE ARCHITECTURE

REVISIONS

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3	2012-01-11	REVISED AS PER COORDINATION WITH DSEL.	JVG
4	2012-01-26	REVISED AS PER CITY COMMENTS	JVG

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PROJECT

Lansdowne
THE TRANSFORMATION OF LANSDOWNE PARK
LA TRANSFORMATION DU PARC LANSDOWNE

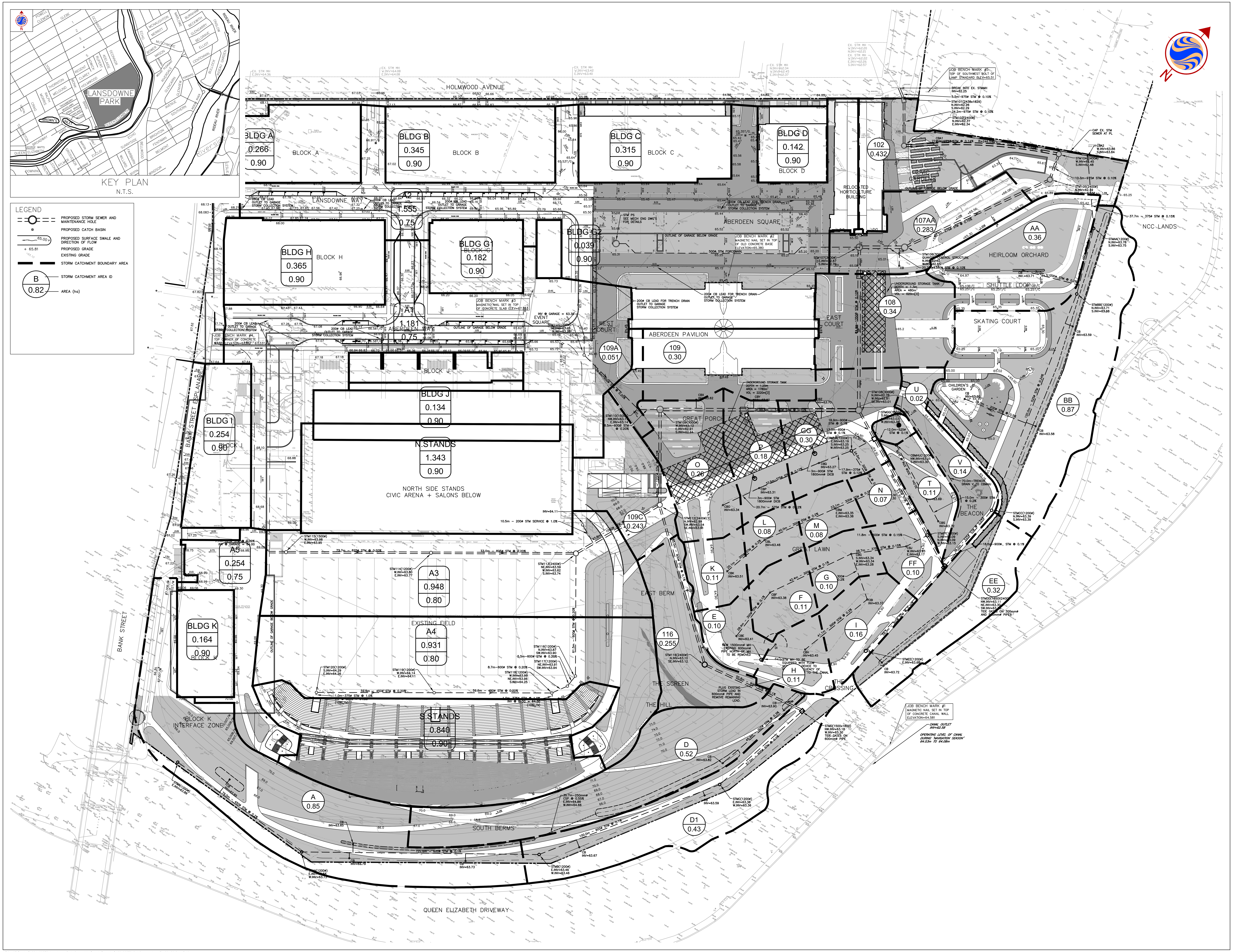
DRAWING TITLE
GRADING PLAN

DATE
Oct. 13, 2011

DRAWING No.
C02

SCALE
1:600

REVISION #
4



CLIENT PARTNERSHIP

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PLANNING + URBAN DESIGN
LANDSCAPE ARCHITECTURE

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4	2012-01-26	REVISED AS PER CITY COMMENTS	JVG

1:600 0 6 18 30m

PROJECT

Lansdowne
THE TRANSFORMATION OF LANSDOWNE PARK
LA TRANSFORMATION DU PARC LANSDOWNE

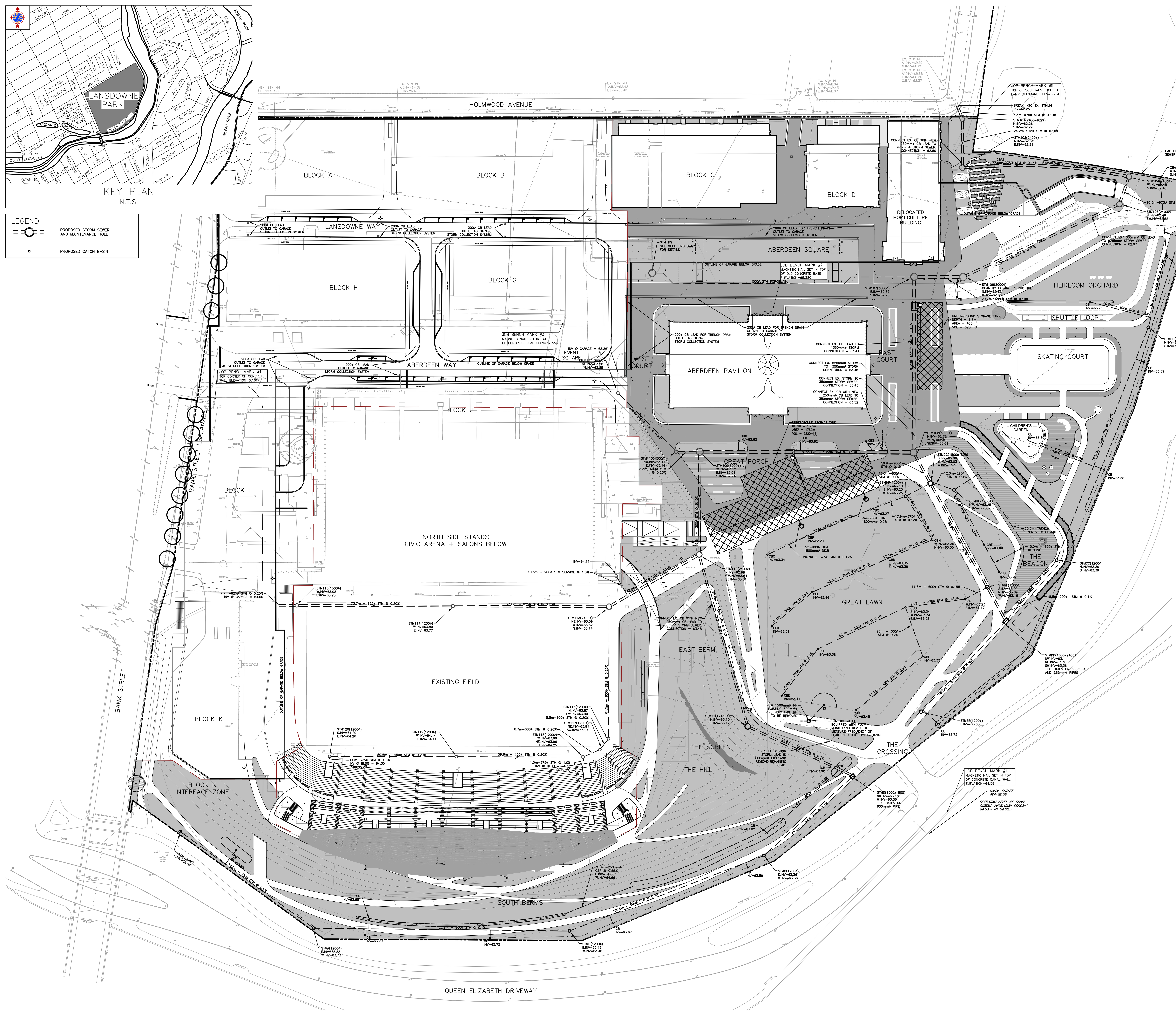
DRAWING TITLE
CATCHMENT AREA PLAN

DATE

SCALE
1:600

REVISION #
4

DRAWING No.
C03



GENERAL NOTES

1 ALL WORK SHALL BE CARRIED OUT IN COMPLIANCE WITH THE ONTARIO OCCUPATIONAL HEALTH AND SAFETY ACT AND REGULATIONS FOR CONSTRUCTION PROJECTS.

2 ALL WORK AND MATERIALS TO CONFORM WITH CURRENT MINISTRY OF THE ENVIRONMENT & ENERGY OF ONTARIO, CITY OF OTTAWA AND ONTARIO PROVINCIAL STANDARDS AND SPECIFICATIONS. LOCAL UTILITY STANDARDS AND MINISTRY OF TRANSPORTATION STANDARDS WILL APPLY WHERE REQUIRED.

3 THE CONTRACTOR IS ADVISED THAT WORKS BY OTHERS MAY BE ONGOING DURING THE PERIOD OF THIS CONTRACT. THE CONTRACTOR SHALL COORDINATE CONSTRUCTION ACTIVITIES AND COORDINATION WITH ALL OTHER CONTRACTORS AND PREVENT CONSTRUCTION CONFLICTS.

4 THE INFORMATION SHOWN FOR EXISTING UTILITIES WAS PROVIDED BY OTHERS. THE CONTRACTOR IS RESPONSIBLE FOR LOCATING AND PROTECTING ALL UTILITIES DURING CONSTRUCTION. ALL EXISTING UTILITIES MUST BE LOCATED AND VERIFIED BY EACH UTILITY PRIOR TO COMMENCEMENT OF WORK. ANY VARIANCE IS TO BE IMMEDIATELY REPORTED TO THE ENGINEER. LOST TIME DUE TO FAILURE OF THE CONTRACTOR TO CONFIRM UTILITY LOCATIONS AND NOTIFY THE ENGINEER OF POSSIBLE CONFLICTS PRIOR TO CONSTRUCTION WILL BE AT THE CONTRACTORS EXPENSE.

5 ALL CONSTRUCTION SHALL BE CARRIED OUT IN ACCORDANCE WITH THE RECOMMENDATIONS MADE IN THE GEOTECHNICAL REPORT.

6 THE CONTRACTOR IS RESPONSIBLE FOR OBTAINING ALL PERMITS REQUIRED AND TO BEAR THE COST OF SAME INCLUDING WATER PERMIT AND ASSOCIATED COSTS.

7 ALL DISTURBED AREAS SHALL BE REINSTATED TO EQUAL OR BETTER CONDITION TO THE SATISFACTION THE ENGINEER AND THE CITY. PAVEMENT REINSTATEMENT FOR SERVICE AND UTILITY CUTS SHALL BE IN ACCORDANCE WITH OPSD 509.010 AND OPSS 310.

8 FOR DETAILS RELATING TO STORMWATER MANAGEMENT AND ROOF DRAINAGE, SEE THE STORMWATER MANAGEMENT REPORT PREPARED BY STANTEC CONSULTING LTD. ROOF DRAINAGE TO BE PROVIDED VIA RESTRICTED RELEASE ROOF DRAINS AS DETAILED IN THE REPORT.

9 BENCHMARKS: IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO VERIFY THAT THE SITE BENCHMARK(S) HAS NOT BEEN ALTERED OR DISTURBED AND THAT ITS RELATIVE ELEVATION AND DESCRIPTION AGREES WITH THE INFORMATION SHOWN ON DRAWING GP-1.

10 THE CONTRACTOR SHALL PROVIDE TO THE ENGINEER 1 (ONE) SET OF AS CONSTRUCTED SITE SERVICING, GRADING, AND SITE ELECTRICAL DWGS.

11 REFER TO RISK MANAGEMENT PLANS FOR CAPPING OF LANDFILL AREAS.

STORM AND SANITARY SEWERS

1 STORM AND SANITARY MANHOLES SHALL BE IN ACCORDANCE WITH OPSD 701.010 TO 701.014. STORM MANHOLES TO HAVE FRAME AND COVER PER OPSD 401.020. CATCH BASIN MANHOLES TO HAVE FRAME AND COVER PER OPSD 400.020. SANITARY MANHOLES TO HAVE FRAME AND COVER AS PER OPSD 401.020 UNLESS LOCATED WITHIN STORM PONDING AREAS THEN WATERTIGHT FRAME AND COVER AS PER OPSD 401.030 IS TO BE USED. SAFETY PLATFORM TO BE INSTALLED IN ALL MANHOLES WHERE DEPTH EXCEEDS 5.0m.

2 ALL CATCH BASINS TO BE PRECAST TO OPSD 705.010 c/w FRAME AND GRATE AS PER OPSD 400.020.

3 SEWER TRENCH SHALL CONSIST OF CLASS 'B' BEDDING PER CITY OF OTTAWA STANDARDS S6 AND S7. COMPACTION SHALL BE A MINIMUM OF 98% STANDARD PROCTOR DENSITY.

4 ALL STORM SEWER PIPES UP TO AND INCLUDING 375mm DIA. SHALL BE PVC SDR-35 OR APPROVED EQUIVALENT. ALL STORM SEWER PIPES 450mm DIA. AND LARGER SHALL BE CONCRETE AND EQUAL TO C.S.A. SPECIFICATIONS A257.2 REINFORCED CLASSES AS SPECIFIED (65-D, 100-D, 140-D,) OR LATEST AMENDMENT UNLESS OTHERWISE SPECIFIED.

5 ALL SANITARY PVC SEWER PIPES SHALL BE SDR-35 EQUAL TO CSA SPECIFICATIONS B182.2-M1990 OR LATEST AMENDMENT UNLESS OTHERWISE NOTED.

6 ALL MANHOLE AND CATCH BASIN EXCAVATIONS TO BE BACKFILLED WITH GRANULAR MATERIAL COMPACTED TO 98% STANDARD PROCTOR DENSITY.

7 STORM MANHOLES SHALL NOT BE BENCHED UNLESS OTHERWISE SPECIFIED. SANITARY MANHOLES SHALL BE BENCHED TO OBVERT. MINIMUM WIDTH OF BENCHING TO BE 230mm OR AS SPECIFIED ON DRAWINGS. GRANULAR 'A' SHALL BE PLACED TO A MIN. THICKNESS OF 300mm AROUND ALL STRUCTURES IN PAVEMENT AREA. MANHOLE DROP STRUCTURES TO BE INSTALLED PER OPSD 1003.01.

8 "MODULOC" OR APPROVED PRE-CAST MANHOLE AND CATCH BASIN ADJUSTERS TO BE USED IN LIEU OF BRICKING. PARGE ADJUSTING UNITS ON THE OUTSIDE ONLY.

9 FOR CONSTRUCTION DETAILS NOT SHOWN ON PLANS, REFERENCE SHALL BE MADE TO THE ONTARIO PROVINCIAL STANDARDS DRAWINGS AND MUNICIPAL STANDARDS.

10 SERVICES TO BUILDINGS TO BE TERMINATED 1.0m FROM THE OUTSIDE FACE OF BUILDING UNLESS OTHERWISE NOTED.

11 ALL SINGLE CATCH BASIN LEADS TO BE 200mmØ PVC. SDR-35 OR APPROVED EQUIVALENT UNLESS OTHERWISE SPECIFIED. CATCH BASIN LEADS TO HAVE MINIMUM GRADE OF 1.0%.

12 ALL CB LEAD INVERTS TO BE 1.5m BELOW FINISHED GRADE UNLESS OTHERWISE SPECIFIED.

13 THE CONTRACTOR IS TO PROVIDE CCTV CAMERA INSPECTIONS OF ALL SANITARY AND STORM SEWERS, INCLUDING PICTORIAL REPORT, ONE (1) CD COPY AND TWO (2) VIDEO TAPES IN A FORMAT SATISFACTORY TO THE ENGINEER. ALL SEWERS ARE TO BE FLUSHED PRIOR TO CAMERA INSPECTION. ASPHALT WEAR COURSE SHALL NOT BE PLACED UNTIL THE VIDEO INSPECTION OF SEWERS & NECESSARY REPAIRS HAVE BEEN CARRIED OUT TO THE SATISFACTION OF THE CONSULTANT.

14 LASER ALIGNMENT CONTROL TO BE UTILIZED ON ALL SEWER INSTALLATIONS.

15 EXISTING MANHOLES TO BE RE-BENCHED WHERE A NEW CONNECTION IS MADE.

16 FROST PROTECTION PER CITY OF OTTAWA STANDARD DRAWING W22 WHERE LESS THAN 1.5m OF COVER.

17 ALL CATCH BASINS AND CATCH BASIN MANHOLES TO HAVE 3.0m LONG SUB-DRAINS HEADING OUT IN 4 DIRECTIONS IN PARKING AREAS AND UNDER SIDEWALKS ADJACENT TO BUILDING. SUBDRAINS TO BE PLACED 300mm BELOW SUBGRADE. THE SUB-DRAIN PIPES SHOULD BE SURROUNDED BY 10mm DIA CLEAR STONE DRAINAGE ZONE OF MIN. 150mm THICKNESS, WHICH SHOULD HAVE NON-WOVEN GEOTEXTILE WRAP-AROUND.

18 CONTRACTOR SHALL PERFORM LEAKAGE TESTING, IN THE PRESENCE OF THE CONSULTANT, FOR SANITARY SEWERS IN ACCORDANCE WITH OPSS 410 AND OPSS 407. A COPY OF THE INSPECTION REPORT SHALL BE SUBMITTED TO THE CONSULTANT FOR REVIEW.

19 STORM SEWER INLET CONTROL DEVICES TO BE INSTALLED AS OUTLINED IN THE ICD SCHEDULE ON THIS DRAWING. ALL INLET CONTROL DEVICES TO BE INSTALLED AT THE DOWNSTREAM MANHOLE OR CATCH BASIN INVERT.

20. MAIN SEWER CONNECTIONS ARE OBVERT TO OBVERT UNLESS DROP STRUCTURE IS TO BE USED.

21. 100mmø PERFORATED SUB-DRAIN AROUND LANDSCAPED TREE ISLANDS TO BE CONNECTED TO STORM SEWER. REFER TO LANDSCAPE PLANS L-1A AND L-2A PREPARED BY LAROCQUE LEVSTEK LANDSCAPE ARCHITECTS.

CLIENT PARTNERSHIP

Ottawa

OSEG
Ottawa Sports and Entertainment Group

CONSULTANT TEAM

CANNONDESIGN
AN IDEAS BASED PRACTICE

CORUSH SUNDERLAND WRIGHT

DSEL
david schaeffer engineering ltd
SMART SUBDIVISIONS

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Stantec

PHILLIPS FAREVAAG SMALLENBERG
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LANDSCAPE ARCHITECTURE

REVISIONS

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4	2012-01-26	REVISED AS PER CITY COMMENTS	JVG

1:600

PROJECT

Lansdowne
THE TRANSFORMATION OF LANSDOWNE PARK
LA TRANSFORMATION DU PARC LANSDOWNE

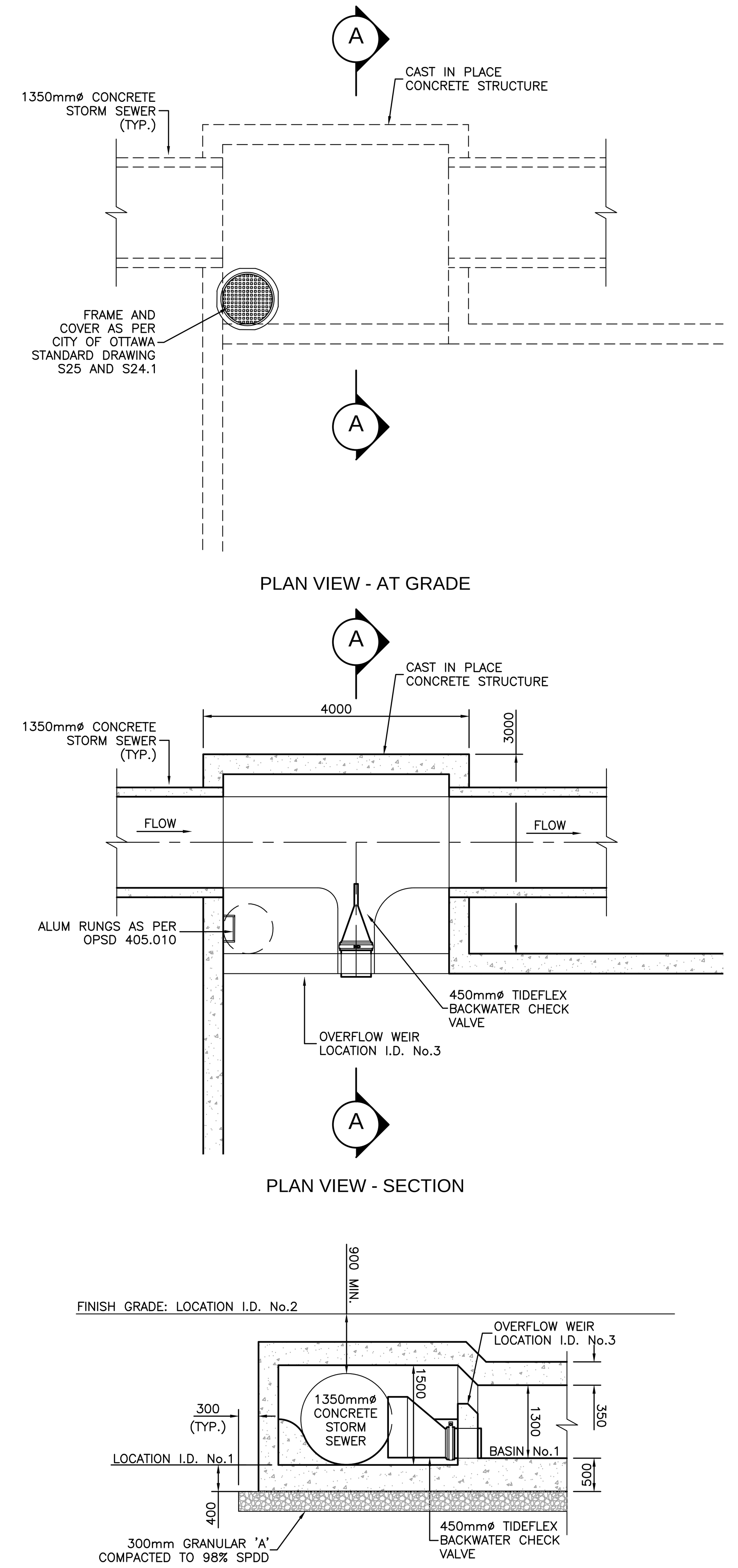
DRAWING TITLE
INTERIM STORM SEWER CONNECTION PLAN

DATE
Oct. 13, 2011

SCALE
1:600

REVISION #
4

DRAWING No.
C04



PLAN VIEW - AT GRADE

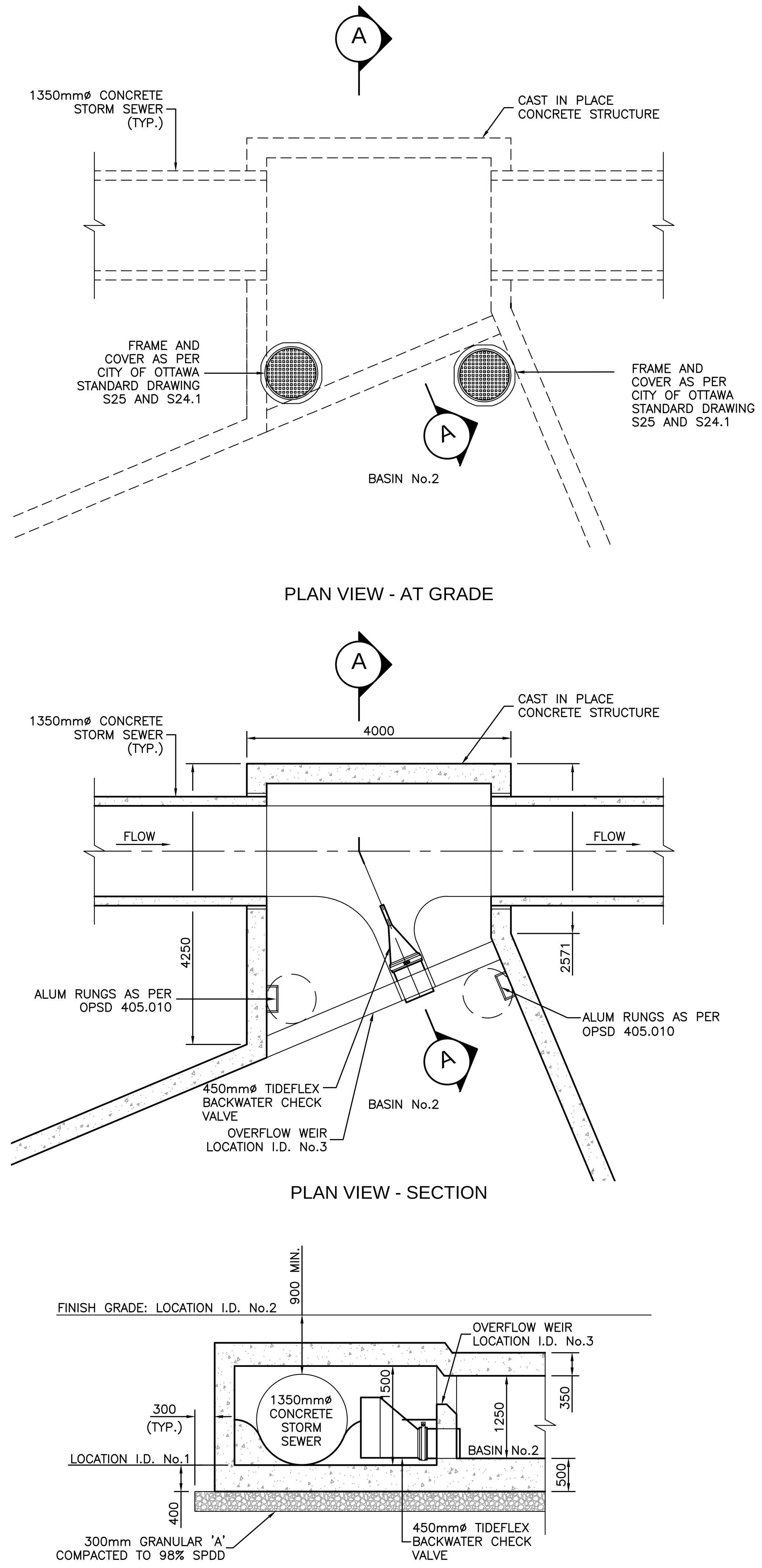
PLAN VIEW - SECTION

SECTION A-A

ELEVATION TABLE–BASIN No.1	
LOCATION I.D. No.	NORTH MANHOLE 1
1	62.71
2	65.04
3	63.65

FLOW CONTROL MANHOLE TO SWM BASIN No.1 DETAIL

N.T.S.



PLAN VIEW - AT GRADE

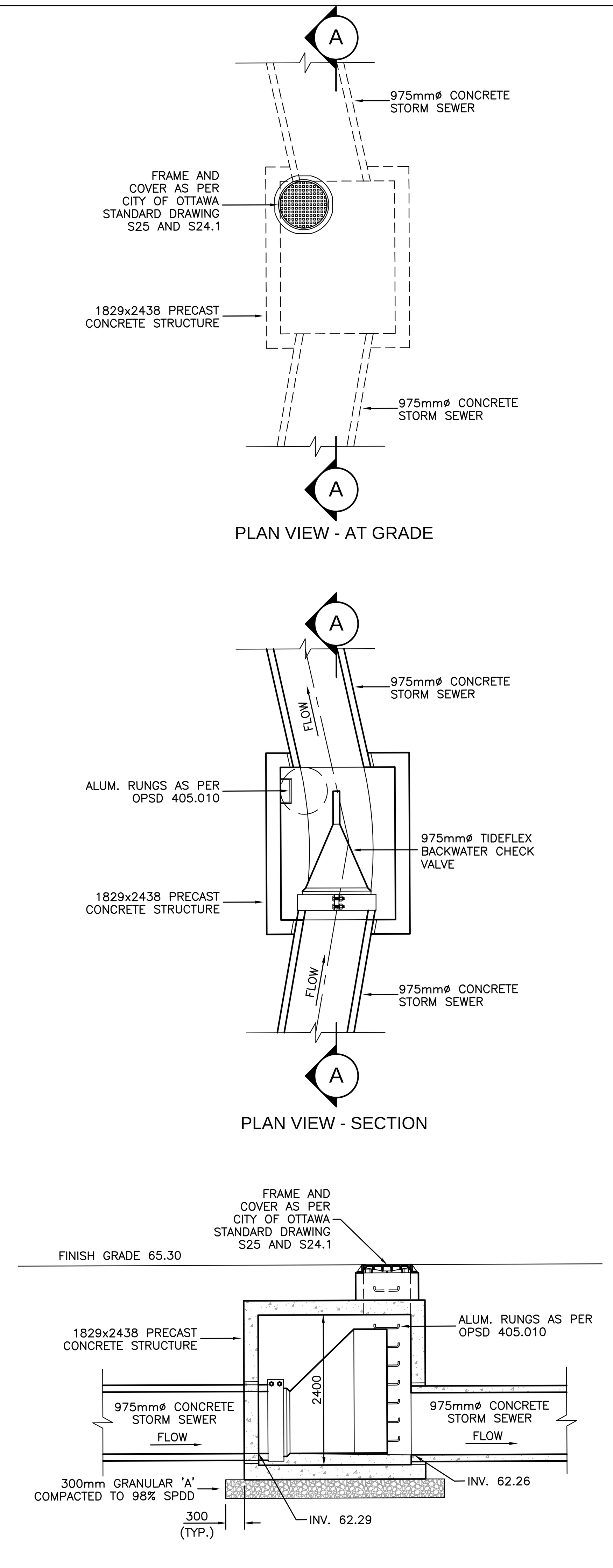
PLAN VIEW - SECTION

SECTION A-A

ELEVATION TABLE–BASIN No.2	
LOCATION I.D. No.	WEST MANHOLE 1
1	62.85
2	65.14
3	63.75

FLOW CONTROL MANHOLE TO SWM BASIN No.2 DETAIL

N.T.S.

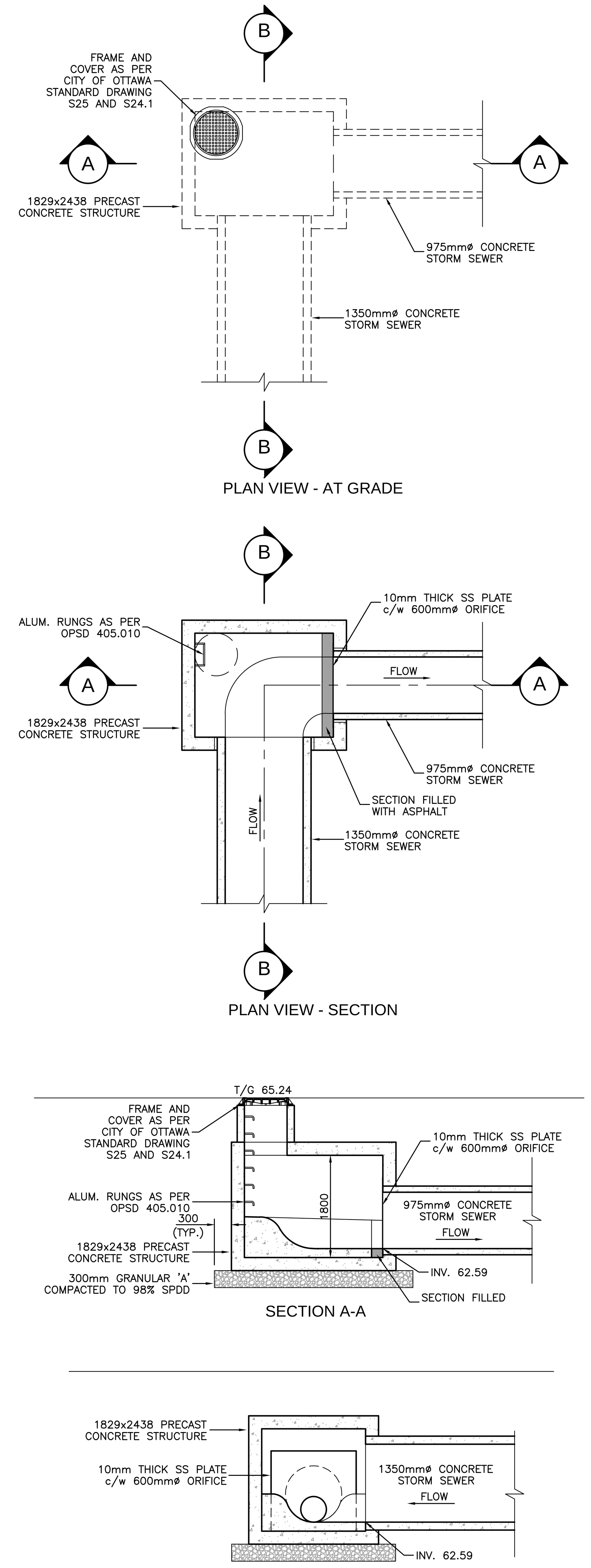


PLAN VIEW - AT GRADE

PLAN VIEW - SECTION

SECTION A-A

FLOW CONTROL MANHOLE No.101 DETAIL



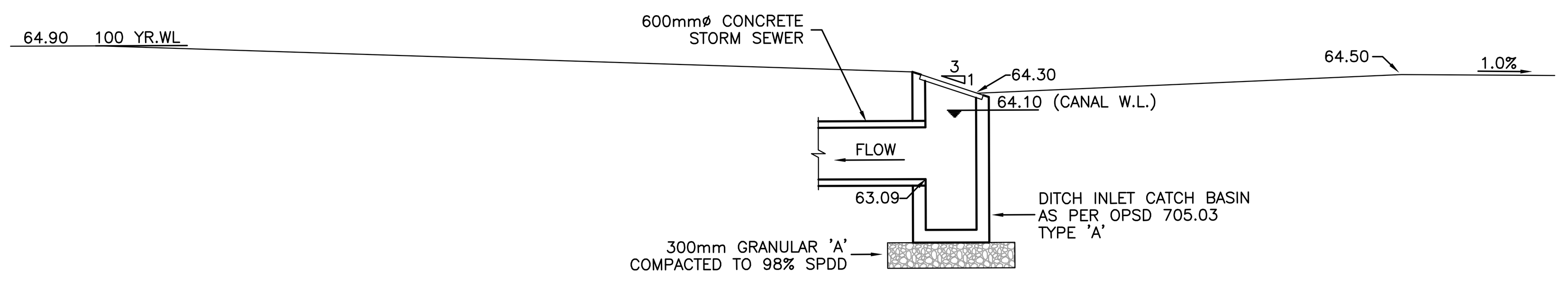
PLAN VIEW - AT GRADE

PLAN VIEW - SECTION

SECTION A-A

SECTION B-B

FLOW CONTROL MANHOLE No.105 DETAIL



CANAL FLOW CONTROL MANHOLE

CLIENT PARTNERSHIP

Ottawa

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CANNONDESIGN

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PHILLIPS FAREVAAG SMALLENBERG PLANNING + URBAN DESIGN LANDSCAPE ARCHITECTURE

REVISIONS

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3	2012–01–26	REVISED AS PER CITY COMMENTS	JVG

PROJECT

Lansdowne THE TRANSFORMATION OF LANSDOWNE PARK / LA TRANSFORMATION DU PARC LANSDOWNE

DRAWING TITLE

DETAILS

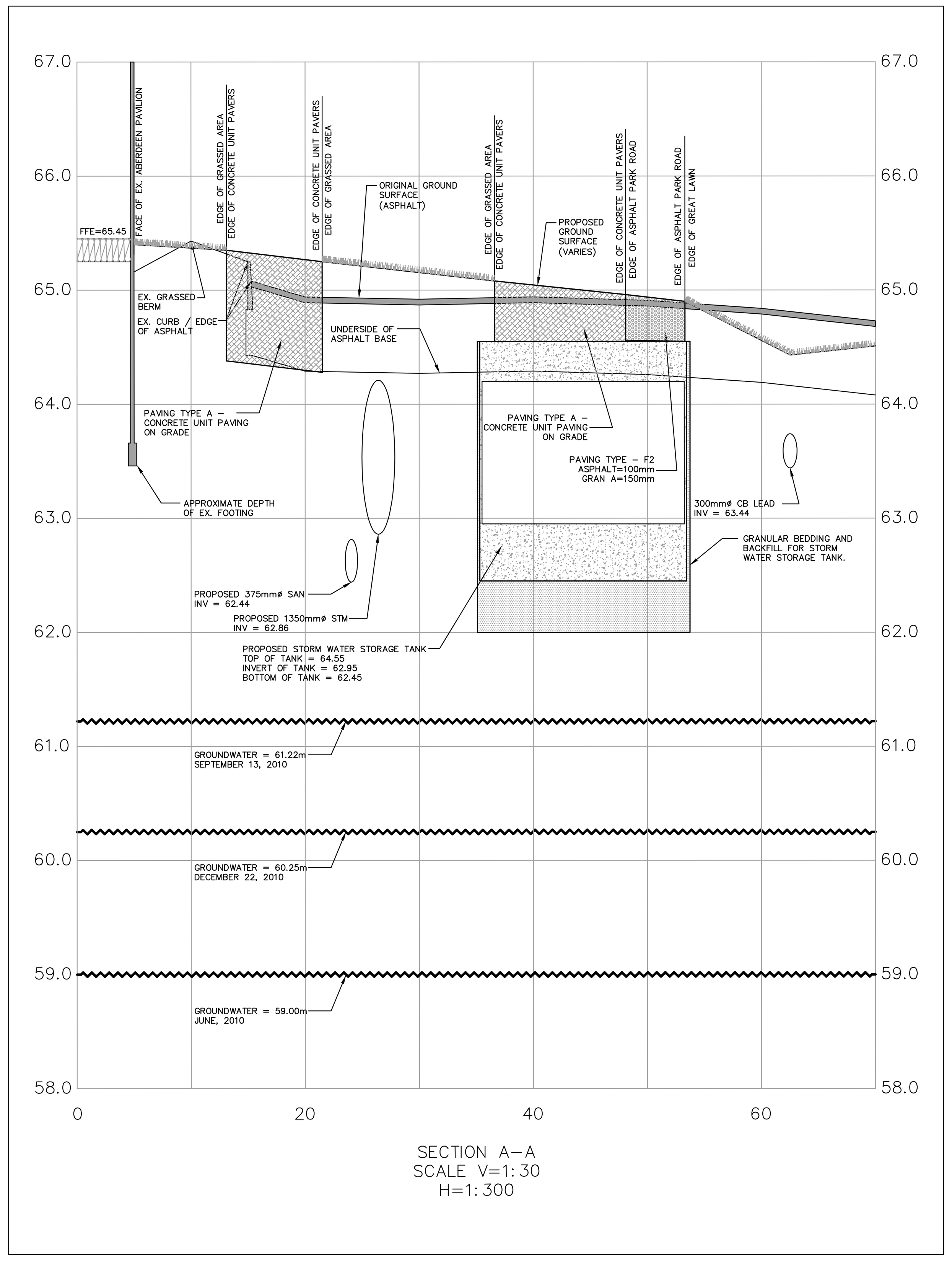
DATE

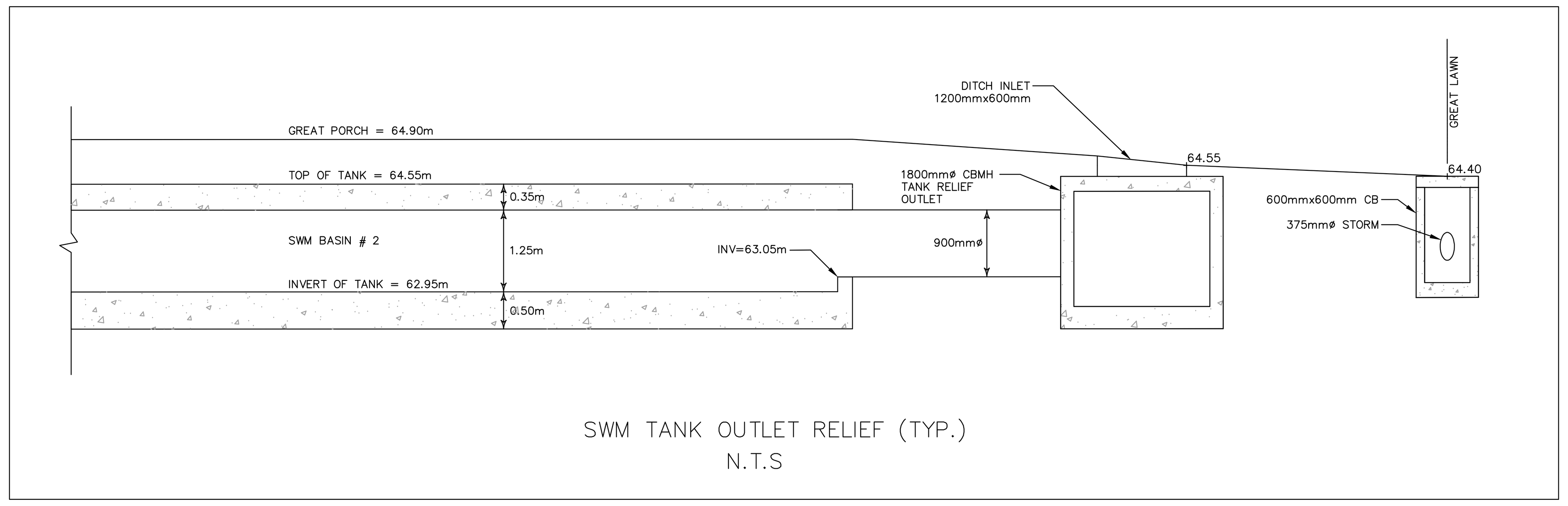
DRAWING No.

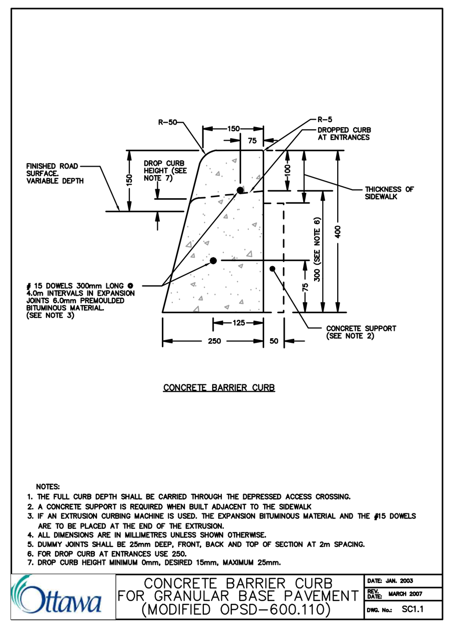
SCALE AS SHOWN

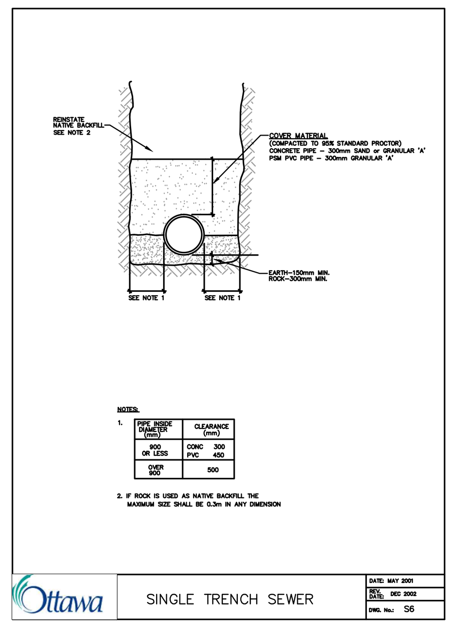
REVISION # 3

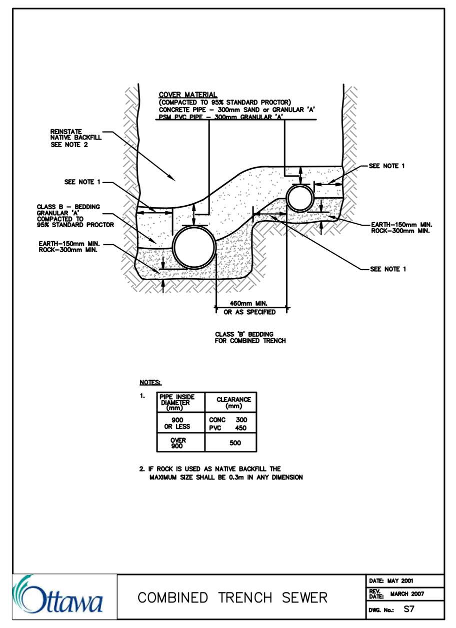
C05

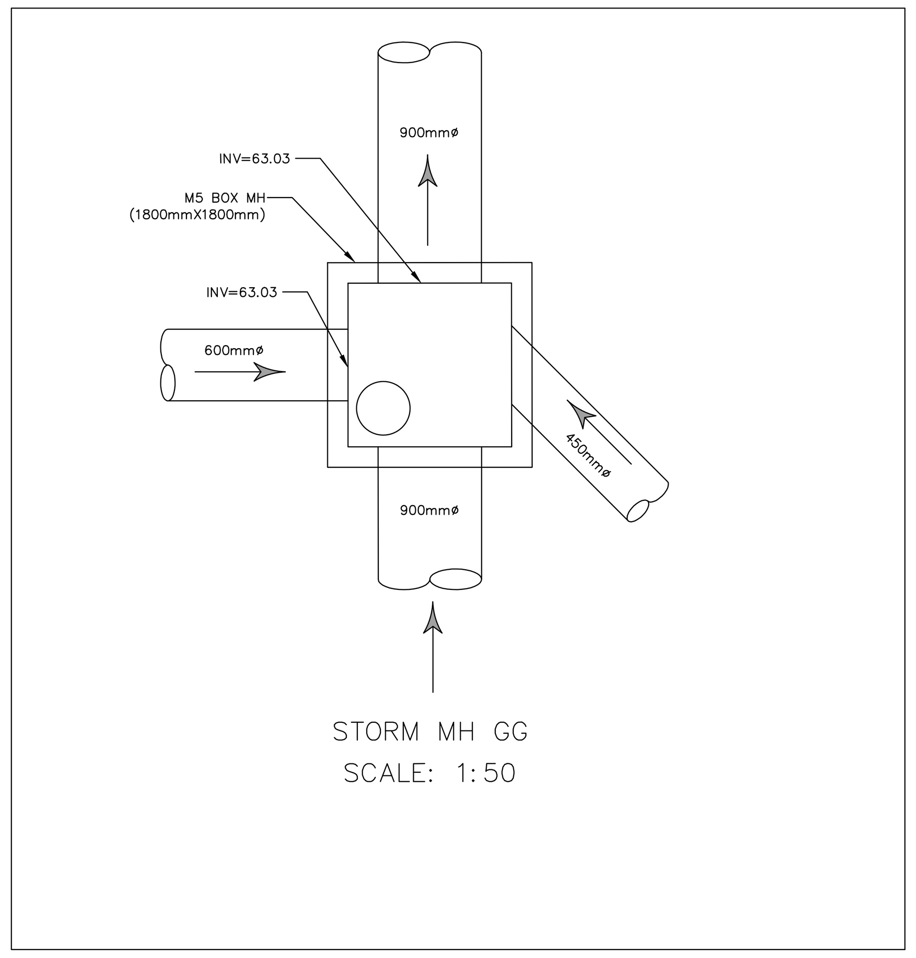


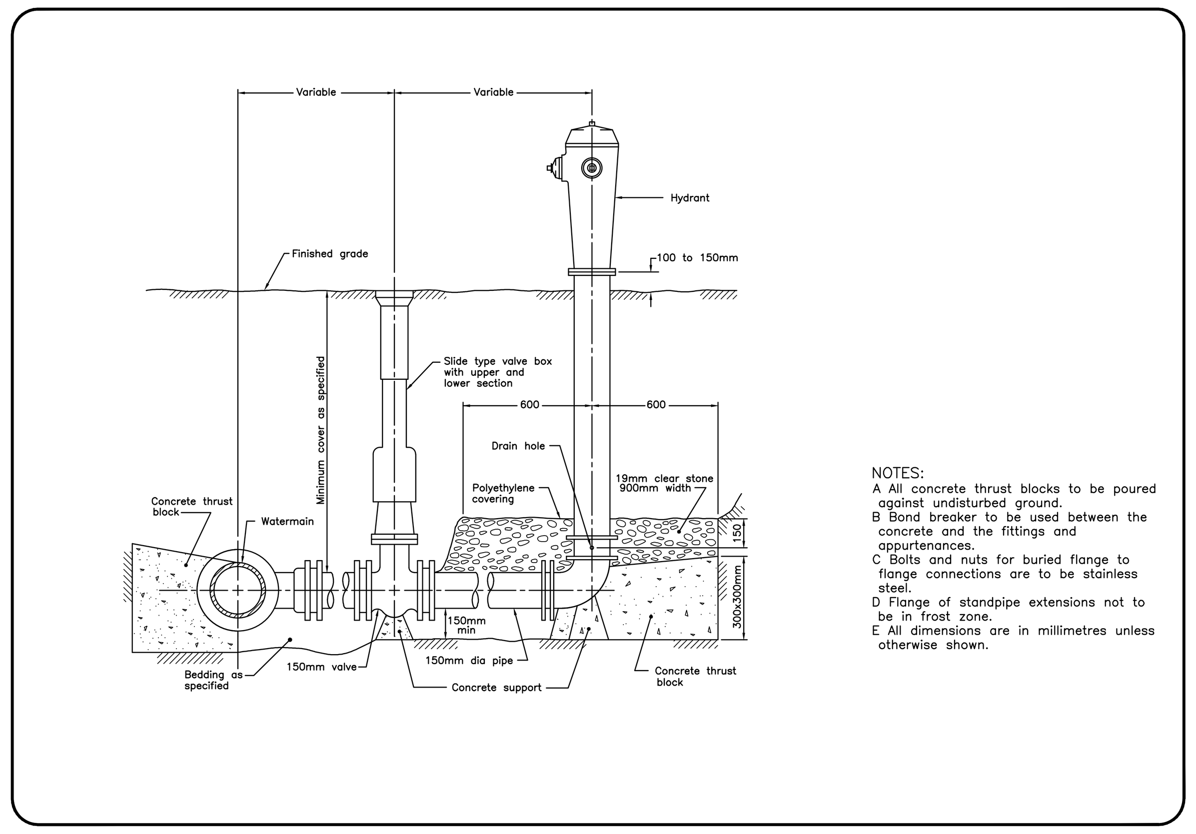


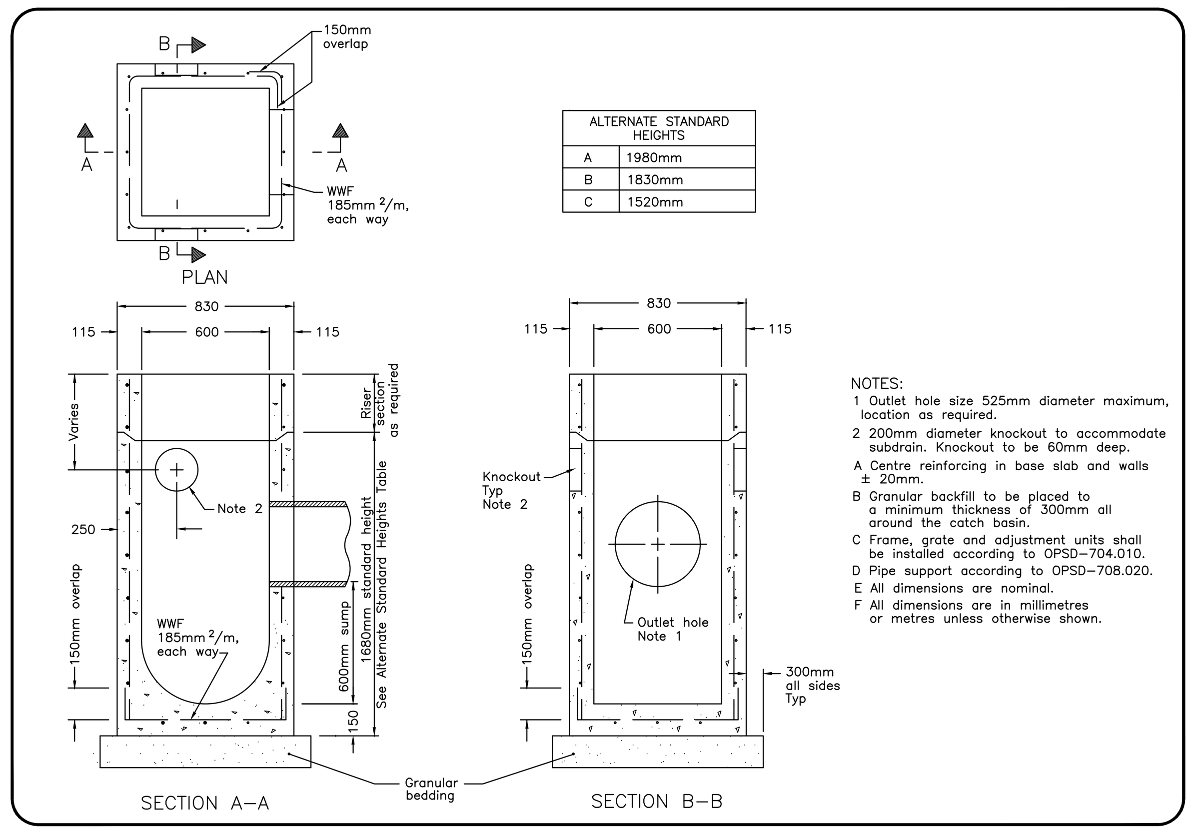


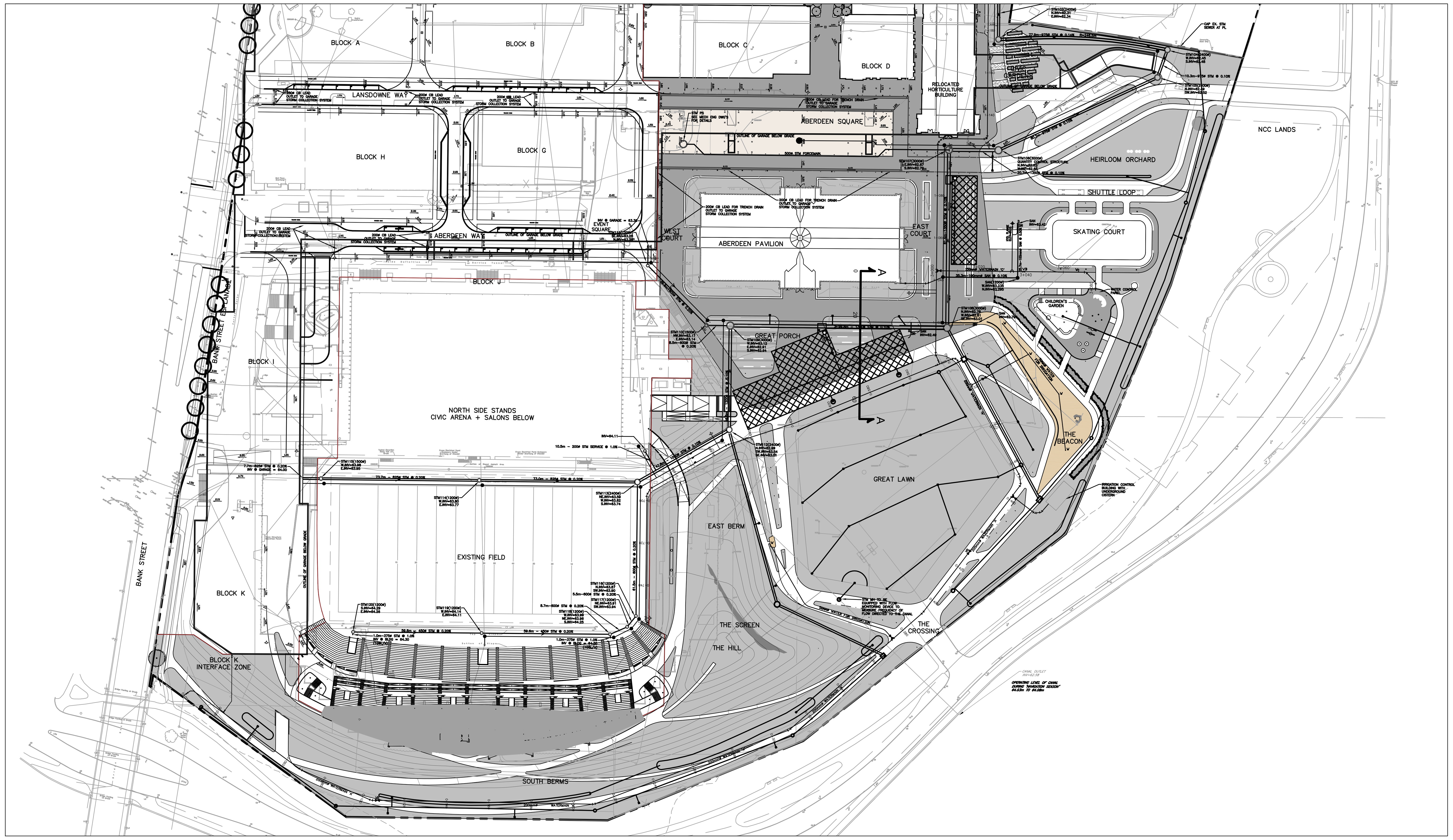












CLIENT PARTNERSHIP

Ottawa

OSEG
Ottawa Sports and Entertainment Group

CONSULTANT TEAM

CANNONDESIGN
AN IDEAS BASED PRACTICE

CORUSH SUNDERLAND WRIGHT

DSEL
david schaeffer engineering ltd

GreenbergFarrow

Stantec

PHILLIPS FAREVAAG SMALLENBERG
PLANNING + URBAN DESIGN
LANDSCAPE ARCHITECTURE

REVISIONS

No.	Date	Details	By
1	2011–11–21	ISSUED TO CITY FOR REVIEW	JVG
2	2011–12–12	REVISED AS PER CITY COMMENTS	JVG
3	2012–01–26	REVISED AS PER CITY COMMENTS	JVG

PROJECT

Lansdowne
THE TRANSFORMATION OF LANSDOWNE PARK
LA TRANSFORMATION DU PARC LANSDOWNE

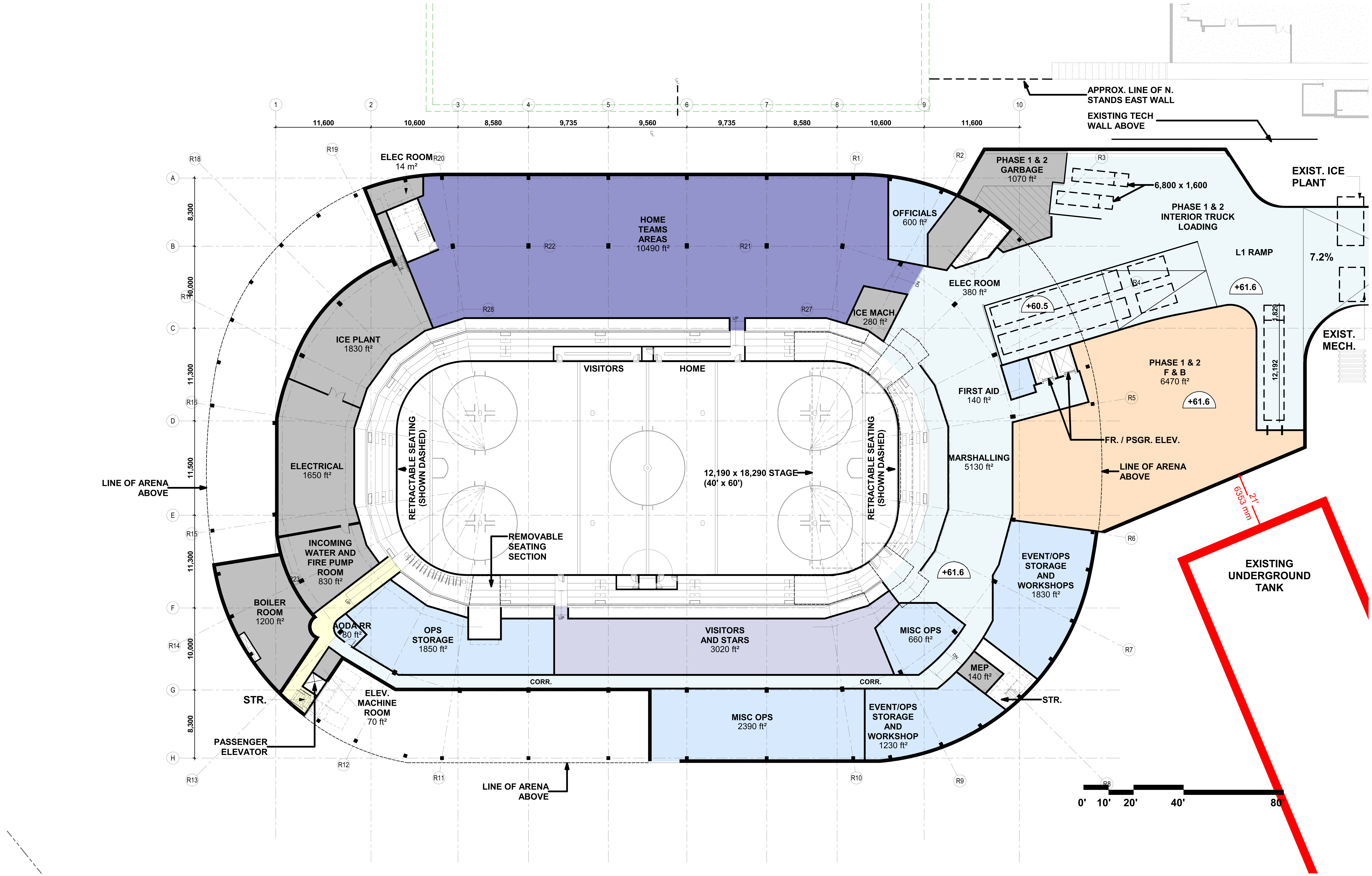
DRAWING TITLE
DETAILS

DATE

DRAWING No.
C06

SCALE
AS SHOWN

REVISION #
3



IN PROGRESS

TOTAL EC BLDG AREAS WILL BE REDUCED TO 160,000sf TO MEET BUDGET. NNS AREAS IN EC PROGRAM & ON THESE PLANS ARE APPROVED TO PROCEED IN THIS EC PHASE. DISTRIBUTION OF FUNCTIONAL SPACES ARE FIXED.

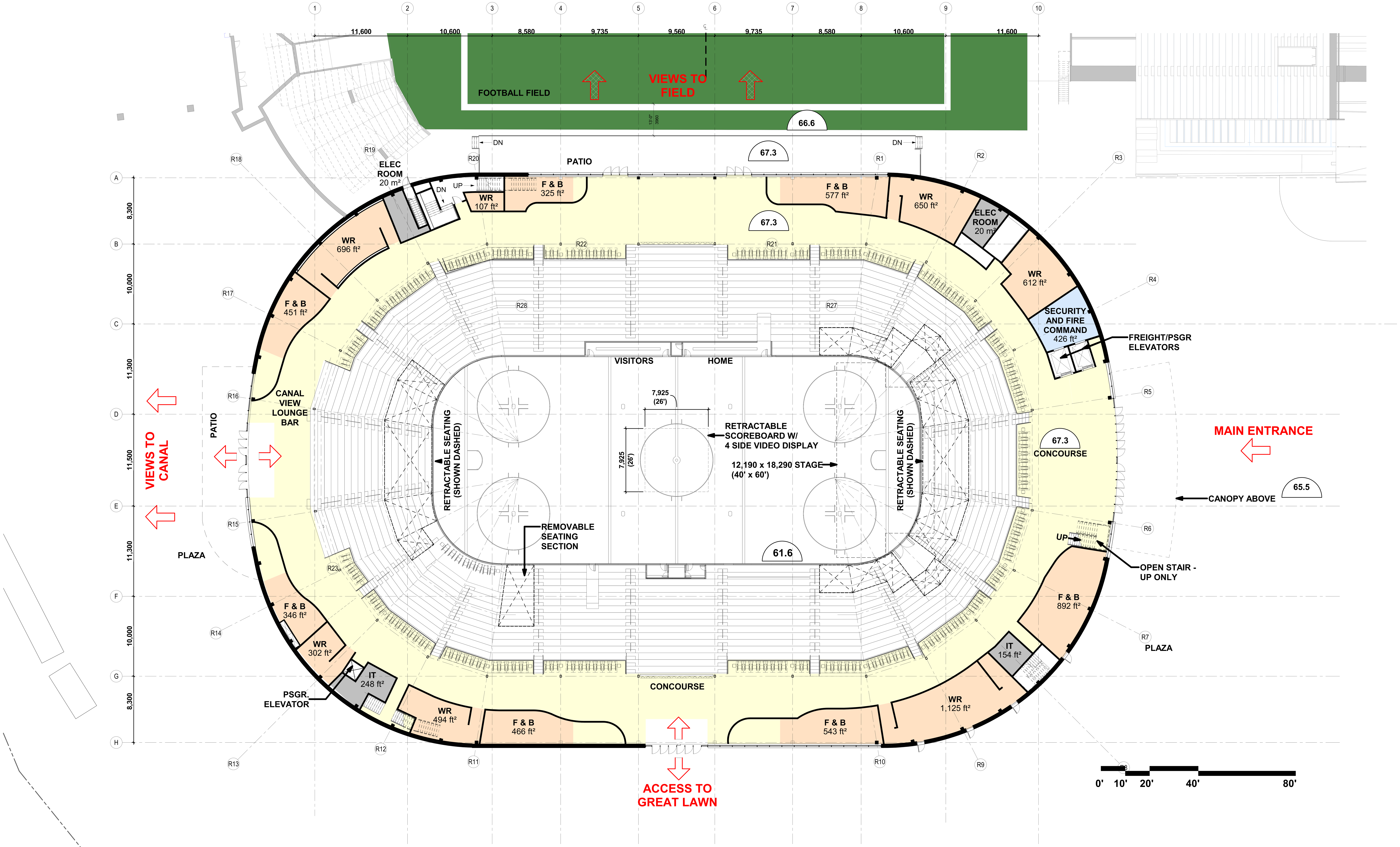
DATE: 2024-07-05

LANSDOWNE EVENT CENTRE
L1 OVERALL PLAN

Schematic Design

BRISBIN BROOK BEYNON ARCHITECTS

2024-07-05 6:48:34 PM



IN PROGRESS

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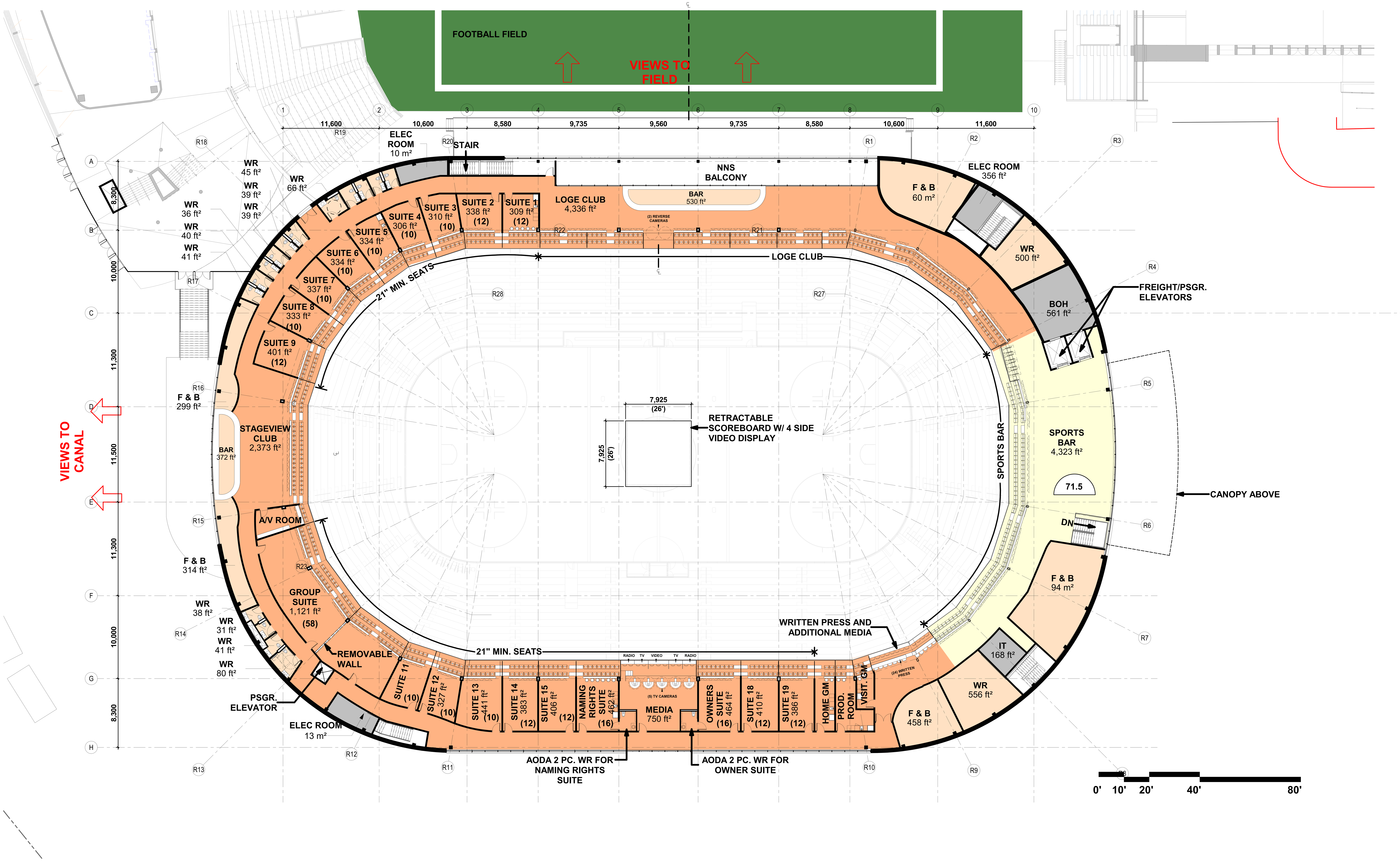
DATE: 2024-07-05

LANSDOWNE EVENT CENTRE
L2 OVERALL PLAN

Schematic Design

BRISBIN BROOK BEYNON ARCHITECTS

2024-07-05 6:48:41 PM



IN PROGRESS

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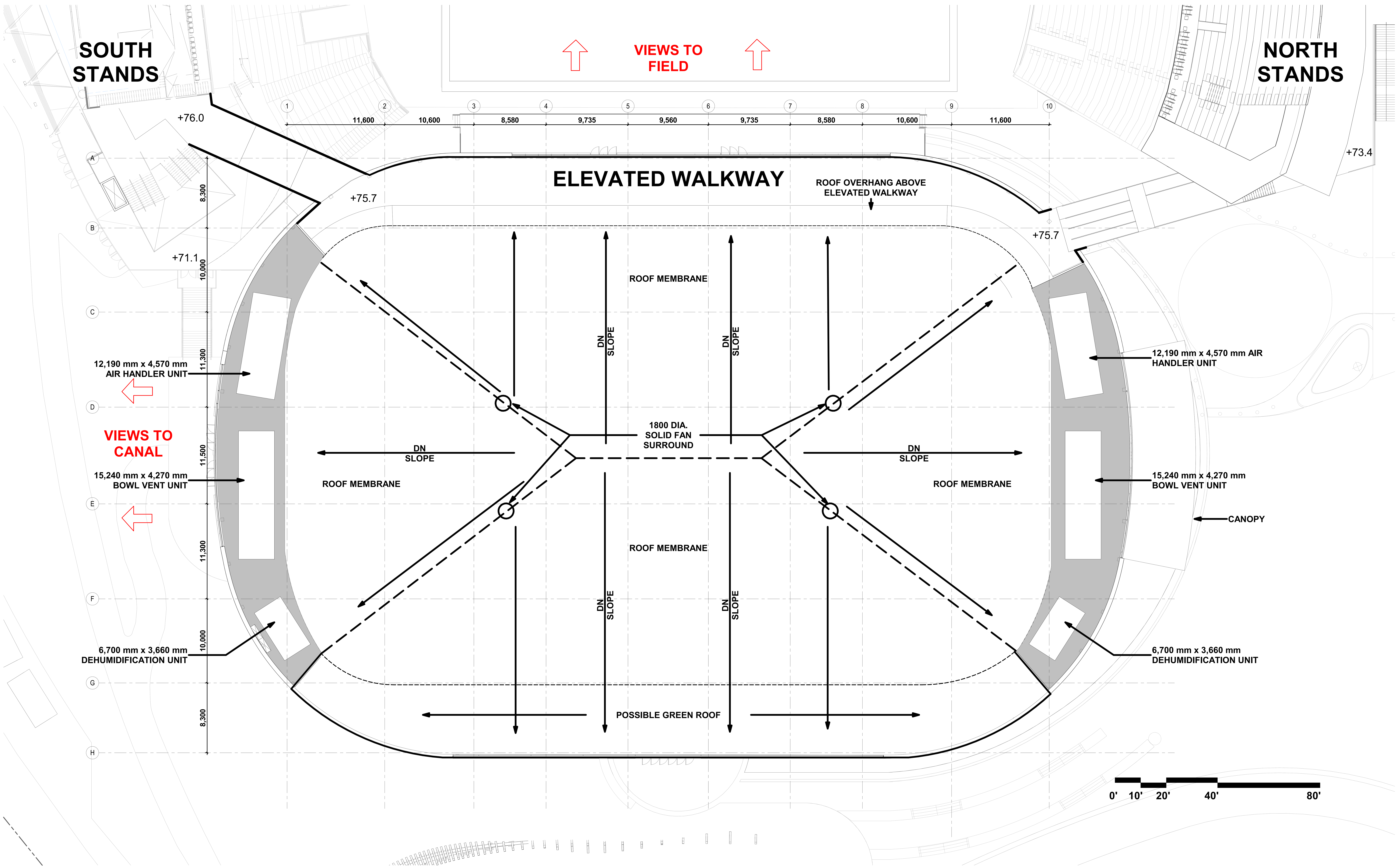
DATE: 2024-07-05

LANSDOWNE EVENT CENTRE
L3 OVERALL PLAN

Schematic Design

BRISBIN BROOK BEYNON ARCHITECTS

DATE PLOTTED: 2024-07-05 6:48:48 PM



IN PROGRESS

TOTAL EC BLDG AREAS WILL BE REDUCED TO 160,000sf TO MEET BUDGET. NNS AREAS IN EC PROGRAM & ON THESE PLANS ARE APPROVED TO PROCEED IN THIS EC PHASE. DISTRIBUTION OF FUNCTIONAL SPACES ARE FIXED.

DATE: 2024-07-05

LANSDOWNE EVENT CENTRE
ROOF PLAN

Schematic Design

BRISBIN BROOK BEYNON ARCHITECTS

IN PROGRESS

TOTAL EC BLDG AREAS WILL BE REDUCED TO 160,000sf TO MEET BUDGET. NNS AREAS IN EC PROGRAM & ON THESE PLANS ARE APPROVED TO PROCEED IN THIS EC PHASE. DISTRIBUTION OF FUNCTIONAL SPACES ARE FIXED.

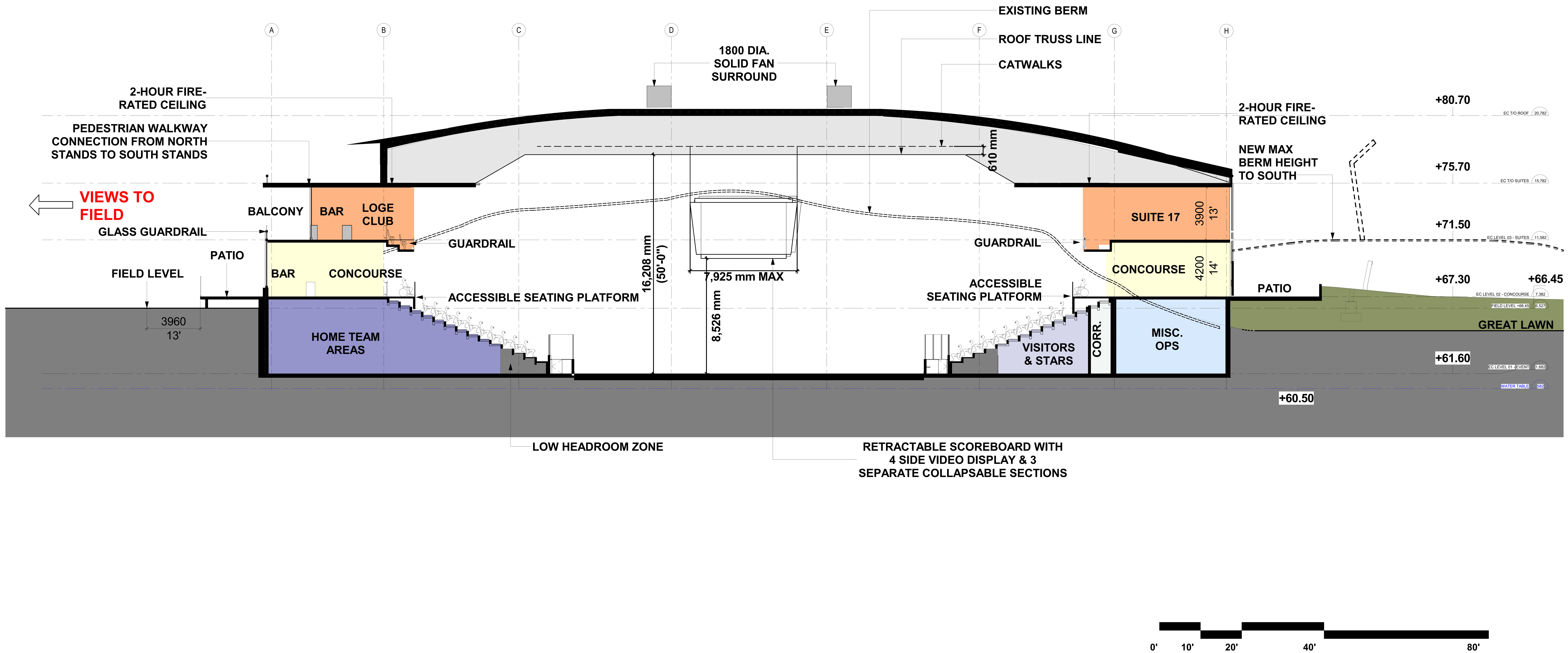
DATE: 2024-07-05

LANSDOWNE EVENT CENTRE NORTH-SOUTH SECTION

Schematic Design

BRISBIN BROOK BEYNON ARCHITECTS

2024-07-05 6:48:49 PM



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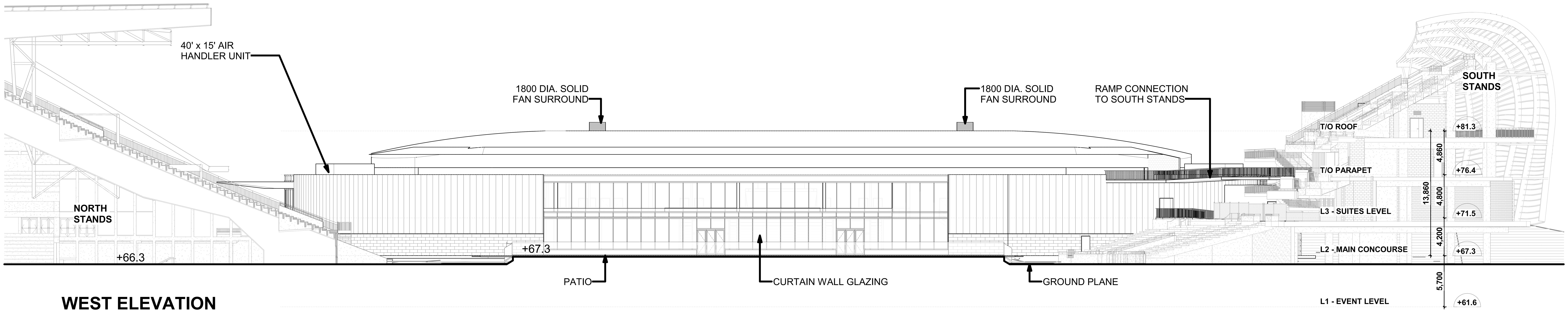
DATE: 2024-07-05

LANSDOWNE EVENT CENTRE
EAST-WEST SECTION

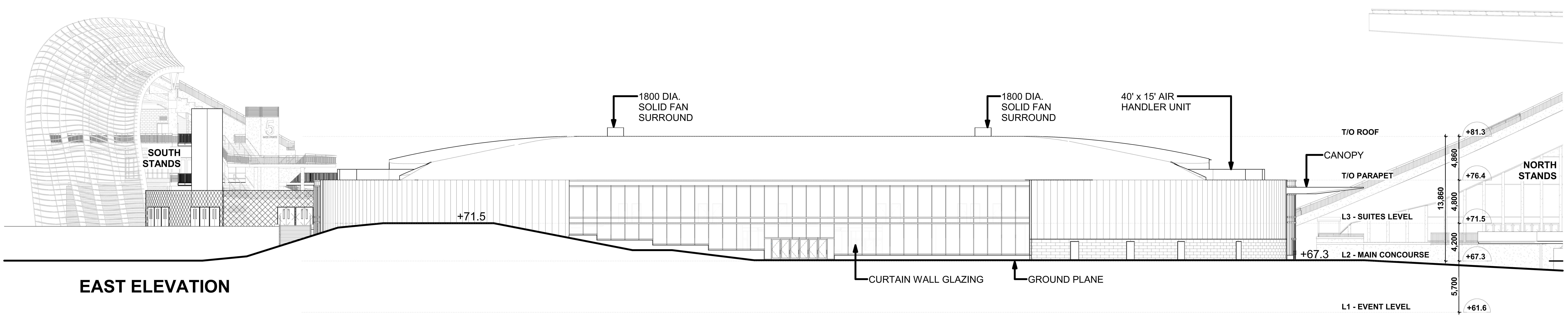
Schematic Design

BRISBIN BROOK BEYNON ARCHITECTS

DATE PLOTTED: 2024-07-05 6:48:49 PM



WEST ELEVATION



EAST ELEVATION

0' 10' 20' 40' 80'

IN PROGRESS

TOTAL EC BLDG AREAS WILL BE REDUCED TO 160,000sf TO MEET BUDGET. NNS AREAS IN EC PROGRAM & ON THESE PLANS ARE APPROVED TO PROCEED IN THIS EC PHASE. DISTRIBUTION OF FUNCTIONAL SPACES ARE FIXED.

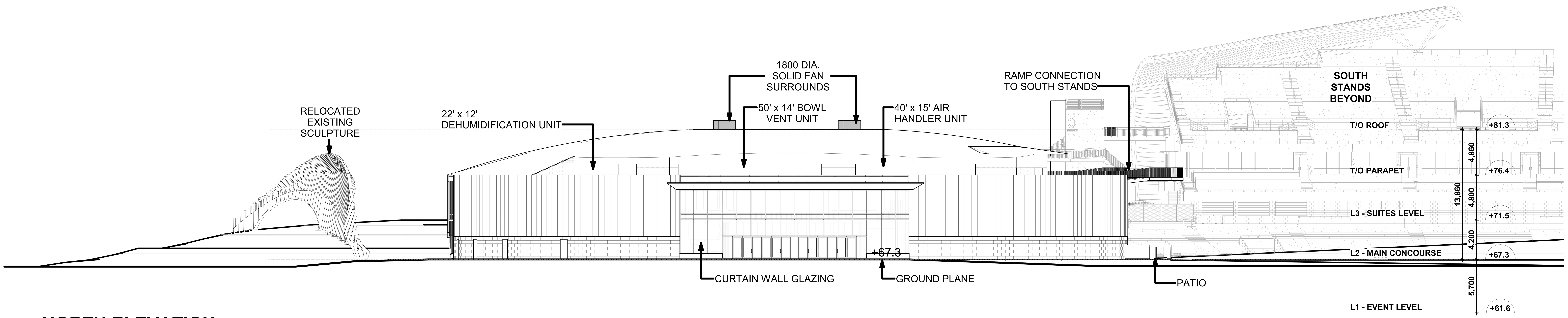
DATE: 2024-07-09

LANSDOWNE EVENT CENTRE EAST AND WEST ELEVATION

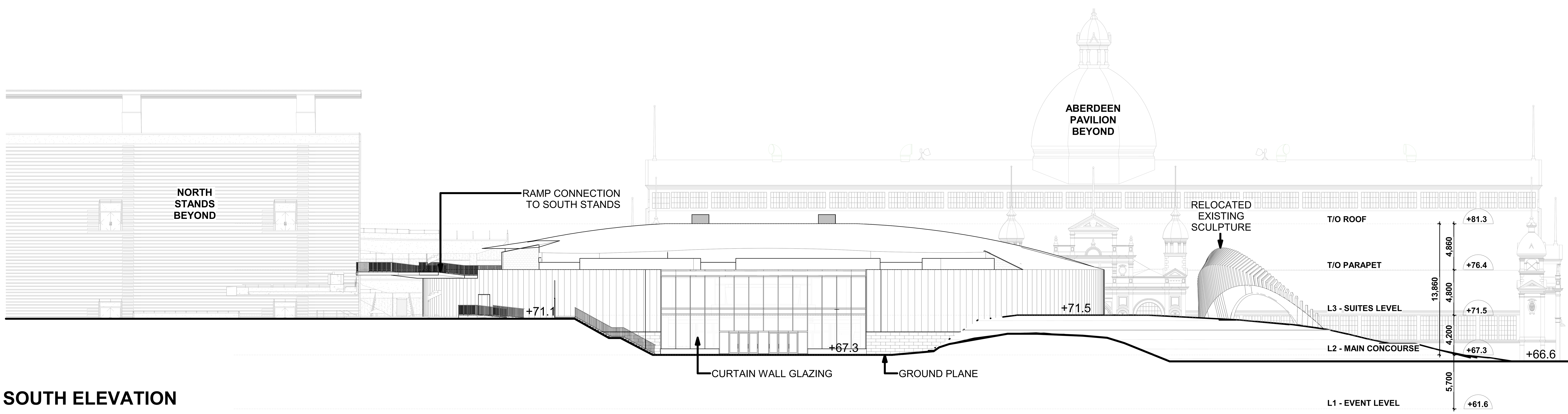
Schematic Design

BRISBIN BROOK BEYNON ARCHITECTS

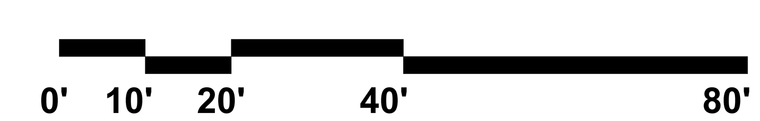
DATE PLOTTED: 2024-07-09 4:42:01 PM



NORTH ELEVATION



SOUTH ELEVATION



IN PROGRESS

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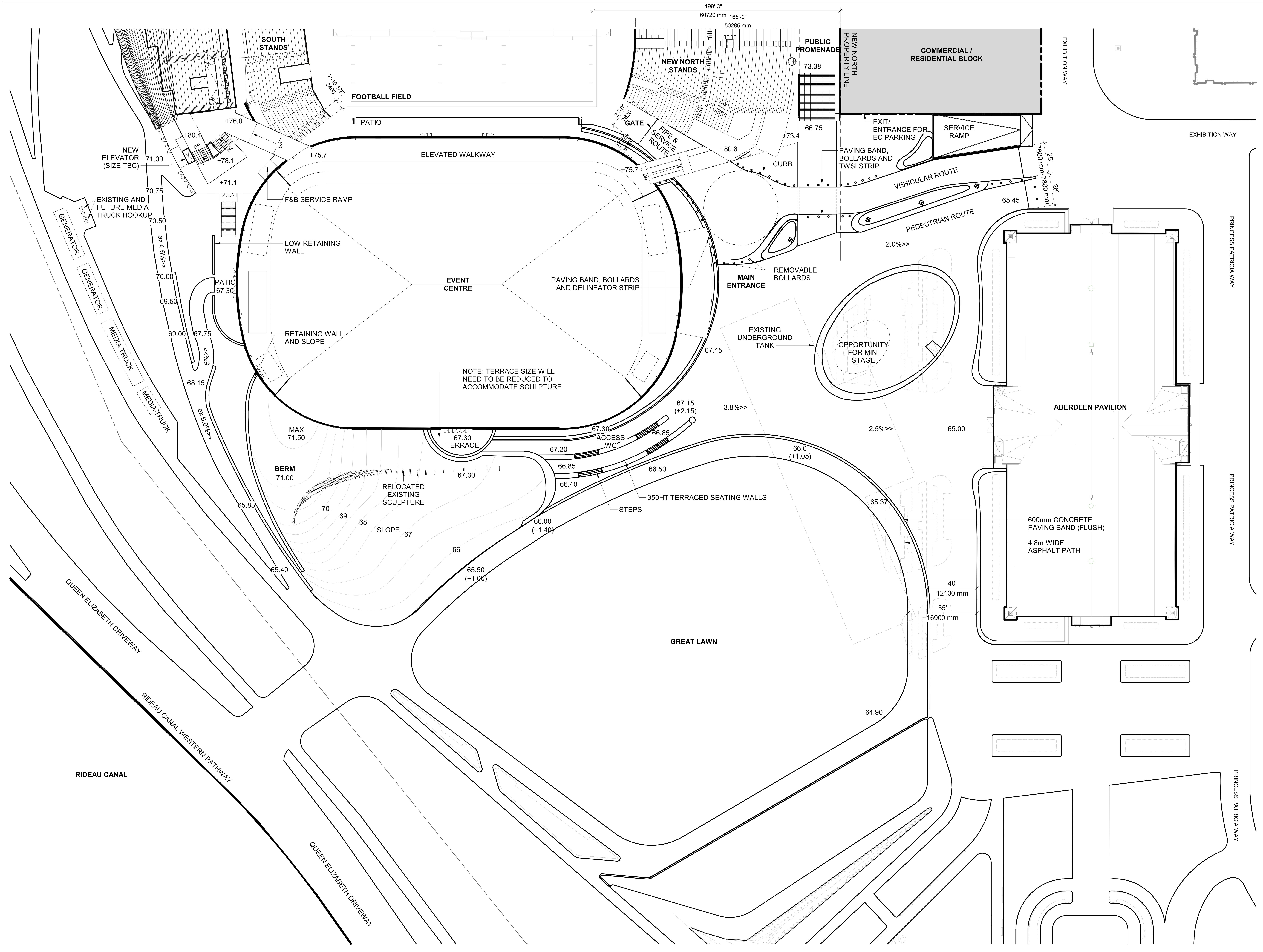
DATE: 2024-07-09

LANSDOWNE EVENT CENTRE NORTH AND SOUTH ELEVATIONS

Schematic Design

BRISBIN BROOK BEYNON ARCHITECTS

DATE PLOTTED: 2024-07-09 4:42:07 PM



DATE PLOTTED: 2024-07-05 6:09:02 PM

Ottawa

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Ottawa Sports and Entertainment Group

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(343) 308-9274
STRUCTURAL ENGINEER

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MECH, PLUMB, FIRE PROTECTION ENGINEER

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90 SHEPPARD AVE EAST, SUITE 500
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ELEC, LIGHTING ENGINEER

S2O
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(224) 717-1999
FOOD AND BEVERAGE

CSW
319 MCRAE AVENUE, SUITE 502
OTTAWA, ONTARIO K1Z 0B9
(613) 729-4536
LANDSCAPE ARCHITECT

NO.	DESCRIPTION	DATE

REVISIONS/ ISSUES

CONTRACTOR SHALL CHECK AND VERIFY ALL DIMENSIONS AND REPORT ANY OMISSIONS OR DISCREPANCIES TO THE ARCHITECT BEFORE PROCEEDING WITH THE WORK.
DO NOT SCALE THE DRAWINGS

1 2 4 3

SEAL

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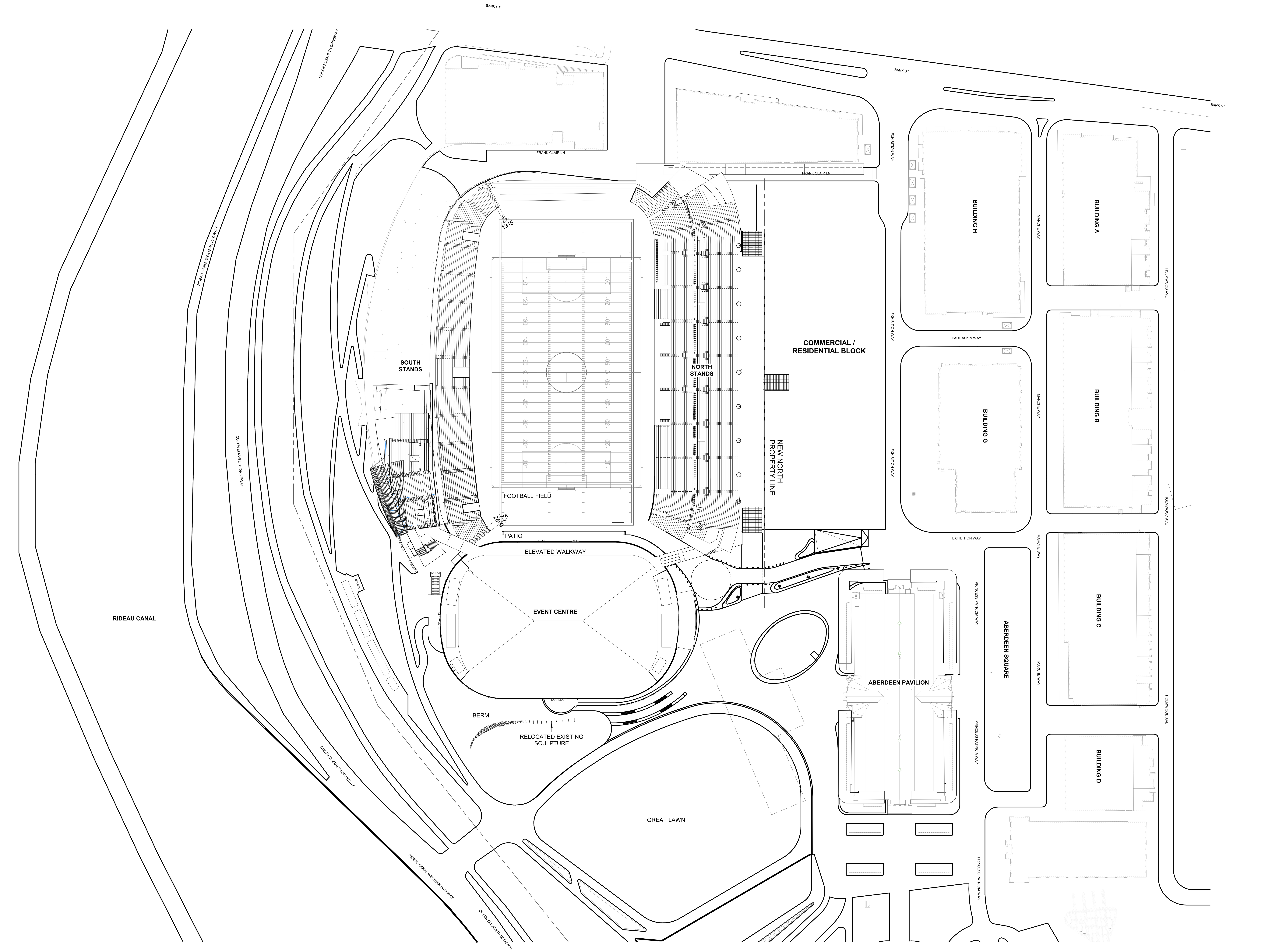
IT IS NOT TO BE USED FOR CONSTRUCTION PURPOSES

DRAWN: JI
DATE: 01/24/24
CHECKED: SJ

LANSDOWNE EVENT CENTRE

DWG. TITLE: OVERALL SITE PLAN DURING CONSTRUCTION

SCALE: 1 : 400
DWG. NO.: A1-002
PROJ. NO.: 2008



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LANDSCAPE ARCHITECT

NO.	DESCRIPTION	DATE

REVISIONS/ ISSUES

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DO NOT SCALE THE DRAWINGS

1 2
4 3

SEAL

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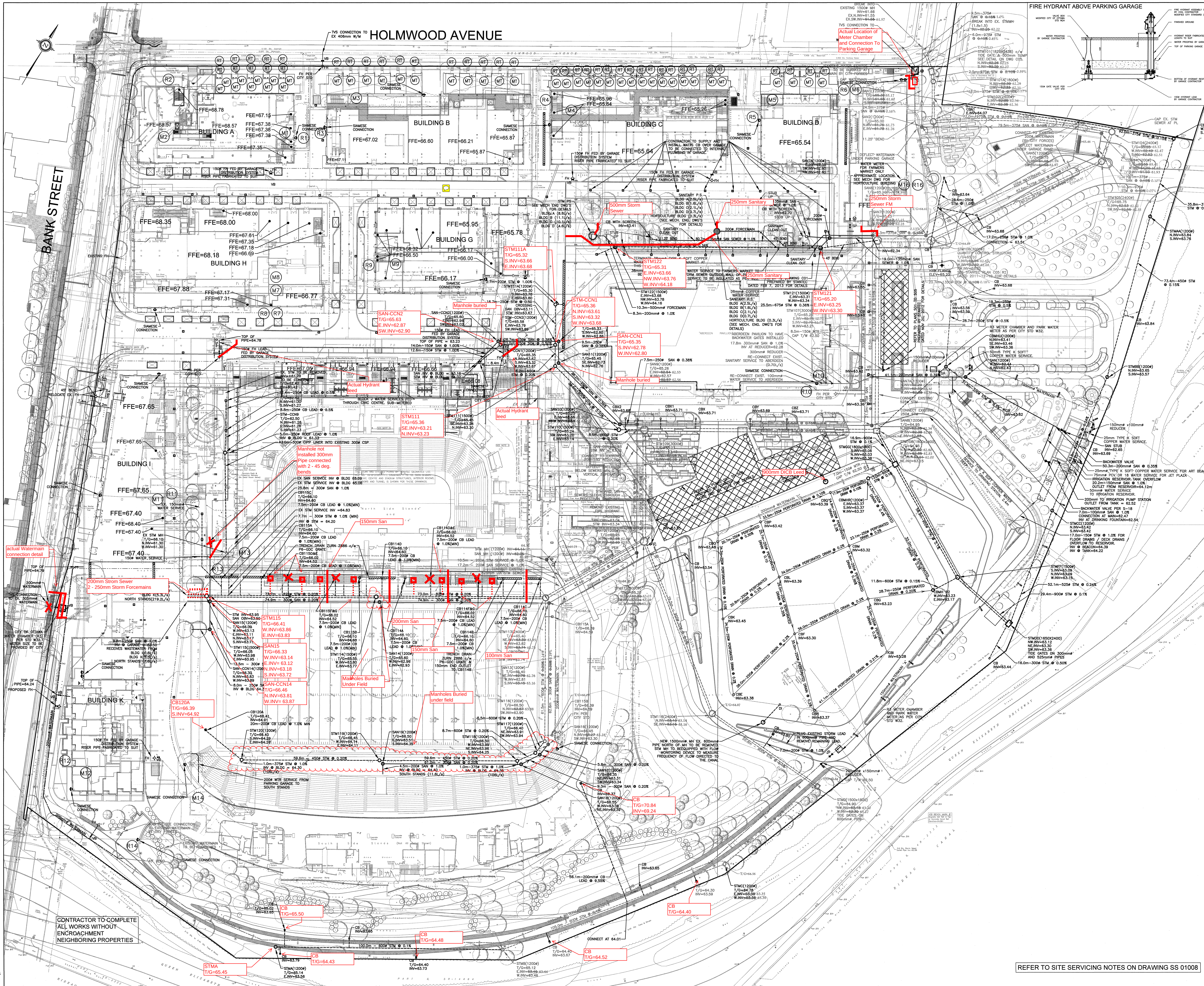
DRAWN JD
DATE 01/24/24
CHECKED SJ

LANSDOWNE EVENT CENTRE

DWG. TITLE
OVERALL SITE PLAN

SCALE 1 : 750
DWG. NO. A1-004
PROJ. NO. 2008

DATE PLOTTED: 2024-07-05 6:10:33 PM



REDEVELOPMENT OF LANSDOWNE PARK

Lansdowne
THE TRANSFORMATION OF LANSDOWNE PARK | LA TRANSFORMATION DU PARC LANSDOWNE

Ottawa

OSEG
Ottawa Sports and Entertainment Group

1015 Bank Street
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K1S 3W7

DSEL
david schaeffer engineering ltd
SMART SUBDIVISIONS™

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Fax. (613) 836-7183
www.DSEL.ca

Stantec

1505 Laperriere Avenue
Ottawa, Ontario, K1Z 7T1
Tel. (613) 722-4420
Fax. (613) 722-2799
www.stantec.com

Drawings are not to be scaled.

Contractor must verify all dimensions on the job and report any discrepancy to architects before proceeding with the work

All drawings and specifications are the property of the architect and must be returned at the completion of the work

This drawing is not to be used for construction until countersigned.

Signature: Date:

Seals:

LICENSED PROFESSIONAL ENGINEER A. D. FOBERT 100090626 2015-02-10 PROVINCE OF ONTARIO

REGISTERED PROFESSIONAL ENGINEER J. W. VAN GAAL Feb 5/15 PROVINCE OF ONTARIO

GENERAL NOTES

1. ALL WORKS AND MATERIALS SHALL CONFORM TO THE LATEST REVISION OF THE STANDARDS AND SPECIFICATIONS FOR THE CITY OF OTTAWA, ONTARIO PROVINCIAL STANDARD DRAWINGS (OPSD) AND SPECIFICATIONS (OPSS), WHERE APPLICABLE. LOCAL UTILITY STANDARDS AND MINISTRY OF TRANSPORTATION STANDARDS WILL APPLY WHERE REQUIRED.
2. THE CONTRACTOR SHALL CONFIRM THE LOCATION OF ALL EXISTING UTILITIES WITHIN THE SITE AND ADJACENT WORK AREAS. THE CONTRACTOR SHALL BE RESPONSIBLE FOR PROTECTING ALL EXISTING UTILITIES TO THE SATISFACTION OF THE AUTHORITY HAVING JURISDICTION. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE REPAIR OR REPLACEMENT OF ANY SERVICES OR UTILITIES DISTURBED DURING CONSTRUCTION, TO THE SATISFACTION OF THE AUTHORITY HAVING JURISDICTION.
3. ALL DIMENSIONS SHALL BE CHECKED AND VERIFIED IN THE FIELD BY THE CONTRACTOR PRIOR TO THE START OF CONSTRUCTION. ANY DISCREPANCIES SHALL BE REPORTED IMMEDIATELY TO THE ENGINEER. LOST TIME DUE TO FAILURE OF THE CONTRACTOR TO CONFIRM UTILITY LOCATIONS AND NOTIFY ENGINEER OF POSSIBLE CONFLICTS PRIOR TO CONSTRUCTION WILL BE AT THE CONTRACTORS EXPENSE.
4. ANY AREAS BEYOND THE LIMIT OF THE SITE DISTURBED DURING CONSTRUCTION SHALL BE RESTORED TO ORIGINAL CONDITION OR BETTER TO THE SATISFACTION OF THE AUTHORITY HAVING JURISDICTION AT THE CONTRACTOR'S EXPENSE.
5. RELOCATION OF EXISTING SERVICES AND/OR UTILITIES SHALL BE AS SHOWN ON THE DRAWINGS OR DIRECTED BY THE ENGINEER AT THE EXPENSE OF THE DEVELOPER.
6. ALL WORK SHALL BE COMPLETED IN ACCORDANCE WITH THE 'OCCUPATIONAL HEALTH AND SAFETY ACT AND REGULATIONS FOR CONSTRUCTION PROJECTS.' THE GENERAL CONTRACTOR SHALL BE DEEMED TO BE THE 'CONSTRUCTOR' AS DEFINED IN THE ACT.
7. ALL CONSTRUCTION SIGNAGE MUST CONFORM TO THE MINISTRY OF TRANSPORTATION OF ONTARIO MANUAL OF UNIFORM TRAFFIC CONTROL DEVICES PER LATEST AMENDMENT.
8. THE CONTRACTOR IS ADVISED THAT WORKS BY OTHERS MAY BE ONGOING DURING THE PERIOD OF THIS CONTRACT. THE CONTRACTOR SHALL COORDINATE CONSTRUCTION ACTIVITIES TO PREVENT CONFLICTS.
9. ALL DIMENSIONS ARE IN METRES UNLESS SPECIFIED OTHERWISE.
10. THERE WILL BE NO SUBSTITUTION OF MATERIALS UNLESS PRIOR WRITTEN APPROVAL IS RECEIVED FROM THE ENGINEER.
11. ALL CONSTRUCTION SHALL BE CARRIED OUT IN ACCORDANCE WITH THE RECOMMENDATIONS MADE IN THE GEOTECHNICAL REPORT.
12. FOR DETAILS RELATING TO STORMWATER MANAGEMENT AND ROOF DRAINAGE REFER TO THE SITE SERVICING AND STORMWATER MANAGEMENT REPORT.
13. ALL SEWERS CONSTRUCTED WITH GRADES LESS THAN 1.0% SHALL BE INSTALLED USING LASER ALIGNMENT AND CHECKED WITH LEVEL INSTRUMENT PRIOR TO BACKFILLING.
14. THE CONTRACTOR IS RESPONSIBLE FOR OBTAINING ALL PERMITS REQUIRED AND TO BEAR THE COST OF THE SAME.
15. THE CONTRACTOR WILL BE RESPONSIBLE FOR ADDITIONAL BEDDING, OR ADDITIONAL STRENGTH PIPE IF THE MAXIMUM TRENCH WIDTH AS SPECIFIED BY OPSD IS EXCEEDED.
16. ALL PIPE / CULVERT SECTION SIZES REFER TO INSIDE DIMENSIONS.
17. SHOULD DEEPLY BURIED ARCHAEOLOGICAL REMAINS BE FOUND ON THE PROPERTY DURING CONSTRUCTION ACTIVITIES, THE HERITAGE OPERATIONS UNIT OF THE ONTARIO MINISTRY OF CULTURE MUST BE NOTIFIED IMMEDIATELY.
18. ALL NECESSARY CLEARING AND GRUBBING SHALL BE COMPLETED BY THE CONTRACTOR. REVIEW WITH CONTRACT ADMINISTRATOR AND THE CITY OF OTTAWA PRIOR TO ANY TREE CUTTING / REMOVAL.
19. DRAWINGS SHALL BE READ IN CONJUNCTION WITH THE ARCHITECTURAL SITE PLAN.
20. THE CONTRACTOR SHALL PROVIDE THE PROJECT ENGINEER ONE SET OF AS CONSTRUCTED SITE SERVICING AND GRADING DRAWINGS.
21. BENCHMARKS: IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO VERIFY THAT THE SITE BENCHMARK(S) HAS NOT BEEN ALTERED OR DISTURBED AND THAT ITS RELATIVE ELEVATION AND DESCRIPTION AGREES WITH THE INFORMATION DEPICTED ON THIS PLAN.

TOPOGRAPHIC INFORMATION

TOPOGRAPHIC INFORMATION PROVIDED BY FAIRHALL, MOFFATT & WOODLEAND LTD.
PROJ. NO. P19500
DATED 2011-09-27

SITE PLAN INFORMATION

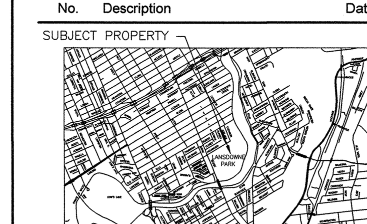
TOPOGRAPHIC INFORMATION PROVIDED BY CORUSH, SUNDERLAND , AND WRIGHT
PROJ. NO. 1766
DATED 2013-06-14

BENCH MARK

MAGNETIC NAIL SET IN TOP OF CONCRETE WALL OF CANAL LOCATED AT SOUTH EAST SITE ACCESS
ELEV=64.581

No.	Description	Date
21	Issued to City	Jan 27/15
20	Issued to City	Sept 04/14
19	Revised Bldg G1 Siamese connection	June 17/14
18	Revised Siamese connections	May 8/14
17	Revised FH Bank Street	Feb 2/14
16	Revised per municipal comments	Dec 10/13
15	Added Meter and Remote Meter locations	Dec 4/13
14	Revised water meter at Bank street, updated per CCN-SS-9r3, CCN-SS-10, CD-SS-3, CD-SS-4	Nov 26/13

SUBJECT PROPERTY



KEY PLAN

Drawing Title:

LANSDOWNE PARK

SITE SERVICING PLAN

Scale.: 1:500 Date Created: MM/DD/YR

Project No.: 09-378 Checked by: CHK

SS 01003

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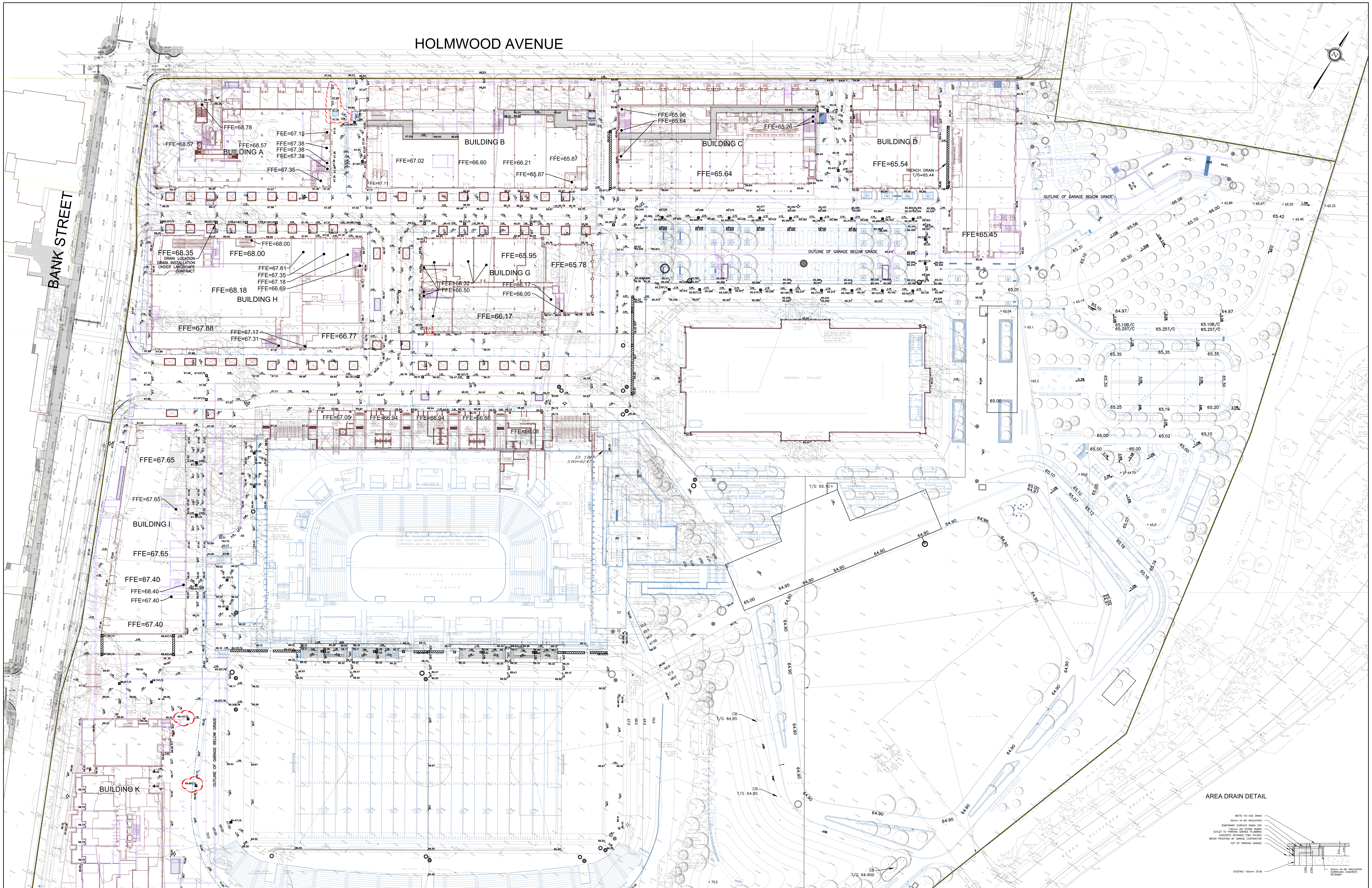

LEGEND

Symbol	Description	Symbol	Description
×100.00	PROPOSED SPOT ELEVATION		LIMITS OF CONTRACT
×100.00T/C	PROPOSED TOP OF CURB ELEVATION	P1 =64.10	APPROX. GARAGE FLOOR ELEVATION
×100.00B/W	PROPOSED BOTTOM OF WALL ELEVATION		PROPOSED TRENCH DRAIN "ACO DRAIN K100S/KS100S" (REFER TO MECHANICAL AND LANDSCAPE DRAWINGS)
×100.00T/W	PROPOSED TOP OF WALL ELEVATION		PROPOSED DRAIN DRAIN LOCATION "WATTS DRAINAGE FD-430" (REFER TO MECHANICAL AND LANDSCAPE DRAWINGS)
×100.00T/L	PROPOSED TOP OF LID ELEVATION		PROPOSED CATCH BASIN (OPSD 705.010)
			PROPOSED STORM MAINTENANCE HOLE
1.0%	PROPOSED GRADE AND DIRECTION		PROPOSED SANITARY MAINTENANCE HOLE
100.00 / 100.00	PROPOSED/EXISTING SPOT ELEVATION		

SITE GRADING NOTES

1. PRIOR TO THE COMMENCEMENT OF THE SITE GRADING WORKS, ALL SILTATION CONTROL DEVICES SHALL BE INSTALLED AND OPERATIONAL PER EROSION CONTROL PLAN.
2. ALL GRANULAR AND PAVEMENT FOR ROADS/PARKING AREAS SHALL BE CONSTRUCTED IN ACCORDANCE WITH GEOTECHNICAL ENGINEER'S RECOMMENDATIONS.
3. ALL TOPSOIL AND ORGANIC MATERIAL SHALL BE STRIPPED WITHIN THE ROAD AND PARKING AREAS ALLOWANCE PRIOR TO THE COMMENCEMENT OF CONSTRUCTION.
4. CONCRETE CURB SHALL BE IN ACCORDANCE WITH CITY OF OTTAWA STD. SC1.1. PROVISION SHALL BE MADE FOR CURB DEPRESSIONS AS INDICATED ON ARCHITECTURAL SITE PLAN. CONCRETE SIDEWALK SHALL BE IN ACCORDANCE WITH CITY OF OTTAWA STD SC1.4. ALL CURBS, CONCRETE ISLANDS, AND SIDEWALKS SHOWN ON THIS DRAWING ARE TO BE PRICED IN THE SITEWORKS PORTION OF THE CONTRACT.
5. PAVEMENT REINSTATEMENT FOR SERVICE AND UTILITY CUTS SHALL BE IN ACCORDANCE WITH THE CITY OF OTTAWA STD. R10 AND OPSD 509.010, AND OPSS 310.
6. GRANULAR 'A' SHALL BE PLACED TO A MINIMUM THICKNESS OF 300mm AROUND ALL STRUCTURES WITHIN THE PAVEMENT AREA.
7. SUB-EXCAVATE SOFT AREAS AND FILL WITH GRANULAR 'B' COMPACTED IN MAXIMUM 300mm LIFTS.
8. ALL WORK ON THE MUNICIPAL RIGHT OF WAY AND EASEMENTS TO BE INSPECTED BY THE MUNICIPALITY PRIOR TO BACKFILLING.
9. CONTRACTOR TO OBTAIN A ROAD OCCUPANCY PERMIT 48 HOURS PRIOR TO COMMENCING ANY WORK WITHIN THE MUNICIPAL ROAD ALLOWANCE, IF REQUIRED BY THE MUNICIPALITY.
10. ALL PAVEMENT MARKING FEATURES AND SITE SIGNAGE SHALL BE PLACED PER ARCHITECTURAL SITE PLAN. LINE PAINTING AND DIRECTIONAL SYMOBOLS SHALL BE APPLIED WITH A MINIMUM OF TWO COATS OF ORGANIC SOLVENT PAINT.
11. REFER TO ARCHITECTURAL SITE PLAN FOR DIMENSIONS AND SITE DETAILS.
12. STEP JOINTS ARE TO BE USED WHERE PROPOSED ASPHALT MEETS EXISTING ASPHALT. ALL JOINTS MUST BE SEALED.
13. SIDEWALKS TO BE 20mm BELOW THE FINISHED FLOOR SLAB ELEVATION AT ENTRANCES UNLESS OTHERWISE NOTED.
14. WHERE APPLICABLE THE CONTRACTOR IS TO SUBMIT SHOP DRAWS FOR RETAINING WALL (INCLUDE RAILINGS IF APPLICABLE) TO THE ENGINEER FOR APPROVAL PRIOR TO CONSTRUCTION. SHOP DRAWINGS MUST BE SITE SPECIFIC, SIGNED AND SEALED BY A LICENSED STRUCTURAL ENGINEER. THE CONTRACTOR WILL ALSO BE REQUIRED TO SUPPLY STRUCTURAL AND GEOTECHNICAL CERTIFICATION OF THE AS-CONSTRUCTRED RETAINING WALL TO THE ENGINEER PRIOR TO FINAL ACCEPTANCE.

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REDEVELOPMENT OF LANSDOWNE PARK

Lansdowne
THE TRANSFORMATION OF LANSDOWNE PARK
LA TRANSFORMATION DU PARC LANSDOWNE

Ottawa

OSEG
Ottawa Sports and Entertainment Group

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Ottawa, Ontario, K1Z 7T1
Tel. (613) 722-4420
Fax. (613) 722-2799
www.stantec.com

Drawings are not to be scaled.

Contractor must verify all dimensions on the job and report any discrepancy to architects before proceeding with the work

All drawings and specifications are the property of the architect and must be returned at the completion of the work

This drawing is not to be used for construction until countersigned.

Signature: Date:

Seals:

GENERAL NOTES

1. ALL WORKS AND MATERIALS SHALL CONFORM TO THE LATEST REVISION OF THE STANDARDS AND SPECIFICATIONS FOR THE CITY OF OTTAWA, ONTARIO PROVINCIAL STANDARD DRAWINGS (OPSD) AND SPECIFICATIONS (OPSS), WHERE APPLICABLE. LOCAL UTILITY STANDARDS AND MINISTRY OF TRANSPORTATION STANDARDS WILL APPLY WHERE REQUIRED.
2. THE CONTRACTOR SHALL CONFIRM THE LOCATION OF ALL EXISTING UTILITIES WITHIN THE SITE AND ADJACENT WORK AREAS. THE CONTRACTOR SHALL BE RESPONSIBLE FOR PROTECTING ALL EXISTING UTILITIES TO THE SATISFACTION OF THE AUTHORITY HAVING JURISDICTION. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE REPAIR OR REPLACEMENT OF ANY SERVICES OR UTILITIES DISTURBED DURING CONSTRUCTION, TO THE SATISFACTION OF THE AUTHORITY HAVING JURISDICTION.
3. ALL DIMENSIONS SHALL BE CHECKED AND VERIFIED IN THE FIELD BY THE CONTRACTOR PRIOR TO THE START OF CONSTRUCTION. ANY DISCREPANCIES SHALL BE REPORTED IMMEDIATELY TO THE ENGINEER. LOST TIME DUE TO FAILURE OF THE CONTRACTOR TO CONFIRM UTILITY LOCATIONS AND NOTIFY ENGINEER OF POSSIBLE CONFLICTS PRIOR TO CONSTRUCTION WILL BE AT THE CONTRACTORS EXPENSE.
4. ANY AREAS BEYOND THE LIMIT OF THE SITE DISTURBED DURING CONSTRUCTION SHALL BE RESTORED TO ORIGINAL CONDITION OR BETTER TO THE SATISFACTION OF THE AUTHORITY HAVING JURISDICTION AT THE CONTRACTOR'S EXPENSE.
5. RELOCATION OF EXISTING SERVICES AND/OR UTILITIES SHALL BE AS SHOWN ON THE DRAWINGS OR DIRECTED BY THE ENGINEER AT THE EXPENSE OF THE DEVELOPER.
6. ALL WORK SHALL BE COMPLETED IN ACCORDANCE WITH THE 'OCCUPATIONAL HEALTH AND SAFETY ACT AND REGULATIONS FOR CONSTRUCTION PROJECTS.' THE GENERAL CONTRACTOR SHALL BE DEEMED TO BE THE 'CONSTRUCTOR' AS DEFINED IN THE ACT.
7. ALL CONSTRUCTION SIGNAGE MUST CONFORM TO THE MINISTRY OF TRANSPORTATION OF ONTARIO MANUAL OF UNIFORM TRAFFIC CONTROL DEVICES PER LATEST AMENDMENT.
8. THE CONTRACTOR IS ADVISED THAT WORKS BY OTHERS MAY BE ONGOING DURING THE PERIOD OF THIS CONTRACT. THE CONTRACTOR SHALL COORDINATE CONSTRUCTION ACTIVITIES TO PREVENT CONFLICTS.
9. ALL DIMENSIONS ARE IN METRES UNLESS SPECIFIED OTHERWISE.
10. THERE WILL BE NO SUBSTITUTION OF MATERIALS UNLESS PRIOR WRITTEN APPROVAL IS RECEIVED FROM THE ENGINEER.
11. ALL CONSTRUCTION SHALL BE CARRIED OUT IN ACCORDANCE WITH THE RECOMMENDATIONS MADE IN THE GEOTECHNICAL REPORT.
12. FOR DETAILS RELATING TO STORMWATER MANAGEMENT AND ROOF DRAINAGE REFER TO THE SITE SERVICING AND STORMWATER MANAGEMENT REPORT.
13. ALL SEWERS CONSTRUCTED WITH GRADES LESS THAN 1.0% SHALL BE INSTALLED USING LASER ALIGNMENT AND CHECKED WITH LEVEL INSTRUMENT PRIOR TO BACKFILLING.
14. THE CONTRACTOR IS RESPONSIBLE FOR OBTAINING ALL PERMITS REQUIRED AND TO BEAR THE COST OF THE SAME.
15. THE CONTRACTOR WILL BE RESPONSIBLE FOR ADDITIONAL BEDDING, OR ADDITIONAL STRENGTH PIPE IF THE MAXIMUM TRENCH WIDTH AS SPECIFIED BY OPSD IS EXCEEDED.
16. ALL PIPE / CULVERT SECTION SIZES REFER TO INSIDE DIMENSIONS.
17. SHOULD DEEPLY BURIED ARCHAEOLOGICAL REMAINS BE FOUND ON THE PROPERTY DURING CONSTRUCTION ACTIVITIES, THE HERITAGE OPERATIONS UNIT OF THE ONTARIO MINISTRY OF CULTURE MUST BE NOTIFIED IMMEDIATELY.
18. ALL NECESSARY CLEARING AND GRUBBING SHALL BE COMPLETED BY THE CONTRACTOR. REVIEW WITH CONTRACT ADMINISTRATOR AND THE CITY OF OTTAWA PRIOR TO ANY TREE CUTTING / REMOVAL.
19. DRAWINGS SHALL BE READ IN CONJUNCTION WITH THE ARCHITECTURAL SITE PLAN.
20. THE CONTRACTOR SHALL PROVIDE THE PROJECT ENGINEER ONE SET OF AS CONSTRUCTED SITE SERVICING AND GRADING DRAWINGS.
21. BENCHMARKS: IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO VERIFY THAT THE SITE BENCHMARK(S) HAS NOT BEEN ALTERED OR DISTURBED AND THAT ITS RELATIVE ELEVATION AND DESCRIPTION AGREES WITH THE INFORMATION DEPICTED ON THIS PLAN.

TOPOGRAPHIC INFORMATION

TOPOGRAPHIC INFORMATION PROVIDED BY FAIRHALL, MOFFATT & WOODLEAND LTD.
PROJ. NO. P19500
DATED 2011-09-27

SITE PLAN INFORMATION

TOPOGRAPHIC INFORMATION PROVIDED BY CORUSH, SUNDERLAND , AND WRIGHT
PROJ. NO. 1766
DATED 2013-06-14

BENCH MARK

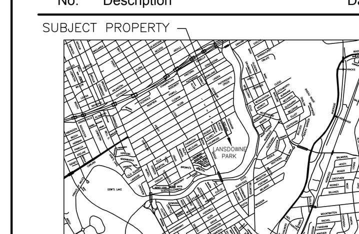
MAGNETIC NAIL SET IN TOP OF CONCRETE WALL OF CANAL LOCATED AT SOUTH EAST SITE ACCESS
ELEV=64.581

GEOTECHNICAL REPORT

PREPARED BY PATERSON GROUP
"PRELIMINARY GEOTECHNICAL INVESTIGATION – PROPOSED LANSDOWNE PARK REDEVELOPMENT BANK STREET AT HOLMWOOD AVENUE, OTTAWA, ON." DATED MARCH 17, 2010
PROJ. NO.: PG1744-1

No.	Description	Date
17	Revised grading at BLDG A per Trinity request	Mar 14/14
16	Added area drain detail	Dec 10/13
15	Add area drains at Building K	Nov 22/13
14	Revised GP per IBI request	Jul 10/13
13	SI-SS-1R2: Modification to Building Locations on Plan	Mar 13/13

SUBJECT PROPERTY



KEY PLAN

Drawing Title:

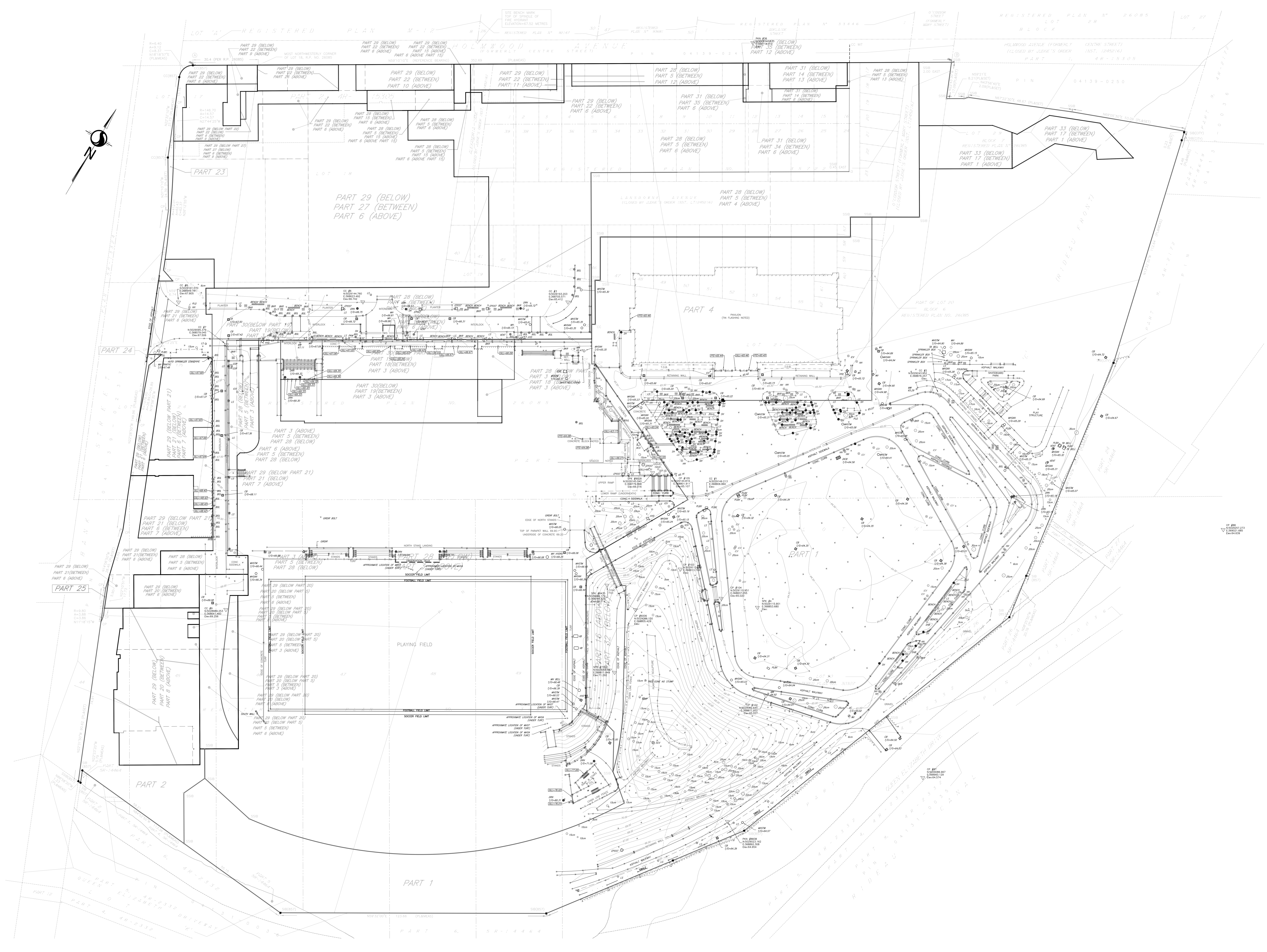
LANSDOWNE PARK

SITE GRADING PLAN

Scale.: 1:500 Date Created: MM/DD/YR

Project No.: 09-378 Checked by: CHK

SS 01002



Stantec

Stantec Geomatics Ltd.
300-1331 Clyde Avenue
Ottawa ON
Tel. 613.722.4420
www.stantec.com

TOPOGRAPHIC SKETCH OF **LANDSDOWNE PARK**

CITY OF OTTAWA

Scale 1:500

10 0 10 20 30 METRES

Stantec Geomatics Ltd.
ONTARIO LAND SURVEYORS

METRIC CONVERSION
DISTANCES AND COORDINATES SHOWN ON THIS PLAN ARE IN METRES AND CAN BE CONVERTED TO FEET BY DIVIDING BY 0.3048

HORIZONTAL DATUM NOTE
PROJECTION: MODIFIED TRANSVERSE MERCATOR (MTM, ZONE 9, CM76°30'W)
DATUM: NAD 83 (ORIGINAL)

DISTANCES ON THIS PLAN MAY BE CONVERTED TO GROUND DISTANCES BY DIVIDING BY A COMBINED SCALE FACTOR OF 0.999XXX.

VERTICAL DATUM NOTE
ELEVATIONS ARE REFERRED TO THE CANADIAN GEODETIC VERTICAL DATUM (CGVD-1928:1978)

BOUNDARY NOTE
BOUNDARY LINEWORK AND INFORMATION IS COMPILED FROM PLAN VARIOUS SOURCES AND IS NOT BASED ON ACTUAL SURVEY.

LEGEND

■	DENOTES	FOUND MONUMENTS
□	"	SET MONUMENTS
IB	"	IRON BAR
IBø	"	ROUND IRON BAR
SIB	"	STANDARD IRON BAR
SSIB	"	SHORT STANDARD IRON BAR
CC	"	CUT CROSS
CP	"	CONCRETE PIN
WIT	"	WITNESS
PIN	"	PROPERTY IDENTIFICATION NUMBER
M/MEAS	"	MEASURED
PROP	"	PROPORTIONED
OU	"	ORIGIN UNKNOWN
SG	"	STANTEC GEOMATICS LTD.
P1	"	PLAN
ACU	"	AIR CONDITIONING UNIT
AN	"	ANCHOR
AP	"	AIR PUMP
ANT	"	ANTENNA
BH	"	BOREHOLE
BIB	"	HOSE BIB
BKR	"	BIKE RACK
BENCH	"	BENCH
BOL	"	BOLLARD
BOUL	"	BOULDER
CB	"	CATCH BASIN
DICB	"	DOUBLE CB
CBMH	"	CB MANHOLE
DCBMH	"	DOUBLE CB MANHOLE
SICB	"	SIDE INLET CB
CHM	"	CHIMNEY
CO	"	CLEAN OUT
CSV	"	CURB STOP VALVE
DRN	"	DRAIN
EPOST	"	ELECTRICAL OUTLET
FP	"	FLAG POLE
FL	"	FLOOD LIGHT
FTF	"	FUEL TANK FILLER CAP
GC	"	GARBAGE CAN
GFL	"	PIPE FLANGE (GAS)
GFP	"	GAS FUEL PUMP
GP	"	POLE GUYWIRE
GSR	"	GAS SERVICE REGULATOR
GV	"	GAS VALVE
HIC	"	HICKENBOTTOM
HDS	"	HEADSTONE
HLS	"	HYDRO LIGHT STANDARD
HM	"	HYDRO METER
HTN	"	HYDRO TRANSFORMER
HW	"	HAND WELL
HYD	"	FIRE HYDRANT
JBX	"	JUNCTION BOX
LS	"	LIGHT STANDARD
MB	"	MAILBOX
MP	"	MONITORING PIN
MH	"	MAINTENANCE HOLE UNIDENTIFIED
MHB	"	MAINTENANCE HOLE BELL
MHF	"	MAINTENANCE HOLE FIBRE OPTIC
MHH	"	MAINTENANCE HOLE HYDRO
MHSAN	"	MAINTENANCE HOLE SANITARY
MHSTM	"	MAINTENANCE HOLE STORM
MHT	"	MAINTENANCE HOLE TRAFFIC
MW	"	MONITORING WELL
NPB	"	NEWS PAPER BOX
OLS	"	LIGHT STANDARD ORNAMENTAL
OW	"	OBSERVATION WELL
PKM	"	PARKING METER
PLBX	"	PULL BOX
PLQ	"	PLAQUE
PLR	"	PILLAR
PZ	"	PIEZIOMETER
RLC	"	RED LIGHT CAMERA
RWSL	"	RAILWAY SIGNAL LIGHT
RWSS	"	RAILWAY SWITCH STAND
SAT	"	SATELLITE DISH
SCLP	"	SCULPTURE
SCP	"	SUMP/CATCH PIT
SCV	"	SPRINKLER CONTROL VALVE
SH	"	SPRINKLER HEAD
SIA	"	SIAMESE CONNECTION
SN	"	SIGN
SPAN	"	SOLAR PANEL
SPT	"	SEPTIC TANK LID
TBL	"	TABLE
TB BELL	"	TERMINAL BOX - BELL
TB CATV	"	TERMINAL BOX - CABLE
TCB	"	TRAFFIC CONTROL BOX
TPIT	"	TEST PIT
TSL	"	TRAFFIC SIGNAL LIGHT
UMB	"	MARKER BELL UNDERGROUND
UMC	"	MARKER CABLE UNDERGROUND
UMG	"	MARKER GAS UNDERGROUND
UMO	"	MARKER OIL UNDERGROUND
UP	"	UTILITY POLE
VB	"	VALVE BOX
VC	"	VALVE CHAMBER
WV	"	WATER VALVE
	"	TREE STUMP
ICV	"	IRRIGATION CONTROL VALVE
	"	TREE CONIFEROUS (D.B.H. SHOWN)
	"	TREE DECIDUOUS (D.B.H. SHOWN)
T		UNDERGROUND TELEPHONE
P		UNDERGROUND HYDRO
WTM		WATERMAIN
G		GASMAIN
STM		STORM SEWER
FOTS		UNDERGROUND FIBRE OPTIC

SURVEYOR'S CERTIFICATE
I CERTIFY THAT :
1. THE SURVEY WAS COMPLETED ON THE 18th DAY OF JUNE , 2024.

DATE

R.G. BENNETT
ONTARIO LAND SURVEYOR

DRAWN: DM CHECKED: CT PM: CT FIELD: CA/ZL/RJ/AW PROJECT No.: 161614737-111

APPENDIX

B

- BOUNDARY CONDITIONS
- CORRESPONDENCE
- FIRE FLOW CALCULATION FOR BUILDINGS
- PROPOSED WATER DEMAND CALCULATION
- EXISTING WATER DEMAND CALCULATION
- HYDRAULIC ANALYSIS
- FIRE HYDRANT TEST RESULTS
- HYDRANT COVERAGE FIGURE

Yang, Winston

From: Whelan, Amy <amy.whelan@ottawa.ca>
Sent: September 11, 2024 10:41 AM
To: Whelan, Amy
Subject: FW: Lansdowne 2.0 - Revised Boundary Conditions Request (Excluding Future Residential Tower 1 and 2)
Attachments: Lansdowne 2.0 Redevelopment REVISED September 2024.pdf

The following are boundary conditions, HGL, for hydraulic analysis at 1015 Bank Street, Lansdowne 2.0 Redevelopment (excluding Towers 1 &2), (zone 1W) assumed to be privately connected to the 305 mm watermain on Bank Street, AND the 406 mm watermain on Holmwood Avenue (see attached PDF for location).

<u>Connection 1 (Holmwood Avenue):</u>

Min HGL: 105.7 m

Max HGL: 114.6 m

Max Day + FF (150L/s): 107.7 m

<u>Connection 2 (Bank Street):</u>

Min HGL: 105.6 m

Max HGL: 114.6 m

Max Day + FF (150 L/s): 106.3 m

These are for current conditions and are based on computer model simulation.

Disclaimer: The boundary condition information is based on current operation of the city water distribution system. The computer model simulation is based on the best information available at the time. The operation of the water distribution system can change on a regular basis, resulting in a variation in boundary conditions. The physical properties of watermains deteriorate over time, as such must be assumed in the absence of actual field test data. The variation in physical watermain properties can therefore alter the results of the computer model simulation.

Shohan

Shohan Ahmad, P.Eng., M.E.Sc., Ph.D.
Senior Engineer, Water Resources
City of Ottawa - Infrastructure & Water Services
Shohan.ahmad@ottawa.ca

From: Whelan, Amy <amy.whelan@ottawa.ca>
Sent: 2024/09/05 2:35 PM
To: Ahmad, Shohan <Shohan.Ahmad@ottawa.ca>
Cc: Mottalib, Abdul <Abdul.Mottalib@ottawa.ca>
Subject: FW: Lansdowne 2.0 - Revised Boundary Conditions Request (Excluding Future Residential Tower 1 and 2)
Importance: High

Good afternoon Shohan,

Please see the boundary condition request below from WSP.

Kind regards,

Amy Whelan, E.I.T
Project Manager, Infrastructure Approvals
Development Review, Central | Examen des projets d'aménagement, Central
Planning, Development and Building Services Department (PDBS) | Direction générale des services de la planification, de l'aménagement et du bâtiment (DGSPAB)
City of Ottawa | Ville d'Ottawa
110 Laurier Avenue West Ottawa, ON | 110, avenue. Laurier Ouest. Ottawa (Ontario) K1P 1J1
613.580.2424 ext./poste 26642, amy.whelan@ottawa.ca

From: Yang, Winston <Winston.Yang@wsp.com>
Sent: September 05, 2024 2:25 PM
To: Whelan, Amy <amy.whelan@ottawa.ca>
Cc: Mottalib, Abdul <Abdul.Mottalib@ottawa.ca>; Moore, Sean <Sean.Moore@ottawa.ca>
Subject: Re: Lansdowne 2.0 - Revised Boundary Conditions Request (Excluding Future Residential Tower 1 and 2)
Importance: High

Hi Amy,

Please find the attached documents for Boundary Conditions, and the details below:

i. Location of service – Please see attached PDF

ii. Type of development – Commercial Development

iii. The amount of fire flow required (per OBC or FUS) – Please see attached PDF (Existing Conditions FUS of 150 L/s is more conservative and therefore used instead of calculated FUS), Please refer to attached Existing FUS Background PDF for more information.

iv. New Average daily demand: 12.3 l/s.

v. New Maximum daily demand: 20.8 l/s.

vi. New Maximum hourly daily demand: 39.3 l/s

Boundary Conditions Request Summary

Existing Water Demands Summary (Red highlights Removal):

	Average Daily Demand	Maximum Daily Demand	Maximum Hourly Demand	FUS
Building A, B, C, D, G1, G2, H, I, J, J Salon, K, North Stands, South Stands, Civic Center, Aberdeen, Horticulture	**11.8**	**19.9**	**38.0**	**150**

Proposed Water Demands with New Additions Summary (Bold Highlights Additions):

	Average Daily Demand	Maximum Daily Demand	Maximum Hourly Demand	FUS
Building A, B, C, D, G1, G2, H, I, K, **New North Stands**, South Stands, **New Event Center**, Aberdeen, Horticulture	**12.3**	**20.8**	**39.3**	**150***

*Note: FUS as per Existing to be Conservative (Please refer to DSEL Report for Existing FUS or the attached Existing FUS Background PDF)

Regards,

Winston Yang
Lead Engineer – Technical Lead
Land Development & Municipal Engineering, Ontario
P.Eng., PMP.

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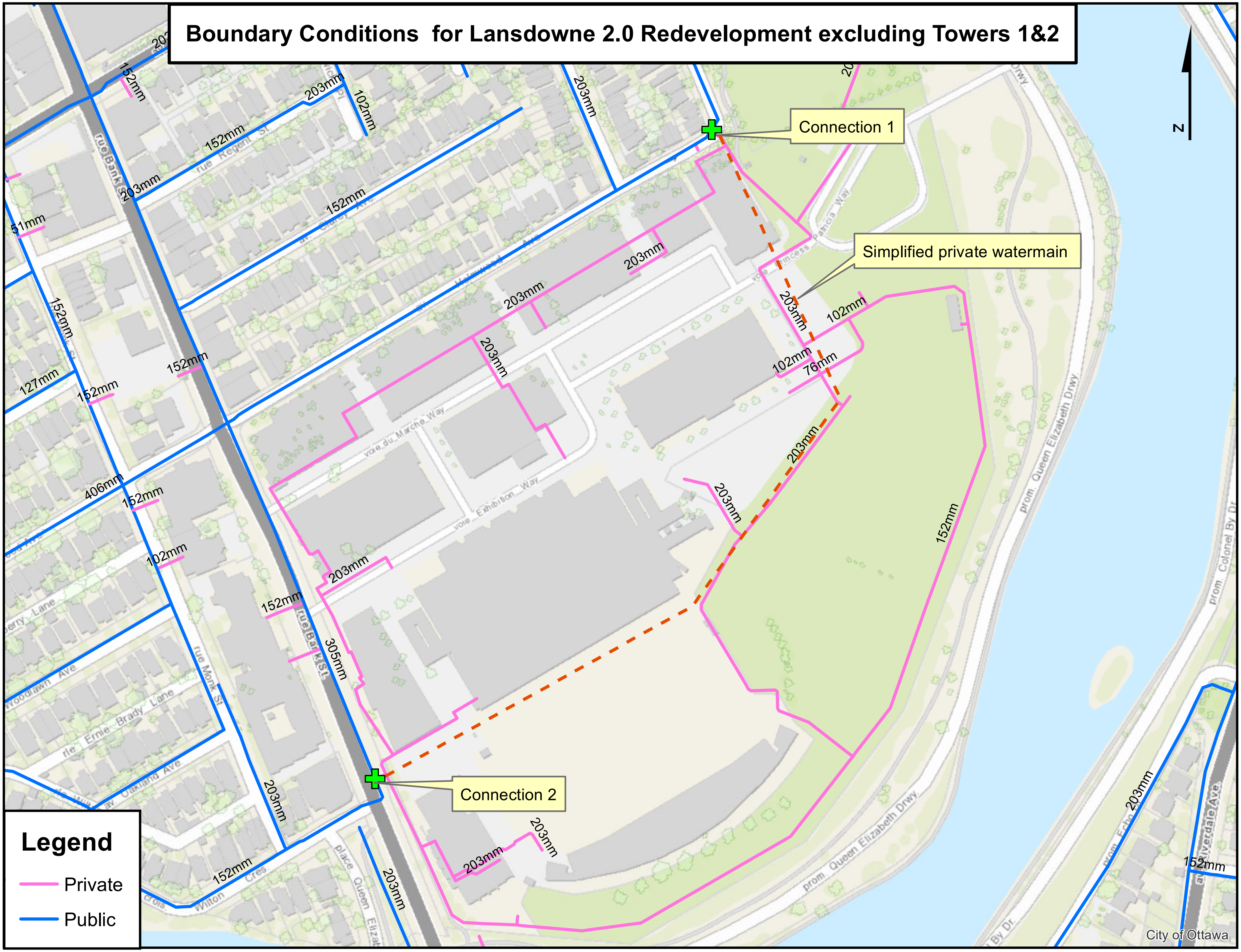
T+ 1 613-690-0538 (Direct)
M+ 1 647-628-8108

WSP Canada Inc.
2611 Queensview Drive, Suite 300
Ottawa, Ontario,
K2B 8K2 Canada

wsp.com

-LAEmHhHzdJzBlTWla4Hgs7pbKl



Boundary Conditions for Lansdowne 2.0 Redevelopment excluding Towers 1&2
Connection 1
Connection 2
Simplified private watermain
Legend
Private
Public
N
City of Ottawa

Yang, Winston

From: Moore, Sean <Sean.Moore@ottawa.ca>
Sent: September 12, 2024 6:55 PM
To: Yang, Winston
Subject: Fw: Lansdowne Park - CODE REPORT to interconnection
Attachments: FW: Lansdowne 2.0 - Revised Boundary Conditions Request (Excluding Future Residential Tower 1 and 2)

Winston please let me know your teams ETA on the necessary updates based on the boundary conditions provided and Amy's deficiencies identified.

Thx

Sean

Get [Outlook for iOS]

From: Moore, Sean <Sean.Moore@ottawa.ca>
Sent: Wednesday, September 11, 2024 3:45 PM
To: Yang, Winston <winston.yang@wsp.com>
Cc: Patricia Warren <warren@fotenn.com>
Subject: Fw: Lansdowne Park - CODE REPORT to interconnection

Winston please see email below from the City and action.

Thank you
Sean

Get [Outlook for iOS]

From: Whelan, Amy <amy.whelan@ottawa.ca>
Sent: Wednesday, September 11, 2024 3:31 PM
To: Moore, Sean <Sean.Moore@ottawa.ca>
Cc: Mottalib, Abdul <Abdul.Mottalib@ottawa.ca>; Hughes, Brett <brett.hughes@ottawa.ca>; Renaud, Jean-Charles <Jean-Charles.Renaud@ottawa.ca>; van Wyk, Adrian <adrian.vanwyk@ottawa.ca>; Smith, Jack <jack.smith@ottawa.ca>; McCreight, Andrew <Andrew.McCreight@ottawa.ca>; Ahmad, Shohan <Shohan.Ahmad@ottawa.ca>
Subject: RE: Lansdowne Park - CODE REPORT to interconnection

Good afternoon Sean,

Please find the updated boundary conditions enclosed in this email. Upon further internal discussion it was determined that due to the rationale that WSP consulting had indicated in the meeting held September 5th 2024 from 11:00am-12:00pm the City is willing to accept a spreadsheet type hydraulic watermain analysis. Please note that the requirement to model the entire private network has been lifted on an exceptional basis, for this specific application, and does not set precedent for future applications.

The applicant is required to demonstrate how the internal private network can support the proposed development i.e. the future event centre through the above mentioned hydraulic watermain analysis and include the results in their servicing report. The City does not accept hydrant pressure testing in place of a hydraulic watermain analysis.

The following details/changes are required for approval:
-Submit an updated boundary condition request to the City of Ottawa for the proposed event center only. (Completed)
-Include the boundary condition request correspondence email in the appendix of the servicing report.
-Remove all language in the site servicing report that states that the design is considering all three phases of the proposed Lansdowne design as it pertains to drinking water servicing.
-Provide the domestic demand calculations of the existing event center and provide the domestic demand calculations of proposed the event center.
-Provide the required fire flow calculations of the existing event center and the required fire flow calculations of the proposed event center.
-Provide discussion in the site servicing report explaining the rational discussed in the meeting detailing how the demands of the proposed event center can be met with the existing watermain network. In addition the report should justify that the proposed development will not negatively impact the existing hydraulic condition. This rational is required as a basis for the City to make an exception for this site to accept a hydraulic analysis using the spreadsheet approach.
-Provide a hydraulic watermain analysis that incorporates the hydraulic losses in the system from the boundary condition connection locations to the proposed event center. The hydraulic watermain analysis is required to include the existing demands from the existing buildings, please contact water metering division to obtain the existing domestic water demand data (alice.zhang@ottawa.ca).
-Provide results of the spread sheet analysis demonstrating that the private system meets the criteria of section 4.2.2 of the Ottawa Design Guidelines – Water Distribution for the proposed event centers demands. This includes data that shows that the expected demands under average day, peak hour and fire flow conditions provide water within the required pressure ranges.

Requirements for future phases:
-All subsequent phases will require updated boundary conditions, and an updated hydraulic watermain analysis.
-Phase 3 Lansdowne project (towers and podium) will be required to demonstrate, via a hydraulic watermain analysis that the private system meets the criteria of section 4.2.2 of the Ottawa Design Guidelines – Water Distribution. The hydraulic watermain analysis will be required to analyze the entire private system and include the existing site demands and the proposed demands for the project.

If you have any questions or wish to arrange a meeting to discuss further, please let us know.

Kind regards,

Amy Whelan, E.I.T
Project Manager, Infrastructure Approvals
Development Review, Central | Examen des projets d'aménagement, Central
Planning, Development and Building Services Department (PDBS) | Direction générale des services de la planification, de l'aménagement et du bâtiment (DGSPAB)
City of Ottawa | Ville d'Ottawa
110 Laurier Avenue West Ottawa, ON | 110, avenue. Laurier Ouest. Ottawa (Ontario) K1P 1J1
613.580.2424 ext./poste 26642, amy.whelan@ottawa.ca

From: Moore, Sean <Sean.Moore@ottawa.ca>
Sent: September 06, 2024 11:59 AM
To: Whelan, Amy <amy.whelan@ottawa.ca>
Cc: Mottalib, Abdul <Abdul.Mottalib@ottawa.ca>
Subject: RE: Lansdowne Park - CODE REPORT to interconnection

Thank you for the update Amy.

Sean.

From: Whelan, Amy <amy.whelan@ottawa.ca>
Sent: September 06, 2024 11:27 AM
To: Moore, Sean <Sean.Moore@ottawa.ca>
Cc: Mottalib, Abdul <Abdul.Mottalib@ottawa.ca>
Subject: RE: Lansdowne Park - CODE REPORT to interconnection

Good morning Sean,

I am just following up to inform you that we are currently awaiting the boundary condition results from the updated request that Winston had sent yesterday. We would like to review the results of the boundary conditions internally and get back to you regarding the hydraulic watermain analysis requirement. As per the meeting we believe that we should be receiving the boundary condition results by Monday or Tuesday next week.

Kind regards,

Amy Whelan, E.I.T
Project Manager, Infrastructure Approvals
Development Review, Central | Examen des projets d'aménagement, Central
Planning, Development and Building Services Department (PDBS) | Direction générale des services de la planification, de l’aménagement et du bâtiment (DGSPAB)
City of Ottawa | Ville d’Ottawa
110 Laurier Avenue West Ottawa, ON | 110, avenue. Laurier Ouest. Ottawa (Ontario) K1P 1J1
613.580.2424 ext./poste 26642, amy.whelan@ottawa.ca

From: Yang, Winston <Winston.Yang@wsp.com>
Sent: September 05, 2024 5:41 PM
To: Moore, Sean <Sean.Moore@ottawa.ca>; Mottalib, Abdul <Abdul.Mottalib@ottawa.ca>
Cc: Whelan, Amy <amy.whelan@ottawa.ca>
Subject: Re: Lansdowne Park - CODE REPORT to interconnection
Importance: High

Hi Sean and Abdul,

Attached is the code report prepared specifically for OSEG by Morrison Hershfield dated May 17, 2012 for the Lansdowne site and this information should be used on future developments on site.

.

The approach used at Lansdowne is unique and took some detailed conversations with the Authority having jurisdiction to come to an agreeable arrangement.

As you are aware that most of the existing watermain network is within the building garage, they are part of the building mechanical system, all these network are also inter-connected within the building plumping system and designed using the O.B.C requirement.
The typical hydraulic water model that City uses to work on is not applicable for this site.

The existing water network was designed and completed by few different consultants, Civil and Building Mechanical, etc., we are not able to put up a unique model that it's suitable for this site.

And as I have mentioned during the meeting, the worse case scenario is the max daily demand + fire flow within the development site shall be governed.
This is typical for all subdivision or site plan developments that we have to make sure there will be adequate demand available from each junction through the hydraulic analysis to meet the targeting max daily and fire.
As per previous approved design, fire flow of 150 l/s has been used for all the buildings within Lansdowne site.
For the current redevelopment phase 1 EC and phase 2 NNS, the max daily demand are almost the same, the fire flow is way less than 150 L/s. This is better off from the existing condition.
If the existing network is working, issues for phase 1 and 2 should not be anticipated.

For future residential development (the two towers), hydraulic analysis is also not required because tower 1 and 2 will be part of the existing building, it should be treated as a single building as per the attached Code report since the underground parking is attached.
The two towers will be serviced internally from the existing garage system.

Further analysis should be provided by the Architect and Mechanical consultant to verify the pressure for daily demand and fire protection during the design of the residential towers.

I am agree that we can obtain an updated boundary condition for city's record, but hydraulic analysis for the entire Lansdowne site is not necessary.
Simple hydraulic check on water pressure using the new boundary condition should be enough to verify the maximum and minimum pressures for phase 1 and 2.
And the hydrant flow test result can be used to confirm the adequate flow within the system down to 140 Kpa (20 psi) to meet the targeting the max daily + fire flow.

Feel free to reach out if you would like to discuss.

Yours truly,

Winston Yang
Lead Engineer – Technical Lead
Land Development & Municipal Engineering, Ontario
P.Eng., PMP.

T+ 1 613-829-2800
T+ 1 613-690-0538 (Direct)
M+ 1 647-628-8108

WSP Canada Inc.
2611 Queensview Drive, Suite 300

Ottawa, Ontario,
K2B 8K2 Canada

wsp.com

-LAEmHhHzdJzBITWfa4Hgs7pbKI

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'

Fire Flow Design Sheet (FUS)
Lansdwone Park Redevelopment
City of Ottawa
WSP Project No. CA000286.1662
Date: 22-Sep-23

Proposed North Stands
Fire Flow Requirements Based on Fire Underwriters Survey (FUS) 2020

1. An estimate of the Fire Flow required for a given fire area may be estimated by: $F = 220\,C\sqrt{A}$

F = required fire flow in litres per minute
C = coefficient related to the type of construction
1.5 for **Type V** Wood Frame Construction
0.8 for **Type IV-A** Mass Timber Construction
0.9 for **Type IV-B** Mass Timber Construction
1.0 for **Type IV-C** Mass Timber Construction
1.5 for **Type IV-D** Mass Timber Construction
1.0 for **Type III** Ordinary Construction
0.8 for **Type II** Noncombustible Construction
0.6 for **Type I** Fire resistive Construction
A =2-b) The single largest Floor Area plus 25% of each of the two immediately adjoining floors

A = 9318.1 m^2
C = 0.6
F = 12742.0 L/min

rounded off to 13,000 L/min (min value of 2000 L/min)

2. The value obtained in 1. may be reduced by as much as 25% for occupancies having a low contents fire hazard.

Non-combustible	-25%
Limited Combustible	-15%
Combustible	0%
Free Burning	15%
Rapid Burning	25%

Reduction due to low occupancy hazard -25% x 13,000 = 9,750 L/min

3. The value obtained in 2. may be reduced by as much as 50% for buildings equipped with automatic sprinkler protection.

Adequate Sprinkler confirms to NFPA13	-30%
Water supply common for sprinklers & fire hoses	-10%
Fully supervised system	-10%
No Automatic Sprinkler System	0%

Reduction due to Sprinkler System -50% x 9,750 = -4,875 L/min

4. The value obtained in 2. is increased for structures exposed within 45 metres by the fire area under consideration.

Separation	Charge
0 to 3 m	25%
3.1 to 10 m	20%
10.1 to 20 m	15%
20.1 to 30 m	10%
30.1 to 45 m	0%

Side 1	10	0%	north side	(fire resistive wall with residential towers)
Side 2	16	0%	east side	(fire resistive wall with Event Centre)
Side 3	85	0%	south side	
Side 4	13	15%	west side	
		15%		(Total shall not exceed 75%)

Increase due to separation 15% x 9,750 = 1,463 L/min

5. The flow requirement is the value obtained in 2., minus the reduction in 3., plus the addition in 4.

The fire flow requirement is 6,000 L/min (Rounded to nearest 1000 L/min)
or **100 L/sec**
or 1,585 gpm (us)
or 1,320 gpm (uk)

Based on method described in:
"Water Supply for Public Fire Protection - A Guide to Recommended Practice", 2020
by Fire Underwriters Survey

Fire Flow Design Sheet (FUS)
Lansdwone Park Redevelopment
City of Ottawa
WSP Project No. CA000286.1662

Date: 22-Sep-23

Proposed Event Centre
Fire Flow Requirements Based on Fire Underwriters Survey (FUS) 2020

1. An estimate of the Fire Flow required for a given fire area may be estimated by: $F = 220\,C\sqrt{A}$

F = required fire flow in litres per minute
C = coefficient related to the type of construction

1.5 for **Type V** Wood Frame Construction
0.8 for **Type IV-A** Mass Timber Construction
0.9 for **Type IV-B** Mass Timber Construction
1.0 for **Type IV-C** Mass Timber Construction
1.5 for **Type IV-D** Mass Timber Construction
1.0 for **Type III** Ordinary Construction
0.8 for **Type II** Noncombustible Construction
0.6 for **Type I** Fire resistive Construction

A =2-b) The single largest Floor Area plus 25% of each of the two immediately adjoining floors

A = 7926.3 m^2
C = 0.6
F = 11751.9 L/min

rounded off to 12,000 L/min (min value of 2000 L/min)

2. The value obtained in 1. may be reduced by as much as 25% for occupancies having a low contents fire hazard.

Non-combustible	-25%
Limited Combustible	-15%
Combustible	0%
Free Burning	15%
Rapid Burning	25%

Reduction due to low occupancy hazard -25% x 12,000 = 9,000 L/min

3. The value obtained in 2. may be reduced by as much as 50% for buildings equipped with automatic sprinkler protection.

Adequate Sprinkler confirms to NFPA13	-30%
Water supply common for sprinklers & fire hoses	-10%
Fully supervised system	-10%
No Automatic Sprinkler System	0%

Reduction due to Sprinkler System -50% x 9,000 = -4,500 L/min

4. The value obtained in 2. is increased for structures exposed within 45 metres by the fire area under consideration.

Separation	Charge
0 to 3 m	25%
3.1 to 10 m	20%
10.1 to 20 m	15%
20.1 to 30 m	10%
30.1 to 45 m	0%

Side 1	85	0% north side	
Side 2	100	0% east side	
Side 3	100	0% south side	
Side 4	16	0% west side	(fire resistive wall seperation with North Stands)
		0%	(Total shall not exceed 75%)

Increase due to separation 0% x 9,000 = 0 L/min

5. The flow requirement is the value obtained in 2., minus the reduction in 3., plus the addition in 4.

The fire flow requirement is 5,000 L/min (Rounded to nearest 1000 L/min)
or **83 L/sec**
or 1,321 gpm (us)
or 1,100 gpm (uk)

Based on method described in:
"Water Supply for Public Fire Protection - A Guide to Recommended Practice", 2020
by Fire Underwriters Survey

					Estimated WTR / SAN / STM per Mechancal Eng.				Estimated Per City of Ottawa Design Guidelines						
										WTR					
Building	Retail	Residential		Office	WTR	FIRE	SAN	STM	AVG	MAX. DAY	PEAK HR	FIRE	SAN	STM	Notes
	(m^2)	# towns	# apts	(m^2)	(L/s)	(L/s)	(L/s)	(L/s)	(L/s)	(L/s)	(L/s)	(L/s)	(L/s)	(L/s)	
A	4,129	7	50		16.7		5.4	8.3	0.6	1.3	2.7	150	2.5	8.6	Mech Eng values provided by LKM 2011-11-29 (Includes retail and residential)
B	5,401	15			6.9		5.7	8.6	0.3	0.6	1.3	150	1.6	11.1	Mech Eng values provided by LKM 2011-11-29 (Includes retail and residential)
C	9,262	11			13.9		5.4	19.6	0.4	0.7	1.4	150	2.1	10.1	Mech Eng values provided by LKM 2011-11-29 (Includes retail and residential)
D	2,131	7			6.3		3.8	5.2	0.1	0.3	0.6	150	0.7	4.6	Mech Eng values provided by LKM 2011-11-29 (Includes retail and residential)
G1	3,507				6.3		5.4	5.5	0.1	0.2	0.3	150	0.6	5.8	Mech Eng values provided by LKM 2011-11-29 (Includes retail)
G2	399				5.0		2.6	2.4	0.0	0.0	0.0	150	0.1	1.3	Mech Eng values provided by LKM 2011-11-29 (Includes retail)
H	7,294				9.5		500FU	9.5	0.2	0.3	0.6	150	1.3	11.7	Mech Eng values provided by LKM 2011-11-29 (Includes retail)
I	2,505			8,361					0.9	1.3	2.3	150	1.6	8.1	
J	1,220								0.0	0.1	0.1	150	0.2	4.3	
J - Salon	3,425								0.1	0.1	0.3	150	0.6	N/A	Roof covered in North Stands flow.
K			190						1.4	3.5	7.6	150	5.5	5.3	
North Stands									2.8	4.2	7.6	150	7.6	219.2	No City standard for estimating flow from stadium / civic centre. Used monitored data
South Stands					25.2	31.5	11.6	211	2.8	4.2	7.5	150	11.6	212.0	No City standard for estimating flow from stadium / civic centre. Used monitored data
Civil Centre									1.9	2.9	5.2	150	5.2	N/A	No City standard for estimating flow from stadium / civic centre. Used monitored data
Aberdeen	4,098								0.1	0.2	0.3	150	0.7	N/A	Peaked Roof, storm runoff included in surface drainage.
Horticulture	1,591								0.0	0.1	0.1	150	0.3	N/A	Peaked Roof, storm runoff included in surface drainage.
Total	**44,962**	**40**	**240**	**8,361**	**89.9**	**31.5**	**39.8**	**270.1**	**11.8**	**19.9**	**38.0**		**42.1**	**502.2**	

Notes

1) Retail floor areas for buildings A, B, C, D, G1, G2, H, I, J, J - Salon provided by Perkins Eastman - Novemeber 18, 2011. Above table uses total GFA.

2) Residential for Buildings A, B, C, D, and K component extracted from RFO Addendum 3 - October 20, 2011 as follows:

Parcel A1 = Residential Tower above Bldg A. 240units (280units max less townhomes) proportionate between Bldg A and K. Therefore, 240units x 66,000/316,000 = 50units.

Parcel A2 = Townhomes abutting buildings A, B, C, D. Assuming 1,225sq.ft townhomes = 40units. Divided between buildings per ground floor area shown on Perkins Eastman November 19, 2011 merchandising plan.

Bldg A = 3,426/19,104 x 40 = 7 units
Bldg B = 7,188/19,104 = 15 units
Bldg C = 5,096/19,104 = 11 units
Bldg D = 3,394/19,104 = 7units

Parcel B = Office tower above Building I, 90,000sq.ft.

Parcel C = Building K 240units (280units max less townhomes) proportionate between Bldg A and K. Therefore, 240units x 250,000/316,000 = 190units.

3) Mech. Eng. Servcing for Bldgs A, B, C, D, G1, G2, H provided by LKM, dated July 19, 2011. Revised Storm and Sanitary flow per November 29, 2011 email.

4) City of Ottawa rates were estimated accordingly

Water Supply

Retail: Average Day 2.5L/m^2/d, Max Day = Avg Day x 1.5, Peak Hour = Avg Day x 2.7

Residential:

Townhouse Avg Day = 2.7p/unit x 350m^3/d, Max Day = Avg Day x 2.5, Peak Hour = Avg Day x 5.5

Apartement Avg Day = 1.8p/unit x 350m^3/d, Max Day = Avg Day x 2.5, Peak Hour = Avg Day x 5.5

Office: Average Day 75L/9.3m^2/d, Max Day = Avg Day x 1.5, Peak Hour = Avg Day x 2.7

North and South Stands: City of Ottawa completed Flow Monitoring in 2005. A peak dry weather flow for a capacity game was recorded to be 15.1L/s.

Report titled "Lansdowne Park - 2005, Combined Sewer Flow Monitoring Report," G.A. Clark & Associates Limited, Proj. No: 200524

Interpolated Average Day, Max Day and, Peak Hour accordingly: Peak Hour = 15.1L/s, Max Day = Peak Hour / 1.8, Average Day = Peak Hour / 2.7

North and South stands flow proportioned by number of seating: North Stands = 14,542 South Stands = 14,284, as decribed in Lansdowne Park information material.

Civil Centre: Flow monitoring completed in 2005 indicated a peak a 4L/s. However, this recorded flow did not account for wastewater directed to Holmwood.

Civil Centre Flow estimated based on Stadium monitored flow and seating: 9,836 / 28,826 x 15.1 = 5.2L/s

Interpolated Average Day, Max Day and, Peak Hour accordingly: Peak Hour = 5.2L/s, Max Day = Peak Hour / 1.8, Average Day = Peak Hour / 2.7

Wastewater

Retail: Average Day 5L/m^2/d x 24hour day / 12hour operation, Peak = Average Day x 1.5

Residential:

Townhouse Avg Day = 2.7p/unit x 350m^3/d, Peak = Avg Day x 3.95

Apartment Avg Day = 1.8p/unit x 350m^3/d, Peak = Avg Day x 3.95

Office: Average Day 75L/9.3m^2/d, Peak = Avg Day x 1.5

North and South Stands: City of Ottawa completed Flow Monitoring in 2005. A peak dry weather flow for a capacity game was recorded to be 15.1L/s.

Report titled "Lansdowne Park - 2005, Combined Sewer Flow Monitoring Report," G.A. Clark & Associates Limited, Proj. No: 200524

Peak flow interpreted as peak monitored flow (15.1L/s)

North stands flow proportioned by number of seating: North Stands = 14,542 South Stands = 14,284, as decribed in Lansdowne Park information material.

Civil Centre: Flow monitoring completed in 2005 indicated a peak a 4L/s. However, this recorded flow did not account for wastewater directed to Holmwood.

Civil Centre Flow estimated based on Stadium monitored flow and seating: 9,836 / 28,826 x 15.1 = 5.2L/s

South Stands - Mechanical Consultant provided estimated peak Wastewater Flow Rate (Smith and Anderson (2011-12-02) servicing sketch)

Storm

See Separate Analysis - Estimated per City of Ottawa IDF curves and Control Flow roof drains where appropriate

North and South Stands assumed to have roof drains sized to accommodate 5-year storm only. To be confirmed by DSEL through modeling.

Water Demand Calculation Sheet

Project: Lansdowne Redevelopment Elementary school
Location: 1015 Bank St, Ottawa ON K1S 3W7
WSP Project No. CA0000286.1662

Date: 2024-09-05
Design: D.M.
Checked D.B.Y
Page: 1 of 1

Proposed Buildings	Residential				Non-Residential			Average Daily			Maximum Daily			Maximum Hourly		
	Units			Beds	Industrial	Institutional	Commercial	Demand (l/s)			Demand (l/s)			Demand (l/s)		
	SF	APT	ST		(ha)	(ha)	(ha)	Res.	Non-Res.	Total	Res.	Non-Res.	Total	Res.	Non-Res.	Total
Event Center									2.6*	2.6		3.9*	3.9		7.0*	7.0
New North Stands									2.8*	2.8		4.2*	4.2		7.6*	7.6
Existing Building A									0.6	0.6		1.3	1.3		2.7	2.7
Existing Building B									0.3	0.3		0.6	0.6		1.3	1.3
Existing Building C									0.4	0.4		0.7	0.7		1.4	1.4
Existing Building D									0.1	0.1		0.3	0.3		0.6	0.6
Existing Building G1									0.1	0.1		0.2	0.2		0.3	0.3
Existing Building G2									0.0	0		0.0	0		0.0	0
Existing Building H									0.2	0.2		0.3	0.3		0.6	0.6
Existing Building I									0.9	0.9		1.3	1.3		2.3	2.3
Existing Building K									1.4	1.4		3.5	3.5		7.6	7.6
Existing South Stands									2.8	2.8		4.2	4.2		7.5	7.5
Existing Aberdeen									0.1	0.1		0.2	0.2		0.3	0.3
Existing Horticulture									0.0	0		0.1	0.1		0.1	0.1
Total										**12.3**			**20.8**			**39.3**

Population Densities

Single Family	3.4	person/unit
Semi-Detached	2.7	person/unit
Duplex	2.3	person/unit
Townhome (Row)	2.7	person/unit
Bachelor Apartment	1.4	person/unit
1 Bedroom Apartment	1.4	person/unit
2 Bedroom Apartment	2.1	person/unit
3 Bedroom Apartment	3.1	person/unit
4 Bedroom Apartment	4.1	person/unit
Avg. Apartment	1.8	person/unit

Average Daily Demand

Residential	280	l/cap/day
Industrial	35000	l/ha/day
Institutional	28000	l/ha/day
Commercial	28000	l/ha/day

Maximum Daily Demand

Residential	2.5	x avg. day
Industrial	1.5	x avg. day
Institutional	1.5	x avg. day
Commercial	1.5	x avg. day

Maximum Hourly Demand

Residential	2.2	x max. day
Industrial	1.8	x max. day
Institutional	1.8	x max. day
Commercial	1.8	x max. day

***Note: 7 L/s Maximum Hourly Flow for Event Center as per Mechanical Recommendation**
***Note: Flows for New North Stands as per Existing Conditions**

The proposed water supply network is illustration on ***Drawing C01003*** and the associated hydraulic analysis is located ***Appendix B***. ***Table 3*** summarizes the anticipated Water Demand and Boundary Conditions under proposed conditions.

Table 4
Water Demand and Boundary Conditions
Proposed Conditions

Design Parameter	Anticipated Demand[1] (L/s)	Boundary Condition[2] (m H_2O / kPa)
Average Daily Demand	11.8	115.6 / 481.7
Max Day + Fire Flow	19.9 + 150 = 169.9	106.4 / 391.4
Peak Hour	38.0	103.1 / 359.0

1) Water demand calculation per Water Supply Guidelines. See ***Appendix B*** for detailed calculations.
2) Boundary conditions supplied by the City of Ottawa. Assumed ground elevation ***65.50m***. See ***Appendix B.***

3.3 Fire Flow Requirements

Section 4.2.11 of the City Design guidelines for water distribution provides guidance for determining the method for estimating Fire Demand. As indicated, the requirements for levels of fire protection on private property are covered in the Ontario Building code. Section 7.2.11 of the OBC addresses the installation of water service pipes and fire service mains. Part 3 of the OBC outlines the requirement for Fire Protection, Occupant Safety, and Accessibility; and sub-section A-3.2.5.7 provides the provisions for fire fighting. Based on trained personnel responding to the emergency, and water supply being delivered through a municipal system, the required minimum provision for water supply shall not be less than 2,700L/min or greater than 9000L/min (OBC Section A.3.2.5.7, Table 2). Therefore, a conservative estimate for the required fire supply is 9000L/min (150L/s). A certified fire protection system specialist shall be employed to design the building fire suppression system(s) and confirm the actual fire flow demand.

City of Ottawa completed fire hydrant testing in ***2007***. The testing indicated that water supply is available between ***8,610/min*** and ***11,610L/min*** at ***140kPa***.

3.4 Water Supply Conclusion

Anticipated water demand under proposed conditions were submitted to the City of Ottawa for establishing boundary conditions considering the existing and proposed zoning.

As demonstrated in ***Table 4***, the recommended pressure range is respected during Maximum Day plus Fire Flow as well as Peak Hour demands. A pressure check should be conducted at the completion of construction to determine if pressure control is required.

Table A1 - 200mm Fire Service Pipe Sizing

WATERMAIN SIZING CALCULATIONS						COMMENTS
Average Day Flow:						
Project Area		Ha				
ADF_{BLDG} =	224,640	L/d	=	2.6	L/s	As per City of Ottawa Water Distribution Guidelines and Existing Consumption Data from Lansdowne 1.0
ADF_{TOTAL} =	224,640	L/d	=	2.6	L/s	Sum of ADF
Maximum Day Flow:						
Maximum Day Factor =	1.50					
MDF_{BLDG} =	336,960	L/d	=	3.9	L/s	As per City of Ottawa Water Distribution Guidelines and Existing Consumption Data from Lansdowne 1.0
MDF_{TOTAL} =	336,960	L/d	=	3.9	L/s	Sum of MDF
Peak Hour Flow:						
Peak Hour Factor =	1.80					
PHF_{BLDG} =	604,800	L/d	=	7	L/s	As per City of Ottawa Water Distribution Guidelines and Existing Consumption Data from Lansdowne 1.0
PHF_{TOTAL} =	604,800	L/d	=	7	L/s	Sum of PHF
Fire Flow =	83	L/s				The FUS (2020) calculated Fire Flow
Max Day + Fire Flow > Peak Hour Flow =	87	L/s	>	7	L/s	Max Day + Fire Flow for sizing calculations - Note: No upgrade to existing network Required
Maximum Pressure =	552	kPa				As per City of Ottawa Water Distribution Guidelines
Minimum Pressure =	276	kPa				As per City of Ottawa Water Distribution Guidelines
Minimum Pressure under Fire Flow =	140	kPa				As per City of Ottawa Water Distribution Guidelines
Existing Static Pressure =	481	kPa				Boundary Condition provided by City at Holmwood Ave
Existing Residual Pressure =	414	kPa				Boundary Condition provided by City at Holmwood Ave
Hazen-Williams Equation Parameters						
Design Flow =	86.900	L/s				MDF + Fire Flow from above
Length =	395	m				Measured (length from the Holmwood Watermain to Building Connection)
C =	110					As per City of Ottawa Water Distribution Guidelines
Inside Diameter of Watermain =	204	mm				Assuming a PVC DR18 Watermain is used.
Solve for Friction Headloss =	17.45	m				Calculated using Hazen Williams Equation
Static Head =	1.80	m				Estimated elevation difference (from boundary connection to building)
Total Headloss =	19.25	m	=	189	kPa	
Residual Pressure for Site =	225	kPa	>	140	kPa	Existing Residual pressure minus total headloss

The residual pressure for the proposed building is calculated by subtracting the total headloss from the residual pressure measured on the connection on Holmwood Ave from City Boundary Condition. The residual pressure for the site is above the minimum pressure for the given pipe size.

To present a conservative scenario, the above calculations assume that the service connection must supply 100% of the building fire sprinkler demand and that the watermain would not be looped or interconnected.

Designed By: Ding Bang Yang, P.Eng.	**Project:** Lansdowne Park 2.0 Redevelopment - Event Centre
Checked By: Ding Bang Yang, P.Eng.	**Location:** 1015 Bank Street Ottawa, ON
Project Number: CA0033920.1056	**Dwg. Reference:**

Table A2 - 200mm Domestic Service Pipe Sizing

WATERMAIN SIZING CALCULATIONS							COMMENTS
Average Day Flow:							
Project Area		Ha					
ADF_{BLDG} =	224,640	L/d	=	2.6	L/s		As per City of Ottawa Water Distribution Guidelines and Existing Consumption Data from Lansdowne 1.0
ADF_{TOTAL} =	224,640	L/d	=	2.6	L/s		Sum of ADF
Maximum Day Flow:							
Maximum Day Factor =	1.50						
MDF_{BLDG} =	336,960	L/d	=	3.9	L/s		As per City of Ottawa Water Distribution Guidelines and Existing Consumption Data from Lansdowne 1.0
MDF_{TOTAL} =	336,960	L/d	=	3.9	L/s		Sum of MDF
Peak Hour Flow:							
Peak Hour Factor =	1.80						
PHF_{BLDG} =	604,800	L/d	=	7	L/s		As per City of Ottawa Water Distribution Guidelines and Existing Consumption Data from Lansdowne 1.0
PHF_{TOTAL} =	604,800	L/d	=	7	L/s		Sum of PHF
Maximum Pressure =	552	kPa					As per City of Ottawa Water Distribution Guidelines
Minimum Pressure =	276	kPa					As per City of Ottawa Water Distribution Guidelines
Minimum Pressure under Fire Flow =	140	kPa					As per City of Ottawa Water Distribution Guidelines
Existing Static Pressure =	481	kPa					Boundary Condition provided by City at Holmwood Ave
Existing Residual Pressure =	394	kPa					Boundary Condition provided by City at Holmwood Ave
Hazen-Williams Equation Parameters							
Design Flow =	7.000	L/s					From above - Peak Hour Flow
Length =	395	m					Measured (length from the Holmwood Watermain to Building Connection)
C =	110						As per City of Ottawa Water Distribution Guidelines
Inside Diameter of Watermain =	204	mm					Assuming a PVC DR18 Watermain is used.
Solve for Friction Headloss =	0.16	m					Calculated using Hazen Williams Equation
Static Head =	1.80	m					Estimated elevation difference (from boundary connection to building)
Total Headloss =	1.96	m	=	19		kPa	
Residual Pressure for Site =	375	kPa	>	276		kPa	Existing Residual pressure minus total headloss

The residual pressure for the proposed building is calculated by subtracting the total headloss from the residual pressure measured on the connection on Holmwood Ave from City Boundary Condition. The residual pressure for the site is above the minimum pressure for the given pipe size.

To present a conservative scenario, the above calculations assume that the service connection must supply 100% of the building Peak Hour Flow and that the watermain would not be looped or interconnected.

Designed By: Ding Bang Yang, P.Eng.	**Project:** **Lansdowne Park 2.0 Redevelopment - Event Centre**
Checked By: Ding Bang Yang, P.Eng.	**Location:** **1015 Bank Street Ottawa, ON**
Project Number: CA0033920.1056	**Dwg. Reference:**

Table A3 - 200mm Fire Service Pipe Sizing

WATERMAIN SIZING CALCULATIONS					COMMENTS
Average Day Flow:					
Project Area		Ha			
ADF_{BLDG} =	224,640	L/d	=	2.6 L/s	As per City of Ottawa Water Distribution Guidelines and Existing Consumption Data from Lansdowne 1.0
ADF_{TOTAL} =	224,640	L/d	=	2.6 L/s	Sum of ADF
Maximum Day Flow:					
Maximum Day Factor =	1.50				
MDF_{BLDG} =	336,960	L/d	=	3.9 L/s	As per City of Ottawa Water Distribution Guidelines and Existing Consumption Data from Lansdowne 1.0
MDF_{TOTAL} =	336,960	L/d	=	3.9 L/s	Sum of MDF
Peak Hour Flow:					
Peak Hour Factor =	1.80				
PHF_{BLDG} =	604,800	L/d	=	7.0 L/s	As per City of Ottawa Water Distribution Guidelines and Existing Consumption Data from Lansdowne 1.0
PHF_{TOTAL} =	604,800	L/d	=	7.0 L/s	Sum of PHF
Fire Flow =	83	L/s			The FUS (2020) calculated Fire Flow
Max Day + Fire Flow > Peak Hour Flow =	86.9	L/s	>	7.0 L/s	Max Day + Fire Flow for sizing calculations - Note: No upgrade to existing network Required
Maximum Pressure =	552	kPa			As per City of Ottawa Water Distribution Guidelines
Minimum Pressure =	276	kPa			As per City of Ottawa Water Distribution Guidelines
Minimum Pressure under Fire Flow =	140	kPa			As per City of Ottawa Water Distribution Guidelines
Existing Static Pressure =	466	kPa			Boundary Condition provided by City at Bank Street
Existing Residual Pressure =	383	kPa			Boundary Condition provided by City at Bank Street
Hazen-Williams Equation Parameters					
Design Flow =	86.9	L/s			MDF + Fire Flow from above
Length =	415	m			Measured (length from the Bank Watermain to Building Connection)
C =	110				As per City of Ottawa Water Distribution Guidelines
Inside Diameter of Watermain =	204	mm			Assuming a PVC DR18 Watermain is used.
Solve for Friction Headloss =	18.33	m			Calculated using Hazen Williams Equation
Static Head =	0.20	m			Estimated elevation difference (from boundary connection to building)
Total Headloss =	18.53	m	=	182 kPa	
Residual Pressure for Site =	201	kPa	>	140 kPa	Existing Residual pressure minus total headloss

The residual pressure for the proposed building is calculated by subtracting the total headloss from the residual pressure measured on the connection on Bank Street from City Boundary Condition. The residual pressure for the site is above the minimum pressure for the given pipe size.

To present a conservative scenario, the above calculations assume that the service connection must supply 100% of the building fire sprinkler demand and that the watermain would not be looped or interconnected.

Designed By: Ding Bang Yang, P.Eng.	**Project:** Lansdowne Park 2.0 Redevelopment - Event Centre
Checked By: Ding Bang Yang, P.Eng.	**Location:** 1015 Bank Street Ottawa, ON
Project Number: CA0033920.1056	**Dwg. Reference:**

Table A4 - 200mm Domestic Service Pipe Sizing

WATERMAIN SIZING CALCULATIONS						COMMENTS
Average Day Flow:						
Project Area		Ha				
ADF_{BLDG} =	224,640	L/d	=	2.6	L/s	As per City of Ottawa Water Distribution Guidelines and Existing Consumption Data from Lansdowne 1.0
ADF_{TOTAL} =	224,640	L/d	=	2.6	L/s	Sum of ADF
Maximum Day Flow:						
Maximum Day Factor =	1.50					
MDF_{BLDG} =	336,960	L/d	=	3.9	L/s	As per City of Ottawa Water Distribution Guidelines and Existing Consumption Data from Lansdowne 1.0
MDF_{TOTAL} =	336,960	L/d	=	3.9	L/s	Sum of MDF
Peak Hour Flow:						
Peak Hour Factor =	1.80					
PHF_{BLDG} =	604,800	L/d	=	7	L/s	As per City of Ottawa Water Distribution Guidelines and Existing Consumption Data from Lansdowne 1.0
PHF_{TOTAL} =	604,800	L/d	=	7	L/s	Sum of PHF
Maximum Pressure =	552	kPa				As per City of Ottawa Water Distribution Guidelines
Minimum Pressure =	276	kPa				As per City of Ottawa Water Distribution Guidelines
Minimum Pressure under Fire Flow =	140	kPa				As per City of Ottawa Water Distribution Guidelines
Existing Static Pressure =	466	kPa				Boundary Condition provided by City at Bank Street
Existing Residual Pressure =	378	kPa				Boundary Condition provided by City at Bank Street
Hazen-Williams Equation Parameters						
Design Flow =	7.000	L/s				From above - Peak Hour Flow
Length =	415	m				Measured (length from the Bank Watermain to Building Connection)
C =	110					As per City of Ottawa Water Distribution Guidelines
Inside Diameter of Watermain =	204	mm				Assuming a PVC DR18 Watermain is used.
Solve for Friction Headloss =	0.17	m				Calculated using Hazen Williams Equation
Static Head =	0.20	m				Estimated elevation difference (from boundary connection to building)
Total Headloss =	0.37	m	=	4	kPa	
Residual Pressure for Site =	374	kPa	>	276	kPa	Existing Residual pressure minus total headloss

The residual pressure for the proposed building is calculated by subtracting the total headloss from the residual pressure measured on the connection on Bank Street from City Boundary Condition. The residual pressure for the site is above the minimum pressure for the given pipe size.

To present a conservative scenario, the above calculations assume that the service connection must supply 100% of the building Peak Hour Flow and that the watermain would not be looped or interconnected.

Designed By: Ding Bang Yang, P.Eng.	**Project:** Lansdowne Park 2.0 Redevelopment - Event Centre
Checked By: Ding Bang Yang, P.Eng.	**Location:** 1015 Bank Street Ottawa, ON
Project Number: CA0033920.1056	**Dwg. Reference:**

Table B1 - 200mm Fire Service Pipe Sizing

WATERMAIN SIZING CALCULATIONS						COMMENTS
Average Day Flow:						
Project Area		Ha				
ADF_{BLDG} =	241,920	L/d	=	2.8	L/s	As per City of Ottawa Water Distribution Guidelines and Existing Consumption Data from Lansdowne 1.0
ADF_{TOTAL} =	241,920	L/d	=	2.8	L/s	Sum of ADF
Maximum Day Flow:						
Maximum Day Factor =	1.50					
MDF_{BLDG} =	362,880	L/d	=	4.2	L/s	As per City of Ottawa Water Distribution Guidelines and Existing Consumption Data from Lansdowne 1.0
MDF_{TOTAL} =	362,880	L/d	=	4.2	L/s	Sum of MDF
Peak Hour Flow:						
Peak Hour Factor =	1.80					
PHF_{BLDG} =	653,184	L/d	=	7.6	L/s	As per City of Ottawa Water Distribution Guidelines and Existing Consumption Data from Lansdowne 1.0
PHF_{TOTAL} =	653,184	L/d	=	7.6	L/s	Sum of PHF
Fire Flow =	100	L/s				The FUS (2020) calculated Fire Flow
Max Day + Fire Flow > Peak Hour Flow =	104	L/s	>	7.6	L/s	Max Day + Fire Flow for sizing calculations - Note: No upgrade to existing network Required
Maximum Pressure =	552	kPa				As per City of Ottawa Water Distribution Guidelines
Minimum Pressure =	276	kPa				As per City of Ottawa Water Distribution Guidelines
Minimum Pressure under Fire Flow =	140	kPa				As per City of Ottawa Water Distribution Guidelines
Existing Static Pressure =	481	kPa				Boundary Condition provided by City at Holmwood Ave
Existing Residual Pressure =	414	kPa				Boundary Condition provided by City at Holmwood Ave
Hazen-Williams Equation Parameters						
Design Flow =	104.200	L/s				MDF + Fire Flow from above
Length =	360	m				Measured (length from the Holmwood Watermain to Building Connection)
C =	110					As per City of Ottawa Water Distribution Guidelines
Inside Diameter of Watermain =	204	mm				Assuming a PVC DR18 Watermain is used.
Solve for Friction Headloss =	22.26	m				Calculated using Hazen Williams Equation
Static Head =	0.50	m				Estimated elevation difference (from boundary connection to building)
Total Headloss =	22.76	m	=	223	kPa	
Residual Pressure for Site =	190	kPa	>	140	kPa	Existing Residual pressure minus total headloss

The residual pressure for the proposed building is calculated by subtracting the total headloss from the residual pressure measured on the connection on Holmwood Ave from City Boundary Condition. The residual pressure for the site is above the minimum pressure for the given pipe size.

To present a conservative scenario, the above calculations assume that the service connection must supply 100% of the building fire sprinkler demand and that the watermain would not be looped or interconnected.

Designed By: Ding Bang Yang, P.Eng.	**Project:** Lansdowne Park 2.0 Redevelopment - New North Stand
Checked By: Ding Bang Yang, P.Eng.	**Location:** 1015 Bank Street Ottawa, ON
Project Number: CA0033920.1056	**Dwg. Reference:**

Table B2 - 200mm Domestic Service Pipe Sizing

WATERMAIN SIZING CALCULATIONS						COMMENTS
Average Day Flow:						
Project Area		Ha				
ADF_{BLDG} =	241,920	L/d	=	2.8	L/s	As per City of Ottawa Water Distribution Guidelines and Existing Consumption Data from Lansdowne 1.0
ADF_{TOTAL} =	241,920	L/d	=	2.8	L/s	Sum of ADF
Maximum Day Flow:						
Maximum Day Factor =	1.50					
MDF_{BLDG} =	362,880	L/d	=	4.2	L/s	As per City of Ottawa Water Distribution Guidelines and Existing Consumption Data from Lansdowne 1.0
MDF_{TOTAL} =	362,880	L/d	=	4.2	L/s	Sum of MDF
Peak Hour Flow:						
Peak Hour Factor =	1.80					
PHF_{BLDG} =	653,184	L/d	=	7.6	L/s	As per City of Ottawa Water Distribution Guidelines and Existing Consumption Data from Lansdowne 1.0
PHF_{TOTAL} =	653,184	L/d	=	7.6	L/s	Sum of PHF
Maximum Pressure =	552	kPa				As per City of Ottawa Water Distribution Guidelines
Minimum Pressure =	276	kPa				As per City of Ottawa Water Distribution Guidelines
Minimum Pressure under Fire Flow =	140	kPa				As per City of Ottawa Water Distribution Guidelines
Existing Static Pressure =	481	kPa				Boundary Condition provided by City at Holmwood Ave
Existing Residual Pressure =	394	kPa				Boundary Condition provided by City at Holmwood Ave
Hazen-Williams Equation Parameters						
Design Flow =	7.560	L/s				From above - Peak Hour Flow
Length =	360	m				Measured (length from the Holmwood Watermain to Building Connection)
C =	110					As per City of Ottawa Water Distribution Guidelines
Inside Diameter of Watermain =	204	mm				Assuming a PVC DR18 Watermain is used.
Solve for Friction Headloss =	0.17	m				Calculated using Hazen Williams Equation
Static Head =	0.50	m				Estimated elevation difference (from boundary connection to building)
Total Headloss =	0.67	m	=	7	kPa	
Residual Pressure for Site =	388	kPa	>	276	kPa	Existing Residual pressure minus total headloss

The residual pressure for the proposed building is calculated by subtracting the total headloss from the residual pressure measured on the connection on Holmwood Ave from City Boundary Condition. The residual pressure for the site is above the minimum pressure for the given pipe size.

To present a conservative scenario, the above calculations assume that the service connection must supply 100% of the building Peak Hour Flow and that the watermain would not be looped or interconnected.

Designed By: Ding Bang Yang, P.Eng.	**Project:** Lansdowne Park 2.0 Redevelopment - New North Stand
Checked By: Ding Bang Yang, P.Eng.	**Location:** 1015 Bank Street Ottawa, ON
Project Number: CA0033920.1056	**Dwg. Reference:**

Table A3 - 200mm Fire Service Pipe Sizing

WATERMAIN SIZING CALCULATIONS					COMMENTS
Average Day Flow:					
Project Area		Ha			
ADF_{BLDG} =	241,920	L/d	=	2.8 L/s	As per City of Ottawa Water Distribution Guidelines and Existing Consumption Data from Lansdowne 1.0
ADF_{TOTAL} =	241,920	L/d	=	2.8 L/s	Sum of ADF
Maximum Day Flow:					
Maximum Day Factor =	1.50				
MDF_{BLDG} =	362,880	L/d	=	4.2 L/s	As per City of Ottawa Water Distribution Guidelines and Existing Consumption Data from Lansdowne 1.0
MDF_{TOTAL} =	362,880	L/d	=	4.2 L/s	Sum of MDF
Peak Hour Flow:					
Peak Hour Factor =	1.80				
PHF_{BLDG} =	653,184	L/d	=	7.6 L/s	As per City of Ottawa Water Distribution Guidelines and Existing Consumption Data from Lansdowne 1.0
PHF_{TOTAL} =	653,184	L/d	=	7.6 L/s	Sum of PHF
Fire Flow =	100.0	L/s			The FUS (2020) calculated Fire Flow
Max Day + Fire Flow > Peak Hour Flow =	104.2	L/s	>	7.56 L/s	Max Day + Fire Flow for sizing calculations - Note: No upgrade to existing network Required
Maximum Pressure =	552	kPa			As per City of Ottawa Water Distribution Guidelines
Minimum Pressure =	276	kPa			As per City of Ottawa Water Distribution Guidelines
Minimum Pressure under Fire Flow =	140	kPa			As per City of Ottawa Water Distribution Guidelines
Existing Static Pressure =	466	kPa			Boundary Condition provided by City at Bank Street
Existing Residual Pressure =	383	kPa			Boundary Condition provided by City at Bank Street
Hazen-Williams Equation Parameters					
Design Flow =	104.2	L/s			MDF + Fire Flow from above
Length =	125	m			Measured (length from the Bank Watermain to Building Connection)
C =	110				As per City of Ottawa Water Distribution Guidelines
Inside Diameter of Watermain =	204	mm			Assuming a PVC DR18 Watermain is used.
Solve for Friction Headloss =	7.73	m			Calculated using Hazen Williams Equation
Static Head =	0.50	m			Estimated elevation difference (from boundary connection to building)
Total Headloss =	8.23	m	=	81 kPa	
Residual Pressure for Site =	303	kPa	>	140 kPa	Existing Residual pressure minus total headloss

The residual pressure for the proposed building is calculated by subtracting the total headloss from the residual pressure measured on the connection on Bank Street from City Boundary Condition. The residual pressure for the site is above the minimum pressure for the given pipe size.

To present a conservative scenario, the above calculations assume that the service connection must supply 100% of the building fire sprinkler demand and that the watermain would not be looped or interconnected.

Designed By: Ding Bang Yang, P.Eng.	**Project:** Lansdowne Park 2.0 Redevelopment - New North Stand
Checked By: Ding Bang Yang, P.Eng.	**Location:** 1015 Bank Street Ottawa, ON
Project Number: CA0033920.1056	**Dwg. Reference:**

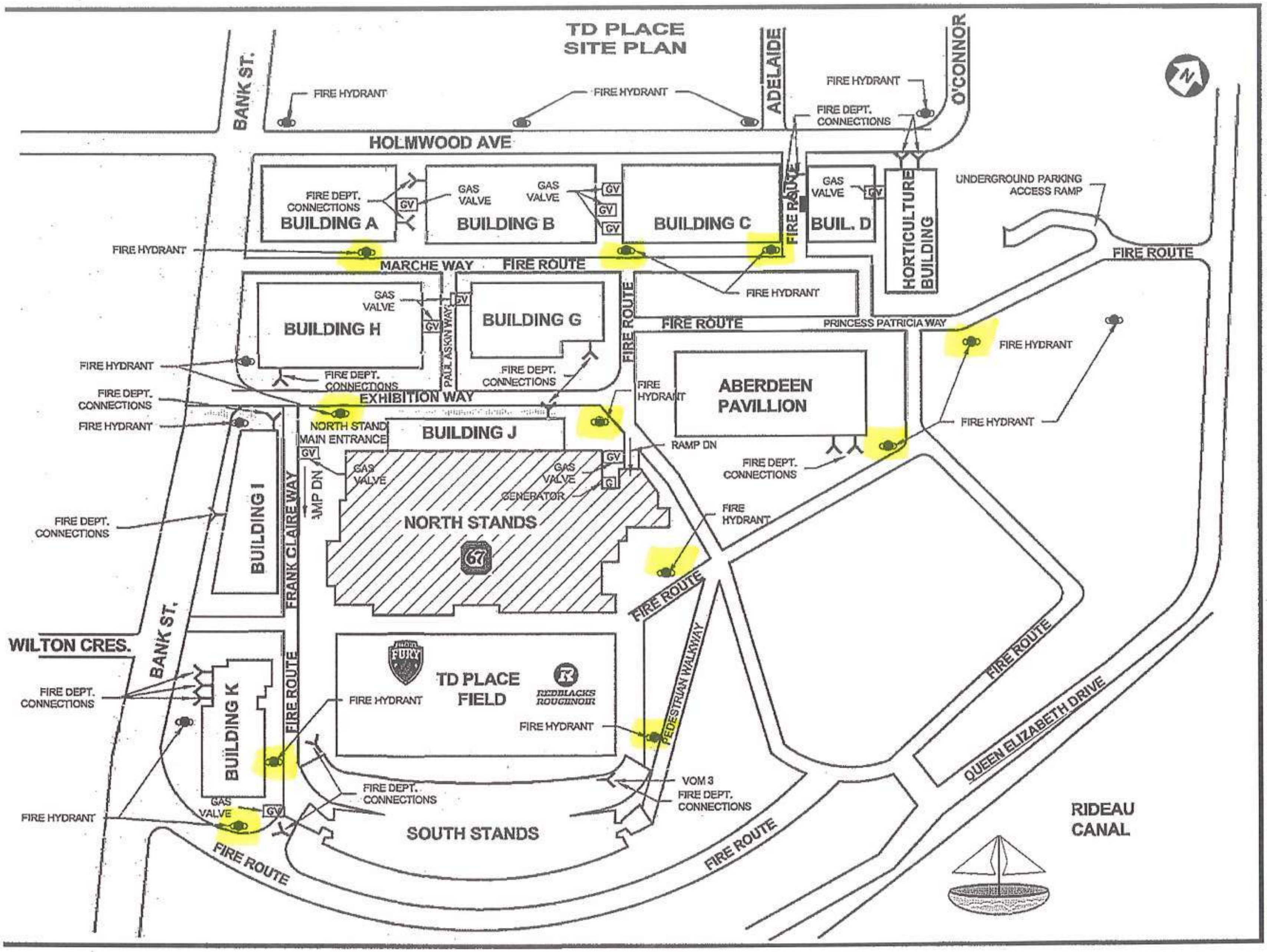
Table A4 - 200mm Domestic Service Pipe Sizing

WATERMAIN SIZING CALCULATIONS							COMMENTS
Average Day Flow:							
Project Area		Ha					
ADF_{BLDG} =	241,920	L/d	=	2.8	L/s		As per City of Ottawa Water Distribution Guidelines and Existing Consumption Data from Lansdowne 1.0
ADF_{TOTAL} =	241,920	L/d	=	2.8	L/s		Sum of ADF
Maximum Day Flow:							
Maximum Day Factor =	1.50						
MDF_{BLDG} =	362,880	L/d	=	4.2	L/s		As per City of Ottawa Water Distribution Guidelines and Existing Consumption Data from Lansdowne 1.0
MDF_{TOTAL} =	362,880	L/d	=	4.2	L/s		Sum of MDF
Peak Hour Flow:							
Peak Hour Factor =	1.80						
PHF_{BLDG} =	653,184	L/d	=	7.6	L/s		As per City of Ottawa Water Distribution Guidelines and Existing Consumption Data from Lansdowne 1.0
PHF_{TOTAL} =	653,184	L/d	=	7.6	L/s		Sum of PHF
Maximum Pressure =	552	kPa					As per City of Ottawa Water Distribution Guidelines
Minimum Pressure =	276	kPa					As per City of Ottawa Water Distribution Guidelines
Minimum Pressure under Fire Flow =	140	kPa					As per City of Ottawa Water Distribution Guidelines
Existing Static Pressure =	466	kPa					Boundary Condition provided by City at Bank Street
Existing Residual Pressure =	378	kPa					Boundary Condition provided by City at Bank Street
Hazen-Williams Equation Parameters							
Design Flow =	7.6	L/s					From above - Peak Hour Flow
Length =	125	m					Measured (length from the Bank Watermain to Building Connection)
C =	110						As per City of Ottawa Water Distribution Guidelines
Inside Diameter of Watermain =	204	mm					Assuming a PVC DR18 Watermain is used.
Solve for Friction Headloss =	0.06	m					Calculated using Hazen Williams Equation
Static Head =	0.50	m					Estimated elevation difference (from boundary connection to building)
Total Headloss =	0.56	m	=	5		kPa	
Residual Pressure for Site =	372	kPa	>	276		kPa	Existing Residual pressure minus total headloss

The residual pressure for the proposed building is calculated by subtracting the total headloss from the residual pressure measured on the connection on Bank Street from City Boundary Condition. The residual pressure for the site is above the minimum pressure for the given pipe size.

To present a conservative scenario, the above calculations assume that the service connection must supply 100% of the building Peak Hour Flow and that the watermain would not be looped or interconnected.

Designed By: Ding Bang Yang, P.Eng.	**Project:** **Lansdowne Park 2.0 Redevelopment - New North Stand**
Checked By: Ding Bang Yang, P.Eng.	**Location:** **1015 Bank Street Ottawa, ON**
Project Number: CA0033920.1056	**Dwg. Reference:**



LEGEND.

- FIRE DEPT. CONNECTION
- FIRE HYDRANT
- GV GAS VALVE
- C GENERATOR

FIRE SAFETY PLAN

SITE PLAN

TD PLACE NORTH STANDS
OTTAWA,ONTARIO

NOT TO SCALE

MAY 2014

HYDRANTS-R-US Inc.

Hydrants-R-Us Inc.
53 Forest Creek Drive
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dalton@hydrantsrus.com

Sept 20th 2022

HYDRANT INSPECTION REPORT

Owner: **Ottawa Sports and Entertainment Group (TD PLACE)**

Hydrant Location: **Apartment Facing Field** **Hydrant Type: DARLING**

Paint: **Paint to code**
Stem: **OK**
O-Rings: **OK**
Top Nut: **OK**
Valve Seat: **OK**
Condition of Water: **Normal**
Isolation Valve: **OK**
Flow test: **Complete**
Caps:**OK**

Residual Hydrant Static Pressure: **68 PSI**
Residual Hydrant Flowing Pressure:**62 PSI**
Flowing Hydrant Pitot Pressure: **39 PSI**

Number of Ports Flowed: **1**
Nozzle Size: **2 ½ in.**

Gallons Per Minute**: 875**
Gallons Per Minute at 20 PSI: **2689**
Color Code: BLUE

Remarks: OK

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Sept 20th 2022

HYDRANT INSPECTION REPORT

Owner: **Ottawa Sports and Entertainment Group (TD PLACE)**

Hydrant Location: **Back Entrance**

Hydrant Type: McAvity

Paint: **Paint to code**
Stem: **OK**
O-Rings: **OK**
Top Nut: **OK**
Valve Seat: **OK**
Condition of Water: **Normal**
Isolation Valve: **OK**
Flow test: **Complete**
Caps:**OK**

Residual Hydrant Static Pressure: **70 PSI**
Residual Hydrant Flowing Pressure:**62 PSI**
Flowing Hydrant Pitot Pressure: **44 PSI**

Number of Ports Flowed: **1**
Nozzle Size: **2 ½ in.**

Gallons Per Minute**: 929**
Gallons Per Minute at 20 PSI: **2499**
Color Code: BLUE

Remarks: OK

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Sept 20th 2022

HYDRANT INSPECTION REPORT

Owner: **Ottawa Sports and Entertainment Group (TD PLACE)**

Hydrant Location: **Behind Apartment (Bank St)** **Hydrant Type: DARLING**

Paint: **Paint to code**
Stem: **OK**
O-Rings: **OK**
Top Nut: **OK**
Valve Seat: **OK**
Condition of Water: **Normal**
Isolation Valve: **OK**
Flow test: **Complete**
Caps:**OK**

Residual Hydrant Static Pressure: **70 PSI**
Residual Hydrant Flowing Pressure:**61 PSI**
Flowing Hydrant Pitot Pressure: **41 PSI**

Number of Ports Flowed: **1**
Nozzle Size: **2 ½ in.**

Gallons Per Minute**: 897**
Gallons Per Minute at 20 PSI: **2264**
Color Code: BLUE

Remarks: OK

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Sept 20th 2022

HYDRANT INSPECTION REPORT

Owner: **Ottawa Sports and Entertainment Group (TD PLACE)**

Hydrant Location: **Behind Apartment (Parkway)** **Hydrant Type: DARLING**

Paint: **Paint to code**
Stem: **OK**
O-Rings: **OK**
Top Nut: **OK**
Valve Seat: **OK**
Condition of Water: **Normal**
Isolation Valve: **OK**
Flow test: **Complete**
Caps:**OK**

Residual Hydrant Static Pressure: **70 PSI**
Residual Hydrant Flowing Pressure:**62 PSI**
Flowing Hydrant Pitot Pressure: **38 PSI**

Number of Ports Flowed: **1**
Nozzle Size: **2 ½ in.**

Gallons Per Minute**: 863**
Gallons Per Minute at 20 PSI: **2323**
Color Code: BLUE

Remarks: OK

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Sept 20th 2022

HYDRANT INSPECTION REPORT

Owner: **Ottawa Sports and Entertainment Group (TD PLACE)**

Hydrant Location: **Box Office**

Hydrant Type: McAvity

Paint: **OK**
Stem: **OK**
O-Rings: **OK**
Top Nut: **OK**
Valve Seat: **OK**
Condition of Water: **Normal**
Isolation Valve: **Buried**
Flow test: **Complete**
Caps:**OK**

Residual Hydrant Static Pressure: **68 PSI**
Residual Hydrant Flowing Pressure:**62 PSI**
Flowing Hydrant Pitot Pressure: **42 PSI**

Number of Ports Flowed: **1**
Nozzle Size: **2 ½ in.**

Gallons Per Minute**: 908**
Gallons Per Minute at 20 PSI: **2790**
Color Code: BLUE

Remarks: OK
Isolation valve-could not locate

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Sept 20th 2022

HYDRANT INSPECTION REPORT

Owner: **Ottawa Sports and Entertainment Group (TD PLACE)**

Hydrant Location: **Cattle Castle**

Hydrant Type: McAvity

Paint: **Paint to code**
Stem: **OK**
O-Rings: **OK**
Top Nut: **OK**
Valve Seat: **OK**
Condition of Water: **Normal**
Isolation Valve: **OK**
Flow test: **Complete**
Caps:**OK**

Residual Hydrant Static Pressure: **70 PSI**
Residual Hydrant Flowing Pressure:**62 PSI**
Flowing Hydrant Pitot Pressure: **38 PSI**

Number of Ports Flowed: **1**
Nozzle Size: **2 ½ in.**

Gallons Per Minute**: 863**
Gallons Per Minute at 20 PSI: **2323**
Color Code: BLUE

Remarks: OK

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Hydrants-R-Us Inc.
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Sept 20th 2022

HYDRANT INSPECTION REPORT

Owner: **Ottawa Sports and Entertainment Group (TD PLACE)**

Hydrant Location: **Cineplex** **Hydrant Type: DARLING**

Paint: **OK**
Stem: **OK**
O-Rings: **OK**
Top Nut: **OK**
Valve Seat: **OK**
Condition of Water: **Normal**
Isolation Valve: **OK**
Flow test: **Complete**
Caps:**OK**

Residual Hydrant Static Pressure: **66 PSI**
Residual Hydrant Flowing Pressure:**61 PSI**
Flowing Hydrant Pitot Pressure: **38 PSI**

Number of Ports Flowed: **1**
Nozzle Size: **2 ½ in.**

Gallons Per Minute**: 86**
Gallons Per Minute at 20 PSI: **2739**
Color Code: BLUE

Remarks: OK

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Sept 20th 2022

HYDRANT INSPECTION REPORT

Owner: **Ottawa Sports and Entertainment Group (TD PLACE)**

Hydrant Location: **Field Entrance** **Hydrant Type: McAvity**

Paint: **Paint to code**
Stem: **OK**
O-Rings: **OK**
Top Nut: **OK**
Valve Seat: **OK**
Condition of Water: **Normal**
Isolation Valve: **Partially Paved over**
Flow test: **Complete**
Caps:**OK**

Residual Hydrant Static Pressure: **70 PSI**
Residual Hydrant Flowing Pressure:**60 PSI**
Flowing Hydrant Pitot Pressure: **39 PSI**

Number of Ports Flowed: **1**
Nozzle Size: **2 ½ in.**

Gallons Per Minute**: 875**
Gallons Per Minute at 20 PSI: **2086**
Color Code: BLUE

Remarks: OK

HYDRANTS-R-US Inc.

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Sept 20th 2022

HYDRANT INSPECTION REPORT

Owner: **Ottawa Sports and Entertainment Group (TD PLACE)**

Hydrant Location: **On Field**

Hydrant Type: McAvity

Paint: **OK**
Stem: **OK**
O-Rings: **OK**
Top Nut: **OK**
Valve Seat: **OK**
Condition of Water: **Normal**
Isolation Valve: **OK**
Flow test: **Complete**
Caps:**OK**

Residual Hydrant Static Pressure: **70 PSI**
Residual Hydrant Flowing Pressure:**62 PSI**
Flowing Hydrant Pitot Pressure: **43 PSI**

Number of Ports Flowed: **1**
Nozzle Size: **2 ½ in.**

Gallons Per Minute**: 918**
Gallons Per Minute at 20 PSI: **2471**
Color Code: BLUE

Remarks: OK

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Sept 20th 2022

HYDRANT INSPECTION REPORT

Owner: **Ottawa Sports and Entertainment Group (TD PLACE)**

Hydrant Location: **Goodlife** **Hydrant Type: Darling**

Paint: **OK**
Stem: **OK**
O-Rings: **OK**
Top Nut: **OK**
Valve Seat: **OK**
Condition of Water: **Normal**
Isolation Valve: **OK**
Flow test: **Complete**
Caps:**OK**

Residual Hydrant Static Pressure: **67 PSI**
Residual Hydrant Flowing Pressure:**60 PSI**
Flowing Hydrant Pitot Pressure: **37 PSI**

Number of Ports Flowed: **1**
Nozzle Size: **2 ½ in.**

Gallons Per Minute**: 852**
Gallons Per Minute at 20 PSI: **2382**
Color Code: BLUE

Remarks: OK

HYDRANTS-R-US Inc.

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Sept 20th 2022

HYDRANT INSPECTION REPORT

Owner: **Ottawa Sports and Entertainment Group (TD PLACE)**

Hydrant Location: **Milestones**

Hydrant Type: DARLING

Paint: **OK**
Stem: **OK**
O-Rings: **OK**
Top Nut: **OK**
Valve Seat: **OK**
Condition of Water: **Normal**
Isolation Valve: **OK**
Flow test: **Complete**
Caps:**OK**

Residual Hydrant Static Pressure: **67 PSI**
Residual Hydrant Flowing Pressure:**62 PSI**
Flowing Hydrant Pitot Pressure: **34 PSI**

Number of Ports Flowed: **1**
Nozzle Size: **2 ½ in.**

Gallons Per Minute**: 817**
Gallons Per Minute at 20 PSI: **2739**
Color Code: BLUE

Remarks: OK

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Sept 20th 2022

HYDRANT INSPECTION REPORT

Owner: **Ottawa Sports and Entertainment Group (TD PLACE)**

Hydrant Location: **Sporting Life**

Hydrant Type: DARLING

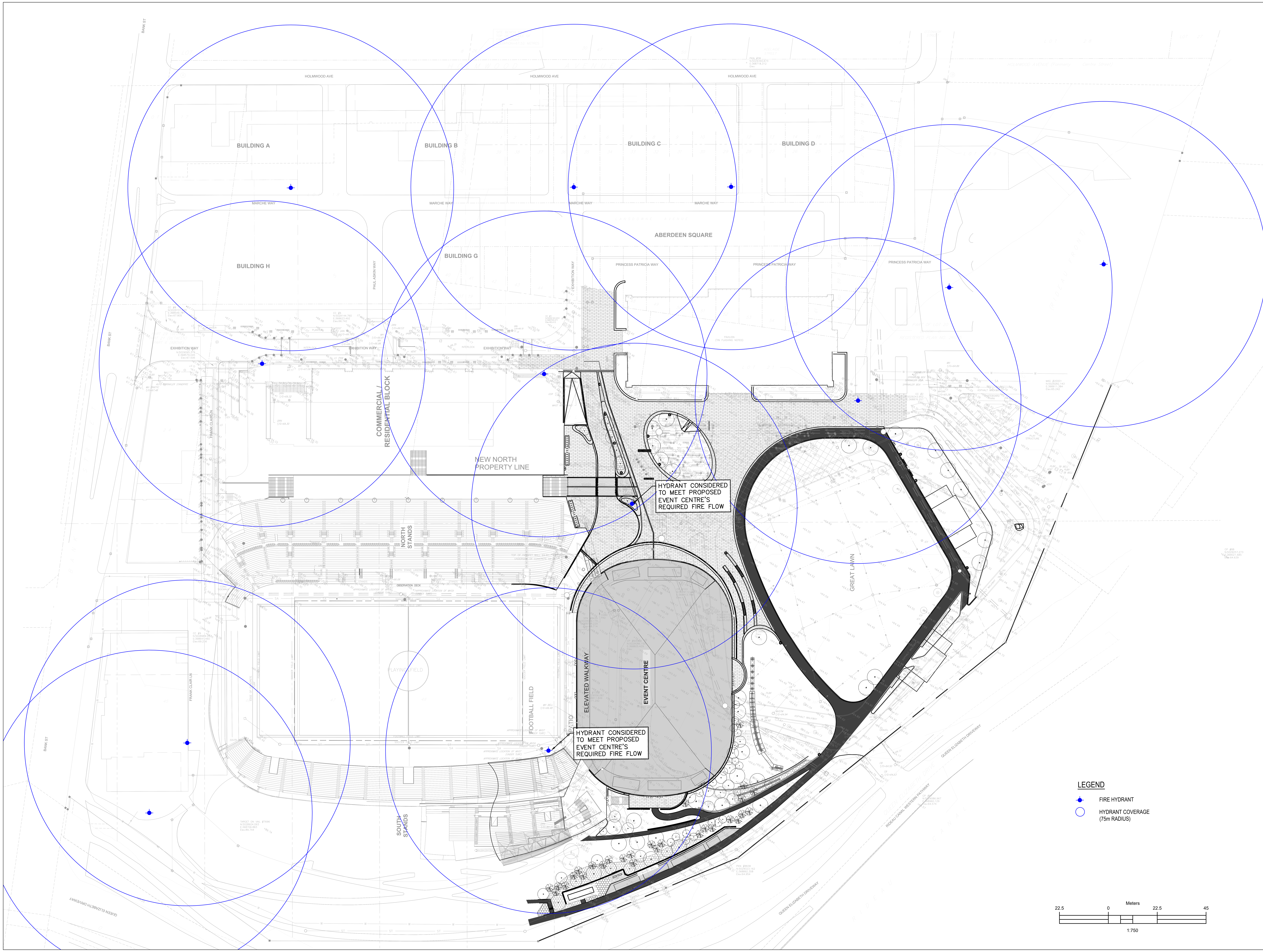
Paint: **OK**
Stem: **OK**
O-Rings: **OK**
Top Nut: **OK**
Valve Seat: **OK**
Condition of Water: **Normal**
Isolation Valve: **Partially Paved Over**
Flow test: **Complete**
Caps:**OK**

Residual Hydrant Static Pressure: **65 PSI**
Residual Hydrant Flowing Pressure:**58 PSI**
Flowing Hydrant Pitot Pressure: **41 PSI**

Number of Ports Flowed: **1**
Nozzle Size: **2 ½ in.**

Gallons Per Minute**: 897**
Gallons Per Minute at 20 PSI: **2450**
Color Code: BLUE

Remarks: OK



Ottawa

OSEG
Ottawa Sports and Entertainment Group

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TORONTO, ON M2N 3A
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ELEC, LIGHTING ENGINEER

S2O
530 N. WOOD STREET #C
CHICAGO, IL 60622
(224) 717-1999
FOOD AND BEVERAGE

CSW
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OTTAWA, ONTARIO K1Z 0B9
(613) 729-4536
LANDSCAPE ARCHITECT

wsp
2011 QUEENSVIEW DR.
OTTAWA, ONTARIO K2B 8K2
(613) 829-2800
CIVIL ENGINEER

NO.	DESCRIPTION	DATE

REVISIONS/ ISSUES

CONTRACTOR SHALL CHECK AND VERIFY ALL DIMENSIONS AND REPORT ANY OMISSIONS OR DISCREPANCIES TO THE ARCHITECT BEFORE PROCEEDING WITH THE WORK.
DO NOT SCALE THE DRAWINGS

SEAL

DRAWN J.T
DATE 2024/08/07
CHECKED W.Y

LANSDOWNE EC

DWG. TITLE
HYDRANT COVERAGE SKETCH

SCALE 1:750
DWG. NO. F01
PROJ. NO. CA0033920.1056

APPENDIX

C

- STORM SEWER DESIGN SHEET
- DWG C07 – STORM DRAINAGE AREA PLAN
- EXISTING STORM SEWER DESIGN SHEET AND DRAINAGE AREA PLAN BY STANTEC
- SANITARY SEWER DESIGN SHEET
- EXISTING SANITARY DESIGN SHEET BY DSEL
- DWG C04 – GRADING PLANS
- DWG C05A/C05B – SERVICING PLANS

STORM SEWER DESIGN SHEET
LANSDOWNE 2.0
REDEVELOPMENT
CITY OF OTTAWA
Project: CA0033920.1056
Date: August, 2024

LOCATION				AREA (Ha)						RATIONAL DESIGN FLOW														PROPSOED SEWER DATA								
BLDG FLOW	AREA ID	FROM	TO	C= 0.20	C= 0.35	C= 0.75	C= 0.80	C= 0.90	C= 1.00	IND 2.78AC	CUM 2.78 AC	INLET (min)	TOTAL (min)	i (2) (mm/hr)	i (5) (mm/hr)	i (100) (mm/hr)	BLDG FLOW (L/s)	2yr PEAK FLOW (L/s)	5yr PEAK FLOW (L/s)	100yr PEAK FLOW (L/s)	ICD FIXED FLOW (L/s)	DESIGN FLOW (L/s)	MODIFIED DESIGN FLOW (L/s)	MATERIAL PIPE	SIZE (mm)	SLOPE (%)	LENGTH (m)	CAPACITY (l/s)	VELOCITY (m/s)	TIME IN PIPE	AVAIL CAP (2yr) (L/s)	AVAIL CAP (2yr) (%)
Lansdowne 2.0																																
+106 l/s	S. STANDS	Ex. STM 120	Ex. STM 119							0.000	0.000	20.00	21.24	52.03	70.25	119.95			0.00			0.00	106.00	CONC	450.0	0.20	59.60	127.63	0.80	1.24	21.63	16.95%
		Ex. STM 119	Ex. STM 118							0.000	0.000	21.24	22.48	50.12	67.64	115.46			0.00			0.00	106.00	CONC	450.0	0.20	59.60	127.63	0.80	1.24	21.63	16.95%
+106 l/s		Ex. STM 118	Ex. STM 117							0.000	0.000	22.48	22.63	48.36	65.24	111.33			0.00			0.00	212.00	CONC	600.0	0.20	8.70	274.87	0.97	0.15	62.87	22.87%
		Ex. STM 117	STMH 208							0.000	0.000	22.63	22.68	48.16	64.97	110.85			0.00			0.00	212.00	CONC	600.0	0.20	3.00	274.87	0.97	0.05	62.87	22.87%
+232.6 l/s	A3, A4, A5, BLDG I, K, N STANDS	Ex. STM 115	Ex. STM 114	1.118				0.399		1.620	1.620	20.00	21.02	52.03	70.25	119.95			113.80			113.80	346.40	CONC	825.0	0.20	73.70	642.59	1.20	1.02	296.19	46.09%
		Ex. STM 114	STMH 209							0.000	1.620	21.02	22.06	50.44	68.08	116.22			110.29			110.29	342.89	CONC	825.0	0.20	74.50	642.59	1.20	1.03	299.71	46.64%
	Half of NEC Area	STMH 209	STMH 208	0.000				0.486		1.215	2.835	22.06	23.27	48.94	66.04	112.69			187.19			187.19	419.79	CONC	900.0	0.10	65.64	573.05	0.90	1.22	153.26	26.74%
$Q_{bldg\ Tot}$ = 444.6 l/s		STMH 208	STMH 207							0.000	2.835	23.27	23.58	47.30	63.80	108.84			180.85			180.85	625.45	CONC	1050.0	0.10	18.55	864.40	1.00	0.31	238.95	27.64%
		STMH 207	STMH 206							0.000	2.835	23.58	23.97	46.90	63.26	107.91			179.31			179.31	623.91	CONC	1050.0	0.10	23.14	864.40	1.00	0.39	240.49	27.82%
	A6	STMH 206	STMH 205	0.048				0.025		0.089	2.924	23.97	24.61	46.41	62.59	106.77			183.01			183.01	627.61	CONC	1050.0	0.10	38.05	864.40	1.00	0.64	236.79	27.39%
		STMH 205	STMH 204							0.000	2.924	24.61	25.10	45.64	61.53	104.94			179.92			179.92	624.52	CONC	1050.0	0.10	29.50	864.40	1.00	0.49	239.89	27.75%
	Half of NEC Area	STMH 204	STMH 203	0.000				0.486		1.215	4.139	25.10	25.55	45.05	60.74	103.58			251.38			251.38	695.98	CONC	1050.0	0.10	27.14	864.40	1.00	0.45	168.43	19.48%
	Great Lawn 5	STMH 203	CBMH 202	0.089				0.026		0.115	4.253	25.55	26.25	44.53	60.03	102.36			255.31			255.31	699.91	CONC	1050.0	0.10	41.65	864.40	1.00	0.70	164.49	19.03%
	Great Lawn 6, A, D, D1, D2	Ex. STMD	CBMH 210	1.237				0.542		2.044	2.044	20.00	20.83	52.03	70.25	119.95			143.58			143.58		CONC	600.0	0.10	34.40	194.36	0.69	0.83	50.78	26.13%
	Great Lawn 4	CBMH 210	CBMH 202	0.160				0.024		0.149	2.193	20.83	21.37	50.73	68.47	116.88			150.15			150.15		CONC	600.0	0.10	22.20	194.36	0.69	0.54	44.22	22.75%
$Q_{bldg\ Tot}$ = 444.6 l/s		CBMH 202	CHAMBER / *Ex. Chamber*							0.000	6.446	26.25	26.25	43.75	58.97	100.54			380.15			380.15	824.75	REFER TO STORMTECH DESIGN								
	OPGG5, Great Lawn 3	CHAMBER / *Ex. Chamber*	Ex. 1350 PIPE	0.228				0.131		0.455	6.901	26.25	26.25	43.75	58.97	100.54			406.95			406.95	851.55	REFER TO STORMTECH DESIGN								
+23.1 l/s	A1, BLDGS H, G, J, J1, J2	Ex. STM-CCN1	NEW STMH 212	0.019				0.938		2.357	2.357	20.00	20.21	52.03	70.25	119.95			165.61			165.61	188.71	CONC	600.0	0.20	12.03	274.87	0.97	0.21	86.16	31.35%
		NEW STMH 212	NEW STMH 211							0.000	2.357	20.21	20.72	51.70	69.80	119.18			164.55			164.55	187.65	CONC	600.0	0.20	30.00	274.87	0.97	0.51	87.22	31.73%
		NEW STMH 211	Ex. STM 110							0.000	2.357	20.72	20.91	50.90	68.71	117.29			161.97			161.97	185.07	CONC	600.0	0.20	11.00	274.87	0.97	0.19	89.80	32.67%
	OPGG1, OPGG4	Ex. STM 110	Ex. STM 109	0.015				0.160		0.409	2.766	20.91	21.11	50.61	68.31	116.62			188.97			188.97	212.07	CONC	600.0	0.20	11.70	274.87	0.97	0.20	62.81	22.85%
$Q_{bldg\ Tot}$ = 467.7 l/s	OPGG2	Ex. STM 109	Ex. STM 108	0.020				0.251		0.639	10.306	26.25	27.49	43.75	58.97	100.54			607.77			607.77	1075.47	CONC	1350.0	0.13	99.80	1926.37	1.34	1.24	850.90	44.17%
	102, AA, BB, EE	Ex. STMDD	Ex. STMFF	1.410				0.594		2.270	2.270	21.70	22.27	49.45	66.73	113.88			151.48			151.48		CONC	900.0	0.10	31.00	573.05	0.90	0.57	421.57	73.57%
	Great Lawn 1 & 2, T1, T2, V1, V2	Ex. STMFF	Ex. STMGG	0.508				0.295		1.021	3.291	22.27	23.33	48.64	65.62	111.98			215.95			215.95		CONC	900.0	0.10	57.00	573.05	0.90	1.06	357.10	62.32%
		Ex. STMGG	Ex. STM 108							0.000	3.291	23.33	23.74	47.23	63.70	108.67			209.61			209.61		CONC	900.0	0.10	22.00	573.05	0.90	0.41	363.43	63.42%
$Q_{bldg\ Tot}$ = 467.7 l/s	OPGG3, 108	Ex. STM 108	Ex. STM 107	0.167				0.316		0.883	14.480	27.49	28.64	42.45	57.20	97.49			828.21			828.21	1295.91	CONC	1350.0	0.10	81.40	1689.54	1.18	1.15	393.63	23.30%
+34.4 l/s, Qbldg Tot = 502.1 l/s	A2, BLDGS A, B, C, D	Ex. STM 107	Ex. STM 106	0.032				1.555		3.908	18.388	28.64	28.93	41.31	55.65	94.82			1023.27			1023.27	1525.37	CONC	1350.0	0.10	20.70	1689.54	1.18	0.29	164.17	9.72%
Controlled Flow		Ex. STM 106	Ex. STM 105																			616.00		CONC	975.0	0.10	80.20	709.40	0.95	1.41	93.40	13.17%
		Ex. STM 105	Ex. STM 104																			616.00		CONC	975.0	0.10	12.10	709.40	0.95	0.21	93.40	13.17%
		Ex. STM 104	Ex. STM 103																			616.00		CONC	975.0	0.10	19.20	709.40	0.95	0.34	93.40	13.17%
		Ex. STM 103	Ex. STM 102																			616.00		CONC	975.0	0.10	54.20	709.40	0.95	0.95	93.40	13.17%
		Ex. STM 102	Ex. STM 101																			616.00		CONC	975.0	0.10	24.20	709.40	0.95	0.42	93.40	13.17%
		Ex. STM 101	Ex. STM MH (O'Connnor)																			616.00		CONC	975.0	0.10	5.80	709.40	0.95	0.10	93.40	13.17%

Definition:
Q=2.78CiA, where:
Q = Peak Flow in Litres per Second (L/s)
A = Area in Hectares (Ha)
i = Rainfall Intensity in millimeters per hour (mm/hr)
i = 732.951/(TC+6.199)^0.810 — 2 Year
i = 1174.184/(TC+6.014)^0.816 — 5 Year
i = 1735.688/(TC+6.014)^0.820 — 100 Year

Notes:
1. Mannings coefficient (n) = 0.013

Time-of-Concentration in the Swale
FAA Equation: t (min) = 3.258 [(1.1 - C) L^0.5 / S^.33]
Where: Longest Watercourse Length, L (m). S (%)
Runoff Coef.C = Impervious

No.	L (m)	S %	Tc (min)
			#DIV/0!

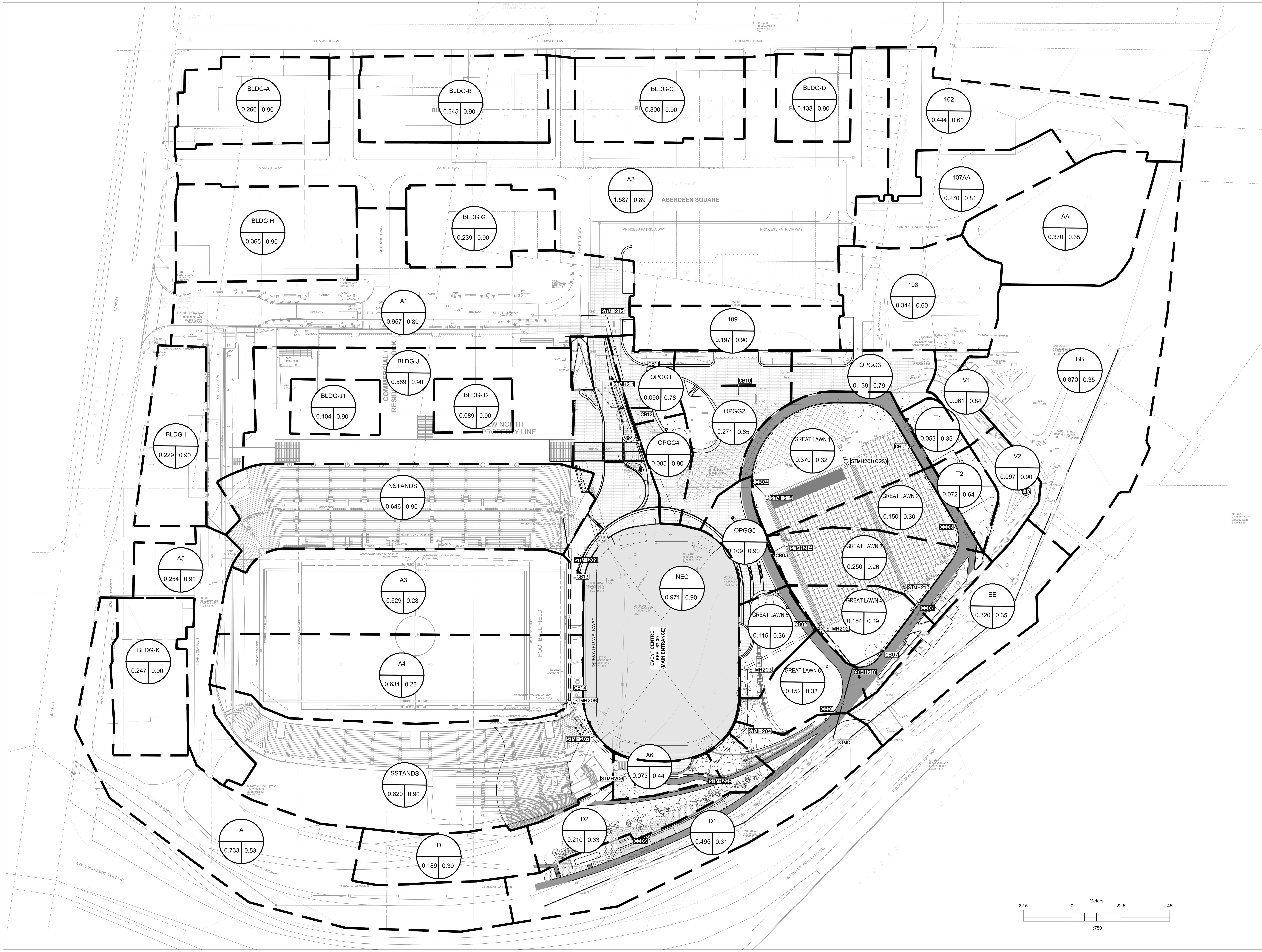
Designed: Z.A.

Checked: D.B.Y.

Dwg. Reference: F2

No.	Revision	Date
1.	City Submission No. 1	2023-05-25
2.	City Submission No. 2	2023-09-22
3.	City Submission No. 3	2024-08-07

File Reference:	Date:	Sheet No:
CA0002045.0622	2023-09-22	1 of 1



Ottawa

OSEG
Ottawa Sports and Entertainment Group

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OTTAWA, ONTARIO K2B 8K2
(613) 829-2800
CIVIL ENGINEER

NO.	DESCRIPTION	DATE
2	REVISED AS PER CITY COMMENTS	2024-09-13
1	ISSUED FOR SPA	2024-08-07

REVISIONS/ ISSUES

CONTRACTOR SHALL CHECK AND VERIFY ALL DIMENSIONS AND REPORT ANY OMISSIONS OR DISCREPANCIES TO THE ARCHITECT BEFORE PROCEEDING WITH THE WORK.
DO NOT SCALE THE DRAWINGS

SEAL

LICENSED PROFESSIONAL ENGINEER
D. B. YANG
100230568
2024-09-13
PROVINCE OF ONTARIO

NORTH

DRAWN J.T
DATE 2024/09/13
CHECKED W.Y

LANSDOWNE EC

DWG. TITLE
POST-DRAINAGE AREA PLAN

SCALE 1:750
DWG. NO. C07
PROJ. NO. CA0033920.1056

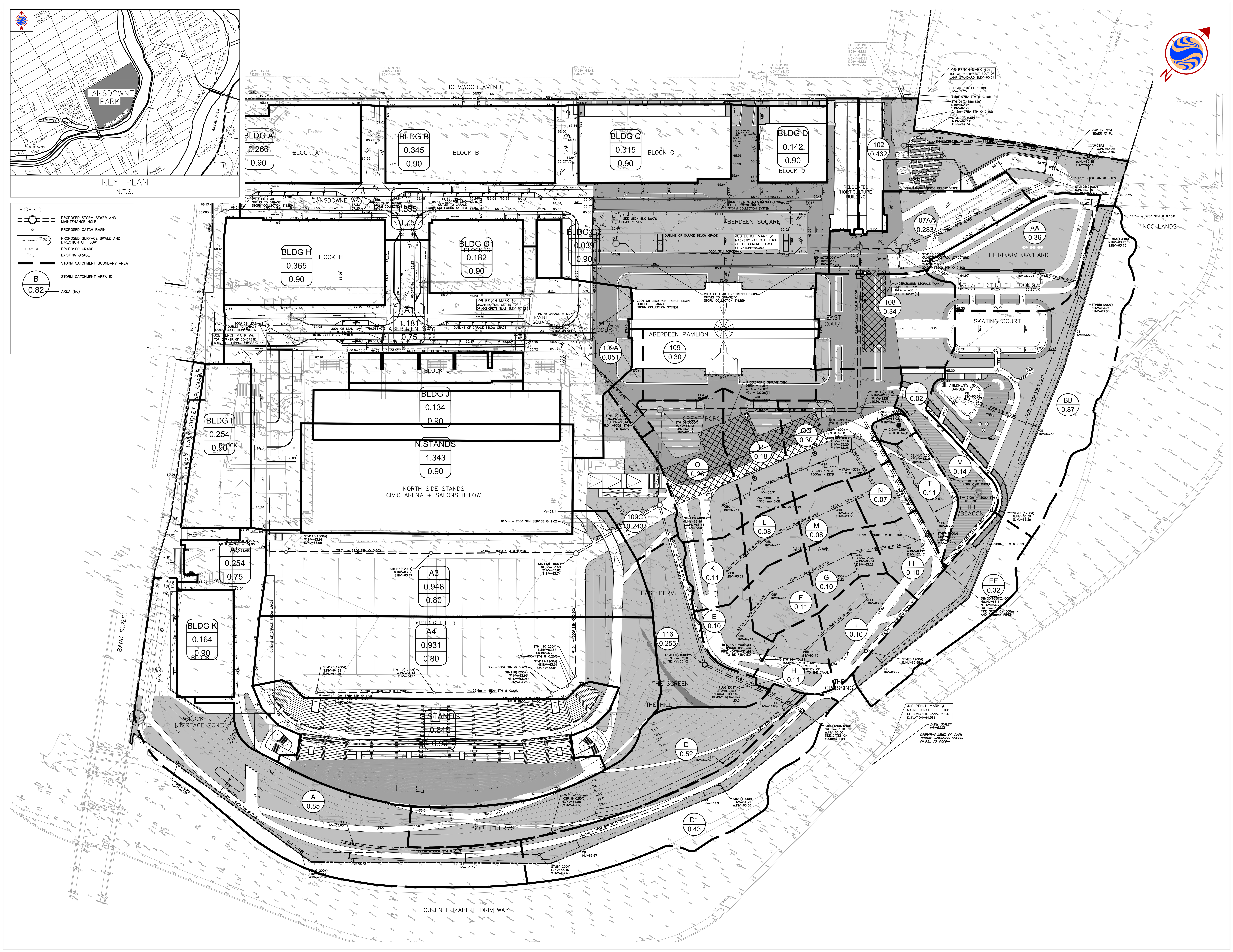
DATE PLOTTED:

Storm Sewer Calculation Sheet
Lansdowne Park Re-Development

Up	Down	BLDG ID	Q_{BLDG}	$Q_{BLDG\ TOT}$	AREA ID	Area	C	Indiv AxC	Acc AxC	T_C	I	Q	Q_{TOT}	Sewer Data DIA	Slope	Length	$A_{hydraulic}$	R	Velocity	Qcap	Time Flow	Q / Q full
			(L/s)	(L/s)		(ha)	(-)			(min)	(mm/hr)	(L/s)	(L/s)	(mm)	(%)	(m)	(m^2)	(m)	(m/s)	(L/s)	(min)	(-)
120	119	S. Stands	106.0	106.0				0.00	0.00	***20.0***	70.3	0.0	106.0	450	0.20	59.6	0.159	0.113	0.80	127.5	1.2	0.83
119	118			106.0				0.00	0.00	21.2	67.6	0.0	106.0	450	0.20	59.6	0.159	0.113	0.80	127.5	1.2	0.83
118	117	S. Stands	106.0	212.0				0.00	0.00	22.5	65.2	0.0	212.0	600	0.20	8.7	0.283	0.150	0.97	274.6	0.1	0.77
117	116			212.0				0.00	0.00	22.6	65.0	0.0	212.0	600	0.20	3.8	0.283	0.150	0.97	274.6	0.1	0.77
116	113			212.0				0.00	0.00	22.7	64.8	0.0	212.0	600	0.20	62.4	0.283	0.150	0.97	274.6	1.1	0.77
										23.8												
115	114	I, K, N.STANDS	232.6	232.6	A3, A4, A5	2.133	0.80	1.71	1.71	***20.0***	70.3	333.0	565.6	825	0.20	73.7	0.535	0.206	1.20	641.9	1.0	0.88
114	113			232.6				0.00	1.71	21.0	68.1	322.7	555.4	825	0.20	73.0	0.535	0.206	1.20	641.9	1.0	0.87
										22.0												
113	112			444.6				0.00	1.71	23.8	62.9	298.4	743.0	1050	0.10	47.8	0.866	0.263	1.00	863.5	0.8	0.86
										24.6												
A	B			0.0		0.870	0.35	0.30	0.30	***15.0***	83.6	70.7	70.7	600	0.10	100.0	0.283	0.150	0.69	194.2	2.4	0.36
B	C			0.0		0.430	0.35	0.15	0.46	17.4	76.5	96.6	96.6	600	0.10	100.0	0.283	0.150	0.69	194.2	2.4	0.50
C	D			0.0				0.00	0.46	19.9	70.6	89.2	89.2	600	0.10	57.0	0.283	0.150	0.69	194.2	1.4	0.46
D	D1			0.0		0.520	0.35	0.18	0.64	21.2	67.6	119.7	119.7	900	0.10	55.8	0.636	0.225	0.90	572.5	1.0	0.21
D1	112			0.0		0.340	0.35	0.12	0.76	22.3	65.6	137.8	137.8	900	0.10	85.0	0.636	0.225	0.90	572.5	1.6	0.24
										23.8												
112	109			444.6				0.00	2.46	24.6	61.6	421.4	866.0	1200	0.10	46.8	1.131	0.300	1.09	1232.9	0.7	0.70
										25.3												
111	110	H, G1, G2, J	23.1	23.1	A1	1.181	0.75	0.89	0.89	***20.0***	70.3	172.8	196.0	600	0.20	39.6	0.283	0.150	0.97	274.6	0.7	0.71
110	109			23.1				0.00	0.89	20.7	68.8	169.3	192.4	600	0.20	8.5	0.283	0.150	0.97	274.6	0.1	0.70
										20.8												
109	108			467.8				0.00	3.35	25.3	60.5	562.3	1030.0	1350	0.10	99.8	1.431	0.338	1.18	1687.8	1.4	0.61
										26.7												
CB1A	AA			0.0		0.430	0.60	0.26	0.26	***15.0***	83.6	59.9	59.9	375	0.15	114.0	0.110	0.094	0.61	67.9	3.1	0.88
AA	BB			0.0		0.360	0.35	0.13	0.38	18.1	74.7	79.7	79.7	450	0.12	35.0	0.159	0.113	0.62	98.8	0.9	0.81
BB	CC			0.0		0.870	0.35	0.30	0.69	19.0	72.5	138.6	138.6	525	0.24	120.0	0.216	0.131	0.97	210.7	2.1	0.66
CC	DD			0.0				0.00	0.69	21.1	68.0	130.0	130.0	525	0.24	38.0	0.216	0.131	0.97	210.7	0.7	0.62
										21.7												
EE	DD			0.0		0.320	0.35	0.11	0.11	***15.0***	83.6	26.0	26.0	300	0.40	59.0	0.071	0.075	0.87	61.2	1.1	0.43
										16.1												
DD	FF			0.0				0.00	0.80	***21.7***	66.7	148.2	148.2	900	0.10	31.0	0.636	0.225	0.90	572.5	0.6	0.26
										22.3												
H	G			0.0		0.270	0.35	0.09	0.09	***15.0***	83.6	21.9	21.9	300	0.20	66.0	0.071	0.075	0.61	43.2	1.8	0.51
G	J			0.0		0.310	0.35	0.11	0.20	16.8	78.2	44.1	44.1	375	0.15	30.0	0.110	0.094	0.61	67.9	0.8	0.65
J	FF			0.0		0.100	0.35	0.04	0.24	17.6	76.0	50.2	50.2	600	0.15	12.0	0.283	0.150	0.84	237.8	0.2	0.21
										17.8												
FF	GG			0.0				0.00	1.04	***22.3***	65.6	189.1	189.1	900	0.10	57.0	0.636	0.225	0.90	572.5	1.1	0.33
										23.4												
K	M			0.0		0.270	0.35	0.09	0.09	***15.0***	83.6	21.9	21.9	300	0.20	65.0	0.071	0.075	0.61	43.2	1.8	0.51
M	R			0.0		0.070	0.35	0.02	0.12	16.8	78.2	25.9	25.9	300	0.20	47.0	0.071	0.075	0.61	43.2	1.3	0.60
										18.1												

Storm Sewer Calculation Sheet
Lansdowne Park Re-Development

														Sewer Data								
Up	**Down**	**BLDG ID**	**Q_{BLDG}**	**$Q_{BLDG\ TOT}$**	**AREA ID**	**Area**	**C**	**Indiv AxC**	**Acc AxC**	**T_C**	**I**	**Q**	**Q_{TOT}**	**DIA**	**Slope**	**Length**	**$A_{hydraulic}$**	**R**	**Velocity**	**Qcap**	**Time Flow**	**Q / Q full**
			(L/s)	**(L/s)**		**(ha)**	**(-)**			**(min)**	**(mm/hr)**	**(L/s)**	**(L/s)**	**(mm)**	**(%)**	**(m)**	**(m^2)**	**(m)**	**(m/s)**	**(L/s)**	**(min)**	**(-)**
O	P			0.0		0.280	0.60	0.17	0.17	***15.0***	83.6	39.0	39.0	375	0.12	21.0	0.110	0.094	0.55	60.7	0.6	0.64
P	Q			0.0		0.180	0.60	0.11	0.28	15.6	81.6	62.5	62.5	375	0.10	34.0	0.110	0.094	0.50	55.4	1.1	1.13
Q	R			0.0		0.300	0.60	0.18	0.46	16.8	78.3	99.1	99.1	375	0.12	18.0	0.110	0.094	0.55	60.7	0.5	1.63
R	GG			0.0				0.00	0.58	17.3	76.8	122.6	122.6	600	0.10	13.0	0.283	0.150	0.69	194.2	0.3	0.63
										17.6												
S	U			0.0		0.130	0.60	0.08	0.08	***15.0***	83.6	18.1	18.1	450	0.20	30.0	0.159	0.113	0.80	127.5	0.6	0.14
U	GG			0.0		0.140	0.60	0.08	0.16	15.6	81.6	36.7	36.7	525	0.10	17.0	0.216	0.131	0.63	136.0	0.5	0.27
										16.1												
GG	108			0.0				0.00	1.78	***17.6***	75.9	374.5	374.5	900	0.10	22.0	0.636	0.225	0.90	572.5	0.4	0.65
										18.0												
108	107			0.0		0.340	0.60	0.20	5.33	***26.7***	58.3	863.2	863.2	1350	0.10	81.4	1.431	0.338	1.18	1687.8	1.2	0.51
107	106	A, B, C, D	34.4	502.2	A2	1.555	0.75	1.17	6.49	27.8	56.7	1023.0	1525.1	1350	0.10	20.7	1.431	0.338	1.18	1687.8	0.3	0.90
										28.1												
CONTROLLED FLOW																						
106	105		616.0	616.0				0.00	0.00	27.8	56.7	0.0	616.0	975	0.10	80.2	0.747	0.244	0.95	708.7	1.4	0.87
105	104			616.0				0.00	0.00	29.2	54.9	0.0	616.0	975	0.10	12.1	0.747	0.244	0.95	708.7	0.2	0.87
104	103			616.0				0.00	0.00	29.5	54.6	0.0	616.0	975	0.10	19.2	0.747	0.244	0.95	708.7	0.3	0.87
103	102			616.0				0.00	0.00	29.8	54.2	0.0	616.0	975	0.10	54.2	0.747	0.244	0.95	708.7	1.0	0.87
102	101			616.0				0.00	0.00	30.7	53.0	0.0	616.0	975	0.10	24.2	0.747	0.244	0.95	708.7	0.4	0.87
101	EX			616.0				0.00	0.00	31.2	52.5	0.0	616.0	975	0.10	5.8	0.747	0.244	0.95	708.7	0.1	0.87
										31.3												



CLIENT PARTNERSHIP

Ottawa

OSEG Ottawa Sports and Entertainment Group

CONSULTANT TEAM

CANNONDESIGN AN IDEAS BASED PRACTICE

CORUSH SUNDERLAND WRIGHT

DSEL david schaeffer engineering ltd

GreenbergFarrow

Stantec

PHILLIPS FAREVAAG SMALLENBERG PLANNING + URBAN DESIGN LANDSCAPE ARCHITECTURE

REVISIONS

No.	Date	Details	By
1	2011-11-21	ISSUED TO CITY FOR REVIEW	JVG
2	2011-12-12	REVISED AS PER CITY COMMENTS	JVG
3	2012-01-11	REVISED AS PER COORDINATION WITH DSEL	JVG
4	2012-01-26	REVISED AS PER CITY COMMENTS	JVG

1:600 0 6 18 30m

PROJECT

Lansdowne
THE TRANSFORMATION OF LANSDOWNE PARK / LA TRANSFORMATION DU PARC LANSDOWNE

DRAWING TITLE

CATCHMENT AREA PLAN

DATE

DRAWING No.

SCALE 1:600

REVISION # 4

C03

SANITARY SEWER DESIGN SHEET
Lansdowne Redevelopment 2.0
Ottawa, ON
Project: CA0000286.1662
Date: September 2023

LOCATION				RESIDENTIAL AREA AND POPULATION												OTHER				RETAIL		OFFICE		I+C+I	INFILTRATION				PIPE					
LOCATION	FROM M.H.	TO M.H.	SANITARY DRAINAGE AREA ID	INDV AREA (ha)	ACCU AREA (ha)	NUMBER OF UNITS: SINGLES	SEMIS	AVG TOWNS	AVG APT.	2-BED APT.	3-BED APT.	POPULATION: INDIV POP.	ACCU POP.	PEAK FACT.	PEAK FLOW (l/s)	GROSS AREA (ha)	DEVEL. AREA (ha)	PEAK FLOW (l/s)	ACCU. PEAK FLOW (l/s)	INDIV AREA (ha)	ACCU. AREA (ha)	INDIV AREA (ha)	ACCU. AREA (ha)	PEAK FLOW (l/s)	INDIV AREA (ha)	ACCU. AREA (ha)	INFILT. FLOW (l/s)	TOTAL FLOW (l/s)	LENGTH (m)	DIA. (mm)	SLOPE (%)	CAP. (FULL) (l/s)	VEL. (FULL) (m/s)	AVAIL. CAP. (%)
EXISTING DEVELOPMENT																																		
South Stands		Ex.19										0	0	3.80	0.00			11.60	11.60					11.60	0.000	0.00	0.00	**11.60**	4.50	200	1.00	32.80	1.04	**64.63%**
	Ex.19	Ex.18										0	0	3.80	0.00				11.60					11.60	0.000	0.00	0.00	**11.60**	9.30	300	0.20	43.25	0.61	**73.18%**
	Ex.18	Ex.17										0	0	3.80	0.00				11.60					11.60	0.000	0.00	0.00	**11.60**	9.30	300	0.20	43.25	0.61	**73.18%**
	Ex.17	Ex.16										0	0	3.80	0.00				11.60					11.60	0.000	0.00	0.00	**11.60**	5.80	300	0.20	43.25	0.61	**73.18%**
	Ex.16	Ex.13										0	0	3.80	0.00				11.60					11.60	0.000	0.00	0.00	**11.60**	62.60	300	0.20	43.25	0.61	**73.18%**
Bldg K, I, N Stands		Ex.15							190			342	342	3.44	3.82			7.60	7.60	0.25	0.25	0.84	0.84	7.95	0.000	0.00	0.00	**11.77**	9.80	250	1.00	59.47	1.21	**80.21%**
	Ex.15	Ex.14										0	342	3.44	3.82				7.60		0.25		0.84	7.95	0.000	0.00	0.00	**11.77**	74.90	300	0.20	43.25	0.61	**72.79%**
	Ex.14	Ex.13										0	342	3.44	3.82				7.60		0.25		0.84	7.95	0.000	0.00	0.00	**11.77**	74.90	300	0.20	43.25	0.61	**72.79%**
	Ex.13	Ex.12										0	342	3.44	3.82				19.20		0.25		0.84	19.55	0.000	0.00	0.00	**23.37**	44.40	300	0.20	43.25	0.61	**45.96%**
	Ex.12	Ex.9										0	342	3.44	3.82				19.20		0.25		0.84	19.55	0.000	0.00	0.00	**23.37**	56.60	300	0.20	43.25	0.61	**45.96%**
Bldg G1, G2, H, J		Ex.11										0	0	3.80	0.00				0.00	1.59	1.59			0.51	0.000	0.00	0.00	**0.51**	8.40	250	0.38	36.66	0.75	**98.60%**
Salon, Civic Centre		Ex.11										0	0	3.80	0.00			5.20	5.20		0.00			5.20	0.000	0.00	0.00	**5.20**	30.80	250	0.38	36.66	0.75	**85.81%**
	Ex.11	Ex.10										0	0	3.80	0.00				5.20		1.59			5.71	0.000	0.00	0.00	**5.71**	38.20	250	0.38	36.66	0.75	**84.41%**
	Ex.10	Ex.9										0	0	3.80	0.00				5.20		1.59			5.71	0.000	0.00	0.00	**5.71**	7.50	250	0.38	36.66	0.75	**84.41%**
	Ex.9	Ex.8										0	342	3.44	3.82				24.40		1.84		0.84	25.27	0.000	0.00	0.00	**29.08**	84.00	375	0.15	67.91	0.61	**57.17%**
Aberdeen Pavilion	Ex.8	Ex.7										0	342	3.44	3.82				24.40	0.41	2.25		0.84	25.40	0.000	0.00	0.00	**29.21**	23.30	375	0.15	67.91	0.61	**56.98%**
Bldg A, B, C, D, Horticulture	Ex.7	Ex.6						40	50			198	540	3.37	5.89				24.40	2.25	4.50		0.84	26.13	0.000	0.00	0.00	**32.02**	23.30	375	0.15	67.91	0.61	**52.85%**
	Ex.6	Ex.5										0	540	3.37	5.89				24.40		4.50		0.84	26.13	0.000	0.00	0.00	**32.02**	83.50	375	0.15	67.91	0.61	**52.85%**
	Ex.5	Ex.4										0	540	3.37	5.89				24.40		4.50		0.84	26.13	0.000	0.00	0.00	**32.02**	10.10	375	0.15	67.91	0.61	**52.85%**
	Ex.4	Ex.3										0	540	3.37	5.89				24.40		4.50		0.84	26.13	0.000	0.00	0.00	**32.02**	17.50	375	0.15	67.91	0.61	**52.85%**
	Ex.3	Ex.2										0	540	3.37	5.89				24.40		4.50		0.84	26.13	0.000	0.00	0.00	**32.02**	60.00	375	0.15	67.91	0.61	**52.85%**
	Ex.2	Ex.1										0	540	3.37	5.89				24.40		4.50		0.84	26.13	0.000	0.00	0.00	**32.02**	24.70	375	0.15	67.91	0.61	**52.85%**
	Ex.1	EX										0	540	3.37	5.89				24.40		4.50		0.84	26.13	0.000	0.00	0.00	**32.02**	9.70	375	0.15	67.91	0.61	**52.85%**

DESIGN PARAMETERS

RESIDENTIAL AVG. DAILY FLOW =	280	l/cap/day
COMMERCIAL AVG. DAILY FLOW =	28,000	l/ha/day
	0.324	l/ha/s
INSTITUTIONAL AVG. DAILY FLOW =	28,000	l/ha/day
	0.324	l/ha/s
LIGHT INDUSTRIAL FLOW =	35,000	l/ha/day
	0.405	l/ha/s
HEAVY INDUSTRIAL FLOW =	55,000	l/ha/day
	0.637	l/ha/s

COMMERCIAL PEAK FACTOR =	1.5	(WHEN AREA > 20%)
	1.0	(WHEN AREA < 20%)
INSTITUTIONAL PEAK FACTOR =	1.5	(WHEN AREA > 20%)
	1.0	(WHEN AREA < 20%)
RESIDENTIAL CORRECTION FACTOR, K =	0.80	
MANNING N =	0.013	
PEAK EXTRANEOUS FLOW, I (l/s/ha) =	0.33	

PEAK POPULATION FLOW, (l/s) =	P*q*M/86400
PEAK EXTRANEOUS FLOW, (l/s) =	I*Ac
RESIDENTIAL PEAKING FACTOR, M =	1+(14/(4+P^0.5))*K
Ac = CUMULATIVE AREA (ha)	
P = POPULATION (THOUSANDS)	
SEWER CAPACITY, Qcap (l/s) =	1/N S^(1/2) R^(2/3) Ac
(MANNING'S EQUATION)	

UNIT TYPE	PERSONS/UNIT
SINGLES	3.4
SEMI-DETACHED	2.7
TOWNHOMES	2.7
WALK UP TOWNS	1.8
2-BED APT. UNIT	2.1
3-BED APT. UNIT	3.1

DESIGNED: D.B.Y
CHECKED: D.B.Y
PROJECT: Lansdowne Redevelopment 2.0
LOCATION: Ottawa, Ontario
PAGE NO: 1 of 2

NO.	REVISION	DATE
1.	City Submission No.1	2023-05-25
2.	City Submission No.2	2023-09-22
3.	City Submission No.3	2024-08-07

FILE & DWG. REFERENCE:

SANITARY SEWER DESIGN SHEET
Lansdowne Redevelopment 2.0
Ottawa, ON
Project: CA0000286.1662
Date: September 2023

LOCATION				RESIDENTIAL AREA AND POPULATION												OTHER				RETAIL		OFFICE		I+C+I	INFILTRATION				PIPE					
LOCATION	FROM M.H.	TO M.H.	SANITARY DRAINAGE AREA ID	INDV AREA (ha)	ACCU AREA (ha)	NUMBER OF UNITS: SINGLES	SEMIS	AVG TOWNS	AVG APT.	2-BED APT.	3-BED APT.	POPULATION: INDIV POP.	ACCU POP.	PEAK FACT.	PEAK FLOW (l/s)	GROSS AREA (ha)	DEVEL. AREA (ha)	PEAK FLOW (l/s)	ACCU. PEAK FLOW (l/s)	INDIV AREA (ha)	ACCU. AREA (ha)	INDIV AREA (ha)	ACCU. AREA (ha)	PEAK FLOW (l/s)	INDIV AREA (ha)	ACCU. AREA (ha)	INFILT. FLOW (l/s)	**TOTAL FLOW (l/s)**	LENGTH (m)	DIA. (mm)	SLOPE (%)	CAP. (FULL) (l/s)	VEL. (FULL) (m/s)	AVAIL. CAP. (%)
POST DEVELOPMENT																																		
BLDG I, K, North Stands		*Ex.15*							190			342	342	3.44	3.82			7.60	7.60	0.25	0.25	0.84	0.84	7.95	0.000	0.00	0.00	**11.77**						
	Ex.15	*Ex.14*										0	342	3.44	3.82				7.60		0.25		0.84	7.95	0.000	0.00	0.00	**11.77**	73.58	375	0.15	67.91	0.61	**82.67%**
	Ex.14	SAMH 208										0	342	3.44	3.82				7.60		0.25		0.84	7.95	0.000	0.00	0.00	**11.77**	71.25	375	0.15	67.91	0.61	**82.67%**
	SAMH 208	SAMH 207										0	342	3.44	3.82				7.60		0.25		0.84	7.95	0.000	0.00	0.00	**11.77**	66.41	375	0.15	67.91	0.61	**82.67%**
South Stands	*Ex.18*	SAMH 207										0	0	3.80	0.00			11.60	11.60		0.00		0.00	11.60	0.000	0.00	0.00	**11.60**	9.20	300	0.20	43.25	0.61	**73.18%**
	SAMH 207	SAMH 206										0	342	3.44	3.82				19.20		0.25		0.84	19.55	0.000	0.00	0.00	**23.37**	17.37	375	0.14	65.60	0.59	**64.38%**
	SAMH 206	SAMH 205										0	342	3.44	3.82				19.20		0.25		0.84	19.55	0.000	0.00	0.00	**23.37**	25.49	375	0.15	67.91	0.61	**65.59%**
	SAMH 205	SAMH 204										0	342	3.44	3.82				19.20		0.25		0.84	19.55	0.000	0.00	0.00	**23.37**	37.48	375	0.16	70.13	0.63	**66.68%**
	SAMH 204	SAMH 203										0	342	3.44	3.82				19.20		0.25		0.84	19.55	0.000	0.00	0.00	**23.37**	31.38	375	0.15	67.91	0.61	**65.59%**
New Event Centre	Bldg	375 Pipe										0	0	3.80	0.00			5.20	5.20		0.00		0.00	5.20	0.000	0.00	0.00	**5.20**	5.40	200	1.00	32.80	1.04	**84.15%**
	SAMH 203	SAMH 202										0	342	3.44	3.82				24.40		0.25		0.84	24.75	0.000	0.00	0.00	**28.57**	106.17	375	0.15	67.91	0.61	**57.93%**
	SAMH 202	SAMH 201										0	342	3.44	3.82				24.40		0.25		0.84	24.75	0.000	0.00	0.00	**28.57**	49.82	375	0.15	67.91	0.61	**57.93%**
	SAMH 201	*Ex.8*										0	342	3.44	3.82				24.40		0.25		0.84	24.75	0.000	0.00	0.00	**28.57**	33.19	375	0.15	67.91	0.61	**57.93%**
Tower 1 & 2, BLDG G1, G2, H, J	*Ex. SAN-CCN1*	SAMH 210							252	250	250	1754	1754	3.10	17.64				0.00	2.33	2.33	0.08	0.08	0.78	0.000	0.00	0.00	**18.42**	12.03	250	0.25	29.73	0.61	**38.07%**
	SAMH 210	SAMH 209										0	1754	3.10	17.64				0.00		2.33		0.08	0.78	0.000	0.00	0.00	**18.42**	30.43	250	0.25	29.73	0.61	**38.07%**
	SAMH 209	*Ex. 10*										0	1754	3.10	17.64				0.00		2.33		0.08	0.78	0.000	0.00	0.00	**18.42**	10.07	250	0.38	36.66	0.75	**49.76%**
	Ex. 10	*Ex.9*										0	1754	3.10	17.64				0.00		2.33		0.08	0.78	0.000	0.00	0.00	**18.42**	*8.00*	*250*	*0.35*	35.18	0.72	**47.66%**
	Ex. CAP	*Ex.9*										0	0	3.80	0.00				0.00		0.00		0.00	0.00	0.000	0.00	0.00	**0.00**	*20.20*	*375*	*0.14*	65.60	0.59	**100.00%**
	Ex.9	*Ex.8*										0	1754	3.10	17.64				0.00		2.33		0.08	0.78	0.000	0.00	0.00	**18.42**	*103.59*	*375*	*0.16*	70.13	0.63	**73.74%**
Aberdeen Pavilion	*Ex.8*	*Ex.7*										0	2096	3.06	20.75				24.40	0.41	2.99		0.92	25.66	0.000	0.00	0.00	**46.42**	*23.30*	*375*	*0.15*	67.91	0.61	**31.64%**
Bldg A, B, C, D, Horticulture	*Ex.7*	*Ex.6*						40	50			198	2294	3.03	22.53				24.40	2.25	5.24		0.92	26.39	14.000	14.00	4.62	**53.54**	*23.30*	*375*	*0.15*	67.91	0.61	**21.15%**

DESIGN PARAMETERS

RESIDENTIAL AVG. DAILY FLOW =	280	l/cap/day
COMMERCIAL AVG. DAILY FLOW =	28,000	l/ha/day
	0.324	l/ha/s
INSTITUTIONAL AVG. DAILY FLOW =	28,000	l/ha/day
	0.324	l/ha/s
LIGHT INDUSTRIAL FLOW =	35,000	l/ha/day
	0.405	l/ha/s
HEAVY INDUSTRIAL FLOW =	55,000	l/ha/day
	0.637	l/ha/s

COMMERCIAL PEAK FACTOR =	1.5	(WHEN AREA > 20%)
	1.0	(WHEN AREA < 20%)
INSTITUTIONAL PEAK FACTOR =	1.5	(WHEN AREA > 20%)
	1.0	(WHEN AREA < 20%)
RESIDENTIAL CORRECTION FACTOR, K =	0.80	
MANNING N =	0.013	
PEAK EXTRANEOUS FLOW, I (l/s/ha) =	0.33	

PEAK POPULATION FLOW, (l/s) =	P*q*M/86400
PEAK EXTRANEOUS FLOW, (l/s) =	I*Ac
RESIDENTIAL PEAKING FACTOR, M =	1+(14/(4+P^0.5))*K
Ac = CUMULATIVE AREA (ha)	
P = POPULATION (THOUSANDS)	
SEWER CAPACITY, Qcap (l/s) =	1/N S^(1/2) R^(2/3) Ac
(MANNING'S EQUATION)	

UNIT TYPE	PERSONS/UNIT
SINGLES	3.4
SEMI-DETACHED	2.7
TOWNHOMES	2.7
WALK UP TOWNS	1.8
2-BED APT. UNIT	2.1
3-BED APT. UNIT	3.1

DESIGNED: D.B.Y
CHECKED: D.B.Y
PROJECT: Lansdowne Redevelopment 2.0
LOCATION: Ottawa, Ontario
PAGE NO: 2 of 2

NO.	REVISION	DATE
1.	City Submission No.1	2023-05-25
2.	City Submission No.2	2023-09-22
3.	City Submission No.3	2024-08-07

FILE & DWG. REFERENCE:

Building	Retail (m²)	Residential # towns	Residential # apts	Office (m²)	Estimated WTR / SAN / STM per Mechancal Eng. WTR (L/s)	FIRE (L/s)	SAN (L/s)	STM (L/s)	Estimated Per City of Ottawa Design Guidelines WTR AVG (L/s)	WTR MAX. DAY (L/s)	WTR PEAK HR (L/s)	FIRE (L/s)	SAN (L/s)	STM (L/s)	Notes
A	4,129	7	50		16.7		5.4	8.3	0.6	1.3	2.7	150	2.5	8.6	Mech Eng values provided by LKM 2011-11-29 (Includes retail and residential)
B	5,401	15			6.9		5.7	8.6	0.3	0.6	1.3	150	1.6	11.1	Mech Eng values provided by LKM 2011-11-29 (Includes retail and residential)
C	9,262	11			13.9		5.4	19.6	0.4	0.7	1.4	150	2.1	10.1	Mech Eng values provided by LKM 2011-11-29 (Includes retail and residential)
D	2,131	7			6.3		3.8	5.2	0.1	0.3	0.6	150	0.7	4.6	Mech Eng values provided by LKM 2011-11-29 (Includes retail and residential)
G1	3,507				6.3		5.4	5.5	0.1	0.2	0.3	150	0.6	5.8	Mech Eng values provided by LKM 2011-11-29 (Includes retail)
G2	399				5.0		2.6	2.4	0.0	0.0	0.0	150	0.1	1.3	Mech Eng values provided by LKM 2011-11-29 (Includes retail)
H	7,294				9.5		500FU	9.5	0.2	0.3	0.6	150	1.3	11.7	Mech Eng values provided by LKM 2011-11-29 (Includes retail)
I	2,505			8,361					0.9	1.3	2.3	150	1.6	8.1	
NEW TOWERS ~~J~~	1,220								0.0	0.1	0.1	150	0.2	4.3	
~~J~~ - Salon	3,425								0.1	0.1	0.3	150	0.6	N/A	Roof covered in North Stands flow.
K			190						1.4	3.5	7.6	150	5.5	5.3	
NEW NORTH STANDS ~~North Stands~~									2.8	4.2	7.6	150	7.6	219.2	No City standard for estimating flow from stadium / civic centre. Used monitored data
South Stands					25.2	31.5	11.6	211	2.8	4.2	7.5	150	11.6	212.0	No City standard for estimating flow from stadium / civic centre. Used monitored data
EVENT CENTRE ~~Civil Centre~~									1.9	2.9	5.2	150	5.2	N/A	No City standard for estimating flow from stadium / civic centre. Used monitored data
Aberdeen	4,098								0.1	0.2	0.3	150	0.7	N/A	Peaked Roof, storm runoff included in surface drainage.
Horticulture	1,591								0.0	0.1	0.1	150	0.3	N/A	Peaked Roof, storm runoff included in surface drainage.
Total	**44,962**	**40**	**240**	**8,361**	**89.9**	**31.5**	**39.8**	**270.1**	**11.8**	**19.9**	**38.0**		**42.1**	**502.2**	

Notes

1) Retail floor areas for buildings A, B, C, D, G1, G2, H, I, J, J - Salon provided by Perkins Eastman - Novemeber 18, 2011. Above table uses total GFA.
2) Residential for Buildings A, B, C, D, and K component extracted from RFO Addendum 3 - October 20, 2011 as follows:
Parcel A1 = Residential Tower above Bldg A. 240units (280units max less townhomes) proportionate between Bldg A and K. Therefore, 240units x 66,000/316,000 = 50units.
Parcel A2 = Townhomes abutting buildings A, B, C, D. Assuming 1,225sq.ft townhomes = 40units. Divided between buildings per ground floor area shown on Perkins Eastman November 19, 2011 merchandising plan.
Bldg A = 3,426/19,104 x 40 = 7 units
Bldg B = 7,188/19,104 = 15 units
Bldg C = 5,096/19,104 = 11 units
Bldg D = 3,394/19,104 = 7units
Parcel B = Office tower above Building I, 90,000sq.ft.
Parcel C = Building K 240units (280units max less townhomes) proportionate between Bldg A and K. Therefore, 240units x 250,000/316,000 = 190units.
3) Mech. Eng. Servcing for Bldgs A, B, C, D, G1, G2, H provided by LKM, dated July 19, 2011. Revised Storm and Sanitary flow per November 29, 2011 email.
4) City of Ottawa rates were estimated accordingly

Water Supply

Retail: Average Day 2.5L/m^2/d, Max Day = Avg Day x 1.5, Peak Hour = Avg Day x 2.7
Residential:
Townhouse Avg Day = 2.7p/unit x 350m^3/d, Max Day = Avg Day x 2.5, Peak Hour = Avg Day x 5.5
Apartement Avg Day = 1.8p/unit x 350m^3/d, Max Day = Avg Day x 2.5, Peak Hour = Avg Day x 5.5
Office: Average Day 75L/9.3m^2/d, Max Day = Avg Day x 1.5, Peak Hour = Avg Day x 2.7
North and South Stands: City of Ottawa completed Flow Monitoring in 2005. A peak dry weather flow for a capacity game was recorded to be 15.1L/s.
Report titled "Lansdowne Park - 2005, Combined Sewer Flow Monitoring Report," G.A. Clark & Associates Limited, Proj. No: 200524
Interpolated Average Day, Max Day and, Peak Hour accordingly: Peak Hour = 15.1L/s, Max Day = Peak Hour / 1.8, Average Day = Peak Hour / 2.7
North and South stands flow proportioned by number of seating: North Stands = 14,542 South Stands = 14,284, as decribed in Lansdowne Park information material.
Civil Centre: Flow monitoring completed in 2005 indicated a peak a 4L/s. However, this recorded flow did not account for wastewater directed to Holmwood.
Civil Centre Flow estimated based on Stadium monitored flow and seating: 9,836 / 28,826 x 15.1 = 5.2L/s
Interpolated Average Day, Max Day and, Peak Hour accordingly: Peak Hour = 5.2L/s, Max Day = Peak Hour / 1.8, Average Day = Peak Hour / 2.7

Wastewater

Retail: Average Day 5L/m^2/d x 24hour day / 12hour operation, Peak = Average Day x 1.5
Residential:
Townhouse Avg Day = 2.7p/unit x 350m^3/d, Peak = Avg Day x 3.95
Apartment Avg Day = 1.8p/unit x 350m^3/d, Peak = Avg Day x 3.95
Office: Average Day 75L/9.3m^2/d, Peak = Avg Day x 1.5
North and South Stands: City of Ottawa completed Flow Monitoring in 2005. A peak dry weather flow for a capacity game was recorded to be 15.1L/s.
Report titled "Lansdowne Park - 2005, Combined Sewer Flow Monitoring Report," G.A. Clark & Associates Limited, Proj. No: 200524
Peak flow interpreted as peak monitored flow (15.1L/s)
North stands flow proportioned by number of seating: North Stands = 14,542 South Stands = 14,284, as decribed in Lansdowne Park information material.
Civil Centre: Flow monitoring completed in 2005 indicated a peak a 4L/s. However, this recorded flow did not account for wastewater directed to Holmwood.
Civil Centre Flow estimated based on Stadium monitored flow and seating: 9,836 / 28,826 x 15.1 = 5.2L/s
South Stands - Mechanical Consultant provided estimated peak Wastewater Flow Rate (Smith and Anderson (2011-12-02) servicing sketch)

Storm

See Separate Analysis - Estimated per City of Ottawa IDF curves and Control Flow roof drains where appropriate
North and South Stands assumed to have roof drains sized to accommodate 5-year storm only. To be confirmed by DSEL through modeling.

EX. BLDGS	AVG	MAX	PEAK	FUS
A, B, C, D, G1, G2, H, 0 J, J-SALON, K ...ETC	11.8 L/S	19.9 L/S	38 L/S	150 L/S

PROJECT: **Lansdowne Park Re-Development**
LOCATION: **City of Ottawa**
FILE REF: **10-378**
DATE: **19-Dec-11**

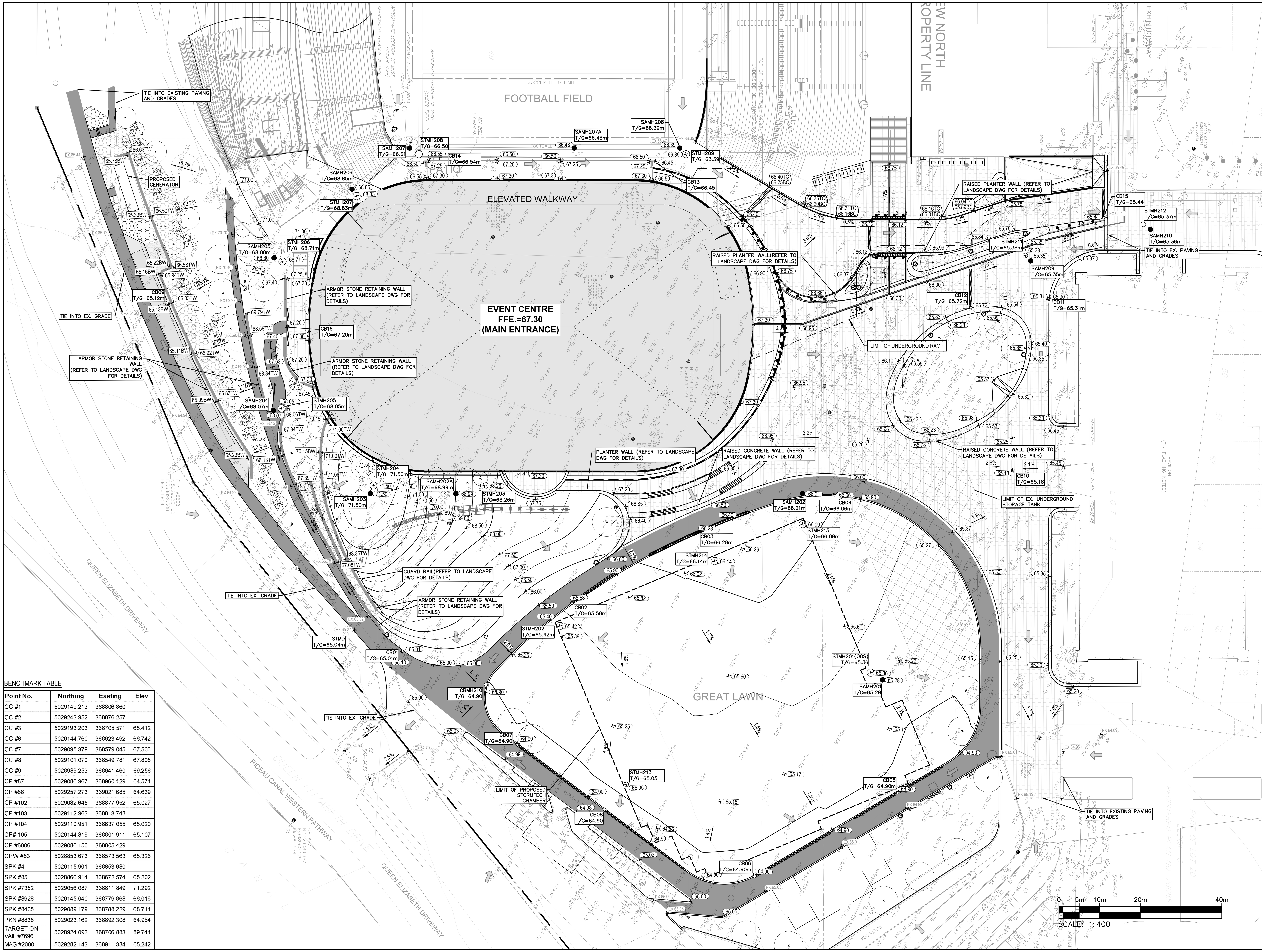
DESIGN PARAMETERS

Avg. Daily Flow Res.	350 L/p/d	Peak Fact Res. Per Harmons: Min = 2.0, Max =4.0		Infiltration / Inflow	0.28 L/s/ha
Avg. Daily Flow Retail	5 L/m^2/d	Peak Fact. Retail	1.5	Min. Pipe Velocity	0.60 m/s full flowing
Avg. Office Flow	75 L/9.3m^2/d	Peak Fact. Office	1.5	Max. Pipe Velocity	3.00 m/s full flowing
				Mannings N	0.013

DSEL

Location: Area ID	Up	Down	Residential: Area (ha)	Town's	Apt's	Pop.	Cumulative Area (ha)	Cumulative Pop.	Peak. Fact. (-)	Q_{res} (L/s)	Retail: Area (m^2)	Retail: Accu. Area (m^2)	Office: Incr. Area (m^2)	Office: Accu. Area (m^2)	Other: Area (L/s)	Other: Accu. Area (L/s)	Q_{C+I+I} (L/s)
South Stands	19	18				0.0	0.000	0.0	4.00	0.0		-		-	11.6	11.6	11.6
	18	17				0.0	0.000	0.0	4.00	0.0		-		-		11.6	11.6
	17	16				0.0	0.000	0.0	4.00	0.0		-		-		11.6	11.6
	16	13				0.0	0.000	0.0	4.00	0.0		-		-		11.6	11.6
BLDG K, I, N.Stands	15	14			190	342.0	0.000	342.0	4.00	5.5	2,505	2,505	8,361	8,361	7.6	7.6	9.2
	14	13				0.0	0.000	342.0	4.00	5.5		2,505		8,361		7.6	9.2
	13	12				0.0	0.000	342.0	4.00	5.5		2,505		8,361		19.2	20.8
	12	9				0.0	0.000	342.0	4.00	5.5		2,505		8,361		19.2	20.8
BLDG G1, G2, H, J, Salon, Civic Cen	11	10				0.0	0.000	0.0	4.00	0.0	15,845	15,845		-	5.2	5.2	8.0
	10	9				0.0	0.000	0.0	4.00	0.0		15,845		-		5.2	8.0
	9	8				0.0	0.000	342.0	4.00	5.5		18,350		8,361		24.4	28.8
Aberdeen Pavilion	8	7				0.0	0.000	342.0	4.00	5.5	4,098	22,448		8,361		24.4	29.5
BLDG A, B, C, D, Horticulture	7	5		40	50	198.0	0.000	540.0	3.96	8.7	22,514	44,962		8,361		24.4	33.4
	5	4				0.0	0.000	540.0	3.96	8.7		44,962		8,361		24.4	33.4
	4	3				0.0	0.000	540.0	3.96	8.7		44,962		8,361		24.4	33.4
	3	2				0.0	0.000	540.0	3.96	8.7		44,962		8,361		24.4	33.4
	2	1				0.0	0.000	540.0	3.96	8.7		44,962		8,361		24.4	33.4
	1	EX				0.0	0.000	540.0	3.96	8.7		44,962		8,361		24.4	33.4

Location: Area ID	Up	Down	Infiltration: Total Area (ha)	Accu. Area (ha)	Infiltration Flow (L/s)	Total Flow (L/s)	Pipe Data: DIA (mm)	Slope (%)	Length (m)	$A_{hydraulic}$ (m^2)	R (m)	Velocity (m/s)	Q_{cap} (L/s)	Q / Q full (-)
South Stands	19	18	0.000	0.000	0.000	11.6	300	0.20	61.0	0.071	0.075	0.61	43.2	0.27
	18	17	0.000	0.000	0.000	11.6	300	0.20	9.3	0.071	0.075	0.61	43.2	0.27
	17	16	0.000	0.000	0.000	11.6	300	0.20	5.8	0.071	0.075	0.61	43.2	0.27
	16	13	0.000	0.000	0.000	11.6	300	0.20	62.6	0.071	0.075	0.61	43.2	0.27
BLDG K, I, N.Stands	15	14	0.000	0.000	0.000	14.8	300	0.20	74.9	0.071	0.075	0.61	43.2	0.34
	14	13	0.000	0.000	0.000	14.8	300	0.20	74.9	0.071	0.075	0.61	43.2	0.34
	13	12	0.000	0.000	0.000	26.4	300	0.20	44.4	0.071	0.075	0.61	43.2	0.61
	12	9	0.000	0.000	0.000	26.4	300	0.20	56.6	0.071	0.075	0.61	43.2	0.61
BLDG G1, G2, H, J, Salon, Civic Cen	11	10	0.000	0.000	0.000	8.0	250	0.38	38.2	0.049	0.063	0.75	36.7	0.22
	10	9	0.000	0.000	0.000	8.0	250	0.38	7.5	0.049	0.063	0.75	36.7	0.22
	9	8	0.000	0.000	0.000	34.3	375	0.15	84.0	0.110	0.094	0.61	67.9	0.51
Aberdeen Pavilion	8	7	0.000	0.000	0.000	35.0	375	0.15	23.3	0.110	0.094	0.61	67.9	0.52
BLDG A, B, C, D, Horticulture	7	5	0.000	0.000	0.000	42.0	375	0.15	83.5	0.110	0.094	0.61	67.9	0.62
	5	4	0.000	0.000	0.000	42.0	375	0.15	10.1	0.110	0.094	0.61	67.9	0.62
	4	3	0.000	0.000	0.000	42.0	375	0.15	17.5	0.110	0.094	0.61	67.9	0.62
	3	2	0.000	0.000	0.000	42.0	375	0.15	60.0	0.110	0.094	0.61	67.9	0.62
	2	1	0.000	0.000	0.000	42.0	375	0.15	24.7	0.110	0.094	0.61	67.9	0.62
	1	EX	0.000	0.000	0.000	42.0	375	0.15	9.7	0.110	0.094	0.61	67.9	0.62



BENCHMARK TABLE

Point No.	Northing	Easting	Elev
CC #1	5029149.213	368806.860	
CC #2	5029243.952	368876.257	
CC #3	5029193.203	368705.571	65.412
CC #6	5029144.760	368623.492	66.742
CC #7	5029095.379	368579.045	67.506
CC #8	5029101.070	368549.781	67.805
CC #9	5028989.253	368641.460	69.256
CP #87	5029086.967	368960.129	64.574
CP #88	5029257.273	369021.685	64.639
CP #102	5029082.645	368877.952	65.027
CP #103	5029112.963	368813.748	
CP #104	5029110.951	368837.055	65.020
CP# 105	5029144.819	368801.911	65.107
CP #6006	5029086.150	368805.429	
CPW #83	5028853.673	368573.563	65.326
SPK #4	5029115.901	368853.680	
SPK #85	5028866.914	368672.574	65.202
SPK #7352	5029056.087	368811.849	71.292
SPK #8928	5029145.040	368779.868	66.016
SPK #8435	5029089.179	368788.229	68.714
PKN #8838	5029023.162	368892.308	64.954
TARGET ON VAIL #7696	5028924.093	368706.883	89.744
MAG #20001	5029282.143	368911.384	65.242

DATE PLOTTED:

Ottawa

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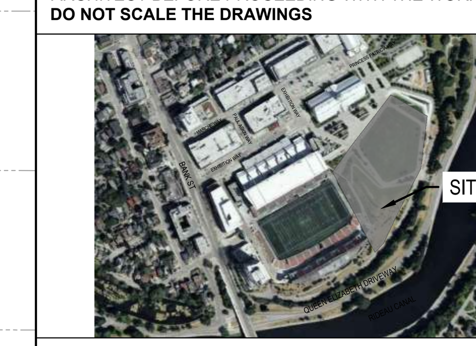
(613) 829-2800
CIVIL ENGINEER

NO.	DESCRIPTION	DATE
2	REVISED AS PER CITY COMMENTS	2024-09-13
1	ISSUED FOR SPA	2024-08-07

REVISIONS/ ISSUES

CONTRACTOR SHALL CHECK AND VERIFY ALL DIMENSIONS AND REPORT ANY OMISSIONS OR DISCREPANCIES TO THE ARCHITECT BEFORE PROCEEDING WITH THE WORK.
DO NOT SCALE THE DRAWINGS



SEAL

LICENSED PROFESSIONAL ENGINEER
D. B. YANG
100230568
2024-09-13
PROVINCE OF ONTARIO

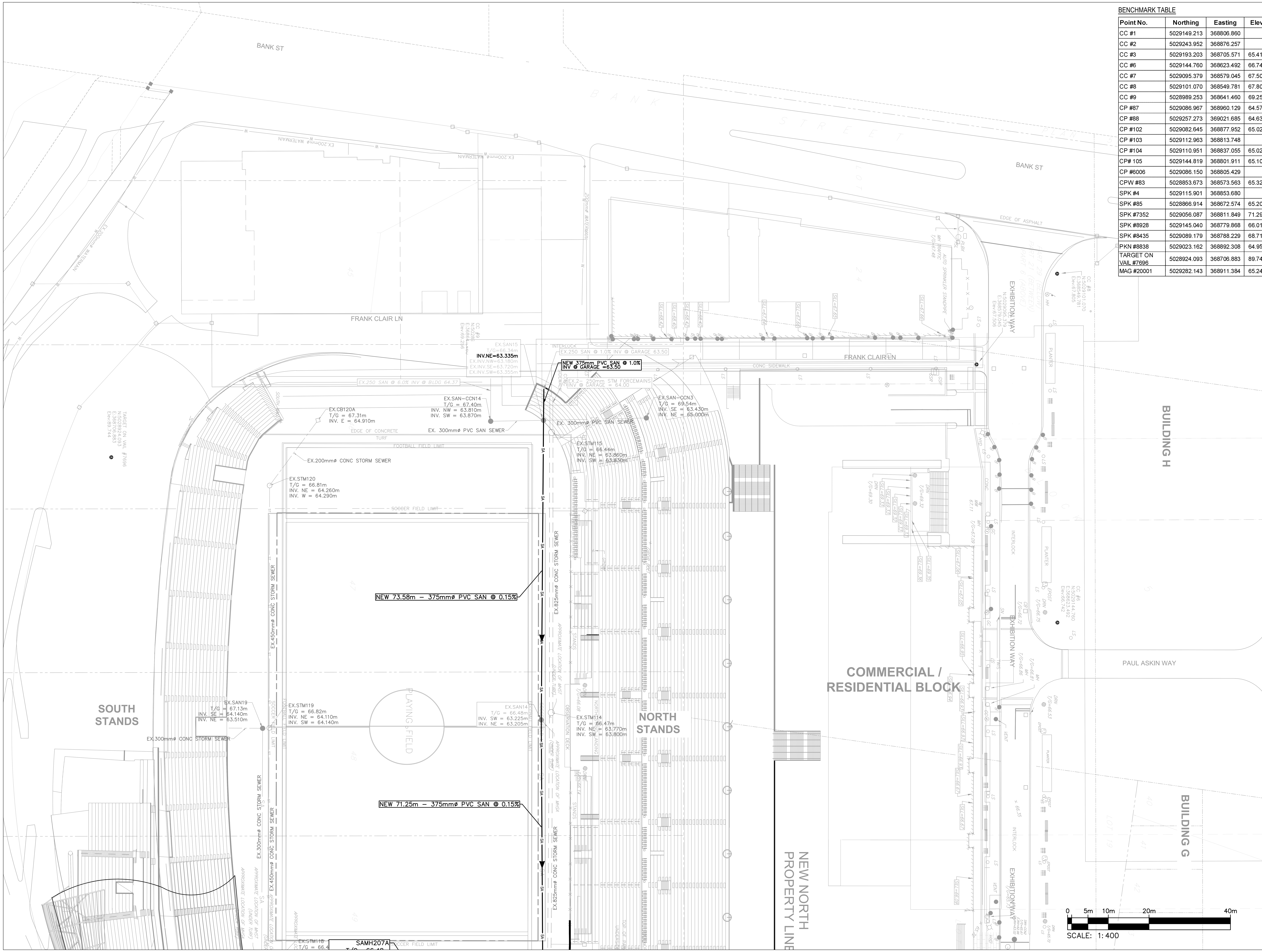
NORTH

DRAWN J.T
DATE 2024/09/13
CHECKED W.Y

LANSDOWNE EC

DWG. TITLE
GRADING PLAN

SCALE 1:400
DWG. NO. C04
PROJ. NO. CA0033920.1056



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CP #103	5029112.963	368813.748	
CP #104	5029110.951	368837.055	65.020
CP# 105	5029144.819	368801.911	65.107
CP #6006	5029086.150	368805.429	
CPW #83	5028853.673	368573.563	65.326
SPK #4	5029115.901	368853.680	
SPK #85	5028866.914	368672.574	65.202
SPK #7352	5029056.087	368811.849	71.292
SPK #8928	5029145.040	368779.868	66.016
SPK #8435	5029089.179	368788.229	68.714
PKN #8838	5029023.162	368892.308	64.954
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Ottawa

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SEAL

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100230568
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PROVINCE OF ONTARIO

NORTH

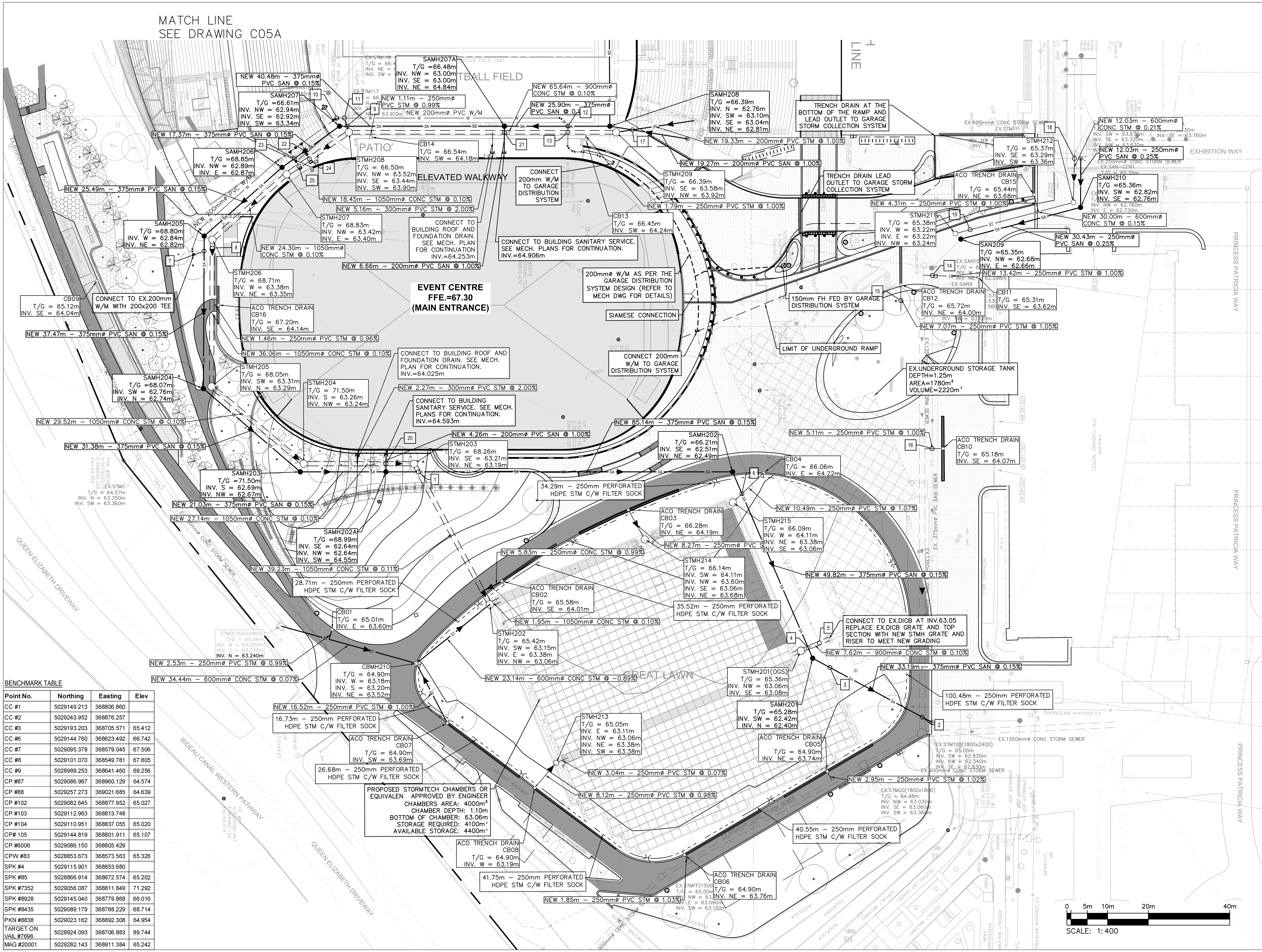
DRAWN J.T
DATE 2024/09/13
CHECKED W.Y

LANSDOWNE EC

DWG. TITLE
SERVICING PLAN

SCALE 1:400
DWG. NO. C05A
PROJ. NO. CA0033920.1056

DATE PLOTTED:



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SITE

SEAL

LICENSED PROFESSIONAL ENGINEER
D. B. YANG
100230568
2024-09-13
PROVINCE OF ONTARIO

DRAWN J.T
DATE 2024/09/13
CHECKED W.Y

LANSDOWNE EC

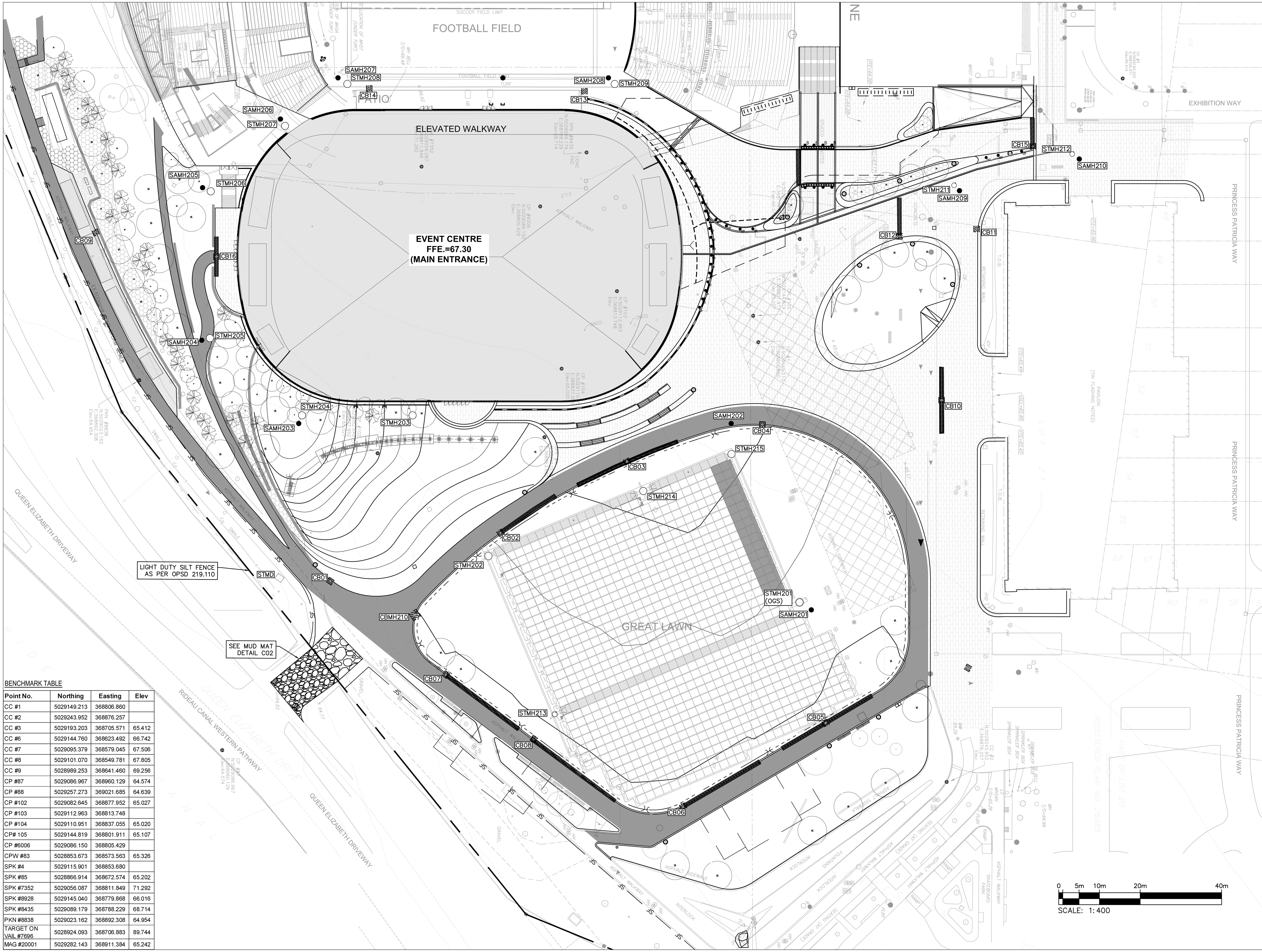
DWG. TITLE
SERVICING PLAN

SCALE 1:400
DWG. NO. C05B
PROJ. NO. CA0033920.1056

APPENDIX

D

- DWG C06 – EROSION AND SEDIMENTATION CONTROL PLAN



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CC #6	5029144.760	368623.492	66.742
CC #7	5029095.379	368579.045	67.506
CC #8	5029101.070	368549.781	67.805
CC #9	5028989.253	368641.460	69.256
CP #87	5029086.967	368960.129	64.574
CP #88	5029257.273	369021.685	64.639
CP #102	5029082.645	368877.952	65.027
CP #103	5029112.963	368813.748	
CP #104	5029110.951	368837.055	65.020
CP# 105	5029144.819	368801.911	65.107
CP #6006	5029086.150	368805.429	
CPW #83	5028853.673	368573.563	65.326
SPK #4	5029115.901	368853.680	
SPK #85	5028866.914	368672.574	65.202
SPK #7352	5029056.087	368811.849	71.292
SPK #8928	5029145.040	368779.868	66.016
SPK #8435	5029089.179	368788.229	68.714
PKN #8838	5029023.162	368892.308	64.954
TARGET ON VAIL #7696	5028924.093	368706.883	89.744
MAG #20001	5029282.143	368911.384	65.242

DATE PLOTTED:

Ottawa

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Ottawa Sports and Entertainment Group

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wsp
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CIVIL ENGINEER

NO.	DESCRIPTION	DATE
2	REVISED AS PER CITY COMMENTS	2024-09-13
1	ISSUED FOR SPA	2024-08-07

REVISIONS/ ISSUES

CONTRACTOR SHALL CHECK AND VERIFY ALL DIMENSIONS AND REPORT ANY OMISSIONS OR DISCREPANCIES TO THE ARCHITECT BEFORE PROCEEDING WITH THE WORK.
DO NOT SCALE THE DRAWINGS

SEAL

LICENSED PROFESSIONAL ENGINEER
D. B. YANG
100230568
2024-09-13
PROVINCE OF ONTARIO

DRAWN: J.T
DATE: 2024/09/13
CHECKED: W.Y

LANSDOWNE EC

DWG. TITLE: EROSION AND SEDIMENT CONTROL PLAN

SCALE: 1:400
DWG. NO.: C06
PROJ. NO.: CA0033920.1056

Servicing study guidelines for development applications

4. Development Servicing Study Checklist

The following section describes the checklist of the required content of servicing studies. It is expected that the proponent will address each one of the following items for the study to be deemed complete and ready for review by City of Ottawa Infrastructure Approvals staff.

The level of required detail in the Servicing Study will increase depending on the type of application. For example, for Official Plan amendments and re-zoning applications, the main issues will be to determine the capacity requirements for the proposed change in land use and confirm this against the existing capacity constraint, and to define the solutions, phasing of works and the financing of works to address the capacity constraint. For subdivisions and site plans, the above will be required with additional detailed information supporting the servicing within the development boundary.

4.1 General Content

- [x] Executive Summary (for larger reports only).
- [x] Date and revision number of the report.
- [x] Location map and plan showing municipal address, boundary, and layout of proposed development.
- [x] Plan showing the site and location of all existing services.
- [x] Development statistics, land use, density, adherence to zoning and official plan, and reference to applicable subwatershed and watershed plans that provide context to which individual developments must adhere.
- [x] Summary of Pre-consultation Meetings with City and other approval agencies.
- [x] Reference and confirm conformance to higher level studies and reports (Master Servicing Studies, Environmental Assessments, Community Design Plans), or in the case where it is not in conformance, the proponent must provide justification and develop a defendable design criteria.
- [x] Statement of objectives and servicing criteria.
- [x] Identification of existing and proposed infrastructure available in the immediate area.
- [x] Identification of Environmentally Significant Areas, watercourses and Municipal Drains potentially impacted by the proposed development (Reference can be made to the Natural Heritage Studies, if available).
- [x] Concept level master grading plan to confirm existing and proposed grades in the development. This is required to confirm the feasibility of proposed stormwater management and drainage, soil removal and fill constraints, and potential impacts to neighbouring properties. This is also required to confirm that the proposed grading will not impede existing major system flow paths.
- [ ] Identification of potential impacts of proposed piped services on private services (such as wells and septic fields on adjacent lands) and mitigation required to address potential impacts.
- [ ] Proposed phasing of the development, if applicable.

☒ Reference to geotechnical studies and recommendations concerning servicing.

☒ All preliminary and formal site plan submissions should have the following information:
- Metric scale
- North arrow (including construction North)
- Key plan
- Name and contact information of applicant and property owner
- Property limits including bearings and dimensions
- Existing and proposed structures and parking areas
- Easements, road widening and rights-of-way
- Adjacent street names

4.2 Development Servicing Report: Water

☒ Confirm consistency with Master Servicing Study, if available

☒ Availability of public infrastructure to service proposed development

☒ Identification of system constraints

☒ Identify boundary conditions

☒ Confirmation of adequate domestic supply and pressure

☒ Confirmation of adequate fire flow protection and confirmation that fire flow is calculated as per the Fire Underwriter's Survey. Output should show available fire flow at locations throughout the development.

☒ Provide a check of high pressures. If pressure is found to be high, an assessment is required to confirm the application of pressure reducing valves.

☐ Definition of phasing constraints. Hydraulic modeling is required to confirm servicing for all defined phases of the project including the ultimate design

☒ Address reliability requirements such as appropriate location of shut-off valves

☒ Check on the necessity of a pressure zone boundary modification.

☒ Reference to water supply analysis to show that major infrastructure is capable of delivering sufficient water for the proposed land use. This includes data that shows that the expected demands under average day, peak hour and fire flow conditions provide water within the required pressure range

☒ Description of the proposed water distribution network, including locations of proposed connections to the existing system, provisions for necessary looping, and appurtenances (valves, pressure reducing valves, valve chambers, and fire hydrants) including special metering provisions.

☒ Description of off-site required feedermains, booster pumping stations, and other water infrastructure that will be ultimately required to service proposed development, including financing, interim facilities, and timing of implementation.

☒ Confirmation that water demands are calculated based on the City of Ottawa Design Guidelines.

☐ Provision of a model schematic showing the boundary conditions locations, streets, parcels, and building locations for reference.

4.3 Development Servicing Report: Wastewater

☒ Summary of proposed design criteria (Note: Wet-weather flow criteria should not deviate from the City of Ottawa Sewer Design Guidelines. Monitored flow data from relatively new infrastructure cannot be used to justify capacity requirements for proposed infrastructure).

☒ Confirm consistency with Master Servicing Study and/or justifications for deviations.

☒ Consideration of local conditions that may contribute to extraneous flows that are higher than the recommended flows in the guidelines. This includes groundwater and soil conditions, and age and condition of sewers.

☒ Description of existing sanitary sewer available for discharge of wastewater from proposed development.

☒ Verify available capacity in downstream sanitary sewer and/or identification of upgrades necessary to service the proposed development. (Reference can be made to previously completed Master Servicing Study if applicable)

☒ Calculations related to dry-weather and wet-weather flow rates from the development in standard MOE sanitary sewer design table (Appendix 'C') format.

☒ Description of proposed sewer network including sewers, pumping stations, and forcemains.

☒ Discussion of previously identified environmental constraints and impact on servicing (environmental constraints are related to limitations imposed on the development in order to preserve the physical condition of watercourses, vegetation, soil cover, as well as protecting against water quantity and quality).

☒ Pumping stations: impacts of proposed development on existing pumping stations or requirements for new pumping station to service development.

☒ Forcemain capacity in terms of operational redundancy, surge pressure and maximum flow velocity.

☒ Identification and implementation of the emergency overflow from sanitary pumping stations in relation to the hydraulic grade line to protect against basement flooding.

☒ Special considerations such as contamination, corrosive environment etc.

4.4 Development Servicing Report: Stormwater Checklist

- ☒ Description of drainage outlets and downstream constraints including legality of outlets (i.e. municipal drain, right-of-way, watercourse, or private property)
- ☒ Analysis of available capacity in existing public infrastructure.
- ☒ A drawing showing the subject lands, its surroundings, the receiving watercourse, existing drainage patterns, and proposed drainage pattern.
- ☒ Water quantity control objective (e.g. controlling post-development peak flows to pre-development level for storm events ranging from the 2 or 5 year event (dependent on the receiving sewer design) to 100 year return period); if other objectives are being applied, a rationale must be included with reference to hydrologic analyses of the potentially affected subwatersheds, taking into account long-term cumulative effects.
- ☒ Water Quality control objective (basic, normal or enhanced level of protection based on the sensitivities of the receiving watercourse) and storage requirements.
- ☒ Description of the stormwater management concept with facility locations and descriptions with references and supporting information.
- ☐ Set-back from private sewage disposal systems.
- ☐ Watercourse and hazard lands setbacks.
- ☐ Record of pre-consultation with the Ontario Ministry of Environment and the Conservation Authority that has jurisdiction on the affected watershed.
- ☐ Confirm consistency with sub-watershed and Master Servicing Study, if applicable study exists.
- ☒ Storage requirements (complete with calculations) and conveyance capacity for minor events (1:5 year return period) and major events (1:100 year return period).
- ☐ Identification of watercourses within the proposed development and how watercourses will be protected, or, if necessary, altered by the proposed development with applicable approvals.
- ☒ Calculate pre and post development peak flow rates including a description of existing site conditions and proposed impervious areas and drainage catchments in comparison to existing conditions.
- ☐ Any proposed diversion of drainage catchment areas from one outlet to another.
- ☒ Proposed minor and major systems including locations and sizes of stormwater trunk sewers, and stormwater management facilities.
- ☐ If quantity control is not proposed, demonstration that downstream system has adequate capacity for the post-development flows up to and including the 100 year return period storm event.
- ☐ Identification of potential impacts to receiving watercourses
- ☒ Identification of municipal drains and related approval requirements.
- ☒ Descriptions of how the conveyance and storage capacity will be achieved for the development.
- ☒ 100 year flood levels and major flow routing to protect proposed development from flooding for establishing minimum building elevations (MBE) and overall grading.

- ☒ Inclusion of hydraulic analysis including hydraulic grade line elevations.
- ☒ Description of approach to erosion and sediment control during construction for the protection of receiving watercourse or drainage corridors.
- ☐ Identification of floodplains – proponent to obtain relevant floodplain information from the appropriate Conservation Authority. The proponent may be required to delineate floodplain elevations to the satisfaction of the Conservation Authority if such information is not available or if information does not match current conditions.
- ☐ Identification of fill constraints related to floodplain and geotechnical investigation.

4.5 Approval and Permit Requirements: Checklist

The Servicing Study shall provide a list of applicable permits and regulatory approvals necessary for the proposed development as well as the relevant issues affecting each approval. The approval and permitting shall include but not be limited to the following:

- ☐ Conservation Authority as the designated approval agency for modification of floodplain, potential impact on fish habitat, proposed works in or adjacent to a watercourse, cut/fill permits and Approval under Lakes and Rivers Improvement Act. The Conservation Authority is not the approval authority for the Lakes and Rivers Improvement Act. Where there are Conservation Authority regulations in place, approval under the Lakes and Rivers Improvement Act is not required, except in cases of dams as defined in the Act.
- ☐ Application for Certificate of Approval (CofA) under the Ontario Water Resources Act.
- ☐ Changes to Municipal Drains.
- ☐ Other permits (National Capital Commission, Parks Canada, Public Works and Government Services Canada, Ministry of Transportation etc.)

4.6 Conclusion Checklist

- ☒ Clearly stated conclusions and recommendations
- ☒ Comments received from review agencies including the City of Ottawa and information on how the comments were addressed. Final sign-off from the responsible reviewing agency.
- ☒ All draft and final reports shall be signed and stamped by a professional Engineer registered in Ontario