Appendices - Joint-use Campus Feasibility Study

City of Cambridge
Idea Exchange
Waterloo Region District School Board
Waterloo Catholic District School Board

February 9, 2021

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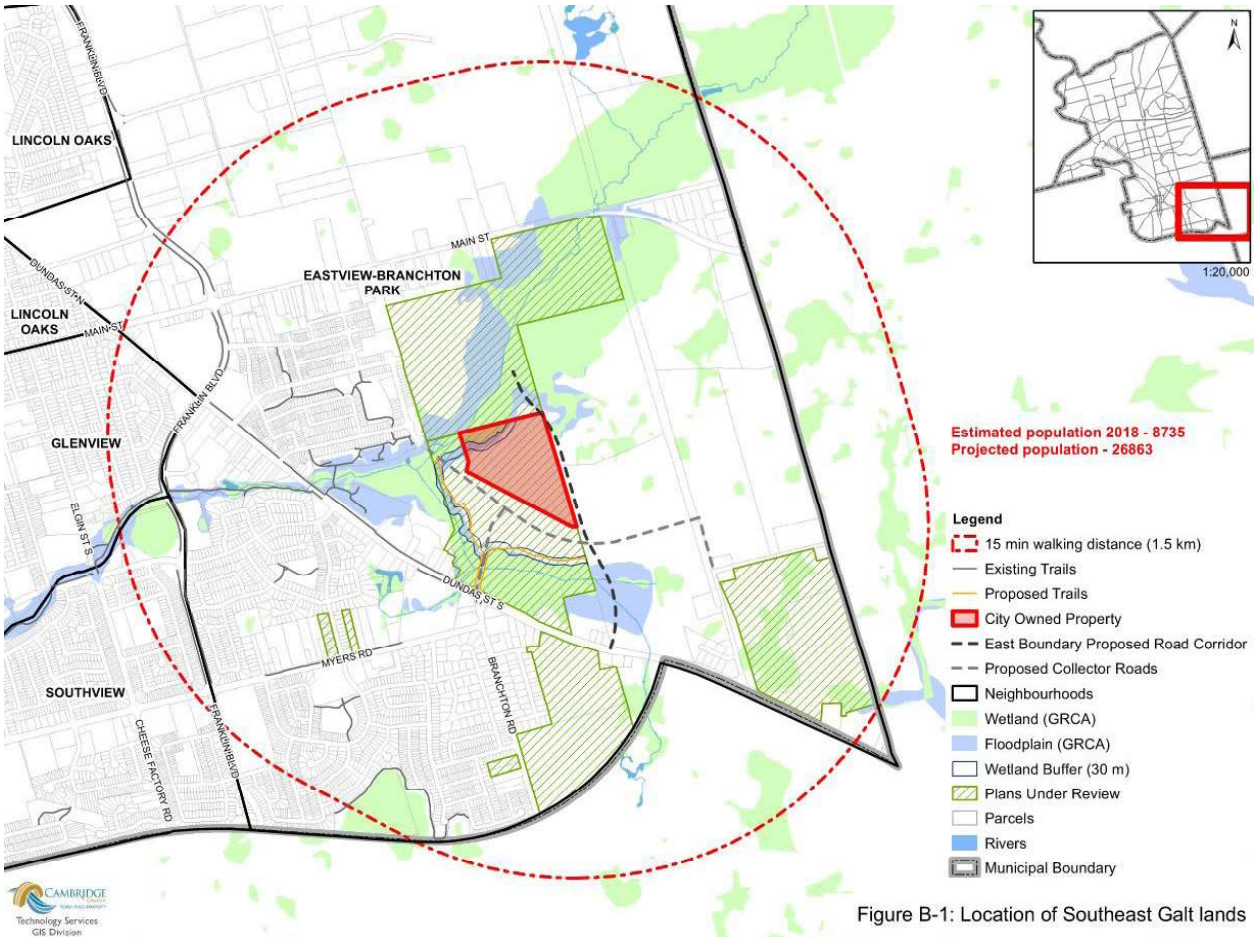
A1 Site Evaluation

SITE EVALUATION
SITE LOCATION

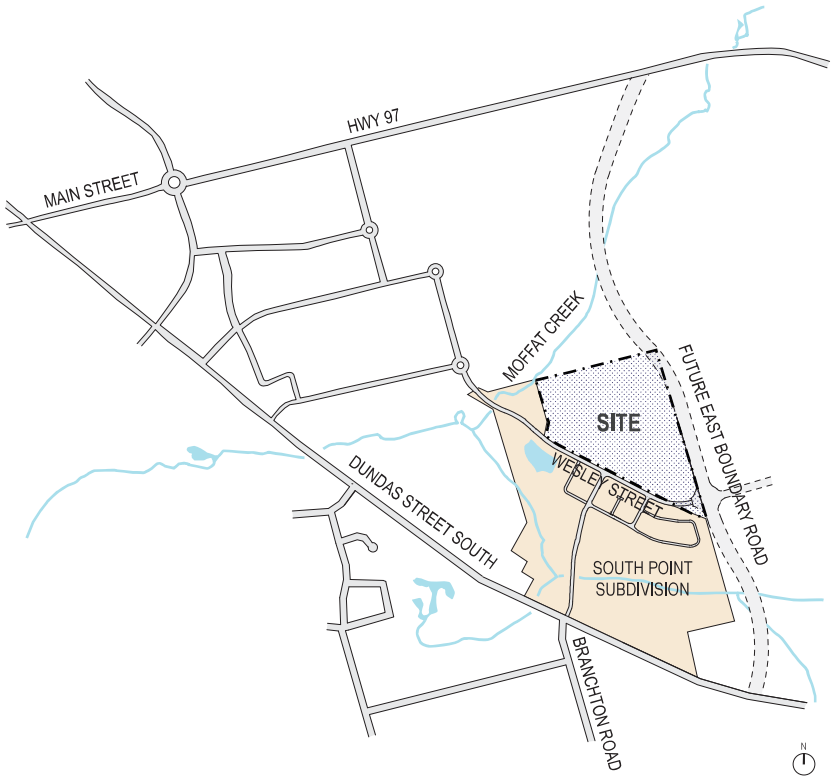
The 32.5 acres site of the future joint-use complex is located in the south-east end of Cambridge, north of Dundas Street South and Branchton Road, in a developing residential community. The areas directly to the north of the site include agricultural lands. Further north are the Shades Mill Conservation Lands and Reservoir.



Location of Southeast Galt Lands (source: City of Cambridge)

Moffat Creek, and its adjacent wetlands (protected by the Grand River Conservation Authority (GRCA)), form the western boundary of the site. A significant commercial and retail hub exists further west to serve the community at Dundas Street South and Franklin Boulevard.

The east property line runs adjacent to the future East Boundary Road, while the South Point subdivision (also referred to as the Bosdale Subdivision) is under development to the south of the site.

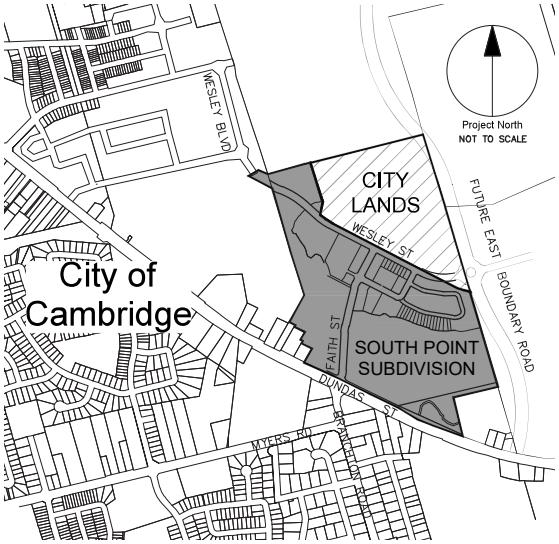


Site location plan – site and nearby South Point Development Lands (source: CS&P)

LOCAL DEVELOPMENT PLANS

The site's nearby lands have been subject to increasing development pressure from the west. The surrounding residential neighbourhoods consist of predominantly low-rise, single-family home subdivisions. Further development of similar and increased density is planned to be developed over the next 5-10 years.

Immediately south of the new joint-use campus site is the South Point subdivision, a mixed density residential subdivision. Future plans will include single family homes, as well as a greater density through the inclusion of townhomes. It is planned for over 300 new residential units.



South Point Subdivision location relative to JUC site

Marketing bird's eye view of new South Point development

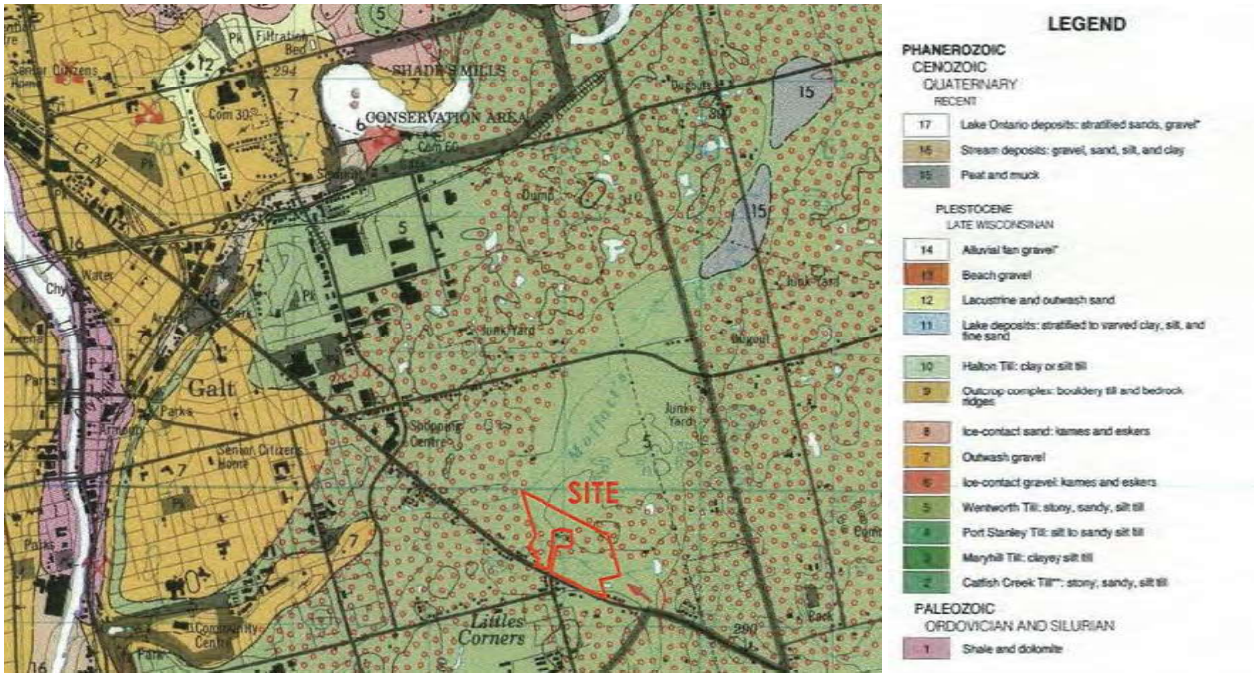
Lands south-east of the site near Vanier Drive have approved plans for single family units and townhouses (1,065 units). Lands immediately north-east of the site are owned by the developers of the South Point lands. While no plans are known at the time of writing this report, it is reasonable to anticipate further residential subdivisions in this area. Further north of the site, just beyond Hwy 97 (Main Street), the proposed Moffat Creek housing development is planned to include low-rise single-family and townhouse units (approximately 200+ units).

It is estimated that once the area is fully developed, over 26,500 residents will be within a 15-minute walking distance from the proposed complex. (report to City Council: Recreation Complex Opportunities, March 5, 2019,)

ISSUES AND OPPORTUNITIES

Soils and Site Grading

The lands north of 'Littles Corners' up to Main Street (Hwy 97) and beyond consist of 'Wentworth till': fairly stony, sandy silt till with 'Hummocky' (hilly) topography. Further details about the present soil conditions can be found in the Geotechnical Investigations prepared by Naylor Engineering Associates (2005). It is recommended these reports be updated by the City prior to construction.



Quaternary Geology Map, Dec 2007 (source: Ministry of Northern Development and Mines Map 2508, accessed in – Bosdale Goetechnical Reports)

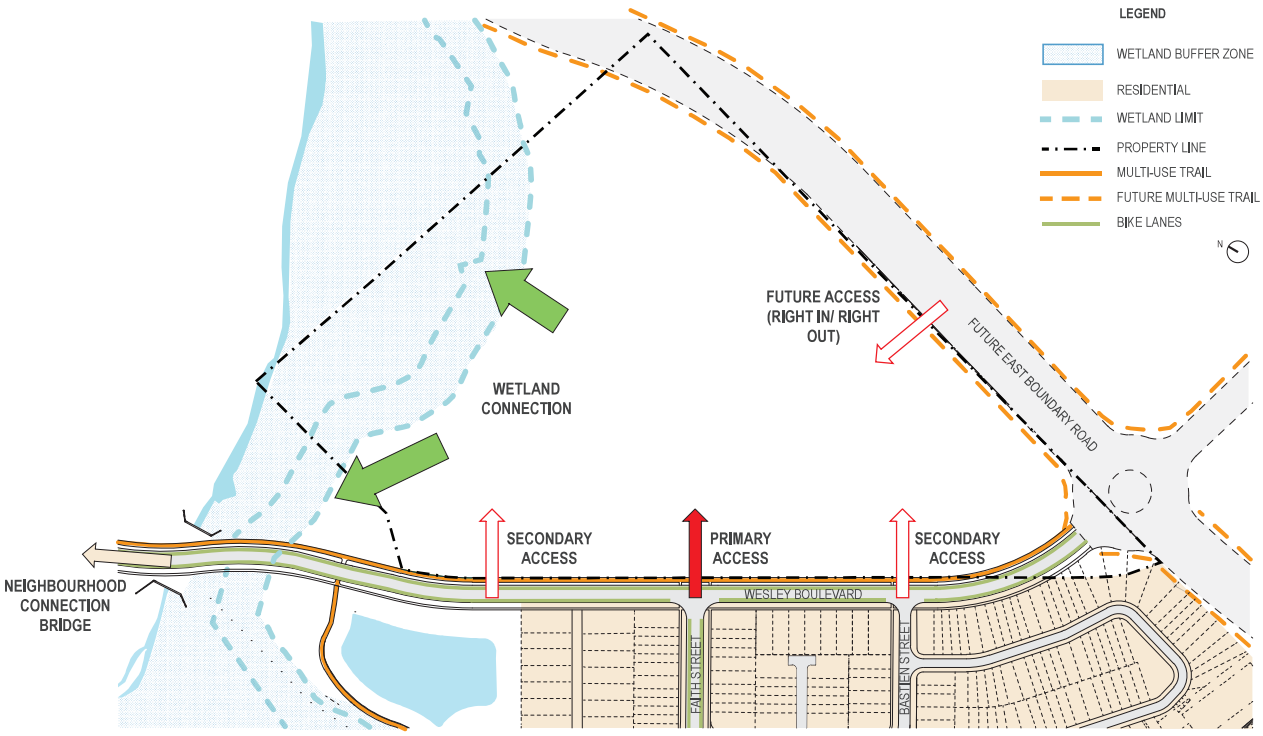
The joint-use campus site – consisting of former agricultural lands – had largely retained those characteristics until recent regrading efforts. The site drains north-west in the direction of Moffat Creek, from 298.5m (AMSL) at the south-east corner to a low point of 284.50m at the site's western edge – though the planned elevation at the limit of development will be closer to 289.0m according to the site grading plan.

At the time of this report, grading had begun of both the Joint-use site and South Point lands to the south, to conform with requirements for the overall subdivision stormwater management strategy. The ultimate intent is for the hills to be smoothed out, and for the site to retain a more gradual slope north and west towards the creek and wetlands (as well as the Storm Water Management (SWM) basin south of the site), with an area of maximum 3:1 slope to meet current grades along the western edge of the wetland buffer and development boundary.

Stockpiling of surplus topsoil for both the City site and subdivision is anticipated along a substantial portion of the eastern edge of the site. Significant grade differential along this eastern edge will require any development (including paving) to be setback from the eastern property line. It is recommended that surveying of the property be undertaken upon completion of the developer's grading to assess full scope of grading challenges and requirements.

ACCESS

Primary access to all facilities of the site will be from Wesley Boulevard. It is recommended that primary access align, where possible, with new Faith Street to the south and that any secondary eastern access point align with Bastien Street to the east. The current plan of subdivision does not contemplate that the western private road west of Faith Street connect to Wesley Boulevard at this time. This approach to site access appears to be supported by the City.



Connection to Wetland (source CS&P)

Connection to wetland

Usable site area is reduced from 32.5 acres to approximately 26.3 acres by wetland setbacks and alignment of the future East Boundary Road. Further details about wetlands can be found in the GRCA subsection below.

EAST BOUNDARY ROAD

The proposed East Boundary Road is a Regional road, planned as an urban road divided by a raised concrete median. Construction of Phase 1 from Franklin Boulevard to the Wesley Boulevard roundabout is scheduled for 2026/2027. Depending on City progress and coordination of Wesley Boulevard construction, East Boundary Road may be completed for service, or the construction may be limited to pre-grade, construct ditching and outlet. The section running north of Wesley is a future phase and is not currently programmed within the next 10 years for construction. Timing is contingent on Regional Council approvals, and could be subject to change.

To improve access to the proposed joint-use campus and relieve anticipated traffic volume on Wesley Boulevard, it is suggested that Right-In-Right-Out access to the site be further explored with the Region. As the timing for the portion of East Boundary Road bounding the site is uncertain, the concept plans must function without this access. Plans for a potential future driveway will improve site access and internal site circulation. The Region may extend the East Boundary Road to provide access to the joint-use site in Phase 1.

ZONING

Currently, the majority of the site is zoned H(R4) – low density residential. Re-zoning of lands to institutional (N1 for schools, childcare and library) and recreational (OS2 and/or C1) land use may be required to support the development of the facility.

The south-western portion of the site, bounded by Moffat Creek is zoned OS1 – Open Space – which does not support the introduction of buildings or structures with very limited exceptions. See section 3.5.1.1 of the City of Cambridge Zoning By-Law No. 150-85 for further details of exceptions.

Current Zoning map of the site and surrounding areas (source: CS&P, generated from City of Cambridge Zoning By-Law No 150-85)

GRAND RIVER CONSERVATION AUTHORITY (GRCA)

Moffat Creek, which runs along the western boundary of the site, is located in the Moffat Creek Subwatershed of the larger Grand River Watershed.

Due to its proximity to Moffat Creek, and regardless of distance from regional flood boundaries, development on any part of the site will be subject to full GRCA review as part of the Authority having jurisdiction (AHJ) approvals process - at time of Site Plan Approval (SPA) and Building Permit submissions (and likely during re-zoning). A development permit from GRCA will be required to build on this site.

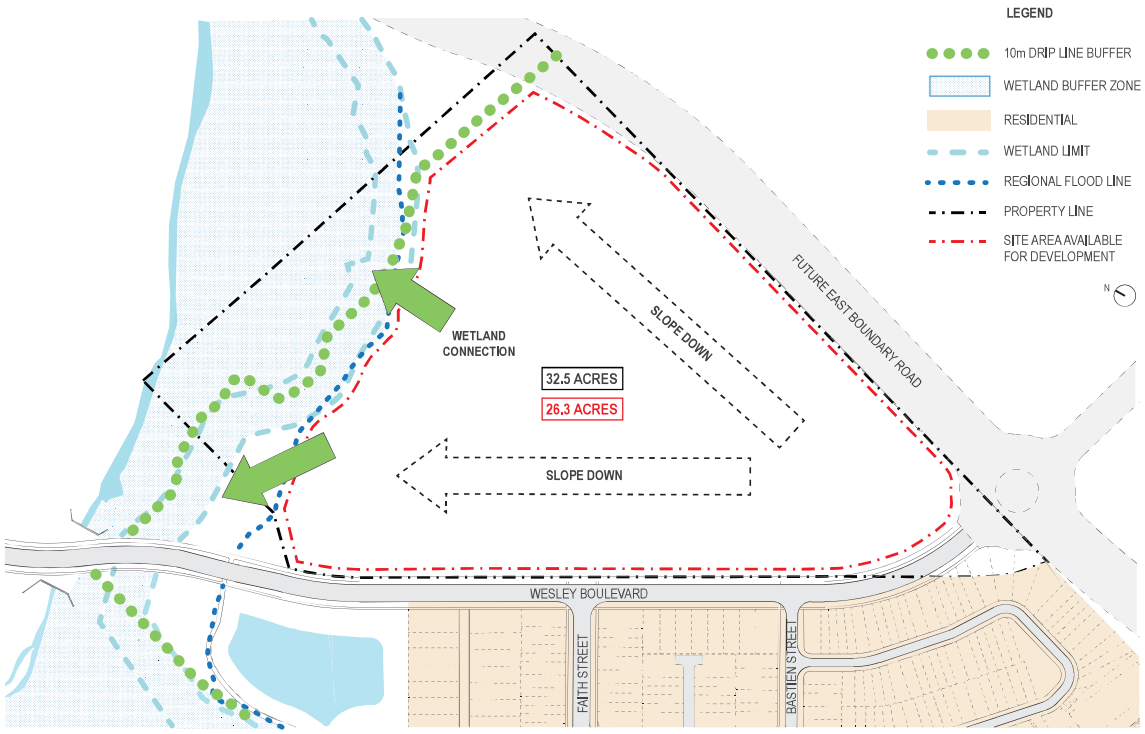
Water bodies, wetlands and development buffers (source: CS&P, generated from Bosdale Subdivision Draft Plan of Subdivision 2019 and GRCA Grand River Watershed Maps)

GRCA confirmed the site has been severed as 'city lands' in the plan of subdivision, though as stated above, the zoning appears to remain unchanged from the current low-density residential H(R4) designation at the time of writing this report.

A 30m wide wetland buffer runs through the north-west edge of the site and the Waterloo Regional flood line boundary runs along a similar line nearby. In addition, a 10m vegetation drip line buffer runs nearby, reducing the area available for development from the 32.5-acre site to approximately 26.3 acres.

Any development proposed that infringes GRCA wetland or flood boundaries would be subject to significant additional approvals, environmental studies and development permits. This would result in a longer development schedule for the project. Development of any kind – other than a possible recreational pedestrian trail - is therefore not recommended beyond the wetland buffer limits, the regional flood line or the drip line buffer (to the west and north).

GRCA does not anticipate any other restrictions/setbacks imposed that would further impede onto the site or reduce the build-to line other than noted above and in the diagram below (site area available for development).



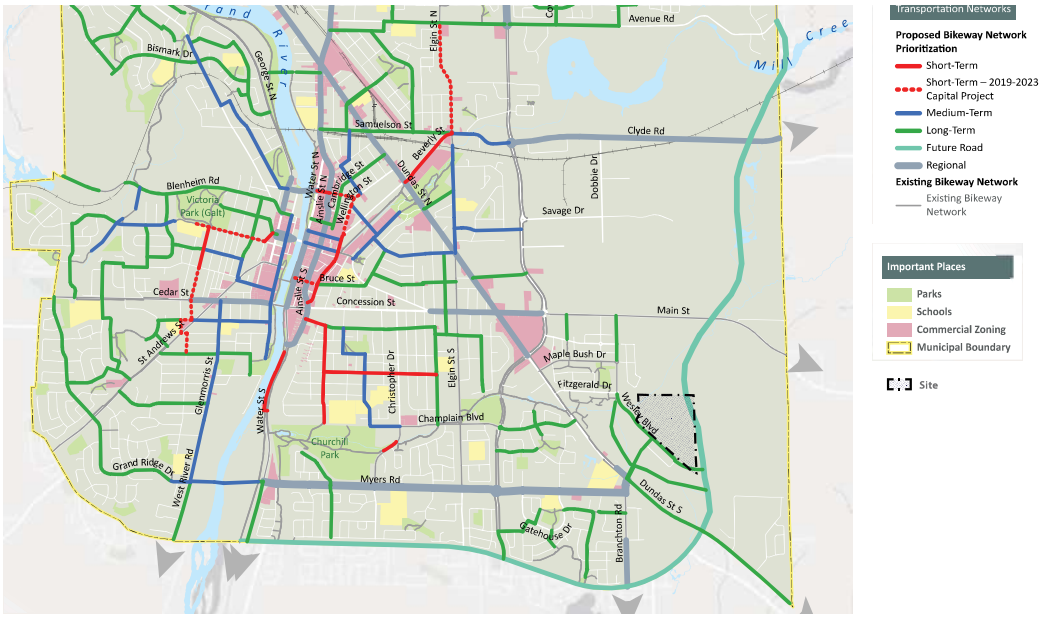
Site conditions relative to Moffat Creek and anticipated South Point subdivision SWM pond (source: CS&P)

STORMWATER MANAGEMENT

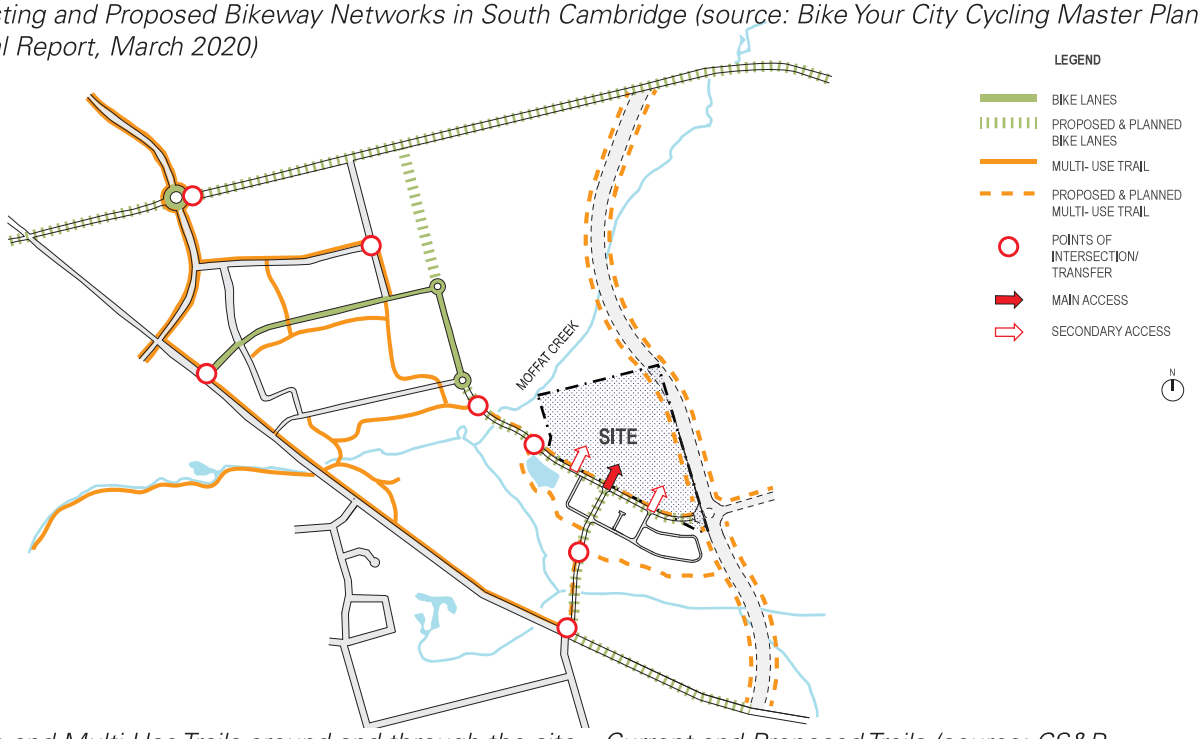
It is understood that stormwater management (SWM) for the site will be handled as part of the larger South Point subdivision SWM plan. As per site servicing plans the SWM facility is located within South Point subdivision (outside City Lands). Grading for the site to support that plan is underway at time of writing this report. Refer to Appendix A4 for Municipal Site Engineering Review for further known details and recommendations concerning SWM.

ACTIVE TRANSPORTATION - TRAILS AND CONNECTIONS

The City of Cambridge encourages active transportation. The Waterloo Region has a rich network of bike and multi-use trails connecting its various townships. 'Bike your city: Cambridge Cycling Master Plan', finalized in March 2020, and endorsed by Council on October 20, 2020, identifies the development of bike lanes on the north and south sides of Wesley Boulevard as a long-term goal. Bike lanes are also planned for future development on either side of East Boundary Road. The joint-use campus will be well supported by this network of bike and multi-use trails.



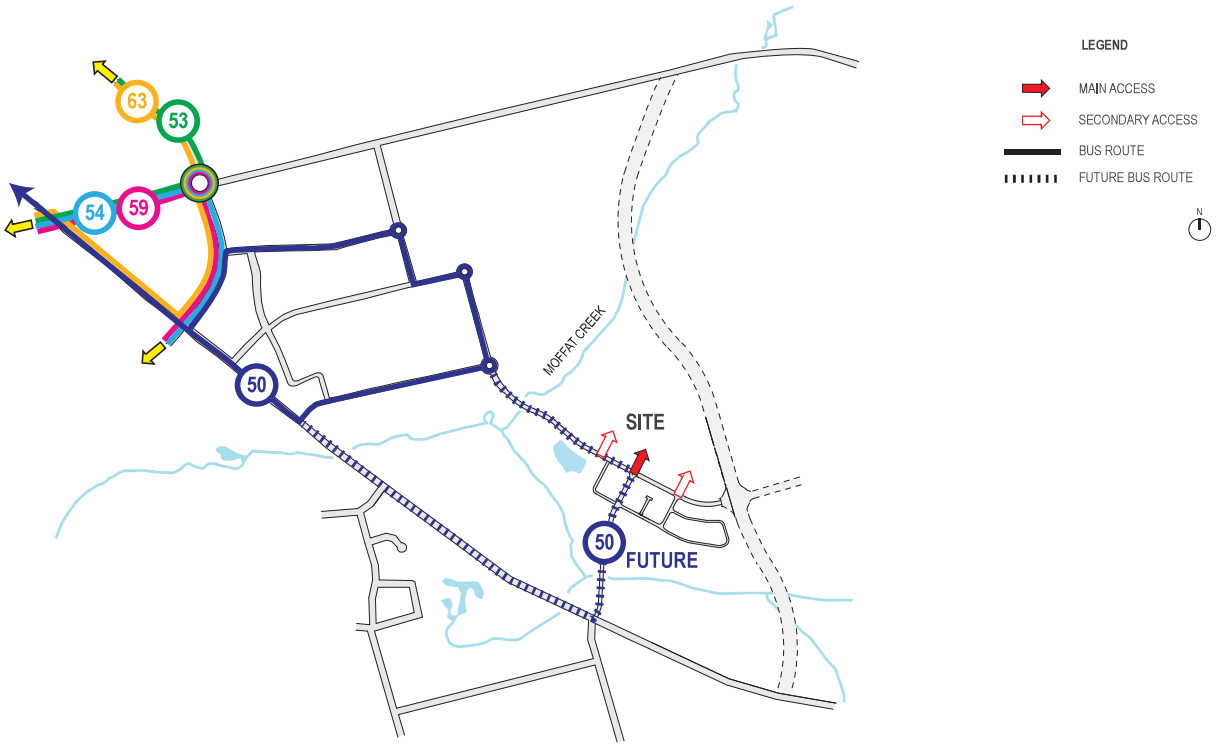
Existing and Proposed Bikeway Networks in South Cambridge (source: Bike Your City Cycling Master Plan Final Report, March 2020)



Bike and Multi-Use Trails around and through the site – Current and Proposed Trails (source: CS&P, generated from research retrieved from City of Cambridge – Engineering and Transportation Services Community Development)

GRAND RIVER TRANSIT

The current plan under development is for Route 50 to extend across Wesley Boulevard, with on street stops at the joint-use campus, turn south on Faith Street to Dundas and Branchton. This plan is in early stages and requires coordination, consultations and approvals prior to implementation. Planning should include a concrete pad for future bus shelters at stops on the north and south side of Wesley. Consideration may be given for a bus stop on the Joint-use site; however, this is not currently in the transit plan.



Transit (Bus) route map – Current and Future extension of route 50 to serve the site and neighbouring subdivision (source: CS&P, generated from maps and in discussion with Region of Waterloo - Grand River Transit, Transit Development)

A2 Sustainability Strategies

SUSTAINABILITY STRATEGIES

REGIONAL DIRECTION

An overarching regional climate mitigation direction and Climate Action Plan for the Waterloo Region has been created, and looks to coordinate the activities of the member communities and monitor their progress on green house gas (GHG) emission targets. The long-term goal is to achieve an 80% greenhouse gas emission reduction below 2010 levels by 2050, using a ladder of goals over time to achieve this target. The 2020 target was a 6% GHG reduction over the base condition at inception. The 10-year target starting in year 2021 has not yet been determined. During the next phase of detailed development, regional targets should be clarified and used as design benchmarks for the project.

GENERAL SUSTAINABLE PRINCIPLES

Building construction and operations can have extensive direct and indirect impacts on the environment, on society, and the economy. Sustainable design principles seek to balance the needs of these areas by using an integrated approach to create design solutions. The main objectives of sustainable design are to reduce, or avoid, depletion of critical resources like energy, water, land, and raw materials; prevent environmental degradation caused by facilities and infrastructure throughout their life cycle. The goal is to create built environments that are accessible, secure, healthy and productive, while minimizing negative impacts upon society, the environment, and the economy.

A number of rating systems and guiding criteria have been developed that can help to guide facility and site design decisions, and optimize a sustainability response. Each rating systems is unique in how they approach and prioritize various sustainability measures. Selected best practice systems and opportunities for the proposed community hub development are outlined below.

LEED

LEED (Leadership in Energy and Environmental Design) is an internationally recognized green building certification system, providing third-party verification that a facility was designed and built using strategies aimed at improving performance. Metrics include energy savings, water efficiency, CO2 emissions reduction, improved indoor environmental quality, and stewardship of resources and sensitivity to their impacts. LEED provides a point system to score green building design and construction. The system is categorized in five basic areas: Sustainable Sites, Water Efficiency, Energy and Atmosphere, Materials and Resources, and Indoor Environmental Quality. Buildings are awarded points based on the extent various sustainable strategies are achieved. The more points awarded the higher the level of certification achieved from Certified, Silver, Gold, to Platinum.

To support the creation of healthy and sustainable communities, the City of Cambridge has mandated all new municipal buildings be LEED Gold Standards. However, Ministry of Education funding benchmarks would limit pursuing LEED certification for the partner public schools, so they may not be included in the LEED certification. The schools have indicated they would be open to implement any recommended sustainable measure and meet the LEED standard as long as they remain within capital funding parameters.

In order to obtain certification, the Recreation Complex would, as part of the LEED process, require its own independent HVAC system, within a LEED defined envelope. As the schools may not be part of the LEED envelope or boundary, they should be separate from an energy standpoint. This means that operational sharing opportunities for a consolidated facility are therefore constrained, and suggest a more defined and independent footprint for the school and city owners would assist in the LEED effort. The consolidated option where all users are in one building is still possible, although perhaps more complex as a defined boundary needs to be created both within the building and on the site.

PASSIVE HOUSE

Passive House (PH) is a rigorous energy-based standard in the design and construction industry, originally developed in Germany for the residential market. It has since expanded across the world and is being applied in many sectors of the industry. The intent of Passive House is to focus on energy and emissions reduction above all other measures, as being most fundamental to climate change remediation. Five principles are central to PH design and construction: super insulated envelopes, airtight construction, high-performance glazing, thermal bridge free detailing, and heat recovery ventilation. For certification, the international PH standard requires very high levels of energy reduction with defined criteria: space heat demand max. 15 kWh/m2a, pressurization test result at 50 Pa max. 0.6 ACH, and Total Primary Energy Demand max. 120 kWh/m2a.

As Passive House is an envelope-based standard, it would not be feasible to apply in a consolidated footprint with partners who were not also seeking certification, as school Ministry funding benchmarks would preclude pursuing PH certification for each or any of the partner public schools. As the Recreation Complex has an energy intensive swimming pool, it is suggested that full certification is not practically achievable in any event. As the level of PH energy reduction targets are very challenging for institutional owners to achieve, many municipal projects are implementing PH principles of energy efficient construction to inform and improve their design, but are not targeting official certification, which could be a suitable approach for this joint use project.

NET ZERO ENERGY BUILDING

A Net Zero Energy Building (NZEB) is defined as a building that produces as much renewable energy as it consumes on an annual basis, while maintaining an acceptable level of service and functionality. In order to meet this requirement, a high performance envelope is first necessary to minimize energy requirements. Once energy uses are reduced to a minimum, then a renewable energy system can be provided as needed to meet the reduced energy load. On site renewable energy sources may include solar water heating, photovoltaics (PV), ground source geothermal and/or air source heat pumps.

A Net Zero Energy Building is possible to achieve on recreation and school buildings. For example, Net Zero is now a required target on many new City of Toronto municipal buildings. The additional capital cost of a NZEB can include triple glazing, increased insulation, envelope testing, as well as PV and geothermal renewable energy sources. The focus on a high performance envelope and other measures with a high impact benefit may offset initial costs and provide a payback over time. Funding strategies can involve roughing in some components and adding at a later date. For example, the facility could be designed with infrastructure to support a solar ready design, with PV panels provided when and if funding becomes available.

There may be financial incentives to offset the increased cost of achieving a net zero energy building, including the Save on Energy High Performance New Construction Initiative, Federation of Canadian Municipalities Innovation Program, and other programs that may become available.

GEOTHERMAL

For renewable energy systems such as geothermal, it is recommended that an exploratory feasibility study be prepared in the early detailed design phase. A business case can be prepared that demonstrates energy savings and payback over a defined period, and identifies incremental design and installation costs of the geothermal renewable energy system over a conventional system.

Design parameters, Building Automation Systems (BAS) capabilities, proposed Heating, Ventilation and Air Conditioning (HVAC) systems and bore field location studies can verify that a ground source geothermal heat pump system is appropriate for the site. The consulting team can work with a local driller and review the Ontario Geological Survey data to estimate the ground thermal conductivity. A test borehole is usually not required at the early feasibility stage, however, a thermal conductivity test is mandatory during later detailed design if the decision has been made to move forward with the system. As part of the study, an evaluation of the energy modeling, cost, and GHG savings should be prepared, to compare against a conventional system.

Due to the large size of the Joint Use Campus site, preliminary evaluations are that geothermal can be an efficient and effective renewable energy source, for both a consolidated facility option or a separated facility option.

CONCLUSION

The sustainability response will be evaluated against the balancing of complex parameters including environmental responsibility, energy efficiency, and creating a healthy environment that contributes to user well being. Evaluating associated construction cost premiums, as well as the ability to optimize cost of ownership over the life cycle, will be a fundamental metric. As energy use has the greatest impact on operating costs, the assistance of rating system criteria that can help reduce energy use and associated GHG emissions may be prioritized.

A practical approach which prioritizes Passive House high performance envelope principles and air quality, together with targeted renewables such as geothermal and PV, may have the greatest impact in both reducing energy, significantly lowering GHG emissions, and promoting a healthy and energy efficient facility. This approach would be suitable for both consolidated and separated design options.

In the next stage of detailed design, it is recommended that energy modeling and an associated financial analysis that can demonstrate a reasonable business case be prepared. This business case can include premium capital costs associated with the energy saving measures, as well as payback and savings over time. Financial incentive programs can be explored to help offset some of the premium costs. A detailed geothermal feasibility study, together with site testing, should be included in this scope. This work should optimally be done as a formalized Sustainability Study in the Schematic Design period of the next phase of design, and would model a number of design options (say 3) against a base case.

A3

Space Program for Consolidated and Separate Buildings

	Original Program			Ground Floor Location	Proposed Program			Potential Sharing/Notes
	No	Room Size SF	Floor Area SF		No	Room Size SF	Floor Area SF	
WRDSB								
INSTRUCTIONAL AREA								
Kindergarten	5	1,100	5,500	Y	5	1,100	5,500	Between Boards, based on utilization Community use after hours
Classroom	14	760	10,640		14	760	10,640	Between Boards, based on utilization Community use after hours
Art Room	1	1,030	1,030		0	1,030	0	Between Boards, based on utilization, delete WRDSB Art Room (area reduction of 1,030 sf) and share WCDSB Art Room and Idea Exchange Multi-purpose Room/Makerspace WRDSB to fund 100 sf to increase size of Makerspace Pupil Loaded for 23 students
Science Room	1	1,230	1,230		1	1,230	1,230	Between Boards, based on utilization, use WRDSB Science/Tech Room shared between both Boards Community use after hours Pupil loaded for 23 students
Special Education Area	1	1,395	1,395	Y	1	1,395	1,395	Exclusive use Ground floor location, near entry and bus drop
Resource Area - Loaded (400-699 sf)	1	615	615		1	615	615	Exclusive use during school day
Resource Area - Unloaded (<400 sf)	3	210	630		3	210	630	Potential for sharing between Boards
Gymnasium Area and Stage	2	3,060	6,120	Y	1	6,500	6,500	Exclusive use during school day Community use after hours, increase to FIBA size to replace Recreation Complex gym Recreation Complex to fund additional required 380 sf for FIBA sized gym + 600 sf for stage area portion of gym
Shared Stage				Y	1	600	600	600 sf Gymnasium and Stage area dedicated to a shared 1,200 sf Stage with WCDSB
Change Rooms	2	230	460	Y	2	230	460	Exclusive use during school day Community use after hours
Library	1	2,630	2,630		1	1,880	1,880	Exclusive use during school day, area reduced by 750 sf as Idea Exchange Learning Commons is available for sharing Community use after hours
General Purpose	3	540	1,620		3	540	1,620	Exclusive use during school day Community use after hours
Net Instructional Area			***31,870***				***31,070***	
OPERATIONAL AREA								
General Office			1,375	Y			1,100	"Safe Welcome" design, shared General Office with WCDSB, efficiency reduces area by 275 sf
Staff Room and Teacher Work Rooms			1,145				1,145	
Kitchen			260				260	
Custodial Areas			450				450	
Academic Storage			435				435	
Washrooms			1,660				1,660	
Gymnasium Storage			575	Y			575	
Chair Storage (in Gymnasium)			460	Y			460	
Mechanical Spaces			690				2,130	Shared central plant @ 4% of GFA for each partner, area increased by 1,440 sf to right-size mechanical space
Net Operational Area			***7,050***				***8,215***	
Sub-total (Net Area)			***38,920***				***39,285***	
Gross-up (36.8%)			14,320				14,460	
Total WRDSB (GFA to be constructed)			**53,240**				**53,745**	
WRDSB Potential Area Change							**505**	
Changes to Areas funded by WRDSB								
Delete Gymnasium Stage Area							-980	Funded by Recreation Complex
Add for increase to Makerspace							100	WRDSB portion of area to increase size of Idea Exchange Makerspace to 750 sf
Sub-total (Net Area)			***38,920***				***38,405***	
Gross-up (36.8%)			14,320				14,130	
Total GFA to be funded by WRDSB			**53,240**				**52,535**	
WRDSB Area Change for Funding							**-705**	

CHILD CARE					
Total Child Care (GFA)	**8,500**		**8,500**	no changes to Child Care	

	Original Program			Ground Floor Location	Proposed Program			Potential Sharing/Notes
	No	Room Size SF	Floor Area SF		No	Room Size SF	Floor Area SF	
WCDSB								
INSTRUCTIONAL AREA								
Kindergarten	3	1,200	3,600	Y	3	1,200	3,600	Between Boards, based on utilization Community use after hours
Classroom	11	750	8,250		11	750	8,250	Between Boards, based on utilization Community use after hours
Art Room	1	1,050	1,050		1	1,050	1,050	Between Boards, based on utilization, use WCDSB Art Room shared between both Boards Community use after hours Pupil Loaded for 23 students
Science Room	1	1,050	1,050		0	1,050	0	Between Boards, based on utilization, delete WCDSB Science (area reduction 1,050 sf) and share WCDSB Science/Tech Room and Idea Exchange Multi-purpose Room/Makerspace WCDSB to contribute 70 sf to increase size of Makerspace
Special Education Area								
Resource Area - Loaded (400-699 sf)								
Resource Area - Unloaded (<400 sf)								
Gymnasium Area and Stage	1	4,000	4,000	Y	1	4,000	4,000	Exclusive use during school day Community use after hours Recreation Complex to fund additional 500 sf of gymnasium area for sharing
Shared Stage					1	600	600	600 sf Instructional Area Flexibility dedicated to a shared 1,200 sf Stage with WRDSB
Change Rooms	2	400	800	Y	2	400	800	Exclusive use of some space during school day Community use after hours
Library	1	2,400	2,400		1	1,820	1,820	Exclusive use during school day, area reduced by 580 sf as Idea Exchange Learning Commons is available for sharing Community use after hours
General Purpose								
Instructional Area Flexibility			2,740				2,140	WCDSB to define uses - which will include chapel and break-out spaces, 600 sf allocated to shared Stage
Net Instructional Area			***23,890***				***22,260***	
OPERATIONAL AREA								
General Office			1,200	Y			1,000	Shared General Office with WRDSB, efficiency reduces area by 200 sf
Staff Room and Teacher Work Rooms			780				780	
Kitchen			210				210	
Custodial Areas			600				600	
Meeting Room	1		230		1		230	
Academic Storage			355				355	
Washrooms			1,135				1,135	
Gymnasium Storage			330	Y			330	
Chair Storage (in Gymnasium)			130	Y			130	
Mechanical Spaces			2,045				1,705	Shared central plant @ 4% of GFA for each partner, area reduced by 340 sf to right-size mechanical space
Net Operational Area			***7,015***				***6,475***	
Sub-total (Net Area)			***30,905***				***28,735***	
Gross-up (38%)			11,740				10,920	
Total WCDSB (GFA to be constructed)			**42,645**				**39,655**	
WCDSB Potential Area Change							**-2,990**	
Changes to Areas funded by WCDSB								
Delete Gymnasium Area							-500	Funded by Recreation Complex
Add for increase to Makerspace							70	WRDSB portion of area to increase size of Idea Exchange Makerspace to 750 sf
Sub-total (Net Area)			***30,905***				***28,305***	
Gross-up (38%)			11,740				10,760	
Total GFA to be funded by WCDSB			**42,645**				**39,065**	
WCDSB Area Change for Funding							**-3,580**	

	Original Program			Ground Floor Location	Proposed Program			Potential Sharing/Notes
	No	Room Size SF	Floor Area SF		No	Room Size SF	Floor Area SF	
RECREATION COMPLEX								
AQUATICS								
Natatorium	1	20,000	20,000	Y	1	20,000	20,000	Occasional scheduled use by Boards 2 tanks - 10 lane 25 m, warm water/therapy, leisure/learning, on deck viewing
Change Rooms	3	1,830	5,490	Y	3	1,830	5,490	Wet - family, male, female
Pool Viewing	1	11,950	11,950		1	11,950	11,950	Contributes area to "main street" central circulation spine
Pool Office	1	250	250	Y	1	250	250	
Pool Storage	1	750	750	Y	1	750	750	
Administrative	1	1,800	1,800	Y	1	1,800	1,800	Staff change - M, F, GN (all staff)
(Pool) Mechanical			7,500		1	3,000	3,000	Pool mech only (remaining mechanical listed in OTHER)
Custodial			0				0	
Net Aquatics Area			***47,740***				***43,240***	
RECREATIONAL								
Gymnasium	3	6,665	20,000		2	7,600	15,200	Time of day exclusive use for 2 FIBA gyms 2 FIBA gyms w/bleachers for 160-200 in each Reduce by one Gym, share WRDSB gym and fund 980 sf of WRDSB increased gym/stage area and 500 sf WCDSB gym area
Walking/Running Track	1	12,000	12,000		1	12,000	12,000	Time of day exclusive use
Multi-use/Meeting	1	2,990	2,990		1	2,990	2,990	All parties Divisible, kitchenette, storage
Multi-use/Meeting	1	2,150	2,150		1	2,150	2,150	All parties Divisible, kitchenette, storage
Multi-use/Meeting	1	970	970		1	970	970	All parties
Sports Hall of Fame	1	0	0	Y	1	0	0	Part of gross-up
Fitness Studio	1	2,000	2,000		1	2,000	2,000	Not equipment based, storage required
Change Rooms	2	800	1,600		2	800	1,600	
Gym Storage	1	1,000	1,000		1	1,000	1,000	
Administrative			0		1	1,000	1,000	lunch room, WR
Public Lobby/Viewing			0	Y			0	
Net Recreational Area			***42,710***				***38,910***	
OTHER								
Lobby/Reception				Y			0	3,000 sf minimum, large, welcoming "grand/statement" entrance (includes area from Pool Viewing)
Bike/Skateboard/Scooter Storage				Y			0	Included in gross-up area
Servery/Canteen							0	Included in gross-up area
Waste/Recycling				Y			0	Included in gross-up area
Loading/Receiving				Y			0	Included in gross-up area
Washrooms							0	Included in gross-up area
Mechanical							4,160	Shared City operated central plant @ 4% of GFA for each partner, area reduced by 340 sf to right-size mechanical space and reallocated out of area originally shown for Pool Mech
Net Other Area			***0***				***4,160***	
Sub-total (Net Area)			***90,450***				***86,310***	
Gross-up (15%)			13,570				12,950	
Total Rec Complex (GFA to be constructed)			**104,020**				**99,260**	
Rec Complex Potential Area Change							**-4,760**	
Changes to Areas funded by Rec Complex								
Add Gymnasium Area							1,480	Contribution to School gyms for sharing
Sub-total (Net Area)			***90,450***				***87,790***	
Gross-up (15%)			13,570				13,170	
Total GFA to be funded by Rec Complex			**104,020**				**100,960**	Total GFA not to exceed 104,020 sf
Rec Complex Area Change for Funding							**-3,060**	

(Recreation Complex Original Space Program as approved by Council June 18, 2019)

	Original Program			Ground Floor Location	Proposed Program			Potential Sharing/Notes
	No	Room Size SF	Floor Area SF		No	Room Size SF	Floor Area SF	
IDEA EXCHANGE								
PUBLIC USE SPACE								
Study Area	1	500	500		1	500	500	
Reading Area with Laptop Bar	1	500	500		1	500	500	
Lounge Seating & Learning Commons	1	1,800	1,800		1	1,800	1,800	Shared with both Boards
Adult & Young Adult Book Stacks	1	1,600	1,600		1	1,600	1,600	
Children's - Program Room	1	750	750		1	750	750	
Children's - Play Area	1	640	640		1	640	640	
Children's - Book Stacks	1	1,350	1,350		1	1,350	1,350	
Small Study/Meeting Rooms	2	130	260		2	130	260	
Medium Study/Meeting Rooms	1	260	260		1	260	260	
Multi-purpose Room	1	750	750		1	750	750	Exclusive us by both Boards during school hours Community use after hours Pupil Loaded for 23 students
Makerspace	1	580	580		1	750	750	Exclusive us by both Boards during school hours Area increased to 750 sf to and funded by School Boards to accommodate school programming Community use after hours Pupil Loaded for 23 students
Internet Station Area	1	200	200		1	200	200	
Public Service Desk	1	400	400		1	400	400	
Public Entrance & Security Gates	1	270	270	Y	1	270	270	
Public Universal Washroom	1	110	110	Y	1	110	110	
Net Public Use Area			***9,970***				***10,140***	
OPERATIONAL SPACE								
IT Server Room			100				100	
Administrative			1,000				1,000	
Staff/Kitchenette/WR			100				100	
Custodial			0				0	Included in gross up
Storage			0				0	Included in gross up
Mechanical			560				560	Central shared, metered mechanical preferred
Waste/Recycling			0	Y			0	Included in gross up
Loading/Receiving			0	Y			0	Included in gross up
Net Operational Area			***1,760***				***1,760***	
Sub-total (Net Area)			***11,730***				***11,900***	
Gross-up (16%)			1,870				1,890	
Total Idea Exchange (GFA to be constructed)			**13,600**				**13,790**	
Idea Exchange Potential Area Change							**190**	
Changes to Areas funded by Idea Exchange								
Delete area to increase Makerspace							-170	100 sf from WRDSB, 70 sf from WCDSB to increase area of Makerspace
Sub-total (Net Area)			***11,730***				***11,730***	
Gross-up (16%)			1,870				1,870	
Total GFA to be funded by Idea Exchange			**13,600**				**13,600**	Total GFA not to exceed 13,600 sf
Idea Exchange Area Change for Funding							**0**	

TOTAL JUC GFA			**222,005**				**214,660**	
Total JUC Potential Area Change							**-7,345**	

	Original Program			Ground Floor Location	Proposed Program			Potential Sharing/Notes
	No	Room Size SF	Floor Area SF		No	Room Size SF	Floor Area SF	
WRDSB								
INSTRUCTIONAL AREA								
Kindergarten	5	1,100	5,500	Y	5	1,100	5,500	Between Boards, based on utilization Community use after hours
Classroom	14	760	10,640		14	760	10,640	Between Boards, based on utilization Community use after hours
Art Room	1	1,030	1,030		1	1,030	1,030	
Science Room	1	1,230	1,230		1	1,230	1,230	
Special Education Area	1	1,395	1,395	Y	1	1,395	1,395	Exclusive use Ground floor location, near entry and bus drop
Resource Area - Loaded (400-699 sf)	1	615	615		1	615	615	Exclusive use during school day
Resource Area - Unloaded (<400 sf)	3	210	630		3	210	630	Potential for sharing between Boards
Gymnasium Area and Stage	2	3,060	6,120	Y	2	3,060	6,120	Exclusive use during school day Community use after hours
Shared Stage				Y	1	600	600	Contribute Stage area from General Purpose area, 1,200 sf to be shared between both Boards
Change Rooms	2	230	460	Y	2	230	460	Exclusive use during school day Community use after hours
Library	1	2,630	2,630		1	2,000	2,000	Shared library with WCDSB, some exclusive use area Area reduced by 630 sf for efficiency of sharing Community use after hours
General Purpose	3	540	1,620		2	510	1,020	Exclusive use during school day Area reduced to contribute 600 sf to Stage Community use after hours
Net Instructional Area			***31,870***				***31,240***	
OPERATIONAL AREA								
General Office			1,375	Y			1,100	"Safe Welcome" design, shared General Office with WCDSB, efficiency reduces area by 275 sf
Staff Room and Teacher Work Rooms			1,145				945	Shared with WCDSB, area reduced by 200 sf for efficiency of sharing
Kitchen			260				260	
Custodial Areas			450				450	
Academic Storage			435				435	
Washrooms			1,660				1,660	
Gymnasium Storage			575	Y			575	
Chair Storage (in Gymnasium)			460	Y			460	
Mechanical Spaces			690				2,130	Shared central plant @ 4% of GFA for each partner, area increased by 1,440 sf to right-size mechanical space
Net Operational Area			***7,050***				***8,015***	
Sub-total (Net Area)			***38,920***				***39,255***	
Gross-up (36.8%)			14,320				14,450	
Total WRDSB (GFA to be constructed)			**53,240**				**53,705**	
WRDSB Potential Area Change							**465**	
CHILD CARE								
Total Child Care (GFA)			**8,500**				**8,500**	no changes to Child Care

	Original Program			Ground Floor Location	Proposed Program			Potential Sharing/Notes
	No	Room Size SF	Floor Area SF		No	Room Size SF	Floor Area SF	
WCDSB								
INSTRUCTIONAL AREA								
Kindergarten	3	1,200	3,600	Y	3	1,200	3,600	Between Boards, based on utilization Community use after hours
Classroom	11	750	8,250		11	750	8,250	Between Boards, based on utilization Community use after hours
Art Room	1	1,050	1,050		1	1,050	1,050	
Science Room	1	1,050	1,050		1	1,050	1,050	
Special Education Area								
Resource Area - Loaded (400-699 sf)								
Resource Area - Unloaded (<400 sf)								
Gymnasium Area and Stage	1	4,000	4,000	Y	1	4,000	4,000	Exclusive use during school day Community use after hours
Shared Stage					1	600	600	600 sf Instructional Area Flexibility dedicated to a shared 1,200 sf Stage with WRDSB
Change Rooms	2	400	800	Y	2	400	800	Exclusive use during school day Community use after hours
Library	1	2,400	2,400		1	2,000	2,000	Shared library with WRDSB, some exclusive use area Area reduced by 400 sf for efficiency of sharing Community use after hours
General Purpose								
Instructional Area Flexibility			2,740				2,140	WCDSB to define uses - which will include chapel and break-out spaces, 600 sf allocated to shared Stage
Net Instructional Area			***23,890***				***23,490***	
OPERATIONAL AREA								
General Office			1,200	Y			1,000	Shared General Office with WRDSB, efficiency reduces area by 200 sf
Staff Room and Teacher Work Rooms			780				680	Shared with WCDSB, area reduced by 100 sf for efficiency of sharing
Kitchen			210				210	
Custodial Areas			600				600	
Meeting Room	1		230		1		230	
Academic Storage			355				355	
Washrooms			1,135				1,135	
Gymnasium Storage			330	Y			330	
Chair Storage (in Gymnasium)			130	Y			130	
Mechanical Spaces			2,045				1,705	Shared central plant @ 4% of GFA for each partner, area reduced by 340 sf to right-size mechanical space
Net Operational Area			***7,015***				***6,375***	
Sub-total (Net Area)			***30,905***				***29,865***	
Gross-up (38%)			11,740				11,350	
Total WCDSB (GFA to be constructed)			**42,645**				**41,215**	
WCDSB Potential Area Change							**-1,430**	

	Original Program			Ground Floor Location	Proposed Program			Potential Sharing/Notes
	No	Room Size SF	Floor Area SF		No	Room Size SF	Floor Area SF	
RECREATION COMPLEX								
AQUATICS	(as approved by Council June 18, 2019)							
Natatorium	1	20,000	20,000	Y	1	20,000	20,000	Occasional scheduled use by Boards 2 tanks - 10 lane 25 m, warm water/therapy, leisure/learning, on deck viewing
Change Rooms	3	1,830	5,490	Y	3	1,830	5,490	Wet - family, male, female
Pool Viewing	1	11,950	11,950		1	11,950	11,950	Contributes area to "main street" central circulation spine
Pool Office	1	250	250	Y	1	250	250	
Pool Storage	1	750	750	Y	1	750	750	
Administrative	1	1,800	1,800	Y	1	1,800	1,800	Staff change - M, F, GN (all staff)
(Pool) Mechanical			7,500		1	3,000	3,000	Pool mech only (remaining mechanical listed in OTHER)
Custodial			0				0	
Net Aquatics Area			***47,740***				***43,240***	
RECREATIONAL								
Gymnasium (FIBA size)	3	6,665	20,000		2	7,600	15,200	FIBA sized gyms with spectator seating @ 7,600 sf each
Gymnasium					1	6,000	6,000	
Walking/Running Track	1	12,000	12,000		1	12,000	12,000	Time of day exclusive use
Multi-use/Meeting	1	2,990	2,990		1	2,990	2,990	All parties Divisible, kitchenette, storage
Multi-use/Meeting	1	2,150	2,150		1	2,150	2,150	All parties Divisible, kitchenette, storage
Multi-use/Meeting	1	970	970		1	970	970	All parties
Sports Hall of Fame	1	0	0	Y	1	0	0	Part of gross-up
Fitness Studio	1	2,000	2,000		1	2,000	2,000	Not equipment based, storage required
Change Rooms	2	800	1,600		2	800	1,600	
Gym Storage	1	1,000	1,000		1	1,000	1,000	
Administrative			0		1	1,000	1,000	lunch room, WR
Public Lobby/Viewing			0	Y			0	
Net Recreational Area			***42,710***				***44,910***	
OTHER								
Lobby/Reception				Y			0	3,000 sf minimum, large, welcoming "grand/statement" entrance (includes area from Pool Viewing)
Bike/Skateboard/Scooter Storage				Y			0	Included in gross-up area
Servery/Canteen							0	Included in gross-up area
Waste/Recycling				Y			0	Included in gross-up area
Loading/Receiving				Y			0	Included in gross-up area
Washrooms							0	Included in gross-up area
Mechanical							4,160	Shared City operated central plant @ 4% of GFA for each partner, area reduced by 340 sf to right-size mechanical space and reallocated out of area originally shown for Pool Mech
Net Other Area			***0***				***4,160***	
Sub-total (Net Area)			***90,450***				***92,310***	
Gross-up (15%)			13,570				13,850	
Total Rec Complex (GFA to be constructed)			**104,020**				**106,160**	
Rec Complex Potential Area Change							**2,140**	

(Recreation Complex Original Space Program as approved by Council June 18, 2019)

	Original Program			Ground Floor Location	Proposed Program			Potential Sharing/Notes
	No	Room Size SF	Floor Area SF		No	Room Size SF	Floor Area SF	
IDEA EXCHANGE								
PUBLIC USE SPACE								
Study Area	1	500	500		1	500	500	
Reading Area with Laptop Bar	1	500	500		1	500	500	
Lounge Seating & Learning Commons	1	1,800	1,800		1	1,800	1,800	Shared with both Boards
Adult & Young Adult Book Stacks	1	1,600	1,600		1	1,600	1,600	
Children's - Program Room	1	750	750		1	750	750	
Children's - Play Area	1	640	640		1	640	640	
Children's - Book Stacks	1	1,350	1,350		1	1,350	1,350	
Small Study/Meeting Rooms	2	130	260		2	130	260	
Medium Study/Meeting Rooms	1	260	260		1	260	260	
Multi-purpose Room	1	750	750		1	750	750	All partners, shared with Recreation Complex Available for school visits
Makerspace	1	580	580		1	580	580	
Internet Station Area	1	200	200		1	200	200	
Public Service Desk	1	400	400		1	400	400	
Public Entrance & Security Gates	1	270	270	Y	1	270	270	
Public Universal Washroom	1	110	110	Y	1	110	110	
Net Public Use Area			***9,970***				***9,970***	
OPERATIONAL SPACE								
IT Server Room			100				100	
Administrative			1,000				1,000	
Staff/Kitchenette/WR			100				100	
Custodial			0				0	Included in gross up
Storage			0				0	Included in gross up
Mechanical			560				560	Central shared, metered mechanical preferred
Waste/Recycling			0	Y			0	Included in gross up
Loading/Receiving			0	Y			0	Included in gross up
Net Operational Area			***1,760***				***1,760***	
Sub-total (Net Area)			***11,730***				***11,730***	
Gross-up (16%)			1,870				1,870	
Total Idea Exchange (GFA to be constructed)			**13,600**				**13,600**	
Idea Exchange Potential Area Change							**0**	

TOTAL JUC GFA			**222,005**				**223,180**	
Total JUC Potential Area Change							**1,175**	

	Original Program			Ground Floor Location	Proposed Program			Potential Sharing/Notes
	No	Room Size SF	Floor Area SF		No	Room Size SF	Floor Area SF	
WRDSB								
INSTRUCTIONAL AREA								
Kindergarten	5	1,100	5,500	Y	5	1,100	5,500	Between Boards, based on utilization Community use after hours
Classroom	14	760	10,640		14	760	10,640	Between Boards, based on utilization Community use after hours
Art Room	1	1,030	1,030		1	1,030	1,030	
Science Room	1	1,230	1,230		1	1,230	1,230	
Special Education Area	1	1,395	1,395	Y	1	1,395	1,395	Exclusive use Ground floor location, near entry and bus drop
Resource Area - Loaded (400-699 sf)	1	615	615		1	615	615	Exclusive use during school day
Resource Area - Unloaded (<400 sf)	3	210	630		3	210	630	Potential for sharing between Boards
Gymnasium Area and Stage	2	3,060	6,120	Y	2	3,060	6,120	Exclusive use during school day Community use after hours
Shared Stage								
Change Rooms	2	230	460	Y	2	230	460	Exclusive use during school day Community use after hours
Library	1	2,630	2,630		1	2,630	2,630	
General Purpose	3	540	1,620		3	540	1,620	Exclusive use during school day Area reduced to contribute 600 sf to Stage Community use after hours
Net Instructional Area			***31,870***				***31,870***	
OPERATIONAL AREA								
General Office			1,375	Y			1,375	"Safe Welcome" design
Staff Room and Teacher Work Rooms			1,145				1,145	
Kitchen			260				260	
Custodial Areas			450				450	
Academic Storage			435				435	
Washrooms			1,660				1,660	
Gymnasium Storage			575	Y			575	
Chair Storage (in Gymnasium)			460	Y			460	
Mechanical Spaces			690				2,130	4% of GFA typical, area increased by 1,440 sf to right-size mechanical space
Net Operational Area			***7,050***				***8,490***	
Sub-total (Net Area)			***38,920***				***40,360***	
Gross-up (36.8%)			14,320				14,850	
Total WRDSB (GFA to be constructed)			**53,240**				**55,210**	
WRDSB Potential Area Change							**1,970**	
CHILD CARE								
Total Child Care (GFA)			**8,500**				**8,500**	no changes to Child Care

	Original Program			Ground Floor Location	Proposed Program			Potential Sharing/Notes
	No	Room Size SF	Floor Area SF		No	Room Size SF	Floor Area SF	
WCDSB								
INSTRUCTIONAL AREA								
Kindergarten	3	1,200	3,600	Y	3	1,200	3,600	Between Boards, based on utilization Community use after hours
Classroom	11	750	8,250		11	750	8,250	Between Boards, based on utilization Community use after hours
Art Room	1	1,050	1,050		1	1,050	1,050	
Science Room	1	1,050	1,050		1	1,050	1,050	
Special Education Area								
Resource Area - Loaded (400-699 sf)								
Resource Area - Unloaded (<400 sf)								
Gymnasium Area and Stage	1	4,000	4,000	Y	1	4,000	4,000	Exclusive use during school day Community use after hours
Shared Stage								
Change Rooms	2	400	800	Y	2	400	800	Exclusive use during school day Community use after hours
Library	1	2,400	2,400		1	2,400	2,400	
General Purpose								
Instructional Area Flexibility			2,740				2,740	WCDSB to define uses - which will include chapel and break-out spaces
Net Instructional Area			***23,890***				***23,890***	
OPERATIONAL AREA								
General Office			1,200	Y			1,200	
Staff Room and Teacher Work Rooms			780				780	
Kitchen			210				210	
Custodial Areas			600				600	
Meeting Room	1		230		1		230	
Academic Storage			355				355	
Washrooms			1,135				1,135	
Gymnasium Storage			330	Y			330	
Chair Storage (in Gymnasium)			130	Y			130	
Mechanical Spaces			2,045				1,705	4% of GFA typical, area reduced by 340 sf to right-size mechanical space
Net Operational Area			***7,015***				***6,675***	
Sub-total (Net Area)			***30,905***				***30,565***	
Gross-up (38%)			11,740				11,610	
Total WCDSB (GFA to be constructed)			**42,645**				**42,175**	
WCDSB Potential Area Change							**-470**	

	Original Program			Ground Floor Location	Proposed Program			Potential Sharing/Notes
	No	Room Size SF	Floor Area SF		No	Room Size SF	Floor Area SF	
RECREATION COMPLEX								
AQUATICS								
Natatorium	1	20,000	20,000	Y	1	20,000	20,000	Occasional scheduled use by Boards 2 tanks - 10 lane 25 m, warm water/therapy, leisure/learning, on deck viewing
Change Rooms	3	1,830	5,490	Y	3	1,830	5,490	Wet - family, male, female
Pool Viewing	1	11,950	11,950		1	11,950	11,950	Contributes area to "main street" central circulation spine
Pool Office	1	250	250	Y	1	250	250	
Pool Storage	1	750	750	Y	1	750	750	
Administrative	1	1,800	1,800	Y	1	1,800	1,800	Staff change - M, F, GN (all staff)
(Pool) Mechanical			7,500		1	3,000	3,000	Pool mech only (remaining mechanical listed in OTHER)
Custodial			0				0	
Net Aquatics Area			***47,740***				***43,240***	
RECREATIONAL								
Gymnasium (FIBA size)	3	6,665	20,000		2	7,600	15,200	FIBA sized gyms with spectator seating @ 7,600 sf each
Gymnasium					1	6,000	6,000	
Walking/Running Track	1	12,000	12,000		1	12,000	12,000	Time of day exclusive use
Multi-use/Meeting	1	2,990	2,990		1	2,990	2,990	All parties Divisible, kitchenette, storage
Multi-use/Meeting	1	2,150	2,150		1	2,150	2,150	All parties Divisible, kitchenette, storage
Multi-use/Meeting	1	970	970		1	970	970	All parties
Sports Hall of Fame	1	0	0	Y	1	0	0	Part of gross-up
Fitness Studio	1	2,000	2,000		1	2,000	2,000	Not equipment based, storage required
Change Rooms	2	800	1,600		2	800	1,600	
Gym Storage	1	1,000	1,000		1	1,000	1,000	
Administrative			0		1	1,000	1,000	lunch room, WR
Public Lobby/Viewing			0	Y			0	
Net Recreational Area			***42,710***				***44,910***	
OTHER								
Lobby/Reception				Y			0	3,000 sf minimum, large, welcoming "grand/statement" entrance (includes area from Pool Viewing)
Bike/Skateboard/Scooter Storage				Y			0	Included in gross-up area
Servery/Canteen							0	Included in gross-up area
Waste/Recycling				Y			0	Included in gross-up area
Loading/Receiving				Y			0	Included in gross-up area
Washrooms							0	Included in gross-up area
Mechanical							4,160	Shared central plant with Idea Exchange @ 4% of GFA for each partner, area reduced by 340 sf to right-size mechanical space and reallocated out of area originally shown for Pool Mech
Net Other Area			***0***				***4,160***	
Sub-total (Net Area)			***90,450***				***92,310***	
Gross-up (15%)			13,570				13,850	
Total Rec Complex (GFA to be constructed)			**104,020**				**106,160**	
Rec Complex Potential Area Change							**2,140**	

(Recreation Complex Original Space Program as approved by Council June 18, 2019)

	Original Program			Ground Floor Location	Proposed Program			Potential Sharing/Notes
	No	Room Size SF	Floor Area SF		No	Room Size SF	Floor Area SF	
IDEA EXCHANGE								
PUBLIC USE SPACE								
Study Area	1	500	500		1	500	500	
Reading Area with Laptop Bar	1	500	500		1	500	500	
Lounge Seating & Learning Commons	1	1,800	1,800		1	1,800	1,800	Shared with both Boards
Adult & Young Adult Book Stacks	1	1,600	1,600		1	1,600	1,600	
Children's - Program Room	1	750	750		1	750	750	
Children's - Play Area	1	640	640		1	640	640	
Children's - Book Stacks	1	1,350	1,350		1	1,350	1,350	
Small Study/Meeting Rooms	2	130	260		2	130	260	
Medium Study/Meeting Rooms	1	260	260		1	260	260	
Multi-purpose Room	1	750	750		1	750	750	All partners, shared with Recreation Complex Available for school visits
Makerspace	1	580	580		1	580	580	
Internet Station Area	1	200	200		1	200	200	
Public Service Desk	1	400	400		1	400	400	
Public Entrance & Security Gates	1	270	270	**Y**	1	270	270	
Public Universal Washroom	1	110	110	**Y**	1	110	110	
Net Public Use Area			***9,970***				***9,970***	
OPERATIONAL SPACE								
IT Server Room			100				100	
Administrative			1,000				1,000	
Staff/Kitchenette/WR			100				100	
Custodial			0				0	Included in gross up
Storage			0				0	Included in gross up
Mechanical			560				560	Central shared, metered mechanical preferred
Waste/Recycling			0	**Y**			0	Included in gross up
Loading/Receiving			0	**Y**			0	Included in gross up
Net Operational Area			***1,760***				***1,760***	
Sub-total (Net Area)			***11,730***				***11,730***	
Gross-up (16%)			1,870				1,870	
Total Idea Exchange (GFA to be constructed)			**13,600**				**13,600**	
Idea Exchange Potential Area Change							**0**	

TOTAL JUC GFA			**222,005**				**225,645**	
Total JUC Potential Area Change							**3,640**	

A4

Engineering Design Briefs

IBI GROUP
101 – 410 Albert Street
Waterloo ON N2L 3V3 Canada
tel 519 585 2255 fax 519 585 2269
ibigroup.com

February 1, 2021 via email: Maureen@csparch.com

Ms. Maureen O'Shaughnessy
CS&P Architects
2345 Yonge Street, Suite 200
Toronto, ON M4P 2E5

Dear Ms. O'Shaughnessy:

CAMBRIDGE JOINT USE FACILITY, CAMBRIDGE
PROPOSED SITE PLAN DEVELOPMENT
MUNICIPAL SITE ENGINEERING REVIEW

IBI Group was retained by CS&P Architecture (CSPA) to provide municipal civil engineering services for this project.

The purpose of this letter-report is to provide an overview of the area grading and municipal servicing for the Cambridge Joint Use Community Centre (JUC). Further, the letter-report will also provide a functional review of Five (5) concepts being considered for the facility at time of writing in order to assist the selection decision.

1. INTRODUCTION:

The Cambridge Joint Use Community Centre (JUC) subject site is located within the Bosdale residential subdivision which in turn is located in southeast Cambridge on the north side of Dundas Street at the northerly extension of Branchton Road. A proposed Region of Waterloo arterial road, the East Boundary Road (EBR) is to be constructed on the eastern limits of the JUC Site and the Bosdale subdivision. Refer to **Plate 1** for a plan of the Bosdale Subdivision and JUC Site.

The JUC Site area is approximately 11ha and proposes the development of a Community Centre, swimming pool, Library, and two Schools all sharing the site as a joint-use facility.

Currently the City of Cambridge (City) is exploring concepts for the site's development. CS&P Architecture (CSPA) has been retained by the City to assist in this work. IBI Group was retained by CSPA to provide municipal Civil engineering expertise (grading and municipal servicing) for the site review.

IBI Group is familiar with the subject lands and the environs as we are the Municipal Engineers for the grading, servicing and roads within the Bosdale Subdivision, of which the subject JUC Site are a part.

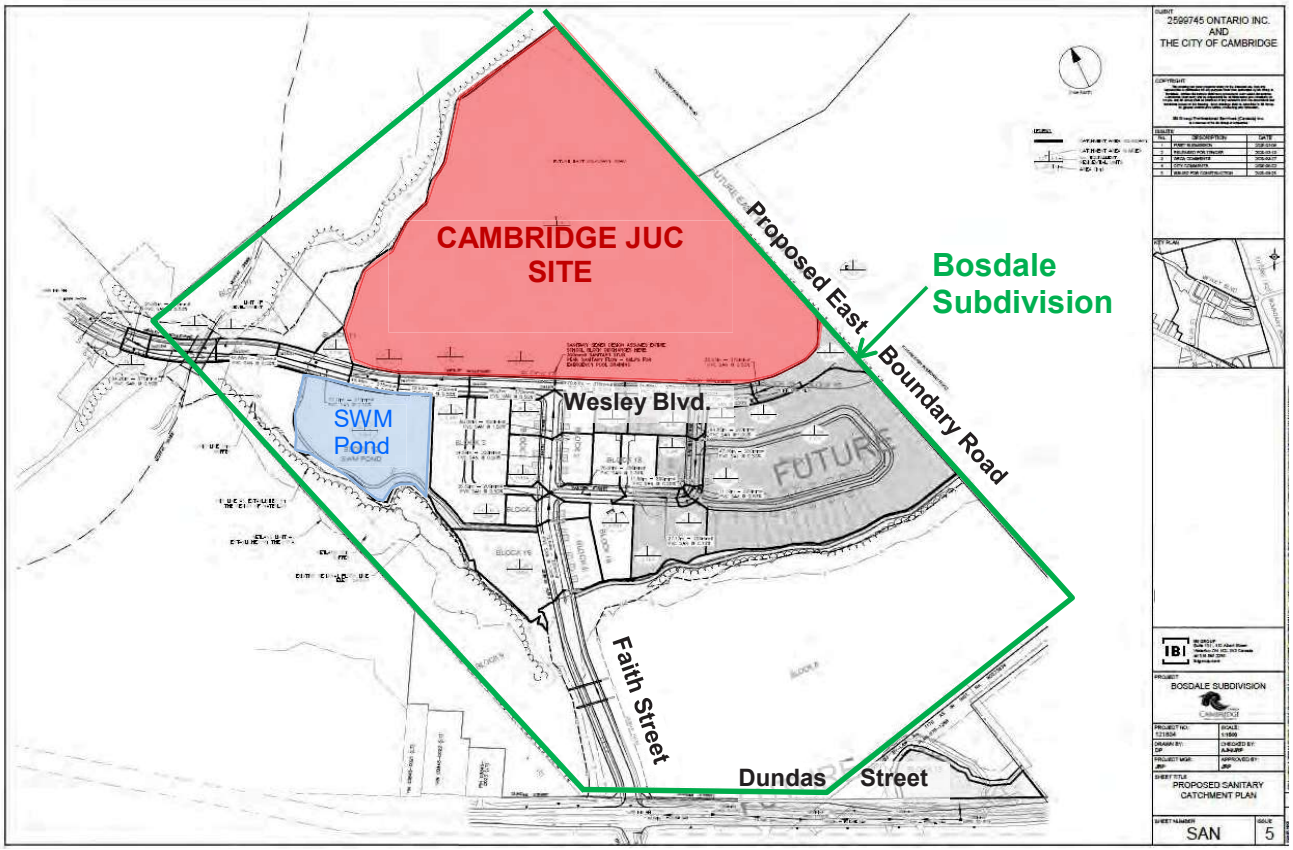


PLATE 1: Bosdale Subdivision

2. EXISTING AND PROPOSED CONDITIONS

It was determined that efficiencies would result from the concurrent development of the JUC Site with the Bosdale residential subdivision of which it is a part. Earth moving operations would benefit from the cut/fill balance generated between the two lands, a joint use and shared municipal SWM facility would reduce the total land area required for SWM facilities as well as allow a wet pond (constructed wetland) to be utilized, and shared municipal servicing and road access could be constructed. Further, developing the two lands concurrently bettered the economies of scale.

The following sections describe the grading and municipal servicing design intent and constraints relating to the JUC Site. Reference is also made to **Attachment 'A'** for the subdivision engineering plans.

2.1 Road and Pedestrian Access

Access to the JUC lands will be provided via the construction of municipal roads within the Bosdale Subdivision. The proposed municipal roads are:

- Wesley Boulevard: extended from the existing eastern terminus of Wesley Boulevard through the subdivision to the proposed Regional East Boundary Road;
- Faith Street: extended from Dundas Street northerly to Wesley Boulevard.

Active transportation facilities will be constructed, including:

- Pedestrian sidewalk on all roads;
- Multi-use paths on Wesley Boulevard, Faith Street and through Open Spaces;
- Bike lanes on Wesley Boulevard and Faith Street.

The Region's East Boundary Road will be constructed along the eastern flankage of the JUC lands. Construction is tentatively scheduled to start in 2026/2027. The Regional road will be limited/controlled access.

2.2 Area Grading

The original topographical conditions of the JUC Site had the site rolling with highs and lows across the site and included areas with no overland drainage outlet. In general the site had an approximately high elevation in the southeastern area of 300.0m and a low elevation of 286.0m in the southwestern area. Refer to **Attachment 'A'** for the area grading plans which include the original topographic contours.

The design intent for the Bosdale Subdivision's area grading, including the JUC site, was to direct all stormwater drainage to a proposed SWM facility located in the southeastern quadrant of Wesley Boulevard and Moffat Creek (i.e., to the southwest of the JUC Site) – refer to **Plate 1**.

2.3 Stormwater Management

A Stormwater Management (SWM) pond is proposed to receive, treat and discharge stormwater from the subdivision and JUC Site. The SWM pond will provide quantity control attenuating post-development flows to pre-development flow levels. The pond will also treat stormwater quality through the implementation of a constructed wetland.

The minor (up to the 5 year storm) stormwater flows from the JUC Site will be directed via overland routes to an internal storm sewer system which will outlet to the Wesley Boulevard storm system (refer to next section). Larger storm events (in excess of the minor storm) will be conveyed overland via sheet flow to Wesley Boulevard which in turn will covey flows overland within its right-of-way to the SWM pond.

Given the proposed municipal SWM pond was designed to control stormwater from the JUC Site, there are no requirements for on-site SWM controls for stormwater quantity or quality control. The only requirements for the JUC lands are:

- The maximum impervious cover must be less than 65%. If the site development exceeds 65%, additional on site controls will be needed;
- Water balance must be achieved (e.g., infiltration of stormwater from rooftop and other areas);

- Conveyance of the minor storm (up to the 5-year storm event) via storm sewers to the proposed storm service laterals on Wesley Boulevard (refer to next section); and,
- Conveyance of storms in excess of the minor storm via overland surface routes to the Wesley Boulevard road allowance.

2.4 Municipal Servicing

The development of the subdivision will extend municipal infrastructure required to service the JUC lands. Refer to **Attachment 'A'** for the plan & profile drawings of the adjacent municipal servicing.

The pertinent services for the JUC lands include:

a. Sanitary sewers:
A municipal 375mm diameter sanitary sewer is proposed to be extended along the full length of Wesley Boulevard from the existing eastern terminus of Wesley Boulevard to the East Boundary Road.

Currently, two sanitary laterals are proposed to be extended from Wesley Boulevard: one lateral (300mm diameter) will be located at the intersection of Faith Street and Wesley Boulevard, and the other (200mm diameter) will be located near the eastern limit of the SWM pond. The subdivision's design flow rate discharging the school site was 6.5 L/s.

Note, the proposed 300mm diameter sanitary lateral was sized to accommodate the full buildout of the proposed JUC Site, including an allowance for "emergency" draining of the proposed swimming pool at a rate of 66 L/s.

b. Storm sewers:
Storm sewers (various sizes) will be extended along Wesley Boulevard from the proposed SWM Pond to approximately 200m east of Faith Street. The storm sewers have been sized for the 5 year storm for the contributing catchment areas, which includes the JUC Site. Storms greater than the 5 year storm will be directed overland via the road allowance to the SWM pond.

Currently two storm sewer laterals, each sized at 750mm diameter, are proposed to be extended from Wesley Boulevard: one lateral will be located at the intersection of Faith Street and Wesley Boulevard, and the other located near the eastern limit of the SWM pond. Each sewer was sized via the rational method to convey the 5 year storm from approximate 50% of the JUC Site area utilizing a 0.70 runoff coefficient.

c. Watermain:
Watermain (300mm diameter) will be extended along the full length of Wesley Boulevard from the existing eastern terminus of Wesley Boulevard to the East Boundary Road. The watermain will also be

"looped" via a 300mm diameter watermain to the existing watermain on Dundas Street.

Currently one 300mm diameter water service lateral is proposed at the Wesley Boulevard/Faith Street intersection. It is noted that per City of Cambridge policy only one service per property is permitted.

2.5 Subdivision Construction Timing (anticipated)

At the time of writing, the following is the status of construction:

a. Area Grading:

At the time of writing, the subdivision, including the JUC Site, have been rough graded. Work completed on the developing area of the Bosdale Subdivision and JUC Site includes:

- All vegetation removed;
- All windrowed rocks from the former farming operations removed and disposed;
- All topsoil stripped and either stockpiled or used as fill in perimeter slopes; and,
- Rough grading has been completed, and earth has been cut and filled to bring the subdivision and JUC Site to pre-grade elevations. The pre-grade elevation of the JUC Site was approximately 0.3m below proposed finished grade.

b. Municipal Servicing and Road Construction:

Further, at the time of writing, a servicing and road construction contract had been awarded by the Subdivision developer, with cost sharing with the City of Cambridge. Construction commenced in December 2020 and is scheduled to be completed in summer 2021. This contract will install municipal servicing (sewers and watermain) and construct the municipal roads within the first phase of the Bosdale subdivision. Phase 1 includes the following main facilities:

- The subdivision's stormwater management (SWM) pond: located in the southeastern quadrant of Wesley Boulevard and Moffat Creek;
- Wesley Boulevard: from its existing western terminus on the west side of Moffat Creek to Faith Street;
- Faith Street: from Wesley Boulevard to Dundas Street; and,
- Bastian Street: from Faith Street eastward approximately 120m.

c. Utility Servicing:

Concurrent with the road construction, electrical and telecommunication services will also be installed within the municipal road right-of-ways. A meeting with Energy+ on December 17, 2020 notified Energy+ of the JUC development intentions so that the primary electrical supply within the Bosdale subdivision will accommodate the JUC Site.

With the completion of the above described work (anticipated by summer 2021), the JUC Site will be left rough graded, and municipal, electrical and telecommunication services will be installed and stubbed at the JUC Site property line. In addition, Wesley Boulevard and Faith Street will be constructed and will provide vehicular and pedestrian access to the JUC Site.

3. JUC SITE DEVELOPMENT CONCEPTS

At the time of writing five development concepts had been developed for the JUC Site. A review of the five concepts was completed from a grading, drainage, municipal servicing and access perspective. All five Concepts appear feasible; however, the Concepts differ in the ease and cost with which they can be implemented from a grading and servicing perspective. Table 1, attached, summarizes our review and findings.

The site development should follow the local municipal, regional and provincial planning and design criteria, including but not limited to:

- City of Cambridge Site Plan Review - Reference Guide;
- City of Cambridge Engineering Standards and Development Manual;
- Region of Waterloo and Area Municipalities Design Guidelines and Supplemental Specifications for Municipal Services (DGSSMS); and,
- Ontario Building Code.

Note, the most current versions of the above guidelines should be used.

4. CLOSURE

We trust the information provided in this letter-report assists in the review and planning of the development of the JUC Site.

Should you have any questions, or require further assistance, please do not hesitate to contact the undersigned.

Yours truly,

IBI GROUP

John Perks, MBA, P.Eng.
Associate Director

JRP/ms

February 1, 2021

CAMBRIDGE JOINT USE FACILITY, CAMBRIDGE

PROPOSED SITE PLAN DEVELOPMENT - MUNICIPAL SITE ENGINEERING REVIEW

February 1, 2021

REVIEW PARAMETER	CONCEPT 1	CONCEPT 2	CONCEPT 3	CONCEPT 4	CONCEPT 5
Road Access	The location of the driveway accesses appears favourable to the proposed subdivision intersections: the central and eastern driveways appear to be opposite Wesley Boulevard's intersections with Faith Street and Bastien Street.	Similar to Concept 1.	The location of the driveway accesses appears favourable to the proposed subdivision intersections: the central and eastern driveways appear to be opposite Wesley Boulevard's intersections with Faith Street and Bastien Street. The internal driveway is significantly longer than other concepts.	Similar to Concept 1.	Similar to Concept 1.
Pedestrian Access	It appears the main building access locations front Wesley Boulevard. Wesley Boulevard has a multi-use path on its northern side which will readily facilitate pedestrian and cyclist access to the site.	Similar to Concept 1.	While access to the Wesley Boulevard active transportation facilities is achieved, the distance for pedestrians and cyclists is increased versus the other concepts.	Similar to Concept 1.	Similar to Concept 1.
Grading and Drainage	The positioning of the building will readily facilitate drainage in a westerly and southerly direction as required by the subdivision development. No concerns.	Similar to Concept 1. Note, given it appears the site is more compact, the storm sewer system will likely be less expansive than Concept 1 (not significantly though).	It appears the parking along the EBR is located close to the property limit. The current grading of the site has a ~4m high 3:1slope (~12m wide) falling from the site to the property line with the EBR. The parking lot will need to be setback to respect this slope. Given the positioning of the proposed building, the eastern parking lot will need to be made to drain in a north to south direction to get around the proposed building – this is opposite to the direction slope of the EBR. While this grading is "awkward", it is achievable. Note, given the long length of the building it likely could not have a constant finished floor elevation and it would need to be stepped.	Similar to Concept 1. Note, given the building is divided into two, this will perhaps facilitate opportunities for drainage between the buildings reducing the impediment caused by one larger building (not a significant issue though).	Similar to Concept 1. Note, given the building is divided into three, this will perhaps facilitate opportunities for drainage between the buildings reducing the impediment caused by one larger building (not a significant issue though).
Storm Servicing	The positioning of the proposed western and central driveway is favourable to storm servicing.	Similar to Concept 1.	While feasible to do, given the location of the building, the storm sewer will need to be extended for a significantly longer distance versus other Concepts.	As the site is more spread-out, the storm system would likely be more expansive versus Concepts 1 and 2.	As the site is more spread-out, the storm system would likely be more expansive versus Concepts 1 and 2.
Sanitary Servicing	The positioning of the proposed western and central driveway is favourable to sanitary servicing. The location of the proposed building is favourable to discharge to the proposed sanitary servicing on Wesley Boulevard.	Similar to Concept 1.	While feasible to do, given the location of the building, the sanitary sewer will need to be extended for a significantly longer distance versus Concept 1 and 2, and possibly 4 and 5.	Given two separate buildings, the on site sanitary system would be increased over Concepts 1 and 2. Similar to Concept 1.	Given three separate buildings, the on site sanitary system would be increased over Concepts 1, 2 and 4.
Water Servicing	The positioning of the proposed central driveway is favourable to water servicing. The location of the proposed building is favourable to the location of the water service.	Similar to Concept 1. Note, if the two buildings will occupy the same property, the City policy of one service per property" would need to be explored if indeed it was desired to service the buildings independently.	While feasible to do, given the location of the building, the water service will need to be extended for a significantly longer distance versus the other Concepts.	Given two separate buildings, on site watermain length would be increased over Concepts 1 and 2, and additional hydrants would likely be needed. Note, if the two buildings will occupy the same property, the City policy of one service per property" would need to be explored if indeed it was desired to service the buildings independently.	Given three separate buildings, on site watermain length would be increased over Concepts 1 and 2, and additional hydrants would likely be needed. Note, if the three buildings will occupy the same property, the City policy of one service per property" would need to be explored if indeed it was desired to service the buildings independently.

ATTACHMENT ‘A’

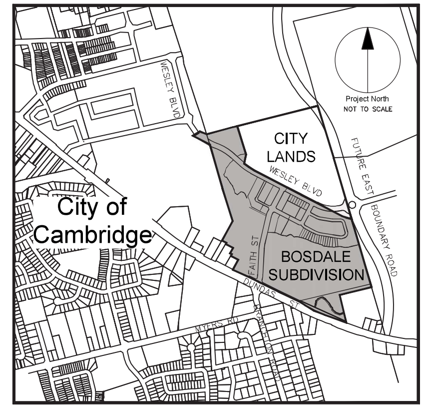
Bosdale Subdivision
Engineering Plans

February 1, 2021

CITY OF CAMBRIDGE
REGIONAL MUNICIPALITY OF WATERLOO

CANADA
CAMBRIDGE
PEOPLE · PLACE · PROSPERITY

MAYOR : KATHRYN McGARRY



BOSDALE SUBDIVISION
30T-13103

ISSUED FOR CONSTRUCTION
SEPTEMBER 25, 2020

ABBREVIATED FOR JUC REVIEW

LIST OF DRAWINGS:

~~ESC-1~~	~~EXISTING CONDITIONS, REMOVALS, EROSION AND SEDIMENT CONTROL PLAN~~
~~ESC-2~~	~~EROSION AND SEDIMENT CONTROL DETAILS AND NOTES~~
~~GR-1~~	~~GRADING PLAN 1~~
~~GR-2~~	~~GRADING PLAN 2~~
~~GR-3~~	~~GRADING PLAN 3~~
~~GR-4~~	~~GRADING PLAN 4~~
~~GR-5~~	~~GRADING PLAN 5~~
~~GR-6~~	~~GRADING PLAN 6~~
~~GR-DET-1~~	~~GRADING DETAILS AND NOTES~~
SERV-1	OVERALL SERVICING PLAN
SERV-2	ABOVE GROUND SERVICING PLAN
~~SAN~~	~~PROPOSED SANITARY CATCHMENT PLAN~~
~~STM~~	~~PROPOSED STORM CATCHMENT PLAN~~
~~PP-1~~	~~PLAN AND PROFILE FAITH ST (STA 0+950 TO STA 1+210)~~
~~PP-2~~	~~PLAN AND PROFILE FAITH ST (STA 1+210 TO STA 1+460)~~
PP-3	PLAN AND PROFILE WESLEY BLVD (STA 2+850 TO STA 3+175)
PP-4	PLAN AND PROFILE WESLEY BLVD (STA 3+175 TO STA 3+475)
PP-5	PLAN AND PROFILE WESLEY BLVD (STA 3+475 TO STA 3+700)
~~PP-6~~	~~PLAN AND PROFILE BASTIEN ST (FAITH ST TO STA 2+155)~~
~~PP-7~~	~~PLAN AND PROFILE BASTIEN ST (STA 2+155 TO WESLEY BLVD)~~
~~DET-1~~	~~GENERAL DETAILS AND SERVICING NOTES~~
~~DET-2~~	~~GENERAL DETAILS 2~~
~~SWM-1~~	~~STORMWATER MANAGEMENT POND - GRADING PLAN~~
~~SWM-SEC1~~	~~STORMWATER MANAGEMENT POND - CROSS SECTION~~
~~SWM-DET1~~	~~STORMWATER MANAGEMENT POND - DETAILS 1~~
TCP-1	WESLEY BLVD SIGNAGE & PAINT MARKING PLAN
TCP-2	WESLEY BLVD SIGNAGE & PAINT MARKING PLAN
~~TCP-3~~	~~FAITH ST SIGNAGE & PAINT MARKING PLAN~~
~~TCP-4~~	~~BASTIEN ST SIGNAGE & PAINT MARKING PLAN~~
~~TCP-5~~	~~DUNDAS ST LEFT TURN LANE PAINT MARKING PLAN~~

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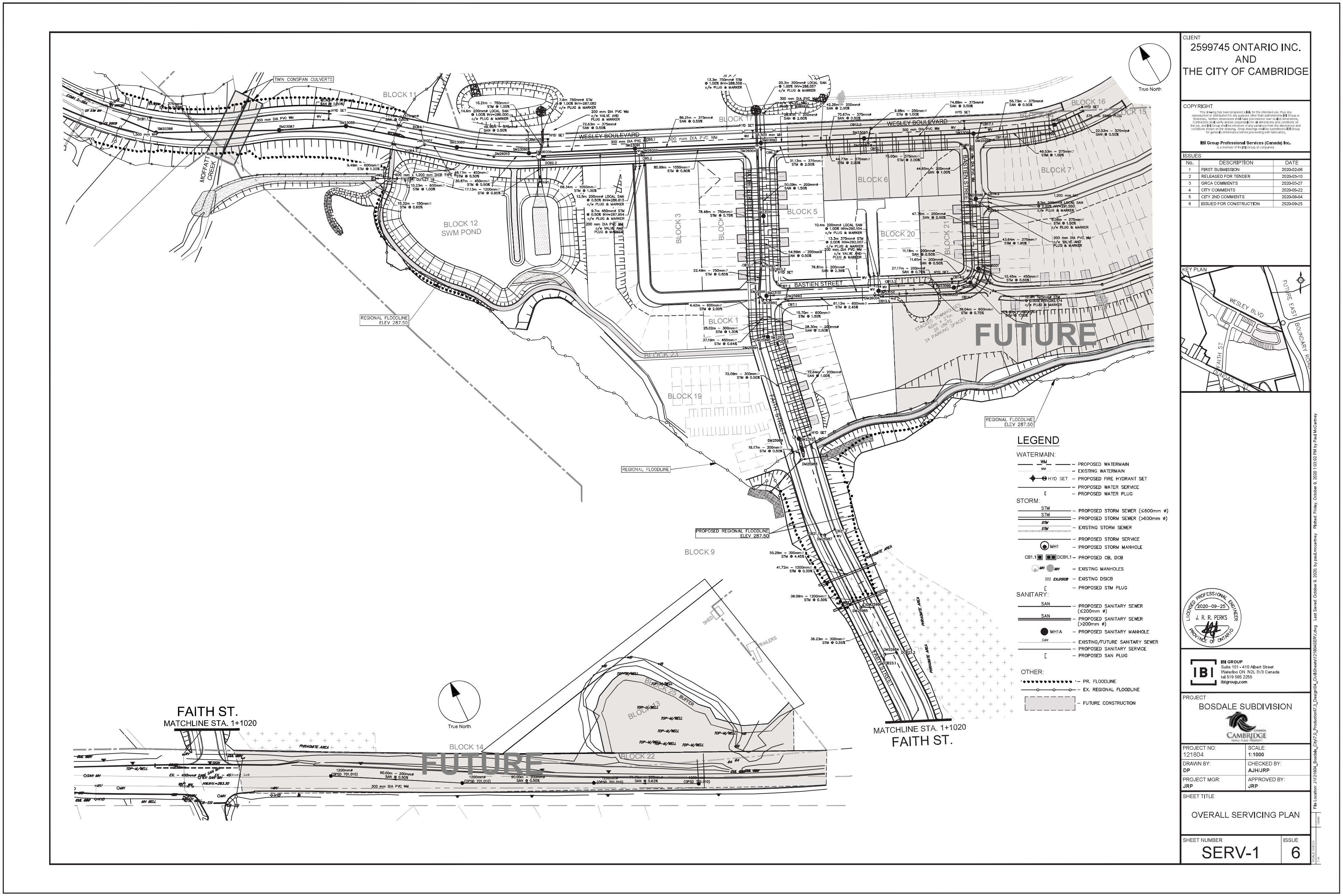
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4 CITY COMMENTS 2020-05-22
5 CITY 2ND COMMENTS 2020-08-04
6 ISSUED FOR CONSTRUCTION 2020-09-25
KEY PLAN
WESLEY BLVD
FUTURE EAST BOUNDARY ROAD
FAITH ST
DUNDAS
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Waterloo ON N2L 3V3 Canada
tel 519 585 2255
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BOSDALE SUBDIVISION
CAMBRIDGE
PROJECT NO: 121804
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CHECKED BY: AJH/JRP
PROJECT MGR: JRP
APPROVED BY: JRP
SHEET TITLE
OVERALL SERVICING PLAN
SHEET NUMBER
SERV-1
ISSUE
6
LICENSED PROFESSIONAL ENGINEER
2020-09-25
J. R. PERKS
PROVINCE OF ONTARIO
LEGEND
WATERMAIN:
PROPOSED WATERMAIN
EXISTING WATERMAIN
PROPOSED FIRE HYDRANT SET
PROPOSED WATER SERVICE
PROPOSED WATER PLUG
STORM:
PROPOSED STORM SEWER (≤600mm ø)
PROPOSED STORM SEWER (>600mm ø)
EXISTING STORM SEWER
PROPOSED STORM SERVICE
PROPOSED STORM MANHOLE
PROPOSED CB, DCB
EXISTING MANHOLES
EXISTING DSICB
PROPOSED STM PLUG
SANITARY:
PROPOSED SANITARY SEWER (≤200mm ø)
PROPOSED SANITARY SEWER (>200mm ø)
PROPOSED SANITARY MANHOLE
EXISTING/FUTURE SANITARY SEWER
PROPOSED SANITARY SERVICE
PROPOSED SAN PLUG
OTHER:
PR. FLOODLINE
EX. REGIONAL FLOODLINE
FUTURE CONSTRUCTION
WESLEY BOULEVARD
BASTIEN STREET
FAITH STREET
FAITH ST.
MATCHLINE STA. 1+1020
MOFFATT CREEK
TWIN CONSPAN CULVERTS
BLOCK 11
BLOCK 12
SWM POND
BLOCK 1
BLOCK 3
BLOCK 5
BLOCK 6
BLOCK 7
BLOCK 9
BLOCK 14
BLOCK 15
BLOCK 16
BLOCK 17
BLOCK 19
BLOCK 20
BLOCK 21
BLOCK 22
BLOCK 23
BLOCK 25
FUTURE
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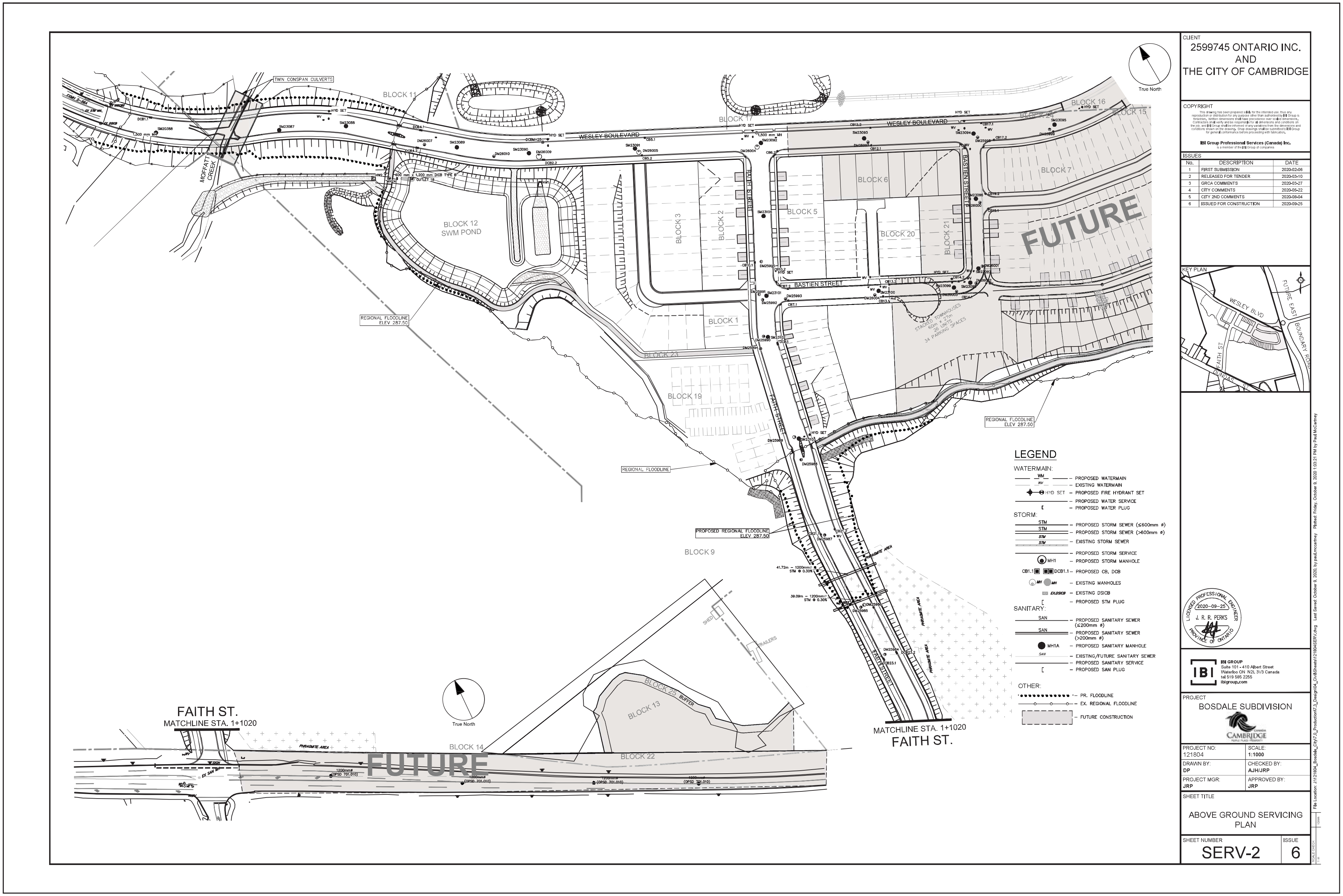
ELEV 287.50
PROPOSED REGIONAL FLOODLINE
ELEV 287.50
True North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SHEET NUMBER
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LEGEND
WATERMAIN:
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PROPOSED WATER PLUG
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EXISTING MANHOLES
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PROPOSED SANITARY SERVICE
PROPOSED SAN PLUG
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PR. FLOODLINE
EX. REGIONAL FLOODLINE
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True North
WESLEY BOULEVARD
BASTIEN STREET
FAITH STREET
BLOCK 1
BLOCK 2
BLOCK 3
BLOCK 5
BLOCK 6
BLOCK 7
BLOCK 9
BLOCK 11
BLOCK 12
SWM POND
BLOCK 13
BLOCK 14
BLOCK 15
BLOCK 16
BLOCK 17
BLOCK 19
BLOCK 20
BLOCK 21
BLOCK 22
BLOCK 23
BLOCK 25 BUFFER
FUTURE
TWIN CONSPAN CULVERTS
MOFFATT CREEK
REGIONAL FLOODLINE ELEV 287.50
REGIONAL FLOODLINE
PROPOSED REGIONAL FLOODLINE ELEV 287.50
STACKED TOWNHOUSES
60m x 27m
26 UNITS
34 PARKING SPACES
SHED
TRAILERS
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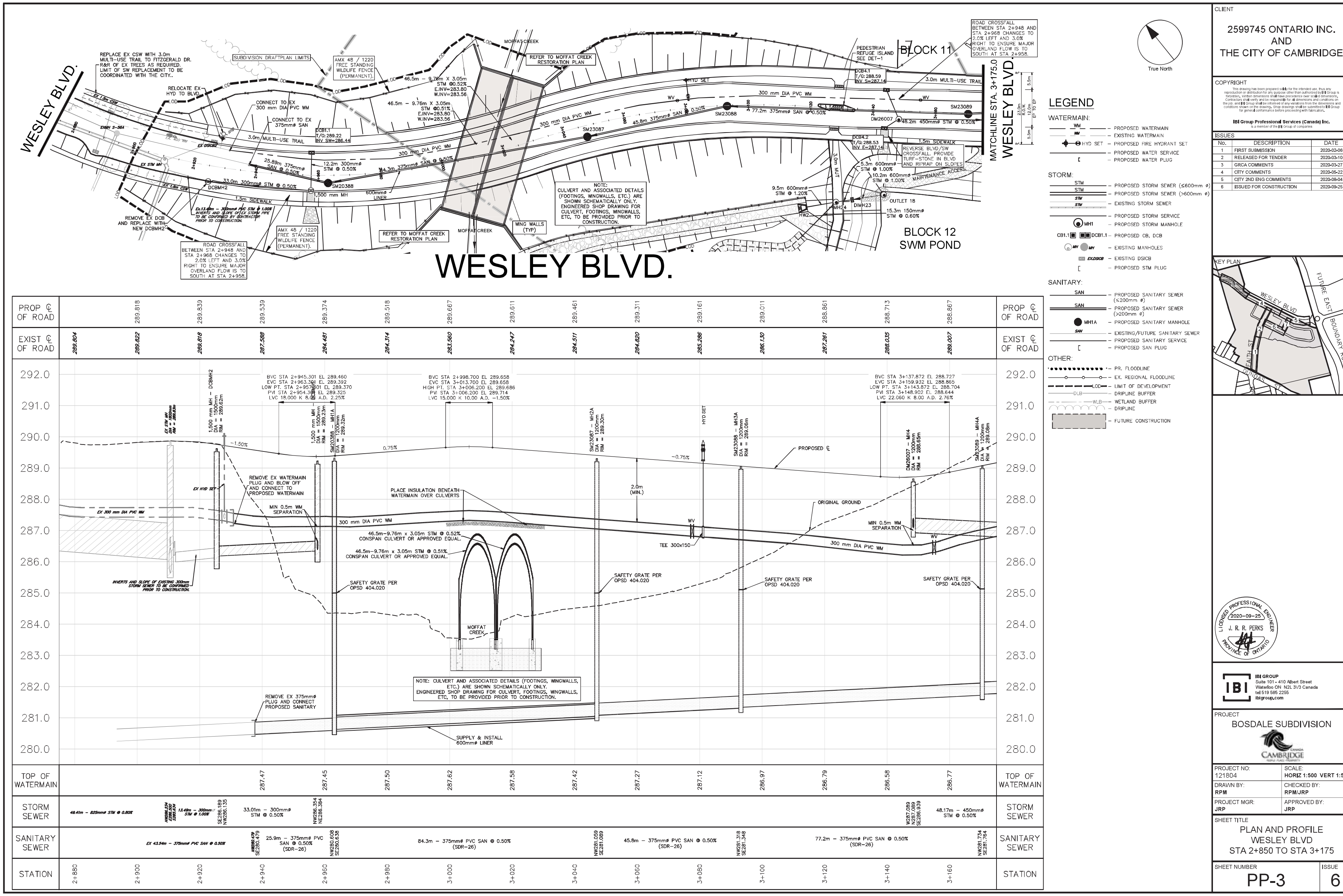
MATCHLINE STA. 1+1020
MATCHLINE STA. 1+1020
FAITH ST.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BLOCK 11
BLOCK 12
SWM POND
MATCHLINE STA. 3+175.0
LEGEND
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STORM:
SANITARY:
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SHEET NUMBER
PP-3
ISSUE
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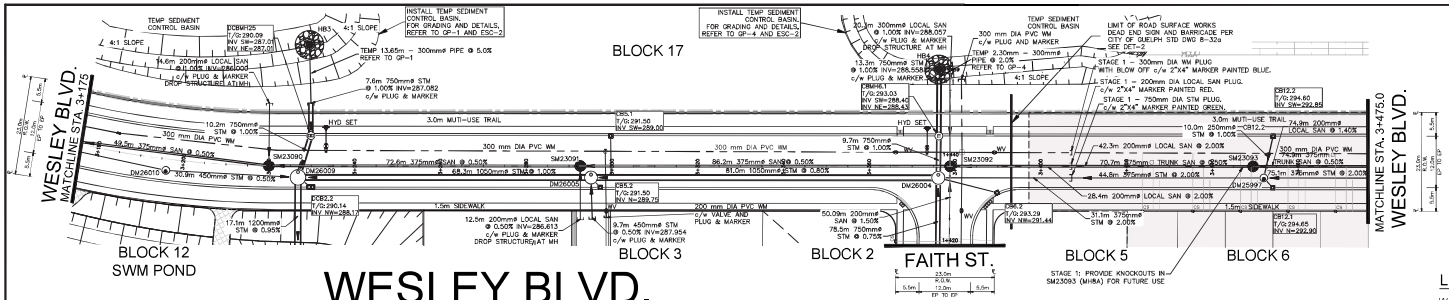
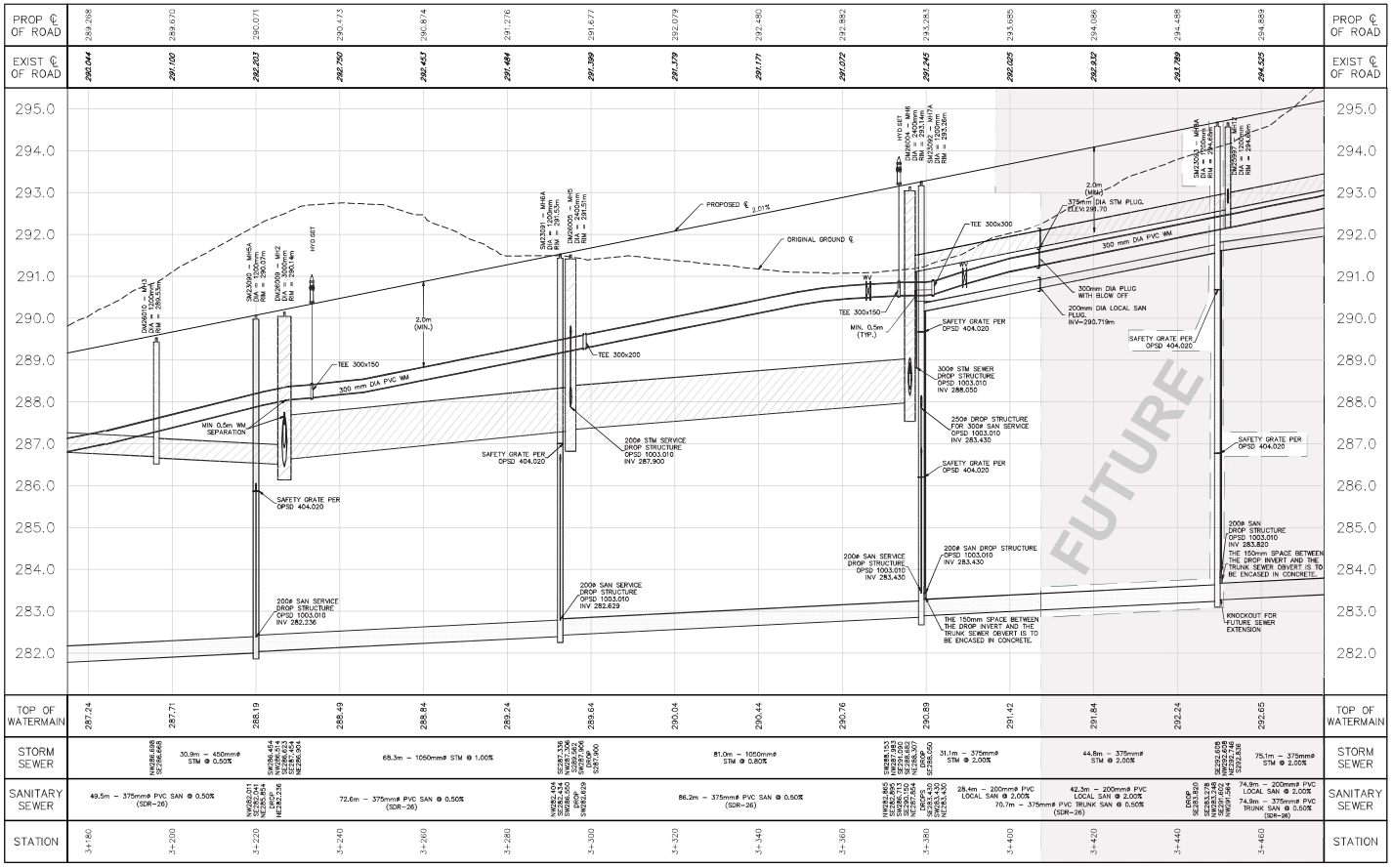


WESLEY BLVD.



LEGEND

WATERMAIN:
- PROPOSED WATERMAIN
- EXISTING WATERMAIN
- HYD SET – PROPOSED FIRE HYDRANT SET
- PROPOSED WATER SERVICE
- PROPOSED WATER PLUG

STORM:
- PROPOSED STORM SEWER (≤600mm ø)
- PROPOSED STORM SEWER (>600mm ø)
- EXISTING STORM SEWER
- PROPOSED STORM SERVICE
- MH1 – PROPOSED STORM MANHOLE
- CB1.1 DCB1.1 – PROPOSED CB, DCB
- EXISTING MANHOLES
- EXDSCB – EXISTING DSCB
- PROPOSED STM PLUG

SANITARY:
- PROPOSED SANITARY SEWER (≤200mm ø)
- PROPOSED SANITARY SEWER (>200mm ø)
- MH1A – PROPOSED SANITARY MANHOLE
- EXISTING/FUTURE SANITARY SEWER
- PROPOSED SANITARY SERVICE
- PROPOSED SAN PLUG

OTHER:
- PR. FLOODLINE
- EX. REGIONAL FLOODLINE
- LOD – LIMIT OF DEVELOPMENT
- DLB – DRYLINE BUFFER
- WLB – WETLAND BUFFER
- DRYLINE
- FUTURE CONSTRUCTION

True North

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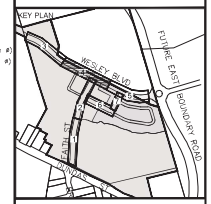
ISSUES

No.	DESCRIPTION	DATE
1	FIRST SUBMISSION	2020-02-06
2	RELEASED FOR TENDER	2020-03-10
3	GRCA COMMENTS	2020-03-27
4	CITY COMMENTS	2020-05-22
5	CITY 2ND ENG COMMENTS	2020-08-04
6	ISSUED FOR CONSTRUCTION	2020-09-25

KEY PLAN



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2020-09-25
J. R. R. PERKS
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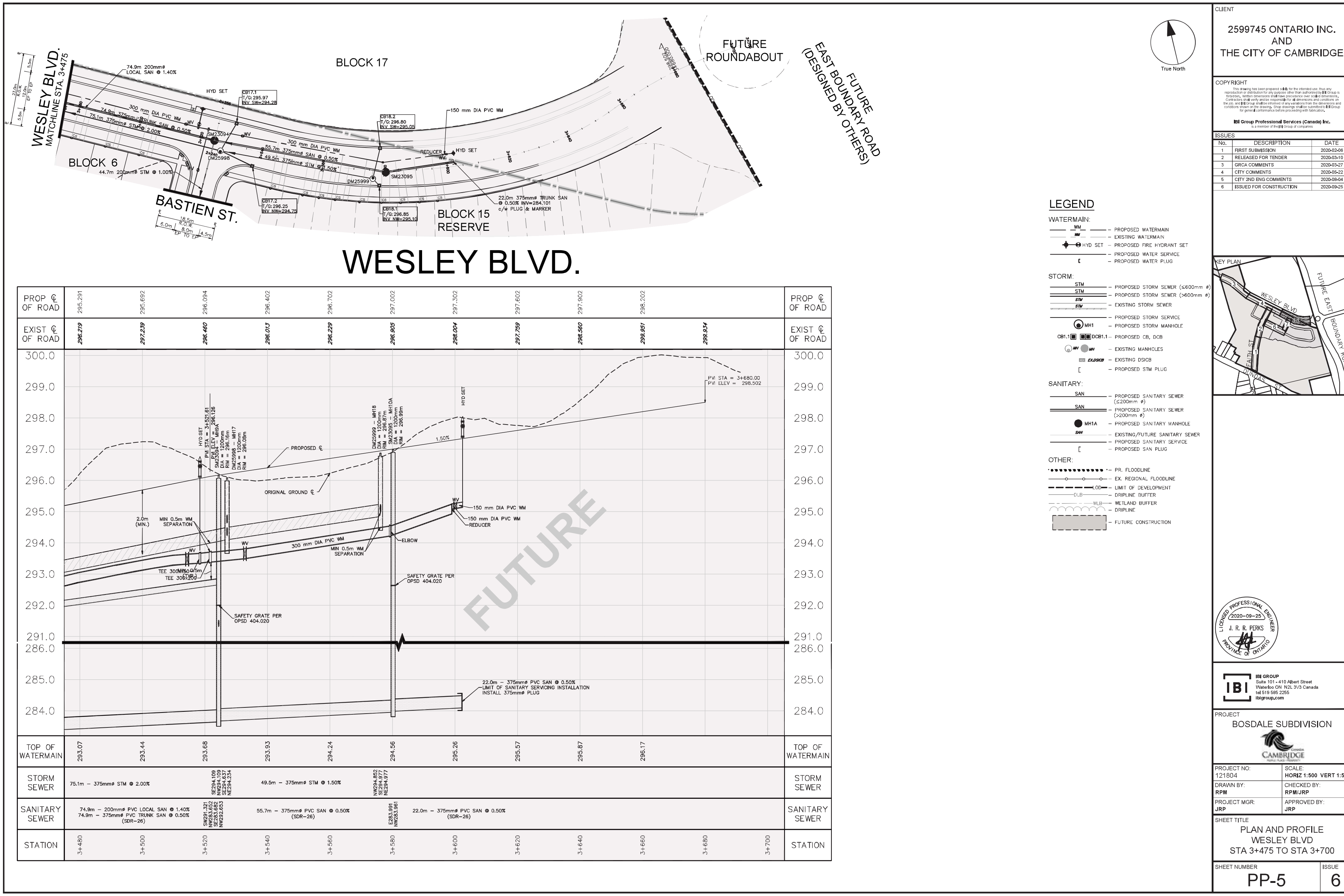
PROJECT
BOSDALE SUBDIVISION
CAMBRIDGE

PROJECT NO:	SCALE:
121804	HORIZ 1:500 VERT 1:50
DRAWN BY: RPM	CHECKED BY: RPM/JRP
PROJECT MGR: JRP	APPROVED BY: JRP

SHEET TITLE
PLAN AND PROFILE
WESLEY BLVD
STA 3+175 TO STA 3+475

SHEET NUMBER PP-4 | ISSUE 6

File Location: J:\121804_Bosdale_Dev\7.0_Production\7.2_Design\Civil_Cad\Drawings\121804PP.dwg Last Saved: October 9, 2020 by paul.mccartney Plotted: Friday, October 9, 2020 10:55:55 PM by Paul McCartney


WESLEY BLVD.
MATCHLINE STA. 3+475
BLOCK 17
BLOCK 6
BASTIEN ST.
BLOCK 15
RESERVE
FUTURE
ROUNDABOUT
FUTURE
EAST BOUNDARY ROAD
(DESIGNED BY OTHERS)
WESLEY BLVD.
FUTURE
PROP ℄ OF ROAD
EXIST ℄ OF ROAD
TOP OF WATERMAIN
STORM SEWER
SANITARY SEWER
STATION
LEGEND
WATERMAIN:
STORM:
SANITARY:
OTHER:
CLIENT
2599745 ONTARIO INC.
AND
THE CITY OF CAMBRIDGE
ISSUES
1 FIRST SUBMISSION 2020-02-06
2 RELEASED FOR TENDER 2020-03-10
3 GRCA COMMENTS 2020-03-27
4 CITY COMMENTS 2020-05-22
5 CITY 2ND ENG COMMENTS 2020-08-04
6 ISSUED FOR CONSTRUCTION 2020-09-25
KEY PLAN
PROJECT
BOSDALE SUBDIVISION
PROJECT NO: 121804
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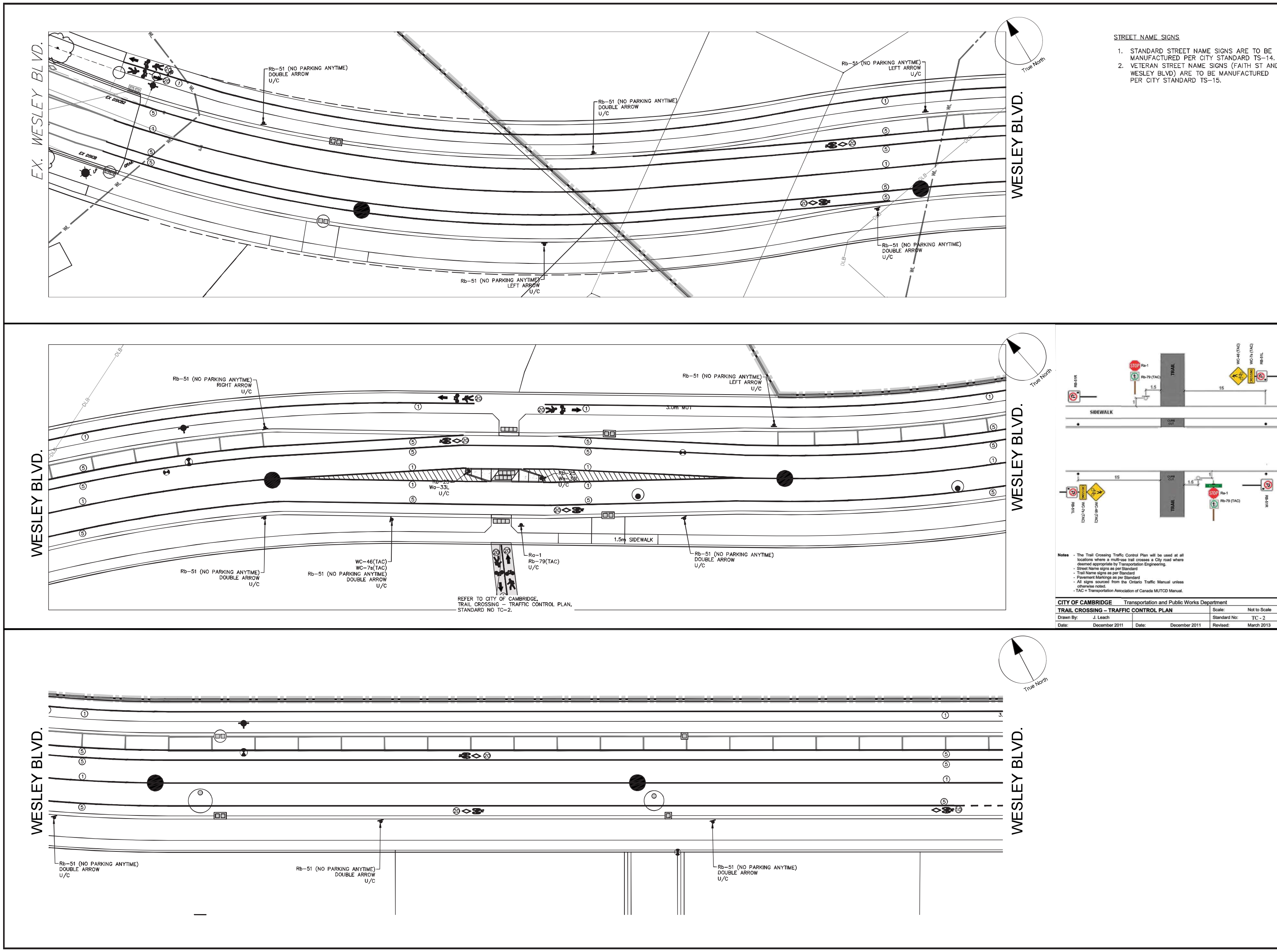
PROJECT MGR: JRP
APPROVED BY: JRP
SHEET TITLE
PLAN AND PROFILE
WESLEY BLVD
STA 3+475 TO STA 3+700
SHEET NUMBER
PP-5
ISSUE
6



STREET NAME SIGNS

1. STANDARD STREET NAME SIGNS ARE TO BE MANUFACTURED PER CITY STANDARD TS–14.
2. VETERAN STREET NAME SIGNS (FAITH ST AND WESLEY BLVD) ARE TO BE MANUFACTURED PER CITY STANDARD TS–15.

CLIENT

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ISSUES

No.	DESCRIPTION	DATE
1	FOR REVIEW	2020-09-22
2	CITY 2ND ENG COMMENTS	2020-09-04
3	ISSUED FOR CONSTRUCTION	2020-09-25

LEGEND

1. 333, 363, 393, DENOTES PAVEMENT MARKING SPACING (E., 3m LINE, 3m GAP, 3m LINE)
2. USE TO DENOTE PAVEMENT MARKING
3. USE ① TO DENOTE PAVEMENT MARKING, DURABLE
4. USE ① TO DENOTE PAVEMENT MARKING, TEMPORARY–REMOVABLE
5. USE △ TO DENOTE PAVEMENT MARKING, TEMPORARY

Rb–84A, Rb–51: REGULATORY SIGNS (THE ORDER THEY ARE DISPLAYED INDICATES HOW THEY SHOULD BE MOUNTED, EG. Rb–84A ON TOP OF Rb–51)
U/C: INDICATES SIGNS ARE TO BE MOUNTED IN THE GROUND ON A STEEL "U" CHANNEL
S/L: INDICATES SIGNS ARE TO BE MOUNTED ON A STREET LIGHT

SIGNS SHOWN ON A CONCRETE SURFACE ARE TO BE SLEEVED AND MOUNTED ON A STEEL "U" CHANNEL

RS ROAD SIGN

PAVEMENT MARKING LEGEND	
1	SOLID YELLOW, 10cm
2	SOLID DOUBLE YELLOW, 10cm
3	363 BROKEN YELLOW, 10cm
4	SOLID YELLOW, 20cm
5	SOLID WHITE, 10cm
6	333 BROKEN WHITE, 10cm
7	363 BROKEN WHITE, 10cm
9	SOLID WHITE, 20cm
10	111 BROKEN WHITE, 10cm
11	333 BROKEN WHITE, 20cm
13	333 BROKEN WHITE, 30cm
14	SOLID WHITE, 30cm
15	SOLID WHITE, 60cm
16	111 BROKEN WHITE, 45cm
20	SOLID WHITE, SYMBOLS AND ARROWS

LICENSED PROFESSIONAL ENGINEER 2020-09-25 J. R. R. PERKS PROVINCE OF ONTARIO

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Waterloo ON N2L 3V3 Canada
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PROJECT

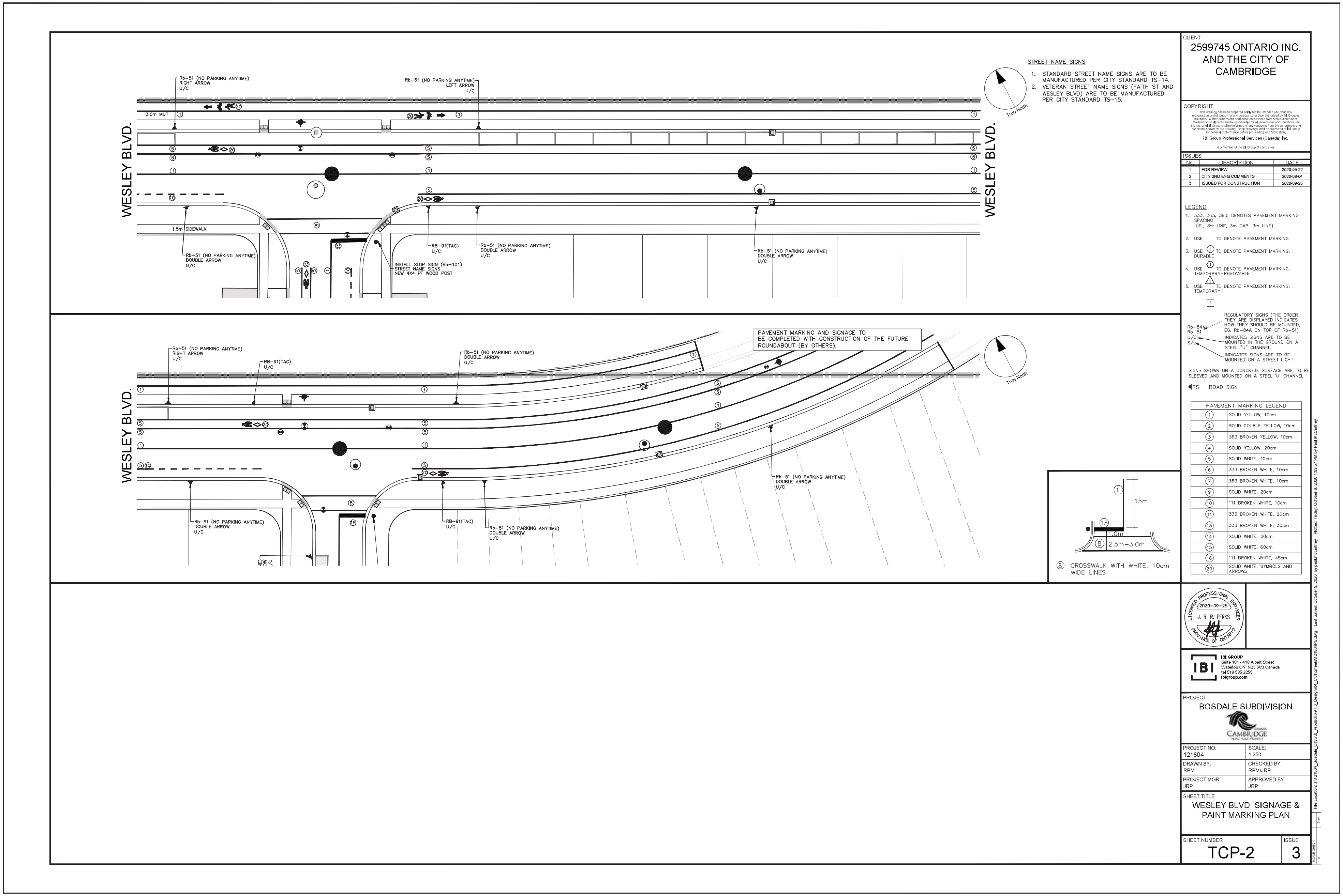
BOSDALE SUBDIVISION

PROJECT NO: 121804	SCALE: 1:250
DRAWN BY: RPM	CHECKED BY: RPM/JRP
PROJECT MGR: JRP	APPROVED BY: JRP

SHEET TITLE

WESLEY BLVD SIGNAGE & PAINT MARKING PLAN

SHEET NUMBER: TCP-1 ISSUE: 3


WESLEY BLVD.
Rb-51 (NO PARKING ANYTIME) RIGHT ARROW U/C
Rb-51 (NO PARKING ANYTIME) LEFT ARROW U/C
3.0m MUT
1.5m SIDEWALK
Rb-51 (NO PARKING ANYTIME) DOUBLE ARROW U/C
RB-91(TAC) U/C
INSTALL STOP SIGN (Ra-101) STREET NAME SIGNS NEW 4X4 PT WOOD POST
PAVEMENT MARKING AND SIGNAGE TO BE COMPLETED WITH CONSTRUCTION OF THE FUTURE ROUNDABOUT (BY OTHERS).
True North
STREET NAME SIGNS
1. STANDARD STREET NAME SIGNS ARE TO BE MANUFACTURED PER CITY STANDARD TS-14.
2. VETERAN STREET NAME SIGNS (FAITH ST AND WESLEY BLVD) ARE TO BE MANUFACTURED PER CITY STANDARD TS-15.
15m
1.0m
2.5m–3.0m
8 CROSSWALK WITH WHITE, 10cm WIDE LINES
CLIENT
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IBI Group Professional Services (Canada) Inc.
ISSUES
No. DESCRIPTION DATE
1 FOR REVIEW 2020-05-22
2 CITY 2ND ENG COMMENTS 2020-08-04
3 ISSUED FOR CONSTRUCTION 2020-09-25
LEGEND
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16 111 BROKEN WHITE, 45cm
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PROJECT
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CAMBRIDGE
PROJECT NO: 121804
SCALE: 1:250
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PROJECT MGR: JRP
APPROVED BY: JRP
SHEET TITLE
WESLEY BLVD SIGNAGE & PAINT MARKING PLAN
SHEET NUMBER
TCP-2
ISSUE
3

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Cambridge Joint Use Campus

STRUCTURAL DESIGN BRIEF

February 9, 2021

1 GENERAL

The purpose of this study is to outline the structural requirements and implications of constructing a multi-purpose facility that houses a school, a community and recreation complex and a library into one building. There are five different concepts being looked at and this brief will comment on the structural implications.

The new building will be constructed on an open field and we understand that there were no buildings constructed on this site in the past. Based on grading drawings prepared by IBI in 2019, the site slopes by about 3 to 4 meters from end to end. The elevation towards the south end of the site is about 297 m. The elevation at the NE corner is about 294 m and slopes down westward to about 291 m. We also understand that grading of the site is underway.

This brief will discuss the structural materiality that is common for all concepts and will address specific requirements related to stacking of different programs and location on the site.

1.1 APPLICABLE CODES AND STANDARDS

The building occupancy for purposes of the structural design will be treated as a school and a community centre, resulting in an importance category of “High” as specified under the 2012 Ontario Building Code

(OBC) Amendment 8. High importance classification is common to all uses of the proposed facility. Design environmental loading data for Cambridge will be as per Supplementary Standard SB-1. Additional requirements included in the User's Guide – NBC 2015 Structural Commentaries (Part 4 of Division B) will be considered.

2 STRUCTURAL SYSTEMS

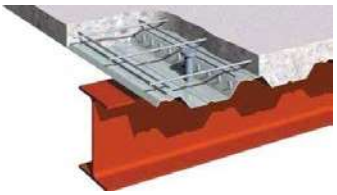
2.1 ROOF

The roof structure will consist of structural steel beams, open web steel joists and steel deck. Over the gymnasium, the deck will be a painted acoustic deck. The structural members and deck within the pool area will be galvanized or epoxy painted deck and steel members.

We expect that some mechanical units will be located on the roof with a screen for acoustic and aesthetics purposes. In these areas, the roof structure will have a concrete topping for the extent of the mechanical area. The roof screen will cantilever from the main roof structure. The main mechanical room will most likely be located on the second-floor level similar to a plant room in schools.

Concepts 4 and 5 show two separated buildings. The systems will be similar to the combined blocking schemes. Since the importance factor for the school and community are the same, combining or separating the two building blocks does not impact the structural costs other than any reduction of perimeter foundations. However, roofs with many different elevations cause snow piling and will add premium to the steel structure since the roof will have to support higher loads.

2.2 SECOND FLOOR



The structural materials could vary for the different schemes. However, based on the size of the project and local practices, it is our opinion that a structural steel solution maybe the most economical. Steel framing tends to be faster and less dependant on weather conditions. This also considers the fact that the roof will be steel due the large span requirements in many areas. In addition, steel tends to provide more flexibility such as achieving longer spans and to transfer columns between floors if required to accommodate the floor layouts.

The structural steel system will consist of 127 mm reinforced concrete topping on steel deck supported by composite steel beams (with shear studs) and steel deck. The columns will also be steel wide flange sections. The steel members would require fire proofing, but the topping on the deck can be designed to meet the fire separation requirements by increasing the topping thickness and avoiding spraying the underside of the deck.

In areas where mechanical room, gymnasium or exercise spaces are located over acoustically sensitive spaces such as the Idea Exchange, mitigation measures will be implemented. These measures include thicker concrete topping with stiffer beams as well as possibly a floating slab on acoustic isolators. In addition, measures can be taken to secure finishes in a manner to avoid transmission of noise and vibration between spaces and floors.

Concepts 1 and 3 have the Ideas Exchange under mechanical room or a gymnasium respectively and will require some isolation.

2.3 FOUNDATIONS

A geotechnical investigation report was prepared by Naylor Engineering Associates dated May 2015. The investigation was primarily done using shallow test pits. The investigation was for a new subdivision with lightweight housing units. Therefore, the report did not provide any information regarding foundation design bearing capacity, site classification or ground water conditions. However, the recommendation in the report is to remove all organic and fill materials before backfilling the site and to backfill in lifts of 300 mm using imported or excavated materials. Unfortunately, this does not provide adequate information to predict the foundation requirements for this type of recreation/school facility but is a good indication that the material under the slab on grade will be suitable. We recommend that certification of the backfill process be transferred to the design team once available. The report does mention wet soil conditions in some of the test pits; therefore, some allowance should be provided to deal with water during excavation. A geotechnical investigation with deep boreholes will be needed once the footprint of the building is set.

Concept 3 shows a linear building footprint along East Boundary Road and stretches from the south end to the north end of the site. We understand that grading can be changed to suit the future design elevation and connection to the roads. For now, we will assume that there will be a change in floor level which will require short retaining walls and stepping of footings along the length of the building.

We do not anticipate any need for shoring of excavation in any of the concepts due to vast free space around the footprint of the buildings.

SLAB-ON-GRADE

Interior Spaces

We anticipate that the slab-on-grade in interior spaces will be 125mm thick concrete slab reinforced with mesh reinforcement. The slab on grade will bear on well compacted granular subgrade. There will be depressions in areas where specialized flooring is required (such as spring flooring in gymnasia). In the gymnasium, special depressed flooring with moisture barrier will be placed for spring flooring. Localized slab thickening will be required under masonry partitions.

2.4 LATERAL LOAD RESISTING ELEMENTS

Lateral wind and earthquake loads will be resisted by steel cross bracing located in each direction that are hidden in exterior and interior walls. Elevator and stair well shaft walls will also be used as part of the lateral system. The lateral system will not be much difference between a single block or separate blocks since the roof levels are at different elevations and the diaphragm is not continuous. We anticipate each section will require its own lateral system. There will be several expansion joints, mainly between single storey portions such as the gymnasium, and the two storey portions.

2.5 POOL TANK

We expect the pool tank will be cast in place concrete. This can be done with either formed walls or use of shotcrete system. However prefabricated metal and lined systems may also be feasible.

3 BUILDING CODE REQUIREMENTS

3.1 GRAVITY LOADS

All structural elements will be designed to resist the loads meeting the requirements and allowances specified in the 2012 Ontario Building Code Amendment 8.

3.2 WIND LOADS

The design wind loads will be based on pressures and parameters recommended in the Ontario Building Code. Hourly wind pressures of 0.36 kPa will be used in the design of structural members for strength and deflections. This pressure represents reference velocity pressures on probabilities of being exceeded 1 in 50 years for strength and for serviceability. High Importance factor (Iw) for wind of 1.15, will be used for both the recreation centre as well as the school.

3.3 SEISMIC LOADS

The structure will be designed to withstand the seismic forces assigned to a high importance building category with an importance factor (Ie) of 1.3. The site classification needs to be determined by a geotechnical investigation. However, Cambridge is a lower seismic zone and therefore we do not expect that non-structural elements will need to be restrained. As mentioned earlier, High Occupancy classification is suitable for school and community centre.

3.4 STRUCTURAL DESIGN

Structural design will be undertaken using the Limit States approach in accordance with the Ontario Building Code and applicable referenced standards. ULS will be used for strength design; SLS will be used for serviceability checks.

4 STRUCTURAL MATERIALS AND STRENGTHS

The following represents the typical materials and strengths that will be used. Specific areas may be revised to meet the design criteria that could not be determined at this stage.

4.1 CONCRETE

Location	Strength	Remarks
Slab-on-Grade	25 MPa	Class C2
Exterior Slabs	35 MPa	Class C1
Interior Slabs (above grade)	35 MPa	Class N
Foundation Walls, Grade Beams, Footings	35/40 MPa	Class F2
Skim Coats	10 MPa	Class N
Exterior Un-reinforced Concrete (Sidewalks, Curbs, etc.)	30 MPa	Class C2

4.2 REINFORCING STEEL

Grade:	400 MPa
Sizes:	10M to 30M

4.3 STRUCTURAL STEEL:

New carbon steel conforming to G40 Series Structural Quality Steel

Rolled Shapes:	350 MPa
Hollow Structural Sections:	350 MPa
Angles and Plates:	300 MPa
38mm & 76mm Metal Decking:	230 MPa

All exterior exposed steel and pool structure shall be Hot-Dip Galvanized Steel.

5 SERVICEABILITY REQUIREMENTS

Serviceability requirements will be checked against the requirements specified in the Ontario Building Code and all other applicable reference standards including CSA Standards A23.3 Design of Concrete Structures and S16.1-01 Limit States Design of Steel Structures.

The structural systems will be designed to meet the following criteria:

Live Load Deflection	Span/360
Wind Storey Drift	Height/500
Seismic Storey Drift	Height/100

6 LEED STRATEGIES

Strategies related to LEED for building structures centre around maximizing recycled content, minimizing construction waste and total elimination and/or significant reduction in the use of materials containing VOC's, and designed to accommodate future flexibility in design.

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November 30, 2020

Ms. Maureen O'Shaughnessy
CS&P Architects
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Toronto, Ontario M4P 2E5
Maureen@csparch.com

RE: Proposed Mechanical Systems Revision 1
Cambridge JUC

Ms. O'Shaughnessy,

The following is a brief summary of the mechanical systems that are proposed for this project. We recommend that this proposal be reviewed by your organization and the Cost Consultants to determine if the systems meet all requirements, preferences, and budget constraints.

The Joint Use Complex in Design Concepts 1, 2, and 3 shall be designed to achieve LEED Gold. For Concepts 4 and 5, only the Recreational Centre building will be designed to achieve LEED Gold, the combined school facility in Concept 4 or the separate school buildings in Concept 5 shall be designed as per OBC energy requirements. The systems described in this brief may be modified or changed throughout the design phase as required to meet LEED Gold requirements.

1. Plumbing

    a. Piping Systems (applicable to all Design Concepts):

        i. The sanitary and the storm piping systems running within the building will be connected to new site service piping. All site service piping will connect to the municipal services.
        ii. The storm water system will be designed according to the allowable flow rate. Roof drain quantity, locations, and drain down time shall comply with Code requirements. Scupper drains shall be provided by others, as required to comply with Code requirements.
        iii. The incoming water service will serve all domestic water systems and an automatic wet sprinkler system.
        iv. Consideration shall be given to providing a Sullage system to supply Water Closets.
        v. A new gas service will be provided. All gas piping will be located on the exterior of the building except for the piping serving the new domestic water heaters, boilers, and the Science Classrooms (the amount of piping within the building will be kept to an absolute minimum).
        vi. Sanitary and storm piping systems will be plastic, copper, or cast iron according to OBC requirements.
        vii. Domestic water piping will be type 'L' copper. Plastic piping will not be permitted.
        viii. Isolation valves will be provided in the Corridor to isolate all fixture groups. Isolation

valves will not be provided for branches serving a single fixture except that where the fixture isolation valves are not easily accessible at the fixture, isolation valves in the branch piping will be provided in the Corridor.

ix. Hydronic heating and chilled water piping shall be schedule 40 steel complete with malleable iron screwed fittings, steel welded fittings, or grooved fittings.

b. Metering:

i. Metering for Concepts 1, 2, and 3 shall be provided as follows:

I A new utility-supplied water meter will be installed to service the entire complex.
II A new gas meter assembly will be supplied and installed by the local utility to service the entire complex.
III Private sub-metering of services to the Public School, Catholic School, and Childcare area will be included.

ii. Metering for Concept 4 shall be provided as follows:

I A new utility-supplied water meter will be installed for the Recreational Complex and for the combined school facility.
II A new gas meter assembly will be supplied and installed by the local utility at the Recreational Complex and at the combined school facility.
III Private sub-metering of the Public School or Catholic School (depending on ownership) and the Childcare will be included in the combined school facility.

iii. Metering for Concept 5 shall be provided as follows:

I A new utility-supplied water meter will be installed for each building.
II A new gas meter assembly will be supplied and installed by the local utility at each building.
III Private sub-metering of services to the Childcare area will be included within the Public School building.

c. Domestic Hot Water:

i. Domestic hot water (applicable to all Design Concepts):

I The Recreational Centre area shall have domestic hot water provided by a gasketed plate type, double walled heat exchanger (Taco PF series or equal), utilizing heating water as the heat source. The domestic hot water produced shall be stored in four 757 L (200 USG) vertical storage tanks (A.O. Smith TJV series or equal) at 57°C (135°F) for safety purposes.

1) Note that if ground source heat pumps are utilized as the building heating source (see Heating System section below), the Recreational Centre domestic hot water shall be provided by two gas fired, condensing water heaters (A.O. Smith BTH series or equal) complete with two 757 L (200 USG) vertical storage tanks (A.O. Smith TJV series or equal).

II The Public School, Catholic School, and Childcare areas will each be served by a dedicated tank-type, gas fired condensing water heater (A.O. Smith BTH series or equal) to allow for sub-metering (where required in Concepts 1, 2, 3, and 4). The water heaters will be set to store water at 57°C (135°F) for safety purposes.

III A central mixing valve will be provided at the storage tanks and each water heater to reduce the water temperature to 49°C (120°F) prior to delivery to the fixtures. The water temperature shall be further reduced as required by limit stops in the single handle faucets and by fixture mounted mixing valves (as applicable).
IV A hot water recirculating system will be provided for each water heater.

d. Water Softening (applicable to all Design Concepts):

i. The Recreational Centre area, Public School area, Catholic School area, and Childcare shall each have dedicated water softening systems.
ii. For Concepts 1, 2, and 3, the common heating water system shall be served by the Recreational area water softener.

e. Plumbing Fixtures (applicable to all Design Concepts):

i. Plumbing fixtures will be provided where indicated on the Architectural drawings.
ii. All water closets shall have a water consumption of 6.0L per flush.

I Where required by the user group, water closets shall be revised to meet the High Efficiency Toilet (HET) definition with a water consumption of 4.8L per flush.

iii. All water closets in the Recreation Centre area and Student Washrooms (excluding the Kindergarten areas) in the Public and Catholic School areas will be barrier-free height, elongated rim type, floor-mounted complete with flush valves.
iv. All water closets in the Staff Washrooms in the Public and Catholic School areas will be elongated rim, floor-mounted tank type.
v. All water closets in the Kindergarten Washrooms in the Public and Catholic School areas will be residential style round front, floor-mounted tank type to emulate home use.
vi. Wall-mounted lavatories shall be provided in Kindergarten washrooms in the Public and Catholic School areas mounted at 24" (610mm) above finished floor.
vii. Kindergarten classrooms in the Public and Catholic School areas shall include a high-level drop-in stainless steel sink with a single lever handle faucet for teacher use.
viii. Kindergarten classrooms in the Public and Catholic School areas shall also include a low-level stainless steel washfountain complete with two spray heads for student use.
ix. Wall-mounted drinking fountains shall be provided in Kindergarten classrooms in the Public and Catholic School areas mounted at 24" (610mm) above finished floor.
x. All lavatory faucets shall be sensor activated type and shall be complete with 0.5 GPM (1.9 LPM) outlets to reduce water consumption. All sink faucets shall be complete with 1.5 GPM (5.7 LPM) outlets.
xi. Elkay (or approved equal) non-refrigerated and non-filtered bottle fillers shall be provided throughout the corridors of the entire complex or throughout each building (as applicable).
xii. An eye wash station will be installed in all Custodial rooms.
xiii. Hose bibbs will be located so that the complete perimeter of the complex or individual buildings (as applicable) can be reached using a 30m (98ft) long hose.
xiv. Interior hose bibbs shall be provided at mop sinks.
xv. Floor drains shall be located in all washrooms, change rooms, custodial rooms, mechanical rooms, electrical rooms, and service rooms.
xvi. All trim for plumbing fixtures shall be Delta or approved equal.
xvii. Traps and trap seal primers shall be provided for all floor drains and standing wastes

according to OBC requirements.

2. Heating, Ventilation, and Air Conditioning (HVAC)

    a. Heating Systems:

        i. The heating system for Concepts 1, 2, and 3 shall be provided as follows:

            I Four high efficiency, modulating gas fired condensing boilers (Cleaver-Brooks CFC-E 4000 or equal) shall be provided as the primary heating source within the facility. Additionally, the following equipment shall be provided for the heating plant:

                1) System pumps complete with variable frequency drives.
                2) Boiler pumps.
                3) Chemical treatment system.
                4) Category IV gas venting system.
                5) Air separator.
                6) DDC controls.
                7) Expansion tank.

            II Heating plant piping shall utilize a primary-secondary arrangement whereby the boiler piping shall make up the primary piping loop and the system piping serving terminal heating equipment shall make up the secondary loop.

            III Consideration shall be given to providing ground source heat pumps (AERMEC or equal) as the primary heating source for all occupiable spaces within the facility based on the suitability of the site. The heat pumps shall be capable of recovering heat when simultaneous heating and cooling is required. The domestic hot water and pool heating systems shall be modified if ground source heat pumps are used. See applicable sections.

            IV Perimeter heating shall be provided by a combination finned tube radiation and fan-powered terminal units for all spaces with exterior exposure depending on space requirements.

            V Radiant in-floor heating shall be considered in certain spaces as an alternative to finned tube radiation or fan-powered terminal units based on user requirements (e.g. Kindergarten classrooms, Childcare toddler rooms, etc.). Radiant in-floor heating can provide higher operational efficiencies due to the low heating water temperatures utilized.

        ii. The heating systems for Concept 4 shall be provided as follows:

            I The Recreational Complex shall be served by three high efficiency, modulating gas fired condensing boilers (Cleaver-Brooks CFC-E 2000 or equal) as the primary heating source. The remainder of the heating system shall be as described above for Concepts 1, 2, and 3.

            II The combined school facility shall be heated by a combination of gas fired rooftop units (refer to Air Distribution Systems section for details on rooftop units) for the conditioned spaces (e.g. classrooms, offices, library, etc.) and a single high efficiency, modulating gas fired condensing boiler (Laars NTH 500 or equal) for areas not served by the rooftop units (e.g. washrooms, vestibules, stairs, utility rooms, etc.). The boiler system shall be complete with the following equipment:

1) Boiler pump.
2) System pump.
3) Chemical treatment system.
4) Category IV gas venting system.
5) Air separator.
6) DDC controls.
7) Expansion tank.

III In-floor heating shall not be provided.

iii. The heating systems for Concept 5 shall be provided as follows:

I The Recreational Complex shall be served by three high efficiency, modulating gas fired condensing boilers (Cleaver-Brooks CFC-E 2000 or equal) as the primary heating source. The remainder of the heating system shall be as described above for Concepts 1, 2, and 3.

II Both the Public School building and Catholic School building shall be heated as described above for the combined school facility in Concept 4 and each building shall have a single high efficiency, modulating gas fired condensing boiler (Laars NTH 399 or equal).

1) A second boiler shall be included where required by the user groups for redundancy.

iv. For all Design Concepts, wall mounted forced flow heaters shall provide heat for all entrance vestibules and exit stairwells. Ceiling suspended horizontal unit heaters shall provide heat for all un-conditioned storage and service spaces with exterior exposure. The forced flow and horizontal unit heaters shall utilize hot water as the heat source.

b. Cooling Systems:

i. The cooling system for Concepts 1, 2, and 3 shall be provided as follows:

I Two water-cooled magnetic bearing centrifugal chillers (Daikin WMC series or equal) shall provide chilled water as the primary cooling source for all conditioned spaces within the facility having an approximate load of 485 refrigeration tons (1,705 kW). The chillers condenser water loop shall be served by a two-cell cooling tower (Evapco UT series or equal), which shall be mounted on the roof. The following equipment shall be provided for the chilled water plant:

1) Chiller primary pumps.
2) Chilled water system pumps complete with variable frequency drives.
3) Condenser water pumps.
4) Chemical treatment systems.
5) Air separator.
6) DDC Controls.
7) Expansion tanks.

II The chilled water plant shall utilize a primary-secondary arrangement whereby the chiller piping connections shall make up the primary piping loop and the system piping serving air handling units shall make up the secondary piping loop.

III Consideration shall be given to providing ground source heat pumps (as described in the Heating System section above) as the primary cooling source for

all occupiable spaces within the facility based on the suitability of the site. The heat pumps shall be capable of recovering heat when simultaneous heating and cooling is required.

ii. The cooling systems for Concept 4 shall be provided as follows:

I The cooling system serving the Recreational Centre area shall be as described above for Concepts 1, 2, and 3, and shall meet a load of approximately 235 refrigeration tons (825 kW).

II The combined school facility shall be cooled by rooftop units (refer to Air Distribution Systems section for details on rooftop units) complete with direct expansion cooling coils.

iii. The cooling systems for Concept 5 shall be provided as follows:

I The cooling system serving the Recreational Centre area shall be as described above for Concepts 1, 2, and 3, and shall meet a load of approximately 235 refrigeration tons (825 kW).

II Both the Public School building and Catholic School building shall be cooled as described above for the combined school facility in Concept 4.

iv. For all Design Concepts, ductless split air conditioning units shall be provided for cooling I.T. rooms. For smaller I.T. rooms and electrical rooms with transformers, exhaust fans complete with reverse acting thermostats shall be provided to control temperature.

c. Air Distribution Systems:

i. Air distribution systems for Concepts 1, 2, and 3 shall be provided as follows:

I Indoor air handling units (Daikin CAH series or equal) shall distribute air throughout the facility and shall be complete with the following:

1) Hot water heating coil and chilled water cooling coil.
2) Low-leakage dampers.
3) Variable frequency drives for fan motors to allow variable air volume (VAV) control.
4) Low voltage terminal strip to permit use of third-party controls.
5) Economizer dampers.

II VAV boxes complete with heating coils to temper the supply air will be provided at each zone for individual temperature control.

III Dedicated air handling units will be provided for each gymnasium. Gymnasium units shall be complete with demand controlled ventilation to reset the outdoor air damper position when high levels of carbon dioxide are measured in the space. The units serving the Public School and Catholic School gymnasiums shall be without mechanical cooling. Free cooling shall be provided using the economizers.

IV Large, centralized indoor energy recovery ventilators (Daikin CAH series or equal) shall be provided to recovery energy from building exhaust (washrooms, changerooms, etc.) and to distribute ventilation air to each of the air handling units. The energy recovery ventilators shall be complete the following:

1) Hot water heating coil and chilled water cooling coil.
2) Low-leakage dampers.

3) Energy recovery enthalpy core.
4) Variable frequency drives for fan motors to allow VAV control.
5) Low voltage terminal strip to permit use of third party controls.

ii. Air distribution systems for Concept 4 shall be provided as follows:

I Air distribution for the Recreational Centre shall be as described above for Concepts 1, 2, and 3.

II Air distribution, including ventilation air, for the combined school facility shall be provided by packaged gas fired / direct expansion rooftop units (Carrier 48HC series or equal) complete with the following:

1) Economizer.
2) Stainless steel heat exchanger.
3) Two-stage gas heat control.
4) Two-stage cooling control.
5) 610mm (24") high roof curb.
6) Variable volume-temperature (VVT) zone dampers and bypass damper to allow room by room temperature control.
7) Demand controlled ventilation.

III Rooftop energy recovery ventilators (Aldes PE series or equal) shall be provided for the combined school facility to recovery energy from building exhaust and to distribute ventilation air to each of the rooftop unit return ducts. Rooftop energy recovery ventilators shall be without heating and cooling.

IV The gymnasiums in the combined school facility shall each be served by a gas fired rooftop heating and ventilating unit (Daikin DAH series or equal) complete with following:

1) Economizer.
2) Modulating gas burner.
3) Exhaust fan.
4) 610mm (24") high roof curb.
5) Demand controlled ventilation.

V Where required by the user groups occupying the combined school facility, cooling shall be added to one or both gymnasiums. Where cooling is added, the rooftop unit shall be revised to Daikin DPS series or equal complete with direct expansion cooling coil and modulating cooling control.

iii. Air distribution systems for Concept 5 shall be provided as follows:

I Air distribution for the Recreational Centre shall be as described above for Concepts 1, 2, and 3.

II Air distribution for both the Public School building and Catholic School building shall be as described above for the combined school facility in Concept 4.

d. Exhaust Systems:

i. Commercial kitchen exhaust system compliant with NFPA 96 shall be provided where required.
ii. Washrooms, changerooms, custodial rooms, etc. shall be served by the energy recovery ventilators as previously described above. The ventilators shall operate during all occupied hours.

iii. All exhaust systems controlled by the BAS will be controlled to remain operational on a fire alarm condition.

e. Indoor Pool Water Heating and Dehumidification System:

i. Dehumidification system (applicable for all Design Concepts):

- The indoor pool shall be served by a standalone indoor dehumidifier (Dectron LD series or equal) complete with following:

1) Direct expansion evaporator coil.
2) Hot gas reheat coil.
3) Internal water-cooled condenser.
4) Remote mounted dry cooler (to be located on the roof).
5) Exhaust fan.
6) Internal pool water heater (utilizes condenser heat).

ii. Pool water heating system (applicable for all design concepts):

- Pool water heating shall be provided by a gasketed plate type heat exchanger (Taco PF series or equal) utilizing heating water as the heat source.

1) Note that if ground source heat pumps are utilized as the building heating source (see Heating System section above), a high efficiency, modulating gas fired condensing boiler (Cleaver-Brooks CFC-E 1500) shall be provided in the pool equipment room to provide heating water to the gasketed plate type heat exchanger.

f. De-stratification Systems:

i. To control de-stratification in the Gymnasiums, high volume low speed (HVLS) fans and low-level return air grilles will be provided.

g. Building Automation System:

i. A building automation system (BAS) will be used to monitor and control the HVAC, plumbing and electrical systems.
ii. System operation data will be available for retrieval and logging through the internet by a web-based interface.
iii. Unless otherwise noted, thermostats with slide bar adjustment and an over-ride push-button will be used throughout the building. Plate type sensors having no adjustment capability or night setback over-ride capability will be used in the Corridors.
iv. BACnet protocol shall be utilized.
v. The above features shall be modified or additional features shall be added as directed by the user groups.

h. Cost Implications of HVAC System Selection:

i. The centralized heating, cooling, and air distribution systems proposed for Design Concepts 1, 2, and 3 can provide significant operational cost savings over the systems proposed for Design Concepts 4 and 5. Energy savings can be realized by more efficient equipment, energy recovery, and control strategies to increase part load efficiencies, and

maintenance costs can be reduced by using fewer pieces of equipment in fewer locations. Additionally, the high diversity of heating and cooling loads increases equipment efficiencies and reduces capital costs of central plant equipment.

ii. A decentralized approach to HVAC systems was proposed for Concept 4 due to the separation of the combined school facility and the Recreational Centre. The decentralized approach can lead to higher operational costs due to less efficient equipment, more equipment to be maintained, and lower load diversity. However, the capital cost of the decentralized equipment can be considerably lower.

iii. In Concept 5, the HVAC systems are further decentralized. This will likely lead to the highest operational costs of all Design Concepts due to the amount of equipment provided and the lowest load diversity. Furthermore, the capital cost is unlikely to be less than that of Concept 4 because a larger number of smaller pieces equipment are required.

3. Sprinkler System:

    a. Sprinkler system zone devices and alarm valves will be located in the water service entrance room.
    b. The piping system will be zoned according to the area limitations of NFPA 13.
    c. The fire department connection will be located adjacent to the fire route.
    d. Sprinklers will be as follows:

        i. Concealed sprinklers in all Washrooms and Corridors.
        ii. Recessed pendant sprinklers in the Classrooms, Staff Areas and Childcare areas.
        iii. Upright and sidewall sprinklers in utility, storage, mechanical and electrical rooms and in areas with no suspended ceiling as required for proper coverage.

If you have questions or require any additional information, please do not hesitate to contact our office.

Regards,

Andrew Berg, P. Eng.
Mechanical Engineer

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November 19, 2020

Ms. Maureen O'Shaughnessy
CS&P Architects
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Toronto, Ontario M4P 2E5
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RE: Proposed Electrical Systems
Cambridge JUC

Ms. O'Shaughnessy ,

The following is a brief summary of the electrical systems that are proposed for this project. We recommend that this proposal be reviewed by your organization and the Cost Consultants to determine if the systems meet all requirements, preferences and budget constraints.

1. Site Servicing

   a. The proposed site is currently unserviced. The local electrical utility (Energy +) anticipates that a three-phase high voltage service will be extended to the property as part of the subdivision servicing.
   b. Energy + will provide utility owned transformation to up to 3000 kVA to each property. This will be more than sufficient for any of the five concepts. Note that it is assumed that lots will be legally severed for Concepts 4 and 5 where there are two and three buildings respectively.
   c. For Concepts 1, 2 & 3, one building is proposed. A 2000 kVA utility owned transformer is recommended for each.
   d. For Concept 4, two buildings are proposed. A 1000 kVA utility owned transformer is recommended for each.
   e. For Concept 5, three buildings are proposed. A 500 kVA utility owned transformer is recommended for each of the school buildings and a 1000 kVA transformer is recommended for the Fitness and Library building.
   f. The costs associated with Energy + work can be estimated at $60,000 per transformer.
   g. Aluminum secondary conductors are proposed for secondary feeders. To mitigate costs, the length of the secondary feeders should be minimized.
   h. The service will be 600/347V, three phase, four wire.
   i. The service entrance board, utility metering and distribution shall be located within the main electrical room located centrally, near an outside wall on either the main floor or the basement. Direct exterior access is not anticipated.
   j. A temporary service will be required to aide with construction.
   k. Underground conduits shall be provided for three-six pack portable classrooms.
   l. Electric Vehicle (EV) charging stations shall be roughed in. A total of fifteen rough-is are suggested for the site. If LEED Gold is desired for the Fitness Centre/Library building, four EV chargers should be provided on the rough-ins.
   m. Communication duct banks (3-100mm) will be provided from the street to the main

communications room of each building. The main communications room should be located near the main electrical room as described above.

n. Communications services from the respective sources to the demarcation point in the communications room shall be the responsibility of the respective utilities (Rogers, Bell, etc.).
o. The costs associated with the communications providers work is unknown.

2. Site Lighting

a. Exterior lighting will be accomplished with LED heads mounted on poles, or on the building.
b. Illumination levels and uniformity will comply with the local municipal standards. An average of 20lx and average to minimum ratio of 4:1 will be provided.
c. Exterior lighting shall be controlled by an astronomic time signal from the from the Building Automation System (BAS).
d. Provision (rough-ins) shall be provided for future illumination of the sports field.
e. Provisions (rough-ins) shall be provided for illuminated road signs. One sign is anticipated for each driveway entrance.
f. Accent lighting may be provided for any unique site features.

3. Service Entrance

a. The main service entrance switchboard will be 600V, three phase, four wire and sized as follows:
    i. Concept 1: 2000A
    ii. Concept 2: 2000A
    iii. Concept 3: 2000A
    iv. Concept 4:
        1. 1200A for school building.
        2. 1200A for Fitness and Library
    v. Concept 5:
        1. 600A for WRDSB school building.
        2. 600A for WCDSB school building.
        3. 1200A for Fitness and Library
b. Each switchboard shall incorporate the following:
    i. Wire way to permit cable entry & bus termination.
    ii. A LSIG main breaker ampacity as indicated above. The interrupting rating shall be sized to suit the available fault current.
    iii. A metering compartment suitable to house Energy + equipment. The compartment shall be linked to a remote metering cabinet. A single utility meter shall be provided by Energy +.
    iv. Customer digital meter connected to BAS for customer monitoring.
    v. Grounding conductors to the electrical service ground.
    vi. Bonding conductors to the metallic water piping, natural gas service, IT hubs, elevators, structural steel.
    vii. Provision for power failure relays, tied to the intrusion alarm system for offsite notification of a utility power failure or phase loss condition.
    viii. Distribution section containing over current protection devices (breakers) for the proposed 600V loads.
c. All building feeders greater than and equal to 100A shall be aluminum alloy. All smaller feeders and branch circuit conductors shall be copper.
d. Provisions shall be made for future rooftop photovoltaic generation and associated net metering for each building.

4. Emergency Power Supply - Generator

a. A natural gas emergency generator shall be exterior pad mounted in a weatherproof, sound-attenuated enclosure. Preliminary standby size is as follows:
    i. Concepts 1,2&3: 500kW.
    ii. Concept 4:
        1. School building: Not applicable, not required.
        2. 200kW for Fitness and Library.
    iii. Concept 5:
        1. WRDSB school building: Not applicable, not required.
        2. WCDSB school building. Not applicable, not required.
        3. 200kW for Fitness and Library.
b. The equipment shall conform to the requirements of CAN-CSA C282-15 Emergency Electrical Power Supply for Buildings.
c. For each generator set, there shall be two 600V, 3-pole, solid neutral automatic transfer switches, without bypass isolation.
    i. The first shall serve the life safety systems including the fire alarm, emergency lighting and exit signs.
    ii. The second shall serve backup (non-life safety) systems including communications equipment, elevator(s), the boiler system, etc.
d. Provisions will be included for load bank testing the generator from grade.
e. Auxiliary contacts will be provided for connection to the fire alarm system as well as BAS.
f. The water pressure available at the site is anticipated to be adequate for fire protection. A fire pump and associated emergency power provisions are not anticipated.

5. Emergency Power Supply – Unit Battery System

    a. Emergency lighting will be provided from strategically placed battery packs located throughout the school buildings in Concepts 4 and 5.

6. Power Distribution

    a. The majority of large mechanical loads are anticipated to require 600V. Remote 600/347V power distribution (panels, boards, motor control centres) are proposed near these loads.
    b. Exterior lighting will be served from 600/347V distribution.
    c. The elevators are assumed to require 600V.
    d. Step down transformers will be provided strategically throughout the building to create isolated 208/120V systems to be used for lighting, receptacle and general purpose loads.
    e. Copper-wound transformers are proposed to step down the voltage for the building loads to 120/208V distribution panels. Transformers will comply with Schedule 6 of the Green Energy Act for energy efficiency.
    f. A Surge Suppression Device (SPD) will be mounted within select 120/208V distribution boards serving critical systems.
    g. Panels shall be surface or recessed as required. All panel bus bars shall be tin plated aluminum. Each panel shall have a minimum of sixty branch circuit positions.
    h. All surface mounted distribution equipment shall be complete with drip shields, suitable for use in sprinklered environment.
    i. A Coordination and Fault Current Study (CFCS), as well as an Arc Flash Analysis are proposed to be included within the electrical scope of work.
    j. Modular Uninterruptible Power Supplies (UPS)s shall be provided where important loads such as IT equipment require 'no break' during a power outage.

7. Wiring Installations and Devices

a. All wiring in noncombustible areas, unless otherwise noted, shall be CSA approved soft copper, type T90/TWN75 in conduit, unless otherwise required by the Electrical Code for specific areas or environmental conditions.
b. Voltage drop shall not exceed 3% in branch circuit or 2% in any feeder in accordance with the Ontario Electrical Safety Code (OESC) and ASHRAE 90.1-13. The minimum wire size shall be #12 AWG.
c. All wiring situated in a return air plenum shall be totally enclosed in a noncombustible raceway or shall be FT6-rated (also known as Communications Media Plenum, or CMP).
d. The Contractor shall provide raceways and junction boxes for low voltage cabling associated with access controls. All electrical installations shall be in accordance with OBC 3.8 Barrier-Free Design.
e. The Contractor shall provide consoles in all teaching spaces.
f. Large spaces such as the Gymnasium, Learning Commons and Performance Commons shall be equipped with assistive listening devices in accordance with OBC 3.8.3.7.
g. Wiring, disconnect switches, motor starters, etc., shall be provided for all Owner-supplied and mechanical equipment.
h. Wiring devices shall be heavy duty specification grade. Cover plates shall also be specification grade stainless steel.
i. All 15A and 20A receptacles (CSA 5-15R and 5-20R) shall be the tamper resistant type.
j. Electric hand dryers shall be provided in the washrooms.
k. Electric hair dryers may be provided in the changerooms at fitness and pool areas.
l. Battery powered clocks are proposed with synchronization to the public address controller in school areas.

8. Interior Lighting

a. Lighting of the building interior will be solid state (LED) for efficiency and energy savings, and to reduce maintenance costs.
b. Colour temperature shall be 3,500K.
c. Target illumination in the teaching spaces is an average of 540lx at desk height.
d. Target illumination in the corridors is an average of 215lx at floor level.
e. The administrative areas, Gymnasium, Learning Commons, Performance Commons, teaching spaces, library and the Childcare will include dimming controls.
f. Wired, low voltage lighting controls as manufactured by nLight or approved alternate are recommended.
g. Night lighting will be provided in limited amounts throughout.
h. The lighting in the corridors and stairs shall conform to OBC 3.2.7.1. and be controlled with occupancy sensors.
i. Lighting power densities will be in accordance with OBC SB-10 Energy Efficiency requirements.
j. Emergency lighting shall meet or exceed the requirements of OBC 3.2.7.3. through typical lighting sourced from the emergency generator and or unit battery packs.
k. Illuminated, running-man exit signs shall be provided in accordance with OBC 3.4.5.

9. Fire Alarm and Detection System

a. An addressable, single stage, fire alarm and detection system is proposed in accordance with OBC 3.2.4 and CAN/ULC-S524-14. The system will extend throughout and shall include the following:
    i. A control panel centrally located in main electrical or main communications room.
    ii. An LCD and LED annunciator, complete with passive zoning graphic at main entrance.
    iii. An LCD annunciator, complete with passive zoning graphic, located at main administrative areas.
    iv. Initiating devices (smoke detectors, pull stations, etc.).

v. Signaling devices (horns with LED strobes).
vi. Ancillary devices as required, including magnetic hold open devices, HVAC interlocks, kitchen fire suppression system interlocks, elevator interlocks, etc.
vii. Monitoring equipment that is listed for Fire Protective Service in accordance with OBC 3.2.4.8.
viii. All accessories required to furnish a complete operational system.

b. Approved manufacturers include Chubb Edwards and Simplex.
c. For Concepts 4 and 5, a fire alarm control panel will be provided in each building and will not be networked together.

10. Communications, Information Technology (IT) and Security Systems

a. Provision of exterior requirements shall be as described in the 'Site Servicing' section.
b. Multiple backboards shall be provided at the demarcation in the main communications room. The backboards shall be painted with two coats of fire-retardant paint and shall include a lug bonded to electrical service ground.
c. From the backboards, conduits, cable tray, sleeves, or communications hangers shall be provided to all accessible ceiling spaces throughout the facility. Pull boxes shall be provided as required.
d. Vertical, fire-rated conduit risers shall link first and second floors in strategic locations.
e. The maximum distance between any telecommunications outlet and a horizontal cross connect shall be no more than 90 meters in accordance with ANSI/TIA/EIA 568 standards. Remote communications closets will be provided when this distance is exceeded.
f. Backbone cabling between cross connects is recommended to be 50µm multimode, laser optimized fibre within innerduct.
g. To suit the premise cabling, a 21mm or 27mm conduit shall be provided from each outlet box to the nearest accessible ceiling space.
h. Spare conduits shall be provided to accommodate potential future expansion.
i. All equipment and associated cabling for the following systems are proposed to be supplied and installed by others:
    i. Intrusion alarm.
    ii. Surveillance.
    iii. Access controls.
    iv. Assistive listening outside of code-mandated areas. It is to be determined if these systems are desired in the teaching spaces.
    v. Gym sound.
    vi. Audio/visual.
    vii. Safe Welcome. An entrance control system for each applicable program.
    viii. Computer (data).
    ix. Telephone (voice).
    x. Public address.
j. The Contractor shall coordinate to supply the proper infrastructure (rough-in work) for the installations.

If you have questions or require any additional information on the proposed systems, please do not hesitate to contact our office.
Regards,

Paul Gubbels, P. Eng.
Electrical

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Elemental Cost Summaries

COST SUMMARY

Project No. can21291
Rev. 4
Feb 1, 2021

Turner & Townsend

CAMBRIDGE JUC FEASIBILITY STUDY
CONCEPT COST ANALYSIS

EXECUTIVE SUMMARY 1

		CONSOLIDATED BUILDING CONCEPTS									SEPARATED BUILDING CONCEPTS					
		CONCEPT 1			CONCEPT 2			CONCEPT 3			CONCEPT 4			CONCEPT 5		
SI	DESCRIPTION	GFA	$/sf	Amount	GFA	$/sf	Amount	GFA	$/sf	Amount	GFA	$/sf	Amount	GFA	$/sf	Amount
	PROJECT COSTS															
	WRDSB - Waterloo Region District School Board															
1	WRDSB - Building Cost	50,741	$217	$11,032,000	51,990	$205	$10,672,000	53,206	$212	$11,306,000	52,773	$201	$10,602,000	54,896	$205	$11,280,000
2	WRDSB - Site Cost			$1,976,000			$1,931,000			$2,175,000			$1,478,000			$1,635,000
	Sub-total WRSDB Construction Costs	50,741	$256	$13,008,000	51,990	$242	$12,603,000	53,206	$253	$13,481,000	52,773	$229	$12,080,000	54,896	$235	$12,915,000
3	WRDSB - Soft Cost Allowance - 15%			$1,951,000			$1,890,000			$2,022,000			$1,812,000			$1,937,000
	WRDSB - TOTAL PROJECT BUDGET (EXCL HST)	**50,741**	**$295**	**$14,959,000**	**51,990**	**$279**	**$14,493,000**	**53,206**	**$291**	**$15,503,000**	**52,773**	**$263**	**$13,892,000**	**54,896**	**$271**	**$14,852,000**
	CC - Childcare Centre															
4	CC - Building Cost	8,934	$250	$2,234,000	8,611	$250	$2,149,000	8,503	$247	$2,102,000	8,503	$250	$2,129,000	8,665	$257	$2,230,000
5	CC - Site Cost			$232,000			$224,000			$249,000			$176,000			$168,000
	Sub-total CC Construction Costs	8,934	$276	$2,466,000	8,611	$276	$2,373,000	8,503	$276	$2,351,000	8,503	$271	$2,305,000	8,665	$277	$2,398,000
6	CC - Soft Cost Allowance - 15%			$370,000			$356,000			$353,000			$346,000			$360,000
	CC - TOTAL PROJECT BUDGET (EXCL HST)	**8,934**	**$317**	**$2,836,000**	**8,611**	**$317**	**$2,729,000**	**8,503**	**$318**	**$2,704,000**	**8,503**	**$312**	**$2,651,000**	**8,665**	**$318**	**$2,758,000**
	WCDSB - Waterloo Catholic District School Board															
7	WCDSB - Building Cost	40,935	$229	$9,362,000	39,267	$229	$8,978,000	42,528	$233	$9,899,000	41,335	$216	$8,944,000	42,001	$224	$9,425,000
8	WCDSB - Site Cost			$1,601,000			$1,512,000			$1,749,000			$1,366,000			$1,285,000
	Sub-total WCSDB Construction Costs	40,935	$268	$10,963,000	39,267	$267	$10,490,000	42,528	$274	$11,648,000	41,335	$249	$10,310,000	42,001	$255	$10,710,000
9	WCDSB - Soft Cost Allowance - 15%			$1,644,000			$1,574,000			$1,747,000			$1,547,000			$1,607,000
	WCDSB - TOTAL PROJECT BUDGET (EXCL HST)	**40,935**	**$308**	**$12,607,000**	**39,267**	**$307**	**$12,064,000**	**42,528**	**$315**	**$13,395,000**	**41,335**	**$287**	**$11,857,000**	**42,001**	**$293**	**$12,317,000**
	REC - Recreation Centre															
10	REC - Building Cost	103,670	$387	$40,077,000	115,676	$380	$43,925,000	106,375	$382	$40,584,000	105,842	$391	$41,377,000	105,842	$391	$41,377,000
11	REC - Site Cost			$3,088,000			$2,949,000			$3,141,000			$3,615,000			$3,377,000
	Sub-total REC Construction Costs	103,670	$416	$43,165,000	115,676	$405	$46,874,000	106,375	$411	$43,725,000	105,842	$425	$44,992,000	105,842	$423	$44,754,000
12	REC - Soft Cost Allowance - 30%			$12,950,000			$14,062,000			$13,118,000			$13,498,000			$13,426,000
	REC - TOTAL PROJECT BUDGET (EXCL HST)	**103,670**	**$541**	**$56,115,000**	**115,676**	**$527**	**$60,936,000**	**106,375**	**$534**	**$56,843,000**	**105,842**	**$553**	**$58,490,000**	**105,842**	**$550**	**$58,180,000**
	IE - Idea Exchange															
13	IE - Building Cost	13,600	$302	$4,113,000	13,600	$302	$4,113,000	13,600	$292	$3,965,000	13,600	$330	$4,492,000	13,600	$330	$4,492,000
14	IE - Site Cost			$407,000			$390,000			$367,000			$312,000			$302,000
	Sub-total Idea Exchange Construction Costs	13,600	$332	$4,520,000	13,600	$331	$4,503,000	13,600	$319	$4,332,000	13,600	$353	$4,804,000	13,600	$353	$4,794,000
15	IE - Soft Cost Allowance - 30%			$1,356,000			$1,351,000			$1,300,000			$1,441,000			$1,438,000
	IE - TOTAL PROJECT BUDGET (EXCL HST)	**13,600**	**$432**	**$5,876,000**	**13,600**	**$430**	**$5,854,000**	**13,600**	**$414**	**$5,632,000**	**13,600**	**$459**	**$6,245,000**	**13,600**	**$458**	**$6,232,000**
	CONTINGENCIES															
16	Design Allowance			Included			Included			Included			Included			Included
17	Escalation Allowance - we recommend 4% to 5% p.a. to mid-point of construction schedule			Excluded			Excluded			Excluded			Excluded			Excluded
18	Construction Contingency Allowance - Post Contract - by Owner			Excluded			Excluded			Excluded			Excluded			Excluded
	TOTAL OVERALL PROJECT CONSTRUCTION COSTS	**217,880**	**$340**	**$74,122,000**	**229,144**	**$335**	**$76,843,000**	**224,213**	**$337**	**$75,537,000**	**222,053**	**$335**	**$74,491,000**	**225,003**	**$336**	**$75,571,000**
	TOTAL OVERALL PROJECT SOFT COST ALLOWANCE			**$18,271,000**			**$19,233,000**			**$18,540,000**			**$18,644,000**			**$18,768,000**
	TOTAL OVERALL PROJECT BUDGET (EXCL HST)	**217,880**	**$424**	**$92,393,000**	**229,144**	**$419**	**$96,076,000**	**224,213**	**$420**	**$94,077,000**	**222,053**	**$419**	**$93,135,000**	**225,003**	**$419**	**$94,339,000**
		X-CHECK		*$92,393,000.00*			*$96,076,000.00*			*$94,077,000.00*			*$93,135,000.00*			*$94,339,000.00*

COST SUMMARY

Project No. can21291
Rev. 4
Feb 1, 2021

Turner & Townsend

CAMBRIDGE JUC FEASIBILITY STUDY
CONCEPT COST ANALYSIS

EXECUTIVE SUMMARY 1

Notes:

1 The above is an opinion of Probable Cost Only. Our estimate is based on Conceptual Sketches provided. Costs will vary as design evolves and details are developed. We recommend that this estimate is updated at all design stages
2 The above amount assumes that the project is to be procured via Stipulated Lump Sum contract
3 We would note the current situation with COVID-19 may affect the supply of labour and material on this project. We are unable to provide an opinion of the likely impact at this time, therefore have not included for any additional costs or schedule delays. However, we will continually monitor the situation and once we become aware of any supply issues that may affect the project, we will inform you.
4 As advised by Consultants, the above estimate assumes LEED Gold is applicable only to REC and IE. Schools and CC are not to LEED Specifications and to to typical school specifications
5 For Concepts 4, 5 and 7, our estimate assumes that the Schools and CC buildings are tendered as separate projects, to typical school specifications, and will be completed by Tier 2 standard school contractors

The following have been specifically excluded:

1 HST
2 Removal of Contaminated Material, if any
3 Construction Price Escalation Beyond 4Q 2020
4 Construction Contingency
5 Premiums for Single Sourced Materials
6 Schedule Acceleration Premium
7 LEED Premiums beyond LEED Gold (for REC and IE Only)
8 AESS Grade Steel

C S & P Architects Inc
Cambridge JUC Feasibility Study

ELEMENTAL ESTIMATE

ELEMENTAL COST SUMMARY
CONCEPT COST ANALYSIS

Turner & Townsend

Project:	Concept 1 Estimate	Cat:	
Location:	Cambridge, ON	File:	MS-DD-R4
Owner/Client:	Cambridge JUC	Date:	Feb 1, 2021
Architect:	C S & P Architects Inc	Project Number:	can21291
		Gross Floor Area:	**20,242 m2**

Element	Ratio to GFA	Elemental Quantity	Elemental Unit Rate	Elemental Amount	Cost/m2	Amount	
A SHELL							
A1 SUBSTRUCTURE					**$122.32**		
A11 Foundation	0.70	14,093 m2	$166.96	$2,353,000	$116.24		
A12 Basement Excavation	0.17	3,360 m3	$36.61	$123,000	$6.08	**$2,476,000**	**3%**
A2 STRUCTURE					**$386.52**		
A21 Lowest Floor Construction	0.70	14,093 m2	$76.56	$1,079,000	$53.31		
A22 Upper Floor Construction	0.30	6,149 m2	$443.65	$2,728,000	$134.77		
A23 Roof Construction	0.70	14,093 m2	$285.04	$4,017,000	$198.45	**$7,824,000**	**11%**
A3 EXTERIOR ENCLOSURE					**$482.91**		
A31 Walls Below Grade	0.02	400 m2	$700.00	$280,000	$13.83		
A32 Walls Above Grade	0.31	6,348 m2	$503.94	$3,199,000	$158.04		
A33 Windows & Entrances	0.07	1,416 m2	$1,152.54	$1,632,000	$80.62		
A34 Roof Covering	0.70	14,093 m2	$256.37	$3,613,000	$178.49		
A35 Projections	1.00	20,242 m2	$51.92	$1,051,000	$51.92	**$9,775,000**	**13%**
B INTERIORS							
B1 PARTITIONS & DOORS					**$290.19**		
B11 Partitions	1.03	20,759 m2	$236.87	$4,917,000	$242.91		
B12 Doors	0.02	329 No	$2,908.81	$957,000	$47.28	**$5,874,000**	**8%**
B2 FINISHES					**$231.55**		
B21 Floor Finishes	0.91	18,342 m2	$128.45	$2,356,000	$116.39		
B22 Ceiling Finishes	0.91	18,343 m2	$85.70	$1,572,000	$77.66		
B23 Wall Finishes	1.64	33,146 m2	$22.90	$759,000	$37.50	**$4,687,000**	**6%**
B3 FITTINGS & EQUIPMENT					**$303.53**		
B31 Fittings & Fixtures	1.00	20,242 m2	$118.42	$2,397,000	$118.42		
B32 Equipment	1.00	20,242 m2	$171.52	$3,472,000	$171.52		
B33 Conveying Systems	0.00	7 Stp	$39,285.71	$275,000	$13.59	**$6,144,000**	**8%**
C SERVICES							
C1 MECHANICAL					**$590.26**		
C11 Plumbing & Drainage	1.00	20,242 m2	$122.57	$2,481,000	$122.57		
C12 Fire Protection	1.00	20,242 m2	$41.45	$839,000	$41.45		
C13 H.V.A.C.	1.00	20,242 m2	$389.98	$7,894,000	$389.98		
C14 Controls	1.00	20,242 m2	$36.26	$734,000	$36.26	**$11,948,000**	**16%**
C2 ELECTRICAL					**$296.31**		
C21 Service & Distribution	1.00	20,242 m2	$92.93	$1,881,000	$92.93		
C22 Lighting, Devices & Heating	1.00	20,242 m2	$110.27	$2,232,000	$110.27		
C23 Systems & Ancillaries	1.00	20,242 m2	$93.12	$1,885,000	$93.12	**$5,998,000**	**8%**
NET BUILDING COST (Excluding Site)					$2,703.59	**$54,726,000**	**74%**
D SITE & ANCILLARY WORK							
D1 SITE WORK					**$295.43**		
D11 Site Development	5.11	103,442 m2	$46.69	$4,830,000	$238.61		
D12 Mechanical Site Services	5.11	103,442 m2	$7.25	$750,000	$37.05		
D13 Electrical Site Services	5.11	103,442 m2	$3.87	$400,000	$19.76	**$5,980,000**	**8%**
D2 ANCILLARY WORK					**$0.00**		
D21 Demolition	0.00	0 m2	$0.00	$0	$0.00		
D22 Alterations	0.00	0 m2	$0.00	$0	$0.00	**$0**	**0%**
NET BUILDING COST (Including Site)					$2,999.01	**$60,706,000**	
Z GENERAL REQUIREMENTS & ALLOWANCES							
Z1 GEN. REQ. & FEE	**11.0%**				**$329.91**		
Z11 General Requirements	9.0%			$5,464,000	$269.93		
Z12 Fee	2.0%			$1,214,000	$59.97	**$6,678,000**	**9%**
TOTAL CONSTRUCTION ESTIMATE (Excluding Allowances)						**$67,384,000**	**91%**
Z2 ALLOWANCES	**10.0%**				**$332.87**		
Z21 Estimating Allowance	10.0%			$6,738,000	$332.87		
Z22 Escalation Allowance	0.0%	Refer to Executive Summary		$0	$0.00		
Z23 Construction Allowance	0.0%	Refer to Executive Summary		$0	$0.00	**$6,738,000**	**9%**
HST	0.0%	EXCLUDED		$0	$0.00	**$0**	**0%**
TOTAL CONSTRUCTION ESTIMATE (Including Allowances)						**$74,122,000**	**100%**

		Cost/unit	
GFA	**20,242 m2**	**$3,662**	**m2**
GFA	**217,885 sf**	**$340**	**sf**

Turner & Townsend

ELEMENTAL COST SUMMARY
CONCEPT COST ANALYSIS

Project:	Concept 2 Estimate	Cat:	0
Location:	Cambridge, ON	File:	MS-DD-R4
Owner/Client:	Cambridge JUC	Date:	Feb 1, 2021
Architect:	C S & P Architects Inc	Project Number:	can21291
		Gross Floor Area:	**21,289 m2**

Element	Ratio to GFA	Elemental Quantity	Elemental Unit Rate	Elemental Amount	Cost/m2	Amount	
A SHELL							
A1 SUBSTRUCTURE					**$112.22**		
A11 Foundation	0.67	14,354 m2	$157.87	$2,266,000	$106.44		
A12 Basement Excavation	0.16	3,360 m3	$36.61	$123,000	$5.78	**$2,389,000**	**3%**
A2 STRUCTURE					**$395.93**		
A21 Lowest Floor Construction	0.67	14,354 m2	$76.63	$1,100,000	$51.67		
A22 Upper Floor Construction	0.33	6,935 m2	$461.14	$3,198,000	$150.22		
A23 Roof Construction	0.67	14,354 m2	$287.79	$4,131,000	$194.04	**$8,429,000**	**11%**
A3 EXTERIOR ENCLOSURE					**$464.61**		
A31 Walls Below Grade	0.02	400 m2	$700.00	$280,000	$13.15		
A32 Walls Above Grade	0.29	6,111 m2	$517.59	$3,163,000	$148.57		
A33 Windows & Entrances	0.06	1,326 m2	$1,216.44	$1,613,000	$75.77		
A34 Roof Covering	0.67	14,354 m2	$257.91	$3,702,000	$173.89		
A35 Projections	1.00	21,289 m2	$53.22	$1,133,000	$53.22	**$9,891,000**	**13%**
B INTERIORS							
B1 PARTITIONS & DOORS					**$291.42**		
B11 Partitions	1.02	21,792 m2	$239.58	$5,221,000	$245.24		
B12 Doors	0.02	339 No	$2,899.71	$983,000	$46.17	**$6,204,000**	**8%**
B2 FINISHES					**$230.78**		
B21 Floor Finishes	0.91	19,308 m2	$126.95	$2,451,000	$115.13		
B22 Ceiling Finishes	0.91	19,308 m2	$84.99	$1,641,000	$77.08		
B23 Wall Finishes	1.64	34,821 m2	$23.58	$821,000	$38.56	**$4,913,000**	**6%**
B3 FITTINGS & EQUIPMENT					**$294.57**		
B31 Fittings & Fixtures	1.00	21,289 m2	$118.56	$2,524,000	$118.56		
B32 Equipment	1.00	21,289 m2	$163.09	$3,472,000	$163.09		
B33 Conveying Systems	0.00	7 Stp	$39,285.71	$275,000	$12.92	**$6,271,000**	**8%**
C SERVICES							
C1 MECHANICAL					**$598.15**		
C11 Plumbing & Drainage	1.00	21,289 m2	$123.82	$2,636,000	$123.82		
C12 Fire Protection	1.00	21,289 m2	$41.76	$889,000	$41.76		
C13 H.V.A.C.	1.00	21,289 m2	$396.03	$8,431,000	$396.03		
C14 Controls	1.00	21,289 m2	$36.54	$778,000	$36.54	**$12,734,000**	**17%**
C2 ELECTRICAL					**$298.93**		
C21 Service & Distribution	1.00	21,289 m2	$94.74	$2,017,000	$94.74		
C22 Lighting, Devices & Heating	1.00	21,289 m2	$110.48	$2,352,000	$110.48		
C23 Systems & Ancillaries	1.00	21,289 m2	$93.71	$1,995,000	$93.71	**$6,364,000**	**8%**
NET BUILDING COST (Excluding Site)					$2,686.60	**$57,195,000**	**74%**
D SITE & ANCILLARY WORK							
D1 SITE WORK					**$269.58**		
D11 Site Development	4.86	103,442 m2	$44.36	$4,589,000	$215.56		
D12 Mechanical Site Services	4.86	103,442 m2	$7.25	$750,000	$35.23		
D13 Electrical Site Services	4.86	103,442 m2	$3.87	$400,000	$18.79	**$5,739,000**	**7%**
D2 ANCILLARY WORK					**$0.00**		
D21 Demolition	0.00	0 m2	$0.00	$0	$0.00		
D22 Alterations	0.00	0 m2	$0.00	$0	$0.00	**$0**	**0%**
NET BUILDING COST (Including Site)					$2,956.17	**$62,934,000**	
Z GENERAL REQUIREMENTS & ALLOWANCES							
Z1 GEN. REQ. & FEE	**11.0%**				**$325.19**		
Z11 General Requirements	9.0%			$5,664,000	$266.05		
Z12 Fee	2.0%			$1,259,000	$59.14	**$6,923,000**	**9%**
TOTAL CONSTRUCTION ESTIMATE (Excluding Allowances)						**$69,857,000**	**91%**
Z2 ALLOWANCES	**10.0%**				**$328.15**		
Z21 Estimating Allowance	10.0%			$6,986,000	$328.15		
Z22 Escalation Allowance	0.0%	Refer to Executive Summary		$0	$0.00		
Z23 Construction Allowance	0.0%	Refer to Executive Summary		$0	$0.00	**$6,986,000**	**9%**
HST	0.0%	EXCLUDED		$0	$0.00	**$0**	**0%**
TOTAL CONSTRUCTION ESTIMATE (Including Allowances)						**$76,843,000**	**100%**

			Cost/unit
GFA	**21,289 m2**		**$3,610 m2**
GFA	**229,155 sf**		**$335 sf**

Turner & Townsend

ELEMENTAL COST SUMMARY
CONCEPT COST ANALYSIS

Project:	Concept 3 Estimate	Cat:	0
Location:	Cambridge, ON	File:	MS-DD-R4
Owner/Client:	Cambridge JUC	Date:	Feb 1, 2021
Architect:	C S & P Architects Inc	Project Number:	can21291
		Gross Floor Area:	**20,831 m2**

Element	Ratio to GFA	Elemental Quantity	Elemental Unit Rate	Elemental Amount	Cost/m2	Amount	
A SHELL							
A1 SUBSTRUCTURE					**$118.53**		
A11 Foundation	0.59	12,347 m2	$190.01	$2,346,000	$112.62		
A12 Basement Excavation	0.16	3,360 m3	$36.61	$123,000	$5.90	**$2,469,000**	**3%**
A2 STRUCTURE					**$393.64**		
A21 Lowest Floor Construction	0.59	12,347 m2	$75.73	$935,000	$44.89		
A22 Upper Floor Construction	0.41	8,484 m2	$468.41	$3,974,000	$190.77		
A23 Roof Construction	0.59	12,347 m2	$266.54	$3,291,000	$157.99	**$8,200,000**	**11%**
A3 EXTERIOR ENCLOSURE					**$453.84**		
A31 Walls Below Grade	0.02	400 m2	$700.00	$280,000	$13.44		
A32 Walls Above Grade	0.32	6,656 m2	$504.81	$3,360,000	$161.30		
A33 Windows & Entrances	0.07	1,473 m2	$1,148.00	$1,691,000	$81.18		
A34 Roof Covering	0.59	12,347 m2	$246.62	$3,045,000	$146.18		
A35 Projections	1.00	20,831 m2	$51.75	$1,078,000	$51.75	**$9,454,000**	**13%**
B INTERIORS							
B1 PARTITIONS & DOORS					**$288.94**		
B11 Partitions	1.03	21,359 m2	$236.25	$5,046,000	$242.24		
B12 Doors	0.02	338 No	$2,878.70	$973,000	$46.71	**$6,019,000**	**8%**
B2 FINISHES					**$229.99**		
B21 Floor Finishes	0.91	18,874 m2	$127.42	$2,405,000	$115.45		
B22 Ceiling Finishes	0.91	18,873 m2	$85.10	$1,606,000	$77.10		
B23 Wall Finishes	1.64	34,088 m2	$22.88	$780,000	$37.44	**$4,791,000**	**6%**
B3 FITTINGS & EQUIPMENT					**$297.83**		
B31 Fittings & Fixtures	1.00	20,831 m2	$117.95	$2,457,000	$117.95		
B32 Equipment	1.00	20,831 m2	$166.67	$3,472,000	$166.67		
B33 Conveying Systems	0.00	7 Stp	$39,285.71	$275,000	$13.20	**$6,204,000**	**8%**
C SERVICES							
C1 MECHANICAL					**$589.22**		
C11 Plumbing & Drainage	1.00	20,831 m2	$122.13	$2,544,000	$122.13		
C12 Fire Protection	1.00	20,831 m2	$41.43	$863,000	$41.43		
C13 H.V.A.C.	1.00	20,831 m2	$389.47	$8,113,000	$389.47		
C14 Controls	1.00	20,831 m2	$36.20	$754,000	$36.20	**$12,274,000**	**16%**
C2 ELECTRICAL					**$295.91**		
C21 Service & Distribution	1.00	20,831 m2	$92.75	$1,932,000	$92.75		
C22 Lighting, Devices & Heating	1.00	20,831 m2	$110.12	$2,294,000	$110.12		
C23 Systems & Ancillaries	1.00	20,831 m2	$93.03	$1,938,000	$93.03	**$6,164,000**	**8%**
NET BUILDING COST (Excluding Site)					$2,667.90	**$55,575,000**	**74%**
D SITE & ANCILLARY WORK							
D1 SITE WORK					**$301.95**		
D11 Site Development	4.97	103,442 m2	$49.69	$5,140,000	$246.75		
D12 Mechanical Site Services	4.97	103,442 m2	$7.25	$750,000	$36.00		
D13 Electrical Site Services	4.97	103,442 m2	$3.87	$400,000	$19.20	**$6,290,000**	**8%**
D2 ANCILLARY WORK					**$0.00**		
D21 Demolition	0.00	0 m2	$0.00	$0	$0.00		
D22 Alterations	0.00	0 m2	$0.00	$0	$0.00	**$0**	**0%**
NET BUILDING COST (Including Site)					$2,969.85	**$61,865,000**	
Z GENERAL REQUIREMENTS & ALLOWANCES							
Z1 GEN. REQ. & FEE	**11.0%**				**$326.68**		
Z11 General Requirements	9.0%			$5,568,000	$267.29		
Z12 Fee	2.0%			$1,237,000	$59.38	**$6,805,000**	**9%**
TOTAL CONSTRUCTION ESTIMATE (Excluding Allowances)						**$68,670,000**	**91%**
Z2 ALLOWANCES	**10.0%**				**$329.65**		
Z21 Estimating Allowance	10.0%			$6,867,000	$329.65		
Z22 Escalation Allowance	0.0%	Refer to Executive Summary		$0	$0.00		
Z23 Construction Allowance	0.0%	Refer to Executive Summary		$0	$0.00	**$6,867,000**	**9%**
HST	0.0%	EXCLUDED		$0	$0.00	**$0**	**0%**
TOTAL CONSTRUCTION ESTIMATE (Including Allowances)						**$75,537,000**	**100%**
						Cost/unit	
GFA	**20,831 m2**					**$3,626**	**m2**
GFA	**224,225 sf**					**$337**	**sf**

Turner & Townsend

ELEMENTAL COST SUMMARY
CONCEPT COST ANALYSIS

Project:	Concept 4 Estimate	Cat:	0
Location:	Cambridge, ON	File:	MS-DD-R4
Owner/Client:	Cambridge JUC	Date:	Feb 1, 2021
Architect:	C S & P Architects Inc	Project Number:	can21291
		Gross Floor Area:	**20,629 m2**

Element	Ratio to GFA	Elemental Quantity	Elemental Unit Rate	Elemental Amount	Cost/m2	Amount	
A SHELL							
A1 SUBSTRUCTURE					**$121.29**		
A11 Foundation	0.68	14,018 m2	$171.85	$2,409,000	$116.78		
A12 Basement Excavation	0.11	2,171 m3	$42.83	$93,000	$4.51	**$2,502,000**	**3%**
A2 STRUCTURE					**$386.88**		
A21 Lowest Floor Construction	0.68	14,018 m2	$76.69	$1,075,000	$52.11		
A22 Upper Floor Construction	0.32	6,611 m2	$425.35	$2,812,000	$136.31		
A23 Roof Construction	0.68	14,018 m2	$292.05	$4,094,000	$198.46	**$7,981,000**	**11%**
A3 EXTERIOR ENCLOSURE					**$490.43**		
A31 Walls Below Grade	0.02	400 m2	$700.00	$280,000	$13.57		
A32 Walls Above Grade	0.31	6,442 m2	$515.83	$3,323,000	$161.08		
A33 Windows & Entrances	0.07	1,458 m2	$1,224.97	$1,786,000	$86.58		
A34 Roof Covering	0.68	14,018 m2	$260.88	$3,657,000	$177.27		
A35 Projections	1.00	20,629 m2	$51.92	$1,071,000	$51.92	**$10,117,000**	**14%**
B INTERIORS							
B1 PARTITIONS & DOORS					**$290.46**		
B11 Partitions	1.03	21,152 m2	$236.67	$5,006,000	$242.67		
B12 Doors	0.02	342 No	$2,883.04	$986,000	$47.80	**$5,992,000**	**8%**
B2 FINISHES					**$230.65**		
B21 Floor Finishes	0.91	18,693 m2	$127.80	$2,389,000	$115.81		
B22 Ceiling Finishes	0.91	18,693 m2	$85.33	$1,595,000	$77.32		
B23 Wall Finishes	1.64	33,765 m2	$22.92	$774,000	$37.52	**$4,758,000**	**6%**
B3 FITTINGS & EQUIPMENT					**$299.77**		
B31 Fittings & Fixtures	1.00	20,629 m2	$118.13	$2,437,000	$118.13		
B32 Equipment	1.00	20,629 m2	$168.31	$3,472,000	$168.31		
B33 Conveying Systems	0.00	7 Stp	$39,285.71	$275,000	$13.33	**$6,184,000**	**8%**
C SERVICES							
C1 MECHANICAL					**$589.90**		
C11 Plumbing & Drainage	1.00	20,629 m2	$122.30	$2,523,000	$122.30		
C12 Fire Protection	1.00	20,629 m2	$41.45	$855,000	$41.45		
C13 H.V.A.C.	1.00	20,629 m2	$389.94	$8,044,000	$389.94		
C14 Controls	1.00	20,629 m2	$36.21	$747,000	$36.21	**$12,169,000**	**16%**
C2 ELECTRICAL					**$296.14**		
C21 Service & Distribution	1.00	20,629 m2	$92.93	$1,917,000	$92.93		
C22 Lighting, Devices & Heating	1.00	20,629 m2	$110.14	$2,272,000	$110.14		
C23 Systems & Ancillaries	1.00	20,629 m2	$93.07	$1,920,000	$93.07	**$6,109,000**	**8%**
NET BUILDING COST (Excluding Site)					$2,705.51	**$55,812,000**	**75%**
D SITE & ANCILLARY WORK							
D1 SITE WORK					**$279.12**		
D11 Site Development	5.01	103,442 m2	$44.55	$4,608,000	$223.37		
D12 Mechanical Site Services	5.01	103,442 m2	$7.25	$750,000	$36.36		
D13 Electrical Site Services	5.01	103,442 m2	$3.87	$400,000	$19.39	**$5,758,000**	**8%**
D2 ANCILLARY WORK					**$0.00**		
D21 Demolition	0.00	0 m2	$0.00	$0	$0.00		
D22 Alterations	0.00	0 m2	$0.00	$0	$0.00	**$0**	**0%**
NET BUILDING COST (Including Site)					$2,984.63	**$61,570,000**	
Z GENERAL REQUIREMENTS & ALLOWANCES							
Z1 GEN. REQ. & FEE	**10.0%**				**$298.08**		
Z11 General Requirements	8.0%	Schools and CC 6%, REC and IE 9%		$6,149,000	$298.08		
Z12 Fee	2.0%			$0	$0.00	**$6,149,000**	**8%**
TOTAL CONSTRUCTION ESTIMATE (Excluding Allowances)						**$67,719,000**	**91%**
Z2 ALLOWANCES	**10.0%**				**$328.28**		
Z21 Estimating Allowance	10.0%			$6,772,000	$328.28		
Z22 Escalation Allowance	0.0%	Refer to Executive Summary		$0	$0.00		
Z23 Construction Allowance	0.0%	Refer to Executive Summary		$0	$0.00	**$6,772,000**	**9%**
HST	0.0%	EXCLUDED		$0	$0.00	**$0**	**0%**
TOTAL CONSTRUCTION ESTIMATE (Including Allowances)						**$74,491,000**	**100%**
						Cost/unit	
GFA	**20,629 m2**					**$3,611**	**m2**
GFA	**222,051 sf**					**$335**	**sf**

Turner & Townsend

ELEMENTAL COST SUMMARY
CONCEPT COST ANALYSIS

Project:	Concept 5 Estimate	Cat:	0
Location:	Cambridge, ON	File:	MS-DD-R4
Owner/Client:	Cambridge JUC	Date:	Feb 1, 2021
Architect:	C S & P Architects Inc	Project Number:	can21291
		Gross Floor Area:	**20,904 m2**

Element	Ratio to GFA	Elemental Quantity	Elemental Unit Rate	Elemental Amount	Cost/m2	Amount	
A SHELL							
A1 SUBSTRUCTURE					**$128.01**		
A11 Foundation	0.69	14,400 m2	$179.38	$2,583,000	$123.56		
A12 Basement Excavation	0.10	2,171 m3	$42.83	$93,000	$4.45	**$2,676,000**	**4%**
A2 STRUCTURE					**$389.64**		
A21 Lowest Floor Construction	0.69	14,400 m2	$76.67	$1,104,000	$52.81		
A22 Upper Floor Construction	0.31	6,504 m2	$428.04	$2,784,000	$133.18		
A23 Roof Construction	0.69	14,400 m2	$295.63	$4,257,000	$203.65	**$8,145,000**	**11%**
A3 EXTERIOR ENCLOSURE					**$504.11**		
A31 Walls Below Grade	0.02	400 m2	$700.00	$280,000	$13.39		
A32 Walls Above Grade	0.33	6,995 m2	$509.51	$3,564,000	$170.49		
A33 Windows & Entrances	0.08	1,596 m2	$1,186.72	$1,894,000	$90.60		
A34 Roof Covering	0.69	14,400 m2	$258.54	$3,723,000	$178.10		
A35 Projections	1.00	20,904 m2	$51.52	$1,077,000	$51.52	**$10,538,000**	**14%**
B INTERIORS							
B1 PARTITIONS & DOORS					**$289.13**		
B11 Partitions	1.03	21,437 m2	$235.66	$5,052,000	$241.68		
B12 Doors	0.02	346 No	$2,867.05	$992,000	$47.46	**$6,044,000**	**8%**
B2 FINISHES					**$229.53**		
B21 Floor Finishes	0.91	18,937 m2	$127.26	$2,410,000	$115.29		
B22 Ceiling Finishes	0.91	18,937 m2	$84.97	$1,609,000	$76.97		
B23 Wall Finishes	1.64	34,205 m2	$22.77	$779,000	$37.27	**$4,798,000**	**6%**
B3 FITTINGS & EQUIPMENT					**$297.02**		
B31 Fittings & Fixtures	1.00	20,904 m2	$117.78	$2,462,000	$117.78		
B32 Equipment	1.00	20,904 m2	$166.09	$3,472,000	$166.09		
B33 Conveying Systems	0.00	7 Stp	$39,285.71	$275,000	$13.16	**$6,209,000**	**8%**
C SERVICES							
C1 MECHANICAL					**$587.88**		
C11 Plumbing & Drainage	1.00	20,904 m2	$121.94	$2,549,000	$121.94		
C12 Fire Protection	1.00	20,904 m2	$41.38	$865,000	$41.38		
C13 H.V.A.C.	1.00	20,904 m2	$388.39	$8,119,000	$388.39		
C14 Controls	1.00	20,904 m2	$36.17	$756,000	$36.17	**$12,289,000**	**16%**
C2 ELECTRICAL					**$295.40**		
C21 Service & Distribution	1.00	20,904 m2	$92.52	$1,934,000	$92.52		
C22 Lighting, Devices & Heating	1.00	20,904 m2	$110.03	$2,300,000	$110.03		
C23 Systems & Ancillaries	1.00	20,904 m2	$92.85	$1,941,000	$92.85	**$6,175,000**	**8%**
NET BUILDING COST (Excluding Site)					$2,720.72	**$56,874,000**	**75%**
D SITE & ANCILLARY WORK							
D1 SITE WORK					**$268.42**		
D11 Site Development	4.95	103,442 m2	$43.13	$4,461,000	$213.40		
D12 Mechanical Site Services	4.95	103,442 m2	$7.25	$750,000	$35.88		
D13 Electrical Site Services	4.95	103,442 m2	$3.87	$400,000	$19.14	**$5,611,000**	**7%**
D2 ANCILLARY WORK					**$0.00**		
D21 Demolition	0.00	0 m2	$0.00	$0	$0.00		
D22 Alterations	0.00	0 m2	$0.00	$0	$0.00	**$0**	**0%**
NET BUILDING COST (Including Site)					$2,989.14	**$62,485,000**	
Z GENERAL REQUIREMENTS & ALLOWANCES							
Z1 GEN. REQ. & FEE	**9.9%**				**$297.36**		
Z11 General Requirements	7.9%	Schools and CC 6%, REC and IE		$6,216,000	$297.36		
Z12 Fee	2.0%			$0	$0.00	**$6,216,000**	**8%**
TOTAL CONSTRUCTION ESTIMATE (Excluding Allowances)						**$68,701,000**	**91%**
Z2 ALLOWANCES	**10.0%**				**$328.65**		
Z21 Estimating Allowance	10.0%			$6,870,000	$328.65		
Z22 Escalation Allowance	0.0%	Refer to Executive Summary		$0	$0.00		
Z23 Construction Allowance	0.0%	Refer to Executive Summary		$0	$0.00	**$6,870,000**	**9%**
HST	0.0%	EXCLUDED		$0	$0.00	**$0**	**0%**
TOTAL CONSTRUCTION ESTIMATE (Including Allowances)						**$75,571,000**	**100%**
						Cost/unit	
GFA	**20,904 m2**					**$3,615**	**m2**
GFA	**225,011 sf**					**$336**	**sf**

A6. STEERING COMMITTEE

City of Cambridge

- Lesley Head, Director of Recreation, Arts and Culture
- Rachel Fraser, Manager of Recreation and Culture
- Mary Kennedy, Steering Committee Coordinator, Project Management Office Analyst
- Archana Chaudhary, Project Manager
- Helen Kelly, Chief Executive Officer, Idea Exchange
- Jamie Kamula, Director, Public Services, Idea Exchange

Waterloo Region District School Board

- Lauren Agar, Manager of Planning
- Todd McDougall, Project Coordinator

Waterloo Catholic District School Board

- Jennifer Passy, Manager of Planning
- Adrian Frigula, Construction and Renovations Supervisor

A7. CONSULTING TEAM

CS&P Architects Inc., Architectural, Urban Planning, Educational Facility Planning

IBI Group, Civil

Lea Consulting, Structural

MNE Engineering, Mechanical and Electrical

BA Group, Transportation

Swallow and Associates, Acoustical

Turner Townsend, Cost

A8. OTHER RESOURCES

Region of Waterloo, Andrew Doman, P.Eng., Senior Engineer, Transportation Expansion, Design & Construction Division

City of Cambridge – Engineering and Transportation Services Community Development, Jason Leach, Senior Transportation Engineer

Region of Waterloo - Grand River Transit, Howard (Shen-Hao) Chang, Principal Planner, Transit Development

Grand River Conservation Authority - John Brum, Resource Planner.

report to City Council: Recreation Complex Opportunities, March 5, 2019, (Attachment B)

https://gosouthpoint.ca/

https://www.lakeviewhomesinc.com/community/the-morrison-preserve/

https://www.laurelviewhomes.com/communities/moffat-creek/

https://www.urbncambridge.ca/

A9. RELATED STUDIES & DOCUMENTS

City Report: Recreation Complex Opportunities, Mar 5, 2019

City Report: Recreation Complex – Recommendations, Jun 4, 2019

City Report: Recreation Complex and Library Capital Project, Feb 18, 2020

City Report: Cambridge Recreation Operating Plan, 2019

Library Letter: South East Galt Joint Development, Mar 31, 2006

Library: South East Public Library Vision Statement

Bosdale Subdivision Draft Plan of Subdivision 2019

Geotechnical Investigation for proposed Subdivision Southeast Galt Area Cambridge, Ontario by Naylor Engineering Associates Ltd, May 2005

Bosdale Subdivision Above Ground Servicing Plans, Feb 06 2020 (including Superimposed preliminary Active Transportation Plan information from Jason Leach, city of Cambridge)

Cambridge JUC Proposed Contours plan, IBI Group, November 16 2020

Figure b-1: Location of Southeast Galt Lands (Projected Development Plans and Population), City of Cambridge, GIS, February 27 2019.

Bike Your City Cycling Master Plan Final Report, March 2020

City of Cambridge Zoning By-Law No 150-85 (Consolidation January 2012 and Interactive Online Mapping)

GRCA Grand River Watershed Maps

- https://www.grandriver.ca/en/our-watershed/resources/Documents/Map_Watershed_Printable.pdf,

- Map generated from Ontario Ministry of Natural Resources and Forestry's Ontario Flow Assessment Tools (https://www.ontario.ca/page/watershed-flow-assessment-tool)

- https://www.cambridge.ca/en/your-city/resources/Moffat-Creek-Watershed-Plan.pdf