



TO: GENERAL COMMITTEE

SUBJECT: ALLANDALE TRANSIT MOBILITY HUB AND DOWNTOWN MINI HUB

WARD: ALL

SUBMITTED BY: R. PEWS, DIRECTOR OF CORPORATE FACILITIES

NOTED: B. FORSYTH, DIRECTOR OF TRANSIT AND PARKING STRATEGY
R. JAMES-REID, EXECUTIVE DIRECTOR OF ACCESS BARRIE

GENERAL MANAGER APPROVAL: D. MCALPINE, GENERAL MANAGER OF COMMUNITY AND CORPORATE SERVICES

CHIEF ADMINISTRATIVE OFFICER APPROVAL: M. PROWSE, CHIEF ADMINISTRATIVE OFFICER

RECOMMENDED MOTION

1. That the Allandale Transit Mobility Hub (ATMH) and Downtown Mini Hub (DTMH) projects proceed as outlined in Staff Report FAC003-22.
2. That capital projects "FC1206" and "FC1250" be consolidated into one project and named the Allandale and Downtown Transit Mobility Hubs with a total approved project budget of \$10,227,150 and that \$4.7M be allocated to the pre-construction phase of the project.
3. That once approval has been received, the Mayor and City Clerk be authorized to execute a Transfer Payment Agreement (TPA) amendment with the Province of Ontario as represented by the Ministry of Transportation related to the public transit stream of the Investing in Canada Infrastructure Program (ICIP), as well as other documents requisite to the execution of the project, to address the increases in the estimated total project cost by utilizing the remaining dollars previously assigned to Barrie for transit-related capital.

PURPOSE & BACKGROUND

Report Overview

4. The purpose of this Staff Report is to present a revised path forward for the Allandale Transit Mobility Hub and Downtown Mini Hub projects given significant construction price escalations due in large part to the global pandemic and other factors impacting the project timelines. This path forward includes applying to the Investing in Canada Infrastructure Program (ICIP) to utilize the remaining dollars assigned to Barrie in a broad funding envelope related to transit, to address the escalating costs for this project since it was initially identified in 2018.

Background

5. In 2018, Staff Report TPS003-18 was provided to City Council and on June 18, 2018, City Council adopted motion 18-G-143 which endorsed in principle, the functional design, Concept C for the Allandale Transit Mobility Hub as set out in the Allandale Mobility Hub Feasibility Study and gave staff delegated authority to apply for the Investing in Canada Infrastructure Program (ICIP) for funding. The Feasibility Study was initiated to determine if the Allandale area was a feasible location for the City of Barrie's main Transit Hub to accommodate a redevelopment of the existing Transit

Terminal, and to provide a transit hub that would improve transportation plans, connections, and services.

6. The Allandale Transit Mobility Hub is intended to provide an inter-regional transit site that is centrally situated within the expanding City of Barrie to host seamless transit services and connections between Simcoe County, Muskoka, and the Greater Toronto Area (GTA). The transit hub will provide a connected and integrated public transit system that coincides with the adjacent Metrolinx all-day, two-way GO train service plans and will progress the City's intensification area and urban growth centre with a transit supportive development to encourage transportation alternatives.
7. A Downtown Mini Hub was also endorsed to maintain downtown transit service levels and provide direct access routes to and from the downtown, a significant area to the City's transit network.

Investing in Canada Infrastructure Program (ICIP) Funding

8. In April 2019, the governments of Canada and Ontario released details regarding the public transit funding stream of the larger Investing in Canada Infrastructure Program (ICIP). The purpose of the public transit funding is to build new urban transit networks and service extensions that will transform the way that Canadians live, move and work. This stream funds capital costs to construct, expand, and improve public transit networks.
9. The City of Barrie has been allocated funding from the provincial government in the amount of \$19,513,005 and federal government in the amount of \$23,417,948 which, with a municipal contribution of \$15,613,917, allows the city to invest in transit-related capital projects totalling \$58,544,870. All capital projects must be substantially complete by October 31, 2027. The funding was allocated to municipalities on the basis of ridership (using 2015 data).
10. The ICIP Program capital project funding requests are coordinated with funding intakes. The first intake closed on May 28th, 2019. Barrie submitted five transit capital projects for this first intake. These five projects represent \$41M of the total \$58.5M ICIP allocation.
11. The Allandale Transit Mobility Hub and Downtown Mini Hub projects were included in the first intake. The two projects, with an estimated \$10,227,150 cost at the time, were approved to receive up to \$7.5M in combined Federal and Provincial funding. The City subsequently received approval for its projects in 2020.
12. After an additional 9 months, on March 1, 2021, the City received the project Transfer Payment Agreement (TPA) from the ICIP team. The Allandale Transit Mobility Hub and Downtown Mini Hub is supported and funded by the Government of Canada (40% contribution) and Government of Ontario (33.33% contribution) through ICIP. The City's contribution covers the remaining 26.67% and any ineligible expenditures as per the Transfer Payment Agreement (TPA). Under the TPA, any increases in the overall project cost are to be borne by the City.
13. The TPA identifies requirements on progress reporting, payment requests and signage. City staff are required to complete quarterly progress reports and payment requests for the Allandale Transit Mobility Hub project and bi-annually progress reports and payment requests for the Downtown Mini Hub. In addition, for both projects, signage recognizing the funding contributions must be erected 30 days prior to the start of construction.
14. While the funding from other levels of government is appreciated, the significant delay in the approvals and agreement allowed for several years of price escalations to occur. The global pandemic had a disproportionate impact on typical annual price escalations for construction. The

ICIP funding envelope and approvals for the first intake projects do not allow for adjustments to project costs to reflect these increases, without the submission of new application.

15. As noted above, the full funding envelope for transit related capital projects provided through ICIP includes an additional \$17,517,634.84 for future project costs (with \$7M and \$5.8M of those costs funded by the Federal and Provincial governments respectively). The remaining funding was anticipated to be utilized mainly for expansion of the Transit Garage on Welham, as most other capital projects within transit's 10-year capital plan are already funded from ICIP, including fleet replacement and on-street transit infrastructure programs. The Welham Garage expansion project is forecasted to be completed in 2026-2027 and is largely funded by development charges, so utilizing these additional ICIP funds for the ATMH will not impact the current capital funding plan. It is also important to note, if the garage expansion is delayed, likely as a result of slowed growth, these additional ICIP funds would be lost as all spending under the ICIP program must occur by October 31, 2027. While the funding envelope has been approved for Barrie, in order to access the funds, further intake applications are required identifying the specific project(s).

Project Delivery and Work Completed

16. Staff initially determined that for both the Allandale Transit Mobility Hub and Downtown Mini Hub, the Integrated Project Delivery (IPD) design and construction model would be used. The IPD model integrates people, systems, and practices into a collaborative process to optimize project results. This model was used successfully on the Barrie-Simcoe Emergency Services Campus project and is currently being used for the Wastewater Treatment Facility Program and Operations Centre Master Plan Implementation projects.
17. In particular, the IPD approach has been utilized successfully to manage significant projects with challenging aspects, such as this site's relatively small footprint, within an existing developed area of the City. Utilizing the IPD approach, it was initially anticipated that the Allandale Transit Mobility Hub project could be completed by Q4 of 2022, due to the fast pace of this project delivery model.
18. This Validation Phase of the project formalizes key objectives, site design and general layout based on operational considerations, as well as costing and schedule details. Part of the IPD's team's role is to develop programmatic requirements and procure additional major engineering consultants and building trades to assist in validating aspects of the project. The IPD team is also responsible for producing conceptual drawings based on the scope from the Allandale Mobility Hub Feasibility Study, received public comments and refined Transit and Parking requirements, including the costing and schedule details.
19. Numerous pre-design site due diligence activities were completed prior to or since the retention of the IPD project team. As noted in past memorandums providing updates on this project, the following are highlights of the work completed to date related to the project:
 - Stage 1 Archaeological Assessment
 - Partial Stage 2-3 Archaeological Assessment
 - Full Stage 3 Archaeological Assessment and Acceptance into the Ontario Public Register of Archaeological Reports
 - Topographic Survey of 20 Essa Road
 - Topographic Survey of Maple Avenue
 - Phase 1 Environmental Site Assessment (ESA)
 - Phase 2 Environmental Site Assessment (ESA)
 - Geotechnical Report
 - Hydrogeological Study
 - Functional Servicing Report

- Preliminary Stormwater Management Study
- Traffic Impact Studies to 2024 and 2031
- Noise / Vibration Impact Analysis
- Species at Risk Study with a Letter of Clearance
- Due Diligence Risk Assessment Report
- Arborist Report
- Development Viability Assessment
- Record of Decommissioning Monitoring Wells
- Fire Hydrant Flow Test
- Infrastructure Canada (INFC) Consultation Obligations with Canada's Indigenous Peoples was satisfied
- Net Zero Feasibility Study

ANALYSIS

20. As reported earlier this year via memorandum, during the Validation Phase of the project, the IPD project team identified that both the project cost and schedule had become issues.

Construction Price Escalations

21. The original project budget, developed by Hanscomb from a conceptual plan in early 2018, included a 6% inflation allowance, however it did not include allowances for heritage and Net Zero premiums. The subsequent delay in project approval through the ICIP until 2020 pushed the project back by more than two years, subjecting the project to impacts from the current and ongoing pandemic, and related labour and material cost escalations.
22. Construction cost escalation has been identified as being 40% since 2018 and is anticipated to be an additional 5% - 10% per annum until project completion. These latter estimates remain subject to continued disruptions to supply chains, material delays and industry labour shortages.
23. To address the significant increase in hard construction costs due to construction escalation, staff consulted with ICIP program personnel regarding additional funding from the Provincial and Federal levels of government for the project. The timeframe required for ICIP approval, already lengthy, will be further impacted by a communications black-out period related to this year's Provincial elections. As a result, approvals on modification requests and applications may affect the project schedule.

Net Zero Feasibility Study

24. A Net Zero Feasibility Study was undertaken aligning with Council's declaration of a climate emergency, to understand what sustainable initiatives would best suit the project and facility. The study identified that targeting net zero standards is the most suitable sustainable pathway to lower emissions and operational costs. The project team subsequently incorporated design elements supporting Net Zero energy, meaning that the facility is expected to generate all energy required for its operation over its lifetime. There are however additional capital costs associated with achieving net zero. These additional capital costs will be determined once a detailed design is completed and are anticipated to be in the range of 5% to 10%. The up-front capital investment will be more than repaid over the life of the building.

Allandale Station Lands Heritage Designations

25. The global Allandale Station Lands consist of the Metrolinx Allandale GO Station (24 Essa Road), the Historic Allandale Train Station (285 Bradford Street) and the Allandale Transit Mobility Hub (20 Essa Road). The design and construction of the Allandale Transit Mobility Hub will ensure

-
- future connections of all three (3) sites, providing seamless circulation. All three parcels of land are currently registered under a single Property Identification Number (PIN).
26. As the plans for the Mobility Hub do not include any development on the Historic Allandale Train Station lands at 285 Bradford, Staff were initially advised that approvals from the Ontario Heritage Trust, the Heritage Committee and Council were not required as a result.
 27. However, City of Barrie By-law 2009-144 designated 285 Bradford as being of architectural and historic value or interest under the Ontario Heritage Act (OHA). This designation by the City is in addition to an earlier Heritage Conservation Easement Agreement with the Ontario Heritage Trust under s.10.(1)(c) of the OHA. As a result of these designations, any intervention on this property must be approved by the Ontario Heritage Trust following written consent of Council after consultation with its Municipal Heritage Committee.
 28. As the sites are currently identified as a single parcel (285 Bradford / 20 Essa Road), City staff engaged a Heritage professional to provide their expert opinion on whether s.33 *Alteration of property* of the Ontario Heritage Act ("OHA"), and other provisions of the OHA, are applicable to the proposal by the City of Barrie to build a Transit Mobility Hub at 20 Essa Road.
 29. Upon reviewing all necessary information, the Heritage professional has determined that the proposal to alter the designated property by Bylaw 2009-144 to construct a Transit Mobility Hub is subject to the provisions of s.33 *Alteration of property*, of the OHA. As a result of this, any intervention on this unsevered property must be approved by the Ontario Heritage Trust, the Heritage Committee and Council.
 30. Further, the Heritage Professional strongly recommended the completion of a Heritage Impact Assessment. The completion of a Heritage Impact Assessment will allow the City to satisfy its obligation under the OHA as well as the cultural heritage resource preservation policies of the City of Barrie Official Plan.
 31. Heritage imposes a further potential risk as the heritage design parameters are not detailed within City of Barrie policies. Therefore, the design and complimentary heritage aspects will require an iterative design process with the architects, our development planners, and the Heritage Committee. Staff continue to work with heritage professionals to implement the heritage deliverables.
 32. To implement the heritage deliverables and to align with heritage design parameters and feedback received from the Heritage Committee, there are additional capital costs associated with designing a building that is complimentary of the Historic Allandale area. These additional capital costs will be determined once a detailed design is prepared and are anticipated to be in the range of 15% to 30%.
 33. Additionally, due to site constraints, construction laydown space is likely required on the Historic Allandale Station Lands. This use must be approved by the Ministry of Heritage, Sport, Tourism and Culture Industries (Archaeology Programs Unit) and the Bereavement Authority of Ontario, based on feedback from the City's Archaeologist of Record (AOR) working on the Historic Allandale Train Station site, as well as the Ontario Heritage Trust which holds an easement over the lands. Although all work is on the surface and approval to proceed is anticipated, the formal approval timeline from all three authorities is unknown and may be lengthy.
 34. As part of the Allandale Transit Mobility Hub project, staff intend to sever the Allandale Stations land parcels to legally separate 285 Bradford Street from 20 Essa Road, thereby minimizing the need for future external reviews and approvals for work on the 20 Essa Road site, and their related costs.

Metrolinx Review

35. Initially staff were advised that Metrolinx would not be required to sign off on the Site Plan application for the Allandale Transit Mobility Hub. However, as part of the Site Plan Approval process and Consultations with Authorities Having Jurisdiction, it was identified that since the project impacts the Metrolinx review corridor, sign offs would be required.
36. Metrolinx has recently announced its plans for electrification of the corridor, as well as expanded service. To support these service enhancements, Metrolinx will be undertaking its own site development works at the Allandale GO Station. As a result, there are multiple potential risks associated with building within the Metrolinx review corridor limits including a requirement for its agreement on relocating existing assets on site, sign-off for Site Plan Approval (SPA) as an Authority Having Jurisdiction and formalizing an agreement between the City and Metrolinx. Metrolinx review timelines are unknown at this time but are expected to be lengthy.

Validation Report

37. The project team has actively worked to quantify the above-noted impacts on the overall project cost and schedule. It has also reviewed the recent Market Precinct Task Force recommendations to ensure that the Downtown Mini Hub design aligns with the Market Precinct Task Force vision.
38. A Validation Report has been completed with the project description, history, stakeholder engagement and list of the technical scope and deliverables for this project. The Report is attached as *Appendix "A" – Allandale Transit Mobility Hub and Downtown Mini Hub Validation Report*. The preliminary drawings provided within Appendix "A" are schematic and may not represent the final design of the project.
39. A brief program overview of both the Hub and Mini Hub is identified in the Validation Report, as follows:
 - The Allandale Transit Mobility Hub will consist of a new hub building located on Essa Road near Gowan Street with a loop configured site that will host all transit operations, compliment the historic elements of the Allandale neighborhood and be extremely efficient as a net zero energy building.
 - The Downtown Mini Hub will consist of bus shelters and road modifications to a portion of Maple Avenue. This work will be completed taking the recent Market Precinct Task Force recommendations into consideration through a more temporary approach that will not disrupt the plans for the future permanent market.

Project Delivery

40. The project's Validation phase is complete. However, the Parties were unable to agree to the Base Target Cost due to the major project risks that were outside of the project team's control. IPD includes a risk / reward model utilizing a risk register to collectively manage risks on the project and is a fast-paced project delivery method.
41. Understanding the project risks as outlined above and their associated processes, the project team had built significant cost allowances into the project's risk register to mitigate the related project schedule impacts and unusual escalation. However, even with this allowance the project completion date cannot be fixed at this time.

42. Integrated project delivery is a fast and Lean project delivery model that takes advantage of parallel workstreams. It is not best suited to a sequential workflow stream necessitated by multiple external approval bodies. City staff therefore recommend moving forward with a sequential project delivery model that will focus on completing the detailed design phase of the project including detailed costing, expanding on the work already completed by the IPD project team. There is no cost associated with ending the IPD project agreement.
43. The change to a sequential project delivery model is a fundamental shift in the project delivery approach and is not supported by the current project execution agreement. Under the City's Procurement Bylaw, such a fundamental shift in deliverables requires that the detailed design and construction packages be re-tendered. The estimated timeframe for retendering the detailed design scope is 3 months. Because tendering of the construction portion of the project can generally happen during the Site Plan and Building Permit Approval stages, its impact on the overall project schedule will be minimal.

Project Funding and Schedule

44. Although it was not possible to agree to the Base Target Cost for the projects, it is understood that the overall \$10.2M budget for the two projects will be significantly underfunded. Until a detailed design is prepared, the cost estimate will not be determined. However, a range of \$25M – \$30M is possible given the factors noted earlier in the report.
45. To address the significant increase in hard construction costs and based on recommendations from ICIP program personnel, staff are completing a modification request to de-scope the current ICIP application to fund the planning and design phases only. The overall ICIP funding envelope has an additional \$17,517,634.84 in funding remaining for transit-related capital projects. An additional application has been submitted for the construction phase of the project to utilize this funding as well as the previous approved funds.
46. Paragraph 3 of the recommended motion would allow the City to execute the amendment to the Transfer Payment Agreement. If the projects require less than the remaining ICIP funds, the unutilized funds would be retained for use in other transit-related capital projects.
47. An anticipated Project Schedule has been compiled from the expected durations for each phase of the project. It is attached as Appendix "B" to this report. These phases are expected to require over two and half years, reflecting the two-year delay in ICIP approvals and an allowance for the time that might be required for external approvals.
48. City staff will work to expedite all phases of work within their control but note that the draft schedule proposed is contingent upon external approvals from Authorities Having Jurisdiction, as well as ICIP approval for the construction application, both of which are beyond staff's control. The project may take longer depending on delays associated with external approvals.
49. Given the importance of this project and its impact on the Permanent Market Precinct, staff reviewed other options to expedite the Allandale Transit Mobility Hub including renovating the historic Allandale Train Station to serve as the Hub. This option was deemed to be undesirable due to several factors, including:
 - It is not in keeping with Council's past direction for the utilization of the historic station;
 - The inability to determine when the ongoing archaeological and burial site investigation will be complete due to the complex nature of the site including external approvals, and the potential for this unknown to further delay the project;

- The results of the ongoing archaeological and burial site investigations may impact the future opportunities to utilize the lands surrounding the historic station; and
- The site configuration does not provide for optimal patron and bus movements or connections with Metrolinx, a key aspect of the Hub. For example, as Essa Rd is the core Barrie Transit corridor, the added distance would result in additional travel delays and a less competitive transit service, especially for the planned express and frequent routes.

ENVIRONMENTAL AND CLIMATE CHANGE IMPACT MATTERS

50. The following environmental and climate change impact matters have been considered in the development of the recommendation:

- For the Allandale Transit Mobility Hub, the project is targeting a net zero energy performance with an all-electric building using renewable energy generation through on-site solar photovoltaics.
- By incorporating a net zero energy performance target, the building will exceed the operations-related carbon reductions common with a LEED project and better align with the City's zero-carbon by 2050 objective.
- Pursuing a net-zero energy, low carbon building design provides a long-term economic benefit for the City by reducing or eliminating operational utility costs. Furthermore, investing in a sustainable building design that minimizes greenhouse gas emissions supports the City's target of achieving net zero carbon emissions.
- City staff are reviewing the requirements for ICIP's climate change resilience assessment and greenhouse gas emissions assessment that may require approval from the Government of Canada.

ALTERNATIVES

51. The following alternatives are available for consideration by General Committee:

Alternative #1

General Committee could choose to cancel the Allandale Transit Mobility Hub and Downtown Mini Hub projects.

This alternative is not recommended given the connections with the improved Metrolinx GO rail service, the City's geographic centre moving southward into the Hewitt and Salem secondary plans, the required growth and expansion of the City's transit services and the Market Precinct project in the current transit terminal location. This alternative would negatively impact the Downtown Permanent Market project proposed at the existing transit terminal located at 24 Maple Avenue.

In addition, ICIP funds that have been received for the project expenses spent to date would need to be reimbursed as the City would not then meet the terms of its agreement with ICIP as per the TPA. The City would also not receive the approved federal and provincial funding for the Hub and Mini Hub.

Alternative #2

General Committee could recommend waiving the City's Procurement By-law and sole source the consulting procurement in an effort to expedite the schedule by a couple weeks.

This alternative is not recommended as a principle of the City of Barrie's Procurement By-law is to seek best value for taxpayers through a competitive bid process that is fair, open, and transparent. The City is also bound by Canadian procurement law and practices, contract law, and international trade agreements. Sole sourcing a project would put at risk the ability to receive best value for taxpayers, particularly in the current environment of rising inflation and supply chain issues. Sole sourcing this project could also violate international trade agreements.

FINANCIAL

52. As the Allandale Transit Mobility Hub (FC1206) and the Downtown Mini Hub (FC1250) have been approved through the City's approved budget, the recommended motions will not have an immediate impact on the City's financial plan.
53. Once the project is at design completion, endorsed, and is construction tender-ready with a budget determined, staff will report back with the budget request and contribution limits for approval to proceed.
54. City staff will move forward with the design of the project and application for construction costs to maximize the federal and provincial funding at a \$27.7 million dollar project. The City's contribution will equate to 26.67% plus the ineligible expenditures noted in the TPA. City staff will complete a capital intake for the additional funds if and when required for construction and once ICIP approval has been received. Any cost overruns and ineligible expenditures are at the City's expense. To maximize the ICIP funding and to cover the ineligible project costs, an additional \$6.1M would be required to meet the municipal funding portion to utilize this grant. Because of grant stacking rules, this funding will have to come from own sources. Once the estimate is known, City Staff will incorporate this request into the 2023 capital plan.

LINKAGE TO 2018–2022 STRATEGIC PLAN

55. The recommendation(s) included in this Staff Report support the following goals identified in the 2018-2022 Strategic Plan:
 - Building Strong Neighbourhoods
 - Offering Innovation and Citizen Driven Services
 - Improving the Ability to Get Around Barrie
56. The recommendations included in this Staff Report for the Allandale Transit Mobility Hub and relevant Downtown Mini Hub will support community connections by integrating with the active transportation network connecting the Waterfront Trail and Essa Road. It will provide a level of customer and transit services to accommodate seamless transit connections, while encouraging safe circulation and linkages between bus, vehicular, and pedestrian traffic. Additionally, it will offer savings to the on-going cost of operations required to support facilities through achieving net zero energy utilizing renewable energy sources.



APPENDIX "A"

Allandale Transit Mobility Hub and Downtown Mini Hub Validation Report

Validation Report

Allandale Transit Mobility Hub & Downtown Mini Hub City of Barrie

May 2022



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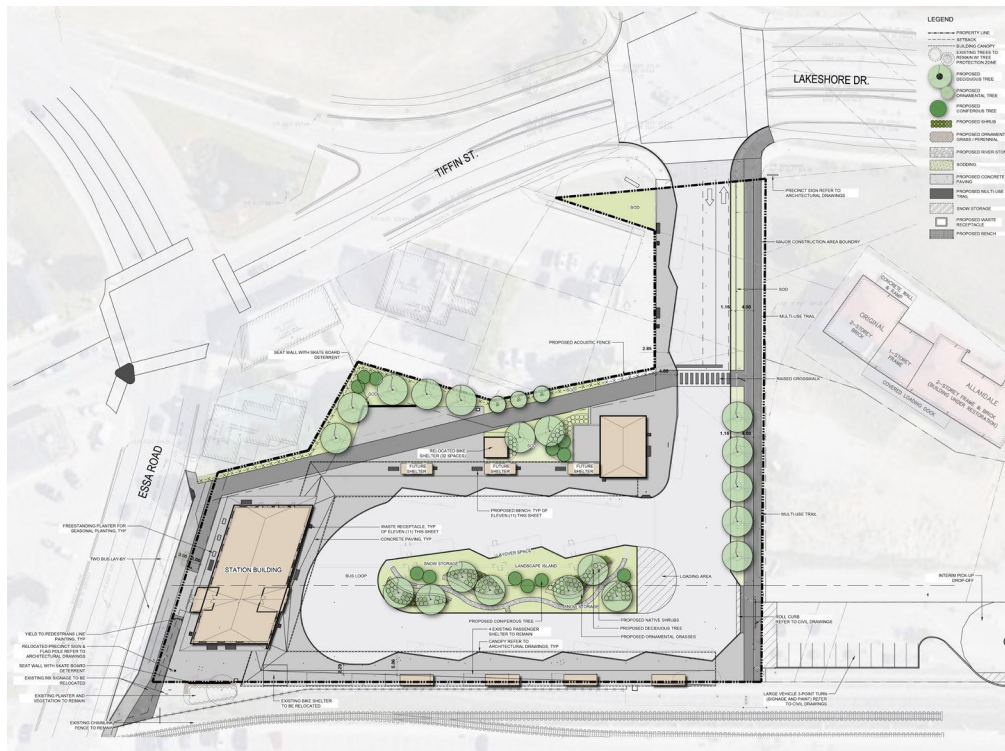
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Coloured Site Plan

1.0 Project Team

The following project team members have been involved and assisted with the development of the Project Validation Report.

owner

City of Barrie

www.barrie.ca

- ❖ *Rick Pews, Natalie Calder, Paolo Bovolini, Jessica Lief, Mike McConnell, Adam McMullin, Joel Giles, Robert Smith, and Wade LeBlanc*

contractor

Chandos Construction Ltd.

www.chandos.com

- ❖ *Greg Stack, Maria Williams, Laura Morales, Raj Bheda, Ryan Zantinge, Lindsay Worton, and Matthew Watson*

IPD process lead

EcoAmmo Sustainable Consulting Inc.

www.ecoammo.com

- ❖ *Stephani Carter, Shafraz Kaba, Andrea Pelland, and Andrianna Beauchemin,*

architect / prime consultant

Architecture49

architecture49.ca

- ❖ *Albert Paquette, Mark Falkenburger, Robert Eland, Alison Groot, Dan Kennedy, and Diego Agudelo*

structural engineer

LEA Consulting Ltd.

www.lea.ca

- ❖ *John Ford, Steve Holyk, and Wesley Dodson*

mechanical engineer

Integral Group

integralgroup.com

- ❖ *Chris Piche and Bhavin Degadwala*

electrical engineer

MCW

www.mcw.com

- ❖ *Desmond Lau, Shiv Bhojak, and Ritwika Bhattacharjee*

sustainability consultant

Village Consulting

villageconsulting.ca

- ❖ *Kiefer MacKenzie and Irene Chung*

building enclosure and energy performance consultant

RDH Building Science

www.rdh.com

- ❖ *Steve Kemp and Amy Montgomery*

civil engineer / landscape architect

WSP

www.wsp.com

- ❖ *Greg Cook, Allison Good Brown, Gillian Cook, Tan Nguyen, Vladimir Nikolic, Reem Digna, Ismet Medic, Fiona Allen, and Max Li*

mechanical trade

Insight Technologies

insighttechnologies.ca

❖ *Duane Zielonko and Ryan Rypkema*

electrical trade

Birnie Electric Ltd.

Birnie.com

❖ *Craig Hanley and Greg Dunn*

2.0 Executive Summary

The purpose of this Validation Report is to identify the project deliverables and state the expected cost and time to achieve those deliverables. The Validation Report compiles the efforts by the Integrated Project Delivery (IPD) team to state with confidence that we can build this building, that does these things, for this much money, in this much time. However as per the Staff Report, the project team was nearing completion on the Validation Report but were not able to agree to the Base Target Cost. The information presented in this report identifies the expected deliverables for the project but does not identify the expected schedule and cost as per the recommendations in the Staff Report.

3.0 Project Description

3.1. Program

PROJECT LAND ACKNOWLEDGEMENT

We acknowledge that this project is taking place on the traditional land of the Anishnaabeg people. The Anishnaabeg include the Odawa, Ojibwe, and Pottawatomi nations, collectively known as the Three Fires Confederacy.

The Allandale Transit Mobility Hub and Downtown Mini Hub Integrated Project Delivery Team is dedicated to honouring Indigenous history and culture and committed to moving forward in the spirit of reconciliation and respect with all First Nations, Métis, and Inuit People.

PROJECT DESCRIPTION

The Allandale Transit Mobility Hub (ATMH) and Downtown Mini Hub (DTMH) developments will assist in progressing the intensification area identified within the City of Barrie's (City) planning policies while expanding the City's transit services with an inter-regional transit hub, thereby supporting the ongoing growth of the City.

The Allandale Transit Mobility Hub site is centrally situated within the expanding City of Barrie and adjacent to rail services that host transit services and connections between Simcoe County, Muskoka, and the Greater Toronto Area (GTA). This site coincides with the Metrolinx all-day, two-way GO train service plans to provide seamless travel connections and improve regional transit access.

The Downtown Mini Hub will include bus stops and a sheltered waiting area located on Maple Avenue. These enhanced bus stops will provide a comfortable and safe rider experience for routes to and from the downtown. Reducing the footprint of the current transit terminal (24 Maple Avenue) within the downtown, will support downtown revitalization objectives and provide continued access to Barrie's busiest destination.

PROJECT HISTORY

The project was initiated to accommodate a redevelopment at the existing transit terminal and to relocate and provide a transit hub that would improve transportations plans, connections, and services. A recap of the project history is provided below:

2017:

- A Stage 1 Archaeological Assessment was completed by the City's Archaeologist of Record.
- A partial Stage 2-3 Archaeological Assessment was completed by the City's Archaeologist of Record.

2018:

- An Allandale Mobility Hub Feasibility Study was completed by WSP to determine if the Allandale area was a feasible location for the City of Barrie's main Transit Hub. The site represents a feasible location offering several benefits to the City.
- A Staff Report TPS003-18 was completed by Transit staff to Council. Council motion 18-G-143 endorsed in principle, Concept C from the Feasibility Study and gave staff delegated authority to apply for the Investing in Canada Infrastructure Program (ICIP) for funding.
- A full Stage 3 Archaeological Assessment was completed by the City's Archaeologist of Record.

2019:

- The ICIP application was submitted by Transit staff.
- The full Stage 3 Archaeological Assessment was accepted into the Ontario Public Register of Archaeological Reports.

2020:

- ICIP approval was received for \$7.5 million in combined federal and provincial project funding.
- Site Due Diligence Activities Commenced including completion of a Topographic Survey, Phase 1 and 2 Environmental Site Assessments, Functional Servicing Report, Traffic Impact Study to 2024, Geotechnical Report and a Hydrogeological Study.

2021:

- Site Due Diligence Activities Continued including completion of a Noise and Vibration Impact Analysis, Traffic Impact Study to 2031, Arborist Report, Development Viability Assessment, Species at Risk Report, Due Diligence Risk Assessment, Hydrant Flow Test, Record of Decommissioning Monitoring Wells, and the Topographic Survey of Maple Avenue for the Downtown Mini Hub.
- Initial Integrated Project Delivery (IPD) Team was procured.
- The Transfer Payment Agreement (TPA) for ICIP, between the Province and the City was received.
- The Infrastructure Canada (INFC) Consultation Obligations with Canada's Indigenous Peoples that was required as per the ICIP determination letter was satisfied.
- The Net Zero Feasibility Study undertaken to understand what sustainable initiatives would best suit the project and facility was completed.
- The Integrated Project Delivery (IPD) team procured additional major engineering consultants and building trades to assist in validating aspects of the project.
- A pre-consultation and initial Site Plan Approval (SPA) application was submitted with initial comments received.

PROJECT SCOPE

Technical Scope and Deliverables:

- The full list of the technical scope and deliverables for this project are listed in Appendix A – Conditions of Satisfaction. Additional information can be found in the building system narratives.

Out of Scope:

- Other related projects that are not included as part of this projects scope include:
 - route changes associated with relocating the transit hub,
 - Allandale GO station parking lot expansion and pick up / drop off improvements,
 - the redevelopment of the existing transit terminal site at 24 Maple Avenue,
 - lease agreements with other transit operators and retail vendors,
 - lay-by lanes for south bound traffic on Essa Road as part of the City's official plan, and
 - the development of the historic Allandale station site.

PROJECT BENEFITS

The project will include the following benefits:

- Support the City of Barrie's continued growth and required community transit services.
- Increase transit access (including alternate access) to the Allandale GO station to provide a more sustainable travel choice and address parking constraints.
- Provide seamless connections for Transit Riders between Simcoe County, Muskoka and the GTA, and provide additional integration between Metrolinx Regional Express Rail (RER) buses and trains, Ontario Northland, and the City of Barrie's transit services, while maintaining a downtown presence.
- Provide a geographically centralized hub within the City.
- Provide a safer transit site by encouraging safe circulation and linkages between bus, vehicular, and pedestrian traffic.
- Provide express bus stops with lay-bys on Essa Road to improve route timelines.
- Support increased ridership and the City's Transportation Master Plan with targets to increase transit modal shares.
- Support increased bicycle ridership with bicycle parking.
- Provide easier access to tourism with multiple modes of transportation.
- Improve the transit network by connecting to the active transportation network.
- Support the City's Official Plan by building within one of the City's identified intensification and urban growth centre areas to promote growth as well as transit-centric developments.
- Provide backup emergency power necessary to maintain uninterrupted transit services during outages.
- Provide an extremely efficient building by targeting Net-Zero energy design, which will reduce ongoing operating costs over the life of the building.
- Create an aesthetically pleasing and fully accessible facility that is consistent with the Allandale Historic Train Station to augment the heritage of the area.

PROJECT FUNDING AND SUPPORT

The Allandale Transit Mobility Hub and Downtown Mini Hub is supported and funded by the Government of Canada (40% contribution) and Government of Ontario (33.33% contribution) through the Investing in Canada Infrastructure Program (ICIP). The City's contribution covers the remaining 26.67%. Contribution amounts and details based on Eligible and Ineligible Expenditures noted in the Transfer Payment Agreement (TPA) are identified in the City's Staff Report.

PROJECT VALUES

The IPD project team inclusive of City stakeholders completed a values workshop by identifying what does success look like for this project. From the items identified, the team grouped areas of success and created defined project values. These values are evaluated against when making decisions for the project. The project values include:

VALUES

SAFETY

Approach construction with safety at the forefront for the community and workers. Design with health, safety, and welfare of the community as a primary goal. To provide a safe built environment facility and to provide a safe operating environment in perpetuity.

VALUES

BUDGET

The project team will use innovative and creative solutions to complete the Allandale Transit Mobility Hub and Downtown Mini-Hub efficiently, maximizing team and economic value.

VALUES

SCHEDULE

The project team will set and, where required, adjust work schedules to meet realistic deadlines utilizing collaborative construction tools and methodologies.

VALUES

COMMUNITY SATISFACTION

A safe, accessible site and building that promotes rider comfort and a healthy connected community that compliments the historical character of the Allandale area. The community is supported by a transit centric development that satisfies project goals and is a gateway to Barrie that we are proud of.

VALUES

INCREASED TRANSIT MULTI-MODAL MOBILITY

This project is a gateway for pedestrians, cyclists, bus and rail passengers. The sites will act as nodes for passengers to access the neighbourhoods of Barrie and beyond. The hubs will be accessible, with clear circulation paths throughout and designed with intuitive wayfinding, supported by inclusive signage.

VALUES

QUALITY TAKES PRECEDENCE

The project team aims to minimize and effectively address deficiencies, achieve design excellence and meet owner requirements. The team will ensure the site and building is fit for its intended purpose by choosing appropriate materials that are installed with master craftsmanship.



3.2. Stakeholder Engagement

PROJECT COMMUNICATION STRATEGY

City staff have developed a communication strategy to inform, update, and communicate with various stakeholders on the project. These stakeholders include Council, Committees of Council, the Allandale Community, City of Barrie Residents, and Indigenous Communities.

COUNCIL

City staff have completed and will continue to provide quarterly Memos to Council. The Memos to Council are intended to provide an update to Council on project achievements, milestones, progress, and information that would be of interest to the project's stakeholders.

HERITAGE COMMITTEE

City staff consulted with the City's Heritage Committee on March 9, 2022, regarding the preliminary design of the building to provide an opportunity for the Committee to share their feedback and suggestions. Feedback and comments provided were shared with the project team and will be taken into future consideration. City staff intend on engaging with the Heritage Committee during the design development stage of the project.

ALLANDALE COMMUNITY AND COB RESIDENTS

Within the communication strategy, there are various forms established for community and resident communication.

There is a dedicated project website which includes a project overview, project benefits, project updates and overall project progress. The website can be accessed at [Allandale Transit Mobility Hub & Downtown Mini Hub \(barrie.ca\)](http://Allandale Transit Mobility Hub & Downtown Mini Hub (barrie.ca)). City staff will continue to update the project website on a quarterly basis.

Residents have the ability to communicate with project staff through the public project phone line, 705-739-4252, and public project email address, ATM.Hub@barrie.ca, which is posted on the project website. The phone line and email address are being used to receive resident inquiries, concerns, and comments. City staff endeavor to respond to all messages and emails within 48 hours.

Community information and engagement sessions will inform residents and neighbouring commercial property owners of the proposed development, project timing, ability to ask questions, and provide comments through in-person or virtual sessions, as appropriate.

Engagement was initiated in 2018 to have the public participate in a priorities and preferences survey to help form the basis of design for the new Transit Mobility Hub.

In addition, a public information session was held on June 23, 2021, which provided the public an opportunity to meet the team, highlighted the results of the 2018 public survey that is being used as a basis of design for the Transit Hub, provided a high-level description of the program and answered questions that were submitted by the public. The session was recorded, and the video can be accessed at [Presentation: Allandale Transit Mobility Hub & Downtown Mini Hub - YouTube](#).

Staff anticipate holding additional public information sessions post design stage and prior to public occupancy.

Community notices will also be provided to residents and neighbouring commercial property owners to provide advance notice and timing on information sessions and site development through a public notice.

INDIGINEOUS COMMUNITIES

The City of Barrie's Archaeologist of Record has engaged Williams Treaties First Nations and the Huron-Wendat First Nation when conducting the archaeological assessments and through the notification of project letters as identified in the section below. Aecom, the City's Archaeologist of Record, will continue to engage the First Nation groups throughout the project as needed. Stage 2 Archaeological Monitoring will commence during site excavation, the First Nations groups have been notified and will be contacted again prior to the work commencing to be made aware of timing, health and safety protocols and site logistics.

The City of Barrie must also abide by the Communications Protocol and Terms and Conditions of the Transfer Payment Agreement (TPA) for the Investing in Canada Infrastructure Program (ICIP).

Based on the TPA communication protocol and the determination letter received by Infrastructure Canada (INFC) regarding our Consultation Obligation with Canada's Indigenous Peoples, the City's Archaeologist of Record, Aecom provided notification letters to the seven signatories of Williams Treaties First Nation, including Alderville First Nation, Hiawatha First Nation, Beausoleil First Nation, Chippewas of Georgina Island First Nation, Chippewas of Rama First Nation, Curve Lake First Nation and Mississaugas of Scugog First Nation. The Huron-Wendat First Nation was also notified of the project. The notification of the project was sent and documented by the City's Archaeologist of Record with record of documentation sent to Infrastructure Canada (INFC) for review. It was determined to be satisfied and the consultation obligation met which meant payment requests may be submitted, and site preparation works could proceed when ready. Consultation and engagement will continue throughout the duration of the project.

The agreement identifies requirements on progress reporting, payment requests and signage. City staff shall complete quarterly progress reports and payment requests for the Allandale Transit Mobility Hub project and bi-annually progress reports and payment requests for the Downtown Mini Hub. In addition, for both projects, signage recognizing the funding contributions must be erected 30 days prior to the start of construction.

PROJECT IMPLEMENTATION TEAM (PITS)

The project team have created project implementation teams (PIT) to focus and complete tasks on various aspects of the project. PITs are made up of diverse stakeholders organized by areas which are focused on driving innovation and value into (and waste out of) the project. PITs can include all members of the team and common PITs include structural, mechanical, electrical etc. The PIT membership is illustrated below.

PIT Membership C = Captain	Sustainability/Energy 10:45AM – 11:30AM	Allandale Site 9:45AM – 10:45AM	Budget/Costing 11:30AM – 12:15AM	Comm. & Doc. 10:45AM – 11:30AM	
	Steve, RDH (C) Kiefer, VC Adam, COB Robert, A49	Greg, WSP (C) Maria, CCL Ismet, WSP Vladimir, WSP Natalie, COB Allison, WSP Robert, A49 Wade, COB Shiv, MCW	Reem, WSP Mike, COB	Raj, CCL (C) Maria, CCL Paolo, COB Ryan, Insight Craig, Birnie Mark, A49 Reem, WSP	Shafraaz, ECO (C) Mark, A49 Maria, CCL Natalie, COB Greg, WSP
	BIM 8:30AM – 9:30AM	Programming & Architectural 9AM – 9:45AM	Owner Tuesday 3PM – 4PM	Structural As Required	
	Ryan, CCL (C) Dan, A49 Joel, COB Keith, INT Wesley, LEA Ritwika, MCW Gillian, WSP Ryan, Insight	Robert, A49 (C) Natalie, COB Mike, COB	Natalie, COB (C) Paolo, COB Rob, COB Mike, COB Adam, COB Wade, COB Joel, COB	John, LEA (C) Mark, A49 Raj, CCL	
	Mechanical & Electrical 9AM – 9:45AM	Downtown Mini Hub 11:30AM – 12:15PM	PMT Monday 3PM – 4PM		
	Bhavin, INT (C) Shiv, MCW Craig, Birnie Duane, Insight Rob, COB Lauran, CCL	Allison, WSP (C) Greg, WSP Ismet, WSP Natalie, COB Laura, CCL Shiv, MCW Mike, COB	Natalie, COB Shafraaz, ECO Mark, A49 Maria, CCL		

4.0 Site Planning and Zoning Bylaws

ZONING INFORMATION

Zone: Central Area Commercial C1-1

Lot Area (Min.): None

Lot Frontage: None

Lot Coverage (Max.): None

Minimum Coverage For Commercial Uses (% Of Lot Area): 50%

Gross Floor Area (GFA) (Max % Of Lot): 600%

Building Height: 10m within 5m of the front lot line and the lot flankage, 30m beyond 5m of the front lot line and the lot flankage.

SETBACKS

Front: None

Side Yard: None

Side Yard Adjoining Residential: 6m

Side Yard Adjoining Street: None

Rear Yard: None

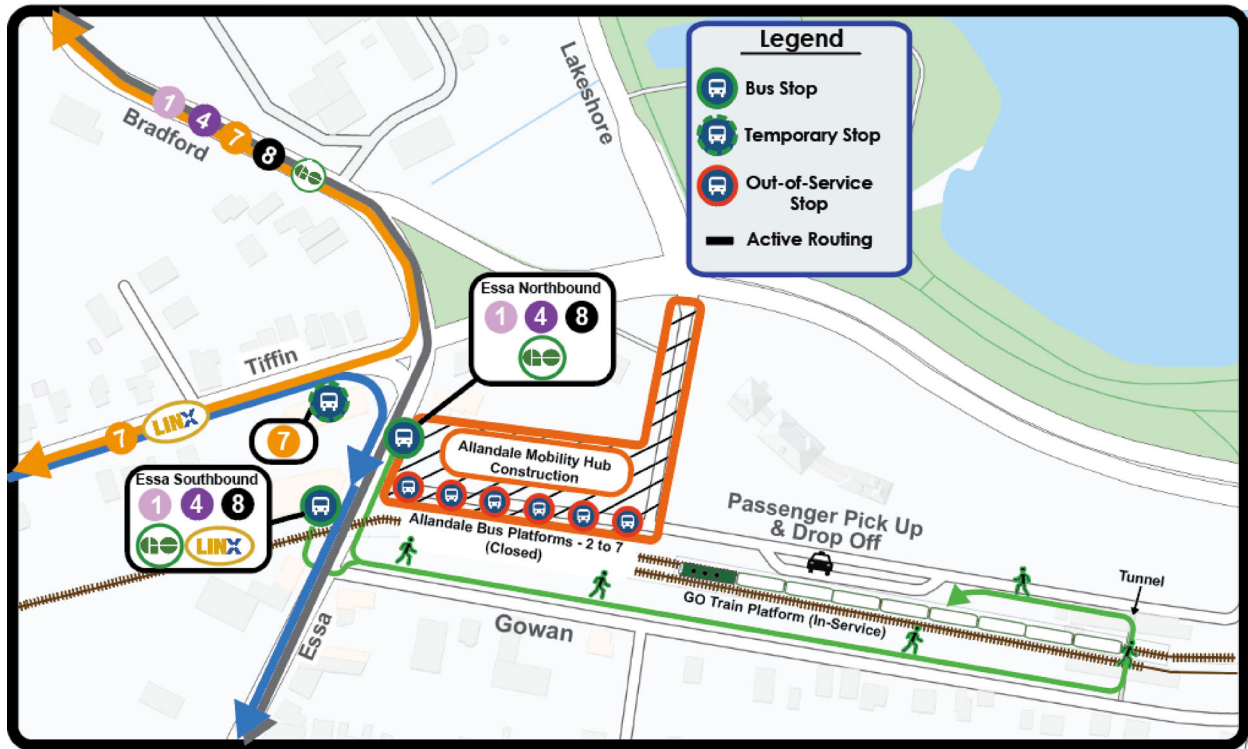
Rear Yard Adjoining Residential: 7m

Rear Yard Adjoining Street: None

DETOUR PLANNING

Multiple regional and transit agencies will be required to detour their transit routes during construction. These are Barrie Transit routes 1, 4, 7, & 8. Simcoe Linx's route 2, GO Bus route 68, and one morning trip for Ontario Northland. A construction phasing plan will be created in coordination with Barrie Transit, GO Metrolinx, Simcoe Linx, and Ontario Northland transit agencies to ensure the least disruptive detour plans are implemented. Print at stop notices, online notices, MyRide push notifications, and pedestrian wayfinding will be provided. Reasonably direct pedestrian access to GO train platforms from all bus routes will be maintained at all times.

Below is an example of the detour plan that could be implemented for the majority of the construction timeline. Note, specific construction phasing may alter the detour plan. This detour plan will be circulated to GO Metrolinx, Simcoe Linx, and Ontario Northland for review and comment prior to implementation.



- Trespassing mitigation is primarily the responsibility of Metrolinx, however coordination between the ATMH developers and Metrolinx is required to ensure that a continuous barrier to prevent unauthorized access to the tracks is established and maintained throughout the entire site.
- Trespassing is also reduced when there are an adequate number of track crossings for pedestrians. At the ATMH, an at-grade crossing is located near the southwest portion of the development, and an underpass of the tracks is provided directly at the Allandale Waterfront GO Station. The crossings are located approximately 375 m apart and will work to reduce the incidence of trespassing into the rail corridor.
- Egress is a key component of the Development Viability Assessment (DVA), and the ATMH provides full vehicular access to and from the site, in the case of an emergency or derailment, from the north side of the site, at the intersection of Tiffin Street and Lakeshore Drive. Site access is located well outside of the setback zone.
- Construction adjacent to an active rail corridor requires careful planning, and early and continuous coordination between the developers and the Railway, to ensure that adequate work plans and mitigation strategies to prevent impacts to the Railway Right-Of-Way are established and maintained throughout the entire course of construction.
- Noise and vibration assessments have been completed for the project and concluded that there will be no negative impact on the ATMH development due to noise and vibration from railway operations.

RAIL REQUIREMENTS

Based on the assessment, in accordance with the Federation of Canadian Municipalities (FCM), the Railway Association of Canada (RAC) Guidelines, and Metrolinx Adjacent Development Guidelines, the team has concluded that there are no additional safety measures required for the ATMH development. The following are the key findings and recommendations:

- Mandatory requirements for setbacks, berms and/ or crash walls, in accordance with the FCM/RAC Guidelines and the GO ADG, are not applicable to the ATMH site as the site contains non-sensitive use activities and there are no residential units incorporated into the development. Any activities within the 30-m setback zone inside the station building are transitory in nature, which Metrolinx has indicated are permitted.
- The ATMH is a third-party transit station and there is an inherent risk associated with it because it must be located adjacent to the rail corridor in order to serve its intended function as a multi-modal transportation node.
- The subject rail corridor is primarily used for passenger trains, with a relatively low maximum track speed of 20 mph, and most trains will be stopping at the ATMH station or operating at platform speeds, thus reducing the risk of major impact to the ATMH site in the case of a train derailment.
- The site is not located adjacent to a high-volume, high speed freight corridor; BCRY freight operations on the corridor are limited to less than 1 train per day and involve spotting cars for local customers on the low speed (10 mph) spur tracks that connect to the Meaford subdivision.
- Review of the Transportation Safety Board (TSB) accident/incident database showed that trespassing poses the greatest risk to public health and safety at the ATMH site.

5.0 Building System Description

5.1. Allandale Transit Mobility Hub

5.1.1. Sustainability

INTRODUCTION

The City of Barrie has declared a climate emergency and identified the need to reduce “municipal carbon emissions including...” “... net zero carbon emissions by 2050”.

To address this, guiding sustainability objectives of the Allandale Transit Mobility Hub includes:

- net-zero energy performance,
- all-electric facility equipment (non-emergency),
- comprehensive sustainability (in alignment with LEED Silver performance, certification not pursued).

By incorporating a net-zero energy target the project building exceeds the operations-related carbon reductions common with a LEED project and better aligns with the City’s zero-carbon by 2050 objective. A net-zero energy objective coupled with all-electric equipment, on-site electricity generation, and Ontario’s low-emission electricity grid provide a near net-zero carbon outcome (for operational energy). In addition, a LEED Silver “Shadow” approach has been incorporated to ensure environmental sustainability metrics beyond operating carbon are accounted for in a cost-effective way. The approach to these other metrics is customized to best meet the needs of the project.

APPLICABLE CODES AND STANDARDS

- LEED v4 BD+C New Construction
- Ontario Building Code SB-10, NECB 2015 path
- ASHRAE 62.1-2010

SUSTAINABILITY CONDITIONS OF SATISFACTION (COS)

Conditions of satisfaction impacted by the project’s approach to sustainability include:

COS	Description	Approach
Net-Zero Energy Performance	Pursue and target Net Zero Carbon by achieving Net Zero Energy performance with an all-electric building and no purchase of carbon offsets. Include a high-performance envelope to support the target.	See “Energy Performance” value approach

Renewable Energy Generation	All energy consumed by the building and site is to be generated on site. Provide renewable energy generation, this can include the use of solar photovoltaics.	See "Energy Performance" value approach
LEED Silver Certification	As per council motion 08-G-328, provide a LEED Silver certified building. Sustainability consultant to provide a sustainable business case for targeting net zero versus LEED Silver certification and show how we are providing equivalent performance (shadowing LEED Silver) or better to demonstrate all aspects of sustainability have been addressed.	See "Approach to LEED Shadow"
Submetering	Submeter the Driver Relief and Kiosk Coffee Shop spaces.	See "Verification of Outcomes" value approach

APPROACH TO SUSTAINABILITY VALUES

The PV panels are installed on the canopies that also provide shelter to transit users during inclement weather.

DIRECT VALUE FOR MONEY

Initiatives that result in direct value to the project either in construction or operations shall be prioritized.

Carbon offsets will not be utilized to close any gap in net-zero energy performance. Carbon offsets would represent a cost to the City, without providing direct environmental or financial value. If, theoretically, net-zero energy performance could not be achieved a more appropriate approach would be to acknowledge the limitation as a learning opportunity to support further energy performance improvements on future projects.

Similarly, LEED certification is not pursued. Instead, the project team will incorporate sustainability best-practices using the LEED rating system as a benchmark to demonstrate a wide range of environmental considerations have been addressed throughout project delivery. This eliminates third-party certification costs and allows the limited project resources to be redirected to pursuing the City of Barrie's Net-Zero by 2050 objective.

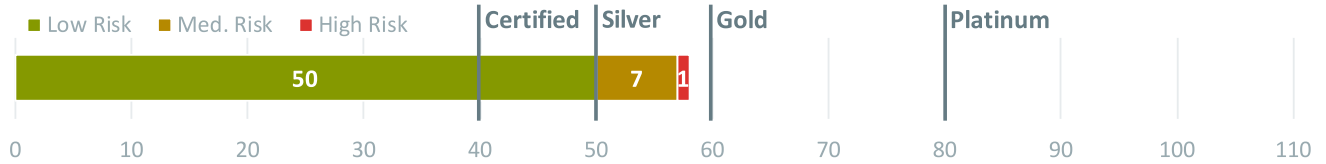
VERIFICATION OF OUTCOMES

Sub-meter data shall be available for analysis during facility operation to understand actual energy performance and identify any opportunities for improvement. Tenant consumption data may be used to support tenant payment of associate utility use. See section 5.1.7 Mechanical Design Brief and 5.1.8 Electrical Design Brief for metering details.

APPROACH TO LEED SHADOW

The project is shadowing (aiming for similar performance to) the Silver level of LEED v4 BD+C New Construction rating system, without pursuing certification.

Rating System to "Shadow": LEED v4 BD+C New Construction



Integrative Process		Tqtd.	Risk
IPc1	Integrative Process	0/1	

		Tqtd.	Risk
EAc6	Enhanced Refrigerant Mgmt.	1/1	1
EAc7	Green Power/Carbon Offsets	0/2	

Location & Transportation

ND	LEED Neighborhood	0/16		
LTc1	Sensitive Land Protection	1/1	1	
LTc2	High Priority Site	2/2		2
LTc3	Density and Diverse Uses	2/5	2	
LTc4	Access to Quality Transit	4/5	4	
LTc5	Bicycle Facilities	1/1		1
LTc6	Reduced Parking Footprint	0/1		
LTc7	Green Vehicles	0/1		

Materials & Resources

MRp1	Collection of Recyclables	P	P	
MRp2	Construction Waste Mgmt.	P	P	
MRC1	Bldg Life Cycle Impact Reduction	0/5		
MRC2	Enviro. Product Declarations	1/2	1	
MRC3	Sourcing of Raw Materials	1/2	1	
MRC4	Material Ingredients	1/2	1	
MRC9	Construction Waste Mgmt.	2/2	2	

Sustainable Sites

SSp1	Construction Pollution	P	P	
SSc1	Site Assessment	0/1		
SSc2	Protect/Restore Habitat	0/2		
SSc3	Open Space	0/1		
SSc4	Rainwater Mgmt.	0/3		
SSc5	Heat Island Reduction	0/2		
SSc6	Light Pollution Reduction	1/1	1	

Indoor Environ. Quality

EQp1	Min Indoor Air Quality	P	P	
EQp2	Tobacco Smoke Control	P	P	
EQc1	Enhanced Indoor Air Quality	1/2	1	
EQc2	Low-Emitting Materials	3/3	2	1
EQc3	Construction IAQ Plan	1/1	1	
EQc4	Indoor Air Quality Assessment	0/2		
EQc5	Thermal Comfort	0/1		
EQc6	Interior Lighting	0/2		
EQc7	Daylight	0/3		
EQc8	Quality Views	1/1		1
EQc9	Acoustic Performance	0/1		

Water Efficiency

WEp1	Outdoor Water Use	P	P	
WEp2	Indoor Water Use	P	P	
WEp3	Bldg-Level Water Metering	P	P	
WEc1	Outdoor Water Use	2/2	2	
WEc2	Indoor Water Use	2/6	2	
WEc3	Cooling Tower Water Use	0/2		
WEc4	Water Metering	1/1	1	

Innovation

INc1	Green Building Education	1/1		1
INc2	Low Mercury Lighting	1/1	1	
INc3	Occupant Comfort Survey	1/1		1
INc4	Exemplary EAc2	1/1	1	
INc5	FBD	0/1		
INc6	LEED AP BD+C	1/1	1	

Energy & Atmosphere

EAp1	Fundamental Cx	P	P	
EAp2	Min. Energy	P	P	
EAp3	Bldg-Level Energy Metering	P	P	
EAp4	Refrigerant Mgmt.	P	P	
EAc1	Enhanced Cx	1/6	1	
EAc2	Optimize Energy	18/18	18	
EAc3	Advanced Energy Metering	1/1	1	
EAc4	Demand Response	0/2		
EAc5	Renewable Energy	3/3	3	

Regional Priority

RPc1	LTc1 (1 pt)	1/1		1
RPc2	EAc2 (10 pts.)	1/1	1	
RPc3	FBD	0/1		
RPc4	FBD	0/1		

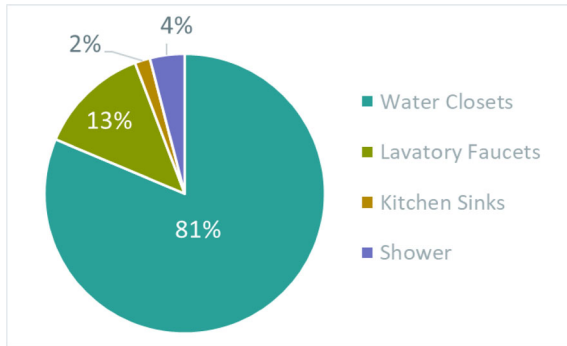
LOCATION AND TRANSPORTATION

The project is in a previously developed site (previously historic train station, then lawn bowling facility before becoming vacant). According to the Phase II ESA Report, soil and ground water contamination is present (including salt, lead, and arsenic). Site remediation may be required. The project site is connected to a cycling network and has diverse amenities within walking distance. By providing bike storage the project can further support low-carbon and active multi-modal transportation options to and on-site.

SUSTAINABLE SITES

During construction, appropriate erosion and sedimentation measures will be implemented to reduce pollution from construction activities. Exterior lights will be selected such that light pollution is minimized.

WATER EFFICIENCY



Native and/or adapted vegetation and rainwater management best practices will be utilized such that no irrigation is required on site. Water sub-metering will be implemented to monitor the building's actual water use. Water efficient plumbing fixtures will be selected that has low maintenance risks associated with low flow fixtures. The following flow rates are best practice for achieving non-process plumbing fixture water savings, but must be balanced with functionality and maintenance considerations:

- Water Closets: 4.2 Liter per Flush
- Lavatory Faucets: 1.3 Liter per Minute
- Kitchen Sinks: 5.7 Liter per Minute

Based on our preliminary water analysis, most water savings potential will come from water closets. Coordination with the City of Barrie to verify the preferred approach will be completed as the project progresses.

ENERGY AND ATMOSPHERE

Energy sub-metering will be implemented to monitor energy use in detail and to feed building performance information to the City of Barrie. Monitoring based commissioning (MBCx) may be adopted to support the City and verify that the building performs as the design intended. As a component of MBCx, an energy measurement and verification process would be completed.

Refrigerants with low Ozone Depletion Potential (ODP) and Global Warming Potential (GWP) will be included in the project specifications. The total refrigerant charge of each unit shall meet the EAc6 credit requirements.

MATERIALS AND RESOURCES

Sufficient recycling collection and storage spaces will be provided to the facility. A construction waste management plan will be developed and implemented throughout the construction phase. Source reduction will take priority over diversion.

At least three points are targeted across MRc2, MRc3, and MRc4 by specifying construction products and materials that are environmentally preferable, have less environmental impacts, and have disclosed chemical inventory.

INDOOR ENVIRONMENTAL QUALITY

The following design features and construction best practices will be incorporated as appropriate to improve indoor air quality:

- Entryway systems
- Low-mitting materials

- Implementation of indoor air quality management plan during construction
- Interior cross contamination prevention strategies
- MERV 13 or higher filters

All regularly occupied spaces are in the building's perimeter areas which provide quality views to the outdoors.

INNOVATION

The facility will have LED lighting with no mercury content. Green Building Education is recommended to promote the project's anticipated sustainable design achievements. Occupant comfort surveys for facility staff may be adopted to assess building occupant comfort and support the post-construction commissioning process.

BUSINESS CASE FOR SUSTAINABILITY

This analysis was completed for the 2021 version of the design. Since then, the look of the building has changed substantially, however design features of the three-life cycle cost analysis (LCCA) paths below would be the same, and therefore the capital and operating cost deltas between the paths will remain similar. Thus, for this Validation report, this Business Case for Sustainability analysis was not revisited for the updated design that this Validation report is based on.

A business case analysis was undertaken to compare the current Net Zero path to two business as usual paths. The first path "Timeline 1" considered a design that would achieve LEED Silver, and in the future the HVAC system would be replaced like-for-like at its end of life. Timeline 2 begins identically to Timeline 1, however at the HVAC end of life the HVAC system is replaced with the nearly the same HVAC system included in the proposed design in this report, albeit with the larger capacity necessitated by the LEED Silver enclosure performance. At the same time a PV system would be installed to achieve Net Zero in at this future time. Timeline 3 is the proposed design. The Net Zero pathway demonstrates the best net present value for the project.

5.1.2. Energy Performance

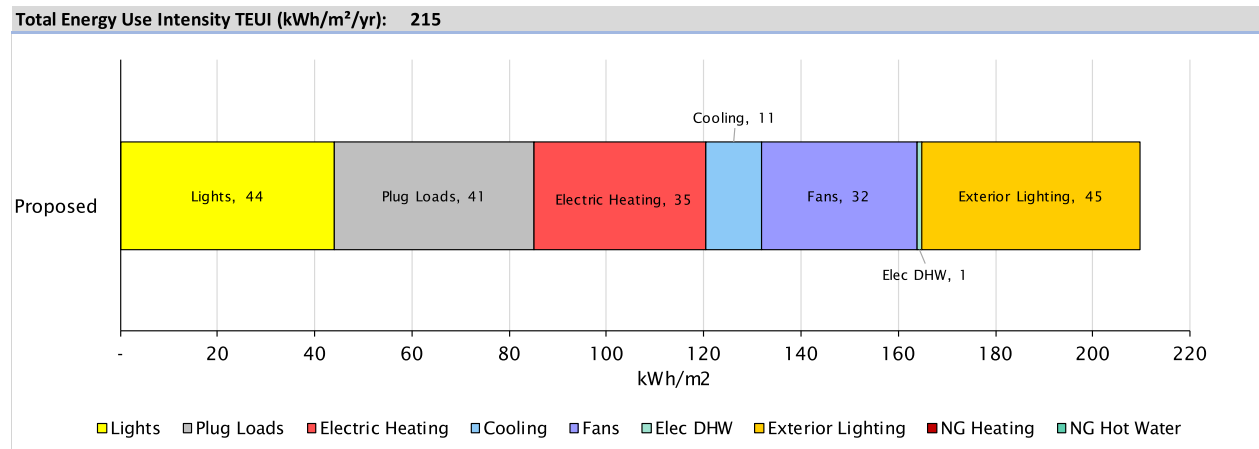
The ATMH conditions of satisfaction includes a "Net Zero Energy" performance goal, specifically that at the end of an operating year, the operating cost with respect to energy consumption is zero dollars. As a result, the strategy for the building systems took the approach that generally, on-sites sourced renewable energy used to offset the consumption of energy in the building would be more expensive than demand reductions in energy consumption. Demand reductions for heating and cooling were achieved through an "enclosure first" approach. Fully insulated slabs, and highly insulated walls and roofs contributed to the heating and cooling demand reduction. One of the higher cost items was triple glazed windows with insulating frames. The cost benefit of this compared to adding more PV to achieve "Net Zero" was tested during validation, with the conclusion that the capital expenditure savings of less insulating windows would not exceed the additional expenditures on Photovoltaics required to achieve net zero when the energy demand increased. Transitional thermal bridging details were included in the thermal analysis of the enclosure. Heat recovery ventilators and a low air leakage envelope goal completes the measures use to mitigate heating and cooling energy demand. Lighting systems, both interior and exterior are assumed to be LED, and empty administrative spaces use occupancy controls to turn off lighting when they are unoccupied as well as for daylight harvesting in all space with available daylight.

Shelter radiant heating, for two new shelters, was in the original design, however it required 18 kWp DC of PV panels to supply the energy to heat the shelters on an annual basis at an approximate cost of \$40,000. As a result, radiant heating for the shelters was removed. The current design may result in existing Metrolinx heated shelters being assigned to this project's electric meter, as worst base value of 4 shelters (36 kWp DC of additional PV panel) has been carried in the risk register.

The heating and cooling system does not consume any on-site fossil fuels. The systems described in Mechanical section below, efficiency provides the required energy to condition the building and adapt to

the occupancy. Initially air to water heat pumps supplying in-floor radiant heat and fan-coils was considered, however this proved to be a \$300K to \$400K premium than the VRF system being used. While the VRF system does consume marginally more energy than the air to water heat pumps, the additional PV required to maintain Net Zero is significantly less than mechanical premium.

The total energy use breakdown is provided below, normalized by the GFA. Energy used for space conditioning (heating, cooling, fans) represent just under a third of the total energy usage, which compared to nearly two thirds for a new construction building. Exterior lighting is higher than most buildings, however as a Transit Hub this is to be expected.



Total Annual Electrical Consumption	138,499 kWh / year	499 GJ / year
Total Annual Gas Consumption	0 ekWh / year	0 GJ / year
Annual Electricity Generation	152,349 kWh / year	548 GJ / year

Due to uncertainties in whole building energy modeling, it was recommended that a buffer be carried, thus the on-site renewable generation requirement was set as 10% higher than the consumption goal. This will require a 127 kWp DC photovoltaic (PV) array to be installed on the site. The PV panels are installed on the canopies that also provide shelter to transit users during inclement weather.

5.1.3. Site / Civil

OVERVIEW OF THE SITE COS REQUIREMENTS

The conditions of satisfaction for the Allandale Transit Mobility Hub site are listed in Appendix A Conditions of Satisfaction which dictate the required criteria and deliverables for the Hub site.

The list of FF&E for the Allandale Transit Mobility Hub are listed in Section 5.1.9. Please refer to that section for the complete list of FF&E required for the Allandale site.

APPLICABLE DESIGN STANDARDS – CIVIL

Servicing design outlined in this section provides the conceptual framework for water distribution, sanitary sewage, storm drainage and stormwater management systems. The site will be serviced by existing local municipal sewers within the adjoining municipal right-of-way. Service connections will be extended into the site and coordinated with the building design team. Where possible, existing service connections is planned to be used. In preparation of the civil servicing design, the following standards and codes will be used to meet the design quality requirements:

- Accessibility for Ontarians with Disabilities Act (2014);
- City of Barrie Lot Grading and Drainage Standards and Design Manual (2019);
- City of Barrie Sanitary Sewage Collection System Policies and Design Guideline (2017);
- City of Barrie Storm Drainage and Stormwater Management Policies and Guidelines (2020);
- City of Barrie Water Transmission and Distribution Design Standard (2021);

- Lake Simcoe Region Conservation Authority Technical Guidelines for Stormwater Submissions (2016)
- Lake Simcoe Region Conservation Authority (LSRCA) Phosphorous Offsetting Policy (POP) (2019);
- Ministry of the Environment Conservation and Parks (MECP) Stormwater Management Policies and Design Guidelines (2003); and
- Ontario Provincial Standard Specification (OPSS) and Ontario Provincial Standard Drawing (OPSD) (2021)
- TAC Guidelines for Understanding Use and Implementation of Accessible Pedestrian Signals (2007)

DESCRIPTION OF CIVIL REQUIREMENTS

The proposed buildings are required to be adequately serviced by the existing municipal watermain system and sanitary sewer system within Essa Road. The site is currently provided with 200 mm water service connection from the existing 300 mm watermain on Essa Road, located at the southwest corner of the proposed building. The water meter room is located at the north-west corner of the proposed building, approximately 23.3 m north of existing water service. Therefore, a new single 150-diameter fire service connection will be provided connecting into the water meter from the existing 300 mm watermain on Essa Road. A domestic water service will be branched from the fire water service line in a form of an "h-style". An additional single 150-diameter fire service will also be branched from this proposed water connection and run east across the site in order to service the driver relief building. The connection to the driver relief building will similarly have a 100-diameter domestic water service line branched off the fire line.

There is a 250 mm sanitary service connection provided to the site from the existing 500 mm diameter sanitary sewer on Essa Road. The location of the service connection has been deemed to be inadequate for the proposed site servicing; therefore, will be removed and a new 250-diameter sanitary connection is proposed to connect from the existing municipal sewer on Essa Road at the northwest corner of the site. A sanitary sewer system has been designed on-site to service both buildings. Two (2) maintenance control manholes will be provided.

The required grading design for the proposed development is to direct minor storm drainage, up to and including the 100-year storm event, to on-site collection points so that drainage is self-contained. Additionally, an overland flow route for the major storm drainage (greater than the 100-year storm event) is required to direct drainage away from the proposed and existing structures to approved outlet points.

Existing constraints include:

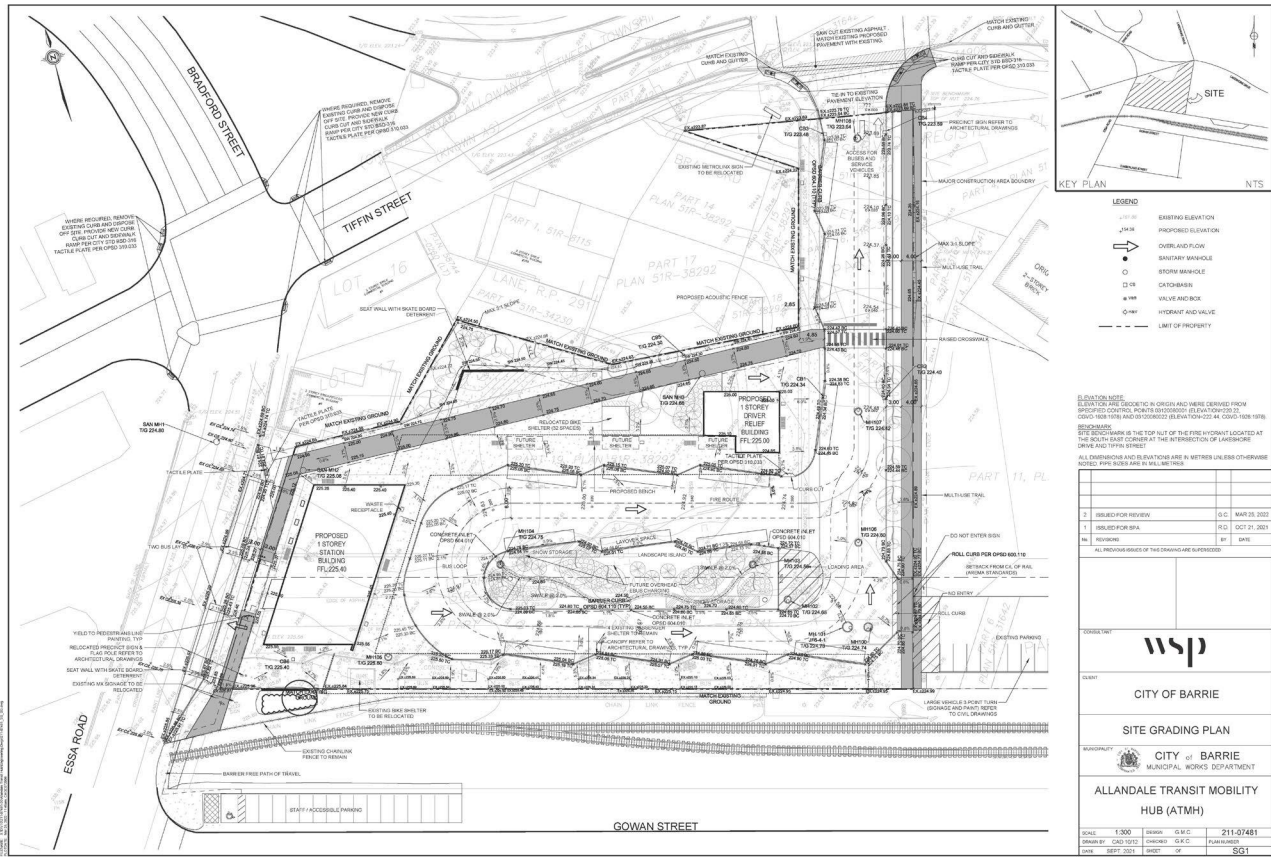
1. Building finished floor elevation is constrained by the grade difference on Essa Road fronting the site (1.25m), considering location of building doors.
2. Site grading is constrained by the existing grades along the south limit of construction and existing bike and bus shelters that are to be removed and relocated back along the south.
3. Storm sewer system is constrained by the invert of existing control manhole outlet. The objectives of the stormwater management (SWM) plan for the site area as follows:
 - Control of the post-development peak flows to pre-development for all storms up to and including the 100-year storms.
 - Provide enhanced level protection (80% TSS removal) for site runoff.
 - Seek to reduce phosphorus load in runoff from the development.

Erosion and sediment controls are required to be implemented on site for the duration of construction.

APPROACH TO SITE AND CIVIL REQUIREMENTS

The proposed site grading design will address the requirements noted above through the implementation of the following:

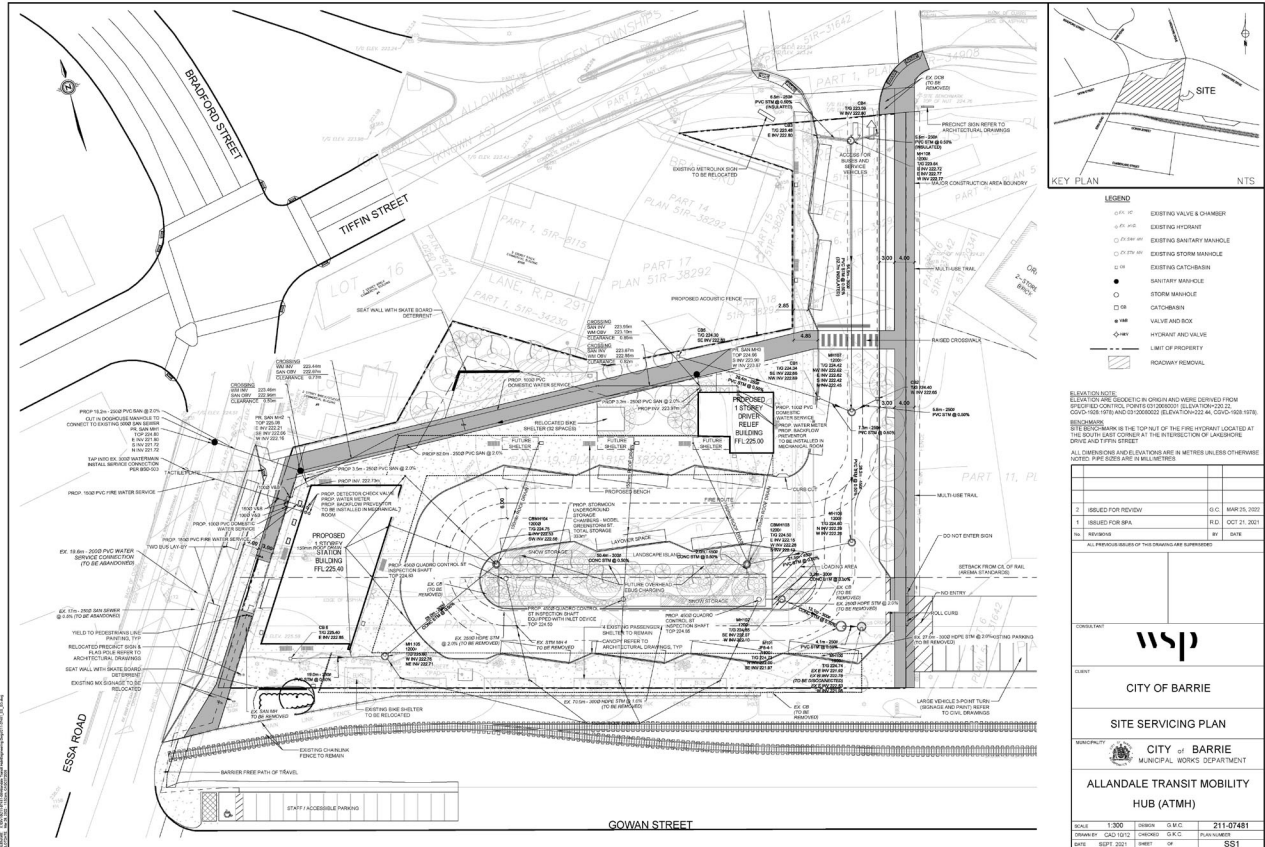
- Introduction of localized high points and low points to create catchment areas corresponding with the proposed minor storm sewer system
- Existing grades along all boundaries are to match existing so that there is no impact to adjacent properties



Site Grading Plan

The site servicing requirements will be addressed as follows:

- A 150mm diameter fire water service and a 100mm diameter domestic water service for each building will be provided. The system is to connect to the existing 300 mm diameter watermain on Essa Road.
- A proposed detector check valve, water meter and backflow preventor to be installed in the mechanical room of each building.
- The existing 250 mm diameter sanitary connection and control manhole to be removed. A new 250 mm diameter sanitary connection to the existing 500 mm diameter sanitary sewer on Essa Road is proposed and will service both proposed buildings on-site through a sanitary sewer network.



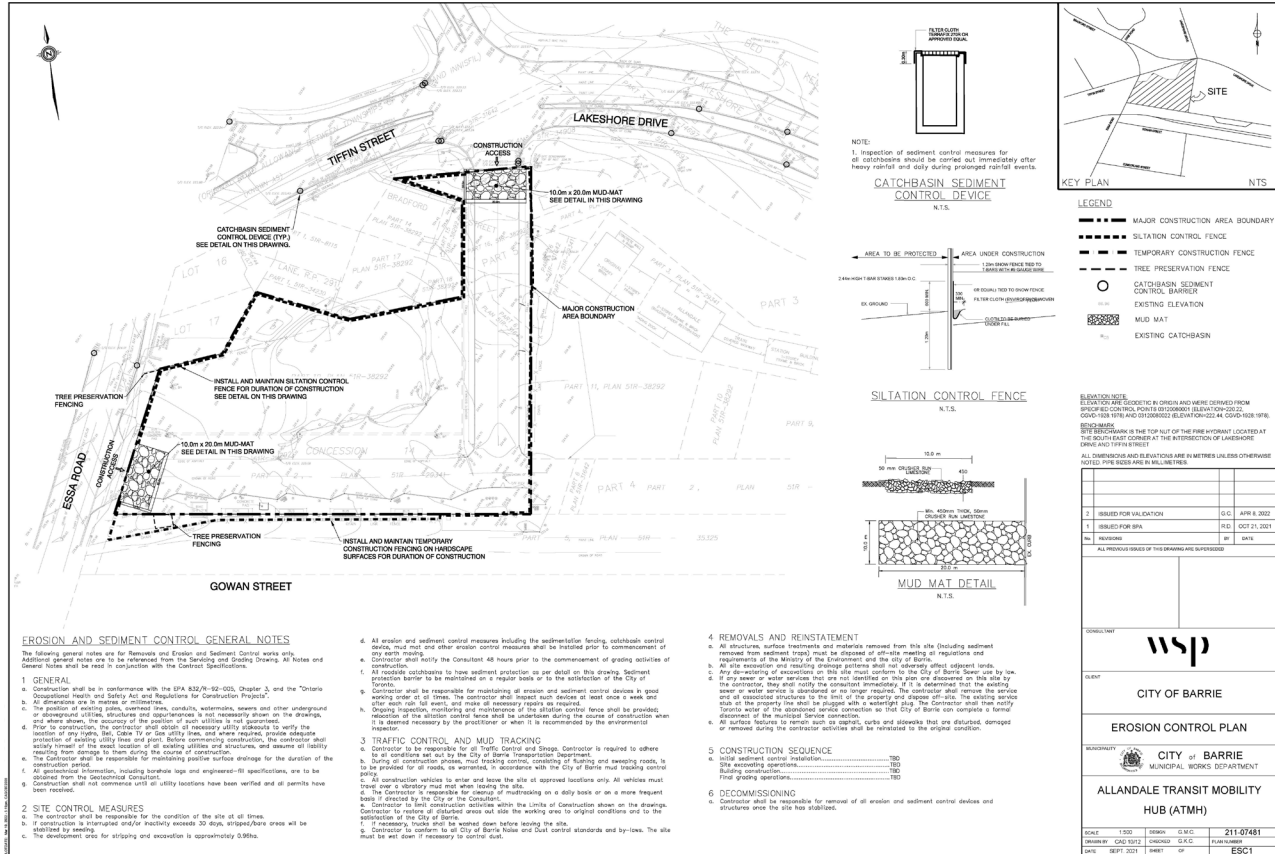
Site Servicing Plan

The SWM plan for the site addresses the requirements through the implementation of the following system:

- An underground stormwater management system comprised of a module system with a total storage of 343 m³ and controlled by a 250 mm orifice tube. The module system is proposed to control post-development flow to pre-development levels.
- A Jellyfish filter unit, JF6-4-1, is recommended to remove 80% of TSS. Additionally, the filter reduces phosphorus load from the site by providing 77% phosphorus removal.

The following erosion and sediment controls will be implemented:

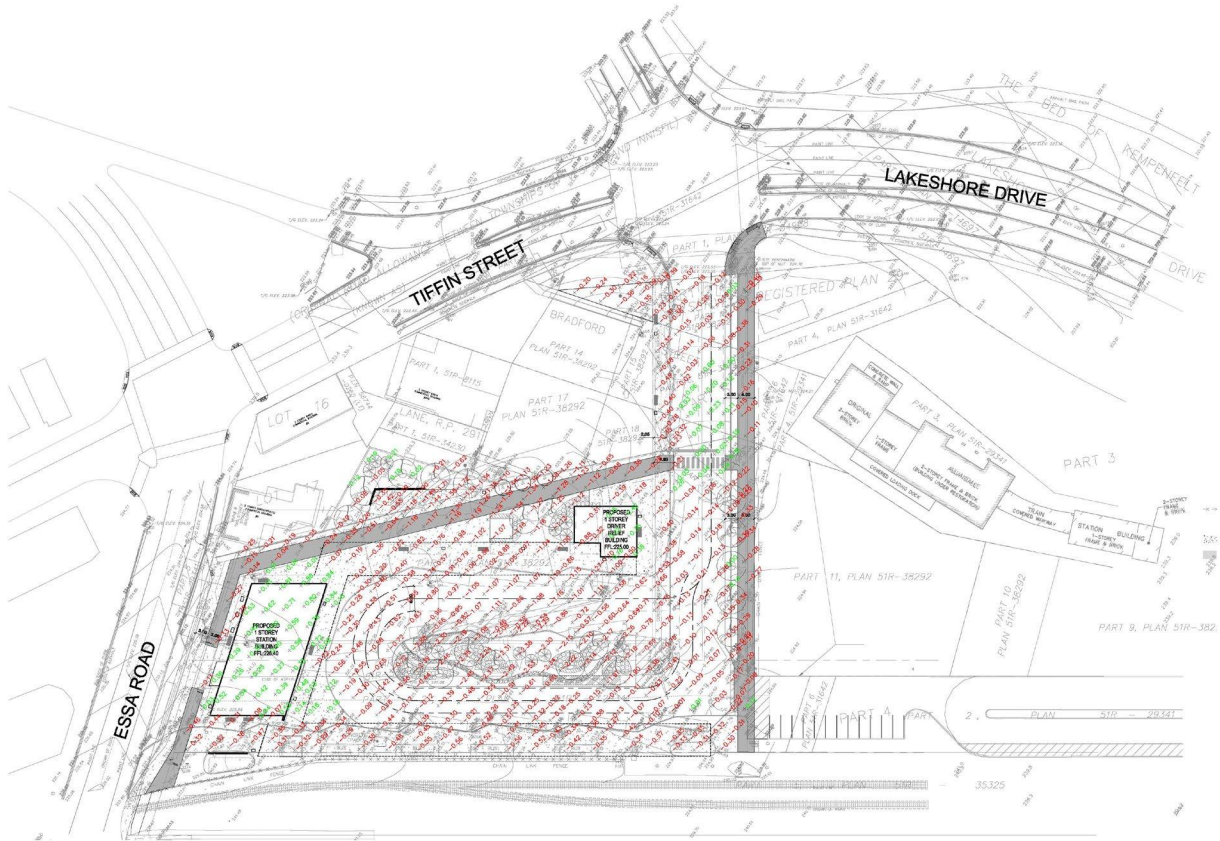
- Siltation control fencing along the property line on softscape surfaces, temporary construction fencing along the property line on hardscape surfaces and tree preservation fencing where required
- Catch basin sediment control devices
- 2 temporary mud-mats at the entrance/exit



Erosion Control Plan

The fill management plan will address earthwork requirements through the implementation of the following:

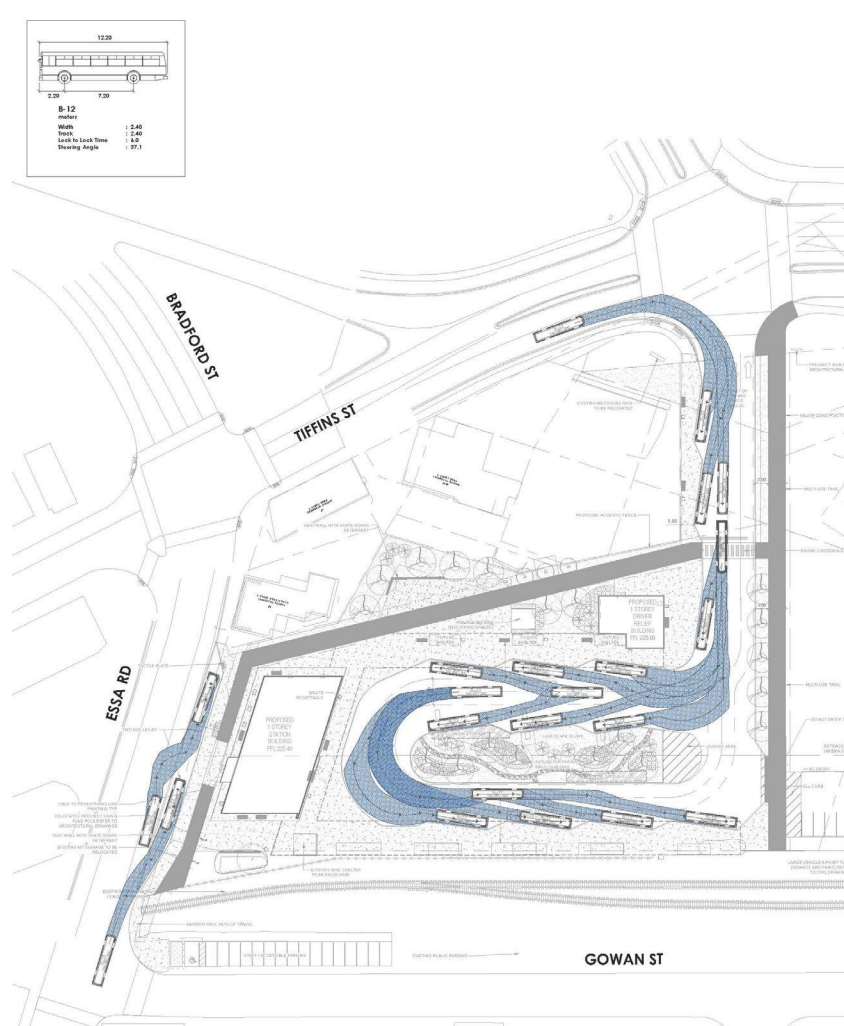
- Strip 0.28m average depth of topsoil from existing landscape areas. The depth of the topsoil is per the geotechnical report prepared by Soil Engineers Ltd., dated February 2020.
- Removal of 0.3m depth for existing sidewalk and waiting area concrete structures. The depth of concrete structures is approximate.
- Removal of 0.71m depth for existing bus area pavement structures. The depth of the pavement structures is approximate and assumed equal to the depth of pavement structure recommended by the Geotechnical Engineer.
- Subgrade depth will be set based on the type of the structures including landscape, building, multi-use trail, concrete sidewalks, waiting area, and bus areas. Depth of each structure will need to be coordinated with the civil, landscape and structural design team.
- The volume analysis will be conducted by comparing the stripped surface and proposed subgrade surface to estimate the required cut and fill soil volumes. All cut soil volumes are assumed be removed from the site.



Fill Management Plan

Auto turn:

- An auto turn analysis has been completed for the site to accommodate all bus routes and laybys
- Provisioning for the fire route for the site has also been completed in the auto turn assessment



Auto Turn Assessment

The development viability assessment (DVA) addresses the required additional rail safety measures through the implementation of the following:

- Mandatory requirements for setbacks, berms and or crash walls are not applicable as the proposed site is a transit station and the activities within the 30m setback zone inside the station building are transitional in nature, which Metrolinx has indicated are permitted within a setback zone.
- Within the study limits, the subject rail corridor is primarily used for passenger trains operating at platform speeds or stopping at the Allandale Waterfront GO Station, thus reducing the risk of major impact of any train derailment on the ATMH.
- Freight operations within the study limits are less than 1 train per day and consist of spotting cars for local customers on 10 mph spur tracks.
- ATMH and Metrolinx shall coordinate to maintain a continuous barrier (fencing) along the entire south side of the site to prevent unauthorized access to the rail corridor.
- There is an adequate number of pedestrian crossings at or near the site to reduce the incidence of trespassing into the rail corridor. There are two at-grade crossings located 375 m apart, one directly adjacent to the ATMH site and one at the Allandale Waterfront Go Station.
- ATMH site provides full vehicular access to and from the site in case of an emergency or derailment and the emergency egress is located outside of the 30m setback.
- Early and continuous coordination with the Railway is required to ensure that adequate work plans and mitigation strategies to prevent impacts to the Railway ROW are established and maintained during construction period.

- Noise and vibration studies have been completed for the site and concluded there will be no negative impacts on the site due to train operations.

STATUS OF SPA

The site plan approval (SPA) application was submitted through the City's APLI program on October 21, 2021. A technical meeting was held with Development Services and Authorities Having Jurisdiction on December 2, 2021, to discuss any questions or comments on the application submission with the project team.

Reports, Studies, and Drawings that were submitted as part of the SPA include the following:

- Stage 3 Archaeological Assessment
- Infrastructure Canada (INFC) Indigenous Consultation Approval
- Phase 1 Environmental Site Assessment
- Phase 2 Environmental Site Assessment
- Functional Servicing Report
- Geotechnical Report
- Hydrogeological Study
- Supplemental Hydrogeological Study
- Topographic Survey
- Noise and Vibration Impact Analysis
- Traffic Impact Study to 2024
- Traffic Impact Study to 2031
- Arborist Report
- Development Viability Assessment
- Species at Risk Report and Letter of Clearance
- Due Diligence Risk Assessment
- Stormwater Management Report
- Hydrant Flow Test
- Decommissioning Monitoring Wells Record
- Architectural Site Plan
- Floor Plan (preliminary)
- Elevations (preliminary)
- Grading Plan
- Site Servicing Plan
- Erosion and Sediment Control Plan
- Site Removals Plan
- Fill Management Plan
- Stormwater Management Plan
- Auto-turn Assessment
- Landscape Plan
- Tree Preservation Plan
- Electrical Site Plan
- Photometrics Plan

A supplemental geotechnical report and site survey have been completed since the initial submission.

SPA comments provided by all Authorities having Jurisdiction will be reviewed and will resolve the design elements inclusive of updating plans and detailed reports and will re-submit for SPA in the design development phase.

PHOSPHORUS BUDGET

The LSRCA requires that the post-development phosphorous loading be zero. As per the POP, in situations where the phosphorus load cannot be met or demonstrated in a post-development scenario to achieve the zero-phosphorus requirement, the City shall be required to provide a phosphorus offsetting to the LSRCA. The overall phosphorus removal rate of 77% was achieved by the use of a Jellyfish Filter. As this is below the required 100% phosphorus removal, a \$43,817 cash in lieu fee will be required by the LSRCA.

SIGNAGE AND PAINT

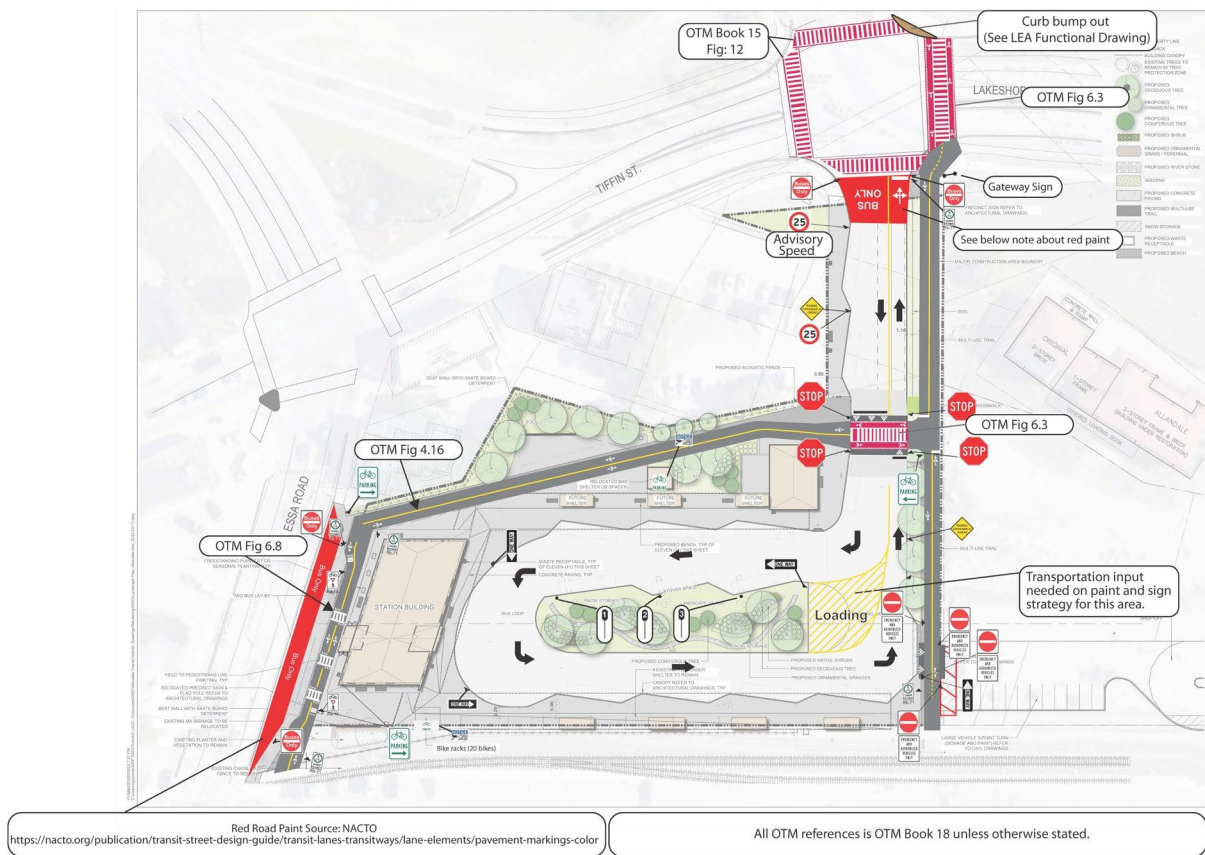
Traffic signals and regulatory signage is proposed on-site to ensure safety and user satisfaction among pedestrians and transit users. The signage and paint plan provided below provides examples of signage / road paint to be included but may not represent all required signage and paint.

Signage may include but is not limited to:

- Investing in Canada Infrastructure Program (ICIP) signage erected 30 days prior to construction to recognize the funding contributions
- Pedestrian crossing signage
- No entry signage
- Stop signage
- Bike parking signage
- Speed advisory and regulatory signage
- Bus platform signage

Painting will also be required and may include but is not limited to:

- Multi-Use Path paint
- Traffic guidance road paint
- Individual bus platform road paint
- Bus only area road paint



5.1.4. Landscape

INTRODUCTION

This report outlines design principles, technical approach and applicable codes and standards used in the development of the Landscape improvements for the Allandale Transit Mobility Hub on Essa Road, in Barrie, Ontario.

The design will reflect the intent of the Conditions of Satisfaction and Issued-for-Proposal concept in response to conformance review comments and comply with all codes and regulations including but not limited to the Accessibility for Ontarians with Disabilities Act (AODA), the Ontario Traffic Manual (OTM) and Ontario Standard Specifications, Drawings and Details. Scope will be delivered via the established project team and their respective design team representatives listed below.

- Architectural
- Civil Roadways
- Civil Drainage
- Electrical
- Utilities
- Landscape

APPLICABLE DESIGN STANDARDS – LANDSCAPE

- Project Conditions of Satisfaction
- OBC (Ontario Building Code)
- City of Barrie Accessible Customer Service Policy
- City of Barrie Accessible Standards Policy
- City of Barrie Accessibility Procedure
- AODA (Accessibility for Ontarians with Disabilities Act)
- OTM (Books 1 through 12 and 18)
- City of Barrie Operation Policy, Procedures and Guidelines
- City of Barrie Lot Grading and Drainage Standards and Design Manual
- OPSS (Ontario Provincial Standard Specification) and OPSD (Ontario Provincial Standard Drawing)
- TAC Guidelines for Understanding Use and Implementation of Accessible Pedestrian Signals
- Canadian Standards for Nursery Stock
- CNLA (Canadian Nursery Landscape Association)
- CPTED (Crime Prevention Through Environmental Design) best practices

APPROACH TO THE ALLANDALE HUB

The Allandale Transit Mobility Hub site and landscape has been designed to address the Conditions of Satisfaction (Appendix A) as prescribed by the City of Barrie in the project charter. The ATMH project consists of the construction of a centralized bus transit hub that is to function as the primary regional and local hub for the City of Barrie, with connection to the Metrolinx rail station to the south-east. The project landscape scope includes, but is not limited to:

- Multi-use trail connection from Essa Road through the north end of the Hub north to the Tiffin/Lakeshore intersection
- A landscaped median/stormwater management feature within the bus loop
- Bike parking for 20+ bikes including relocation of the existing bike shelter
- Bench seating
- Street tree and shrub landscape planting
- Public outdoor amenity space to provide rest areas, bicycle parking space and opportunity for future programming by City of Barrie

DESCRIPTION OF LANDSCAPE REQUIREMENTS

Technical approach and requirements of overall landscape architecture endeavors to meet the Conditions of Satisfaction in accordance with applicable codes and standards identified above.

Landscape drawings for detailed design will include:

- Material and layout drawing noting critical dimensions for all landscape hard surface treatments, site furniture, and soft landscape items
- Planting Plans indicating species and quantities
- Material Plans indicating all proposed hard surfaces and site furnishings, and
- Details for all proposed landscape items.

Landscape requirements have been considered to meet the Conditions of Satisfaction for the site (Appendix A) and included, but not limited to the following site-specific requirements:



- Provide a safe, comfortable, and convenient pedestrian environment.
- Consideration of pedestrian's barriers (fences, planting etc.) to direct foot traffic to desired crossings
- Minimize pedestrian circulation conflicts with bus traffic
- Bike parking in an area of visibility to discourage theft. Additional consideration for covered bicycle parking, bicycle storage including e-bike charging.
- Benches throughout
- Centre landscaped area (in the bus loop median)
- Full accessibility in accordance with the legislated Accessibility for Ontarians with Disabilities Act (AODA) and OBC.
- Litter containers throughout.

Landscape design has been developed to address the COS as follows.

Surface Materials

There are two primary hard surface landscape treatments proposed: the asphalt multi-use trail that traverses the site, and the concrete pedestrian areas between street, bus platform and building. Paving material installation will be designed to accommodate heavy duty commercial use, consistent with the high-traffic use of the site. All new sidewalks will be concrete, 32mPa, magnesium float finish on a granular base. Pedestrian surfaces will be designed to meet universal accessibility requirements (COADS, AODA) with respect to slope, material and colour.

Table 1: Hard Surface Materials





Material	Image
Concrete Sidewalk (with sawn control joints)	
Multi-Use Trail (asphalt)	

Site Furnishings

Site furniture included in the landscape design drawings is additional to passenger seating provided within bus shelters/for bus stops. Furnishings will be located adjacent to sidewalks and passenger waiting areas to contribute to passenger wayfinding, comfort, and to maximize use. Furnishings are summarized in the table of furnishings.

Table 2: Site Furnishings

Item	Image
<p>Waste Receptacle: Receptacles will be two-stream. Placement shall be outside and adjacent to passenger paths of travel and waiting areas as indicated on the landscape plans.</p>	

<p>Bench Seating: Bench seating will be provided at key locations across the site, additional to dedicated bench seating on the bus platform. Placement to be close to pathway and plaza areas, back of sidewalk. Benches to be provided by the City of Barrie from surplus storage.</p>	
<p>Bike Parking: Bike racks are a combination of existing and proposed fixtures.</p>	
<p>Freestanding planters: Suggest freestanding planters along the Essa Road façade that can be planted seasonally to provide visual interest and punctuate the entrance, and be removed in winter to accommodate snow storage</p>	
<p>Bike Shelter: Existing bike shelter will be retained and relocated to the north side of the north bus platform adjacent to one of the amenity spaces, providing equal access for those arriving from Essa Road and those cyclists accessing the site from Lakeshore and Tiffin. Additional bike parking is located at select locations on site.</p>	

Planting

High value existing trees along the north side of the site are anticipated to be retained as the limit of disturbance to accommodate the bus loop and building construction allows. Understory will be cleared to provide clear sightlines. Refer to the Arborist Report and Tree Mitigation Plan. Proposed planting will be used to define the public realm around the Transfer Building, including free standing planters for seasonal planting under the building canopy facing Essa Road, as well as some modest shrub planting and trees to provide shade and define pedestrian routes at the perimeter of the site. Within the bus loop, the stormwater area will be vegetated. Vegetation will be selected for its salt tolerance, tolerance to wet/dry conditions and to deter pedestrian travel across the loop and to the east side of the access road – both by placement and selection of 'hostile' species. Planting is sited to allow for some snow storage, and in consideration of sightlines for bus operators travelling through the loop. Planting is coordinated with the drainage design to provide areas for infiltration and accommodate runoff in peak rain events. All planting on site and in consideration of CPTED, sightlines, snow maintenance movements, and AODA clearances. Planting will be specified in accordance with Canadian Nursery Landscape Association and Canadian Standards for Nursery Stock, OPSD standard details and City of Barrie details as applicable.

Seed and Sod

Imported horticultural topsoil will be provided for proposed planting areas as required. Planting soil will be fertile, friable, natural sandy loam containing not less than 4% of organic matter for sandy loams, with an acidity value ranging from pH 6.0 to pH 7.5 capable of sustaining vigorous plant growth; free of stems or roots, stones, and clods more than 50mm diameter or other extraneous matter. Soil will be screened where applicable and not supplied in a frozen state. All imported earth borrow shall be of the quality as defined

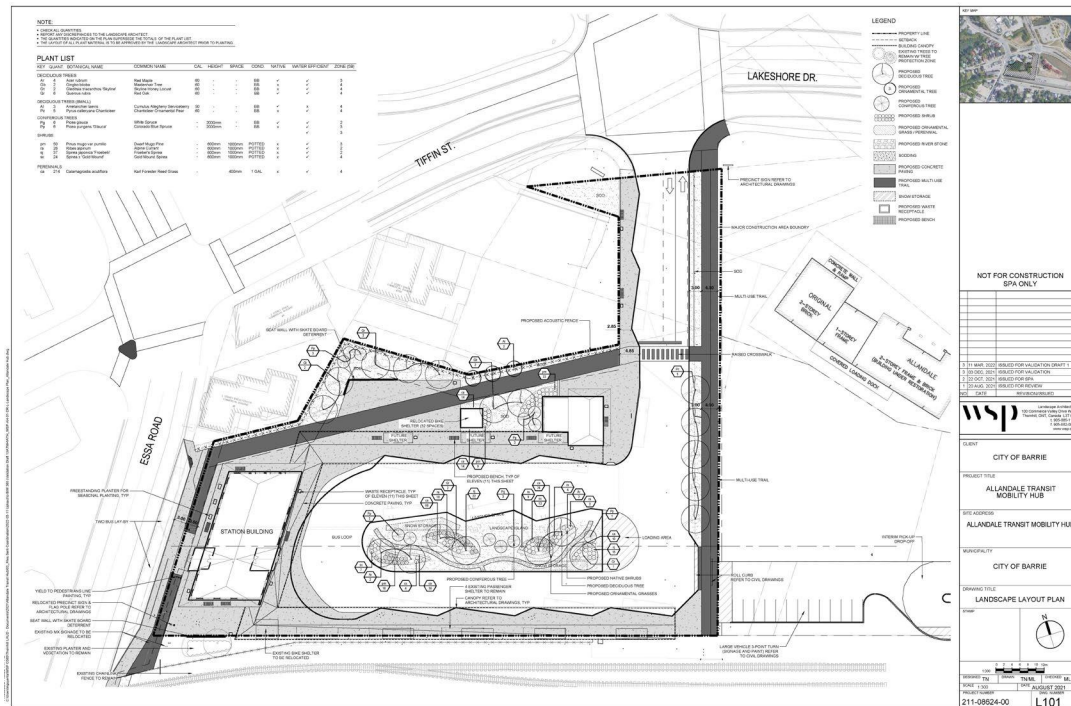
by OPSS 212. Sod will be implemented where defined on the drawings and meet Canadian Nursery Landscape Association and Canadian Standards for Nursery Stock adjacent pathways and paved public spaces. Disturbed areas are to be scarified to a minimum of 200mm depth with 200mm topsoil applied prior to seed application.

Crime Prevention Through Environmental Design (CPTED)

The design of landscape areas will apply the principles and strategies of Crime Prevention Through Environmental Design (CPTED). Site design will promote natural surveillance and user comfort within a functional landscape.

Site furniture will be located near main pedestrian routes with adequate and appropriate lighting project requirements to reinforce natural surveillance to/from the street and bus stops. All pedestrian areas will be designed to allow for pass-through movement such that 'dead end' spaces are not created and to promote perceptions of pedestrian comfort and safety, any time of day. Unintended light spill will be mitigated such that 'in-between' lighting space is not created.

Select shrub and deciduous tree species (if required) will be 'below the knees and above the head' along pathways and waiting areas. At the base of walls and backs of buildings, thorny or 'hostile' and evergreen species will be used to deter unauthorized pedestrian access and to mitigate vandalism of vertical structures. The landscape design will consider existing site lighting to ensure proposed tree plantings do not affect appropriate illumination of pedestrian routes and waiting areas.



Landscape Plan

5.1.5. Architectural / Enclosure / Interiors

GENERAL

Using the previous reports, the team identified previous design components as well as identified additional ones which should be amalgamated into the project as they aligned with our team values. Utilization of space, and positive community impact values acted as catalysts in identifying the key planning objects for this project. Working with the City of Barrie team and understanding the Conditions of Satisfaction, along with the rest of the design team, the building components were laid out and massed proportionally. The driver relief was segregated into its own building separate from the main terminal as a result of those discussions.

Exterior Elements

- 90mm Brick – premanufactured concrete brick, maximum of three colours
- Cladding - aluminum composite metal cladding on manufacture clips
- Cladding for canopies - aluminum metal cladding on manufacture clips
- Triple glazed Clear anodized aluminum curtain wall glazing system for vestibules (exterior only)
- Triple glazed clear anodized aluminum windows
- 2 ply modified bitumen for station building with solar panel array on top
- Standing seam metal roof panels for admin building
- Site work including new concrete sidewalk around site and bus shelters
- Perforated weeping tile around perimeter
- Laser cut metal gusset plates are incorporated into the canopies and structural components.
- Signage on the building assumes illuminated aluminium box lettering anchored to the curtainwall at the main entrances
- PV panels will be incorporated onto the canopies

Thermal Performance

- Exterior Wall Assemblies Minimum R-19ci (OBC), designed (R-22)
- Exterior Wall Assemblies below grade Minimum R-20 (OBC), designed (R-20)
- Flat Roof Assemblies Minimum R-35 (OBC), designed (R-44)
- Sloped Roof Assemblies Minimum R-60 (OBC), designed (R-40)
- Floor Slab Assemblies Minimum R-10 (OBC), designed (R-10)

Acoustic Performance

STC 54 for exterior brick

WALL ASSEMBLIES**Typical Exterior Wall Assembly #1**

90mm Brick Veneer
 25mm Air Space
 90mm Sprayed Insulation (Min R19)
 Peel & Stick Air /Vapour Barrier
 13mm densglas sheathing
 38x140mm wood studs or 38X152mm metal studs
 (13mm plywood sheathing in public areas)
 13mm G.W.B.
 Ceramic tile or paint

Typical Exterior Wall Assembly #2

38mm metal composite panels siding
 Siding stanchions
 90mm Sprayed Insulation (Min R19)
 Air /Vapour Barrier
 13mm densglas sheathing
 38x140mm wood studs or 38X152mm metal studs
 (13mm plywood sheathing in public areas)
 13mm G.W.B.
 Ceramic tile or paint

Typical Roof Assembly #1

38mm Metal Standing Seam Roof Panels (faux tile)
 Ice and Water Shield over entire roof
 19mm plywood
 Fire-retardant treated Wood Roof Truss
 Blown Insulation (Min R60)
 Vapour Barrier
 13mm G.W.B

Typical Roof Assembly #2

2 ply mod bit
 protection board
 150mm Tapered Insulation or as req'd
 200mm Rigid Insulation (R5.6 per 25.4mm)
 Peel & Stick A/V Barrier
 Metal Deck
 T&G wood soffit
 Structural Steel Roof Support

Typical Interior Wall Assembly #1

13mm G.W.B
 38x89mm wood studs or 38X92mm metal studs
 Sound Batt Insulation
 (13mm plywood sheathing in public areas)
 13mm G.W.B.
 Ceramic tile or paint

Typical Interior Wall Assembly #2 (Driver Relief)

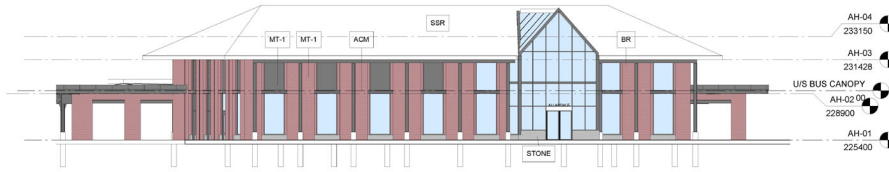
140 or 190mm Concrete block

Typical Floor Assembly #1

100mm concrete
50mm rigid insulation

Typical Floor Assembly #2

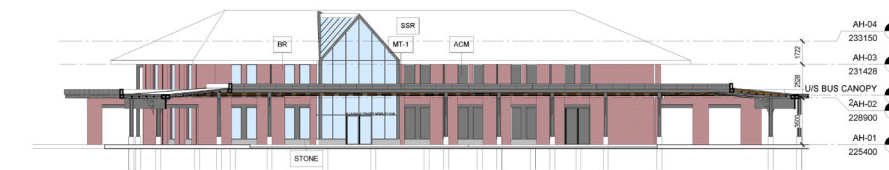
100mm Concrete
Metal Deck
structural steel
fire proofing on supporting steel



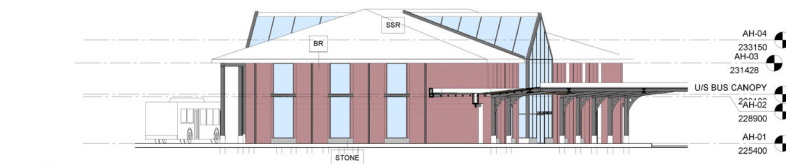
1 ELEVATION - STATION WEST
A201 1:150



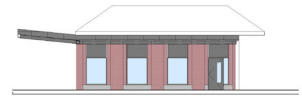
2 ELEVATION - STATION NORTH
A201 1:150



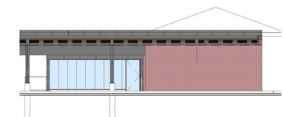
3 ELEVATION - STATION EAST
A201 1:150



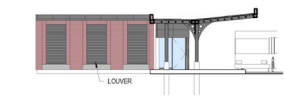
4 ELEVATION - STATION SOUTH
A201 1:150



5 ELEVATION - DRIVER'S RELIEF EAST
1:150



6 ELEVATION - DRIVER'S RELIEF SOUTH
1:150



7 ELEVATION - DRIVER'S RELIEF WEST
1:150



8 ELEVATION - DRIVER'S RELIEF NORTH
1:150

LEGEND:
ACM - ALUMINUM COMPOSITE MATERIAL
BR - BRICK
CONC - CONCRETE
MT-1 - METAL COLUMN #1
SSR - STANDING SEAM ROOF

Elevations

INTERIORS

The Architectural and Interior design theme is one of “simplified elegance” – clean creative and timeless design.

Public Space

- Ceramic tile on drywall up to 2440mm A.F.F (above finish floor), with plywood backup to 2440mm A.F.F. In atrium, tile is full height of space
- Single glazed Clear black anodized aluminum curtain wall system for vestibules (interior only)
- Interior walls painted gypsum steel or wood stud
- Water closets to be tiled, full height u/s of ceiling, floor tile to match wall tile
- Metal handrails and guardrails to be stainless steel

Administration Space

- Interior walls painted gypsum steel or wood stud with acoustic batt
- Water closets to be tiled, full height u/s of ceiling, floor tile to match wall tile
- Metal handrails and guardrails to be stainless steel

Driver Relief

- Metal foot grille in vestibule
- T-bar ceiling

Millwork

- kitchenette, plastic laminate fronts with solid surface countertop, drop sink
- Water closets floating solid surface countertop, drop sink

Doors and Hardware

- Vestibule doors in Station, thermally broken aluminum door w/ hollow aluminum frames with full lights
- Vestibule doors in Admin, thermally broken, insulated painted metal door w/ hollow metal frames with 150x1100mm lite.
- Exit doors in Admin, thermally broken, insulated painted metal door w/ hollow metal frames
- Water closet & storage room doors, metal door w/ hollow metal frames,
- Barrier free passage sets (electronic strike, push buttons, power door operator)
- Security door sets (electronic strike, card reader)
- Garbage room and mezzanine access doors to have sealed gaskets

Ceilings

- Drywall bulkhead in Waiting Area
- Drywall ceiling in Vestibules and washrooms
- Drywall in Mechanical, electrical, IT, Janitors room.
- ACT provided in all other rooms

Flooring

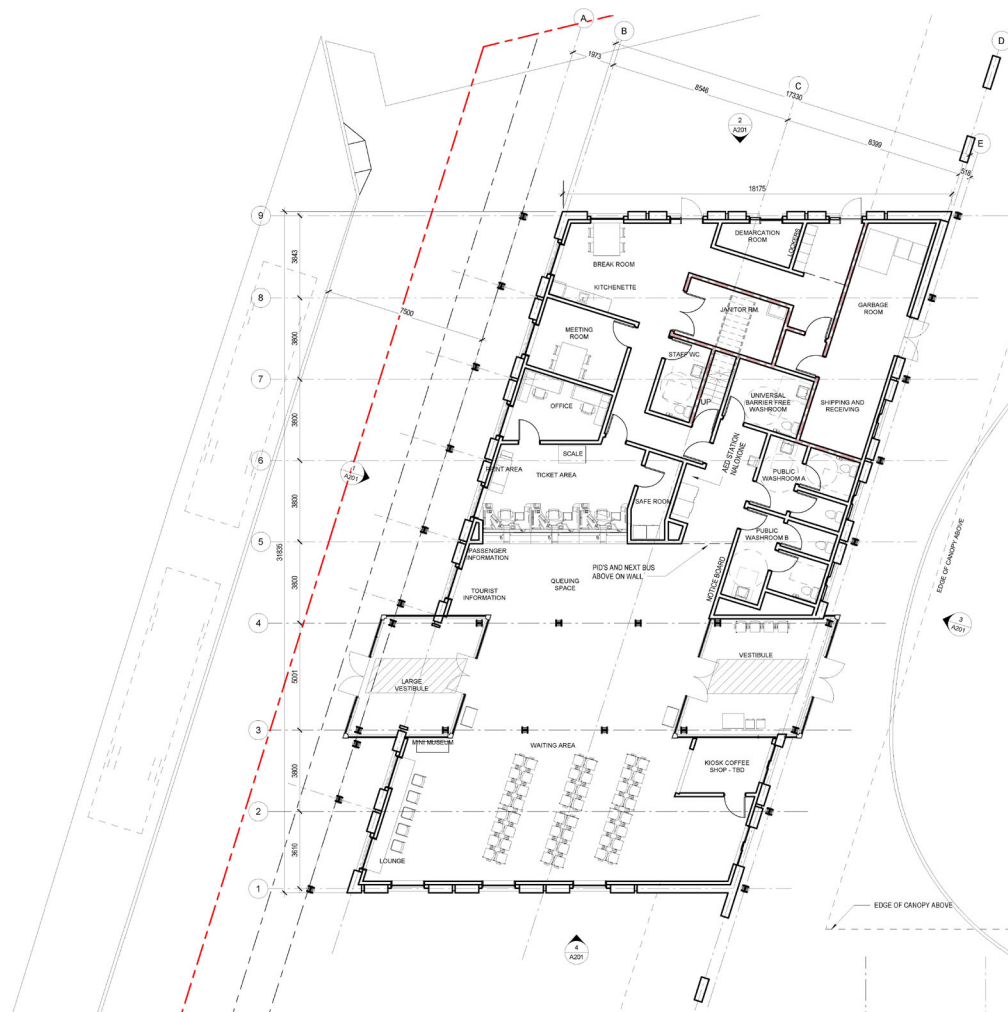
- Ceramic Tile in all Public spaces and all washrooms
- Sheet Vinyl in Ticket counter area
- Carpet tile in Administration Areas
- Storage, Janitor, Mechanical and Electrical rooms to be sealed concrete
- IT room to be dissipative static tile
- Rubber base if not ceramic tile

Windows

- STC 39 for windows

Noise and Sound Requirements

<u>Space Type</u>	<u>NC Rating</u>
Private Office	35-40
Open Plan Office	40-45
Conference	35-40
Corridor	40-50
Ticket area	40-50
Waiting room	40-50



Floor Plan

GLOSSARY

Doors

- ALUM Aluminum Glazed Door
- CCS Coiling Counter Shutter
- HM Hollow Metal
- HMI Hollow Metal Insulated
- SCW Solid Core Wood
- SG Sliding / Folding Security Grille

Finishes

- ACT Acoustic Ceiling Tile
- CHDR Concrete Hardener & Sealer
- CL Clear Finish (Wood, Alum., etc.)
- CPT Carpet Tile
- CWT Ceramic Wall Tile
- EPC Epoxy Wall Coating
- EPF Epoxy Floor Coating
- EXP Exposed (Unfinished)
- PF Pre-finished
- PFT Porcelain Floor Tile
- PLAM Plastic Laminate

PWT Porcelain Wall Tile
 PT Paint
 RB Resilient Base
 VCT Vinyl Composition Tile
 VSDT Vinyl Static Dissipative Tile
 WV Wood Veneer

Frames

PS Pressed Steel
 ALUM Aluminum – black anodized

Materials

ACM Aluminum Composite Material
 CMU Concrete Masonry units
 CW Curtain Wall
 GWB Gypsum Wall Board
 IMP Insulated Metal Panels
 PCON Precast Concrete
 SGB Suspended Gypsum Board
 S/FP Sprayed Fire Proofing
 STST Stainless Steel
 TFM Melamine
 QRZ Quartz – Engineered Stone

5.1.6. Structural

GENERAL

The Allandale Transit Mobility Hub will consist of several structures: 1) a single storey terminal building to house ticket kiosks, a passenger waiting area, and support programs; 2) bus canopies to provide shelter for waiting passengers; and a support building for driver amenities and ancillary functions. The superstructure for both the building and the bus canopies will primarily be constructed of structural steel elements; however, conventional wood trusses for the pitched roofs over a portion of the building and structural steel to support the atrium glass. The driver relief building will be constructed of load bearing masonry walls and conventional wood trusses for the roof. The terminal building will be stabilized against lateral loads (e.g., seismic, wind) with steel moment frames and vertical steel bracing elements and the bus canopies by moment frames. The masonry walls of the driver amenities building will resist the lateral loads. The structures will be supported on conventional cast-in-place concrete spread and strip footings. This design brief is to be read in conjunction with the structural scheme drawings provided.

APPLICABLE CODES AND STANDARDS – STRUCTURAL

The building and bus canopy structures will be designed as 'Normal Importance' occupancy, according to the Ontario Building Code 2012 including amendments (OBC). Design environmental loading data for Barrie, ON will be as per Ministry of Municipal Affairs and Housing (MMAH) Supplementary Standard SB-1. Additional requirements included in the User's Guide – National Building Code of Canada (NBC) 2015 Structural Commentaries (Part 4 of Division B) will be considered.

STRUCTURAL SYSTEMS

TERMINAL BUILDING

The proposed structure for the terminal building will primarily be a structural steel superstructure. However, pitched roofs over portions of the building will be framed with conventional wood trusses. The building will be supported on conventional spread and strip footing foundations.

Foundations

The building structure will be supported mainly on conventional concrete spread footings and piers centered below columns. The exterior building perimeter will be enclosed by a foundation wall supported by continuous strip footings.

As described in the site-specific geotechnical report 1910-S064 prepared by Soil Engineers Ltd, dated February 2020, and Supplementary Geotechnical Recommendations dated September 13, 2021, the foundations are to bear on the undisturbed native sand deposits that are approximately 1.5 m below the existing grades on site. As recommended, the maximum bearing pressures for the design of the foundations are 100 kPa Serviceability Limit State (SLS) and 160 kPa Ultimate Limit State (ULS). The minimum frost depth to the underside of perimeter building foundations will be no less than 1.2 m below finished grade, as recommended by the geotechnical report. For exterior foundations, such as footings supporting building canopies or the generator enclosure, the frost depth will be no less than 1.6 m.

Slab-on-Grade

Interior Spaces

The floor structure of the building will be constructed with a 125 mm thick concrete slab-on-grade reinforced with wire mesh reinforcement. It will be locally thickened and formed with depressions where required for elements such as trench drains, if required. The slab will be supported by compacted granular materials as described in the geotechnical report.

Frost Slab at Entrances

At public entrances, a 150mm thick reinforced concrete slab-on-grade will be provided locally. These will be cast on top of 100mm of below grade rigid insulation extending a minimum of 1.6m beyond the perimeter for frost protection of the slab. The slab/insulation assembly will be supported by compacted granular materials, as described in the geotechnical report.

Columns

The majority of the structural steel columns for the building will be W sections. W sections will also be used where the exterior building canopies cantilever from the building columns for additional strength and stiffness. Any exterior columns supporting the building canopies will be hot-dipped galvanized for protection from the elements.

Decorative Steel Structure

On the west side of the terminal building, a series of structural steel columns and beams are desired for the architectural appearance but are not required to support the roof structure. These steel W-section columns will be supported on nominal concrete piers and spread footings solely for the purposes of limiting risk of frost action.

2nd Floor Mechanical Mezzanine

The 2nd floor mechanical mezzanine structure will consist of 89mm reinforced concrete on 76mm deep composite steel deck, supported by structural steel beams and columns.

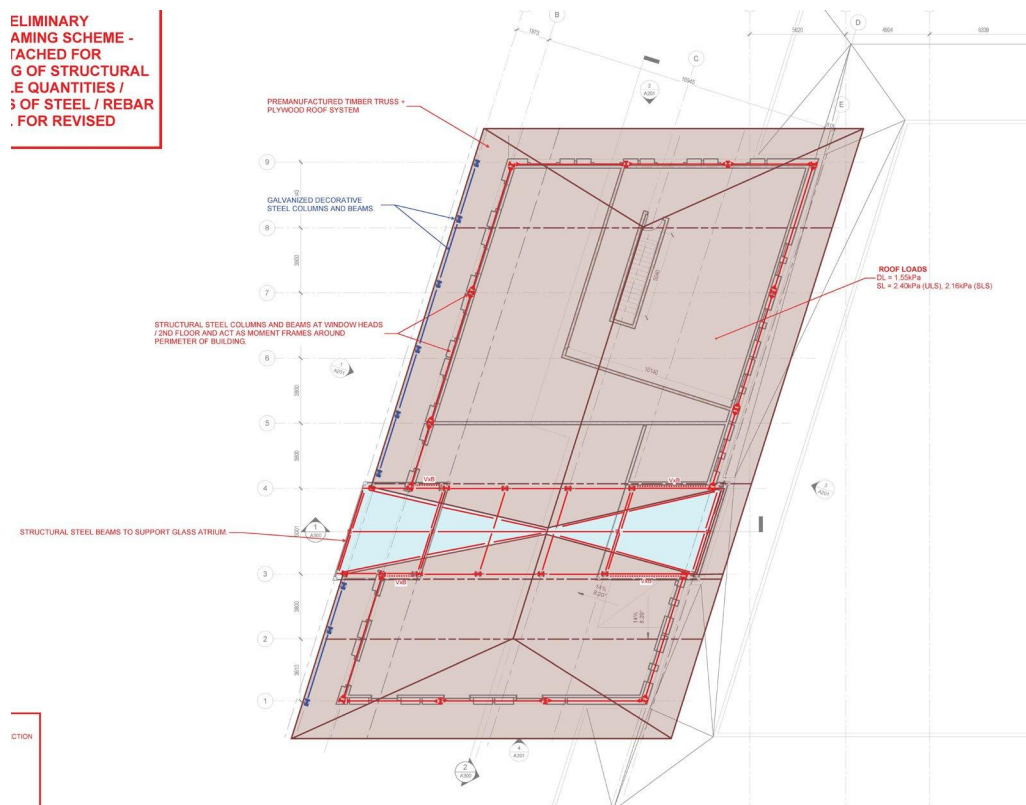
Pitched Roof Structure

The pitched roof structure will have hip ends. This roof will be constructed of conventional wood trusses and plywood decking (preference for 19mm plywood). The trusses will be supported at the perimeter with structural steel beams and columns. The glass atrium skylight will be supported by structural steel beams and columns framing the perimeter.

Lateral Force Resisting System (LFRS)

The building lateral force resisting system (LFRS) will consist of steel moment frames around the perimeter of the building and supplemented with vertical structural steel braces in an 'X' shape, chevron shape or single leg braces between columns at the atrium. The 2nd floor mechanical mezzanine will also require supplemental vertical bracing. The shape and locations of the vertical bracing will be established to work with the proposed architecture and functionality of the building.

ELIMINARY
FRAMING SCHEME -
ATTACHED FOR
DETERMINATION
OF STRUCTURAL
LOADS / QUANTITIES /
SIZES OF STEEL / REBAR
FOR REVISION



Preliminary Roof Framing Plan

BUS CANOPIES

The bus canopies will be constructed of steel deck, supported by structural steel beams/columns, and supported by conventional spread footing foundations.

Foundations

The bus canopies will be supported on conventional concrete spread footings and piers centered below columns. As described in the site-specific geotechnical report 1910-S064 prepared by Soil Engineers Ltd, dated February 2020, and Supplementary Geotechnical Recommendations dated September 13, 2021, the foundations are to bear on the undisturbed native sand deposits that are approximately 1.5 m below the existing grades on site. As recommended, the maximum bearing pressures for the design of the foundations are 100 kPa Serviceability Limit State (SLS) and 160 kPa Ultimate Limit State (ULS). The minimum frost depth to the underside of these foundations will be no less than 1.6 m.

As identified in the geotechnical report and clarified in an email from the geotechnical engineer (Kelvin Hung, Soil Engineers Ltd.), dated September 23, 2021, all exterior footings and concrete piers are to be backfilled with granular fill or be wrapped with a slip membrane (such as dimple board) to prevent adfreezing effects.

Superstructure

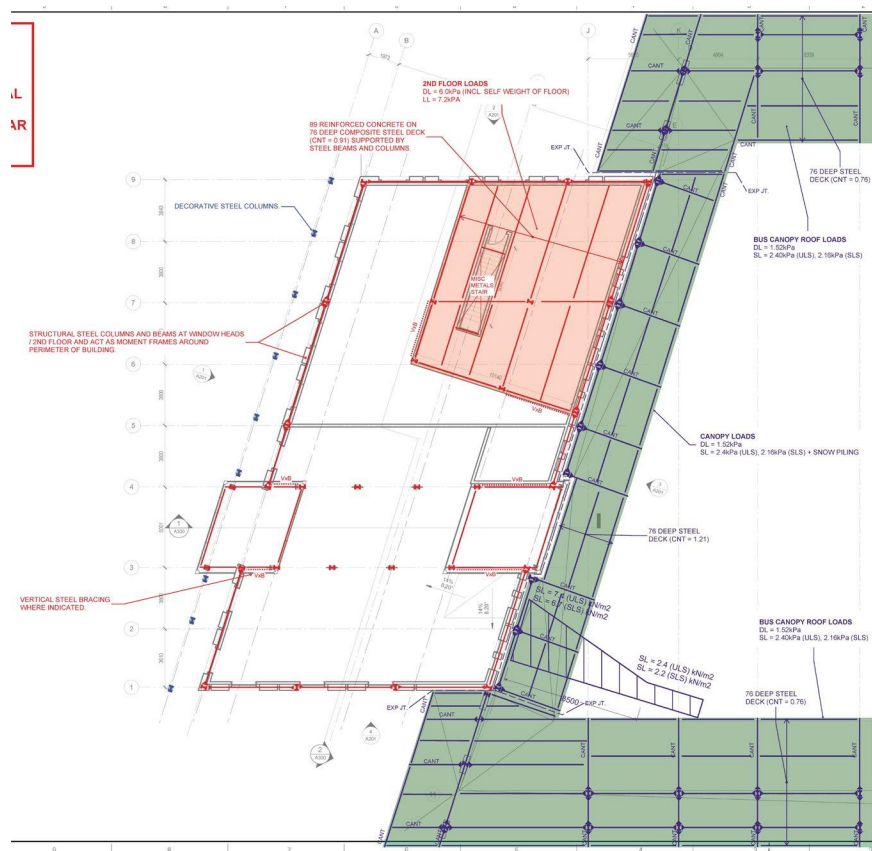
The superstructure for the bus canopies will include steel deck supported by structural steel beams and columns. Any exposed structural steel elements of the bus canopies will be hot-dipped galvanized for protection from the elements.

Thermal Movements

Due to the length and exposed conditions of the bus canopies, allowance will be made for thermal expansion and contraction. This may include expansion joints along the length of canopy or sliding connections to accommodate movement at some beam/column connections.

Lateral Force Resisting System (LFRS)

The lateral force resisting system (LFRS) for the bus canopies will be moment resisting frames and/or cantilevered columns from the foundations.



Preliminary Partial Canopy Framing Plan

DRIVER RELIEF BUILDING

The proposed structure for the driver relief building will primarily be masonry load bearing masonry walls supporting conventional wood trusses for the roof. The building will be supported on conventional spread and strip footing foundations.

Foundations

The building structure will be supported mainly on conventional strip footings. The exterior building perimeter will be

enclosed by a foundation wall. As described in the site-specific geotechnical report 1910-S064 prepared by Soil Engineers Ltd, dated February 2020, and Supplementary Geotechnical Recommendations dated September 13, 2021, the foundations are to bear on the undisturbed native sand deposits that are approximately 1.5 m below the existing grades on site. As recommended, the maximum bearing pressures for the design of the foundations are 100 kPa Serviceability Limit State (SLS) and 160 kPa Ultimate Limit State (ULS). The minimum frost depth to the underside of perimeter building foundations will be no less than 1.2 m below finished grade, as recommended by the geotechnical report. Exterior foundations for the open-air generator enclosure will have a frost depth no less than 1.6 m.

Slab-on-Grade

Interior Spaces

The floor structure of the building will be constructed with a 125 mm thick concrete slab-on-grade reinforced with wire mesh reinforcement. It will be locally thickened and formed with depressions where required for elements such as trench drains, if required. The slab will be supported by compacted granular materials as described in the geotechnical report.

Frost Slab at Entrances

At public entrances, a 150mm thick reinforced concrete slab-on-grade will be provided locally. These will be cast on top of 100mm of below grade rigid insulation extending a minimum of 1.6m beyond the perimeter for frost protection of the slab. The slab/insulation assembly will be supported by compacted granular materials, as described in the geotechnical report.

Load Bearing Masonry Walls

Load bearing masonry walls will form the perimeter of the building to support the roof structure and will be reinforced with rebar, as required. Structural steel lintels will be provided over window and door openings.

Pitched Roof Structure

The pitched roof structure will have hip ends. This roof will be constructed of conventional wood trusses and plywood decking (preference to have 19mm). The trusses will be supported at the perimeter by the load bearing masonry walls

Lateral Force Resisting System (LFRS)

The reinforced load bearing masonry walls will act as the lateral force resisting system (LFRS) for the building.

Generator Enclosure

The walls of the generator enclosure will be framed with galvanized steel columns and horizontal girts that will support backup masonry wall and the brick façade. Galvanized structural steel lintels will also be provided over the door and louvre openings, as required. The columns will be supported on cast-in-place concrete piers and spread footings. The masonry backup walls, and brick façade will be supported on continuous foundation walls and strip footings.

BUILDING CODE REQUIREMENTS

Climatic data

The climatic data for this site is obtained from the MMAH Supplementary Standard SB-1 for the municipality of Barrie, ON.

Gravity Loads

All structural elements will be designed to resist the loads meeting or exceeding the requirements and allowances specified in the OBC. Additionally, the flat roof structures will be designed to accommodate ballasted roof top photovoltaic systems.

Snow Loads

The design snow loads will be based on pressures and parameters recommended in the OBC. Snow loads of $S_s = 2.5\text{kPa}$ and $S_r = 0.4\text{kPa}$ will be used in the design of structural members for strength and deflections. This load represents snow accumulation on probabilities of being exceeded 1 in 50 years for strength and for serviceability. Importance factors of $I_s(\text{uls}) = 1.0$ and $I_s(\text{sls}) = 0.9$ will be used. Snow piling on low roofs or around rooftop equipment will also be considered, as required.

Wind Loads

The design wind loads will be based on pressures and parameters recommended in the OBC. Hourly wind pressures of $q = 0.36\text{kPa}$ 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. Importance factors of $I_w(\text{uls}) = 1.0$ and $I_w(\text{sls}) = 0.75$ will be used.

Seismic Loads

The structure will be designed to withstand the seismic forces assigned to a Normal importance building category with an importance factor $I_e = 1.0$. Seismic data taken from the OBC and will used for design is as follows: $S_a(0.2) = 0.108$, $S_a(0.5) = 0.077$, $S_a(1.0) = 0.047$, $S_a(2.0) = 0.025$, $S_a(5.0) = 0.0061$, $S_a(10.) = 0.0025$, $PGA = 0.063$, and $PGV = 0.060$. As per the geotechnical report, the Site Class for Seismic Site Response used when calculating seismic loads is Site Classification 'D' (stiff soil).

Structural Design

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

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.

Concrete

<u>Location</u>	<u>Strength</u>	<u>Remarks</u>
Interior Slab-on-Grade	25 MPa	Class N
Exterior Slab-on-Grade	35 MPa	Class C1
Building Foundation Walls, Piers, Footings	25 MPa	Class F2
Exterior Canopy Piers, Footings	35MPa	Class C1
Skim Coats	10 MPa	
Exterior Un-reinforced Concrete (Sidewalks, Curbs, etc.)	30 MPa	Class C2

All reinforced concrete elements shall remain shored (and re-shored) until the 28-day specified cylinder concrete strength is achieved. All cast concrete elements shall be cured and protected from frost during the winter months and hot weather concrete measures taken during summer months, as required by applicable codes and standards.

Reinforcing Steel

Grade: 400 MPa
 Sizes: 10M to 45M

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 shall be Hot-Dip Galvanized Steel.

SERVICEABILITY REQUIREMENTS

Serviceability requirements will be checked against the requirements specified in the OBC 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:

Steel Structures Live Load Deflection	Span/360
Total Load Deflection	Span/240
Wind Storey Drift	Height/500
Seismic Storey Drift	Height/100

5.1.7. Mechanical**GENERAL**

Mechanical Project Goals

- Reduction of Energy usage by employing active and passive strategies.
- Aspirational Net Zero Energy Ready On-Site (Non certification)
- Maximize passive energy efficient features
- Optimize the plant and systems using available current technologies to minimize energy consumption, carbon emissions and increase the performance.
- Optimum space thermal comfort (including expanded indoor conditions), indoor air quality and acoustics.
- Mechanical system flexibility and climate control strategy throughout the building.
- HCFC-free refrigerants for all the refrigeration equipment.
- Equipment with optimized life cycle, ease of operation and maintenance to require minimal re-commissioning to maintain efficient controllable operation throughout the life of the building.
- Optimized building asset value by reducing maintenance costs and future capital investments in mechanical and electrical equipment having a finite life cycle.
- Provide industry leading IAQ

APPLICABLE CODES AND STANDARDS – MECHANICAL

Mechanical Codes and Standards

The Mechanical design will comply with all applicable codes and standards, including those listed below:

- Current version of Ontario Building Codes
- ASHRAE Standard 55-2017, Thermal Environmental Conditions
- ASHRAE Standard 62.1-2019, Ventilation for Acceptable Indoor Air Quality
- ASHRAE Standard 90.1-2019, Energy Standard for Buildings
- Ontario Building Code and all applicable revisions.

OUTDOOR DESIGN CONDITIONS

Location: Barrie, Ontario

Season	Condition	Temperature
Cooling	0.4% Monthly Condition	29°C (84°F) DB, 21.8°C (70°F) MCWB
Dehumidification	0.4% Monthly Condition	21.3°C (70°F) DP
Heating	0.4% Annual Condition	-23°C (-10°F) DB

Table 1 Outdoor Design Conditions – 2019 ASHRAE Fundamentals

Designing to the 0.4% design conditions is industry standard practice. The 0.4% condition for cooling is taken from the monthly peak rather than annual to consider a stricter standard due to climate change. While designing to the 0.4% conditions indicates that design setpoints will be exceeded during peak periods, typical design often requires a minimal amount of over sizing so that control is always maintained. This results in only a small amount of risk while resulting in significant first cost and operating cost savings.

INDOOR DESIGN CONDITIONS

The indoor environmental conditions are intended to satisfy the requirements of the Thermal Environmental Conditions for Human Occupancy Standard 55-2020 using the Predicted Mean Vote model, developed, and published by the American Society of Heating, Refrigerating, and Air-Conditioning Engineers (ASHRAE) and ANSI. Designing to meet these conditions enables the design to operate to meet industry accepted comfort levels. ASHRAE 55 specifies conditions in which a specified fraction of the occupants will find the environment thermally acceptable. It considers air temperature, radiant temperature, air movement, air moisture content, metabolic rate, and clothing level.

Space Type	Design Air Temperature Setpoints °C (°F)	
	Cooling	Heating
Office	23 (74) ± 2	20 (68) ± 2
Conference / Meeting	23 (74) ± 2	20 (68) ± 2
Corridor	23 (74) ± 2	20 (68) ± 2
Ticketing Counter	23 (74) ± 2	20 (68) ± 2
Kitchenette	23 (74) ± 2	20 (68) ± 2
Employee Breakroom	23 (74) ± 2	20 (68) ± 2
Waiting area	23 (74) ± 2	20 (68) ± 2
Service Rooms	24 (76) ± 2	19 (66) ± 2
Retail / Café	23 (74) ± 2	20 (68) ± 2
Vestibules	25.5 (78) ± 2	19 (66) ± 2

Table 2 Interior Design Conditions

VENTILATION

Outside air ventilation will be provided to maintain desired levels of indoor air quality. The design will ensure that the base building air handling units provide code compliant quantity of outdoor air per Ontario Building Code (OBC) requirements. Additionally, Integral Group has recommended to increase outdoor air filtration above code minimums in order to enhance IEQ and human health. For the basis of design, Integral Group will review the ventilation requirements by space type and adjust as needed. Per OBC requirements, carbon dioxide sensors will be provided in spaces where occupant density exceeds 25 persons per 1000ft²,

and ventilation rates will operate in a demand control ventilation (DCV) manner. Ventilation rates will be turned down when CO2 levels are below a threshold, and ventilation will ramp up in response to rises in CO2, reflecting occupancy. Ventilation rates and CO2 thresholds can be set as needed to ensure both high levels of ventilation are provided when such spaces are occupied, and not provided when spaces are unoccupied.

Space Type	L/S/Person (CFM / Person)	L/S-sqm (CFM / SF)
Office	2.5 (5)	0.3 (0.06)
Conference / Meeting	2.5 (5)	0.3 (0.06)
Corridor	-	0.3 (0.06)
Ticketing Counter	2.5 (5)	0.3 (0.06)
Kitchenette	2.5 (5)	0.3 (0.06)
Employee Breakroom	2.5 (5)	0.3 (0.06)
Waiting area	2.5 (5)	0.3 (0.06)
Service Rooms	-	0.3 (0.06)
Retail / Café	3.8 (7.5)	0.6 (0.12)
Vestibules	-	0.3 (0.06)

Table 3 OBC/ASHRAE 62.1 Ventilation Rates

EXHAUST

Exhaust systems have been provided by the core and shell design. Their exhaust rates per M0.06 are as follows:

Space Type	Exhaust Rate	Units
Toilet -private	12.5/25 (25/50)	CFM/Fixture
Toilet – Public	25/35 (50/70)	CFM/Fixture
Janitor’s Closets	5 (1)	L/s-m2(CFM/ft2)
Kitchenette	1.5 (0.3)	L/s-m2(CFM/ft2)
Retail / Café BOH	1.5 (0.3)	L/s-m2(CFM/ft2)
Waste/Recycling room	7.5 (1.5)	L/s-m2(CFM/ft2)

Table 4 OBC/ASHRAE 62.1 exhaust Rates

ACOUSTICS

The noise levels will comply with ASHRAE and OBC standards. Sounds and vibrations associated with HVAC systems will be controlled to achieve the required NC levels as outlined below. Additionally, no mechanical equipment will be located above conference rooms or other acoustically sensitive spaces.

Space Type	NC Rating	Max Diffuser Outlet Velocity (fpm)	Max Main Duct Air Velocity (fpm)	Max Branch Duct Air Velocity (fpm)
Private Office	35-40	500	1200	800
Open Plan Office	40-45	500		
Conference / Meeting	35-40	500		
Corridor	40-50	625		

Ticket area	40-50	500		
Waiting room	40-50	500		

Table 5 Noise Design Criteria

Note: These are preliminary assumptions for acoustical performance. Pending input from acoustical engineer. All MEP systems shall be reviewed by an acoustical engineer contracted to the Owner or Architect prior to the beginning of design development.

SEISMIC CRITERIA

Based on the Site seismic class, it is determined by the team, we have determined that not to include seismic restraints for the mechanical systems based on OBC requirements and SMACNA "Seismic Restraint Manual – Guidelines for Mechanical Systems".

DUCTWORK DESIGN

Duct systems shall be designed to obtain lowest cost-beneficial pressure loss by limiting certain duct velocities, avoiding dynamic loss components where possible and utilization of low dynamic loss components. High-loss fittings, such as mitered elbows, abrupt transitions, and takeoffs and internal obstructions must be avoided.

Duct Type	Criteria
Low Pressure Supply/Return Air	0.05"-0.08"/100ft
Transfer Ducts	300 FPM Max

Table 6 Ductwork Sizing Criteria

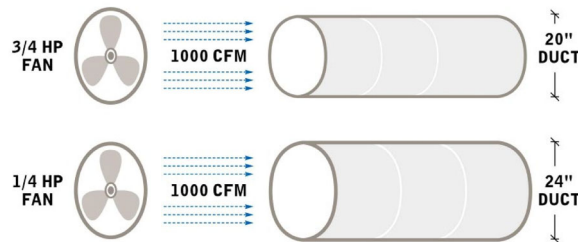


Figure 1- Low pressure duct design reduces fan energy

PIPE WORK DESIGN

Pipe systems shall be designed to obtain lowest cost-beneficial pressure loss by limiting certain pipe velocities, avoiding dynamic loss components where possible and utilization of low dynamic loss components. The pipe work design within the building will be made in accordance with ASHRAE's recommendations and will be based on the following recommendations:

Piping Type	Criteria
Hot Water	8 FPM Max
Hot Water	4ft WC/100ft
Fittings	2ft WC /100ft

Table 7 Piping Sizing Criteria

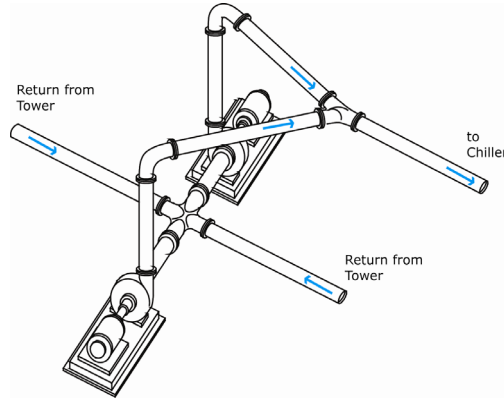


Figure 2 Low pressure pipe design reduces pump energy

HVAC SYSTEMS

Centralized Systems (Heating & Cooling)

Centralized system includes Variable Refrigerant flow heat recovery heat pumps providing cooling and heating. It also includes the ventilation air system and domestic hot water system.

Variable Refrigerant Flow with Heat Recovery

The proposed design utilizes variable refrigerant flow to quietly heat and cool the building and its occupants. Small piping will supply and return the environmentally safe and energy efficient refrigerant to all rooms within the building. Outdoor condensing units with energy recovery are the only large outdoor equipment required to operate this system. To further expedite energy efficiency, this system is paired branch selector boxes for precise mixing.

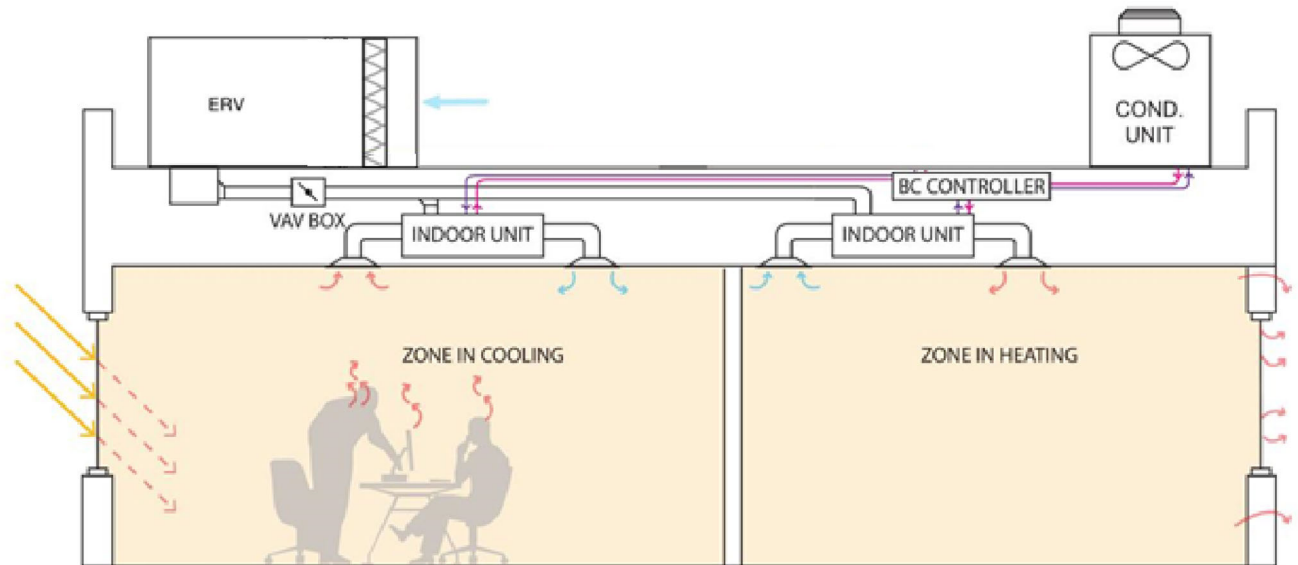


Figure 3 ERV for ventilation

The Variable Refrigerant Flow system specified provides a number of key efficiency features:

- Heat recovery and sharing within the system
- Well-developed control options for multi-tenant use, including energy recovery ventilators
- A variety of low-profile, low noise fan coil units
- Winter heating down to below -5°F at a reasonable COP of 2.3

The source of cooling and heating for the building will be a high efficiency air-source variable refrigerant heat recovery heat pump. When there are simultaneous cooling and heating load due to the various

occupancy and usage of the building, the heat recovery heat pump is able to move the heat from a space that requires cooling to a space that requires heating. The heat pump did not have to pull or push that heat from the atmosphere. Moving the heat in this manner is heat recovery because we are utilizing the waste heat in a useful manner.

In a VRF system refrigerant is piped from the outdoor condensing unit to a Branch Circuit (BC) controller, which, depending on heating or cooling needs, distributes heating or cooling to the indoor fan coil units. Branch selector boxes will separate the units to direct heating and/or cooling and will run refrigerant piping to each guestroom, retail space, office, and any other installed fan coil units. The branch selector boxes allow for optimal and individual room control which allows for varying refrigerant temperatures within the building, providing flexibility for maintaining different desired indoor conditions. They also allow for the system to operate the heat recovery option, in efforts to recover energy for heating needs. Piping will be sized and configured to minimize friction loss. All refrigerant piping in the VRF system must be installed to manufacturer's specifications.



Figure 4 Branch Selector and general Layout of VRV system with branch selector

The VRF system will modulate the speed of the inverter-driven compressor when zonal demand is below the design peak, ensuring a high coefficient of performance across operating conditions. During the warm season, the variable speed inverter-driven compressor within the unit varies its speed in proportion to the amount of cooling needed inside the zones. During cold days, the compressor operates at high speed, efficiently extracting energy from the refrigerant loop to heat the zones resulting in outstanding heating performance. The indoor fan coil unit will contain the circulation fan and a heating/cooling coil.



Figure 5 . Air-Source VRF Heat Recovery Condensing Unit

A VRF system with heat recovery will operate in partial load for the majority of the year. The unique heat-recovery capabilities of the recommended system allow for the removal of heat from a space that requires cooling and transfer the same heat to another space that requires heating, without the direct use of the

compressor to heat and cool. This feature is what really differentiates a VRF system with heat recovery from a traditional heat pump closet unit, which would require a four-pipe fan coil unit to provide different tempered air to different zones.

The VRF system also offers the benefit of requiring no floor space needed within the building for mechanical equipment. The only equipment required within the conditioned spaces in a VRF system is a relatively small fan coil unit which can be housed within the ceiling plenum, installed onto a wall, or installed flush with the ceiling.



Figure 6 Ducted fan Coil Unit

Supplementary Heating

If the super insulated shell is implemented, heating load will be reduced significantly. An electric resistance duct heater integrated into the ventilation air supply duct will be the secondary heating source for the time when the heat recovery heat pump cannot meet the load. The electric resistance heat will be sized for the full heating load to avoid any thermal discomfort during the colder winter days when the heat pump is unable to recover heat.

Ventilation Air

Two Energy Recovery Ventilator (ERV) will supply ventilation air to all spaces including Waiting area. The ERV will be equipped with a heating coil to supply 31°C (88°F) air during wintertime and filtration system to filter out any outdoor pollutants.

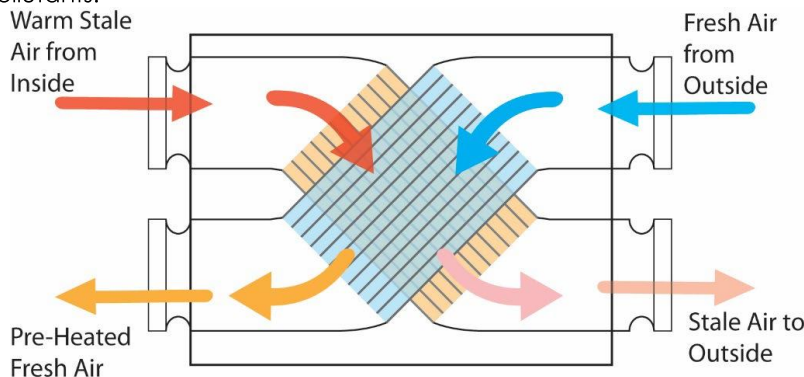


Figure 7 ERV energy recovery core

There are two energy recovery ventilator units designed currently. Based on the program need this can be combined to save the cost of installation.

UNIT 1 – ERV Serving the Main Transit Station

Configuration: Total Energy recovery core technology, and supplementary Electric Heating coil.

- Total Air Flow: 1200 CFM
- External SP Supply – 1.25 in. w.g.
- External SP Exhaust – 0.75 in. w.g.
- Heating Coil Capacity: 5 KW

UNIT 2 – ERV Serving the Driver Relief Building

Configuration: Total Energy recovery core technology and, supplementary Electric Heating coil.

- Max. Outside Air Flow: 500 CFM
- External SP Supply – 1.25 in. w.g.
- External SP Exhaust – 0.75 in. w.g.
- Heating Coil Capacity: 5 KW

Ceiling Fans

Ceiling mounted fans can be introduced to waiting spaces to ensure sufficient air mixing & local air movement and help expand the thermal comfort range due to increased local air movement. Fans should be variable speed, reversible with manual control and highly efficient. Where fans are located in common spaces, they will have BAS control.



Figure 8 Haiku L from Big Ass Fan Solutions

Example high-performing low-cost ceiling fans include Big Ass Solutions Haiku L.

Ceiling fans are an integral part of a system for the following benefits:

- Reduce the perceived temperature by approximately 5 °F
- Moving air creates a wind chill effect that cools your body
- Field studies verify warm and neutral users prefer more air movement
- Discourage stratification during cooler days by bringing warmer air downwards to the occupied level

Restroom Exhaust

Dedicated exhaust fans exhaust air from restroom spaces and pull transfer air from the surrounding spaces. We will be able to connect the exhaust right into exhaust stream of the ERVs with backdraft dampers.

General Exhaust

The Energy Recovery Ventilator have exhaust fans to draw exhaust air back to the units. All exhaust/return air then passes through the energy recovery core which transfers cooling/heating energy to the outdoor air further reducing the cooling/heating load. The Electrical, Elevator machine room and communications room shall have transfer fans and fan coil units (if needed) utilized to cool.

CONTROLS AND METERING

A new building automation system (BAS) featuring a full DDC web-based system for remote control and monitoring shall be provided for the new building. The new DDC system shall be expandable to serve future buildings as well as other existing buildings on the transit route. The control system shall monitor and control all MEP systems noted and provide an alarm if systems are out of control range. A lighting control system is to be integrated with building automation system for occupancy sensor status (BAS shall read lighting occupancy sensor status). Ventilation to high density spaces shall be modulated based on CO2 levels via demand-controlled ventilation. Energy and water metering will be implemented to monitor building performance and to feed live building performance information to the City of Barrie. Energy by end use (heating, cooling, domestic hot water, etc.) will be sub-metered and trended (measured in kWh and BTU) through the BAS. Through metering, consumption will be documented, and trends will be developed to show not only areas of improvement, but also to showcase successful energy and water strategies.

Preliminary Mechanical Equipment List

Air System	Area Served	Quantity	Type	Total airflow CFM	Terminal Units	Location
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ERV-1	Waiting	1	100% O/A with energy recovery core	1200	Ducted Fan Coil unit	Mech room	
ERV-2	Admin area	1	100% O/A with energy recovery core	500	Ducted Fan Coil unit	Mech room	
Heat Pump	Model #	Power supply	Cooling Capacity	Heating Capacity	Weight	Refrigerant	Refrigerant Charge
HP-1	Daikin# RXYQ240PBTJ	5208-230/3/60	228,000	257000	1240	R410a	45
HP-2	Daikin # DZ20S	208-230/3/60	35,800	35,400	291	R410a	17

PLUMBING

Project Goals

- Low-flow fixtures will be provided to reduce domestic water load by 30-40%. Restrooms and breakrooms fixtures will be provided with flow restrictors.
- Retail / Café at ground level to be provided with domestic cold water from the base building plumbing.
- All plumbing fixtures shall be hard wired, no battery-operated fixtures.

Plumbing Codes and Standards

The plumbing design will comply with all applicable codes and standards, including those listed below:

- National Fire Protection Association (NFPA), Latest Adopted Edition of Applicable Standards
- ADA Standards for Accessible Design- Code of Regulations (Including Amendments)
- Occupational Safety and Health Administration (OSHA)
- 2012 Ontario Building Code (OBC) part 7 with all applicable amendments

Plumbing System Descriptions

The following plumbing services will be provided to the building tenants:

- Domestic Cold Water (CW)
- Domestic Hot Water (HW/HWR)
- Sanitary Waste and Vent (SAN/V)
- Condensate (CD)

Plumbing Space Requirements

Item No.	Room	Approximate Size (Feet)	Location	Remarks
1	Pipe Chases - Toilet Room	1'-6" back-to-back fixtures, 9" clear at walls with fixtures at one side only. (Water Closets). 13" clear at wall with fixtures for Bottle Filler and electric water coolers.	Public Toilet Rooms	Floor Mounted water closets.

Table 8 Plumbing Space requirement estimate

Sanitary Waste and Vent (SAN/V)

A complete sanitary waste (SAN), and vent (V) system shall be provided throughout the building in accordance with the local codes. A gravity system shall be provided with cleanouts for fixtures above grade or below grade. Floor drains with trap primers will be provided for each restroom containing two or more water closets and/or urinals and mechanical rooms. As required, underground piping within the building will be supported and braced from the floor slab in order to prevent piping movement and rupture due to soil settlement. Sanitary sewer and vent piping will be no-hub cast iron pipe and fittings with heavyweight couplings for underground and above ground installation. Cast iron or System 15/XFR piping shall conform to CISPI standards.

Domestic Potable Water (CW)

The Domestic Cold Water will be provided to all restrooms, breakrooms, and the Retail / Café kitchen as required by code. Domestic cold water shall be metered. Domestic water pipe material shall be type L copper above grade and type K copper or PEXa underground with brazed connections. Pipe sizing inside of the building shall comply with the requirements in the Ontario Building Code. All buried domestic water pipe will be protected with 20 mil polyethylene tape and/or pipe sleeve. Domestic cold water shall be supplied to the mechanical hydronic system with a reduced pressure zone (RPZ) backflow preventer. Domestic cold water will be sized with maximum velocity of 6ft/sec.

Domestic Hot Water (HW/HWR) – Point of Use electric heater/Instantaneous water heater

Since the domestic heating load is pretty minor for our building, the most economical and energy efficient option is to employ point of use electric heater to generate the domestic hot water at the fixture itself. The size of each Instantaneous heater will be determined in the later stages of the design. Retail / Café Domestic hot water heater will be provided by the end user and it is not a part of the project.

Natural Gas (G)

We are eliminating the requirement for natural gas by selecting the mechanical system to align with the project goal of fossil fuel free site.

Condensate (CD)

Condensate waste from cooling coils and other mechanical equipment shall be discharged as an indirect waste. Condensate waste will be discharged to sanitary with a code approved airgap fitting acceptable to the Authority Having Jurisdiction.

Preliminary Plumbing Equipment List

Plumbing Fixtures:

Fixture Type	Proposed Water Usage
Water Closet Flushometer	1.11 gallons per flush
Urinal Flushometer	0.125 gallons per flush
Lavatory Faucet	0.35 gallons per minute, 30 seconds
Break Room Sink	1.0 gallons per minute, 15 seconds
Janitorial Sink	2.0 gallons per minute

5.1.8. Electrical

ELECTRICAL PROJECT GOALS

- Electrical system flexibility, scalability, and redundancy to accommodate future growth
- Design and install electrical systems safe and easy to operate and maintain
- Aspirational Net Zero Carbon Ready On-Site (Non certification)
- Reduction of facility energy usage by employing active and passive strategies

- Maximize economic value for all stakeholders involved while adhering to project budget
- High community and end-user satisfaction with electrical systems that promote safety, comfort, and accessibility
- Fulfill Owner requirements to ensure building and electrical systems are fit for their intended purpose

APPLICABLE CODES AND STANDARDS – ELECTRICAL

The electrical systems will be designed and built-in accordance with the applicable legislation, Codes and Standards, and engineering best practices. The electrical design will comply with the requirements of the latest versions in effect of the following legislations, Codes and Standards, and authorities:

- Ontario Building Code
- Ontario Fire Code
- Ontario Electrical Safety Code and applicable Bulletins
- CSA Standard C282 – Emergency Electrical Power Supply for Buildings
- CSA Standard C802.2 – Minimum Efficiency Values for Dry Type Transformers
- CSA Standard C802.3 – Maximum Losses for Power Transformers
- IESNA Lighting Handbook
- IESNA – Recommended practice and guidelines
- ASHRAE 90.1 – Energy Standard for Buildings Except Low-Rise Residential Buildings
- CAN/ULC Standard S524 – Standard for the Installation of Fire Alarm Systems
- CAN/ULC S525 – Audible Signal Device for Fire Alarm
- CAN/ULC S526 – Visual Signal Devices for Fire Alarm Systems
- CAN/ULC S527 – Control Units
- CAN/ULC S528 – Manual Pull Stations for Fire Alarm Systems
- CAN/ULC S529 – Smoke Detectors for Fire Alarm systems
- CAN/ULC S530 – Heat Actuated Fire Detectors for Fire Alarm Systems
- CAN/ULC S536 – Inspection and Testing of Fire Alarm Systems
- CAN/ULC S537 – Verification of Fire Alarm Systems
- Local Building Department
- Local Fire Department
- Electrical Safety Authority
- Ministry of Environment, Conservation and Parks
- Alectra Utilities Systems

ELECTRICAL SITE SERVICES

Alectra Utilities will feed the project site with one 3-phase, high voltage (HV) service (via underground feeder) to one utility supplied and owned pad mount transformer located on site. It is assumed that incoming power will come from Tiffin Road however, exact service voltage, location, and transformer size will be determined based on discussions and coordination with Alectra Utilities. All metering will be done by Alectra Utilities, at the secondary side of the utility transformer at the main distribution panel. Alectra Utilities will provide primary cables to the pad-mount transformer located on site. Secondary cable to the building distribution system will be provided by the Contractor. Any existing Metrolinx poles or services within the scope of works area of this project will be isolated, made-safe, and removed.

ELECTRICAL SERVICE AND DISTRIBUTION

The anticipated design load for the new building is approximately 120kVA. The main utilization voltage is 347/600V into the facility via underground concrete encased duct banks. Incoming feeder cables will be terminated into a main fused disconnect and 225A, 347/600V, 3 phase, 4 wire main distribution panel. The building electrical distribution system will be sized with minimum 15% spare capacity to accommodate future growth and system expansion. All electrical systems, materials, and equipment will be new and of type and quality intended for use in a transit facility. The Main Electrical Room will be located in the Driver Relief Building and will provide easy access for equipment replacement and avoid interference with other services and equipment. Electrical equipment serving the base building City of Barrie areas will be housed within the Level 2 Service Space and any floor mounted equipment will be installed on 100mm high concrete housekeeping pads. Distribution panel boards will be provided as CSA approved, factory assembled, wall mounted with switch and fuses or breaker panel boards. Power, lighting, and mechanical

equipment branch panel boards will be provided as CSA approved, factory assembled, wall mounted, and complete with single pole or multi-pole moulded case bolt-on circuit breakers. Electrical branch panel boards shall be rated with a minimum short circuit interrupting capacity of 10kA at 208V. All electrical branch panel boards will be provided with 20% spare capacity and space to accommodate additional future branch circuit loads. Power and wiring devices will be provided to suit the City of Barrie's FF&E requirements and typically found in transit facilities. All convenience receptacles will be duplex 20A t-slot type and will be provided with GFCI and/or weather-proof enclosures to suit intended location and meet code requirements. Receptacles complete with USB-A and USB-C connectors will be provided with Waiting Area for patrons use and convenience. A dedicated 100A, 120/208V, 3 phase, 4 wire electrical panel will be provided within the Retail/Coffee Shop space for future tenant use. All necessary design and installations for the tenant space fit-out will be completed by the future tenant. The electrical service to the Retail/Coffee Shop will be sub-metered via revenue grade metering. Two 1" conduits brought to a ¾" plywood backboard will be provided from the Demarcation Room to the Retail/Coffee Shop space for the future tenant telecommunications services.

A dedicated 100A, 120/208V, 3 phase, 4 wire electrical panel will be provided within the Driver Relief Building. The Driver Relief space will be fit-out with all necessary receptacles, power wiring devices, lighting, lighting controls, and fire alarm. Rough-ins and pathways will be provided for communications services and the transit operators will complete all necessary communications cable installations in future. The electrical service for the Driver Relief will be sub-metered via revenue grade metering. An arc flash hazard analysis and coordination study will be completed upon completion of the electrical distribution system design to ensure all system components are adequately rated, coordinated, and provided with suitable warning labels provided.

EMERGENCY POWER

A diesel emergency generator set will be provided to support 100% of the building electrical loads for twelve (12) hours and will be sized with 15% spare capacity for future growth. The generator will be a Cummins or approved equivalent with a 5-year extended warranty package complete with a preventative maintenance service plan. Generac will not be considered an acceptable manufacturer for the emergency generator. The generator will be an 1800rpm unit with the following characteristics:

- Rated at 125kW, at 0.8PF, standby rated.
- System Voltage: 347/600V, 3 phase, 4 wire, 60Hz.
- The generator set will include inherent overcurrent protection, short circuit and overload protection, digital AC metering, and sensor failure detection.

The emergency generator will be located outdoors and be provided with a weather-proof skin-tight enclosure to provide sound attenuation.



Figure 5.1.8-1: Outdoor diesel generator with skin-tight enclosure



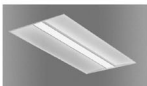


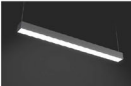
A 200A, 347/600V, 3 phase, 4 wire, weather-proof quick-connect box will be provided at the exterior of the building to allow mobile generator connection during extended maintenance or outages. Shunt trip

provisions will be provided for the quick-connect box feeder breaker to prevent paralleling the emergency generator and mobile generator power sources. Automatic transfer switches will be provided to automatically transfer to emergency power in the event normal utility power is lost. One ATS will be provided for all Life Safety Systems which include all lighting and exit signage and the second ATS for Non-Life Safety Systems in accordance with the latest Ontario Electrical Safety Code. Each ATS will be equipped with the following characteristics:

- Open transition, 4 pole double-throw for use on a 347/600V, 3 phase, 4 wire, 60Hz system. Life safety ATS will come complete with by-pass and non-life safety ATS with no by-pass.
- The ATS will be electrically operated, mechanically held, and will be rated for full load continuous duty.
- The ATS will contain auxiliary contacts which will close the automatic starting circuit of the emergency generator set on a normal power failure or if utility voltage is reduced to 70% of the nominal rating on any phase.

LIGHTING AND LIGHTING CONTROL

The lighting design will be in accordance with OBC requirements, IESNA requirements, good engineering practices, comfort, and safety. All luminaires will be LED, easily cleaned and permit practical and easy access and disassembly by authorized personnel. LED luminaires will comply with IESNA LM-79 and LM-80. Lighting power density levels will comply with ASHRAE Standard 90.1-2013. Interior lighting fixture selections will be comprised of downlights, pendant lights, recessed troffers, and strip lights. Exact fixture types and specifications will be coordinated with the Architect during the design development. All exterior lighting will conform to ASHRAE-90.1 requirements and will have uniform lighting levels, uniform colour temperatures, minimize glare, full cut-off, and avoid any up-lighting. All exterior lighting will have 3000K with a CRI>70 in order to comply with dark sky requirements and ensure safety. Exterior lighting fixture selections will be comprised of pole-mounted lights, wall packs, bollards, pendants, and canopy mounted linear lights. The lighting control system will be an IP-based, non-DALI, low voltage, de-centralized, networked type with dimming capabilities and control devices such as, but not limited to, wall switches, occupancy sensors, daylight sensors, dimmers, photocells, multi-scene controllers. The lighting control system and its operation will be design in each functional space to meet ASHRAE 90.1 as amended by SB-10 requirements. Individual rooms will be controlled via local wall or ceiling mounted sensors. Common areas will be controlled by time schedule and occupancy. Utility spaces where safety is an issue will be provided with local line voltage switches only. The lighting control system will be interfaced with the fire alarm system and Building Automation System (BAS) as a minimum to turn all lights at the Main Waiting Area to full brightness under a fire alarm condition. All exterior lighting shall also be controlled by the BAS.

TYPE	DESCRIPTION	BALLAST / DRIVER		IMAGE (REFERENCE ONLY)	COMMENTS / USE (SEE DRAWINGS)		
		TYPE	Color Temp			VOLTS	TYPE
C 1	4" ROUND DOWN LIGHT - INTERIOR AND EXTERIOR, RATED 60,000HRS LIFE SPAN @L70. WET LOCATION RATED	LED	3500K	347V	0-10V		GENERAL SPACES (INTERIOR + EXTERIOR) VESTIBULE TICKET COUNTERS MEETING ROOMS
E 1	BACKLIT ALUMINUM EXTRUDED RUNNING MAN SIGN NUMBER OF FACES AND PICTOGRAMS TO BE COORDINATED.	LED	N/A	347V	N/A		GENERAL SPACES (INDOORS)
F 1	2'x4' RECESSED TROFFER, DIRECT/INDIRECT LIGHTING, MATTE-WHITE FINISH, RATED 60,000HRS LIFE SPAN @L80.	LED	3500K	347V	0-10V		GENERAL SPACES (INDOORS) CORRIDORS STAFF LOUNGE
F 2	1'x4' RECESSED TROFFER, LOW GLARE, SATIN WHITE LENS, RATED 60,000HRS LIFE SPAN @L70.	LED	3500K	347V	0-10V		BACK OF HOUSE CIRCULATION AREAS
F 3	4' SUSPENDED, DIRECT/INDIRECT LIGHTING, EXTRUDED ALUMINUM HOUSING, FINISH TO BE CONFIRMED, 60,000HRS LIFE SPAN @L80.	LED	3500K	347V	0-10V		WAITING AREA QUEING SPACE MEETING ROOMS
F 4	8' RECESSED, LINEAR, DIRECT LIGHTING, ALUMINUM FIXTURE, RATED 60,000HRS @L70. WET LOCATION RATED	LED	3000K	347V	0-10V		EXTERIOR BUS SHELTER CANOPIES

TYPE	DESCRIPTION	BALLAST / DRIVER		IMAGE (REFERENCE ONLY)	COMMENTS / USE (SEE DRAWINGS)		
		TYPE	Color Temp			VOLTS	TYPE
F 5	2' WALL MOUNT, LINEAR FIXTURE, FINISH TO BE CONFIRMED, 50,000HRS @L70.	LED	3500K	347V	0-10V		WASHROOMS
P 1	4' SUSPENDED, STRIP LIGHT FIXTURE, WHITE FINISH, RATED 60,000HRS @L79.	LED	3500K	347V	0-10V		SERVICE SPACES
S 2	POLE MOUNTED LIGHT FIXTURE, TYPE IV SHORT DISTRIBUTION, FULL CUT-OFF OPTICS, DARK-SKY APPROVED, DLC LISTED, IP-66 RATED, 100,000HRS RATED @L80. WET LOCATION RATED INSTALLED ON LIGHTING POLE AND 3' TALL CONCRETE BASE. DETAILS TO BE CONFIRMED.	LED	3000K	347V	0-10V		GENERAL EXTERIOR SITE LIGHTING EXTERIOR BUS LOOP LAYOVER LANE ROADWAY
W 1	WALL MOUNT WALL PACK, TYPE II VERY SHORT DISTRIBUTION, FULL CUT-OFF OPTICS, DARK-SKY APPROVED, DLC LISTED, IP-66 RATED, 100,000HRS RATED @L80. WET LOCATION RATED	LED	3000K	347V	0-10V		EXTERIOR BUILDING FAÇADE
B 1	4' TALL BOLLARD, ALUMINUM FINISH, TYPE IV DISTRIBUTION, DARK-SKY APPROVED, IP-66 RATED, 125,000HRS RATED @L80. WET LOCATION RATED	LED	3000K	347V	0-10V		GENERAL EXTERIOR SITE LIGHTING MULTI-USE PATH

Preliminary Light Fixture Schedule

EXIT LIGHTS

All exit lights will be "Running Man" style LED, maximum 5 watts per sign. Exit lights in front-of-house areas (main waiting areas, common areas, public corridors, etc.) and back-of-house areas (service spaces, utility rooms, back-of-house corridors, etc.) will be aluminum extruded back lit type. Weather-proof exit lights will be coordinated and provided as required.

FIRE ALARM AND VOICE COMMUNICATION SYSTEM

The fire alarm system will be a single-stage, addressable, zoned, and supervised system that will include addressable intelligent, automatic, and manual initiation devices, audio/visual devices and emergency voice communications.

The system will be initiated by manual pull stations, smoke detectors, and heat detectors. Fire alarm speakers will be located throughout the building for signaling of alarm conditions and emergency voice communications. Fire alarm visual strobes will be provided throughout the building to supplement the fire alarm speakers. Heat detectors will be used in environments where smoke detectors are not suitable and are likely to cause nuisance or false alarm. Smoke detectors will be provided throughout the building, including services spaces, for early detection as required by Code in lieu of a fire protection system. Where electromagnetic locks are required, manual pull stations will have dual alarm contacts, one connected to the fire alarm system and the other connected to the locking device. Exact locations and details of the electromagnetic locking devices will be developed as design details are further developed in design development. Any held open doors or other closures in fire or smoke separations will be released on fire alarm signal.

The fire alarm system will not be used for paging and general announcement purposes. The fire alarm system will include, but not limited to, the following main components:

- Fire Alarm Control Panel
- Fire Alarm Annunciator Panel
- Data Gathering Panel
- Trouble signal devices
- Power supply equipment
- Manual alarm stations
- Automatic alarm initiating devices
- Audible and visual signalling devices
- End of line devices

INFORMATION, COMMUNICATION, AUTOMATION AND TECHNOLOGY (ICAT)

ICAT PROJECT GOALS

- ICAT system flexibility, scalability, and redundancy to accommodate future growth (two - 4" conduits to the building, with a 2" conduit to the Historic Allandale Station Administration Building as per City of Barrie IT)
- Design and install ICAT systems safe and easy to operate and maintain
- Maximize economic value for all stakeholders involved while adhering to project budget
- High community and end-user satisfaction with ICAT systems that promote safety, comfort, and accessibility
- Fulfill Owner requirements to ensure building and ICAT systems are fit for their intended purpose
- Clear delineations between various user groups information technology infrastructure

CODES AND STANDARDS

The ICAT systems will be designed and built-in accordance with the applicable legislation, Codes and Standards, and engineering best practices. The ICAT design will comply with the requirements of the latest versions in effect of the following legislations, Codes and Standards, and authorities:

- Ontario Building Code
- Ontario Electrical Safety Code and applicable Bulletins
- CSA C22.2 No 214 – Communication Cables
- CSA C22.2 No. 232-M – Optical Fibre Cables
- ANSI/TIA/EIA-492BAAA – Detail Specification for Class IV a Dispersion-Unshifted Single-Mode Optical Waveguide Fibres Used in Communication Systems
- BICSI Telecommunications Distribution Methods Manual (TDMM)
- ANSI/TIA/EIA-568-B.1 and associated Addenda – Commercial Building Telecommunications Cabling Standard, Part 1: General Requirements
- ANSI/TIA/EIA-568-B.2 and associated Addenda – Commercial Building Telecommunications Cabling Standard, Part 2: Balanced Twisted-Pair Cabling Components

- ANSI/TIA/EIA-568-B.3 and associated Addenda – Commercial Building Telecommunications Cabling Standard, Part 3: Optical Fiber Cabling Components
- ANSI/TIA/EIA-568-C.1-3 and associated Addenda – Commercial Building Telecommunications Cabling Standards and Components
- ANSI/TIA/EIA-569-B – Commercial Building Standard for Telecommunications Pathways and Spaces
- ANSI/TIA/EIA-455 – Test Procedures for Fiber Optical Cables and Transistor
- ANSI/TIA/EIA-598 – Colour Coding of Fiber Optical Cables
- ANSI/TIA/EIA-606-A – Administration Standard for Commercial Telecommunications Infrastructure
- ANSI-J-STD-607-A – Commercial Building Grounding (Earthing) and Bonding Requirements for Telecommunications
- NFPA 90A, Installation of Air Conditions and Ventilation Systems. IEEE 802 family of standards and communications
- ISO/IEC 17799 Security Practice Standards

COMMUNICATION DISTRIBUTION SYSTEM

New telecommunications services will enter the building via direct buried conduits and into the Demarcation Room. It is assumed incoming telecommunications services will be fed off Essa Road however, exact routing for the incoming communications services will be confirmed as the design details are further developed in the Implementation Stage. 4 – 4" direct buried conduits will be provided from the property line terminated into the Demarcation Room for the incoming telecommunications services. One Telecommunications Room (TR) will be provided in the Main Building to house telephone, wired and wireless network, video surveillance, and access controls terminations. TR's will be located strategically so the horizontal cabling and pathway distances will not exceed 90m. The TR will be sized to accommodate one full size two-post rack complete with vertical power distribution units and 6" vertical cable managers on each side. Fire rated plywood backboard, painted in white with two coats of fire-retardant paint will be provided on walls to support any additional wall mounted equipment. The horizontal cabling system will be CAT6, UTP, plenum rated, yellow colour jacket, with each telecommunications outlet (TO) in work areas back to the TR. All TO will be wired using the T568B wiring standard. Permanent links will not exceed 90m as measured from the cable termination point at each end. An additional 10m is allowed for cordage at each end, for maximum allowable end-to-end or channel length of 100m. The fibre backbone cabling system will be CommScope fibre, 12-strand, multi-mode OM4 complete with connectors. The communications distribution system will consist of complete conduit infrastructure and horizontal cabling will be installed in free-air and supported by j-hooks at accessible ceiling spaces. Cable tray will be 12"x4" overhead basket tray within the TR to facilitate the horizontal cabling to the two-post rack. 2 – 3" conduit rough-ins only will be provided to the Driver Relief Building from the Demarcation Room in the Main Building for telecommunications services. All necessary communications design and installations for the Driver Relief space fit-out will be completed by MVT. The City of Barrie WIFI system will be designed to provide full coverage for all City of Barrie staff. Public WIFI system will be provided by the telecommunications service provider, conduit rough ins will be provided throughout public areas for installation of public WIFI system Wireless Access Points (WAPs). For City of Barrie WIFI system WAPs, two data cable drops will be terminated to a surface mount TO located in the ceiling space within 3m of the actual WAP location. A CAT6, 3.5m patch cable will be provided for WAP connectivity. Depending on the distance between TO and WAP, loose cabling will be coiled and secured neatly. All active IT and networking equipment including, but not limited to, core switches, edge switches, servers, rack-mount UPS, will be designed by the City of Barrie's IT Team and provided under this project scope.

SECURITY SYSTEMS

The electronic access control security system (EACSS) will function as the foundation of the overall building security system. The EACSS will be a scalable IP based system with management software for control and operation and will communicate via the converged campus network. The EACSS will integrate with the Video Surveillance System into an easy-to-use IP based, upgradeable and scalable security management system, fully backed by UPS.

Electronic access control provisions will be provided for the doors with access control needs. The EACSS will consist of components including, but not limited to, card readers, keypads, request-to-exit buttons, request-

to-exit sensors, door controllers and visual doorbell / monitor to open the shipping and receiving area to bus agencies.

The following doors will be considered to have electronic access control provisions:

- Main Building main exterior doors
- Electrical Rooms exterior door
- All Public doors leading to City of Barrie spaces

The EACSS will have an interface with the fire alarm system in order to control the operation of egress doors as required.

The video surveillance system will be IP based and will reside on the City of Barrie's IT network. The digital video surveillance system will consist of digital colour, high definition (HD), IP, PoE, ONVIF compliant cameras that will provide images with HD (1920x1080 or higher) megapixel (MP) resolution. Cameras will be minimum 2MP resolution. Multi-head video surveillance cameras will be utilized to maximize surveillance coverage while minimizing infrastructure costs.

Video Storage capacity will be sized for 14 days at 1080p and 10 frames per second per City of Barrie standards. The recording system will be a scalable hard disk drive solution. The Video Management system will also be scalable, cloud enabled and have open architecture. System with no or lesser annual license maintenance fees will be selected.

The following areas will have video surveillance coverage:

- Public entrances and exits to the building
- Main Waiting Area
- Queuing Space
- Retail / Coffee Shop
- Public Areas
- Transit Platforms
- Ticket Counter
- Safe Room
- Bike rack locations
- Pick Up/Drop Off Area
- Driver Relief Building

AUDIO VISUAL SYSTEMS

Audio Visual (AV) systems will be provided in the City of Barrie Meeting Room as per City of Barrie Standards. The AV system will be designed for end user ease of operations and plug-and-play use. The AV system will consist of the following components:

- Tabletop mounted touch screen controller/speaker phone with Microsoft Teams compatibility, HDMI and USB connection
- Wall mounted webcam with autocropping
- 65" 4K UHD resolution commercial grade flat panel digital display to support Basic Decision-Making applications.



Figure 5.1.8-2: Tabletop AV/teleconferencing device

PUBLIC ADDRESS SYSTEM

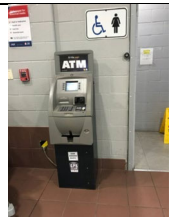

Public address system will be provided throughout the Public Areas and Waiting Area of the building and exterior bus platforms. The public address system will be completed with high performance plug and play mixer amplifier, loudspeakers, and paging microphones. Loudspeakers as part of the public address system will be lightweight, flush mounted, quick and easy to install. They will have wide frequency range and dispersion to ensure high quality sound reproduction and excellent speech intelligibility. Weather-proof loudspeakers suitable for outdoor conditions will be provided at the platforms to allow ticket staff to announce arrival of intercity buses. Loudspeaker horns will be provided at the exterior as required by the City of Barrie.


5.1.9. Furniture & Equipment

INTRODUCTION



The furniture, fixture, and equipment (FF&E) list outlines all the required furniture, equipment, dispensers, and fixtures to be within the building. A review of the existing FF&E at the current Transit Terminal, located at 24 Maple Avenue informed the required furniture and equipment for the new transit hub. A review of the Hub floor plan and spatial requirements informed on various waiting area seating to provide specific waiting seating based on rider waiting timelines, rider comfortability, and durability.


Allandale Transit Mobility Hub Furniture & Equipment List




Room or Location:	Item:	Item Details:	Power & Data:	Quantity:	Supplier & Installer:	Visuals:
Vestibule To Essa Road	Mat	Provide a mat at the entrance		1	Supplied and Installed by City's Vendor	
	Hand Sanitizer Dispenser	Provide a wall mounted hand sanitizer dispenser		1	Supplied and Installed by Glen Martin	
Vestibule To Bus Loop	Integrated Bench	Provide an integrated bench system (duet) that shall be fixed and secured to the floor.		TBD	Supplied and Installed by the City's Furniture Vendor	
	Hand Sanitizer Dispenser	Provide a wall mounted hand sanitizer dispenser		1	Supplied and Installed by Glen Martin	
	Waste & Recycling Receptacles	Provide one waste (black), one paper (grey), and one plastic (blue) receptacles		1 of each, 3 total	Supplied and Installed by GC	
	Mat	Provide a mat at the entrance		1	Supplied and Installed by City's Vendor	
	Ticket Vending Machines within Large Vestibule	GC to provide rough in and space for TVM's. One TVM for Metrolinx and two for Barrie Transit.	Each TVM requires one receptacle and one data jack.	3	Supplied and Installed by Barrie Transit and Metrolinx.	
Waiting Area	AED Station	Wall mounted AED station		1	Supplied by COB and Installed by GC	
	Naloxone Kit	Wall mounted naloxone kit		1	Supplied by COB Fire, Installed by GC	
	Water Bottle Filler	Water bottle filler within wall, requires water supply		1	Supplied and Installed by GC	
	Hand Sanitizer Dispensers	Provide a wall mounted hand sanitizer dispenser		TBD	Supplied and Installed by Glen Martin	
	Waste & Recycling Receptacles	Provide waste (black), paper (grey), and plastic (blue) receptacles		TBD	Supplied and Installed by GC	
	ATM Machine	Provide one ATM machine	power required, no data as it is wireless	1	Supplied and Installed by City's new vendor	 <p>Similar to what will be provided.</p>
	Barrie's Strategic Plan	Put on wall, wall mounted board		1	Supplied by COB, Installed by GC	 <p>Similar board will be provided.</p>
	Vending Machines	One for food and one for drink.	Power required for each as well as data for POS.	2	Supplied and Installed by City's vendor	

Barrie Transit System Map	Map system that will be on wall		2	Supplied and Installed by Barrie Transit	
TVs for Ads	Two SMART TVs, 65 inches.	One receptacle and one data jack for each TV.	2	Supplied and Installed by the City's Ad Contractor	
TV for Next Bus Arrival	For next bus arrival, ability to be programmed by the ticketing staff. Need power and data, 65 inches. Smart TV.	Power, one receptacle and one data jack per TV, 3 total.	3	Supplied and Installed by GC through the City's vendor, Cinema Stage	
TV for Maps	For transit maps. 65 inches. Smart TV.	Power, one receptacle and one data jack per TV, 2 total.	2	Existing, moved by City's Mover	 Existing TVs
TV for CCTV	For CCTV. 65 inches. Smart TV.	Power, one receptacle and one data jack. Provide additional power receptacles and data jacks for future touch displays.	1	Supplied and Installed by GC through the City's vendor	
Notice Board	Wall mounted tack board with keyed lock face for informational materials. One by ticketing and one in waiting area.		2	Supplied and installed by GC	
Bench Seating	Provide an integrated bench system (duet – 4-seater) that shall be fixed and secured to the floor		Estimated 12	Supplied and Installed by the City's Furniture Vendor	
Lounge Seating	Provide lounge seating that does not obstruct views and includes charging ports. Lounge seating to be river system or similar. To be fixed and secured to the floor.	Power required, additionally USB ports for charging	Estimated 5	Supplied and Installed by the City's Furniture Vendor	
Table & Chair Seating	Provide tabletop seating, provide two areas at normal dining height with 3 chairs (duet-cushioned) and two areas at standing height with no chairs to encourage a standing working space. Tabletop shall be licence or similar and shall be secured and fixed to the floor.	Power required, additionally USB ports for charging	Estimated 2 low top 2 high top 6 chairs	Supplied and Installed by the City's Furniture Vendor	
Wall Space for Art	Provide wall space for art	Provide power, one receptacle		Supplied and Installed by City of Barrie art vendors	

Public Washroom A	Needle Disposal Bin	Provide wall mounted needle disposal bin		1	Supplied and Installed by ECS Cares Inc.	
	Soap Dispenser	Provide wall mounted soap dispenser		1	Supplied and Installed by Glen Martin	
	Hand Sanitizer Dispenser	Provide wall mounted hand sanitizer dispenser		1	Supplied and Installed by Glen Martin	
	Hand Dryer	Provide wall mounted hand dryer	Power required	1	Supplied and Installed by GC	
	Toilet Paper Dispenser	Provide stall mounted toilet paper dispenser		2	Supplied and Installed by Glen Martin	
	Simcoe Green Solutions Bin	Provide floor standing Simcoe green solutions bin in stalls		2	Supplied and Installed by Simcoe Green Solutions	
	Garbage Receptacle	Provide garbage receptacle within stalls		2	Supplied and Installed by GC	
Public Washroom B	Needle Disposal Bin	Provide wall mounted needle disposal bin		1	Supplied and Installed by ECS Cares Inc.	
	Soap Dispenser	Provide wall mounted soap dispenser		1	Supplied and Installed by Glen Martin	
	Hand Sanitizer Dispenser	Provide wall mounted hand sanitizer dispenser		1	Supplied and Installed by Glen Martin	
	Hand Dryer	Provide wall mounted hand dryer	Power required	1	Supplied and Installed by GC	
	Toilet Paper Dispenser	Provide stall mounted toilet paper dispenser		2	Supplied and Installed by Glen Martin	
	Simcoe Green Solutions Bin	Provide floor standing Simcoe green solutions bin in stalls		2	Supplied and Installed by Simcoe Green Solutions	
	Garbage Receptacle	Provide garbage receptacle within stalls		2	Supplied and Installed by GC	
Universal Barrier Free Washroom	Needle Disposal Bin	Provide wall mounted needle disposal bin		1	Supplied and Installed by ECS Cares Inc.	
	Soap Dispenser	Provide wall mounted soap dispenser		1	Supplied and Installed by Glen Martin	
	Hand Sanitizer Dispenser	Provide wall mounted hand sanitizer dispenser		1	Supplied and Installed by Glen Martin	
	Hand Dryer	Provide wall mounted hand dryer	Power required	1	Supplied and Installed by GC	
	Toilet Paper Dispenser	Provide wall mounted toilet paper dispenser		1	Supplied and Installed by Glen Martin	
	Simcoe Green Solutions Bin	Provide floor standing Simcoe green solutions bin in stalls		1	Supplied and Installed by Simcoe Green Solutions	
	Garbage Receptacle	Provide wall mounted garbage receptacle		1	Supplied and Installed by GC	
Mini-Museum / Display	Display Case in Waiting Room	For Indigenous and Rail Heritage. To be fixed.	Power required, one receptacle.	1	Supplied and Installed by GC	
Retail / Coffee Shop	Front Counter Millwork	Provide front counter millwork with rolled lockable security grille. Point of sale will be at front counter.	Provide receptacles within room, conduit for data that will be pulled by future vendor.	1	Supplied and Installed by GC	
	Sink	To be provided by future vendor. Capped domestic			Supplied and Installed by future vendor	


		cold and sanitary required by project team.				
	Appliances	Appliances may include fridge etc.			Supplied and Installed by future vendor	
Passenger Information and Tourist Information	Tourism & Transit Brochure Stand	Stand supplied and installed by COB. Brochures provided by Barrie Transit. To be fixed to the floor.		1	Supplied and Installed by City of Barrie	
Ticket Counter	Key Lockbox	Existing wall mounted key lockbox to be moved	Requires power, once receptacle	1	Existing, moved by City's Mover	 Existing Lockbox
	Day Pass Printers	Printer for day passes and printer for memberships	Requires power, one receptacle and one data jack per printer, 2 total	2	Existing, moved by City's Mover	
	Weigh Scale	Existing weigh scale to be moved		1	Existing, moved by City's Mover	 Existing weigh scale
	Task Chairs	Three new task chairs, Tritex from Global Furniture Group		2	Supplied and Installed by the City's Furniture Vendor	
	Chair Elevations	Millwork to elevate chairs for 2 ticket counters agents to be eye level with customers when seated. Third ticket counter (freight/customer service) is not elevated.		2		
	Millwork for Ticket Counter	Millwork for 2 workstations at the ticket counter will require clear glass above. Third ticket counter (closest to bus loop) will be a freight customer service window. Same as existing which includes a sliding window to pass freight packages and a door to drag packages on the ground.		1	Supplied and Installed by GC	

Metrolinx IT Box & Antenna	Existing Metrolinx IT Box and Antenna	Power required	1	Existing, moved by Metrolinx	 Metrolinx box
Desktops	Desktops for each ticket counter	Need power, one receptacle and one data jack for each, 3 total	3	Moved by City's Mover or Supplied and Installed by COB IT	
Monitor	Computer monitors. Includes an outward facing screen to show transactions and transit directions for the public.	Need power, one receptacle for each, 3 total	2	Moved by City's Mover or Supplied and Installed by COB IT	
Desk Phone	Desk phones	Need power, can share receptacle with monitor	2	Moved by City's Mover or Supplied and Installed by COB IT	
Keyboard	Keyboards for each ticket counter		3	Moved by City's Mover or Supplied and Installed by COB IT	
Mouse	Mouses for each ticket counter		3	Moved by City's Mover or Supplied and Installed by COB IT	
Point of Sale (POS)	Point of sale	Need power, one receptacle and one data jack, additional data feed to enable POS sales from ONTC system	2	Moved by City's Mover or Supplied and Installed by COB IT	
Cash drawer	Lockable cash drawer. Large enough for a cash holder receptacle.		2	Supplied and Installed by GC	
Pass drawer	Lockable drawer for transit passes		2	Supplied and Installed by GC	
Mechanical Speakers	Punch into glass to speak from ticket counter to queuing space shall have safety film.		3	Supplied and Installed by GC	
Web Camera	We camera for pictures for transit passes	Need power	2	Moved by City's Mover or Supplied and Installed by COB IT	
PA System	Public address system to waiting area, platforms, and laybys	Need power	1	Supplied and Installed by GC through the City's vendor	
TV for CCTV	TV is required above ticketing stations for CCTV. Staff shall have the ability to program TV the waiting area. TV should be approximately 55 inches.	Power, one receptacle and one data jack	1	Supplied and Installed by GC through the City's vendor	
TV for Next Bus Arrival	TV is required above ticketing stations for next bus arrival displays. Staff shall have the ability to program information on	Power, one receptacle and one data jack	1	Supplied and Installed by GC through the City's vendor, Cinema Stage	

		TVs in ticketing and the waiting area. TV should be approximately 55 inches.				
Ticket Office	L-shaped Workstations	Existing 6' x 6' L-shaped workstations, height adjustable	Two receptacles and one data jack are required per workstation, 2 workstations total	2	Existing, moved by City's Mover	 <p>Existing stations and chairs</p>
	Task Chairs	Existing task chairs		2	Existing, moved by City's Mover	
	Laptop	Laptop per workstation	Included above	2	Moved by City's Mover or Supplied and Installed by COB IT	
	Docking Station	Docking station per workstation	Included above	2	Moved by City's Mover or Supplied and Installed by COB IT	
	Monitor	Monitor per workstation	Included above	2	Moved by City's Mover or Supplied and Installed by COB IT	
	Desk Phone	Desk phone per workstation	Included above	2	Moved by City's Mover or Supplied and Installed by COB IT	
	Keyboard	Keyboard per workstation		2	Moved by City's Mover or Supplied and Installed by COB IT	
	Mouse	Mouse per workstation		2	Moved by City's Mover or Supplied and Installed by COB IT	
	Tackboard	Wall mounted tackboard		1	Supplied and Installed by the City's Furniture Vendor	
	Pedestals	Existing pedestals, below workstations		2	Existing, moved by City's Mover	
Safe Room	Safe 1	Existing safe to be moved		1	Existing, moved by City's Mover	 <p>Existing safe</p>
	Safe 2	Drop box type safe. No cage needed with drop box new safe		1	Supplied and Installed by City of Barrie	 <p>New Safe</p>


	Touchdown Workstation	Existing 2' x 4' touchdown workstation, height adjustable	Two receptacles and one data jack are required per workstation	1	Existing, moved by City's Mover	 Existing station and pedestal
	Task Chair	Existing task chair		1	Existing, moved by City's Mover	 Existing chair
	File Cabinet	File cabinets		2	Supplied and Installed by the City's Furniture Vendor	
	Shelf	One wall mounted shelf		1	Supplied and Installed by GC	
	Desktop	Desktop	Included above	1	Moved by City's Mover or Supplied and Installed by COB IT	
	Monitor	Monitor	Included above	1	Moved by City's Mover or Supplied and Installed by COB IT	
	Desk Phone	Desk phone	Included above	1	Moved by City's Mover or Supplied and Installed by COB IT	
	Keyboard	Keyboard		1	Moved by City's Mover or Supplied and Installed by COB IT	
	Mouse	Mouse		1	Moved by City's Mover or Supplied and Installed by COB IT	
	Pedestal	Existing pedestal		1	Existing, moved by City's Mover	
Barrie Flex Office / Meeting Room	Table	Table against wall that will have built in power and data.	Power required. Two receptacles within table and 4 data jacks, one face plate.	1	Supplied and Installed by the City's Furniture Vendor	
	Chairs	Informal meeting chairs		4	Supplied and Installed by the City's Furniture Vendor	
	TV	Table height TV	Included above		Supplied and Installed by GC through the City's vendor, Cinema Stage	
	Conference Line	Conference line on table	Included above		Supplied and Installed by COB IT	
	Whiteboard	Wall painted whiteboard		1 wall	Supplied and Installed by GC	
Print Area	Printer Table	Table for printer items		1	Supplied and Installed by the City's Furniture Vendor	

	Printer	Printer	Power, one receptacle and one data jack	1	Moved by City's Mover or Supplied and Installed by COB IT	
Staff Lunch / Breakroom	Paper Towel Dispenser	Provide wall mounted paper towel dispenser		1	Supplied and Installed by Glen Martin	
	Soap Dispenser	Provide wall mounted soap dispenser		1	Supplied and Installed by Glen Martin	
	Waste & Recycling Receptacles	Provide one waste (black), one paper (grey) and one plastic (blue) receptacles		1 of each, 3 total	Supplied and Installed by GC	
	Fridge	Fridge	Power required, one receptacle	1	Supplied and Installed by the City of Barrie's Appliance Vendor	
	Microwave	Existing microwave to be moved	Power required, one receptacle	1	Existing, moved by City's Mover	
	Kitchenette Millwork & Sink	Millwork for a small kitchenette and plumbing for sink		1	Supplied and Installed by GC	
	Break Room Table	Table		1	Supplied and Installed by the City's Furniture Vendor	
	Break Room Chairs	Informal meeting chairs		4	Supplied and Installed by the City's Furniture Vendor	
	Coat Area	Area to store boots and coats outside of public view. For 4 staff.		1	Supplied and Installed by the GC	
	Cubby's	Wall mounted cubby for personal work materials (training/informational). Personalized by staff.		12 cubby's	Supplied and Installed by GC	
	First aid and evacuation kit	First aid and evacuation kit		1	Supplied and Installed by Corporate Facilities	
	Tackboard	Wall mounted tackboard		1	Supplied and Installed by the City's Furniture Vendor	
Barrie Staff Washroom	Soap Dispenser	Provide wall mounted soap dispenser		1	Supplied and Installed by Glen Martin	
	Hand Sanitizer Dispenser	Provide wall mounted hand sanitizer dispenser		1	Supplied and Installed by Glen Martin	
	Hand Dryer	Provide wall mounted hand dryer	Power required	1	Supplied and Installed by GC	
	Toilet Paper Dispenser	Provide wall mounted toilet paper dispenser		1	Supplied and Installed by Glen Martin	
	Simcoe Green Solutions Bin	Provide floor standing Simcoe green solutions bin in stalls		1	Supplied and Installed by Simcoe Green Solutions	
	Garbage Receptacle	Provide wall mounted garbage receptacle		1	Supplied and Installed by GC	
Staff Vestibule	Mat	Provide a mat at the entrance		1	Supplied and Installed by City's Vendor	
Janitorial Room	Eyewash Station	Eyewash station, will require plumbing		1	Supplied and Installed by GC	



	Slop Sink	Slop sink, will require plumbing		1	Supplied and Installed by GC	
	Touchdown Workstation	2' x 4' touchdown workstation	Two receptacles and one data jack are required per workstation	1	Supplied and Installed by the City's Furniture Vendor	
	Task Chair	Task chair		1	Supplied and Installed by the City's Furniture Vendor	
	Laptop	Laptop	Included above	1	Moved by City's Mover or Supplied and Installed by COB IT	
	Shelving	Existing shelving to be moved		3	Existing, moved by City's Mover	
	Soap Dispenser	Provide wall mounted soap dispenser		1	Supplied and Installed by Glen Martin	
	Paper Towel Dispenser	Provide wall mounted paper towel dispenser		1	Supplied and Installed by Glen Martin	
	Waste & Recycling Receptacles	Provide one waste (black), one paper (grey), and one plastic (blue) receptacles		1 of each, 3 total	Supplied and Installed by GC	
	Cleaning Cart	One cleaning cart		1	Supplied and Installed by Corporate Facilities	
	Ride on Floor Machine	Existing ride on floor machine to be moved	Will need power somewhere in janitorial	1	Supplied and Installed by Corporate Facilities	
	Vacuum	One vacuum		1	Supplied and Installed by Corporate Facilities	
	Mops and Incidental Supplies	Mops and cleaning supplies			Supplied and Installed by Corporate Facilities	
Garbage / Storage / Shipping and Receiving	Shelving	Existing multiple metal shelving to be moved, need 10 ft x 6ft high metal shelving.			Existing, moved by City's Mover	
	Moving Carts / Trolleys	Existing			Existing, moved by City's Mover	Existing shelving
	Garbage and Recycling Bins	One 4x6 yard bin for waste and Two 95L bins for recycling	Power and water supply feeds	1 +	Supplied and Installed by GC	
Main IT	IT Cabinet for City of Barrie	IT cabinet for city of Barrie IT network. Cabling into open post rack, closed rack for IT equipment, switch, UPS, grounding and access points.	Power required	1	Supplied and Installed by GC, through the City's IT vendor. Marcomm, Longview, compugen.	
	Retail / Café IT Cabinet	IT cabinet for retail/café IT network	Power required	1	Supplied and Installed by Future Vendor	
	Building Automation System	BAS for lighting, temperature, utilities. Facilities will require racks for BAS.	Power required	1	Supplied and Installed by GC, through the City's vendor	
Driver Relief Washroom A	Soap Dispenser	Provide wall mounted soap dispenser		1	Supplied and Installed by Glen Martin	
	Hand Sanitizer Dispenser	Provide wall mounted hand sanitizer dispenser		1	Supplied and Installed by Glen Martin	

	Hand Dryer	Provide wall mounted hand dryer	Power required	1	Supplied and Installed by GC	
	Toilet Paper Dispenser	Provide wall mounted toilet paper dispenser		1	Supplied and Installed by Glen Martin	
	Simcoe Green Solutions Bin	Provide floor standing Simcoe green solutions bin in stalls		1	Supplied and Installed by Simcoe Green Solutions	
	Garbage Receptacle	Provide wall mounted garbage receptacle		1	Supplied and Installed by GC	
Driver Relief Washroom B	Soap Dispenser	Provide wall mounted soap dispenser		1	Supplied and Installed by Glen Martin	
	Hand Sanitizer Dispenser	Provide wall mounted hand sanitizer dispenser		1	Supplied and Installed by Glen Martin	
	Hand Dryer	Provide wall mounted hand dryer	Power required	1	Supplied and Installed by GC	
	Toilet Paper Dispenser	Provide wall mounted toilet paper dispenser		1	Supplied and Installed by Glen Martin	
	Simcoe Green Solutions Bin	Provide floor standing Simcoe green solutions bin in stalls		1	Supplied and Installed by Simcoe Green Solutions	
	Garbage Receptacle	Provide wall mounted garbage receptacle		1	Supplied and Installed by GC	
Driver Relief Break / Lunchroom	Lounge Chairs	Informal lounge chairs		TBD	Supplied and Installed by MVT	
	Break Room Tables	Tables		TBD	Supplied and Installed by MVT	
	Break Room Chairs	Informal task chairs		TBD	Supplied and Installed by MVT	
Driver Relief Kitchenette	Kitchenette Millwork & Sink	Millwork for a small kitchenette and plumbing for sink		1	Supplied and Installed by GC	
	Fridge	Fridge	Power required, one receptacle	1	Supplied and Installed by MVT	
	Microwave	Microwave	Power required, one receptacle	1	Supplied and Installed by MVT	
	Paper Towel Dispenser	Provide wall mounted paper towel dispenser		1	Supplied and Installed by Glen Martin	
	Soap Dispenser	Provide wall mounted soap dispenser		1	Supplied and Installed by Glen Martin	
	Waste & Recycling Receptacles	Provide one waste (black), one paper (grey) and one plastic (blue) receptacles		1 of each, 3 total	Supplied and Installed by GC	
Driver Relief Shared Office	L-Shaped Workstation	6' x 6' workstation, plan for height adjustable	Two receptacles and one data jack required per workstation	2	Supplied and Installed by MVT	
	Touchdown Workstation	2' x 6' workstation, plan for height adjustable	Two receptacles and one data jack required	1	Supplied and Installed by MVT	
	Task Chair	Task chair		3	Supplied and Installed by MVT	
	TVs	Wall space for four TVs for operations monitoring. Would require power and data.		4	Supplied and Installed by MVT	
	Laptop	Laptop	Included above	3	Supplied and Installed by MVT	

	Docking Station	Docking Station	Included above	3	Supplied and Installed by MVT	
	Monitor	Monitor	Included above	3	Supplied and Installed by MVT	
	Desk Phone	Desk Phone	Included above	3	Supplied and Installed by MVT	
	Keyboard	Keyboard		3	Supplied and Installed by MVT	
	Mouse	Mouse		3	Supplied and Installed by MVT	
Driver Relief Private Office	Touchdown Workstation	2' x 6' workstation, plan for height adjustable, need power and data to station	Two receptacles and one data jack required	1	Supplied and Installed by MVT	
	Task Chair	Task chair		1	Supplied and Installed by MVT	
	Laptop	Laptop	Included above	1	Supplied and Installed by MVT	
	Docking Station	Docking Station	Included above	1	Supplied and Installed by MVT	
	Monitor	Monitor	Included above	1	Supplied and Installed by MVT	
	Desk Phone	Desk Phone	Included above	1	Supplied and Installed by MVT	
	Keyboard	Keyboard		1	Supplied and Installed by MVT	
	Mouse	Mouse		1	Supplied and Installed by MVT	
Driver Relief IT	Driver Relief IT Cabinet	IT cabinet for Driver Relief IT network	Power required	1	Supplied and Installed by MVT	
Exterior	Waste Receptacles	Spread across the site		11	Supplied and Installed by GC	
	Shovels	Within enclosure or storage rooms			Supplied and Installed by Corporate Facilities	
	Rakes	Within enclosure or storage rooms			Supplied and Installed by Corporate Facilities	
	Snowblower	Within enclosure or storage rooms		1	Supplied and Installed by Corporate Facilities	
	Leaf Blower	Within enclosure or storage rooms		1	Supplied and Installed by Corporate Facilities	
	Salt Spreader	Within enclosure or storage rooms		1	Supplied and Installed by Corporate Facilities	
	Benches	11 existing benches to be moved from 29 Sperling to 20 Essa		11	Existing, moved by City's Mover	
	SOS Salt Bins	For front and back of the building		2	Supplied by U-line and Installed by GC	
	Bike Racks	Outdoor bike racks		20	Supplied and Installed by GC	
	Flagpole	One flagpole to be provided for Canadian Flag		1	Supplied and Installed by GC	
	Unheated Shelter	Relocate existing shelter on Essa Road to the entrance of bus loop		1	Relocated and Installed by GC	

Electronic Bus Platform Signs	Platforms to have displays, displaying information on routes and next arrival, ability to be programmed by the ticketing staff. Platform number remains the same. Require power and data. See visual of required display or equivalent. Includes 1 for lay by bus platform.	Power and data required	11	Supplied and Installed by GC	 Sample Electronic Bus Platform Sign
Generator	Diesel generator		1	Supplied and Installed by GC	

Downtown Mini Hub Furniture & Equipment List

Room or Location:	Item:	Item Details:	Power & Data:	Quantity:	Supplier & Installer:	Visuals:
Exterior	Outdoor Waste and Recycling Receptacles	Utilize and place existing receptacles close to shelters. There are five existing that can be utilized. One shall be placed adjacent and outside of the east shelter, the other ones shall be placed on the west side of Maple Avenue.		2	Existing, Relocated and Installed by GC	 Existing Receptacles Visual
Exterior	Benches	Utilize and place existing benches close to shelters. There is twelve existing that can be utilized. Two benches shall be located adjacent and outside of the east shelter. One relocated on west side.		3	Existing, Relocated and Installed by GC	 Existing Benches Visual
Shelter	Heated Shelter	Shelter with heating, lights, integrated benches, and display case for informational materials.	One receptacle and data is wireless via modem.	1	Supplied and Installed by GC	
	Next Bus Arrival Display	Display to be provided within east shelter, that displays next bus and arrival time.	One receptacle and data is wireless via modem.	1	Supplied and Installed by GC	
Exterior	Ticket Vending Machine	Ticket vending machine outside of the east shelter.	One receptacle and data is wireless via modem required for TVM.	1	Rough In by GC, TVM Supplied and Installed by Barrie Transit	

Furniture Precedents



Lounge Seating



Seating for Tables



Bench Seating

5.2 Downtown Mini Hub

INTRODUCTION

This report outlines design principles, technical approach and applicable codes and standards used in the development of the Civil, Electrical and Landscape improvements for the Downtown Mini-Hub at Maple Avenue and Simcoe Street, Barrie, Ontario. The design will reflect the intent of Conditions of Satisfaction and Issued-for-Proposal concept in response to conformance review comments and comply with all codes and regulations including, but not limited to, the Accessibility for Ontarians with Disabilities Act (AODA), the Ontario Traffic Manual (OTM) and Ontario Standard Specifications, Drawings and Details. Scope will be delivered via the established project team and their respective design team representatives listed below.

- Civil Roadways
- Electrical
- Utilities
- Landscape

APPLICABLE DESIGN STANDARDS

- Project Conditions of Satisfaction
- OBC (Ontario Building Code)
- City of Barrie Accessible Customer Service Policy
- City of Barrie Accessible Standards Policy
- City of Barrie Accessibility Procedure
- AODA (Accessibility for Ontarians with Disabilities Act)
- OTM (Books 1 through 12 and 18)
- City of Barrie Operation Policy, Procedures and Guidelines
- City of Barrie Lot Grading and Drainage Standards and Design Manual
- OPSS (Ontario Provincial Standard Specification) and OPSD (Ontario Provincial Standard Drawing)
- TAC Guidelines for Understanding Use and Implementation of Accessible Pedestrian Signals
- Canadian Standards for Nursery Stock
- CNLA (Canadian Nursery Landscape Association)
- CPTED (Crime Prevention Through Environmental Design) best practices
- Ontario Electrical Safety Code and applicable Bulletins

Site plan development application is not anticipated for the scope of work defined in this report. A municipal class Environmental Assessment (EA) is not required if the scope does not include permanent applications to the west side of Maple Avenue and does not implement transit only.

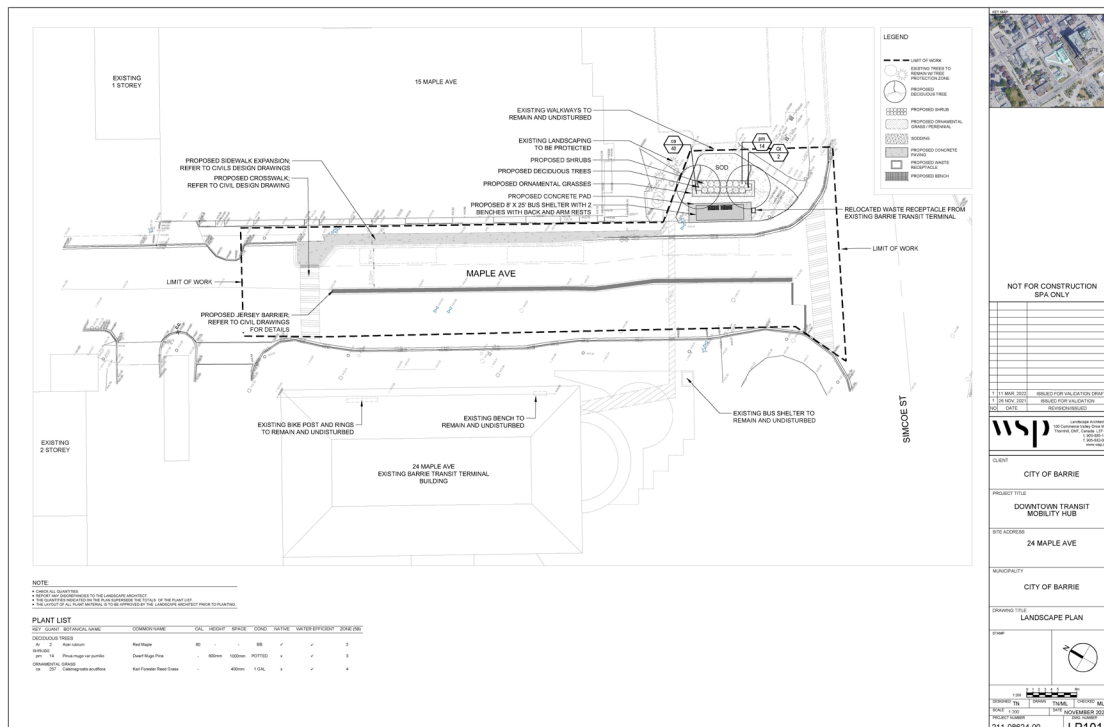
APPROACH TO DOWNTOWN MINI HUB

The Downtown Mini Hub has been designed to address the Conditions of Satisfaction (Appendix A) as prescribed by the City of Barrie in the project charter. The Downtown Mini Hub project consists of the

construction of a downtown bus transit hub that is to function as the primary downtown bus stop/transfer location for the City of Barrie. The project scope includes the construction of bus lay-by lanes on Maple Avenue, designed to accommodate up to six buses at one time (3 on the east side and 3 within the existing roadway on the west side of Maple Avenue). Additional site improvements include one heated transit shelter with seating and next bus display, and new pedestrian crossings (raised at the north end) with decorative pavement, centre-line pedestrian barriers to discourage unsafe travel, improvements to the hard surface area and space for bus boarding and de-boarding, line painting for new transit use, and signage to facilitate wayfinding and new routes. City of Barrie staff will consult with adjacent residents through public information sessions as described in section 3.2 of this report.

OVERVIEW OF COS

The conditions of satisfaction for the Downtown Mini Hub are listed in Appendix A Conditions of Satisfaction which dictate the required criteria and deliverables for the Downtown Mini Hub.



Downtown Mini Hub Plan

DESCRIPTION OF CIVIL REQUIREMENTS


The requirement of overall civil design is to meet the Conditions of Satisfaction. Existing servicing within the development and adjacent to the development is to remain; no servicing upgrades are required with the development/ improvements to the Downtown Mini Hub.

A new stormwater management plan will not be provided for the Downtown Mini Hub as there are no significant changes made to the configuration of the site and the existing infrastructure can provide adequate service for the site.

Grading design for the proposed development is to promote and maintain the existing drainage system and direct minor storm drainage to existing on-site collection points. Additionally, the existing overland flow route for the major storm drainage is required to be maintained and continue to direct drainage towards Simcoe Street. In order to deter pedestrians from crossing Maple Avenue which is not at a crosswalk, different options of pedestrian barriers were analyzed and compared. It was determined that a low-profile jersey barrier with road painting on either side (see Table 1) would be implemented along the centreline of Maple Avenue would promote pedestrian safety and user satisfaction. Consultations with emergency and


operational staff will commence in design implementation to ensure barriers will not affect roadway access for emergency and operational (i.e. snowplows) vehicles.

Table 1: Pedestrian Barrier

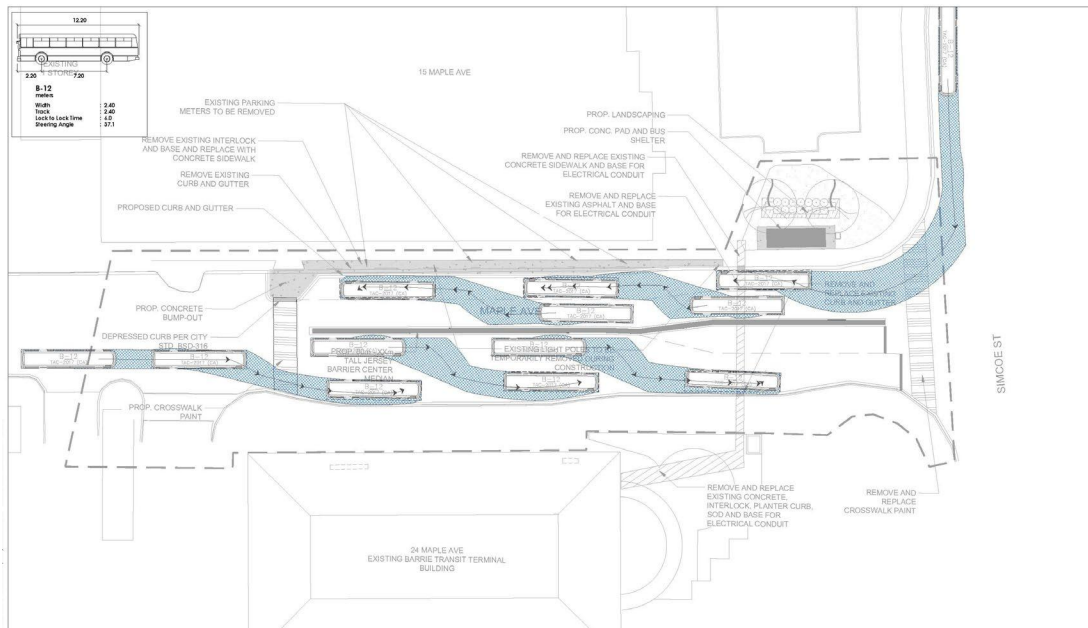
Item	Image
<p>Pedestrian Barrier: Low-Profile Jersey Barrier with 1m road painted buffer</p>	

It is required to provide a safe and feasible crossing location for pedestrians along Maple Avenue. A decision matrix was utilized to determine that the Speed Design Table form of a raised crosswalk is preferred. This design will realize the safety benefits of raised crossing for pedestrians while also not interfering with the drainage (gutter flow) on-site and will also promote safe (slower) traffic flow.

Table 2: Raised Crosswalk

Item	Image
<p>Raised Crosswalk: Speed Design Table</p>	

An auto turn analysis has been completed for the site to accommodate all bus routes and laybys.



Auto Turn Analysis

Traffic signals and regulatory signage is proposed on-site to ensure safety and user satisfaction among pedestrians and transit users. Signage may include but is not limited to:

- Investing in Canada Infrastructure Program (ICIP) signage erected 30 days prior to construction to recognize the funding contributions
- Pedestrian crossing signage
- Raised crosswalk in roadway signage
- Speed advisory and regulatory signage
- Bus platform signage

Painting will also be required and may include but is not limited to:

- Jersey barrier buffer painted area
- Traffic guidance road paint
- Individual bus platform road paint
- Bus only area road paint

TRANSIT ONLY DETERMINATION

A transit-only configuration is recommended due to the significant safety benefits and minimal drawbacks. The Transit Only Brief is provided by WSP under a separate cover. City of Barrie Transit and Transportation staff will continue to review the feasibility of creating a portion of Maple Avenue a transit only roadway. The roadway will not be converted to transit only at the completion of this project and will be implemented in the future with consideration from the Market Precinct project.

DESCRIPTION OF LANDSCAPE REQUIREMENTS

The technical approach and requirements of overall the landscape architecture endeavors to meet the Conditions of Satisfaction in accordance with applicable codes and standards identified above.

Landscape drawings for detailed design will included:


- Material and layout drawings noting critical dimensions for landscape hard surface treatments, site furniture, and soft landscape items
- Planting plans indicating species and quantities
- Material plans indicating proposed surface treatments and site furnishings, and
- Details for all proposed landscape items.

Landscape requirements have been considered to meet the Conditions of Satisfaction for the site (Appendix A) and included specification of the proposed bus shelter and site furniture; improvements to hard and soft surface treatments and consideration of plantings as follows:

Surface Materials

Existing pre-cast concrete unit pavers within the boulevard on Maple Avenue are proposed to be replaced with cast-in-place concrete to provide a firm, staple, slip-resistant surface for bus boarding/deboarding areas. Paving material installation will be designed to accommodate heavy duty commercial use, consistent with the high-traffic use of the site. All new sidewalks will be concrete, 32mPa, with a magnesium float finish on a granular base. Pedestrian surfaces will be designed to meet universal accessibility requirements (COADS, AODA) with respect to slope, material, and colour.





Table 3: Hard Surface Materials

Material	Image
Concrete Sidewalk (with expansion and control joints, perpendicular broom finish to direction of pathway)	

Site Furnishings

Site furniture is predominantly to be relocated from the existing transit hub or will be retained on site in their current configuration. This decision has been made to address both sustainability and cost objectives of the project. Relocated furnishings will be located adjacent to sidewalks to contribute to passenger wayfinding, comfort, and to maximize use. Furnishings are summarized table of furnishings below.

Table 4: Site Furnishings

Item	Image
Proposed site furniture:	
<p>Bus Shelter: 'Palladian' Bus Shelter by Day Tech, Model# APF09x25N; 8'-0"W x 25'-0"L; with doors, radiant heating, lighting and bench seating; or approved equal.</p>	
Relocated site furniture:	
<p>Waste Receptacle: Two of five existing receptacles at the existing Downtown Hub to be relocated. Placement shall be outside and adjacent the new bus shelter east side of Maple Avenue, and one on the west side of Maple Avenue proximate the bus boarding area, back of sidewalk.</p>	
<p>Bench Seating: Three of twelve existing benches at the existing Downtown Hub to be relocated. Placement to be close to bus shelters, back of sidewalk. Two benches shall be located east side of Maple Ave: one bench to west side of Maple Ave.</p>	
Existing site furniture to be retained:	
<p>Bike parking: West side of Maple Avenue, existing bike parking will be retained.</p>	

Planting

Planting may be used to define the public realm at the east waiting area, in consideration of Crime Prevention Through Environmental Design (CPTED) sightlines, snow maintenance movements, and AODA clearances. Planting will be specified in accordance with Canadian Nursery Landscape Association, Canadian Standards for Nursery Stock, OPSD standard details and City of Barrie details as applicable. Planting of a single tree and modest shrub planting to define the waiting area and address site restoration are being considered and will be implemented as project budget allows.

Seed and Sod

Imported horticultural topsoil will be provided for the proposed planting areas as required. Planting soil will be fertile, friable, natural sandy loam containing no less than 4% of organic matter. The acidity value will range from pH 6.0 to pH 7.5 making it capable of sustaining vigorous plant growth and will be free of stems or roots, stones, clods, and extraneous matter more than 50mm diameter. Soil will be screened where applicable and not supplied in a frozen state. All imported earth borrow shall be of the quality as defined by OPSS 212. Sod will be implemented where defined on the drawings and will meet the Canadian Nursery Landscape Association, and Canadian Standards for Nursery Stock. Disturbed areas are to be scarified to a minimum of 200mm depth with 200mm topsoil applied prior to seed application.

Crime Prevention Through Environmental Design

The design of landscape areas will apply the principles and strategies of CPTED. Site design will promote natural surveillance and user comfort within a functional landscape. Site furniture will be located near main pedestrian routes with adequate and appropriate lighting project requirements to reinforce natural surveillance to/from the street and bus stops. All pedestrian areas will be designed to allow for pass-through movement and 'dead end' spaces will be avoided to promote perceptions of pedestrian comfort and safety, any time of day. Unintended light spill will be mitigated such that 'in-between' lighting space is not created. Select shrub and deciduous tree species (if required) will be installed at the level 'below the knees and above the head' along pathways and waiting areas. The landscape design will consider existing site lighting to ensure proposed tree plantings will not affect existing illumination of pedestrian routes and waiting areas.

DESCRIPTION OF ELECTRICAL REQUIREMENTS

Power to the proposed bus shelters will be fed from the existing 24 Maple Avenue building electrical distribution system via below grade conduit and manholes. A 208V, 1 phase, 30A, 60Hz power supply will be provided for the East bus shelter. Common below-grade conduit will be utilized for future West bus shelter installation. This below-grade conduit will be sized for both East and future West bus shelter power feeds and will also accommodate for upsized cables due to voltage drop.

LIST OF FF&E

The list of furniture, fixtures and equipment for the Downtown Mini Hub are listed in Section 5.1.9. Please refer to that section for the complete list of FF&E required.

Appendix A – Conditions of Satisfaction

INTRODUCTION

The Conditions of Satisfaction (COS) includes the conditions and criteria that is required to ensure this project is a success and achieves the required deliverables. This list shall be read in conjunction with the FF&E list, room data sheets and the entire list of assumptions and narratives that make part of the Validation Report. To help inform this projects' COS, the feasibility study, Investing in Canada Infrastructure Program (ICIP) application and results from a public survey were reviewed. The application descriptions and survey results are noted below.

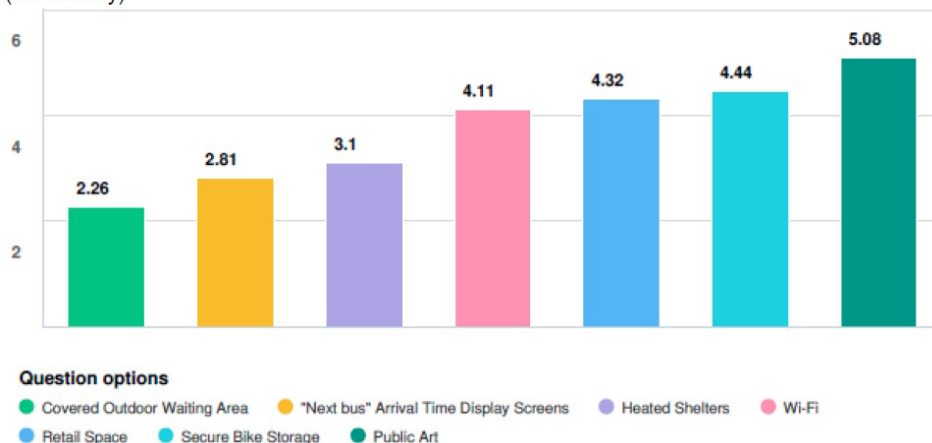
ICIP-BAR-05 Allandale Mobility Hub – New Transit Terminal: Locate the primary bus terminal on the same site as the local GO Train Station for local/regional transit connectivity with future all-day GO train service. Locate the primary bus terminal towards the future geographic center of Barrie with expected urban expansion to the south. Choose a site and concept plan with phasing for growth potential. Allandale GO Station has six existing bus platforms and one train platform. The site will be expanded with this project to include 13 platforms and a two-storey terminal building. The terminal building will include a passenger waiting area, ticketing window, small retail space, and driver break room.

A scope change request has been submitted to ICIP to change the description from a two-storey terminal building to a one-storey terminal building as the conditions and program listed below can be accommodated within a one-storey building. A one-storey building has various benefits that include an enlarged waiting area with the removal of vertical circulation (elevator and stairs), enhanced accessibility through the building, improved transit operations and cost effectiveness to eliminate circulation space that is not required.

ICIP-BAR-04 Downtown Connection Hub: The project consists of the construction of a downtown connection hub which would function as the primary downtown bus stop for the city. The project scope includes the construction of two lay-by lane bus stops which will accommodate six buses at one time, and one heated transit shelter. The project aims to improve the capacity of the public transit system and improve the quality, safety of the existing and future transit system and improving access to public transit systems.

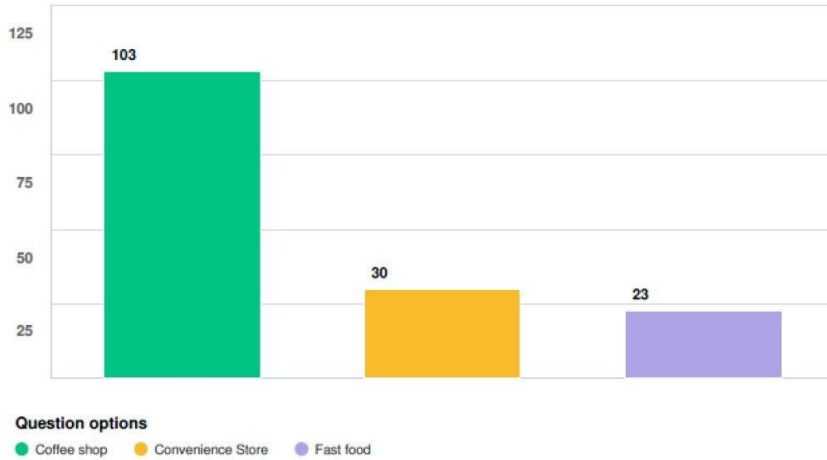
An initial survey was open for feedback in Spring 2018 to understand the public's priorities and preferences. The results of that survey are shown below.

Rank the following items in order of most important (1) to least important (7). You don't need to rank all items — if only a few are important to you, please rank only those items. (mandatory)



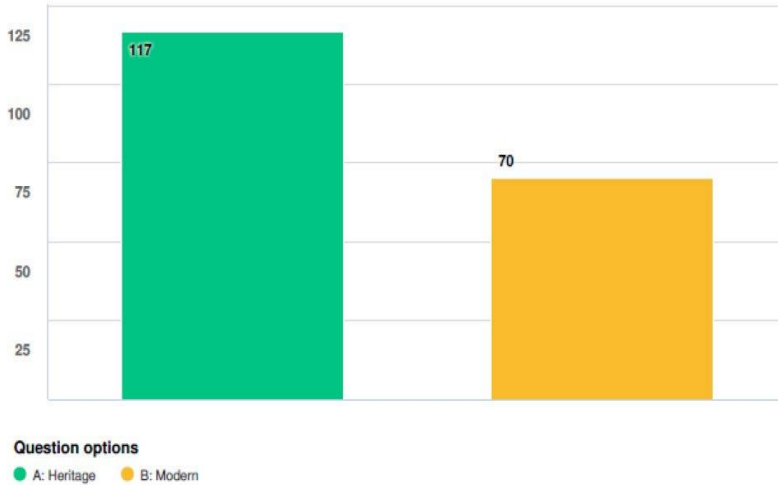
The preferred amenity that ranked the highest was a covered outdoor waiting area.

4. If retail space can be included in the final design, what type of retail space would you prefer? (optional)



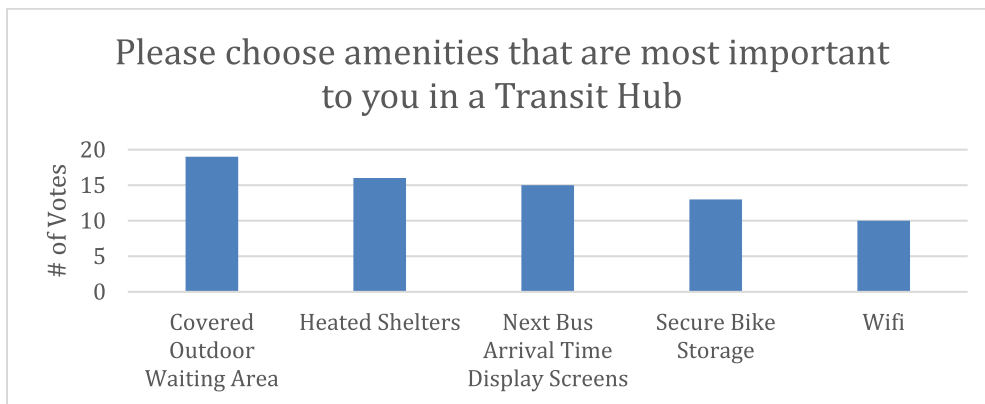
The preferred retail space that ranked the highest was a coffee shop.

Which building design do you prefer for a Transit Hub in Allandale? (mandatory)

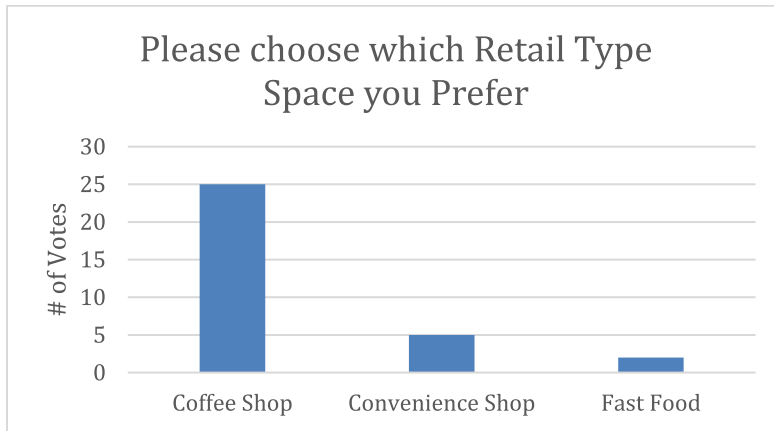


The preferred building design that ranked the highest was heritage.

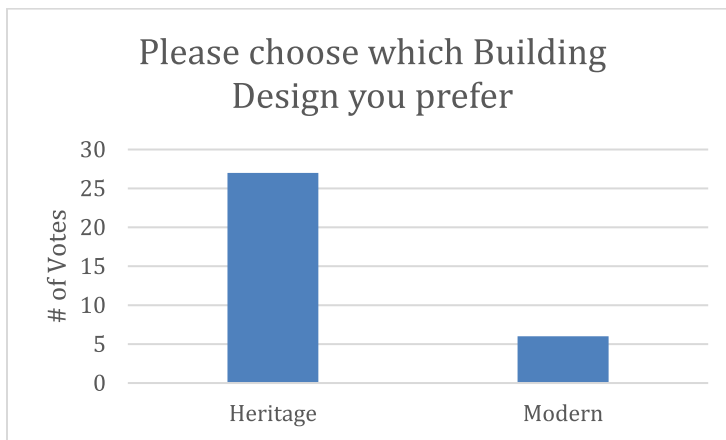
An additional survey was taken during the virtual public information session in Summer 2021 to understand if the priorities and preferences results from 2018 were still applicable. The results of the survey are shown below.



Covered outdoor waiting areas remained the top preferred amenity.



A coffee shop remained the top preferred retail space.




A heritage building design remained the top preferred building design.

Allandale Transit Mobility Hub Conditions of Satisfaction List

Component:	Condition of Satisfaction Item:	Detailed Description:
Site	Site Location	The new Allandale Transit Mobility Hub site shall be located within the intensification area as noted within the City’s planning policies. As progressed, the Allandale Transit Mobility Hub site (20 Essa Road) is within the City’s intensification area.
Site	Adjacent to Existing Rail Corridor	The new Allandale Transit Mobility Hub site shall be located adjacent to the existing rail corridor to accommodate seamless transit connections and will connect the hub to the active transportation network. The site shall maintain direct accessible connection to the rail platforms between the hub, buses, and train. As progressed, this has been accommodated with the site location and site plan drawings.
Site	Flagpole	Provide 1 flagpole for a Canadian flag.
Site	Interim pick up / drop off (PUDO) area	Shall provide an interim Allandale GO pick up / drop off design as we are closing off the access through the site. The site plan shall maintain emergency and maintenance vehicles access through the site but not public access which results in providing a turnaround. A continuous elevated path over the now closed PUDO roadway with signage that notes only emergency and maintenance vehicle access. The interim PUDO would only require signage and road paint to turnaround public vehicles.

Site	Loop Configured Site	Provide a loop configured site to encourage safety and provide ease of bus circulation for Single Bus Equivalents (40 foot) and Intercity Buses (45 foot). There will be no internal platforms in the loop for Articulated Buses (60 foot and 80 foot). Articulated buses would only be provided on Essa Road in the future.
Site	Transit Only Site	The site shall incorporate a transit only roadway with the loop configured site to limit vehicular congestion.
Site	Crosswalk Upgrades	Crosswalk upgrades at the Lakeshore / Tiffin intersection with textured and coloured asphalt at the four crossings, as well as a curb bump out at north-east corner of the intersection. The east crossing shall include the multi-use path (MUP) level crosswalk (OTM Book 18) that connects from Lakeshore to the site. Barrie transit staff will update the pedestrian signal timing. A functional drawing by LEA consulting is available.
Site	Pedestrian Environment	Provide a safe, comfortable, and convenient pedestrian environment. Within the site include wayfinding and surface treatments to encourage safe pathing within site.
Site	Pedestrian Barriers	Pedestrian barriers such as fencing or landscaping / planting shall be provided to direct foot traffic to desired crossings, control pedestrian traffic and limit pedestrians in undesirable areas, especially accessing through the bus loop and centre island. If fencing is provided, it should be secure, anti-climb and vandal proof.
Site	Bike Parking	Bike parking shall be in an area of visibility to discourage theft. Include rough in for e-bike electric charging/sharing, allocate space for 7 e-bike share docking stations. Supply and provide space for 20 bikes on outdoor bike racks. Bike racks are typical, and the team should plan for covered bike parking in the future. Security cameras shall cover the area of bike parking with signage indicating the area is under surveillance for deterrence. Existing covered bike parking to remain on site but shall be removed from its original location and relocated.
Site	Canopies	Canopies shall be provided along the platforms and interconnected to the building to provide continuous weather protected connections. The canopies will protect riders from the elements with a canopy integrated to the building for seamlessness. Project team shall consider how the canopy supports may affect buses boarding/deboarding. The canopies do not need to extend to the north access roadway to the bus loop. Canopies should also include bird netting or similar to prevent birds. The canopies shall also provide heat tracing in drain lines and down spouts to decrease ice formations and ponding of surfaces below. Consider the canopy supports to ensure they do not impede on circulation to Gowan Street and how the canopy could be expanded towards Gowan Street in the future.
Site	Benches	Provide outdoor benches throughout the site. City staff have confirmed that there are 11 benches that can be re-used and relocated from 29 Sperling.
Site	Bus Platforms	Incorporate 10 bus platforms sized to accommodate standard 12m city buses (B-12) within the loop. Of the 10 bus platforms, 7 are to accommodate 45-foot buses for future dynamic bus bay assignment ability. 45-foot buses shall be able to circulate throughout the site. Bus platforms shall include AODA features such as textured surfaces, concrete curbs painted yellow on the top and side (entire length of bus loop) and accommodate bus weights.
Site	Layover area	Layover areas for 3 spots on the north side of the centre landscaped island. Buses will operate independently from one another and need the ability to enter and egress with a full lineup of buses. Shall be able to accommodate bus waiting for a long period of time. At least one layover area shall be for a 45-foot bus.

Site	Lay by stop	2 lay by stops on Essa for easy pull in and out independent of other buses, should be elevated with a textured and coloured surface treatment (typically red) to dissuade vehicular traffic. Shall be able to accommodate bus weights. The lay by stops buses are 40 feet. Include signage for bus / maintenance or emergency vehicles only.
Site	Staff Parking	Update line painting and provide signage for the first spots on Gowan Street for staff vehicle parking. Parking should accommodate 14 staff vehicles and accessible parking as required by the zoning by law.
Site	Centre Landscaped Island	Provide a centre landscaped island for stormwater management and include landscaping that eliminate crossing through the bus loop.
Site	Bus Only Paint and Signage	Provide bus only roadway paint and signage at all vehicular entrances to identify the bus only area. This would be required entering the bus loop at the Lakeshore / Tiffin intersection, through the interim PUDO area and at the lay by stops on Essa, at a minimum.
Site	Multi-Use Path	The multi-use path (MUP) shall be extended from the existing Lakeshore trail to directly connect to the new hub site and connect to Essa. This is part of the greater active transportation (AT) network to connect Essa to the Waterfront Trail to encourage active travel access and complete the missing gap. The site will include an east / west and a north / south MUP for cyclist and pedestrian mobility through the site. The MUP shall start from the northeast corner of the Lakeshore / Tiffin Intersection and continue south through the site to the south platforms. In addition, the MUP should cross over the bus only aisles at the crosswalk, which should be a raised, coloured crosswalk, and continue west towards Essa. The MUP then turns south in front of the hub building to the edge of asphalt at the rail corridor. The crossing over the now closed PUDO road shall be raised to MUP level with MUP surface to indicate this is now an MUP and not a road. Shall include sloped vertical approaches to allow access for maintenance and emergency vehicles. The MUP shall be 4 metres in width at a minimum with the exception of 3m of width in front of the building on Essa and adjacent to the most easterly bus platform. The MUP shall have a solid yellow centre line and hard surfaces. Throughout the site shall have clear delineation as to what is the MUP and space for boarding and de-boarding where they are in close proximity. Paint and design features to follow Ontario Traffic Manual (OTM) book 18.
Site	Electronic Bus Platform Signs	At all platforms provide electronic bus platform signs that display information on routes and next bus arrival that will be programmed by ticketing staff. The platform number would always stay the same on the sign. This requires power and data. Shall be provided at all 10 internal site platforms and 1 for the layover area. See visual below: 
Site	Loading and Maintenance Vehicle Area	Provide access and an area for service, maintenance and loading vehicles. Loading area shall be provided for vehicles that need to park but that do not intrude on bus auto-turns and movement through the site. Service vehicles will also perform routine maintenance without interrupting transit operations. An area for snow storage is required with the assumption that snow will need to be trucked off due to the space constraints.
Site	Shelters	Rough in and future proof for 3 unheated shelters on the northside of the bus loop. The future shelter size would be 7.25 metres by 2.4

		metres. The future shelters would require power and data as the shelters would include an integrated bench, lighting, and next bus arrival (similar to the electronic bus platform sign). Additionally, relocate the one standard size shelter currently located along Essa Road to a platform on the north access road. The 4 existing Metrolinx shelters at the south shall remain on site but will be removed and relocated.
Site	Outdoor Waiting / Community Area	Provide an outdoor waiting area within the transit plaza's that can also be utilized by the community for programs etc. this would include the requirement for exterior power. Waiting area shall include benches, landscaping, and garbage and recycling receptacles. Freestanding benches would be provided by the City as per the above.
Site	Future Site and Space Planning	Provide a drawing of potential future platforms on the east side of the bus only roadway that would encroach on the Allandale Historic Station lands. Additionally, consider and ensure we are not obstructing the circulation and pathing to a future crosswalk that would cross from the east side of Essa Road to the west side above the rail corridor to obtain easy access to future south bound lay by lanes on the west side of Essa Road.
Site and Building	Waste and Recycling Receptacles	Provide outdoor and indoor waste and recycling throughout the building and site.
Site and Building	Signage and Wayfinding	Provide signage and wayfinding throughout the building and site. A focus on site circulation for transit buses, vehicles and pedestrians should be clearly identified. This includes signage for the Investing in Canada Infrastructure program (ICIP) as per the transfer payment agreement (TPA), to be up 30 days prior to construction and needs to be reviewed prior to.
Site and Building	Accessibility	Full accessibility in accordance with the legislated Accessibility for Ontarians with Disabilities Act (AODA) and OBC.
Site and Building	Security	Security and live stream camera system shall cover all areas of the site and building and to connect to the City's current enterprise system. Camera shall cover all platforms, laybys and lay by stops, interim PUDO area and bike parking. Security to also include card access on doors that need to have access, mainly between public and private areas. Security system would do an after hour lock out tied to the operational bus hours. Camera system is Tyco Exact Vision and security system is Cantech. Specific areas, resolution and storage requirements are detailed in the mechanical and electrical narratives.
Site and Building	Net-Zero Energy Performance	Pursue and target Net Zero Carbon by achieving Net Zero Energy performance with an all-electric building and no purchase of carbon offsets. Include a high-performance envelope to support the target.
Site and Building	Renewable Energy Generation	All energy consumed by the building and site is to be generated on site. Provide renewable energy generation, this can include the use of solar photovoltaics.
Site and Building	LEED Silver Certification	As per council motion 08-G-328, provide a LEED Silver certified building. Sustainability consultant to provide a sustainable business case for targeting net zero versus LEED Silver certification and show how we are providing equivalent performance (shadowing LEED Silver) or better to demonstrate all aspects of sustainability have been addressed.
Site and Building	Emergency Power Supply	Provide emergency power supply, diesel. With diesel we require a float switch. We require constant back-up power on site hooked into the building with a transfer switch. Emergency power shall be good for 12 hours for the full building load. Emergency power tap box shall be provided to be at least the same capacity as the generator (full load). Generator on site shall be hidden and partially enclosed with open air above.
Building	Submetering	Submeter the Driver Relief and Kiosk Coffee Shop spaces.

Building	Building Aesthetic	Building design shall provide a heritage / historical presence to be complimentary with the Allandale area and adjacent buildings, inclusive of the Allandale Historic Station Land Buildings. Provide a 3D visual that provides a realistic depiction of what the building will look like when constructed. Heritage and complimentary features of the surrounding buildings would include but is not limited to a peaked roof, detailing of windows and brick. This shall be to provide a heritage look and does not mean that we will utilize heritage materials.
Building	Materials	Provide accessible and high resilient flooring for cleaning and for regional passengers and their luggage. This could be ceramic floor tile, or similar. Public areas should have durable materials such as tile. Public washroom cleaning is done by a Kaivac Machines which requires waterproof fixtures.
Building	Public Wi-Fi.	Need rough ins for Rogers or Bell to come into the Demarc room to provide public wi-fi in the waiting area.
Building	Efficient Equipment	Choose systems and equipment that are efficient with low life cycle costs. Capital and operational costing shall be considered in decision making, as such, full life-cycle approach and costing shall be considered.
Building	Building Automation System (BAS)	Building automation system shall be provided to control lighting, temperature, and utilities and to connect to the City's current enterprise system which is a virtual server that holds the City's automation systems. The BAS system is Reliable Controls and would be supplied and installed by Setpoint through the General Contractor. The BAS shall be remotely accessible (read and controlled) by City staff per their existing tools. The BAS can be put in the IT room. If any windows are operable consider tying them into the BAS.
Building	Contactless Fixtures	Provide contactless fixtures where appropriate to limit the use of touch contact on highly used fixtures. This would include fixtures in bathrooms, dispensers, and accessible doors to be complete with contactless operators (wave style) to enter doors.
Building	Fire Panel	Fire panel required and needs to be ULC listed. Shall connect to 3rd party additional panel and monitoring company, Huronia Alarm with a backup cellular and Internet connection. All rooms shall have horns and strobes.
Building	Future Power Capacity	Allow 20% electrical panel capacity for future which is in addition to the engineers load factor.
Building	Arc Flash Study	Arc flash study to be completed by electrical trade.
Building	Large Vestibule (Waiting Area)	Provide a large vestibule to act as a waiting area when the main building is closed. Large vestibule should include space for three ticket vending machines (TVM), secured bench seating, and shall have security cameras with signage showing you are on camera. Ticketing vending machines shall be roughed in for power and data by the project team. Size for (1) Metrolinx (GO) TVM and for (2) Barrie Transit TVM's. The TVM will be supplied by Metrolinx and Barrie Transit.
Building	Waiting Area	Waiting area shall be centralized for riders to wait. The estimated peak waiting riders shall accommodate 40 riders. Waiting area shall have adequate lighting inclusive of natural lighting, unobstructed views and sightlines to the platforms and bus loop. Various types of seating to be provided including bench seating for short-term waiting, lounge seating for long-term waiting and tabletop seating for additional long-term seating / working area.
Building	AED Station	An automated external defibrillator (AED) station shall be located in the waiting area. Only one is required.
Building	Naloxone Kit Station	A naloxone kit station shall be located in the waiting area. Only one is required.
Building	Water Bottle Filler Station	One water bottle fill station shall be located in the waiting area.
Building	ATM Machine	One ATM machine shall be located in the waiting area.

Building	Vending Machines	Two vending machines, one for drinks and one for snacks shall be located in the waiting area. The machines will be supplied by the City as per the FF&E list.
Building	Passenger service information	Passenger service information TVs by the City's ad contract. Two TVs shall be sized around 65 inches for wall space. Project team to provide wall space, power, and data. TVs will be supplied by the ad contractor.
Building	Public Art Space	Provide wall space for public art. Project team to provide wall space and power.
Building	Public Washrooms	Public washrooms shall be provided and accessible from the waiting area. Washrooms shall have the ability to be closed for cleaning protocols, restricting public access during cleaning, this would require an additional washroom to be made available. Number of washrooms to be guided by current building code and operational requirements, include a universal barrier free washroom. Flat surfaces shall be minimized. City of Barrie will provide dispensers as per the FF&E list.
Building	Area / Display Case	Allocate space for an area / display case to showcase historic Barrie transit train and indigenous heritage items. Shall be located within waiting area, have power and be durable.
Building	Kiosk Coffee Shop	Provide a kiosk coffee shop or similar. Space to be sized for a front counter, additional counter or shelving, a sink, and appliances. This space would not have dedicated seating, would utilize seating in the waiting room. Project team is responsible for providing the space including the wall finish and paint, finished floor, finished ceiling, installation of a front counter with a rolled lockable security grille, capped domestic cold water, basic lighting (for occupancy), sub metered electrical panel (revenue grade) and conduit rough ins to space for IT. Future vendor is responsible for running their own IT cabling, receptacles, and infrastructure. Future vendor will be responsible for supplying their own appliances, additional millwork / counters, shelving, sink, dispensers, signage, and IT equipment.
Building	Displays	Provide six TVs within the waiting area. Three TVs shall be for next bus arrival that can be programmed by ticketing staff. Two TVs shall be provided for transit maps, real-time route information. One TV shall be provided for security camera live stream footage. All TVs shall be SMART TVs and 65 inches with power and data provided. Note, the TV's must be able to withstand being turned on for long portions of the day.
Building	Tourism Barrie Area	Provide a tourism Barrie area within the ticketing queuing space. Space for a brochure stand.
Building	Ticket Queuing Space	Space for a ticketing queuing space for 5 – 7 customers per attendant, outside of the ticketing windows. Shall be open space with no obstructions.
Building	Ticketing Counter Area	Ticketing sales to sell Barrie Transit tickets and customer service. Ticketing area shall see platforms and waiting area. Should be a lockable room and lockable from the private staff side as well. 3 ticketing (2 for ticketing, 1 for information) windows plus workstations shall be provided (millwork with window above). Two ticket counters shall be elevated similar to Service Ontario, where the seated staff behind the ticket counter is eye to eye to the standing customer. The third ticket counter does not need to be elevated and shall include a sliding window. Space should include a wall mounted key lockbox, space for a floor weigh scale, two TVs, PA system, MetroInx IT box and antenna and at each counter, computers, phones, point of sale, cash drawer, pass drawer, and web camera. The full list is provided in the FF&E list. PA system shall be to waiting area, all platforms, and laybys. Ticketing staff shall have the ability to program the next bus arrival displays in the waiting room at the platforms. Each ticket window should have plexiglass protection and mechanical speakers, provide

		safety film. Two printers (day pass and membership) to be near windows.
Building	Ticket Office	Need an office close to ticketing that would be sized for two L-shaped workstations and one-way viewing window out to ticketing.
Building	Safe Room	Safe room to be located off the ticketing counter area. Room shall be secured for vaulted funds. Sized for two safes, a touchdown workstation and two file cabinets. Full list is provided within the FF&E list.
Building	Barrie Flex Office / Meeting Room	Need a flexible office and meeting room for Barrie staff. Should include space for a flexible table for four people. Each spot shall have power and data. Provide TV and whiteboard painted wall.
Building	Print Area	Provide space for a full-size printer and table for print material, to be close to ticketing counter area.
Building	Barrie Staff Break Room	Small kitchenette millwork with sink, full size fridge, and countertop microwave. Small table and chairs for four people for break / lunch space. Shall include space to hang coats, inclusive of wall mounted cubbies for personal work materials (training and informational).
Building	Staff Vestibule	Staff vestibule to access the building from private locked side.
Building	Staff Washroom	Staff washroom to be used by staff with access from staff area.
Building	Janitorial Room	Provide a janitorial room that is sized for a ride on floor machine, cleaning cart, shelving for dispenser and bulk cleaning agents, touchdown workstation and chair, eyewash station, slop sink and small waste and recycling receptacles. Include a low-level floor drain to empty machine, backflow preventor, and small waste and recycling.
Building	Shipping and Receiving / Storage Room	Provide an interior loading area, storage, shipping and receiving for operational and Transit deliveries. For general equipment storage (operational space that is 12-foot x 4 foot), parcel delivery and access to a pickup and drop off, inclusive of receiving Ontario Northland parcels. Include heavy duty shelving 10 foot long by 6 foot high for Ontario Northland. Double door access and ability to move larger items on a trolley.
Building	Garbage Enclosure	Garbage enclosure to be provided, can be adjacent to shipping and receiving and sized for two 4 x 6-yard bins, shovels, rakes, a snowblower, leaf blower and salt spreader. Shall be exterior to the building, and close to the waste pick up area. Electrical and water supply feeds is required and shall have lockable bay doors.
Accessory Building	Driver Relief Space (Transit Operators)	Transit Operator, driver relief staff, office and breakroom. Driver relief staff shall have direct access to their space without having to access through Barrie Transit areas. Space to include a small kitchenette (millwork with sink, full size fridge and countertop microwave), breakroom for 12 staff, one office with a touchdown workstation and a second office with a touchdown workstation and two L-shaped workstations, and a washroom. Four TVs will be required in the office for operations monitoring, power will be provided by the team, TV's to be supplied by the transit operators. Project team is responsible for providing the space including the wall finish and paint, finished floor, finished ceiling, complete built out washrooms, finished millwork and sink, lighting, power inclusive of receptacles, sub metered electrical panel (revenue grade) and conduit rough ins for IT. Transit operators are responsible for running their own IT cabling and for supplying their own appliances, IT equipment and furniture.

Downtown Mini Hub Conditions of Satisfaction List

Component:	Condition of Satisfaction Item:	Detailed Description:
Site	East Heated Shelter	Provide a large, heated shelter, 7.25 metre by 2.4 metre on the east side of Maple Avenue. The shelter would include a next bus display (similar to the electronic bus platform display), integrated bench, and touch heating that can become activated and heated when temperatures drop below 5 degrees Celsius. Requires power and data is via wireless modem. Locate two exterior benches adjacent to the shelter that will be relocated from the existing transit terminal. Locate one exterior garbage and recycling receptacle adjacent to the shelter that will be relocated from the existing transit terminal. Consider the wind direction from Lake and having doorways not open to the south. Rough in for a ticketing vending machine outside of the shelter.
Site	Future Proof for West Heated Shelter	Future proof for a large, heated shelter (as described in the above line item) on the west side of Maple Avenue. Include conduit run to the west side when running conduit to the east side shelter to ensure that it can be connected in the future for power and data is via wireless modem. In the interim locate one bench on the west side that will be relocated from the existing transit terminal and locate one exterior garbage and recycling receptacle on the west side that will be relocated from the existing transit terminal.
Site	Lay By and Bus Stops	Provide lay by and bus stops for 6 buses to board and de-board at one time, 3 on east side and 3 on west side. Buses will arrive and depart independently. Provide line painting on the roadway to indicate the bus stops and lay bys.
Site	Centre Barrier	Centre barrier shall be provided on Maple Avenue roadway to restrict uncontrolled pedestrian crossing.
Site	Crosswalks	Provide a north crosswalk that is raised, paint-based coloured, highly visible and continue to additional east side space as noted below. This would also act as a traffic calming feature to slow vehicles down and raise awareness of drivers. Provide a south crosswalk that is paint based coloured and highly visible, potential to add curb bumps out to limit crossing distance. Safety is a priority and include passenger safety features within the design and minimize pedestrian circulation conflicts with vehicular and bus traffic.
Site	Signage and Wayfinding	Signage and wayfinding shall be provided focusing on circulation for transit buses, vehicles, and pedestrians. Signage may include a sign on a metal pole at all 6 bus stops, signs/road paint to slow down, reduce km/h signs (contingent on transportation planning approval), at a minimum. This includes signage for the Investing in Canada Infrastructure program (ICIP) as per the transfer payment agreement (TPA), to be up 30 days prior to construction and needs to be reviewed prior to.
Site	Letter for Transit Only Roadway	Provide a letter to Transit staff for a transit only roadway justification for future implementation with the Market Precinct project. Project shall proceed with validating a non-transit only roadway. Letter should assess the implementation, cost, and benefits of a 'transit only' roadway on Maple Avenue from Simcoe Street to the northeast edge of 24 Maple Avenue site, which is approximately 80 metres.
Site	Additional East Side Space	Provide additional east side space on Maple Avenue, may involve a curb bump out into current roadway extending alongside the two north east side platforms and to reduce crossing distance at the north crosswalk. This will provide additional space for riders to wait adjacent to bus queuing space, boarding and de-boarding on the east side of Maple Avenue, which is adjacent to the building, as currently there is minimal space.

Appendix B – Wish List

Allandale Transit Mobility Hub Wish List

Priority:	Component:	Wish Item:	Detailed Description:
1	Building and Site	Integration of Old Foundation from Allandale Historic Train Station	Utilize part of the exposed foundation at the Allandale Historic Train Station adjacent to the project site. Pieces of the foundation could be utilized as a focal piece in the waiting room, for example the front of the ticketing counter or can be utilized for exterior landscaping features. Full extent of how to integrate the old foundation shall be determined by the project team. Work involved and assumptions include: design of the old foundation integration, selection of the pieces to be utilized, additional material costs, coordination, and construction.
2	Site	Additional Crosswalk Modifications	Include crosswalk modifications at two additional intersections. First, 4 crosswalks at the Bradford Street, Tiffin Street, and Essa Road intersection. Second, 2 crosswalks at the Gowan Street and Essa Road intersection. Crosswalk modifications include a coloured and textured surface treatment on the roadway with zebra paint on top, or equivalent. Work involved and assumptions include: design of the additional intersections, selection of the surface treatment, review by transportation planning, materials costs, right-of-way activity (ROWA) permits, traffic management, and site supervision.
3	Site	Canopy Seasonal Light Hooks	Hooks along the canopies to provide ability to add seasonal LED lights for seasonal aesthetic, community feel and to celebrate the rider. Will require power to operate the seasonal lights. Work involved and assumptions include: design location of power feed for lights, understand electrical load requirements, select hooks that can be incorporated within the canopy, material costs.
4	Site	Covered Bike Parking	Include coverage for the new bike parking racks. The site currently has an existing covered bike parking area that will remain, new bike parking racks will be provided throughout the site.. This item would include covering the new bike parking racks adjacent to the north canopies. Work involved and assumptions include: design the covered area for the new bike parking, select covered structure, material costs, coordination.
5	Site	Unheated Bus Shelters	Includes up to three unheated bus shelters at the north platforms. The shelters shall match existing shelter size (7.25m x 2.4m) and would require power and data for the next bus arrival display, an integrated bench and lighting. Work involved and assumptions include: design of placement of shelters, selection of shelter, understanding of shelter power and data requirements, cost of shelter, cost of power, and data hookups.
6	Building	Public Change Room	Would include a public change room for arriving passengers. Work involved and assumptions include: require understanding of space requirements, design of change room within floor plan, determine room data and material types for room, material selection, cost to build out change room.
7	Building	Staff Shower	Would include a staff shower, located in the private administration portion of the building. Work involved and assumptions include: require understanding of space requirements, design of shower and space within floor plan, determine room data and material types for room, plumbing requirements, material selection, cost to build out shower.

8	Off Site	EV (Electric Vehicle) Staff Parking	Would include electric vehicle parking at the staff parking located on Gowan Street. Work involved and assumptions include: understanding of how many EV spots are required, power requirements to Gowan Street, material costs, and site supervision.
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Downtown Mini-Hub Wish List

Priority:	Component:	Wish Item:	Detailed Description:
1	Site	West Heated Shelter	Include a large shelter on the west side of Maple Avenue, located at the existing small unheated shelter which is to remain unless this item can be accommodated. Shelter shall be at least 7.25m x 2.4m, power, data for the next bus arrival display, an integrated bench, touch heating, and lighting. In addition, outside the shelter shall be two exterior benches provided (can utilize existing benches at transit terminal), garbage receptacles (can utilize existing receptacles at transit terminal), space and rough in for a ticket vending machine. Work involved and assumptions include, design of placement of shelter, selection of shelter, understanding of shelter power and data requirements, cost of shelter, cost of power, and data hookups.
2	Site	Accommodate Articulating Buses	One of the three bus spots on the west and east side of the roadway on Maple Avenue shall be able to accommodate an articulated bus, with total of two bus spots. Articulated bus is 59 ft or 18 m in length. Work involved and assumptions include: design spots for an articulated bus, complete auto turn assessment, build out spots to accommodate the articulated buses.

APPENDIX "B"

Anticipated Project Schedule

The anticipated project schedule has been estimated and is contingent on external approvals that is beyond staff control.

