City of Saint John

Request for Proposal

2021-094501P
ARCHITECTURAL SERVICES: LOYALIST PLAZA & FUNDY QUAY HARBOUR PASSAGE EXTENSION

Emailed proposals, addressed to monic MacVicar, CCLP, CPPB, and titled:

"PROPOSAL 2021-094501P
ARCHITECTURAL SERVICES: LOYALIST PLAZA & FUNDY QUAY HARBOUR PASSAGE EXTENSION"

will be received until **4:00 p.m. Local Time**., Thursday, **February 11th, 2021**, for Architectural and Engineering Design and Construction Management Services for the above noted project, as per the Request for
Proposal.

Due to the Covid-19 pandemic, there will be no public opening. A list of Proponents who have submitted proposals will be available on the City's website following the closing time.

*The lowest cost or any proposal not necessarily accepted.

Monic MacVicar, CCLP, CPPB
Procurement Specialist
Supply Chain Management

RFP No. 2021-094501P – Architectural Services: Loyalist Plaza & Fundy Quay Harbour Passage Extension

Scope and requirement changes from RFP 2020-091004P, issued July 2020

The following is a brief summary of changes in the RFP from a previous RFP issued for a similar scope of work in July 2020. This section is intended as a summary and reference only. The changes to the RFP can be found throughout the document highlighted in red text.

1. Changes to project descriptions and grouping of project components. See pg.3-5
2. New information provided on project timelines and the phasing of tenders and construction. See pg. 5.
3. Requirement for video inspection of existing storm and sanitary sewers on the site included in Part A. See page 7.
4. Clarification of level of effort for public and stakeholder consultations provided. See pg. 8 & 9
5. Scope for detailed design now includes the preparation of a storm water management plan. See pg. 10
6. Tender(s) to incorporate updated construction timelines and phasing requirements. See pg. 10
7. Updated estimated construction timelines for projects 1 & 2. See pg. 17.
8. Proponents are required to submit a PowerPoint presentation. See pg. 18
9. Proponents who are re-submitting an updated proposal are to provide a summary list of changes made to their original proposal submission. See page 19.
10. Adjustments to project contingencies. See pg. 19.

1. General

The City has prepared this document for Consulting Architectural and Landscape Architecture firms wishing to provide their services to the City of Saint John. This request for proposals is to be used as a guide, in combination with good architectural judgment and standard architectural practices and is not intended to be a complete procedural document. It reflects basic standards the consultant is to adhere to when preparing a proposal or carrying out work for the City.

All architects and landscape architects working on this project for the City must be licensed to practice architecture or landscape architecture in the Province of New Brunswick. All Engineers working on this project for the City must be a current member, licensee or holder of a certificate of authorization with APEGNB. All Engineering companies working on this project for the City must have a current certificate of authorization with APEGNB.

The consultant shall in all matters act as a faithful advisor to the City. The consultant shall keep the City informed on all matters related to design, procurement and construction and all other important aspects forming part of the scope of work.

The consultant must aggressively and proactively manage the project in the best interest of the City of Saint John. ***The project is targeted for tenders beginning in 2021, with construction of several components beginning in 2021 with federal funding requirements for completion by December 31st, 2021. The tender and construction of some components will be conditional on receiving a timeline extension from the Federal Government.*** The consultant must allow for this in their proposal budget.

The consultant will oversee and manage the entire project on behalf of the City of Saint John. The proposal shall clearly explain the anticipated structure of project management during each phase.

***This Request for Proposal is conditional upon the City of Saint John obtaining funding through the *Integrated Bi-Lateral Agreement for the Investment in Canada Infrastructure Program (ICIP)* for this Project; specifically, the Fundy Quay Site, on or before the 31st day of March, 2021.**

2. Project Description

In 2019, the City of Saint John entered into an agreement with Fundy Quay Developments Inc. for the ground lease and development of the property. Subsequent to this agreement, the City of Saint John has made application through the Integrated Bi-Lateral Agreement for the Investment in Canada Infrastructure Program (ICIP), for the purposes of obtaining funding support for both the site infrastructure projects required to deliver a development ready site and to support municipal public space improvements included in this request for proposals. The first component of this infrastructure work was the repair and vertical extension of the seawall, which was awarded in early 2020 and is currently under design. A second call for proposals has been released simultaneously with this current call for proposals, for engineering services for the remediation of contaminated soils and regrading of the Fundy Quay property. This proposal is for architectural services to reimagine the public space shared by the Fundy Quay and Market Square and to extend public access to the waterfront along the perimeter of the Fundy Quay property.

With the release of this new RFP for the Fundy Quay public space, the overall project scope of work and budget envelope for the two projects has remained unchanged, however, due to changes in the federal funding for the projects, the project components have been re-organized into two new groupings. Proponents who are resubmitting a proposal will be required to resubmit their financial proposals and draft schedule based upon these changes.

Revised Project Groupings

Project 1 – Covid Stream ($8,995,000)

A. Loyalist Plaza

B. Pedway Connection

C. Harbour Passage Extension Phase 1 150 metres

Project 2 – Harbour Passage Phase 2- IBA Culture & Rec ($2,675,000)

A. Harbour Passage Extension phase 2 & pedway. 350 metres

Project 1 – Harbour Passage Extension Phase 1, Loyalist Plaza, and Pedway Connection

Loyalist Plaza is a central plaza and waterfront boardwalk located at the heart of Uptown Saint John. With the potential development of the Fundy Quay, improvements will be required to effectively integrate with the design of new development and to provide a high quality connection to the waterfront boardwalk system. Loyalist Plaza is the City's primary location for hosting small to mid-sized concerts, festivals, vendors and has been a gathering spot for tourists, visitors and citizens. Redevelopment of this highly utilized public space will add to the value proposition of working and living in the urban core.

As part of this project, an internal below grade pedway connection between the Fundy Quay and Market Square will be developed. This will be an important piece of community infrastructure, connecting the public space and atrium of market square, harbour station and the aquatic centre to the new community, cultural, and entertainment uses of the Fundy Quay project. This pedway connection will be integrated with the design of loyalist plaza and will be coordinated with the interconnection of the proposed district energy system between the Fundy Quay and Market Square. An engineering development plan is being prepared and will provide guidance to the successful proponent. Access to this portion of the Fundy Quay site may not be possible in 2021, and the construction of this component will be conditional upon receiving an extension on funding from Infrastructure Canada.

The final component of this project is a 150 metre extension of the Harbour Passage trail along the southern portion of the site. Access to this portion of the Fundy Quay site may not be possible in 2021, and the construction of this component will be conditional upon receiving an extension on the funding from Infrastructure Canada.

Preliminary design for loyalist plaza was undertaken beginning in 2013 as part of a campaign to update and re-imagine this prominent public space. With nearly half a decade since this work was completed, a number of changing factors have impacted the applicability of the previous design work. This includes, but is not limited to:

- the completion of a new neighbourhood plan for the Central Peninsula;
- an agreement with a new developer for the Fundy Quay;
- proposals for a seasonal beer garden; and
- growth of the Area 506 regional music festival to a scale greater than what can be accommodated at Loyalist Plaza.

Based on these changing factors and the high cost of the full extent of the previous design, a new or reworked design is required for Loyalist Plaza. This design should build on the established character of Market Square while creating a new and distinct public space that serves as a front door to both Market Square and the Fundy Quay. The design should incorporate creative solutions to deliver a high quality space at a reduced price. To achieve this, the design should heavily consider future programming opportunities and the types of activities that will draw people to the waterfront. A focus on cost effective placemaking strategies will be important in ensuring the new or re-worked design creates an authentic and enticing space, while managing future operations and maintenance costs incurred by the City of Saint John.

The design should also consider in its scope of work and project team, the necessary engineering services required to address any implications of the new or re-worked design on existing underground utilities and any requirements for new underground infrastructure.

The overall budget for the three components included as Project one is $8,995,000, inclusive of design, construction, and HST.

Project 2 – Harbour Passage Extension Phase 2

There is nearly 5 kilometers of waterfront in the City of Saint John's Central Peninsula neighbourhood, but there are very few places where it can be accessed by the public, with more than 90% of the waterfront currently inaccessible. The development of the Fundy Quay Site will provide an opportunity to extend the City's waterfront boardwalk and harbor passage system, effectively doubling the amount of accessible waterfront in Uptown Saint John. This key active transportation and recreational infrastructure will improve connections from the waterfront to the rest of the harbour passage trail system, enhancing linkages between the City's Central Peninsula, the North End and the West Side.

The project may consider incorporating the existing cranberry trail design implemented across the Saint John waterfront, while also considering other options such as wooden boardwalks, street furniture, small park spaces and other design interventions. The harbour passage extension will encompass a roughly 30-foot-wide public space system along the edge of the Fundy Quay property and extend roughly 350 metres in length along the perimeter of the Fundy Quay site, spanning from Loyalist Plaza to Water Street. The budget for project 2 is $2,675,000, inclusive of design, construction, and HST (the City of Saint John receives a 71% rebate on HST).

Timeline and Phasing Requirements

Loyalist Plaza The loyalist plaza project will require prioritization for design and tender in 2021. Project funding for this component requires completion by December 31st 2021. Proponents should consider options such as phasing tenders to begin work as soon as possible. If the full project cannot be completed within this timeframe, the City will require proponents to consider identifying components which can be completed and other components that to become conditional upon receiving a funding timeline extension.

Harbour Passage Phase 1 Phase one of Harbour Passage, along the southern portion of the Fundy Quay site will undergo design in 2021. It is unlikely that this area will be available for construction of this project in 2021. The construction of this component will be conditional upon receiving a timeline extension from Infrastructure Canada.

Pedway Connection The pedway connection will undergo design in 2021. It is unlikely that the Fundy Quay site will be available for the construction of this project in 2021. The construction of this component will be conditional upon receiving a timeline extension from Infrastructure Canada.

Harbour Passage Phase 2 Phase two of Harbour Passage, along the remaining portions of the Fundy Quay site will undergo design in 2021. It is unlikely that this area will be available for construction of this project in 2021, and availability may be delayed further beyond 2022. The construction of this project component is not conditional on an extension to funding timelines.

3. Professional Services Required

The professional services required for these projects has been divided into seven distinct parts, as follows:

Part A: Background Information, Preliminary Investigation & Site Analysis, Environmental Assessment & Climate Change Evaluations, First Nations Consultation & Federal Funding Agreement Requirements

Part A is comprised of the activities required to provide an adequate understanding of site conditions to support the design process and to undertake the necessary analysis and approvals to meet federal requirements and to allow the project to proceed.

1. Review background documentation provided by the City of Saint John and Fundy Quay Developments Inc., including an engineering development plan prepared for the Fundy Quay project.

2. Consult with the Province of New Brunswick, Department of Fisheries and Oceans, the Impact Assessment Agency of Canada, Transport Canada, as well as Infrastructure Canada (IC) to comply with any environmental regulations and requirements associated with the work outlined in this call for proposals. The proponent shall conduct, coordinate and complete all the necessary tasks and process activities including all documentations and procedures to comply with all the federal and provincial environmental regulations. This task may involve coordination with key stakeholders and other impacted groups.

3. Consult with First Nations groups with respect to any rights or title, and other concerns that may be expressed with respect to projects 1 and 2. The City of Saint John will make initial contact with the various groups, provide project information, and hold some discussions with the First Nations groups. If required, the consultant is expected to work with the First Nations Groups to ensure that all concerns are identified, documented and addressed. If required, the consultant shall retain the services of an Archeologist to participate in a review of the affected parcels of land. This shall be carried out in cooperation with the Province of New Brunswick Archeological Services Branch (ASB) and the appointed representative(s) of the First Nations group.

4. If required, conduct a climate vulnerability assessment using various protocol, such as PIEVC to, identify climate hazards, quantify climate loads and evaluate infrastructure vulnerabilities, in order to mitigate the hazards and risks identified.

5. Determine the necessary additional site investigation required to support the design and construction of projects 1 and 2. This could include further environmental testing, geotechnical investigation, structural analyses, and other investigation. It is the responsibility of the proponent to review the attached materials in assessing the scope of additional site investigations in their proposals.

6. Coordinate all the activities and tasks with the various subcontractors and other firms hired by the consultant firm as well as utility providers to complete the evaluation and design activities. This activity will identify any water, sanitary, storm water, electrical, mechanical and natural gas infrastructure required as part of projects 1 and 2.

7. Coordinate and engage key stakeholders on all important information.

8. Provide a complete evaluation report identifying all the outcomes and necessary requirements to complete this design. The report will be presented to the City working committee for their review and approval.

9. The consultant shall video all storm and sanitary sewers within the project boundaries, and 100m upstream and downstream as a minimum. Submit the DVD's or storage drives and the written report. Review service cards and compare the service laterals to the information from the DVD / storage drive. The consultant should include appropriate funds in their proposal to flush existing sewer lines if necessary in order to complete the video inspections.

a. Survey field work shall include opening all chamber and manhole lids, and taking all necessary invert elevations, survey shots, measurements and photos as required to collect all pertinent information such as pipe material and diameter. Survey work should also include a full condition assessment on each structure.
b. Investigate existing infrastructure by reviewing all digital and paper records available from the City or other utilities. Contact all buried infrastructure owners to confirm what is in the ground, and request field locates as required.
c. Alert the City to conflicting information and contact the appropriate personnel to clarify the ambiguities.
d. Submit full size plans, showing only the existing infrastructure including the known water and sewer service laterals and the location and nature of each deficiency noted in the report and from the consultant's review. All pipes to be clearly labeled with their size and material. The consultant shall include a letter summarizing their findings from their review and highlight any items that may impact this project. The consultant's letter should provide their condition assessments of each structure as well as recommendations on removals, repairs, replacements or realignments of existing infrastructure within the project limits (ie. Water, sanitary, and storm).

**As part of the design activities for the refurbishment of the Fundy Quay Seawall, remediation of soils on the Fundy Quay site and regrading of the Fundy Quay site, consultations have been undertaken for the scope of those specific projects, but not for the specific scope of the projects outlined in this RFP. Proponents should consider this when assessing the level of effort required to complete Part A.*

Part B: Concept Design & Plans

The concept design process is intended to support the evaluation of options for the design. The concept design will consider the City's budget for the full project and consider design solutions to maximize the City's investment, prioritizing creative and cost effective design solutions focused on placemaking.

The consultant shall carry out the following activities:

Provide a detailed concept design of the proposed measures and options for projects 1 & 2. The concept design process should consider an iterative approach, working with the City's project team to build support for the design as it progresses.

The concept design should provide a detailed cost estimation of the various options including the timeframe, work plan activities and milestones to complete the work, advantages and disadvantages for each option if required and any necessary drawings.

The consultant shall also provide the digital file of any designs or model(s) used and/or prepared for this project. The consultant shall provide digital files and at least 5 hard copies of the final design report and the preliminary design (printed in double sided format).

All reports and construction specifications must be signed and stamped by the consultant's architect, landscape architect or engineer. All reports and construction specifications submitted to the City shall become the property of the City, which may be used and redistributed as the City sees fit.

After review and acceptance of the report by the Technical Review Team, the consultant may proceed with Part (C), Part (D), Part (E), and Part (F) as they pertain to the projects 1 & 2.

Part C: Consultation

The consultant shall carry out further consultation on the concept design options with other key stakeholders as determined by the City of Saint John. This will include:

- Fundy Quay Developments Inc.
- Saint John Water
- Saint John Energy
- Province of New Brunswick
- Key stakeholders within Market Square
- Design consultants for the following municipal projects:
    - o Seawall refurbishment
    - o Loyalist plaza redesign
    - o Harbour Passage extension
    - o District energy System

In addition to consulting critical municipal stakeholders, the consultant will support the City of Saint John in undertaking a public engagement on the overall Fundy Quay project in the Fall. This will include a minimum of attendance at 1 digital town hall which may incorporate other facets of the development of the Fundy Quay.

The consultant will also be responsible for leading a digital engagement session on the concept design once completed and a digital release of the final design once completed.

Group sessions will be encouraged where possible (in digital format) and proponents should plan for the following level of engagement:

- 1 introductory digital public meeting organized by the City of Saint John
- 1 Digital public meeting to solicit feedback on the concept design, organized by the consultant
- 1 digital public unveiling of the final detailed design
- 10 key stakeholder meetings

- The consultant will also be required to prepare a presentation to be provided to a meeting of Common Council
- The consultant should also account for additional meetings to coordinate design activities with consultants engaged to complete the other projects planned for the Fundy Quay.

Part E: Detailed Design & Tender Documents

The consultant team shall prepare all detailed design drawings, specifications, and tender documents for the public space and all the other items mentioned in the description of the works.

Detailed design typically involves several iterations and revisions of major design elements. The construction cost estimates will require updating in conjunction with the design revisions.

The consultant must look beyond the confines of the immediate project site, and determine what impacts the new works will have on the area as a whole, including storm water, and propose solutions to avoid possible problems.

The consultant must review all applicable plans, report(s) and data made available by the City. The consultant shall review the material in detail, as the consultant will be responsible for performing any further investigation, data gathering, etc., which may be necessary. The cost of such shall be detailed and included by the consultant in the proposal.

Detailed design shall be defined as the following:

- All items completed from the preliminary design requirements.
- Location of works is selected within 100mm.
- Detailed design calculations completed.
- A revised and detailed construction cost estimate.
- Complete the 100% design drawings and tender documents reviewed and approved by the City's Technical Review Team.
- Approvals and permits from all utilities and approval agencies.

Designs must also incorporate planning and sequencing of service disruptions (such as water main shutdowns), testing, disinfection and commissioning. The consultants will be required to lead the team of sub-consultants, contractors and City staff through these phases.

Work on any street must have traffic planning and organizing being led by the consultant. Traffic planning must be carried out by the consultant before tendering to give the City and contractor guidance as to the general scope of the detours, etc. The consultant may specify in the tender documents that the contractor is to submit traffic detour and work zone safety plans and drawings. The consultant must review submissions from the contractor and seek approval from the City. Traffic detour and work zone safety plans and drawings must be approved by the City before construction commences.

The consultant may also have to co-ordinate timing of work with other agencies to avoid conflicting traffic detours.

The consultant shall co-ordinate the design drawings with all the underground utilities before the preparation of the tender documents in order to avoid conflicts with other utilities such as gas, electric, telephone, etc. Underground utility lines must be marked out and picked up during the topographic survey in Part A.

Before detailed designs and related documents are sent to the client for review, the consultant must have other architects, landscape architects, or engineers from their firm review them for errors to ensure only high quality work is released.

The consultant must identify in the proposal the peer reviewers. The peer review architects, landscape architects, or engineers must send a memo to the City with the final drawings and specifications, stating the outcome of the review.

The consultant shall prepare a storm water management plan for the site, adhering to the City's Storm Drainage Criteria Manual. If projects are phased, the plan will address any drainage issues with this phased work and indicate to the Contractor in the tender documents how to complete the work in order to not adversely effect downstream systems as a result of phased work.

For each project, the consultant shall be responsible for applying for, and obtaining, all of the design approvals and permits necessary from all approval agencies, such as the New Brunswick Department of Environment and Local Government, New Brunswick Department of Natural Resources and Energy Development, Fisheries and Oceans Canada etc. These Approvals shall include, but not be limited to, Approval to Construct, Watercourse and Wetland Alteration permits, Highway Usage Permit (HUP); and Planning Advisory Committee (PAC) etc. The consultant must ensure that construction does not begin on the project until all approvals and permits have been received.

The City's Engineer must approve any variance from these requirements in writing before any construction tenders are called.

Part E: Tender Period Services, Materials Testing, & Inspection, Red Books and Record Drawings

Tender Schedule

Tender(s) are expected to be begin to be unfolded in 2021. The consultant shall prepare tender(s) in accordance with the project schedule and phasing requirements outlined in section 2, addressing the risks to the municipality associated with federal funding timelines.

Tender Period Services

Upon approval of the consultant's work, City staff will make copies and tender the project, however the consultant is to be available during the tender period to respond to questions (write addenda if required) and to perform the tender analysis. The consultant shall prepare a Tender Summary for each tender. It shall be a digital spreadsheet that compares the consultants estimate to all tendered items from all tenders submitted.

Materials Testing & Inspection

The contractor shall provide quality control testing for concrete, compaction of soils, for asphalt placement & testing, pile inspections and testing, and all additional quality assurance required to implement the design. The consultant shall still provide random quality assurance tests to confirm that

the contractor tests are in compliance. The consultant shall also make sure that the contractor is completing all his required testing. The consultant shall provide the Quality Assurance for concrete, compaction of soils, for asphalt placement & testing, pile inspections and testing, and all additional quality assurance required to implement the design. All costs for quality assurance testing and inspections must be included in Part E of the consultant's proposal.

The consultant's minimum requirements for material testing and inspection are as follows:

Asphalt Inspection and Testing

• Full time inspection for asphalt placement by qualified personnel. The inspector assigned to this task shall have a minimum of 2 years direct related experience with asphalt inspection. The consultant shall identify in the proposal the qualified personnel they intend to utilize for this task including related experience. If the consultant does not have the qualified personnel directly on staff then the consultant must propose to utilize a sub-consultant that has the required expertise in asphalt inspection.

• Measurement of thickness, temperature, etc.

• Signing and collection of weight tickets as they arrive

• Quality Assurance of asphalt in accordance with Division 27 of the General Specifications.

Concrete Inspection and Testing

• Slump, temperature, air test and compressive strength cylinders shall be considered a "set" of tests.

• Compressive strength testing at CSA standard A283 certified laboratory

• Check formwork and compaction of base gravels before each pour

• Check elevations, slopes and grades before every placement

• Quality Assurance by the consultant shall consist of random testing.

• Sampling and testing frequency of concrete: The minimum frequency shall be one set of tests for every 10 done by the contractor. On smaller projects involving only a few loads of concrete, one complete set of tests shall be made.

a. Test Samples:

i. The test samples shall consist of three (3) concrete cylinders. Compressive strength testing obtained at 7 and 28 days.

b. Reporting of field and laboratory testing:

i. Field test results obtained shall be recorded on the Form – Concrete Testing Summary and shall be submitted to the City.

ii. Compressive strength results shall be submitted to the City on the consultant's standard reporting form.

Granular Material supply and placement (soils and gravels) testing

- Confirming the contractor's test results onsite (QC by contractor)
- Ensuring proper frequency of compaction tests by contractor
- QA by consultant shall consist of random compaction testing using nuclear density equipment. The minimum frequency shall be one test for every 15 done by the contractor.
- Enforcement of established rolling pattern
- Approval of material before it arrives onsite (gradation and other properties)
- Checking grades, slopes, thicknesses during fine grading
- Witness and comment on proof rolling tests

Pile Foundation Inspections and Testing

The consultant shall provide the necessary quality assurance, inspection and testing required for pile foundations supporting the pedway connection or any other features of the design supported on piles. The proposed quality assurance measures will be sufficiently robust to ensure that all construction adheres to the quality specifications outlined by the architectural and engineering consultants detailed design and tender documents.

Public Space Finishes, Equipment & Pedway Inspections and Testing

In addition to the above noted inspection and testing requirements in this RFP, proponents will be expected to outline any additional quality assurance, inspection and testing required in their proposals. The proposed quality assurance measures will be sufficiently robust to ensure that all construction adheres to the quality specifications outlined by the architectural and engineering consultants detailed design and tender documents.

Red Books

It is the responsibility of the consultant to obtain a copy of the "Standard Format for City of Saint John Red Book Notes" and to maintain a copy on file for all future projects. This format shall be followed by the consultant when preparing the notes for the project. The City of Saint John will provide Red Books for the consultant to fill out and return to City staff at the end of the project.

Record Drawings

The consultant shall submit a set of Record Drawings on plastic and in digital formats. The drawings and data shall be in accordance with the Drawing Standards noted below. The as-built drawings will show the actual in-place vertical and horizontal alignments. The finished works shall be re-surveyed by the consultant to establish exact locations and elevations, and the date the site was re-surveyed shall be noted on the signed and sealed Record Drawings. The final survey shall also include the pickup of structures (valves, manholes, etc.) that were not newly installed during the project, but are along the same section of street, easement or parcel. The consultant shall be responsible for obtaining the data and measurements used in the Record Drawings and shall not rely on the contractor to provide this information. The consultant shall note on each sheet of the Record Drawings the number of the Red

Book where the project information was recorded. The Record Drawings shall also include the ground water table elevation and geotechnical information, and the names and models of all products used.

All new works specified and incorporated shall have as-built information recorded including electrical, mechanical, structural, etc. All sheets in the set of Record Drawings shall be signed and sealed, including those of sub-consultants.

The digital as-built data submitted to the City shall become the property of the City, which may be used and redistributed as the City sees fit.

DIGITAL DRAWING STANDARDS

PURPOSE

The development of Geographic Information Systems (GIS) and computer aided drawing (CAD) has facilitated the method to reduce the time and costs of development processing and land use map updates. Hence, a digital drawing submissions standard has been adopted by the City of Saint John to set the standard and facilitate the transfer process. The intent of this program is to take advantage of new technology, reduce the cost of digital conversion, maintain the mapping and facilitate the efficient transfer of data from private organizations to the City.

The standards and specifications contained within this document shall be used for digital drawing submissions to the City's Records Division for the purpose of development processing and GIS digital land use map updates.

DIGITAL FORMAT

1. The Consultant shall provide to the Engineer an As-Built record of the project which will include: all required documentation, CAD files and any associated digital files as described below in both printed and digital versions.

2. All CAD drawings shall be submitted in AutoCad (.DWG or .DXF) format with all line work complete. Each CAD project shall include all relevant resource files such as line & font resource files such as (.shx) resource files. The Consultant also shall provide the drawings in PDF format, with full color, on the CD. This shall be a direct conversion, not a scan.

3. The City of Saint John will provide drawing file names for the legend portion of the drawing.

4. Each CAD project shall be accompanied with an ASCII text file of all as-built structure locations as well as any existing underground structure within the limits of the project. This text file is to be used for importing as-built and unknown structure locations into the City's G.I.S. The text file shall meet the following conditions:

- ✓ ASCII text file will include as-built structure locations such as catch basins, gate valves, manholes, air valves, outfalls, service boxes or any existing underground structure within the limits of the project.
- ✓ ASCII text file shall only include all as-built structure locations as well as any existing structures within the limits of the project and shall not contain other coordinated points such as curb

shots, utility poles, corners of buildings, etc. This ASCII text file is to be used for importing structure locations into the City's G.I.S.

All coordinated points for the structures shall be delivered in a single comma-delimited ASCII text file. Each line of the file shall contain coordinate values (NAD83 CSRS Horizontal and HT2 Vertical) for a single point as follows:

Pt Number,Northing,Easting,Elevation,Field Code (Numeric

1,7362284.223,2533177.653,15.207,3

2,7362028.622,2533004.711,25.695,16

3,7362009.446,2532991.590,25.935,4

The field code in the ASCII text file shall be City of Saint John field codes (i.e. Numeric Field Codes).

City of Saint John Field Codes			
3	CB EXIST CENTER	50	CATCHBASIN MANHOLE
4	CB EXIST EDGE	51	CATCH BASIN PYRD TOP
6	CULVERT	54	DRAIN TILE
14	FIRE HYDRANT	58	MH CP TELEGRAPH
16	GATE VALVE EXISTING	69	UTILITY HYDRO BOX
24	MANHOLE EXIST	70	UTILITY TEL BOX
25	HYDRO MANHOLE	71	UTILITY CABL BOX
26	TELEPHONE MANHOLE	79	NEW SANITARY MANHOLE
27	OTHER	80	NEW STORM MANHOLE
46	WATER TRACE	81	NEW CB EDGE
43	UTILITY BOX	82	NEW CB CENTER
44	SERVICE BOX	83	NEW FIRE HYDRANT
45	VAULT	1205	GATE VALVE NEW

<u>DRAWING DOCUMENTATION</u>

1. The horizontal and vertical datum utilized (NAD83 CSRS and HT2) shall be identified as NOTE 1 on all architectural and engineering drawings prepared for the City of Saint John.

2. All as-built drawings are to be marked on the title block in an obvious fashion with the text “Record Drawing” on the CAD files and manual copies of the drawings.

3. Each CAD project shall be accompanied with documentation to indicate CAD layers.

4. All required drawing documentation shall be summarized on a transmittal sheet submitted in both printed and digital versions. The transmittal sheet shall be placed on the same CD as the drawing files that the documentation refers to. The transmittal sheet shall include:

- ✓ Please find enclosed :
- ✓ Job Title

- ✓ Company/ Firm
- ✓ Contact Person
- ✓ Address
- ✓ Email Address
- ✓ Phone FAX
- ✓ List of attachments
- ✓ CD's (2 sets) Number of disks per set :
- ✓ As-built reproducibles (Hard Copies) 1 set

MEDIA

1. All electronic files shall be delivered on CD-ROM.

2. All submitted CD's shall be typed and clearly labeled with the project title, contract number, contractor, consultant name, date of submittal, and list of contents on CD.

3. As-built reproducibles shall be prepared on plastic (4 mil, mat 2 side film)

4. Plans are to be produced on an ISO A1 paper size no larger than 600x900mm

OPERATION and MAINTENANCE MANUALS

The consultant shall provide the contractor with examples, both hard copy and CD's of what is expected in the form of Operation and Maintenance Manuals.

Two weeks prior to Substantial Completion of the work the consultant shall review, for completeness and accuracy, the contractors one hard copy and five CD's of the Operation and Maintenance Manual.

Receipt of acceptable Operation and Maintenance Manuals is a prerequisite for the granting of a Certificate of Substantial Completion.

Part F: Construction Management

The consultant must prepare all required documentation for construction management in a formal and standardized format acceptable to the City. The list of documents must include but is not limited to the following: change orders, addenda, progress payments, summary of extras, minutes of meetings, status reports, construction and consultant budget updates and forecasts, reports to the engineer, meeting agendas, reports on contractor performance, quality control test reports, deficiency lists, letters, memos and so on.

The consultant is responsible for the primary field layout, including marking out property lines for the contractors. This may require the services of a legal surveyor where property pins are not present. The consultant shall do the primary field layout at least once during each phase of the project. If the contractor does not preserve the layout stakes, the consultant may request a fee from the contractor to replace them. The consultant shall be responsible for the primary field layout, which consists of the layout of centerline, control points and structures. All other layout will be the responsibility of the contractor. The consultant shall give the contractor all the information and survey data points required to build the works utilizing the standard City of Saint John field codes from Digital Drawing Standards.

The consultant must co-ordinate, plan and notify all parties of all service shutdowns, testing, water main pressure testing & disinfection and system commissioning. The consultant will submit drawings or neat sketches that clearly communicate the proposed activity for the City's approval. The City will prepare all water service shutdown and street closure notices. The consultant must co-ordinate and plan traffic detours, and review proposed work zone safety plans received from the contractor. The City of Saint John staff will translate all routine and standardized public notices during construction.

The consultant must review and comment on all submissions and correspondence from the contractor, and provide recommendations to the City as to the best course of action.

The consultant must invite the WorkSafeNB safety inspector to the pre-construction meeting, giving the appropriate officer a minimum of one week's notice.

The consultant must report to NBDELG on any sewage overflows discharged to the environment. Consultants are responsible for preparing the detailed "bypass" reports required should sewage overflow occur, with discharge to the environment as a result of project activities.

The field inspector (or resident architect, landscape architect, or engineer) assigned to this project shall have significant (minimum 4 years) related experience with such construction activity. The field inspector shall have a local cellular phone for the duration of the project and the number is to be provided to the City prior to the start of construction.

The field inspector shall have a copy of the latest revision of the General Specifications, the contract drawings and specifications and the standard format for Red Book Notes, any applicable permits or approvals onsite, and be familiar with them. The principals of the consulting firm must educate and prepare the field inspectors before the start of construction. They must understand the tasks and responsibilities of the position.

The City of Saint John Construction Inspection Guidelines shall be used as a basis for the general requirements for inspecting the construction and installation of municipal infrastructure.

The field inspector shall take pre-construction photographs and shall also take construction photographs for the duration of the project utilizing a digital camera. Each photograph must have the date taken on it and the location labeled. A labeled CD containing the digital photographs in chronological order shall be provided to the City at the end of the project.

The consultant shall provide daily inspection 'Field Notes' to detail all work done on the construction site that day. Daily Field Reports in the consultant's standard format shall be completed every day and sent to the City's project engineer at least once a week. The inspector shall also fill out service cards for each building serviced to detail the water, sanitary and storm services that are installed during the project. During construction, the consultant must provide the City with weekly e-mails (by Monday at 4:00pm) indicating those staff members who worked on the project the previous week, a brief description on their work as well as how many hours each person worked.

The field inspector shall be available to work overtime and on weekends (if the contractor is working), without extra charges to the City. The consultant will provide full time inspection and be on-site at all times, when the contractor is working. The inspector shall advise the client immediately when work on-site starts or stops unexpectedly and of all planned schedule changes and of all changes to the work that may result in extra costs to the City or standby charges.

The consultant shall review and approve the contractor's work including but not limited to all soil conditions, mechanical, electrical, architectural, pipework, excavation, grading, compaction, concrete work, asphalt paving and building finishes etc. In addition the consultant shall verify and provide detail on quantities of excavation and fill material, (measured by the inspector, not the contractor) as well as provide certification of work for progress payments.

4. Method Of Payment

Upon award of the contract the City will execute an agreement with the successful architectural or engineering firm for the work to be performed. Payment of fees shall be in accordance with the terms of the Request For Proposal at the rates submitted and accepted in the consultants proposal not to exceed the Recommended Minimum Hourly Rates as contained in The Atlantic Provinces Association of Landscape Architects – Consultant Fee Schedule for Landscape Architectural Consulting Fees and The Association of Consulting Engineering Companies – New Brunswick fee guideline to a maximum of the upset fee for Parts A, B, C, D, and E as required.

For Part F, payment of fees shall be based on actual time in hours plus reimbursable expenses subject to approval by the City.
The consultant shall invoice the City on a monthly basis for the work performed in accordance with the architectural and engineering services agreement. The consultant shall provide a status report with each invoice outlining in detail the scope of the work completed during that month. Payments will not be processed unless the invoice is signed by an authorized representative of the company, accompanied by a status report in the proper timed based format (hourly rate x hours worked).

Architectural and engineering fees are not based on a percentage of the construction costs; therefore, the approved upset prices will not be changed due to the final construction costs being different from the current budget estimate. A change in the fees may be considered only if the scope of the architectural or engineering work is changed at the request of the City's Engineer.

Upset prices (including HST) will be included in the proposal for Part A, Part B, Part C, Part D, and Part E of this project beyond which no additional payments will be considered unless first submitted by the consultant in writing and authorized in writing by the City.

The price submitted for Part F shall be in the format of a budget estimate based on the following estimated construction timeline for each project.

- Project 1 = 44 weeks
- Project 2 = 20 weeks
  Total = 64 weeks

In Part F, the consultant's budget should also assume a 55-hour work week for the inspection services as well as 20 hours of project management per week for the consultant's Architect, Landscape Architect, or Engineer overseeing the project plus reimbursable expenses.

The final amount paid to the consultant for Part F shall be based on actual time in hours to complete Part F plus reimbursable expenses subject to approval by the City's Engineer.

The total price stated, must also include a $115,000 contingency for unforeseen work total for projects 1 and 2 combined.

No part of this contingency shall be expended without the written direction of the City's Engineer, and any part not so expended shall be deducted from the contingency allowance. Payments for architectural and engineering work performed in the preparation of as-built drawings will only be made upon receipt of completed drawings.

5. Termination of Contract

The City will reserve the right to terminate the contract with the Architectural or Engineering Firm after completion of Part A or at any other time during the course of the work. In such an event, payment will be made only for the work completed up to the time of termination.

The City of Saint John does not, by virtue of any proposal request, commit to an award of this RFP, nor does it commit to accepting the proposal submitted, but reserves the right to award this proposal in a manner deemed to be in the best interest of the City.

6. Content of Proposal

The consultant shall confirm a clear understanding of the work to be undertaken as described in the Scope of Work. The proposal must demonstrate that the consultant and its team have recent and significant experience with this type of work. When noting examples of experience gained on similar projects, the proposal must also note which current staff members worked on that project and what their role was. The proposal must specifically address all requirements of the work and any matters related to its successful implementation. The proposal must indicate what role each of the consultant's team will be carrying out for the project. The consultant may not substitute the project team members noted in the proposal without permission of the client. When proposing a schedule, the consultant must also indicate that their workload is such that they will have time to complete the project as promised. If the consultant is very busy, they should either decline the work or propose a longer schedule at the time of the RFP submission.

An important component of the proposal is a narrative description of the proponents approach to either re-designing the public space or re-working the previous design to meet the current needs and constraints of the City. The narrative should introduce high level, conceptual ideas regarding this design work and demonstrate the proponents vision for both the functional and programmatic use of the site, as well as the overall creative aesthetic vision. The narrative vision may contain rough conceptual sketches, or inspirational precedent images, but is not a requirement of the proposal. Appendix 2 includes relevant information regarding the City's vision for this part of the City, as contained in the recently adopted Central Peninsula Neighbourhood Plan. Proponents should review this document in support of the preparation of their proposal.

In addition to the narrative description provided in the proposal, proponents are also required to submit a PowerPoint presentation, summarizing the proponents approach to the design of the site.

The proposal shall include the following sections:

A. TECHNICAL PROPOSAL:

- Table of Contents
- Narrative Describing the Proponents Preliminary Vision for the Design of the Space
- Work Plan and Schedule
- Project Team
- Experience with similar projects

If a proponent is resubmitting an updated proposal that was initially submitted in response to RFP 2020-091004P, the proponent is to include with their technical proposal a cover letter, providing a bullet point summary of any changes to the proposal. This should include any changes to scope or personnel assigned and should include references to page numbers where the details of the proposal changes have been included. Proposal changes can be included in either a supplementary appendix to the proposal outlining detailed changes or within the body of the proposal, highlighted in contrasting font colour (preferably red).

B. FINANCIAL PROPOSAL:

- Maximum or Upset Fee(s) for each of parts A, B, C, D, & E (for each project).
- Budget Estimate for Part F (for each project)
- All costs are to be subtotaled (including contingency allowance) with the 15% HST component identified separately and added to arrive at a total cost.
- Billing Rate Summary (hourly billing rates for all key personnel).
- The consultant must submit the cost breakdown in the following matrix format.

Sample format for financial proposal breakdown.

Project ID	Part A	Part B	Part C	Part D	Part E	Part F	Engineering Contingency	Subtotal (excluding HST)	HST (15%)	Total (including HST)
1							$110,000			
2							$40,000			

The financial proposal shall include separate prices (including reimbursable expenses) for each of Part A, Part B, Part C, Part D, & Part E for each project.

A further breakdown of Part F is required with the financial proposal to identify all staff participating in Part F; including hourly rates, hours and reimbursable expenses.

All sub-consultants such as geotechnical, legal survey, electrical, structural and others shall have their fees identified and included in the appropriate part of the proposal.

7. Evaluation Criteria

For the purposes of this proposal call, submissions will be evaluated on the following criteria:

- QUALITY AND COMPLETENESS – Has the proposal addressed all of the needs raised? Is the proposal presented in an organized and professional manner? (Criteria weight = 5 points)

- CONSULTANT'S VISION FOR THE DESIGN – Does the proposal's narrative vision for the design lay out a clear approach to cost effective placemaking and an inspiring approach to the design of both public spaces? (Criteria weight = 40 points)

- CONSULTANT'S EXPERIENCE – Has the proposal demonstrated a level of expertise with the requirements of this project? (Include references for projects of a similar nature.) (Criteria weight = 10 points)

- EXPERIENCE OF EMPLOYEES / SUB-CONSULTANTS – Has the proposal demonstrated a level of expertise for the employees of the company and sub-consultants listed? (Include resumes for staff and sub-contractors required) (Criteria weight = 30 points)

- METHODOLGY – Does the approach to the project outlined in the proposal address, in a realistic sense, attainable goals and is it in keeping with the City's expectations for the project? (Criteria weight = 50 points)

- VALUE ADDED – What additional information, technology, process or options has the consultant included in his proposal? Is there value added to the consultant's response for this additional information? (Criteria weight = 5 points)

- Schedule & Availability – Does the proposal meet the requirements of the City's schedule requirements? Are the necessary staff available to complete the work within this timeline? (Criteria weight = 10 points)

- COST – Cost will be a factor, however not the only factor to be considered. (Criteria weight = 50 points)

Consultants are advised that proposals will be evaluated solely on the basis of information submitted in accordance with the request for proposals. The City reserves the right, if deemed necessary, to short-list the proposals and to request an additional verbal presentation from each short-listed proponent. The Consultant may supplement their presentation with a summary in written format to clarify points raised during the process.

8. Insurance Requirements

The consulting engineering firm shall obtain and keep in force, during the full duration of this contract, an Errors and Omissions Liability policy with a minimum limit of two million dollars, and two million

dollars per claim. The policy shall include a clause stating that thirty days' notice of cancellation of this policy will be given to the City of Saint John, by the insurers. Provide evidence of this policy.

The consultant must provide proof of current coverage from WorkSafeNB prior to the start of the work.

The consultant shall provide evidence of the following insurance coverage:

General Liability with minimum limits of two million dollars per occurrence. The policy shall include:

- operations of the consultants in connection with this project;
- products and completed operations coverage;
- contractual liability with respect to this project;
- the City of Saint John added as an additional named insured;
- a cross-liability clause;
- non-owned automobile;
- thirty days' notice of cancellation of this policy will be given to the City of Saint John, by the insurers;
- Standard automobile insurance for owned automobiles with at least the minimum limits allowed by law.

9. Formality Clause

In order for the City of Saint John to consider any proposal submission as a legally binding offer, on behalf of the consultant, it is necessary for the consultant to communicate this formality to the City in the form of an offer which contains the original signature of the individual or representative of the firm who is authorized to act on behalf of the consultant. In order to meet this requirement, all proposal submissions to the City of Saint John must be prefaced with a covering letter which contains an original signature of the individual authorized by the consultant to submit proposals on their behalf.

The covering letter must be on official company letterhead, be dated and be addressed to the attention of the City of Saint John representative specified in the request for proposal document. Additionally it must make reference in the body of the letter to the request for proposal number and project title, as well as to the fact that the enclosed documents constitute a formal proposal offer and finally, the letter must contain the original signature as indicated.

Failure to include the required covering letter as a preface with your proposal will be grounds for immediate rejection on the basis that it is not formal.

10. Standard Terms and Conditions

Advisory Notice(s)

Periodically, the City of Saint John is required to issue clarification notices to an RFP document in the form of Advisory Notices. Normally these notifications will not have a direct bearing on the cost of a project and will not influence bidding.

Proponents are responsible for obtaining all advisory notice(s) issued by the City. Advisory Notice(s) may be obtained from the City's website (www.saintjohn.ca) under the menu option "news".

Proponents are instructed to sign the Advisory Notice and return it by email to monic.macvicar@saintjohn.ca prior to the closing date.

Failure to comply with the instructions on an Advisory Notice may result in rejection of the Proposal.

Addenda

Periodically, the City of Saint John is required to issue notification of changes or corrections to a Proposal document by way of addenda. Normally these notifications will have direct bearing on the cost of a project and will influence bidding. Therefore, it is important that the City have assurances that Proponents have in-fact received the notification(s).

Proponents are responsible for obtaining all addenda issued by the City. Addenda may be obtained from the City's website (www.saintjohn.ca) under the menu option "News" or by emailing monic.macvicar@saintjohn.ca.

Proponents are required to sign and include all addenda with their Proposal submission.

Failure to include a copy of all signed addenda with the Proposal submission may result in rejection of the Proposal regardless of whether or not the changes noted in the addendum are included in the Proposal submission.

Review of Proposals

The evaluation committee may invite proponents to meet with the review committee to make an oral/visual presentation in support of their proposal. The City will provide the meeting venue at its cost. The proponent shall bear its own costs related to such meeting.

Additional Information from Proponents

The City of Saint John reserves the right during evaluation of the Proposals to seek further information from any proponent and to utilize that information in evaluation and award without becoming obligated to seek further information from any other proponents.

Clarification of Proposals

The City of Saint John reserves the right in its sole discretion to clarify any Proposal after the close of the RFP process without becoming obligated to clarify any other Proposal.

Negotiation

The City reserves the right in its sole discretion to negotiate the final terms and conditions of the engagement contract with the most probable candidate for award prior to award of the engagement.

Inconsistency between Paper and Electronic Form

If there is any inconsistency between the paper form of a document issued by or on behalf of the City to proponents and the digital, electronic or other computer readable form, the paper form of the document prevails.

Acceptance, Revocation and Rejection of Proposals

The proposal constitutes an offer which shall remain open and irrevocable until 90 days after the date of the proposal opening.

Reserved Rights

The City reserves the right to:

a) Reject an unbalanced Proposal. For the purpose of this section, an unbalanced Proposal is a Proposal containing a unit price which deviates substantially from, or does not fairly represent, reasonable and proper compensation for the unit of work bid or one that contains prices which appear to be so unbalanced as to adversely affect the interests of the City. The City reserves the right to use Proposals submitted in response to other like or similar Requests for Proposals as a guideline in determining if a proposal is unbalanced.

b) Amend or modify the scope of a project, and/or cancel or suspend the RFP process at any time for any reason.

c) Require proponents to provide additional information after the Closing Date for the RFP process to support or clarify their Proposals.

d) Not accept any or all Proposals.

e) Not accept a Proposal from a Proponent who is involved in litigation, arbitration or any other similar proceeding against the City.

f) Reject any or all Proposals without any obligation, compensation or reimbursement to any Proponent or any of its team members.

g) Reject any or all Proposals in the event that the City does not receipt formal written approval of its application for funding on or before the 31st day of March, 2021; said application being dated the 27th day of June, 2019 and submitted under the Integrated Bilateral Agreement for the Investing in Canada Infrastructure Program (ICIP).

h) Withdraw an RFP process and cancel or suspend the RFP process.

i) Extend, from time to time, any date, any time period or deadline provided in an RFP process (including, without limitation, the RFP process Closing Date), upon written notice to all Proponents.

j) Assess and reject a proposal on the basis of
   i. information provided by references;
   ii. the Proponent's past performance on previous contracts;

iii. information provided by a Proponent pursuant to the City exercising its clarification rights under the RFP process;
iv. the Proponent's experience with performing the type and scope of work specified including the Proponent's experience;
v. other relevant information that arises during an RFP process.

k) Waive formalities and accept Proposals which substantially comply with the requirements of the RFP process.

l) Verify with any Proponent or with a third party any information set out in a Proposal.

m) Disqualify any Proponent whose Proposal contains misrepresentations or any other inaccurate or misleading information.

n) Disqualify any Proponent who has engaged in conduct prohibited by the RFP documents.
o) Make changes including substantial changes to the RFP documents provided that those changes are issued by way of an addendum in the manner set out in the RFP documents.

p) Select any Proponent other than the Proponent whose Proposal reflects the lowest cost to the City.

q) Cancel an RFP process at any stage.

r) Cancel an RFP process at any stage and issue a new RFP for the same or similar deliverable.

s) Accept any Proposal in whole or in part.

And these reserved rights are in addition to any other express rights or any other rights which may be implied in the circumstances and the City shall not be liable for any expenses, costs, losses or any direct or indirect damages incurred or suffered by any Proponent or any third party resulting from the City exercising any of its express or implied rights under an RFP process.

Limitation of Liability and Waiver

In every RFP process, the City shall draft the documents such that each Proponent, by submitting a Proposal, agrees that:

a) Neither the City nor any of its employees, agents, advisers or representatives will be liable, under any circumstances, for any claims arising out of an RFP process including but not limited to costs of preparation of the Proposal, loss of profits, loss of opportunity or any other claim.

b) The Proponent waives any claim for any compensation of any kind whatsoever including claims for costs of preparation of the Proposal, loss of profit or loss of opportunity by reason of the City's decision to not accept the Proposal submitted by the Proponent, to award a contract to any other Proponent or to cancel the RFP process, and the Proponent shall be deemed to have agreed to waive such right or claim.

Proposal Debrief

Immediately following the City's acceptance of a Proposal submitted, Supply Chain Management shall send a written notification of award to all unsuccessful proponents disclosing the name of the successful proponent and providing a brief explanation rationalizing the City's selection:

i. For all Requests for Proposals valued at Fifty Thousand Dollars **($50,000.00) or less**, the written notification of award will be the only form of debriefing offered by the City;

ii. In the case of Requests for Proposals valued **in excess** of Fifty Thousand Dollars **($50,000.00)**, Supply Chain Management may, in addition to the notification of award and upon written request from any proponent, provide a more detailed oral debriefing either by phone or in person, as required by the proponent. During this debriefing, Supply Chain Management may disclose information such as the total price of the successful proponent and may discuss an overview of the process as well as the strengths and weaknesses of the requesting proponent's proposal.

iii. The written request referred to paragraph (ii) shall be submitted to the Office of the Purchasing Agent no later than fifteen (15) business days after the notification of award is issued.

iv. The acceptance of the successful Proposal shall not be discussed during a debriefing.

11. Submittals

When preparing the Agreement for Architectural Services, the consultant is required to submit a "Business Corporation Act Certificate" to the engineer.

12. Inquiries

All inquiries regarding this request for proposals shall be submitted in writing via email, by 4:00 p.m. Local Time on **Wednesday, February 3rd, 2021**, only to the attention of:

Monic MacVicar, CCLP, CPPB
Procurement Specialist
Supply Chain Management
Email: monic.macvicar@saintjohn.ca

Responses to inquiries will be in writing and distributed by email to all Consultants registered as having received the Terms of Reference as of the date the response is prepared. The source of the question will not be identified in the response. Verbal information shall not be binding upon the City. Inquiries after the above deadline will not receive a response.

13. Attachments

Over the past several years, there have been several design and planning initiatives the addressed both Loyalist Plaza and the extension of Harbour Passage along the perimeter of Fundy Quay. While this call for proposals does not intend to hold proponents to the previous designs, information contained within

these documents may provide useful to proponents in contemplate the scope of work for this RFP. The following is a list of relevant documents appended to this RFP:

Appendix 1: Site Aerial Photography

Appendix 2: Central Peninsula Neighbourhood Plan Section 2.1, City of Saint John 2020

Appendix 3: Loyalist Plaza & North Market Slip Preliminary Design Report by Glenn Group 2016

Appendix 4: Loyalist Plaza & North Market Slip Preliminary Design Report #2 by Glenn Group 2016

Appendix 5: Loyalist Plaza & North Market Slip Preliminary Design Class C Cost Estimates by Glenn Group 2016

14. Other Relevant Documents

City of Saint John Construction Inspection Guidelines

Details of the preliminary plans for future development will be shared with the successful proponent following the awarding of the project

Draft Consulting Agreement

15. Submission of Proposals

In light of the current Covid-19 situation, the submission instructions for this RFP are as follows:

Public openings of all Tenders and Proposals have been cancelled until further notice. The summary of Proposal submissions may be viewed on the City's website under "news" and then 24 hours after the closing date and time.

A. Proposals Shall Be Submitted at the Prescribed Location

1) Proposals shall be submitted via email to: monic.macvicar@saintjohn.ca

B. Proposals Should Be Submitted in Prescribed Manner

1) Proponents should submit two signed electronic documents in PDF format, complete with all mandatory forms, as follows:
    a. RFP No. 2021-094501P – Architectural Services: Loyalist Plaza & Fundy Quay Harbour Passage Extension– Technical Proposal
    b. RFP No. 2021-094501P – Architectural Services: Loyalist Plaza & Fundy Quay Harbour Passage Extension– Financial Proposal

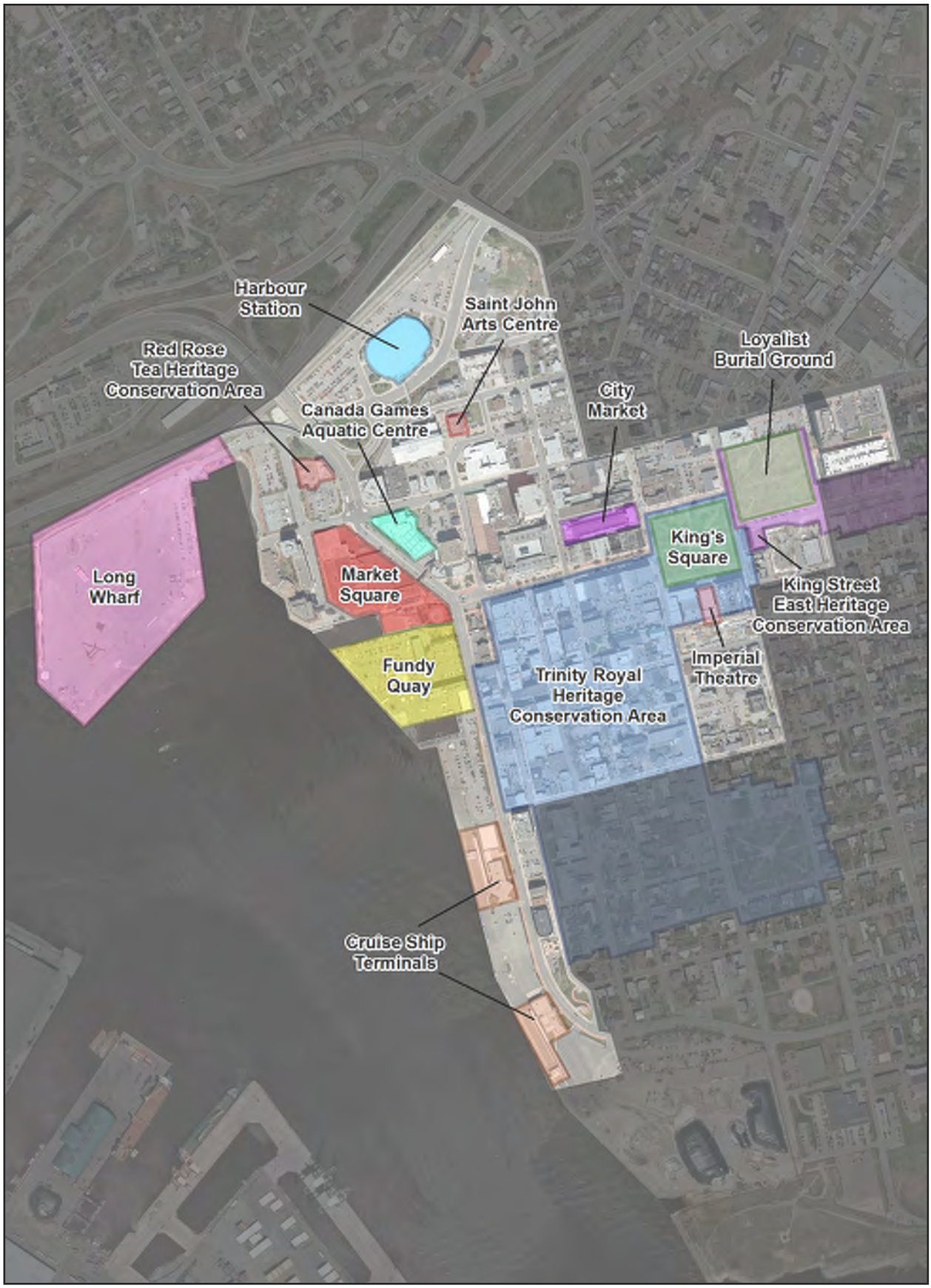
C. Proposals Shall Be Submitted on Time

1) Proposals shall be submitted in accordance with the above on or before the Submission Deadline. Proposals submitted after the Submission Deadline will be rejected.

Appendix 1: Site Aerial Photography


Market Square
Market Square Boardwalk
Loyalist Plaza
Approximate Area of Harbour Passage Extension
Fundy Quay Property
voie Pat Rocca Way
rue Water St
car
Market Sq
100 m

Appendix 2: Central Peninsula Neighbourhood Plan Section 2.1, City of Saint John 2020



MAP 5- THE UPTOWN NEIGHBOURHOOD

2.1 The Uptown

2.1.1 Uptown Core and Central Waterfront

The Uptown Core is the heart of the Central Peninsula and the City. This area is anchored by King's Square and the Loyalist Burial Ground to the east and the Central Waterfront to the west. It is connected by King Street, an important and iconic corridor and home to some of the City's most recognizable heritage assets. King's Square is a beautiful and historic space that provides a strong focus for commercial and cultural activity. It also serves as a public gathering space and transit hub, connecting people from across the City to the Uptown Core and beyond.

The Uptown Core faces challenges, particularly along King Street as urban renewal era developments have created a somewhat disconnected street north to south. The internalized mall of Brunswick Square enables pedestrian movement from Market Square to the City Market which reduces the presence of pedestrians on historic King Street. Additionally, large office developments have created a number of blank walls along prominent streets throughout the Uptown Core, which have affected the pedestrian environment.

There are opportunities for strategic infill development around King's Square, the Fundy Quay, and on key parts of the Port's property. Strategic infill development will deliver new mixed-use environments that can add new people, jobs, and vitality to the Uptown Core. There are also opportunities for new institutions to expand the economic and cultural offerings of the Uptown Core and Central Waterfront. At the same time, new and attractive pedestrian oriented destinations and improvements can support urban living.

Neighbourhood Direction

With the highest concentration of employment, the Uptown Core will remain the City's most vibrant, complete neighbourhood. New, mixed-use development will increase population density, adding vibrancy to the streetscape. Continued and enriched Arts and Cultural programming along the Waterfront, historic streets, alleys, and parks and open spaces will enable the Uptown Core to be the primary destination in the region for year-round festivals and events. The redeveloped Fundy Quay site will provide services and amenities, including housing opportunities, while providing residents and visitors with expanded access to the waterfront through an extension of Harbour Passage along the perimeter of the site. King Street will continue to develop as a prominent civic corridor with enhanced street level activity from redeveloped urban renewal-era projects, strengthening the connection between King's Square and Market Square. New infill developments around King's Square and throughout the Trinity Royal Heritage Area will fill gaps along historic streetscapes while complementing heritage elements with modern architectural details. The Uptown Core will feature the City's most interesting and vibrant public realm, with public art, amenities for pedestrians and cyclists, vibrant commercial streets, and pedestrianized streets and lanes.

Design Characteristics

- Mid-rise and tall buildings to accommodate full build-out and to capitalize on market and zoning provisions for commercial and residential density.

- Prominent heritage buildings to inform new, contemporary built form elements and infill opportunities.

- Where appropriate, buildings will incorporate non-residential ground floor uses to maintain and enhance a vibrant, pedestrian-oriented urban environment, animating the public realm.

- Street wall heights are regulated through setbacks and stepbacks to maintain a comfortable, human-scaled built environment.

- Corner buildings feature well-designed entrances that transition the corner. Existing civic spaces are strengthened to support green space and recreation amenities in the core; new civic spaces along the waterfront will support increased access to the waterfront.

- New infill development will feature a mix of uses and high quality design which will maintain and enhance urban form.

- A mix of structured and dense, on-street parking to accommodate residents, employees, and visitors.

THE CENTRAL WATERFRONT AND UPTOWN

Growth Concepts

REINFORCE THE SYMBOLIC HEART OF THE CENTRAL PENINSULA – KING'S SQUARE

King's Square is framed by iconic and historic buildings such as the Imperial Theatre, the University of New Brunswick Saint John building, the City Market, the Admiral Beatty, the Court House, and the Irving Oil Limited Home Office. Existing vacant lots and buildings inconsistent with the overall character and quality of the predominant architectural fabric and landscape represent significant redevelopment opportunities. These include 91 King Street, 59 King's Square North and the adjacent parking lot, and the parking lot south of the Royal Bank of Canada.

Loyalist Burial Ground, adjacent to King's Square, is a historic site that speaks to the history of the City and provides opportunity for passive recreation. The Golden Ball Building frames the north edge of the burial ground and Union Street. An adjacent parking lot creates a gap in the framing around King's Square, creating potential for transformative development like the installation of educational or cultural institutions.

SAINT JOHN NIGHT MARKET AT 91 KING ST

HEAD OF KING STREET

DEVELOP THE CENTRAL WATERFRONT AS A KEY MIXED-USE EDUCATIONAL AND CULTURAL DESTINATION

There are numerous opportunities for strategic place-making along the Central Waterfront. The Fundy Quay site is 2.4 hectares with almost 350 meters of water frontage and is primed for development. Port-owned property around Pugsley Slip and the neighbouring sections of Water Street are the entryway for cruise ship visitors, creating substantial opportunities for incremental and impactful improvements for visitors and residents alike.

FUNDY QUAY CONCEPTUAL DEVELOPMENT

MIXED-USE WATERFRONT EXAMPLE

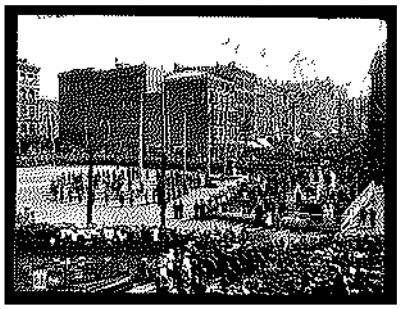
REINFORCE EAST-WEST CONNECTIONS BETWEEN THE TWO CORE ANCHORS – THE CENTRAL WATERFRONT AND KING'S SQUARE

King Street is an important corridor that links the Uptown Core's two anchors – King's Square and the Central Waterfront. It is one of the broadest streets on the Central Peninsula, which gives the street a sense of openness and creates potential for civic space. Its prominence should be retained when undertaking streetscape redesign or redevelopment, paying attention to the grade so ample public space is encouraged which will entice people to remain in the space for a time.

At the foot of King Street are Loyalist Plaza and the Market Square intersection. Loyalist Plaza is an important public space along the Central Waterfront which could benefit from reinvestment. The plaza is an opportunity for people to engage with the waterfront. Future redesign of the adjacent municipally owned Market Square lands should consider increasing the utility of the area, particularly in the right-of-way at the foot of City Hall, as a place for civic gathering and celebration.

There is potential to reimagine King Street as an enhanced pedestrian environment through encouraging better cross-street relationships to the Heritage fabric as well as street-level improvements to Brunswick Square. As an alternative to this approach, building on the recent success of Grannan Lane, a network of east to west pedestrian alleyways through the Trinity Church block would create a novel way of navigating the city in enclosed, urban spaces.

POSSIBLE LOYALIST PLAZA/MARKET SQUARE RE-DESIGN



MARKET SQUARE, HISTORICALLY A GATHERING PLACE FOR CIVIC EVENTS

LOYALIST PLAZA RE-DESIGN EXAMPLE

TRINITY CHURCH BLOCK INFILL EXAMPLE

Policies And Proposals

Council Shall:

U-1 Reinforce King Square as the heart of the Central Peninsula

Proposals:

1. Complete the missing built form edge around King's Square by filling in gaps and encouraging redevelopment.

2. Explore opportunities to work with educational institutions and economic development agencies to create an innovation district at King's Square.

3. Complete the missing built form edge of the Loyalist Burial Ground and reinforce the Union Street streetscape.

U-2 Develop the Central Waterfront as an educational and cultural destination

Proposals:

4. Promote the incremental development of Fundy Quay as a mixed-use cultural destination on the waterfront.

5. Redevelop the Pugsley Slip site as commercial space with waterfront green space.

6. Create an enhanced streetscape along Water Street between King Street and the southern end of the Marco Polo Cruise Terminal.

U-3 Improve the east-west connections between the Central Waterfront and King's Square

Proposals:

7. Enhance Loyalist Plaza as a contemporary public space through the installation of imaginative seating, planting, and other landscaping elements.

8. Redefine Market Square as large, flexible civic gathering space through the hardscaping and creative delineation elements.

9. Intensify the Trinity Church block and create a new north-south pedestrian laneway from Charlotte Street to Grannan Street.

10. Transform South Market Street into an animated and pedestrian-oriented laneway.

11. Reconfigure the King Street right-of-way to enhance the public realm and reinforce the connection between King's Square and the Central Waterfront.

12. Encourage the renovation or redevelopment of Brunswick Square's King Street

façade to animate King Street's public realm.

13. Encourage infill development at the foot of King Street on the current site of the Barbour's General Store to complete the King Street corridor.

Actions And Outreach

1. Undertake an Uptown Commercial Market Study and associated Recruitment Strategy to address gaps in the offerings of the Uptown

2. Build upon the Brick Park initiative by undertaking an Uptown Office Strategy to address high vacancy rates within commercial office buildings and urban malls

3. Establish an employer "Live Where You Work" program for Uptown businesses to encourage more Uptown employees to live in the Central Peninsula

4. Working with community partners, prepare a Waterfront Tourism Strategy to capitalize on future investments in waterfront development

5. Ensure reinvestment in key economic assets that support major events in the Uptown, such as conference and events centres

6. Encourage the Province of New Brunswick, University of New Brunswick, and New Brunswick Community College to establish a joint Information and Communications Technology Centre to collaborate with the Brick Park knowledge cluster and to connect businesses with emerging ICT graduates

7. Implement a phased approach to the resolution of the existing noise issue that addresses the Uptown Core's continued destination as an entertainment district, with festivals and live music, while ensuring acoustic measures are in place to safeguard quality of life for residents

8. Evaluate the purchase of an additional sidewalk cleaning vehicle and explore other litter abatement programs through partnerships with Uptown Saint John

9. Identify opportunities for piloting permanent or seasonal pedestrian streets as a future enhancement option for shared streets

10. Improve street level access to the City Market to include outdoor patio space, vendor space, and pedestrianize South Market Street

11. Undertake a Strategic Plan for the Saint John City Market

12. Working with community partners, enhance existing or adopt new programs to encourage street level box planters and window box planters within the Business Improvement Area

13. Encourage creative and adaptive use of Market and Brunswick Squares to enhance their contributions to the City's core.

2.1.2 Long Wharf

Long Wharf is an underutilized vacant site in the Inner Harbour owned and maintained by the Port in conjunction with the Federal Government. With 7.3 hectares of flat asphalt, the area is used by the Port as a laydown area for salt, a temporary terminal for cruise ships, and a docking area for commercial ships among many other uses over the years. More recently, Long Wharf has been optimized for hosting the Area 506 music festival, adding depth to the event offerings in the Central Peninsula. Long Wharf's location on the waterfront and close proximity to the Uptown Core makes it a strategic, long-term infill development opportunity within the Central Peninsula.

Neighbourhood Direction

Long Wharf will be transformed from a vacant waterfront site to a modern, mixed-use neighbourhood, with expansive harbour views and waterfront access. In the future, Long Wharf will feature a mix of office, retail, and entertainment uses in mixed-use, modern developments with residential development intentionally incorporated in the long term. Waterfront setbacks will maintain access for continued Port operations, primarily Cruise Ship berthing. The area will be connected to the City via Harbour Passage and a new road network via Station Street.

Design Characteristics

- A dense mix of mid-rise to tall buildings that step down to the waterfront, while maintaining view corridors from Fort Howe.
- Contemporary architecture, with a mix of wood, glass and cementitious materials.
- Contemporary, mid-rise residential developments feature entrance plazas, setback from the street.
- Building setbacks from the waterfront, providing continuous public access to the harbour.
- In-building parking structures to support the building's residential uses.
- Structured and on-street parking to accommodate visitors and employees.
- New civic parks and open spaces to provide amenities to new residents.
- A new, pedestrian bridge over Long Wharf Slip connecting the foot of Union Street to Long Wharf.

Growth Concepts

DEVELOP LONG WHARF AS A NEW MIXED USE NEIGHBOURHOOD EXTENSION TO THE UPTOWN CORE

As a large, underutilized site in close proximity to Uptown Core, Long Wharf is a

strategic opportunity for development. Through the long-term, phased redevelopment of the site, the City can foster the creation of a new distinct waterfront neighbourhood adjacent to the Uptown Core. Long Wharf is envisioned as incubating commercial development with residential development introduced as a result of burgeoning commercial activity.

At the eastern side of Long Wharf is Long Wharf Slip, which has a mix of natural and hard shoreline. Building on residential development on the Market Square Boardwalk and Robertson's Wharf, the Secondary Plan contemplates mixed use development on either side of the slip, including the redevelopment of the surface parking lot and electrical substation. A pedestrian bridge will cross Long Wharf Slip, creating an access from Union Street, through the Long Wharf site, and connecting to Fort LaTour. A pedestrian bridge across the slip would make Long Wharf more accessible by foot and bicycle to the rest of the Central Peninsula.

CREATE NEW OPPORTUNITIES TO EXPERIENCE THE WATERFRONT

With almost 700 metres of frontage along Saint John's Inner Harbour, Long Wharf has enormous potential to reconnect the Central Peninsula to its waterfront. Currently, Long Wharf is only accessible to the public during special events, though plans have been established to extend Harbour Passage along the edge of Long Wharf as an interim measure to enhance the public use of the site. The future development of Long Wharf will secure the waterfront for public use, creating new opportunities for passive recreation and gathering.

Extending out into the Inner Harbour, Long Wharf offers a unique vantage point of the harbour and the City. There are opportunities to establish lookout points in strategic areas throughout Long Wharf, mimicking the established pattern along Harbour Passage, increasing the site's public use. Such lookout points are suitable locations for public art, commemoration, or historical interpretation.

At the east end of the site, Long Wharf Slip is an ideal location for a small-craft marina to introduce recreational boat traffic to the Inner Harbour. A small-craft marina would generate new interest in the waterfront and diversify the Central Peninsula's offering, contributing to the overall vibrancy of the Central Peninsula. The potential popularity of a small-craft marina can be leveraged to help create market demand for residential development on lands surrounding the Long Wharf Slip.

Fort LaTour – a designated Provincial Historic Site - lies adjacent to the western boundary of Long Wharf. Work to redevelop the green space to enhance its function as a destination for locals and tourists are underway. The plans include an outdoor amphitheater, the recreation of the historic fort on the site, and an interpretation centre including a public washroom. The redevelopment of Fort LaTour will help to spur the redevelopment of Long Wharf and the extension of Harbour Passage.

MAINTAIN COMPATIBLE MARINE FUNCTIONS ON LONG WHARF

While a working waterfront creates challenges for public access, its value to the local, regional, and provincial economy is undeniable. Long Wharf is used intermittently for Port functions, including as a laydown area and for docking commercial ships. The City has emerged as an important port-of-call for cruise ships, with more than 1,000 ships visiting since 1989. When ships are berthed at the Central Waterfront's two cruise terminals, a third ship is able to moor on Long Wharf. Given its proximity to the

Uptown Core, passengers are able to enjoy the same amenities as those passengers docked at the Central Waterfront. The cruise industry is an important and growing dimension of City's economy and therefore the redevelopment of Long Wharf should maintain its marine function.

The southern edge of Long Wharf can be designed as a hard-surfaced public space which can accommodate cruise ship activity when required. As cruise ships only moor at Long Wharf on occasion, this approach balances the needs of the industry with the public's enjoyment of the site. Temporary fencing or removable bollards can be used to address the security requirements associated with international cruise travel.

Policies And Proposals

Council Shall:

LW-1 Work with the Port to develop Long Wharf as an extension of the Uptown area

Proposals

1. Relocate the electrical sub-station on Long Wharf Slip and reposition the site for mixed use.

2. Integrate residential development on Long Wharf Slip.

3. Develop a pedestrian crossing bridge over Long Wharf Slip from Long Wharf to the Uptown.

LW-2 Provide public access to the water along Long Wharf

Proposals:

4. Develop strategic lookout areas.

5. Develop a small-craft marina at Long Wharf Slip.

6. Support the redevelopment of Fort LaTour.

LW-3

Maintain Long Wharf's functionality as an active Port asset

Proposals:

7. Ensure future development of the site accommodates the safe and efficient docking of cruise ships.

8. Encourage a balanced approach to marine infrastructure needs and public space requirements and waterfront access.

Actions And Outreach

1. Work with the Port to harmonize the community's vision for Long Wharf with the Port's Land Use Plan.

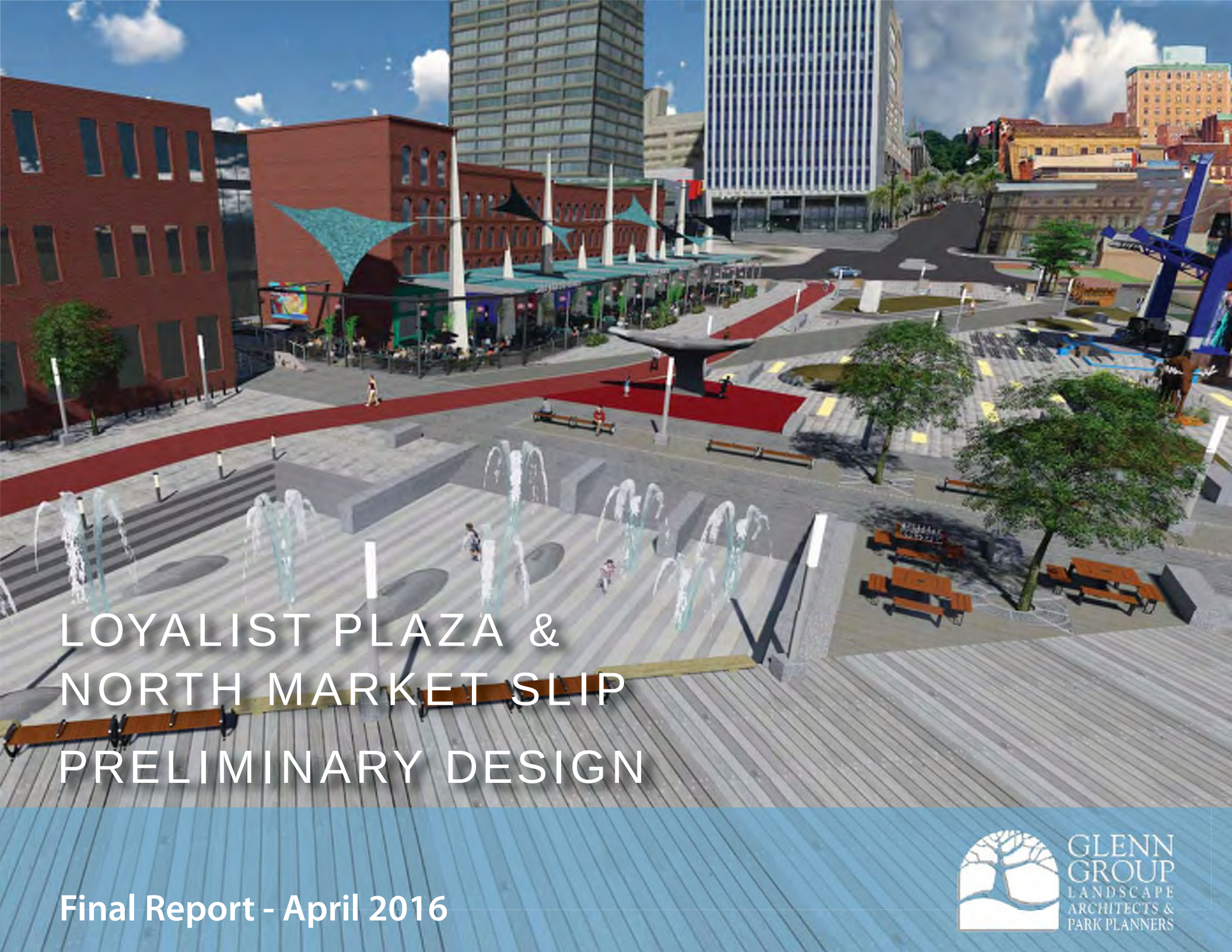
2. Work with the Fort La Tour Development Authority to ensure the site maintains public access to waterfront lands.

3. Support the siting of well-designed and contextually appropriate public art and commemorations along Harbour Passage.

4. Work with the community's arts and cultural groups to encourage programming and events along Harbour Passage.

5. Work with CN and NB Southern Railway to ensure public access to rail lands adjacent to Harbour Passage is maintained.

Appendix 3: Loyalist Plaza & North Market Slip Preliminary Design Report by Glenn Group 2016



LOYALIST PLAZA & NORTH MARKET SLIP PRELIMINARY DESIGN

Final Report - April 2016

GLENN GROUP
LANDSCAPE ARCHITECTS & PARK PLANNERS

ACKNOWLEDGEMENTS

The revitalization plan for Loyalist Plaza and North Market Slip has been a collaborative process. Representation from a wide spectrum of individuals and organizations including; residents, city staff, business owners and managers, councillors and developers has been instrumental in the formation of this visionary plan.

We would like to acknowledge the primary contributors that influenced and shaped the planning decisions and the resultant preliminary design.

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TABLE OF CONTENTS

1.1 Purpose

The primary purpose of the Preliminary Design Report is to evolve the conceptual Master Plan (2015) into a more detailed description of the proposed renewal. Supported by field investigations into the condition of service pipes, soils conditions, extent of existing services, determination of basement wall locations and a topographic survey the updated plan responds to the findings. As such, the Preliminary Design has fewer unknowns and assumptions than the Master Plan (2015). Cost estimates have been generated to a Class "C" level of accuracy. Furthermore, Preliminary Design provides an opportunity to revisit some of the earlier designs and tweak them to suit the new data. Preliminary Design will inform the detailed and technical next stage of the project - Tender Documents. The scope of Preliminary Design includes:

- Undertake topographic survey
- Investigate conditions of underground services
- Determine structural characteristics of soil
- Identify potential triggers for environmental permitting
- Advance the design to suit found conditions
- Consult with the Steering Committee
- Prepare a Class "C" level cost estimate

Existing Site

The Cost Estimate is tabulated in an accompanying document.

1.2 Vision

As Canada's oldest incorporated City, Saint John is steeped in history; however, it is equally a City of the future. The transformation of this key public space will reflect not only the rich heritage, but also the vibrant business, cultural, educational and tourism opportunities. The renewal will showcase design excellence, innovation and animation. The waterfront will once again become the focus of the space with strong re-connections to King Street and Kings Square. As a major gathering space it will be a place of interaction and community pride. The plaza will welcome all people and inspire new hope and new enterprises to invest in the City. It will be both the heart and gateway to the City of Saint John.

> World-class heritage sites and a proud industrial and marine transportation heritage, creating a waterfront environment unlike any other in Canada.
> ***Inner Harbour Land Use Plan 2003***

2.0 Site Plan

The site plan has evolved in detail to meet the actual conditions for investigations (soil testing, pipe conditions, underground infrastructure) and a topographic survey. Steering Committee input has also lead to further refinements. The following chapter describes each feature of the plan.

3.0 Features

Performance Stage

A new permanent stage will be positioned where the present cabanas are located next to the beach volleyball courts. Set back 15m from the existing temporary stage, this more central location will accommodate a much larger audience. Taking its design style from the Harbour Passage structures the concrete stage will be covered by a metal cantilevered roof. The galvanized steel uprights will be powder coated grey and detailed to minimize potential rusting. The roof will be navy blue.

The performance area is approximately 16.5m (54') wide by 7m (23') deep. A rear ramp will facilitate wheelchairs and loading equipment onto the stage. A 150mm curb will act as a safety guide/warning strip. The stage will be elevated 900mm (3') from the plaza. Stairs with lighting strips on the risers will flank the stage. Textured nose plates will alert performers of the edge. Underneath the stage, storage for folding chairs on dolly carts will be accessed from three locked doors in the front on the stage.

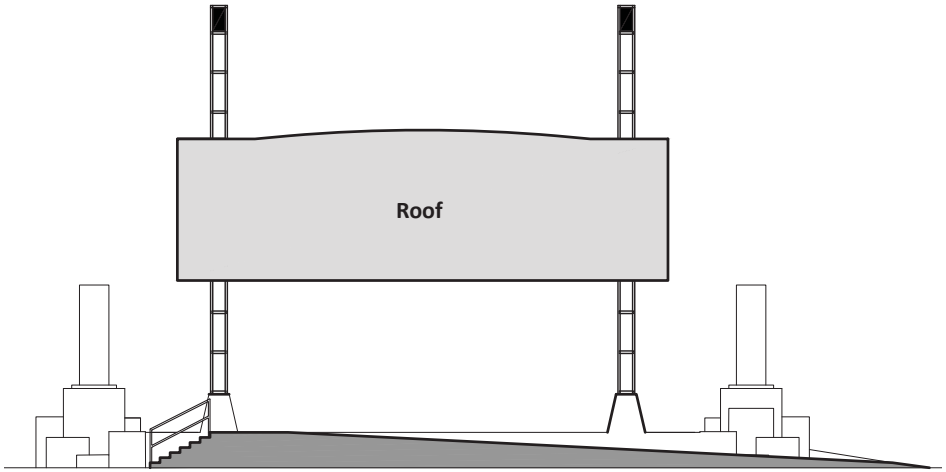
Temporary windscreens on the rear stage and sides will be lowered from the roof when needed. These fabric sheets with small holes can be printed with sponsor graphics each year or for special events.

Wind Screen Sample

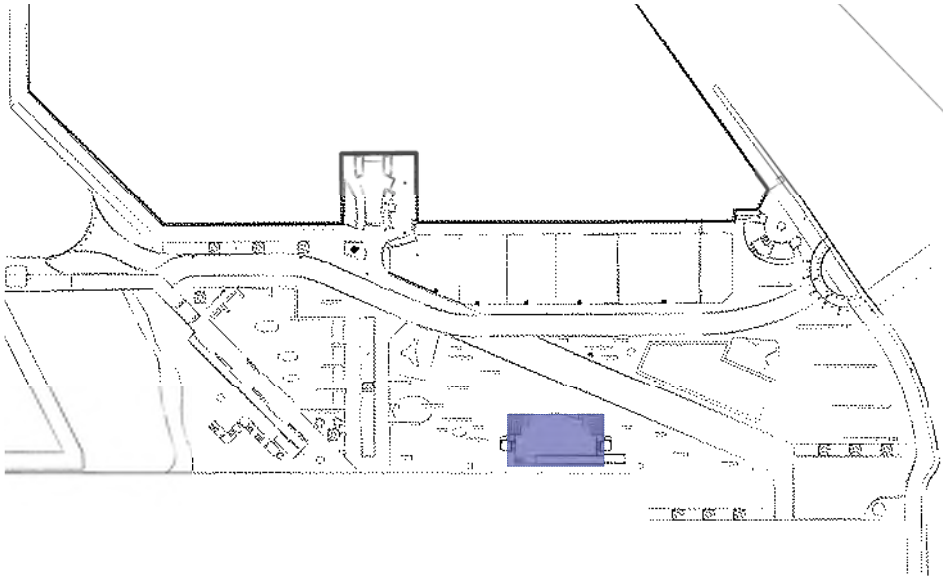
When not in use as a live performance venue the stage can be used to project videos, watch the watermark fountain show or as a play space for children running through the waterfall or exploring the stage. Brass icons embedded in the concrete could be used as interpretive talking points and for exploration games to find the thematic Bay of Fundy symbols.

Long Wharf Interpretive Structure

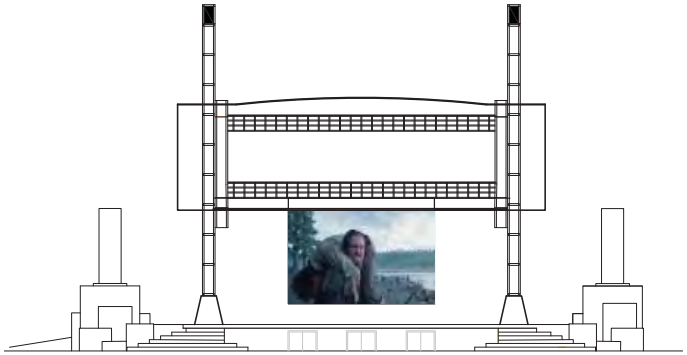
Cruise Terminal Gateway Structure



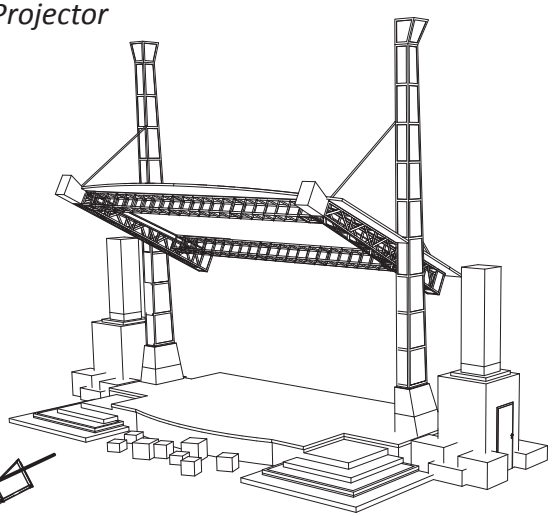
Ramp Elevation - Back of Stage



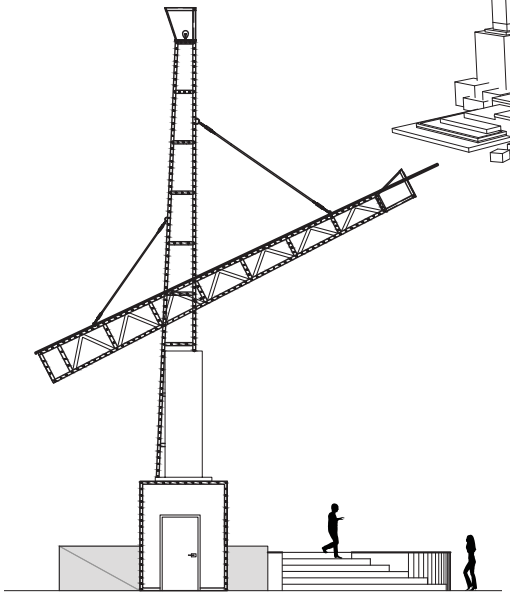
Stage Locator Map



Frontview with Drop Down Projector Screen



Isometric View (NTS)

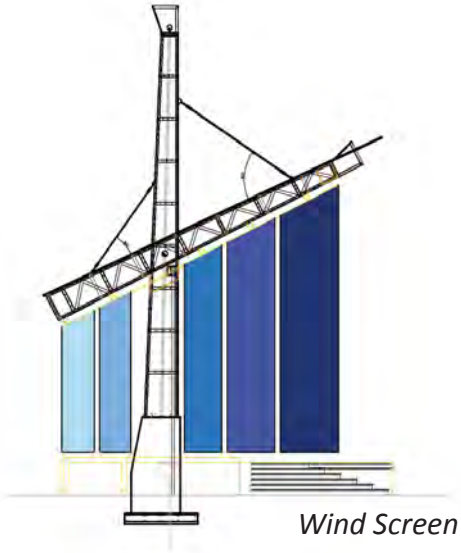


Side View

Public washrooms on either side of the performance stage will be accessible and blended into the stage infrastructure. A self-cleaning type system such as the Sagelec Canada offer a ready to install unit which is highly accessible, vandal-proof, economical to run and safe. An exterior drinking fountain with bottle fill and dog bowl options will be included. The washroom exterior facade could be an artful expression of the plaza.

Projection Screen

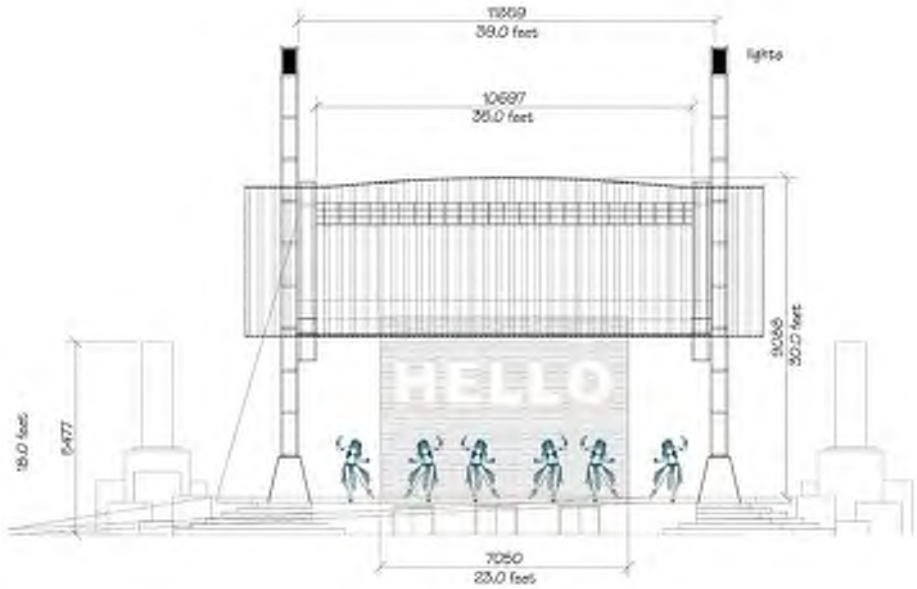
Within the bulkhead beam between the canopy of the performance stage an electronically controlled video screen will be lowered for video projections. The screen will be anchored in place. Material options include blackout cloth, Tyvek or theatre-grade PVC for durability. Screen size 5626mm wide, 3200mm high with an 80mm border and 16:9 aspect ratio. The border will have grommets for tie down. Standard of Acceptance is model DIY251RH by Elite screens or equivalent.



Wind Screen

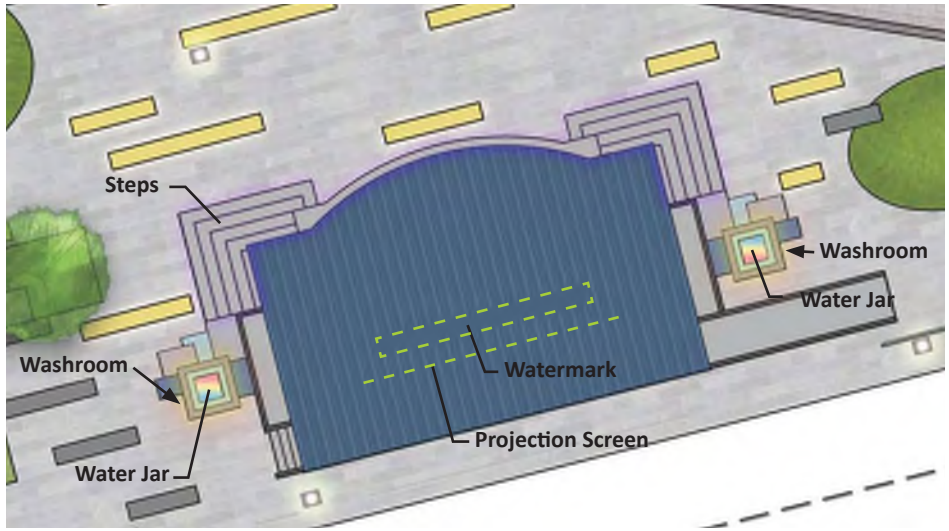
Programmable Water Wall (Watermark)

A metal beam between the canopy posts at the back of the performance stage will house a cutting-edge interactive water wall that can create patterns and words by digitally manipulating the flow of water. Synchronized lights and water sequences will use RGB LED lighting to blend with colour and illuminate the effects. Controlled with a mobile device the digital water expressions can be custom pre-programmed sequences, scheduled by calender or operating hours or for interactivity. People can instantly write, draw or choose patterns to display. The unit minimizes water usage through recirculation. Grates in the stage floor will drain the water to the splash pad treatment plant. A Standard of Acceptance product is Watermark distributed through Vortex. The interlocking units are 1 metre long. Five units will be linked together in a seamless configuration with 25 valves per unit for optimal resolution.



Water Jars

Framing the performance stage will be a set of large speakers topped with an acrylic jar filled with water or antifreeze. The water will dance to the rhythm of the vibration from a waterproof speaker and jets synchronized to the music. LED lights will illuminate the dancing water. These will be custom designed speakers. The base is planned at 1.0m high and the jar at 2.0m high. The public washroom below will form the base for the Water Jars at 2.4m height.

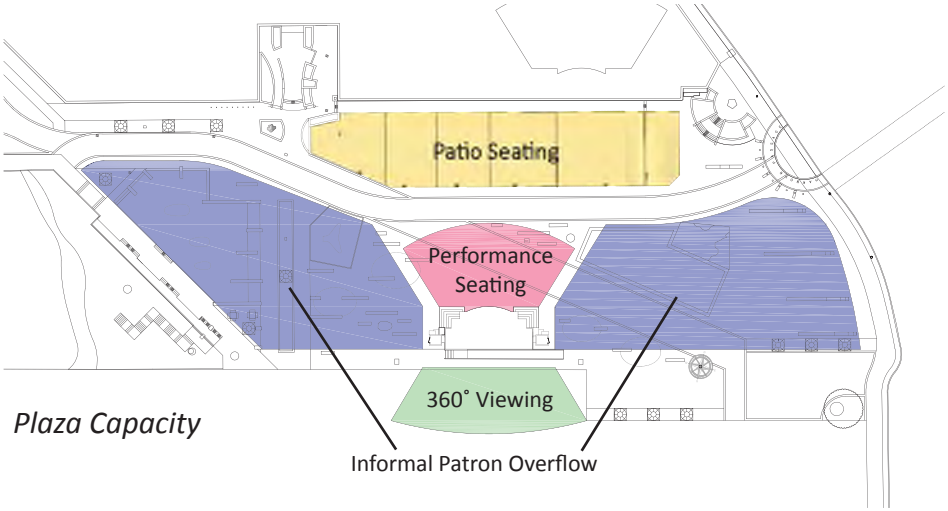


Water Street Plaza

The new plaza reconnects the street to Market Slip, positioning the public space as a hub for natural traffic flow in the Uptown. Kings Square and Loyalist Plaza anchor King Street as the central urban corridor. The plaza is blessed with several entry points from the streets, Market Square, the proposed redevelopment of the Old Coast Guard site, and the harbour. The plaza occupies approximately 9,000 m^2 of space. At 0.6 m^2 per person the maximum occupancy would be under 5,000 people. Major performances could handle audiences of ~2,500 (excluding patio patrons). Typical shows of 500-600 people can be accommodated in front of the stage. Opportunities to view the performance from the rear of the stage (on the old coast guard site) may offer additional capacity for major events with 360˚ viewing or "in the round" performances.

The plaza is a wide open space capable of supporting a diverse range of activities and functions. The unobstructed views offer good surveillance potential from the street and within the plaza itself. The existing 6 m wide emergency road has been replaced with a 4 m wide pedestrian route which also serves as an emergency access. "Meridian" for Harbour Passage starts/ends at Water Street and meanders through the plaza connecting to Smythe Street and the Boardwalk.

A range of pavement treatments help to orient the visitor and demark character areas. The historic connection of the slip to the street is portrayed with recycled granite cobbles. Harbour Passage will be constructed of the signature red or "cranberry" coloured concrete. The patios will have special stain resistant concrete pavers. A wood boardwalk will be extended over the tunnel. The fountain/splash pad will be coloured concrete. The plaza proper will be treated with large format plank pavers of precast concrete in shades of grey colour. The longitudinal axis of the site will be visually reinforced with the direction of the paver pattern. Varying patterns and colour will reinforce circulation routes. Borders of pavers will define the transition to different materials and patterns.



Plaza Capacity

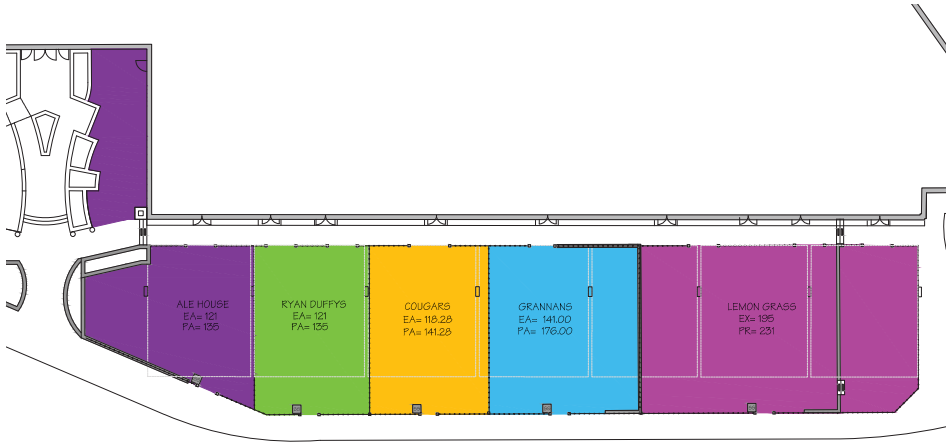
Patios

The patios are vital to the success of the plaza and the businesses inside Market Square. The new scheme serves to:

- Increase the patio size
- Improve access and accessibility
- Offer protection from the elements
- Improve views
- Create a unified appearance with consistent materials

The new patios will follow the existing space allocations. The patios will be moved 1.5m from the building to provide an access path along the facade to offer better window shopping for seats inside. The patios will be expanded outward toward the plaza by approximately 3.0m to add an additional 1.5m of table space.

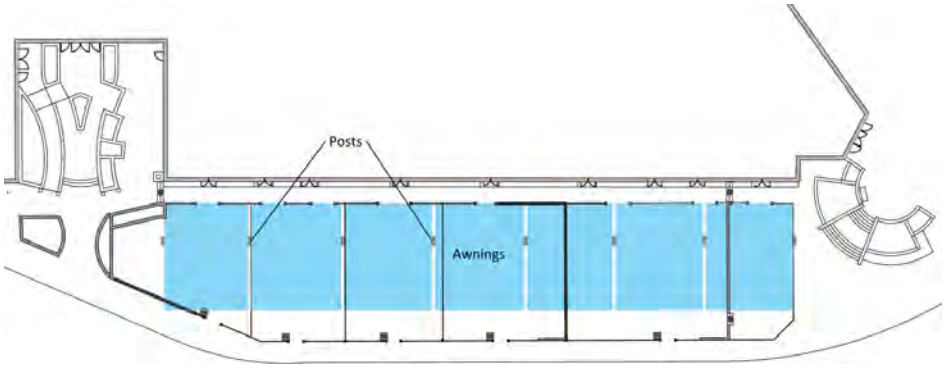
Patios will terrace down the slope to allow flush access into most of doorways. Terracing will require some low retaining walls and steps to make the transition; all with pavers laid at a minimal slope suitable for tables. A suitable paver is Unilock - Umbario series with Enduracolar and Easy Clean for its properties of chlorine and salt/de-icing resistant and stain repelling of substances typically experienced at restaurants. Aluminum railings with glass panels will contain the patio areas to the satisfaction of the NBLCC license requirements. Planters will also serve to separate the patios. Space heaters on the ground and above will warm the patios to extend the seasons. Waiter station/serving bars, hostess stands and menu boards will all be coordinated. Patio furnishings will also be uniform for all establishments.



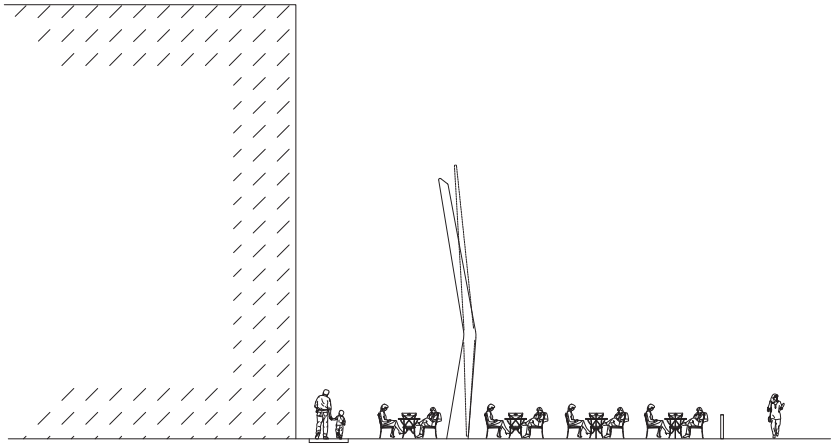
Awnings

Free standing awning supports will run the length of patios. Symbolically they harken to the days when masks from tall ships lined the slip. The metal structures will support two retractable awnings and decorative shade sails.

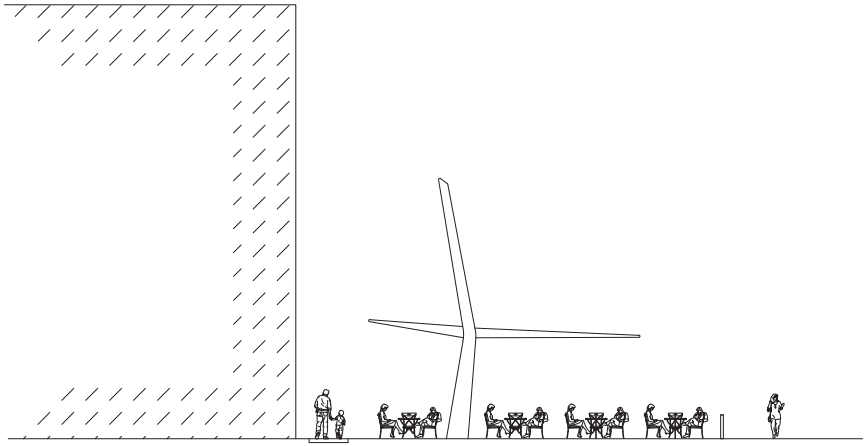
The awning and posts are configured for a number of positions: retracted or closed for the winter, front open back closed, back open front closed or both back and front awnings open.



The awning posts will also support programmable LED lighting fixtures, both functional and for effect illuminations. Speakers and power outlets can also be incorporated into the posts.



Upright Position

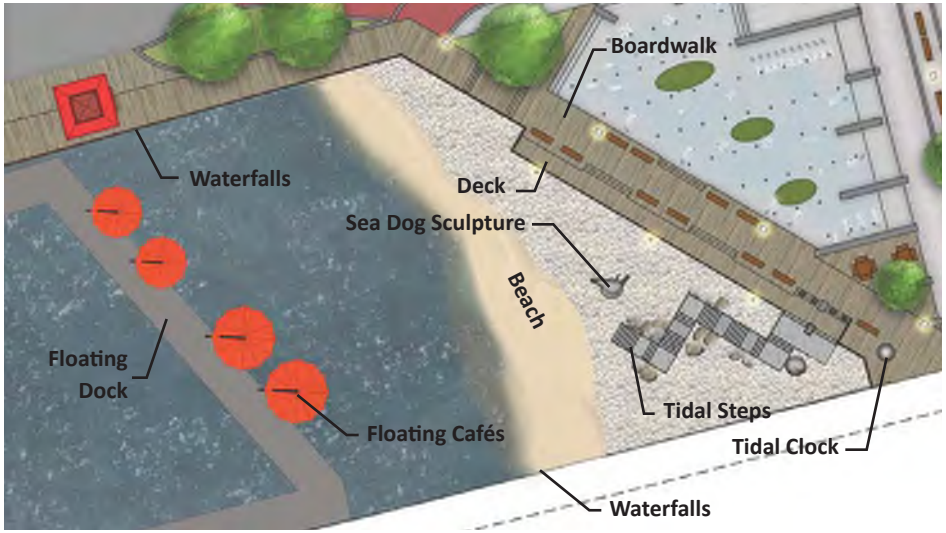


Shade Position

Wharf Face

The Wharf is currently faced with metal sheet piling. Cathodic Protection will be installed along the Piling to prevent future corrosion. In front of the piling, on either side of the slip, waterfalls will be installed to create a soft, cascading curtain and ambient sound. This water wall will be backlit for further effect in the evening and will tie into the programmable lighting.

The boardwalk will be enhanced with steps down to a cantilevered viewing deck. The steps can double as seating for people wishing to relax and enjoy the views of the slip and harbour. With a 0.45 m step down to the deck, people on the boardwalk will be able to see over the deck railing with unobstructed views. Windows from the pedestrian tunnel will be located below the deck to allow natural light into the tunnel and views out to the harbor.



Tidal Steps

Access to the water will be achieved using large stone steps stacked in risers of three anchored to concrete and protected with bordering armour rock. The rock will be imported slabs of slate or limestone unless some local sources can be found. Large rocks will also be suitable for sitting to watch the slip and harbour. A stone "seadog" sculpture (Saint John version of Little Mermaid) will serve as a marker for average high tide to just barely reveal the snout above the water. A stacked boulder arrangement (kept in place by a central steel rod) will serve as a photo-op at the entry to the stairs.

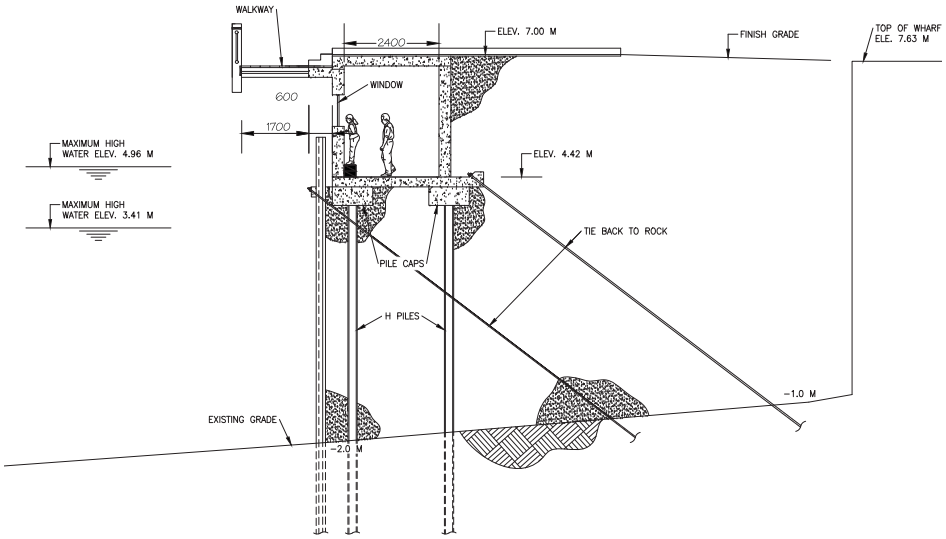
Tunnel

A pedway extension is proposed from the basement of Market Square (through the existing security room) to the old coast guard site. The tunnel will be set behind the new wharf face that crosses the slip on a diagonal line. The tunnel finishes will match the existing pedway. Windows on the harbour side will let in natural light and offer views out to the slip.

A mechanical & electrical room will be accessed from the tunnel under the splash pad fountain.

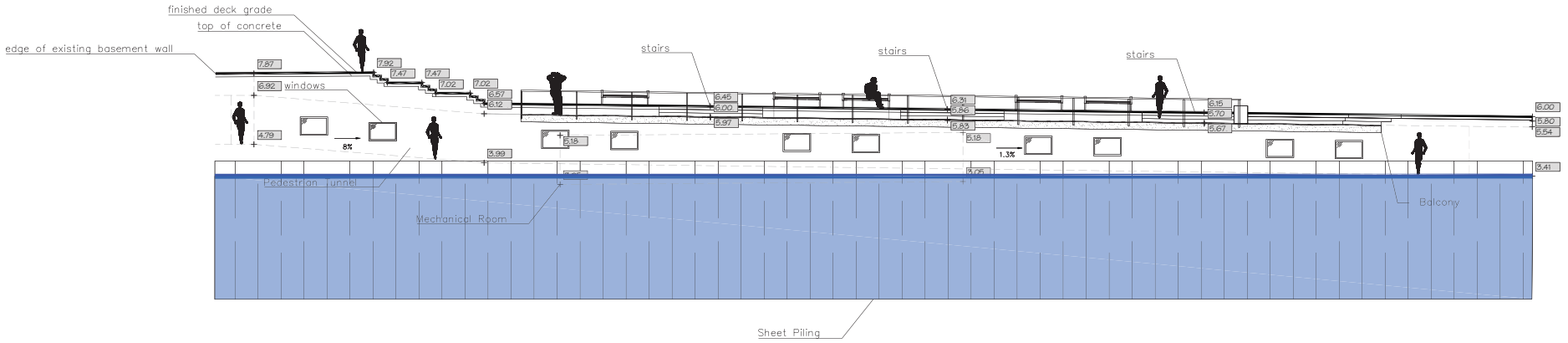
Tunnel Location

The tunnel floor will be level except at the Market Square entrance where it will slope at 8.0% for accessible access with handrails.

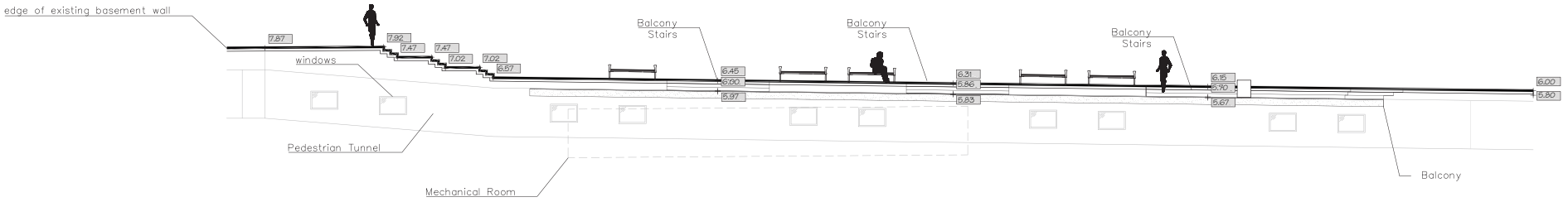


Tunnel Cross Section

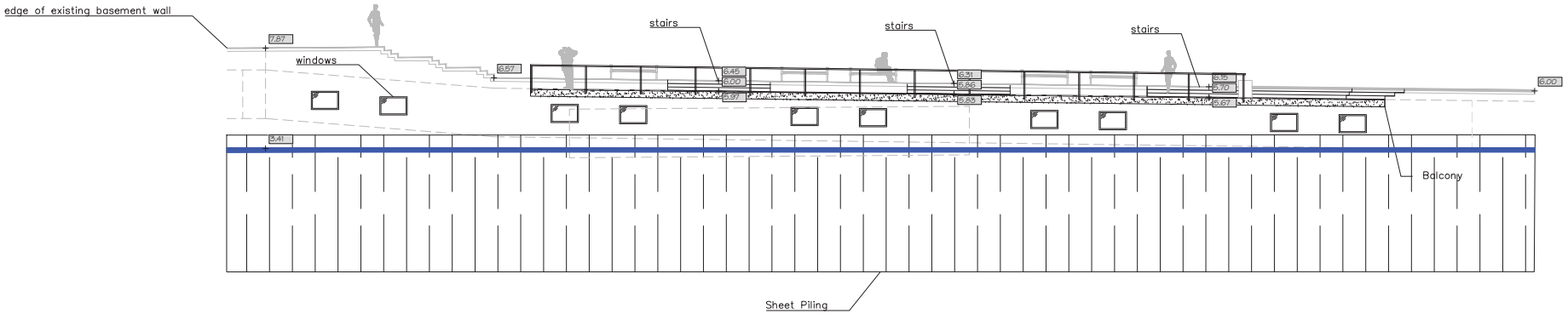
ELEVATION



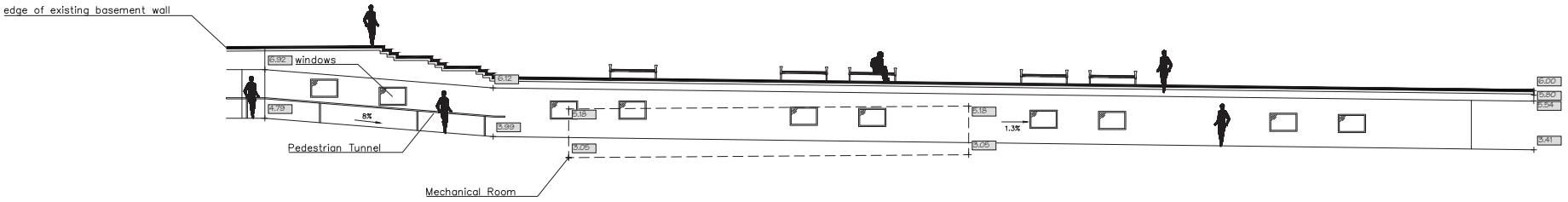
DECK LEVEL



BALCONY & PILING



TUNNEL & MECHANICAL ROOM

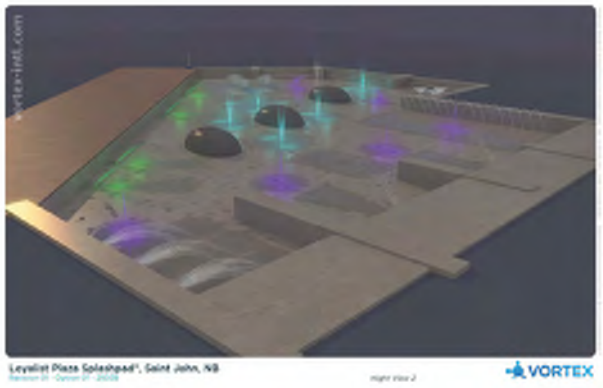


Splash Pad (Fountain)

The splash pad is a multi-functional and accessible space. The fountain is sunken to provide informal seating on the perimeter steps and on the deck side benches. The fountain will be constructed of coloured concrete. The steps will include skateboard deterrents in the design. Water will drain into a recirculating system which filters, disinfects and recycles the water. Water spray will be enacted by touching activators that send a signal to the command centre. The command centre will orchestrate water flow based on preset sequences and timing. Water is stored in a subterranean tank.

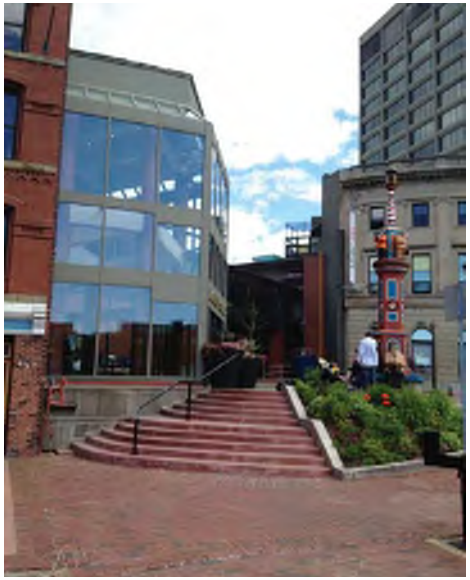
The spray features will primarily come from ground or wall mounted directional sprayers. The spray features will be augmented with LED lighting to enhance water jet pre-programmed routines. A mist or fog maker component will generate a low level fog for special effects.

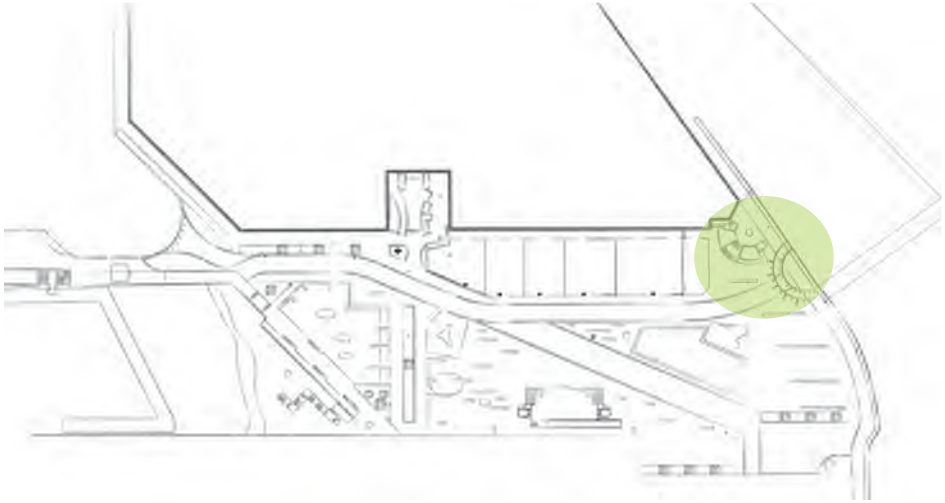
When not in use as a splash pad/fountain the space can be programmed for small venue performances or open air art gallery. Power connections for audio equipment will be built into the sidewall of the fountain.

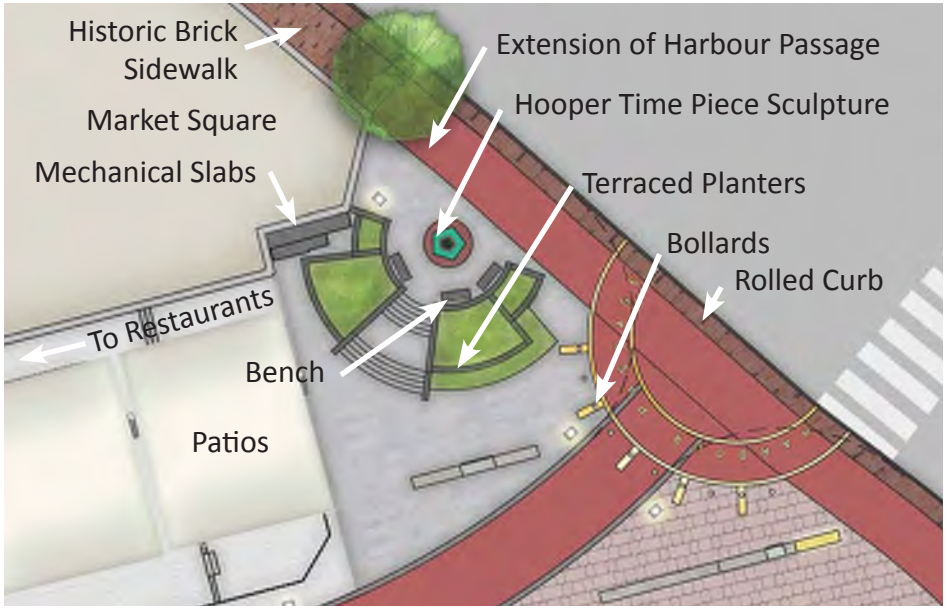


Market Square Water Street Entrance

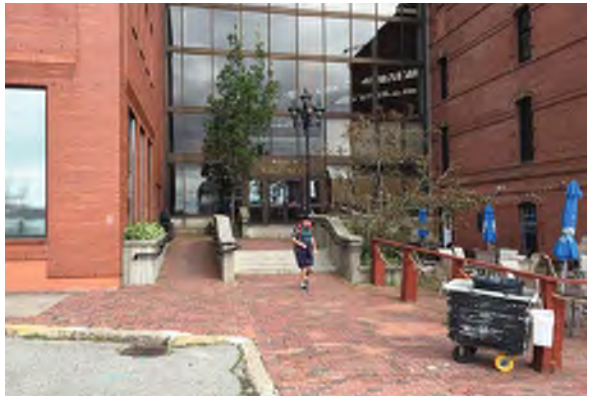
The Harbour Passage sidewalk treatment (red coloured concrete and brick strip along the curb) on Water Street will be extended to the area in front of the doors into Market Square. The existing clay red brick pavers will be replaced with more durable precast concrete pavers to match the plaza. The granite block planter will be replaced with a larger, concrete planter clad with granite. The large stairs will also be replaced. This new scheme will create more space for sitting to admire the Hooper "Time Piece" sculpture and allow a more gentle slope to the walkways. Heritage style lights will be updated with the new saber style light fixture. With the narrowing of the emergency lane (Harbour Passage) to 4m the crosswalk across the emergency lane can be eliminated. A rolled curb along the street and removable traffic bollards will separate vehicles from pedestrians.



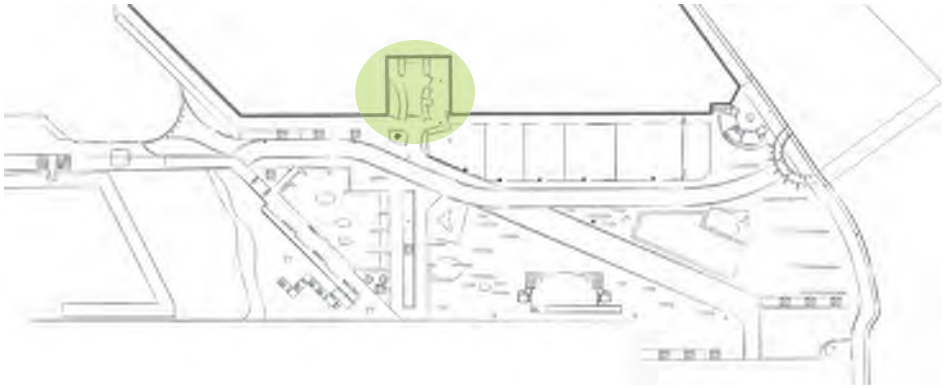




Market Square Plaza Entrance



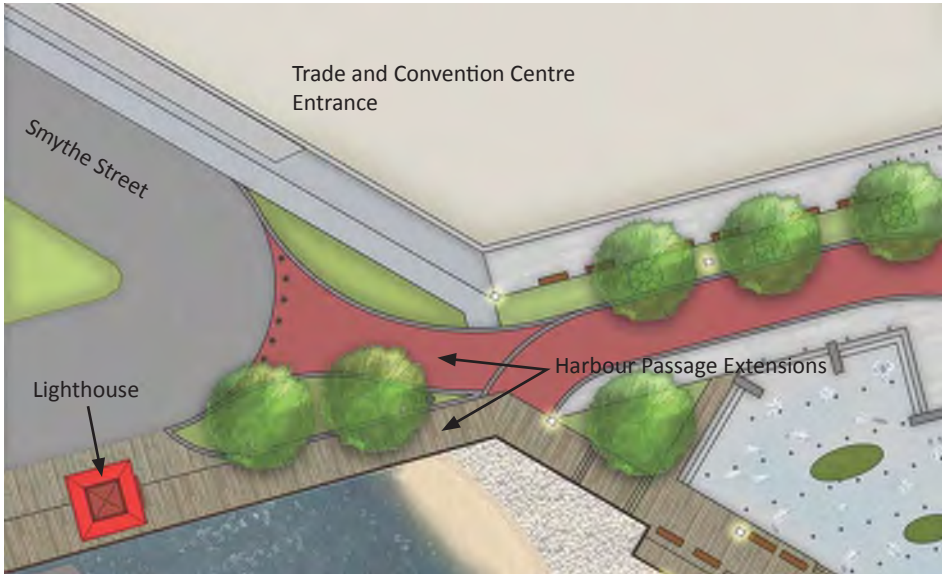
The existing entrance is tucked into a courtyard setting which accommodates the varying floor heights and access doors. The new scheme replaces the poured-in-place, barn board finished, concrete walls and stairs with granite clad walls and only three stair risers. The design opens up views to the main doors and addresses the exisitng non-code compliant accessible ramp. An overhead signage structure brings the building entrance more forward and prominent. The concrete facade walls will be treated with landscape (vertical gardens) and sculptures to animate the setting. A welcoming sculpture could speak to the geological heritage of the area (Stonehammer Geopark). Bicycle parking is located close by.

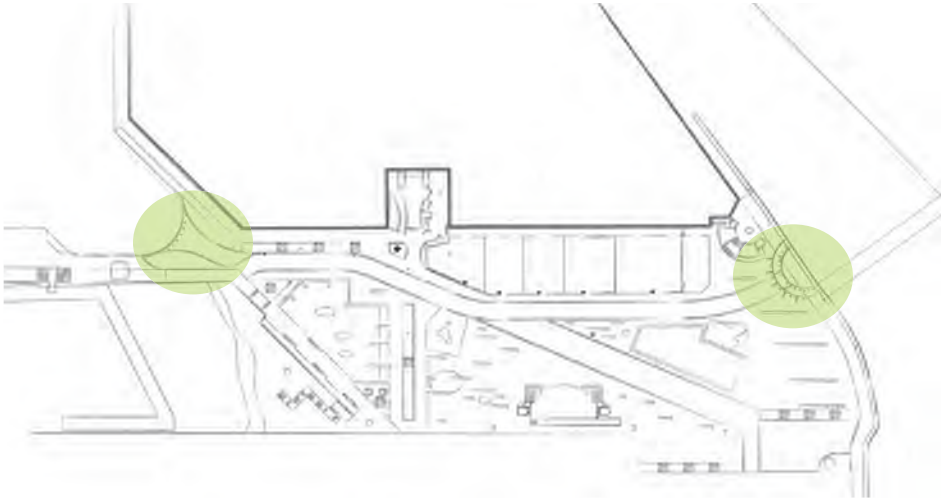


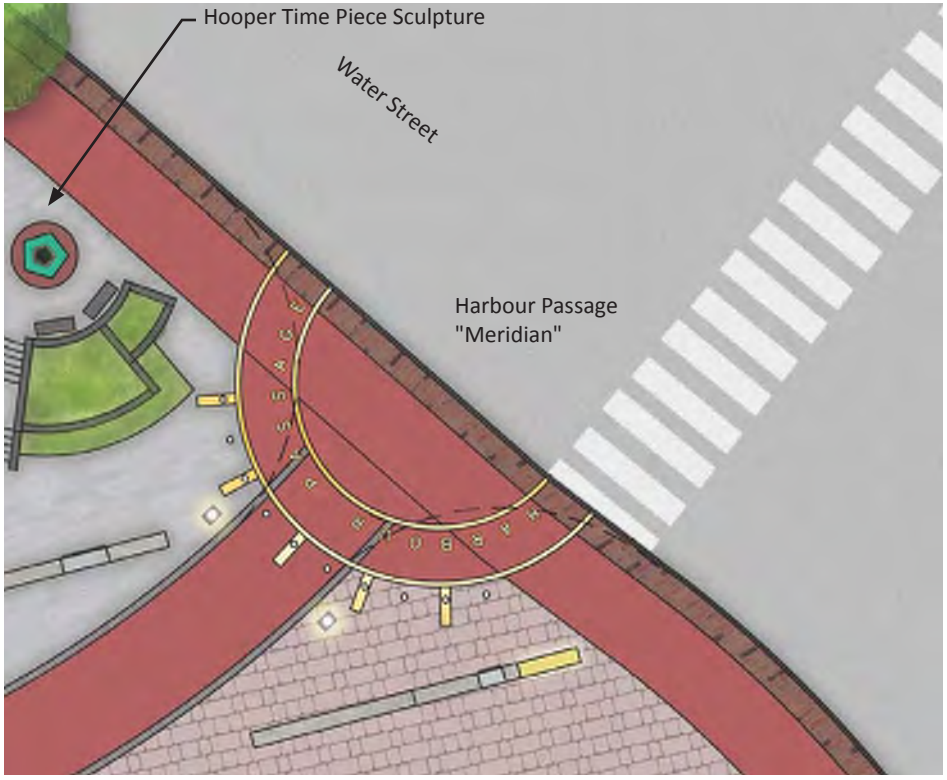
Harbour Passage

Meridian for Harbour Passgae is demarked with a paving pattern in a ship's wheel design. Two rings of half circle shapes arching out from the rolled curb will define the iconic logo of Harbour Passage and serve as a pivot point of travel. Bronze letters inset flush in the coloured concrete will spell out the words "*HARBOUR PASSAGE*".

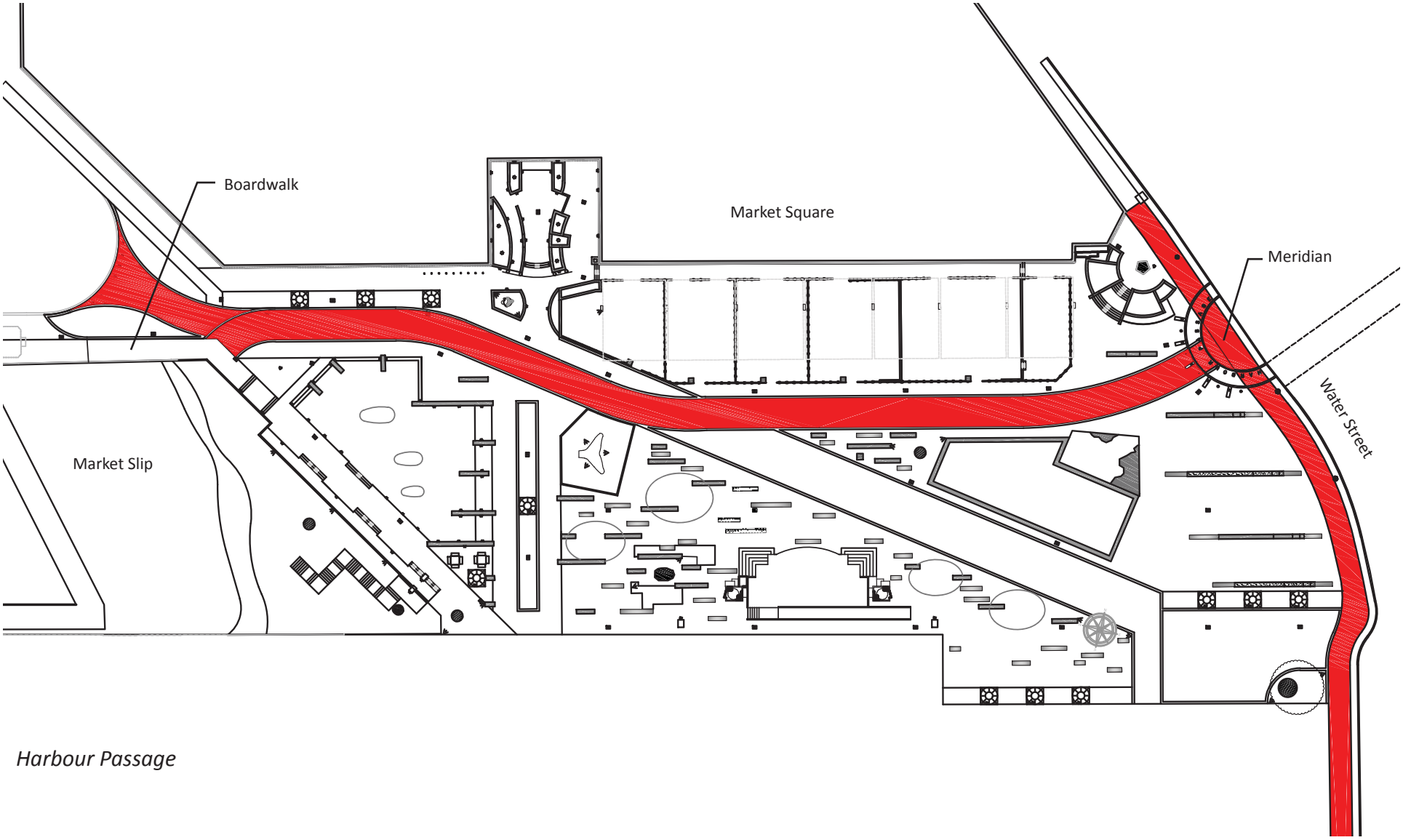
At the boardwalk connection to Harbour Passage the path will split to connect to the drop-off at the Convention Centre. A border of pavers will frame the paths. At this location a wayfinding directory will guide visitors to key attractions and amenities.







"Meridian" Harbour Passage



Harbour Passage

Lighting

Creative lighting will play a key role in animating the plaza at night. The primary lighting sources will come from light columns or sabers, ground mounted programmable panels, flood lights and light tape.

Light Columns

The shuffle model from Schreder is much more than a simple, stylish column it is a multi-functional and interactive smart device. Comprised of interchangeable modules the column options include: efficient LED luminaire with refractors and reflectors for 360˚ light or cutoff, WLAN for WiFi connections, motion detector, spot lights, CCTV camera, loud speaker, EV charger, decorative light ring or spacer. The shuffle helps declutter sites by organizing multi-function in one place. More than a series of light solutions it can fulfill and monitor all societal needs in the same system.

Ground Mounted Panels

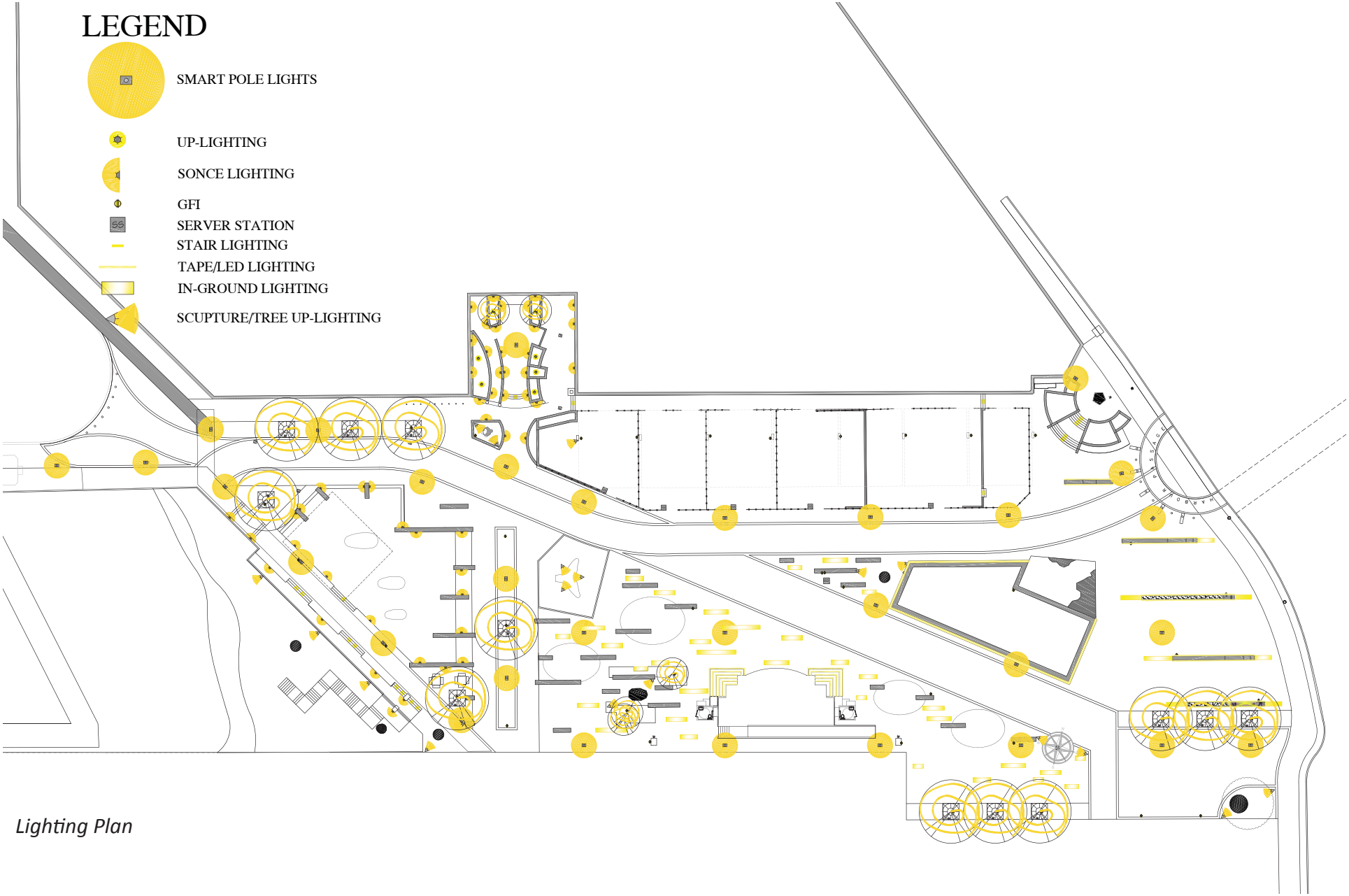
Programmable panels with heavy duty translucent lens mounted flush to the plaza will provide ambient light, but primarily they will flash and animate the plaza floor in waves of choreographed light patterns.

Flood Lights

Programmable LED floodlights will be incorporated into the stage, awning posts and building facade.

Light Tape

Light tape is a relatively new product. Ultra-low-profile, light panels of energy efficient LED panels form an electroluminescent light which can also be programmed. It will be used in tight locations like around planters to make them glow and on the stage steps.



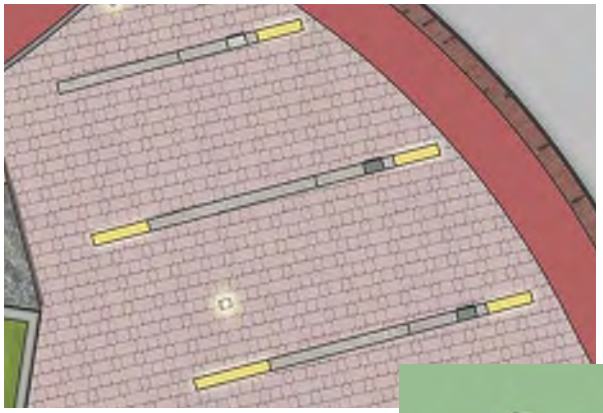
Lighting Plan

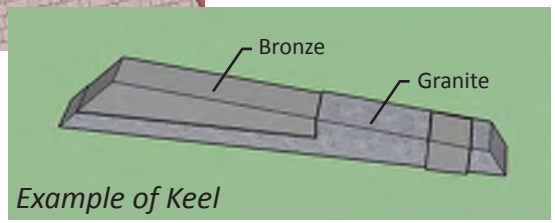
Sculptures

The plaza will be animated with several pieces of artwork. Some will be built as part of the construction and others are proposed as competition or commissioned pieces. To accommodate future sculptures, concrete bases should be included in the construction.

Keels

The keels represent the boating heritage and site of boat repairs in the age of tall ships. They serve to visually draw visitors into the site, reinforcing the linear circulation pattern. As gateways they also act as visual turnstyles. They will be constructed of concrete, clad in granite and bronze. Inscriptions will tell the stories and events of Market Slip.

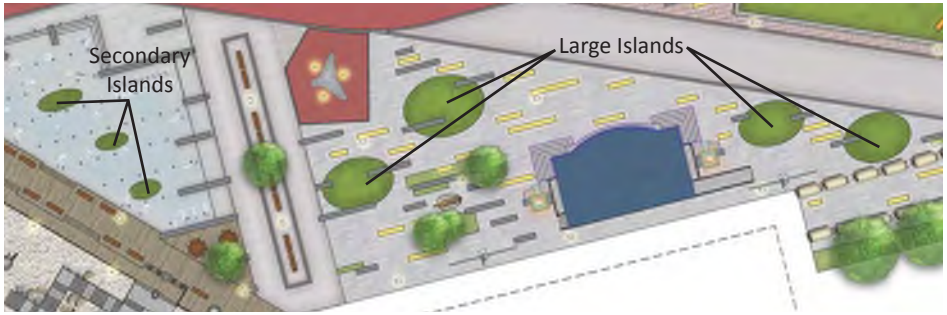


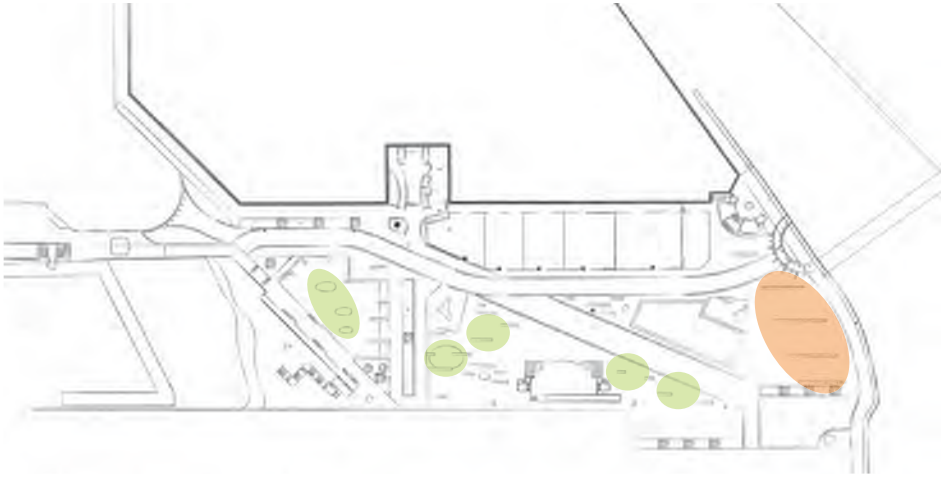


Example of Keel

Islands

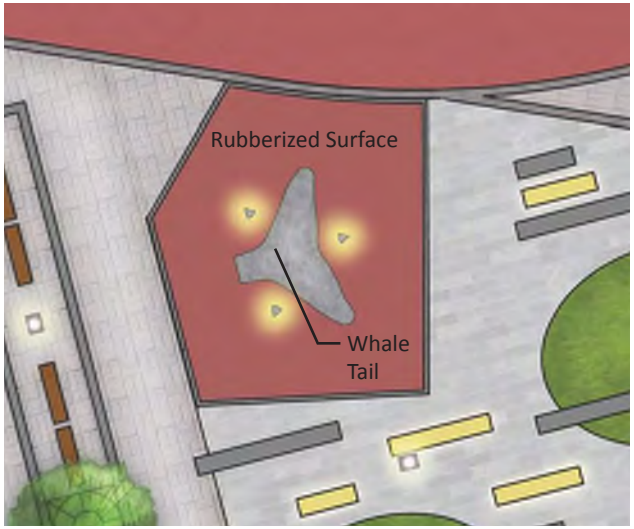
The Fundy Isles will be represented by oval islands of mounding turf. The islands will each represent one of the larger inhabited islands - Grand Manan Island, Campobello Island, Deer Island and White Head Island which will contain a reference stone with QR codes and/or interpretation. The smaller, green rubber islands in the fountain will represent notable smaller green islands like Partridge Island, Ste. Croix Island and Minister's Island.





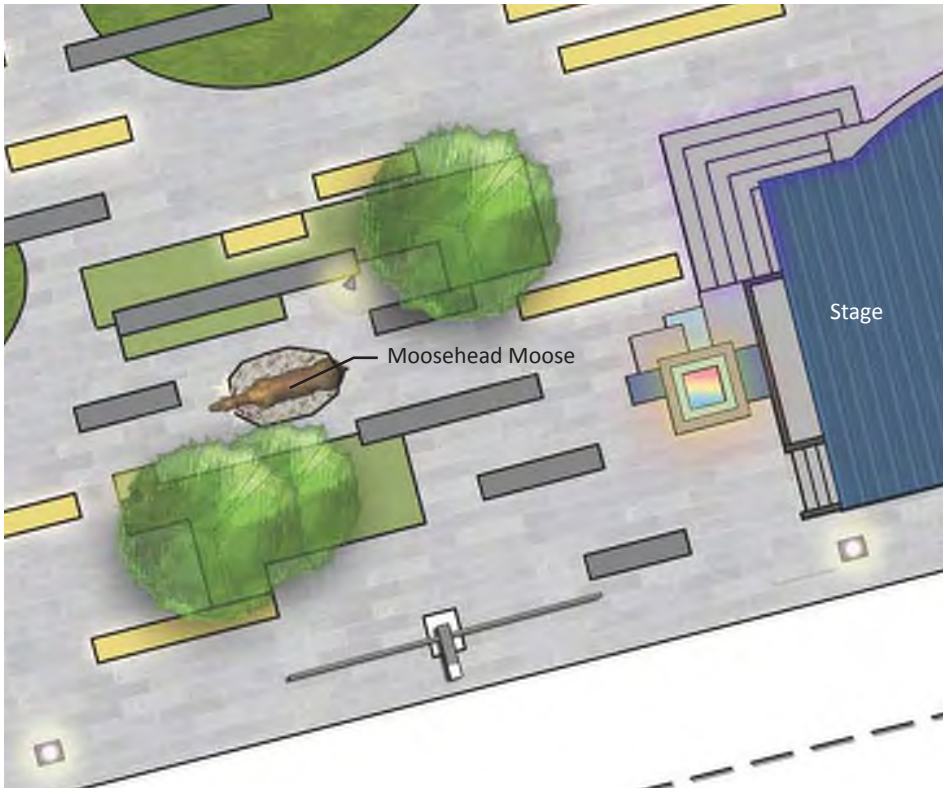
Whale's Tail

The Whale's Tail is located at a key location and serves to pivot visitors into Market Square or from Market Square to Harbour Passage. The tail will be formed from polyresin, fibreglass or sculpted from granite. A rubber safety surface will surround the Whale's Tail to minimize injury from uninvited climbers. Water will spill from the tail and be recirculated in the treatment command centre. The tail will be life size and 3m high.



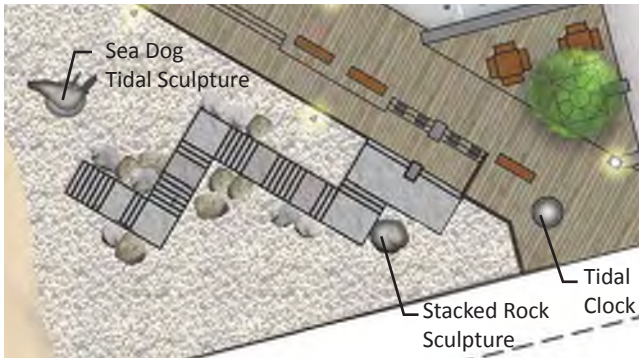
Moosehead Moose

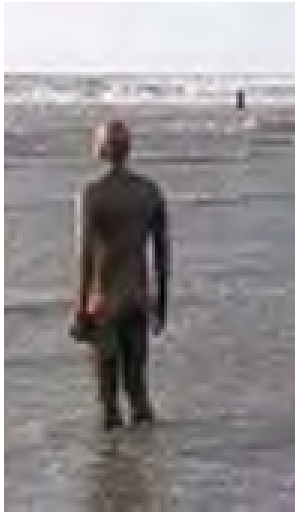
The moose will be relocated to a high profile area close to the stage. The landscaped setting will help buffer winds and focus views to the stage. Photo-ops will be incorporated into the setting.



Tidal Clock

The status of the tidal cycle will be communicated through several forms of static markers - like sculptures in the slip that get exposed or covered by tidal waters. A kinetic type of sculpture will be commissioned from a sculpture competition to portray the tidal clock.

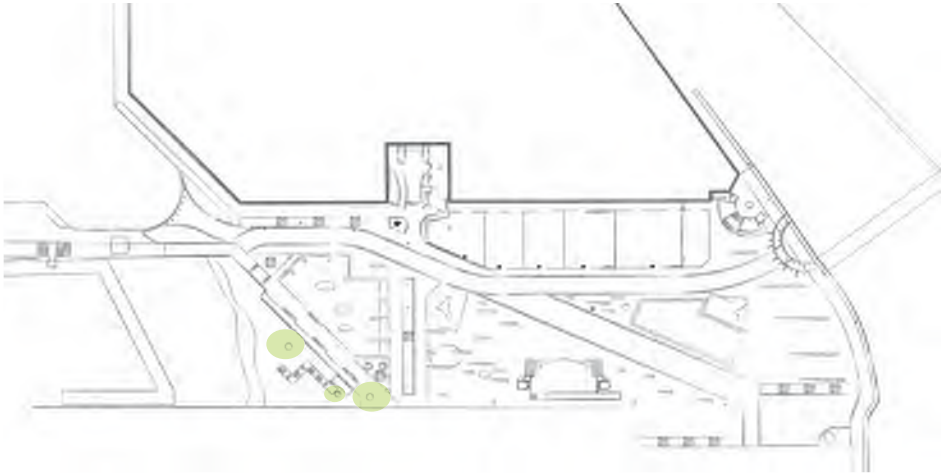




Examples of Tidal Sculptures

Sea Dog

A granite sculpture of a "sea dog" will serve as a tidal marker, with the snout to be set at mean high tide. Other forms of rock sculptures or stacking of rocks can provide interest and tidal markers.



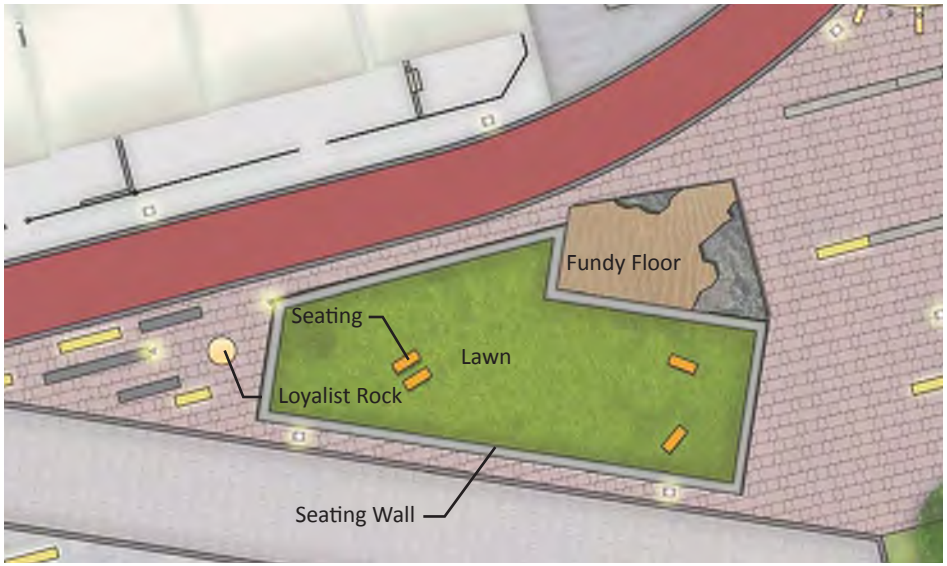
Stonehammer

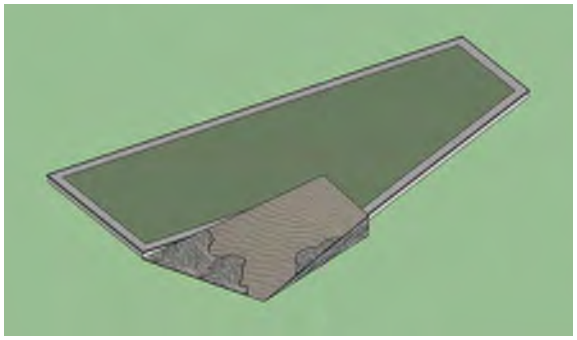
A sculpture is proposed outside the central door courtyard at Market Square to commemorate the Geopark designation and rich geological heritage of the region.

Market Square Entrance

Fundy Floor

A wedge shaped sculpture rising from the plaza will serve as a tactile representation of the Fundy Bay floor. This sculpture will be made of polyresin or textured granite. Children will be able to touch and climb on the interactive sculpture.



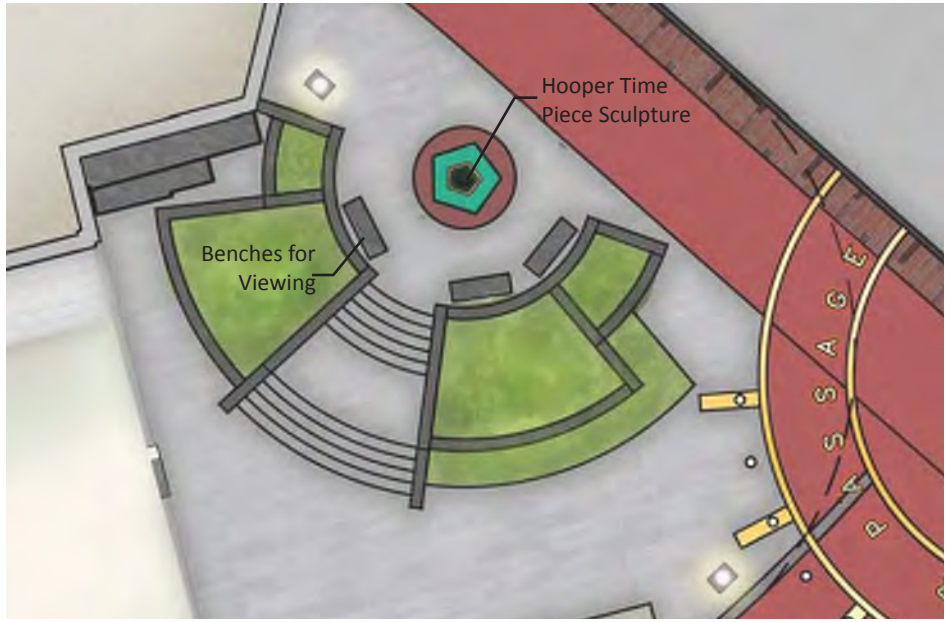


Trade Sculpture

A sculpture competition is recommended for the market stall area along Water Street. The theme should be based on "trade" between the original peoples of the area and the explorers from Europe. This would reflect the traditional use of this space for commerce and a talking point for interpretation of aboriginal culture in the harbour.

Hooper Time Piece

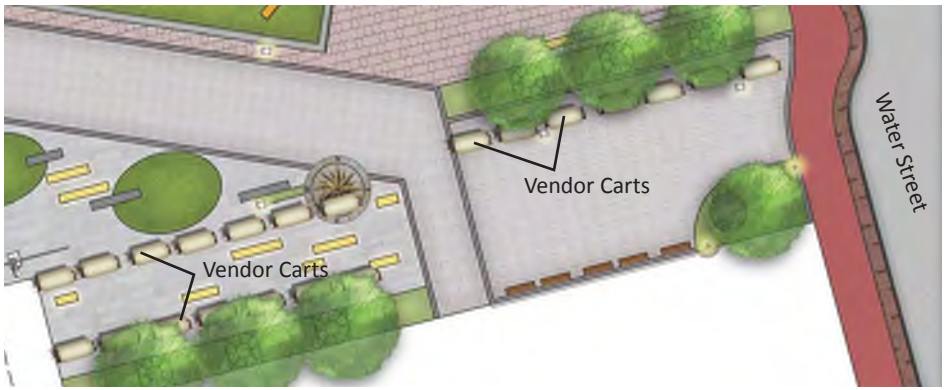
The Hooper sculpture "Time Piece" at the Water Street Entrance to Market Square needs more space to appreciate the intricate artwork. An expanded seating plaza with a newly configured planter and stairs is recommended.



Vendor Carts - Outdoor Market

The outdoor market is positioned closest to the sidewalk on Water Street. This is the traditional location for such activity going back to the days of tall ships and currently with cruise ship vendors. A 12 x 50m space will serve as a multi-functional location for vendors, tented events, gatherings and vehicle access to the performance stage. A large flag pole (24.4m, 80') with a 6 x 9m (20' x 30') Canadian Flag will serve as a beacon to the plaza and location for Canada celebrations. The outdoor market will include trees for shade and spatial definition. Electrical outlets at the base of trees will be available for vendor use. Concrete bases for anchoring temporary tents will be incorporated into the plaza pavers.

Vendors will be required to use a signature cart to display their wares. The carts will be portable with lock in place chains. Carts will have nautical detailing and finishes. A couple of "sloven" style carts are also recommended to reflect on the heritage of these low slung carts designed for ease of loading and unloading from boats.




Vendor Cart


Sloven Cart

Floating Cafe

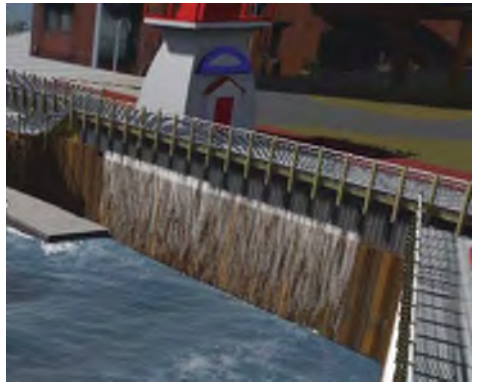
The floating cafes will be a purchased unit available through Alibaba - Sea Lake Water Amusement Park BBQ Donut Boat. Two model YH-2500 2.5m diameter to hold 6 people and two model YH-3200 3.2m diameter to hold 12 people. The units include a central BBQ and/or ice bucket, shade umbrella and built in advertising panels. Options include a small motor; however, these boats are not suitable for ocean or harbour currents. They can be equipped with LED mood lights for evening dining.

Crows Nest

A structural review of the proposed Crow's Nest, hydraulic lift lookout was deemed to be unfeasible at the boardwalk location. Should this feature still be desirable it can be relocated to the plaza proper.

Wharf Water Walls

The faces of the slip will have sheet waterfalls installed for ambience. These waterfalls will be designed to pump sea water from the harbor which will cascade in a curtain effect in front of the pilings. The system will be designed to accommodate salt water. The suction pipe will be designed to permit removal for maintenance and winterization.



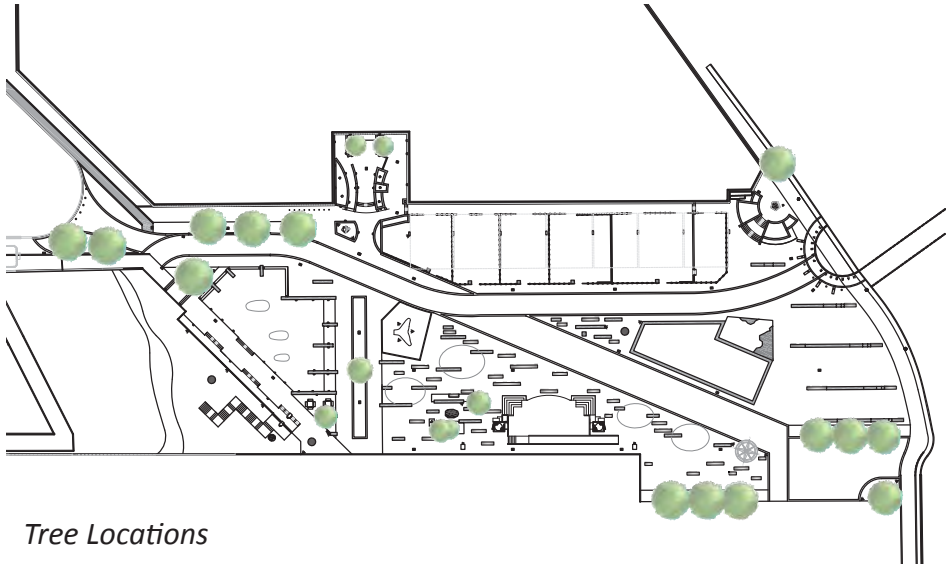
Distribution piping along the top of the sheet pile walls will create the waterfall effect. Optimal sizing and spacing of the perforations will be determined to achieve the desired effect. Each distribution pipe will be individually connected to the pump in order to achieve even distribution across the wall, while valves on each pipe will allow for balancing of the water flow to each pipe.

Tree Planting

The long term performance of the trees planned for the urban plaza will be enhanced by:

- Providing a minimum of 20m^3 of planting soil mix at min 1m depth
- Incorporating "structural soil" of 20mm clear granite (not limestone) compacted in 150mm layers
- Use of "silva cells" by Deeproot or equivalent for structural support, gas and water flow and to aid in stormwater retention
- Selection of species most adaptable to windy, urban, coastal environment ie. Japanese Silk Tree Lilac, Red Oak, Thornless Honeylocust, Linden
- Inclusion of two year maintenance contract and winter wrap protection for first three years
- Using root barrier for preventing lifting of pavement

Silva Cells



Tree Locations

Site Furnishings

Site furniture will augment the built-in casual seating offered by the longitudinal granite blocks, planters at sitting height and informal steps, landings and turf area. The furniture must be resistant to corrosion. As models are updated each year and new models introduced the selection of specific models should be done just prior to tendering. The following options should be considered.

EP 6463

EP 4951

Equiparc

EP 1950

EP 1975

EP 1910

EP 5950

EP 1951

EP 1911

EP 2950

EP 6934

Dumor

470

472-601

471-601

473-601

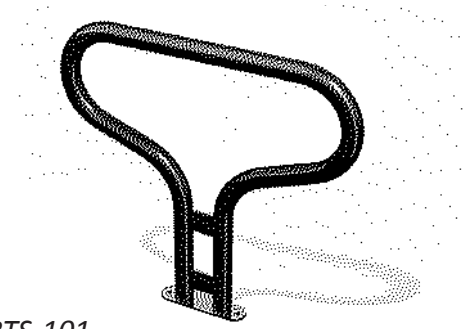
475-601

Victor Stanley

BIST-30R & BIST-36R

FB-314

LIL-23



BRTS-101

W-89

Maglin

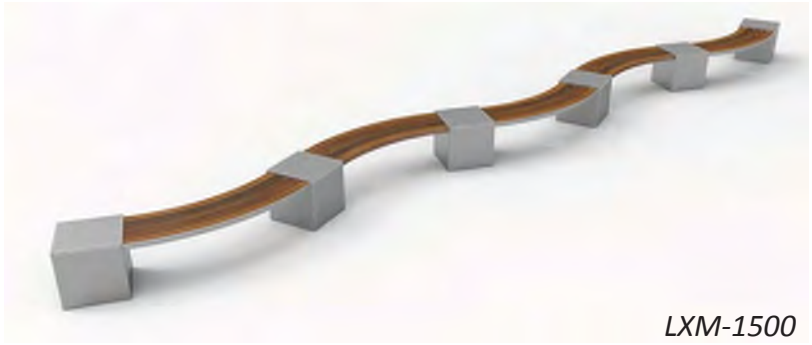

MCL-720


FRC-1700


MLB-872B


MTB-650


MLWR-650-32


LXM-1500

4.0 Services

The existing services encountered in the plaza are in a good state of repair. A copy of the "Pipe Report" generated by CBCL is appended. A closed circuit television camera was pulled through the existing pipes to video the pipe conditions. Manhole covers and catch basin grates were removed, where possible, to allow a visual inspection of the structures. The existing system, although lower in elevation than necessary, can be reused to significantly reduce costs.

An existing 900 mm diameter storm sewer runs along the service road and outfalls at elevation +/- 1.91m at the boardwalk stairs. The outfall will have to be extended beyond the proposed tunnel to daylight at elevation +/- 1.63m. This extension should be sized at 1050mm diameter to handle additional flow and storage. The system currently surcharges during high tide and prevented running the video camera through parts of the system. A check valve (backflow preventer) such as Tideflex valve should be considered; however, during a heavy rainfall event at high tide the check valve would add a headloss for the storm drainage. More detailed design considerations should be reviewed at the next stage of design.

Another potential issue is the need to extend the storm outflow under the tunnel. City Engineers may require special detailing to allow for this pipe being under a building structure, making access difficult.

Fire Hydrants

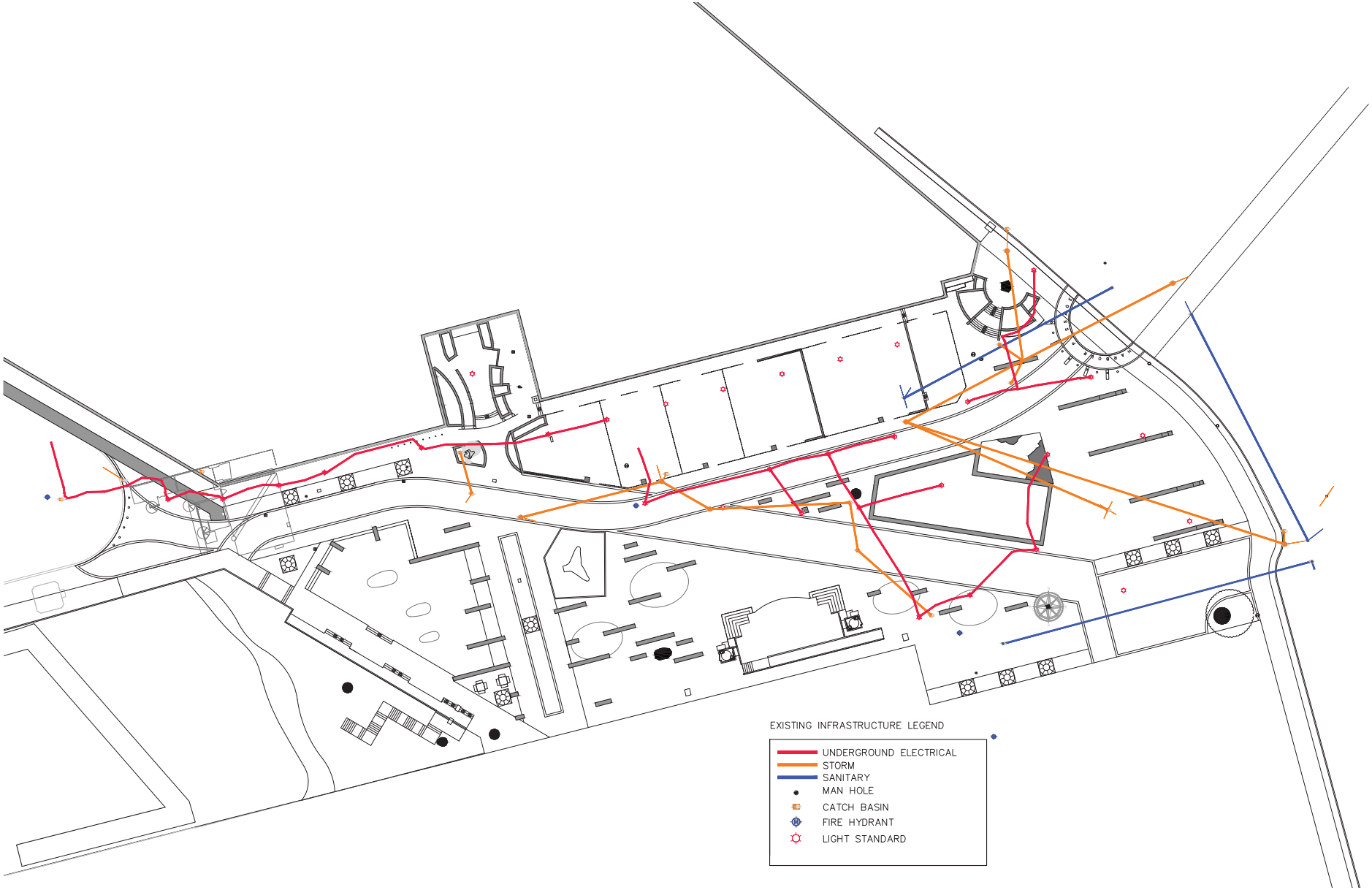
One of the two existing fire hydrants will have to be relocated and the adjustments made to the height of the other one to suit new grades. Consideration for period style fixtures such as Mueller Centurion should be considered.

Manhole Covers

The manholes present an opportunity to include an artistic expression from a casting such as the fish images shown on the accompanying photograph.

Hose Bibs

In order to clean the site, maintain vegetation and for winter events like ice sculptures, hose bibs will be required on the washrooms buildings.



Existing Infrastructure Plan

Tidal Impact

The tidal chart elevations and geodetic elevations are not the same scale of units, leading to confusion for most people. The Geodetic Datum for Mean Sea Level is actually 4.18m above the U.0m used for sea level on nautical charts. Consequently, 4.18m must be subtracted from the NHB Datum LWOST or Chart Datum. Therefore Extreme High Water is 4.96m Geodetic, Mean Tide High Water is 3.41m. Geodetic, Mean Water Level 0.2m Geodetic, Mean Tide Low Water Level -3.08 and Extreme Low Tide -4.58m Geodetic.

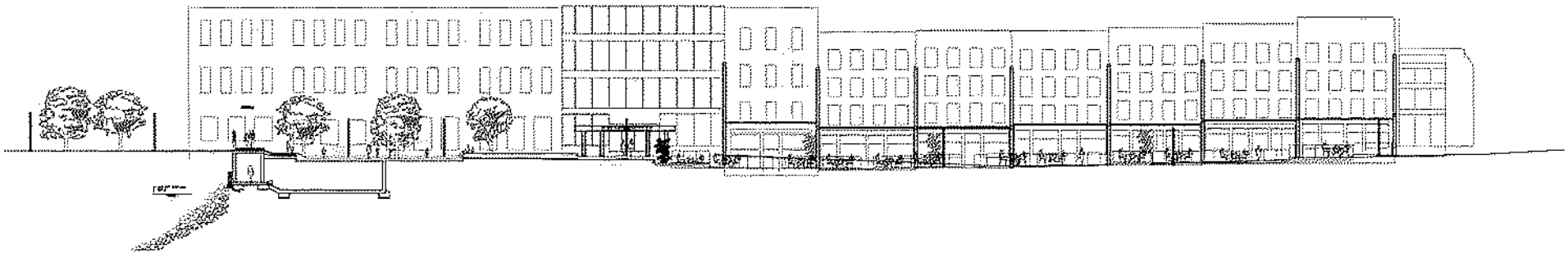
The Seadog sculpture will serve as a visual marker within the tidal range. As the tides vary in range by 6.49m on average and 9.54m on extreme events the position of the seadog will simply indicate approximate tidal position. The seadogs nose will be set at elevation 2.5m Geodetic.

A tidal chart along the wharf face in NHB Datum LWOST or Chart Datum is recommended.

Drainage & Site Grading

The plaza will slope gradually from Water Street to a low point before the splash pad and rise back up to the deck over the pedestrian tunnel. The sidewalk along Water Street and the Boardwalk over the tunnel will be at approximately the same elevation 7.0m on average. The plaza will form a shallow bowl shape. A network of existing and proposed catch basins will collect the stormwater and deposit into the slip under the tunnel near the stairs in the existing boardwalk.

Grades along the building will follow the finish floor elevations to offer accessible doorways. The grade along the Old Coast Guard site will need to be raised from 1.5m along the property at the tunnel and 0.5m behind the stage. The grades at the vendors market will tie into the existing grades flush.



Cross Section From Market Slip to Water Street

5.0 Next Steps

1. Adopt the Preliminary Design report.
2. Conduct the conceptual design for architectural projection and lighting design sequencing.
3. Conduct further bore holes within the slip to inform the structural design of the proposed tunnel.
4. Review performance areas with input from event planning specialist and performers.
5. Prepare tender documents, possibly for phased construction.
6. Prepare the following reports:
    - Phase II ESA
    - Remedial Action Plan
    - Erosion and Sedimentation Control Plan
    - Code Compliance Review
    - Storm Water Management Plan
7. Prepare Pre-Tender Construction Estimate.
8. Tender and Award.
9. Contract Management including full time supervision.

Appendix

Geotechnical Report

GEOTECHNICAL INVESTIGATION REPORT:

GEOTECHNICAL INVESTIGATION
LOYALIST PLAZA
SAINT JOHN,
NEW BRUNSWICK

Prepared for:

Dan Glenn
Glenn Group Landscape
Architects & Park Planners
248 Brunswick Street
Fredericton, NB
E3B 1G9

January 2016

Prepared by:

Fundy Engineering
27 Wellington Row
Saint John, NB
E2L 4S1
www.fundyeng.com

Project No: 11615

EXECUTIVE SUMMARY

Fundy Engineering & Consulting Ltd. (Fundy Engineering) was contracted by Glenn Group Landscape Architects & Park Planners (Glenn Group) to complete a geotechnical investigation at the property that is known as *"Loyalist Plaza"* adjacent to Market Square in Saint John, New Brunswick. Loyalist Plaza was developed by filling Market Slip with sand and gravel. The purpose of this geotechnical investigation was to identify the soils and bedrock within the area of a proposed plaza development, determine the properties of the soils and bedrock, and to provide earthwork recommendations for the construction of various proposed structures.

Our understanding is that the Loyalist Plaza Development will include structures including: canopy supports, light standards, and an underground tunnel. In addition to these structures various walkways, curbs, sidewalks and statues will be included in the final design, although this design has not been finalized at the time of this report.

The geotechnical investigation consisted of six (6) boreholes distributed throughout the properties that make up the Loyalist Plaza. A trailer mounted drill supplied and operated by Knoftell Drilling was used to complete the boreholes. The boreholes were extended through the overburden material until to refusal was encountered. Bedrock was encountered in some, but not all, boreholes during the geotechnical investigation.

Soils encountered in this geotechnical investigation can generally be described as an Asphalt, Paving Stones or Concrete over Loose to Compact Brown Sand and Gravel FILL over BEDROCK. Water was encountered at various depths. More information regarding soils bedrock and water levels can be found in the borehole logs attached in Appendix III.

The following recommendations may be used for the earthwork in the construction of a new structures and landscaping:

- Remove topsoil, brick, asphalt, retaining structures, etc. prior to construction of elements included in the proposed development.
- Footings may be founded on insitu Brown Sand and Gravel FILL with a bearing capacity for design of 150kPa.
- The foundation design for the proposed tunnel should incorporate a system to anchor the tunnel in to the bedrock.
- Groundwater levels should be more closely studied to determine exact levels as they are related to the tides in the Saint John Harbour prior to final design.
- Pedestrian areas, parking areas and roadways may be constructed with the recommended cross section over the insitu Brown Sand and Gravel FILL.
- All engineered Fills placed should be inspected on-site by a Geotechnical Engineer.
- Additional geotechnical investigation work is recommended prior to final design and release of the project for construction.
- It is our understanding that multiple surfaces will be used for this development and those have not been finalized at the time of this report. We recommend that once final design choices have been made that we provide final design recommendations relating to design of subgrades for surface treatments.

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1.0 INTRODUCTION

Fundy Engineering & Consulting Ltd. (Fundy Engineering) was contracted by Glenn Group Landscape Architects & Park Planners (Glenn Group) to complete a geotechnical investigation at the property that is known as *"Loyalist Plaza"* adjacent to Market Square in Saint John, New Brunswick.

The purpose of this geotechnical investigation was to identify the soils and bedrock within the area of a proposed plaza development, determine the properties of the soils and bedrock, and to provide earthwork recommendations for the construction of various proposed structures.

The geotechnical investigation consisted of six (6) distributed throughout the property. A trailer mount drill supplied and operated by Knoftell Drilling was used to put down the boreholes. The boreholes were extended through the overburden material until to refusal was encountered. Bedrock was encountered in some boreholes during the geotechnical investigation.

1.1 Scope of Work Completed

This following scope of work was performed by Fundy Engineering as part of our geotechnical investigation:

- Six (6) geotechnical boreholes;
- Identification of soils and bedrock encountered within boreholes and
- Geotechnical report with findings and recommendations pertaining to the earthwork in the construction of a new structure.

1.2 Limitations

The observations made and facts presented in this report are based on the geotechnical investigation completed in November 2015. While every effort has been made to comprehensively catalogue geotechnical concerns pertaining to the site at Loyalist Plaza in Saint John, NB, discovery or development of other geotechnical problems cannot be precluded. Further investigation may reveal additional information that may have some bearing on the recommendations included herein. Should such information be revealed, Fundy Engineering should be notified in a timely fashion so that any required amendments to our recommendations can be made.

These results are reported confidentially to the client, who is advised to take appropriate action to rectify any areas of concern. No professional responsibility is assumed for the use or interpretation of these findings by others.

2.0 SITE DESCRIPTION

2.1 Area of Interest

The existing area is a public open space with hard and soft landscaping occupied by various structures, including three beach volleyball courts, a stage, restaurant patios and other sculptures, statues, wooden retaining walls, etc. The proposed development is located to the south of Market Square.

2.2 Location and Property Ownership

The subject property is the location of Loyalist Plaza on Market Wharf Street in Saint John, NB. This plaza's footprint is made up of five (5) separate PID numbers (Figure 1). The properties are identified by Service New Brunswick as PID numbers 55006878, 55027809, 00018614, 55042618, and 55006886. The registered owners of the various PIDs are:

Table 1 - Property Ownership

PID	Owner
55006878	City of Saint John
55027809	City of Saint John
00018614	City of Saint John
55042618	City of Saint John
55006886	City of Saint John

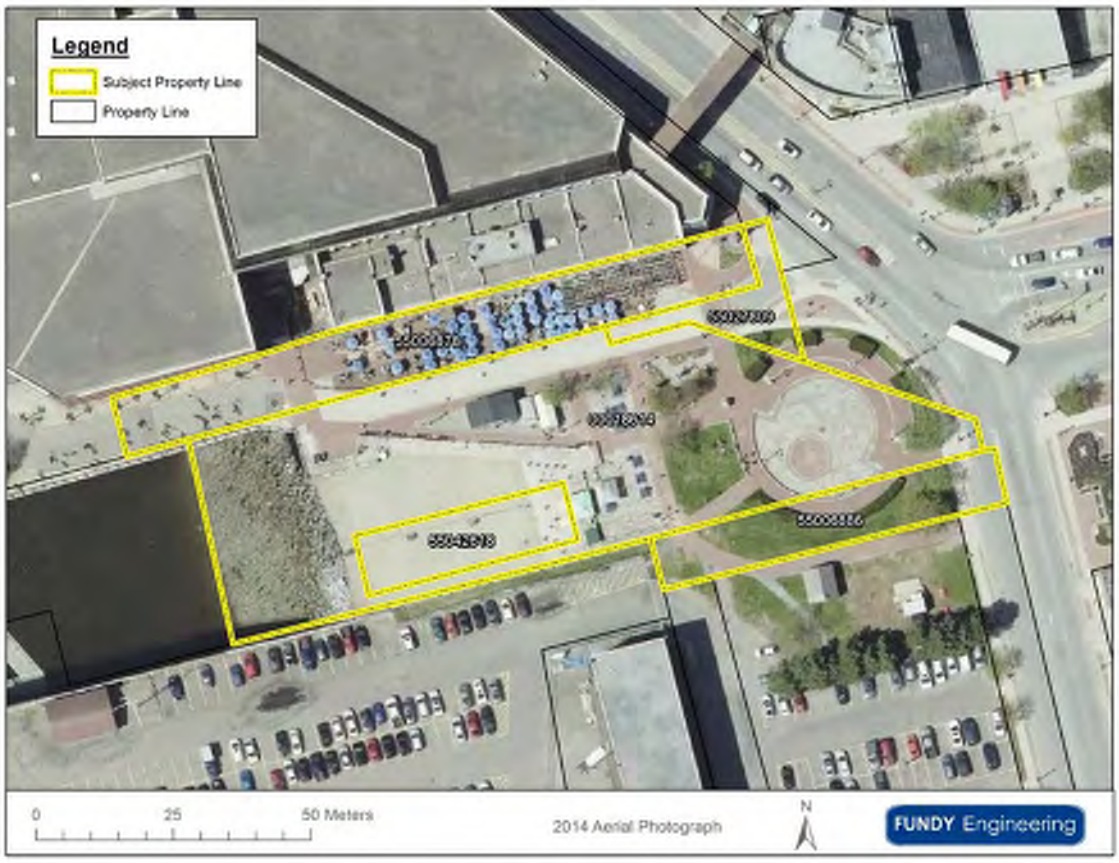


Figure 1 - Property Boundaries and PIDs

2.3 General Description of Proposed Design and Geotechnical Considerations

Our understanding is that the Loyalist Plaza Development will include various structures including: patio canopy supports, light standards, walkways, curbs, sidewalks, statues, a new stage, a sea wall and an underground tunnel. The canopy structures are intended to shelter the market square restaurant patios and potentially extend their season. The light standards, walkways, curbs and sidewalks will be reconfigured and refurbished. Existing statues will be reestablished elsewhere on the site and new statues will be added to the space. The existing stage will be removed and a new stage structure will be constructed that will increase the capacity and usefulness of the performance area. The site will be extended westward and an underground pedestrian tunnel will be constructed at the new seawall. Land which is currently within the intertidal and sub tidal zone of the Saint John Harbour will be reclaimed and an embankment will be constructed to support and protect the new plaza.

2.4 Tides and Water Level Fluctuations

The Bay of Fundy experiences the World's highest tides. The semi-diurnal tides, on a cycle of about 12.42 hours, are generally in the range of 6.49 m. The tides within the Bay of Fundy vary based on tidal constituent (*e.g.*, moon and sun gravitational effects, bathymetry, weather, *etc.*). Tidal levels have been measured within Saint John Habour since May 1896. As illustrated in Figure 2, the mean water level within the Harbour is 4.38 m (n = 797 405) above chart datum

and the mean tidal range is 6.49 m. The extreme high water level measured at Saint John was 9.14 m above chart datum, which has occurred twice since 1896; on 2 February 1976 (*i.e.*, the *Groundhog Day Gale*) and on 10 January 1997. Conversely, the extreme low water level was 0.40 m below chart datum and occurred on 26 January 1944.

Figure 2 – Historic Tidal levels for Saint John Harbour, New Brunswick.

Any structures or embankments that are constructed within the elevation zone outlined in Figure 2 or below must consider the local environment's fluctuating water level in the design. Not considering this environmental aspect would result in erosion of embankments, upward displacement of structures and water infiltration into below ground level interior spaces.

3.0 SITE WORK COMPLETED

3.1 Borehole Investigation

The purpose of the borehole investigation was to assess the underlying soils and bedrock in the Plaza area to the south of Market Square in order to provide recommendations for the earthwork required in the construction of various new structures.

On November 25th and 26th, 2015 , six (6) geotechnical boreholes were put down to obtain such information via a trailer mounted drill provided by Knoftell Drilling under the direction of Fundy Engineering. Samples of the overburden soils were obtained using a split spoon sampler. Bedrock samples were not taken. Bedrock was inferred by refusal to penetration of the split spoon sampler.

3.2 Soils Encountered

Soils encountered in this geotechnical investigation can generally be described as a Loose to Dense Brown Sand and Gravel that overlays a Very Stiff to Hard Reddish Brown Clay and Sand Till with Some Gravel. Further details of the soils encountered in the geotechnical investigation can be found in the borehole logs that are appended to this report (see Appendix III).

3.3 Bedrock

Bedrock was encountered in Boreholes 1 through 4 and 6 at depths ranging from four (4) to six point six (6.6) metres below the ground surface.

3.4 Groundwater Encountered

Groundwater was encountered during the geotechnical investigation. It is likely that the elevation of the groundwater will be dependent on the elevation of the tide in the Bay of Fundy.

Ongoing monitoring of the groundwater level over time was not part of the scope of work for this project.

4.0 RECOMMENDATIONS

Based on our observations made in the field recommendations have been developed for the various structures that are proposed for the development. At the time of this report the design of foundations was not known to us. Some assumptions have been made based on the underground conditions and architectural renderings.

4.1 Site Preparation

With any development in the area of the investigation, it is recommended that the brick, asphalt and topsoil be removed. In addition, the Sand on the surface of the volleyball courts should be removed. Any wooden decks and retaining walls should be demolished and any 'hard' landscaping (i.e. curb and sidewalk) should be removed. At a minimum the excavation to prepare the site should extend to the Brown Sand and Gravel FILL elevation or other competent material.

4.2 Shallow Foundations

Based observations made in the field, the recommended shallow foundation design for the various structures is a combination of strip footings for large structures and spread footings for statues and awning support foundations.

Footings may be founded on the Brown Sand and Gravel FILL layer. Prior to placement of footings the area should be inspected by a Geotechnical Engineer as additional soil improvements may be required based on actual site conditions. The insitu or imported engineered FILL should be compacted to a minimum of 95% of its modified proctor density at the underside of footing grade.

Any surface water should be directed away from the excavated areas to prevent any disturbance or softening of the FILL. Traffic should also be minimized in the building footprint as building grade is approached to prevent the mobilization of the finer soil particles to the surface.

If additional material is required to bring the building footings or slabs up to grade, it should be done so using a Structural Fill. Structural Fill should consist of an approved material which is free from organics and deleterious materials, such as a pit run or other approved inorganic soil similar to NBDOT "Pit Run Gravel Subbase" (Table 2).

Table 2 - NBDOT Table 201-4, "Grading Limits - Pit Run Gravel"

ASTM Sieve Size (mm)	% Passing
125	100
100	95-100
75	82-100
50	62-100
37.5	52-100
19	30-90
9.5	22-79
4.75	16-66
2.36	12-55
1.18	9-44
0.30	4-25
0.075	0-7

All structural Fill placed within the foundation zone of influence should be placed and compacted in lifts to 95% of its Modified Proctor density. The lift thickness must be compatible with the compaction equipment used. A maximum lift thickness of 300mm is recommended for structural Fill material placed under the building.

It is recommended that removal of all unsuitable materials and the placement of structural Fills be monitored continuously by a Geotechnical Engineer.

For Limit States Design, it is recommended that the footings be proportioned for a bearing pressure at serviceability limit states of 150 kPa. A factored geotechnical resistance of 200 kPa is recommended for ultimate limit states.

Total and differential settlements under the proposed loading will be less than 25 mm and 15 mm, respectively.

The building pads (*i.e.*, structural Fills used to bring site up to grade), where required, must be constructed with a minimum slope of 1:1 from the edge of the pad to the insitu bearing soils. The 1:1 slope should be protected with compacted materials having a slope no steeper 2:1. The minimum distance from the edge of the engineered pad to the edge of the footing should be 1.0m.

All footings should have a minimum of 1.5 m of soil cover or equivalent in insulation for frost protection.

Per Table 4.1.8.4.A of the National Building Code of Canada (2005) the site is classified as a Class "C" for seismic response.

Perimeter drains (Drain tile), if required, should be installed at the footing elevation and should be connected to an outlet which drains by gravity.

Exterior backfilling of the foundations should be carried out with free draining structural Fill or subbase (Table 2) and compacted to 90% of its Modified Proctor value. Any particles larger than 100mm shall not be placed within 300mm of the foundation walls.

If construction is completed during freezing conditions refer to Appendix IV, "Geotechnical Guidelines/Recommendations for Winter Construction" for details on winter construction recommendations.

4.3 Sea Wall

The design incorporates some additional square footage west of the existing plaza within the intertidal and sub tidal zones. Therefore a new sea wall constructed of a combination of a sheet pile wall and a rock embankment will be required to support the pedestrian tunnel and the new reclaimed land.

At this time the final location of the tunnel and its elevation is not known, therefore a final sheet pile or embankment design cannot be completed.

The sheet pile wall structure will likely require a system of tie backs and whalers to anchor the sheet pile to the soils behind it. The sheet pile anchors should extend such that they can pass below the tunnel bottom and not interfere with any anchor piles incorporated in to the tunnel foundation design (see section 4.4 Pedestrian Tunnel).

The fluctuation of the water level and the salt content of the water will require that cathodic protection of the sheet pile be included in the final design. Tie back rods will require corrosion protection. Anchors may consist of concrete blocks.

An embankment structure can be constructed similar to a breakwater with a relatively small clear stone core and larger armour stone making up the outer layer of the embankment. Care should be taken to select materials that will not be susceptible to erosion. Therefore large large armour stone such as an R-100 or possibly larger armour stone outlined in NBDTI Table 608-1 "Random Riprap Grading Limits" is recommended. Further investigation is recommended prior to final material selection.

4.4 Pedestrian Tunnel

It is our understanding that the base of the tunnel will be set at an elevation below the high tide mark (i.e. within the tidal zone outlined in Figure 2). Therefore it is recommended that the pedestrian tunnel be founded on pipe piles. The pipe piles should be fastened to the bedrock with rock anchors drilled in to bedrock through the bottom of the foundation pipe piles. They will serve the dual purpose of preventing upward displacement and supporting the tunnel structure from settlement. Anchor design can be provided when foundation and uplift details have been determined. For preliminary design 300 to 500mm pipe piles with a driver shoe are recommended. Piles should be concrete filled.

Waterproofing of foundation walls to prevent movement of water into occupied spaces is recommended.

4.5 Material Reuse

Any insitu Sand and Gravel FILL removed from the site has some reuse potential. Due to the fine material content, this material should be tested by a geotechnical engineering company prior to reuse.

4.6 Non-Building Areas

It is recommended that pedestrian areas, parking areas and roadways be constructed using crushed rock base and subbase meeting the NBDOT specifications for particle size distributions (ASTM C136 and C117) outlined in Tables 201-2 *("Grading Limits – Crushed Rock Base/Subbase"),* or 201-5 *("Grading Limits – Crushed Rock Sandstone Subbase").*, which are outlined below in Table 3.

On-site materials may not be reused in roadway or parking areas as base or sub-base.

It is recommended that the roadway/entrances consist of 450mm of Crushed Rock Subbase and 150mm of Crushed Rock Base.

It is recommended that the pedestrian areas and parking area consist of 300 mm of Crushed Rock Subbase and 100mm of Crushed Rock Base.

Subbase and Base materials should be placed in lifts not exceeding 300 mm (12 inches) or appropriate for the compaction equipment used to achieve compaction to 95% of its Modified Proctor Value.

Crushed Rock Base shall have a minimum of 40% of particles by, mass with at least one fractured face, when tested to ASTM D5821.

Table 3 - NBDTI Table 201-2 "Grading Limits - Crushed Rock Base/Subbase"

ASTM Sieve Size (mm)	Aggregate Base		Aggregate Subbase	
	25mm % passing	31.5mm % passing	50mm % passing	75mm % passing
90.0				100
75.0				95-100
63.0			100	85-100
50.0			95-100	73-95
37.5		100	76-100	58-87
31.5	100	95-100		
25.0	95-100	81-100	60-84	
19.0	71-100	66-90	50-76	35-69
12.5	56-82	50-77		
9.50	47-74	41-70	32-61	25-54
4.75	31-59	27-54	21-49	17-43
2.36	21-46	17-43	15-40	12-35

ASTM Sieve Size (mm)	Aggregate Base		Aggregate Subbase	
	25mm % passing	31.5mm % passing	50mm % passing	75mm % passing
1.18	13-34	11-32	10-32	8-28
0.300	5-18	4-19	4-18	4-16
0.075	0-8	0-8	0-9	0-9

Pedestrian sidewalks and entrances should be placed on a crushed rock/gravel base material which will drain in a positive manner and be compacted to 90% of its Modified Proctor value.

4.7 Recommended Additional Geotechnical Investigation

Fundy Engineering's geotechnical field investigation was limited to land based boreholes that did not permanently damage the current plaza structures or wooden retaining structures. The information gathered should only be considered reliable within the current plaza footprint excluding the beach volleyball area.

It is our understanding that the pedestrian tunnel and new sea wall will be constructed in an area within the existing intertidal zone and can only be accessed by water for a geotechnical investigation. Therefore, a water based investigation of the tunnel and sea wall area is recommended to collect information on overburden soils and bedrock prior to the project being released for construction. This will allow for geotechnical recommendations and design of sheet pile, anchor piles and the required embankment soils.

Boreholes also are recommended within the beach volleyball area as it occupies a large percentage of the proposed project footprint and should be investigated to confirm the recommendations contained within this report.

5.0 CONCLUSIONS AND CLOSING REMARKS

The following recommendations may be used for the earthwork in the construction of a new structures and landscaping:

- Remove topsoil, brick, asphalt, retaining structures, etc. prior to construction of elements included in the proposed development.
- Footings may be founded on insitu Brown Sand and Gravel FILL with a bearing capacity for design of 150kPa.
- The foundation design for the proposed tunnel should incorporate a system to anchor the tunnel in to the bedrock.
- Groundwater levels should be more closely studied to determine exact levels as they are related to the tides in the Saint John Harbour prior to final design.
- Pedestrian areas, parking areas and roadways may be constructed with the recommended cross section over the insitu Brown Sand and Gravel FILL.
- All engineered Fills placed should be inspected on-site by a Geotechnical Engineer.
- Additional geotechnical investigation work is recommended prior to final design and release of the project for construction.
- It is our understanding that multiple surfaces will be used for this development and those have not been finalized at the time of this report. We recommend that once final design choices have been made that we provide final design recommendations relating to design of subgrades for surface treatments.

Should additions or changes to the new construction be proposed, it is recommended that additional geotechnical recommendations be provided and, if required, additional field work be completed specific to those plans.

We trust the information herein is sufficient to meet your present needs. Should you have any questions or require further clarification, please feel free to contact the undersigned at your earliest convenience by email at al.mouland@fundyeng.com or by phone at 506.635-1566.

Sincerely,
Fundy Engineering & Consulting Ltd.

Mr. Alex Mouland, P.Eng., PMP

APPENDIX I

DRAWINGS

Legend

- Subject Property Line
- Property Line
- Borehole

Project Title: Geotechnical Investigation Loyalist Plaza, Saint John, NB		FUNDY Engineering *Serving Our Clients' Needs First*
Drawing Title: Borehole Location Plan (2014 Aerial Photograph)		Job No: 15-11615
Drawn By: SL	Checked By: AM	Date: JAN 5, 2015
		Figure:

APPENDIX II

SYMBOLS AND TERMS

FUNDY ENGINEERING SYMBOLS AND TERMS
Borehole, Test Pit, and Monitoring Well Logs

SOIL DESCRIPTION

Behavioural properties (i.e. plasticity, permeability) take precedence over particle gradation in describing soils.

Terminology describing soil structure:

Desiccated.....having visible signs of weathering by oxidization of clay minerals, shrinkage cracks, etc.
Fissured..... having cracks, and hence a blocky structure
Varved.....composed of regular alternating layers of silt and clay
Stratified.....composed of alternating layers of different soil types, e.g. silt and sand or silt and clay
Well Graded.....having wide range in grain sizes and substantial amounts of all intermediate particle sizes
Uniformly Graded.....predominantly of one grain size

Terminology used for describing soil strata based upon the proportion of individual particle sizes present:

Trace, or occasional.....less than 10%
Some.....10-20%
Adjective (e.g. silty or sandy).....20-35%
And (e.g. silt or sand.....35-50%

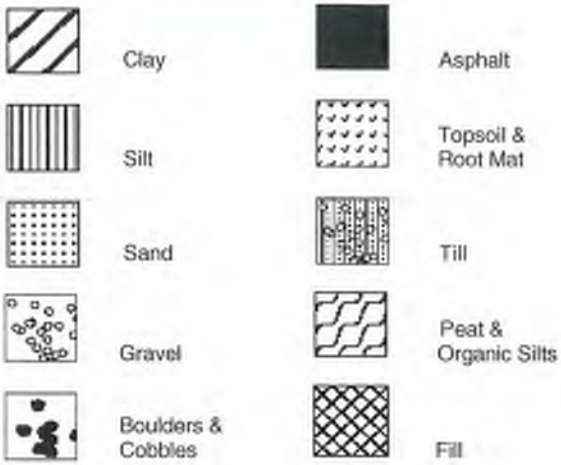
The standard terminology to describe cohesionless soils includes the relative density, as determined by laboratory test or by the Standard Penetration Test 'N' - value: the number of blows of 140 pound (64kg) hammer falling 30 inches (50.8mm) O.D. split spoon sampler one foot (305mm) into the soil.

RELATIVE DENSITY	N' VALUE	RELATIVE DENSITY %
Very Loose	<4	<15
Loose	4-10	15-35
Compact	10-30	35-65
Dense	30-50	65-85
Very Dense	>50	>85

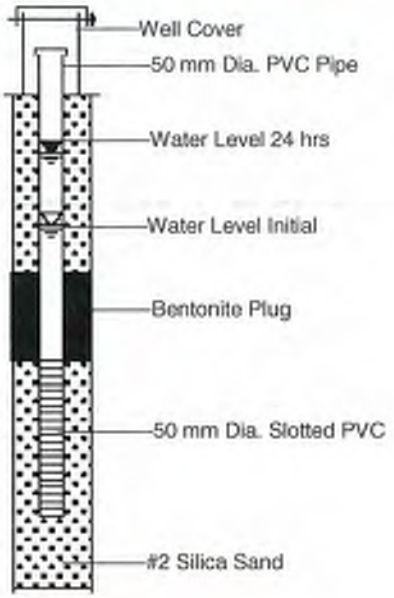
The standard terminology to describe cohesive soils includes the consistency, which is based on undrained shear strength as measured by insitu vane tests, penetrometer test, unconfined compression tests, or occasionally by standard penetration tests.

CONSISTENCY	UNDRAINED SHEAR STRENGTH		'N' VALUE
	kips/sq.ft.	kPa	
Very Soft	<0.25	<12.5	<2
Soft	0.25-0.5	12.5-25	2-4
Firm	0.5-1.0	25-50	4-8
Stiff	1.0-2.0	50-100	8-15
Very Stiff	2.0-4.0	100-200	15-30
Hard	>4.0	>200	>30

SOILS GRAPHIC LEGEND

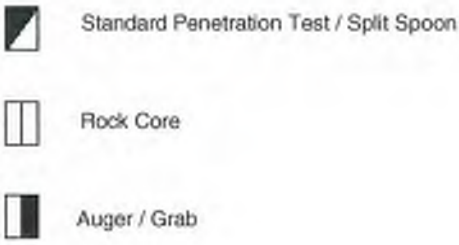


MONITORING WELL SCHEMATIC



BEDROCK GRAPHIC LEGEND

SAMPLER SYMBOLS



LABORATORY TESTS

MC	Moisture Content	P	Field Permeability	CD	Consolidation Drained Triaxial
SG	Specific Gravity	PF	Permeability Falling Head	CU	Consolidation Undrained Triaxial
HA	Hydrometer Analysis	PC	Permeability Constant Head	UU	Unconsolidated Undrained Triaxial
SA	Sieve Analysis	PR	Proctor	DS	Direct Shear

BEDROCK DESCRIPTION

The description of bedrock is based on the rock quality designation (RQD).

The classification is based on a modified core recovery percentage in which all pieces of sound core over 100mm long are expressed as a percentage of total recovery. The small pieces are considered to be due to close shearing, jointing, faulting, or weathering in the rock mass and are not counted. In most cases RQD is measured on NXL core.

RQD	ROCK QUALITY
90-100	Excellent, intact, very sound
75-90	Good, massive, moderately jointed or sound
50-75	Fair, blocky and seamy, fractured
25-50	Poor, shattered and very seamy or blocky, severely fractured
0-25	Very poor, crushed, very severely fractured

APPENDIX III

BOREHOLE LOGS

FUNDY Engineering

BOREHOLE LOG No. BH1

PROJECT: Loyalist Plaza **PROJECT NO.:** 11615

CLIENT: Glenn Group

PROJECT LOCATION: Market Sq. **ELEVATION:** 5.83 NAD83 CSRS

DRILLING CONTRACTOR: Noftell Drilling

LOGGED BY: AM **CHECKED BY:** GM

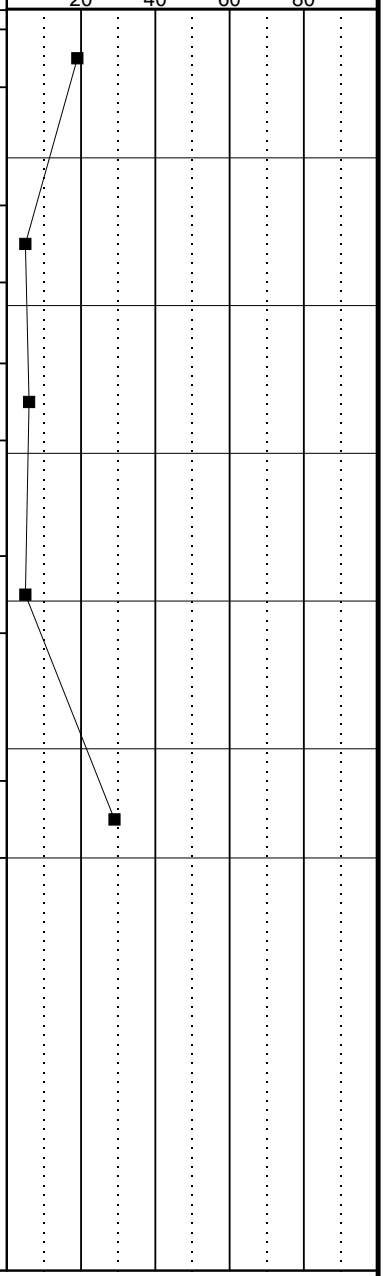
DRILLING METHOD: Standard Auger **DATE:** Nov 25

DEPTH TO - WATER> INITIAL: ▽ 4.57m **AFTER 24 HOURS:** ▽ **CAVING>** C

Depth (meters)	Depth (feet)	Description	Graphic	Sample Type	Sample No.	Sample Rec. (cm)	Blow Counts (N value)	RQD (%)	Bedrock Compressive Strength (MPa)	% < #200
0	0	Augered through Decorative Stone								
		Compact Brown Sand and Gravel FILL		SS	1	0.3	1-7-12-5 (19)			
1.15	4.6	Loose Brown Sand and Gravel FILL		SS	2		4-3-2-3 (5)			
2.3	9.2			SS	3		3-3-3-9 (6)			
3.45	13.8			SS	4		2-2-3-3 (5)			
4.6		▽								
5.75	18.4	Weathered Grey Shale Bedrock		SS	5		7-7-22-22 (29)			
		Boring terminated at 6.6 m.								

TEST RESULTS SUMMARY

Bedrock Core Recovery (%) ⌖
RQD (%) ▲
Plastic Limit ⊢ Liquid Limit
Water Content - ●
SPT N Values - ■



This information pertains only to this boring and should not be interpreted as being indicitive of the site.

FUNDY Engineering

BOREHOLE LOG No. BH2

PROJECT: Loyalist Plaza **PROJECT NO.:** 11615

CLIENT: Glenn Group

PROJECT LOCATION: Market Sq. **ELEVATION:** 6.00 NAD83 CSRS

DRILLING CONTRACTOR: Noftell Drilling

LOGGED BY: AM **CHECKED BY:** GM

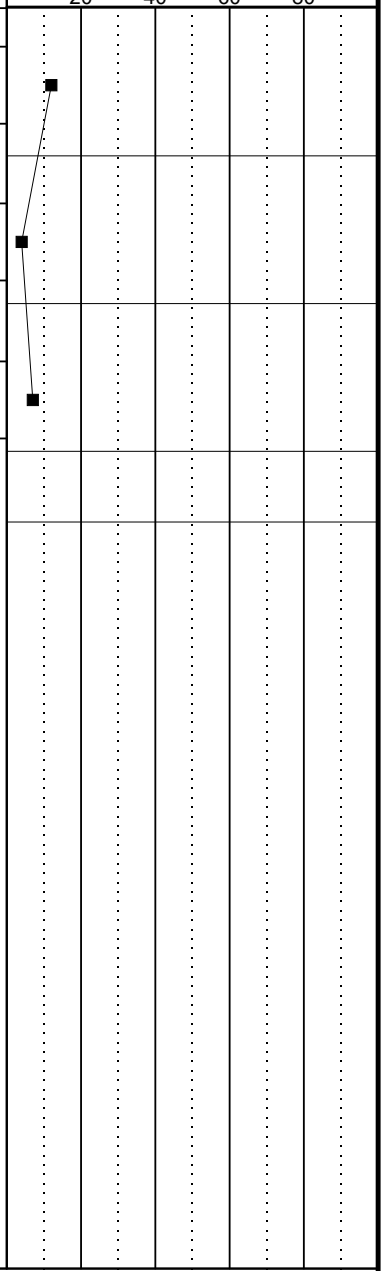
DRILLING METHOD: Standard Auger **DATE:** Nov 25

DEPTH TO - WATER> INITIAL: ▽ **AFTER 24 HOURS:** ▼ **CAVING>** C

Depth (meters)	Depth (feet)	Description	Graphic	Sample Type	Sample No.	Sample Rec. (cm)	Blow Counts (N value)	RQD (%)	Bedrock Compressive Strength (MPa)	% < #200
0	0	Augered through Decorative Stone				0				
		Compact Brown Sand and Gravel FILL			1		6-6-6-4 (12)			
1.15	4.6	Loose Brown Silty Sand and Gravel FILL			2		3-2-2-1 (4)			
2.3	9.2	Wood Timber			3	20	2-2-5-14 (7)			
3.45		Augered to Refusal at 4 metres								
		Boring terminated at 4 m.								

TEST RESULTS SUMMARY

Bedrock Core Recovery (%) ⌖
RQD (%) ▲
Plastic Limit ⊢ Liquid Limit
Water Content - ●
SPT N Values - ■



This information pertains only to this boring and should not be interpreted as being indicitive of the site.

FUNDY Engineering

BOREHOLE LOG No. BH3

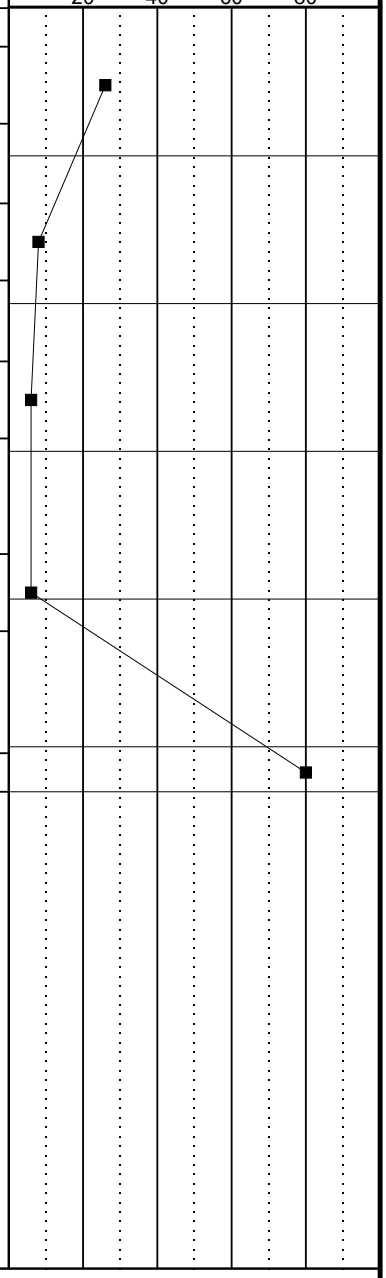
PROJECT: Loyalist Plaza **PROJECT NO.:** 11615
CLIENT: Glenn Group
PROJECT LOCATION: Market Sq. **ELEVATION:** 5.85 NAD83 CSRS
DRILLING CONTRACTOR: Noftell Drilling
LOGGED BY: AM **CHECKED BY:** GM
DRILLING METHOD: Standard Auger **DATE:** Nov 25
DEPTH TO - WATER> INITIAL: ▽ **AFTER 24 HOURS:** ▽ **CAVING>** C

Depth (meters)	Depth (feet)	Description	Graphic	Sample Type	Sample No.	Sample Rec. (cm)	Blow Counts (N value)	RQD (%)	Bedrock Compressive Strength (MPa)	% < #200
0	0	Concrete				0				
		Compact Brown Sand and Gravel Fill			1	40	5-11-15-12 (26)			
1.15	4.6	Loose Brown Sand and Gravel			2		3-4-4-4 (8)			
2.3	9.2				3		2-3-3-3 (6)			
3.45	13.8				4		3-3-3-3 (6)			
4.6	18.4									
5.75		Weathered Grey Shale Bedrock			5		13-30-50 (80)			
		Boring terminated at 6.1 m.								

TEST RESULTS SUMMARY

Bedrock Core Recovery (%) ⌖
RQD (%) ▲
Plastic Limit ⊢ Liquid Limit
Water Content - ●
SPT N Values - ■

20 40 60 80



This information pertains only to this boring and should not be interpreted as being indicitive of the site.

FUNDY Engineering

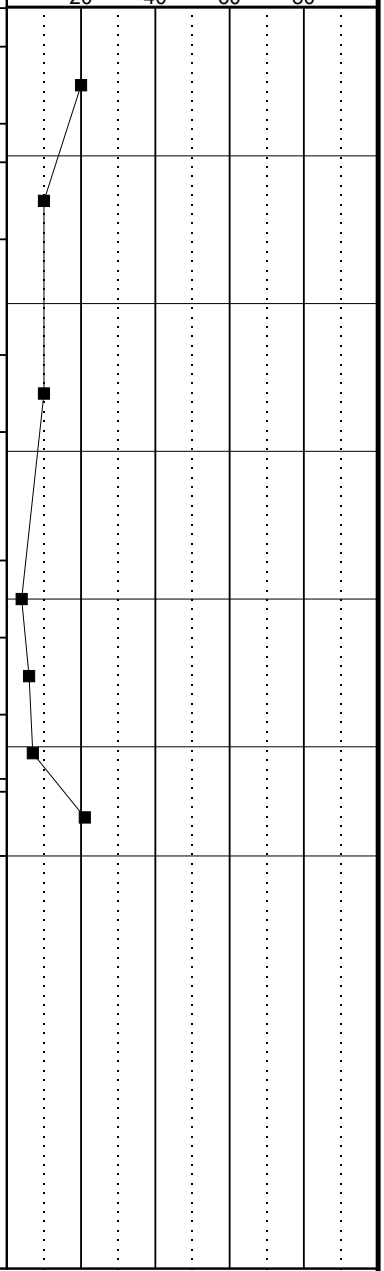
BOREHOLE LOG
No. BH4

PROJECT: Loyalist Plaza **PROJECT NO.:** 11615
CLIENT: Glenn Group
PROJECT LOCATION: Market Sq. **ELEVATION:** 5.04 NAD83 CSRS
DRILLING CONTRACTOR: Noftell Drilling
LOGGED BY: AM **CHECKED BY:** GM
DRILLING METHOD: Standard Auger **DATE:** Nov 25
DEPTH TO - WATER> INITIAL: ▽ 4.0 **AFTER 24 HOURS:** ▼ **CAVING>** C

Depth (meters)	Depth (feet)	Description	Graphic	Sample Type	Sample No.	Sample Rec. (cm)	Blow Counts (N value)	RQD (%)	Bedrock Compressive Strength (MPa)	% < #200
0	0	Concrete								
		Compact Brown Sand and Gravel FILL			1		5-12-8-8 (20)			
1.15	4.6				2		6-6-4-3 (10)			
2.3	9.2				3		4-6-4-4 (10)			
3.45	13.8	▽								
4.6		Loose Brown Sand with Gravel FILL			4		2-2-2-2 (4)			
					5		2-3-3-3 (6)			
5.75	18.4				6		3-3-4-4 (7)			
		Weathered Grey Shale Bedrock			7		12-10-11-12 (21)			
		Boring terminated at 6.6 m.								

TEST RESULTS SUMMARY

Bedrock Core Recovery (%) ⌖
RQD (%) ▲
Plastic Limit ⊢ Liquid Limit
Water Content - ●
SPT N Values - ■



This information pertains only to this boring and should not be interpreted as being indicitive of the site.

FUNDY Engineering

BOREHOLE LOG No. BH5

PROJECT: Loyalist Plaza **PROJECT NO.:** 11615
CLIENT: Glenn Group
PROJECT LOCATION: Market Sq. **ELEVATION:** 5.68 NAD83 CSRS
DRILLING CONTRACTOR: Noftell Drilling
LOGGED BY: AM **CHECKED BY:** GM
DRILLING METHOD: Standard Auger **DATE:** Nov 25
DEPTH TO - WATER> INITIAL: ▽ 4.4 **AFTER 24 HOURS:** ▽ **CAVING>** C

Depth (meters)	Depth (feet)	Description	Graphic	Sample Type	Sample No.	Sample Rec. (cm)	Blow Counts (N value)	RQD (%)	Bedrock Compressive Strength (MPa)	% < #200
0	0	Asphalt								
		Dense Brown Sand and Gravel FILL with some Silt			1		10-21-18-13 (39)			
1.15	4.6	Compact Brown Sand and Gravel FILL			2		6-8-7-6 (15)			
					3		6-5-6-5 (11)			
2.3	9.2				4		5-5-6-5 (11)			
					5		8-10-8-8 (18)			
3.45	13.8									
4.6		▽ Loose Brown Sand and Gravel FILL			6		3-2-4-5 (6)			
					7		6-4-5-5 (9)			
5.75	18.4	Compact Brown Sand and Grvael FILL			8		5-6-6-5 (12)			
					9		5-6-6-5 (12)			
6.9	23									
8.05		Dense Brown Red and White Course SAND with some Silt			10	28	12-22-15-9 (37)			
	27.6				11	41	15-17-27-9 (44)			
		Wood			11	6				
		Boring terminated at 9 m.								

TEST RESULTS SUMMARY

Bedrock Core Recovery (%) ⌖
RQD (%) ▲
Plastic Limit ⊢ Liquid Limit
Water Content - ●
SPT N Values - ■

20 40 60 80

This information pertains only to this boring and should not be interpreted as being indicitive of the site.

FUNDY Engineering

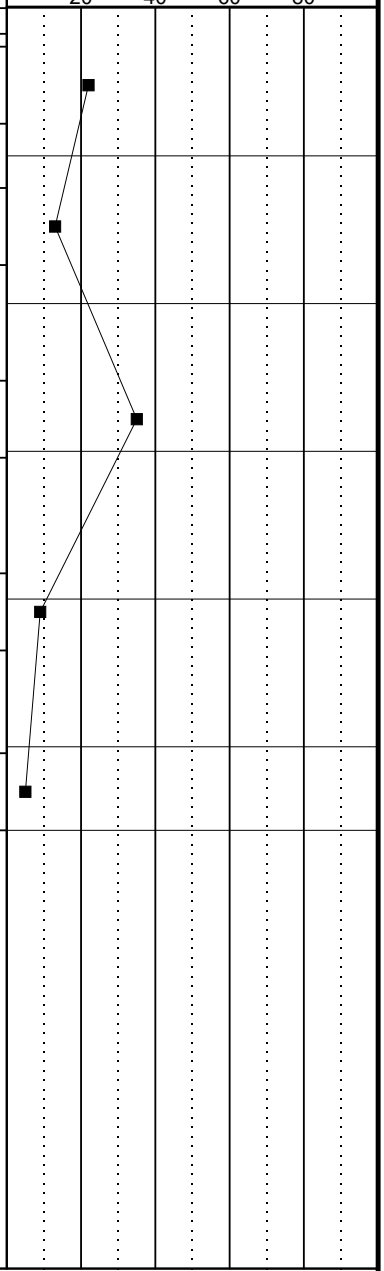
BOREHOLE LOG No. BH6

PROJECT: Loyalist Plaza **PROJECT NO.:** 11615
CLIENT: Glenn Group
PROJECT LOCATION: Market Sq. **ELEVATION:** 5.50 NAD83 CSRS
DRILLING CONTRACTOR: Noftell Drilling
LOGGED BY: AM **CHECKED BY:** GM
DRILLING METHOD: Standard Auger **DATE:** Nov 25
DEPTH TO - WATER> INITIAL: ▽ **AFTER 24 HOURS:** ▼ **CAVING>** C

Depth (meters)	Depth (feet)	Description	Graphic	Sample Type	Sample No.	Sample Rec. (cm)	Blow Counts (N value)	RQD (%)	Bedrock Compressive Strength (MPa)	% < #200
0	0	Concrete				20				
		Compact Brown Sand and Gravel FILL			1	33	5-14-8-12 (22)			
1.15	4.6				2	33	6-6-7-10 (13)			
2.3	9.2	Dense Brown Sand and Gravel FILL			3	11	19-23-12-11 (35)			
3.45	13.8	Loose Brown Sand and Gravel FIll			4	36	3-4-5-5 (9)			
4.6	18.4				5	20	3-3-2-1 (5)			
5.75		Boring terminated at 6.4 m.								

TEST RESULTS SUMMARY

Bedrock Core Recovery (%) ⌖
RQD (%) ▲
Plastic Limit ⊢ Liquid Limit
Water Content - ●
SPT N Values - ■



This information pertains only to this boring and should not be interpreted as being indicitive of the site.

APPENDIX IV

GEOTECHNICAL GUIDELINES/RECOMMENDATIONS FOR WINTER CONSTRUCTION

Geotechnical Guidelines/Recommendations for Winter Construction

Construction during winter months exposes a construction project to freezing temperatures and other weather events, such as snow, which can have a detrimental effect on Engineered Fill and concrete construction activities. Therefore it is recommended that some extra work be undertaken to protect these construction elements during winter construction.

The following sections outline a set of guidelines for concrete and earthwork construction activities in cold weather.

Excavation

Insitu soils, such as root mat or topsoil can act as natural insulators and can protect the underlying soils from frost. Therefore excavation activities should be limited to sections which can be filled over before the end of the working day.

It is **NOT** recommended that Fills to be used at a later date be stockpiled on site during freezing conditions. They should be placed and compacted immediately.

Fill Type

A well-graded material with sand content of 30% or over is **NOT** recommended for use as Fills in freezing temperatures. Clear stone or rock fills are not as susceptible to freezing and are therefore recommended as they will remain workable for a longer period of time.

Fill Placement Methods

Fill placement should be conducted in small areas such that it can be completed in the area by the end of the working day. The area should be small enough to allow for the subsequent lift to be placed over compacted unfrozen material.

Material that contains snow and/or ice should not be allowed to be placed in a Fill. If a snow event occurs during Fill procedures the snow should be removed before any additional material can be placed. It is recommended that the surface of the Fill under the snow should be removed to ensure that all the snow and ice has been removed.

For areas that will require additional Fill but must be left for a long period of time (ex. overnight) frost protection should be provided to the placed Fill in the form of straw, insulated blankets, or some other approved measure. If frost protection is not available then any frozen material at or near the top of the lift should be removed and wasted before fill placement resumes.

Underside of slabs, footings and any other 'final' Fill surface should be protected from frost. If frost protection is not possible then the soil should be thawed prior to placing footings, slabs, etc. I it is suspected that the soil is frozen then some limited excavations should be undertaken to determine the temperature prior to pouring concrete or placing additional Fills. Any areas that have been determined to be frozen should be removed and replaced with new compacted materials.

All slopes and edges of Fills should be tamped or compacted to reduce frost penetration.

During compaction of Fills the soil temperature should be greater than $2^{o}C$. Any Fills below this temperature will not achieve the theoretical maximum compaction density and should therefore be removed.

Footings

Building footings should **NEVER** be placed on frozen Fill.

If the foundation design recommends that footings be placed on insitu soils, but those soils are fine grained, it is recommended that below the footings an over-excavation of approximately 6 inches be completed to allow for a base of 25mm clear stone be placed.

Once the footings have been placed they should be protected from cold weather with insulated blankets, hay or some approved means. The frost protection should extend beyond the footings to also protect the surrounding bearing soils.

During cold weather the depth of interior footings should be dropped to 1.2 metres below ground surface for frost protection. If lowering the footings is not possible then some other approved method of protecting the interior footings is recommended.

Foundations should be backfilled with free-draining granular materials that will not hold moisture.

Inspection and Testing

The above document is intended as a set of guidelines for geotechnical winter construction in general. A strategy for winter construction will be required for each individual site. It is recommended that prior to beginning any winter earthwork construction the services of a qualified geotechnical engineering company be engaged to develop a customized plan a specific site. Testing and inspection services by a geotechnical engineering company are especially important during winter geotechnical construction activities. A plan developed with the expertise of a Geotechnical Engineer will reduce harmful procedures and mistakes and will allow construction activities to continue during cold weather without unexpected delays and costs.

Dan Glenn
Glenn Group Landscape Architects and Park Planners
248 Brunswick Street
Fredericton, New Brunswick
E3B 5A6

Job File: 11615
6 January 2016

Correspondence via email (dkg@glenngroup.ca)

RE: Preliminary Environmental Findings
Loyalist Plaza Project, Saint John, NB

Dear Mr. Glenn:

Fundy Engineering & Consulting Ltd. (Fundy Engineering) was contracted by Glenn Group Landscape Architects & Park Planners (Glenn Group) to complete a combined geotechnical and environmental investigation at the property that is known as *"Loyalist Plaza"* adjacent to Market Square in Saint John, New Brunswick. Loyalist Plaza was developed by filling Market Slip with sand and gravel fill. The purpose of this investigation was to identify the soils and bedrock within the area of a proposed plaza development, determine the properties of the soils and bedrock, and to provide earthwork recommendations for the construction of various proposed structures as well as gain an understanding of the soil and groundwater quality as it relates to environmental conditions.

Our understanding is that the Loyalist Plaza Development will include various structures including: canopy supports, light standards, and an underground tunnel. In addition to the structures various walkways, curbs, sidewalks and statues will be included. The purpose of this letter report is to provide the preliminary environmental results and interpret the water quality against the appropriate guideline value.

Field Work

The combined geotechnical and environmental investigation consisted of six (6) boreholes distributed throughout the property. The work was completed on November 25 And 26, 2015. A trailer mount drill supplied and operated by Knoftell Drilling was used to put down the boreholes under the direction of Fundy Engineering field representatives. The boreholes were extended through the overburden material until to refusal was encountered. Bedrock was encountered in some boreholes during the geotechnical investigation. Three of the boreholes were subsequently converted to monitoring wells for the collection of groundwater elevation data and representative water quality parameters.

Applicable Guidelines

The management of the environment, with respect to the most frequently encountered environmental concerns is regulated by agencies of the Provincial and Federal Government. A listing of the potential environmental concerns, regulatory agency, and the appropriate guideline document are as shown on Table 1.

Table 1 - Potential Environmental Concerns, Regulatory Agency, and Guideline.

Potential Environmental Concern	Regulatory Agency	Guideline
• Petroleum Hydrocarbons Release into Subsurface	NB Department of the Environment	Guideline for the Management of Contaminated Sites
• Heavy Metals and Hazardous Wastes	Environment Canada and NB Department of the Environment	CCME: Interim Canadian Environmental Quality Criteria for Contaminated Sites
• Polycyclic Aromatic Hydrocarbons (PAHs)	Environment Canada and NB Department of the Environment	CCME: Interim Canadian Environmental Quality Criteria for Contaminated Sites
• Drinking Water Guidelines	Environment Canada	Canadian Drinking Water Quality Guidelines

The management of sites in New Brunswick, with respect to environmental concerns of petroleum hydrocarbons, is documented in the *Guideline for the Management of Contaminated Sites Guidelines, Version 3*. The Petroleum Guideline determines acceptable limits under certain site conditions that relate to potential receptors (residential or commercial), groundwater use (potable or non-potable), and soil type encountered (coarse-grained or fine-grained). The results are provided for individual petroleum hydrocarbon parameters that include Benzene, Toluene, Ethyl-benzene, and Xylene (BTEX). The sum of all petroleum hydrocarbons detected, as there may be in excess of two hundred parameters, is collectively reported as Total Petroleum Hydrocarbons (TPH). Laboratory analyses are reported for BTEX and TPH constituents. The province relies on the federal CCME guidelines for trace metal constituents and PAH's.

For the purpose of evaluating the property, the Tier I criteria were used. This site is considered a commercial property with an on-site potable water source and coarse-grained soils. The contamination would most likely resemble gasoline and fuel oil. The table below list the criteria that were followed for the subject site.

Table 2. Criteria Used at the Subject Site (Commercial, Potable, Coarse-grained Soil)

Parameters	Soil (mg/kg)	Groundwater (mg/L)
Benzene	0.042	0.005
Toluene	0.35	0.024
Ethyl benzene	0.043	0.0016
Xylene	0.73	0.02
Gasoline	870	4.4
Diesel #2	1,800	3.2
#6 Oil	10,000	7.8

Preliminary Results

The results of the soil and groundwater analysis are presented on Figures 1 through 5 as follows:

- Figure 1. Soil Sample Results Trace Metals
  - **Arsenic, copper and lead exceed applicable guideline in two samples**
  - **Tin exceeds applicable guideline in one sample**

- Figure 2. Soil Sample Results Petroleum Hydrocarbons
  - All parameters below the applicable guideline values

- Figure 3. Soil Sample Results PAH's
  - All parameters below the applicable guideline values

- Figure 4. Groundwater Results Trace Metals
  - All parameters below the applicable guideline values

- Figure 5. Groundwater Results Petroleum Hydrocarbons
  - All parameters below the applicable guideline values

Given the analytical results, all within the applicable guideline with the exception of heavy metals, the site would appear to be a good candidate for redevelopment within the management process. The next steps recommended are:

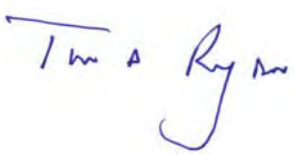
1. Finish Phase II ESA Report.
2. Notification to the NBDENV
3. Develop a RAP Plan to manage the metals encountered, likely through a risked based approach that leaves the impacted soil in place.
4. Implement Risk Management Plan.
5. Document work and obtain file closure from the NBDENV.

Closing

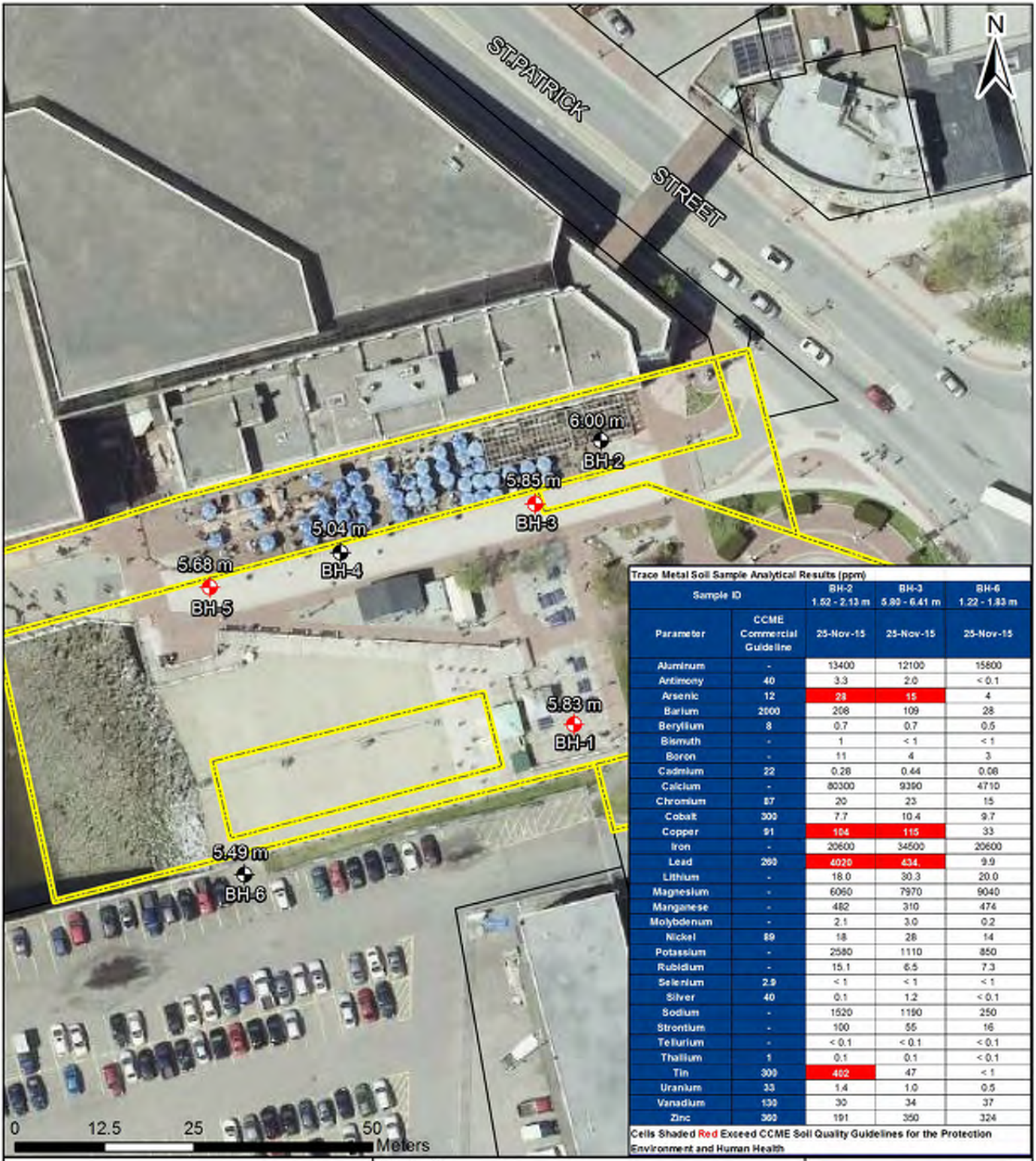
We trust these preliminary results satisfy your present needs. Please feel free to contact me via telephone at 506.674.9403 or by email at tim.ryan@fundyeng.com if further clarification or explanation is required.

Respectfully Submitted,

FUNDY ENGINEERING & CONSULTING LTD.



Mr. Tim A. Ryan, *M.Eng., P.Eng.*



Trace Metal Soil Sample Analytical Results (ppm)

Sample ID		BH-2 1.52 - 2.13 m	BH-3 5.80 - 6.41 m	BH-6 1.22 - 1.83 m
Parameter	CCME Commercial Guideline	25-Nov-15	25-Nov-15	25-Nov-15
Aluminum	-	13400	12100	15800
Antimony	40	3.3	2.0	< 0.1
Arsenic	12	28	15	4
Barium	2000	208	109	28
Beryllium	8	0.7	0.7	0.5
Bismuth	-	1	< 1	< 1
Boron	-	11	4	3
Cadmium	22	0.28	0.44	0.08
Calcium	-	80300	9350	4710
Chromium	87	20	23	15
Cobalt	300	7.7	10.4	9.7
Copper	91	104	115	33
Iron	-	20600	34500	20600
Lead	260	4020	434	9.9
Lithium	-	18.0	30.3	20.0
Magnesium	-	6060	7970	9040
Manganese	-	482	310	474
Molybdenum	-	2.1	3.0	0.2
Nickel	89	18	28	14
Potassium	-	2580	1110	850
Rubidium	-	15.1	6.5	7.3
Selenium	2.9	< 1	< 1	< 1
Silver	40	0.1	1.2	< 0.1
Sodium	-	1520	1150	250
Strontium	-	100	55	16
Tellurium	-	< 0.1	< 0.1	< 0.1
Thallium	1	0.1	0.1	< 0.1
Tin	300	462	47	< 1
Uranium	33	1.4	1.0	0.5
Vanadium	130	30	34	37
Zinc	360	191	350	324

Cells Shaded Red Exceed CCME Soil Quality Guidelines for the Protection Environment and Human Health

Legend

- Subject Property Line
- Property Line
- Borehole / Monitoring Well
- Borehole

Project Title:
Phase I & II Environmental Site Assessment
Loyalist Plaza, Saint John, NB

Drawing Title:
Borehole / Monitoring Well Location Plan
(2014 Aerial Photograph)

FUNDY Engineering
Serving Our Clients' Needs First

Job No: 15-11615

Drawn By:	Checked By:	Date:	Figure:
SL	TR	JAN 5, 2015	1

Soil Sample Analytical Results (ppm)

Sample ID	Depth (m)	Date	Benzene	Touluene	Ethyl-Benzene	Xylenes	TPH	Resemblance
BH-2	1.52 - 2.13	25-Nov-15	< 0.005	< 0.05	< 0.01	< 0.05	230	PAH.LO
BH-3	5.80 - 6.41	25-Nov-15	0.013	< 0.05	< 0.01	< 0.05	1000	PAH.LO
BH-6	1.22 - 1.83	25-Nov-15	< 0.005	< 0.05	< 0.01	< 0.05	< 21	ND
Atlantic RBCA Tier I Criteria			2.5	10000	10000	110	10000	

ND = Non Detect LO = Lube Oil PAH = Polycyclic Aromatic Hydrocarbons

Cells Shaded Red Exceed Atlantic Risk-Based Corrective Action (RBCA) Guidelines

Legend

- Subject Property Line
- Property Line
- Borehole / Monitoring Well
- Borehole

Project Title: Phase I & II Environmental Site Assessment
Loyalist Plaza, Saint John, NB

Drawing Title: Borehole / Monitoring Well Location Plan (2014 Aerial Photograph)

FUNDY Engineering
Serving Our Clients' Needs First

Job No: 15-11615

Drawn By:	Checked By:	Date:	Figure:
SL	TR	JAN 5, 2015	2

Soil Sample Analyzes for Polyaromatic Hydrocarbons (mg/kg)

Carcinogenic PAH's	Guideline	Potency Equivalence Factors	BH-3
Benzo(a)anthracene	-	0.1	1.9
Benzo(a)pyrene	-	1	1.8
Benzo(b, b+j)fluoranthene*	-	0.1	2
Benzo(ghi)perylene	-	0.01	1.2
Chrysene	-	0.01	1.8
Dibenzo(a,h)anthracene	-	1	0.36
Indeno(1,2,3)pyrene	-	0.1	1
B[a]P TPE Concentration	5.3	-	2.68

Cells shaded Red exceed the CCME Human Health Guideline for direct contact based on carcinogenic effects of PAHs

Legend

- Subject Property Line
- Property Line
- Borehole / Monitoring Well
- Borehole

Project Title:
Phase I & II Environmental Site Assessment
Loyalist Plaza, Saint John, NB

FUNDY Engineering
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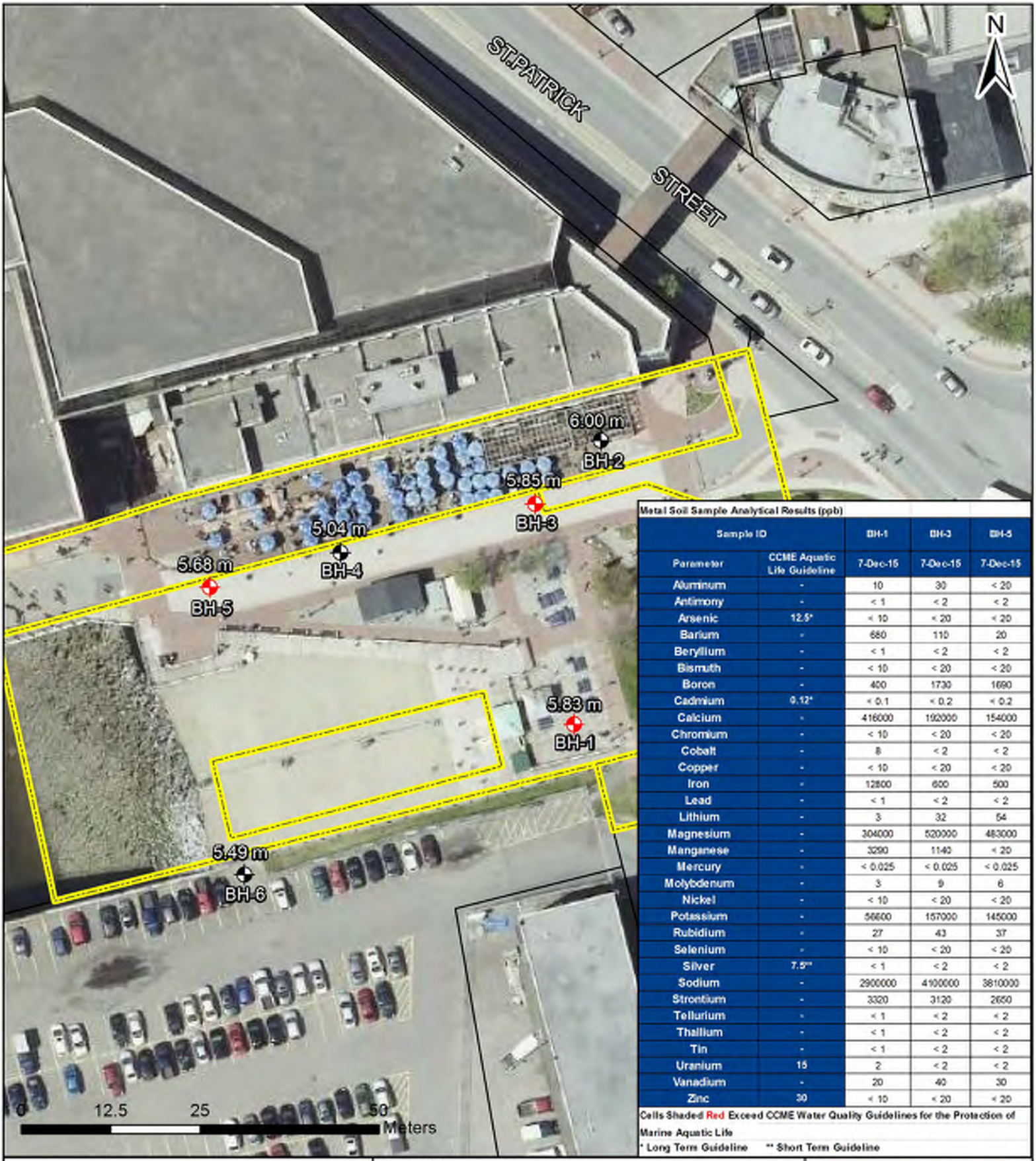
Drawing Title:
Borehole / Monitoring Well Location Plan
(2014 Aerial Photograph)

Job No: 15-11615

Drawn By:	Checked By:	Date:	Figure:
SL	TR	JAN 5, 2015	3



Metal Soil Sample Analytical Results (ppb)

Sample ID		BH-1	BH-3	BH-5
Parameter	CCME Aquatic Life Guideline	7-Dec-15	7-Dec-15	7-Dec-15
Aluminum	-	10	30	< 20
Antimony	-	< 1	< 2	< 2
Arsenic	12.5*	< 10	< 20	< 20
Barium	-	680	110	20
Beryllium	-	< 1	< 2	< 2
Bismuth	-	< 10	< 20	< 20
Boron	-	400	1730	1690
Cadmium	0.12*	< 0.1	< 0.2	< 0.2
Calcium	-	416000	192000	154000
Chromium	-	< 10	< 20	< 20
Cobalt	-	8	< 2	< 2
Copper	-	< 10	< 20	< 20
Iron	-	12800	600	500
Lead	-	< 1	< 2	< 2
Lithium	-	3	32	54
Magnesium	-	304000	520000	483000
Manganese	-	3290	1140	< 20
Mercury	-	< 0.025	< 0.025	< 0.025
Molybdenum	-	3	9	8
Nickel	-	< 10	< 20	< 20
Potassium	-	56600	157000	145000
Rubidium	-	27	43	37
Selenium	-	< 10	< 20	< 20
Silver	7.5**	< 1	< 2	< 2
Sodium	-	2900000	4100000	3810000
Strontium	-	3320	3120	2650
Tellurium	-	< 1	< 2	< 2
Thallium	-	< 1	< 2	< 2
Tin	-	< 1	< 2	< 2
Uranium	15	2	< 2	< 2
Vanadium	-	20	40	30
Zinc	30	< 10	< 20	< 20

Cells Shaded Red Exceed CCME Water Quality Guidelines for the Protection of Marine Aquatic Life

* Long Term Guideline ** Short Term Guideline

Legend

- Subject Property Line
- Property Line
- Borehole / Monitoring Well
- Borehole

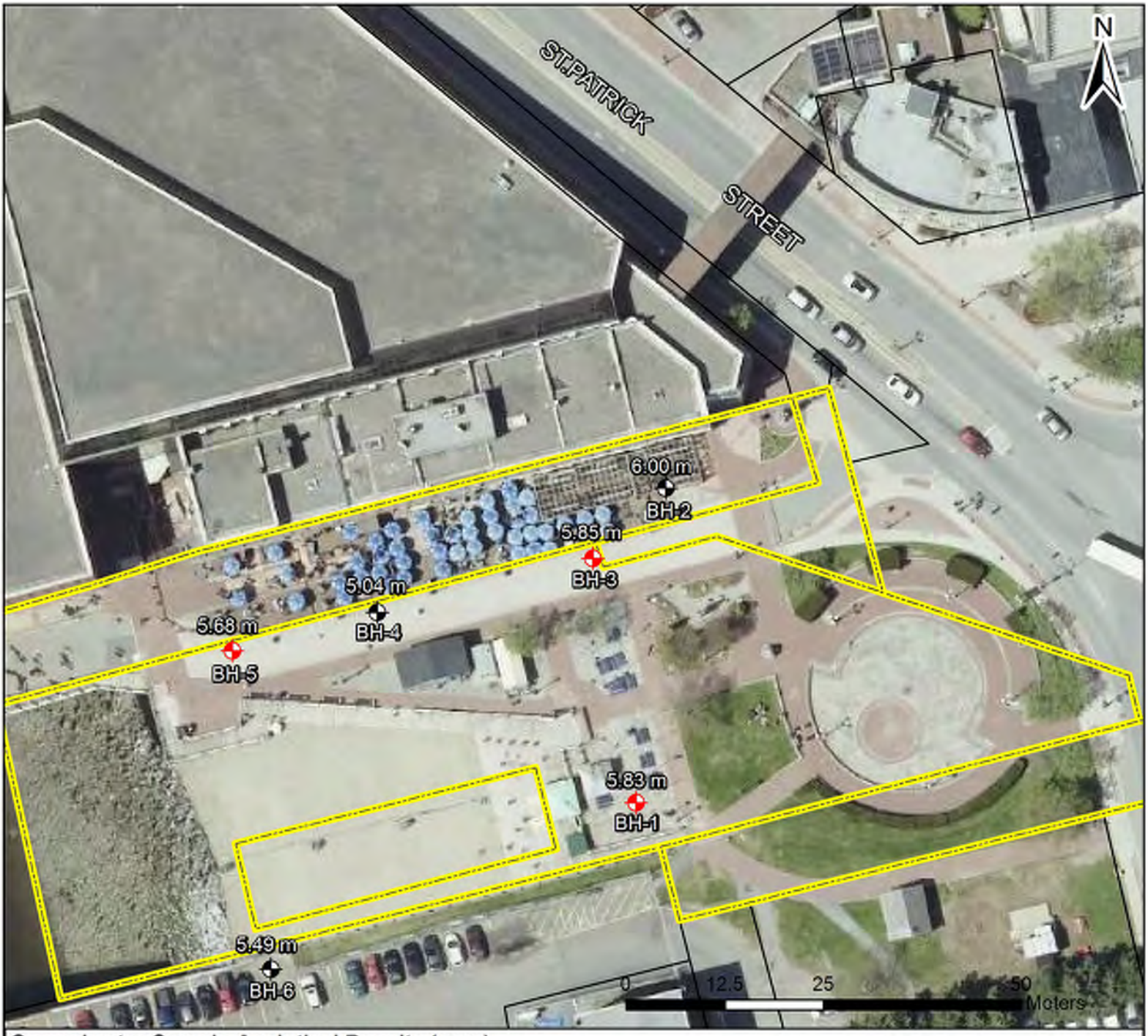
Project Title:
Phase I & II Environmental Site Assessment
Loyalist Plaza, Saint John, NB

FUNDY Engineering
Serving Our Clients' Needs First

Drawing Title:
Borehole / Monitoring Well Location Plan
(2014 Aerial Photograph)

Job No: 15-11615

Drawn By:	Checked By:	Date:	Figure:
SL	TR	JAN 5, 2015	4



Groundwater Sample Analytical Results (ppm)

Sample ID	Date	Benzene	Touluene	Ethyl-Benzene	Xylenes	TPH	Resemblance
BH-1	7-Dec-15	< 0.001	< 0.001	< 0.001	< 0.001	< 0.1	ND
BH-3	7-Dec-15	< 0.001	< 0.001	< 0.001	< 0.001	1.9	PWFO.LO
BH-5	7-Dec-15	< 0.001	< 0.001	< 0.001	< 0.001	< 0.1	ND
Atlantic RBCA Tier I Criteria		20	20	20	20	20	

ND = Non-Dectected PWFO = Possible Weathered Fuel Oil LO = Lube Oil

Cells Shaded Red Exceed Atlantic Risk-Based Corrective Action (RBCA) Guidelines

Legend

- Subject Property Line
- Property Line
- Borehole / Monitoring Well
- Borehole

Project Title: Phase I & II Environmental Site Assessment
Loyalist Plaza, Saint John, NB

FUNDY Engineering
Serving Our Clients' Needs First

Drawing Title: Borehole / Monitoring Well Location Plan (2014 Aerial Photograph)

Job No: 15-11615

Drawn By:	Checked By:	Date:	Figure:
SL	TR	JAN 5, 2015	5

Mr. Dan Glenn, Principal
Glenn Group Landscape Architects and Park Planners
248 Brunswick Street
Fredericton, New Brunswick
E3B 5A6

Job File: 11615
12 January 2016

Correspondence via email (dkg@glenngroup.ca)

RE: Environmental Permitting Requirements
Loyalist Plaza Project, Saint John, NB

Dear Mr. Glenn:

Fundy Engineering & Consulting Ltd. (Fundy Engineering) was contracted by Glenn Group Landscape Architects & Park Planners (Glenn Group) to complete a combined geotechnical and environmental investigation at the property that is known as *"Loyalist Plaza"* adjacent to Market Square in Saint John, New Brunswick. A redevelopment of Loyalist Plaza *(i.e.*, the Project) is being considered.

One component of the Project is a tunnel and mechanical room, which is designed to run underground where currently there is a rocky intertidal area. This will result in an alteration to the marine environment. Based on our knowledge of the Project and existing environment, we have outlined several environmental permitting requirements below.

Fisheries and Oceans – Request for Review

We understand that the proposed Project involves filling in a portion of Market Slip to allow the construction of the underground tunnel. Any works within the marine environment that involve disturbance to the seabed (*e.g.*, dredging) or placement of permanent structures (*e.g.*, seawalls, sediments, footings, *etc.*) will require approval by the Department of Fisheries and Oceans (DFO) through a Request for Review Application. In our experience, Request for Reviews can take several weeks to a few months to obtain, which should be considered when planning the Project development.

The DFO Request for Review Application requires that specific information be provided regarding the project, such as: what is the nature of the disturbance, what is the anticipated size of the disturbance, when will in-water work be completed, what equipment will be required, *etc.* Sketches of the area and / or structures involved are also necessary, though they need not be in the final detailed design stage.

Navigation Protection Act – Notice of Works

As outlined above, this Project will require alterations of the Saint John Harbour shoreline, and as such a Notice of Works Permit under the *Navigable Waters Act* will be required before any work can be completed.

Application for a Notice of Works permit requires that specific information be provided regarding the Project. It will be necessary to provide the reviewers with a conceptual plan of the location (*e.g.*, where will it be located, what will it look like, *etc.*) and outline construction methods. Dimensions, such as seawall height above water, and changes to the marine environment (*i.e.,* infilling dimensions) will be required. Additional details may also be necessary as requested by the reviewers. We anticipate that obtaining a permit will be a lengthy process (*i.e.*, several months) because most often the proposed Project must be advertised in the media and the *Canadian Gazette*, which means there may be objections to the proposal.

Ocean Dredging and Disposal at Sea

This Project will require the removal and disposal of marine sediment as part of the construction process for the underground tunnel and seawall, and therefore an ocean dredging and disposal at sea permit will be required before any in water work commences.

Due to a variety of specific information requested, a disposal at sea permit will require some preliminary work to be completed before the permitting process can begin. The two major items necessary are:

1. A description of the material to be disposed of at sea. This will require sampling the material and describing its composition (*i.e*., rock, gravel, sand, silt, *etc*.), a grain size analysis will need to be completed on any sediments, and the total volume of material which will be removed will need to be determined.
2. Testing of the material to be disposed of, to ensure it is not hazardous (*i.e.,* does not contain heavy metals, hydrocarbons, *etc*.) and can be disposed of at sea. Consultation with Environment Canada before sampling is begun will be beneficial to the application process.

A dredging / construction plan will also need to be in place before the permit application process can begin. Specifically the equipment and methods which are to be used will have to be outlined for all stages of the work including, dredging, transport and disposal.

CEAA Screening Report

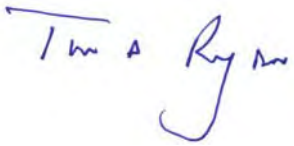
The *Canadian Environmental Assessment Act* (*CEAA*) ensures that projects are planned in a manner that no significant adverse environmental impacts are realized. The *Act* is triggered in many circumstances and one that Fundy Engineering commonly experiences is when a Federal Authority (*e.g.*, Department of Transport, the Canadian Coast Guard, Department of Fisheries and Oceans, *etc.*) owns lands and proposes to sell, lease, or otherwise transfer control or administration of the land to enable a project to go forward. A *CEAA* Screening Report is a systematic approach at documenting the environmental effects of a proposed project. It is also used for determining the need to eliminate or minimize any adverse effects, to modify the project plan, or to recommend further assessment through mediation or an assessment by a review panel.

To determine if a *CEAA* screening report would be required for this Project, a project description would need to be submitted and a pre-consultation meeting scheduled, where the Project would be discussed with the regulators.

Closing

I trust the above information apprises you of the potential environmental permitting issues associated with the alteration of the marine environment during the proposed development of the Project. I encourage you to distribute this information as necessary. Please feel free to contact me via telephone at 506.674.9403 or by email at tim.ryan@fundyeng.com if further clarification or explanation is required. Fundy Engineering looks forward to continuing to work with the Project Team to see this Project come to fruition.

Sincerely,



Mr. Tim A. Ryan, *M.Eng., P.Eng.*
Fundy Engineering and Consulting Ltd.

Pipe Video Report

Loyalist Plaza Pipe Condition Report

Pipe Report

152884.00 ● Pipe Report ● January 2016

Prepared for:

Glenn Group Landscape Architects and Park Planners

Prepared by:

CBCL LIMITED

Consulting Engineers

Issued to Client	K. Tays	Feb. 15, 2016	T. McCluskey
Internal Review	K. Tays	Jan. 12, 2016	T. McCluskey
Issue or Revision	***Reviewed By:***	***Date***	***Issued By:***

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Solving today's problems with tomorrow in mind

15 February 2016

Daniel Glenn, FCSLA
Glenn Group Landscape Architects and Park Planners
PO Box 624
248 Brunswick Street
Fredericton, NB
E3B 5A6

Dear Daniel:

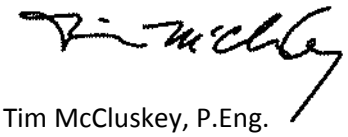
RE: *Project No. 152884.00* – Loyalist Plaza Pipe Condition Report

CBCL Limited is pleased to submit three (3) hard copies and one (1) digital copy of the pipe report for the Loyalist Plaza and North Market Slip Renewal & Refurbishment project. Please note that only the inspection index table of contents for each appendix are included in hard copies of the report. The complete report, including digital inspection reports and videos are contained on the DVD in Appendix A.

If you have any questions or require clarification, please do not hesitate to contact me.

Yours very truly,

CBCL Limited



Tim McCluskey, P.Eng.
Municipal Engineer
Direct: (506) 633-6650
E-Mail: timm@cbcl.ca

Project No: 152884.00

Contents

Appendices

F Storm Sewer Videos (Video files on DVD in Appendix A)

G Existing Conditions Drawings (separate rolled set of drawings) (PDF files on DVD in Appendix A)

CHAPTER 1 INTRODUCTION

1.1 Background

Pipe Reports for all projects has been adopted by the City of Saint John to ensure that existing infrastructure is up to today's standards. Projects such as water main renewal, site works and road reconstruction require pipe reports to ensure that the sanitary and storm sewer infrastructure in the vicinity of the proposed works are in adequate shape moving forward. The City does not want to get into situations where new works are constructed over infrastructure that will need to be replaced in the not to distance future.

1.2 Scope

The objective of the Pipe Reports is to document all deficiencies (condition assessment) in the sanitary and storm sewer system and make recommendations as to the need for replacement and/or repair. The following activities have been completed to document the condition of the infrastructure:

- Video inspection of piping system (where possible);
- Survey of all structures in the NAD83 CSRS coordinate system;
- Condition assessment of all structures in the piping systems;
- Identify and document all deficiencies;
- Review City digital data to incorporate in pipe report;
- Investigate service card documents to compare with video inspection reports;
- Produce record drawings of all infrastructure on scaled drawings.
- Produce pipe report outlining findings along with recommendations on repairs or replacement of infrastructure not previously anticipated in the vicinity of the Loyalist Plaza project corridor.

CHAPTER 2 VIDEO INSPECTION

2.1 CCTV

As part of the pipe report, an attempt was made to perform closed circuit television (CCTV) video inspections on all sanitary and storm sewer piping within the Loyalist Plaza project area on various days, working around tidal conditions. Video inspections were intended for all main lines between manholes, intakes and outfalls, but not service laterals. The CCTV inspections were performed by an outside source (sub-contractor) with state of the art equipment. The equipment uses CCTV cameras with capabilities of zoom in and out as well as full 180-degree rotation for identifying deficiencies and all side connections.

The summary tables of the CCTV inspections and attempted inspections can be found in Appendices C and F. The table summarizes the following:

- Start and finish labelling of each individual section being videoed using City of Saint John GIS numbering system; and
- Chainage and nature of all deficiencies, including: cracks, separated joints, debris, sag, etc.

The digital CCTV video inspections are provided on the DVD included in Appendix A.

2.2 Service Cards

During infrastructure construction, the City of Saint John inspectors produce service cards for each individual service lateral from the main to the connection point at individual homes. These service cards are checked with the CCTV video and the video reports to determine that they match with each other. The video reports along with the service cards give a measurement of the distance either upstream or downstream from the nearest structure. In addition, information on the pipe material and size are compared for consistency between the service cards and the video report. The service card information along with the video report information on services have been included in the Existing Conditions Drawings found in Appendix G.

CHAPTER 3 DIGITAL DATA COLLECTION

3.1 Survey Equipment

CBCL Limited completed the survey of all structures within the study area including sanitary manholes, storm manholes, inlet structures and outlet structures. The survey was completed using state-of-the-art GPS equipment. The coordinate system used is the NAD83 CSRS and was completed with a high degree of accuracy.

3.2 Structure Labels

The City of Saint John has a GIS database for all of their water, sewer and storm sewer piping. As part of this, structure labels are used for each structure in the City. The structure survey, CCTV video and video reports require the use of these numbers to ensure continuity from all the data collected. For example, a label for a sanitary manhole may have the designation *2006sam24682*. The prefix number, 2006, refers to the year the structure was installed. The root name, "sam", stands for sanitary manhole. The five digit suffix is a unique identifier for the structure that is only used once.

3.3 Structure Inspection

Where access was possible, inspections and condition assessments were completed for sanitary manholes, storm manholes, main line piping, inlet pipes and outlet pipes. These condition assessments include the following:

- Type of system; sanitary, storm or combined;
- Condition and type of structure frame and cover;
- Frame and Cover inflow potential;
- Ground sloping condition around frame and cover;
- All inlet and outlet pipe inverts;
- Size of all pipes;
- Material of all pipes;
- Condition of structure chimney (shafting);
- Condition of grade rings;
- Benching condition;
- Overall condition of inside of structure;
- Overall condition of headwalls on inlets and outlets;

- Flow conditions;
- Plan and profile sketches of structures; and
- Photographs.

CHAPTER 4 SCALED PLANS

4.1 Description

As part of the pipe report, scaled existing conditions drawings were created for the pipe network. These existing conditions drawings show all of the following:

- All deficiencies found during the video inspection and condition assessment of structures;
- All pipes including size and material; and
- All service card information.

CHAPTER 5 INSPECTION & RECOMMENDATIONS

5.1 Sanitary Sewer Pipe Inspection

For the Loyalist Plaza project, sanitary sewer CCTV inspections were attempted in all pipes from Water Street to North Market Wharf. In total 2 sections between manholes 0000SAM33650, 0000SAM33657 and SANMH7823 were attempted video without success. The depth of the structures along with the tidal conditions and sever flows would not provide an opportunity to video the lines below 80% full. The following deficiencies were found on the sanitary sewer pipe:

- 2 surveys could not be completed due to surcharge conditions.

A complete summary (Table A-1) of sanitary sewer pipe deficiencies can be found in Appendix A.

5.2 Sanitary Sewer Structure Inspection

In addition to the above-noted, condition assessments have been completed for 3 structures (sanitary manholes). The following deficiencies were found on the sanitary sewer system:

- 1 structure is buried and will need to be excavated and raised to grade.

A complete summary (Table B-1) of sanitary sewer structure deficiencies along with the condition assessment reports can be found in Appendix B.

5.3 Storm Sewer Pipe Inspection

For the Loyalist Plaza project, storm sewer CCTV inspections were completed in all pipes from the Water Street to North Market Wharf. In total 206.7 meters of storm sewer was videoed, which include 12 sections between manholes, catch basins and outlet pipes. The following deficiencies were found on the storm sewer pipe:

- 1 pipe video could not be completed due to tidal influence.

A complete summary of storm sewer pipe deficiencies can be found in Appendix D (Table D-1).

5.4 Storm Sewer Structure Inspection

In addition to the piping, condition assessments have been carried out on 14 structures (storm manholes and catch basins). The following deficiencies were found on the storm sewer system:

- 4 structure requires a new cover; and
- 2 structure were surcharged and could not be fully inspected.

A complete summary (Table E-1) of storm sewer structure deficiencies along with the condition assessment reports can be found in Appendix E.

5.5 Recommendations

Overall the sanitary sewer system appears to be in fairly moderate shape however with the excessive flows, full inspection could not be completed. The structures appear to be relatively new and do not require any additional investigation. The system should be videoed during the construction of the new Plaza while pumping around to get a clearer picture of the condition of the pipe. Also the structure SANMH7823 should be excavated so that the buried cover is flush.

The storm sewer system is also generally in good condition. Four structures require the covers to be replaced with the City of Saint John Standard Catch Basin cover. Two structures could not be fully inspected due to surcharge conditions. Also the outfall is not visible at low tide and it appears that the rip rap is covering the end. Modifications to the storm sewer for this project will be from STMH7853 to its outfall connection. This structure and outfall alignment will need to be relocated to avoid proposed tunnel and mechanical room.

Prepared by:

Tim McCluskey, P.Eng
Municipal Engineer

Reviewed by:

Kent Tays, CET
Senior Technologist

APPENDIX A

Sanitary Sewer Pipe Video Summary

(PDF files on DVD in Appendix A)

CBCL LIMITED
Consulting Engineers

TABLE A-1
PIPE REPORT
SANITARY PIPE DEFICIENCIES SUMMARY

PROJECT: **Loyalist Plaza**
PROJECT NO.: **152884.00**

VIDEO FROM_MH	VIDEO TO_MH	LENGTH	STREET	DISTANCE	DEFICIENCY*
0000SAM33650	0000SAM33657	Unknown	Water Street	0.00	SURCHARGED 80%
0000SAM33657	SANMH7823	Unknown	North Market Wharf	0.00	SURCHARGED 80%

**The percentage given represents the amount of cross-sectional area or depth that is lost due to the deficiency*

APPENDIX B

Sanitary Sewer Structure Condition Assessments Summary

(PDF files on DVD in Appendix A)

CBCL LIMITED
Consulting Engineers

TABLE B-1
PIPE REPORT
SANITARY MANHOLE DEFICIENCIES SUMMARY

PROJECT: **Loyalist Plaza**

PROJECT NO.: **152884.00**

ID	STREET	NEAREST CIVIC #	DESCRIPTION
0000SAM33650	Market Street	N/A	NO DEFICENCIES
0000SAM33657	North Market Wharf	N/A	NO DEFICENCIES
SANMH7823	North Market Wharf	N/A	STRUCTURE BURIED

MANHOLE INSPECTION FORM

General:

Project #	152884.00 Loyalist Plaza Pipe Report							Inspector	CODY MILLETT	Location / Street	WATER STREET
Structure Reference / GIS #	0000SAM33650							Date of Inspection	DEC 15,2015	Nearest Civic Number	N/A
Type of Sewer	Sanitary		Storm		Combined	X	Unknown		Last Known Rain Event		Weather Condition	RAIN / SNOW
Gas Reading	LEL				O2				HO2S		CO	

Frame, Cover & Surrounding Area:

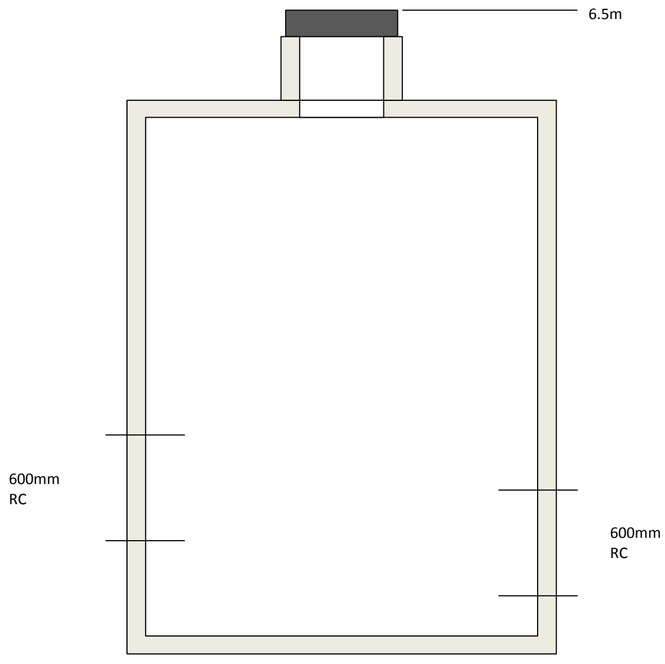
Shape of Cover	Round	X	Square/CB		Pyramid		N													
Size of Cover	mm	600					E		Cover Type	Asphalt	X	Concrete		Grass		Gravel		Other		
Condition of Cover	New		Good		Bad		Critical		Interface Condition	Excellent		Good	X	Moderate		Poor		Unfinished		
Condition of Frame	New		Good		Bad		Critical		Grade Around Manhole	Away	X	Flat		Towards		Washout				

Internal Structure of Manhole:

Cover Elevation (meters)	6.5	GPS Shot #		Cannot Remove		Pipes entering structure (#)	1			Material	Depth	Angle	Invert
Internal Diameter (mm) & Condition	2100	Good	X	Bad		Critical		Main Pipe (Outlet)	Dia (mm)	600	RC	3320	0	3.18
Depth From Top of Frame (mm)	3550	Debris		Bottom	X			Main Pipe (Inlet) #1	Dia (mm)	600	RC	3010	200	3.49
Chimney Height (mm) & Condition	660	Good	X	Bad		Critical		Inlet Pipe #2	Dia (mm)					
Chimney	Rings	X	Bricks		None			Inlet Pipe #3	Dia (mm)					
Benching and Condition	Yes		No	X	Good		Bad		Inlet Pipe #4	Dia (mm)					
Condition of Joints	Good	X	Bad						Inlet Pipe #5	Dia (mm)					
Condition of Interfaces	Good	X	Bad						Inlet Pipe #6	Dia (mm)					
									Inlet Pipe #7	Dia (mm)					
Flow in Structure:									Inlet Pipe #8	Dia (mm)					
Depth of Flow in Main Channel (mm)	LARGE	Muddy		Silty		Normal	X		Inlet Pipe #9	Dia (mm)					
Depth of Debris in Channel (mm)		Gravel		Garbage		Sticks									
Needs to be Cleaned		Yes		No		Critical									

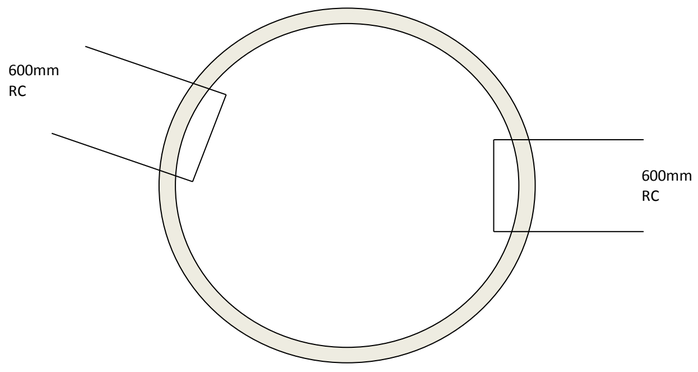
Sketch an Elevation of the Structure:

Note all dimensions and lateral ID numbers as they are shown in the section above.



Sketch a Plan of the Structure:

Note all dimensions and lateral ID numbers as they are shown in the section above.



Comments:

Picture File Name:

MANHOLE INSPECTION FORM

General:

Project #	152884.00 Loyalist Plaza Pipe Report							Inspector	CODY MILLETT	Location / Street	NORTH MARKET WHARF
Structure Reference / GIS #	0000SAM33657							Date of Inspection	DEC 15,2015	Nearest Civic Number	N/A
Type of Sewer	Sanitary		Storm		Combined	X	Unknown		Last Known Rain Event		Weather Condition	RAIN / Snow
Gas Reading	LEL		O2					HO2S		CO	

Frame, Cover & Surrounding Area:

Shape of Cover	Round	X	Square/CB		Pyramid		N											
Size of Cover	mm	600					E		Cover Type	Asphalt		Concrete		Grass	X	Gravel		Other	
Condition of Cover	New		Good	X	Bad		Critical		Interface Condition	Excellent		Good	X	Moderate		Poor		Unfinished	
Condition of Frame	New		Good	X	Bad		Critical		Grade Around Manhole	Away		Flat	X	Towards		Washout			

Internal Structure of Manhole:

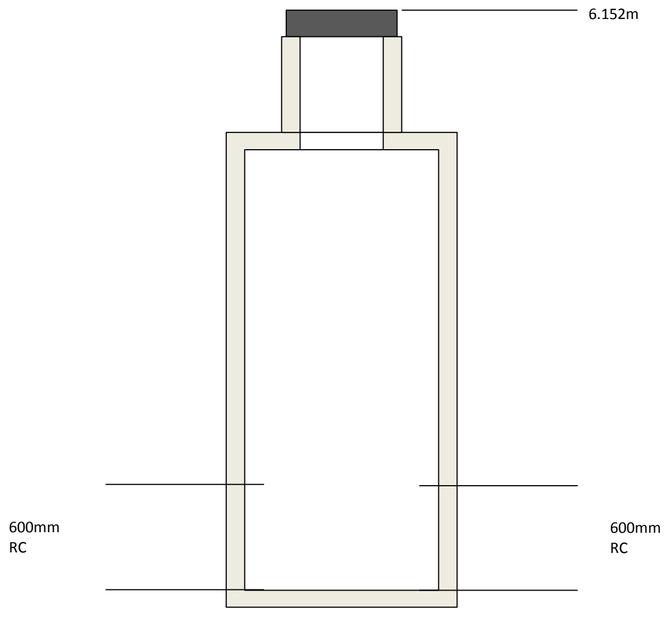
Cover Elevation (meters)	6.152	GPS Shot #		Cannot Remove		Pipes entering structure (#)	1			Material	Depth	Angle	Invert
Internal Diameter (mm) & Condition	1050	Good	X	Bad		Critical		Main Pipe (Outlet)	Dia (mm)	600	RC	3323	0	2.83
Depth From Top of Frame (mm)	3323	Debris		Bottom	X			Main Pipe (Inlet) #1	Dia (mm)	600	RC	3320	160	2.83
Chimney Height (mm) & Condition	850	Good	X	Bad		Critical		Inlet Pipe #2	Dia (mm)					
Chimney	Rings		Bricks		None			Inlet Pipe #3	Dia (mm)					
Benching and Condition	Yes		No	X	Good		Bad	Inlet Pipe #4	Dia (mm)					
Condition of Joints	Good		Bad					Inlet Pipe #5	Dia (mm)					
Condition of Interfaces	Good		Bad					Inlet Pipe #6	Dia (mm)					
								Inlet Pipe #7	Dia (mm)					
								Inlet Pipe #8	Dia (mm)					
								Inlet Pipe #9	Dia (mm)					

Flow in Structure:

Depth of Flow in Main Channel (mm)	150	Muddy		Silty		Normal	X
Depth of Debris in Channel (mm)		Gravel		Garbage		Sticks	
Needs to be Cleaned		Yes		No		Critical	

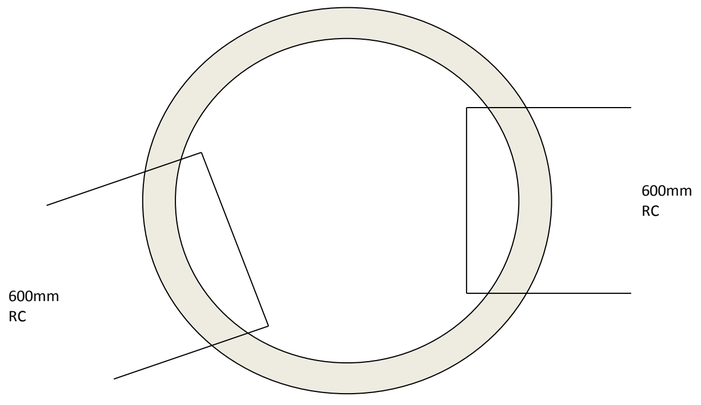
Sketch an Elevation of the Structure:

Note all dimensions and lateral ID numbers as they are shown in the section above.



Sketch a Plan of the Structure:

Note all dimensions and lateral ID numbers as they are shown in the section above.



Comments:

PUNCH THROUGH MANHOLE. APPEARS TO BE TEE MANHOLE.

Picture File Name:

1463

1464

1465

1466

MANHOLE INSPECTION FORM

General:

Project #	152884.00 Loyalist Plaza Pipe Report							Inspector	CODY MILLETT	Location / Street	NORTH MARKET WHARF
Structure Reference / GIS #	SANMH7823							Date of Inspection	DEC 15,2015	Nearest Civic Number	N/A
Type of Sewer	Sanitary		Storm		Combined	X	Unknown		Last Known Rain Event		Weather Condition	RAIN / SNOW
Gas Reading	LEL				O2				HO2S		CO	

Frame, Cover & Surrounding Area:

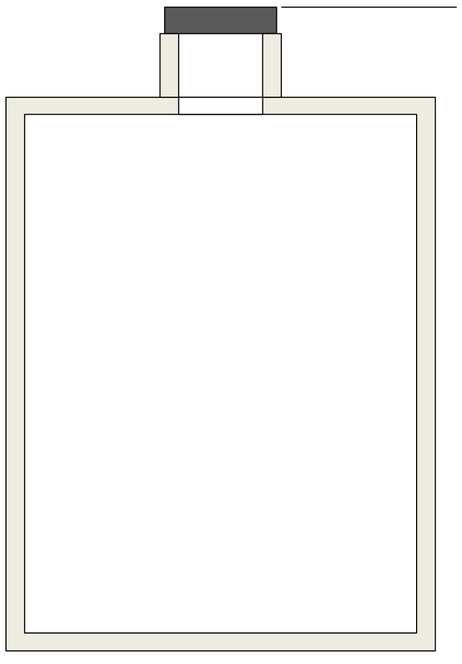
Shape of Cover	Round		Square/CB		Pyramid		N												
Size of Cover	mm	600					E		Cover Type	Asphalt		Concrete		Grass		Gravel		Other	
Condition of Cover	New		Good		Bad		Critical		Interface Condition	Excellent		Good		Moderate		Poor		Unfinished	
Condition of Frame	New		Good		Bad		Critical		Grade Around Manhole	Away		Flat		Towards		Washout			

Internal Structure of Manhole:

Cover Elevation (meters)		GPS Shot #		Cannot Remove		Pipes entering structure (#)	0		Material	Depth	Angle	Invert
Internal Diameter (mm) & Condition		Good		Bad		Critical		Main Pipe (Outlet)	Dia (mm)						
Depth From Top of Frame (mm)		Debris		Bottom				Main Pipe (Inlet) #1	Dia (mm)						
Chimney Height (mm) & Condition		Good		Bad		Critical		Inlet Pipe #2	Dia (mm)						
Chimney	Rings		Bricks		None			Inlet Pipe #3	Dia (mm)						
Benching and Condition	Yes		No		Good		Bad		Inlet Pipe #4	Dia (mm)						
Condition of Joints	Good		Bad						Inlet Pipe #5	Dia (mm)						
Condition of Interfaces	Good		Bad						Inlet Pipe #6	Dia (mm)						
									Inlet Pipe #7	Dia (mm)						
Flow in Structure:									Inlet Pipe #8	Dia (mm)						
Depth of Flow in Main Channel (mm)		Muddy		Silty		Normal			Inlet Pipe #9	Dia (mm)						
Depth of Debris in Channel (mm)		Gravel		Garbage		Sticks										
Needs to be Cleaned		Yes		No		Critical										

Sketch an Elevation of the Structure:

Note all dimensions and lateral ID numbers as they are shown in the section above.



Sketch a Plan of the Structure:

Note all dimensions and lateral ID numbers as they are shown in the section above.

Comments:

Structure Buried

Picture File Name:

APPENDIX C

Sanitary Sewer Videos

(Video files on DVD in Appendix A)

CBCL LIMITED
Consulting Engineers

TABLE C-1
PIPE REPORT
SANITARY PIPE VIDEO INSPECTION INDEX

PROJECT: **Loyalist Plaza**
PROJECT NO.: **152884.00**

SANITARY PIPE VIDEO INSPECTION INDEX
0000SAM33650 (No Video Surcharged)
0000SAM33657 (No Video Surcharged)
SANMH7823 (No Video Surcharged)

APPENDIX D

Storm Sewer Pipe Video Summary

(PDF files on DVD in Appendix A)

CBCL LIMITED
Consulting Engineers

TABLE D-1
PIPE REPORT
STORM PIPE DEFICIENCIES SUMMARY

PROJECT: **Loyalist Plaza**
PROJECT NO.: **152884.00**

VIDEO FROM_MH	VIDEO TO_MH	LENGTH	STREET	DISTANCE	DEFICIENCY*
0000CBT33660 (CB 7)	STMH7854 (MH 3)	32.92	LOYALIST PLAZA		NO DEFICIENCIES
0000CBT33667 (CB 9)	0000STMH33684 (Proposed MH 1)	2.62	LOYALIST PLAZA		NO DEFICIENCIES
0000CBT33668 (CB 8)	0000STMH33684 (Proposed MH 1)	2.47	LOYALIST PLAZA		NO DEFICIENCIES
0000CBT33669 (CB 6)	0000CBT33697 (CB 5)	13.27	LOYALIST PLAZA		NO DEFICIENCIES
0000CBT33670 (CB 4)	CBCL_0000CBT33670(A) (CB 3)	18.58	LOYALIST PLAZA		NO DEFICIENCIES
0000CBT33697 (CB 5)	0000CBT33670 (CB 4)	5.22	LOYALIST PLAZA		NO DEFICIENCIES
0000STMH33684 (Proposed MH 1)	STMH7854 (EXT MH 3)	19.41	LOYALIST PLAZA		NO DEFICIENCIES
CBCL_0000CBT33670(A) (CB 3)	CBCL_STMH7853(A) (STMH 1)	5.99	LOYALIST PLAZA		NO DEFICIENCIES
CBCL_STMH7853(A) (STMH 1)	STMH7853	20.74	LOYALIST PLAZA		NO DEFICIENCIES
(CBCL) STMH7854(A)	STMH7854	2.82	LOYALIST PLAZA		NO DEFICIENCIES
2005STM33647 (0000CBT33660)	STMH7854	59.07	LOYALIST PLAZA		NO DEFICIENCIES
STMH7854	STMH7853	23.59	LOYALIST PLAZA		SURVEY ENDS
					FULLY SUBMERGED

**The percentage given represents the amount of cross-sectional area or depth that is lost due to the deficiency*

APPENDIX E

Storm Sewer Structure Condition Assessments Summary

(PDF files on DVD in Appendix A)

CBCL LIMITED
Consulting Engineers

TABLE E-1
PIPE REPORT
STORM MANHOLE DEFICIENCIES SUMMARY

PROJECT: **Loyalist Plaza**
PROJECT NO.: **152884.00**

ID	STREET	NEAREST CIVIC #	DESCRIPTION
2005STM33647	LOYALIST PLAZA	N/A	NO DEFICENCIES
0000CBT33660	LOYALIST PLAZA	N/A	NO DEFICENCIES
STMH7854	LOYALIST PLAZA	N/A	STRUCTURE SURCHARGED
STMH7853	LOYALIST PLAZA	N/A	STRUCTURE SURCHARGED
CBCL_STMH7854(A)	LOYALIST PLAZA	N/A	NO DEFICENCIES
0000STM33684	LOYALIST PLAZA	N/A	NO DEFICENCIES
0000CBT33667	LOYALIST PLAZA	N/A	FUTURE REPLACE COVER
0000CBT33668	LOYALIST PLAZA	N/A	NO DEFICENCIES
0000CBT33669	LOYALIST PLAZA	N/A	NO DEFICENCIES
0000CBT33697	LOYALIST PLAZA	N/A	FUTURE REPLACE COVER
0000CBT33670	LOYALIST PLAZA	N/A	FUTURE REPLACE COVER
CBCL_0000CBT33670(A)	LOYALIST PLAZA	N/A	NO DEFICENCIES
CBCL_STMH7853(A)	LOYALIST PLAZA	N/A	NO DEFICENCIES
CBCL_CB7853(A)	LOYALIST PLAZA	N/A	FUTURE REPLACE COVER

MANHOLE INSPECTION FORM

General:

Project #	152884.00 Loyalist Plaza Pipe Report							Inspector	CODY MILLETT		Location / Street	NORTH MARKET WHARF	
Structure Reference / GIS #	2005STM33647							Date of Inspection	DEC 15,2015		Nearest Civic Number	N/A	
Type of Sewer	Sanitary		Storm	X	Combined		Unknown		Last Known Rain Event		Weather Condition	RAIN / Snow	
Gas Reading	LEL		O2					HO2S		CO			

Frame, Cover & Surrounding Area:

Shape of Cover	Round	X	Square/CB		Pyramid		N											
Size of Cover	mm	600					E		Cover Type	Asphalt		Concrete	X	Grass		Gravel		Other	
Condition of Cover	New		Good	X	Bad		Critical		Interface Condition	Excellent		Good	X	Moderate		Poor		Unfinished	
Condition of Frame	New		Good	X	Bad		Critical		Grade Around Manhole	Away	X	Flat		Towards		Washout			

Internal Structure of Manhole:

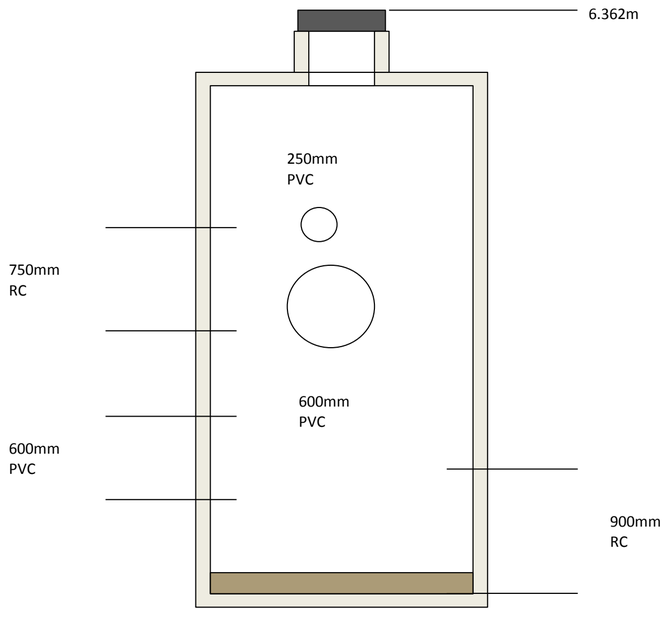
Cover Elevation (meters)	6.362	GPS Shot #		Cannot Remove		Pipes entering structure (#)	4			Material	Depth	Angle	Invert
Internal Diameter (mm) & Condition	1800	Good	X	Bad		Critical		Main Pipe (Outlet)	Dia (mm)	900	RC	4230	0	2.13
Depth From Top of Frame (mm)	4233	Debris	X	Bottom				Main Pipe (Inlet) #1	Dia (mm)	250	PVC	1680	100	4.68
Chimney Height (mm) & Condition	600	Good	X	Bad		Critical		Inlet Pipe #2	Dia (mm)	750	RC	2326	160	4.04
Chimney	Rings	X	Bricks		None			Inlet Pipe #3	Dia (mm)	600	PVC	3550	200	2.81
Benching and Condition	Yes		No		Good		Bad	Inlet Pipe #4	Dia (mm)	600	PVC	2450	265	3.91
Condition of Joints	Good	X	Bad					Inlet Pipe #5	Dia (mm)					
Condition of Interfaces	Good	X	Bad					Inlet Pipe #6	Dia (mm)					
								Inlet Pipe #7	Dia (mm)					

Flow in Structure:

Depth of Flow in Main Channel (mm)	LARGE	Muddy		Silty	X			Inlet Pipe #8	Dia (mm)
Depth of Debris in Channel (mm)	150	Gravel		Garbage		Normal	X	Inlet Pipe #9	Dia (mm)
Needs to be Cleaned		Yes		No		Sticks			
						Critical			

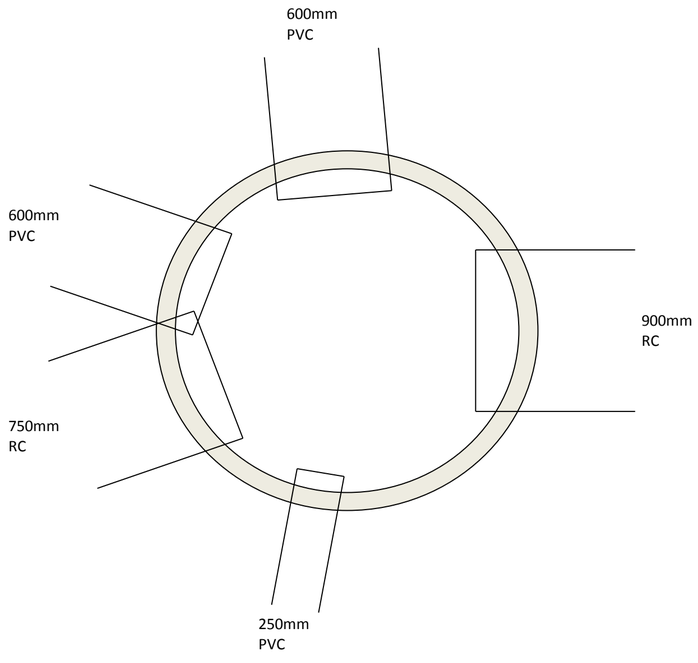
Sketch an Elevation of the Structure:

Note all dimensions and lateral ID numbers as they are shown in the section above.



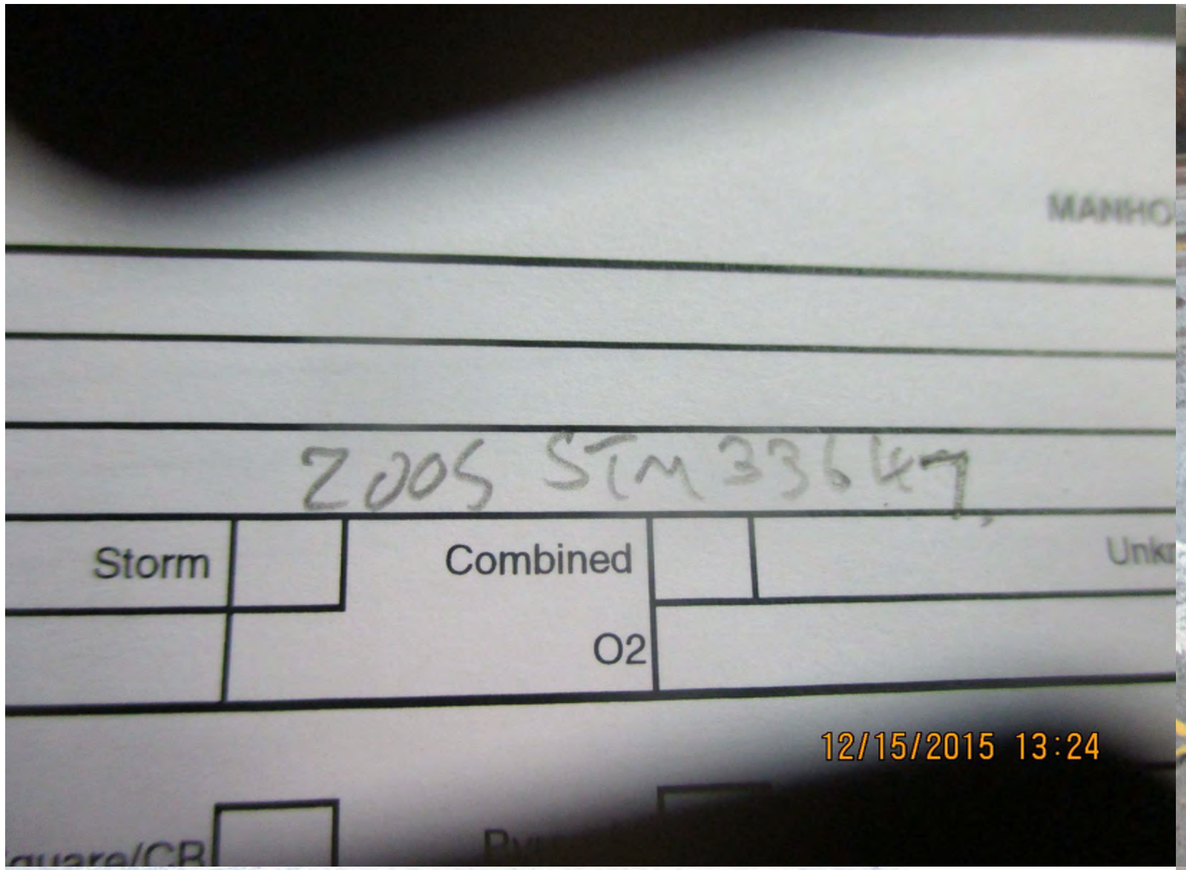
Sketch a Plan of the Structure:

Note all dimensions and lateral ID numbers as they are shown in the section above.



Comments:

Picture File Name:


2005 STM 33649
Storm
Combined
O2
12/15/2015 13:24


12/15/2015 10:29


12/15/2015 10:29


12/15/2015 10:30

MANHOLE INSPECTION FORM

General:

Project #	152884.00 Loyalist Plaza Pipe Report							Inspector	CODY MILLETT	Location / Street	NORTH MARKET WHARF
Structure Reference / GIS #	0000CBT33660							Date of Inspection	17/11/2015	Nearest Civic Number	N/A
Type of Sewer	Sanitary		Storm	X	Combined		Unknown		Last Known Rain Event		Weather Condition	OVERCAST
Gas Reading	LEL		O2					HO2S		CO	

Frame, Cover & Surrounding Area:

Shape of Cover	Round	X	Square/CB		Pyramid		N												
Size of Cover	mm	600					E		Cover Type	Asphalt		Concrete		Grass		Gravel		Other	BRICK
Condition of Cover	New		Good	X	Bad		Critical		Interface Condition	Excellent		Good	X	Moderate		Poor		Unfinished	
Condition of Frame	New		Good	X	Bad		Critical		Grade Around Manhole	Away		Flat		Towards	X	Washout			

Internal Structure of Manhole:

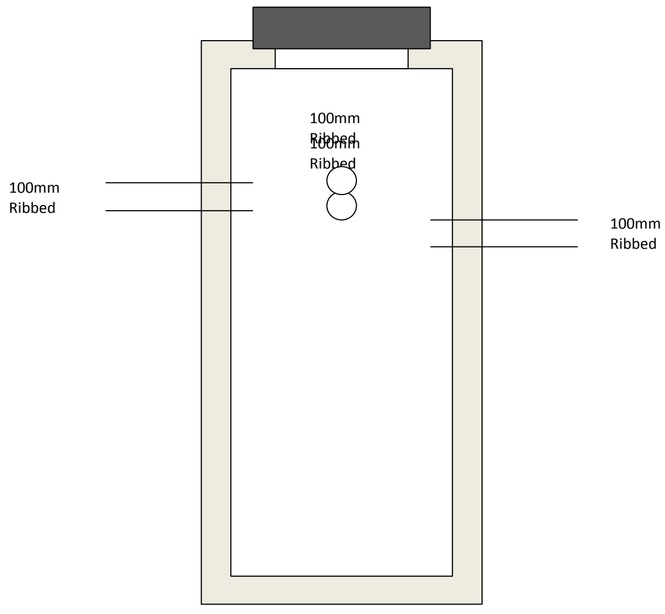
Cover Elevation (meters)		GPS Shot #		Cannot Remove		Pipes entering structure (#)	4		Material	Depth	Angle	Invert
Internal Diameter (mm) & Condition	750	Good	X	Bad		Critical		Main Pipe (Outlet)	Dia (mm)	UNK			0	0.00
Depth From Top of Frame (mm)	2040	Debris		Bottom	X			Main Pipe (Inlet) #1	Dia (mm)	100	Ribbed	860	0	-0.86
Chimney Height (mm) & Condition	270	Good	X	Bad		Critical		Inlet Pipe #2	Dia (mm)	100	Ribbed	760	90	-0.76
Chimney	Rings	X	Bricks		None			Inlet Pipe #3	Dia (mm)	100	Ribbed	730	180	-0.73
Benching and Condition	Yes		No	X	Good		Bad	Inlet Pipe #4	Dia (mm)	100	Ribbed	670	270	-0.67
Condition of Joints	Good	X	Bad					Inlet Pipe #5	Dia (mm)					
Condition of Interfaces	Good	X	Bad					Inlet Pipe #6	Dia (mm)					
								Inlet Pipe #7	Dia (mm)					

Flow in Structure:

Depth of Flow in Main Channel (mm)	UNK	Muddy		Silty				Inlet Pipe #8	Dia (mm)					
Depth of Debris in Channel (mm)	UNK	Gravel		Garbage		Normal		Inlet Pipe #9	Dia (mm)					
Needs to be Cleaned		Yes		No	X	Sticks								
						Critical								

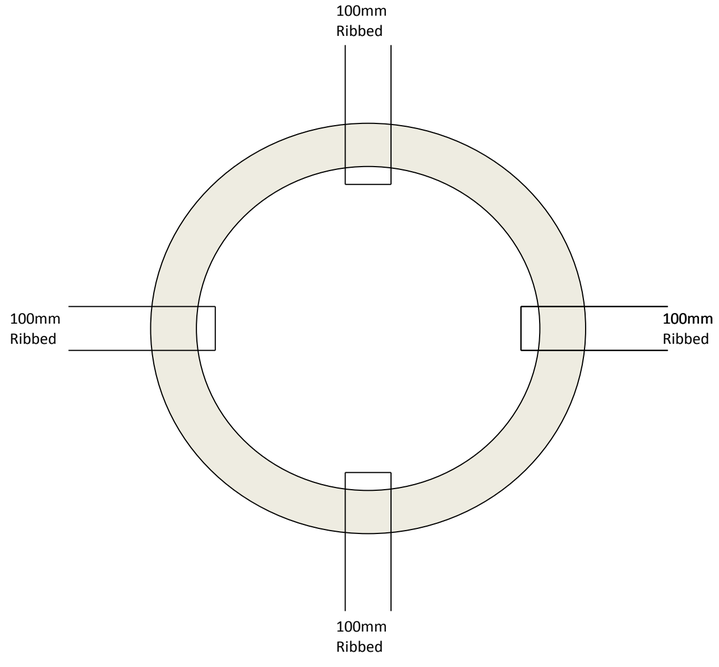
Sketch an Elevation of the Structure:

Note all dimensions and lateral ID numbers as they are shown in the section above.



Sketch a Plan of the Structure:

Note all dimensions and lateral ID numbers as they are shown in the section above.



Comments:

SURCHARGED MH

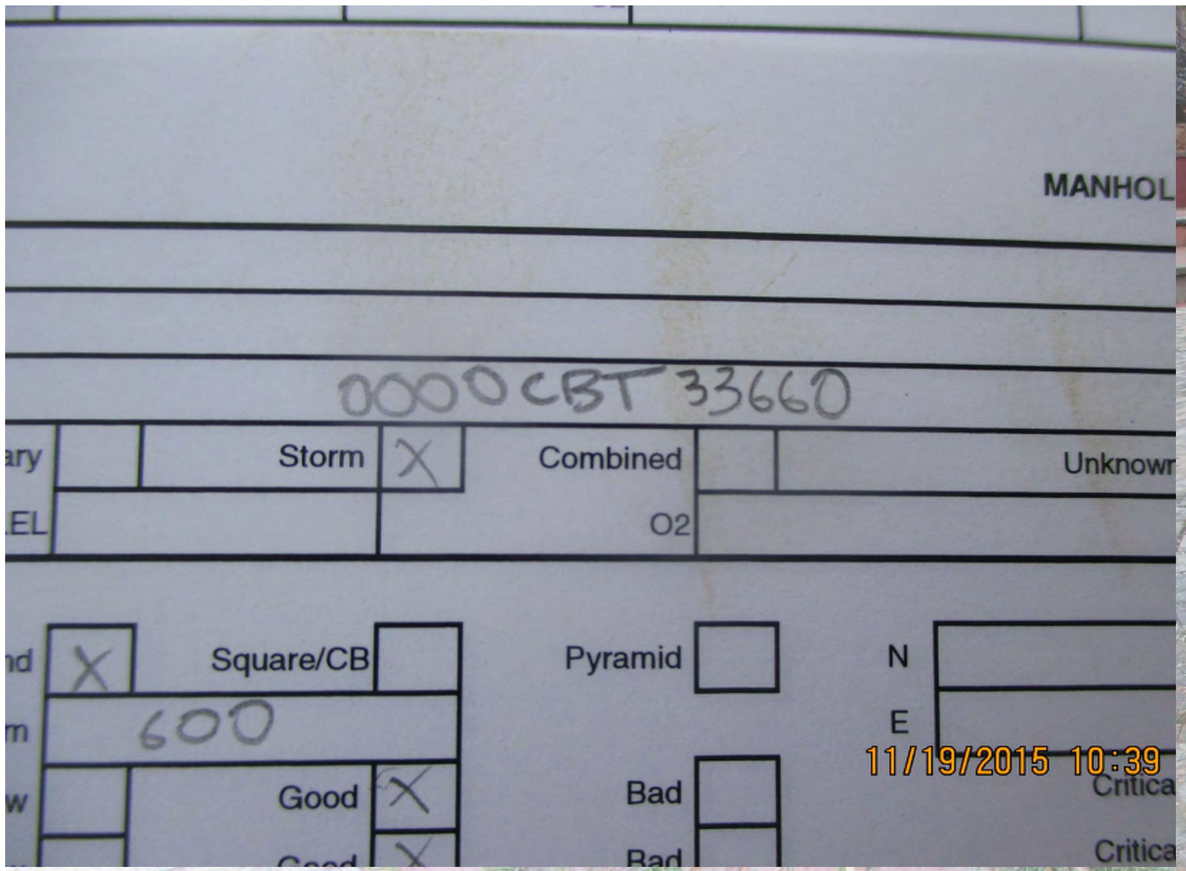
Picture File Name:

1390

1391

1392

1393


MANHOL
0000CBT33660
ary
Storm
X
Combined
Unknown
EL
O2
nd
X
Square/CB
Pyramid
N
E
m
600
w
Good
X
Bad
Critica
Good
X
Bad
Critica
11/19/2015 10:39


11/19/2015 10:39


11/19/2015 10:39


11/19/2015 10:40

MANHOLE INSPECTION FORM

General:

Project #	152884.00 Loyalist Plaza Pipe Report							Inspector	CODY MILLETT	Location / Street	NORTH MARKET WHARF
Structure Reference / GIS #	STMH7854							Date of Inspection	30/11/2015	Nearest Civic Number	N/A
Type of Sewer	Sanitary		Storm	X	Combined		Unknown		Last Known Rain Event		Weather Condition	SUNNY
Gas Reading	LEL		O2					HO2S		CO	

Frame, Cover & Surrounding Area:

Shape of Cover	Round	X	Square/CB		Pyramid		N												
Size of Cover	mm	600					E		Cover Type	Asphalt		Concrete		Grass		Gravel		Other	BRICK
Condition of Cover	New		Good	X	Bad		Critical		Interface Condition	Excellent		Good	X	Moderate		Poor		Unfinished	
Condition of Frame	New		Good	X	Bad		Critical		Grade Around Manhole	Away	X	Flat		Towards		Washout			

Internal Structure of Manhole:

Cover Elevation (meters)	6.201	GPS Shot #		Cannot Remove		Pipes entering structure (#)	2			Material	Depth	Angle	Invert
Internal Diameter (mm) & Condition	1050	Good	X	Bad		Critical		Main Pipe (Outlet)	Dia (mm)	900?	UNK	UNK	0	
Depth From Top of Frame (mm)	UNK	Debris		Bottom				Main Pipe (Inlet) #1	Dia (mm)	375	RC	2940	150	3.26
Chimney Height (mm) & Condition	2550	Good	X	Bad		Critical		Inlet Pipe #2	Dia (mm)	900?	UNK	UNK	200	
Chimney	Rings	X	Bricks		None			Inlet Pipe #3	Dia (mm)	250	RC	2570	210	3.63
Benching and Condition	Yes		No	X	Good		Bad	Inlet Pipe #4	Dia (mm)					
Condition of Joints	Good	X	Bad					Inlet Pipe #5	Dia (mm)					
Condition of Interfaces	Good	X	Bad					Inlet Pipe #6	Dia (mm)					
								Inlet Pipe #7	Dia (mm)					
								Inlet Pipe #8	Dia (mm)					
								Inlet Pipe #9	Dia (mm)					

Flow in Structure:

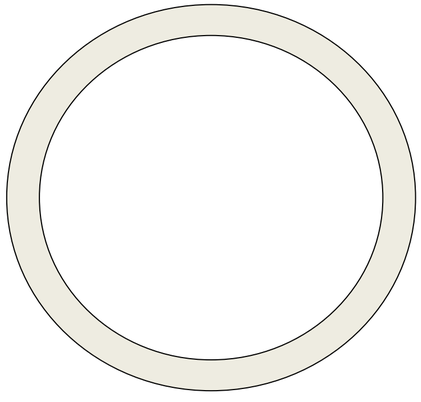
Depth of Flow in Main Channel (mm)	LARGE	Muddy		Silty		Normal	X
Depth of Debris in Channel (mm)	0	Gravel		Garbage		Sticks	
Needs to be Cleaned		Yes		No	X	Critical	

Sketch an Elevation of the Structure:

Note all dimensions and lateral ID numbers as they are shown in the section above.

Sketch a Plan of the Structure:

Note all dimensions and lateral ID numbers as they are shown in the section above.



Comments:

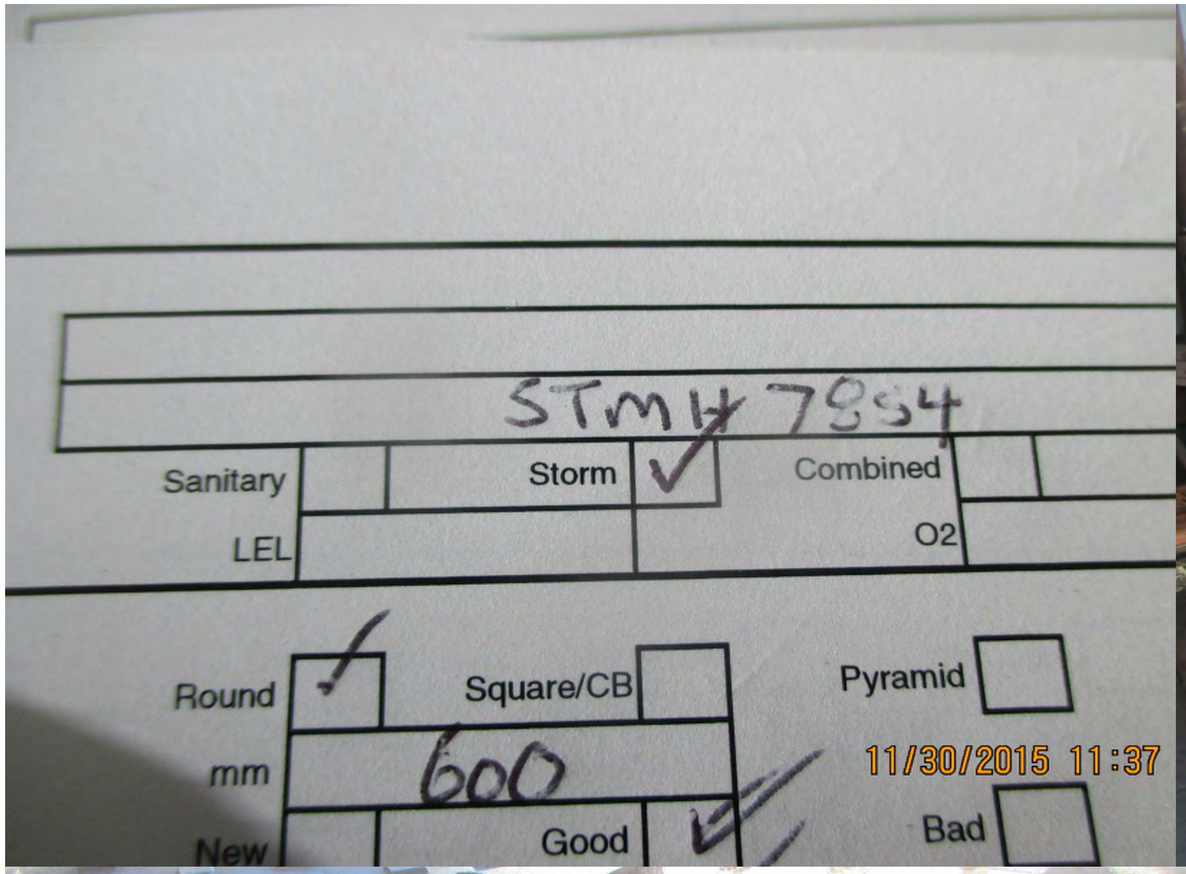
STRUCTURE SURCHARGED

Picture File Name:

1438

1439

1440


STMH 7954
Sanitary
Storm
Combined
LEL
O2
Round
Square/CB
Pyramid
mm
600
New
Good
Bad
11/30/2015 11:37


11/30/2015 11:37


11/30/2015 11:37

MANHOLE INSPECTION FORM

General:

Project #	152884.00 Loyalist Plaza Pipe Report							Inspector	CODY MILLETT	Location / Street	NORTH MARKET WHARF
Structure Reference / GIS #	STMH7853							Date of Inspection	DEC 15,2015	Nearest Civic Number	N/A
Type of Sewer	Sanitary		Storm	X	Combined		Unknown		Last Known Rain Event		Weather Condition	RAIN / SNOW
Gas Reading	LEL		O2						HO2S		CO	

Frame, Cover & Surrounding Area:

Shape of Cover	Round	X	Square/CB		Pyramid		N												
Size of Cover	mm	500					E		Cover Type	Asphalt		Concrete		Grass		Gravel		Other	BRICK
Condition of Cover	New		Good	X	Bad		Critical		Interface Condition	Excellent		Good	X	Moderate		Poor		Unfinished	
Condition of Frame	New		Good	X	Bad		Critical		Grade Around Manhole	Away	X	Flat		Towards		Washout			

Internal Structure of Manhole:

Cover Elevation (meters)	6.126	GPS Shot #		Cannot Remove		Pipes entering structure (#)	2			Material	Depth	Angle	Invert
Internal Diameter (mm) & Condition	1050	Good	X	Bad		Critical		Main Pipe (Outlet)	Dia (mm)	UNK	UNK	UNK	0	
Depth From Top of Frame (mm)	UNK	Debris		Bottom				Main Pipe (Inlet) #1	Dia (mm)	250	RC	4020	180	2.11
Chimney Height (mm) & Condition	1350	Good	X	Bad		Critical		Inlet Pipe #2	Dia (mm)	250	CONC	2510	210	3.62
Chimney	Rings	X	Bricks		None			Inlet Pipe #3	Dia (mm)					
Benching and Condition	Yes		No	X	Good		Bad	Inlet Pipe #4	Dia (mm)					
Condition of Joints	Good	X	Bad					Inlet Pipe #5	Dia (mm)					
Condition of Interfaces	Good	X	Bad					Inlet Pipe #6	Dia (mm)					
								Inlet Pipe #7	Dia (mm)					
								Inlet Pipe #8	Dia (mm)					
								Inlet Pipe #9	Dia (mm)					

Flow in Structure:

Depth of Flow in Main Channel (mm)	150	Muddy		Silty		Normal	X
Depth of Debris in Channel (mm)	0	Gravel		Garbage		Sticks	
Needs to be Cleaned		Yes		No	X	Critical	

Sketch an Elevation of the Structure:

Note all dimensions and lateral ID numbers as they are shown in the section above.

Sketch a Plan of the Structure:

Note all dimensions and lateral ID numbers as they are shown in the section above.

Comments:

UNABLE TO DETERMINE PIPE SIZES DUE TO SURCHARGE.

STRUCTURE APPEARS IN GOOD SHAPE.

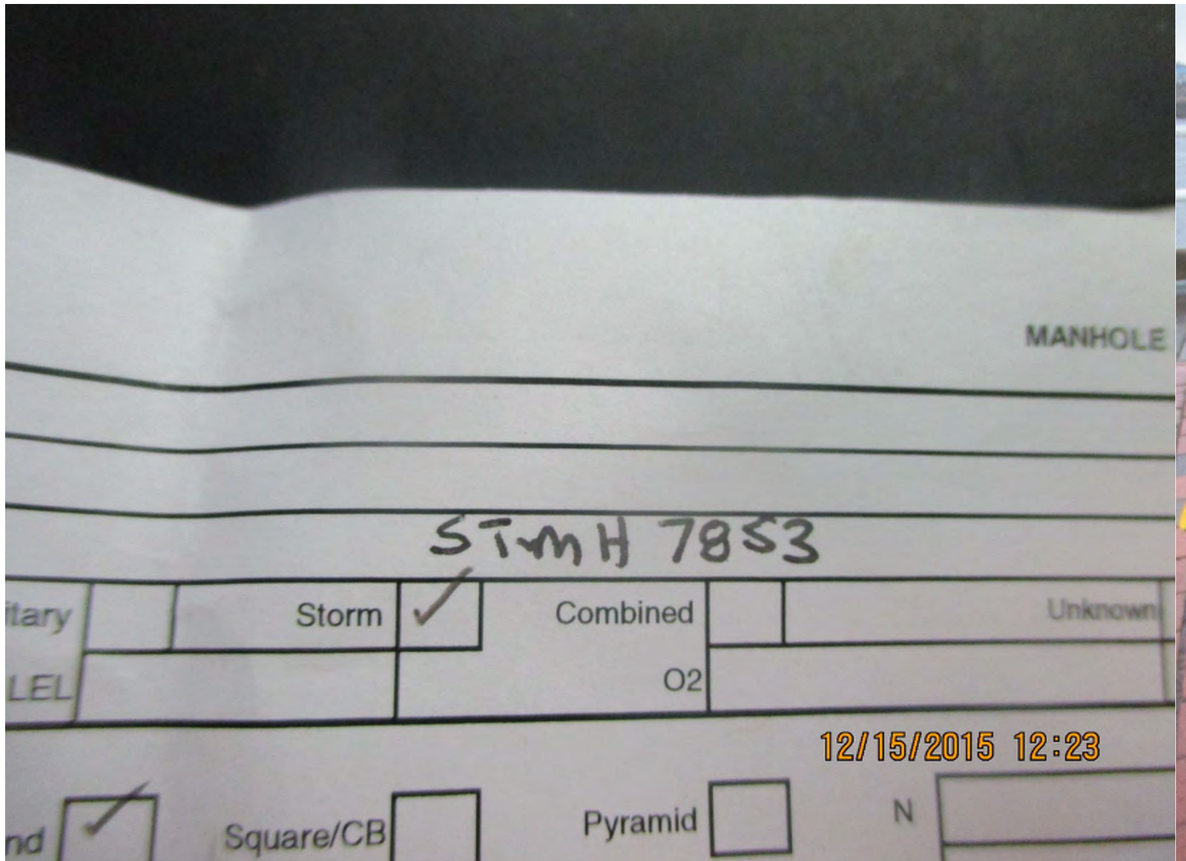
Picture File Name:

1472

1450

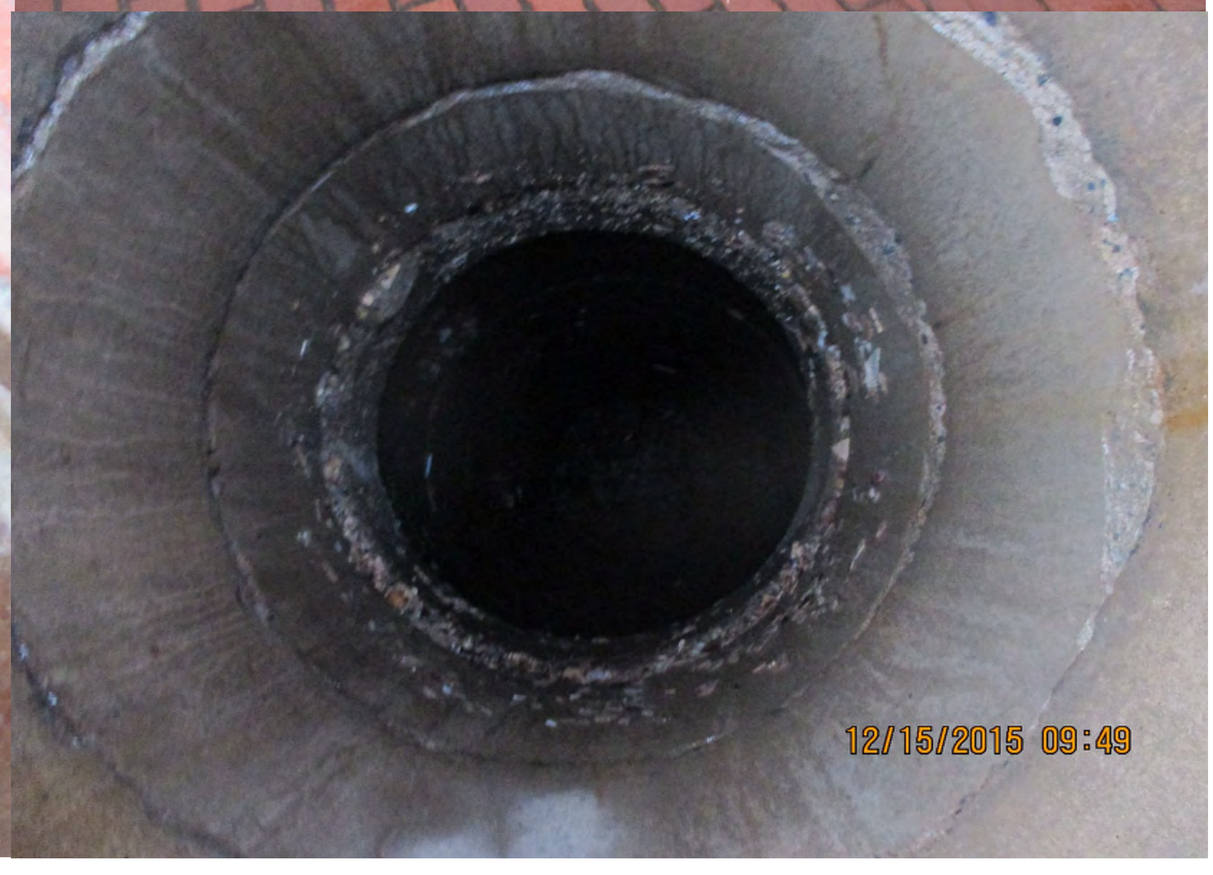
1451

1452


MANHOLE
STMH 7853
itary
Storm
Combined
Unknown
LEL
O2
12/15/2015 12:23
nd
Square/CB
Pyramid
N


12/15/2015 09:47


12/15/2015 09:47


12/15/2015 09:49

MANHOLE INSPECTION FORM

General:

Project #	152884.00 Loyalist Plaza Pipe Report							Inspector	CODY MILLETT	Location / Street	NORTH MARKET WHARF
Structure Reference / GIS #	CBCL_STMH7854A							Date of Inspection	DEC 15,2015	Nearest Civic Number	N/A
Type of Sewer	Sanitary		Storm		Combined	X	Unknown		Last Known Rain Event		Weather Condition	RAIN ? Snow
Gas Reading	LEL			O2				HO2S		CO	

Frame, Cover & Surrounding Area:

Shape of Cover	Round	X	Square/CB		Pyramid		N												
Size of Cover	mm	600					E		Cover Type	Asphalt		Concrete	X	Grass		Gravel		Other	
Condition of Cover	New		Good	X	Bad		Critical		Interface Condition	Excellent		Good	X	Moderate		Poor		Unfinished	
Condition of Frame	New		Good	X	Bad		Critical		Grade Around Manhole	Away	X	Flat		Towards		Washout			

Internal Structure of Manhole:

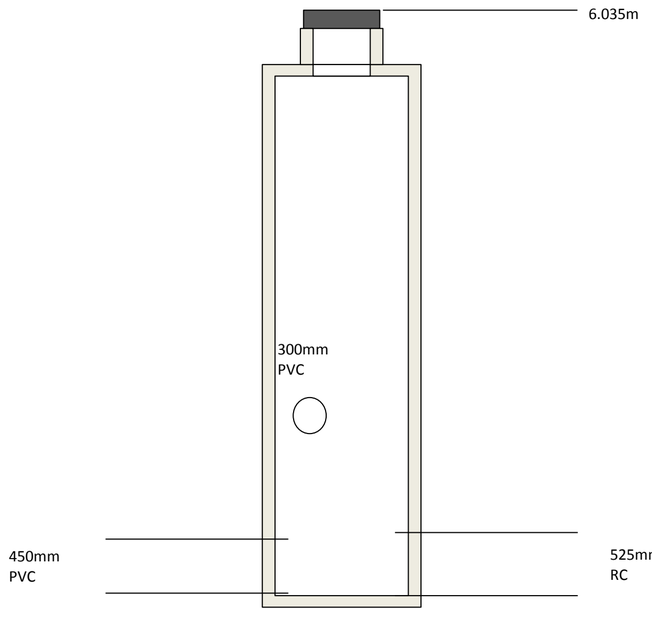
Cover Elevation (meters)	6.035	GPS Shot #		Cannot Remove		Pipes entering structure (#)	2			Material	Depth	Angle	Invert
Internal Diameter (mm) & Condition	1050	Good	X	Bad		Critical		Main Pipe (Outlet)	Dia (mm)	525	RC	4880	0	1.16
Depth From Top of Frame (mm)	4880	Debris		Bottom	X			Main Pipe (Inlet) #1	Dia (mm)	450	PVC	4860	180	1.18
Chimney Height (mm) & Condition	600	Good	X	Bad		Critical		Inlet Pipe #2	Dia (mm)	300	PVC	3530	240	2.51
Chimney	Rings	X	Bricks		None			Inlet Pipe #3	Dia (mm)					
Benching and Condition	Yes	X	No		Good	X	Bad	Inlet Pipe #4	Dia (mm)					
Condition of Joints	Good	X	Bad					Inlet Pipe #5	Dia (mm)					
Condition of Interfaces	Good	X	Bad					Inlet Pipe #6	Dia (mm)					
								Inlet Pipe #7	Dia (mm)					
								Inlet Pipe #8	Dia (mm)					
								Inlet Pipe #9	Dia (mm)					

Flow in Structure:

Depth of Flow in Main Channel (mm)	5	Muddy		Silty		Normal	X
Depth of Debris in Channel (mm)	0	Gravel		Garbage		Sticks	
Needs to be Cleaned		Yes		No	X	Critical	

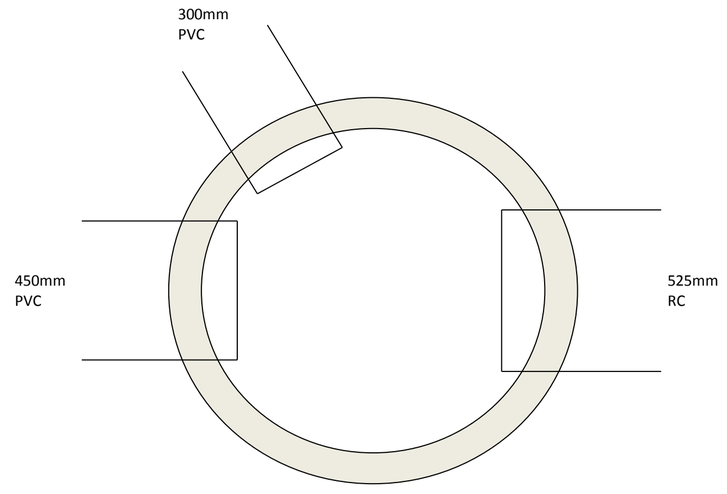
Sketch an Elevation of the Structure:

Note all dimensions and lateral ID numbers as they are shown in the section above.



Sketch a Plan of the Structure:

Note all dimensions and lateral ID numbers as they are shown in the section above.



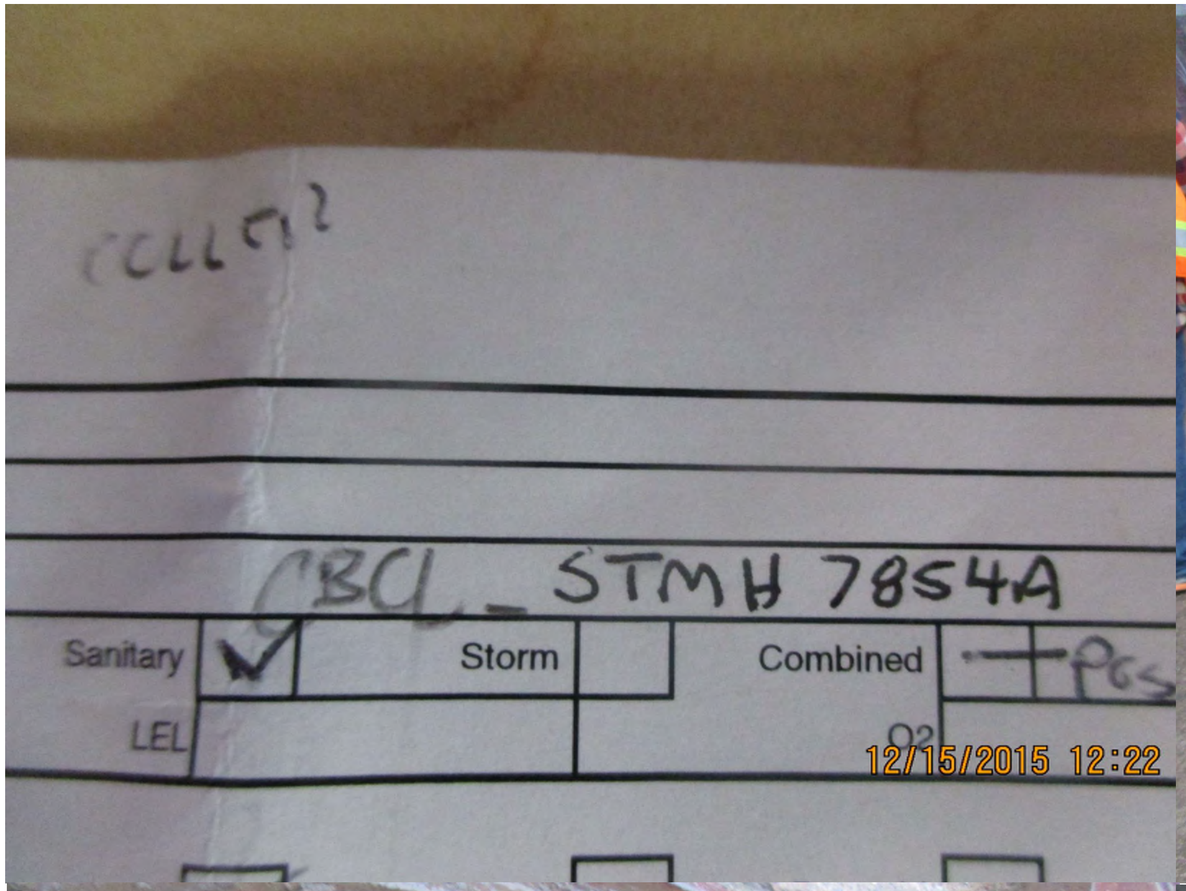
Comments:

Picture File Name:

1438

1439

1440


CBCL_STMH 7854A
Sanitary
Storm
Combined
LEL
O2
12/15/2015 12:22


Lemongrass
Peppers Pub
12/15/2015 10:07


12/15/2015 10:07


12/15/2015 10:08

MANHOLE INSPECTION FORM

General:

Project #	152884.00 Loyalist Plaza Pipe Report							Inspector	CODY MILLETT	Location / Street	NORTH MARKET WHARF
Structure Reference / GIS #	0000STM33684							Date of Inspection	19/11/2015	Nearest Civic Number	N/A
Type of Sewer	Sanitary		Storm	X	Combined		Unknown		Last Known Rain Event		Weather Condition	OVERCAST
Gas Reading	LEL		O2					HO2S		CO	

Frame, Cover & Surrounding Area:

Shape of Cover	Round	X	Square/CB		Pyramid		N												
Size of Cover	mm	600					E		Cover Type	Asphalt	X	Concrete		Grass		Gravel		Other	
Condition of Cover	New		Good		Bad	X	Critical		Interface Condition	Excellent		Good	X	Moderate		Poor		Unfinished	
Condition of Frame	New		Good		Bad	X	Critical		Grade Around Manhole	Away	X	Flat		Towards		Washout			

Internal Structure of Manhole:

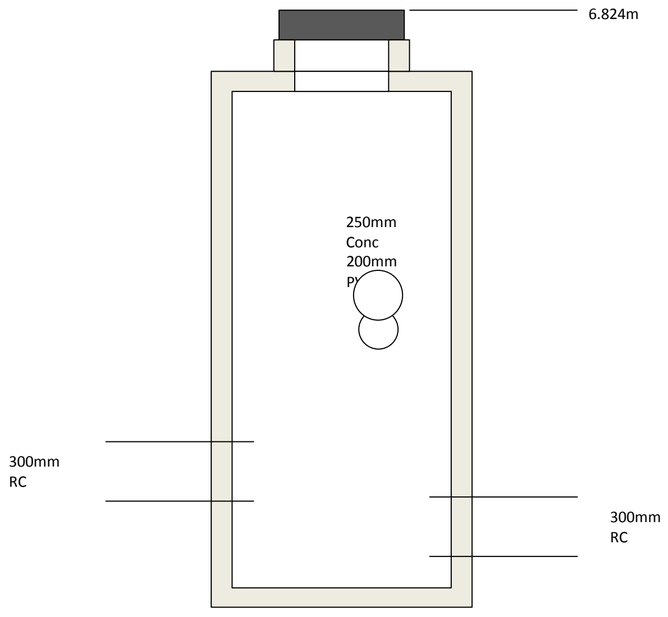
Cover Elevation (meters)	6.824	GPS Shot #		Cannot Remove		Pipes entering structure (#)	3			Material	Depth	Angle	Invert
Internal Diameter (mm) & Condition	1050	Good	X	Bad		Critical		Main Pipe (Outlet)	Dia (mm)	300	RC	2770	0	4.05
Depth From Top of Frame (mm)	2930	Debris		Bottom	X			Main Pipe (Inlet) #1	Dia (mm)	200	PVC	1720	70	5.10
Chimney Height (mm) & Condition	460	Good	X	Bad		Critical		Inlet Pipe #2	Dia (mm)	300	RC	2490	180	4.33
Chimney	Rings	X	Bricks		None			Inlet Pipe #3	Dia (mm)	250	Conc	1570	290	5.25
Benching and Condition	Yes		No	X	Good		Bad	Inlet Pipe #4	Dia (mm)					
Condition of Joints	Good	X	Bad					Inlet Pipe #5	Dia (mm)					
Condition of Interfaces	Good	X	Bad					Inlet Pipe #6	Dia (mm)					
								Inlet Pipe #7	Dia (mm)					

Flow in Structure:

Depth of Flow in Main Channel (mm)	0	Muddy		Silty			Inlet Pipe #8	Dia (mm)	
Depth of Debris in Channel (mm)	0	Gravel		Garbage		Normal / Sticks	Inlet Pipe #9	Dia (mm)	
Needs to be Cleaned		Yes		No	X	Critical			

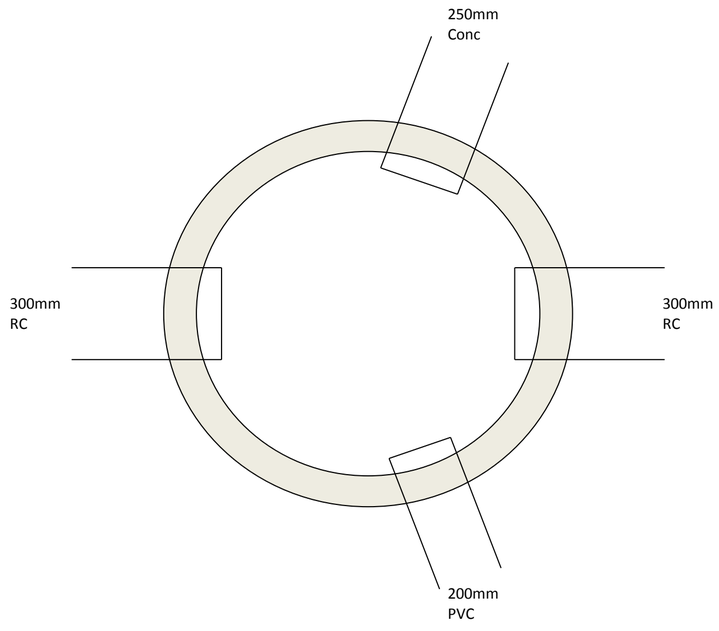
Sketch an Elevation of the Structure:

Note all dimensions and lateral ID numbers as they are shown in the section above.



Sketch a Plan of the Structure:

Note all dimensions and lateral ID numbers as they are shown in the section above.



Comments:

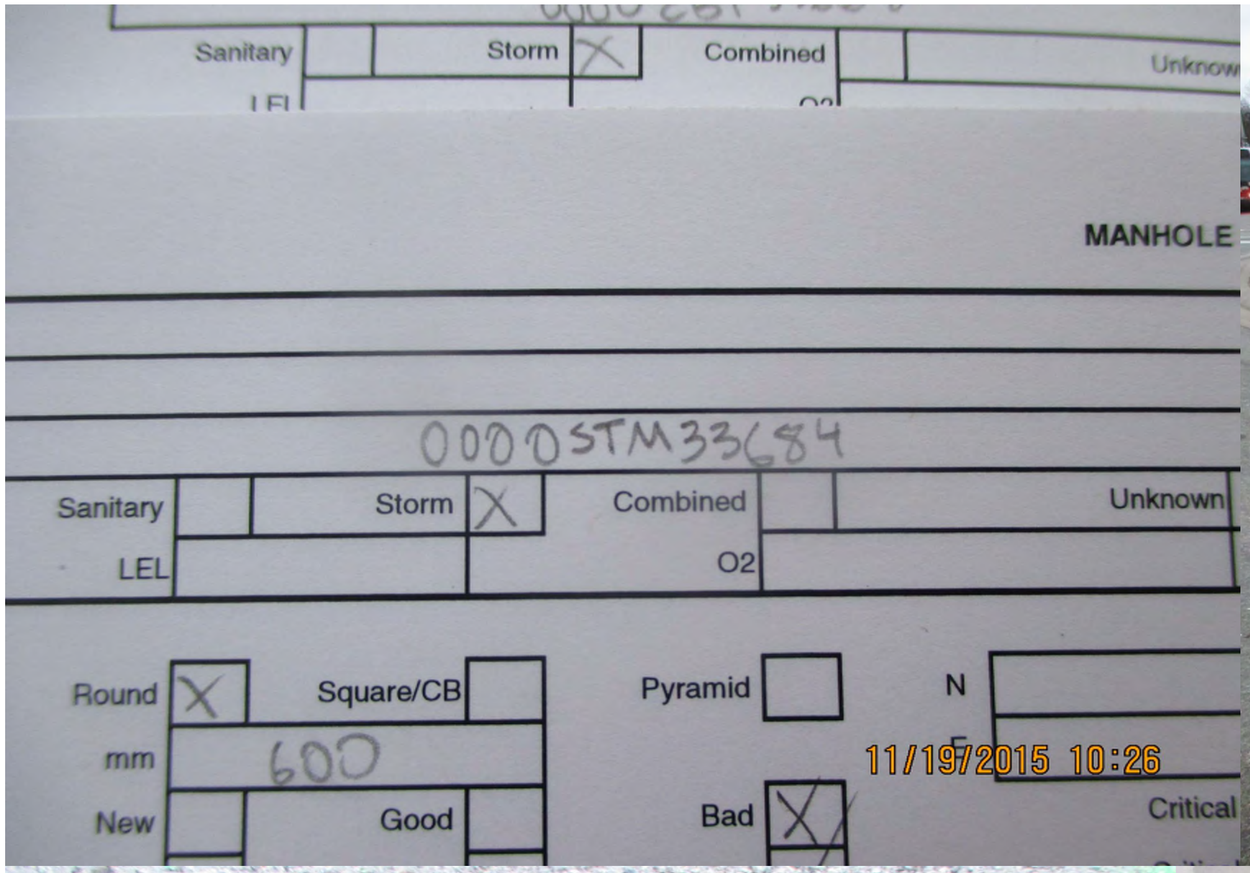
Picture File Name:

1385

1386

1387

1388


Sanitary
Storm X
Combined
Unknow
MANHOLE
0000STM33684
Sanitary
Storm X
Combined
Unknown
LEL
O2
Round X
Square/CB
Pyramid
N
mm 600
11/19/2015 10:26
New
Good
Bad X
Critical


11/19/2015 10:26


11/19/2015 10:26


11/19/2015 10:26

MANHOLE INSPECTION FORM

General:

Project #	152884.00 Loyalist Plaza Pipe Report							Inspector	CODY MILLETT	Location / Street	NORHT MARKET WHARF
Structure Reference / GIS #	0000CBT33667							Date of Inspection	19/11/2015	Nearest Civic Number	N/A
Type of Sewer	Sanitary		Storm	X	Combined		Unknown		Last Known Rain Event		Weather Condition	OVERCAST
Gas Reading	LEL		O2					HO2S		CO	

Frame, Cover & Surrounding Area:

Shape of Cover	Round		Square/CB	X	Pyramid		N												
Size of Cover	mm	450					E		Cover Type	Asphalt	X	Concrete		Grass		Gravel		Other	
Condition of Cover	New		Good	X	Bad		Critical		Interface Condition	Excellent		Good	X	Moderate		Poor		Unfinished	
Condition of Frame	New		Good	X	Bad		Critical		Grade Around Manhole	Away		Flat		Towards	X	Washout			

Internal Structure of Manhole:

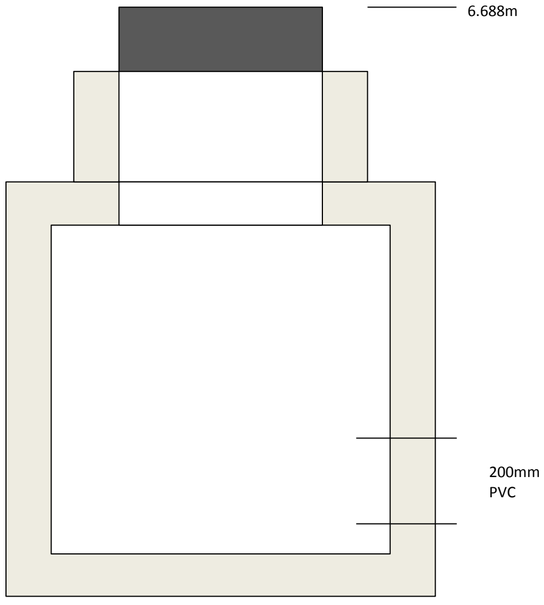
Cover Elevation (meters)	6.688	GPS Shot #		Cannot Remove		Pipes entering structure (#)	0		Material	Depth	Angle	Invert
Internal Diameter (mm) & Condition	750	Good	X	Bad		Critical		Main Pipe (Outlet)	Dia (mm)	200	PVC	1210	0	5.48
Depth From Top of Frame (mm)	1280	Debris		Bottom	X			Main Pipe (Inlet) #1	Dia (mm)					
Chimney Height (mm) & Condition	560	Good	X	Bad		Critical		Inlet Pipe #2	Dia (mm)					
Chimney	Rings	X	Bricks		None			Inlet Pipe #3	Dia (mm)					
Benching and Condition	Yes		No	X	Good		Bad	Inlet Pipe #4	Dia (mm)					
Condition of Joints	Good	X	Bad					Inlet Pipe #5	Dia (mm)					
Condition of Interfaces	Good	X	Bad					Inlet Pipe #6	Dia (mm)					
								Inlet Pipe #7	Dia (mm)					

Flow in Structure:

Depth of Flow in Main Channel (mm)	0	Muddy		Silty		Normal		Inlet Pipe #8	Dia (mm)
Depth of Debris in Channel (mm)	0	Gravel		Garbage		Sticks	X	Inlet Pipe #9	Dia (mm)
Needs to be Cleaned		Yes		No	X	Critical			

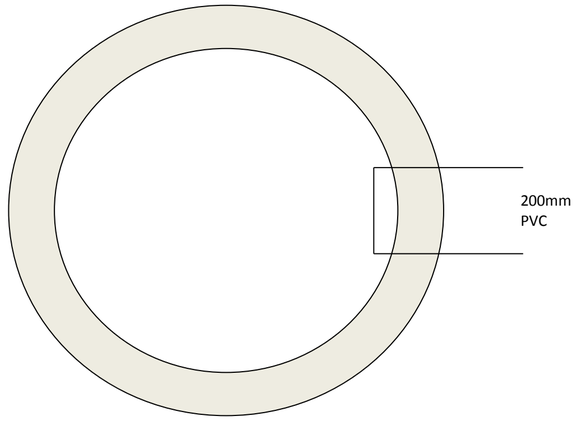
Sketch an Elevation of the Structure:

Note all dimensions and lateral ID numbers as they are shown in the section above.



Sketch a Plan of the Structure:

Note all dimensions and lateral ID numbers as they are shown in the section above.



Comments:

OVAL COVER

COULD NOT POP

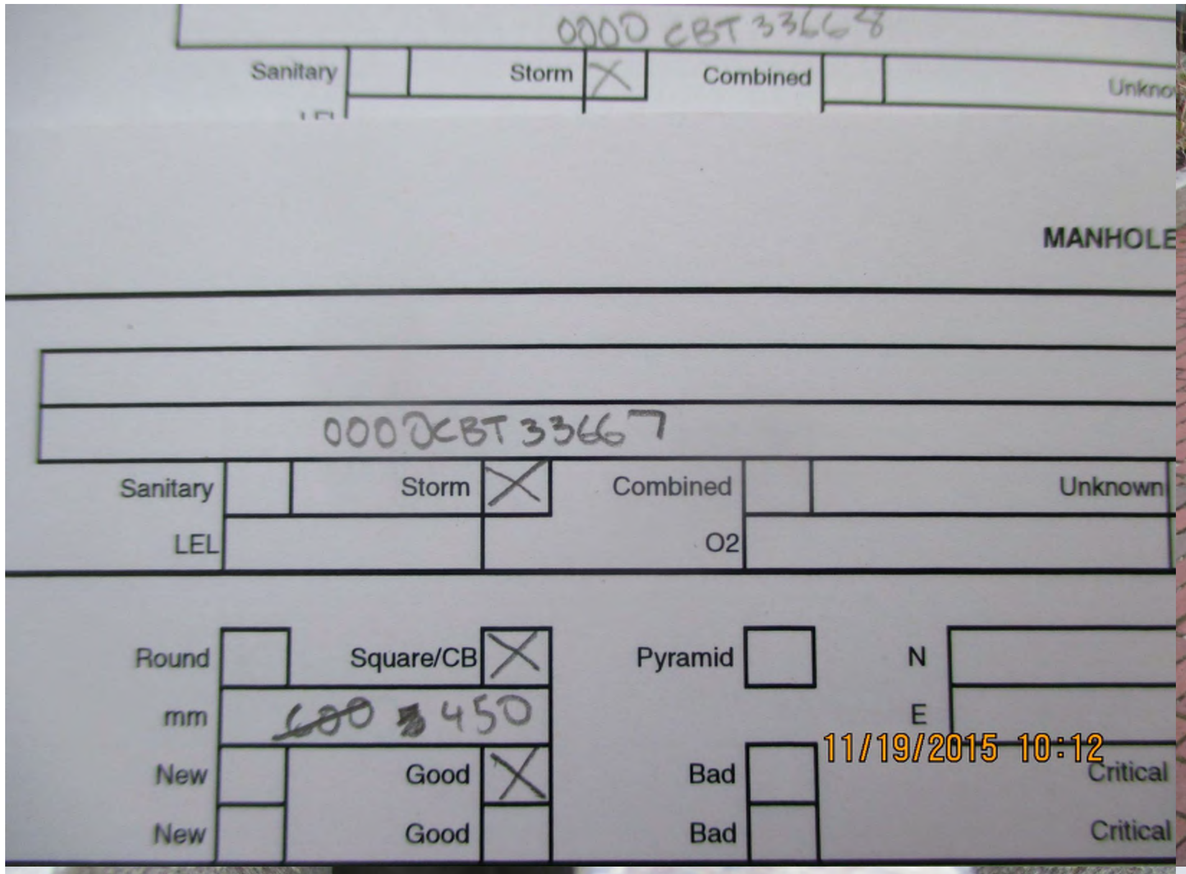
Picture File Name:

1381

1382

1383

1384


0000CBT33668
Sanitary
Storm
Combined
Unkno
MANHOLE
0002CBT33667
Sanitary
Storm
Combined
Unknown
LEL
O2
Round
Square/CB
Pyramid
N
mm
600 → 450
E
11/19/2015 10:12
New
Good
Bad
Critical
New
Good
Bad
Critical


11/19/2015 10:13


11/19/2015 10:13


11/19/2015 10:13

MANHOLE INSPECTION FORM

General:

Project #	152884.00 Loyalist Plaza Pipe Report							Inspector	CODY MILLETT		Location / Street	NORTH MARKET WHARF	
Structure Reference / GIS #	0000CBT33668							Date of Inspection	19/11/2015		Nearest Civic Number	N/A	
Type of Sewer	Sanitary		Storm	X	Combined		Unknown		Last Known Rain Event		Weather Condition	OVERCAST	
Gas Reading	LEL		O2						HO2S		CO		

Frame, Cover & Surrounding Area:

Shape of Cover	Round		Square/CB	X	Pyramid		N												
Size of Cover	mm	600					E		Cover Type	Asphalt	X	Concrete		Grass		Gravel		Other	
Condition of Cover	New		Good	X	Bad		Critical		Interface Condition	Excellent		Good	X	Moderate		Poor		Unfinished	
Condition of Frame	New		Good	X	Bad		Critical		Grade Around Manhole	Away		Flat		Towards	X	Washout			

Internal Structure of Manhole:

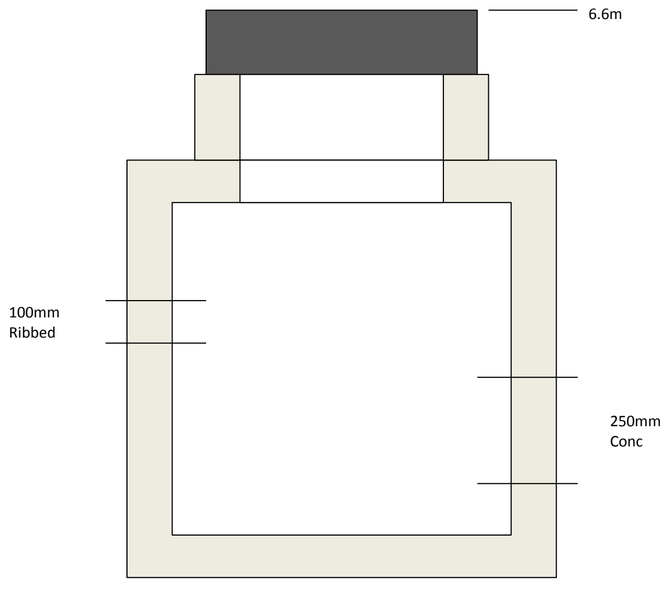
Cover Elevation (meters)	6.6	GPS Shot #		Cannot Remove		Pipes entering structure (#)	1		Material	Depth	Angle	Invert
Internal Diameter (mm) & Condition	750	Good	X	Bad		Critical		Main Pipe (Outlet)	Dia (mm)	250	Conc	1110	0	5.49
Depth From Top of Frame (mm)	1230	Debris		Bottom	X			Main Pipe (Inlet) #1	Dia (mm)	100	Ribbed	780	165	5.82
Chimney Height (mm) & Condition	500	Good	X	Bad		Critical		Inlet Pipe #2	Dia (mm)					
Chimney	Rings	X	Bricks		None			Inlet Pipe #3	Dia (mm)					
Benching and Condition	Yes		No	X	Good		Bad	Inlet Pipe #4	Dia (mm)					
Condition of Joints	Good	X	Bad					Inlet Pipe #5	Dia (mm)					
Condition of Interfaces	Good	X	Bad					Inlet Pipe #6	Dia (mm)					
								Inlet Pipe #7	Dia (mm)					
								Inlet Pipe #8	Dia (mm)					
								Inlet Pipe #9	Dia (mm)					

Flow in Structure:

Depth of Flow in Main Channel (mm)	0	Muddy		Silty		Normal	
Depth of Debris in Channel (mm)	0	Gravel	X	Garbage		Sticks	X
Needs to be Cleaned		Yes		No	X	Critical	

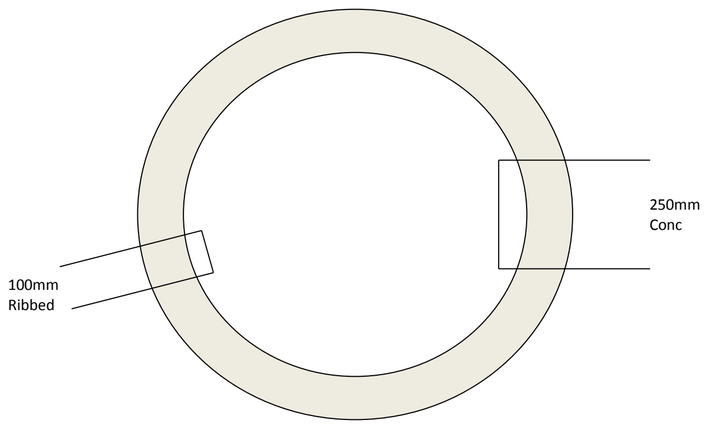
Sketch an Elevation of the Structure:

Note all dimensions and lateral ID numbers as they are shown in the section above.



Sketch a Plan of the Structure:

Note all dimensions and lateral ID numbers as they are shown in the section above.



Comments:

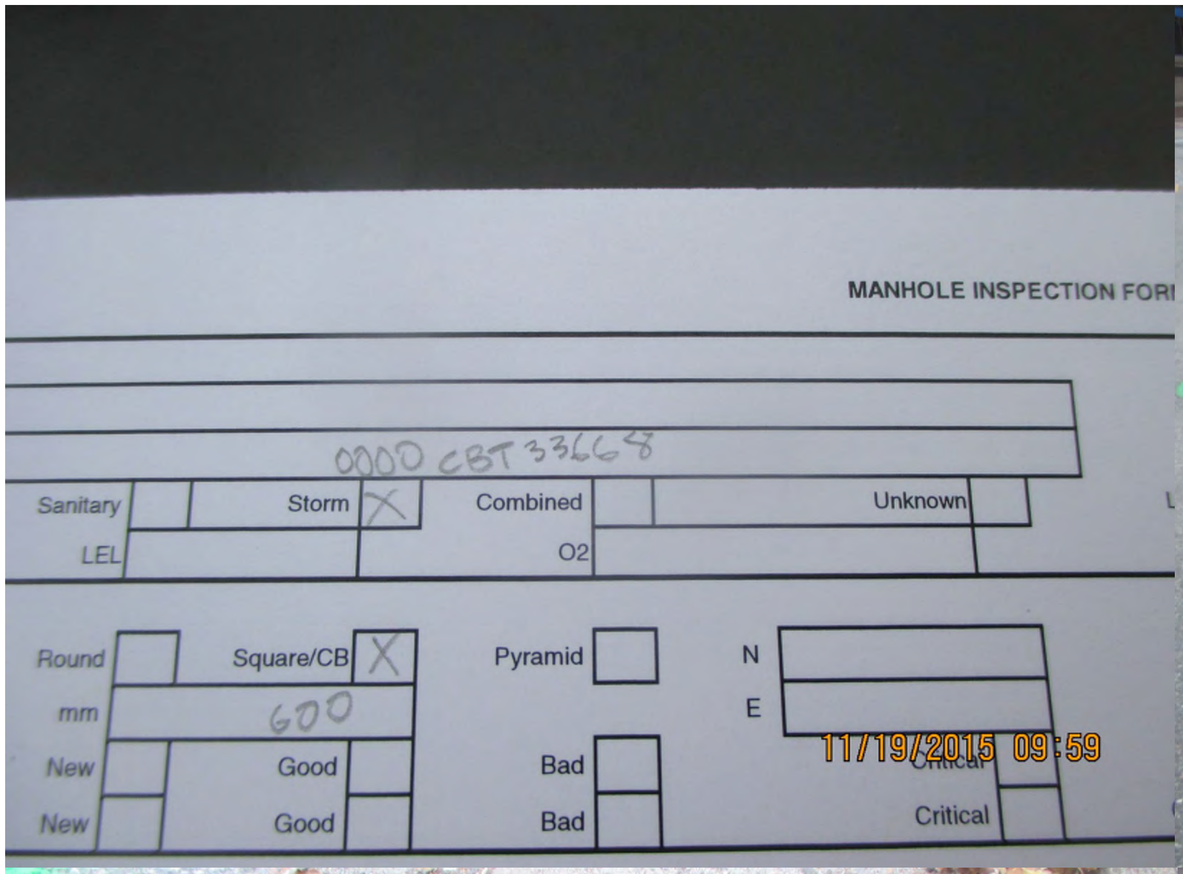
Picture File Name:

1377

1378

1379

1380


MANHOLE INSPECTION FORI
0000 CBT 33668
Sanitary
Storm X
Combined
Unknown
LEL
O2
Round
Square/CB X
Pyramid
N
E
mm
600
New
Good
Bad
New
Good
Bad
Critical
11/19/2015 09:59


11/19/2015 09:59


11/19/2015 09:59


11/19/2015 09:59

MANHOLE INSPECTION FORM

General:

Project #	152884.00 Loyalist Plaza Pipe Report							Inspector	CODY MILLETT	Location / Street	NORTH MARKET WHARF
Structure Reference / GIS #	0000CBT33669							Date of Inspection	19/11/2015	Nearest Civic Number	N/A
Type of Sewer	Sanitary		Storm	X	Combined		Unknown		Last Known Rain Event		Weather Condition	OVERCAST
Gas Reading	LEL		O2					HO2S		CO	

Frame, Cover & Surrounding Area:

Shape of Cover	Round		Square/CB	X	Pyramid		N												
Size of Cover	mm	450					E		Cover Type	Asphalt		Concrete		Grass		Gravel		Other	BRICKS
Condition of Cover	New		Good	X	Bad		Critical		Interface Condition	Excellent		Good	X	Moderate		Poor		Unfinished	
Condition of Frame	New		Good	X	Bad		Critical		Grade Around Manhole	Away		Flat		Towards	X	Washout			

Internal Structure of Manhole:

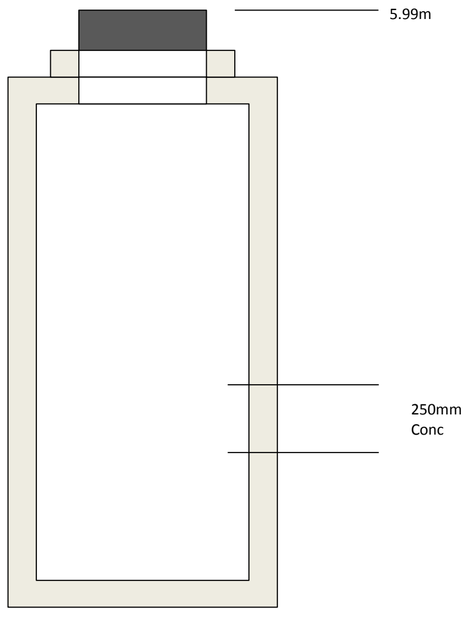
Cover Elevation (meters)	5.99	GPS Shot #		Cannot Remove		Pipes entering structure (#)	0		Material	Depth	Angle	Invert
Internal Diameter (mm) & Condition	750	Good	X	Bad		Critical		Main Pipe (Outlet)	Dia (mm)	250	Conc	1650	0	4.34
Depth From Top of Frame (mm)	2130	Debris		Bottom	X			Main Pipe (Inlet) #1	Dia (mm)					
Chimney Height (mm) & Condition	400	Good		Bad	X	Critical		Inlet Pipe #2	Dia (mm)					
Chimney	Rings	X	Bricks		None			Inlet Pipe #3	Dia (mm)					
Benching and Condition	Yes		No	X	Good		Bad	Inlet Pipe #4	Dia (mm)					
Condition of Joints	Good	X	Bad					Inlet Pipe #5	Dia (mm)					
Condition of Interfaces	Good	X	Bad					Inlet Pipe #6	Dia (mm)					
								Inlet Pipe #7	Dia (mm)					
								Inlet Pipe #8	Dia (mm)					
								Inlet Pipe #9	Dia (mm)					

Flow in Structure:

Depth of Flow in Main Channel (mm)	0	Muddy		Silty	X	Normal	
Depth of Debris in Channel (mm)	0	Gravel		Garbage		Sticks	X
Needs to be Cleaned		Yes		No	X	Critical	

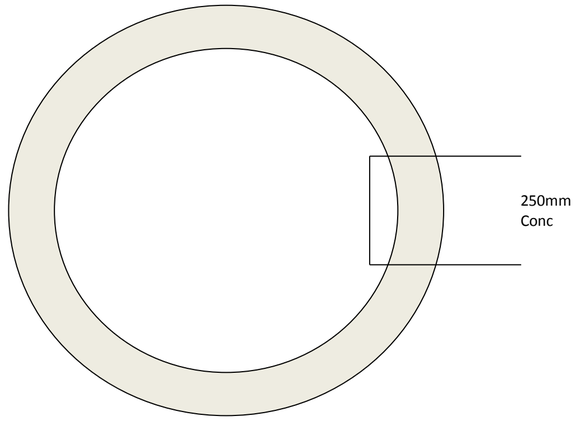
Sketch an Elevation of the Structure:

Note all dimensions and lateral ID numbers as they are shown in the section above.



Sketch a Plan of the Structure:

Note all dimensions and lateral ID numbers as they are shown in the section above.



Comments:

OVAL COVER

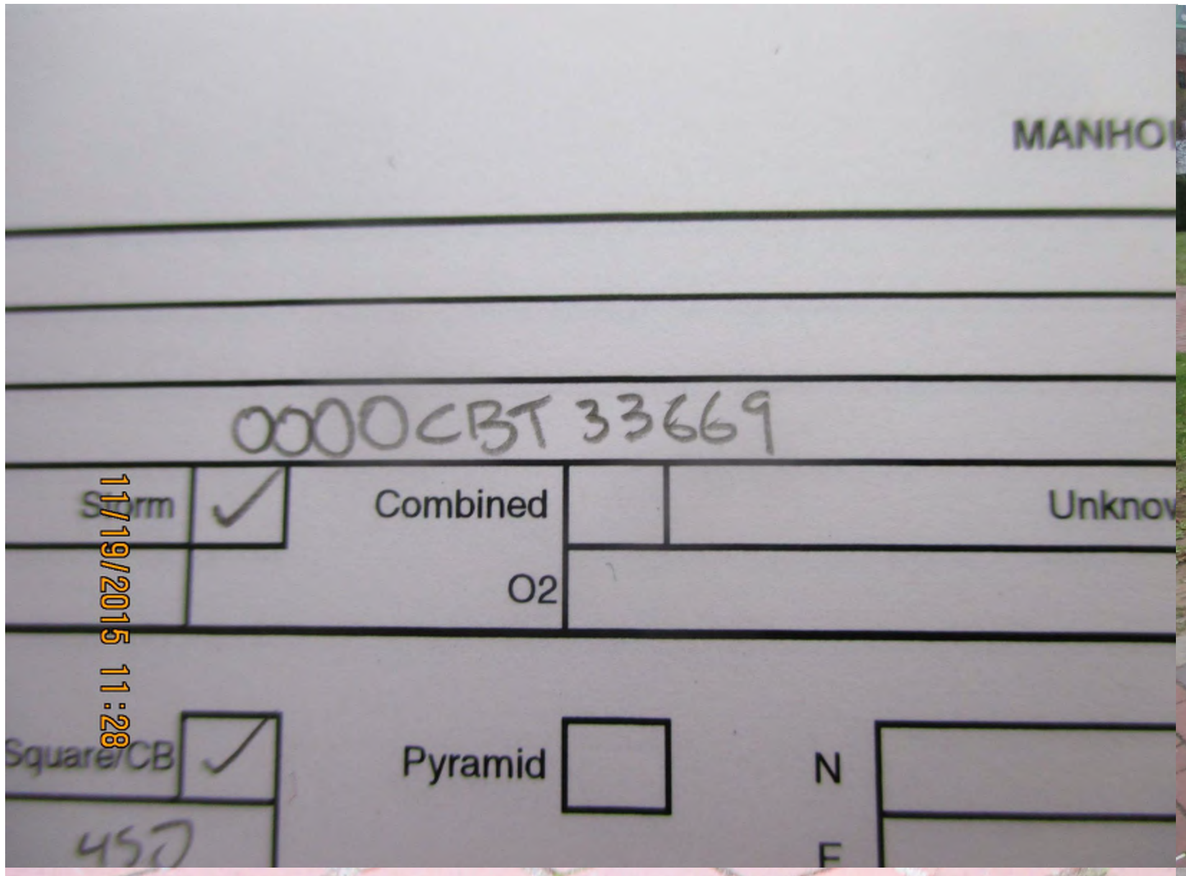
Picture File Name:

1403

1404

1405

1406


MANHO
0000CBT 33669
Storm
Combined
Unknov
O2
Square/CB
Pyramid
N
E
11/19/2015 11:28


11/19/2015 11:28


11/19/2015 11:28


11/19/2015 11:29

MANHOLE INSPECTION FORM

General:

Project #	152884.00 Loyalist Plaza Pipe Report							Inspector	CODY MILLETT	Location / Street	NORTH MARKET WHARF
Structure Reference / GIS #	0000CBT33697							Date of Inspection	19/11/2015	Nearest Civic Number	N/A
Type of Sewer	Sanitary		Storm	X	Combined		Unknown		Last Known Rain Event		Weather Condition	OVERCAST
Gas Reading	LEL		O2					HO2S		CO	

Frame, Cover & Surrounding Area:

Shape of Cover	Round		Square/CB	X	Pyramid		N												
Size of Cover	mm	450					E		Cover Type	Asphalt		Concrete		Grass		Gravel		Other	BRICK
Condition of Cover	New		Good	X	Bad		Critical		Interface Condition	Excellent		Good	X	Moderate		Poor		Unfinished	
Condition of Frame	New		Good	X	Bad		Critical		Grade Around Manhole	Away		Flat		Towards	X	Washout			

Internal Structure of Manhole:

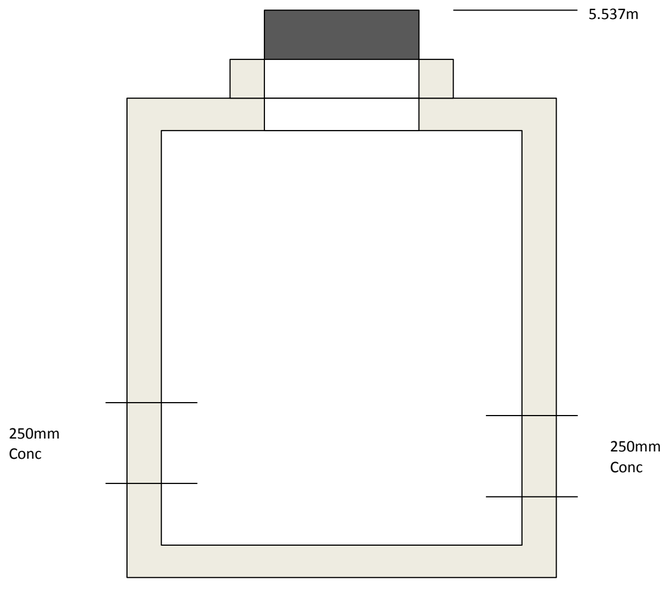
Cover Elevation (meters)	5.537	GPS Shot #		Cannot Remove		Pipes entering structure (#)	1			Material	Depth	Angle	Invert
Internal Diameter (mm) & Condition	1050	Good X	Bad	Critical		Main Pipe (Outlet)	Dia (mm)	250		Conc	1500	0	4.04
Depth From Top of Frame (mm)	1650	Debris	Bottom X			Main Pipe (Inlet) #1	Dia (mm)	250		Conc	1460	160	4.08
Chimney Height (mm) & Condition	420	Good X	Bad	Critical		Inlet Pipe #2	Dia (mm)						
Chimney	Rings X	Bricks	None			Inlet Pipe #3	Dia (mm)						
Benching and Condition	Yes	No X	Good	Bad		Inlet Pipe #4	Dia (mm)						
Condition of Joints	Good X	Bad				Inlet Pipe #5	Dia (mm)						
Condition of Interfaces	Good X	Bad				Inlet Pipe #6	Dia (mm)						
						Inlet Pipe #7	Dia (mm)						
						Inlet Pipe #8	Dia (mm)						
						Inlet Pipe #9	Dia (mm)						

Flow in Structure:

Depth of Flow in Main Channel (mm)	0	Muddy	Silty X	Normal		
Depth of Debris in Channel (mm)	0	Gravel	Garbage	Sticks	X	
Needs to be Cleaned		Yes	No X	Critical		

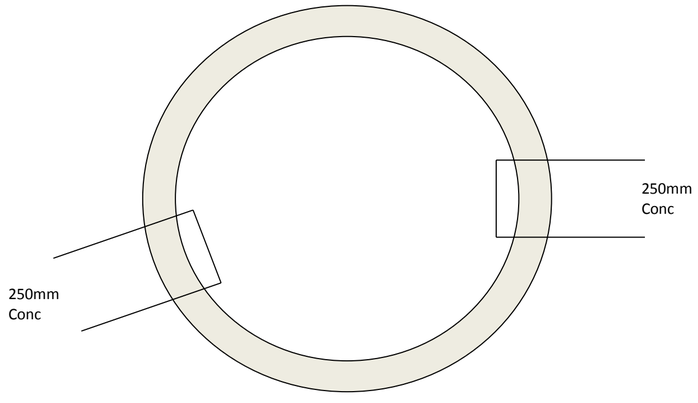
Sketch an Elevation of the Structure:

Note all dimensions and lateral ID numbers as they are shown in the section above.



Sketch a Plan of the Structure:

Note all dimensions and lateral ID numbers as they are shown in the section above.



Comments:

OVAL COVER

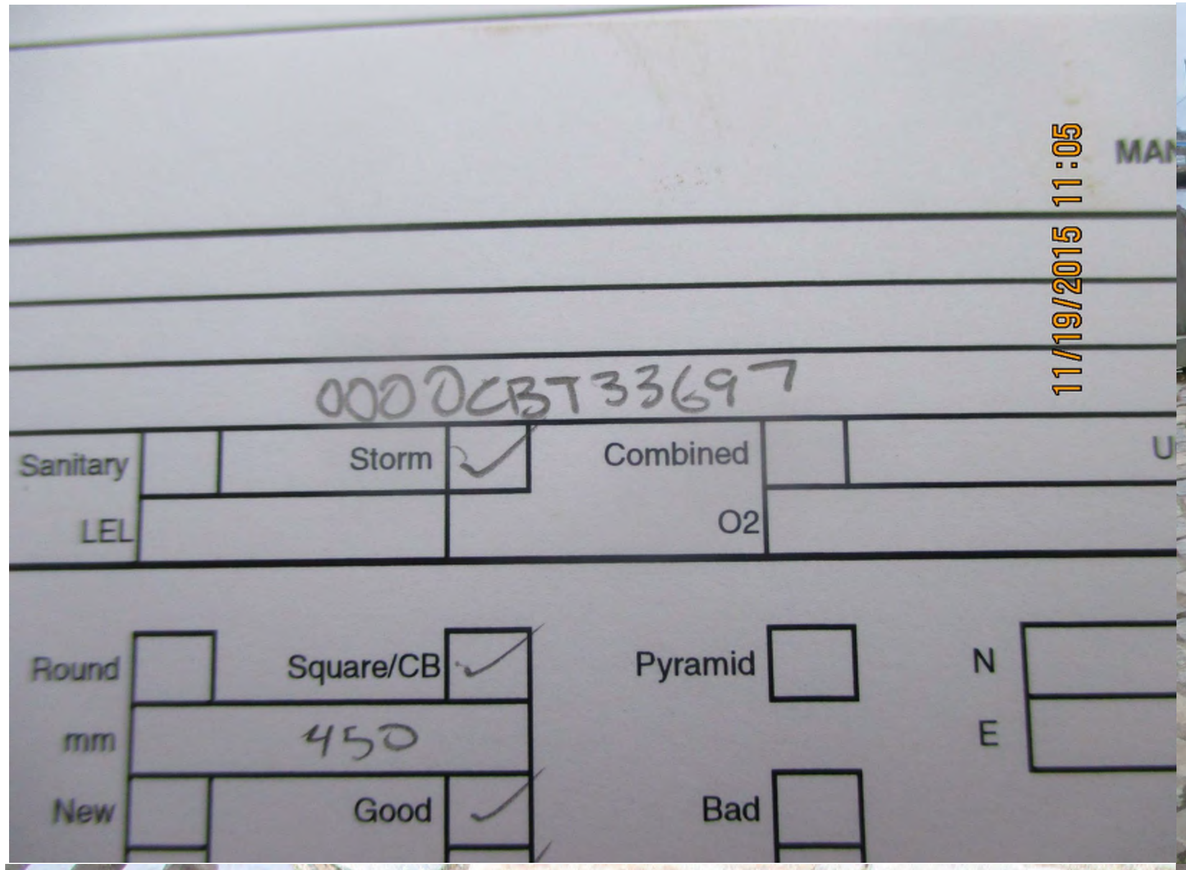
Picture File Name:

1394

1395

1396

1397


11/19/2015 11:05
MA
OOOCBT33697
Sanitary
Storm
Combined
U
LEL
O2
Round
Square/CB
Pyramid
N
mm
450
E
New
Good
Bad


11/19/2015 11:05


11/19/2015 11:05


11/19/2015 11:05

MANHOLE INSPECTION FORM

General:

Project #	152884.00 Loyalist Plaza Pipe Report							Inspector	CODY MILLETT	Location / Street	NORTH MARKET WHARF
Structure Reference / GIS #	0000CBT33670							Date of Inspection	19/11/2015	Nearest Civic Number	N/A
Type of Sewer	Sanitary		Storm	X	Combined		Unknown		Last Known Rain Event		Weather Condition	OVERCAST
Gas Reading	LEL		O2					HO2S		CO	

Frame, Cover & Surrounding Area:

Shape of Cover	Round		Square/CB	X	Pyramid		N												
Size of Cover	mm	450					E		Cover Type	Asphalt		Concrete		Grass		Gravel		Other	BRICK
Condition of Cover	New		Good	X	Bad		Critical		Interface Condition	Excellent		Good	X	Moderate		Poor		Unfinished	
Condition of Frame	New		Good	X	Bad		Critical		Grade Around Manhole	Away		Flat		Towards	X	Washout			

Internal Structure of Manhole:

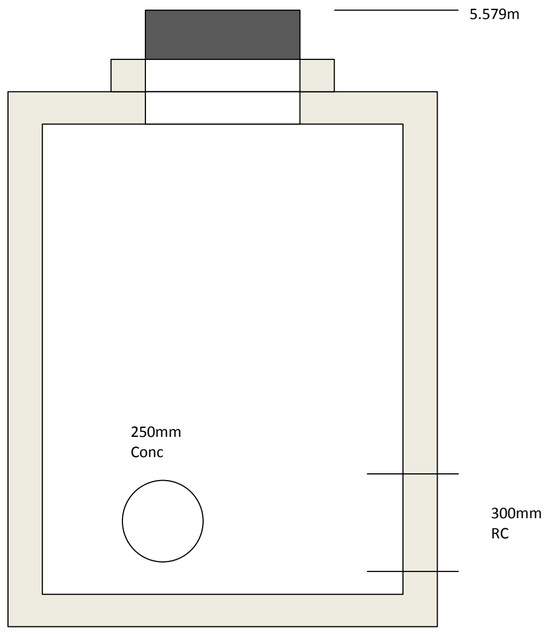
Cover Elevation (meters)	5.579	GPS Shot #		Cannot Remove		Pipes entering structure (#)	1			Material	Depth	Angle	Invert
Internal Diameter (mm) & Condition	1050	Good X	Bad	Critical		Main Pipe (Outlet)	Dia (mm)	300		RC	1730	0	3.85
Depth From Top of Frame (mm)	1800	Debris	Bottom X			Main Pipe (Inlet) #1	Dia (mm)	250		Conc	1700	250	3.88
Chimney Height (mm) & Condition	400	Good X	Bad	Critical		Inlet Pipe #2	Dia (mm)						
Chimney	Rings X	Bricks	None			Inlet Pipe #3	Dia (mm)						
Benching and Condition	Yes	No X	Good	Bad		Inlet Pipe #4	Dia (mm)						
Condition of Joints	Good X	Bad				Inlet Pipe #5	Dia (mm)						
Condition of Interfaces	Good X	Bad				Inlet Pipe #6	Dia (mm)						
						Inlet Pipe #7	Dia (mm)						

Flow in Structure:

Depth of Flow in Main Channel (mm)	0	Muddy		Silty X		Normal		Inlet Pipe #8	Dia (mm)					
Depth of Debris in Channel (mm)	0	Gravel		Garbage		Sticks		Inlet Pipe #9	Dia (mm)					
Needs to be Cleaned		Yes		No X		Critical								

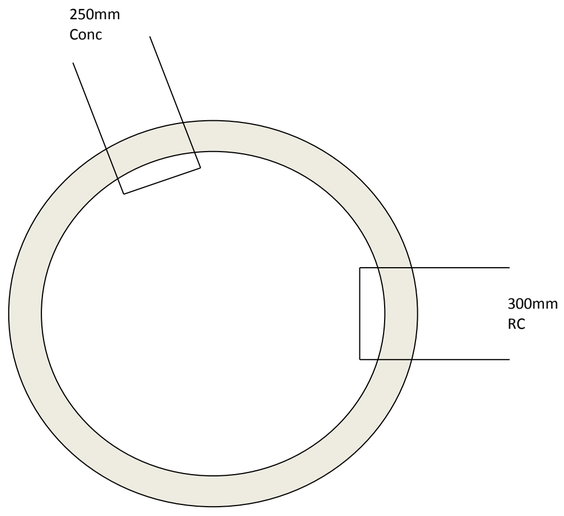
Sketch an Elevation of the Structure:

Note all dimensions and lateral ID numbers as they are shown in the section above.



Sketch a Plan of the Structure:

Note all dimensions and lateral ID numbers as they are shown in the section above.



Comments:

OVAL COVER

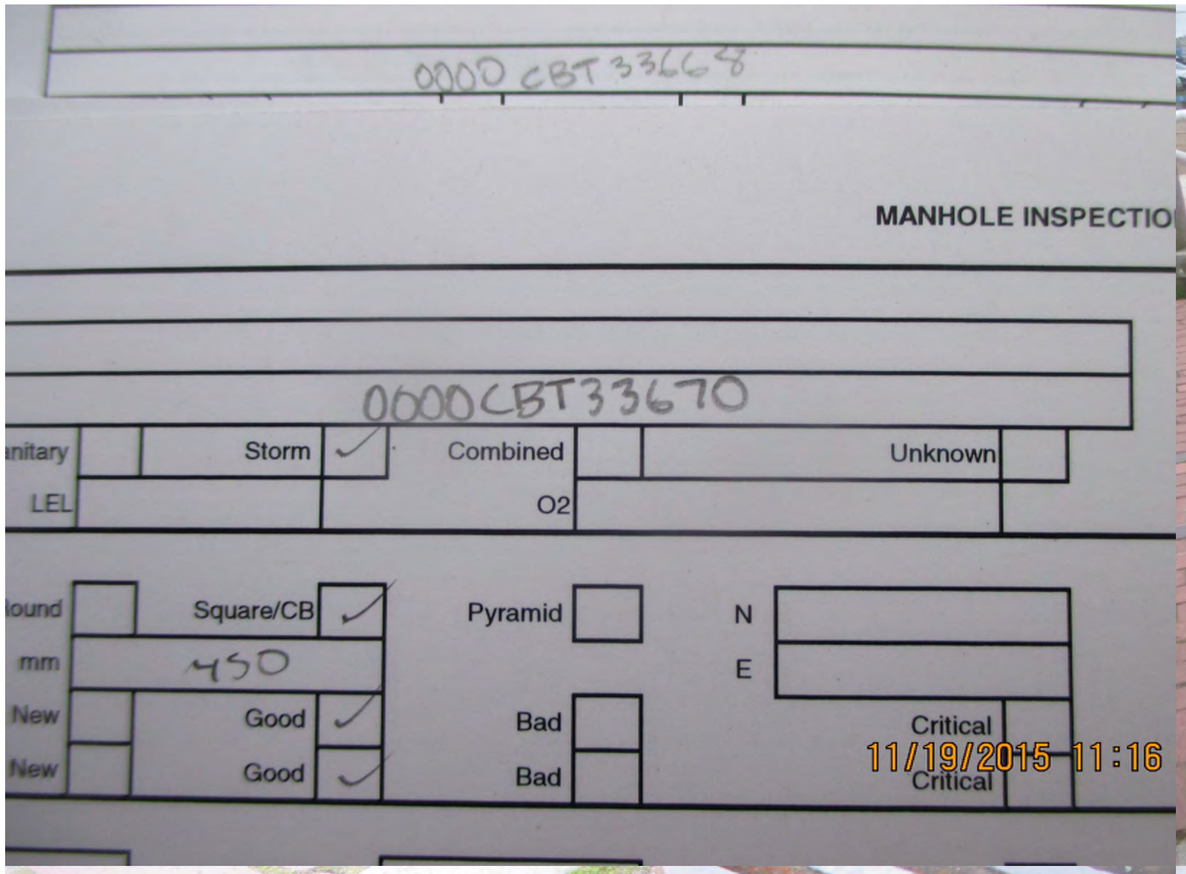
Picture File Name:

1398

1399

1400

1401


0000CBT33668
MANHOLE INSPECTIO
0000CBT33670
nitary
Storm
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N
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New
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Bad
Critical
New
Good
Bad
Critical
11/19/2015 11:16


11/19/2015 11:16


11/19/2015 11:16


11/19/2015 11:16

MANHOLE INSPECTION FORM

General:

Project #	152884.00 Loyalist Plaza Pipe Report							Inspector	CODY MILLETT		Location / Street	NORTH MARKET WHARF	
Structure Reference / GIS #	CBCL_000CBT33670A							Date of Inspection	NOV.30		Nearest Civic Number	N/A	
Type of Sewer	Sanitary		Storm	X	Combined		Unknown		Last Known Rain Event		Weather Condition	SUNNY	
Gas Reading	LEL		O2						HO2S		CO		

Frame, Cover & Surrounding Area:

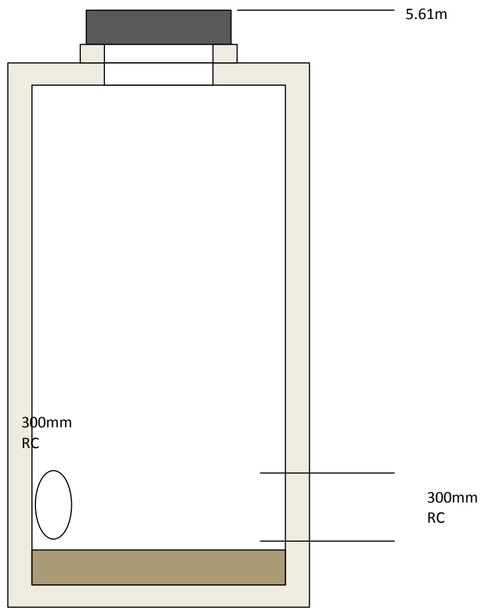
Shape of Cover	Round	X	Square/CB		Pyramid		N												
Size of Cover	mm	600					E		Cover Type	Asphalt		Concrete	X	Grass		Gravel		Other	
Condition of Cover	New		Good	X	Bad		Critical		Interface Condition	Excellent		Good	X	Moderate		Poor		Unfinished	
Condition of Frame	New		Good	X	Bad		Critical		Grade Around Manhole	Away		Flat	X	Towards		Washout			

Internal Structure of Manhole:

Cover Elevation (meters)	5.61	GPS Shot #		Cannot Remove		Pipes entering structure (#)	1			Material	Depth	Angle	Invert
Internal Diameter (mm) & Condition	1050	Good	X	Bad		Critical		Main Pipe (Outlet)	Dia (mm)	300	RC	2330	0	3.28
Depth From Top of Frame (mm)	2520	Debris	X	Bottom				Main Pipe (Inlet) #1	Dia (mm)	300	RC	2320	210	3.29
Chimney Height (mm) & Condition	380	Good	X	Bad		Critical		Inlet Pipe #2	Dia (mm)					
Chimney	Rings		Bricks		None	X		Inlet Pipe #3	Dia (mm)					
Benching and Condition	Yes		No	X	Good		Bad	Inlet Pipe #4	Dia (mm)					
Condition of Joints	Good	X	Bad					Inlet Pipe #5	Dia (mm)					
Condition of Interfaces	Good	X	Bad					Inlet Pipe #6	Dia (mm)					
								Inlet Pipe #7	Dia (mm)					
Flow in Structure:								Inlet Pipe #8	Dia (mm)					
Depth of Flow in Main Channel (mm)	1	Muddy	X	Silty	X	Normal		Inlet Pipe #9	Dia (mm)					
Depth of Debris in Channel (mm)	150	Gravel		Garbage		Sticks								
Needs to be Cleaned		Yes		No	X	Critical								

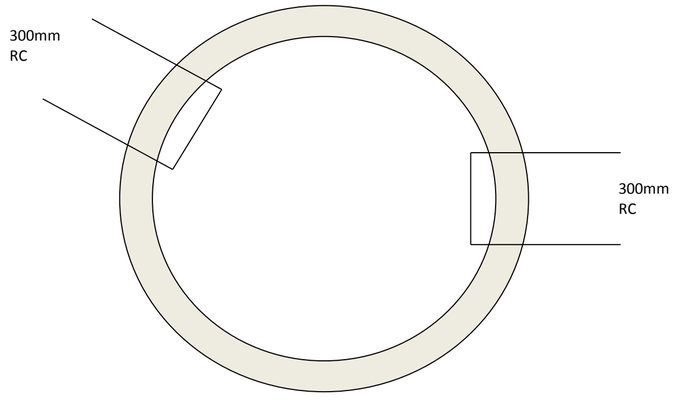
Sketch an Elevation of the Structure:

Note all dimensions and lateral ID numbers as they are shown in the section above.



Sketch a Plan of the Structure:

Note all dimensions and lateral ID numbers as they are shown in the section above.



Comments:

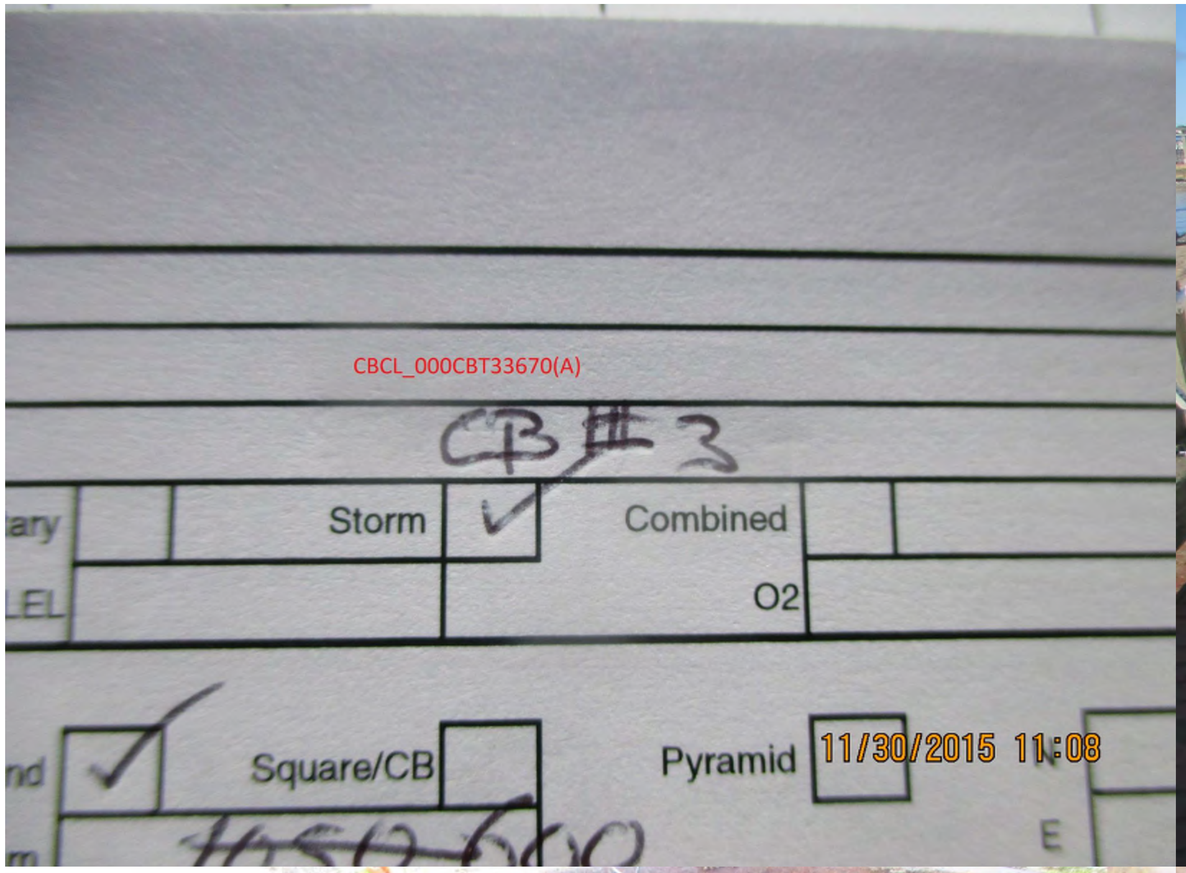
Picture File Name:

1434

1435

1436

1437


CBCL_000CBT33670(A)
CB#3
Storm
Combined
O2
Square/CB
Pyramid
11/30/2015 11:08


11/30/2015 11:08


11/30/2015 11:08


11/30/2015 11:08

MANHOLE INSPECTION FORM

General:

Project #	152884.00 Loyalist Plaza Pipe Report							Inspector	CODY MILLETT	Location / Street	NORTH MARKET WHARF
Structure Reference / GIS #	CBCL_STMH7853A							Date of Inspection	NOV.30	Nearest Civic Number	N/A
Type of Sewer	Sanitary		Storm	X	Combined		Unknown		Last Known Rain Event		Weather Condition	SUNNY
Gas Reading	LEL				O2				HO2S		CO	

Frame, Cover & Surrounding Area:

Shape of Cover	Round	X	Square/CB		Pyramid		N												
Size of Cover	mm	600					E		Cover Type	Asphalt		Concrete		Grass		Gravel		Other	BRICK
Condition of Cover	New		Good	X	Bad		Critical		Interface Condition	Excellent		Good	X	Moderate		Poor		Unfinished	
Condition of Frame	New		Good	X	Bad		Critical		Grade Around Manhole	Away		Flat		Towards	X	Washout			

Internal Structure of Manhole:

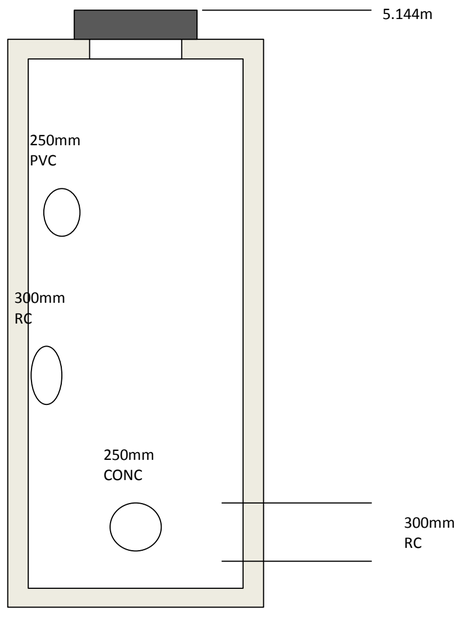
Cover Elevation (meters)	5.144	GPS Shot #		Cannot Remove		Pipes entering structure (#)	3			Material	Depth	Angle	Invert
Internal Diameter (mm) & Condition	1050	Good	X	Bad		Critical		Main Pipe (Outlet)	Dia (mm)	300	RC	2850	0	2.29
Depth From Top of Frame (mm)	2990	Debris		Bottom	X			Main Pipe (Inlet) #1	Dia (mm)	250	CONC	2800	90	2.34
Chimney Height (mm) & Condition	300	Good	X	Bad		Critical		Inlet Pipe #2	Dia (mm)	250	PVC	1170	135	3.97
Chimney	Rings		Bricks	X	None			Inlet Pipe #3	Dia (mm)	300	RC	2040	210	3.10
Benching and Condition	Yes		No	X	Good		Bad	Inlet Pipe #4	Dia (mm)					
Condition of Joints	Good	X	Bad					Inlet Pipe #5	Dia (mm)					
Condition of Interfaces	Good	X	Bad					Inlet Pipe #6	Dia (mm)					
								Inlet Pipe #7	Dia (mm)					
								Inlet Pipe #8	Dia (mm)					
								Inlet Pipe #9	Dia (mm)					

Flow in Structure:

Depth of Flow in Main Channel (mm)	20	Muddy		Silty		Normal	X
Depth of Debris in Channel (mm)		Gravel		Garbage		Sticks	
Needs to be Cleaned		Yes		No		Critical	

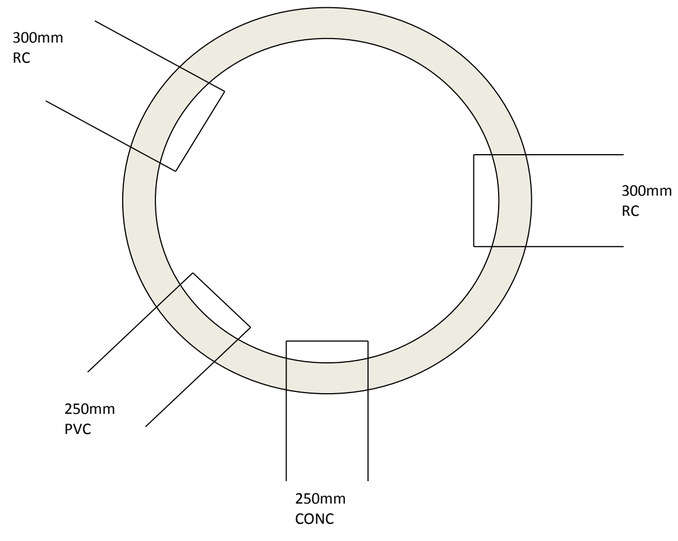
Sketch an Elevation of the Structure:

Note all dimensions and lateral ID numbers as they are shown in the section above.



Sketch a Plan of the Structure:

Note all dimensions and lateral ID numbers as they are shown in the section above.



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Picture File Name:

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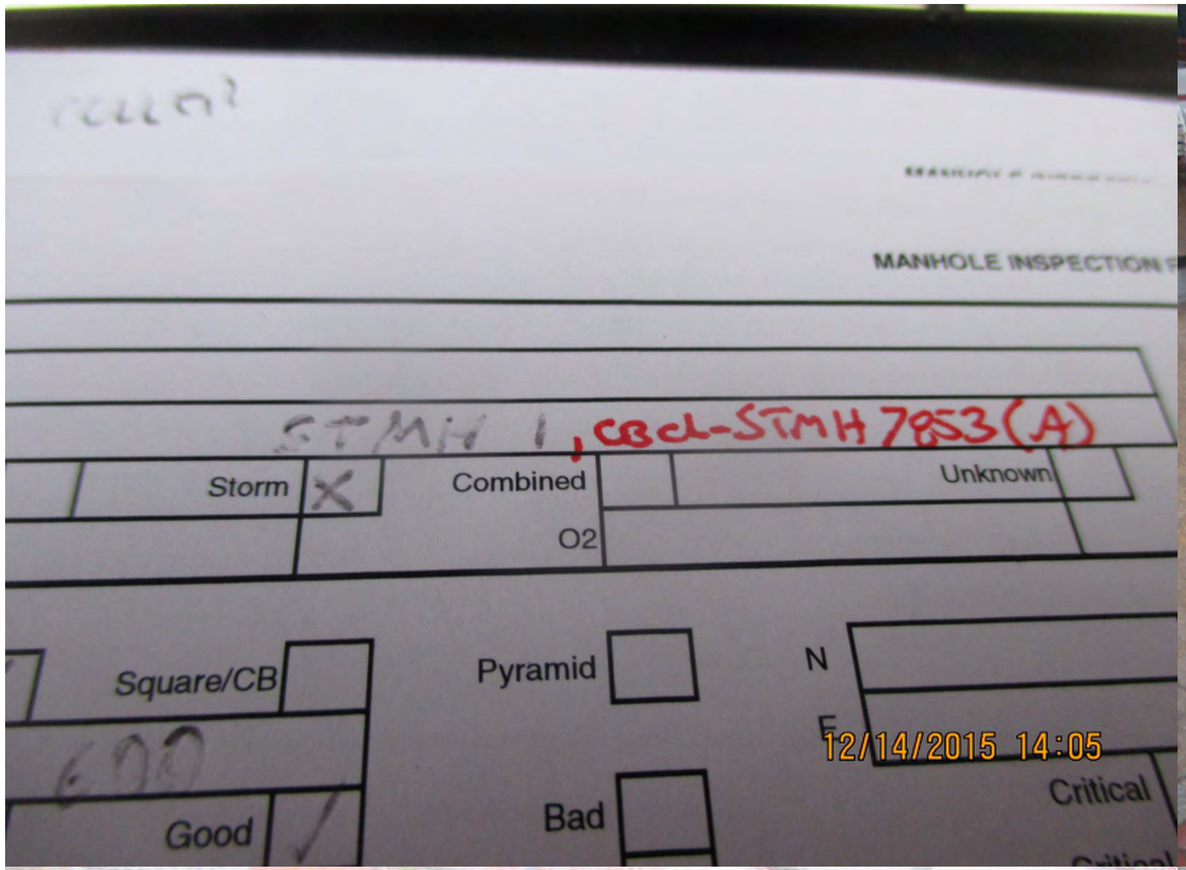
1435

1436

1437


MANHOLE INSPECTION
STMH 1, CBCL-STMH 7853(A)
Storm X
Combined
Unknown
O2
Square/CB
Pyramid
N
E
600
Good
Bad
Critical
12/14/2015 14:05


12/15/2015 10:01


12/15/2015 10:01


12/15/2015 10:02

MANHOLE INSPECTION FORM

General:

Project #	152884.00 Loyalist Plaza Pipe Report							Inspector	CODY MILLETT		Location / Street	NORTH MARKET WHARF	
Structure Reference / GIS #	CBCL_CB7853A							Date of Inspection	DEC 14,2015		Nearest Civic Number	N/A	
Type of Sewer	Sanitary		Storm	X	Combined		Unknown		Last Known Rain Event		Weather Condition	RAINNY	
Gas Reading	LEL		O2					HO2S		CO			

Frame, Cover & Surrounding Area:

Shape of Cover	Round		Square/CB	X	Pyramid		N												
Size of Cover	mm	600					E		Cover Type	Asphalt		Concrete	X	Grass		Gravel		Other	
Condition of Cover	New		Good	X	Bad		Critical		Interface Condition	Excellent		Good	X	Moderate		Poor		Unfinished	
Condition of Frame	New		Good	X	Bad		Critical		Grade Around Manhole	Away		Flat		Towards	X	Washout			

Internal Structure of Manhole:

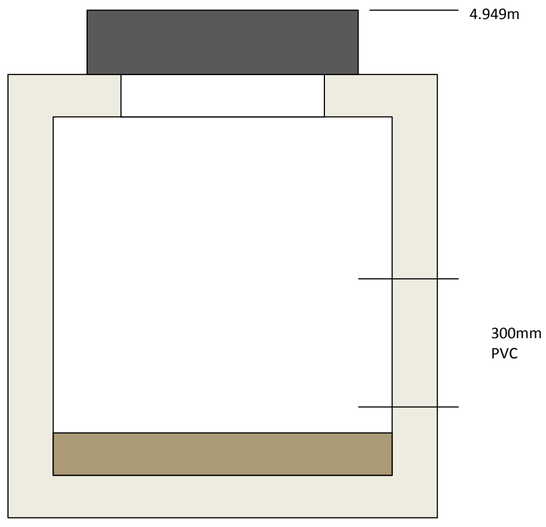
Cover Elevation (meters)	4.949	GPS Shot #		Cannot Remove		Pipes entering structure (#)	0		Material	Depth	Angle	Invert
Internal Diameter (mm) & Condition	750	Good X	Bad	Critical		Main Pipe (Outlet)	Dia (mm)	300	PVC	930	0	4.02
Depth From Top of Frame (mm)	1090	Debris X	Bottom			Main Pipe (Inlet) #1	Dia (mm)					
Chimney Height (mm) & Condition	300	Good X	Bad	Critical		Inlet Pipe #2	Dia (mm)					
Chimney	Rings X	Bricks	None			Inlet Pipe #3	Dia (mm)					
Benching and Condition	Yes	No X	Good	Bad		Inlet Pipe #4	Dia (mm)					
Condition of Joints	Good X	Bad				Inlet Pipe #5	Dia (mm)					
Condition of Interfaces	Good X	Bad				Inlet Pipe #6	Dia (mm)					
						Inlet Pipe #7	Dia (mm)					

Flow in Structure:

Depth of Flow in Main Channel (mm)	5	Muddy X	Silty X		Inlet Pipe #8	Dia (mm)								
Depth of Debris in Channel (mm)	100	Gravel	Garbage	Normal	Sticks	Inlet Pipe #9	Dia (mm)							
Needs to be Cleaned		Yes	No	Critical										

Sketch an Elevation of the Structure:

Note all dimensions and lateral ID numbers as they are shown in the section above.



Sketch a Plan of the Structure:

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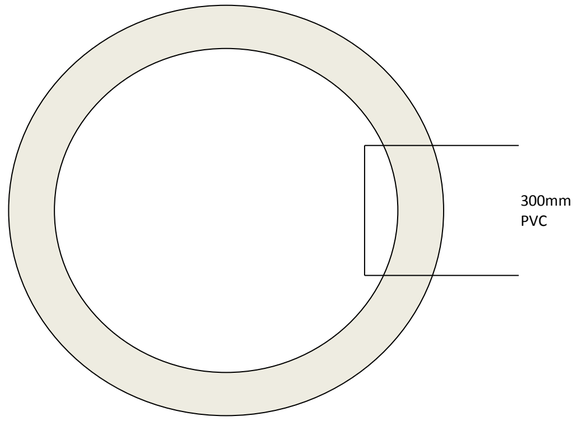

Comments:

Picture File Name:

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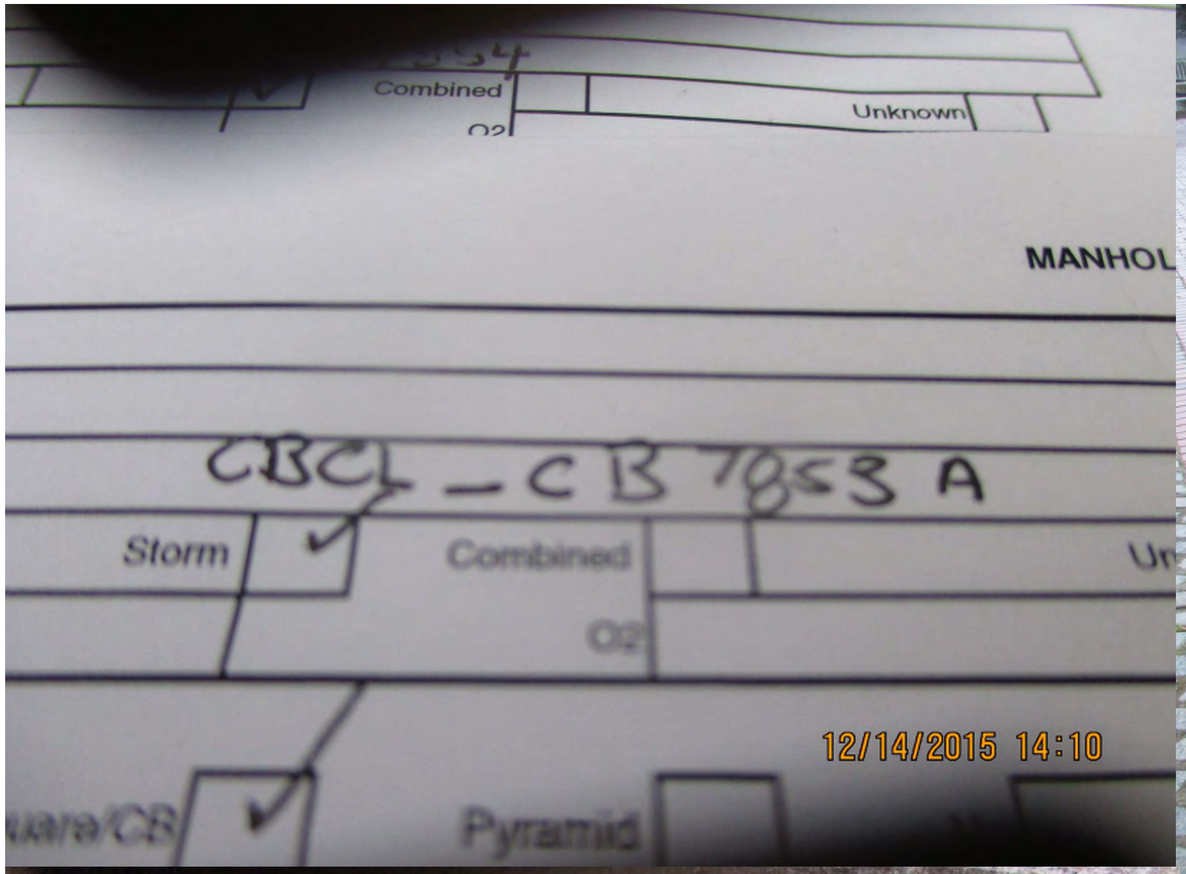
1446

1447

1448


Combined
Unknown
MANHOL
CBCL - CB 7853 A
Storm
Combined
Un
Pyramid
12/14/2015 14:10


12/14/2015 14:10


12/14/2015 14:11


12/14/2015 14:11

APPENDIX F

Storm Sewer Videos

(Video files on DVD in Appendix A)

CBCL LIMITED
Consulting Engineers

TABLE F-1
PIPE REPORT
STORM PIPE VIDEO INSPECTION INDEX

PROJECT: **Loyalist Plaza**
PROJECT NO.: **152884.00**

STORM PIPE VIDEO INSPECTION INDEX
0000CBT33660 (CB 7) TO STMH7854 (MH 3)
0000CBT33667 (CB 9) TO 0000STMH33684 (Proposed MH 1)
0000CBT33668 (CB 8) TO 0000STMH33684 (Proposed MH 1)
0000CBT33669 (CB 6) TO 0000CBT33697 (CB 5)
0000CBT33670 (CB 4) TO CBCL_0000CBT33670(A) (CB 3)
0000CBT33697 (CB 5) TO 0000CBT33670 (CB 4)
0000STMH33684 (Proposed MH 1) TO STMH7854 (EXT MH 3)
CBCL_0000CBT33670(A) (CB 3) TO CBCL_STMH7853(A) (STMH 1)
CBCL_STMH7853(A) (STMH 1) TO STMH7853
CBCL_STMH7854(A) TO STMH7854
2005STM33647 (0000CBT33660) TO STMH7854
STMH7854 TO STMH7853

APPENDIX G

Existing Conditions Drawings

(Separate rolled set of drawings)
(PDF files on DVD in Appendix A)

Contract No. XXXX-XX

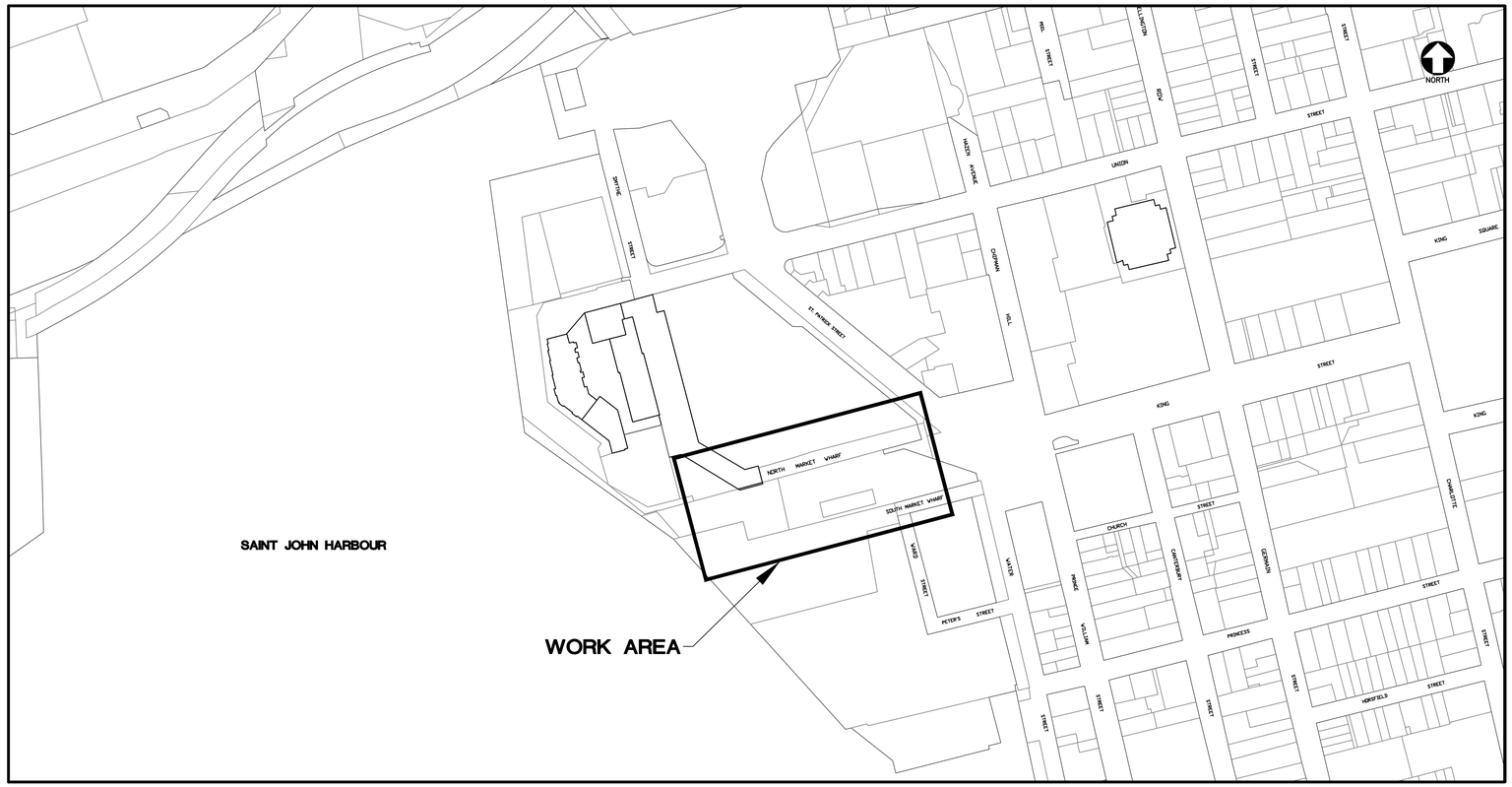
DRAWING LIST

Sheet No.	Drawing Title
–	COVER SHEET & KEY PLAN
1	CIVIL PIPE REPORT EXISTING CONDITIONS

CITY OF SAINT JOHN

PIPE REPORT

LOYALIST PLAZA PIPE CONDITIONS



KEY PLAN
1:2000

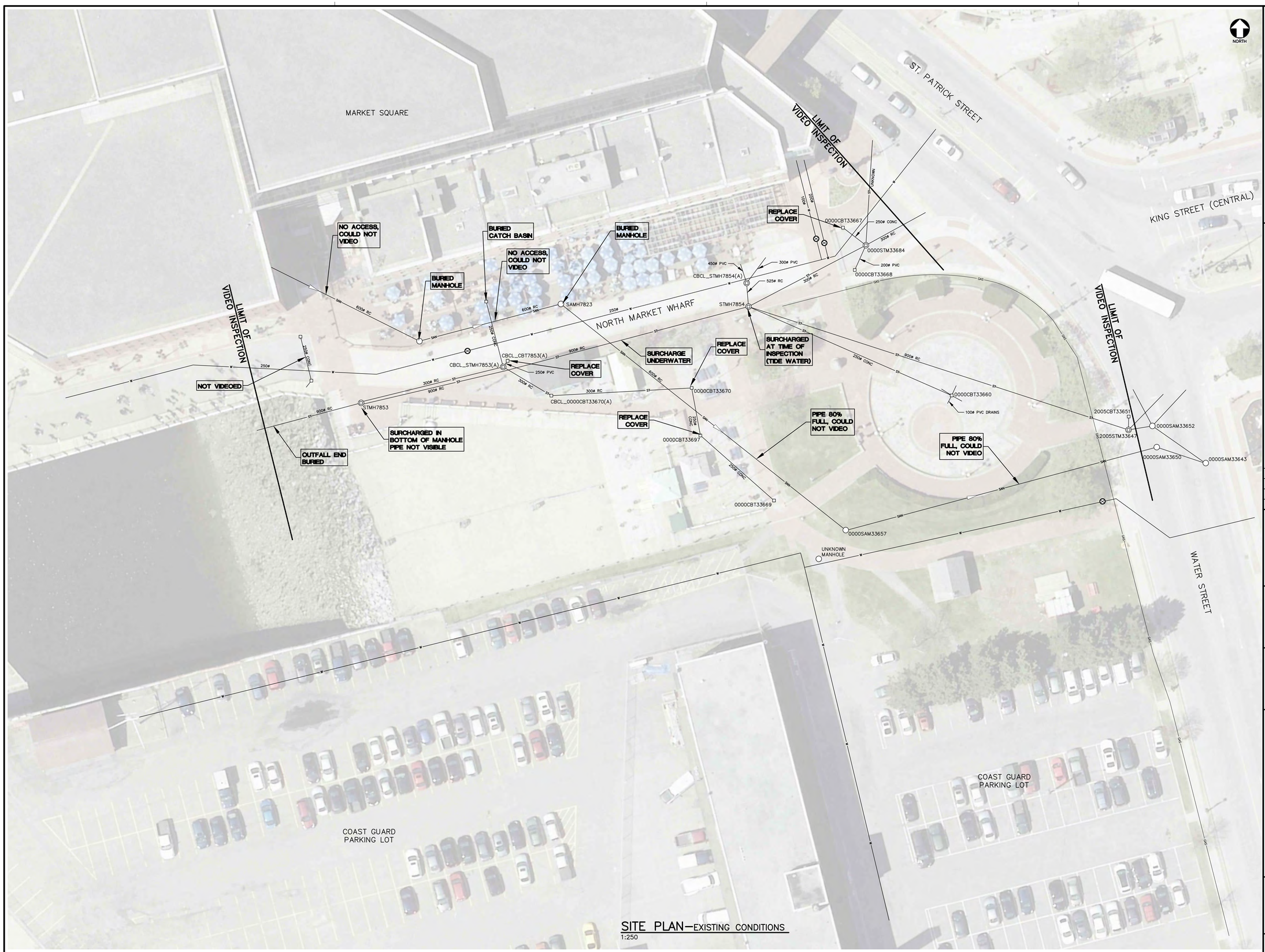
CBCL LIMITED
Consulting Engineers
ISO 9001 CERTIFIED

Project No. 152884.00

ISSUED FOR REVIEW

JANUARY 07, 2016

DRAWING NAME: Y:\SAINT JOHN\DATA\PROJECTS\2015\152884.00 LOYALIST PLAZA PIPE CONDITION\03 CAD\01 CIVIL\152884-00 COD.DWG LAYOUT NAME: COD-CITY CS PLOT DATE: January-07-16 4:50:57 PM CAD OPERATOR: TRAVISM



SITE PLAN—EXISTING CONDITIONS
1:250

NOTES

1. ALL DIMENSIONS ARE IN MILLIMETRES.
2. LOCATION OF EXISTING SERVICES, STRUCTURES AND BUILDINGS APPROXIMATE ONLY.

LEGEND

EXISTING

- SANITARY MANHOLE (SMH)
- CATCH BASIN (CB)
- STORM MANHOLE (STMH)
- SAN — SANITARY SEWER
- FM — SANITARY FORCE MAIN
- ST — STORM SEWER
- W — WATER MAIN
- EAS — EASEMENT
- E/P — EDGE OF PAVEMENT
- E/G — EDGE OF GRAVEL
- O/H — OVERHEAD UTILITIES
- U/G — UNDERGROUND UTILITIES
- E — UNDERGROUND ELECTRICAL
- S/W — SIDEWALK
- curb — CURB
- C/G — CURB & GUTTER
- DITCH
- ELECTRICAL PULLPIT/MANHOLE
- UP — UTILITY POLE
- LIGHT STANDARD
- ISOLATION VALVE (BUTTERFLY/GATE)
- CURB STOP
- VALVE IN CHAMBER
- FIRE HYDRANT

NO.	BY	DATE	REVISION
A	TMc	07/01/2016	ISSUED FOR REVIEW

CITY OF SAINT JOHN

PROJECT TITLE

LOYALIST PLAZA
PIPE CONDITION

DRAWING TITLE

PIPE REPORT
EXISTING CONDITIONS

APPROVAL

CONTRACT NO.	YYYY - PP
SCALE	1 : 250
DRAWN BY	THM / DLM
DATE	JAN. 5, 2016
CHECKED BY	KDT | TMc

PROJECT ENGINEER

ENGINEERING MANAGER

CHIEF CITY ENGINEER

CBCL LIMITED
Consulting Engineers
ISO 9001 CERTIFIED

PROJECT No. 152884.00

SHEET	1	FILE	XXXX
OF	1		

Structural

Loyalist Plaza Refurbishment
Saint John, NB
Schematic Design Report
Structural

February 12, 2016

Prepared for:

Glenn Group Ltd.
248 Brunswick Street
Fredericton, NB
E3B 1G9

Prepared by:

Estabrooks Engineering Inc.
STRUCTURAL CONSULTANTS

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E2L 1G5
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e-mail: info@estabrooks.com

TABLE OF CONTENTS

February 12, 2016

1.0 INTRODUCTION

Estabrooks Engineering Inc. was engaged by Glenn Group Landscape Architects and Park Planners to develop, to the schematic design stage, the structural aspects of the planned Loyalist Plaza Refurbishment project. This report outlines the main structural systems and any significant structural issues which may be involved in the design and construction of the project. Design criteria to be used during the future development stages of the project, in conjunction with other relevant team disciplines, are discussed in the report.

2.0 STRUCTURAL SYSTEMS

2.1 Sheet Pile Wall

The routing of the pedway tunnel is largely determined by accessibility into the existing Market Square pedway system at Elevation 4.70 metres (parking garage level). The entrance location will be west of the existing mechanical/security rooms. A new door opening will be cut through the 350 mm thick concrete wall at the north end of the pedway tunnel. A new steel sheet pile retaining structure will be constructed along the full length of the western edge of the pedway. The sheet pile wall will resist soil pressure from the new fill materials which will be placed in the eastern end of Market Slip, and will also provide protection against tidal and wave action from the harbour side of the wall.

The steel sheet pile wall will be fixed at the base, extending into the existing soil and/or socketed into bedrock. The sheet pile wall will be restrained laterally near the top, by a structural steel waler system with pre-tensioned, high strength tie rods. The tie rods will be connected to “deadman” concrete anchor blocks located in the stable soil zone. The steel sheet piling, walers and anchor rods will require long term protection against corrosion, to be achieved by means of cathodic protection, galvanizing, cement grouting and/or a combination of the above.

2.2 Substructure

In order to limit settlement and to provide adequate resistance against buoyancy forces (which would occur under high water level storm conditions), the main structures (pedway and mechanical room) will be founded on concrete-filled steel pipe piles extending to bedrock. Rock anchors will be employed in conjunction with the piles to provide tension capacity where

required to resist uplift. The piling design will be performed in accordance with the criteria as outlined in the geotechnical report developed by Fundy Engineering. Reinforced concrete pile caps will be cast-in-place at the top of each single pile or pile group to form a base upon which the concrete tunnel and mechanical room structures will be constructed.

2.3 Pedway Tunnel

The pedway tunnel will connect, at the north end to the existing Elevation 4.7 level pedway system. This system provides access to the Hilton Hotel and Market Square parking garage and, by way of the existing stairs, to the Trade and Convention Centre and the rest of the interconnected uptown facilities. The tunnel will slope gradually down toward the south, to reflect surface grades.

An important design criterion is that the pedway tunnel must accommodate the effects of extreme high water levels due to storm surges. An additional allowance for future higher water levels as a result of expected climate change, is recommended. Accordingly, the design of the tunnel, along with associated structures, must provide adequate resistance against buoyancy forces and must include an effective and robust waterproofing system.

The structural walls, floor and roof slabs of the tunnel will be of reinforced concrete. The tunnel will support a cantilevered walkway on the harbour side and a timber boardwalk above. Windows on the west side of the tunnel will provide natural lighting.

2.4 Mechanical Room

The mechanical room, adjacent to and accessible from the tunnel, will also be constructed of reinforced concrete. The floor will consist of a two-way structural slab with a central supporting pile below and piles spaced at approximately 5 metres under the exterior walls. The roof slab will be supported at the exterior walls and on a central supporting concrete column. The roof structure will be designed to support gravity loads including a layer of compacted fill and the weight of the concrete splash pad plus applicable live loading.

As per the tunnel, all mechanical room envelope surfaces must have waterproofing protection and adequate tie down anchorage to resist buoyant forces.

2.5 Restaurant Patios and Canopies

The support columns for the patio structures will be fabricated from welded steel plate, forming a tapered section as indicated on the architectural renderings. These columns will support the canopy arms, sails, lighting and infrared heating as required.

Each column will be anchored to a cast-in-place concrete foundation with a spread footing located below the level of frost penetration.

In order to prevent corrosion, it is recommended that the steel structures be hot-dip galvanized after fabrication.

2.6 Stage, Roof Structure and Obelisks

The stage floor structure will consist of a raised 125 mm thick concrete slab on grade, with cast-in-place concrete stairs for access and egress. A reinforced concrete retaining wall will form the edge of the stage. The concrete stage structure will incorporate storage compartments below the floor slab for chairs and equipment.

The stage design will also include concrete foundations and footings for the water features, obelisks and for the columns which will support the roof steel and space frame structure.

The steel columns which will support the stage roof structure and the obelisks on each side of the stage will be fabricated of welded steel plate. The steel should be hot-dip galvanized for long term corrosion protection. The roof framing system will be of steel rolled sections with metal roof deck and a tubular space truss system to support lighting and sound equipment. The steel structure will also support the rear windbreak panel system and associated mechanical equipment.

2.7 Whale Tail, Moose and Keel Sculpture Foundations

The Whale Tail and Moose features and the Keel Sculpture will be supported on individual concrete spread footing foundations. The footing elevation will be at least 1.4 m below grade to prevent movement and heaving due to frost action. The foundations will be designed for stability against wind and gravity loads. The features will be connected to the foundations with corrosion resistant steel anchor rods.

2.8 Splash Pad

The splash pad surface will be a 100 to 125 mm thick concrete slab on grade, cast on a layer of compacted granular material placed above the mechanical room roof structure. Mechanical piping for the splash pad can be run below the concrete slab.

2.9 Crows Nest

The Crows Nest feature will be approximately 12 metres in height. The central tube column (mast) will be of galvanized steel. The structure will be designed for a safe load of approxi-

mately 1200 kg. which will be raised and lowered hydraulically. The structure will be anchored to a cast in place reinforced concrete foundation and spread footing extending to below frost level.

2.10 Tidal Steps

Currently , geotechnical information as to existing materials is limited in the area proposed for the tidal steps. The tidal steps are not considered to be as sensitive to movement as the main structures and therefore these features could be supported on footings rather than piles. Some dredging to remove unsuitable materials may be necessary. A concrete base may be required and/or an embankment protected by armour stone. The units to which the steps are anchored must be massive enough to resist wave and tidal action.

2.11 Floating Patios

The floating patios will be connected to the existing seasonal floating dock structure. The dock structure is framed with aluminum. Therefore, connection of the floating patios to the dock will be made with aluminum connections with adequate fatigue resistance due to repetitive wave motion.

3.0 SUMMARY

The above outlines the main structural components of the project which will be developed in later design stages.

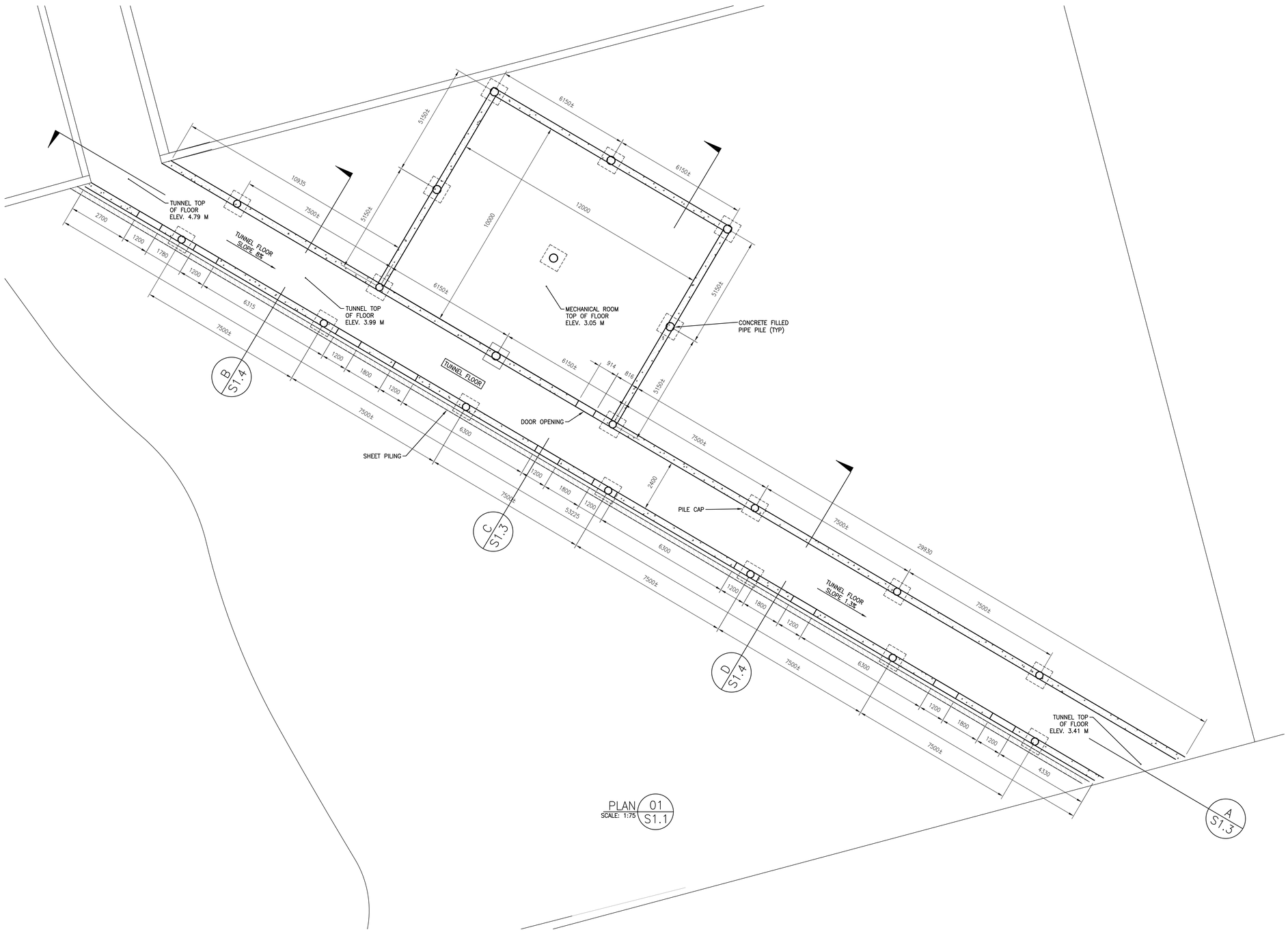
We trust the above is satisfactory to meet your current requirements. Please contact the undersigned, at your convenience, should you require any additional information or should you wish to discuss the contents of this report in more detail.

Yours sincerely,

Estabrooks Engineering Inc.

Daniel A. Estabrooks P.Eng.

APPENDIX A- DRAWINGS



CLIENT:

SAINT JOHN WATERFRONT

LEAD CONSULTANT:

GLENN GROUP
LANDSCAPE ARCHITECTS & PARK PLANNERS
PH: (506)455-2473
FAX: (506)459-2685

IN ASSOCIATION WITH:

ESTABROOKS ENGINEERING INC.
STRUCTURAL CONSULTANTS
69 King Street
Saint John, New Brunswick
Tel: (506) 674-1810
Fax: (506) 674-1812
Email: info@estabrooks.com

REVISIONS

No.	DESCRIPTION	DATE
1	XXX	XXX

LEGEND

DETAIL REFERENCE NODE

1 / L6 — DETAIL NUMBER / SHEET NUMBER

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STAMP | STAMP

PROJECT TITLE

LOYALIST PLAZA

SAINT JOHN - NB

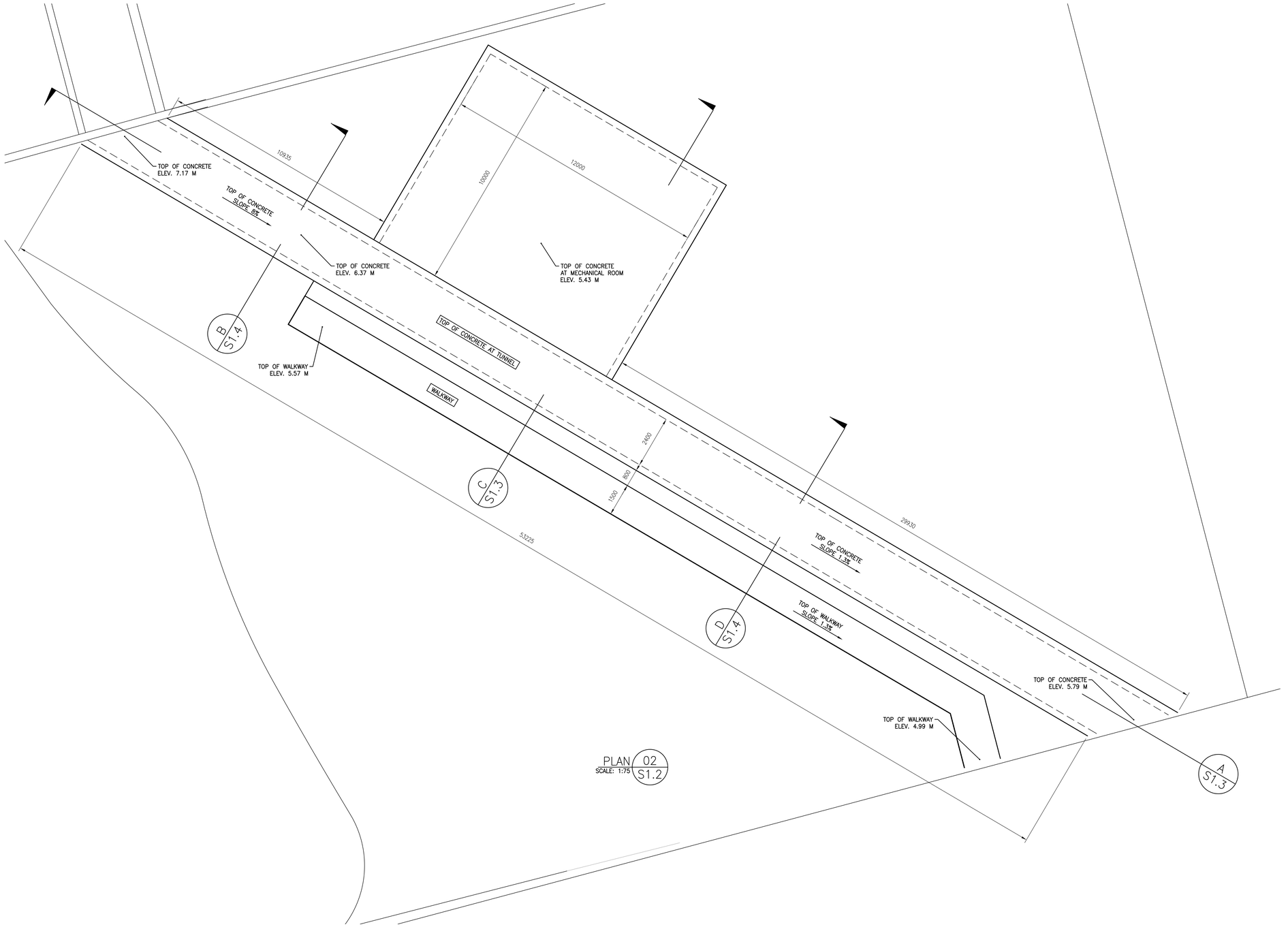
DRAWING NAME

PLAN

DATE PRINTED: 07/01/16	DESIGNED BY: DAE
DRAWN BY: TH	CHECKED BY: XX
CLIENT PROJECT No.: 15086	GG PROJECT NO: 1516
SCALE: AS NOTED	DATE: 06/01/16

SHEET NUMBER

S1.1



PLAN 02
SCALE: 1:75 S1.2

CLIENT:

SAINT JOHN WATERFRONT

LEAD CONSULTANT:

GLENN GROUP
LANDSCAPE ARCHITECTS & PARK PLANNERS
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IN ASSOCIATION WITH:

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Fax: (506) 674-1812
Email: info@estabrooks.com

REVISIONS

No.	DESCRIPTION	DATE
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DETAIL REFERENCE NODE

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LOYALIST PLAZA
SAINT JOHN - NB

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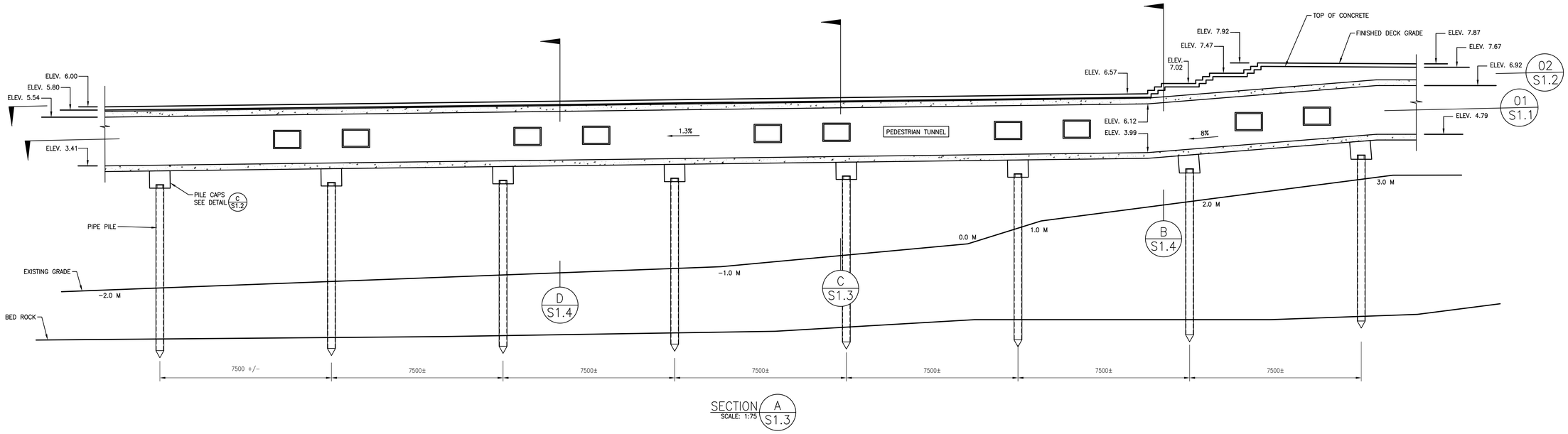
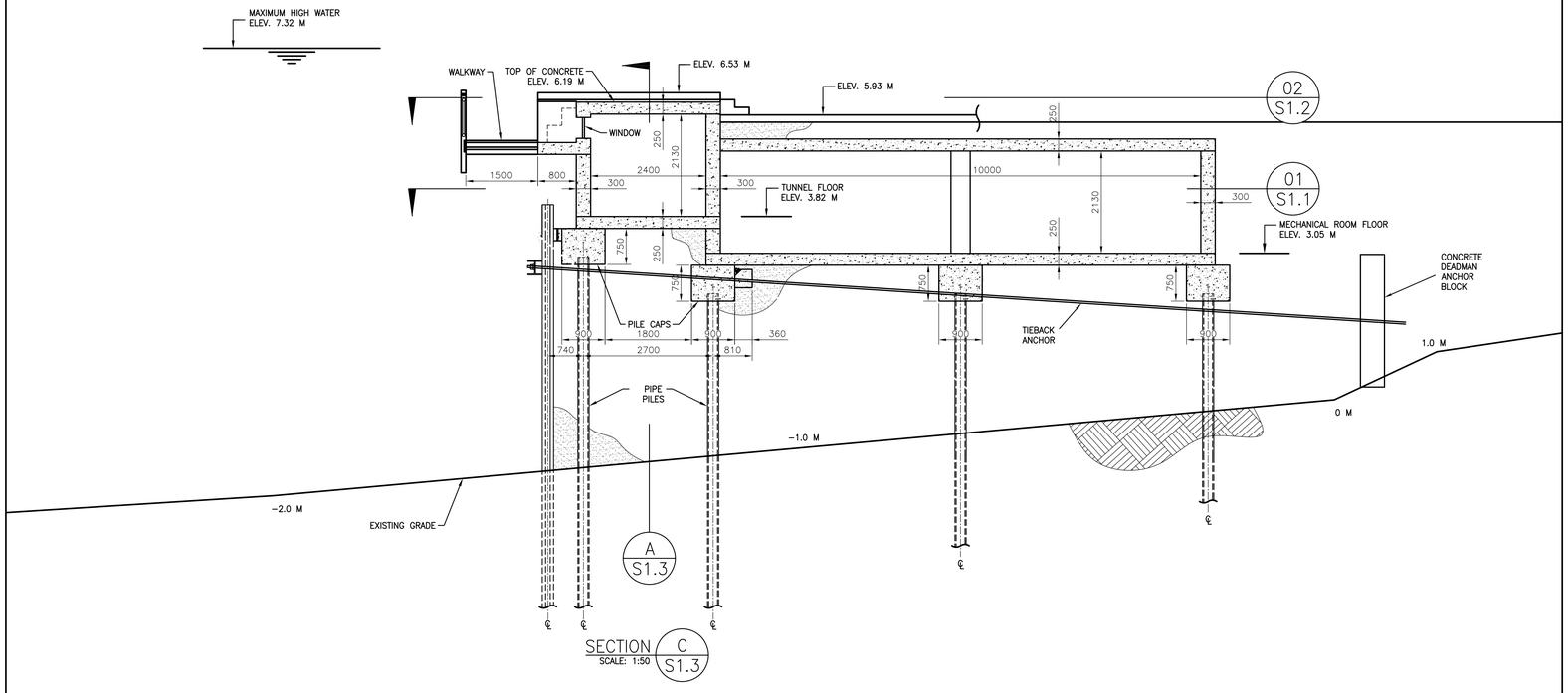
DRAWN BY: TH	CHECKED BY: XX
CLIENT PROJECT No.: 15086	GG PROJECT NO.: 1516
SCALE: AS NOTED	DATE: 06/01/16

SHEET NUMBER

S1.2



SECTION A S1.3
SCALE: 1:75



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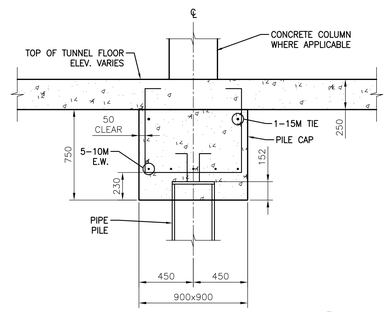

TYPICAL PILE CAP DETAIL D S1.3
SCALE: 1:20

CLIENT:
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LEAD CONSULTANT:
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REVISIONS

No.	DESCRIPTION	DATE
1	XXX	XXX

LEGEND

DETAIL REFERENCE NODE

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PROJECT TITLE

LOYALIST PLAZA
SAINT JOHN - NB

DRAWING NAME

SECTIONS AND DETAIL

DATE PRINTED: 07/01/15	DESIGNED BY: DAE
DRAWN BY: TH	CHECKED BY: XX
CLIENT PROJECT No.: 15086	GG PROJECT NO: 1516
SCALE: AS NOTED	DATE: 06/01/15

SHEET NUMBER

S1.3

Mechanical & Electrical

☎ 877.635.1566 ✉ fundy@fundyeng.com www.fundyeng.com

Bio-Resources | Building Systems | Environmental | Geotechnical | Project Management

Schematic Design

Loyalist Plaza & North Market Slip Renewal & Refurbishment

February 2016

Prepared For:
Glenn Group Ltd.
248 Brunswick Street
Fredericton, NB
E3B 1G9

Prepared by:
Fundy Engineering & Consulting Ltd.
27 Wellington Row
PO Box 6626
Saint John, NB
E2L 4S1

Project Number: 11658

FUNDY Engineering

Serving Our Clients' Needs First

SAINT JOHN CHARLOTTETOWN HALIFAX

Table of Contents

1 Introduction

At the request of Daniel Glean of Glen Group Landscape Architects & Park Planners, the services of Fundy Engineering & Consulting Ltd. (Fundy Engineering) were engaged to develop a design brief outlining the basic equipment requirements for the planned Loyalist Plaza development, Saint John, New Brunswick.

This document provides descriptions of equipment and systems to be designed, modified and installed and sets the basic standards of acceptance. Specific details in relation to the routing and layout of mechanical & electrical services will be coordinated with other disciplines as we move into more advanced stages of the design development process.

1.1 Corporate Information: Fundy Engineering

Fundy Engineering & Consulting Ltd. (Fundy Engineering) is one of the largest employee-owned, full-service multi-disciplinary engineering-consulting companies headquartered in New Brunswick. The firm was incorporated in 1989 by two engineers, Gordon Mouland and Peter McKelvey. Since incorporation, Fundy Engineering has grown to a competent staff of over 25 people comprised of professional engineers, geoscientists, scientists, technologists, as well as, administrative and support personnel.

Fundy Engineering specializes in geotechnical engineering, environmental engineering, building systems engineering (i.e., mechanical & electrical), bio-resources industry engineering, and project management. We are a regionally operated firm that has completed in excess of 11,000 project assignments for clients in the private and public sectors. We have successfully completed projects for the municipal, provincial, and federal government with construction budgets ranging from a few hundred to several million dollars. Fundy Engineering's professionals are either registered with or eligible to become registered with the provincial engineering professional associations in Atlantic Canada.

Fundy Engineering is headquartered in Saint John, NB with branch offices in Charlottetown, PE, and Halifax, NS.

2 Mechanical Systems

2.1 Ventilation Systems

Ventilation for the tunnel and service room will be through a Heat Recovery Ventilator (HRV) to be located within the new service room. The HRV will provide the outside air required to maintain acceptable indoor air quality in accordance with ASHRAE Standard 62.1. An electric heating coil on the supply air will provide tempered supply air when outdoor conditions warrant.

With the current size of the tunnel and service room, it is anticipated that the HRV will require a capacity of approximately 1,600 CFM of air to ventilate the space. The outside air intake and exhausts vents will terminate with a penthouse louver or gooseneck. The termination point will be located in a protected area to reduce the potential for vandalism.

2.2 Water Entrance

A new water service entrance for the site will be run from the municipal water main on St. Patrick Street / Water Street to the new service space accessed from the new tunnel. The new water main will be installed in accordance with the City of Saint John general specifications. It is anticipated that a 1-1/2" water supply will be required. A new water meter and backflow prevention device will be installed on the water service main in the new service room.

2.3 Fire Protection

Existing fire hydrants may need to be removed or relocated and new fire hydrants will be installed to suit the new layout of the proposed Loyalist Plaza development. Any new fire hydrants will be installed in accordance with applicable codes and the requirements of the local authority having jurisdiction.

2.4 Water Distribution & Recirculation

Water supply will run from the Vortex watermark unit in the tunnel service space underground to the various water features including the splash pad / fountain, whale tail, and stage speakers / water wall. Underground water piping will be run with a continuous slope back to the service room to permit seasonal drainage for winterization.

Drainage from the Splash Pad and Stage water features will be in accordance with the manufactures recommendations. It is proposed that a radius channel trench drain be installed around the perimeter of the whale tale for drainage from this water feature.

Recirculation water from the various water features will be piped back to a storage cistern / storage tank in the tunnel service space. The recirculation water will be treated by the Vortex equipment prior to being supplied to the water features.

2.5 Sanitary Drainage

All sanitary drainage from the tunnel service room will pass through an oil water separator to ensure oil & grease is not introduced into the municipal sanitary system. Given the elevation of the tunnel a sanitary lift pump and associated force main may be required to allow for connection to the municipal sanitary system. As the tunnel and service space may be below the high sea water level in extreme conditions waterproofing of the oil water separator and potential sump pit for lift pumps will be a concern. Solutions to the concerns will be addressed and coordinated by the consultant/design team.

2.6 Sheet Pile Waterfall

There will be three main components to the proposed sheet pile waterfall. These include the sea water pump, the waterfall distribution piping, and the interconnecting piping. A water pump connected to a suction pipe w/ intake strainer will draw sea water from the Saint John Harbour. The suction pipe would also be equipped with a foot valve at the base of the suction pipe to prevent loss of pumping prime. The suction pipe will be designed to permit removal for maintenance and system winterization. Additional strainers would be installed on the suction side of the pump to prevent any debris from causing damage to the pumps impeller. It is proposed that pump be constructed of Stainless Steel or have a special epoxy coating on any surface exposed to sea water. The pump will be installed in a pump house or in the tunnel service room.

The waterfall effect will be created by installing water distribution piping along the top of sheet pile walls. Orifices (holes) will be drilled into the distribution piping to allow the water to fall down the sheet pile wall to the sea water below. The optima size and spacing of the orifices will have to be researched to ensure the proper waterfall effect is delivered. The distribution piping will installed in sections to ensure consistent flow across the waterfall.

A header will be installed at the discharge of the pump and each waterfall distribution pipe will be individually connected to the header. Valves on each pipe run will permit balancing of the water flow to each waterfall distribution pipe ensuring consistent flow across the waterfall

effect. All piping in the system will be sloped to permit drainage when the system is not operating or for ease of seasonal winterization. Piping materials that are resistant to sea water corrosion will be selected.

As part of the waterfall feature, environmental permitting will be required prior to construction.

2.7 Patio Canopy w/ Retractable Shades

The canopy over the patio area will offer visitors protection from the sun, wind, and rain. The canopy main support arms will extend out over the patio seating area by approximately 10.9 meters. The extension arms will be supported by the vertical steel canopy towers. The canopy itself will be furnished with a fully framed system with retractable shades. The shades will run along a track system connected to the canopy extension arms. An electric motor drive system will allow for setting of the protective shades in any position from fully extended to fully retracted. Alternately, either a cable/pulley system or an hydraulic piston system could be employed to raise and lower the canopy extension arms from a horizontal to a vertical position.

3 Electrical Systems

3.1 Electrical Service Entrance

A new electrical service entrance from Saint John Energy will come underground from across Water Street to a new pad mounted transformer located on-site. Exact location of new pad mounted transformer will be determined and coordinated with the consultant/design team

3.2 Power Distribution

The estimated size of the service entrance is 600V, 400A, 3 phase power to be fed from a new utility pad mounted transformer. The main service entrance disconnect will be rated 600V, 400A, 3 phase and will feed a 600V, 400A distribution panel which will feed all 600V equipment. Power will be supplied to panelboards through a 600V:208/120V dry type transformer and distribution boards as necessary.

3.3 Lighting

Site lighting will be accomplished through a combination of the following type of fixtures:

1. smart pole lights,
2. in-ground lights,
3. stair lights,

4. wall sconces,
5. linear led lights, and
6. landscape flood lights.

All lighting will be LED and will be compatible with a programmable light management system. The light management system will be complete with relays to allow for the capability to control multiple lighting circuits as well as other electrical devices.

3.4 Communications

The current WI-FI signal at the site is minimal. Therefore, select smart pole lights shall come equipped with WLAN modules in order to strengthen the WI-FI signal throughout the site.

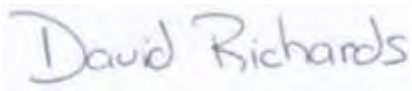
3.5 Stage

The electrical requirements for the stage include power for stage lighting and general use receptacles for instruments/equipment. The stage will also be wired for a basic sound system that can be used by small bands. However, conduit will be run from the stage to the sound station complete will pull cord that can be used for larger venues. The conduit will allow these venues to run their own cabling underground to a remote station that can be set up with a sound board. This prevents cables to have to be run on the ground creating a tripping hazard.

The stage will also have a lighting control panel for stage lighting. The control panel provides the capability to change the colour and intensity of each light fixture on the stage light bar. The light fixtures can be moved and along the light bar and positioned in any direction.

4 Summary

We trust that you will find the contents of this report satisfactory for your current purposes. Please feel free to contact the undersigned at your convenience if further assistance or clarification is required.



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Fundy Engineering & Consulting Ltd.

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Email: drichards@fundyeng.com

Appendix 4: Loyalist Plaza & North Market Slip Preliminary Design Report #2 by Glenn Group 2016

LOYALIST PLAZA
NORTH MARKET SLIP
RENEWAL

PRELIMINARY DESIGN REPORT #2

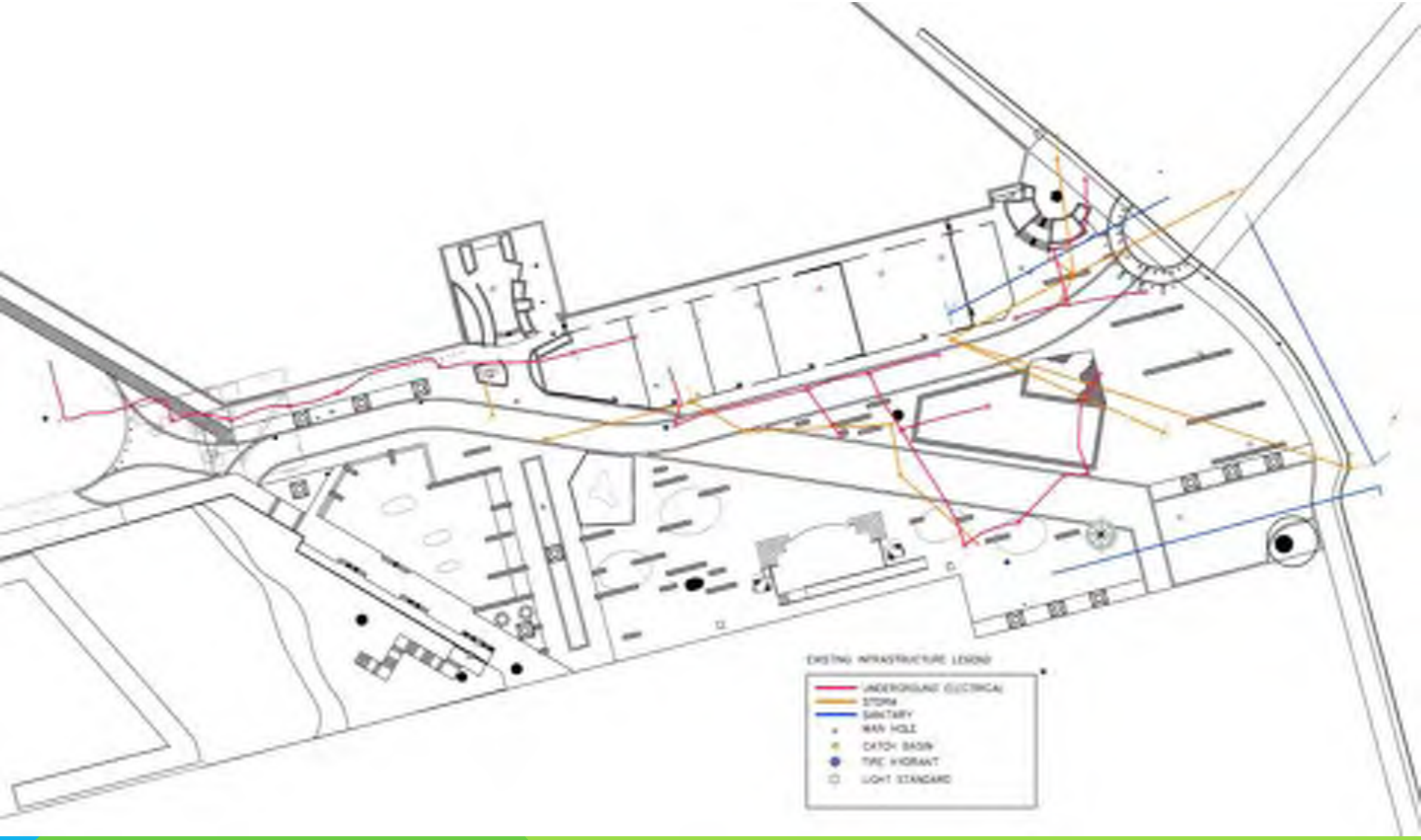
JANUARY 14, 2016

FIELD WORK

FIELD WORK

- Borehole Locations

SERVICES


EXISTING INFRASTRUCTURE LEGEND
UNDERGROUND ELECTRICAL
STORM
SANITARY
MAN HOLE
CATCH BASIN
FIRE HYDRANT
LIGHT STANDARD

FIELD WORK

- Video of Pipes

FIELD WORK

ESA Results & Actions

Trace Metals – Arsenic, Copper, Lead exceed applicable level in 2 samples

- Tin exceeded in 1 sample

Groundwater – High sodium

Petroleum Hydrocarbons – below levels in groundwater , above in soil

RAP needed

- DFO – Request for Review A[p[plication – weeks to months
- Navigation Protection Act – Notice of Works – several weeks
- Ocean Dredging and Disposal at Sea – requires sampling
- CEAA Screening Report – project description and pre-consultation

FIELD WORK

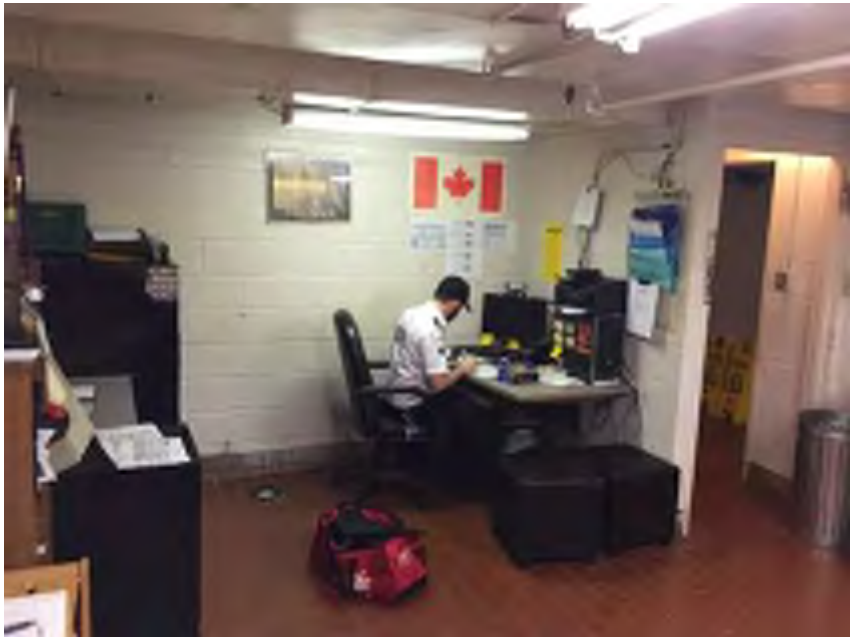
ESA Field Work

The next steps recommended are:

- Finish Phase II ESA Report.
- Notification to the NBDENV
- Develop a RAP Plan to manage the metals encountered, likely through a risked based approach that leaves the impacted soil in place.
- Implement Risk Management Plan.
- Document work and obtain file closure from the NBDENV.

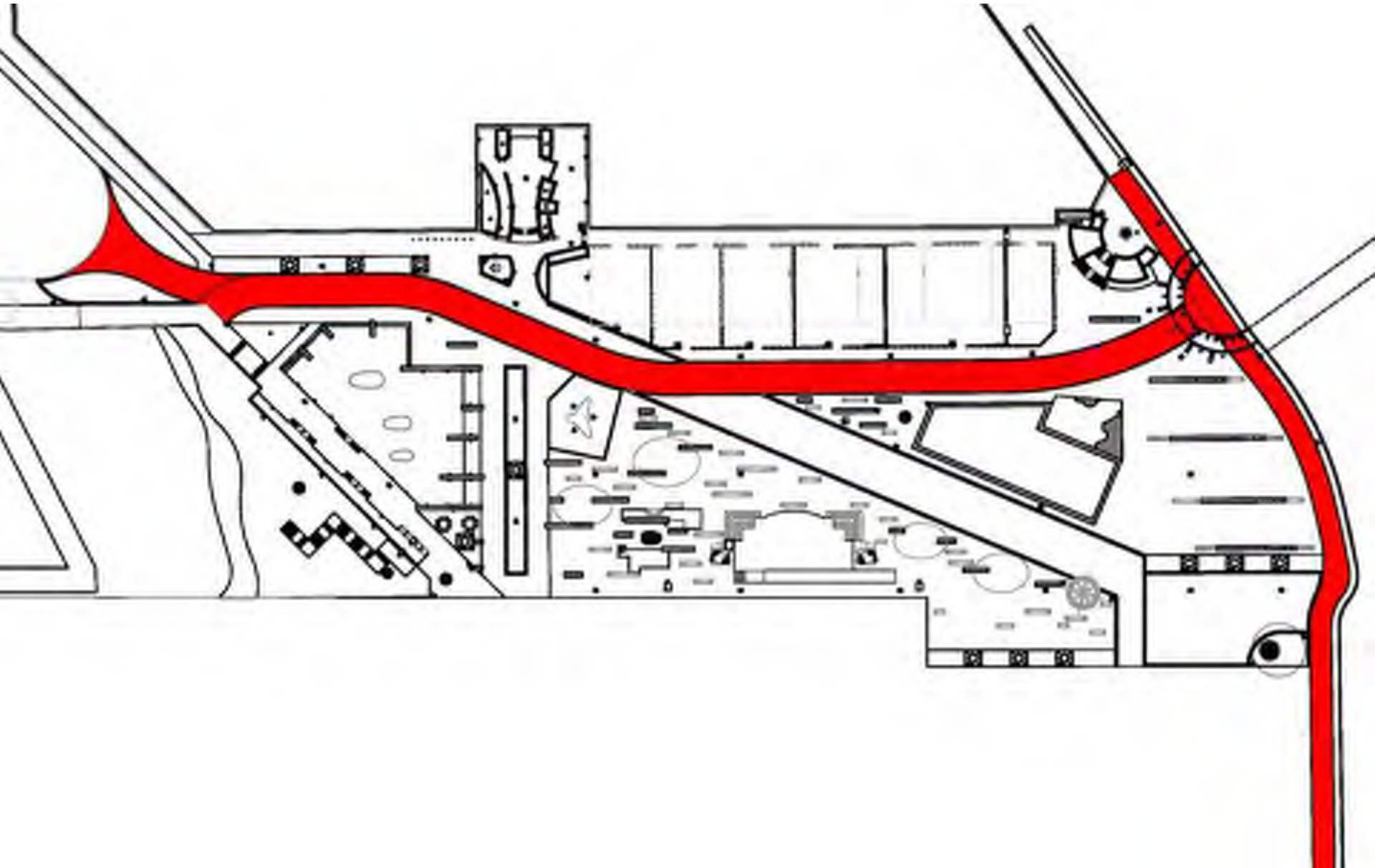
FIELD WORK

- Basement

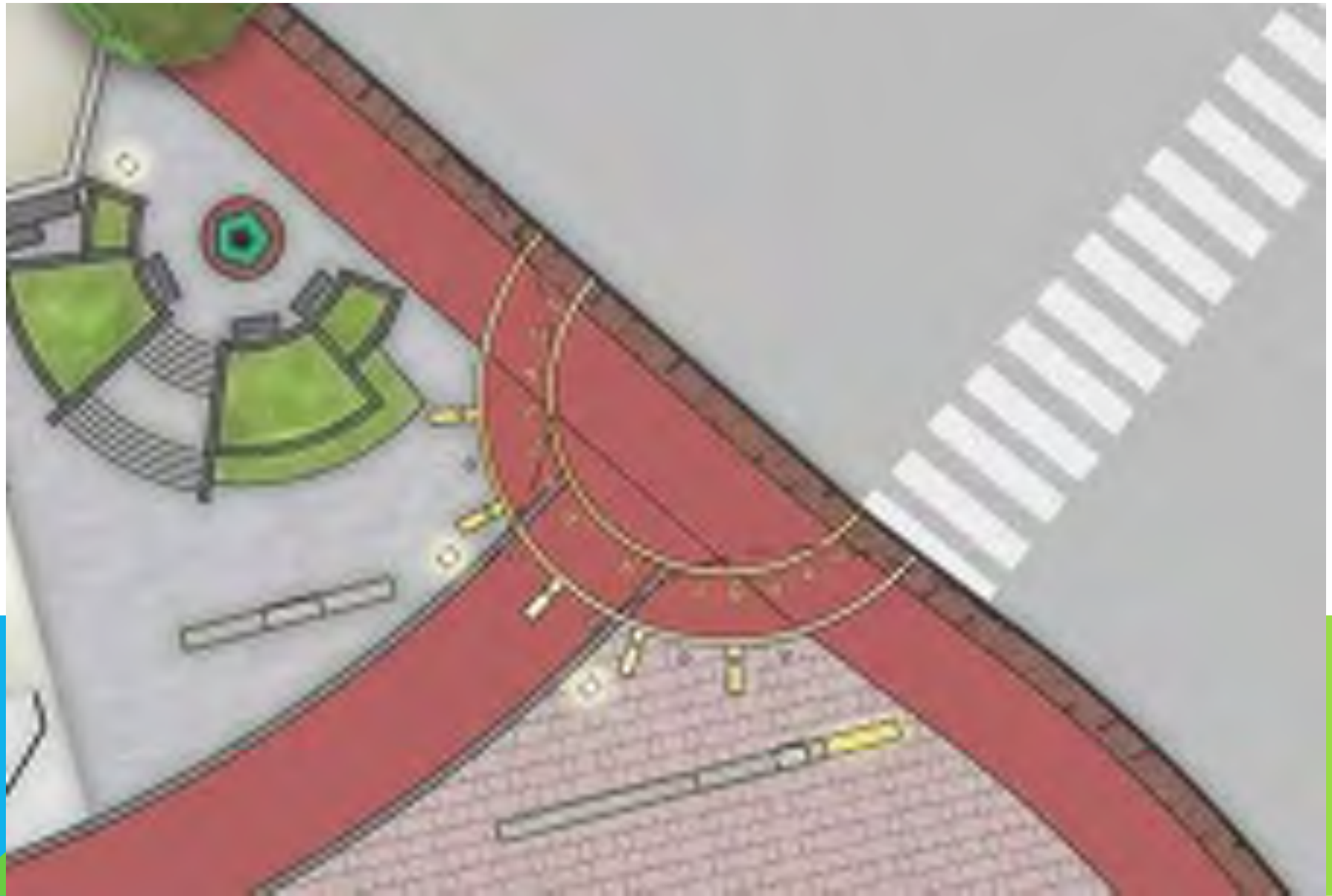


OVERALL PLAN

OVERALL PLAN – HARBOUR PASSAGE



OVERALL PLAN – HARBOUR PASSAGE



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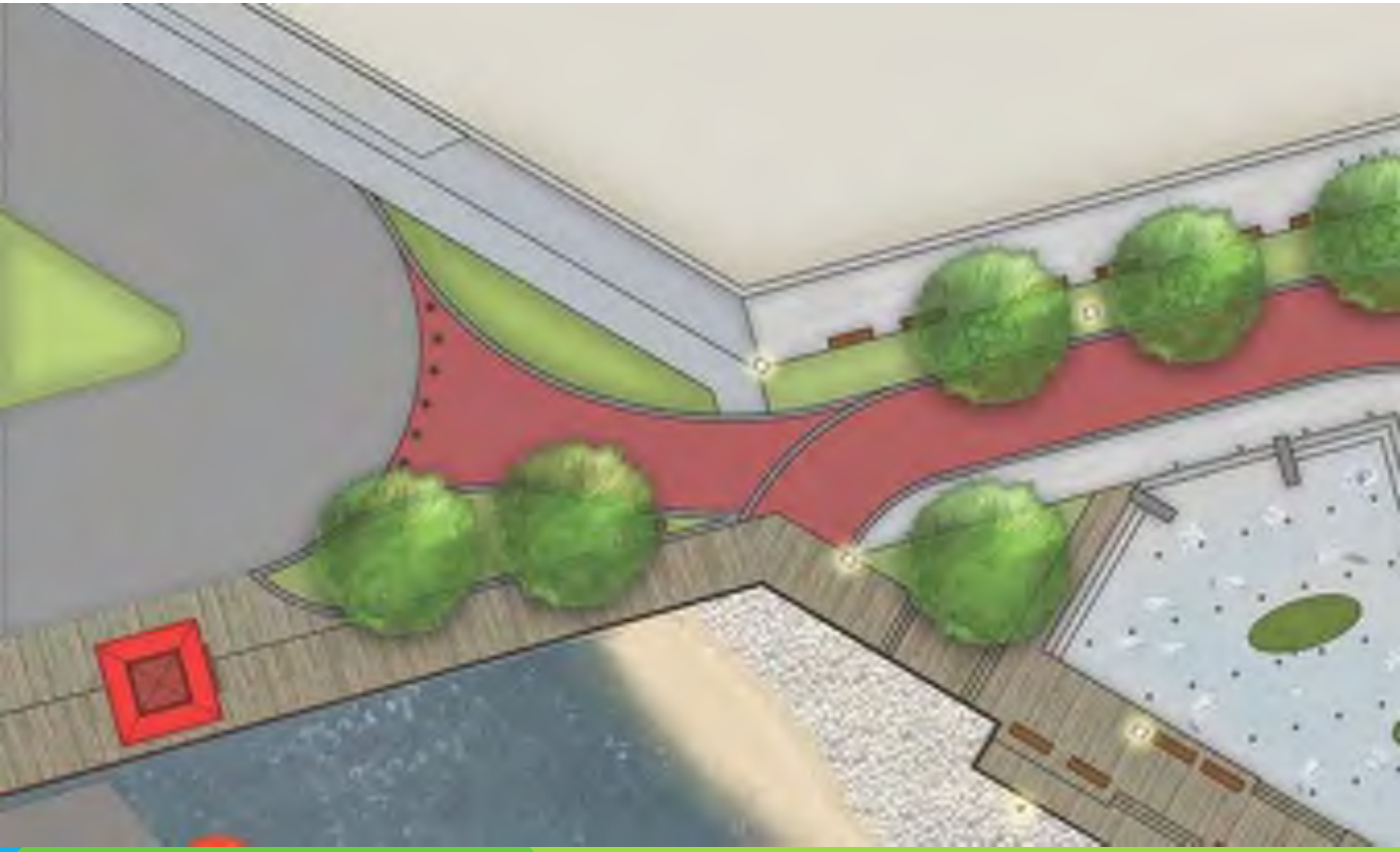

TUNNEL

TUNNEL

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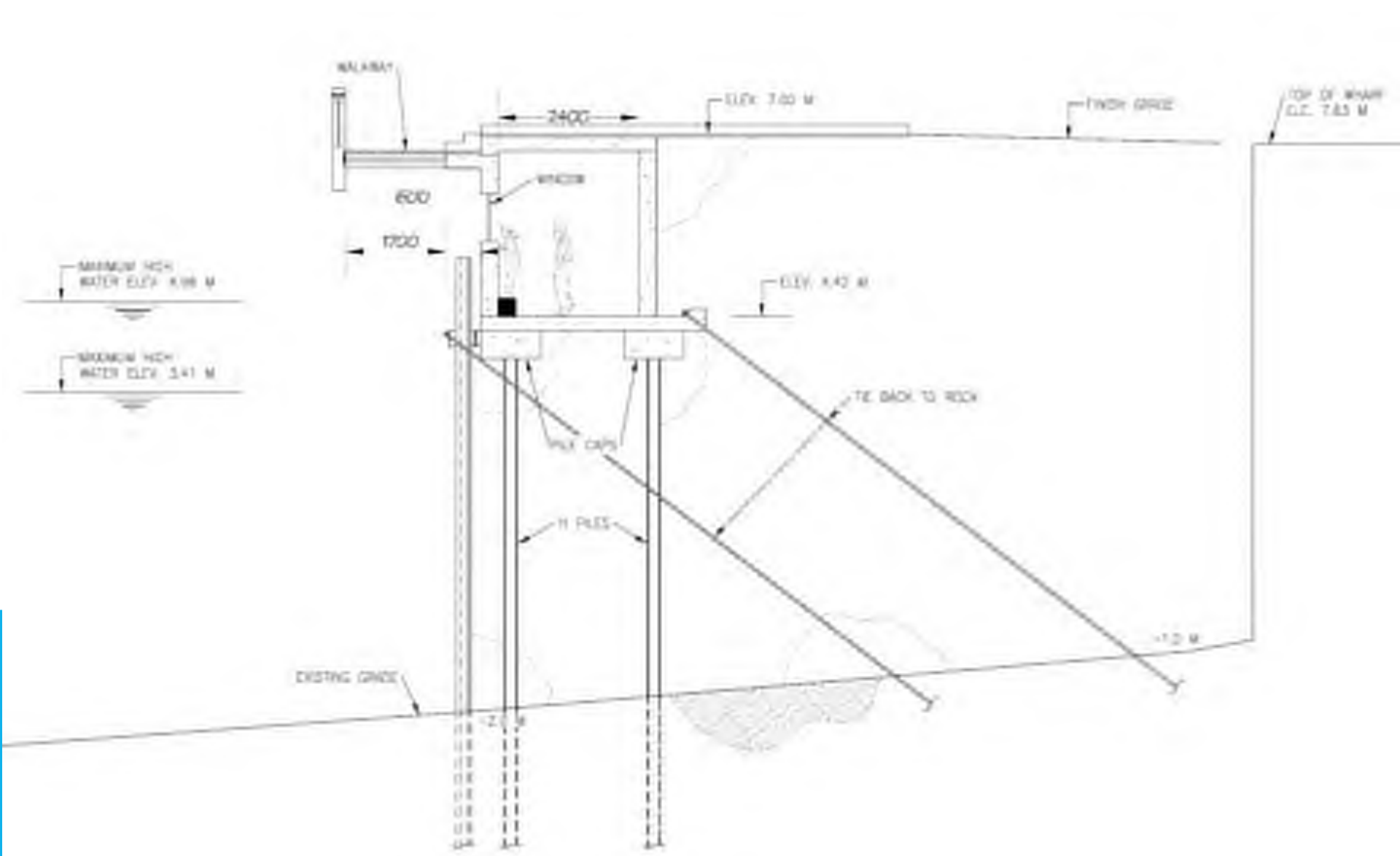

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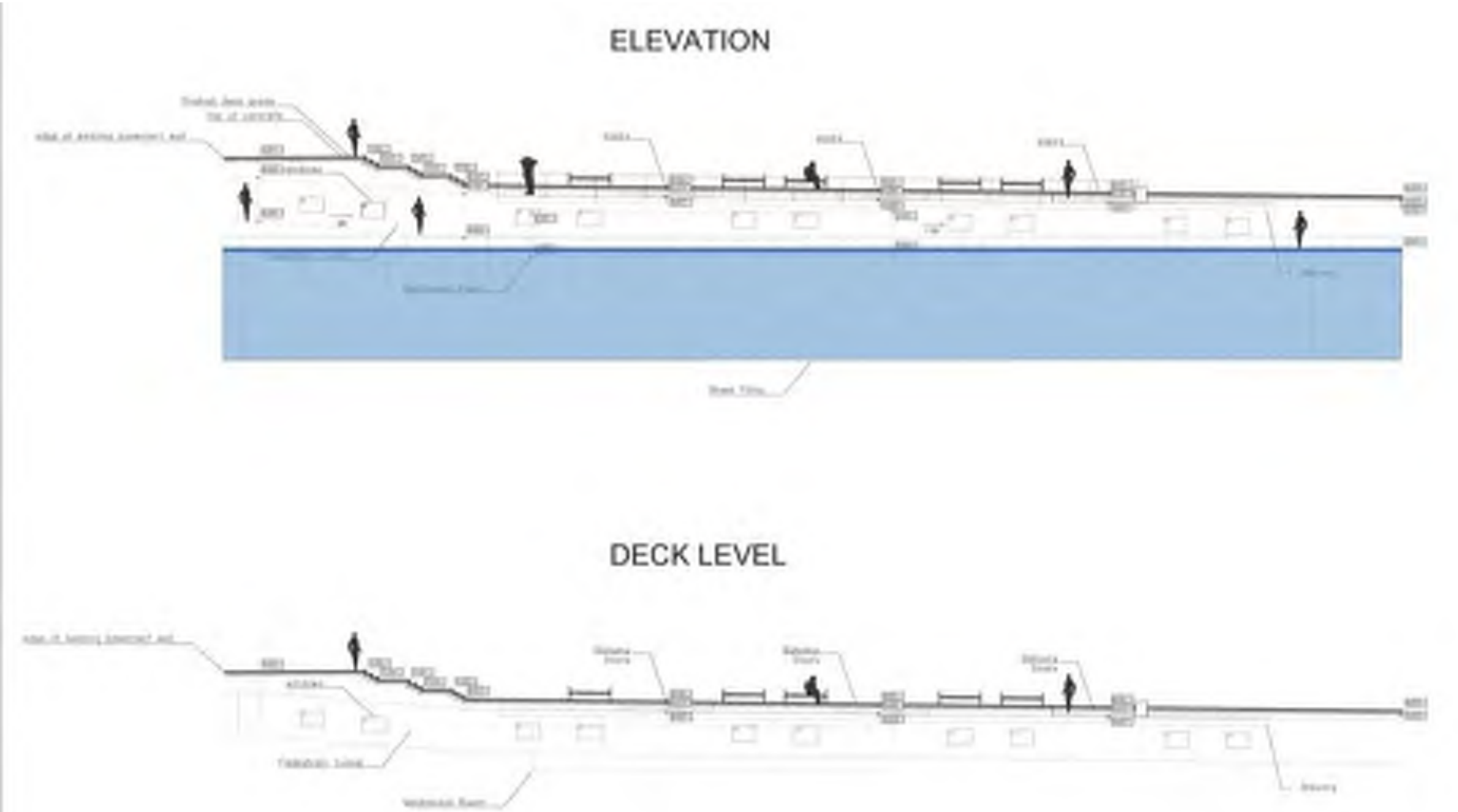
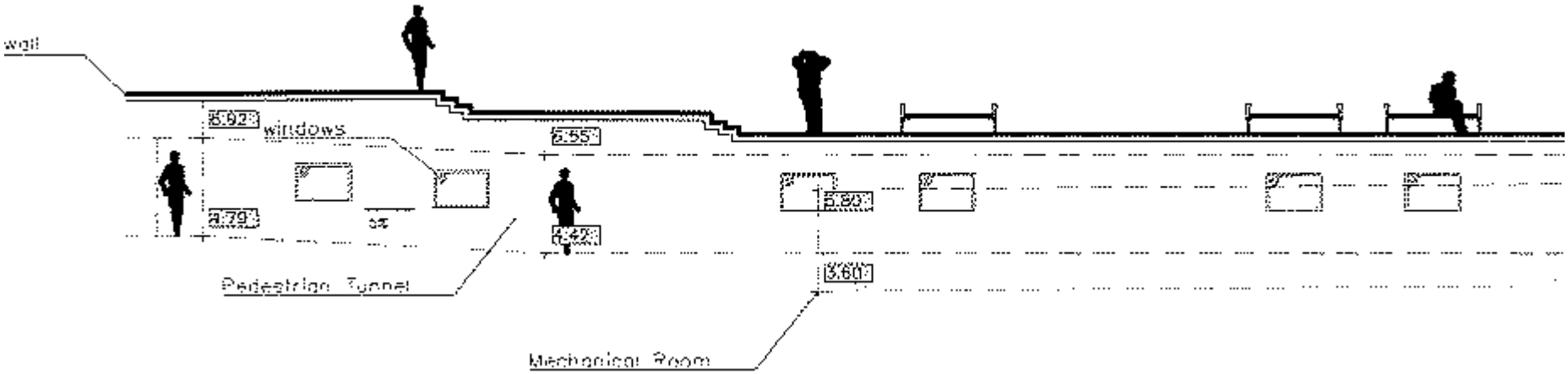


TUNNEL

BALCONY & PILING

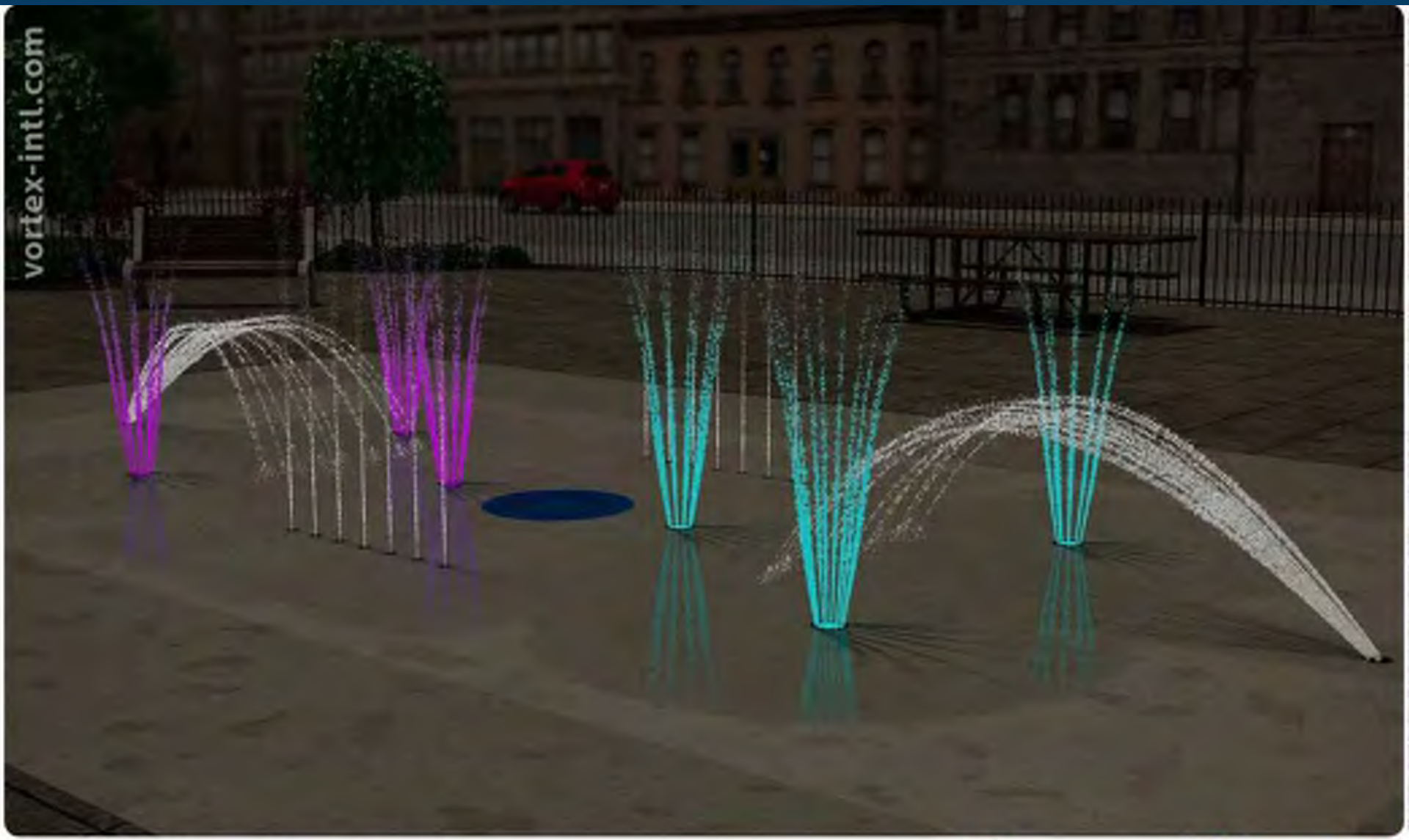
TUNNEL & MECHANICAL ROOM

TUNNEL



FOUNTAIN

FOUNTAIN



Albert Campbell Square Splashpad®, ON - Option 1 - Night View 2

VORTEX

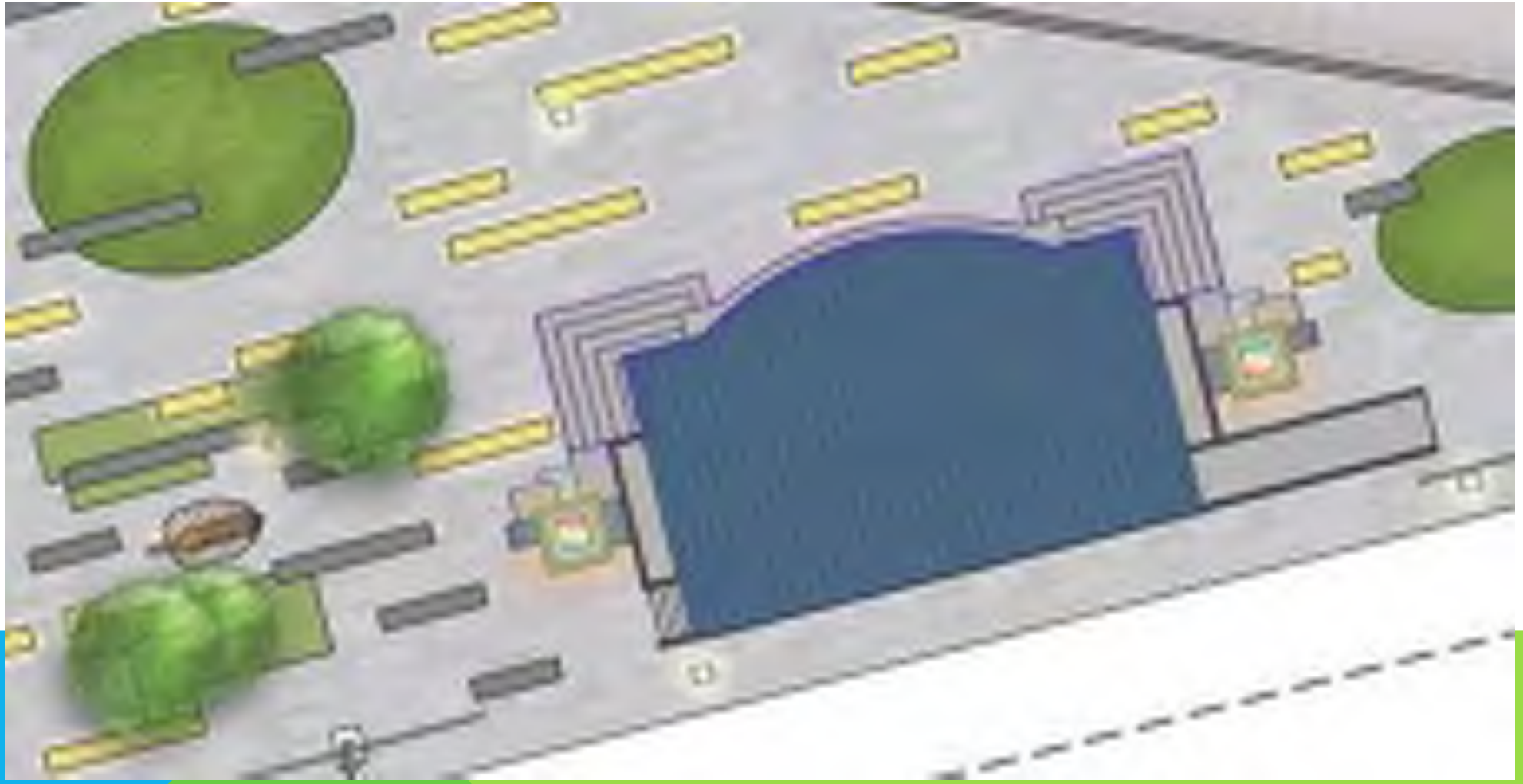
FOUNTAIN

Albert Campbell Square Splashpad®, ON - Option 1 - Day View 1

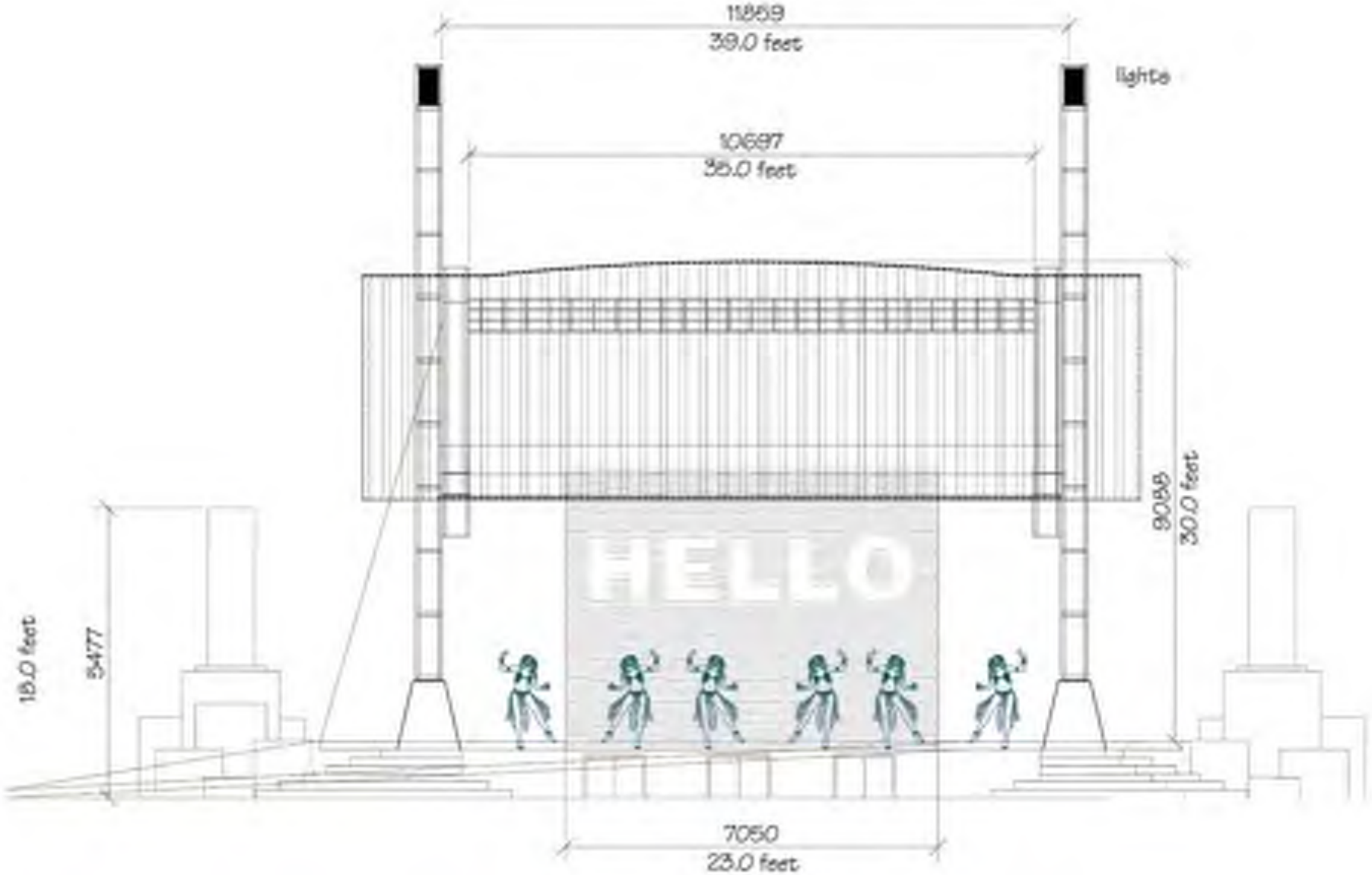
VORTEX

PERFORMANCE STAGE

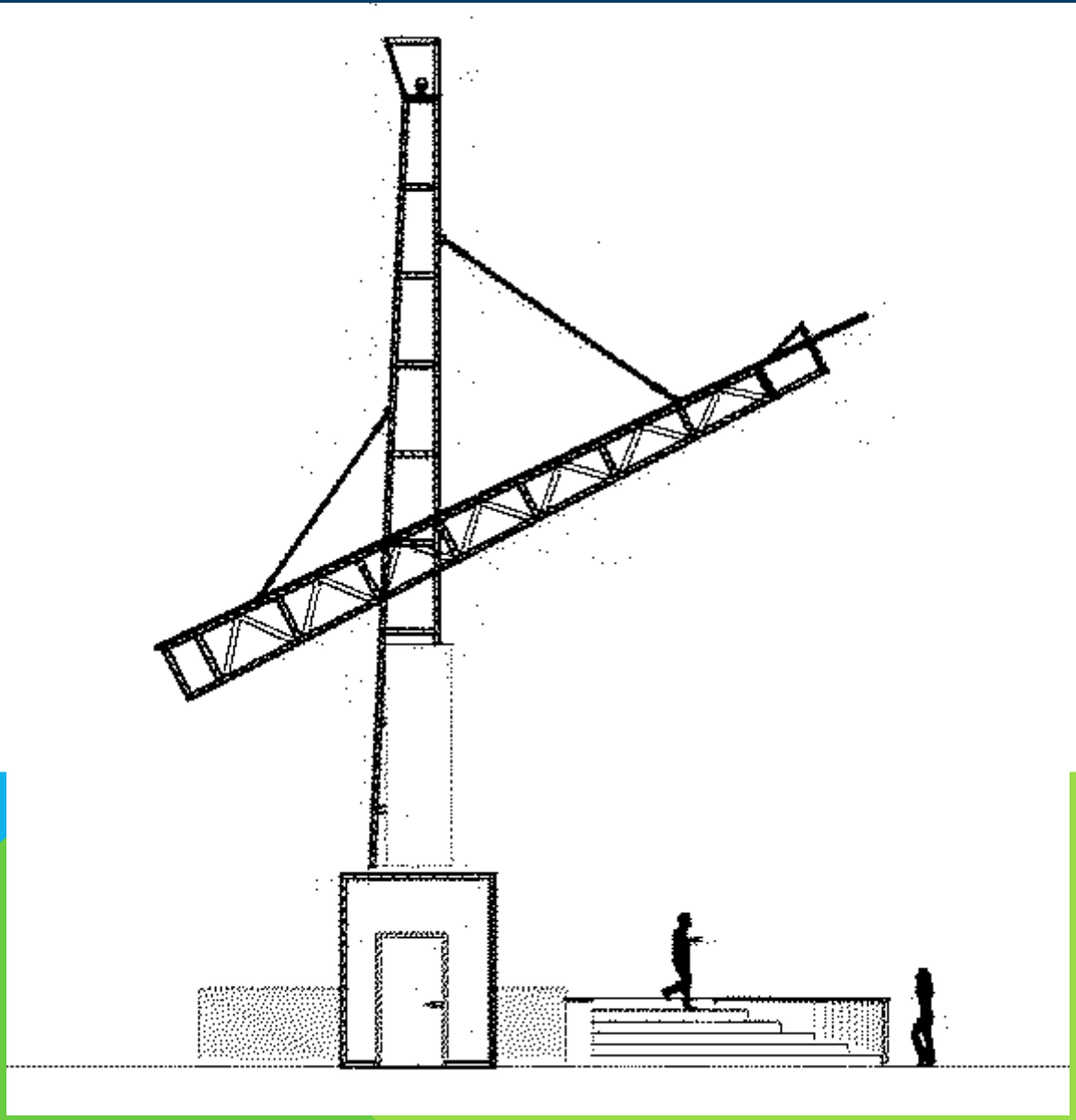
PERFORMANCE STAGE



PERFORMANCE STAGE - FRONT



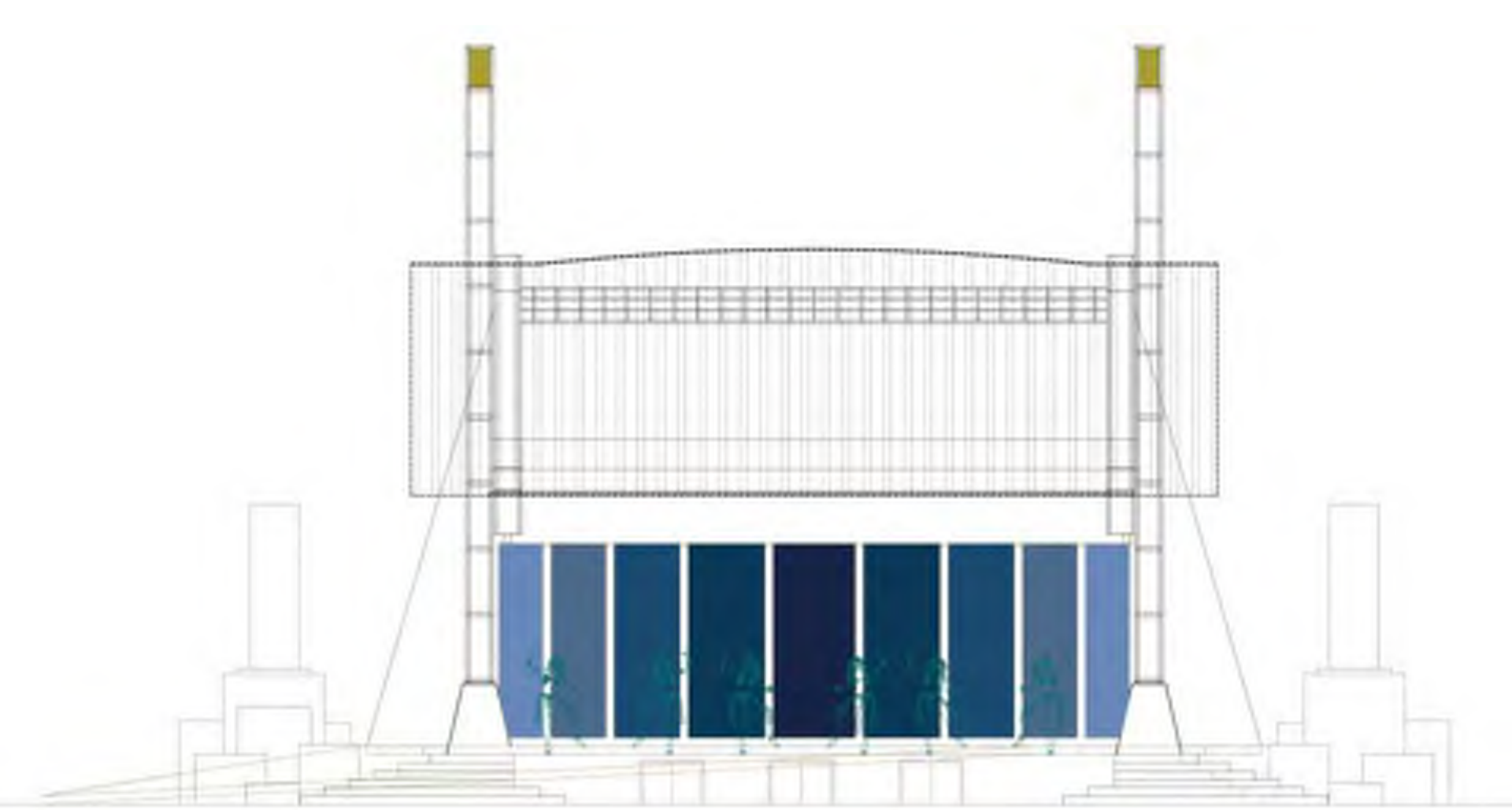
PERFORMANCE STAGE - SIDE



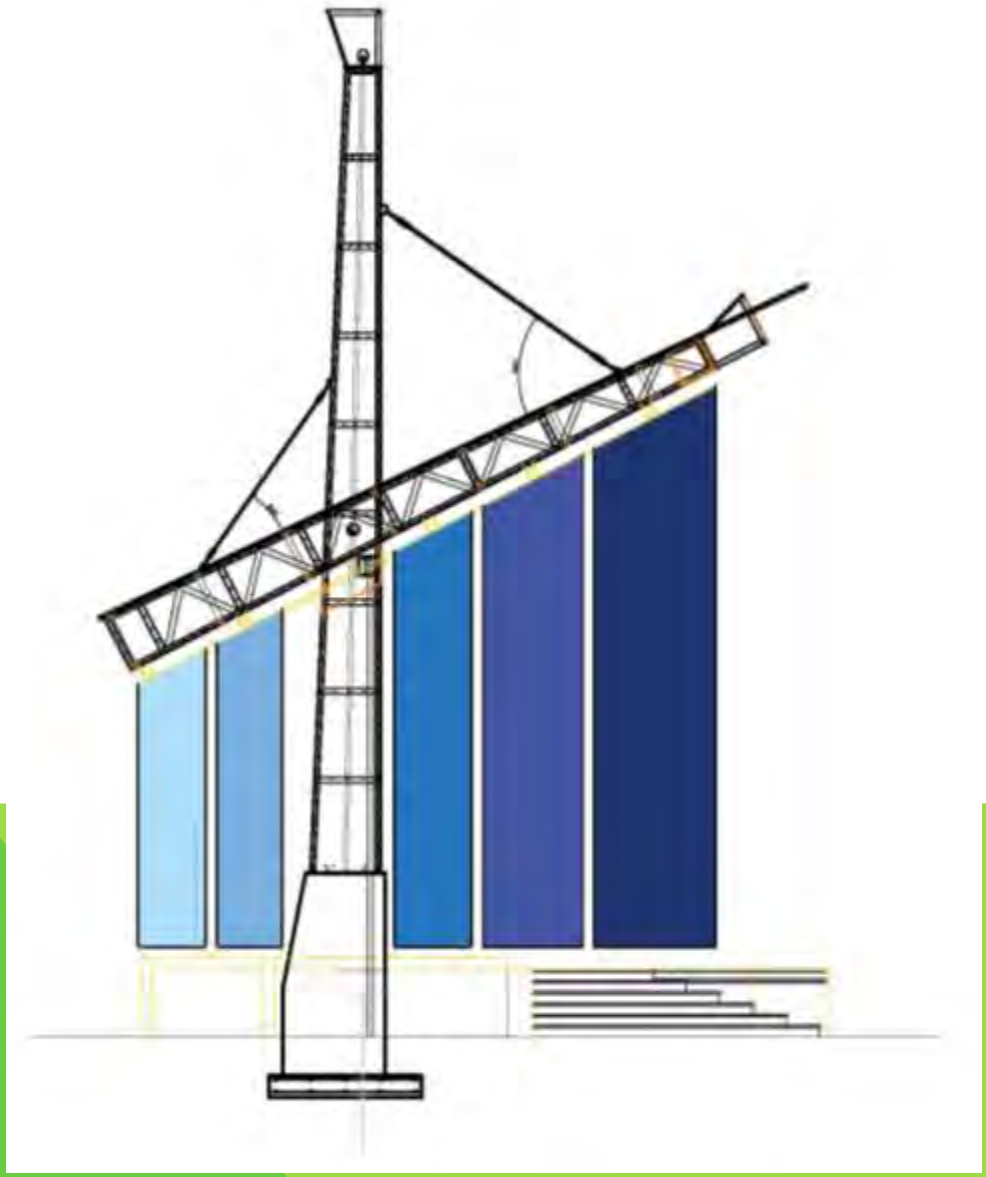
PERFORMANCE STAGE – VIDEO SCREEN

PERFORMANCE STAGE - WINDSCREENS

PERFORMANCE STAGE



PERFORMANCE STAGE



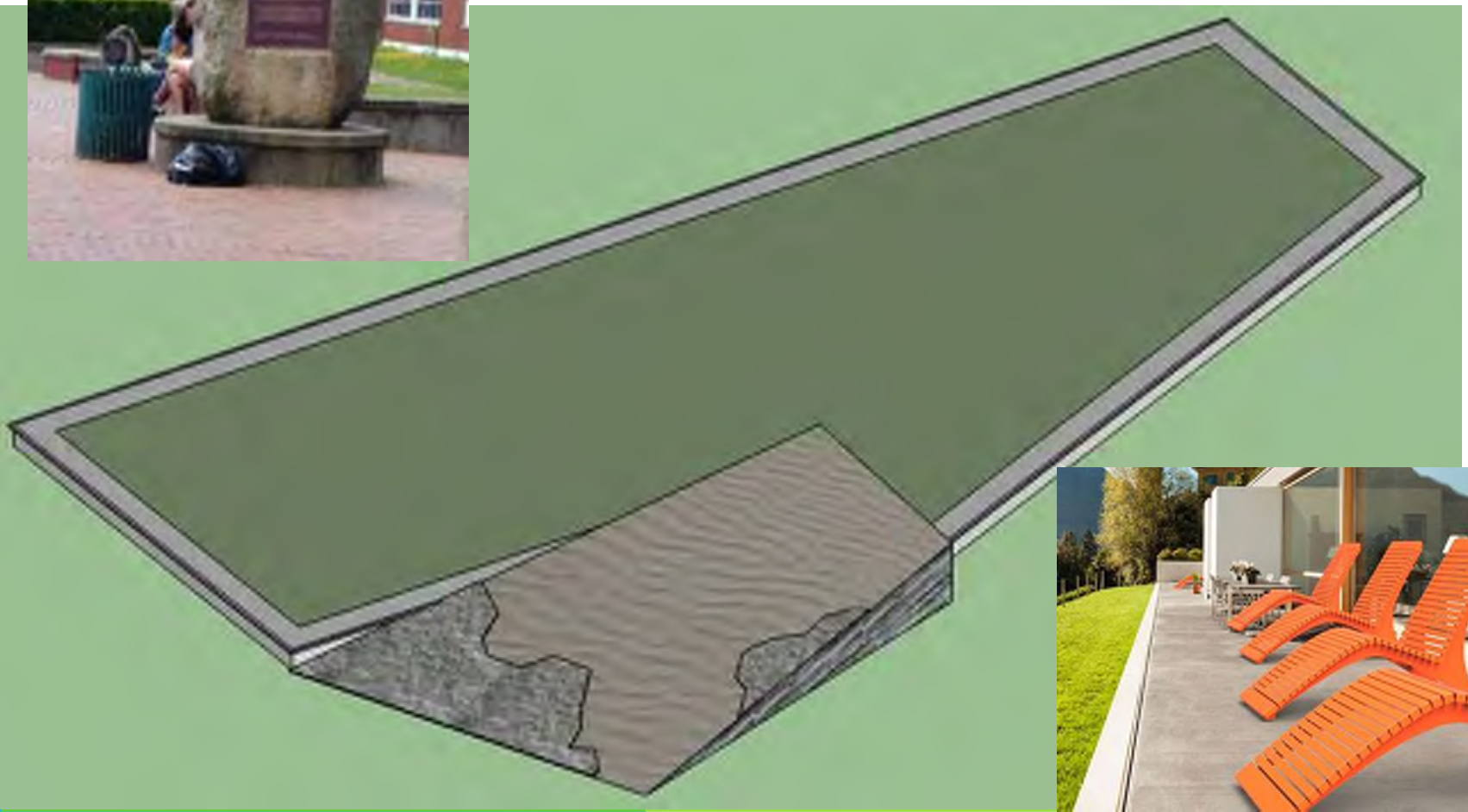
PERFORMANCE STAGE

- Storage

PERFORMANCE STAGE

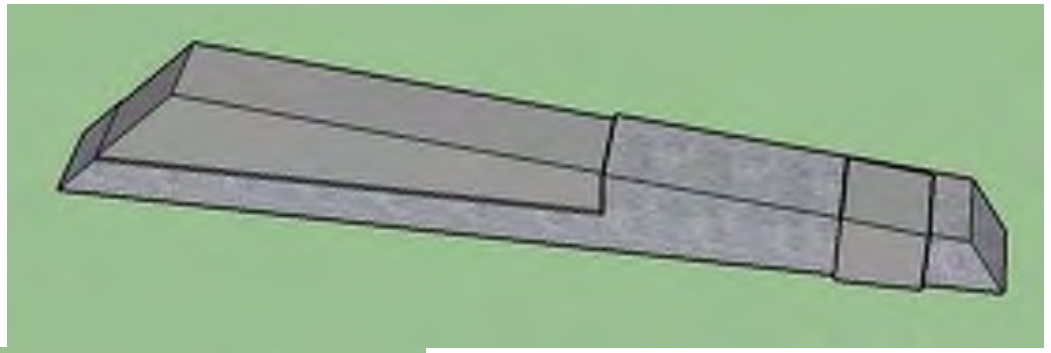
- Water Mark

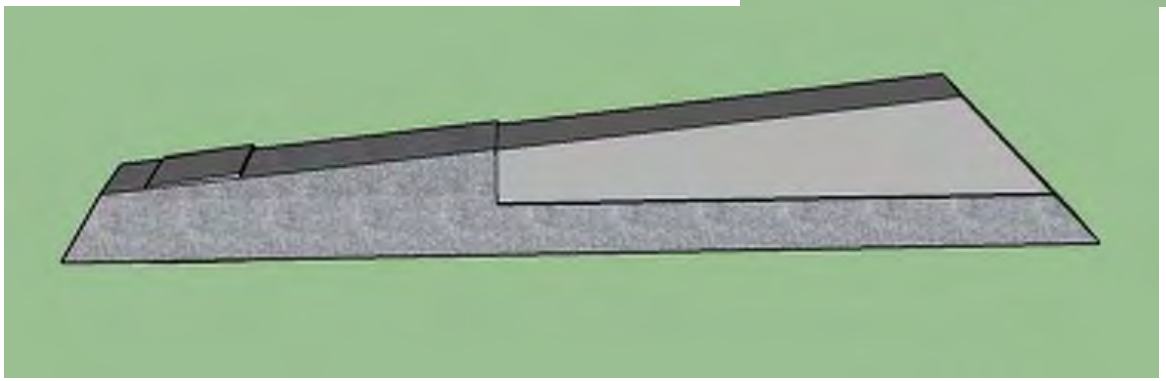
OCEAN FLOOR ISLAND



TEMPORARY SCULPTURES

KEELS





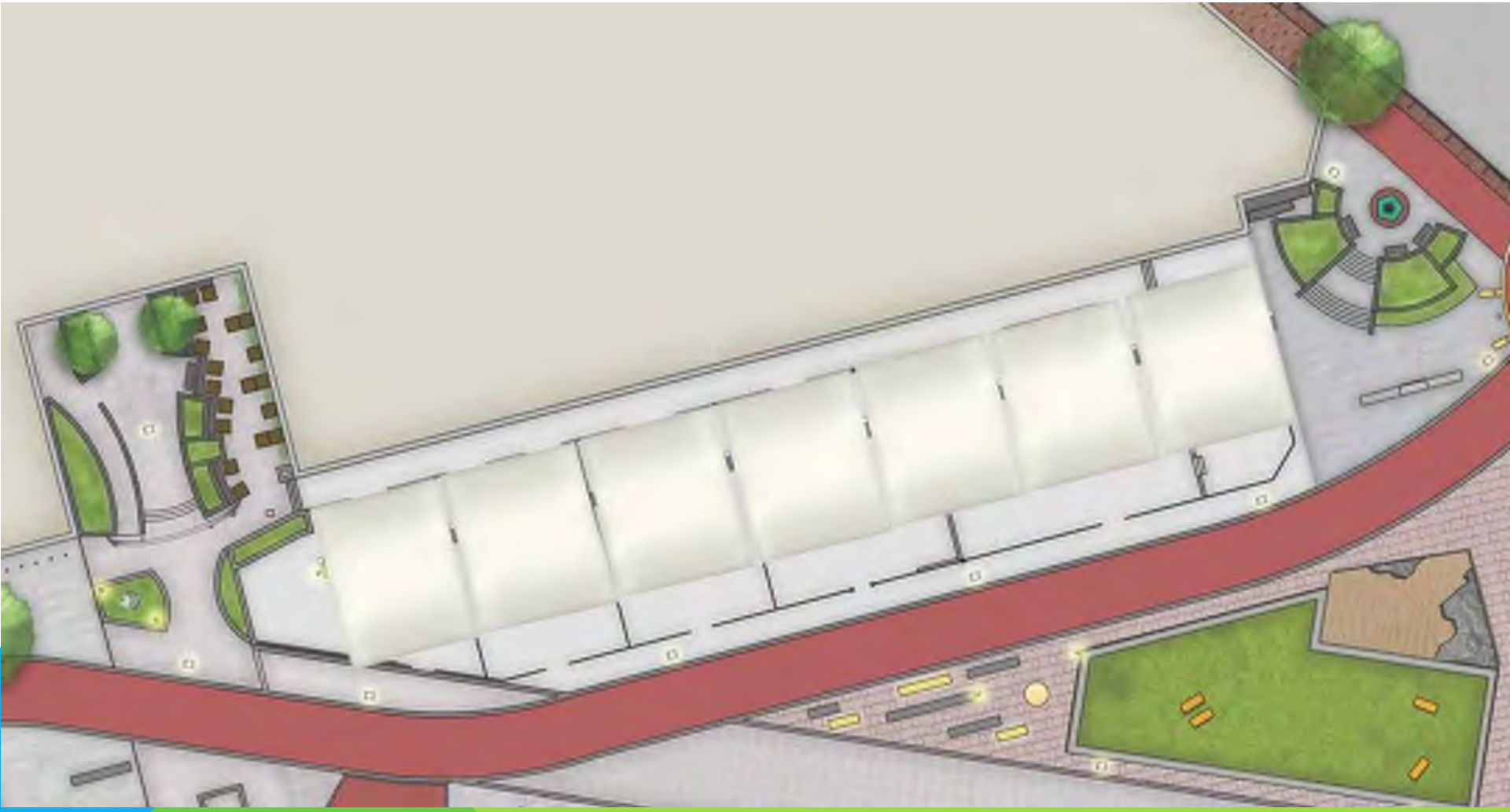
MARKET STALLS

FLAG POLE

MARKET STALLS

MARKET CART

PATIOS



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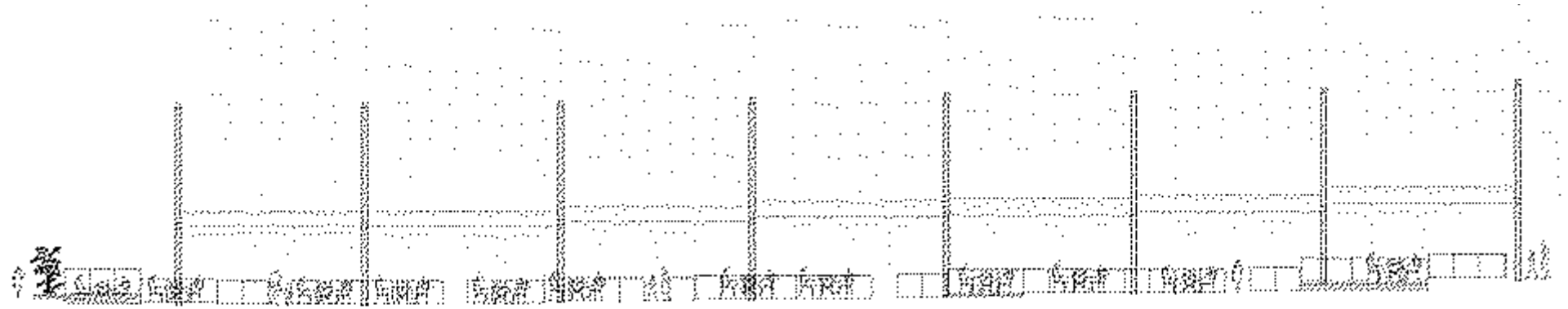

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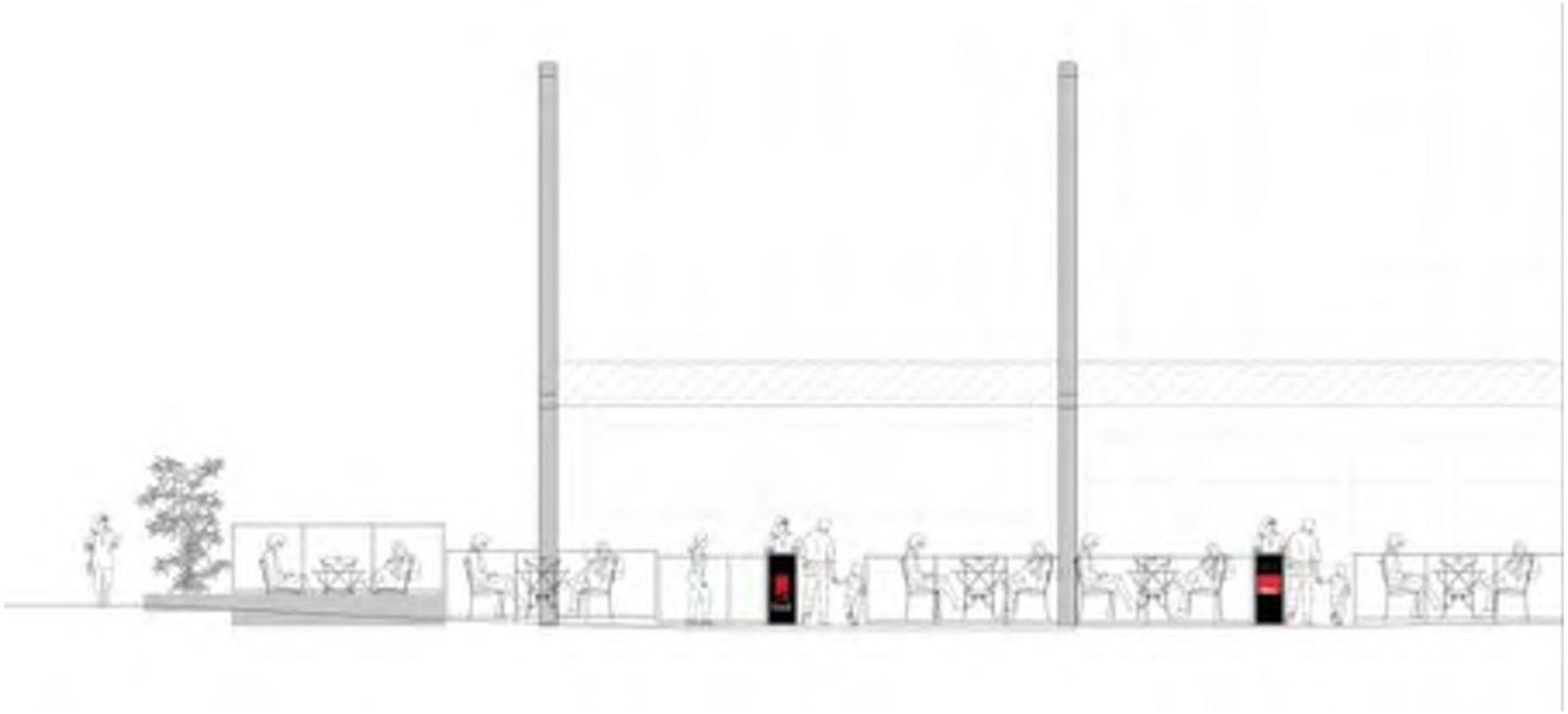

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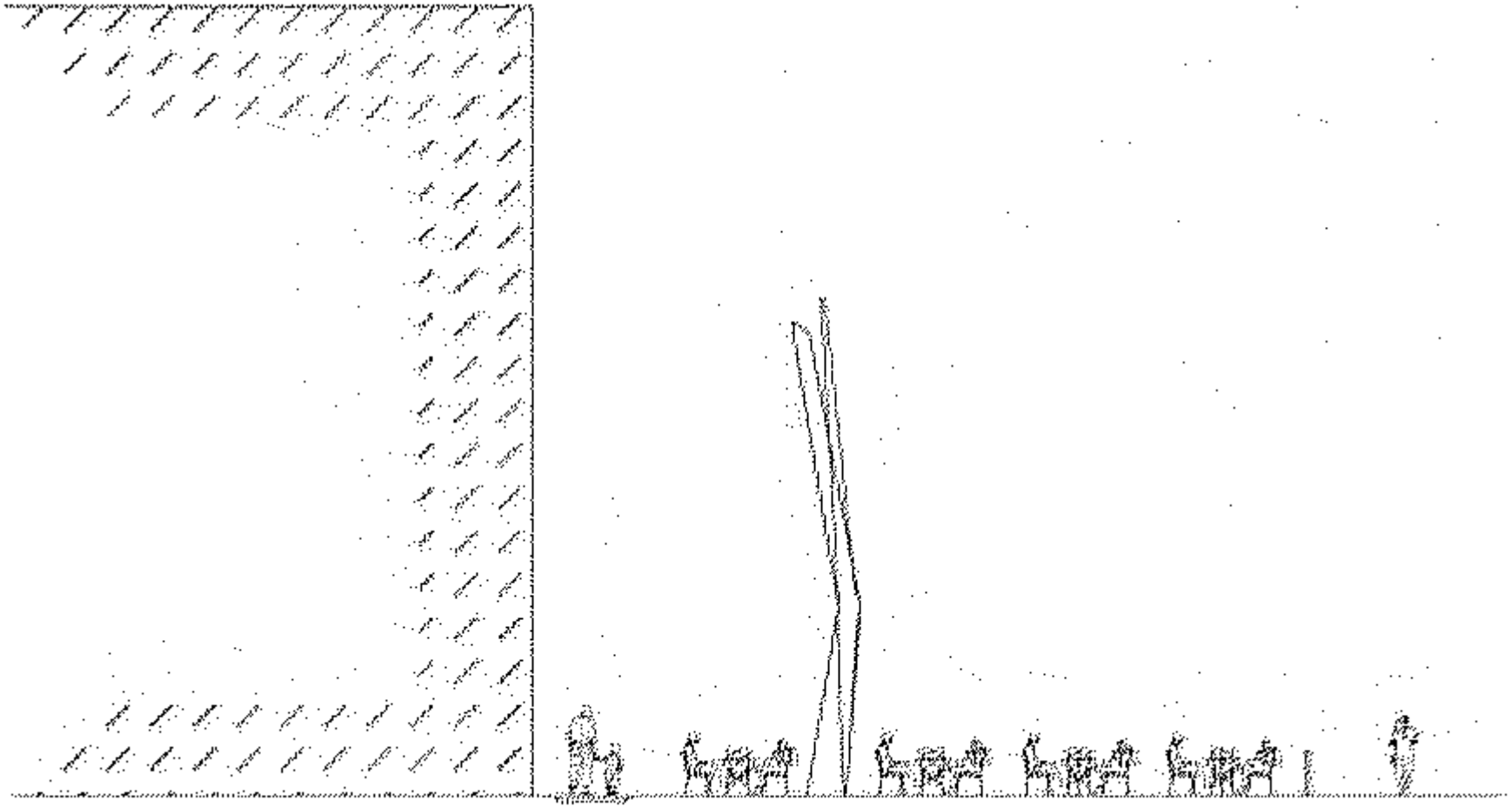

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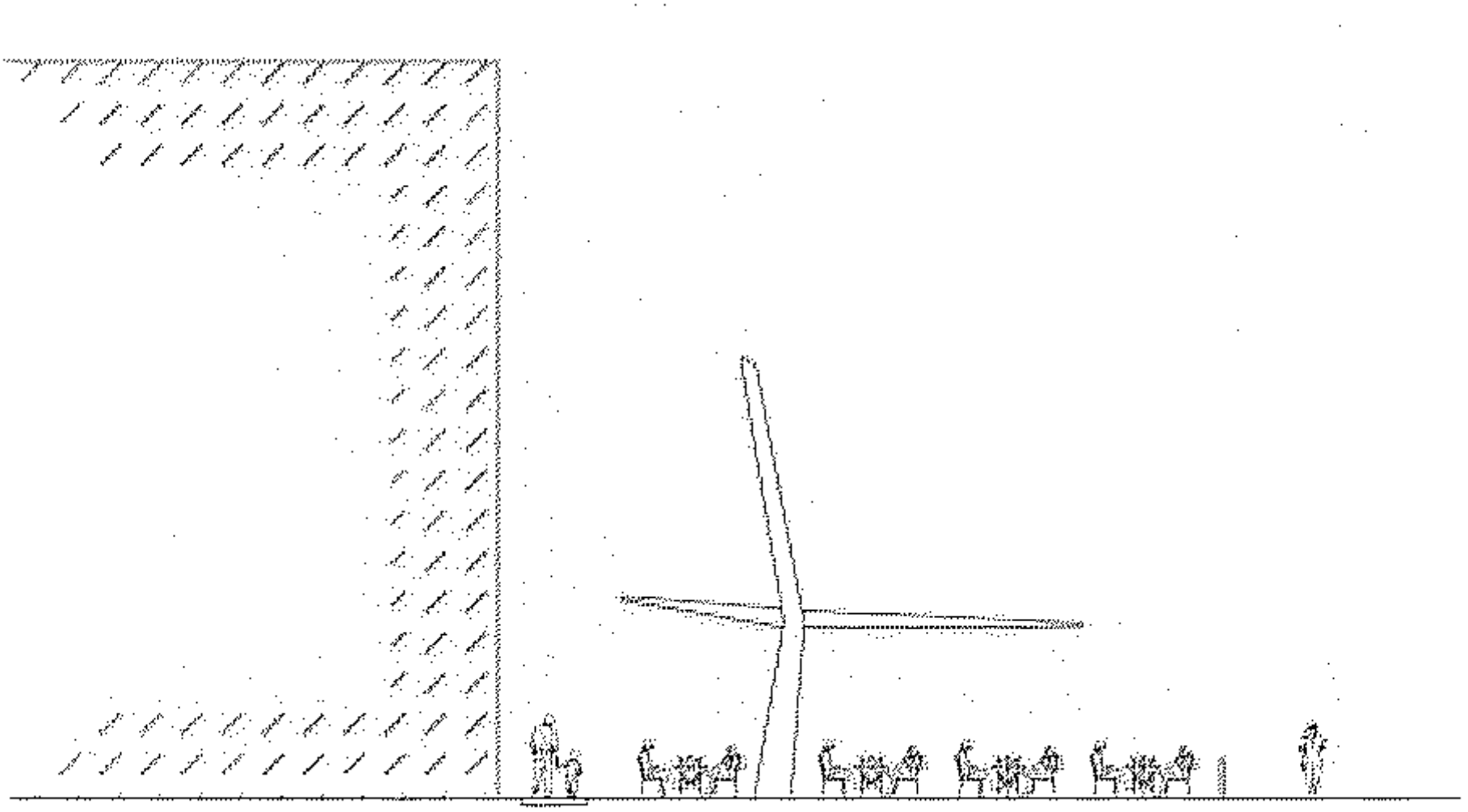


PATIOS

PATIOS

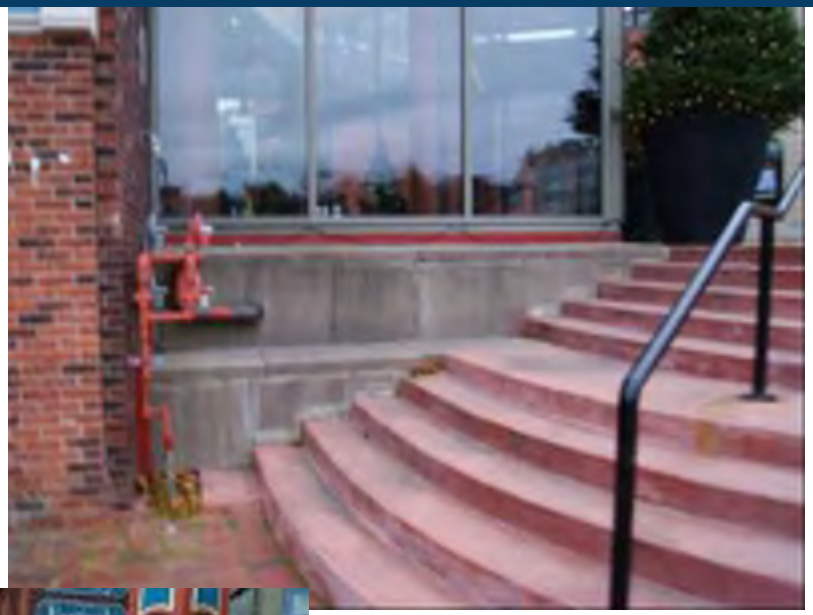
PATIOS

MARKET SQUARE CENTRAL ENTRANCE

MARKET SQUARE CENTRAL ENTRANCE

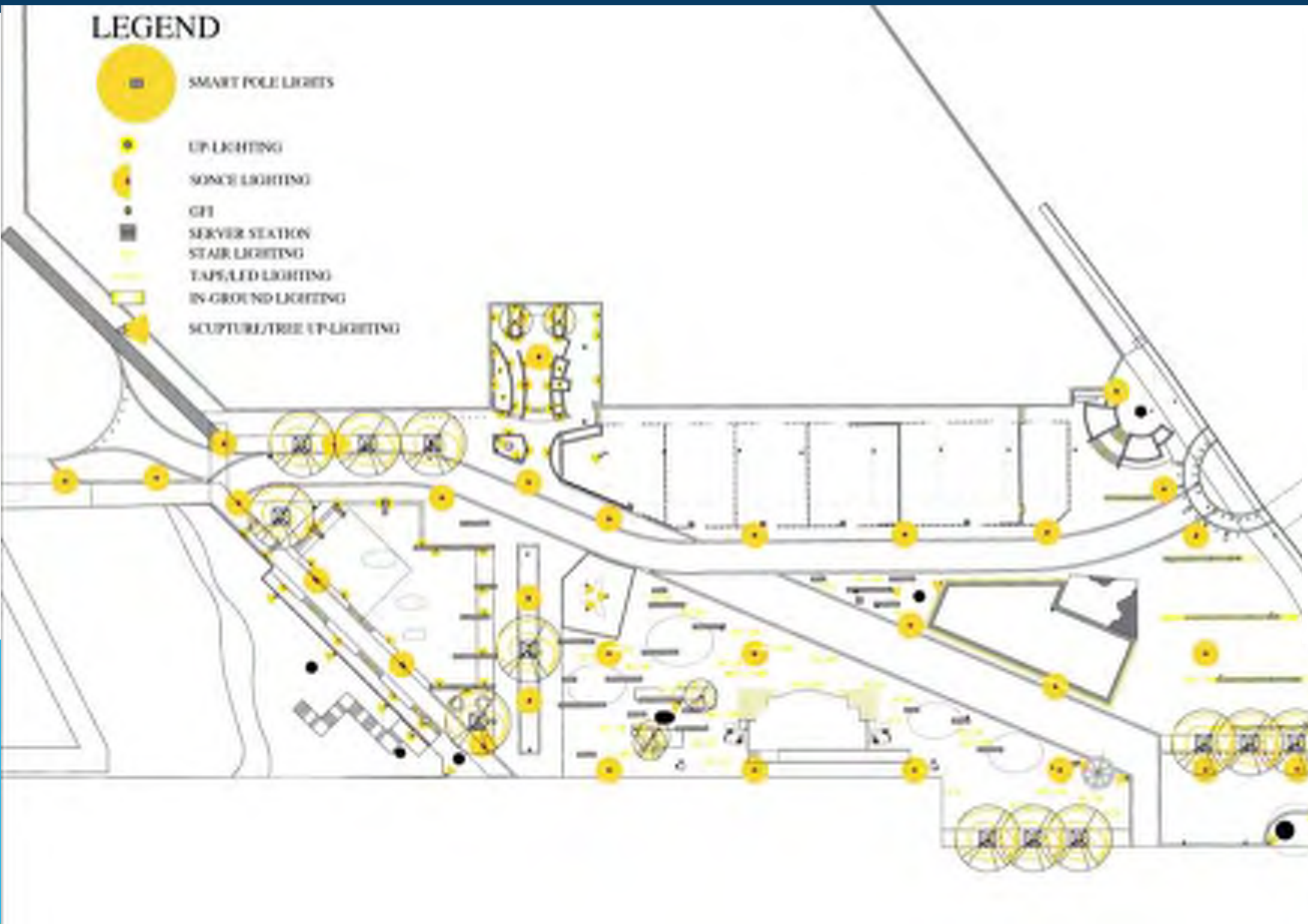
MARKET SQUARE CENTRAL ENTRANCE

WATER STREET ENTRANCE

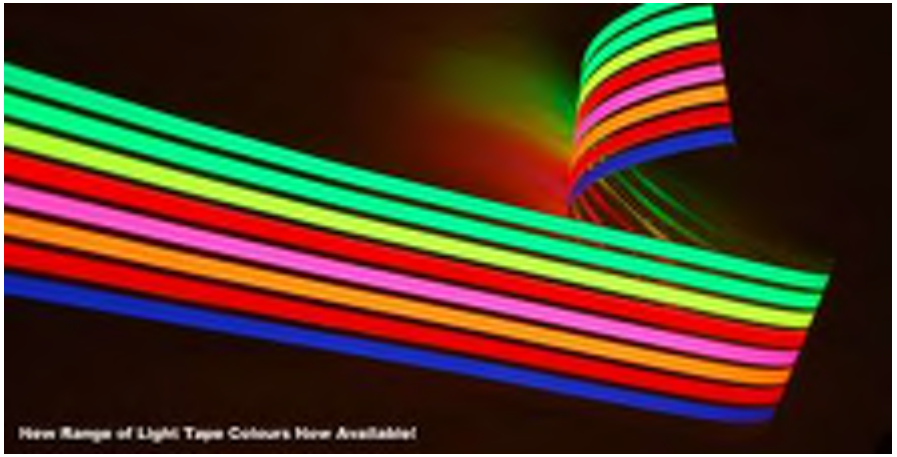


WATER STREET ENTRANCE

LIGHTING PLAN



LIGHTING PLAN



TIDAL STEPS

TIDAL STEPS SEADOG SCULPTURE

TIDAL STEPS – TIDE MARKERS

TIDAL STEPS – TIDE MARKERS

TIDAL CLOCK – TIDE MARKERS

TRADE SCULPTURE

FLOATING CAFE

FLOATING CAFE

FLOATING CAFE

Let’s Take a Journey...

Appendix 5: Loyalist Plaza & North Market Slip Preliminary Design Class C Cost Estimates by Glenn Group 2016

LOYALIST PLAZA & NORTH MARKET SLIP

PRELIMINARY DESIGN

COST ESTIMATE

April 2016

GLENN GROUP
LANDSCAPE ARCHITECTS & PARK PLANNERS

COST ESTIMATE - CLASS C

Loyalist Plaza - Market Slip Preliminary Design

Client: Saint John Waterfront Development

Project Number: 1516

Date: April 4, 2016

Prepared By: Questworks in conjunction with; Glenn Group Ltd., Easterbrook's Consulting, CBCL Ltd, Fundy Engineering Inc.

Item	Qty.	Unit	Unit Cost	Item Cost
Demolition				
Surface Demolition and Structures				
Pavers - Granite Cobbles - (Stockpile)	**888**	**m²**	**$ 25**	**$ 22,200.00**
Pavers - Red Brick	**1850**	**m²**	**$ 5**	**$ 9,250.00**
Pavers/Concrete Slab Base	**440**	**m²**	**$ 5**	**$ 2,200.00**
Granite Curb Removal - Service Street	**148**	**Lm**	**$ 8**	**$ 1,184.00**
Concrete Paving Removal - Service Street	**506**	**m²**	**$ 4**	**$ 1,771.00**
Asphalt Road Connection & Street Modifications	**135**	**m²**	**$ 10**	**$ 1,350.00**
Concrete Stairs - Market Square Entry	**16**	**Lm**	**$ 40**	**$ 640.00**
- Walls	**50**	**Lm**	**$ 45**	**$ 2,250.00**
Concrete Stairs - Water Street Entry	**56**	**Lm**	**$ 40**	**$ 2,240.00**
- Walls	**17.25**	**Lm**	**$ 45**	**$ 776.25**
Concrete Stairs - Amphitheater	**40**	**Lm**	**$ 40**	**$ 1,600.00**
- Walls	**233**	**Lm**	**$ 45**	**$ 10,485.00**
Patio Wood Decks	**443**	**m²**	**$ 10**	**$ 4,430.00**
Patio Bollards	**115**	**Lm**	**$ 5**	**$ 575.00**
Patio Pergola & Wind Screens	**1**	**Lump Sum**	**$ 1,000**	**$ 1,000.00**
Existing Chain Link Fence (remove and replace)	**145**	**Lm**	**$ 40**	**$ 5,800.00**
Pier Railing & Posts	**55**	**Lm**	**$ 45**	**$ 2,475.00**
Wood Patio Railings	**97**	**Lm**	**$ 25**	**$ 2,425.00**
Wood Deck at Volleyball Courts	**318**	**m²**	**$ 25**	**$ 7,950.00**
Wood Wall by Coast Guard	**58**	**Lm**	**$ 65**	**$ 3,770.00**
Boardwalk Demolition	**178**	**m²**	**$ 50**	**$ 8,900.00**
Loyalist Boulder (remove and retain)	**1**	**Lump Sum**	**$ 2,500**	**$ 2,500.00**
Light Fixtures (Stockpile)	**30**		**$ 500**	**$ 15,000.00**
Gate & Barriers/bollard (remove & turn over to owner)	**2**	**Ea.**	**$ 1,800**	**$ 3,600.00**
Flag Poles (13) (Stockpile)	**13**	**Ea.**	**$ 1,000**	**$ 13,000.00**
Site Furnishings (remove and return to owner)				
Tree Bench (Relocation)	**1**	**Lump Sum**	**$ 500**	**$ 500.00**
Benches with Planters	**1**	**Lump Sum**	**$ 400**	**$ 400.00**
Picnic Tables (Relocation)	**1**	**Lump Sum**	**$ 250**	**$ 250.00**
Volleyball Posts, Nets, Fencing	**1**	**Lump Sum**	**$ 1,000**	**$ 1,000.00**
Trash Can & Benches	**1**	**Lump Sum**	**$ 500**	**$ 500.00**
Trees	**16**	**Ea.**	**$ 100**	**$ 1,600.00**
Shrub Beds	**198**	**m²**	**$ 10**	**$ 1,980.00**
Lawn Areas	**190**	**m²**	**$ 5**	**$ 950.00**
Beach Volleyball - Sand & Nets & screen	**1**	**Lump Sum**	**$ 1,500**	**$ 1,500.00**

Existing Buildings/Structures				
Stage	**1**	**Lump Sum**	**$ 1,000**	**$ 1,000.00**
Ice Cream Shed	**1**	**Lump Sum**	**$ 500**	**$ 500.00**
Storage Shed	**1**	**Lump Sum**	**$ 500**	**$ 500.00**
Storage Shed 2	**1**	**Lump Sum**	**$ 500**	**$ 500.00**
Canteen	**1**	**Lump Sum**	**$ 500**	**$ 500.00**
Relocate Fire Hydrant Locations	**1**	**Lump Sum**	**$ 10,000**	**$ 10,000.00**
Remove Existing Electrical	**1**	**Lump Sum**	**$ 50,000**	**$ 50,000.00**
Signs & Misc. Items	**1**	**Lump Sum**	**$ 10,000**	**$ 10,000.00**
			Total Demolition	**$ 209,051.25**
Construction				
SITEWORK				
Site Hoarding/Protection	**1**	**Lump Sum**	**$ 25,000**	**$ 25,000.00**
Insulating Under Doors/Exits	**16**	**ea**	**$ 2,000**	**$ 32,000.00**
Rough Grading	**6000**	**m²**	**$ 5**	**$ 30,000.00**
Finish Grading	**6000**	**m²**	**$ 5**	**$ 30,000.00**
Rock Excavation	**1**	**Lump Sum**	**$ 20,000**	**$ 20,000.00**
Cut	**1**	**Lump Sum**	**$ 10,000**	**$ 10,000.00**
Fill	**1**	**Lump Sum**	**$ 20,000**	**$ 20,000.00**
Asphalt Patching at Water Street	**1**	**Lump Sum**	**$ 5,000**	**$ 5,000.00**
Retaining Wall (to tie into neighbouring property/Coast Guard)	**1**	**Lump Sum**	**$ 22,000**	**$ 22,000.00**
LANDSCAPE / HARDSCAPE / STREETSCAPE				
Re-Laid Granite Cobble Paving Stones	**800**	**m²**	**$ 100**	**$ 80,000.00**
Unit Paving Type A - Easy Clean Patio	**1165**	**m²**	**$ 200**	**$ 233,000.00**
Unit Paving Type B - Plank	**1350**	**m²**	**$ 160**	**$ 216,000.00**
Unit Paving Type C - Directional	**1000**	**m²**	**$ 160**	**$ 160,000.00**
Unit Paving Type D - Red Streetscape	**100**	**m²**	**$ 160**	**$ 16,000.00**
Harbour Passage - Unit Paving Edger	**181**	**m²**	**$ 200**	**$ 36,180.00**
Harbour Passage - Concrete 125mm	**625**	**m²**	**$ 75**	**$ 46,875.00**
Harbour Passage - Concrete Colouring	**625**	**m²**	**$ 20**	**$ 12,500.00**
Smyth Street Connection Concrete Paving	**75**	**m²**	**$ 75**	**$ 5,625.00**
Concrete Colouring	**75**	**m²**	**$ 20**	**$ 1,500.00**
Water Street Curb Repair/Replacement	**81**	**Lm**	**$ 70**	**$ 5,670.00**
Water Street Concrete Sidewalk Remove/Replace	**225**	**m²**	**$ 75**	**$ 16,875.00**
Decorative Brass Sidewalk - "Harbour Passage"-Lettering & Pattern	**1**	**Lump Sum**	**$ 5,000**	**$ 5,000.00**
Harbour Passage Brass inlay	**5**	**Ea**	**$ 1,000**	**$ 5,000.00**
Decorative Concrete or Pavers - Compass Rose	**1**	**Lump Sum**	**$ 7,500**	**$ 7,500.00**
Tree Wells - w/ Silva Cells	**12**	**Ea.**	**$ 5,000**	**$ 60,000.00**
Landscape Sod Areas	**625**	**m²**	**$ 12**	**$ 7,500.00**
Landscape Topsoil	**94**	**Cu.M.**	**$ 35**	**$ 3,281.25**
Plaza Planting Beds	**115**	**m²**	**$ 10**	**$ 1,150.00**
Plaza Topsoil	**58**	**Cu.M.**	**$ 35**	**$ 2,012.50**
Planting Grasses & Perennials	**1**	**Lump Sum**	**$ 5,000**	**$ 5,000.00**

PATIO AREA				
Patio Retaining walls (low profile grade transition)	**45**	**Lm**	**$ 600**	**$ 27,000.00**
Entry Stairs and Exit Stairs "Concrete" w/footing	**6**	**Steps**	**$ 435**	**$ 2,610.00**
Western Retaining Wall/Planter	**34**	**Lm**	**$ 800**	**$ 27,200.00**
Western Retaining Wall Planter Drainage	**1**	**Ea**	**$ 1,000**	**$ 1,000.00**
Western Planter at Building wall (Square)	**1**	**Lump Sum**	**$ 600**	**$ 600.00**
Patio Railings	**159**	**Lm**	**$ 295**	**$ 46,905.00**
Patio Railings - Glass	**241**	**m²**	**$ 86**	**$ 20,726.00**
Patio Screen - Drink Rails	**1**	**Lump Sum**	**$ 5,000**	**$ 5,000.00**
Patio Screen - Winter Heating/Enclosure	**1**	**Lump Sum**	**$ 75,000**	**$ 75,000.00**
Building Renovations & Threshold Repair	**1**	**Lump Sum**	**$ 10,000**	**$ 10,000.00**
Architectural Retail Banding Restoration	**1**	**Lump Sum**	**$ 10,000**	**$ 10,000.00**
Painted Brick Art/ Building Restoration Project	**1**	**Lump Sum**	**$ 10,000**	**$ 10,000.00**
Canopy Fabric	**1**	**Lump Sum**	**$ 50,000**	**$ 50,000.00**
MARKET SQUARE ENTRY				
Planter Walls	**85**	**Lm**	**$ 1,100**	**$ 93,390.00**
Handrails/Ramps and HC Requirements	**18**	**Lm**	**$ 300**	**$ 5,400.00**
Stairs	**4**	**sets**	**$ 750**	**$ 3,000.00**
Market Square - Aluminum Entry Signage	**1**	**Lump Sum**	**$ 20,000**	**$ 20,000.00**
Market Square - Sculpture Planter Wall	**15**	**Lm**	**$ 800**	**$ 12,000.00**
Market Square - Sculpture Foundation	**1**	**Each**	**$ 2,500**	**$ 2,500.00**
WATER STREET ENTRY				
Planter Walls w/ Footing	**35**	**Lm**	**$ 1,100**	**$ 38,500.00**
Planter Walls w/o Footing	**20**	**Lm**	**$ 600**	**$ 12,000.00**
Handrails	**10**	**Lm**	**$ 300**	**$ 3,000.00**
Stairs	**11**	**Steps**	**$ 200**	**$ 2,200.00**
Planter - Drainage	**1**	**Lump Sum**	**$ 500**	**$ 500.00**
CONCERT FLOOR				
Landscape Knolls Edger	**80**	**Lm**	**$ 70**	**$ 5,600.00**
Landscape Knolls Textile/Grid/Drainage	**4**	**Ea**	**$ 1,500**	**$ 6,000.00**
WHALE TAIL				
Flush Curbing (Coloured)	**36**	**Lm**	**$ 100**	**$ 3,600.00**
Synthetic Rubberized Surface	**85**	**m²**	**$ 240**	**$ 20,400.00**
BOARDWALK				
Wooden Platform - Supported on Tunnel	**227**	**m²**	**$ 225**	**$ 51,075.00**
Cantelevered Boardwalk Support	**1**	**Lump Sum**	**$ 10,000**	**$ 10,000.00**
Wooden Stairs	**8**	**Ea**	**$ 2,500**	**$ 20,000.00**
Handrail	**75**	**Lm**	**$ 500**	**$ 37,500.00**
THE SLIP				
Floating Patios - Large	**2**	**ea**	**$ 30,000**	**$ 60,000.00**
Floating Patios - Small	**2**	**ea**	**$ 25,000**	**$ 50,000.00**
Dock Repairs and Modifications	**1**	**Lump Sum**	**$ 5,000**	**$ 5,000.00**
Beach Sand	**170**	**m³**	**$ 40**	**$ 6,800.00**

Tidal/Fundy Steps				
Precast Landings Sections	**8**	**ea**	**$ 6,000**	**$ 48,000.00**
Precast Stairs - Concrete Large	**4**	**ea**	**$ 4,000**	**$ 16,000.00**
Precast Stairs - Concrete Small	**3**	**ea**	**$ 3,000**	**$ 9,000.00**
Limestone Tops Stairs	**29**	**ea**	**$ 750**	**$ 21,750.00**
Limestone Tops Landings	**30**	**m²**	**$ 1,500**	**$ 45,000.00**
Retain & Stockpile existing Rip Rap	**400**	**m³**	**$ 15**	**$ 6,000.00**
Fill Material/Beach Rip Rap	**1100**	**m³**	**$ 25**	**$ 27,500.00**
SPLASH PAD				
Fog Machine	**1**	**Lump Sum**	**$ 10,000**	**$ 10,000.00**
Coloured Concrete Deck	**365**	**m²**	**$ 120**	**$ 43,800.00**
Synthetic Turf "Grassy Knolls"	**20**	**m²**	**$ 225**	**$ 4,500.00**
Steps	**1**	**Lump Sum**	**$ 7,500**	**$ 7,500.00**
Ramps	**1**	**Lump Sum**	**$ 5,000**	**$ 5,000.00**
FUNDY FLOOR FEATURE (THE WEDGE)				
Frost Wall	**76**	**Lm**	**$ 600**	**$ 45,600.00**
Granite Cladding	**76**	**Lm**	**$ 800**	**$ 60,800.00**
Wedge - Poly Resin	**1**	**Lump**	**$ 75,000**	**$ 75,000.00**
STAGE				
Rear Handrail	**15**	**Lm**	**$ 200**	**$ 3,000.00**
Stairs (6 Steps) Concrete	**1**	**Lump Sum**	**$ 4,500**	**$ 4,500.00**
Ramp	**30**	**m²**	**$ 140**	**$ 4,200.00**
TUNNEL				
Interior Finishing - Flooring	**155**	**m²**	**$ 53**	**$ 8,215.00**
Interior Finishing - Walls	**300**	**m²**	**$ 53**	**$ 15,900.00**
Hand Rail	**35**	**Lm**	**$ 250**	**$ 8,750.00**
Steps at Windows	**1**	**Lump Sum**	**$ 2,000**	**$ 2,000.00**
SITE FURNISHINGS				
Patio- Hostess Stations	**5**	**Ea**	**$ 3,000**	**$ 15,000.00**
Patio - Server Stations	**5**	**Ea**	**$ 1,500**	**$ 7,500.00**
Patio - Patio/Vendor Signage	**5**	**Ea**	**$ 5,000**	**$ 25,000.00**
Patio - Ale House Custom Furniture & Benches	**1**	**Lump Sum**	**$ 25,000**	**$ 25,000.00**
Patio - Customer Chairs/Tables/Umbrellas	**1**	**Lump Sum**	**$ 100,000**	**$ 100,000.00**
Patio - Planters	**1**	**Lump Sum**	**$ 25,000**	**$ 25,000.00**
Benches	**18**	**Ea**	**$ 2,500**	**$ 45,000.00**
Boardwalk - Games Tables	**2**	**Ea**	**$ 4,000**	**$ 8,000.00**
Stage - Collapsible Chairs (150 Chairs)	**1**	**Lump Sum**	**$ 7,500**	**$ 7,500.00**
Stage - Storage Doors Lockable	**1**	**Lump Sum**	**$ 2,500**	**$ 2,500.00**
Stage - Projector	**1**	**Ea**	**$ 6,000**	**$ 6,000.00**
Flagpole	**1**	**Ea**	**$ 17,500**	**$ 17,500.00**
Plaza - Removable Bollards	**17**	**Ea**	**$ 3,500**	**$ 59,500.00**
Plaza - Trash Cans	**5**	**Ea**	**$ 3,000**	**$ 15,000.00**
Plaza - Smoke Trash	**3**	**Ea**	**$ 1,500**	**$ 4,500.00**
Plaza - Bike Racks	**9**	**Ea**	**$ 1,500**	**$ 13,500.00**
Fundy Floor/Wedge - Large Chairs in Lawn	**4**	**Ea**	**$ 3,500**	**$ 14,000.00**

SCULPUTRES AND FEATURES				
Concert Floor - Relocated Moose	1	Lump Sum	$ 10,000	$ 10,000.00
Concert Floor - Relocate Medallion	1	Lump Sum	$ 1,500	$ 1,500.00
Fundy Floor - Relocate Loyalist Rock	1	Lump Sum	$ 5,000	$ 5,000.00
Whale Tail - Supply & Install	1	Lump Sum	$ 75,000	$ 75,000.00
Stage - Granite Rocks & Bronze Images	1	Lump Sum	$ 50,000	$ 50,000.00
Stage - Decorative Masts (Patio + Banners)	2	Ea	$ 27,500	$ 55,000.00
The Slip - Sea Dog Sculpture	1	Lump Sum	$ 30,000	$ 30,000.00
The Slip - Balancing Rock Sculpture	1	Lump Sum	$ 20,000	$ 20,000.00
Boardwalk - Tidal Clock	1	Lump Sum	$ 200,000	$ 200,000.00
Trade Sculpture - Market Stalls	1	Lump Sum	$ 250,000	$ 250,000.00
Decorative Man Hole Covers	2	Ea	$ 3,000	$ 6,000.00
Stone Hammer Sculpture	1	Lump Sum	$ 150,000	$ 150,000.00
Granite Keel's - Entry - Large	4	Ea	$ 75,000	$ 300,000.00
Granite Keel's - Entry - Small	1	Ea	$ 30,000	$ 30,000.00
Seating Blocks Foundation - Lineal Measurement	54	Lm	$ 800	$ 43,200.00
Seating Blocks - Concert Space - Small	11	Ea	$ 850	$ 9,350.00
Seating Blocks - Concert Space - Large	14	Ea	$ 1,250	$ 17,500.00
Seating Blocks - Splashpad - Large	2	Ea	$ 1,250	$ 2,500.00
Seating Blocks - Splashpad - Small	5	Ea	$ 850	$ 4,250.00
Seating Blocks Foundation - Concert Space	87	Lm	$ 800	$ 69,600.00
Seating Blocks - Inscribing	1	Lump Sum	$ 10,000	$ 10,000.00
Skateboard Deterrents	1	Lump Sum	$ 10,000	$ 10,000.00
Granite Plaques - Fundy Isles	7	Ea	$ 1,500	$ 10,500.00
Vendor Carts	21	Ea	$ 5,000	$ 105,000.00
Vendor Carts (Market Cart) Support System	21	Ea	$ 500	$ 10,500.00
Event Tent Support System	12	Ea	$ 500	$ 6,000.00
Brass Bollard Insets	5	Ea	$ 2,000	$ 10,000.00
			Total Construction	$ 4,228,589.75
ELECTRICAL COMPONENTS				
Main electrical feed to site/underground duct	1	Lump Sum	$ 7,500	$ 7,500.00
Saint John Energy Service Entrance	1	Lump Sum	$ 40,000	$ 40,000.00
Distribution Equipment	1	Lump Sum	$ 50,000	$ 50,000.00
Replacement of Street Lights & Traffic Control	4	Ea	$ 5,000	$ 20,000.00
WIFI for customer	10	Ea	$ 1,000	$ 10,000.00
Whole Site Smart Control System	1	Lump Sum	$ 15,000	$ 15,000.00
Cathodic Protection	50	Ea	$ 600	$ 30,000.00
Shuffle Lighting System	30	Ea	$ 9,000	$ 270,000.00
Concert Area - In Ground Lighting	40	Ea	$ 3,000	$ 120,000.00
Concert Area - General - GFI Posts	6	Ea	$ 750	$ 4,500.00
Concert Area - Sound Booth Station - Conduit & Access	1	Lump Sum	$ 3,000	$ 3,000.00

Stage - Tape Lighting	1	Lump Sum	$ 7,500	$ 7,500.00
Stage - Speakers Sound/Pa System/Sound Booth	1	Lump Sum	$ 50,000	$ 50,000.00
Stage - Performance Lighting	1	Lump Sum	$ 20,000	$ 20,000.00
Stage - Performance Lighting Controller	1	Lump Sum	$ 15,000	$ 15,000.00
Stage - Watermark Controls & Lighting	1	Lump Sum	$ 6,500	$ 6,500.00
Stage - Performer Power	1	Lump Sum	$ 7,000	$ 7,000.00
Splash Pad- Lighting & GFI	1	Lump Sum	$ 10,000	$ 10,000.00
Splash Pad- Wall/ Stair Lighting	1	Lump Sum	$ 10,000	$ 10,000.00
Tunnel - Lighting/GFI/General Requirements	1	Lump Sum	$ 35,000	$ 35,000.00
Tunnel - Fire Alarm System	1	Lump Sum	$ 10,000	$ 10,000.00
Sheet Pile Waterfall Feature - Electrical Requirements	2	Ea	$ 8,500	$ 17,000.00
Sheet Pile Waterfall backlighting	25	Lm	$ 1,000	$ 25,000.00
Whale Tail - Mechanical Water Pumps Electrical Feed	1	Lump Sum	$ 2,000	$ 2,000.00
Whale Tail - Up lighting	3	Ea	$ 1,750	$ 5,250.00
Patio Area - Canopy Heating	12	Ea	$ 2,100	$ 25,200.00
Patio Area - Canopy Lighting	1	Lump Sum	$ 45,000	$ 45,000.00
Patio Area - Canopy Mechanical Power Req.	8	Ea	$ 2,500	$ 20,000.00
Patio Area - Server Stations	5	Ea	$ 1,500	$ 7,500.00
Patio Area - Speakers	16	Ea	$ 1,250	$ 20,000.00
Patio Area - Retractable Building Mounting Canopy	5	Ea	$ 1,000	$ 5,000.00
Patio Area - Architectural Building Mounted Lighting	5	Ea	$ 1,500	$ 7,500.00
Patio Area - Architectural Projection Lighting	1	Ea	$ 1,000,000	$ 1,000,000.00
Water Street Entry - Sculpture Lighting (top)	1	Ea	$ 2,500	$ 2,500.00
Water Street Entry - Stair Lighting	1	Lump Sum	$ 10,500	$ 10,500.00
Market Square Entrance - Signage Lighting	1	Ea	$ 1,850	$ 1,850.00
Market Square Entrance - Stair Down Lighting	1	Ea	$ 2,250	$ 2,250.00
Market Square Entrance- Wall Sconces	24	Ea	$ 1,000	$ 24,000.00
Market Square Entrance - Tree/ planting up lighting	9	Ea	$ 1,250	$ 11,250.00
General Site - GFI's	8	Ea	$ 800	$ 6,400.00
General Site - Planting Up lighting	26	Ea	$ 1,300	$ 33,800.00
General Site - Boardwalk Up lighting	16	Ea	$ 1,300	$ 20,800.00
General Site - String lights for trees	8	Ea	$ 500	$ 4,000.00
Security/Webcam/Programming	1	Lump Sum	$ 15,000	$ 15,000.00
Sculpture - Wall	1	Ea	$ 2,000	$ 2,000.00
Sculpture - Stage Uprights	2	Ea	$ 2,000	$ 4,000.00
Sculpture - Cooper Time Lighting	1	Ea	$ 2,000	$ 2,000.00
Sculpture - Moose Lighting	1	Ea	$ 2,000	$ 2,000.00
Sculpture - Medallion Lighting	1	Ea	$ 2,000	$ 2,000.00
Sculpture - Loyalist Rock	1	Ea	$ 2,000	$ 2,000.00
Sculpture - Fundy Floor - Light tape	1	Ea	$ 2,000	$ 2,000.00
Sculpture - Market Square Sculpture	1	Ea	$ 2,000	$ 2,000.00
Sculpture - Stone Hammer	1	Ea	$ 2,000	$ 2,000.00
			Total Electrical Components	$ 2,072,800.00

MECHACNIAL COMPONENTS				
Main Water Feed to Site	**1**	**ea**	**$ 14,000**	**$ 14,000.00**
Main Manifold	**1**	**ea**	**$ 15,500**	**$ 15,500.00**
Removal, Replacement & Addition of Fire Hydrants	**2**	**ea**	**$ 18,000**	**$ 36,000.00**
Vortex - Water Storage Tank	**1**	**ea**	**$ 23,470**	**$ 23,470.00**
Vortex - Watermark Manifold/Pumps	**1**	**ea**	**$ 69,505**	**$ 69,505.00**
Stage - Vortex - Watermark Units	**5**	**ea**	**$ 20,000**	**$ 100,000.00**
Stage - Vortex - Watermark Plumbing & Housing	**1**	**ea**	**$ 10,000**	**$ 10,000.00**
Stage - Dancing Speaker System	**2**	**ea**	**$ 20,000**	**$ 40,000.00**
Stage - Access Waterlines	**1**	**ea**	**$ 9,000**	**$ 9,000.00**
Stage - Roll Down Movie Screen	**1**	**ea**	**$ 10,000**	**$ 10,000.00**
Stage - Washrooms Plumbing	**1**	**ea**	**$ 13,300**	**$ 13,300.00**
Stage - Washrooms Ventilation	**1**	**ea**	**$ 3,600**	**$ 3,600.00**
Stage - Self Cleaning Washrooms	**2**	**ea**	**$ 125,000**	**$ 250,000.00**
Exterior Drinking Fountain at Washroom	**1**	**ea**	**$ 3,000**	**$ 3,000.00**
Splash Pad - Water Features	**1**	**ea**	**$ 34,191**	**$ 34,191.00**
Misc Vortex/Water Feature Costs	**1**	**ea**	**$ 10,000**	**$ 10,000.00**
Hose Bibs	**3**	**ea**	**$ 1,500**	**$ 4,500.00**
Whale Tail - Water Lines	**1**	**ea**	**$ 1,500**	**$ 1,500.00**
Whale Tail - Recirculating System	**1**	**ea**	**$ 6,500**	**$ 6,500.00**
Whale Tail - Whale Control/Mechanical System	**1**	**ea**	**$ 1,500**	**$ 6,500.00**
Tunnel - HVAC System	**1**	**ea**	**$ 63,500**	**$ 63,500.00**
Tunnel - Oil Water Separator	**1**	**ea**	**$ 8,000**	**$ 8,000.00**
Tunnel - Fire Suppression	**1**	**ea**	**$ 20,000**	**$ 20,000.00**
Sheet Pile Waterfall - Pumps	**1**	**ea**	**$ 57,000**	**$ 57,000.00**
Sheet Pile Waterfall - Water Lines	**1**	**ea**	**$ 30,000**	**$ 30,000.00**
Patio Canopy - Retractable Arm Mechanics	**1**	**ea**	**$ 40,000**	**$ 40,000.00**
			Total Mechanical Components	**$ 879,066.00**
CIVIL COMPONENTS				
Catch Basins	**11**	**ea**	**$ 4,500**	**$ 49,500.00**
Man Holes	**2**	**ea**	**$ 3,812**	**$ 7,624.00**
Drain (whale tail)	**1**	**ea**	**$ 1,983**	**$ 1,983.00**
Drains (fundy floor wedge)	**2**	**ea**	**$ 1,983**	**$ 3,966.00**
Storm Line - 1050mm	**27**	**m**	**$ 1,563**	**$ 42,187.50**
Storm Line - 600mm	**23**	**m**	**$ 395**	**$ 8,876.25**
Storm Line - 300mm	**124**	**m**	**$ 280**	**$ 34,580.00**
Sanitary Sewer Lines	**43**	**m**	**$ 286**	**$ 12,298.00**
Drain Tile	**100**	**m**	**$ 123**	**$ 12,300.00**
Backflow Preventer on Main Discharge, Tidelfex Valve	**1**	**ea**	**$ 7,500**	**$ 7,500.00**
Water Service	**57**	**m**	**$ 258**	**$ 14,577.00**
Modify Rims/Covers Etc.	**18**	**ea**	**$ 1,043**	**$ 18,774.00**
Connection to Existing Infrastructure	**4**	**ea**	**$ 1,339**	**$ 5,356.00**
Core into Existing Structure	**3**	**ea**	**$ 721**	**$ 2,163.00**
			Total Civil Components	**$ 221,684.75**

STRUCTURAL COMPONENTS				
Patio - Building Mounted Canopy	**1**	**Lump Sum**	**$ 45,000**	**$ 45,000.00**
Patio - Canopy Construction	**8**	**Ea**	**$ 27,000**	**$ 216,000.00**
Patio - Canopy Foundation	**8**	**Ea**	**$ 3,000**	**$ 24,000.00**
Patio - Wall Mounted Vine Trellis	**1**	**Lump Sum**	**$ 20,000**	**$ 20,000.00**
Whale Tail- footing	**1**	**Lump Sum**	**$ 5,000**	**$ 5,000.00**
Stage - Foundation	**1**	**Lump Sum**	**$ 40,000**	**$ 40,000.00**
Stage - Columns/Footings	**1**	**Lump Sum**	**$ 85,000**	**$ 85,000.00**
Tunnel - Pipe Piles and Tieback Anchors	**1**	**Lump Sum**	**$ 150,000**	**$ 150,000.00**
Tunnel - Sheet Pile Wall	**1**	**Lump Sum**	**$ 360,000**	**$ 360,000.00**
Tunnel - Tunnel Concrete	**1**	**Lump Sum**	**$ 240,000**	**$ 240,000.00**
Tunnel - Mechanical Room Concrete	**1**	**Lump Sum**	**$ 102,000**	**$ 102,000.00**
Tunnel - Water Storage Mounting and Securement.	**1**	**Lump Sum**	**$ 20,000**	**$ 20,000.00**
Tunnel - Splashpad Slab, Stairs and Support	**1**	**Lump Sum**	**$ 50,000**	**$ 50,000.00**
Tunnel - Temporary Emergency Exit	**1**	**Lump Sum**	**$ 10,000**	**$ 10,000.00**
The Slip - Floating Patio Support	**1**	**Lump Sum**	**$ 10,000**	**$ 10,000.00**
Concert Area - Upright Masts with Banner Arms	**2**	**Ea**	**$ 32,000**	**$ 64,000.00**
Concret Area - Mast Foundation	**1**	**Ea**	**$ 5,000**	**$ 5,000.00**
Market Square Entrance - Sign Foundations	**1**	**Lump Sum**	**$ 5,000**	**$ 5,000.00**
			Total Structural Components	**$ 1,451,000.00**
Soft Costs				
Environmental Consulting Costs	**1**	**Lump Sum**	**$ 19,340**	**$ 19,340.00**
DFO Review				
Navigations Protection Act				
Ocean Dredging & Disposal				
CEAA Consultation				
Additional Borehole	**1**	**Lump Sum**	**$ 10,000**	**$ 10,000.00**
Special Event Planning Input	**1**	**Lump Sum**	**$ 10,000**	**$ 10,000.00**
Environmental Contamination Clean Up	**1**	**Lump Sum**	**$ 22,690**	**$ 22,690.00**
Finish Phase II ESA Report				
Develop Remedial Action Plan				
Site Progress Inspection Fee's				
Testing and Inspection (Geotechnical)	**1**	**Lump Sum**	**$ 39,975**	**$ 39,975.00**
Compaction Testing				
Material Testing				
Concrete Strength Testing				
Concept Design for Architechtural Projection	**1**	**Lump Sum**	**$ 30,000**	**$ 30,000.00**
Lighting Programming	**1**	**Lump Sum**	**$ 20,000**	**$ 20,000.00**
Storm Water Management Plan	**1**	**Lump Sum**	**$ 10,000**	**$ 10,000.00**
Code Review Consultant	**1**	**Lump Sum**	**$ 2,500**	**$ 2,500.00**
Erosion and Sedimentation Control Plan	**1**	**Lump Sum**	**$ 10,000**	**$ 10,000.00**
As-Built File Production/Surveys	**1**	**Lump Sum**	**$ 25,000**	**$ 25,000.00**
			Total Soft Costs	**$ 199,505.00**

			Subtotal	$ 9,261,696.75
			Contractor Admin (15%)	$ 1,389,254.51
			Contingency (10%)	$ 1,065,095.13
			Subtotal	$ 11,716,046.39
			Tender Documents & Full Time Supervision (12%)	$ 1,405,925.57
			Total	**$ 13,121,971.96**

OPTIONAL PRICE ITEM				
Crows Nest - Structural Foundation	**1**	**Lump Sum**	**$ 10,000**	**$ 10,000.00**
Crows Nest - Electrical Conduit Feed	**1**	**Lump Sum**	**$ 2,500**	**$ 2,500.00**
Crows Nest - Control System	**1**	**Lump Sum**	**$ 5,000**	**$ 5,000.00**
Crows Nest - Lighting	**1**	**Lump Sum**	**$ 5,000**	**$ 5,000.00**
Crows Nest - Mechanical Equipment and Structure	**1**	**Lump Sum**	**$ 125,000**	**$ 125,000.00**
			Subtotal	$ 147,500.00
			Contractor Admin (15%)	$ 22,125.00
			Contingency (25%)	$ 42,406.25
			Subtotal	$ 212,031.25
			Tender Documents & Full Time Supervision (12%)	$ 25,443.75
			Total	**$ 237,475.00**