Appendix A
DIA Scoping Document
(Parks Canada - July 2016)

Scoping Document for the Detailed Impact Analysis of the City of Kingston Third Crossing of the Cataraqui River Project

Prepared by Parks Canada

Updated: July 28, 2016

1. INTRODUCTION

1.1 PROJECT SUMMARY

The City of Kingston is proposing a project consisting of the following elements:

- Construction of a new 2-lane bridge over the Cataraqui River linking John Counter Boulevard and Gore Road in the City of Kingston (the bridge corridor);.
- Roadway improvements to John Counter Boulevard and Gore Road including potential widening and reconfiguration;
- Dredging to accommodate construction barges;
- Installation of infrastructure and utility works, including a potential Utilities Kingston watermain placed in the dredged channel as well as stormwater management provisions for the bridge deck and associated approaches;
- Temporary facilities and laydown-area(s);
- Associated site restoration and rehabilitation works; and

Operation:

- Operation and maintenance of the bridge.

1.2 FEDERAL REGULATORY REQUIREMENTS

Parks Canada is responsible for the administration of the Rideau Canal National Historic Site. The Rideau Canal is also a Canadian Heritage River and was inscribed on the UNESCO World Heritage List in 2007. Figure 1 shows the boundary of the UNESCO World Heritage Site as it applies to the southern end of the Rideau Canal; the southern end of Fort Henry; Fort Frederick; and the Martello Towers (i.e. Shoal, Murney and Cathcart). The project will require authorization under section 14(2) of the *Historic Canals Regulations* (*Department of Transport Act)* and may take action in relation to paragraph 4(2)(a) of the *Federal Real Property and Federal Immovables Act.*

Transport Canada is responsible for the administration of the *Navigation Protection Act (NPA,* which replaced the *Navigable Waters Protection Act [NWPA]* referred to in the original scoping document*).* The NPA prohibits the construction or placement of any "works" in navigable waters without first obtaining approval. Parks Canada will include Transport Canada as part of the circulation protocol for the EIA in order to determine whether an NPA authorization will be required.

DFO is responsible for the administration of the fisheries protection provisions of the *Fisheries Act,* including s.35, which prohibits serious harm to fish. Impacts to fish and fish habitat, including impacts on aquatic species at risk (fish and mussels) will be assessed in relation to the proposed Project. The proposed Project may require authorization under section 35(2) of the *Fisheries Act.*

1.3 CANADIAN ENVIRONMENTAL ASSESSMENT ACT, 2012 (CEAA 2012) AND THE PARKS CANADA DIRECTIVE ON IMPACT ASSESSMENT

Parks Canada's legal accountability under section 67 of *CEAA 2012* (the Act) is to ensure that no project on the lands and waters it manages is authorized **unless a determination is made that the project does not have the potential to result in significant adverse environmental effects.** The Act provides discretion regarding how to conduct an analysis to determine whether or not a project is likely to cause significant adverse environmental effects.

The *Parks Canada Directive on Impact Assessment (2015)* outlines the legislative and policy requirements and accountabilities for the assessment of impacts of proposed projects within Parks Canada protected heritage places. In keeping with its mandated priorities, Parks Canada's EIA process examines how a project may lead to adverse effects on:

- Natural resources – such as species at risk, air, ground and surface water, soils, habitat features, as well as plants and animals found in the vicinity of a project or otherwise potentially affected by it, and
- Cultural resources – including potential adverse effects to heritage value and character defining elements of known cultural resources, and risks to areas with high potential to contain cultural resources where no inventory has yet been completed.

In addition the Parks Canada EIA process requires consideration of potential indirect effects of a proposed project; specifically, how the effects of a proposed project on natural resources may in turn cause:

- adverse effects to characteristics of the environment important to key visitor experience (how the proposal is anticipated to affect activities and/or visitors' enjoyment and connection to place, in relation to defined objectives for the protected heritage place);
- adverse effects to health and socio-economic conditions of Indigenous and non-Indigenous peoples, and
- adverse effects to Indigenous people's current use of lands and resources for traditional purposes.

Given the scope of work proposed for the Kingston 3rd Crossing Project and the sensitivity of the project area, the Director of Waterways has determined that the Detailed Impact Analysis (DIA) pathway will be used for analysis. DIA is the most comprehensive level of assessment, intended for complex projects that require applied analysis of project interactions with valued components that may affect a particularly sensitive environmental setting or threaten one or more sensitive valued components.

The purpose of this Scoping Document is to provide guidance to the proponent on the issues that must be addressed in the DIA and associated report. Information contained in this document does not limit Parks Canada from requesting additional information or details as required.

1.4 DIA ROLES AND RESPONSIBILITIES

Parks Canada

As the federal land manager in charge of the bed of the Rideau Canal National Historic Site, Parks Canada is responsible for making a determination on the likelihood of the proposed project to cause significant adverse environmental effects as per section 67 of CEAA 2012.

Parks Canada will provide guidance to the proponent, both written and verbally, to support the proponent in preparing a draft report that will cover all of the key considerations highlighted in this scoping document. This includes participation in meetings and teleconferences, written correspondence, and comments and recommendations on drafts submitted for review.

Expert Federal Authorities (FAs)

Federal authorities in possession of specialist or expert information that may assist with input or advice on the DIA include:

- Fisheries and Oceans Canada (DFO)
- Environment and Climate Change Canada (ECCC)
- Transport Canada (TC)

Proponent (City of Kingston)

The proponent is responsible for preparing a DIA report and providing supporting documentation that will be submitted to Parks Canada for a determination on the likelihood of the project to cause significant adverse environmental impacts.

There may be permits or authorizations required by other departments or agencies to complete the project. The proponent is responsible for determining these requirements and obtaining any necessary

authorizations.

The proponent is encouraged to regularly seek feedback or direction and collaborate with Parks Canada during the development of the DIA so that any concerns, issues, or questions can be addressed early in the process.

IMPORTANT: When a final draft of the DIA is submitted for Determination by the Director of Waterways, a determination will be made and the results will be shared with the proponent. It is important to note that the DIA is only an evaluation of potential environmental effects. A DIA determination is one of the considerations that will be considered in the decision about whether or not to authorize a project to proceed. A DIA determination does not constitute a Project Decision in and of itself.

1.5 FEDERAL/PROVINCIAL COORDINATION

In June of 2013, the provincial Environmental Study Report (ESR) was approved by the Province to satisfy the Ontario Municipal Class EA requirements. This process had started as a coordinated federal/provincial environmental assessment, but substantial legislative changes to the Canadian Environmental Assessment Act in July of 2012 resulted in the Proponent moving forward with the provincial process during the time in which federal procedures were being sorted out to fit the new legislation.

The DIA will be focused on areas of federal jurisdiction and will cross-reference the approved provincial ESR wherever possible in order to minimize duplication. When cross-referencing material in the provincial ESR, the DIA should be as specific as possible.

2. SCOPE OF ASSESSMENT

2.1 SCOPE OF PROJECT

The scope of project for the City of Kingston Third Crossing of the Cataraqui River has been identified as:

> *All physical works and activities associated with the construction and operation of the project as proposed by the proponent that may reasonably be predicted to have environmental effects on those areas of federal jurisdiction shown on Figure 2, based on the following project components:*

Phase 1: Preparation

- site preparation: excavation of soil and bedrock, vegetation clearing;
- temporary and permanent access roads;
- temporary facilities and laydown area(s);

Phase 2: Construction

- new bridge crossing and associated approaches;
- roadway improvements to John Counter Boulevard and Gore Road associated with the new bridge crossing, including potential widening and reconfiguration;
- dredging to accommodate construction barges;
- associated infrastructure and utility works including: a potential Utilities Kingston watermain placed in the dredged channel and stormwater management provisions for the bridge deck and associated approaches;
- disposal of waste materials (including excavated materials, solid non-hazardous construction waste and waste debris from clearing activities);

Phase 3: Site Restoration and Rehabilitation

- site restoration;
- use and storage of construction vehicles and equipment;
- transportation and storage of construction materials;
- any landscaping or aquatic habitat management activities;

Phase 4: Operation

- cleaning, de-icing, and other maintenance activities;
- operations and repairs during operation;
- emergency procedures;
- any compensatory measures required to address residual fish habitat impacts; and
- any other works or undertakings directly associated with the bridge project, including those that are temporary.

Decommissioning was not included as part of the scope of the project as the proponent has not proposed any decommissioning works at this time. It is anticipated that the structure will have a life span of more than 100 years and, as such, details regarding decommissioning works are not available at this time. If and when decommissioning is required, such works will be subject to impact assessment as per regulations current to that time.

The DIA must provide a complete description of all proposed project components, and the associated physical works and activities, with an approximate schedule (timing, frequency, duration). The report must also clearly state who is responsible for the ownership, construction and operation of each work or activity. The level of detail should be appropriate to the scale and complexity of the project and to the sensitivity of its location. Reference maps and/or site plans should be attached to indicate the project location and/or its key features. For any of the requirements outlined above, it is possible to make reference to the provincial ESR if some or all of the details are already provided.

Parks Canada understands that the proposed project description, as described in Section 1.1 above, will be refined as the City of Kingston progresses through the planning process. Updated project description information must be provided as it becomes available.

2.2 SCOPE OF FACTORS

2.2.1 Environmental Components

Potential interactions between project components and environmental components must be identified and considered as part of the analysis. Based on a review of information available to date on the project, the project's environmental setting and potential interactions, Parks Canada has identified the following Valued Components, and secondary components to be considered in the analysis of the bridge corridor. Valued components or "VCs" refer to specifically identified components of the environment that have a higher probability of being affected by a project and are considered to be particularly important to fulfilling Parks Canada's mandate. These should comprise the focus of the analysis. The secondary components are those that may be affected but which are predicted to be impacted to a lesser degree or mitigated easily using well understood and common mitigation practices.

Valued Components:

- The Greater Cataraqui Marsh Provincially Significant Wetland – A Great Lakes coastal wetland composed of multiple wetland communities, both submerged and emergent
- Fish and Fish habitat
- Migratory Birds and their habitat
- Species at Risk
- Surface water quality and quantity
- Hydrologic processes

- Aquatic habitat quality (biodiversity, wetland communities, health of ecosystems, invasive species)
- Aquatic wildlife and vegetation
- Surrounding cultural landscape, including the predominantly natural landscape character to the north and the urban environment to the south, east and west and the significance of the Greater Cataraqui Marsh as the only part of the Rideau Canal that remains in its natural state following construction of the navigation route
- Submerged cultural resources
- The Rideau Canal's commemorative integrity (CI) as a national historic site
- The Rideau Canal`s outstanding universal value (OUV) as a UNESCO world heritage site
- Visitor experience and recreational opportunities
- Aesthetic values
- Navigation

Secondary Components:

- Ground water quality and quantity
- Terrain, geology, and soils
- Terrestrial wildlife
- Terrestrial vegetation
- Air quality and climate change

For each valued component that has the potential to interact with the project, a description of the existing conditions must be provided. Consideration should be given to details that are relevant for each environmental component. The level of detail should be appropriate to the scale and complexity of the project and to the sensitivity of its location.

Please refer to the Bridge Design Guidelines for the Proposed Third Crossing of the Lower Cataraqui Section of the Rideau Canal (Appendix 1) for additional information on the desired outcomes for various valued components.

2.2.2 Temporal and Spatial Boundaries

The DIA should describe the geographic scope and temporal scope for each valued component, focused on: the assessment of areas conducted in support of the ESR, as shown on Figure 3; and the assessment of the bridge corridor and associated surrounding offset areas in support of the current project phase, the parameters of which are shown on Figure 4. Note the offset areas are based on conservative estimates of the potential areas of influence for each assessment and professional best management practice based on other transportation projects. Additional assessment highlights are provided below:

- Geotechnical Assessment: Geotechnical conditions within the bridge corridor will be assessed, the area of which will be more specifically limited to: in-water boreholes, which will be advanced from a barge-mounted drill rig through the overburden and into the bedrock at 7 pier locations; and the advancement of 6 shouldow on-land boreholes within the rights-of-way of John Counter Boulevard and Gore Road. Archaeological monitoring of the in-water work will be provided. Groundwater springs will be documented and mitigation measures will be provided, as required.
- Cultural-Natural Heritage Assessment: Potential significant species habitats and other natural features will be identified within the bridge corridor and a 250 metre offset area, based on literature reviews and 3 field study efforts, focusing on general habitat, bird surveys and Ecological Land Classification. Cultural heritage sites and areas will also be identified and assessed, focusing on the Rideau Canal and the City-owned Gore Road Library. Mitigation measures will be provided.
- Bio-Acoustic Noise Assessment: Potential impacts of noise and vibration from bridge construction and operations on aquatic and terrestrial fauna will be identified within the bridge corridor and a 500 metre offset area, based on literature reviews and noise modelling. Mitigation measures will be provided.
- Transportation Noise Assessment: Potential impacts of noise from bridge operations at

representative points of reception will be assessed within the bridge corridor and a 500 metre offset area. This assessment will be completed in accordance with applicable guidelines. Mitigation measures will be provided.

- Geo-Environmental Assessment: A Phase I Environmental Site Assessment will be undertaken within the bridge corridor and a 100 metre offset area to better understand potential areas for subsurface impacts that might affect materials management protocols. In coordination with the geotechnical drilling: 5 to 10 soil samples from the John Counter Boulevard right-of-way will be analyzed; and 10 river sediment samples will be analyzed. The purpose of the testing will be to develop management options for soil and dredged material.

The geographic scope indicates the areas within which potential effects are reasonably anticipated. The temporal scope identifies the project phase and timeframe when potential effects are likely to occur. The geographic scale of potential effects can vary considerably due to the nature of the valued component being analyzed (i.e. – Effects on bedrock are most often the result of direct mechanical disturbance and often limited to the immediate project footprint. Effects on aquatic resources are dependent on a number of factors such as flow, volume, bathymetry, etc. The geographic scope of analysis for aquatic resources may be more linear in the case of a river, but more expansive in range.) For this reason, it is useful to define the geographic scope for each valued component.

Cumulative effects stressors should be considered when identifying the geographic scope as it may be worth expanding the geographic area based on the nature of any known or potential cumulative effects stressors that could apply to a valued component.

The following table describes both the temporal and geographic scope for the analysis:

	Temporal Scope			Geographic Scope
	Preparation Phase	**Construction Phase**	**Operation Phase**	
Valued Components				
Greater Cataraqui Marsh PSW (Submergent and Emergent Communities) Fish and Fish Habitat Migratory Birds and Habitat Species at Risk Surface Water Quality and Quantity Aquatic Habitat Quality Aquatic Wildlife and Vegetation Cultural Landscape Rideau Canal's Commemorative Integrity (National Historic Site) Rideau Canal's Outstanding Universal Value (UNESCO World Heritage Site)	1. Stage 1 / Stage 2 of the Class EA (see Figure 3) 2. Preliminary bridge design scope: a) John Counter Boulevard-Gore Road bridge corridor (plus a 250 metre buffer zone – see Figure 4.2)			
Visitor Experience and Recreational Opportunities Aesthetic Values Navigation	1. Stage 1 / Stage 2 of the Class EA (see Figure 3) 2. Preliminary bridge design scope: a) John Counter Boulevard-Gore Road bridge corridor (refined bridge, roadway and landscape concept)			
Hydrologic Processes Submerged Cultural Resources	1. Stage 1 / Stage 2 of the Class EA (see Figure 3) 2. Preliminary Bridge Design: a) John Counter Boulevard-Gore Road bridge corridor (geotechnical fieldwork zone – see Figure 4.1)			
Secondary Components				
Groundwater Quality and Quantity Terrain, Geology, and Soils	1. Stage 1 / Stage 2 of the Class EA (see Figure 3) 2. Preliminary bridge design scope: a) John Counter Boulevard-Gore Road bridge corridor (geotechnical and geo-environmental fieldwork zones – see Figures 4.1 and 4.4)			
Terrestrial Wildlife Terrestrial Vegetation	1. Stage 1 / Stage 2 of the Class EA (see Figure 3) 2. Preliminary bridge design scope: a) John Counter Boulevard-Gore Road bridge corridor (plus a 250 metre buffer zone – see Figure 4.2)			
Air Quality and Climate Change	1. Stage 2 of the Class EA (see Figure 3) 2. Preliminary bridge design scope: a) John Counter Boulevard-Gore Road bridge corridor (plus a 500 metre buffer zone – see Figure 4.3)			

2.2.3 Analysis of Environmental Effects

Briefly describe the methodology that will be/has been used to collect baseline information, predict potential adverse effects, prescribe appropriate mitigation measures, and analyze the significance of residual and cumulative environmental effects.

Provide a description of existing environment in sufficient detail to enable an understanding of how the valued components might be affected (beneficially or adversely) by the proposed development. The existing conditions should be described for the area affected by the development (the Provincial Class EA can be referenced where applicable).

Identify the predicted interactions between project phases (preparation/construction/operation) and the valued/secondary components included in the DIA scope.

Identify the potential environmental effects of these interactions during each project phase, including residual and cumulative effects and the effects of accidents and malfunctions. These effects will be quantified where feasible.

2.2.4 Accidents and Malfunctions

Include an analysis of the potential for accidents and malfunctions. Identify high risk areas, seasonal variations and any other factors that may affect the severity of impacts. Describe any proactive steps that will be taken to minimize the risk.

Some considerations include but are not limited to: leaks and spills, equipment failure, flow constrictions/blockages, vehicle collisions, etc., as well as the effect of accidents and malfunctions on the environment. Emphasis should be placed on accidents and malfunctions that are reasonably plausible. The effects of accidents and malfunctions on each valued component should be considered as well as the contribution to cumulative effects.

2.2.5 Effects of the Environment on the Project

Assess the environmental effects of geological, climatic and other natural phenomena on the project, including effects associated with:

- extreme drought, flooding, or rainfall, including that associated with climate change, and any associated geophysical effects (e.g. increased erosion potential, changes to bank stability, abnormally elevated/depressed groundwater levels, frost heave etc.); and,
- other extreme events (e.g. ice storms, river ice formation and jamming, forest fires, tornados or earthquakes, etc.).

The proponent must demonstrate that the project design is sufficiently robust to accommodate any expected changes in extreme flows, precipitation and temperature without potential failure. Emphasis should be on environmental conditions that are reasonably plausible, but should not be limited to events that occur on a regular basis.

2.2.6 Mitigation Measures

For each potential adverse environmental effect, including cumulative effects, technically and economically feasible mitigation measures must be identified. Mitigation measures should be firm tangible action items that the proponent will undertake and they should be defined in a clear and concise manner.

Identify any measurable net (residual) effects that will persist after the implementation of mitigation measures, and those effects must be carried forward to the cumulative environmental effects analysis.

Where mitigation cannot be fully described until the detailed design stage, the gaps in design details will be identified and the principles and criteria upon which such mitigation will be developed should be provided.

The DIA must clearly state who is responsible for implementing each mitigation measure proposed.

2.2.7 Cumulative Effects Assessment

Consider the net (residual) environmental effects associated with the project in combination with the environmental effects of other past, present or reasonably foreseeable future projects or activities, to determine the potential for cumulative environmental effects. "Reasonably foreseeable" activities are defined as projects that have already been proposed, approved, or that are advancing through the regulatory approvals process. Activities and projects associated with resource management plans should also be considered.

Cumulative effects are to be considered for those projects and activities that have residual effects that have the potential to overlap in time and space with the environmental effects of the proposed project (construction and operation phases). Cumulative environmental effects considered must be related to a direct environmental effect of the project, but the direct effect need not be significant on its own. In conducting the analysis, consideration should be given to the length of time over which the environmental effects of the project will occur, not just the period of time during which the project will be constructed.

When considering cumulative effects, consideration should also be given to other stressors affecting valued components. Great Lakes Coastal Wetlands in Southern Ontario, for example, have been subject to substantial degradation from industrial and commercial development along the shorelines of Lake Ontario. Evaluation of effects to the Greater Cataraqui Marsh Wetland should take into consideration its importance as a Great Lakes Coastal Wetland.

2.2.8 Residual Effects Analysis

While the final determination of significance rests with Parks Canada, the information and analysis provided in the DIA will be factored into the determination on the likelihood of the project to cause significant adverse environmental effects. Conclusions must be clearly supported by and traceable from the description of the existing environment, the description of project activities, the potential interactions (environmental effects) and the predicted effectiveness of the mitigation measures to be applied. The DIA should identify any knowledge deficiencies and address this by providing an indication of the prediction confidence.

The analysis and conclusions should retain focus on the scoped valued components and consider the magnitude, geographical extent, duration, frequency, reversibility, and ecological and socio-economic context of any residual effects.

2.2.9 Indigenous Consultation

Clearly describe Indigenous consultation that was completed in relation to the proposed project. Concerns raised, including any concerns relating to impacts to current and traditional activities being practiced by Indigenous peoples in the vicinity of the project, must be described.

Specifically, the DIA report should detail the following:

- the consultation activities undertaken, including objectives, methods of consultation (including how Indigenous groups were identified and how comments were addressed), and timing;
- the list of Indigenous groups and other interested parties/stakeholders that were consulted;
- a summary of comments received during consultation, including actions requested of the proponent;
- a list of actions taken by the proponent to address concerns;
- where applicable, reasoning for why action was not taken for an identified concern; and
- any commitments to future consultation.

2.2.10 Public Engagement

The proponent is responsible for leading the public engagement process, with input from Parks Canada. Responsibilities include, but are not limited to:

- Hosting a website with all of the required public consultation information;
- Managing public responses received through various public engagement tools such as emails, comment forms, letters, surveys, etc;
- Documenting how the feedback received will be considered and whether any changes will be incorporated into the final version of the DIA or into the project design;
- Providing Parks Canada with a summary report of the public engagement process; and
- Following up on any commitments made with respect to public engagement.

Scope of Public Engagement

Given that the project proposal and the Municipal Class EA have already been subject to numerous iterations of public engagement and consultation. It is proposed that the scope of public engagement for the DIA be restricted to the subject matter addressed in the draft DIA.

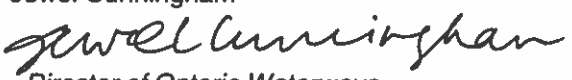
Once a draft DIA has been reviewed by Parks Canada and comments and recommendations have been incorporated to the satisfaction of Parks Canada, the draft DIA will be made available for public comment. The proponent will be responsible for managing the draft DIA's public review process, including public posting, determining time period of commenting period, summarizing comments, performing revisions to the draft DIA as a result of comments received, and submission of the revised draft DIA to Parks Canada for their review. Generally, the time period for public review is between 14 and 30 days. Parks Canada will recommend the time period closer to the circulation date based on a series of factors such as level of expressed interest, length of the report, and discretion of the Director of Waterways. Note that the proponent may be required to have the report translated to French upon request.

2.2.11 Monitoring and Follow-up

In order to ensure effective implementation of the mitigation measures identified in the DIA, plans and procedures proposed for quality control and assurance should be described, including technical specifications for mitigation works, inspection activities during construction and operation; and, procedures for resolving issues and addressing unforeseen effects that may arise during construction or operation. These plans and procedures should also include, but not be limited to, environmental protection plans, emergency/contingency plans, construction environmental specifications, construction special provisions, operational maintenance plans, etc. Identify proposed roles and leads for surveillance and reporting. As plans are completed they will be added to the DIA as addenda.

Identify whether a follow-up program is required after project completion in order to verify the accuracy of the DIA and to determine the effectiveness of any measures taken to mitigate the adverse environmental effects of a project. Follow-up requirements and responsibilities must be described in detail.

3. Approval

Scoping Document Recommended by: Jacquie Bastick  *Impact Assessment Specialist, Ontario Region*	Date: August 4, 2016
Scoping Document Approval: Jewel Cunningham  *Director of Ontario Waterways*	Date: Aug 18, 2016

PROJECT:
PRELIMINARY DESIGN FOR THE THIRD CROSSING OF THE CATARAQUI RIVER

DRAWING:
UNESCO WORLD HERITAGE SITE BOUNDARY

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DESIGN:	WP
DRAWN:	JCBS
CHECKED:	
PLOTTED:	18-Jul-16

DRAWING NO.: Figure 1
JLR NO.: 27143

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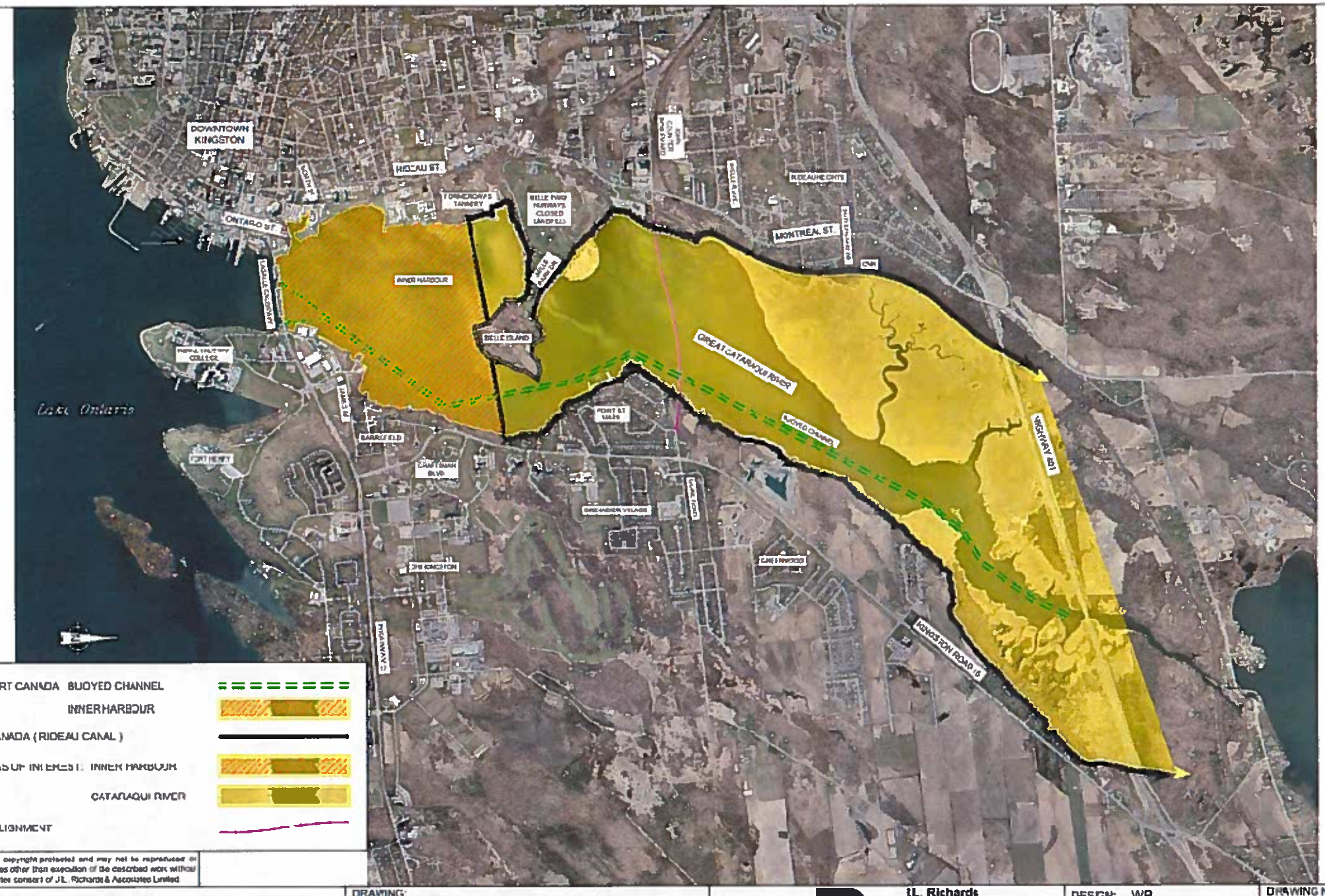

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PROJECT:
PRELIMINARY DESIGN FOR THE THIRD CROSSING OF THE CATARAQUI RIVER

DRAWING:
FEDERAL JURISDICTION AREAS

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DESIGN: WP
DRAWN: JCBC
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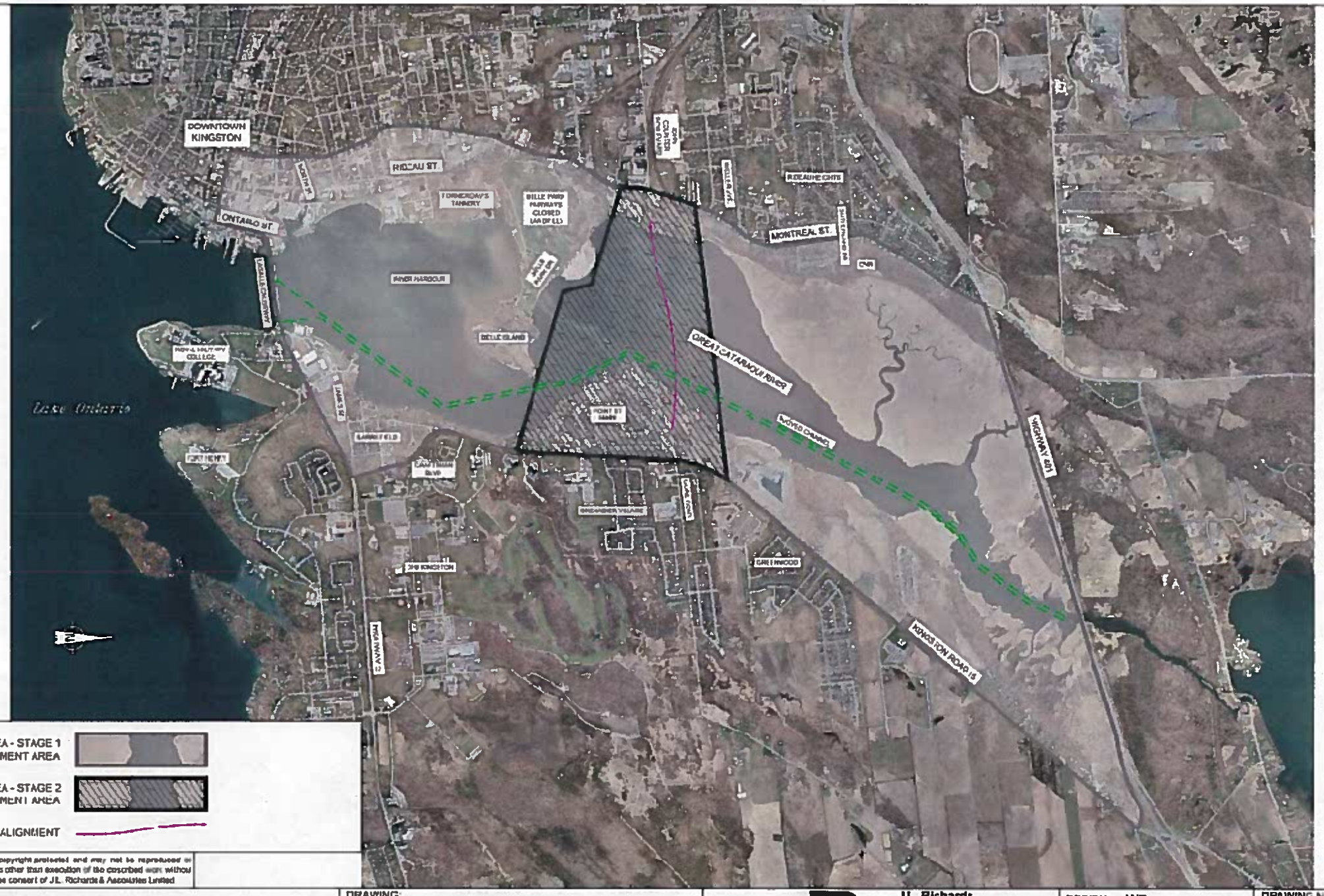
PLOTTED: 18-Jul-16

DRAWING NO.: Figure 2
JLR NO.: 27143



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PROJECT:	PRELIMINARY DESIGN FOR THE THIRD CROSSING OF THE CATARAQUI RIVER
DRAWING:	CLASS EA ASSESSMENT AREAS

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DESIGN:	WP
DRAWN:	JGB8
CHECKED:	
PLOTTED:	15-Jul-15

DRAWING NO.: **Figure 3**

JLR NO.: 27143

1 - GEOTECHNICAL ASSESSMENT BOREHOLE LOCATIONS

2 - CULTURAL - NATURAL HERITAGE ASSESSMENT BOUNDARY (250m OFFSET)

3 - TRANSPORTATION NOISE AND BIO-ACOUSTIC NOISE ASSESSMENT BOUNDARY (500m OFFSET)

4 - GEOENVIRONMENTAL ASSESSMENT BOUNDARY (100m OFFSET)

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PROJECT: PRELIMINARY DESIGN FOR THE THIRD CROSSING OF THE CATARAQUI RIVER	DRAWING: PRELIMINARY DESIGN ASSESSMENT AREAS	J.L. Richards & Associates Limited 303-863 Princess Street Kingston, ON Canada K7L 5N4 Tel: 613 544 1424 Fax: 613 544 5679	DESIGN: WP DRAWN: JGBS CHECKED: PLOTTED: 16-Jul-15	DRAWING NO.: Figure 4 JLR NO.: 27143

APPENDIX 1: BRIDGE DESIGN GUIDELINES FOR THE PROPOSED THIRD-CROSSING OF THE LOWER CATARAQUI SECTION OF THE RIDEAU CANAL

The lower Cataraqui section of the Rideau Canal south from Highway 401 to the northern entrance of Kingston's Inner Harbour near Belle Island is a rare example of the waterway where the natural environment was not altered during canal construction. Over the intervening 179 years, the extensive wetlands of the Great Cataraqui Marsh, as well as the river valley's sloped physiography and forested landscapes adjacent to the navigation channel have remained largely intact. As such, this natural setting has contributed to the unique historical, ecological and visual environment of this section of the waterway.

This landscape has experienced change. There is the auditory and visual intrusion from the Highway 401 bridge crossing and the Canadian National Railway line. From the water, the Highway 401 bridge structure is lost to sight once the navigation channel enters the main section of the Great Cataraqui Marsh. From a boater's perspective, the CN railway is visually screened to some extent because the tracks run on the far western edge of the marsh approximately one kilometre from the navigation channel. As boaters proceed southward through the marsh, Kingston's urban landscape becomes visible in the background. While there has been some modern development adjacent to the marsh, the overall impact is minimal from the perspective of the boater. Users of this section of the canal are most aware of the vast wetlands stretching out to the west and the sloped physiography of the Cataraqui River valley.

Management strategies in this section of the canal focus on the protection of the natural character of the lands and waters and managing change on the landscape. The construction of a bridge over the Cataraqui River linking John Counter Boulevard on the west and Gore Road on the east, is located in the transition area between the dominant natural character of this section of the waterway and the more urbanized environment of the city to the south (the project setting). This section of the waterway is also important to the history and heritage of many First Nations communities. As such, the Rideau Canal, as a National Historic Site of Canada, a Canadian Heritage River, and a UNESCO World Heritage Site, warrants a world-class bridge design that respects the history and character of the waterway in this particular and unique setting.

General Guiding Principles

- Bridge design should respect the natural and cultural heritage values of the Rideau Canal in this particular section of the waterway
- Bridge design should reflect the customs and traditions integral to the distinctive cultures of the First Nations communities
- Bridge design should be of high quality that responds to the significance of the Rideau Canal and is compatible with the project setting
- Bridge design should respond to the history of engineering innovation and evolution of high quality bridge designs along the length of the Rideau Canal, yet it should be an expression of its own time
- Bridge design should be pleasing to the eye, from a distance and up close, by day and night
- Bridge design should support a safe, enjoyable and memorable experience for those crossing over and under the bridge

Functional Requirements

Bridge Layout (provisional information only at this time, and subject to refinements as the bridge design progresses)

- Width of the deck: 16.45m
- Number of vehicular traffic lanes: one 3.5m wide eastbound traffic lane (and 2m wide shoulder), one 3.5m wide westbound traffic lane (and 2m wide shoulder)
- One 4m wide multi-use path, complete with 1 eastbound bicycle lane and 1 westbound bicycle lane on the south side of the bridge
- One 0.5m wide barrier on the north side of the bridge, one 0.45m wide barrier separating the eastbound traffic lane and multi-use path, one 0.5m wide barrier on the south side of the bridge

- Pedestrian/cyclist viewing nodes: on south side of bridge
- Spans: 61 -104m with a 150m span over the navigation channel
- Number and size of piers (including height of each span above controlled high-water elevation): 12 piers accommodating a bridge clearance of 3.0m above the water on the west shore that gradually rises to 13m over the navigation channel
- Size, location and design of abutments: west abutment at Station 10+265(+/-) and east abutment at Station 11+465(+/-)

Clearances

- Provide adequate/safe vertical and horizontal clearance for canal users
- Navigational Clearance: 6.7m clear height above upper controlled water elevation limit

Utilities

- Incorporate suspended utilities into the bridge design such that they are concealed and accessible as required by Bridge Code

A. Fundamental Aesthetic Strategies

The bridge design should achieve an appropriate balance of the following fundamental aesthetic strategies:

Functional Clarity

- The form of the structure should be an honest expression of its required function
- The size and shape of structural elements should be appropriate for their respective structural tasks
- Architectural expression and detailing should be respectful of the nationally- and internationally-recognized heritage character of the Rideau Canal
- Materials should be appropriate for their function and express their inherent nature

Economy and Simplicity

- Aim at simplicity of form with clean uncluttered lines, without becoming monotonous
- Provide economy in design in terms of capital, maintenance and lifecycle costs: minimum number of components, minimum dimensions

Scale and Proportion

- The structure should be in scale and complement its surroundings
- Bridge components should have good proportional relationships with one another
- Minimize visual impact of structure as scale increases by maximizing transparency/lightness through the structure

Harmony and Visual Balance

- Provide harmony and visual balance (utilizing order, symmetry, rhythm) amongst the structure's component parts as well as its composition in its surroundings
- Order – elements are arranged logically without visual confusion
- Rhythm – regular recurrence of similar elements to create a visual flow that is pleasing to the eye

Contrast and Complexity

- Consider incorporating solid and void to allow for the play of light and shadow on the structure
- Consider surface texture to provide visual interest, both at a distance and up close
- Consider colour to help integrate the bridge into its surroundings

Materials and Finishes

- Utilize high quality, durable, compatible materials and finishes to maintain a premium appearance, protect against adverse environmental effects and minimize ongoing maintenance

- The effects of bird droppings on the appearance and condition of the bridge should be anticipated and appropriate design solutions explored
- Apply rigorous and consistent approach to details and connections
- Allow for introducing texture, colour and visual interest to enhance the user's experience
- Consider opportunities for introducing local stone and wood

Enduring Visual Quality
- The bridge should still be perceived as visually pleasing decades after its construction
- Avoid extremes of "current fashion" design or overtly historicist references
- Key factors: quality and durability of base materials, good design and detailing, regular maintenance procedures

Compatibility
- The bridge should be compatible with the heritage character of the Rideau Canal National Historic Site, Canadian Heritage River and UNESCO World Heritage Site and the project setting

B. Context-Specific Aesthetic Strategies

The bridge design should consider and achieve sufficient compliance with the following context-specific strategies:

High Quality
- Achieve a high quality design that responds to and respects the project setting
- Achieve aesthetically pleasing structural solution beyond traditional highway bridge design

Respect the heritage character of the Rideau Canal
- Ensure the bridge respects the heritage values stated in the "Commemorative Integrity Statement" for the Rideau Canal National Historic Site of Canada, and the "Statement of Outstanding Universal Value" of the Rideau Canal World Heritage Site

Interpretive Opportunities
- Consider opportunities for users to learn about significant aspects of the canal's heritage, the history of First Nations communities in this area, and the ecological dynamics of the wetland
- Allow for incorporating interpretive signage or nodes
- Views from the bridge north provide a never-seen-before opportunity for a panoramic view of the Cataraqui Marsh and the canal channel
- Provide viewing nodes for cyclists and pedestrians on the bridge with interpretive media
- Identify opportunities for public contributions, such as public art

Views
Given the values of the Rideau Canal in this initial assessment the key views are:
- To the bridge from the navigation channel during the day and night and from the north and south
- To the Great Cataraqui Marsh and the slopes of the river valley from the navigation channel
- From the bridge to the navigation channel, the Great Cataraqui Marsh and the slopes of the river valley, the northern entrance to the Inner Harbour and Kingston's skyline
- From the Highway 401 and the slopes of the river valley to the bridge, navigation channel and the Great Cataraqui Marsh

More specifically, the important views from the navigation channel include:
- From approximately 1 km south of the Highway 401 bridge, boaters travelling south will have a dramatic and kinetic view of the entire bridge in its river setting, as well as the urban landscape emerging in the background over the 2 km approach; views to the marsh lands are not obstructed via this approach but the presence of a 1 km long modern structure stretching across the river may negatively impact the views of this predominantly natural setting

- Boaters travelling north first encounter a view of the eastern-half of the bridge as the channel rounds Belle Island; the entire bridge in its river setting will not be visible from the south until the boater rounds Belle Island, approximately 250m from the span; views of the marsh lands and the river are unobstructed once boaters travelling north pass under the bridge

Views from the bridge: In this initial assessment views from the bridge are assumed to be from the central part of the span across the river:

- Views to the south will include parts of the golf course and Belle Island, approximately 750 m distant; views south down the river will extend approximately 1.3 km as the channel enters the inner harbour. Neither the Inner Harbour nor Outer Harbour will be visible from the bridge. This southern view may provide an opportunity to communicate stories of the First Nations' use and occupation of this part of the river
- Views from the bridge to the north should provide a new and significant opportunity to see the extensive wetlands of the Great Cataraqui Marsh and the navigation channel as it runs through the river valley. This northern view may provide an opportunity to communicate stories of the First Nations' use and occupation of this part of the river.

Views from the land:

- The bridge will be visible from the Highway 401, the slopes of the river valley and Belle Island, and Fort Henry to the south
- It should be noted that views from Cataraqui Park (Belle Island) looking north will see the western section of the bridge but not the entire span; views from Belle Island to the marsh lands to the north will be impacted with the construction of the bridge

Maximize viewing opportunities from the bridge for all bridge users:

- The design should provide opportunities for lookout vantage points or nodes above river, including seating and some interpretive signage and public art
- Provide minimum height barriers and open railings to maximize views
- Investigate the possibility of interpretive opportunities for boaters as they pass under the bridge

Pathway User Experience

Railings

- Provide continuous open railings to optimize views
- Allow for custom design to provide distinctive enhanced visual effect within the pathway user realm: consider use of stainless steel, aluminum or premium custom-colour paint finish over steel

Barriers

Enhance design of barriers between non-vehicle user realm and traffic:

- Provide a code complying barrier that is not a full height concrete barrier
- Provide custom-designed railings instead of typical functional approach such as chain link fence
- Allow for enhanced and innovative barrier wall terminations e.g. shaped precast concrete, stone facing, inlaid text identification

Lighting/Poles

- Provide functional, high quality, attractively designed low lighting directed and limited to the bridge
- Lighting should be kept simple and subtle, in harmony with the project setting
- Avoid using constant-on lighting and flood lighting directed to the sky to minimize avian fatalities; white strobe or flashing lights, of a minimum number, intensity and number of flashes is recommended at night
- Include provision of above-deck pedestrian-scale lighting at appropriate intervals
- Minimize number of pole systems on bridge by integrating support of roadway lighting, and possibly pedestrian scale lighting

- Include provision of accent lighting at appropriate intervals to enhance night-time illumination of bridge structure

Signage

- Signage on the bridge and in the vicinity of the bridge should be well-integrated and planned from the beginning. It should not be treated as an isolated component.
- Overhead signage is not recommended. The treatment of the approaches to the bridge need to complement the bridge design and not contrast with it nor detract from the aesthetics of the bridge. It should be planned as part of the evolving design.