CULTURAL HERITAGE EVALUATION REPORT
WHARNCLIFFE ROAD BRIDGE (1-BR-07) OVER THE THAMES RIVER

WHARNCLIFFE ROAD
CITY OF LONDON, ONTARIO

Prepared for:

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EXECUTIVE SUMMARY

ASI was contracted by Dillon Consulting Limited to conduct a cultural heritage evaluation of the Wharncliffe Road Bridge (Structure No. 1-BR-07) to determine if the proposed work falls under Schedule A, A+, B, or C definitions of the Municipal Class Environmental Assessment Act. The bridge is on London's 0-5year Major Repair Program listing. The general scope of repair work is anticipated to include: rehabilitation of concrete substructure, girders, deck and sidewalks; bearing replacement or rehabilitation; rehabilitation of the parapet walls; replacement or elimination of the expansion joints; repairs to the suspended utilities; upgrades to existing lighting; waterproofing; asphalt repaving; and improving connectivity to the Thames Valley Parkway pathway system will be considered.

The bridge has a north-south orientation and carries four lanes of vehicular traffic across the main branch of the Thames River in four continuous spans with a total crossing length of 134m (between abutment bearings). The deck has a travel width of 14.3m and an overall width of 18.4m. It is a reinforced cast-in-place concrete T-beam bridge built in 1958. According to available bridge documentation, the railing system was replaced in 1987 and in 1992 the deck and bearings were rehabilitated and new expansion joints and light standards were installed.

The Wharncliffe Road Bridge has not been previously identified as an Ontario Heritage Bridge and is not currently listed on the City Register (Inventory of Heritage Resources) or designated under the *Ontario Heritage Act*. Based on the results of archival research, an analysis of bridge design and construction in Ontario, comparative bridge analysis, field investigations, and application of *Ontario Heritage Act* Regulation 9/06, the Wharncliffe Road Bridge was not determined to retain cultural heritage value. Accordingly no heritage impact is anticipated.

Given this evaluation of the Wharncliffe Road Bridge, the following recommendations should be considered and implemented:

1. This report should be filed with London's heritage staff including London's Advisory Committee on Heritage.

2. This report serves as sufficient heritage documentation of the bridge.

PROJECT PERSONNEL

Senior Project Manager:	Annie Veilleux, MA, CAHP *Senior Heritage Specialist* *Manager, Cultural Heritage Division*
Project Manager:	Tara Jenkins, MA, CAHP *Cultural Heritage Specialist, Cultural Heritage Division*
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Project Administrator:	Carol Bella, Hon. BA *Executive Assistant, Operations Division*
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1.0 INTRODUCTION

ASI was contracted by Dillon Consulting Limited to conduct a cultural heritage evaluation of the Wharncliffe Road Bridge (Structure No. 1-BR-07) to determine if the proposed work falls under Schedule A, A+, B, or C definitions of the Municipal Class Environmental Assessment Act. The bridge is on London's 0-5year Major Repair Program listing. The general scope of repair work is anticipated to include: rehabilitation of concrete substructure, girders, deck and sidewalks; bearing replacement or rehabilitation; rehabilitation of the parapet walls; replacement or elimination of the expansion joints; repairs to the suspended utilities; upgrades to existing lighting; waterproofing; asphalt repaving; and improving connectivity to the Thames Valley Parkway pathway system will be considered.

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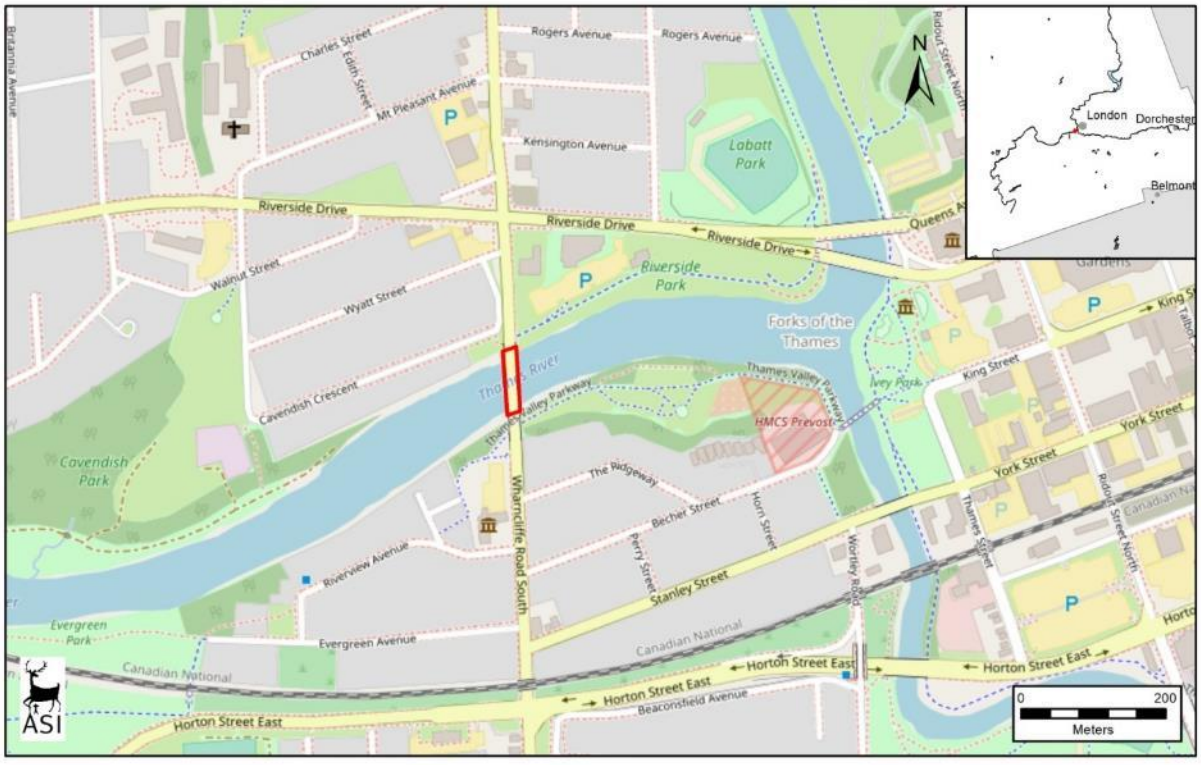

Figure 1: Location of the Wharncliffe Road Bridge study area (in red)
Base Map: ©OpenStreetMap and contributors, Creative Commons-Share Alike License (CC-BY-SA ESRI Street Maps)

Figure 2: View looking west to the Wharncliffe Road Bridge from the Thames River Corridor, ca. 2017

As this structure exceeds the 40-year age limit, a Cultural Heritage Evaluation Report (CHER) is required to determine if the bridge is of any cultural heritage value warranting a more in-depth Environmental Assessment (EA) prior to the detailed design or construction work progress. The principal aims of this report are to:

- Describe the methodology that was employed and the legislative and policy context that guides heritage evaluations of bridges over 40 years old;
- Provide a historical overview of the design and construction of the bridge within the broader context of the surrounding township and bridge construction generally;
- Describe existing conditions and heritage integrity;
- Evaluate the bridge using *Ontario Regulation 9/06, Criteria for Determining Cultural Heritage Value or Interest*, of the *Ontario Heritage Act* and draw conclusions about the heritage attributes of the structure; and.
- If warranted, provide a preliminary assessment of impacts, ascertaining sensitivity to change in the context of identified heritage attributes and recommend appropriate mitigation measures.

2.0 LEGISLATION AND POLICY CONTEXT

Infrastructure projects have the potential to impact cultural heritage resources in a variety of ways. These include loss or displacement of resources through removal or demolition and the disruption of resources by introducing physical, visual, audible or atmospheric elements that are not in keeping with the resources and/or their setting.

A 40-year-old threshold is used as a guiding principle when conducting a preliminary identification of cultural heritage resources (Ministry of Tourism, Culture and Sport 2016). While identification of a resource that is 40 years old or older does not confer outright heritage significance, this threshold provides a means to collect information about resources that may retain heritage value. Similarly, if a resource is slightly younger than 40 years old, this does not preclude the resource from retaining heritage value.

The analysis used throughout the cultural heritage resource assessment process addresses cultural heritage resources under various pieces of legislation and their supporting guidelines:

- *Environmental Assessment Act* (R.S.O. 1990, Chapter E.18)
    - *Guideline for Preparing the Cultural Heritage Resource Component of Environmental Assessments* (MCC 1992)
    - *Guidelines on the Man-Made Heritage Component of Environmental Assessments* (MCR 1980)

- *Ontario Heritage Act* (R.S.O. 1990, Chapter O.18) and a number of guidelines and reference documents utilized by the Ministry of Tourism, Culture and Sport (MTCS):
    - *Ontario Heritage Tool Kit* (MCL 2006)
    - *Criteria for Evaluation Potential for Built Heritage Resources and Cultural Heritage Landscapes* (MTCS 2016)

The *Ontario Heritage Act* makes provisions for the protection and conservation of heritage resources in the Province of Ontario. A Cultural Heritage Evaluation Report is intended to identify areas of heritage interest as specified in the *Provincial Policy Statement*. Built heritage concerns are recognized as a matter of provincial interest in Section 2.6.1 of the *Provincial Policy Statement* (PPS) which states:

- Significant built heritage resources and cultural heritage landscapes shall be conserved (PPS 2014:29).

In the *Provincial Policy Statement* the term Conserved means:

> the identification, protection, management and use of built heritage resources, cultural heritage landscapes and archaeological resources in a manner that ensures their cultural heritage value or interest is retained under the *Ontario Heritage Act*. This may be achieved by the implementation of recommendations set out in a conservation plan, archaeological assessment and/or heritage impact assessment. Mitigative measures and/or alternative development approaches can be included in these plans and assessments (MMAH 2014:40).

Additionally, Part 4.7 of the PPS states that:

> The official plan is the most important vehicle for implementation of this Provincial Policy Statement. Comprehensive, integrated and long-term planning is best achieved through official plans.
>
> Official plans shall identify provincial interests and set out appropriate land use designations and policies. To determine the significance of some natural heritage features and other resources, evaluation may be required.
>
> Official plans should also coordinate cross-boundary matters to complement the actions of other planning authorities and promote mutually beneficial solutions. Official plans shall provide clear, reasonable and attainable policies to protect provincial interests and direct development to suitable areas.
>
> In order to protect provincial interests, planning authorities shall keep their official plans up-to-date with this Provincial Policy Statement. The policies of this Provincial Policy Statement continue to apply after adoption and approval of an official plan.

The Ministry of Tourism, Culture and Sport (MTCS) published the *Standards and Guidelines for the Conservation of Provincial Heritage Properties* (2014). These Standards and Guidelines apply to properties the Government of Ontario owns or controls that have cultural heritage value or interest. The Standards and Guidelines, and associated guidance documents, apply to provincially owned or controlled heritage properties in the areas of identification and evaluation, protection, maintenance, use, and disposal. However, as the Wharncliffe Road Bridge is not provincially owned, the Standards and Guidelines can only provide general reference in determining the heritage significance of a property. The *Ontario Heritage Toolkit* (MCL 2006) provides a guide on how to evaluate heritage properties that are subject to or are being considered for municipal designation and/or listing under sections 27, 29 or 41 of the *Ontario Heritage Act*.

2.1 Municipal Policies

Cultural heritage is an important component of sustainable development and place making. The preservation of the City of London's cultural heritage is essential to the character of an urban and liveable city that can contribute to other social cultural, economic and environmental goals of a city. As a result, heritage conservation is integrated within the policies in many other sections of the City of London's *Official Plan*. The heritage policies of this Plan not only promote the preservation of important heritage buildings, but also the public views of them for the enjoyment of Londoners. As the Wharncliffe Road Bridge is located within the City of London, London's *Official Plan* was consulted with respect to policies regarding cultural heritage resources.

The City of London's *Official Plan* (1989; sections amended 2009), which conforms to the 2014 *Provincial Policy Statement*, recognizes the important role of "properties of cultural heritage value or interest" as assisting "in instilling civic pride, benefiting the local economy by attracting visitors to the city, and favourably influencing the decisions of those contemplating new investment or residence in the City." The *Official Plan* sets out criteria for designation under the *Ontario Heritage Act* of heritage buildings and Heritage Conservation Districts. Such properties include "buildings or structures, either individually or in groups, which are considered by Council to be of architectural and/or historical significance at the community, regional, provincial, or national level (section 13.0)." Section 13.1 of the *Official Plan* lists the following objectives for heritage resources:

> i) Protect in accordance with Provincial policy those heritage resources which contribute to the identity and character of the City.
>
> ii) Encourage the protection, enhancement, restoration, maintenance, and utilization of buildings, structures, areas, or sites within London which are considered to be of cultural value or interest to the community.
>
> iii) Encourage new development, redevelopment, and public works to be sensitive to, and in harmony with, the City's heritage resources; and
>
> iv) Increase public awareness and appreciation of the City's heritage resources, and encourage participation by the public, corporations, and other levels of government in the protection, restoration, and utilization of these resources.

The *Official Plan* sets out criteria for designation (Section 13.2.2; amended 2009). City Council may designate heritage buildings or examples of heritage buildings by law pursuant to the *Ontario Heritage Act* .

In addition, the City maintains a descriptive inventory of properties of cultural heritage value or interest. The City of London's *Inventory of Heritage Resources* (2006) includes information related to the listing of properties in London. The inventory includes a priority level system for identifying properties of greater priority and/or significance for heritage recognition. In addition, properties designated under the *Ontario Heritage Act* are maintained in the City's inventory. The inventory is a living document subject to changes and approvals by City Council, advised by the London Advisory Committee on Heritage. As a result, when preparing this CHER, consultation with City of London staff was undertaken to confirm as to the potential heritage interest or listing of the Wharncliffe Road Bridge (Section 2.1.2).

The *Strategic Plan for the City of London* (2015-2019) sets out a broad direction for the future of London. It identifies London City Council's vision, mission, values, strategic areas for focus and the specific strategies that define how Council and Administration will respond to the needs and aspirations of Londoners. As such, as part of the City's initiative for "Building a Sustainable City," the Strategic Plan identifies the management of upgrading of transportation infrastructure such as heritage bridges, and more specifically, the Heritage Bridge Preservation Strategy (Blackfriars Bridge and Meadowlily Footbridge) as a part of its focus on robust infrastructure.

Lastly, the *Thames Valley Corridor Plan* (2011) is a key planning tool that provides recommendations on enhancing and protecting the corridors features and functions. Its vision is the following:

> The Thames Valley Corridor is London's most important natural, cultural, recreational and aesthetic resource. The City and community partners will preserve and enhance the natural environment, Thames River health, vistas, beauty and cultural heritage while accommodating compatible infrastructure, accessibility and recreation.

The plans make recommendation on bridges and valley crossings and are as follows:

> B-1 Maintain and enhance views from the bridges into the Thames River Valley, and views of the bridges from existing vantage points. New or reconstructed bridges or valley crossings should create new vistas into the valley and create additional vantage points where possible.

B-2 New or reconstructed bridges or valley crossings should respect and protect the adjacent natural heritage features and functions, and methods for minimizing impacts should be employed in the design and construction of all transportation, communication, sewerage or other infrastructure that cross the valley.

B-3 Preserve / maintain historic features, proportions and structural attributes of the existing bridges, where feasible and with consideration to public safety and structural integrity.

B-4 Consider aesthetic bridge design in the bridge structure and components such as decorative railings, columns or panel treatments as enhancement to existing bridges, or in bridge reconstruction as part of a program of public art. Aesthetic bridge design should be in accordance with the 'Aesthetic Guidelines for Bridges' produced by the Ministry of Transportation, or design guidelines prepared by the City in the future.

B-5 Continue to celebrate and promote awareness of the history of London's bridges through bridge naming, heritage and interpretive plaques, and published material such as the Urban League of London's 'Celebrate the Thames' Thames Topics brochures (Booklet #6 Bridges). Bridge signage should be visible to vehicular traffic, boaters and users of the Thames Valley Parkway system.

B-6 Identify key areas adjacent to Thames River bridges and crossings for urban design and ecological and / or decorative landscape enhancements, e.g. within the valley, or in open space lands associated with road network.

B-7 For new or reconstructed bridges, consider opportunities for divided lane bridges to allow natural valley vegetation to penetrate road infrastructure (example: City of Mississauga – Burnhamthorpe Road Bridge over the Credit River).

B-8 Urban land uses adjacent to the crossings and the Thames River should consider the maintenance of views to the river valley and demonstrate a high quality of design and aesthetics in built form and landscape.

B-9 Protect historic and distinctive bridges and features, including those of the modern period, through formal recognition. Heritage Bridge Evaluations should be completed for all bridges that have not been ranked, in order to identify their heritage value. Until such time as the City develops heritage bridge assessment guidelines, the assessments should be completed following the Ontario Heritage Bridge Guidelines for Provincially Owned Bridges (2008). The London Advisory Committee on Heritage shall review all Heritage Bridge Evaluations.

B-10 Integrate pedestrian / bike friendly measures into all bridge crossings and underpasses to facilitate connectivity.

2.1.1 The Thames River Heritage River Designation

The Thames River was formally designated a Canadian Heritage River on August 14, 2000. The designation was announced by the Minister of Canadian Heritage, the Honourable Sheila Copps and Ontario's Minister of Natural Resources, the Honourable John Snobelen. The Thames River was

recognized as a heritage river for its outstanding contributions to the country's cultural heritage, natural heritage, and recreational opportunities. The broad goal of managing the Thames as a Canadian Heritage river is: "To increase the appreciation, enjoyment and stewardship of the natural, and cultural heritage and recreational opportunities of the Thames River and its watershed through community cooperation and involvement" (Quinlan 2013:2). The Wharncliffe Road Bridge crosses the main branch of the Thames River.

2.1.2 Consultation

The following stakeholders were contacted with inquiries regarding the heritage status and for information concerning the Wharncliffe Road Bridge.

Table 1: Results of Consultation

Contact	Organization	Date(s) of Communications	Description of Information Received
Kyle Gonyou, Heritage Planner	City of London	14 September 2017	Response received. Confirmed that no previous heritage studies have been completed and the bridge is not on the heritage inventory or designated under the *Ontario Heritage Act*.
Theresa Regnier, President	London & Middlesex Historical Society	20 September 2017	Response received. The Society does not have any material on the Wharncliffe Road Bridge.
Archive Staff	Ivey Family London Room- London Public Library	15 September 2017	Staff assisted and pulled newspaper clipping files on London bridges.
Archive Staff	Archives and Research Collections Centre- Western University	15 and 19 September 2017	Jean Hung assisted in photographic print production (archives of the London Free Press)
Western University Staff	Map and Data Centre- Western University	15 September 2017	Assisted in historical map search.
Brad Schmidt, Associate	Dillon Consulting Limited	14 September 2017	Response Received. Provided bridge dimensions.
Jane Fullick, Senior Technologist	City of London- Transportation Planning and Design	26 September 2017	Response Received. Compiled a list of bridges in London crossing the Thames with date of construction (compiling bridge type is still pending).

2.2 Cultural Heritage Evaluation Report

The purpose of the CHER is to examine a property as whole, its relationship to surrounding landscapes, and its individual elements. Conducting scholarly research and site visits inform such an examination. Background information is gathered from heritage stakeholders where available, local archives, land registry offices, local history collections at public libraries, and the Ministry of Tourism, Culture and Sport when appropriate. Once background data collection is complete, a site visit is carried out to conduct photographic documentation and site analysis. These components provide a means to soundly establish the resource's cultural heritage value.

The scope of a Cultural Heritage Evaluation Report (CHER) is guided by the Ministry of Tourism, Culture and Sport's *Ontario Heritage Toolkit* (2006). Generally, CHERs include the following components:

- A general description of the history of a study area as well as a detailed historical summary of property ownership and building(s) development;
- A description of the cultural heritage landscape and built heritage resources;
- Representative photographs of the exterior and interior of a building or structure, and character-defining architectural details;
- A cultural heritage resource evaluation guided by the *Ontario Heritage Act* criteria;
- A summary of heritage attributes;
- Historical mapping and photographs; and
- A location plan.

Using background information and data collected during the site visit, the property is evaluated using criteria contained within Regulation 9/06 of the *Ontario Heritage Act*.

Ontario Heritage Act Regulation 9/06 provides a set of criteria, grouped into the following categories which determine the cultural heritage value or interest of a potential heritage resource in a municipality:

i) Design/Physical Value;
ii) Historical/Associative Value; and
iii) Contextual Value.

Should the potential heritage resource meet one or more of the above mentioned criteria, a Heritage Impact Assessment (HIA) is required and the resource considered for designation under the *Ontario Heritage Act*.

When evaluating the cultural heritage significance of the Wharncliffe Road Bridge, the *Ontario Heritage Bridge Guidelines for Provincially Owned Bridges* (OHGB) (MTO 2008) and the *Ontario Heritage Bridge Program* (MCC 1991) were consulted as points of reference.

The OHBG provides rationale for the protection and preservation of heritage bridges and is described as follows (MTO 2008:5-6):

> Bridges are important parts of our engineering and architectural heritage. Perhaps more than any other type of structure built by man, they exhibit major historical change and innovation in the development and use of materials, in design, and in construction methods. They can be viewed as important elements and make a positive contribution to their surroundings. In some cases, they are rare survivors of an important bridge type or are revered because of their age, historical associations or other publicly perceived values.

The following CHER will determine if the proposed work falls under Schedule A, A+, B, or C definitions of the Municipal Class Environmental Assessment Act.

3.0 HISTORICAL CONTEXT AND CONSTRUCTION

3.1 Introduction

The Wharncliffe Road Bridge is a reinforced cast-in-place concrete T-beam bridge built in 1958 located in London, Ontario. The bridge has a north-south orientation carrying four lanes of Wharncliffe Road vehicular traffic over the Thames River in four continuous spans with a total crossing length of 134m (between abutment bearings). The deck has a travel width of 14.3m and an overall width of 18.4m (Brad Schmidt, personal communication, 14 September 2017). The bridge has not been identified as a heritage bridge in the Ontario Heritage Bridge inventory and does not currently have any status under the *Ontario Heritage Act*.

Cultural heritage resources are those buildings or structures that have one or more heritage attributes. Heritage attributes are constituted by and linked to historical associations, architectural or engineering qualities, and contextual values. Inevitably many, if not all, heritage resources are inherently tied to "place," a geographical space within which they are uniquely linked to local themes of historical activity and from which many of their heritage attributes are directly distinguished today. In certain cases, however, heritage features may also be viewed within a much broader context. Section 3.2 of this report details a brief historical background to the settlement of the surrounding area. A description is also provided of the construction of the bridge within its historical context (Section 3.3).

3.2 Local History and Settlement

Historically, the Wharncliffe Road Bridge was located over the boundary between London Township and Westminster Township in Middlesex County.

3.2.1 Middlesex County

Prior to the earliest European settlement in the Thames River Valley, the London environs were actively used for hunting and camping by Chippewa, Ottawa, and Pottawatami peoples. It was from them that the British Crown purchased the lands in 1790 (LTHBC 2001). Shortly after the purchase, Abraham Iredell surveyed the general area. Lieutenant- Governor John Graves Simcoe visited the Thames River area in 1793 on his journey to Detroit from Niagara, and so admired the countryside and the forks of the Thames that he aspired to establish the capital of Upper Canada in London. Because the site was too far inland, his vision was never realized. Nevertheless, the Thames River Valley and London Township attracted European settlers in the early nineteenth century.

In 1798 the lands that are now Middlesex County formed part of Upper Canada's newly established London District which also included the future Oxford and Norfolk counties. Port Stanley offered a lakeside port entry for migrants destined for the London District (Whebell 1992), with travel facilitated by Kettle Creek or the Port Stanley to London Road (now Highway 4) constructed in 1822 that connected Port Stanley, St. Thomas, and London. Although Simcoe's dream of having London become the capital of Upper Canada was never realized, the centre was chosen in 1826 to be the administrative seat for the London District, and land overlooking the forks of the Thames River was selected for the construction of a government building - the London District Courthouse (Cunningham 1976). In the same year London was officially founded as a hamlet when its first settler, Peter McGreggor [sic. Peter MacGregor], erected a log shanty at the southwest corner of King and Ridout streets (LMHS 1906). The settlement grew

rapidly, focused first along the river and expanding to the north, west, and south. By 1827 there were 20 to 30 buildings, by 1831, 96 houses and by 1842, 386 houses (Brock 1992). Records suggest that London grew by 239 percent between 1840 and 1850 as the population increased from 2,078 to 7,035 due to the entry of masses of British immigrants to Upper Canada (Whebell 1992).

3.2.2 London Township

London Township is one of the first in Middlesex County to be extensively settled. Working alongside Colonel Thomas Talbot to create opportunities for settlement, Colonel Mahlon Burwell initiated the first formal survey of London Township in 1810. This survey initially focused on the first six concessions north to today's Sunningdale Road, but was suspended when war erupted in 1812. The northern section of the township was surveyed following the war, with the first settlers arriving between 1817 and 1818. The first land patent, however, dates to 1812 and relates to lands that formed part of Burwell's initial survey. Among those who received the earliest patents were Burwell himself and the honorable John Hale. These grants were given *in lieu* of payment for services and loyalty, as both gentlemen did not plan to homestead on these lots, but instead intended to sell them to arriving immigrants (LTHBC 2001:11-14; H.R. Page & Co. 1878:9).

In 1818, a group of Irish settlers arrived in London Township and established homesteads on lots in the 4th, 5th, and 6th concessions. Their emigration was organized by Richard Talbot of Tipperary, Ireland, who had spent a great deal of time working on behalf of the government to find families who were interested in relocating to Upper Canada. Richard Talbot took the advice of his kinsman Colonel Thomas Talbot, and brought these families to London Township which was said to be one of the most productive agricultural areas in the Thames River Valley (LTHBC 2001:13-14). By 1851, much of London Township had been settled.

3.2.3 Westminster Township

The first settlers arrived in Westminster Township when the North Branch of the Talbot Road was just a blazed trail. The official survey of the road was undertaken by Deputy Land Surveyor Mahlon Burwell. The settlement promoter, Colonel Thomas Talbot, wanted the road in order to divert trade to his interests at Port Talbot on Lake Erie. In 1811, he wrote to the Surveyor General of Upper Canada that "to connect the Talbot Road with Westminster is of first consequence as without that all my exertions for affording facility of communication through this western part of the province will be incomplete, as the country situated to the north has not any other vent or means of transporting its produce but by Port Talbot" (Crinklaw 1986:1; Mika and Mika 1983:634).

In 1810, Simon Zelotes Watson was appointed a deputy surveyor. He laid a base line across the northern part of Westminster Township and laid out two concessions to its south and broken lots to the north from the base line to the Thames River (Baker and Neary 2003). Unlike in neighbouring townships, the land in Westminster Township was not granted to absentee owners, so early settlers cleared the land and established homes. By 1817, there were 107 homes and 428 people resident in the township. Colonel Talbot required his settlers to "clear and open half the road in front of their lot." If they failed to do so, their names would be erased from his map and he would give the land to someone else. In 1824, Mahlon Burwell conducted a survey in London Township which included part of Concession 'B' in Westminster Township (Bates and Neary 2003). In 1850, the township had grown to have 4,525 inhabitants, three grist

mills and a number of schools. It was one of the largest townships in Middlesex and had fertile fields, dairies, and fruit trees (Mika and Mika 1983:634-635; WTHS 2006:395).

3.2.4 The City of London

The Thames River had a profound impact on the growth of London. The city developed at the junction of the north and south branches of the river, and as a result bridge construction has been important in connecting London to the river. London underwent a number of population booms throughout its history beginning when the 32nd Regiment was stationed in London in 1838. Development of saw, cording, and grist industries powered by the Thames River and Medway Creek assisted the city's growth in the mid 1800's, bolstered by the arrival of the railways in the 1850s including the Great Western Railway in 1853, the London Port Stanley Railway in 1856, and the Grand Trunk Railway in 1858. The railway brought an influx of immigrants and promoted community commerce and travel. Records suggested London grew by 239 percent between 1840 and 1850 as the population increased from 2,078 to 7,035 due to the entry of British immigrants to Upper Canada (Whebell 1992). Steady growth in London continued as the city was established as a financial centre for the surrounding regions with large manufacturing industries taking root, including the Carling and Labatt's Brewery and the London Cigar Industry. London was incorporated as a village in 1840 and by 1855 the population had leapt to 10,000 at which time it officially became a city (Armstrong 1986).

3.2.5 Wharncliffe Road

In 1824, Thomas Talbot instructed Burwell to survey Wharncliffe Highway (Wharncliffe North and Wharncliffe South) through Crown Reserve. Lots were laid out on both sides of Wharncliffe (Armstrong 1986:24) (Figure 3). The road was designed to connect the developing settlements in Westminster Township with future settlements in London Township. It also was surveyed to connect Longwoods Road with Commissioners Road. The road was named after Talbot's friend, James A. Wharncliffe, later Baron Wharncliffe (Ecoplans et al. 2014). At this time, there is no evidence that there were plans to connect Wharncliffe North and South via a bridge over the Thames River.

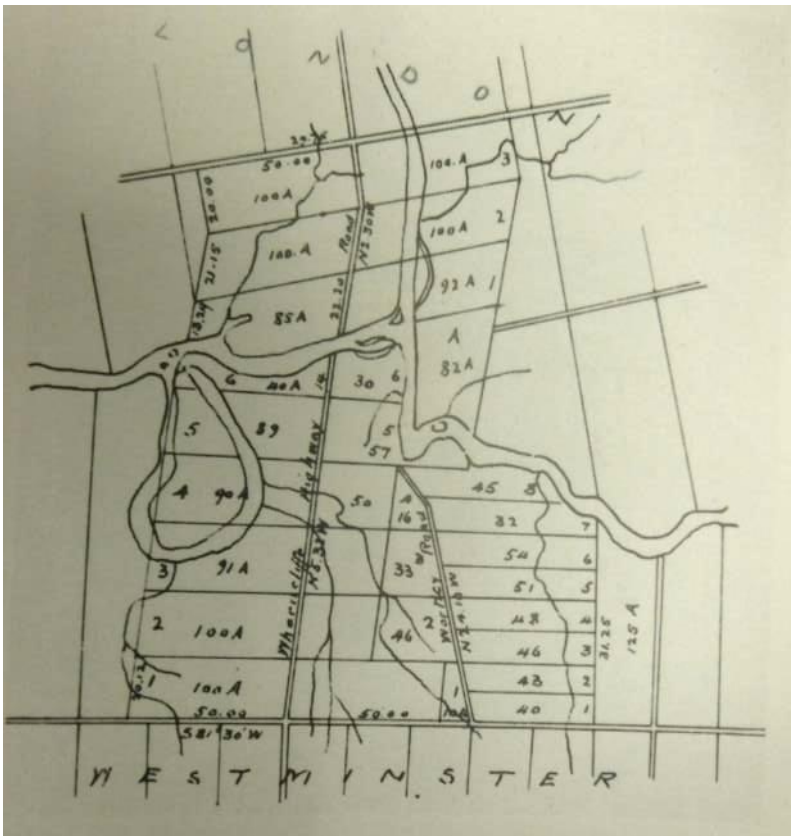

Figure 3: The 1824 survey map of Wharncliffe Highway
Source: Armstrong 1986:24

3.3 History of the Study Area, Wharncliffe Road Bridge, and Previous Bridge Crossing

3.3.1 Review of Nineteenth and Twentieth Century Mapping

The Wharncliffe Road Bridge study area straddles the Thames River and historically, it was a crossing between the two townships – London Township and Westminster Township. The 1872 E.S. Glover's *Bird's Eye View of London* shows the GWR railway with a bridge structure at Wharncliffe Road (Figure 4). This view shows the north side of Wharncliffe near the Thames River as a steep forested slope. The second *Bird's Eye View of London*, ca. 1893, more accurately depicts the north and south side of Wharncliffe Road (Figure 6). The drawing does not depict a bridge joining Wharncliffe North and Wharncliffe South. The view however does show that there was residential settlement along both sides of Wharncliffe Road. Similarly, the 1878 *Map of the City of London and Suburbs*, shows the lot plans and street allowances along Wharncliffe Road within the City of London boundary (Figure 5). Again, there is no bridge illustrated crossing Wharncliffe Road at this time.

The 1912 (Revised 1915) *Fire Insurance Plan for the City of* London shows the first structure connecting Wharncliffe Road North and South (Figure 7). The map illustrates the bridge as a steel and concrete structure. The map also shows a number of one storey frame dwellings built on the north side of the bridge, south of Wyatt Street (including 10 and 12 Wharncliffe Road North) and a few one storey frame houses south of the bridge, north of The Ridgeway (including 6 Wharncliffe Road South). The 1919

topographic map was not revised to show the new bridge, however the map illustrates as Wharncliffe Road being at the edge of urban London (Figure 8). In 1919 there are a number of frame and brick residences on the west side of Wharncliffe Road, both north and south of the Thames River. The 1922 *Fire Insurance Plan* and 1922 aerial photograph shows detail of the built features surrounding the bridge, including the newly built Riverview Public School (Figures 9 and 10). The 1936 map of London drawn to illustrate prominent features which include the "Wharncliffe Bridge," illustrated as a truss type bridge, and Riverview School, located southwest of the bridge (Figure 11). By 1958, the new Wharncliffe Road Bridge had been constructed. A 1960 aerial photograph shows the newly-constructed bridge and shows that a row of houses on the east side of the north approach were no longer extant (Figure 12).

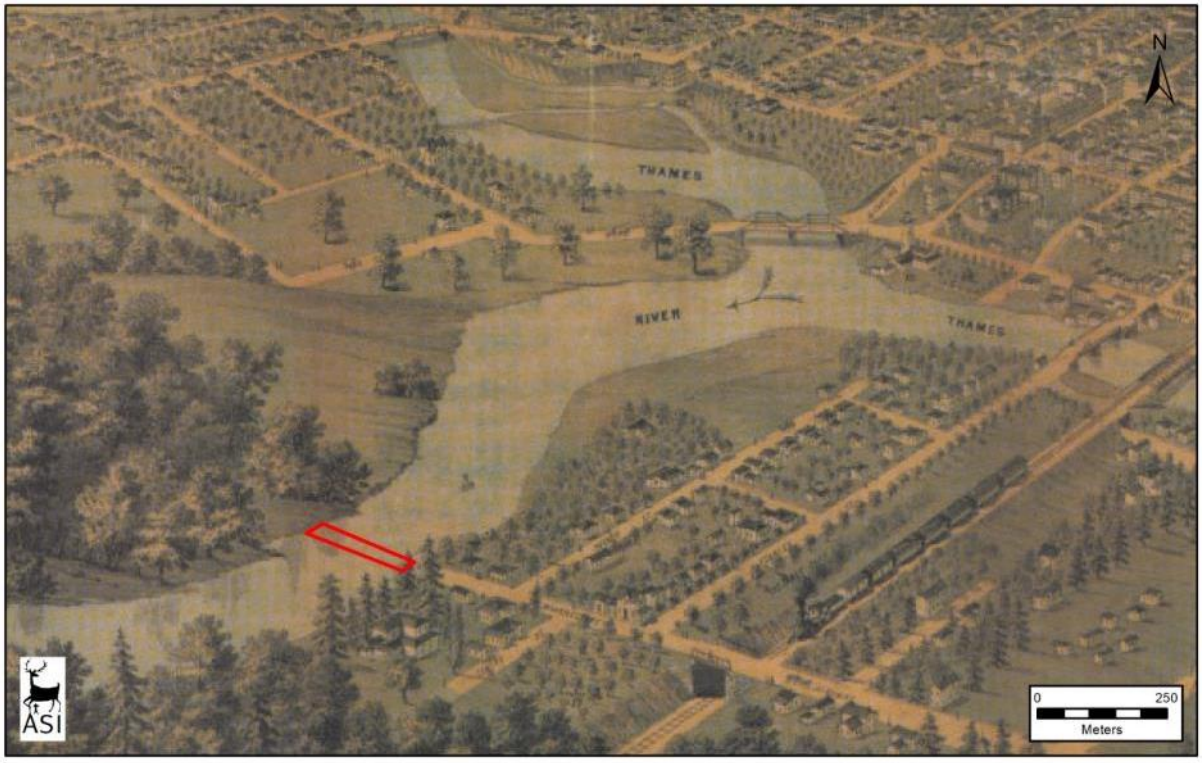

Figure 4: The study area overlaid on the 1872 bird's eye view showing Wharncliffe Road South and the terrain on the north side of the Thames River
Source: drawn by E.S. Glover, Bird's Eye View of London, Ontario Canada, 1872

Figure 5: The study area overlaid on 1878 *Map of the City of London and Suburbs*

Source: drawn by John Rogers

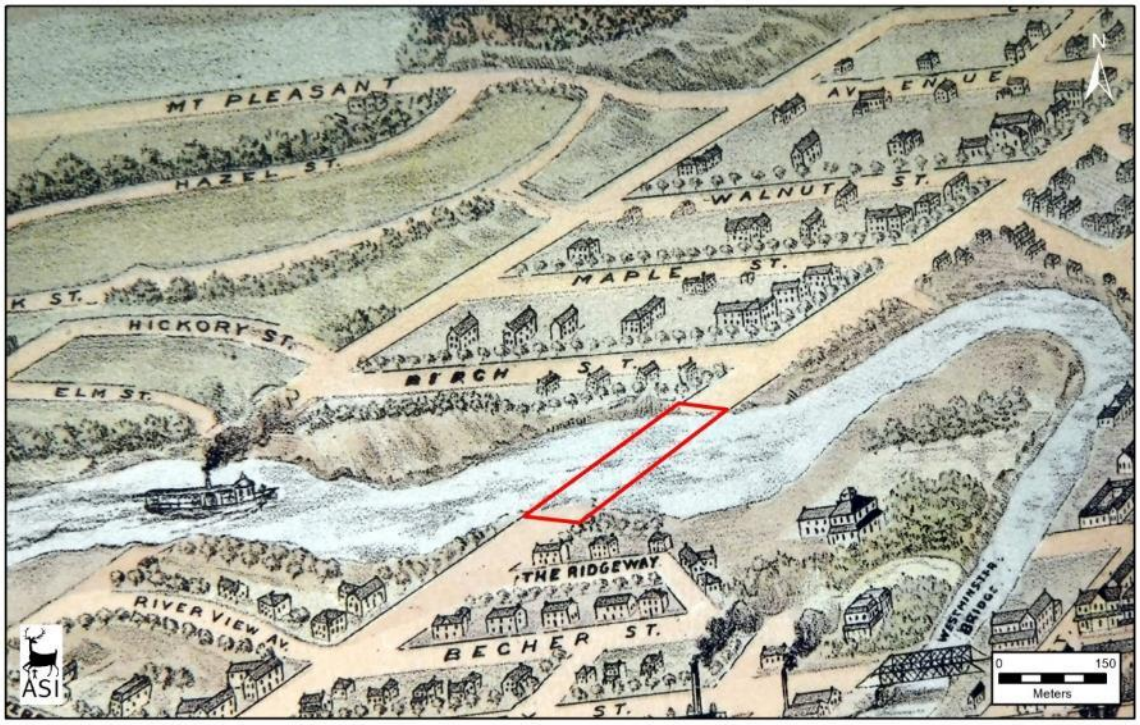

Figure 6: The study area overlaid on the 1893 bird's eye view showing settlement along Wharncliffe Road North and South

Source: drawn by Toronto Lithographing Co, 1893

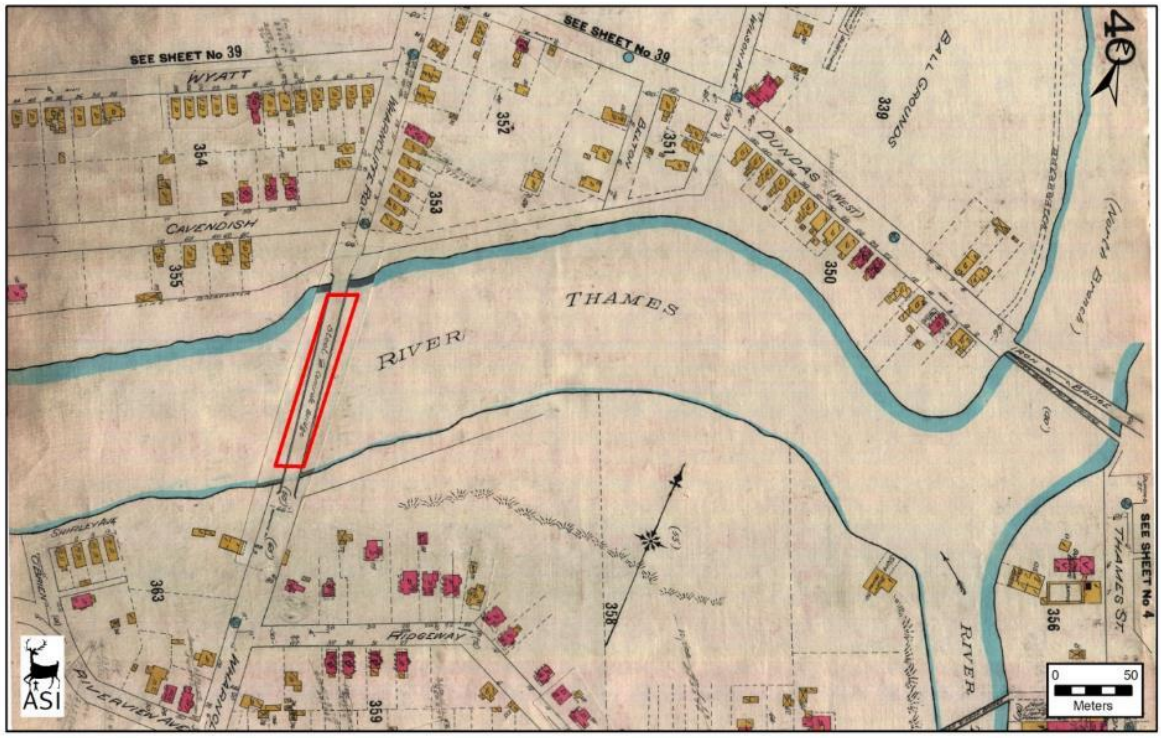

Figure 7: The study area overlaid on the 1912 (Revised 1915) Goad's *Fire Insurance Plan*
Source: Charles E. Goad Co., 1912

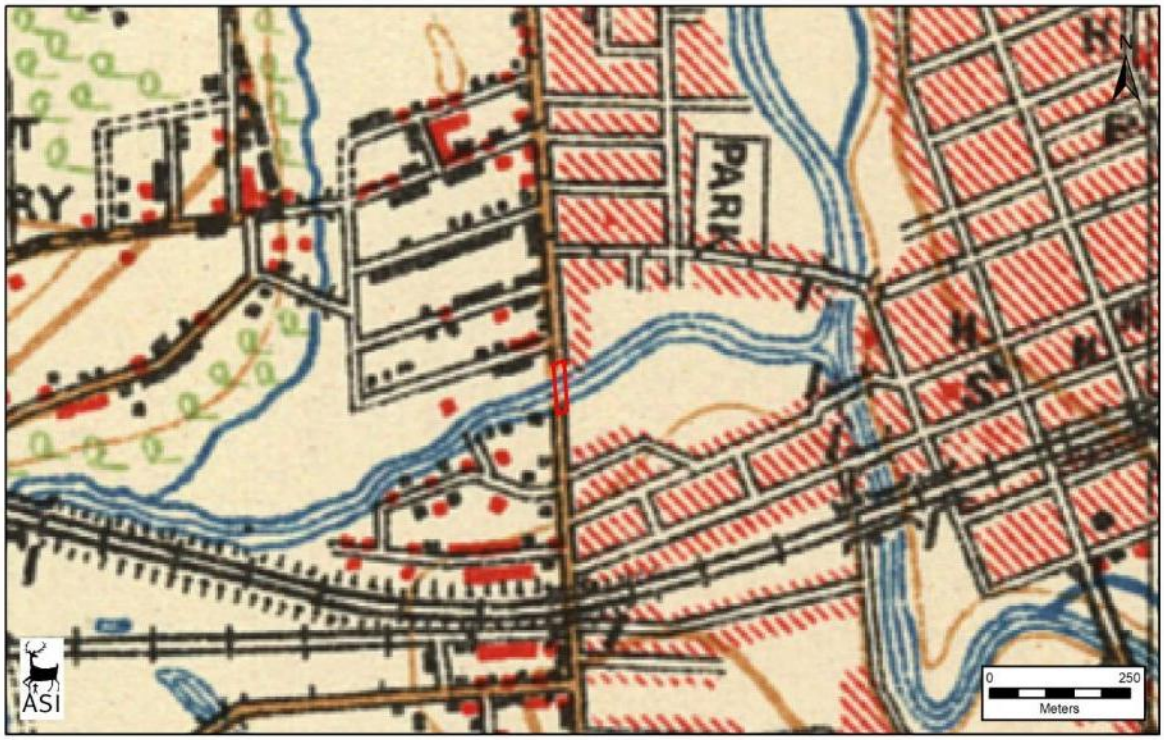

Figure 8: The study area overlaid on 1919 NTS mapping
Source: St. Thomas Sheet 40 I/14 (Department of Militia and Defence 1919)

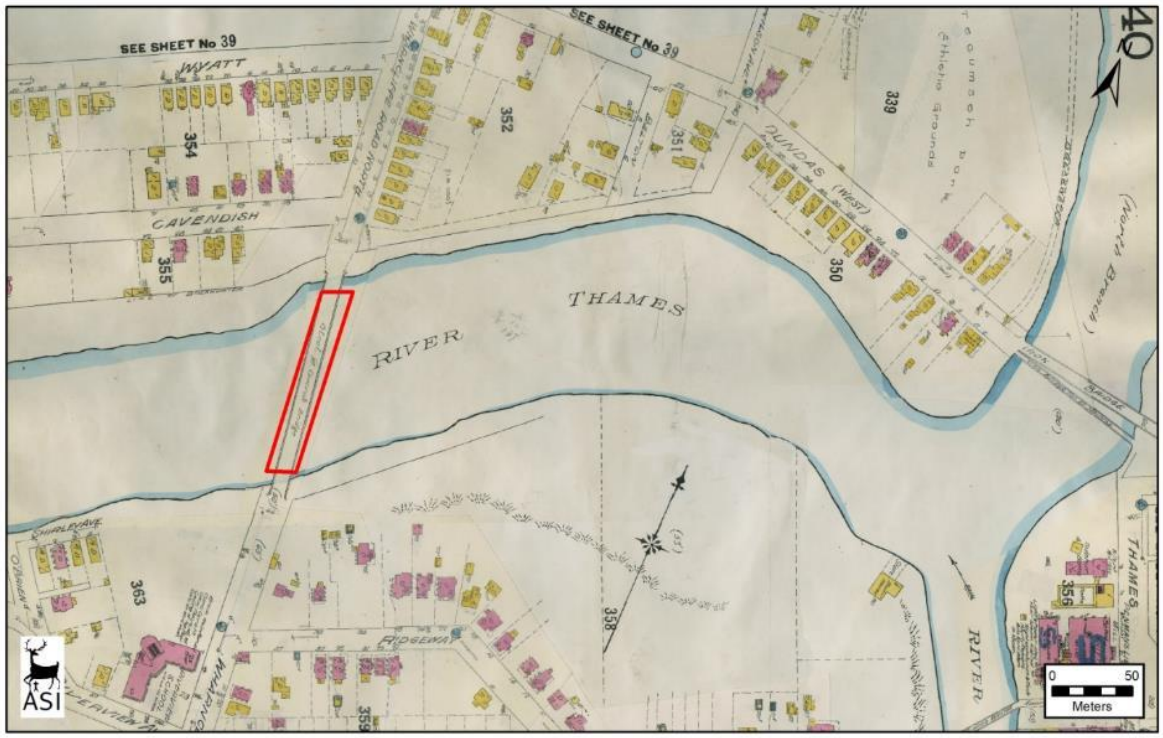

Figure 9: The study area overlaid on the 1912 (Revised 1922) London's *Fire Insurance Plan*
Source: Underwriters' Survey Bureau, 1922

Figure 10: The study area overlaid on the 1922 aerial photograph
Source: Western University
https://www.lib.uwo.ca/madgic/airphotos.html#digitalair

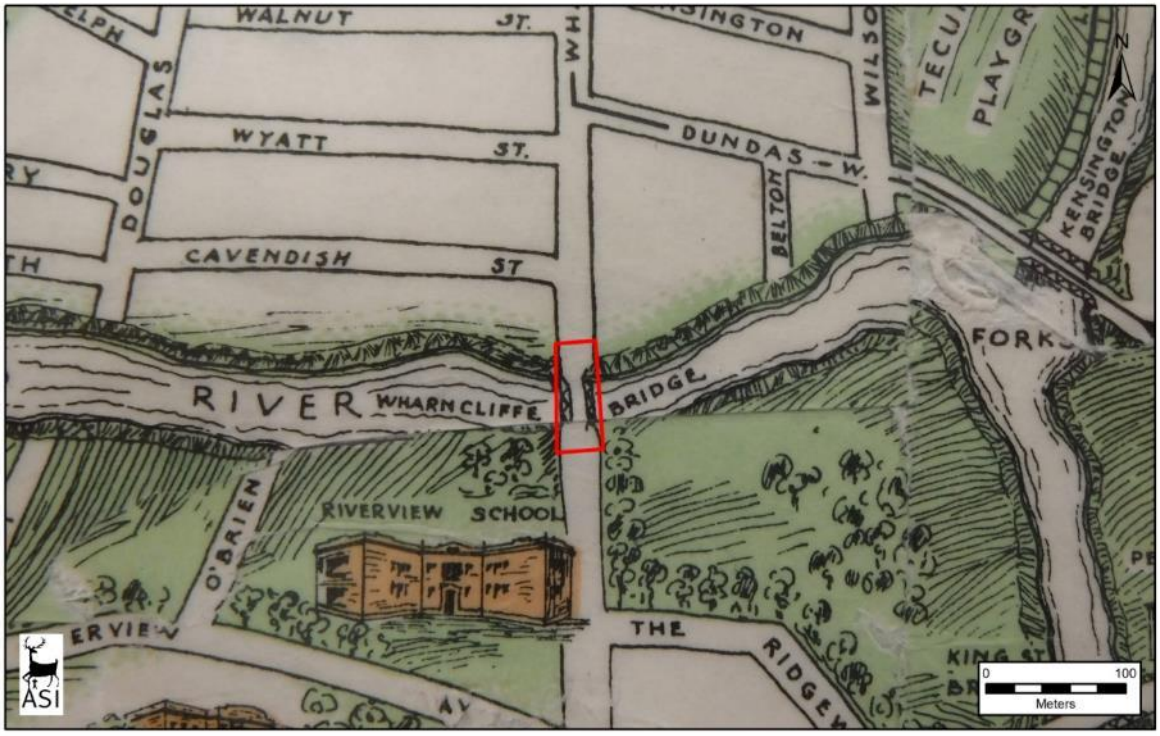

Figure 11: The study area overlaid on the 1936 *Map of London Canada* (photograph)
Source: drawn by Canadian Civic Map Service, 1936

Figure 12: The study area overlaid on the 1960 aerial photograph
Source: Western University
https://www.lib.uwo.ca/madgic/airphotos.html#digitalair

3.3.2 Previous Bridge Crossings

As stated in Section 3.3.1 of this report, no crossing of Wharncliffe Road Bridge is illustrated on available historical mapping until 1915. This map date of 1915 demonstrates that the existing Wharncliffe Road Bridge, which was constructed in 1958, is not the first crossing over the Thames River at this location.

On February 17, 1949, the *London Free Press* reminisced how the Wharncliffe Road Bridge, which began construction in 1913 was London's first "citified" bridge, meaning it was London's first bridge to be built in an urban environment. The bridge was constructed to address the need for a Thames River crossing between West London and South London to accommodate for population increases in both areas. A by-law had been passed in 1912 to permit its construction with the City providing $20,000 towards its construction (LFP February 17, 1949).

The two-lane bridge, which opened in October 1914, was constructed of steel and concrete, as shown on Figures 7 and 9 above. Based on Figure 11, the bridge appears to be a Pratt style truss structure with concrete road and piers. This first crossing cost the City approximately $31,380 (Brock 2011:186). The 124.7m bridge had the masonry work constructed by Bain and Ross Embro, the steel work completed by the Hamilton Bridge Works Company, and the deck construction by the City's Engineering Department (Brock 2011:186). The river had to be lowered by laying stop logs in the waterworks dam (cofferdam) (LFP February 17, 1949). The bridge was not built to accommodate streetcars, only pedestrian and motor vehicles. In 1948, the bridge underwent renovations since the structure was showing wear (LFP February 17, 1949). On August 28, 1957, the *London Free Press* reported that Eric Skelton, London's City Engineer, had stated that the City had no plans to replace the bridge, even though it was "rotting away."

Figure 13: View of the first two lane Wharncliffe Road crossing over the Thames River
Source: LFP, Feb. 17, 1949

3.4 Wharncliffe Road Bridge Construction

3.4.1 Early Bridge Building in Ontario

Bridges were a necessity from the earliest days of road construction. Most road bridge designs that evolved were based on principles derived from railroad construction. In Ontario, the timber bridge dominated the landscape in rural areas from 1780-1880, and persisted into the early twentieth century (Cuming 1983:38). Stone and wrought iron materials were also employed, but due to higher costs and a lack of skilled craftsmen such structures were generally restricted to market towns. By the 1890s, steel and concrete were becoming the materials of choice when constructing bridges given that both were less expensive and more durable than their wood and wrought iron predecessors. Steel truss structures were very common by 1900, as were steel girder bridges. The use of concrete in constructing bridges was introduced at the beginning of the twentieth century, and by the 1930s, it was challenging steel as the primary bridge construction material in Ontario (Ministry of Culture and Ministry of Transportation [n.d.]:7-8). Structurally a concrete slab bridge is the simplest to construct, relying solely upon the inherent strength of a single member for both structure and road surface. A concrete beam bridge is in essence a slab that is additionally strengthened by a number of longitudinal members. A girder bridge is a beam bridge with additional transverse supports between the beams (Kramer 2004).

3.4.2 History of T-Beam Bridges

In North America, the first reference to a T-beam bridge in the early twentieth century is attributed to Henry Grattan Tyrrell, a graduate of the University of Toronto, in his book *Concrete Bridges and Culverts* (Tyrrell 1909). Reinforced concrete T-beam construction was in widespread use across the United States by 1920, and was a recommended standard design by the United States Bureau of Public Roads at that time (Ketchum 1920). The construction of reinforced concrete T-beam bridges tapered off in the early 1960s. Reinforcing concrete typically introduced by laying steel rods or mesh in the formwork before pouring the wet concrete, creating a tension frame with the concrete to eliminate fractures (Chase 2015). This type appeared at the same time as flat slab span, but more economical for longer lengths. The top of the T-beam constitutes the slab, the bottom of the T-beam (the stem) appears like a girder when viewed from the side elevation. A review of the provincial bridge inventory maintained by the MTO confirmed that T-Beam bridges began to appear on Ontario roads prior to 1920 as well.

3.4.3 Construction of the Wharncliffe Road Bridge

On October 17, 1957, the *London Free Press* reported that the original Wharncliffe Road Bridge was undergoing a controlled removal piece by piece. A temporary pedestrian bridge was built to the west of the first bridge. The temporary bridge was built from timber (Figure 14), and seen in the far right in Figure 17. The newspaper article also reports that Riverview Public School lost a half of its yard to construction storage space and that many houses, with the exception of 19 Wharncliffe Road North, were torn down (LFP October 17, 1957).

Over the Christmas holidays construction on the bridge halted. When work resumed January 6, 1958, the north pier, which was ready for concrete, had shifted and required correction (Figure 15).

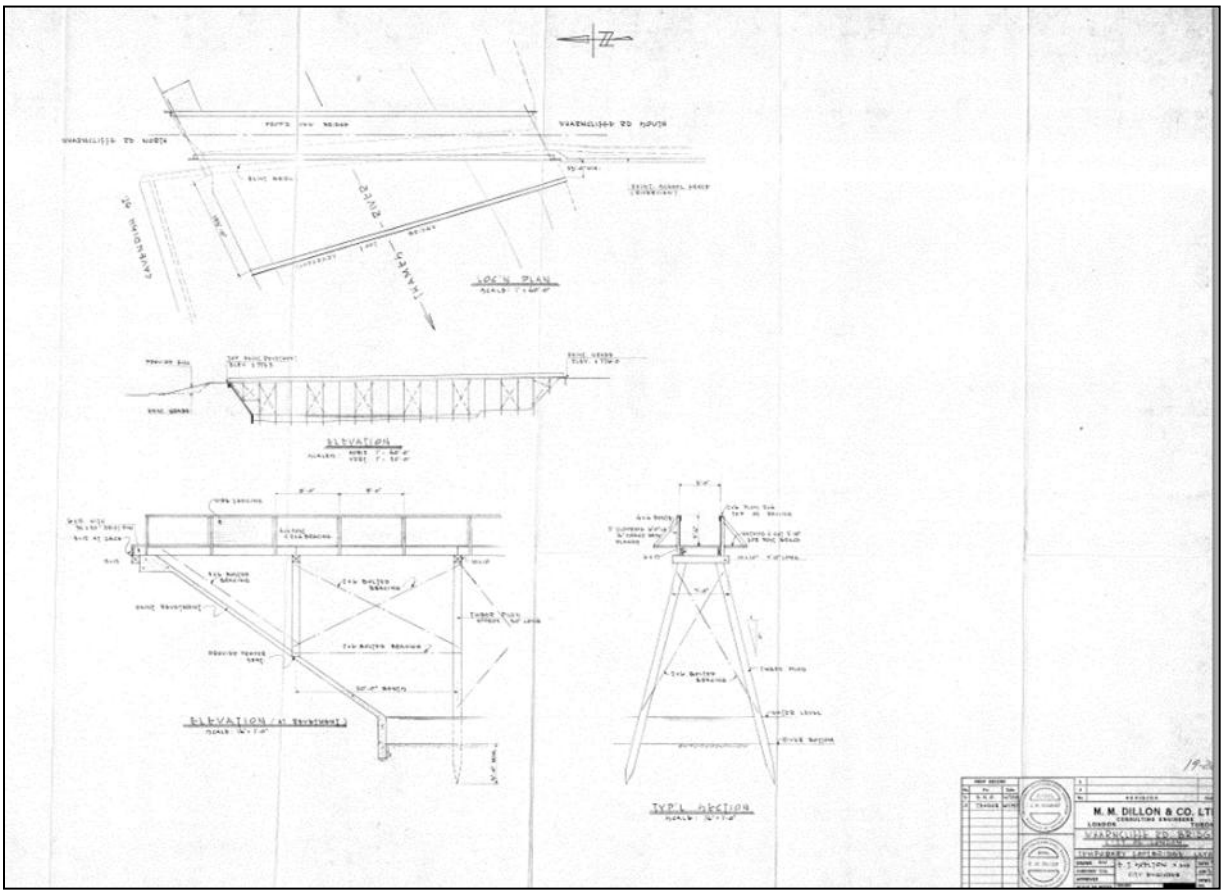

Figure 14: Plan of the temporary pedestrian bridge

Source: M.M Dillon & Co. Ltd. 1957

Prior to the opening of the bridge, S.W. Archibald, OLS, surveyor for the new structure, suggested that a name should be given to the new Wharncliffe Road Bridge. The name suggested was the "Mahlon Burwell Bridge" to commemorate the area's first surveyor, and the surveyor of Wharncliffe Highway. The name was endorsed by M.M. Dillon & Co. Ltd. and the suggestion went to London and Middlesex Historical Society who supported the suggestion. The recommended name was then forwarded to the City clerk (LFP March 23, 1958). However, a March 23, 1986 *London Free Press* newspaper article states that the names of London bridges should reflect their locations, making them easy to find. Hence the bridge was named "Wharncliffe Bridge" (LFP March 23, 1986).

On April 14, 1958, the *London Free Press* reported that 140 men were pouring 1,080 cubic metres of concrete per hour by two-wheeled buggies for two days straight, on eight hour shifts. The newspaper reported that this pour was the largest of its kind undertaken in London in order to construct London's biggest bridge (LFP April 14, 1958).

On May 8, 1958, the *London Free Press* announced that the bridge should open by the end of May. Mr. Skelton (the City Engineer) stated that there was still major work as form work had to be removed and the deck and sidewalk, poured in April, were still hardening (LFP May 8, 1958). He stated that the hardening period is usually 28 days and it would take 10 days to remove the form work (LFP May 8, 1958).

On May 29, 1958, excitement awaited the bridge's opening (LFP May 29, 1958). On May 31, 1958, the *London Free Press* announced the Wharncliffe Road Bridge was open, and on June 2, 1958 cars lined up in order to drive the new crossing (LFP June 2, 1958).

The Wharncliffe Road Bridge is a continuous four span reinforced concrete cast-in-place T- beam bridge that carries two lanes of northbound and two lanes of southbound vehicular and pedestrian traffic over the main branch of the Thames River. The bridge cost $800,000 to build which included the widening of the approaches and the demolition of houses (LFP September 8, 1958). The span has three piers and measures 400 feet long, has a 48 foot wide roadway, and a six foot wide sidewalk (LFP September 8, 1958). More than 62,000 cubic yards of concrete were poured into the structure, making it the biggest continuing concrete pours in London since the concrete pouring for the Fanshawe Dam (LFP September 8, 1958)[1].

The bridge design plans and specifications were prepared in July 1957 by M.M. Dillon & Co. Ltd, the Consulting Engineers, and the plans were approved by the City of London Engineer E.T. Skelton (see Appendix C). In September 1957 the plans were approved by the Chief Bridge Engineer of the Department of Highways, Ontario. Aiken & Maclachlan Ltd. were contracted to build the bridge and Towland Construction were contracted for the approaches.

Photographs of the bridge during construction and post-construction were found in the course of the background historical research (Figures 15 to 21).

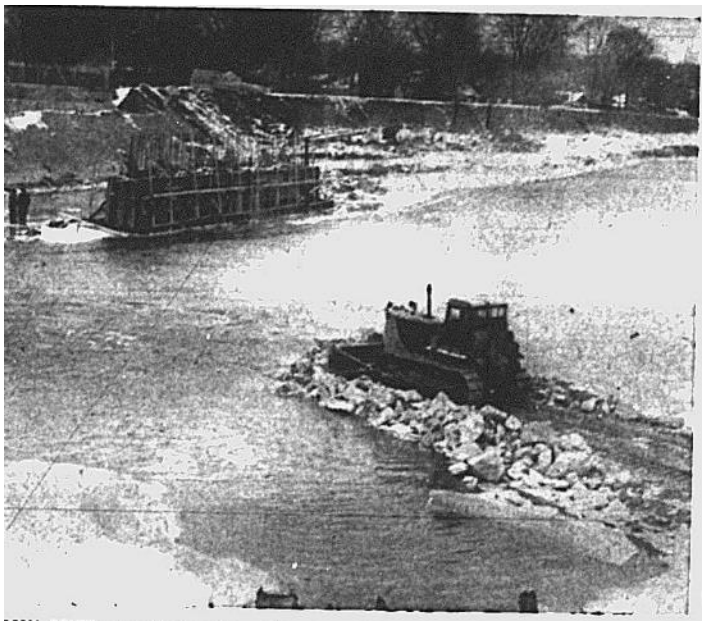

Figure 15: Breaking ice to correct the north pier after the Christmas holiday

Source: LFP January 6, 1958

[1] The Upper Thames River Conservation Authority built the dam to control the level of the Thames River; construction began 1950 and completed in 1952.

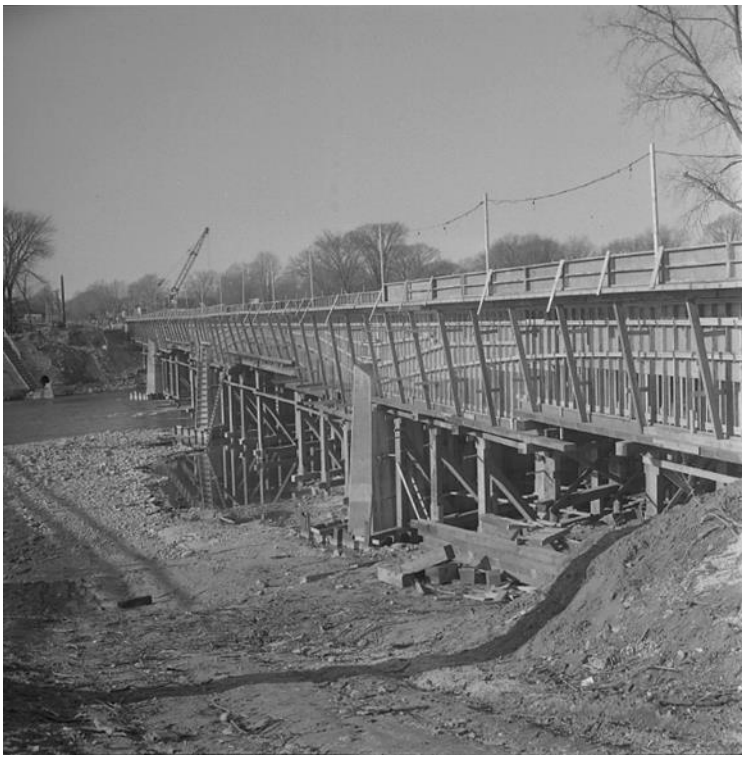

Figure 16: "Wharncliffe Road Bridge is ready for cement", view northeast
Source: LFP Collection of Photographic Negatives, Western Archives, April 13, 1958

Figure 17: Pouring cement at Wharncliffe Road Bridge, view south
Source: LFP Collection of Photographic Negatives, Western Archives, April 14, 1958

Figure 18: Progress on Wharncliffe Road Bridge
Source: LFP Collection of Photographic Negatives, Western Archives, May 7, 1958

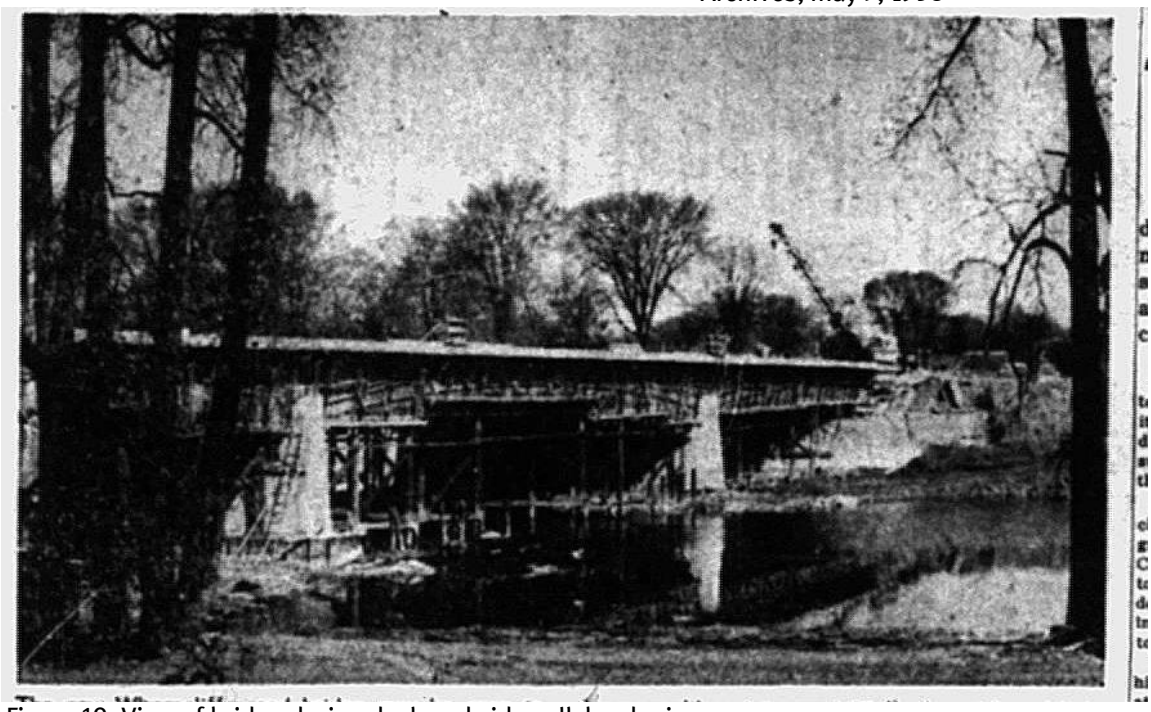

Figure 19: View of bridge during deck and sidewalk hardening
Source: LFP May 8, 1958

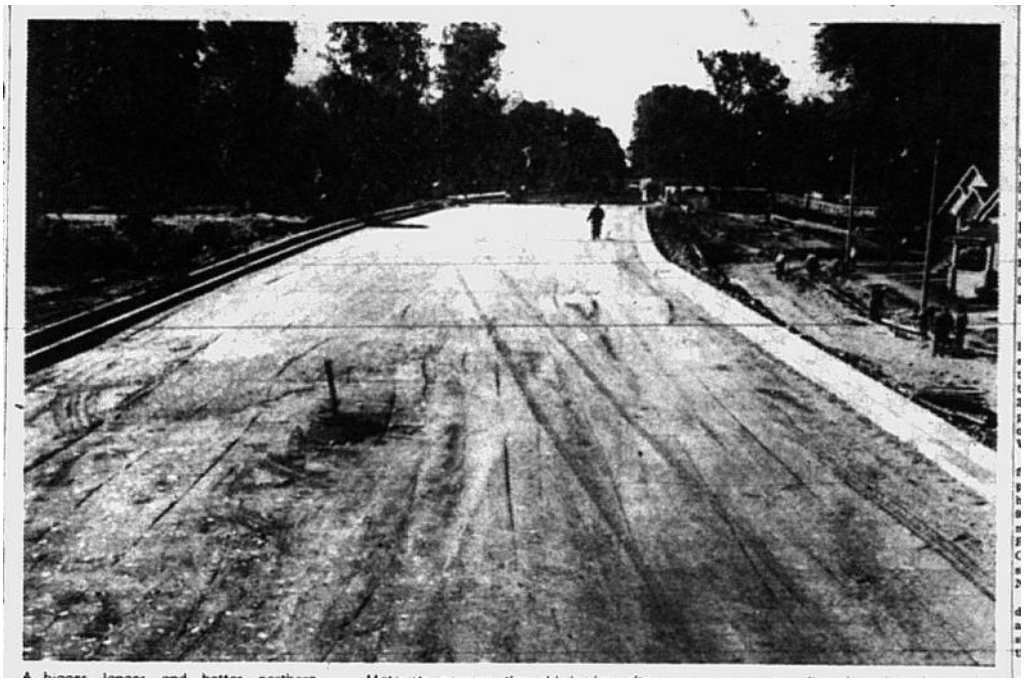

Figure 20: The new northern approach to Wharncliffe Road Bridge without the 'ski jump'
Source: LFP May 29, 1958

Figure 21: Vehicle line up after the opening of the Wharncliffe Road Bridge

Source: LFP June 2, 1958

The *London Free Press* stated on September 8, 1958, that there were three new bridges built in London that year, all part of a plan to speed traffic. Once the Wharncliffe Road Bridge had opened, traffic increased 10 percent. The old Wharncliffe Bridge had 7,300 vehicles cross per day and after the opening of the new bridge an estimated 8,000-9,000 crossed per day. The new bridge was built to accommodate 74,000 vehicles per day (LFP September 8, 1958).

According to available bridge documentation, the railing system was replaced in 1987[2] and in 1992 the deck and bearings were rehabilitated and new expansion joints and light standards were installed.

4.0 EXISTING CONDITIONS AND INTEGRITY

A field review was undertaken by Tara Jenkins on 15 September 2017 to conduct photographic documentation of the bridge crossing and to collect data relevant for completing a heritage evaluation of the structure. Results of the field review and bridge inspection reports received from the client were then utilized to describe the existing conditions of the bridge crossing. This section provides a general description of the bridge and associated cultural heritage features. For ease of description the bridge is considered to have a north-south orientation. Photographic documentation of the structure is provided in Appendix A and photograph locations and orientations are provided on the map in Appendix B.

The bridge is a continuous, four span reinforced concrete cast-in-place T-beam bridge that carries four lanes of Wharncliffe Road traffic over the Thames River. Wharncliffe Road is a major north-south arterial road that is comprised of four lanes of vehicular traffic, including left turning lanes at selected street intersections. Generally, there are pedestrian sidewalks, streetlights and utility poles on both sides of the road. In the vicinity of the bridge approaches, the area is characterized by late nineteenth to early twentieth century residential, commercial and institutional development, and includes park space along the abutting the banks of the Thames River. Notably, to the southwest of the bridge is 21 Wharncliffe Road, the former Riverview Public School, which opened in 1916.

According to an inspection undertaken in 2015, the structure is referred to as the Wharncliffe Road Bridge located on Wharncliffe Road over the Thames River (City of London Structures Database). The framing system is described as a four-span continuous T-beam and cast-in-place concrete slab. The bridge has a total crossing length of 134m (between abutment bearings). The deck has a travel width of 14.3m and an overall width of 18.4m. The four span lengths measure at 28m, 39m, 39m, and 28m (Brad Schmidt, personal communication, 14 September 2017). There are paved concrete sidewalks with curbs on either side of the traffic lanes.

The Wharncliffe Road Bridge has not been identified as a heritage structure by the City of London, and thus is not designated under Part IV of the *Ontario Heritage Act* nor is it listed on a heritage inventory (Kyle Gonyou, personal communication, 14 September 2017).

In general, the bridge features two approach spans. The topography of the bridge can be seen in Figure 28, Appendix C. The southern approach is inclined towards the deck, while the northern approach slopes down from the deck. Steel beam guide rails with wooden posts are present along the northern approach, although not secured to the wingwalls (Plates 3 and 7). Both approach spans rest on steel bearings on concrete abutments (Plate 18). The north abutment includes a concrete backwall to retain the steep embankment (Plate 23). The centre spans, also paved with asphalt, are continuous and rest on three concrete piers that make up the four-span bridge. Two piers were constructed in the Thames River, while the other was built on the south bank (i.e. Plate 1). The Thames Valley Parkway (TVP), a multi-use pathway system, associated with River Forks Park is located between the south pier and the south abutment (Plate 16). The structure has a high vertical clearance that could allow for boats to pass under in order to travel the Thames River. The design plans were prepared by M.M. Dillon & Co. Ltd, the

[2] Original railing system is shown on the profile drawing of Wharncliffe Road Bridge, ca. 1957 (Appendix C: Figure 23)

Consulting Engineers, and the plans were approved by the City of London Engineer E.T. Skelton. A selection of bridge design plans are provided in Appendix C.

There is an asphalt deck surface (i.e. Plate 9) upon the deck structure. The deck structure consists of a concrete slab span soffit. Deck drains are located on the east side and west side adjacent to the concrete curbs (Plate 11). The deck slab is integrated with longitudinal "T-beams" (Plate 21). Design plans suggest the transverse diaphragms (distributer beams) were cast-in-place along with the deck structure, thus forming the deck system. This gives the bridge a final appearance of a girder bridge when viewed from underneath or from a side elevation. The decorative detailing of the bridge is seen in the concrete formed arch of the beams, which creates a visual appeal (Plate 22). As seen along the west elevation of the bridge there is a 300m watermain carried across the bridge (Plate 24).

The deck system rests upon either rocker (on the north and south piers) or fixed bearings (on the centre pier) which are connected to the concrete piers and the abutment walls. Concrete wingwalls which act as retaining walls are adjacent to the abutment (i.e. Plate 29). These wingwalls are cantilevering from the abutment wall, necessitated by the steep embankment slope. There is a marker (19-288) on the northwest wingwall indicating the structure number (Plate 6). In addition, the southeast wingwall contains the City of London bridge plaque which contains the name of the bridge ("Wharncliffe Road Bridge"), date erected, name of the Mayor, names of Chair and Members of the Environment & Transportation Committee, name of the City Engineer, name of the Consulting Engineer, name of the bridge contractor and the approach contractor (Plate 27). The practice of plaquing newly constructed bridges by the municipality was discontinued in 1995.

Beneath the bridge the structure appears to be skewed, as evident in the southern abutment, and the view of bridge from the walking path beneath (Plate 20). This however does create a level deck surface. Design plans show that the original railing system was comprised of steel rail and posts (Figure 23, Appendix C). This original railing system was replaced in 1987 and today the guide railing arrangement is comprised of a concrete parapet wall and aluminum two-rail system (i.e. Plates 4, 7, and 8). The guide rail is attached by typical bolts. This railing system still allows pedestrians to view the river from the bridge sidewalk. There are four light standards attached to the parapet walls on concrete parapet posts. These light standards are also not original. A light standard, on the northern approach is an earlier pole and retains a support for the bracket arm, once a decorative feature on the bridge. This pole also contains the City of London Thames River crossing sign naming the bridge as "Wharncliffe Bridge, Since 1914" (Plate 5).

In March 1985, M.M. Dillon undertook a Bridge and Structure Study for the City of London. The report stated that deck bearings required urgent attention involving the cleaning of bearings and abutment seats, the restoring of abutments, the repair of the south slope, and the repair of the railings.

The Wharncliffe Road Bridge is currently owned and maintained by the City of London. The speed limit is 50 km/h with no posted load limit. According to the City of London Structures Database, Single Structure Condition Report (2015) completed by AECOM, the report found the following deficiencies required attention (Appendix D):

Short Term, Maintenance to:

- Clear expansion joints.
- Clear deck drains.
- Remove biohazard material below bridge.
- Concrete patch repairs on curbs/sidewalks.

Medium Term, Major Rehab to:

- Replace bearings.
- Concrete repairs on the north concrete slope paving.
- Install erosion protection at south abutment.
- Concrete patch repairs.
- Eliminate/replace expansion joints.
- Consider repairs to watermain.
- Waterproof and pave road.

4.1 Comparative Geographic and Historic Context of Bridges in the City of London and in Ontario

The Ministry of Transportation's (MTO) inventory of bridges was reviewed for comparison and revealed that there are 157 reinforced cast-in-place concrete bridges in the West Region for southern Ontario. Of the 157, 138 are frame or slab type reinforced cast-in-place concrete bridges. The remaining 19 are beam/girder cast-in-place bridges.

Of the 19 beam/girder cast-in-place type bridges, one is a rigid frame T-beam bridge, two are box beam, five are T-beam (boat type), and 11 are T-beam. Three of the 19 beam/girder bridges were built in the 1930s, one in the 1970 and one in the 1980s. The majority of these beam/girder reinforced cast-in-place concrete bridges were built in the 1950s (n=5) and 1960s (n=9), when the Wharncliffe Road Bridge was constructed.

Of the 11 T-beam cast-in-place bridges, four bridges have one span, one has two spans, one has three spans and four have four spans, similar to the Wharncliffe Road Bridge. None of the cast-in-place concrete beam/girder bridges for the West Region exceed the deck length of 81.4m or exceed a span length of 29m. Therefore, in comparison to the other MTO Regions, the Wharncliffe Road Bridge is the longest cast-in-place T-beam bridge making it an atypical length of bridge to be cast-in-place.

A search of *historicplaces.ca* for concrete bridges in Middlesex County, Ontario, resulted in six bridges, all of which are one span concrete rigid frame type bridges[3].

The Wharncliffe Road Bridge is not typically considered part of the historical bridge group in downtown London (Blackfriars Bridge, King Street Bridge, Kensington Bridge and Victoria Bridge) (AECOM 2016). The *London Free Press*, March 23, 1986, reported that 18 bridges crossed the Thames River in the City of London. In addition, 15 bridges crossed creeks and eight were overpasses of the CN and CP rail. Table 2 provides of a list of the 18 Thames River crossings from the *London Free Press*, March 23, 1986.

Table 2: The "Facts about London Bridges", adapted from the LFP March 23, 1986[4]

Bridge Name (c.1986)	Street	Built	Rebuilt	Length
Blackfriars	Ridout-Blackfriars	1875		66.75m
Victoria	Ridout	1875	1926	78.64m

[3] Parks Canada's *Canada's Historic Places* website: available online, the searchable register provides information on historic places recognized for their heritage value at the local, provincial, territorial, and national levels, available at http://www.historicplaces.ca/en/pages/about-apropos.aspx (reviewed 22 September 2017)
[4] The data in Table 2 from 1986 may be outdated.

Table 2: The "Facts about London Bridges", adapted from the LFP March 23, 1986[4]

Bridge Name (c.1986)	Street	Built	Rebuilt	Length
Oxford	Oxford	1881-82	1954, 1980	121.31m
York	York-Stanely	1881	1977	48.16m
Wellington	Wellington	1882	1974	65.23m
Kensington	Dundas	1884	1930	95.40m
Adelaide North	Adelaide North	1887	1982	70.71m
King	King-Becher	1897		64.92m
Chelsea	Adelaide South	1904		81.08m
Vauxhall	Egerton-Thompson	1904	1958	64.16m
Meadowlily	Meadowlily	1910		86.87m
Wharncliffe	Wharncliffe	1913-14	1958	134.36m
Richmond	Richmond North	1922	1962	60.96m
Richmond	Richmond (Old Traction Bridge)	1934		48.77m
Byron	Boler-Riverside	1973		76.20m
Queens	Queens-Riverside	1973		118.26m
Guy Lombardo	Wonderland	1977		219.46m
Horton	Horton	1985		64.00m

The Vauxhall Bridge, which carries Egerton Street traffic across the Thames River, opened the same year as the Wharncliffe Road Bridge. The design of the bridge is different to the Wharncliffe Road Bridge, in that the Vauxhall Bridge is a reinforced concrete rigid frame bridge including an inverted U shape arch over the river and the horizontal components were cast to resemble a pier shape.

Email communication with the City of London Transportation Planning and Design Department states that as of 2017, the City of London has 102 bridges and of that, 25 bridges and four footbridges span the Thames River (personal communication, Jane Fullick, 26 September 2017). The Wharncliffe Road Bridge is one of eight bridges built before 1960 that are extant. There is one other cast-in-place T-beam bridge in London, however with a significantly shorter span, crossing Pottersburg Creek.

In summary, Wharncliffe Road Bridge is one of the older Thames River bridge crossings in London. It was a substantial infrastructure project for its time as it is an exceptionally long T-beam bridge to be cast-in-place. It can be considered a bridge in a group of bridges crossing the Thames River near the Forks of the Thames. This group includes bridges: Blackfriars Bridge (built in 1875), Kensington Bridge (1930), King Street Bridge (1897), Queen's Street Bridge (1973), Westminster Bridge (1977), Victoria Street Bridge (1926), and the Canadian National Bridge over the main branch of the Thames River. These structures do not represent a family of bridges; however they contribute to the character and significance of the Forks of the Thames and to the understanding of the history and the evolution of the City of London.

4.2 Additional Cultural Heritage Resources

In addition to the Thames River as a designated Canadian Heritage River (see section 2.1.1), there is one property designated under Part V and two properties on London's Register (Inventory of Heritage Resources) in the vicinity of the Wharncliffe Road Bridge. See Appendix A for views and additional cultural heritage resources in the context of the bridge.

The first heritage property is Riverside Park (70-84 Riverside Drive), which is designated Part V under the *Ontario Heritage Act* – a part of the Blackfriars/Petersville Conservation District. The park is noted as a public space/landmark in the City of London. A pathway leading to the trail associated with the park is accessible from the northern approach of Wharncliffe Road Bridge (Plate 30).

The second heritage property is the former Riverview Public School, now London's Regional Children's Museum located at 21 Wharncliffe Road South. The property was placed on the City's Register (Inventory of Heritage Resources) in 2016. The two storey brick and reinforced concrete school with two wings opened in 1916. The school was designed by L.E. Carrothers and J.V. Munro. The school closed in 1978 and was repurposed as a Children's Museum in 1981. A portion of this heritage property is adjacent to the southern approach of the Wharncliffe Road Bridge (Plate 15). In addition, a portion of the site includes the River Forks Park - West (UMcA Draft 2016:31)

The third heritage property is 30 Wharncliffe Road North. It is ranked a Priority 2 on London's heritage inventory, meaning the building merits evaluation for designation under Part IV of the *Ontario Heritage Act*. It was recommended for listing on the inventory in the Blackfriars/Petersville Conservation District report guidelines (Golder Associates *et al.* 2014). The building was built in 1940-41 and eventually became the Three Little Pigs Pantry, one of several Disney-themed restaurants in London at the time. Now housing a Mexican restaurant, "Under the Volcano," the building still exhibits its fine modern lines. The property falls just north of the northern approach of the Wharncliffe Road Bridge (Plate 33).

In addition, two heritage properties, 18 and 20 Wharncliffe Road South were identified in a previous assessment (UMcA Draft 2016:32) however these are located just south of the southern approach. It should be noted that other properties sit close to the bridge approaches, such as 6 Wharncliffe Road South and 8, 9, 10, and 12 Cavendish Crescent. These properties have not been included on the City of London Inventory of Heritage Resources, but may have potential cultural heritage value or interest, since some predate 1915, as indicated by London's Fire Insurance Plans (Figure 7).

5.0 HERITAGE EVALUATION OF THE WHARNCLIFFE ROAD BRIDGE

Table 3 contains the evaluation of the Wharncliffe Road Bridge against criteria as set out in *Ontario Heritage Act* Regulation 9/06. In the Municipal EA process, Ontario Regulation 9/06 is the prevailing evaluation tool when determining if a heritage resource, in this case a bridge, has cultural heritage value.

Table 3: Evaluation of the Wharncliffe Road Bridge using Ontario Regulation 9/06

1. The property has design value or physical value because it:

Ontario Heritage Act Criteria	Yes/No	Analysis
i. is a rare, unique, representative or early example of a style, type, expression, material or construction method;	No	The Wharncliffe Road Bridge is a representative example of a reinforced cast-in-place concrete T-beam bridge. This four lane bridge carries vehicular and pedestrian traffic on Wharncliffe Road across the Thames River. Built in 1958, the structure contains its original design features including: concrete span soffit, longitudinal arched concrete beams, concrete wingwalls, concrete piers, and steel bearings. According to the design drawings, the deck system of the bridge (deck and beams) was monolithically cast-in-place. This construction method combined with its long overall deck length of 134m (between abutment bearings) and long individual span lengths (28m, 39m, 39m, 28m) makes this bridge noteworthy as a large concrete pour infrastructure project in the City of London for its time. However, this bridge represents a common bridge type for the 1950s and 1960s, many of which still exist in Ontario today, and it is not considered to have significant design or physical value.
ii. displays a high degree of craftsmanship or artistic merit, or;	No	The Wharncliffe Road Bridge does not display a high degree of craftsmanship or artistic merit.
iii. demonstrates a high degree of technical or scientific achievement.	No	The Wharncliffe Road Bridge does not exhibit a notable design and it is not considered to exhibit a high degree of technical or scientific achievement.

2. The property has historical value or associative value because it:

Ontario Heritage Act Criteria	Yes/No	Analysis
i. has direct associations with a theme, event, belief, person, activity, organization or institution that is significant to a community;	No	Historically, in 1824 Colonel Thomas Talbot instructed Deputy Land Surveyor Mahlon Burwell to survey the right-of-way for Wharncliffe Road, a road named after Talbot's friend James A. Wharncliffe. Wharncliffe Road was an important transportation route which was constructed to link settlements in Westminster Township with future settlements in London Township. However, the bridge itself does not have any direct associations with a theme, event, belief, person, activity, organization or institution that is significant to the community of London.
ii. yields, or has the potential to yield, information that contributes to an understanding of a community or culture, or;	No	This bridge is not considered to have the potential to yield information that contributes to an understanding of a community or culture.

Table 3: Evaluation of the Wharncliffe Road Bridge using Ontario Regulation 9/06

iii. demonstrates or reflects the work or ideas of an architect, artist, builder, designer or theorist who is significant to a community.	No	This bridge is not known to represent the work or ideas of a particular architect or building significant to the community.

3. The property has contextual value because it:

Ontario Heritage Act Criteria	Yes/No	Analysis
i. is important in defining, maintaining or supporting the character of an area;	No	Bridges crossing the Thames River in London are iconic features of the city. They provide interactions and visual windows to the Thames Valley Corridor, both visually and functionally. They are a distinctive part of the city's identity. However, the Wharncliffe Road Bridge is not of a significant, interesting or notable design, and therefore does not play a significant role in defining, maintaining and supporting the character of the area.
ii. is physically, functionally, visually or historically linked to its surroundings, or;	No	The Wharncliffe Road Bridge is known to have served as a vehicular and pedestrian bridging point over the Thames River since 1914 when the first two lane steel and concrete Truss bridge was built at this location connecting London's west and south neighbourhoods. The bridge was replaced in 1958 by the current bridge. The bridge can be seen from the Forks of the Thames, however it is not a significant visual feature. This bridge does not significantly define or support the character of its surroundings, and is not visually or historically linked to its surroundings.
iii. is a landmark.	No	The Wharncliffe Road Bridge is not locally recognized as a landmark.

The above evaluation has determined that the Wharncliffe Road Bridge does not meet any of the criteria contained in Regulation 9/06 of the *Ontario Heritage Act.* Accordingly, this structure does not retain significant cultural heritage value and is not eligible for designation under the *Ontario Heritage Act.*

6.0 CONCLUSIONS AND RECOMMENDATIONS

The bridge is on London's 0-5 year Major Repair Program listing. The general scope of repair work is anticipated to include: rehabilitation of concrete substructure, girders, deck and sidewalks; bearing replacement or rehabilitation; rehabilitation of the parapet walls; replacement or elimination of the expansion joints; repairs to the suspended utilities; upgrades to existing lighting; waterproofing; asphalt repaving; and improving connectivity to the Thames Valley Parkway pathway system will be considered.

The Wharncliffe Road Bridge is 59 years old and in accordance with the Ontario Ministry of Tourism, Culture and Sport policy, may have cultural heritage value given its age. Therefore, a Cultural Heritage Evaluation report by a qualified heritage consultant was required.

The Wharncliffe Road Bridge is a four span reinforced cast-in-place concrete T-beam bridge built to carry Wharncliffe Road vehicular and pedestrian traffic over the Thames River in London, Ontario. Based on the results of archival research, an analysis of bridge design and construction in Ontario, comparative bridge analysis, field investigations and application of *Ontario Heritage Act* Regulation 9/06, the Wharncliffe Road Bridge was not determined to retain cultural heritage value. Accordingly no heritage impact is anticipated.

Given this evaluation of the Wharncliffe Road Bridge, the following recommendations should be considered and implemented:

1. This report should be filed with London's heritage staff including London's Advisory Committee on Heritage.

2. This report serves as sufficient heritage documentation of the bridge.

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APPENDIX A: Photographic Plates

Plate 1: View of the west elevation of the Wharncliffe Road Bridge and the Thames River Valley.

Plate 2: View of row of houses on Cavendish Crescent, adjacent to the northern approach.

Plate 3: View of northern approach to the bridge.

Plate 4: Oblique view of the west elevation.

Plate 5: View of Bridge sign along the northern approach: "Thames River, Wharncliffe Bridge, Since 1914."

Plate 6: Bridge structure number.

Plate 7: North expansion joint with view of the wingwall and the railing system.

Plate 8: Pedestrian walkway on west side of bridge. View of the light standard.

Plate 9: View of the bridge deck and east sidewalk and curb.

Plate 10: View of downstream Thames River from the west sidewalk.

Plate 11: Example of the deck drains.

Plate 12: Base of light standard on the parapet post.

Plate 13: View of sidewalk, looking north.

Plate 14: View of south expansion joint.

Plate 15: View of 21 Wharncliffe Road South looking from the south approach.

Plate 16: The Thames Valley Parkway, a multi-use pathway, under the bridge.

Plate 17: View of the south face of the south pier from the abutment.

Plate 18: View of the south abutment and bearings.

Plate 19: Close up of the south abutment.

Plate 20: View of the south face of the centre pier. Note the slight skew of the pier.

Plate 21: View of the bridge soffit and beams.

Plate 22: Oblique view of the east elevation.

Plate 23: View of the steep backwall and north pier.

Plate 24: West elevation of bridge, view of watermain pipe.

Plate 25: View of the south pier, looking east.

Plate 26: Sidewalk looking north along the east side of the bridge.

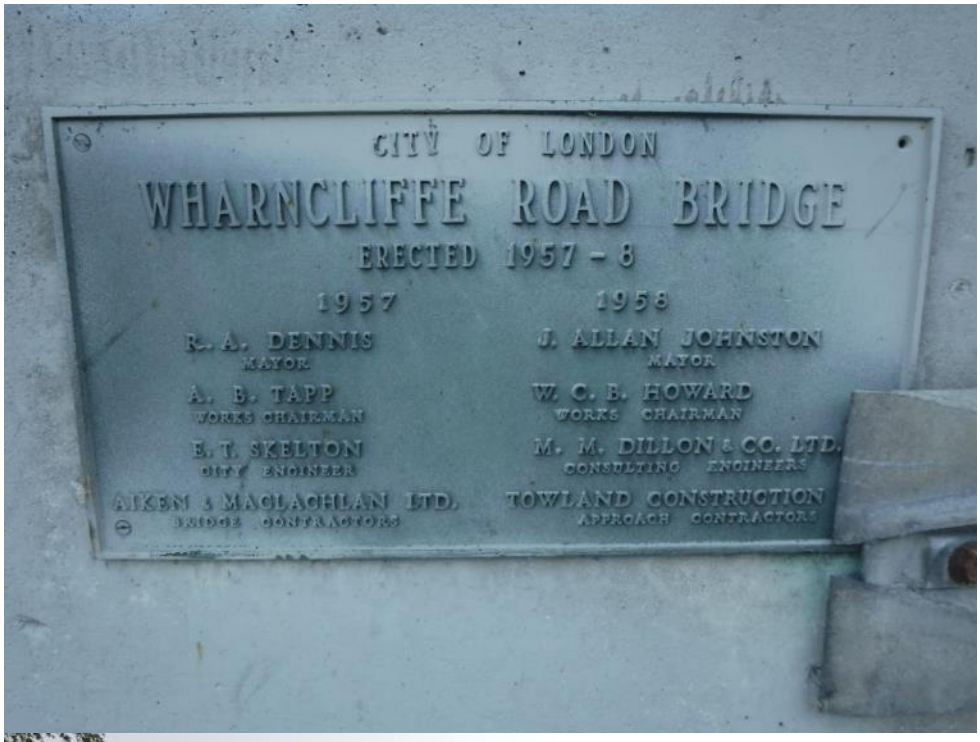


Plate 27: City of London bridge plaque, located on the southeast wingwall.

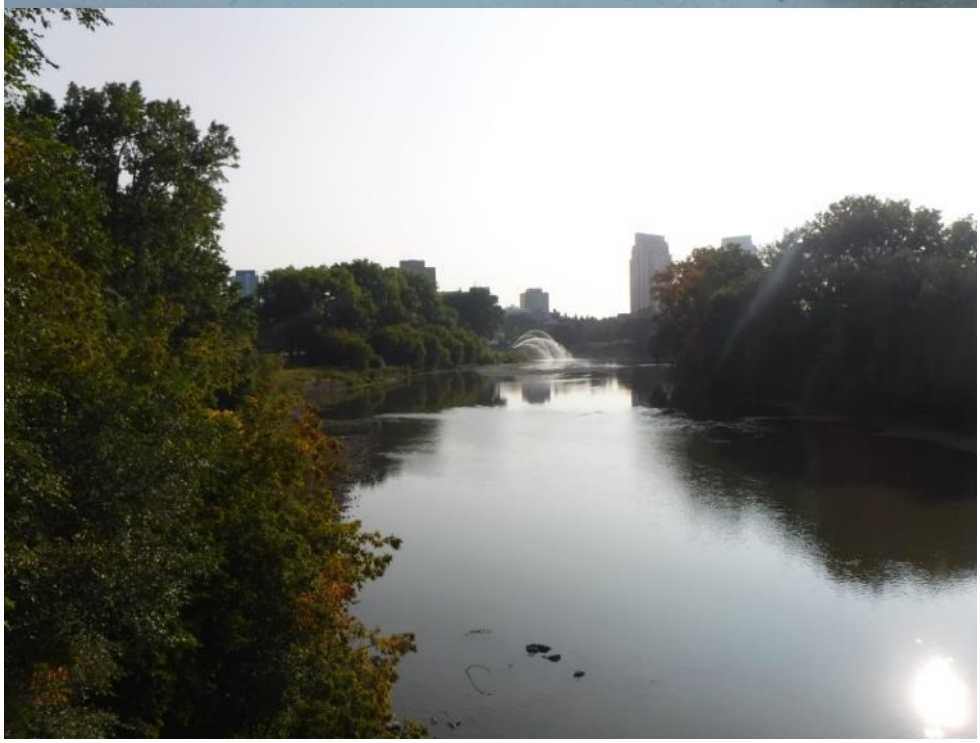


Plate 28: View of upstream Thames River from the east sidewalk.

Plate 29: View of the northeast wingwall and steep slope of the embankment.

Plate 30: View of the north approach and the Blackfriars/ Petersville HCD property to the left of the bridge.

Plate 31: View of the east elevation from within the Thames River Corridor.

Plate 32: View of the east elevation from Ivey Park, at the Forks of Thames.

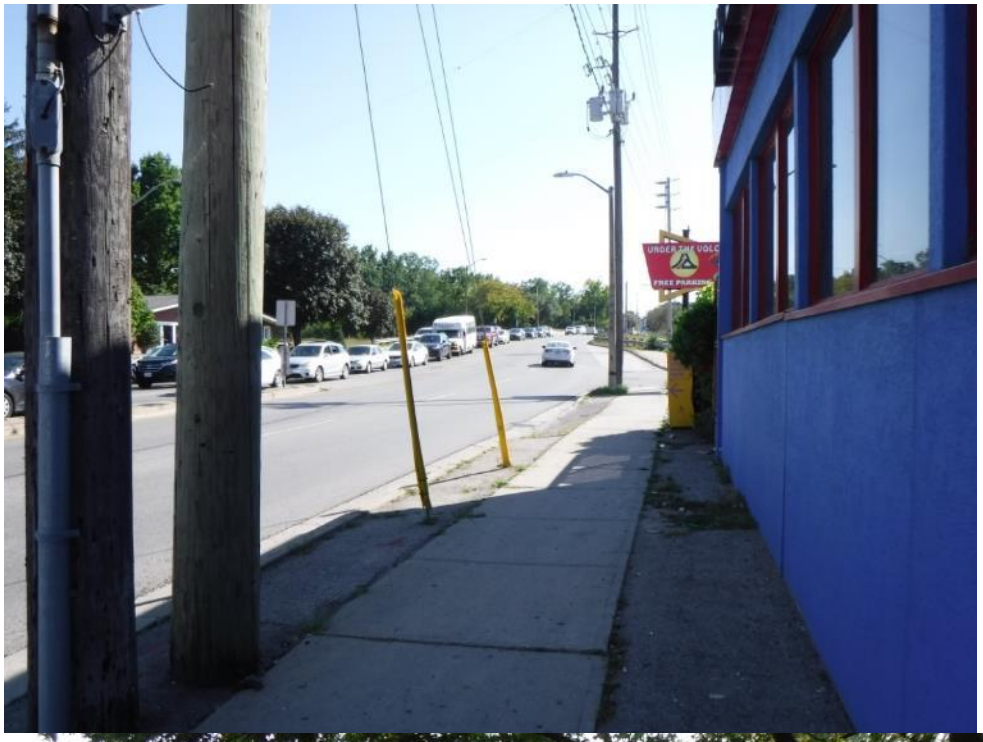
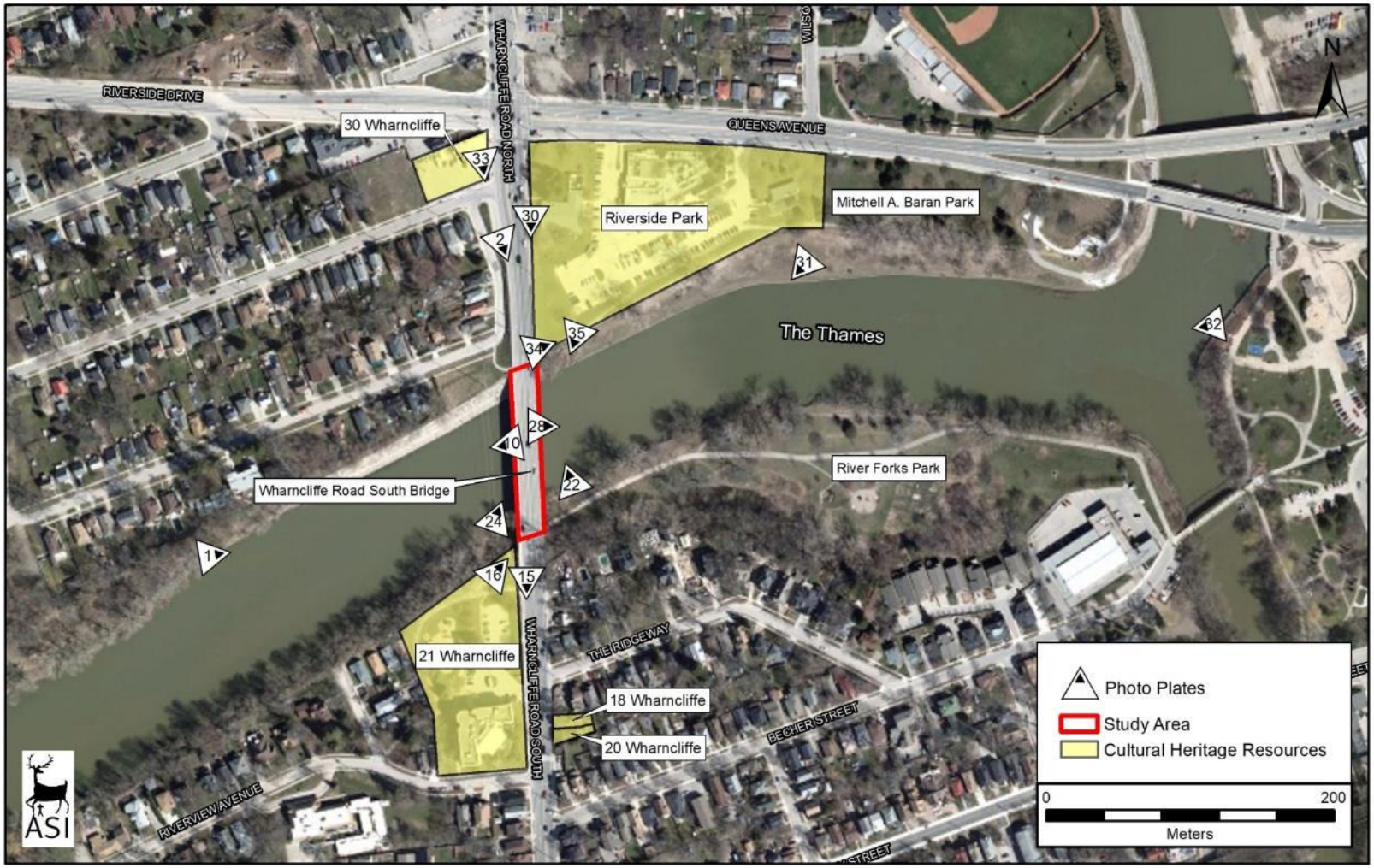


Plate 33: Looking towards the northern approach of the bridge from 30 Wharncliffe Road North.

Plate 34: Walking path from northern approach into the Blackfriars/ Peterville HCD.

Plate 35: View of bridge from the walking path in the Blackfriars/ Peterville HCD.

APPENDIX B: Views, Cultural Heritage Resources, with Select Photographic Plates



APPENDIX C: M.M. Dillon & Co. Ltd. – Wharncliffe Road Bridge Select Design Plans

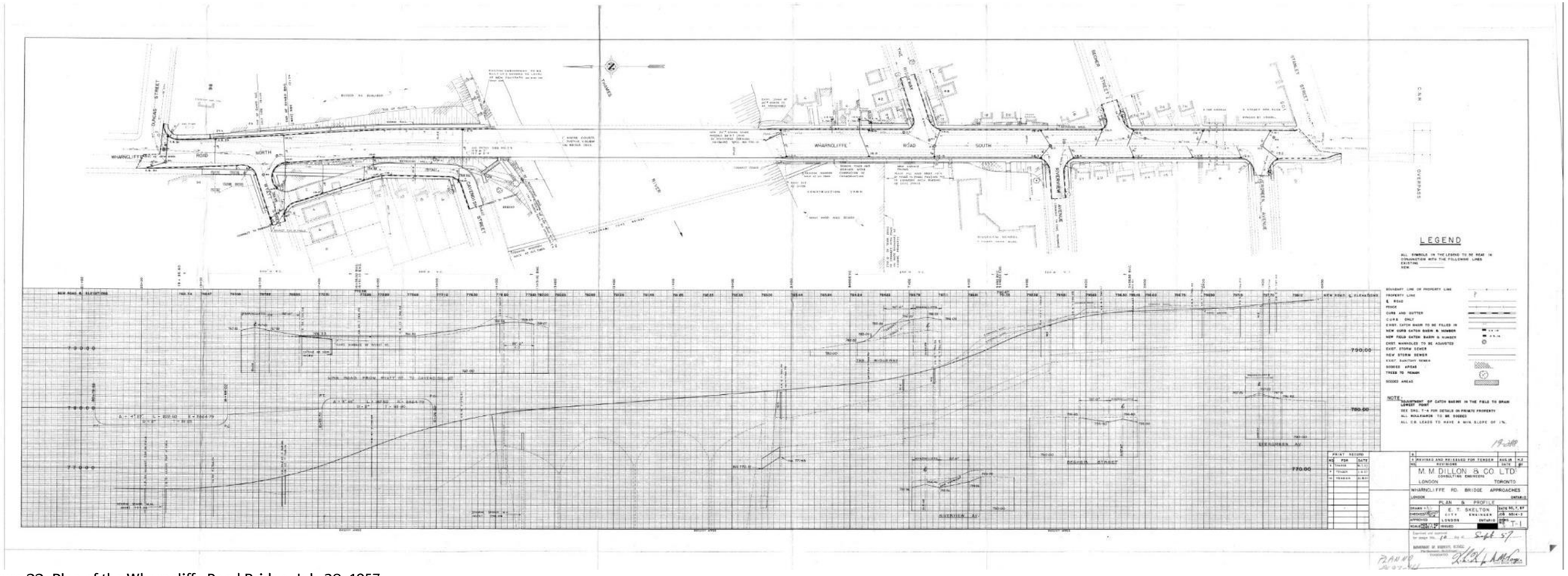


Figure 22: Plan of the Wharncliffe Road Bridge, July 30, 1957

Source: M.M. Dillon & Co. Ltd.

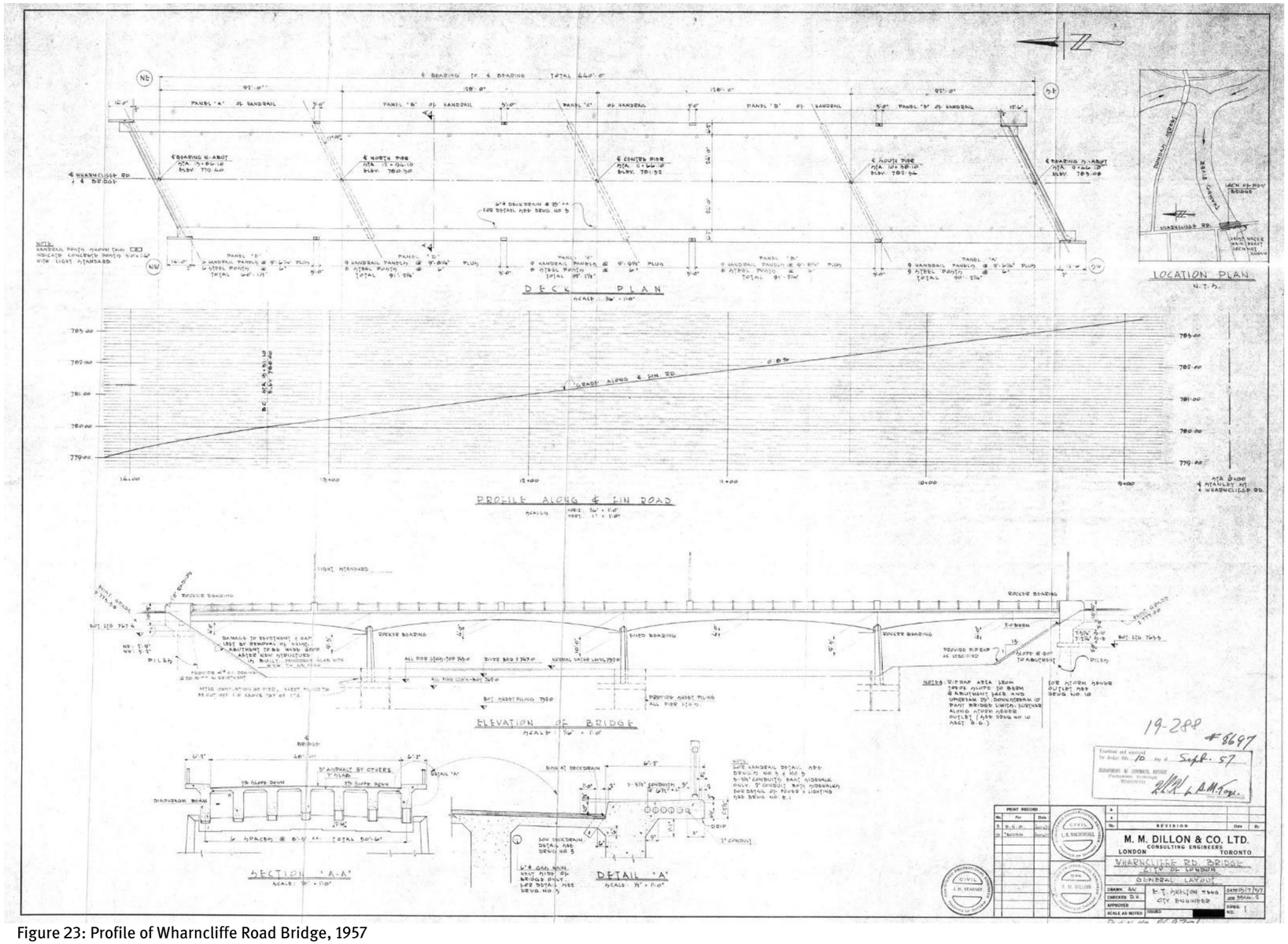


Figure 23: Profile of Wharncliffe Road Bridge, 1957

Source: M.M. Dillon & Co. Ltd.

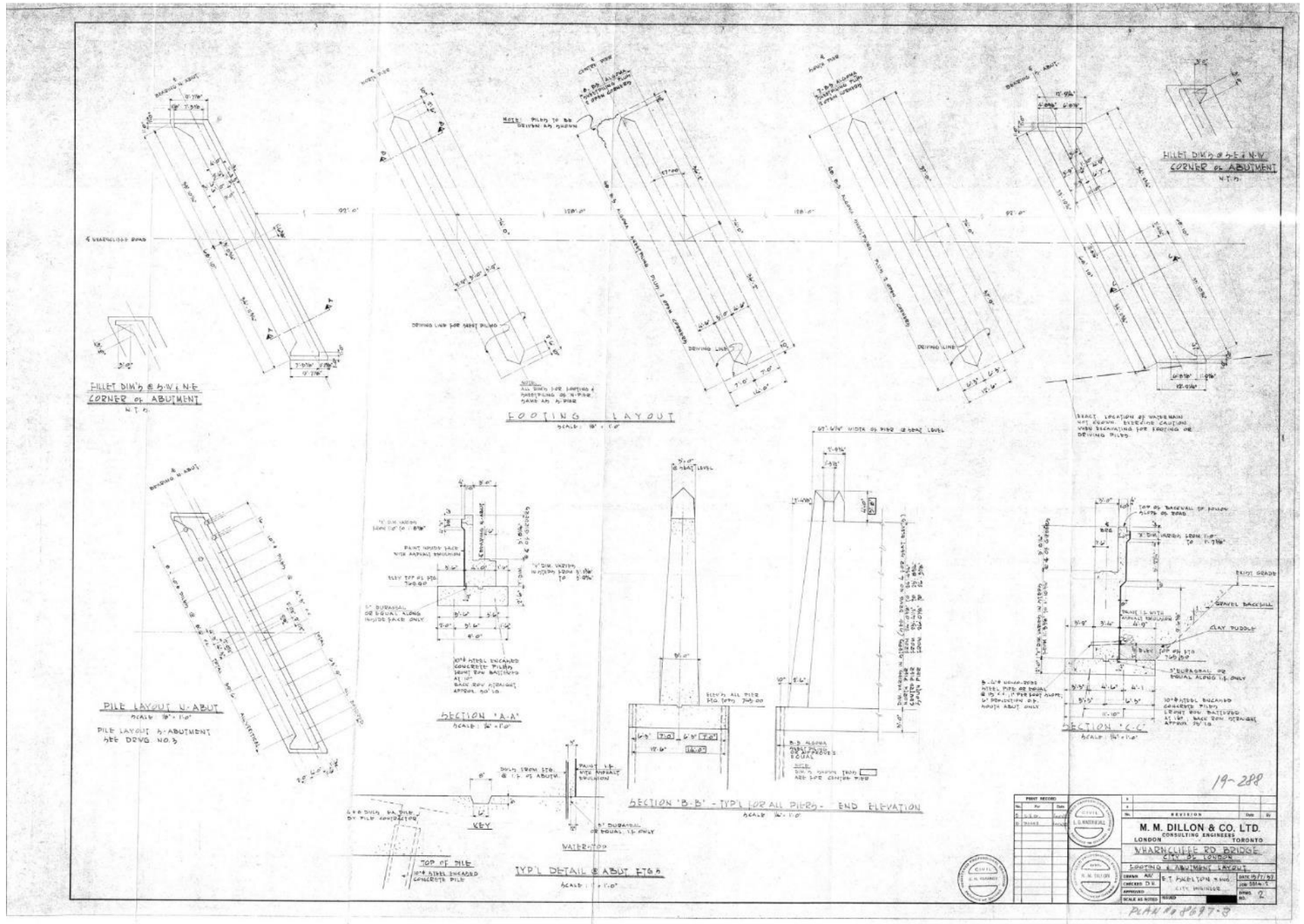


Figure 24: Pier Details of Wharncliffe Road Bridge, 1957

Source: M.M. Dillon & Co. Ltd.

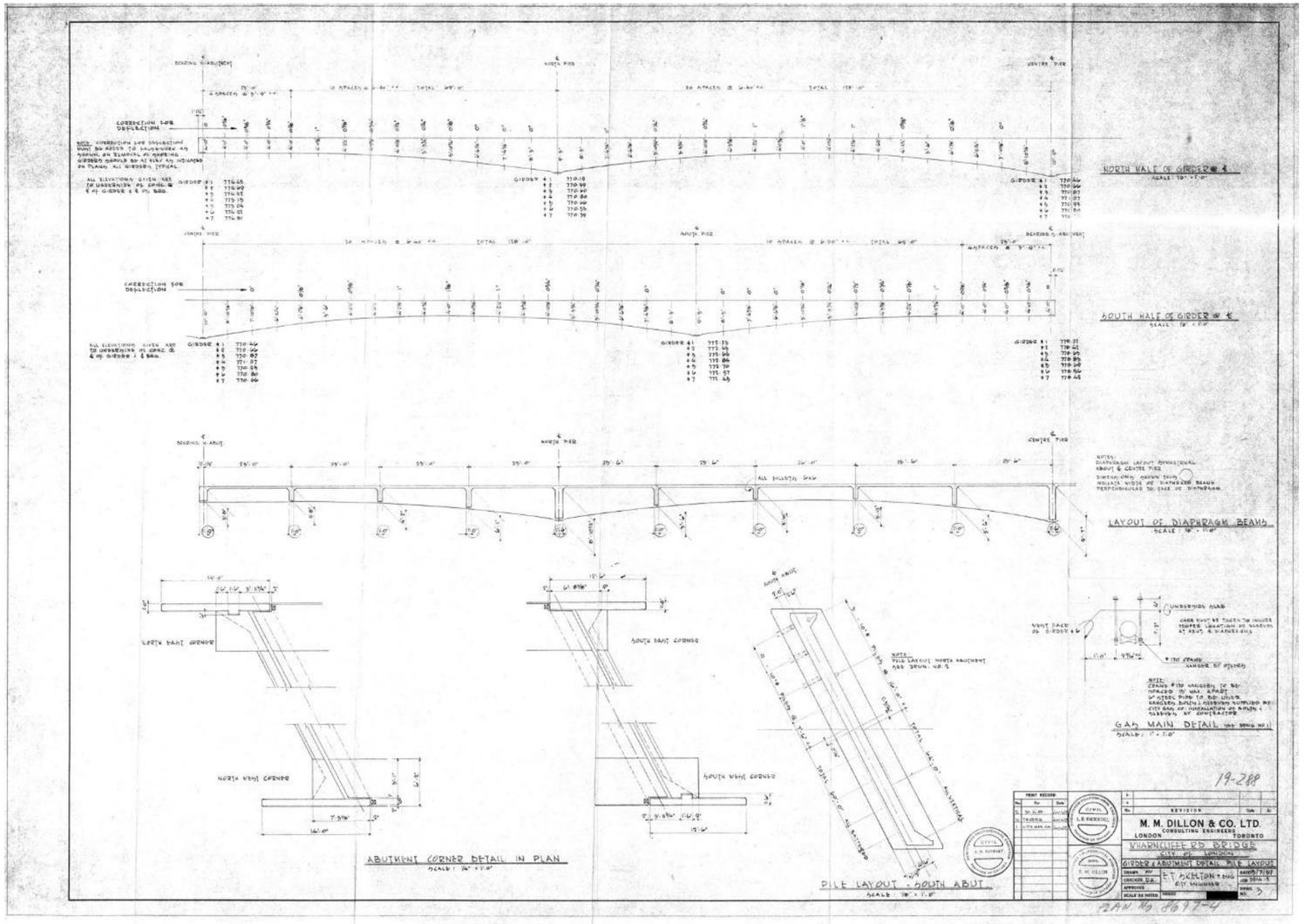


Figure 25: Girder Details of Wharncliffe Road Bridge, 1957

Source: M.M. Dillon & Co. Ltd.

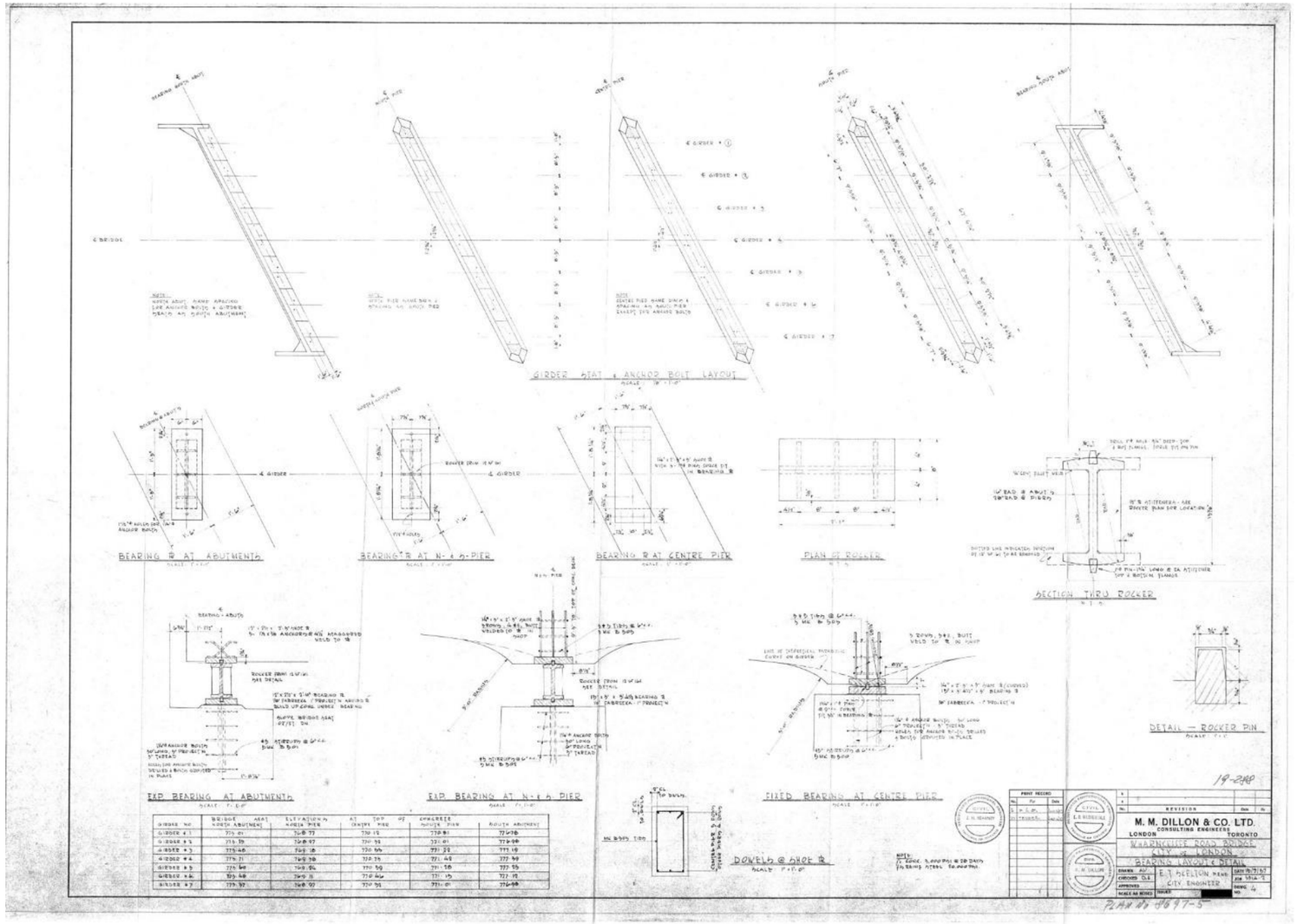


Figure 26: Bearing Details of Wharncliffe Road Bridge, 1957

Source: M.M. Dillon & Co. Ltd.

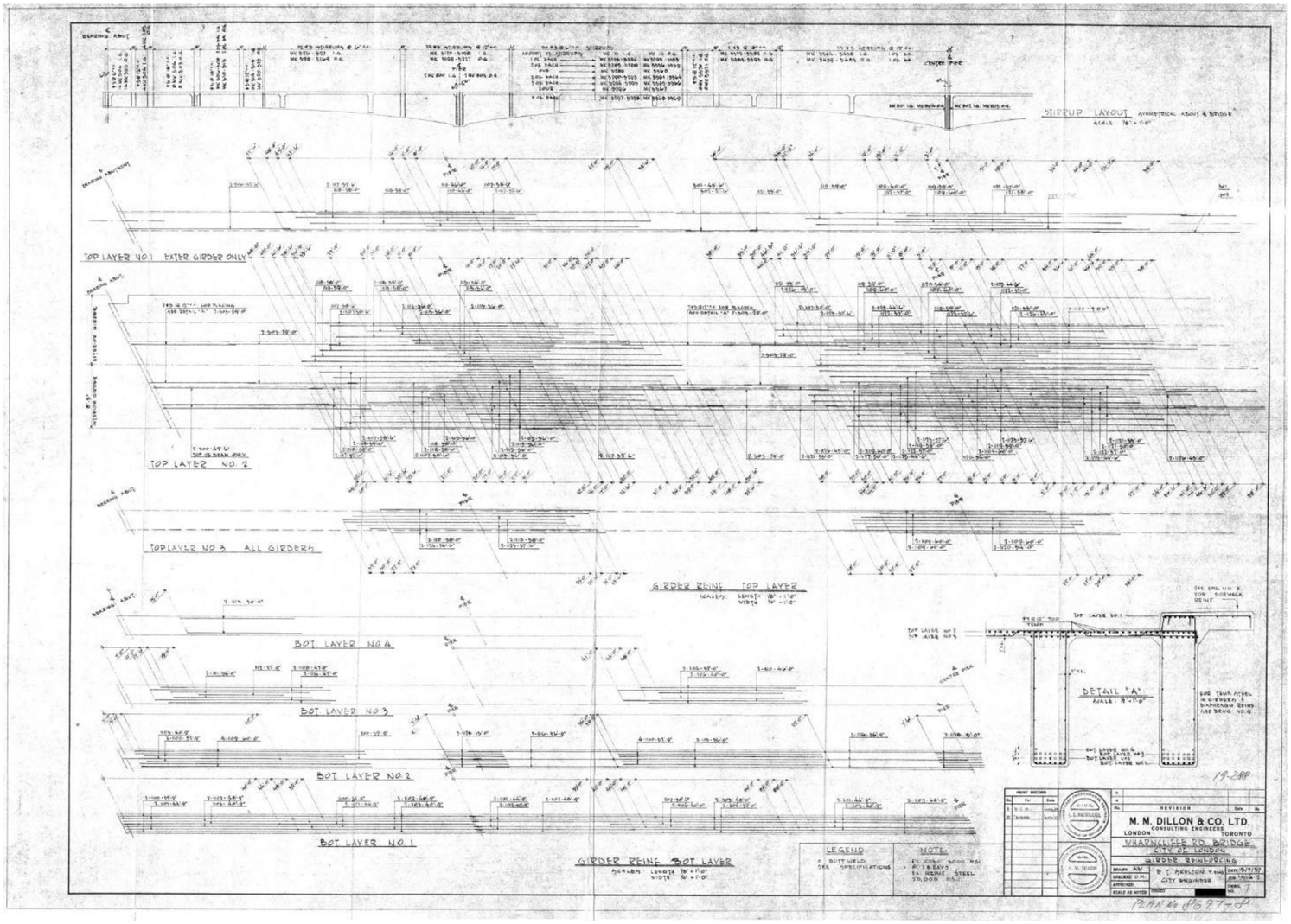


Figure 27: Girder Details of Wharncliffe Road Bridge, 1957

Source: M.M. Dillon & Co. Ltd.

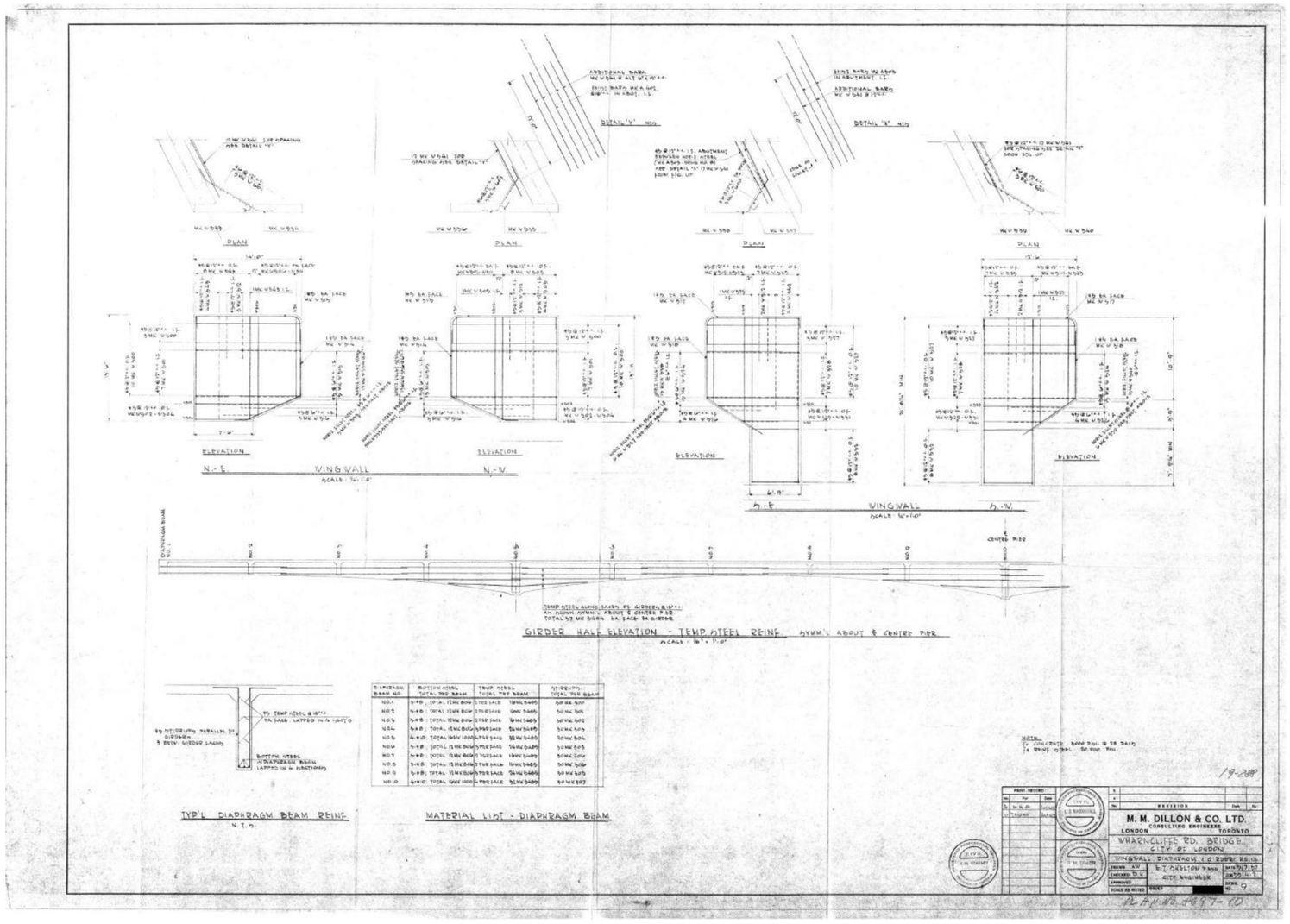


Figure 28: Wingwall and Girder Details of Wharncliffe Road Bridge, 1957

Source: M.M. Dillon & Co. Ltd.

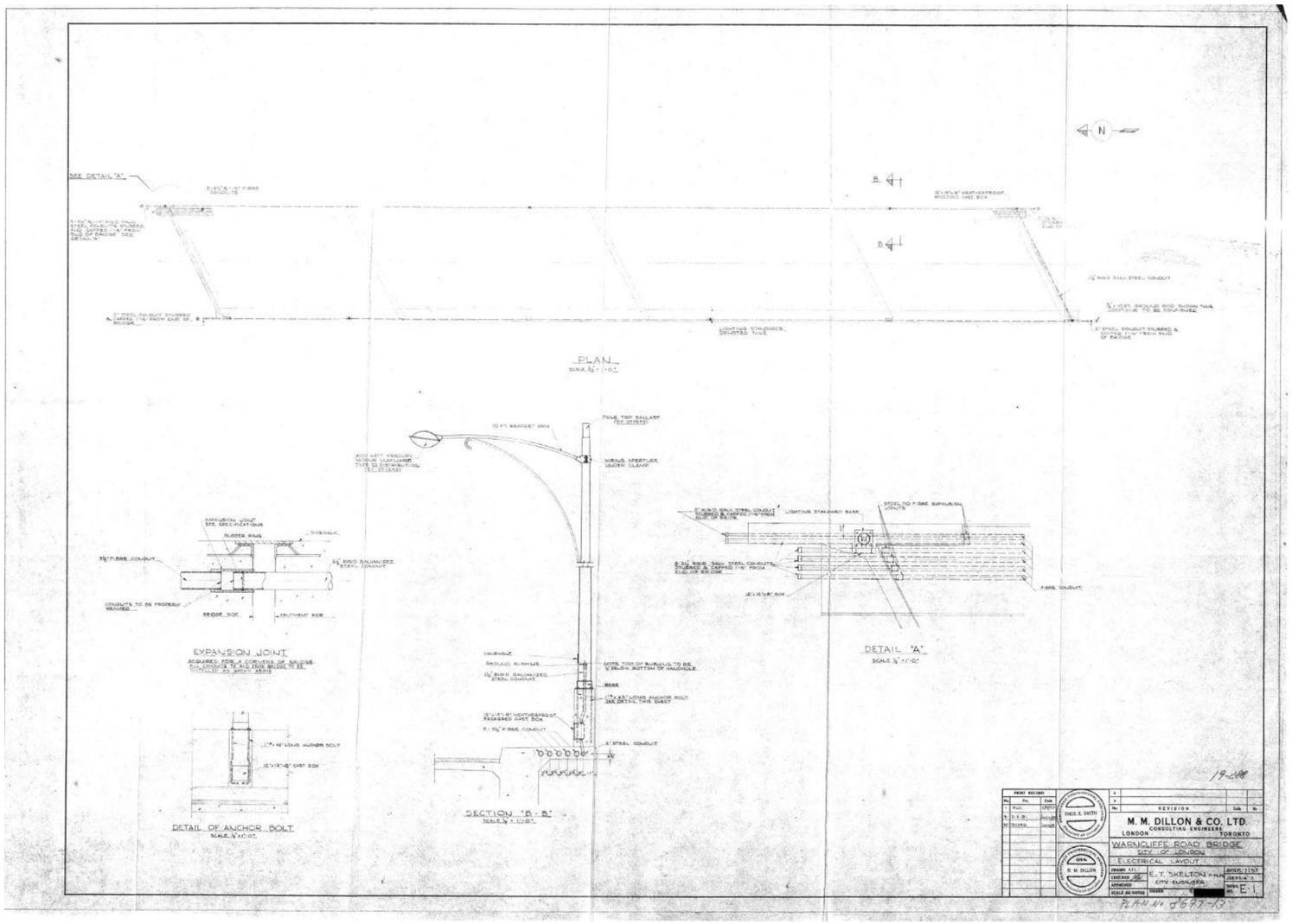


Figure 29: Light Standard Details of Wharncliffe Road Bridge, 1957

Source: M.M. Dillon & Co. Ltd.

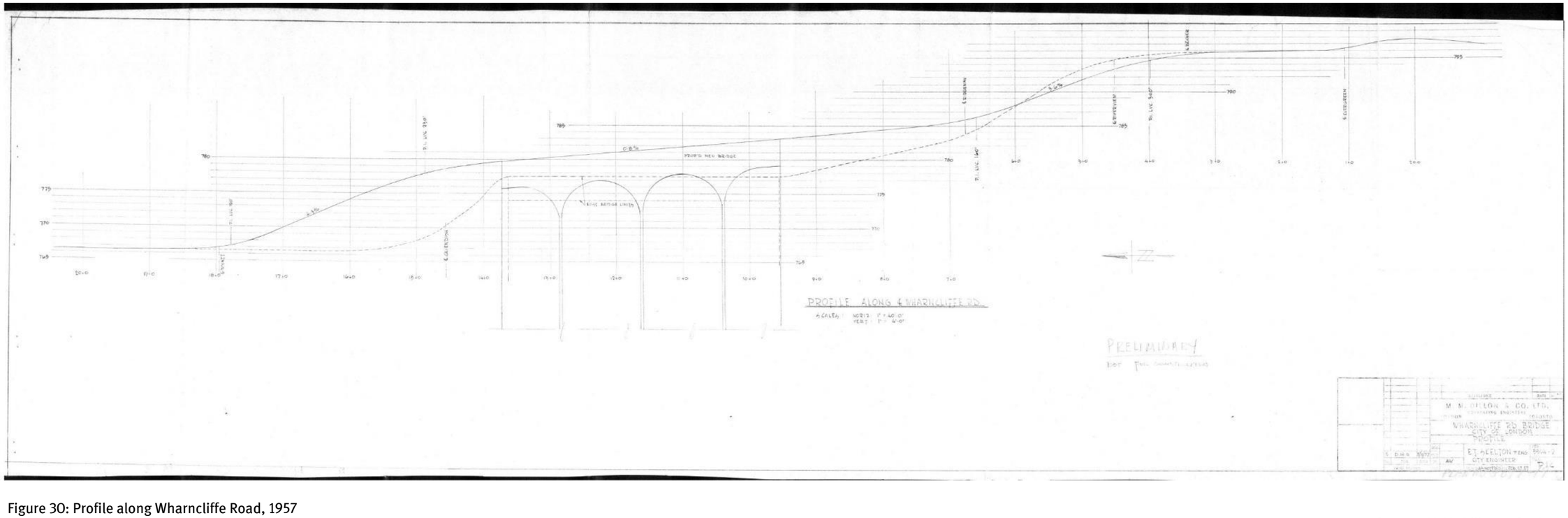


Figure 30: Profile along Wharncliffe Road, 1957

Source: M.M. Dillon & Co. Ltd.

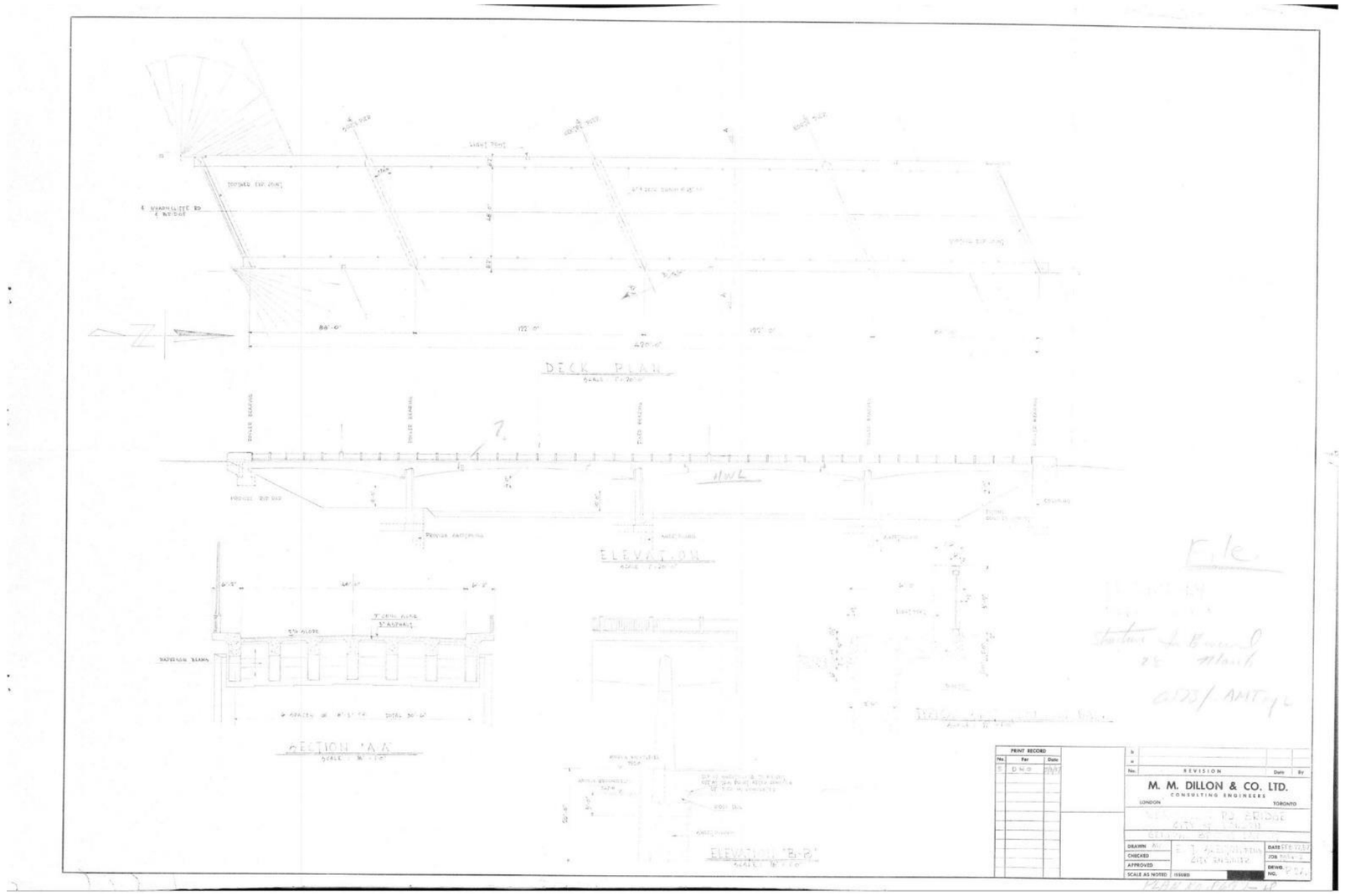


Figure 31: Deck Plan of Wharncliffe Road Bridge, 1957

Source: M.M. Dillon & Co. Ltd.

APPENDIX D: City of London Structures Database, Single Structure Condition Report, 2015

City of London Structures Database

Single Structure Condition Report

Inventory No: 1-BR-07

Location: Wharncliffe Road South over Thames River

Structure Name: **Wharncliffe Road Bridge**

WEST ELEVATION LOOKING SOUTH - AUG'15

Road Classification: Arterial

Adjacent Road Section:

AADT: 29000 (2014)

Pavement Quality Index:

Structure Type

Function: Road over water

Framing System: 4-span continuous T-beams and cast-in-place concrete slab

Materials: Reinforced concrete

Supported/Suspended Utility: Yes

Utility Type: (1) 300mm watermain, (1) pipe on west girder bay

Construction Date: 1958

Weight/Height/Width Restrictions: None

Deck Area: 2466

Original Cost: $420,000

Waterway Opening: Adequate

Replacement Cost: $8,236,000

Maintained by: City

Ownership: City

Maintenance History and Expenditures:

1987 - Repaired railings - $22,000
1992 - Rehabilitated deck and bearings, new expansion joints - $414,000

Inspection Date: 2015

Inspector: Sam Mansor, Tony Fediw
AECOM Canada Ltd

City of London Structures Database

Single Structure Condition Report

Inventory No: 1-BR-07

CONDITION DATA **Rating:**

Foundations or Base Slab:
The foundation is not visible. - limited inspection 5

Abutments or Side Walls:
The abutments are in fair condition with narrow to wide vertical cracking. Horizontal cracking and light to medium scaling on top surface. Medium delaminations on the top face of the north abutment wall. 6

Wingwalls/Head Walls:
The wingwalls are in fair to good condition with light scaling. 7

Piers:
The piers appear to be in fair to good condition with light scaling and light erosion at the base of the piers. Few light spalls with exposed rebar. Light corrosion on the cutwater. 7

Bearings:
The abutment rocker bearings are in fair condition. Several bearings exhibit medium to severe corrosion. Limited inspection of the pier rocker bearings due to access. Light corrosion was noted on the pier bearings. The concrete pedestals are in fair condition with some spalled sections. 5

Superstructure:
The concrete arched beams and diaphragms are in fair to good overall condition with light scaling and localized spalling with exposed rebar on the T-beams. Light to medium spalling and delamination with horizontal cracking at the abutment diaphragms. Light spalling of the girders at abutment bearings. Leech staining on beam at south abutment on east side. 6

Deck Structure or Top Slab:
The soffit is generally in fair to good condition with few wet delaminated areas near the abutments consisting of pattern, longitudinal and transverse cracking with corrosion and efflorescence staining. Transverse cracking with efflorescence staining on the soffit overhang with wet areas. Wetness and some cracking with efflorescence staining around the deck drains. Limited inspection of the 2nd span from north end due to access. Light spalling at abutment bearings. 7

Deck Surface or Road Surface:
The asphalt pavement is in fair condition with light to wide unsealed longitudinal and transverse pattern cracking. 6

Expansion Joints:
The expansion joints are in fair condition. The seal is filled with debris. The concrete end dams have light scaling and minor random cracking. There is light corrosion on the steel armouring. The expansion joints appear to be leaking. 6

Sidewalks/Safety Curbs/Median:
The sidewalks are in fair to good condition with narrow transverse cracking and light aggregate pop-outs. The curb is in fair condition with light spalling, scaling, and abrasion. Minor localized spalls with localized wide cracking and spalling on the east curb. The NE asphalt sidewalk is in fair to poor condition with random light to wide cracking and light settlements. 7

Railings:
The concrete parapet wall with 2-rail system is in fair condition with numerous wet narrow to medium vertical cracks and pattern cracking. Light scaling on top of the parapet wall. Light aggregate pop-outs and some efflorescence staining. Pedestrian railing at NE approach is in fair condition with few bent bars and light corrosion. Pedestrian railing at NW approach is in good condition. 6

Deck Drains:
The deck drains are in fair condition with light to medium corrosion below the deck. Few of the deck drains are plugged. 6

Approaches:
Approaches are in fair condition with wide unsealed longitudinal and transverse cracking. Medium map/alligator cracking along the north end dam. Light pothole at NE corner of approach. 6

Guide Rail:
The flex beam guide rail at southeast corner is connected to end post. Flex beam guide rail on both sides of the north abutment are not connected to the bridge. No guide rail at southwest corner. 7

Slope Protection/Miscellaneous:
The concrete slope paving at the north abutment is in fair to poor condition with several spalled, cracked and settled areas with medium concrete scaling. Several wide cracks on the concrete slab. The south embankment is in fair condition with light erosion. A watermain is suspended on the west exterior girder with light to medium corrosion on the jacket. One pipe is suspended on the west bay. Several scattered needles were noted at the south and north abutments (biohazard safety issue). 6

City of London Structures Database

Single Structure Condition Report

Inventory No: 1-BR-07

Average Condition Rating: **6.2**

Inventory No: 1-BR-07

IDENTIFIED PROBLEMS/COMMENTS	Timing
Maintenance:	
Clear expansion joints. Clear deck drains. Remove biohazard material below the bridge. Concrete patch repairs on the curbs/sidewalk.	Short Term
Minor Rehab:	
None.	
Major Rehab:	
Replace bearings. Concrete repairs on the north concrete slope paving. Install erosion protection at south abutment. Concrete patch repairs. Eliminate/replace expansion joints. Consider repairs to watermain. Waterproof and pave road.	Medium Term
Replacement:	
None.	
Additional Inspections:	
Inspect pier bearings.	Medium Term
Next Routine Visual Inspection Date:	
	2017

Inventory No: 1-BR-07

IMAGE SUMMARY

ABRASION AT PARAPET POST - AUG'15

BEARINGS AT NORTH PIER - AUG'15

Inventory No: 1-BR-07

BEARINGS AT NORTH PIER (2) - AUG'15

BLOCKED DECK DRAIN - AUG'15

Inventory No: 1-BR-07

BROKEN ELECTRICAL BOX ON SOUTH PIER - AUG'15

CRACKING AT CURB - AUG'15

Inventory No: 1-BR-07

CRACKING AT GIRDER ENDS - AUG'15

CRACKING AT PARPET WALL - AUG'15

Inventory No: 1-BR-07

CRACKING AT SIDEWALK - AUG'15

CRACKING AT SOUTH DIAPHRAGM - AUG'15

Inventory No: 1-BR-07

DECK DRAIN - AUG'15

DELAMINATION AT DIAPHRAGM AT NORTH ABUTMENT - AUG'15

Inventory No: 1-BR-07

DELAMINATION ON GIRDER - AUG'15

DOWNSTREAM - AUG'15

Inventory No: 1-BR-07

EAST PARAPET WALL - AUG'15

EAST SIDEWALK - AUG'15

Inventory No: 1-BR-07

EXPOSED BARS ON GIRDERS - AUG'15

LOOKING NORTH - AUG'15

Inventory No: 1-BR-07

LOOKING SOUTH - AUG'15

NORTH ABUTMENT - AUG'15

Inventory No: 1-BR-07

NORTH ABUTMENT BEARINGS - AUG'15

NORTH APPROACH - AUG'15

Inventory No: 1-BR-07

NORTH EXPANSION JOINT - AUG'15

NORTH PIER - AUG'15

Inventory No: 1-BR-07

NORTH SPAN - AUG'15

PIPE ALONG WEST SIDE OF BRIDGE - AUG'15

Inventory No: 1-BR-07

PLAQUE - AUG'15

SCALING ON PARAPET WALL - AUG'15

Inventory No: 1-BR-07

SECOND SPAN FROM THE SOUTH - AUG'15

SOUTH ABUTMENT - AUG'15

Inventory No: 1-BR-07

SOUTH ABUTMENT BEARING - AUG'15

SOUTH ABUTMENT BEARINGS - AUG'15

Inventory No: 1-BR-07

SOUTH APPROACH - AUG'15

SOUTH EXPANSION JOINT - AUG'15

Inventory No: 1-BR-07

SOUTH PIER - AUG'15

SOUTHEAST GUIDERAIL - AUG'15

Inventory No: 1-BR-07

SOUTHEAST WINGWALL - AUG'15

SOUTHWEST WINGWALL - AUG'15

Inventory No: 1-BR-07

SPALL AT BOTTOM OF GIRDER - AUG'15

SPALL IN SIDEWALK - AUG'15

Inventory No: 1-BR-07

SPALL IN WALKWAY - AUG'15

STAINED CRACKS IN SOFFIT - AUG'15

Inventory No: 1-BR-07

STAINING ON SOFFIT AT SOUTHEAST CORNER - AUG'15

TYPICAL JUNCTION BOX - AUG'15

Inventory No: 1-BR-07

TYPICAL ROCKER BEARING - AUG'15

UPSTREAM - AUG'15

Inventory No: 1-BR-07

WEARING SURFACE - AUG'15

WEARING SURFACE (2) - AUG'15

Inventory No: 1-BR-07

WEARING SURFACE LOOKING NORTH - AUG'15

WEARING SURFACE LOOKING NORTH (2) - AUG'15

Inventory No: 1-BR-07

WEST ELEVATION LOOKING SOUTH - AUG'15

WEST PARAPET WALL - AUG'15