

City of London

# Cultural Heritage Evaluation Report Victoria Bridge over the Thames River Ridout Street London, Ontario

**Prepared by:**

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## Revision History

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0	May 6, 2016	MG	Draft Report
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## Quality Information

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# Executive Summary

AECOM Canada Ltd. (AECOM) was retained by the City of London to conduct a Cultural Heritage Evaluation Report (CHER) as a part of the investigation regarding the feasibility of accommodating bicycle lanes and the general rehabilitation, as well as the overall condition, and the future uses of the Victoria Bridge, on Ridout Street over the South Branch of the Thames River. At the time of the preparation of this report, there is no specified proposed undertaking – rehabilitation, replacement, adaptive re-use – for the Victoria Bridge. It is understood that Ridout Street incorporates on-street bicycle lanes connecting *Signed Bike Road Routes* from the south end of the city with downtown and the Thames Valley Parkway. However, the existing width of the Victoria Bridge deck is not insufficient to accommodate bicycle lanes. In addition, there is also a bicycle path on the north bank of the Thames River, passing under the bridge, which is scheduled for construction upgrades in the near future.

This CHER was prepared according to the guidelines set out in the Ontario Ministry of Tourism, Culture, and Sports' *Heritage Resources in the Land Use Planning Process* document included as a part of the *Ontario Heritage Toolkit*. For the purposes of this report, AECOM undertook the following tasks:

- 1) Preparation of a land use history of the Study Area based on a review of:
  - a) Primary and secondary resources;
  - b) Historic mapping.
- 2) A review of the City of London's *Inventory of Heritage Resources*, as well as the Ontario Heritage Trust Properties Database, and the Canadian Register of Historic Places.
- 3) Consultation with Kyle Gonyou, Heritage Planner for the City of London to identify the presence of heritage properties or potential heritage properties.
- 4) A site investigation, undertaken on March 11, 2016 to document the existing conditions of the bridge structure and its associated landscape.
- 5) Evaluation of the bridge structure and its landscape using *Ontario Regulation 9/06, Criteria for Determining Cultural Heritage Value or Interest*.

Based on the *Ontario Regulation 9/06* evaluation the Victoria Bridge was determined to have design/physical, historic/associative, and contextual value.

The following Statement of Cultural Heritage Value was prepared for the bridge:

The Victoria Bridge is a seven panel modified Warren steel-pony truss bridge that carries Ridout Street over the South Branch of the Thames River. The two-span structure was built in 1926 as the fourth crossing of the Thames River at this location. It was designed by municipal engineer John R. Rostron as an elegant but affordable design that would utilize the remaining stone abutments and pier from the previous bridge at this crossing. As such, the concrete pier and abutments at the Victoria Bridge also include an undetermined amount of stone that has been encased in the concrete since 1926. The bridge is one of several historic truss crossings of the Thames River in London.

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# 1. Introduction

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## 1.1 Study Purpose

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## 1.2 Study Method

This CHER was prepared according to the guidelines set out in the Ontario Ministry of Tourism, Culture, and Sports' *Heritage Resources in the Land Use Planning Process* document included as a part of the *Ontario Heritage Toolkit*. For the purposes of this report, AECOM undertook the following tasks:

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- 5) Evaluation of the bridge structure and its landscape using *Ontario Regulation 9/06, Criteria for Determining Cultural Heritage Value or Interest*.

## 1.3 Metric Measurements

Between 1971 and 1984 Canada adopted the metric system. All structural dimensions in this text are given in Imperial units. In general, the use of Imperial rather than Metric is preferred for describing historic structures. Engineered structures were often built to standard Imperial dimensions and distinctive patterns within such structures can be obscured by converting the original Imperial to Metric units. Unless there are historical issues (i.e. contract specifications), distances and other common measurements are given in Metric units.









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## 2. Policy and Planning Framework

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### 2.1 Environmental Assessment Act

This report has been produced to satisfy cultural heritage reporting requirements typically undertaken as part of the Ontario Environmental Assessment (EA) process. Pursuant to the *Environmental Assessment Act* (R.S.O. 1990, Chapter E.18), applicable infrastructure improvements and development projects are subject to appropriate studies to evaluate and assess the potential related impacts of a project on the social, economic, or cultural environment, i.e. the cultural heritage of an area. Infrastructure improvement projects have the potential to impact cultural heritage resources in various ways including, but not limited to:

- Loss or displacement of resources through removal or demolition;
- Disruption of resources by introducing physical, visual, audible, or atmospheric elements that are not in keeping with the resources and their contextual surroundings.

It is understood that at this stage, an Environmental Assessment for the bridge project has not been initiated, however, this report utilizes the methods and practice typically undertaken for cultural heritage reporting as required by the EA process.

### 2.2 Additional Guidelines

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

- *Environmental Assessment Act* (R.S.O. 1990, Chapter E.18)
  - *Guidelines for Preparing the Cultural Heritage Resource Component of Environmental Assessments* (MCC-MOE 1992)
  - *Guidelines on the Man-Made Heritage Component of Environmental Assessments* (MCR-MOE 1981)
- *Planning Act* (R.S.O. 1990, Chapter P.13)
  - *Heritage Resources in the Land Use Planning Process*, 2005 Provincial Policy Statement
- *Ontario Heritage Act* (R.S.O. 1990, Chapter O.18) and Ministry of Tourism, Culture, and Sport
  - *Ontario Heritage Toolkit* (MCL 2006)

### 2.3 City of London Official Plan

The City of London Official Plan (OP) outlines a policy context for land use planning, amongst other items, within the City of London. Chapter 13 of the OP identifies planning policies, goals, and objectives associated with the identification, evaluation, and management of cultural heritage resources (built heritage, cultural heritage landscapes, and archaeological resources) within the city. Specifically, the objectives of the OP as they relate to heritage conservation include:

- Protect in accordance with Provincial policy those heritage resources which contribute to the identity and character of the City;
- Encourage the protection, enhancement, restoration, maintenance, and utilization of buildings, structures, areas, or sites within London which are considered to be of cultural heritage value or interest to the community;
- Encourage new development, redevelopment, and public works to be sensitive to, and in harmony with, the City's heritage resources; and
- 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.

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 Victoria Bridge.

Lastly, the City of London's Strategic Plan set 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 bridge, and more specifically, the Heritage Bridge Preservation Strategy as a part of its focus on robust infrastructure.

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## 3. Historical Overview

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### 3.1 Natural Environment and Physical Setting

The Victoria Bridge is located within the Caradoc Sand Plains and London Annex physiographic region, which are characterized by small sand plains typically located west and east of London. At the site of the bridge, the landscape consists of a wide valley with relatively steep valley walls, located just south of downtown London. The Thames Valley Parkway, a recreational trail extends along the north side of the river. An additional, separate trail on the south side of the river connects Ridout Street south of the bridge to Wortley Road on the west side of Thames Park (Photographs 1 – 3).

The bridge structure carries Ridout Street South over the Thames River. The river runs through London, flows southwest towards Chatham and eventually drains into Lake St. Clair. The South Branch of the Thames River meanders from Woodstock through south London before joining the North Branch at the Forks of the Thames just northeast of the Victoria Bridge. At the site of the bridge, the river flows through a wide channel with moderately sloped banks lined to the north with gabion baskets. A concrete pier in the centre of the river supports the Victoria Bridge deck.



**Photograph 1: View looking east to the Victoria Bridge showing Thames River valley and surrounding landscape**



**Photograph 2: View looking east showing Thames River channel and embankments on the south side of the river at left**



**Photograph 3: View looking north showing Thames River meandering westwards. The Thames Valley Parkway is visible on the far embankment**



## 3.2 Historic Context

### 3.2.1 Local Historic Context

Historically the bridge was located over the boundary between London Township and Westminster Township in Middlesex County. The Township of London was first surveyed by Colonel Mahlon Burwell in 1810. The lots were laid out using the double front survey system which was commonly used by the Crown between 1815 and 1829. The survey was put on hold during the War of 1812 but resumed once peace had been reestablished and a total of 3,850 acres of land was reserved by Lieutenant Governor Simcoe for the future town of London. In 1826, the town plot was surveyed by Mahlon Burwell with settlement beginning shortly after around the Forks of the Thames along Ridout Street and the Talbot Block. Settlement in London began to expand rapidly after the construction of the courthouse in 1827 with the population reaching 1,000 by 1835.

The Thames River had a profound impact on the growth of London. Historically, 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 32<sup>nd</sup> Regiment was stationed in London in 1838. Development of saw, cordage, and grist industry 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 with the Great Western Railway in 1853, the London Port Stanley Railway in 1856, and the Grand Trunk Railway in 1858. 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.

The former London Township survey system laid out by Burwell created a grid-like pattern of eight 100-acre lot allowances.<sup>1</sup> The resulting survey created much of the modern farm landscape that is still visible in the rural areas north of London. The survey pattern also created the modern road pattern that is still visible today. Ridout Street would have been laid out as one of the early town plot roads. However, the Thames River formed the boundary between Westminster Township and London Township and the road is shown continuing south through Westminster Township by the 1870s, where it eventually terminates at what is now Commissioners Road East. Since then, Upper Queen Street has been opened south of Commissioners Road.

The former Township of Westminster was one of the early townships to be settled within Middlesex County. The Township was first surveyed by Mahlon Burwell and land patents were issued by the Crown for lands within Westminster Township as early as 1812. The lots were divided by the double front system which was commonly used by the Crown between 1815 and 1829. The earliest roads within Westminster Township were Commissioners and Longwoods Roads, to the south of the study area, established during the War of 1812; however, the majority of the township did not have an early road system and few passable roads.

By the late-nineteenth century, the areas surrounding the bridge crossing on Ridout Street – both north and south of the structure – are depicted as relatively developed areas. Although the *Illustrated Historic Atlas* map for Westminster Township does not show structures in this area by 1877, the subdivision of the lots along Ridout Street suggest that the area was relatively developed. By 1919, historic mapping indicates that structures were located south of the bridge and the surrounding neighbourhoods on either side of the structure were developed. Fire Insurance Plans available from 1892, and revised in 1907 and 1912, revised in 1922 also confirm the development of the surrounding areas and indicate that the bridge was also used by the London Street Railway.

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<sup>1</sup> Typically the double front survey system was designed to lay out ten 100-acre lots, however, the system used in London Township laid out eight 100-acre lots.

The Thames Park, located south and west of the Victoria Bridge appears to have been constructed in the early-20<sup>th</sup> century. The lands on which the park was built belonged to Albert Major, son of William Simpson Smith, who served a term as a Mayor of London. Before Major's death he expressed his wish for his land holdings east of Wortley Road to be given to the City for use as a public park. In 1926, his executors arranged the lands to be given to the City, which in turn led to the creation of Thames Park. As early as 1926, when the City was the subject of a Geodetic Survey, the area that would become Thames Park was identified as containing four tennis courts and a swimming pool (Photograph 4).<sup>2</sup>



**Photograph 4: Geodetic Survey of Canada, 1926, showing Victoria Bridge, and the newly-established Thames Park. Note, the fourth tennis court and the swimming pool constructed in the park are shown on a separate survey sheet**

### 3.2.2 London Street Railway

The London Street Railway (LSR), incorporated in 1873 by provincial charter, provided what has been described as the “great transportation breakthrough” for London at the end of the 19<sup>th</sup> century. In 1875, the company was started to provide an early transit system in London and negotiated rights to use the city streets for a horse-drawn railway network. That year, service commenced with three horse-drawn vehicles running on Dundas Street between Richmond Street and Adelaide Street. By the end of the year, it extended to the Western Fairgrounds. In 1888, it continued its expansion of services and constructed tracks across the Victoria Bridge (a predecessor of the existing bridge) to provide service to south London. The LSR eventually provided electric streetcar service and extended its network throughout London. Labour disruptions and backlash over fare prices plagued the company of numerous instances at the end of the 19<sup>th</sup> and throughout the early-20<sup>th</sup> century. In addition, by the 1940s most routes were phased out and replaced with bus service. By 1951, the London Transit Commission was formed and the LSR ceased to exist.<sup>3</sup>

<sup>2</sup> *Geodetic Survey of Canada, 1926; Wortley Village/Old South Heritage Conservation District Final Study Report, 2013.*

<sup>3</sup> *Frederick H. Armstrong, The Forest City: An Illustrated History of London, Canada, p. 105-202.*



### 3.2.3 Bridge Building Context

Most public highway bridges were built and owned by a municipality such as a county, town or a township. Much more rarely, they were owned by the province. Matters pertaining to bridge ownership have been dictated by the *Ontario Municipal Act* since 1867. The construction and operation of bridges over water courses that formed boundaries between townships were always assumed by an upper level of government, such as a County.

Most 19<sup>th</sup>-century bridges in southern Ontario were built of timber. Short spans were beam structures; longer spans employed simple trusses, such as King and Queen Post trusses. A few iron truss bridges were built in the 1870s-1880s but were generally too costly to be widely used. Two iron bridges, an early Victoria Bridge, and the well-known Blackfriar's Bridge were built within London.

The economic value to communities of good roads, and by extension good bridges, was becoming evident. Nineteenth-century wooden bridges could not carry the weight of heavier wagon and street railway equipment coming into use. By the First World War, motor vehicles were becoming increasingly common and the provincial government began to provide grant programs and technical advice on bridge building. At the same time, counties began to create county-wide road networks by assuming the ownership of key township roads and bridges.

Inexpensive steel trusses came into use in the 1890s and the designs were commonly used into the 1930s. The Pratt truss and the Warren truss dominated the early-20<sup>th</sup> century, and were typically used for spans of up to 400 feet.<sup>4</sup> The existing Victoria Bridge is a modified Warren truss designed for a span of 258 feet. It is a late example of the use of steel bridge construction.

At the beginning of the 20<sup>th</sup> century concrete became widely used to construct short span bridges. One of the earliest forms was the solid spandrel concrete arch design that was inexpensive to build. This design consisted of solid concrete spandrel walls that held back the stone rubble and earth fill on the interior of the arch. The arch itself was formed with rebar. By the 1930s, concrete challenged steel as the primary bridge-building material of choice and various concrete bridges types have since been used for road bridge construction.

### 3.2.4 Victoria Bridge

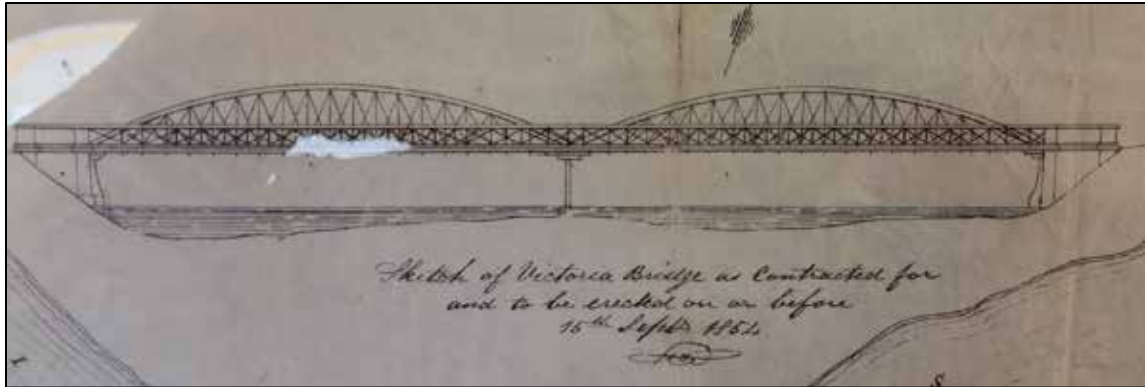
The existing Victoria Bridge was not the first bridge crossing over the Thames River at Ridout Street. There has been three previous crossings at this location dating back to 1848. Spring flooding of the Thames was a continual threat to the survival of the Victoria Bridge – and all other London – bridges.

The first crossing of the Thames at Ridout Street was opened in 1848 and was the fourth bridge constructed in London. The bridge was a short lived wood structure, the first to be named after Queen Victoria. Newspapers reported that during construction, the piles for the structure were not driven properly. The reports indicated that the pile drivers sawed off the tops of the piles to expedite their work process but within a few months the rising Thames River washed the bridge away. The crossing was not rebuilt until the 1860s, leaving a ferry to provide the only method of crossing at this location until a new structure was built. A new structure was planned in 1854 and designed by Samuel Peters, the Town Engineer for London between 1852 and 1854, then City Engineer for the newly incorporated City in 1855, however the structure never came to fruition (Photograph 5). The second Victoria Bridge was constructed in 1863, but no description exists of its design. In February 1874 a flood swept the bridge away.<sup>5</sup>

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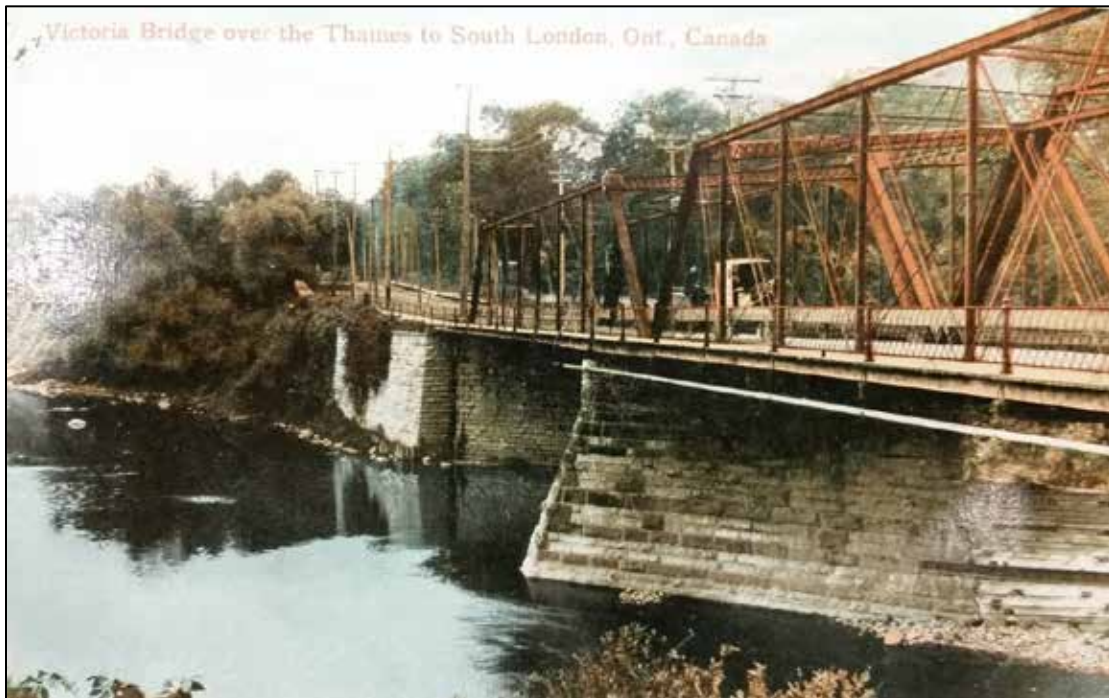
<sup>4</sup> T. Allan Comp and Donald Jackson, "Bridge Truss Types: A Guide to Dating and Identifying," in *American Association for State and Local History*, 1977; *National Park Services*, "Trusses: A Study by the Historic American Engineering Record", 1976.

<sup>5</sup> *London Free Press*, Feb 1949; Arthur McClelland, "Bridges to the Past"; Arthur McClelland, "All things Victorian,"; Samuel Peters, *Plan of Part of Lot No. 7, East of Wortley Road in the Township of Westminster*.



**Photograph 5: Proposed Victoria Bridge designed by Samuel Peters, 1854 (Plan of Part of Lot No. 7, East Side of the Wortley Road in the Township of Westminster, 1854, London Room)**

The third Victoria Bridge, a much longer lived structure, was then built of wrought iron in 1875 (Photograph 6). The new bridge was constructed by the Wrought Iron Bridge Company of Canton, Ohio, that had been building the Blackfriars Bridge, when the Victoria Bridge was destroyed. The new bridge was a two-span iron structure of 258 feet, with an 18-foot roadway and one sidewalk. The abutments and the centre pier were of stone. The bridge design was a pin-connected through Pratt truss, a common truss bridge design. The bridge deck was suspended by stirrup hangers. Although designed for road traffic, it was sufficiently sturdy to accommodate the weight of the London Street Railway cars when streetcar service was extended into south London in the late 1890s. The bridge reached the end of its service life by 1919, and was ruled unsafe for motorists, however, Londoners voted against the use of public funds for construction of a new crossing. By 1925, the Ontario Railway and Municipal Board declared the bridge unsafe and closed the structure.<sup>6</sup>



**Photograph 6: Early-20th century postcard showing the third Victoria Bridge that was used between 1875 and 1925**

<sup>6</sup> *Ibid.*

The existing Victoria Bridge was the fourth structure built over the Thames River at this location. The bridge was designed by John R. Rostron, a municipal engineer with the City of London, and was built in 1926 as a steel pony truss design, constructed by the Hamilton Bridge Company. This 258-foot bridge, with two spans of 126 feet and a 31 foot wide deck, also carried a streetcar track with two six-foot sidewalks suspended on the outside of the bridge trusses. The bridge was opened in January of 1927.<sup>7</sup>

In 1927, the *Canadian Engineer*, a weekly paper published an article written by Rostron in which he outlines the context for the construction of the new bridge and a series of design challenges associated with the bridge. Given the public objection to the use of public funds for a new bridge, Rostron highlighted the particular challenge of building a bridge that would be elegant but not costly. In addition, the 41 degree skew, together with the cramped room for depth construction presented a particular design challenge. The decision to retain the existing stone pier and abutments and encase them in concrete with an extension to accommodate widening the structure provided an economical solution. The City also wished to do away with overhead obstructions on this structure. As a result, the use of a pony truss was decided on (Photographs 7 – 12).<sup>8</sup>

The present bridge was built on a sharp skew of 41 degrees due to the angle at which Ridout Street crossed the Thames River at this location. The designer reused the abutments and centre pier of the previous bridge but it is unknown if the two earlier bridges were also on a skew. A skew design adds to the complexity of the bridge construction (See Appendix A for 1926 Plans).

The chief aesthetic consideration for this bridge was centered on the approach to the crossing. At the time of design and construction it was determined that viewing the bridge from the east and west would not be very common so the approaches were to be the most elegant feature. As such, cut stone pilasters with concrete cores and solid cut stone newel posts were placed at the ends of the railings to provide a gateway-like design for the structure. Functionally, the abutments each had expansion bearings and the bearings on the pier were fixed. In addition to the sidewalks, a 10 inch gas main, an 8 inch sewer pipe, and a Bell conduit was carried across the river under the sidewalks, the remnants of which can still be seen (Photograph 13).<sup>9</sup>

In the mid-20<sup>th</sup> century the bridge underwent major repairs and reconstruction as a result of gradual deterioration. The bridge was closed in 1956 to repair damages to the abutments and piers caused by seasonal flooding. The bridge was closed first in March of that year, but by April the east side of the south abutments crumbled and collapsed resulting in additional reconstruction work. The bridge stayed closed until November of 1956. The bridge was also closed for a month in 1960 for replacement of the deck.<sup>10</sup>

### 3.2.5 Hamilton Bridge Works Company Ltd.

The Hamilton Bridge Works Company Limited was a well-known and prolific bridge building company, both provincially and nationally. It flourished in the latter part of the 1890s and well into the 20<sup>th</sup> century, specializing in steel bridge construction, and making steel for the fabrication of buildings and bridges. Notable bridge projects include several bridges over the Welland Canal, the Blue Water Bridge, Montreal, the Burlington Canal lift bridge, the Burlington Skyway Bridge on the Beach Strip over the Canal as well as the Lion's Gate Bridge, Vancouver, as well as prominent railway bridges in Toronto including the Highland Creek Bridge and the Rouge River Bridge, built for the Grand Trunk Railway. The company ceased operation in 1984.

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<sup>7</sup> *Ibid.*; Armstrong, p. 105.

<sup>8</sup> Rostron, "Victoria Bridge, Ridout Street, London, Ont." *Canadian Engineer*, 1927.; London Free Press.

<sup>9</sup> *Ibid.*

<sup>10</sup> *Ibid.*



### 3.2.6 John R. Rostron

John Rostron was identified as one of the key team members for the design and construction of the Victoria Bridge. Little biographical information could be determined for Rostron, however, he was identified in an article as an Assistant Engineer on Structural Works for the City of London, Ontario. The article in the 1927 edition of *The Canadian Engineer*, a weekly paper for civil engineer and contractor was a summary of the engineering design challenges and the construction process for the 1926 Victoria Bridge.



**Photograph 7: Victoria Bridge under construction in 1925**



**Photograph 8: Victoria Bridge under construction in 1925**



**Photograph 9: Victoria Bridge under construction in 1925 showing trusses nearing completion**



**Photograph 10: Victoria Bridge under construction in 1925, showing temporary trestle structure under the bridge during construction**

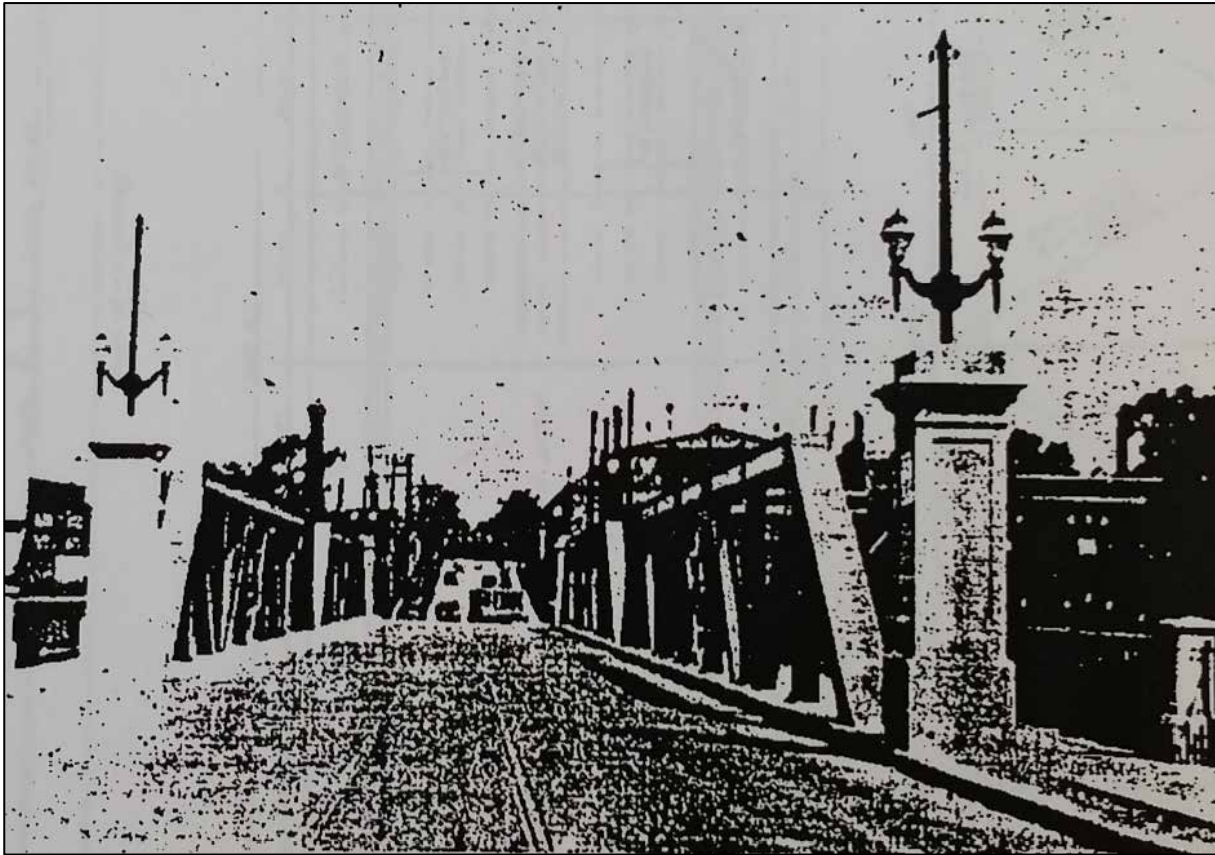




**Photograph 11: Victoria Bridge under construction in 1925**



**Photograph 12: Victoria Bridge following rising flood waters, 1937. The centre pier appears to be nearly submerged**



**Photograph 13: Original approaches to the Victoria Bridge showing the concrete posts and integrated light fixtures. The only remnants of these approach features is a portion of a concrete post on the northwest side of the bridge (Canadian Engineer, 1927)**





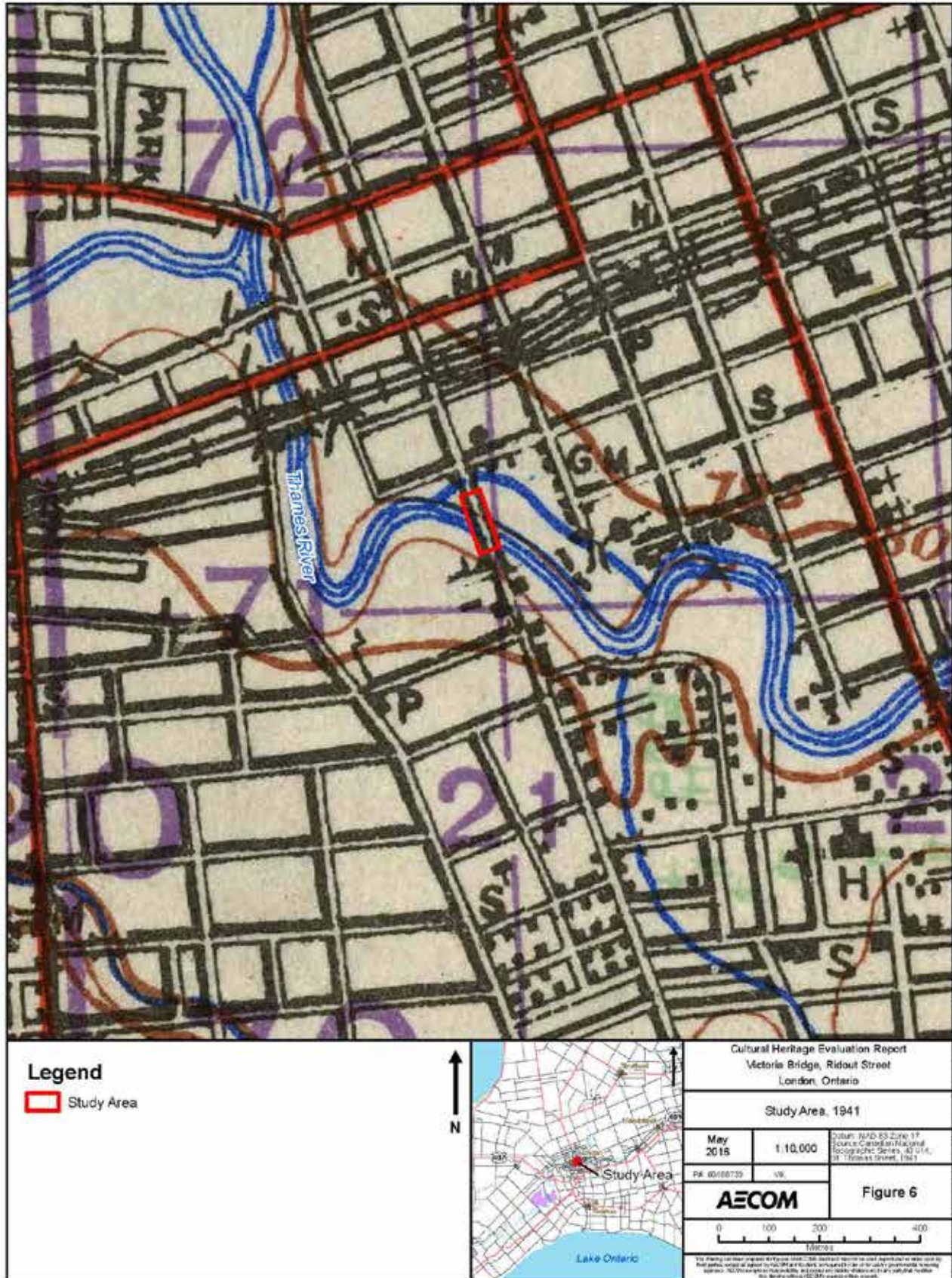












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## 4. Site Description

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### 4.1 Context

The Victoria Bridge is a two-span, riveted-steel pony truss bridge that carries Ridout Street over the South Branch of the Thames River, in London, Ontario (Photograph 14).

### 4.2 Cultural Landscape

Ridout Street is a two lane, urban road that connects the downtown core with south London. Historically, the bridge crossing was an important link to traffic between London Township north of the Thames River and Westminster Township south of the river. The road was laid out as part of the early surveys for the City of London. The Victoria Bridge is located approximately 100m south of Ridout Street's intersection with Horton Street East.

At the site of the bridge, the river flows through a wide channel with moderately sloped embankments. The north side of the river, the embankment is lined with gabion baskets, and is the steeper of the two sides. On the south side, the river embankment is a shallower slope that extends back a greater distance. The river meanders through this portion of London before joining with the north branch just northwest of this bridge site.

Recreational uses are also located on either side of the bridge crossing. Thames Park is a municipal park located on the southwest side of the bridge and includes tennis courts, an outdoor pool, and a paved path that extends along the river. On the north side of the river, the Thames Valley Parkway, the City's multi-use path system passes under the bridge. London Hydro properties and municipal services structures are located on either side of Ridout Street at the north end of the bridge (Photographs 15-18).

### 4.3 Approaches

Both approaches to the bridge have a slight incline as one approaches the truss, however, the approaches are relatively flat and are consistent with the grading of the road. Both approaches are also on straight alignments from north to south of the bridge. Guard rails extend past the end posts of the truss at each approach. The skewed trusses are particularly evident at the north approach. In addition, the only remnants of the decorative stone and concrete end posts that were on the original structure is a short post on the east side of the north approach at the end of the pedestrian hand railings (Photographs 19-20).

### 4.4 Abutments and Pier

The abutments and the pier are constructed of a mix of concrete and stone. Historic records indicate that when the bridge was constructed in 1926, the earlier stone abutments and pier were repurposed and encased in concrete to reduce the cost of the bridge project. As a result of widening the 1926 structure, the centre stone pier was encased in concrete and extended. In addition, the bridge underwent some extensive rehabilitation work in 1956 which included work on the abutments and pier. As a result of the 1926 rebuilding and subsequent repairs the amount of

stone remaining in the abutments and pier is unknown. The only visible stone on the structure is on the east side of the north abutment, built into the sloping embankment (Photographs 20-25).

## 4.5 Truss

The Victoria Bridge is a two-span, steel pony truss structure. It has two spans each 126 feet, 6 inches long with a deck width of approximately 31 feet. Sidewalks are located on both the east and west sides of the bridge with a combination of open railing barriers and modern guard rails.

The bridge is a rendition of a Warren truss structure, a truss type typically used for spans ranging from 50 – 400 feet. The trusses consist of five main panels and two half panels at each end post. The top chords and end posts are constructed of steel channels separated with riveted plates, and include riveted lattice on their underside. Unlike most verticals and diagonals on truss bridges, the vertical and diagonal members on the Victoria Bridge consist of heavy steel beams with riveted connections. The use of these members give the truss structure a much more stout and heavy appearance than most truss bridges. The centre panel on each of the trusses consists of two opposite diagonal steel channels connected by riveted plates that form an “X” with a large central gusset plate. A true Warren truss would typically consist of uninterrupted equilateral triangles, however, the central “X” panel in this structure results in a modified Warren truss. Throughout the top and bottom chords, and the heavy vertical and diagonal members “CARNEGIE”, a well-known American steel manufacturer, can be found stamped onto the steel (Photographs 26 - 31). A newspaper reference from the time of construction identifies that the bridge may have been painted red at one point, however, no further evidence about the colour of the bridge was located. Currently, the bridge includes a gray paint colour.

The bridge is similar to the Kensington Bridge, a three-span modified Warren truss that carries Riverside Drive/Dundas Street over the North Branch of the Thames River approximately 800m northwest of the Victoria Bridge. Much like the Victoria Bridge, the Kensington Bridge, a “sibling” bridge was built in 1930 by the Hamilton Bridge Works Co. Ltd.

## 4.6 Deck/Railings

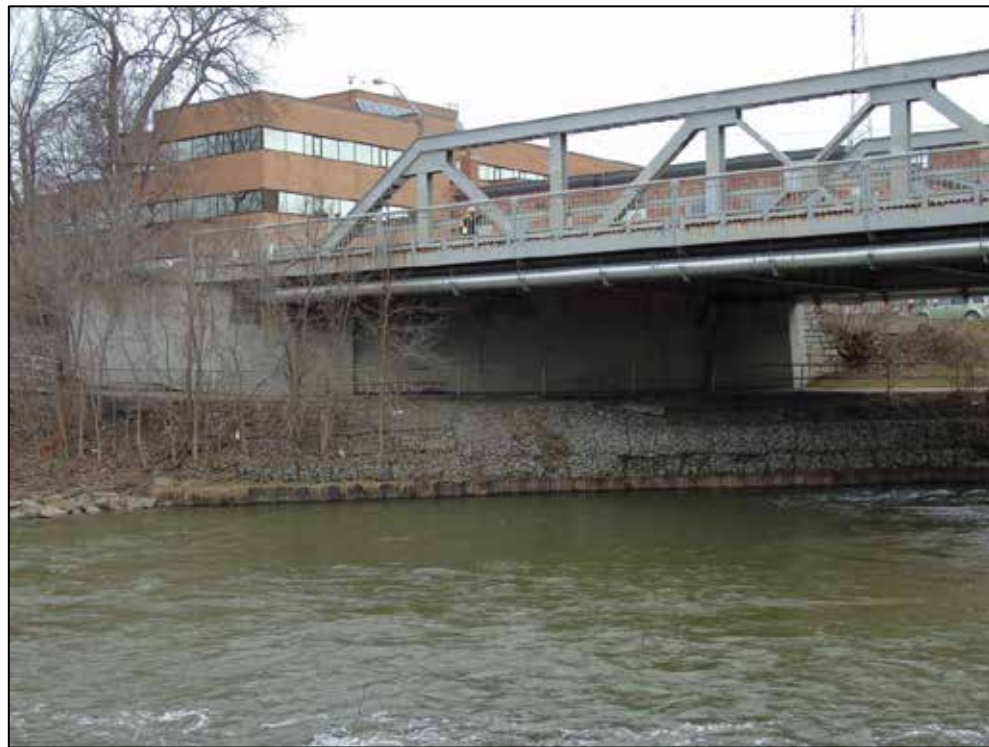
The existing concrete deck is supported on floor beams riveted to the bottom chords of the trusses and stringers that run the length of the bridge. On the underside of the deck a series of pipes and conduits run the length of the crossing.

The railing systems located on the outside of the cantilevered sidewalks consist of open steels posts and a railing that extends the length of the crossing. The only railing system that separates the traffic from the pedestrian sidewalk is a modern guard rail. In addition, decorative lampposts are located in between each truss and appear to have been a part of the original construction of the bridge. The bases of the lampposts appear to be original to the 1926 construction, however, the light fixtures have been replaced (Photographs 32-36).





**Photograph 14: Looking east showing west side of the Victoria Bridge**



**Photograph 15: View looking north showing gabion baskets on the north side of the Thames River**



**Photograph 16: View looking east showing rising embankment on south side of the Thames River**



**Photograph 17: View looking west showing Thames Valley Parkway located on the north side of the river**





Photograph 18: View looking east showing recreational trail on the south side of the river



Photograph 19: North approach showing sidewalks and slight grade change at truss





**Photograph 20: South approach showing sidewalks and relatively flat approach**



**Photograph 21: North abutment, west side, showing location on embankment**



**Photograph 22: North embankment, east side, showing remnants of original stone abutment and stone/concrete end post above**



**Photograph 23: View looking south, showing centre pier**





**Photograph 24: View looking northeast, showing centre pier**



**Photograph 25: South abutment, west side, showing embankment and retaining wall**



**Photograph 26: View looking south showing east side of trusses**



**Photograph 27: View showing vertical and diagonal members and top chord with riveted lattice**





**Photograph 28: Viewing showing centre panel with diagonals forming an “X” as part of the modified Warren truss**



**Photograph 29: Viewing showing riveted lattice under the diagonal end posts and decorative lamp posts in between trusses**



**Photograph 30: Connection on top chord showing gusset plates and connection of vertical and diagonal members**



**Photograph 31: "CARNEGIE" stamp found throughout the steel used on the truss**



**Photograph 32: Underside of deck at north abutments showing deck tray, stringers, and cross beams**



**Photograph 33: Viewing looking south showing stringers and cross beams**





**Photograph 34: View of riveted lattice connecting the steel on the bottom chord and the conduits and pipes extending along the west side of the bridge**



**Photograph 35: View showing railing system on the west sidewalk**





**Photograph 36: Base of decorative lamp post in between trusses**

## 5. Evaluation

### 5.1 Ontario Regulation 9/06

*Ontario Regulation 9/06* provides criteria for determining cultural heritage value or interest. If a property meets one or more of the following criteria it may be designated under Section 29, Part IV of the Ontario Heritage Act. The criteria for determining cultural heritage value under *Ontario Regulation 9/06* have been adopted by City of London and are outlined below:

- 1) The property has **design or physical value** because it:
  - Is a rare, unique, representative or early example of a style, type, expression, material or construction method;
  - Displays a high degree of craftsmanship or artistic merit; or
  - Demonstrates a high degree of technical or scientific achievement.
- 2) The property has **historic or associative value** because it:
  - Has direct associations with a theme, event, belief, person, activity, organization, or institution that is significant to a community;
  - Yields, or has the potential to yield information that contributes to an understanding of a community or culture; or
  - Demonstrates or reflects the work or ideas of an architect, artist, builder, designer, or theorist who is significant to a community.
- 3) The property has **contextual value** because it:
  - Is important in defining, maintaining, or supporting the character of an area;
  - Is physically, functionally, visually, or historically linked to its surroundings; or
  - Is a landmark.

The application of the criteria for the evaluation of the Victoria Bridge is provided below in Table 1. Rationale for each criteria and its application is provided below in Section 5.1.1 to 5.1.3.

**Table 1: Ontario Regulation 9/06 Evaluation of the Victoria Bridge**

Criteria	Site Specific Value
<b>1) The property has <i>design or physical value</i> because it:</b>	
i) Is a rare, unique, representative or early example of a style, type, expression, material or construction method.	The Victoria Bridge is a representative example of a modified Warren truss structure. The use of steel trusses in highway bridge design is increasingly rare. A number of steel truss bridges remain in London, however, this is one of two modified Warren pony trusses in the City.
ii) Displays a high degree of craftsmanship or artistic merit.	None identified
iii) Demonstrates a high degree of technical or scientific achievement.	None identified

<b>2) The property has <i>historic value</i> or <i>associate value</i> because it:</b>	
i) Has direct associations with a theme, event, belief, person, activity, organization, or institution that is significant to a community.	Historically, a crossing of the Thames River at Ridout Street has provided an important link in connecting London to its growing surroundings
ii) Yields, or has the potential to yield information that contributes to an understanding of a community or culture.	The bridge was designed by John R. Rostron, a municipal engineer for the City of London. In addition, the bridge was built by the Hamilton Bridge Co., a well-known bridge manufacturing company in the early-20 <sup>th</sup> century.
iii) Demonstrates or reflects the work or ideas of an architect, artist, builder, designer, or theorist who is significant to a community.	None identified
<b>3) The property has <i>contextual value</i> because it:</b>	
i) Is important in defining, maintaining or supporting the character of an area.	The Victoria Bridge, along with the King Street, Kensington and Blackfriars bridges form a grouping of historic bridges in downtown London.
ii) Is physically, functionally, visually or historically linked to its surroundings.	The Victoria Bridge is historically linked to its surroundings as one of the four crossings at this location.
iii) Is a landmark.	None identified

## 5.1.1 Design/Physical Value

The Victoria Bridge is a representative example of a modified Warren truss Bridge. Warren trusses were typically used for crossings between 50 and 400 feet. While a true Warren truss consists of equilateral triangle, the Victoria Bridge includes a centre panel with diagonals that form an “X”, indicating that it is a modified Warren truss. The nearby 1930 Kensington Bridge, is of a similar design. A number of steel truss bridges remain in London; however, this, along with the Kensington Bridge, is one of two modified Warren pony trusses in the City.

## 5.1.2 Historic/Association Value

Historically, a crossing of the Thames River at Ridout Street has provided an important link in connecting London to its growing surroundings. Specifically, the existing bridge is the fourth crossing that has been vital in connecting downtown to South London.

The Victoria Bridge was designed by John R. Rostron, Assistant Engineer on Structural Works for the City of London in 1926. Little information was determined about Rostron, however, he did write an article about the design challenges related to the Victoria Bridge. In addition, the bridge was constructed by the Hamilton Bridge Works Company, Ltd., a well-known bridge manufacturing company in Canada responsible for building a number of steel truss bridges in London, and elsewhere in Canada.

## 5.1.3 Contextual Value

The Victoria Bridge is one of many historic bridges that can be found in London. The bridge, along with the King Street, Kensington and Blackfriars bridges form an important grouping of historic bridges in downtown London. The similarity in design and age to the Kensington Bridge add to a continuity of bridge design in the core. In addition,

the bridge is the last of four crossings that have been constructed at Ridout Street since 1848. The abutments are partially constructed of stone and remnant materials from the third bridge that was in use at this location from 1875 to 1925. As such, the existing structure is historically linked to its surroundings.

## 5.2 Statement of Cultural Heritage Value

The Victoria Bridge, is a seven panel modified Warren steel-pony truss bridge that carries Ridout Street over the South Branch of the Thames River. The two-span structure was built in 1926 as the fourth crossing of the Thames River at this location. It was designed by municipal engineer John R. Rostron as an elegant but affordable design that would utilize the remaining stone abutments and pier from the previous bridge at this crossing. As such, the concrete pier and abutments at the Victoria Bridge also include an undetermined amount of stone that has been encased in the concrete since 1926. The bridge is one of several historic truss crossings of the Thames River in London.

### 5.2.1 Heritage Attributes

The following elements are the heritage attributes of the Victoria Bridge:

- Riveted, modified Warren truss structure with seven panels;
- Remnants of decorative stone and concrete end post at north abutment;
- Decorative lamp posts in centre of the bridge spans;
- Bridge skew evident in abutments, pier and truss alignments; and
- Hand railings original to the design of the bridge.

## 5.3 Review of Heritage Registers and Consultation

As a part of the evaluation undertaken for this CHER, AECOM reviewed municipal, provincial, and federal heritage registers and inventories including:

- *City of London, Inventory of Heritage Resources (2006);*
- *Ontario Heritage Trust Plaque Guide;*
- *Canadian Register of Historic Places; and*
- *Federal Heritage Designations.*

The 1926 Victoria Bridge does not appear on any of the above registers or inventories. In addition, consultation with Kyle Gonyou, Heritage Planner for the City of London indicated that the bridge is not listed or designated under the *Ontario Heritage Act*, however it was noted to be among one the older of London's bridges. It was also noted that the 1930 Kensington Bridge (described above) is designated under Part V of the *Ontario Heritage Act* as part of the Blackfriars-Petersville Heritage Conservation District.

Lastly, the Thames River is a designated river as part of the Canadian Heritage Rivers System (CHRS). The CHRS is a conservation program that promotes, protects, and enhances Canada's river heritage and ensure that Canada's leading rivers are sustainably managed. As part of the designation application and the on-going monitoring and reporting for the Thames River, a series of publications have been developed to preserve and enhance the natural and cultural heritage of the river.



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## 6. Recommendations

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At the time of the preparation of this report, there is no specified proposed undertaking – rehabilitation, replacement, adaptive re-use – for the Victoria Bridge. It is understood that Ridout Street incorporates on-street bicycle lanes connecting Signed Bike Road Routes from the south end of the city with downtown and the Thames Valley Parkway. However, the existing bridge deck is not sufficiently wide enough to accommodate bicycle lanes. In addition, there is also a bicycle path on the north bank of the Thames River, passing under the bridge, which is scheduled for construction upgrades in the near future. As such, this study has been undertaken as part of an investigation regarding the feasibility of accommodating full bicycle lanes, the general rehabilitation potential of the structure, as well as an assessment of the over condition of the bridge and the potential future use of the structure.

The CHER has identified that the Victoria Bridge has significant cultural heritage value or interest under *Ontario Regulation 9/06*. As such, the bridge met the evaluation criteria to merit designation under the *Ontario Heritage Act*. This should be considered when determining a proposed undertaking for the bridge. Ideally, a solution should be developed that conserves the cultural heritage value of the bridge. This may include retaining the bridge *in situ*, rehabilitation with sympathetic modifications, or other forms of heritage conservation.

If feasible, the City of London should consider an option that retains the bridge *in situ*. Given the cultural heritage value or interest identified in this report and the requirements to rehabilitate the bridge and assess the potential widening of the bridge deck for bicycle lanes, it is more likely that an option to retain the bridge with sympathetic modifications is the most appropriate form of heritage conservation for this structure. A Heritage Impact Assessment should be undertaken when a preferred rehabilitation or replacement option is identified in order to more fully evaluate the potential impacts and identify mitigation options, if required, for the bridge.

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## 7. Bibliography

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- Rostron, John R. "Victoria Bridge, Ridout St., London, Ont." *The Canadian Engineer*. Vol. 53. No. 7. October 25, 1927.

# **Appendix A**

## **Drawings**

**City of London**

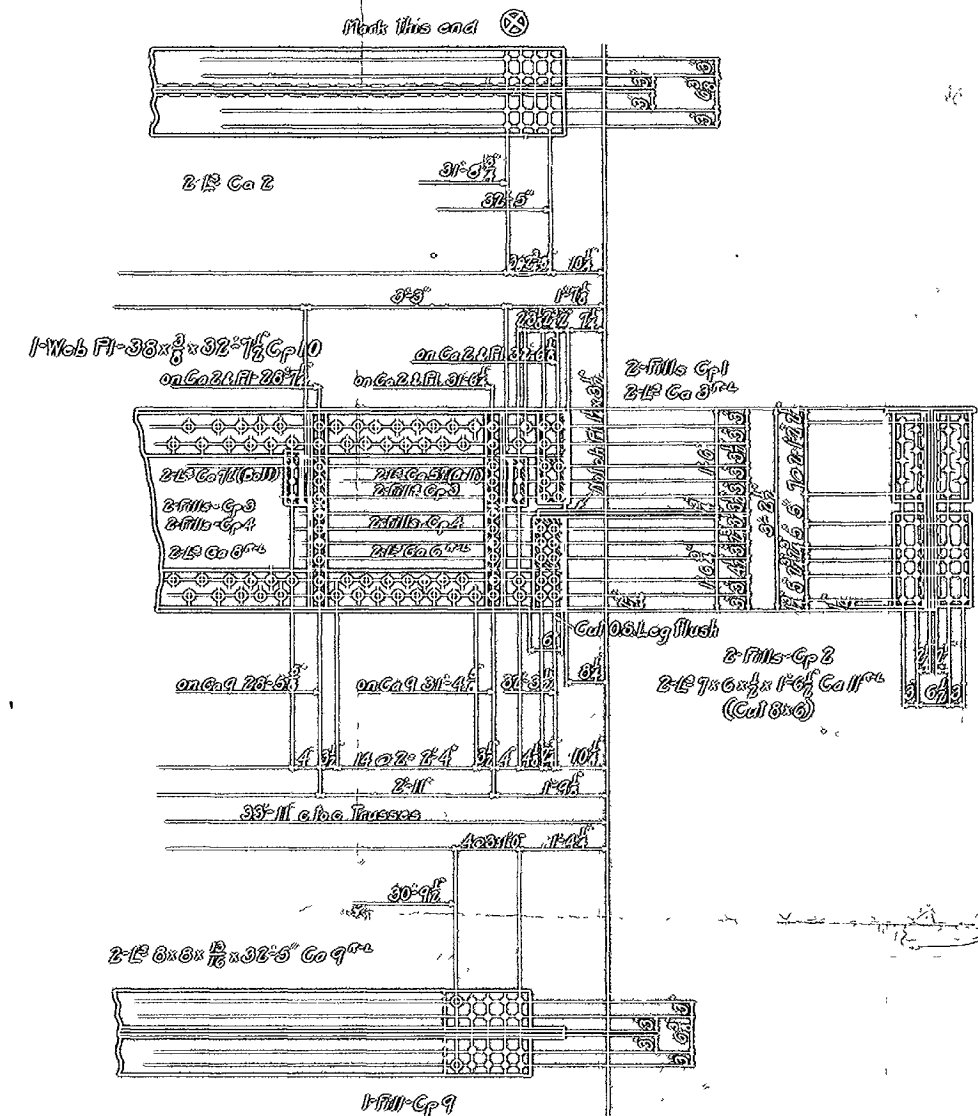
**Ridout Street Bridge**

**The Hamilton Bridge Works Co., Limited**

**Hamilton, Ontario**

**1926**





SEC A-A

SEC B-B

SEC C-C

SEC D-D

4- -FB2 Parts not shown same as FBI.

NOTES APPROVED 10/10/68	REVISED CUSTOMER ORDER STRUCTURE LOCATION OVER RIVER THAMES ON RIBOUT STREET DRAWING FLOOR BEAMS THE HAMILTON BRIDGE WORKS CO., Limited HAMILTON, ONTARIO DRAWN BY M. J. W.	CITY OF LONDON RIBOUT STREET BRIDGE OVER RIVER THAMES ON RIBOUT STREET FLOOR BEAMS THE HAMILTON BRIDGE WORKS CO., Limited HAMILTON, ONTARIO DRAWN BY M. J. W.	5/13/64 8/19/68 3
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N.E. CORNER

S.E. CORNER

Brackets displaced with  
wall will take its place

Special bracket as of  
N.W. Corner

The strength in this Bay is to remain  
as that of N.W. corner both as regards  
length & strength of crossbracing &c.

Old plate may be rebuilt &  
altered, but strength is as shown

Bell Telephone Cables

10" Gas Main

Expansion open will be required here  
at end of concrete floor

Street Railway Tracks

Ballast wall will be built to proper  
position for expansion of beam filling  
to proper level when steel is erected  
in position

Under steel girder wall

10" Gas Main  
6" Sewer

Check the design  
for increased load

Suitable diaphragm plates  
or channels to be inserted  
7' to apart to stiffen floor girder

Special bracket to  
take increased loading

Suitable L beams to be properly  
anchored to gusseted truss & over  
edge of gas main, to prevent  
slipping of truss spreading  
under expansion.

N.W. CORNER

Notes for N.W. apply here

Below

Level of level of bridge seat

at center

Brackets displaced with

S.W. CORNER

CITY OF LONDON  
RUBOUT STREET BRIDGE. ADDENDA PLAN No 3

City Engineer's Office  
Dept. of Bridges

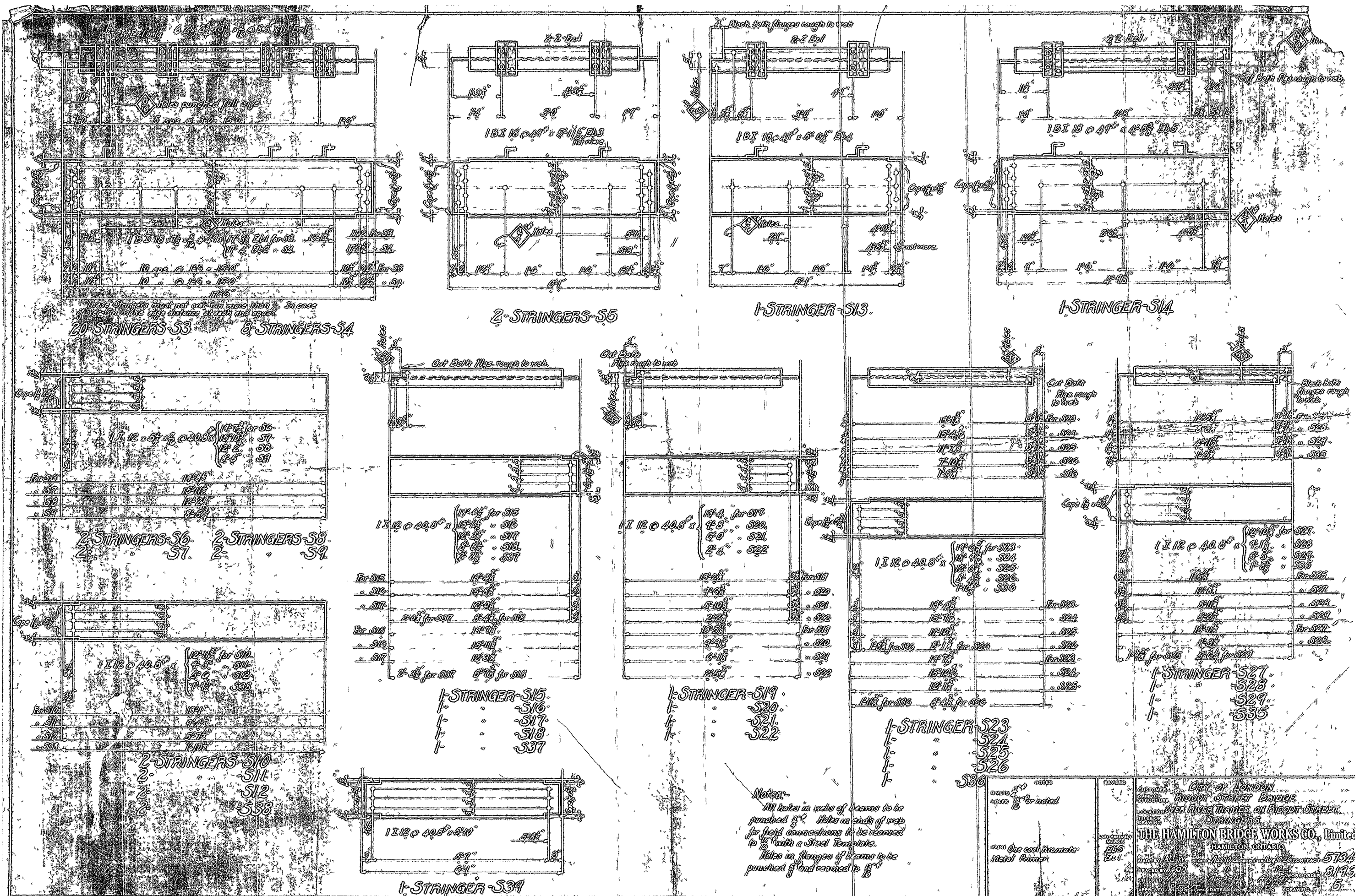
London, Eng.  
26<sup>th</sup> July 1926

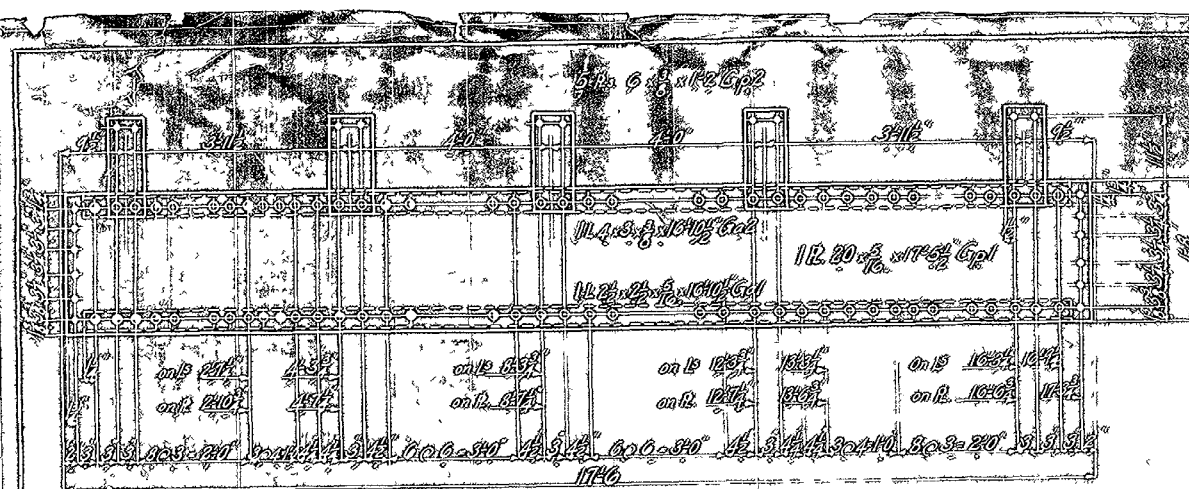
Scale 1/4" = 1'

H. P. H. son  
City Engineer

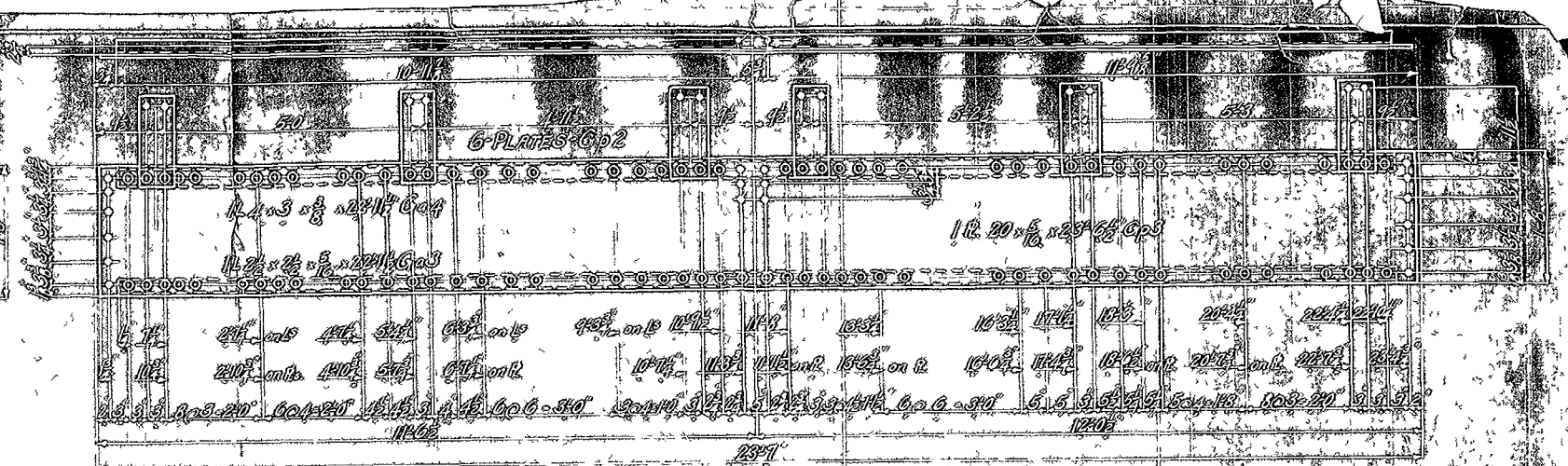




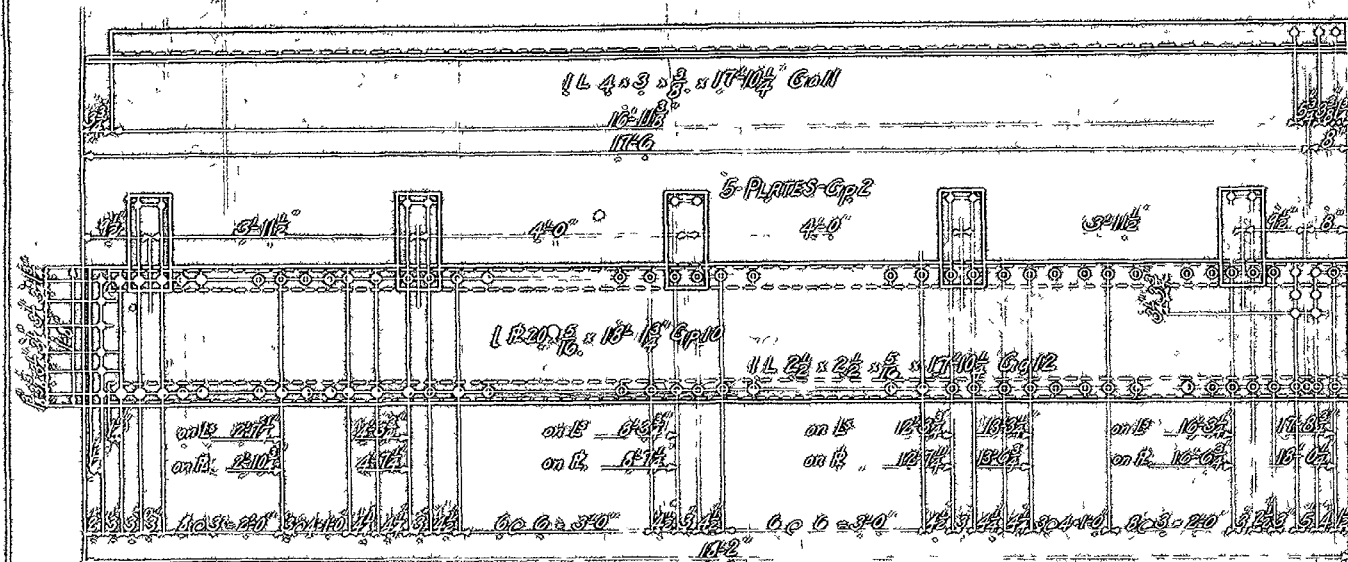




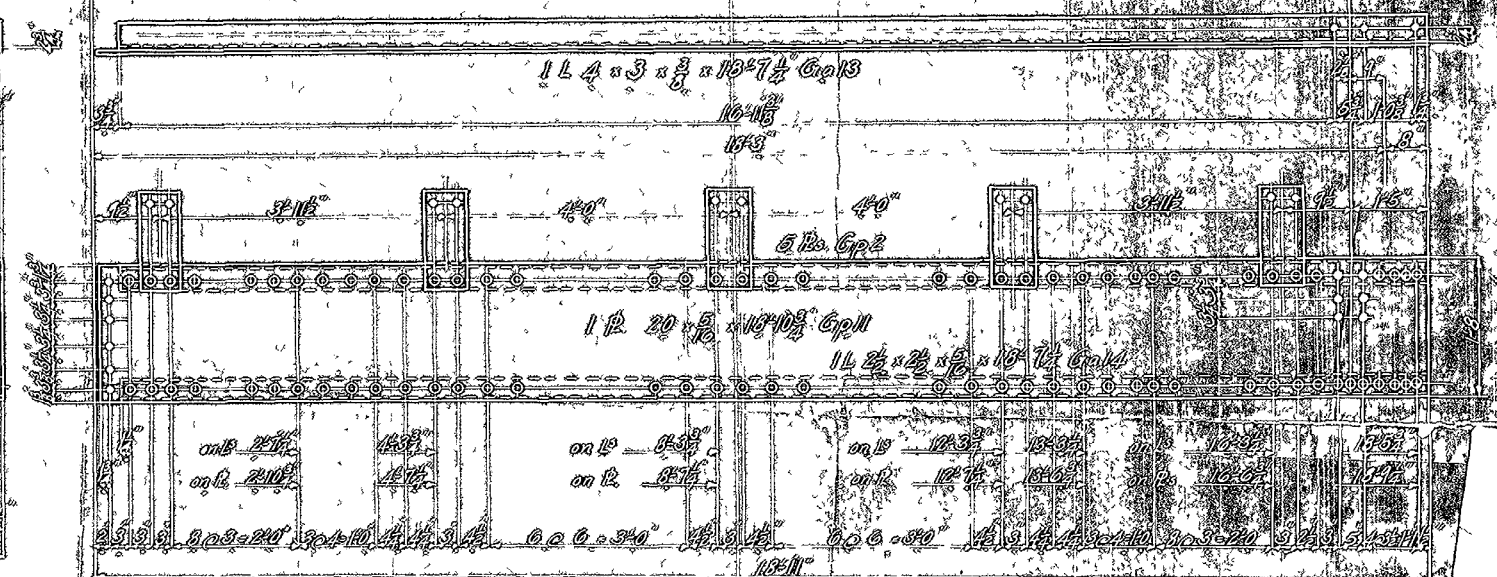
22-FRASCIA GUARDERS-GIO



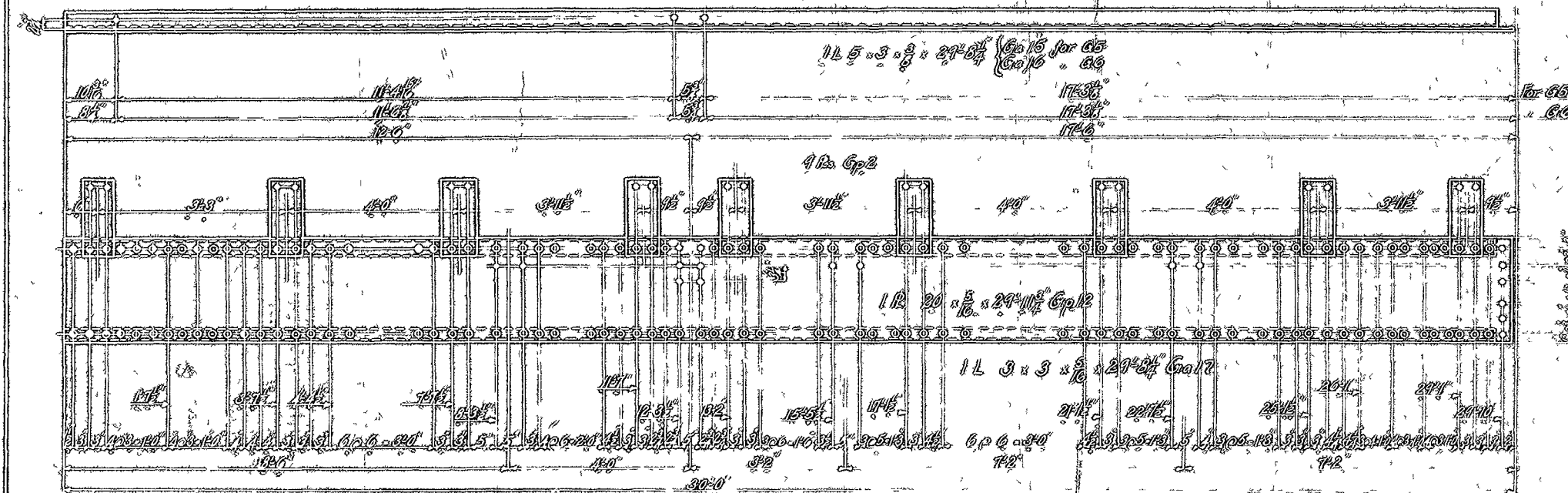
## 2-FASCIA GIRDERS-GT



1-FASCIA GIRDER-G3



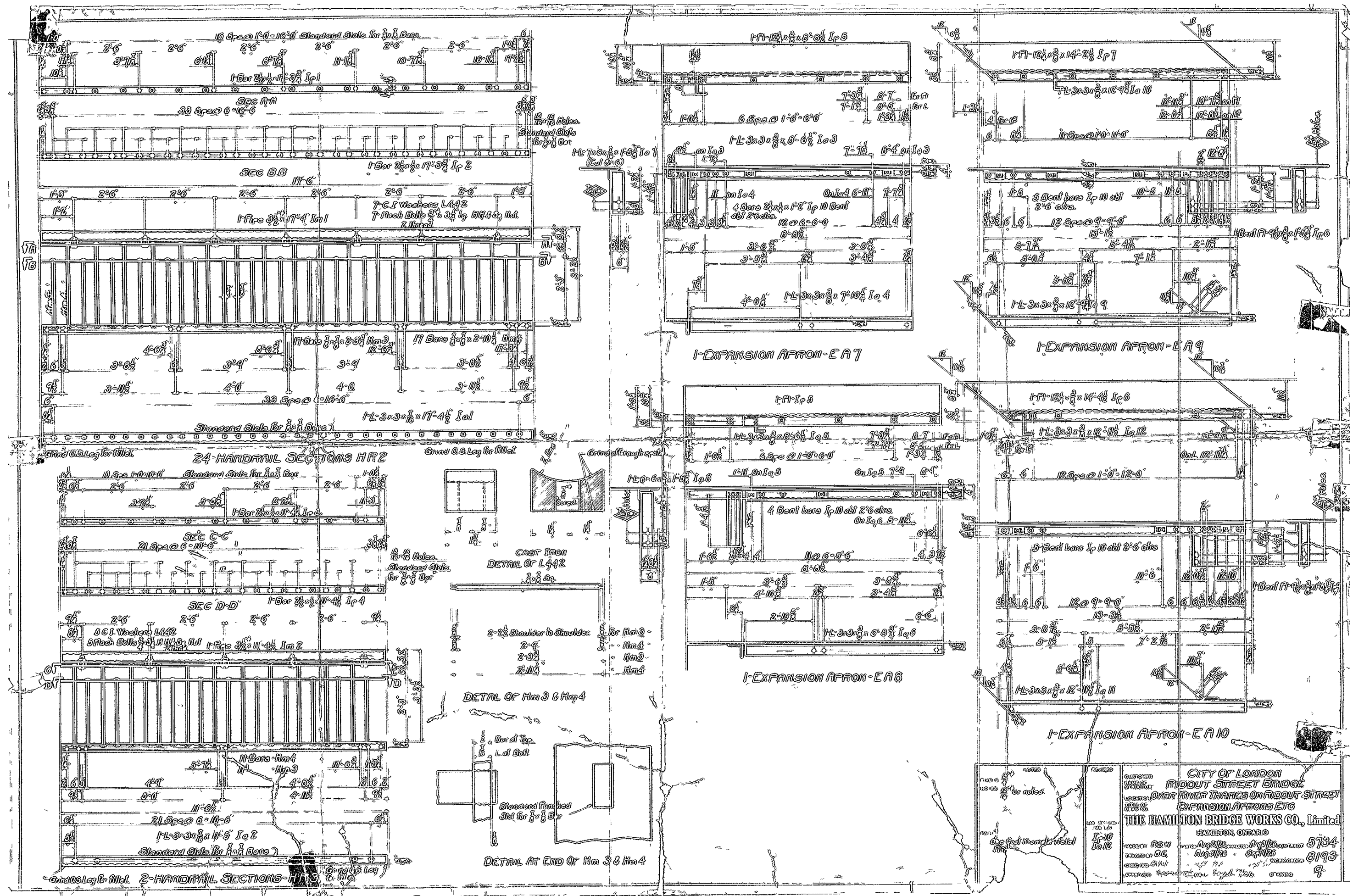
1-FASCIA GUIDER-GA



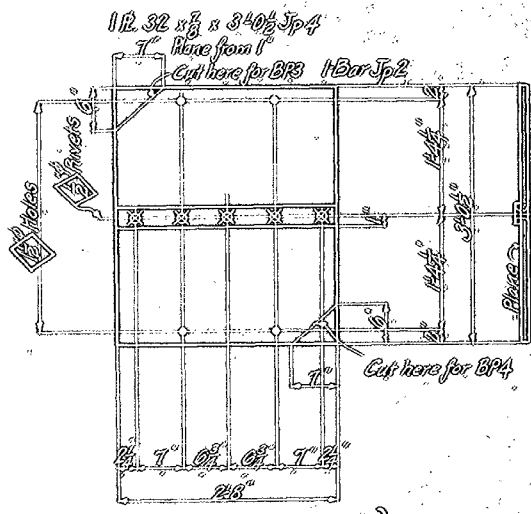
1- FASCIA GIRDER - 6'5"

[illegible]

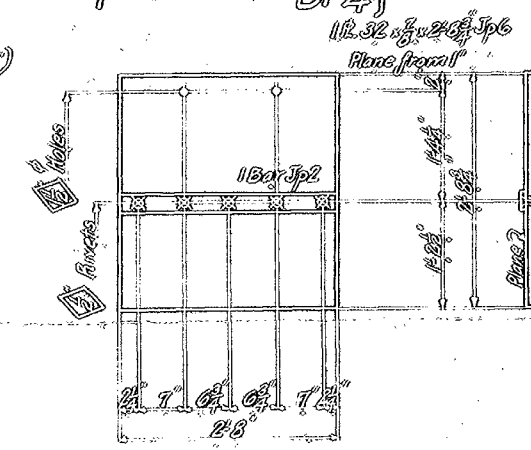




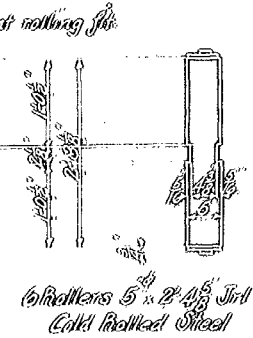




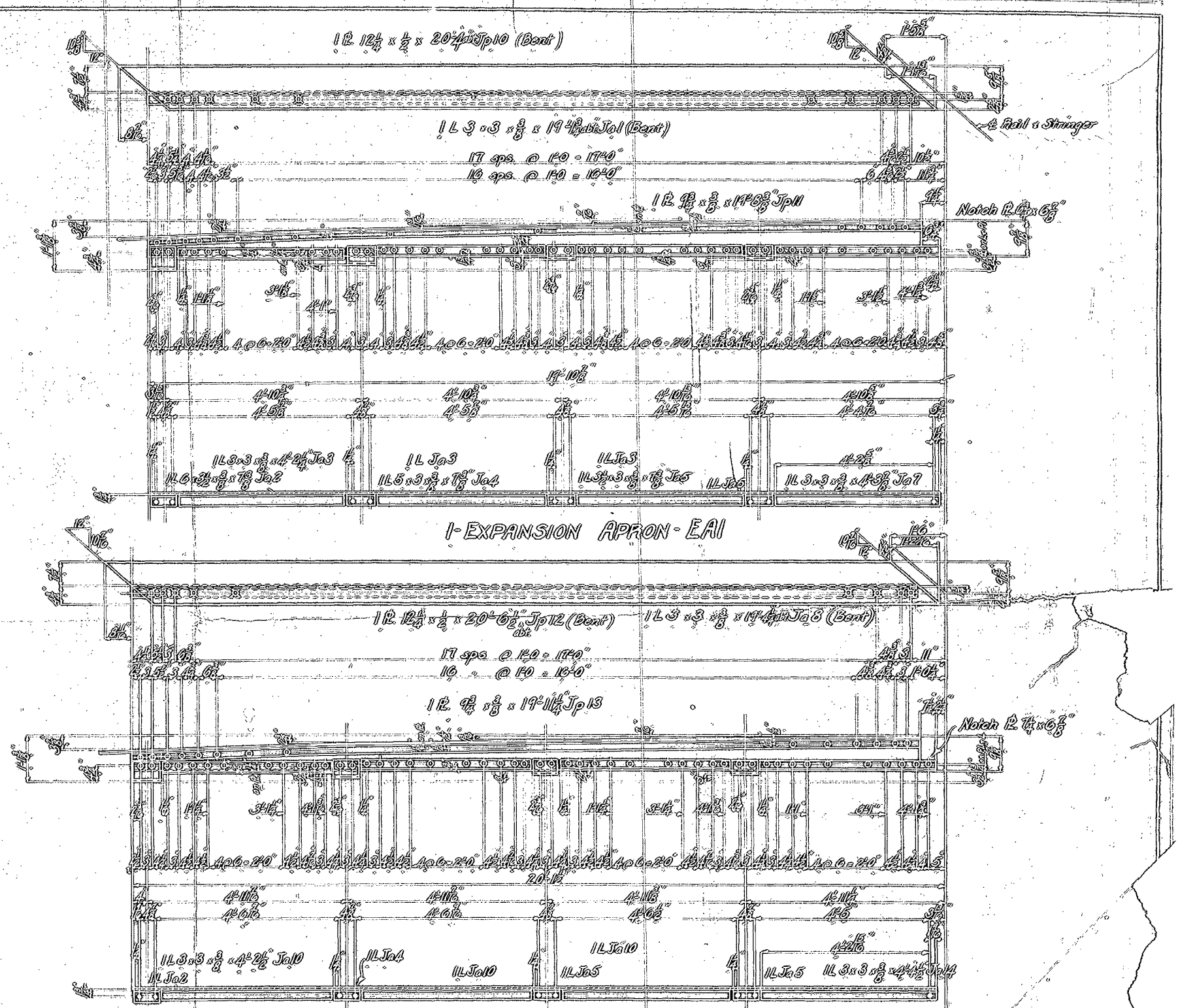
1-BED PLATE-BP3 } Anne  
1 " " -BP4 }



1-BED PLATE - BP5 } Aline  
1 " " - BP6 }



1-EXPANSION APRON-EA2

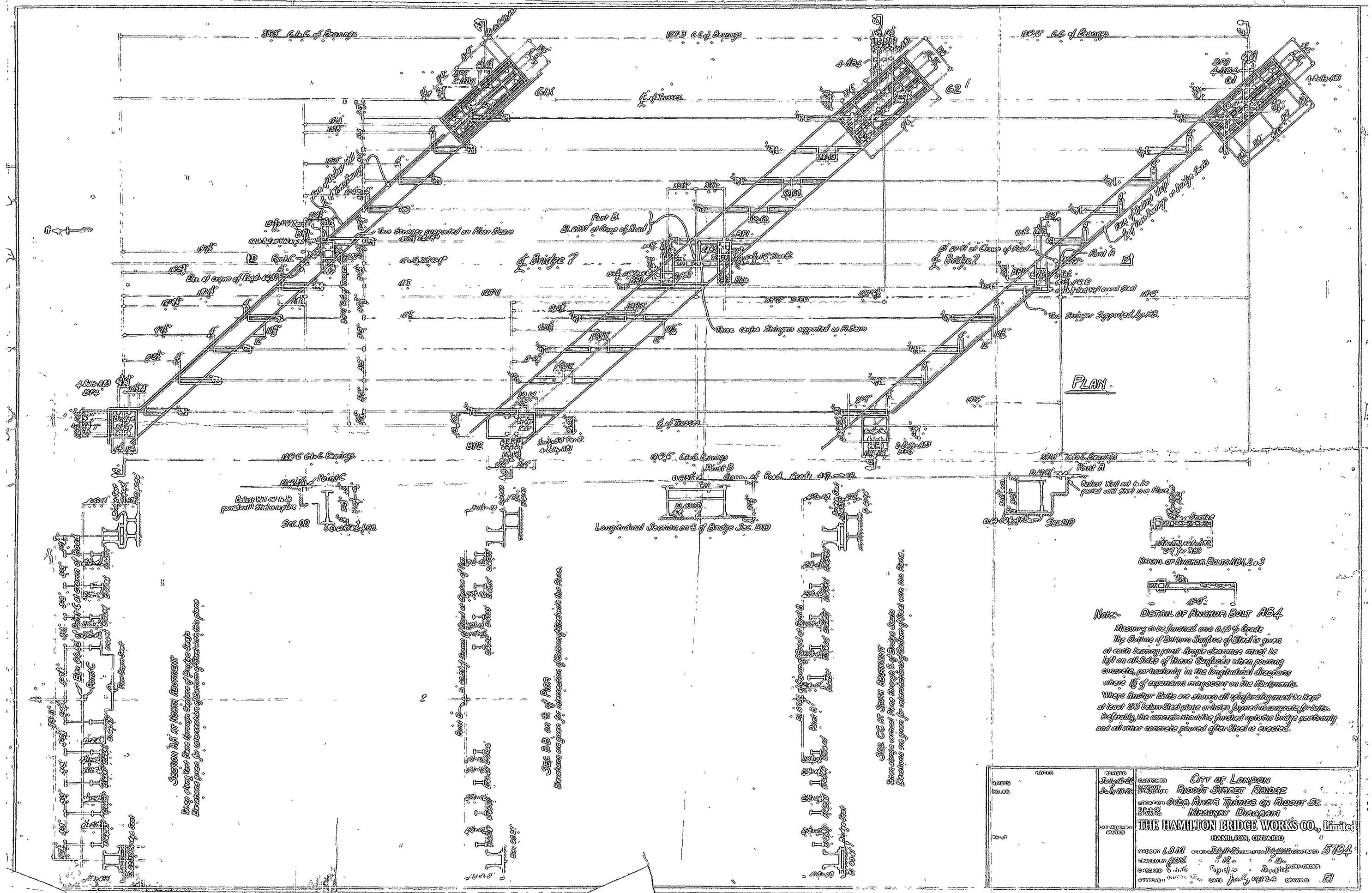


<p>NOTES</p> <p>PAGES <i>9</i> <i>unless noted.</i></p> <p>FIGS. <i>16</i> <i>unless noted.</i></p>	<p>REVISION</p>	<p>CUSTOMER <i>CITY OF LONDON</i></p> <p>NAME OF PROJECT <i>ROADOUT STREET BRIDGE</i></p> <p>LOCATION <i>OVER RIVER THAMES ON ROADOUT STREET</i></p> <p>TYPE OF DRAWING <i>EXPANSION APRONS ETC.</i></p> <p><b>THE HAMILTON BRIDGE WORKS CO., Limited</b></p> <p>HAMILTON, ONTARIO</p> <p>MADE BY <i>AS.M.</i> DRAWN <i>1/2/24</i> CHECKED <i>1/2/24</i> CONTRACT NO. <i>5734</i></p> <p>TITLE <i>EXP.</i> DATE <i>2/24</i> SCALE <i>2/24</i></p> <p>CHECKED <i>1/2/24</i> WORKSHEET NO. <i>31123</i></p> <p>APPROVED <i>1/2/24</i> BY <i>ONE</i> SIGNED <i>1/2/24</i> DATE <i>1/2/24</i></p>
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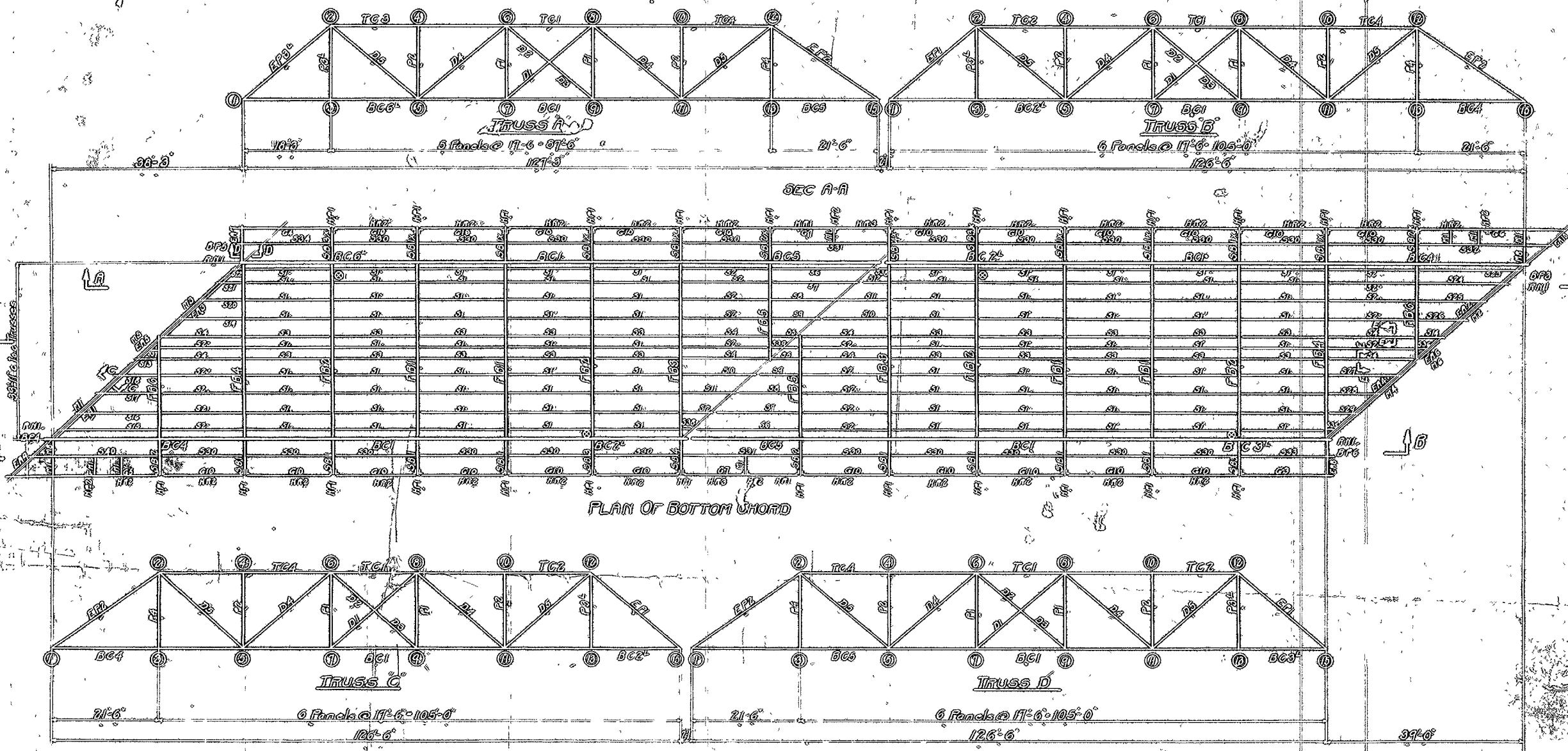
**Note:- DETAIL OF ANCHOR BOLT RB4**

Masonry to be finished on 0.45 ft Grade

The Outline of Bottom Surface of Steel is given at each bearing point. Adequate clearance must be left on all sides of these surfaces when pouring concrete, particularly in the longitudinal directions where 1/2 of expansion may occur on the abutments.

Where Anchor Bolts are shown all reinforcing must be kept at least 2\"/>

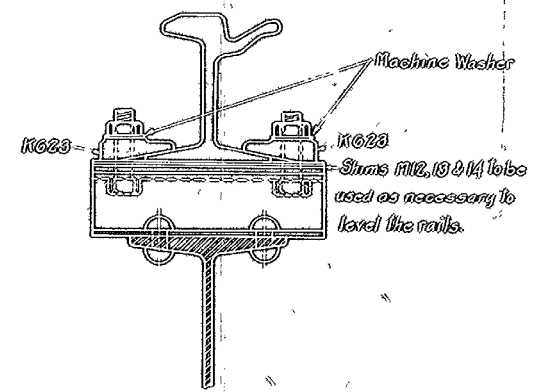
NOTES	REVISED	CUSTOMER
100' 6"	July 13-22 July 22-22	CITY OF LONDON RIDEOUT STREET BRIDGE
		LOCATION OVER RIVER THAMES ON RIDEOUT ST. MASONRY DIAGRAM
		THE HAMILTON BRIDGE WORKS CO., Limited
		HAMILTON, ONTARIO
720167		MADE BY L.S.M. ORDERED July 11-22 CONTRACT 5794
		TRACED BY 620167
		DESIGNED BY 620167
		APPROVED BY 620167



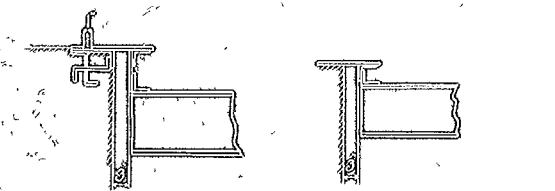
VIEW B-B



CAMBER DIAGRAM



SEC E-E



Through Roadway Exp Apron Through Sidewalk Exp Apron

**Note:**  
 Shop Inspector will match mark Trusses as shown on Diagram while they are assembled in shop.  
 Match marks to be shown thus (1) (2) (3) (4)  
 When erecting Handrail the erector will first remove 1/2 plate from top of Posts. After Handrail is erected replace and brace loose end snug against pipe.  
 All field connections rivetted except Handrail to Posts. Expansion Aprons to Stringers & Trusses which are bolted. Drill holes in field for accommodation of Expansion Aprons where necessary.

NOTES	CITY OF LONDON	
	HARDOUT STREET BRIDGE	
REVISIONS	LOCATION OVER RIVER THAMES ON HARDOUT STREET	
	ERECTOR THE HAMILTON BRIDGE WORKS CO., Limited	
DATE	HAMILTON, ONTARIO	
	DRAWN BY E.P.	
CHECKED BY	DATE	
	APPROVED	

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