DRAFT REPORT – JANUARY 23, 2019

CULTURAL HERITAGE EVALUATION REPORT

TRANSIT PROJECT ASSESSMENT PROCESS
LONDON BUS RAPID TRANSIT

UNIVERSITY DRIVE BRIDGE
CITY OF LONDON
PROVINCE OF ONTARIO

wsp

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CITY OF LONDON
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REPORT

PROJECT NO.: 141-21085-00
DATE: JANUARY 2019

WSP

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SIGNATURES

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EXECUTIVE SUMMARY

WSP Canada Inc. (WSP) was retained by the City of London to complete a Cultural Heritage Evaluation Report (CHER) for University Drive Bridge as part of the Transit Project Assessment Process (TPAP) for the proposed London Bus Rapid Transit (BRT) system. The study area, which includes University Drive Bridge and approaches, was identified by WSP as a cultural heritage resource in the Cultural Heritage Screening Report (October 2018) completed for the London BRT TPAP. University Drive Bridge spans the north branch of the Thames River bringing traffic across University Drive, providing access to Western University. The purpose of this report is to evaluate the study area using *Ontario Heritage Act* Regulation 9/06 to determine its cultural heritage value and provide a Statement of Cultural Heritage Value or Interest and list of attributes, if appropriate.

Based on archival research, review of background information, site investigation, and application of criteria from Ontario Regulation 9/06, University Drive Bridge was determined to demonstrate significant cultural heritage value or interest.

The completion of the study has resulting in the following recommendations:

1. **The University Drive Bridge was determined to demonstrate cultural heritage value or interest. As such, a Heritage Impact Assessment is required for this resource to identify appropriate mitigation measures.**

2. **A Cultural Heritage Evaluation Report should be undertaken in coordination with Western University following the completion of TPAP for the Western University property.**

PROJECT PERSONNEL

CLIENT

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1 INTRODUCTION

1.1 DEVELOPMENT CONTEXT

WSP Canada Inc. (WSP) was retained by the City of London to complete a Cultural Heritage Evaluation Report (CHER) as part of the Transit Project Assessment Process (TPAP) for the proposed London Bus Rapid Transit (BRT) system to establish the cultural heritage value of the study area encompassing University Drive Bridge and its approaches (Figure 1). The BRT system is comprised of four segments, combined into two operational routes: the north/east corridor and the south/west corridor. The BRT network was approved by City Council through the Rapid Transit Master Plan in July 2017.

The study area encompassing University Drive is part of the property known as Western University (1400 Western Road) which was identified as a listed cultural heritage property in the City of London Cultural Heritage Screening Report (CHSR) (WSP, October 2018) as being directly impacted. The CHSR was completed as part of the Transit Project Assessment Process for the London Bus Rapid Transit project. The TPAP is regulated by the *Environmental Assessment Act* (EAA) under Ontario Regulation 231/08: Transit Projects and Metrolinx Undertakings (O. Reg. 231/08). This CHER form part of the Environmental Project Report (EPR) completed under the TPAP.

The following report has been prepared utilizing the CHER Terms of Referece prepared for the London BRT TPAP process, which was prepared in consultation with the City of London Heritage Planning staff and the Ministry of Tourism, Culture and Sport (MTCS) and has been received by the London Advisory Committee on Heritage (LACH).

2 LEGISLATION AND POLICY CONTEXT

2.1 PROVINCIAL AND MUNICIPAL CONTEXT AND POLICIES

2.1.1 PROVINCIAL POLICY CONTEXT

The Ministry of Tourism, Culture and Sport is charged under Section 2 of the *Ontario Heritage Act* (2006) with the responsibility to determine policies, priorities and programs for the conservation, protection, and preservation of the heritage of Ontario and has published guidelines to assist in assessing cultural heritage resources as part of an environmental assessment. The following guidelines have been utilized in the preparation of this CHER:

- Reference Guide on Physical and Cultural Heritage Resources (Canadian Environmental Assessment Agency,1996)
- Guideline for Preparing the Cultural Heritage Resource Component of Environmental Assessments (1992),
- Guidelines on the Man-Made Heritage Component of Environmental Assessments (1981), and
- The Ontario Heritage Toolkit (2006).

An Environmental Assessment is required for all large-scale projects that have potential impact on the environment in accordance with the *Environmental Assessment Act* (1990). These projects require approval from the Government of Ontario. Certain projects, such as transit projects, have more predictable environmental impacts or effects, and can be more readily managed. This streamlined approach protects the environment, but shortens the timeline to six months for commencement, review and approval. This Environmental Assessment process for transit projects is known as the Transit Project Assessment Process (TPAP).

TPAP provides a framework for focused consultation and objection processes. Through TPAP, the Minister of the Environment may initiate a Time Out period if there is a potential for a negative impact on a matter of provincial importance that relates to the natural environment or has cultural heritage value or interest, or on a constitutionally protected Aboriginal or treaty right (TPAP Guide to Environmental Assessment Requirements for Transit Projects, 2014).

Additionally, the *Planning Act* (1990) and related *Provincial Policy Statement* (PPS) (2014) provide guidance for the assessment and evaluation of potential heritage resources. Subsection 2.6 of the PPS, Cultural Heritage and Archaeological Resources, states that:

> 2.6.1 Significant built heritage resources and significant cultural heritage landscapes shall be conserved.

Criteria for determining significance for the resources are mandated by the Province in Ontario Regulation 9/06 of the *Ontario Heritage Act*.

2.1.2 ONTARIO REGULATION 9/06

Ontario Regulation 9/06 (O. Reg 9/06) provides the Criteria for Determining Cultural Heritage Value or Interest under the *Ontario Heritage Act.* This regulation was created to ensure a consistent approach to the designation of heritage properties in Ontario under the *Ontario Heritage Act*. All designations under the *Ontario Heritage Act* (2006) after 2006 must meet the minimum criteria outlined in the regulation.

Criteria

A property may be designated under Section 29 (Designation of Properties by Municipalities) of the *Ontario Heritage Act* if it meets one or more of the following criteria for determining whether it is of cultural heritage value or interest:

1. The property has design value or physical value because it,
    i. is a rare, unique, representative or early example of a style, type, expression, material or construction method,
    ii. displays a high degree of craftsmanship or artistic merit, or
    iii. demonstrates a high degree of technical or scientific achievement.
2. The property has historical value or associative value because it,
    i. has direct associations with a theme, event, belief, person, activity, organization or institution that is significant to a community,
    ii. ii. yields, or has the potential to yield, information that contributes to an understanding of a community or culture, or
    iii. 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,
    i. is important in defining, maintaining or supporting the character of an area,
    ii. is physically, functionally, visually or historically linked to its surroundings, or
    iii. is a landmark. O. Reg. 9/06, s. 1 (2).

2.1.3 MUNICIPAL POLICIES

In addition to provincial legislation, policies, and guiding documents, municipal policies regarding cultural heritage have also been considered as a part of this CHER.

The London Plan is the City of London's new Official Plan which was consolidated August 27, 2018. *The London Plan* focuses on three areas of cultural heritage planning: general policies for the protection and enhancement of cultural heritage resources; specific policies related to the identification of cultural heritage resources including individual heritage resources, heritage conservation districts, cultural heritage landscapes, and archaeological resources; and specific policies related to the protection and conservation of these cultural heritage resources. The criteria outlined in *The*

London Plan for the identification and designation of individual properties of cultural heritage value or interest reflect the criteria defined in O. Reg 9/06 and are listed on pages 572-574 of the document.

2.1.4 METHODOLOGY

This bridge CHER examines the University Drive Bridge structure in isolation from the rest of the Western Unviersity. The recommendations of the report are based on an understanding of the physical values of the structure alone, a documentation of its history through research, an analysis of its social context, comparisons with similar properties and mapping. A complete CHER for the Western Unviersity Property should be completed to understand the cultural heritage value of the property as a whole.

This CHER is guided by key documents such as the *Reference Guide on Physical and Cultural Heritage Resources* (Canadian Environmental Assessment Agency,1996), the *Ontario Heritage Toolkit* (Ministry of Tourism Culture and Sport (MTCS), 2006), and the *Guidelines for Preparing the Cultural Heritage Resource Component of Environmental Assessments* (Ministry of Culture and Communications,1992). This report follows the Terms of Referece prepared for the London BRT TPAP process, which has been recived by the London Advisory Committee on Heritage (LACH) and the MTCS (Appendix A).

2.2 CONSULTATION

Consultation for the London BRT project has been conducted with the LACH. A draft CHSR report (dated February 6, 2018) was provided for their review and comment. Upon their review LACH recommended that 104 of the properties identified as having potential cultural heritage value in the CHSR did not have cultural heritage value or interest. The LACH also recommended 30 properties not identified by the CHSR be evaluated for their potential cultural heritage value. Further, the remaining properties flagged by the draft CHSR requiring further cultural heritage work were added to the Register (Inventory of Heritage Resources) pursuant to Section 27 of the *Ontario Heritage Act* (2006) by resolution of Municipal Council on March 27, 2018.

The CHSR was also provided to the MTCS for review and comments were received in July 2018. In response to MTCS comments, the CHSR was expanded to a fulfil the requirements of a CHAR, including additional information on impacted properties, and a preliminary impact assessment. Ongoing communications with MTCS have continued as a part of the TPAP process.

The updated CHSR report (Dated October 8, 2018) was provided to the LACH on October 10, 2018. The Draft Terms of Reference for CHERs was also received and referred to the LACH Stewardship Sub-Committee for review. The updated CHSR was submitted and reviewed by the LACH Stewardship Sub-Committee at their meeting on November 5, 2018. The LACH Stewardship Sub-Committee had no further concerns

regarding the updated CHSR, and communicated this to the LACH at their meeting on November 14, 2018. A review timeline for Pre-TPAP CHERs, including the University Drive Bridge, was proposed and received by the LACH on November 14, 2018. This report is scheduled to be reviewed by the LACH at their meeting on February 13, 2019.

3 HISTORICAL CONTEXT

3.1 LOCAL CONTEXT AND SETTLEMENT HISTORY

City of London

For a detailed local history of the City of London, please refer to the City of London Cultural Heritage Screening Report: London Bus Rapid Transit System (WSP, 2018).

Western University

The Western University of London Ontario was founded on March 7, 1878 by Diocese of Huron Bishop Isaac Hellmuth (An Act to incorporate The Western University and College of London, Ontario 1878, as amended 1882). Huron's College (established 1863) was Western University's founding college and in 1881 Western University and Huron College established a faculty of arts. When the first classes were opened in 1881, to study Arts, Divinity, Law or Medicine, students met in at Huron College's Rough Park campus (Western University, n.d.). In that same year, the students, faculty and library were moved to Hellmuth Boys' College (located on the block bound by St. James, Waterloo, Oxford and Wellington Streets) (Western University, n.d.). In 1885 Western University had to close the Faculty of Arts due to financial constraints and Huron College withdrew its affiliation and returns to its Rough Park campus. Ten years later, Western University was able to revive its Faculty of Arts as well as its affiliation with Huron College. In 1908 the University became nondenominational.

For a number of years, the University's Board of Governors envisioned a separate campus for the University and a property committee was established find land in 1910. In 1916, the farm known as "Bellevue" was purchased from the Kingsmill family, and in 1923 the university was renamed The University of Western Ontario (Tausky and Distefano, 1986:376-377; Talman, 1953; Gwynne-Timothy, 1978). The choice of location was ridiculed at the time, as the campus grounds were located just outside of the City of London's limits, a seemingly remote location. The property committee continued to acquire more land and by 1920 had approximately 230 acres of land intended to service the University over the next two centuries (Gwynne-Timothy, 1978). Public funding for the construction of the campus included $100,000 from the County of Middlesex, $250,000 from the City of London, and an initial capital grant of $850,000 from the Province of Ontario (Tausky and Distefano, 1986:376-377).

Frederick H. Spier, a prominent Detroit architect drew up the first ground plan for the campus and the tentative floor plans for the main buildings (Tausky and Distefano, 1986:376-377; Talman, 1953). Thomas Adams, a well known Scottish architect and planner from Scotland was also invited to view the university plans (Noon, 2003; Gwynne-Timothy, 1978). It was Adams that identified that access to the University should be across a bridge over the Thames River, that would frame the views to the memorial tower of the University College building (Gwynne-Timothy, 1978).

The Board began to gather the necessary funds to construct the buildings and in 1921 the County of Middlesex decided to contribute $100,000 towards the construction of a memorial tower to honour those who served and died in the first World War (Talman, 1953). Following the recommendation of the Cody commission, the Ontario Government provided $800,000, later adding another $200,000 for the construction of the campus buildings (Talman, 1953).

The University hired local firm, John M. Moore & Co. Architects to design the first campus buildings and the University Drive Bridge. The University Drive Bridge was the first structure built on the new campus completed in November 1923. The three buildings which followed were the University College building (Arts Building), Convocation Hall and a library including the administrative offices for the university. Influenced by Oxford and Cambridge Universities in England, and Ivy League colleges in the United States, the style adopted for these buildings was Collegiate Gothic (Tausky and Distefano, 1986:376-377, Gwynne-Timothy, 1978). The buildings used Credit Valley sandstone from a quarry at Rockwood near Guelph and were faced with Indiana limestone (Gwynne-Timothy, 1978). The inclusion of sculptural grotesques on many of the campus buildings evoke medieval architecture and are demonstrative of the Collegiate Gothic style.

The Board of Governors understood the importance of cultivating the natural beauty of the setting in addition to building in pleasing architectural styles. As such the services of Mr. Gordon Culham of Toronto, a graduate of landscape architecture and planning at the University of Harvard, were acquired in 1934. Under Mr. Culham's direction the river banks were cleared, filled and strengthened to prevent erosion; existing trees pruned and dead wood removed; and twelve thousand new trees were planted (Gwynne-Timothy, 1978).

Following construction of the first three buildings, the J.W. Little Memorial Stadium was the next to be completed in 1929. Designed by Fielding Yost, who was the well-respected Football Coach at the University of Michigan, the stadium allowed Western University to join the senior intercollegiate football league (Gwynne-Timothy, 1978). The construction of the Lawson Memorial Library followed in 1934, the Hume Cronyn Memorial Observatory in 1940 and the McIntosh Memorial Art Galley in 1942. Expansion of the campus accelerated in the 1950s and 1960s with new buildings constructed on the east side of the Thames River and south of Phillip Aziz/Sarnia Road. Additions to existing buildings were prevalent in the 1990s and 2000s (Campus Master Plan, 2015).

3.1.1 HISTORICAL MAPPING REVIEW

The 1863 Map of the Township of London, Canada West, depicts the area adjacent to the location of the University Drive Bridge is largely rural, with the agricultural development of Broughdale to the south (Figure 2). The future location of University Drive Bridge is along the north branch of the Thames River, south of a former mill race, within the farm of Thos. Ball. No crossing currently exists at this location. The 1878 Illustrated Historical Atlas of the County of Middlesex reveals thatthe rural property is

now owned by the Kingsmille family (Figure 3). The mill race is no longer extant and no crossing exists at this location.

The 1915, 1923 and 1928 Topographic Map depict the area as still largely rural, with the adjacent area being identified as Broughdale (Figure 4, Figure 5 and Figure 7). No crossing exists, but the mill race is once again noted on the map.

The 1926 Geodetic Survey of London depicts the University Drive Bridge is present labelled as “University Bridge”, the area northwest of the bridge including the University campus is not included, likely as it was outside of the City’s boundaries at the time (Figure 6).

The 1930 Topographic Map outlines the Western University campus, including the bridge, and several university buildings (Figure 8). The area remains relatively unchanged in the 1936 Topographic Map (Figure 9).

The bridge is depicted in the 1957 Geodetic Survey, however significant institutional development has occurred within the University on lands adjacent to the bridge (Figure 10). This development is also visible in the 1967 Aerial Image, as well as in the 1998 Aerial Image (Figure 11 and Figure 12). In the 2018 aerial imagery, additional institutional development to the east of the bridge has been constructed (Figure 1).

3.2 EARLY BRIDGE BUILDING IN ONTARIO

Bridges have been an early necessity in Ontario due to the many waterways that required fording by roads and railways. Eighteenth-century bridges were typically of a simple wood slab design and construction was crude (Bradford, 2015; 10). There was little appetite by the government of Upper Canada to take on road and bridge construction and the first Parliament of Upper Canada focussed instead on building military and trading outposts connected by water routes (Bradford, 2015; 11). As a result, early bridges were typically constructed by land-owners and local governments and consisted of timber felled from local forests to produce makeshift crossings along primitive roads

Early engineered bridges were constructed using timber, with covered bridges used for road passage and timber trestle bridges for railway crossings. Timber bridges dominated the rural landscape between 1780-1880 and continued into the early twentieth century (Cumming, 1983). Railway expansion in the second half of the nineteenth century led to significant advances in civil infrastructure to construct structures strong enough to support trains across longer spans (Bradford, 2015; 28).

Wrought iron was briefly used in bridge construction, and most notably on the bridge crossings along the Grand Trunk Railway between Montreal and Toronto and the Blackfriars Bridge of London, Ontario. (Legget, 2017). However, by the end of the nineteenth century steel was the material of choice for bridge construction as it had a greater tensile strength than iron and was more durable than timber. The truss design, characterized by a framework of supporting members, was the most common bridge type in the late-nineteenth century, with steel members replacing wood members

generally by the 1890s (Cleary 2007; 127-128). Truss designs proliferated in the final decades of the nineteenth century, though these structures are generally separated into three categories: deck truss (where the deck rests wholly upon the truss); through truss (where the truss extends above the deck and is joined above the deck); and half-truss or pony-truss (where the truss extends above the deck but the top members are not connected). The use of steel in bridge construction decreased during the early twentieth century as a result of steel shortage during The Second World War, innovations in concrete fabrication, and the subsequent favouring of that material by bridge engineers. However, steel is still used on Ontario's roads for some girder and steel box girder bridges and, less often, cable-stayed or suspension bridges.

Advancements in concrete production and bridge design in the first half of the twentieth century led to the general movement away from steel bridge construction by mid-century (Cleary 2007; 54-63). Rigid frame bridges, those that were entirely cast in place, appeared on Ontario's roads in the first decades of the twentieth century. These structures are defined by their monolithic casting (where the superstructure and substructure are continuous) and commonly utilized steel rebar reinforcement within the concrete for greater strength (Cleary 2007; 54-63). Simple concrete slab bridges, characterized by a single superstructure resting atop substructure components (such as piers and abutments) were developed during the mid-twentieth century. Advancements in concrete engineering in the 1950s led to the development of pre-cast, pre-stressed concrete, which was widely adopted for bridge construction during the second half of the twentieth century. Using this design, concrete girders are typically cast off-site and compressed to ensure predictable tensile strength under load (Cleary 2007; 54-63). At present, most roads and highways in Ontario use reinforced concrete bridges, and increasingly with prefabricated components (Legget, 2017).

3.2.1 HISTORY OF PLATE GIRDER BRIDGES

Steel plate girder bridges are characterized by the connection of steel plates, by rivets, bolts, or welds, to create a continuous girder. Plate girders became popular in the late nineteenth century, most commonly used in the construction of railway bridges (Unterman McPhail, 2011: 13). As a plate girder bridge could be assembled onsite it allowed for more convenient transportation of materials. This bridge design proliferated in the first half of the twentieth century and comprised most of Canada's railway crossings by 1914. The technology was used to construct road bridges by the 1920s and 1930s, though steel shortages during World War II resulted in a reduction of structures constructed at this time (Unterman McPhail 2011: 13). By the 1950s, welded plate girders replaced riveted and bolted plate girders and innovations in concrete bridge design resulted in a proliferation of concrete beam bridges on Ontario's roads.

3.3 CONSTRUCTION AND HISTORY OF UNIVERSITY DRIVE BRIDGE

The land use history for the University Drive Bridge was produced using historical mapping, bridge drawings, archival research, and secondary sources where available.

This section has generally been divided into periods of significant changes or alterations. The subject property is located on former Lot 16, Concession 3 in London Township.

3.3.1 1863-1916

The 1863 map of the Township of London, Canada West, identifies the lands on which the bridge sits as belonging to Thomas Ball with no building footprints (Figure 2). Several smaller lots owned by Thomas Ball are identified south of the Thames River and north of the University Drive Bridge's location.

The 1878 *Illustrated Historical Atlas of Middlesex County* identifies the land as vacant, though owned by the Kingsmille (sic. Kingsmill) family (Figure 3). There is no Kingsmille family identified in the Census data in 1881 and 1891, however, there is a Kingsmill family (Schedule 1, District No.167 East Riding of Middlesex, Sub District No. 6 London Township, Page 38-39 and Schedule 1, District No. 90 East Middlesex, Sub District C London Township, Page 27). Given that spelling mistakes in historical maps and historical census records were common, it is likely that the Kingsmill family identified in the Census data were the same as the Kingsmille family identified on the 1878 Middlesex County map. The Kingsmill family recorded in the 1881 and 1891 Census Records identifies Thomas Fraser as the husband and father, Ann as his wife, and Ann, Aliy as their daughters and Thomas, Henry and Arthur as their sons. Thomas Fraser Kingsmill is recorded as a merchant and was the founder of the Kingsmill Department Store which began as a 1,800 square foot general store that operated on Main Street until its eventual closing in 2014 (*Kingsmill History*, 2014). The "Bellevue" Farm was sold by the owner Miss Ann Kingsmill to the University in 1916 (Talman, 1953; Gwynne-Timothy, 1978).

3.3.2 1917-1923

The bridge crossing the Thames River from Richmond Road along what was to become University Drive was the first structure built on the new campus in 1923 (Figure 5). The new bridge was constructed over the north branch of the Thames River, linking Richmond Street with the university grounds. The bridge was specifically designed with a low setting to provide an unobstructed view of University College. (The Journal Royal Architectural Institute of Canada 1925:128) According to John R. W. Gwynne-Timothy in his book Western's First Century (1978) it was Thomas Adams, a well known Scottish architect and planner from Scotland that proposed reversing the siting of University College to face east rather than west (Gwynne-Timothy, 1978). Adams identified the key to the plan as building a bridge across the river, leading to the memorial tower of the University College building that would be straight ahead above the crest of the hill (Gwynne-Timothy, 1978). The university adopted Adams' suggestion.

The Canadian Institute of Planners describes Thomas Adams as the godfather of Canadian urban planning. Adams came from humble beginnings being born on a farm just outside of Edinburgh, Scotland in 1871. He went on to become the first president of the British Town Planning Institute, founder of the Town Planning Institute of Canada

and a founding member of the American City Planning Institute, forerunner of the American Institute of Planners, making Adams not only the godfather of Canadian urban planning but arguably instrumental in the establishment of urban planning in Britain and the United States, including London.

Alan Noon provides a slightly different account of the planning and design of the University Bridge in the Fall 2012 edition of the *Alumni Gazette*, suggesting that the Detroit Architect Frederick Spier, who is credited with the first campus concept for Western University's current campus, came up with the idea to connect the campus to Richmond Street by crossing the Thames River. Noon suggests that Thomas Adams disagreed with Spiers organization of the campus buildings in block formation and rather advocated for a circular layout with the central campus as open space. However, Noon does indicate that Thomas Adams precisely fixed the location of the present-day University Drive Bridge.

While a completely steel bridge would have been a less expensive endeavor, the University opted for the more ornate steel girder bridge covered in stone and concrete, providing an early emphasis on design. The firm John M. Moore & Co. Architects designed the steel girder bridge disguised as a concrete and stone arch bridge. The piers were of poured concrete and outside faces of the girders were and still are encased in concrete, which appears to be a very rare practice in Ontario bridge building (Holth, 2013). The bridge design included stone clad abutment walls, stone clad pylons, stone wingwalls, ornate wrought iron light standards and carved stone railing and spindles. The stone included Cut Indiana Limestone and Credit Valley Sandstone (The Journal Royal Architectural Institute of Canada 1925:128). John M. Moore & Co. Architects were active in London from 1857 to 1930 and designed the other original buildings on the current Western University campus and many institutional and residential buildings in the City of London such as St. Luke the Evangelist Anglican Church (1204 Richmond Street) and Elsie Perrin Williams Estate (101 Windermere Road). However, the University Drive Bridge is the only known bridge attributed to John M. Moore's firm.

London contractor John Putherbough began construction of the bridge in August 1922 and finished in November 1923 (Figure 12). Putherbough was an pioneer with new ways to mix and pour concrete that allowed him to pour record amounts of concrete in a single day (Noon, 2012). He was also the first contractor in the City of London to use a steam powered shovel, which he used to excavate the bridge footings to 16 feet below the river bed (Noon, 2012). Putherbough was also awarded the construction contract for the University's Science Building, JW Little Stadium, Lawson Memorial Library and the Cronyn Observatory.

3.3.3 1924-PRESENT

The bridge remained largely unaltered from its construction until 1973 when Vandals were blamed for $12,000 worth of damage to the bridge caused by pushing the south railing of the University Drive Bridge, including 60 linear feet of stone railing and 75 stone spindles, into the Thames River (*London Free Press*,1974). As a result, the top

rail and spindles on the south side of the bridge and a portion of those on north side of the bridge were replaced with new varied colour Indiana limestone in 1974.

In 2003, extensive repairs were undertaken to the bridge, including replacing the stone balusters and railings with steel, removing the pylons except for those located at the entrances to the bridge which were rebuilt, replacing the light standards, repaving the asphalt road, adding cycling lanes, and replacing the sidewalks.

4 EXISTING CONDITIONS

4.1 DESCRIPTION OF STUDY AREA AND LANDSCAPE CONTEXT

The study area consists of the University Drive Bridge located on the Western University campus, City of London, and includes the approaches to the bridge. The structure was built in 1923 to carry two lanes of east-west University Drive traffic over the north branch of the Thames River. University Drive is temporarily closed to vehicular travel at the bridge, though pedestrian and cyclist traffic is still permitted.

Located within the Western University Campus, the bridge is surrounded by the Thames River on the north and south and naturalized treed areas with walking paths, including an informal walking path that travels underneath the bridge on the east side of the Thames River and the TVP on the west side. Several campus buildings, including Sydenham Hall and Elgin Hall are located to the east of the structure, beyond Sunset Street. Delaware Hall is located across the Thames River on the west side of the bridge along with a parking lot and tennis courts. The University College Building, including the Memorial Tower, is framed when looking west from the bridge and is notable as one of the original buildings designed in the modern gothic style (Image 1).

4.2 ARCHITECTURAL DESCRIPTION

The University Drive Bridge is a three-span, riveted plate girder bridge with concrete cladding covering the exterior of the north and south girders. The structure measures 296 feet (90.2 metres), with the centre span 130 feet (39.5 metres) and the other two spans 83 feet (25.3 metres) long.

4.2.1 APPROACHES

Both approaches are level and consistent with the grade of the road at the bridge. On the east side of the Thames River, University Drive approaches the bridge on a slight horizontal curve just west of Sunset Street (Images 2 and 3). Black painted metal spear-top fences are located immediately adjacent to each wingwall and extend approximately four metres from the wingwalls.

4.2.2 WINGWALLS, ABUTMENTS AND PIERS

The wingwalls on the west and east sides of the bridge are built into the abutment and are of cut stone featuring cut stone in the shape of shields facing University Drive and a stone coping in a hipped shape with a bull-nose (Image 4 to Image 6). The footings at both abutments are cast-in-place concrete and above ground the abutments are stone faced (Image 5 to Image 7). Each abutment features a projecting portion that supports a stone clad pylon (see Section 4.2.3 for further description). A solid band of stone is set

at grade, below which cut and dressed stone extends to the embankments (Image 4 and Image 5).

Two piers are located on concrete footings in the Thames River (Image 8 and Image 9). The base of each pier is comprised of cast-in-place concrete and flares out towards the bottom with metal ice floe protection located on the north side of each pier. The concrete portion of each pier ends generally where the steel girders rest on their bearings, with rectangular stone pylons extending to meet the top of the steel plate girder and cantilevered portion of the bridge deck. Decorative shield shaped stones adorn the exterior elevations of the stone portion of the piers (Image 10).

4.2.3 GIRDERS/DECK/RAILINGS/PYLONS

The bridge deck is supported on three spans of arched steel plate girders to form an overall span of 296 feet long (90.2 metres) (Image 11 to Image 13). Steel vertical stiffener plates are riveted to the main plate girder to keep the girder from twisting. Steel stringers and cross-girders support the deck. There is also metal cross bracing riveted to the main plate girder. Concrete cladding covers the exterior elevations of the steel plate girders. From the underside of the bridge, reinforced concrete brackets support the sidewalks. Various utilities also run underneath the bridge. Metal mesh protects the first few metres of the bridge soffit on the western and eastern spans.

The road surface consists of paved asphalt painted for two-way automobile and bicycle traffic and there are concrete sidewalks on both sides of the bridge (Image 14).

The railing on the outer side of the bridge consists of an open design with a mixture of narrow metal pickets and wide metal balustrades designed to be reminiscent of the stone balustrades existing before 2002 (Image 15). The railing separating traffic from the sidewalk is a utilitarian steel design consisting of a steel panel with two horizontal steel box beams bolted to vertical steel posts on the lower half and a simple open steel design on the upper half (Image 16).

Decorative stone clad pylons are located at each corner of the bridge (Image 7). They have buttress features on three sides with the side facing University Drive featuring a shield shaped stone. Each pylon supports a metal light standard. While not the original pylon design or metal light standard, the existing pylon replaced in 2003 is reminiscent of the original design and used the original stone. Together, the stone clad pylons and light standards create a striking entrance feature on each side of the bridge.

Tall light standards are located at each pier along the bridge, and are installed on the outside of the bridge, supported by a cantilevered concrete pad (Image 16 and Image 17).

5 HERITAGE EVALUATION

5.1 ONTARIO REGULATION 9/06 EVALUATION

Table 1: Ontario Regulation 9/06 Evaluation

CATEGORY	CRITERIA	Y/N	COMMENTS
Design/ Physical Value	Is a rare, unique, representative or early example of a style, type, expression, material or construction method	Y	The University Drive Bridge is an early example of a three-span, steel plate-girder bridge that exhibits a rare design, particularly in its use of stone and concrete cladding in the City of London. Use of stone in bridge construction was rare during the early twentieth century in Ontario, primarily due to the lack of local availability and high cost of installation. The use of stone cladding on the abutments, upper portion of the piers, and in the deck design and stone shields reflects the Collegiate Gothic style which was also rare for bridge design. Concrete cladding used to obscure the steel plate girder construction is also unique and was likely designed to create a sense of consistency in colour, if not material, in the bridge's substructure.
	Displays a high degree of craftsmanship or artistic merit	Y	The University Drive Bridge displays a high degree of artistic merit in the design and execution of the bridge. The concrete cladding design demonstrates an unusual approach that was intended to achieve architectural continuity with other elements of the campus. Therefore, the University Drive Bridge meets this criterion.
	Demonstrates a high degree of technical or scientific achievement	Y	Accounts of the bridge construction emphasize the "record braking" speed John Putherborough displayed in pouring and setting the concrete for the piers. As such, the University Drive Bridge meets this criterion.
Historical/ Associative Value	Has direct associations with a theme, event, belief, person, activity,	Y	The University Drive Bridge has direct associations with the establishment of the Western University campus which moved to the current site that was originally bounded by the Thames River to the east

	organization or institution that is significant to a community		and was the first structure built on the new campus in 1923.
	Yields, or has the potential to yield, information that contributes to an understanding of a community or culture	N	The University Drive Bridge does not yield or have the potential to yield an understanding of a community or culture.
	Demonstrates or reflects the work or ideas of an architect, artist, builder, designer or theorist who is significant to a community	Y	The University Drive Bridge demonstrates the ideas of John M. Moore & Co. Architects who designed the bridge in 1922 to reflect the Collegiate Gothic style that would complement the future campus buildings. John M. Moore is responsible for the design of many buildings across Ontario and many of his designs are held at the University of Western Ontario's D.B. Weldon Library. This is the only known bridge attributed to John M. Moore. The bridge demonstrates the work of contractor John Putherborough who was known for his innovation in concrete application and mixing. Putherboroough was also responsible for construction of many of Western University's early buildings on the current campus.
Contextual Value	Is important in defining, maintaining or supporting the character of an area	Y	The University Drive Bridge defines, maintains, and the supports the character of the Western University campus. It acts as an entrance feature to the original campus grounds (1924) and supports the Collegiate Gothic style of the original and some subsequent campus buildings. As the original architectural component of the present Western University campus, the University Drive Bridge is a physical anchor for the property and maintains a visual relationship with the surrounding buildings, many of which support the campus' Collegiate Gothic architecture. Therefore, the University Drive Bridge meets this criterion.

	Is physically, functionally, visually or historically linked to its surroundings	Y	The University Drive Bridge is visually and historically linked to the Western University Campus which was designed to evoke a Collegiate Gothic style. The form and location of the bridge supports a visual relationship with the University College Building in particular, and the view west along the bridge toward the campus was devised as a defining viewshed. As such, the University Drive Bridge meets this criterion.
	Is a landmark	Y	The bridge was designed as a gateway to Western University's original campus (1924). As the University's only eastern entrance to the original campus, the bridge provides a recognizable point of reference on the University's campus.

5.2 COMPARATIVE ANALYSIS

A comparative analysis was undertaken to establish a baseline understanding of similar structures within the City of London, and to determine if the property *"is a rare, unique, representative or early example of a style, type, expression, material or construction method"* as described in O. Reg. 9/06. Comparative examples were drawn from the City of London Bridge Inventory (January 2019) which included information about bridge type, age and materials, of bridges owned by the City of London. The City of London Bridge Inventory is not a comprehensive list of bridges in the City of London, but rather a list of bridges owned by the City of London. Comparative examples were also drawn from the Ministry of Transportation's (MTO) West Region inventory of bridges (2013), selecting for the type of structure to compare the number of spans and length of similar bridges as this information was not included in the City of London's Bridge Inventory. This additional comparative data is included to establish the heritage value of the Overpass within a regional context.

Of the 102 bridges in the City of London's Bridge inventory, five are identified as girder bridges, three of which are box girders, one of which is a T-girder bridge, and one is a continuous slab on girder. As such, the University Drive Bridge may be the only steel plate-girder bridge in London. Furthermore, it is one of the oldest girder bridges in London (second to the Dundas Street East Bridge located over Pottersburg Creek and constructed in 1911).

Furthermore, of 102 bridges owned by the City of London, there are only three that include a mixture of masonry and concrete materials and they are Blackfriars Bridge, Dundas Street East Bridge and Victoria Bridge. It is not clear from the inventory whether the stone on each bridge is structural or cladding.

The MTO inventory of bridges revealed that there are 178 girder bridges in the West Region in southern Ontario. Of the 178, 28 of them are steel girder bridges.

Of the 28 steel girder bridges identified in West Region, two were constructed in 1950s, 21 in the 1960s, three in the 1970s and two in the 1990s. This supports the findings that University Drive Bridge is an early example of a steel girder bridge in the City of London and the MTO's West Region.

The majority of MTO's steel girder bridges have four spans (11), with the following breakdown for the remaining structures: three spans (6), six spans (4), one span (4) and one six and one ten span bridge. The longest structure of this type on the MTO West Region inventory measures 252 metres. As such, the University Drive Bridge with three spans for a total span of 91.5m is not considered significant in terms of number of spans, individual spans length or overall length.

In summary, the University Drive Bridge appears to be an early example of steel girder bridge and one of the only structures in the City of London and MTO West Region to include a mixture of masonry and concrete materials.

5.3 DISCUSSION OF INTEGRITY

According to the Ontario Heritage Toolkit, Heritage Property Evaluation (MTCS 2006), *"Integrity is a question of whether the surviving physical features (heritage attributes) continue to represent or support the cultural heritage value or interest of the property."* The following discussion of integrity was prepared to consider the ability of the structure to represent and retain its value over time. It does not consider the structural integrity of the structure, or the overall condition of the structure. Observations have been made from the public right-of-way. Structural integrity, should it be identified as a concern, should be determined by a qualified heritage engineer, building scientist, or architect.

Original plans of the bridge from 1922 were examined against the bridge's current condition to determine the degree of integrity that remains (Appendix B).

The bridge has been through two major repairs. The first in 1974 as a result of vandalism to the south stone railing that rendered the bridge unsafe. Consequently, the top rail and spindles on the south side of the bridge and a portion of the north side of the bridge replicated with varied colour Indiana limestone (Appendix C).

In 2003, extensive repairs to the bridge were undertaken, including a replacement of the stone balusters and railings with steel, removing the pylons located above the piers, and replacing the pylons at the east and west side of the bridge (Appendix D). The pylons at the east and west side of the bridge of the bridge were rebuilt using material from the original pylons. While the new design is similar to the original pylon, it is narrower with a taller cap stone and some of the details such as the stone shields on the buttress-like features that were identified in the bridge drawings were not incorporated into the final design (see original pylons in Figure 13). Additionally, new light standards were installed that did not reflect the same design as the original cast iron light standards.

Unfortunately, these repairs resulted in the removal of portions of this bridge that would have likely been identified as heritage attributes such as the stone railings and light standards, if such work had not occurred. While the new pylon design does maintain the Collegiate Gothic style, it does not continue to reflect the original design. Notwithstanding these repairs, the bridge still retains sufficient original materials as a whole to continue to reflect the ideas of John M. Moore & Co. Architects.

Repairs to the expansion joints were undertaken in 1985 and 1994, though these are not considered to affect the integrity of the bridge as their replacement is considered a typical requirement of bridge maintenance.

The bridge is currently closed to vehicular access as a result of an engineering report that noted damage to bearings that allow the bridge to flex under traffic load and temperature changes. As of the latest update provided by Western University on January 3rd, repair work commenced on January 7, 2019 and is expected to be completed by March 1, 2019.

The integrity of the University Drive Bridge is considered fair given that the repairs in 2003 have resulted in alteration and/or removal of elements what would have been cultural heritage attributes. However, there remains sufficient cultural heritage attributes that reflect the value of the University Drive Bridge as a unique and rare example of a Collegiate Gothic styled steel plate girder bridge clad in concrete and stone.

6 CONCLUSIONS

Based on the evaluation of background historical research, site investigation, and application of criteria from *Ontario Regulation 9/06*, the University Drive Bridge was determined to have significant cultural heritage value or interest. Accordingly, the following Statement of Cultural Heritage Value or Interest and list of heritage attributes have been prepared.

6.1 STATEMENT OF CULTURAL HERITAGE VALUE OR INTEREST

6.1.1 DESCRIPTION OF UNIVERSITY DRIVE BRIDGE

Spanning the north branch of the Thames River in the City of London, in 1923 the University Drive Bridge was the first structure constructed on the new Western University campus. The riveted plate girder bridge now serves as a landmark providing the only eastern entrance to the original part of Western University campus.

6.1.2 CULTURAL HERITAGE VALUE

As the first structure built on the new Western University campus in 1923, the University Drive Bridge established the University's vision of Collegiate Gothic design. It was specifically oriented across the Thames River in such a way as to frame the view towards the University College building and its Memorial Tower that sit prominently upon a hill. Sitting in the middle of Western University campus, the bridge is a landmark that depicts the original eastern entrance of campus. As such, University Drive Bridge is also historically linked to its surroundings and is important in defining, maintaining and supporting the character and architectural aesthetic of the University's campus.

The University retained a local team of professionals to design and construct the bridge. John M. Moore, architect, was retained to design the structure and John Putherborough, contractor, was awarded the contract to construct the bridge. The University Drive Bridge is the only bridge attributed to John M. Moore and reflects his interpretation of the Collegiate Gothic style applied to a bridge design. Moore was a significant local architect, responsible for a number of buildings in London, including early buildings on the Western University's campus, numerous places of worship such as St. Luke the Evangelist Anglican Church (1204 Richmond Street), and residential buildings such as the Elsie Perrin Williams Estate (101 Windermere Road). The University Drive Bridge also reflects the work of local contractor John Putherborough, who demonstrated a high degree of technical achievement using a new concrete mixing technique which allowed him to pour a record amount of concrete per day. John Putherborough was also awarded the contract to construct many of the other early University buildings including the University's Science Building, Boiler House, J.W. Little Stadium, Lawson Memorial Library, and the Cronyn Observatory.

The riveted plate girder bridge is largely camouflaged by the use of concrete and stone cladding. While construction of a completely steel bridge may have been a more economical choice, the aesthetics of the bridge were important to the University's vision for the campus. As such, the University Drive Bridge provides a rare example of a Collegiate Gothic styled bridge and a rare example of the use of stone and concrete as cladding. The use of stone cladding on the abutments, upper portion of the piers, and in the deck design reflects the Collegiate Gothic style. Concrete cladding used to obscure the steel plate girder construction is also unique and was likely undertaken to create a sense of consistency in colour, if not material, in the bridge's substructure. It is the application of Collegiate Gothic style to a bridge that also speaks to the University Drive Bridge's high degree of artistic merit.

6.2 DESCRIPTION OF HERITAGE ATTRIBUTES

The heritage attributes that reflect the cultural heritage value of the subject property include:

- Three-span length
- Concrete, sandstone and limestone clad abutments;
- Cut and dressed sandstone and limestone wingwalls including stone shields and bull-nosed hipped stone coping;
- Sandstone and limestone clad pylons and light standards including stone shields, buttress-like features and concrete cap;
- Concrete, sandstone and limestone clad piers and stone shields;
- Metal substructure including riveted steel plate girders, steel stringers, cross-girders and cross-bracing;
- Concrete cladding on exterior of steel plate girders;
- Reinforced concrete brackets supporting the sidewalks;
- Unobstructed north and south views to the Thames River from the University Drive bridge;
- Unobstructed view from the east approach towards the University Drive Bridge framing the University College Building's Memorial Tower; and,
- Location crossing the north branch of the Thames River and on the University of Western's campus.

7 RECOMMENDATIONS

WSP Canada Inc. (WSP) was retained by the City of London to complete a Cultural Heritage Evaluation Report (CHER) of the University Drive Bridge as part of the Transit Project Assessment Process (TPAP) for the proposed London Bus Rapid Transit (BRT) system. The University Drive Bridge, which includes the structure and approaches, was identified by WSP as a potential cultural heritage resource in the Cultural Heritage Screening Report (October 2018) completed for the London BRT TPAP. The purpose of this report is to evaluate the University Drive Bridge using *Ontario Heritage Act* Regulation 9/06 to determine its cultural heritage value and provide a Statement of Cultural Heritage Value or Interest and list of attributes, if appropriate.

The study area consists of the University Drive Bridge and the approaches to the bridge. Based on the results of the background historical research, site investigation, and application of criteria from *Ontario Regulation 9/06,* the study area was determined to demonstrate cultural heritage value or interest.

The completion of the study has resulting in the following recommendation:

3 **The University Drive Bridge was determined to demonstrate cultural heritage value or interest. As such, a Heritage Impact Assessment is required for this resource to identify appropriate mitigation measures.**

4 **A Cultural Heritage Evaluation Report should be undertaken in coordination with Western University following the completion of TPAP for the Western University property.**

8 IMAGES

Image 1: View of towards University College building including Memorial Tower from eastern bridge approach, looking west (WSP, 2018).

Image 2: East approach to University Drive Bridge, looking west (WSP, 2018).

Image 3: View of University Drive east of the Thames River, looking west at Sunset Street (WSP, 2018).

Image 4: View of north east wingwall, looking north west, note stone shields (WSP, 2018).

Image 5: View toward south east abutment, looking north (WSP, 2018).

Image 6: View of toward south east abutment; note projecting buttresses on pylon (WSP, 2018).

Image 7: View of north east pylon, light standard and wing wall, looking north (WSP, 2018).

Image 8: View of south side of bridge, looking north; note steel cross bracing visible from open barrel arch (WSP, 2018).

Image 9: View of the western most pier of bridge, looking east (WSP, 2018).

Image 10: Detail of concrete and stone pier, looking south, note shield shaped stone (WSP, 2018).

Image 11: View of the eastern most span of the bridge, looking west (WSP, 2018).

Image 11: Detail of underside of the bridge, western most span (WSP, 2018).

Image 13: Detail of reinforced concrete brackets supporting sidewalk on underside of west end of bridge, looking west (WSP, 2018).

Image 14: View of road surface across bridge, looking east (WSP, 2018).

Image 15: Detail of the railing between the sidewalk and Thames River on the bridge, looking south (WSP, 2018).

Image 16: View looking northwest on bridge, note railing between sidewalk and road surface's design (WSP, 2018).

Image 17: Detail of light standard base (WSP, 2018).

9 HISTORICAL PHOTOS AND MAPPING

Service Layer Credit Sources: Esri, HERE, Garmin, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance

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LEGEND

STUDY AREA

0 50 100 200 m

TITLE:
FIGURE 2: LOCATION AND CONTEXT OF UNIVERSITY DRIVE BRIDGE, CITY OF LONDON, ONTARIO

SCALE:	PROJECT NO:	DATE:
1:2,500	141-21085-00	JANUARY 2019

DRAWN BY: JAS
CLIENT: CITY OF LONDON
CREDITS:

PROJECT:
CULTURAL HERITAGE EVALUATION REPORT
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LEGEND

STUDY AREA

0 150 300 600 m

TITLE:
FIGURE 2: UNIVERSITY DRIVE BRIDGE, CITY OF LONDON
1863 TOWNSHIP OF LONDON

PROJECT:
CULTURAL HERITAGE EVALUATION REPORT
LONDON RAPID TRANSIT CORRIDOR
UNIVERSITY DRIVE BRIDGE

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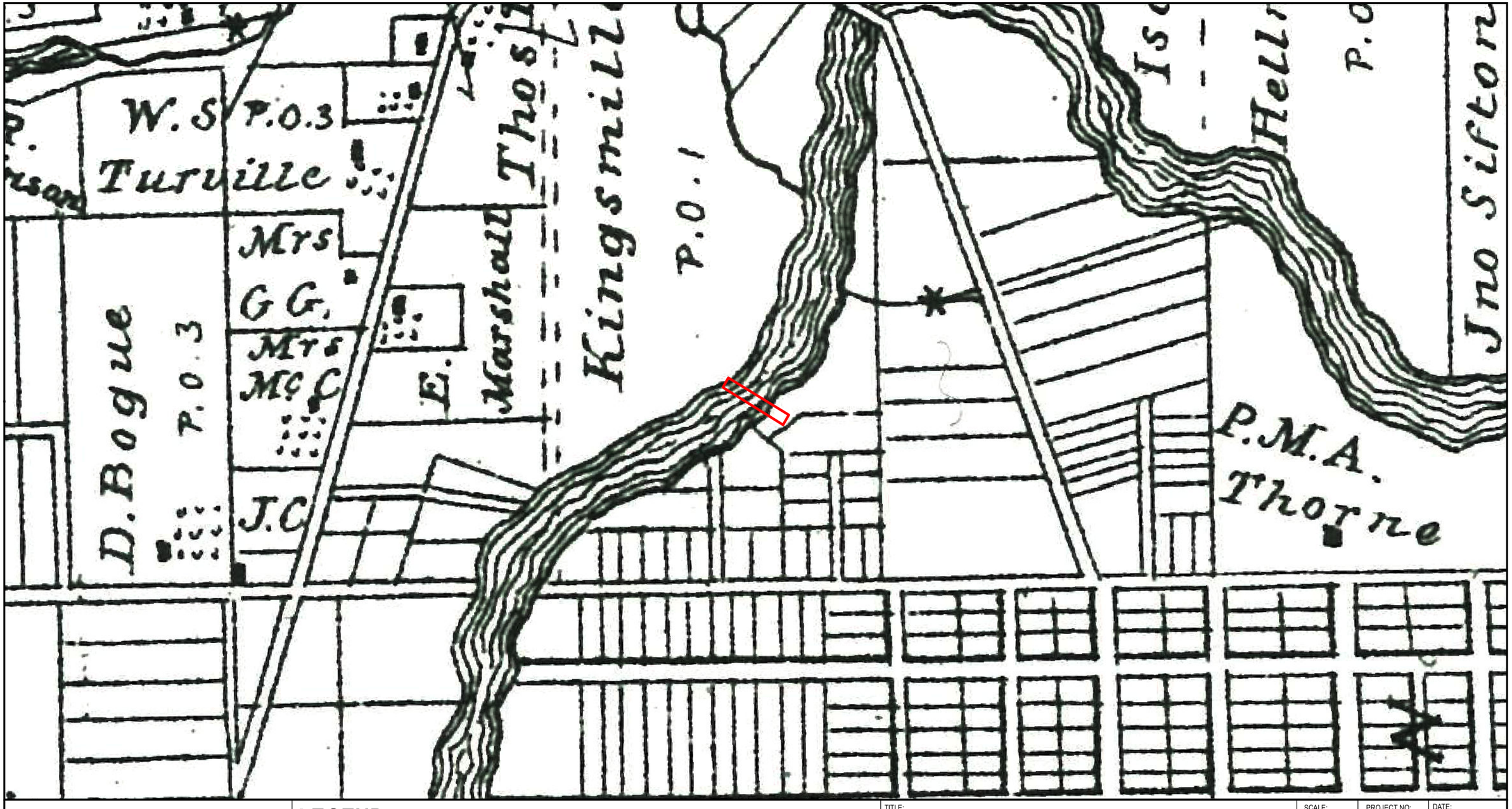

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LEGEND

STUDY AREA

0 150 300 600 m

TITLE:
FIGURE 3: UNIVERSITY DRIVE BRIDGE, CITY OF LONDON
1878 HISTORICAL ATLAS MAP

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STUDY AREA

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TITLE:
FIGURE 4: UNIVERSITY DRIVE BRIDGE, CITY OF LONDON
1915 TOPOGRAPHIC MAP, LUCAN

PROJECT:
CULTURAL HERITAGE EVALUATION REPORT
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UNIVERSITY DRIVE BRIDGE

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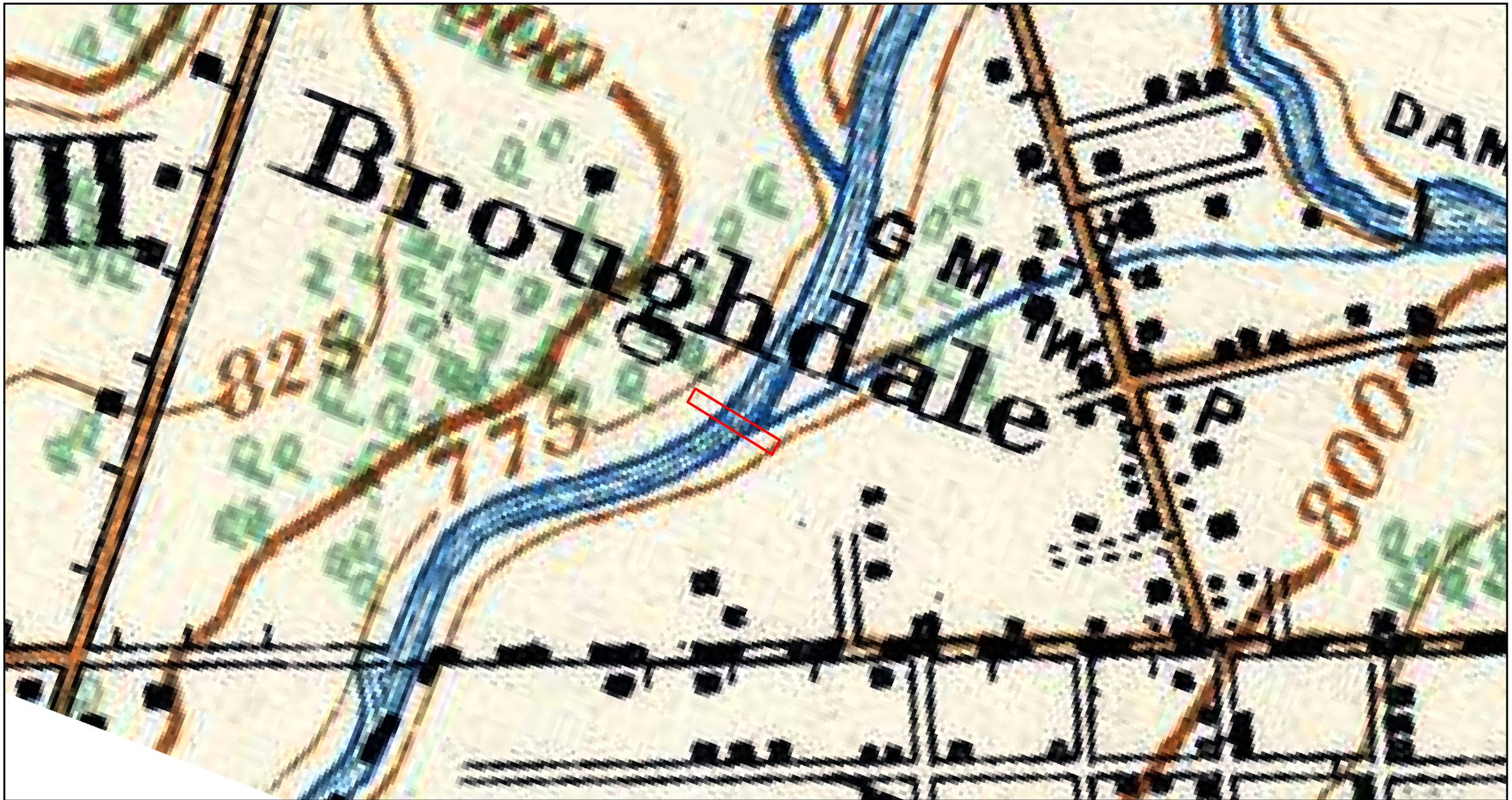

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TITLE:
FIGURE 5: UNIVERSITY DRIVE BRIDGE, CITY OF LONDON
1923 TOPOGRAPHIC MAP, LUCAN

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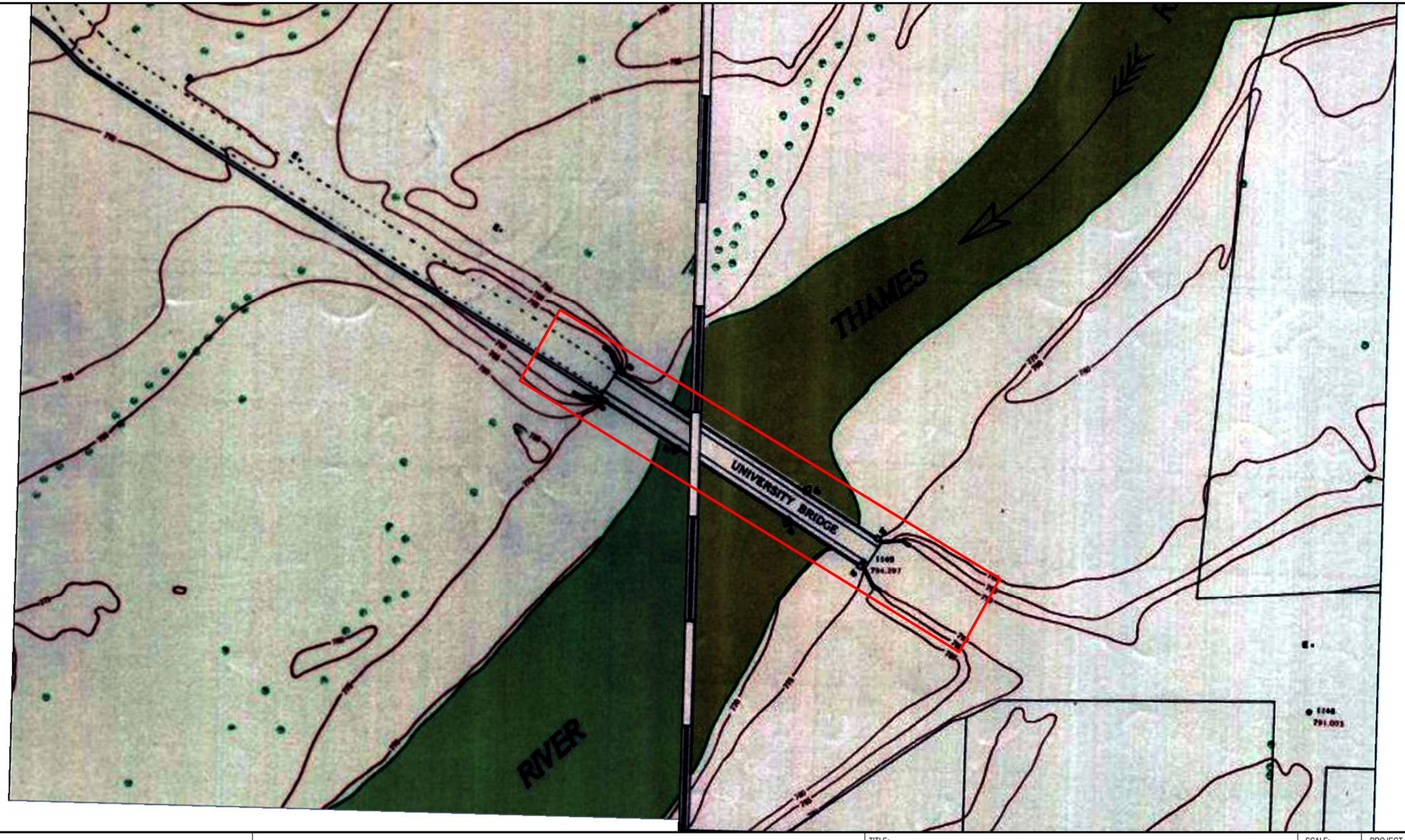

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LEGEND

STUDY AREA

0 20 40 80 m

TITLE:

FIGURE 6: UNIVERSITY DRIVE BRIDGE, CITY OF LONDON
1926 GEODETIC SURVEY OF LONDON

PROJECT:

CULTURAL HERITAGE EVALUATION REPORT
LONDON RAPID TRANSIT CORRIDOR
UNIVERSITY DRIVE BRIDGE

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1926 SHEETS 26 & 27
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STUDY AREA

0 105 210 420 m

TITLE:
FIGURE 7: UNIVERSITY DRIVE BRIDGE, CITY OF LONDON
1928 TOPOGRAPHIC MAP, LUCAN

PROJECT:
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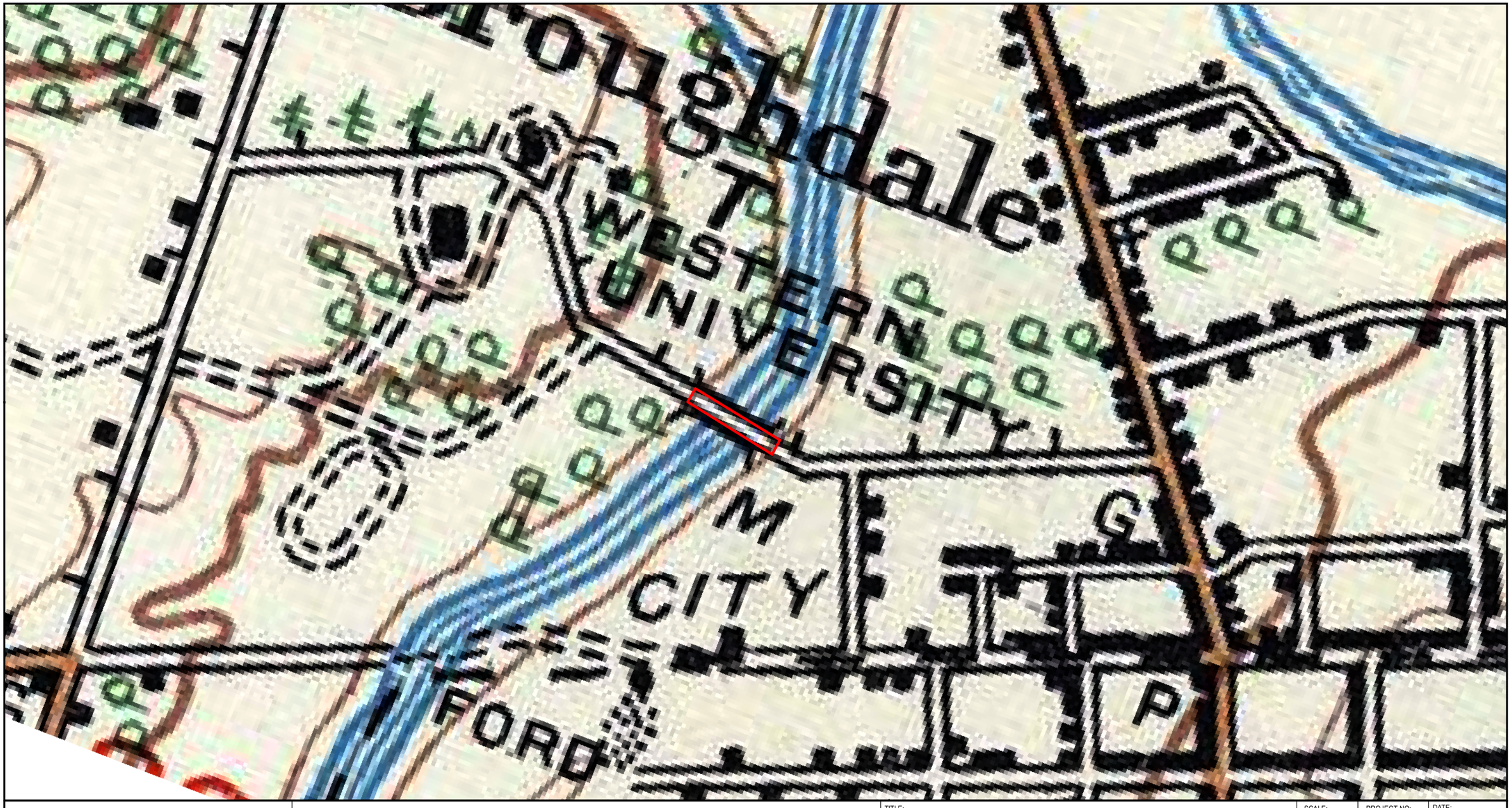

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STUDY AREA

0 105 210 420 m

TITLE:
FIGURE 8: UNIVERSITY DRIVE BRIDGE, CITY OF LONDON
1930 TOPOGRAPHIC MAP, LUCAN

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LONDON RAPID TRANSIT CORRIDOR
UNIVERSITY DRIVE BRIDGE

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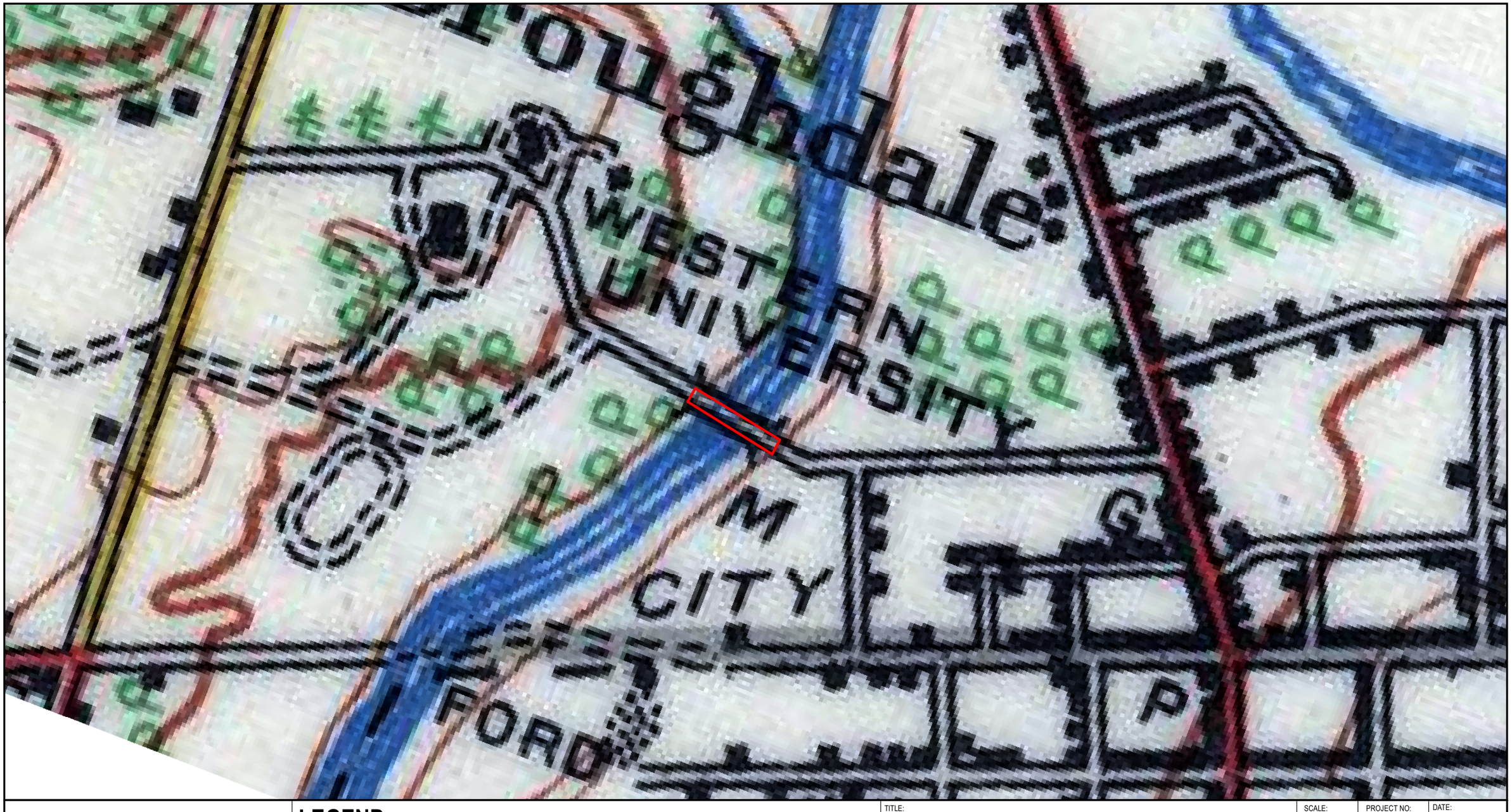

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STUDY AREA

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TITLE:
FIGURE 9: UNIVERSITY DRIVE BRIDGE, CITY OF LONDON
1936 TOPOGRAPHIC MAP, LUCAN

PROJECT:
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LONDON RAPID TRANSIT CORRIDOR
UNIVERSITY DRIVE BRIDGE

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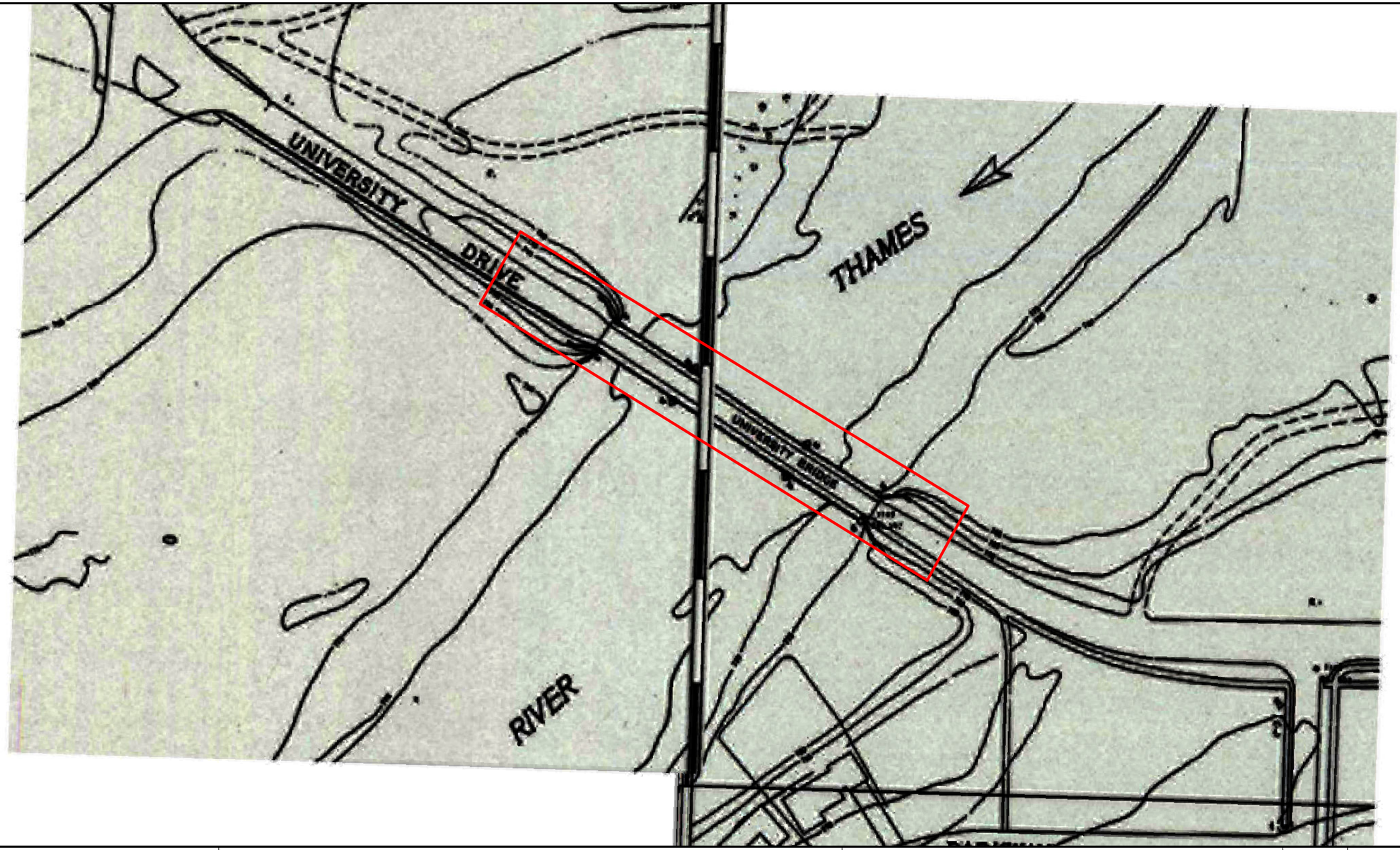

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TITLE:
FIGURE 10: UNIVERSITY DRIVE BRIDGE, CITY OF LONDON
1957 GEODETIC SURVEY OF LONDON

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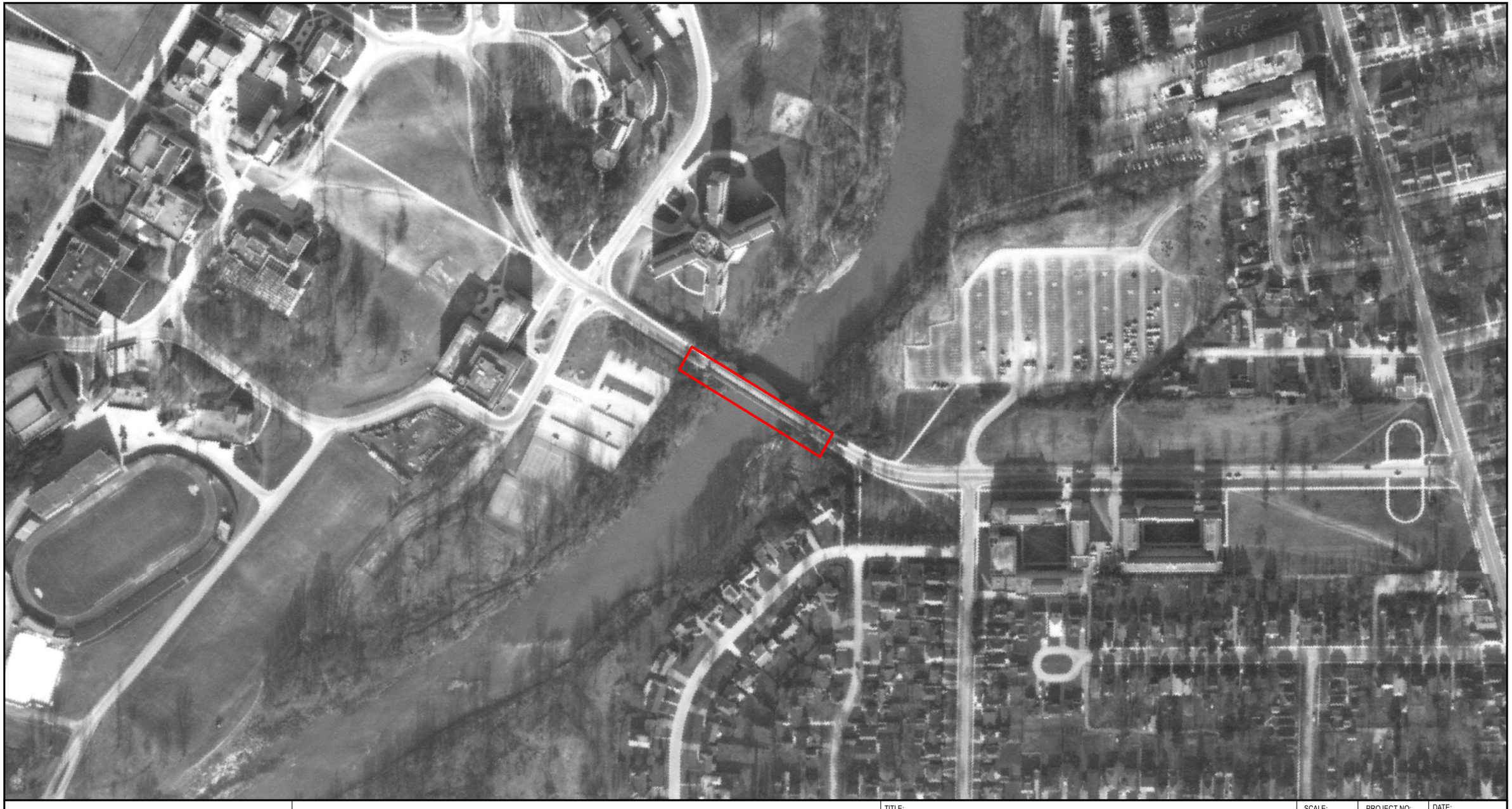
WESTERN UNIVERSITY

Document Path: C:\Users\jason.stephenson\Documents\GIS\2018\London BRT\Bridge CHERs\University_Drive_Rev2\University_Figure10_1957Geodetic.mxd



582 LANCASTER STREET WEST
KITCHENER, ONTARIO CANADA N2K 1M3
TEL.: 519-743-8777 | WWW.WSP.COM

LEGEND

STUDY AREA

0 65 130 260 m

TITLE:

FIGURE 11: UNIVERSITY DRIVE BRIDGE, CITY OF LONDON
AERIAL IMAGERY 1967

PROJECT:

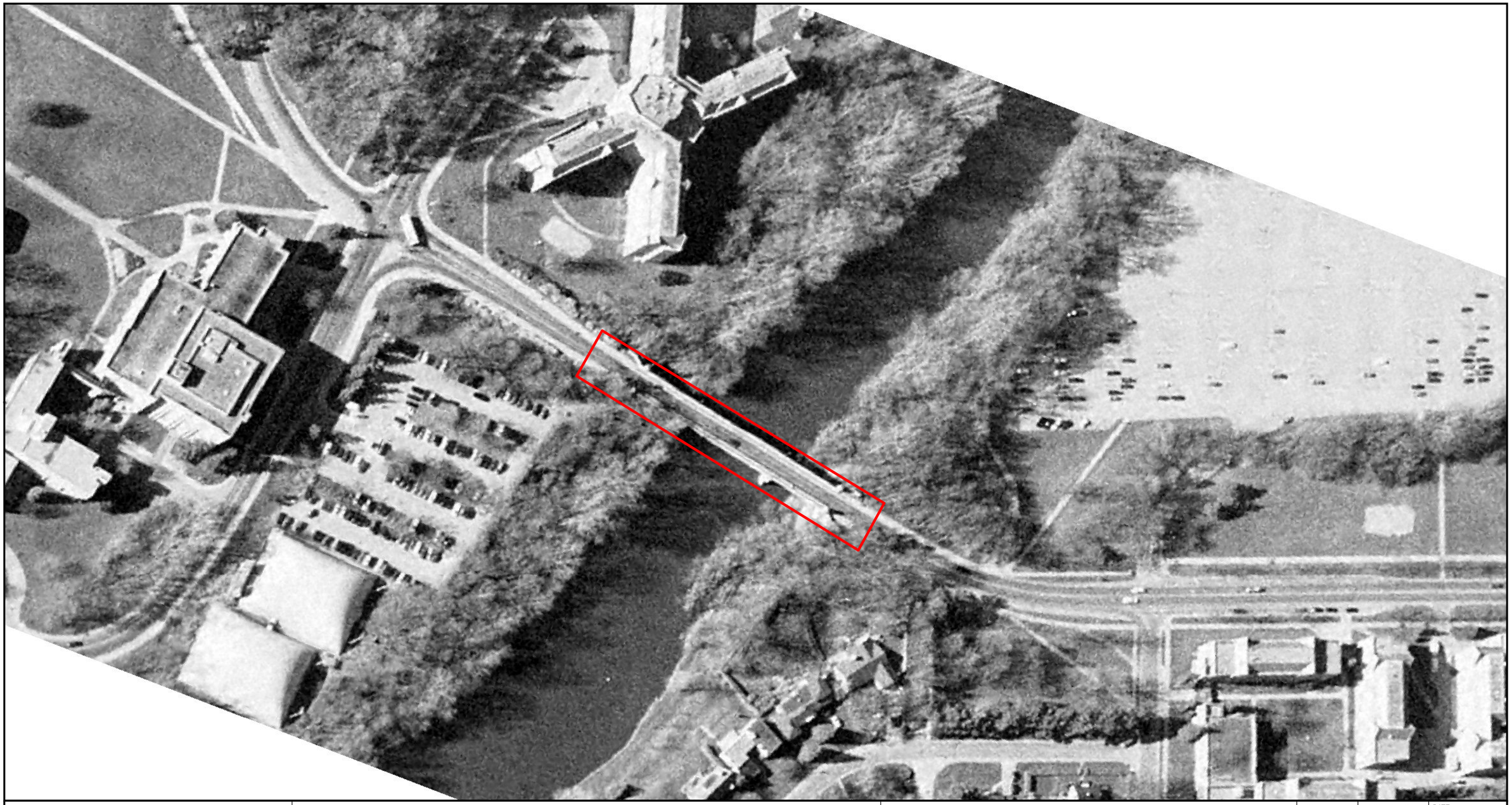
CULTURAL HERITAGE EVALUATION REPORT
LONDON RAPID TRANSIT CORRIDOR
UNIVERSITY DRIVE BRIDGE

SCALE:	PROJECT NO:	DATE:
1:3,000	141-21085-00	JANUARY 2019
DRAWN BY:	CLIENT:	
JAS	CITY OF LONDON	

CREDITS:

LOCKWOOD SURVEY CORP
DATE 12/12/1967
LINE 5, PHOTO 54
WESTERN UNIVERSITY

Document Path: C:\Users\jason.stephenson\Documents\GIS\2018\London BRT\Bridge CHERs\University_Drive_Rev2\University_Figure11_1967Aerial.mxd



wsp

582 LANCASTER STREET WEST
KITCHENER, ONTARIO CANADA N2K 1M3
TEL.: 519-743-8777 | WWW.WSP.COM

LEGEND

STUDY AREA

0 30 60 120 m

TITLE:

FIGURE 12: UNIVERSITY DRIVE BRIDGE, CITY OF LONDON
AERIAL IMAGERY 1998

PROJECT:

CULTURAL HERITAGE EVALUATION REPORT
LONDON RAPID TRANSIT CORRIDOR
UNIVERSITY DRIVE BRIDGE

SCALE:	PROJECT NO:	DATE:
1:1,500	141-21085-00	JANUARY 2019
DRAWN BY:	CLIENT:	
JAS	CITY OF LONDON	

CREDITS:

CITY OF LONDON

Document Path: C:\Users\jason.stephenson\Documents\GIS\2018\London BRT\Bridge CHERs\University_Drive_Rev2\University_Figure12_1998Aerial.mxd

Figure 13: University Drive Bridge, City of London, under construction (Source: Alumni Gazette Fall 2002)

Figure 14: The first students cross University Bridge from Richmond Street for summer school classes in 1924. Note width and design details of original entrance pylons

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APPENDIX

A DRAFT TERMS OF REFERENCE FOR CULTURAL HERITAGE EVALUATIONS

Terms of Reference:

Cultural Heritage Evaluation Report

A Cultural Heritage Evaluation Report will be prepared by a qualified heritage consultant as required by the recommendations of the Cultural Heritage Screening Report.

The Cultural Heritage Evaluation Report will include:

- an executive summary, describing a summary of the outcome of the cultural heritage evaluation;
- an introduction providing context for the report and providing a brief overview of how and why the research was undertaken;
- a general description of the history of the immediate context, considering the unique setting of the property, which may consist of a village, neighborhood, commercial district, and/or street the property is located within;
- a land use history of the property parcel describing key transfers of land and milestones, informed by Land Registry records and additional archival research into prominent owners or tenants, including but not limited to the use of tax assessments or City Directories, if identified;
- a description of the character of the immediate landscape context, including views and/or vistas;
- a description of the exterior of a resource visible from the public right-of-way for a building, and if an engineering work, a description of its structural design and materials;
- representative photographs of the exterior of a building or structure, character-defining architectural details taken during a site visit from the public right-of-way, or, of a structure, representative photographs of the elevations and structural details of a bridge or engineering work;
- a comparative analysis, using resources of a similar age, style, typology, context and/or history, informed by a search of the City of London Inventory of Heritage Resources
- a qualified statement about integrity, including observations from the public right-of-way, description of limitations, and recommendations for future work by a qualified heritage engineer, building scientist, or architect;
- evaluation under O. Reg. 9/06, guided by the Ontario Heritage Toolkit (2006) and the Ministry of Tourism, Culture and Sport's Standards and Guidelines for the Conservation of Provincial Heritage Properties (2014);
- a statement of cultural heritage value or interest (if applicable);
- a description of the heritage attributes (if applicable);
- historical mapping, photographs of the property if available;
- a location plan;
- a description of consultation undertaken;
- recommendations for further work; and
- sources cited.

Group Cultural Heritage Evaluation Report

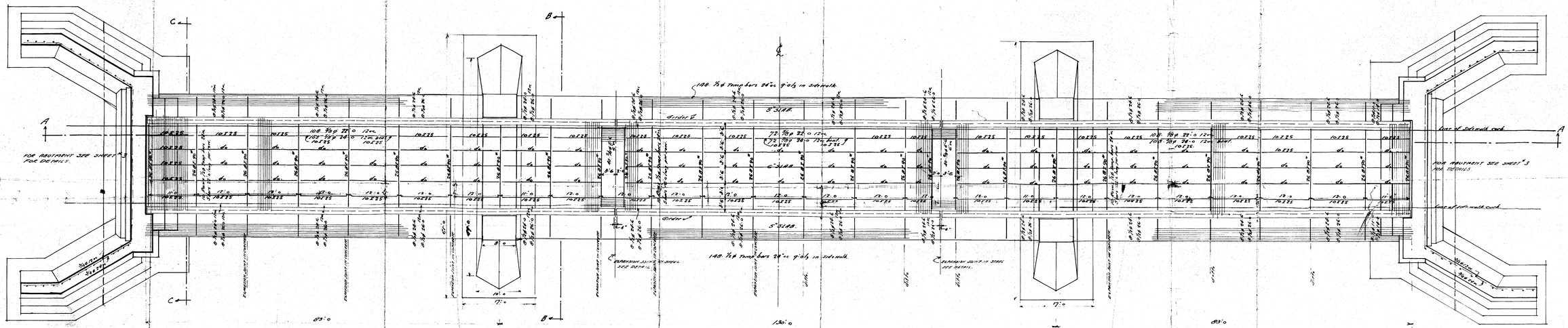
A group Cultural Heritage Evaluation Report will be prepared by a qualified heritage consultant as required by the recommendations of the Cultural Heritage Screening Report for contiguous properties which share a geography, style, age, use and typology.

A Grouped Cultural Heritage Evaluation Report will include:

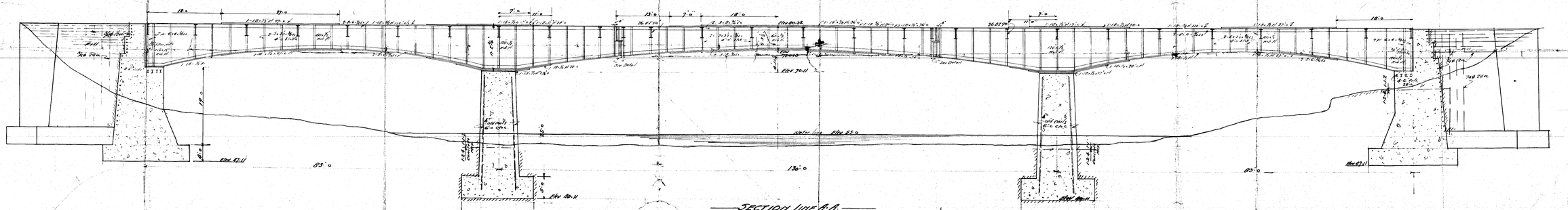
- an executive summary, describing a summary of the outcome of the cultural heritage evaluation(s);
- an introduction providing context for the report and providing a brief overview of how and why the research was undertaken;
- a shared general description of the history of the of the immediate context, considering the unique setting of the property, which may consist of the village, neighborhood, commercial district, and/or street the properties are located within;
- a shared description of the character of the immediate landscape context, including views and/or vistas;
- a land use history of the property parcel describing key transfers of land and milestones, informed by Land Registry records and additional archival research into prominent owners or tenants, including but not limited to the use of tax assessments or City Directories, if identified;
- a description of the exterior of each resource visible from the public right-of-way for a building, and if an engineering work, a description of its structural design and materials;
- representative photographs of the exterior of each resource, including architectural details, taken during a site visit from the public right-of-way, or, of a structure, representative photographs of the elevations and structural details of a bridge or engineering work;
- a comparative analysis for each resource, using resources of a similar age, style, typology, context and/or history, informed by a search of the City of London Inventory of Heritage Resources;
- a qualified statement about integrity for each resource, including observations from the public right-of-way, description of limitations, and recommendations for future work by a qualified heritage engineer, building scientist, or architect;
- evaluation under O. Reg. 9/06 for each property, guided by the Ontario Heritage Toolkit (2006) and the Ministry of Tourism, Culture and Sport's Standards and Guidelines for the Conservation of Provincial Heritage Properties (2014);
- a statement of cultural heritage value or interest for each property that meets O. Reg. 9/06 (if applicable);
- a description of the heritage attributes for each property that meets O. Reg. 9/06 (if applicable);
- historical mapping, photographs of the property if available;
- a location plan;
- a description of consultation undertaken; and
- recommendations for further work; and
- sources cited.

APPENDIX

B ORIGINAL BRIDGE DRAWINGS, MAY 1922



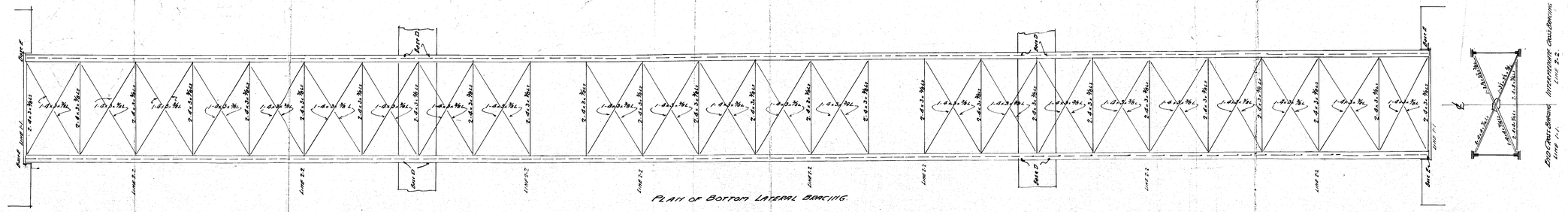
PLAN OF BRIDGE DECK



SECTION LINE A-A

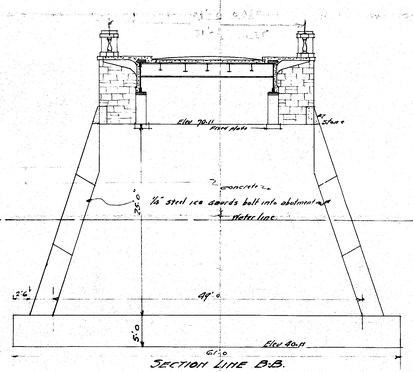
(1)

WESTERN UNIVERSITY, LONDON, ONT.
BRIDGE OVER RIVER THAMES.
STRUCTURAL PLAN
& ELEVATION
SCALE: USE FIGURED DIMENSIONS ONLY
JOHN M. MOORE & CO. ARCHITECTS
LONDON, ONT.
R.F.W. HAGARTY, CONSULTING ENGINEER
TORONTO, ONT. MAY 17, 1922.
SHEET 4.



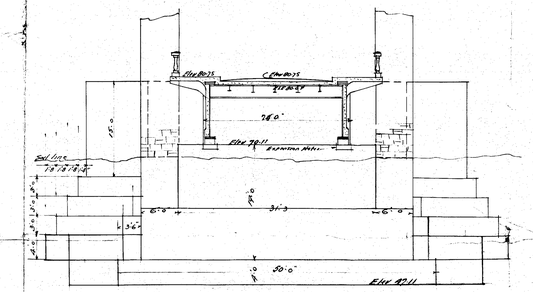
PLAN OF BOTTOM LATERAL BRACING.

BOTTOM CHORD BRACING INTERMEDIATE CROSS BRACING
LINE 1-1. LINE 2-2

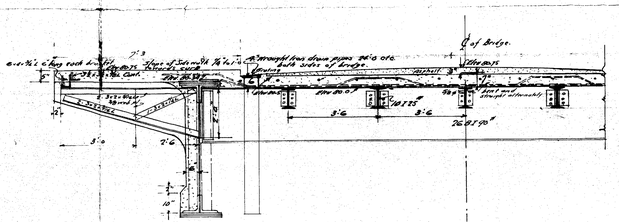


SECTION LINE B.B.

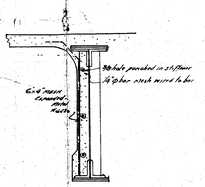
ELEVATION OF CENTRE PIERS.



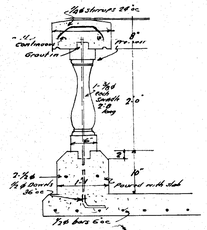
ELEVATION OF END ABUTMENTS.
SECTION LINE C.C



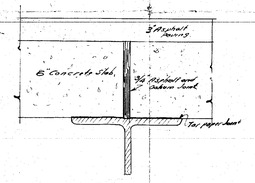
HALF CROSS SECTION THRO' BRIDGE FLOOR
Scale 1/2"=1'-0"



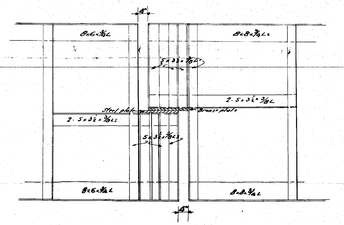
DETAIL SHOWING METHOD OF ANCHORING CURB ANGLE OF STEEL GIRDER.



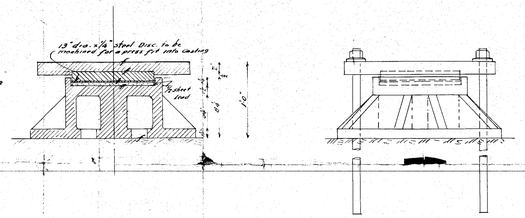
DETAIL OF SIDEWALK RAILING Scale 1"=1'-0"



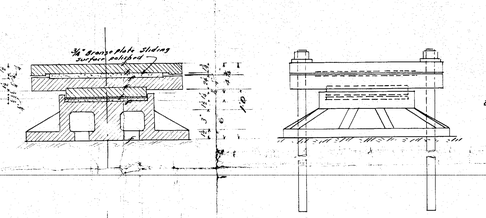
DETAIL OF EXPANSION JOINT IN ROADWAY.
Scale 3"=1'-0"
SIDEWALK JOINT SIMILAR.



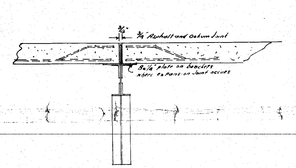
DETAIL OF SEAT BETWEEN
SUSPENDED GIRDER & CANTILEVER ARM.



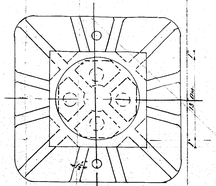
FIXED END.
BASE D



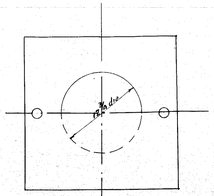
EXPANSION END
BASE E.



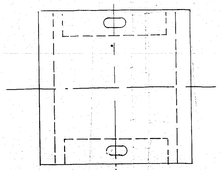
DETAIL OF EXPANSION JOINT IN SIDEWALK
AT BRACKETS.



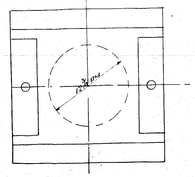
CAST STEEL



2" ROLLED STEEL PLATE.
2" Hole and 1⅛ Disc. Shop Rivited to Girder.



1⅛" ROLLED STEEL PLATE.
Shop Rivited to Girder.



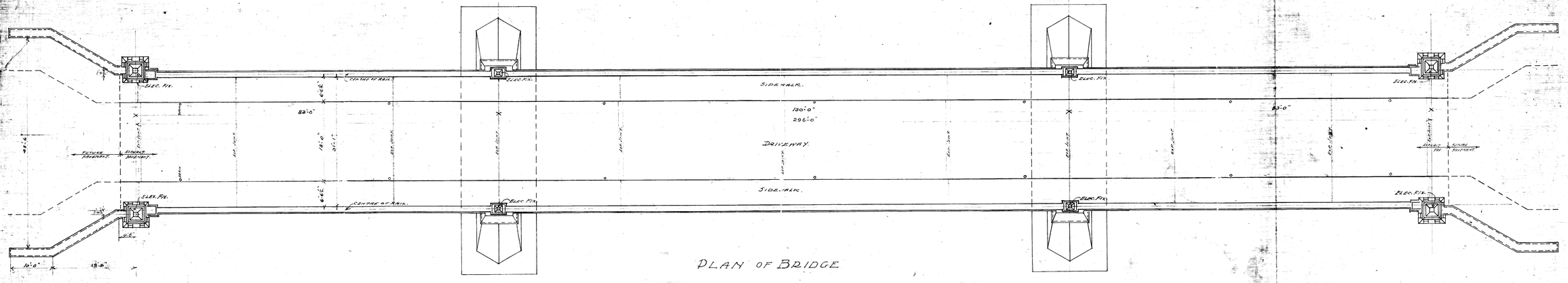
2⅛ ROLLED STEEL PLATE
2⅛ plate and 1⅛ Disc Shop
rivetted together.

WESTERN UNIVERSITY LONDON ONT.

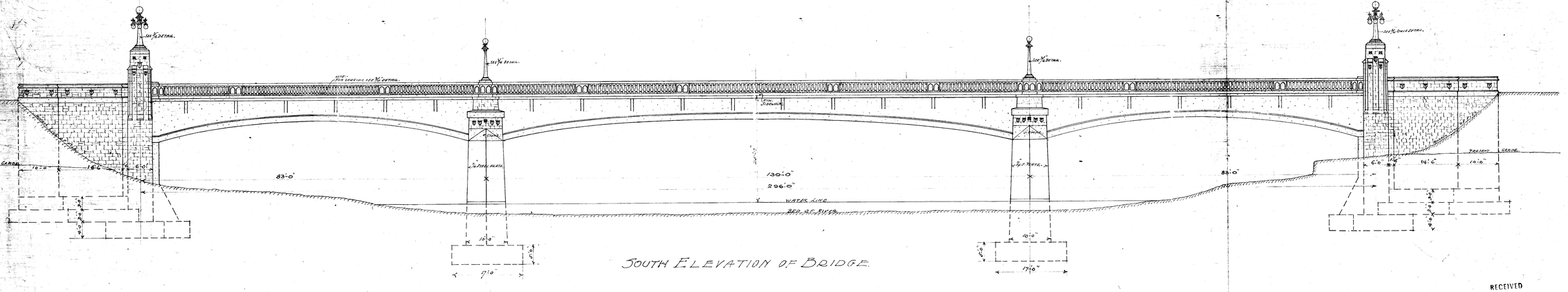
BRIDGE OVER RIVER THAMES.
LATERAL BRACING
& DETAILS.

JOHN M. MOORE & CO. ARCHITECTS.
LONDON ONT.
R.E.W. HARVATT. CONSULTING ENGINEER.
TORONTO ONT. MAR 17 1922

SHEET 1/2



PLAN OF BRIDGE



SOUTH ELEVATION OF BRIDGE

RECEIVED
JUN 22 1973
PHYSICAL PLANT

WESTERN UNIVERSITY, LONDON, ONT.
BRIDGE OVER RIVER THAMES.
SCALE 1/8"-1'-0"

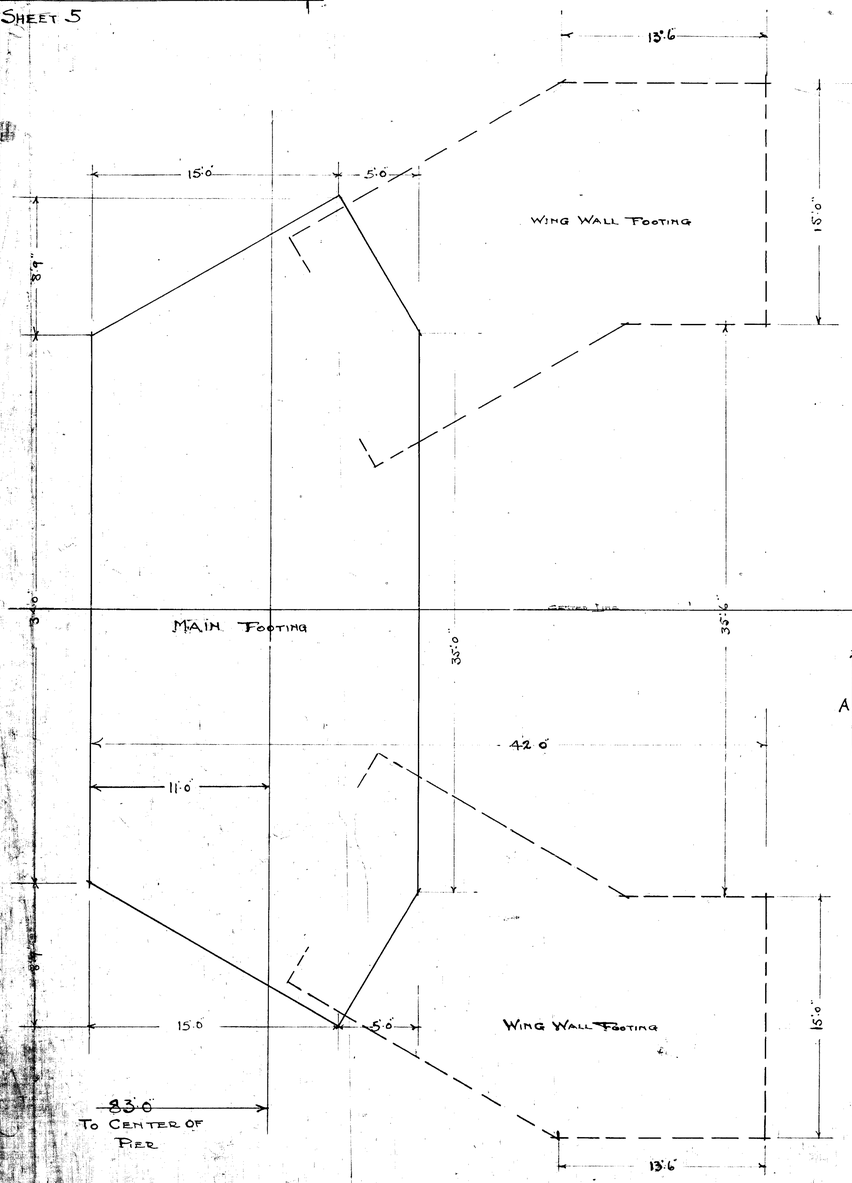
JOHN B. ROSANE & CO. ARCHITECTS.
LONDON, ONT.
REIN. HAGERTY, CONSULTING ENGINEER.
MAY 1922.

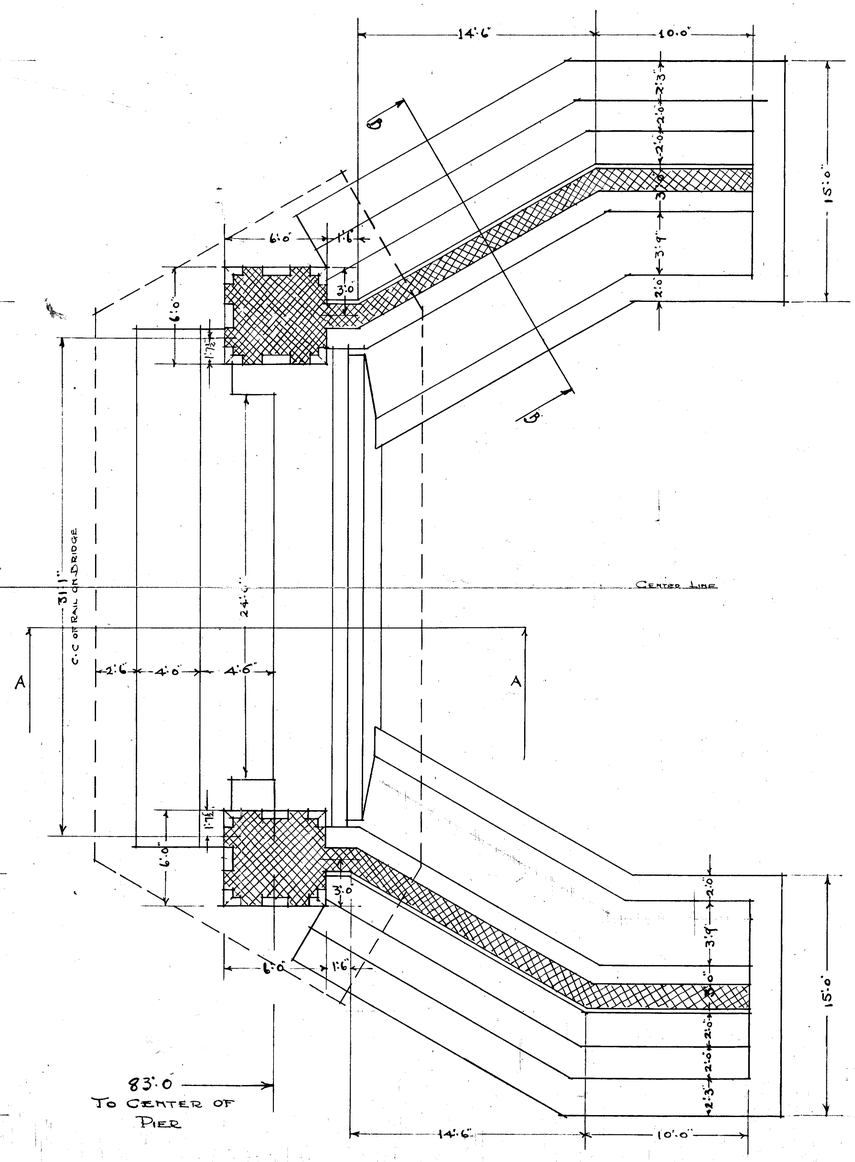
SHEET NO 3.

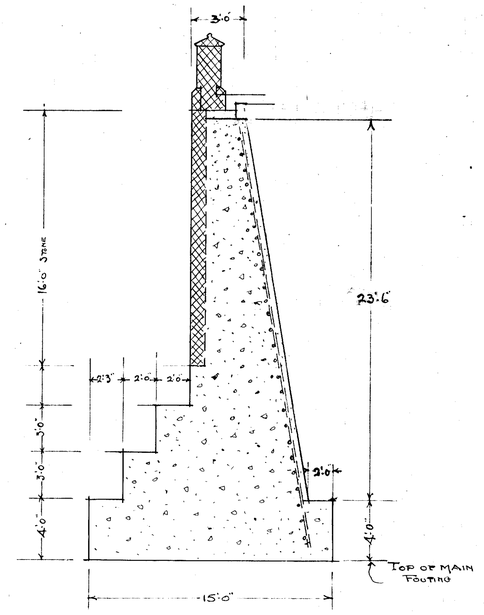

Profile of Bridge Approaches
Hor. Scale 1/32 inch = 1 foot
Ver. Scale 1/8 inch = 1 foot
Section B-B.
Section A-A
Fill
Floor Level
Face of Abutment
Center of Pier
Square in Section. Submit Details for Approval.
Door.
Cut Stone.
Stone.
Top of Sidewalk
Fin. Sidewalk Line.
Sidewalk to Slope
Roadway
Asphalt.
Drip.
Note: No shields on sides.
Section.
Elevation of Brackets.
Section of End Walls.
End Piers.
Finial of Railings at End Piers.
Plan.
Sheet No. 4.
RECEIVED
JUN 22 1973
PHYSICAL PLANT
Western University. London, Ont.
Bridge over River Thames.
Scale 3/4" = 1'-0"
John M. Moore & Co. Architects. London, Ont.
R. E. W. Hagarty - Consulting Engineer
May 1922.

WESTERN UNIVERSITY LONDON, ONT.
BRIDGE OVER RIVER THAMES.
¼" SCALE DETAIL OF ABUTMENTS.
J.M. MOORE & CO ARCHTS. LONDON
R.E.W. HAGGERTY CONSULTING ENGINEER.

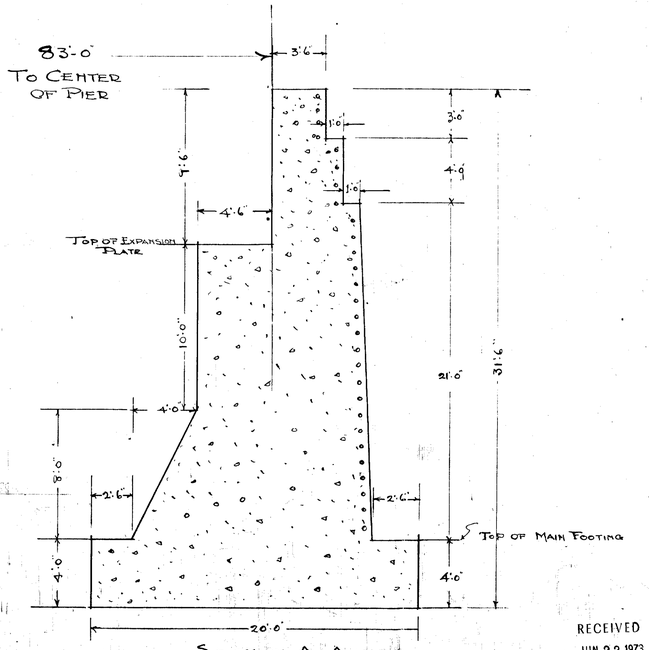
SHEET 5



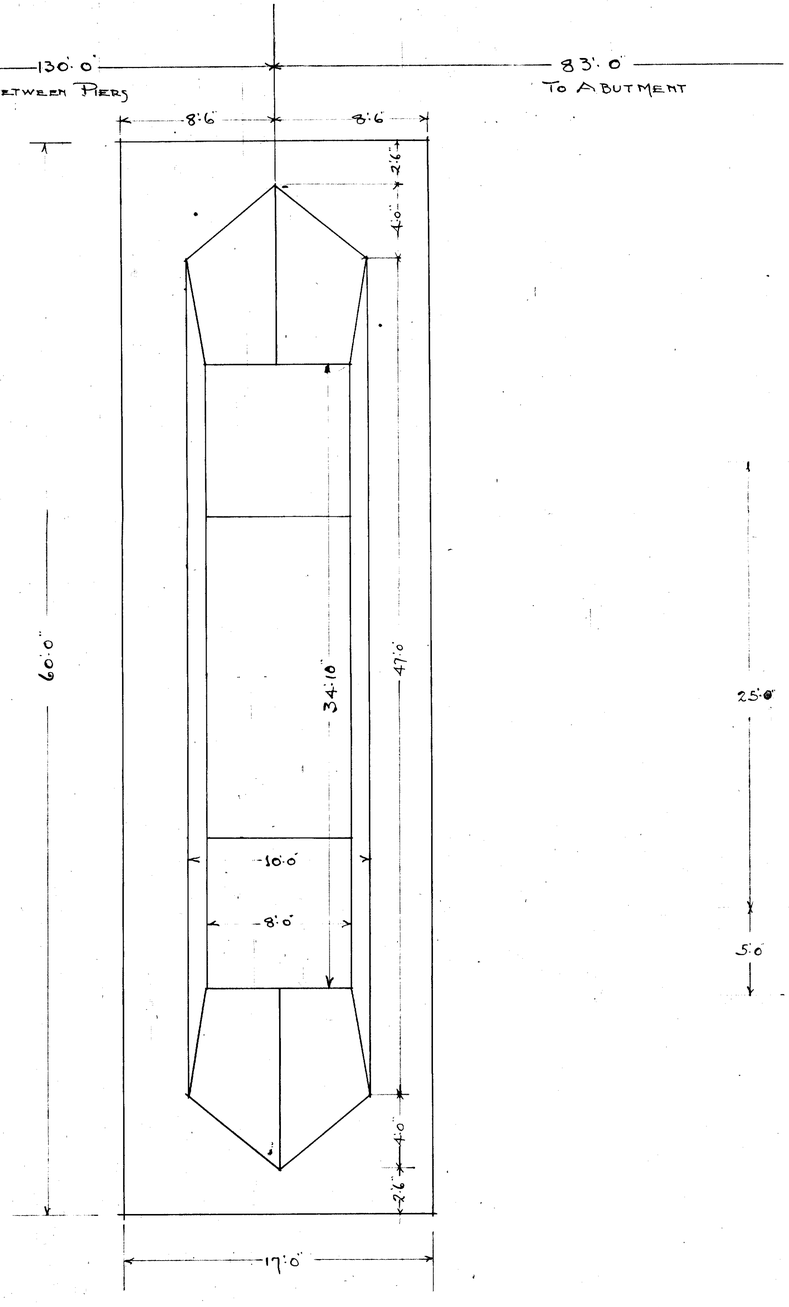


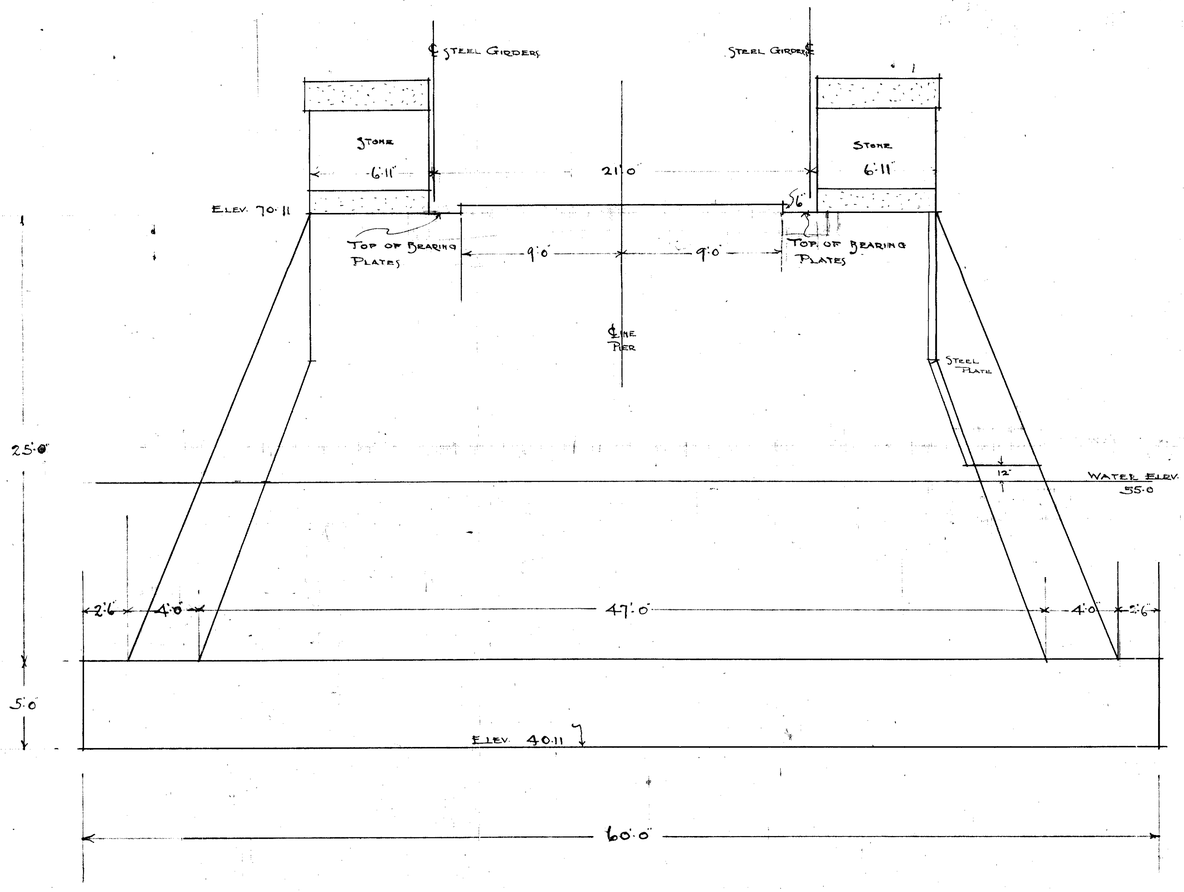


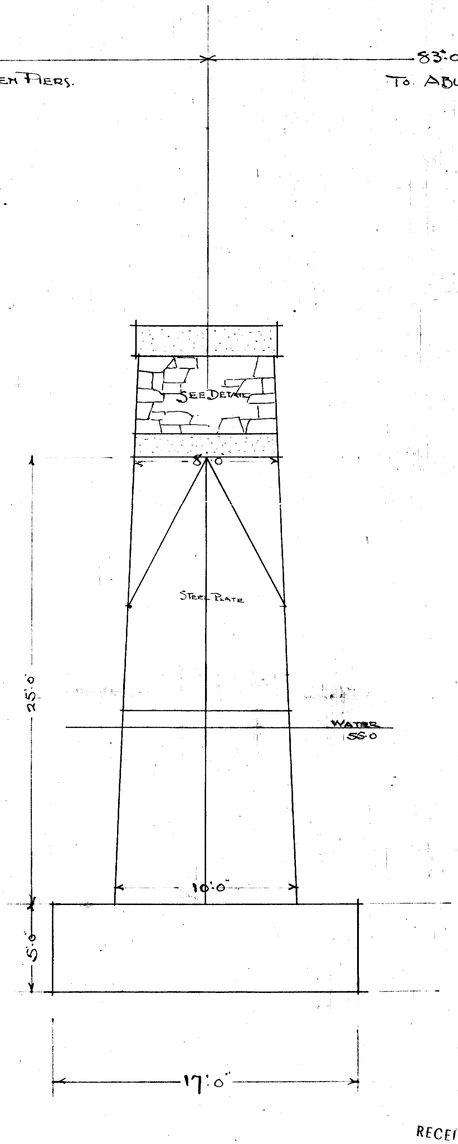
SECTION B-B



SECTION A-A



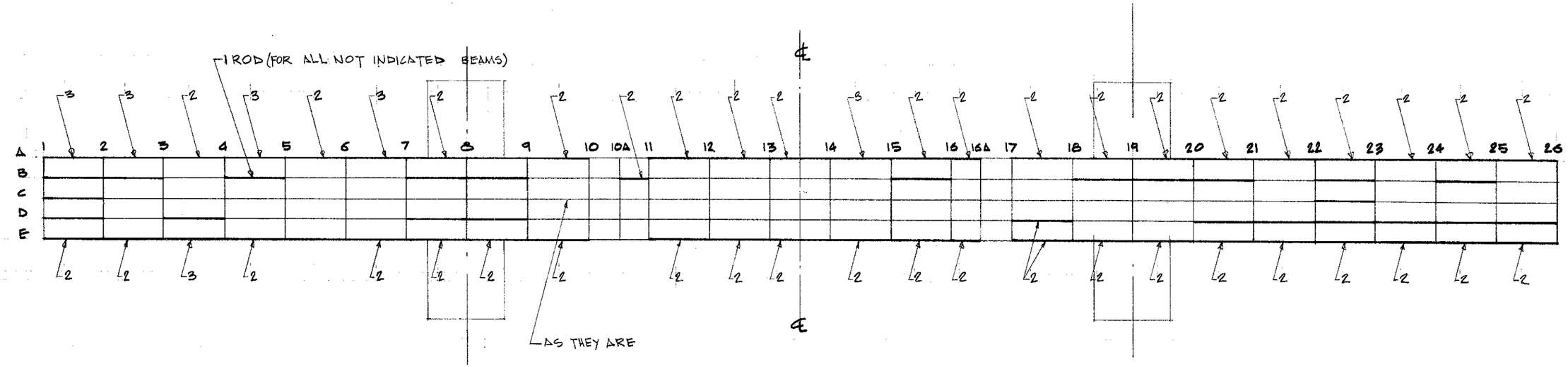


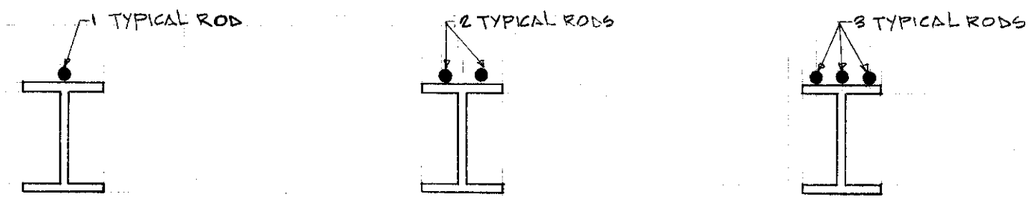


WESTERN UNIVERSITY LONDON, ONT.
BRIDGE OVER RIVER THAMES
¼" SCALE DETAIL OF PIERS.
J. M. MOORE & Co ARCHTS. LONDON
R.E.W. HAGGERTY CONSULTING ENGINEER

APPENDIX

C BRIDGE DRAWINGS, 1974 REPAIRS



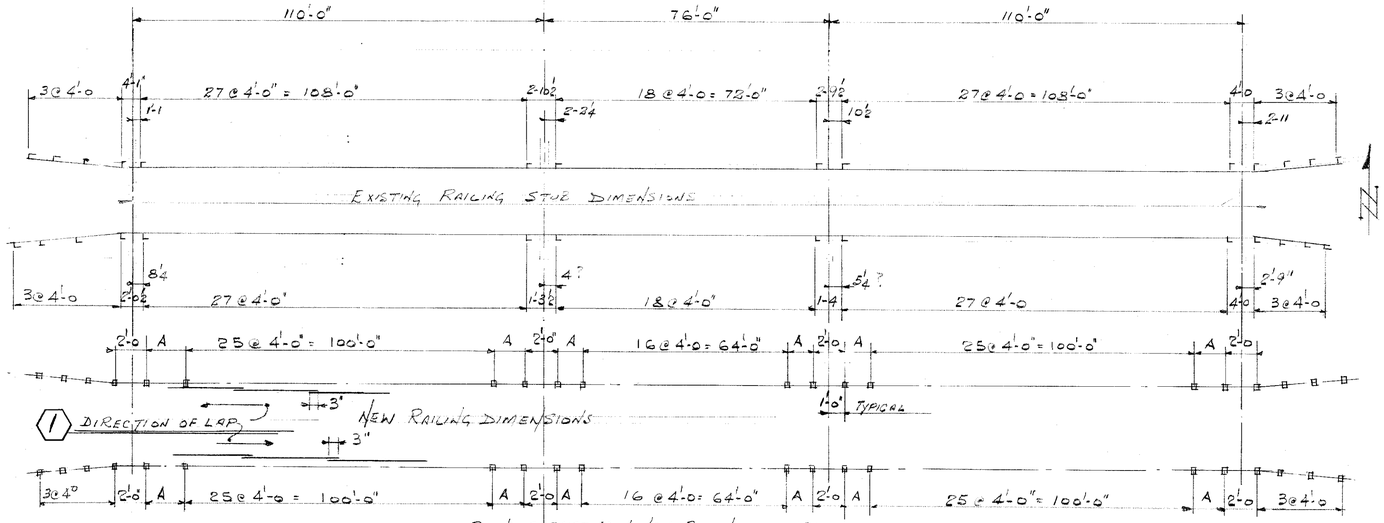


TYPICAL RODS PLACEMENT

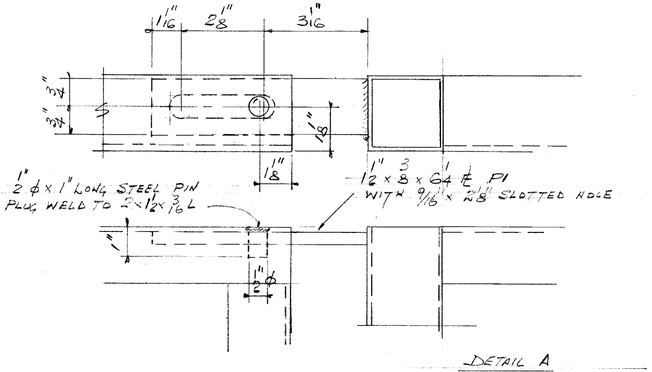
NOTE:
ALL RODS ARE No. 6

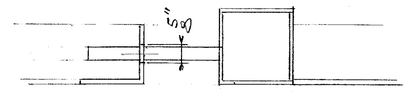
REV. NO.	DESCRIPTION	BY	DATE
THE UNIVERSITY OF WESTERN ONTARIO			
PHYSICAL PLANT DEPARTMENT	SCALE		DATE
	DRG.		NOV 76
UNIVERSITY DRIVE BRIDGE	CHKD.		
	APPD.		
INSTALLED RODS	DRWG. NO.	10-02-2-3	

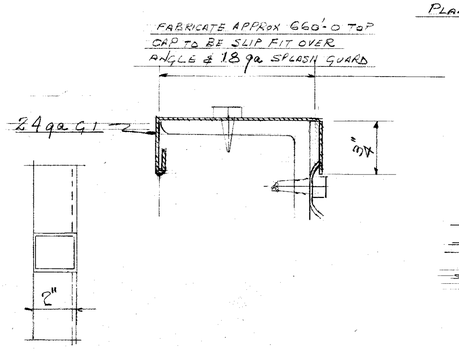
UDB\03-SK1

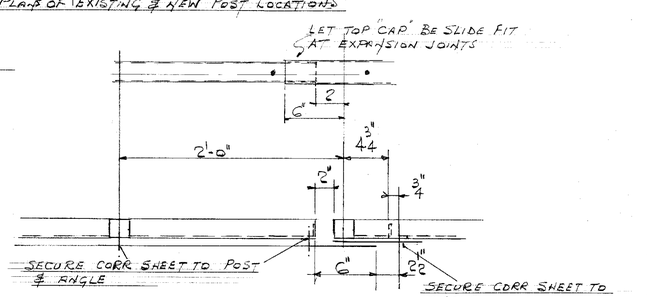


CROSS SECTION EXISTING BRIDGE SHOWING SPLASH GUARDS

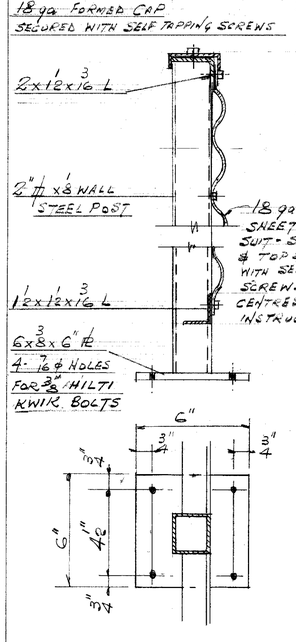


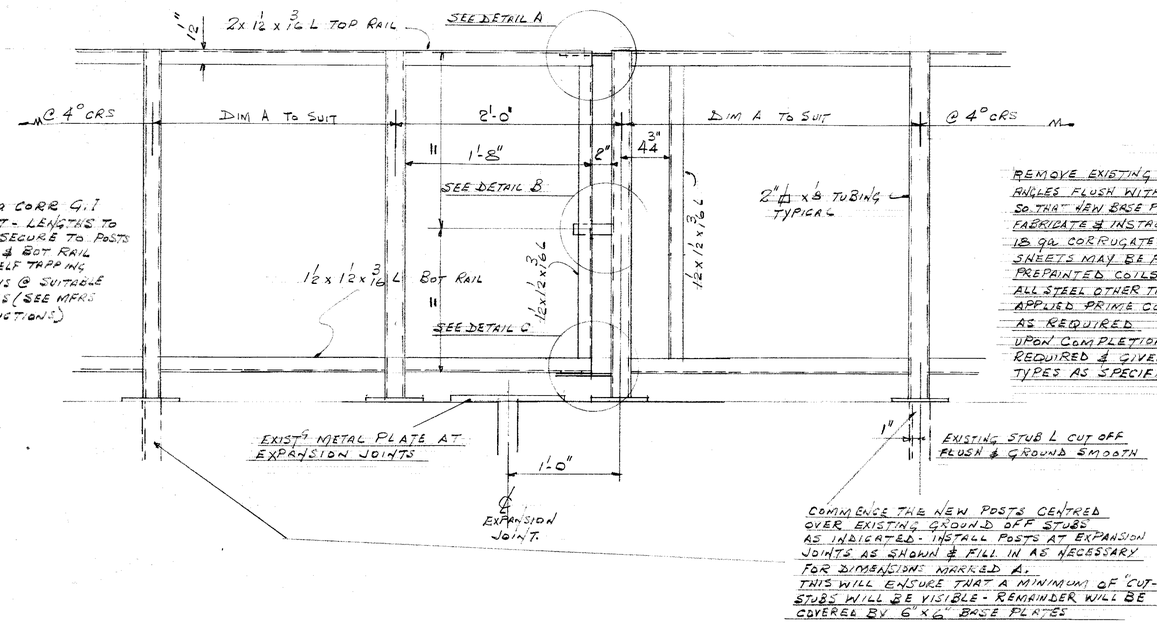






DETAIL OF SHEET LAP AT EXP JOINT





SCOPE OF WORK

REMOVE EXISTING SPLASH RAIL & CUT OFF EXISTING STUB ANGLES FLUSH WITH TOP OF CONC - GRIND FLUSH IF NECESSARY SO THAT NEW BASE PLATES WILL BED ON CONCRETE SIDEWALK & KERB. FABRICATE & INSTALL NEW SPLASH GUARDS AS DETAILED ON PLAN. 18 ga CORRUGATED SHEETS TO OVERLAP 5" AT JOINTS. SHEETS MAY BE FABRICATED FROM GALVANIZED OR PREPAINTED COILS. ALL STEEL OTHER THAN CORR SHEETS SHALL HAVE SHOP APPLIED PRIME COAT - TOUCHED UP AFTER ERECTION AS REQUIRED. UPON COMPLETION ALL WORK SHALL BE PRIMED AS REQUIRED & GIVEN 2 FINISH COATS - COLOR & PAINT TYPES AS SPECIFIED.

COMMENCE THE NEW POSTS CENTRED OVER EXISTING GROUND OFF STUBS AS INDICATED. INSTALL POSTS AT EXPANSION JOINTS AS SHOWN & FILL IN AS NECESSARY FOR DIMENSIONS MARKED A. THIS WILL ENSURE THAT A MINIMUM OF "CUT-OFF" STUBS WILL BE VISIBLE - REMAINDER WILL BE COVERED BY 6"x6" BASE PLATES

REV. No	DESCRIPTION	DRN.	DATE
1	LAPPING OF SHEETS SHOWN	AUG 3/83	

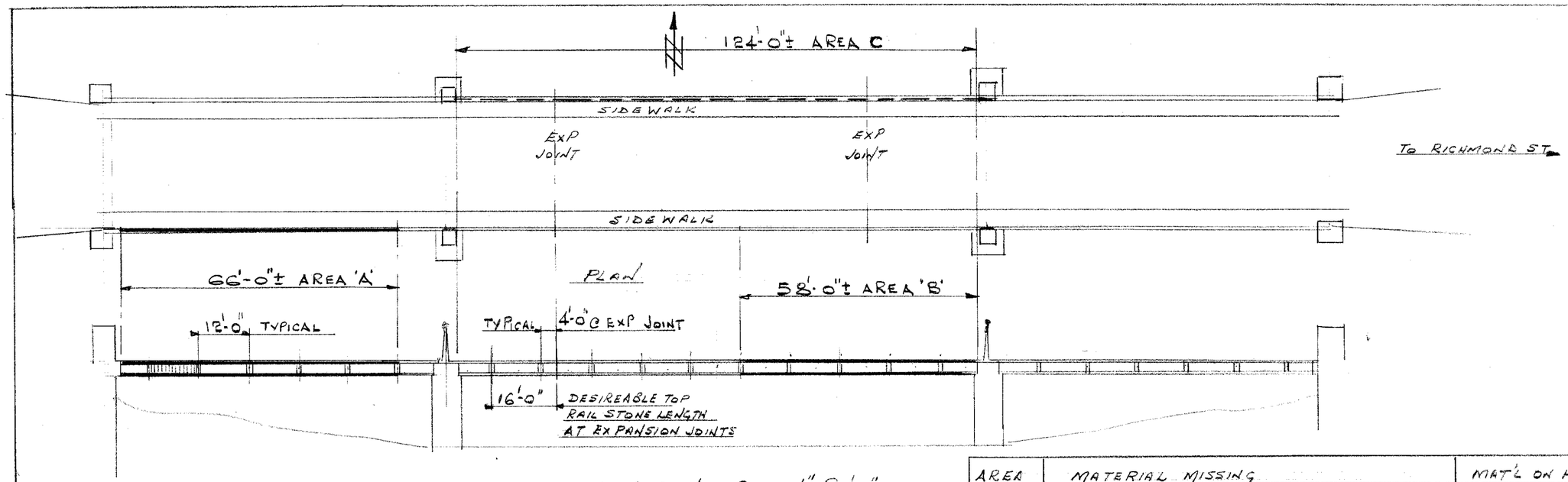
THE UNIVERSITY OF WESTERN ONTARIO

PHYSICAL PLANT DEPARTMENT

SPLASH GUARDS
UNIVERSITY AVENUE
BRIDGE

SCALE	
DRN.	
CKD.	07/13/83
APPD.	
DRWG. No	10-02-2-5

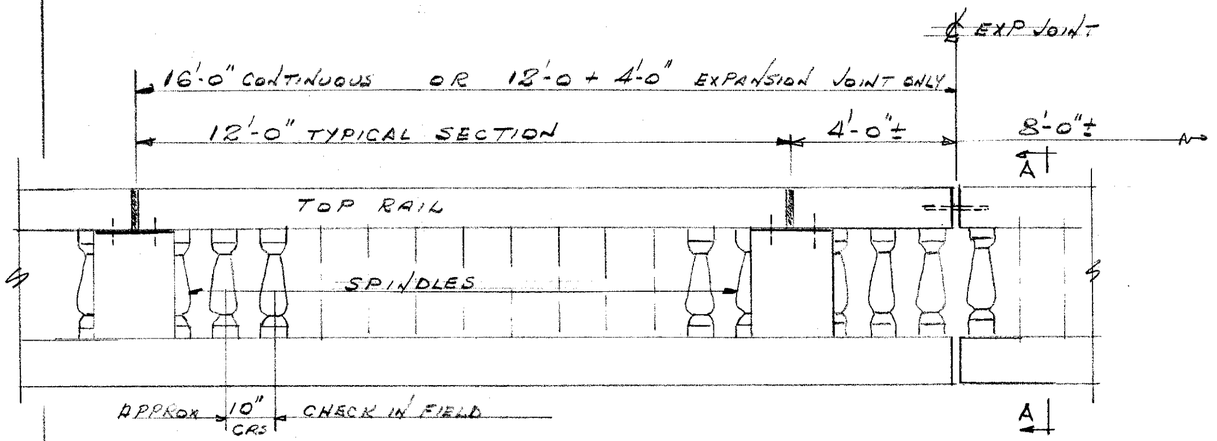
UDB 05-A1



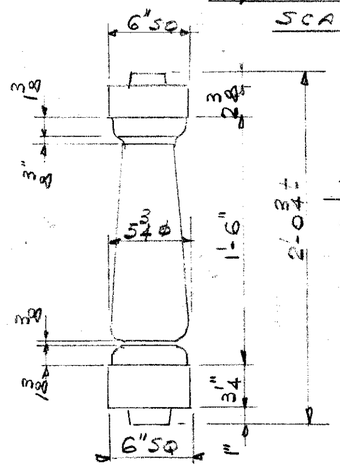
ELEVATION. SCALE 1"=20'-0"

AREA	MATERIAL MISSING	MAT'L ON HAND U.W.O
A	TOP RAIL - 60 SPINDLES - 4 HALF SPINDLES	17 SPINDLES
B	TOP RAIL - 53 SPINDLES - 8 HALF SPINDLES	20 SPINDLES 8'-0" TOP RAIL 12'-0 TOP RAIL
C		ALL MATERIAL

1 DESCRIPTION OF WORK TO BE DONE IN EACH AREA SEE PURCHASE ORDERS
2 THE RAILINGS & SPINDLES TO BE CONSTRUCTED OF FIRST QUALITY VARIEGATED COLOURED INDIANA LIMESTONE, ALL TO BE CUT OR TURNED TO MATCH ORIGINAL
3 ALL SURFACES TO BE RUBBED SMOOTH & THE ENTIRE WORK WELL ANCHORED & DOWELLED TOGETHER. ALL UNEXPOSED PORTIONS TO BE PAINTED WITH AN APPROVED DAMP RESISTANT PAINT
4 CONTRACTORS AND/OR SUPPLIERS TO VERIFY ALL DIMENSIONS - SAMPLE SPINDLE WILL BE PROVIDED
5 OTHER DOWELLING METHODS MAY BE USED SUBJECT TO UWO APPROVAL

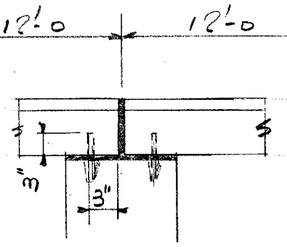


TYPICAL SECTION OF RAIL
SCALE ½ = 1'-0"



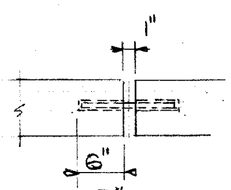
76 REQ'D AS SHOWN
12 REQ'D HALF SPINDLES

TYPICAL SPINDLE
SCALE 1½"=1'-0



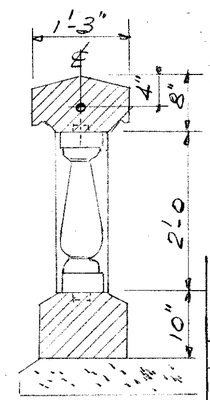
DRILL 1"ø HOLE IN STONE USE ¾"ø x 2" LG REDHEAD IN PIER & ¾ø x 4" THREADED ROD AS ANCHOR

TYPICAL CONNECTION STONE RAIL TO PIERS



DRILL 8 ø HOLE IN STONE & INSERT ¾"ø x 1'-0" LONG S.S ROD AT EXPANSION JOINTS

TYPICAL EXPANSION JOINT CONNECTION



SECTION A-A

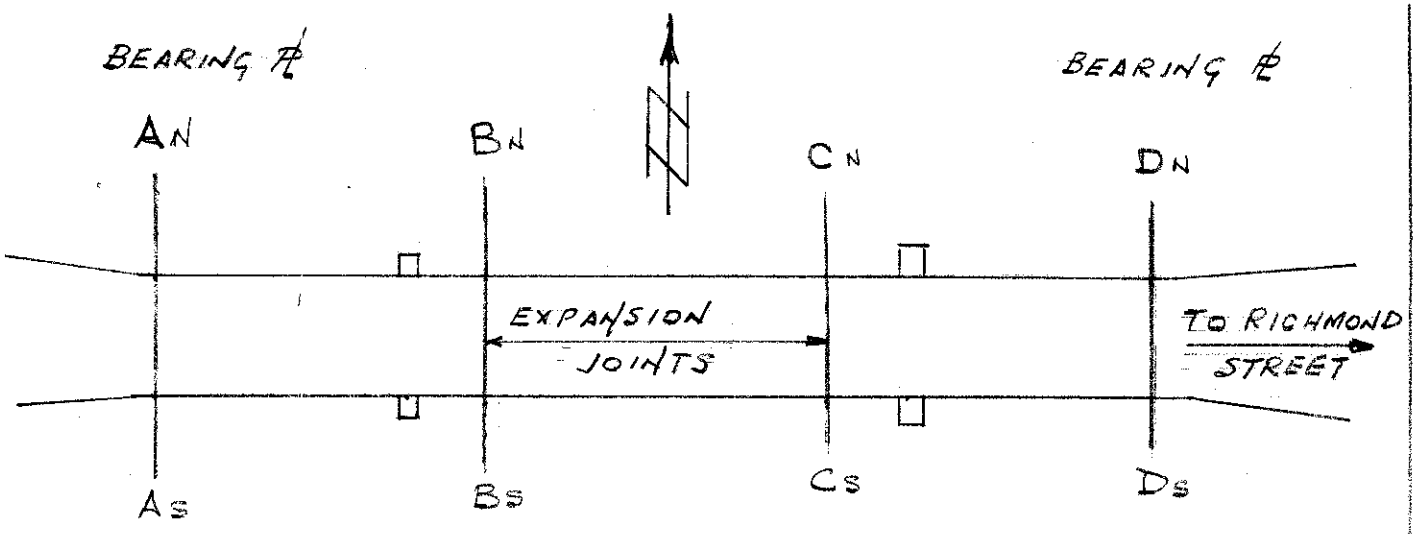
NOTES FOR GENERAL CONTRACTOR
1 STONE & SPINDLES SUPPLIED BY UWO
2 ALL NECESSARY HOLES IN NEW & EXISTING STONE TO BE DRILLED BY GENERAL CONTRACTOR
3 ONE LANE ONLY TRAFFIC TO BE AVAILABLE DURING CONSTRUCTION

THIS DRG REPLACES DRG WITH SAME NUMBER DATED JAN 15/74

THE UNIVERSITY OF WESTERN ONTARIO
PHYSICAL PLANT DEPARTMENT
UNIVERSITY BRIDGE REPAIRS

SCALE	AS NOTED
DATE	6/2/74
DRN	
CKD	
APPD	
DRG NO	10-02-2-1

UDB\01-A1



PLAN OF BRIDGE SHOWING MEASURENT POINTS

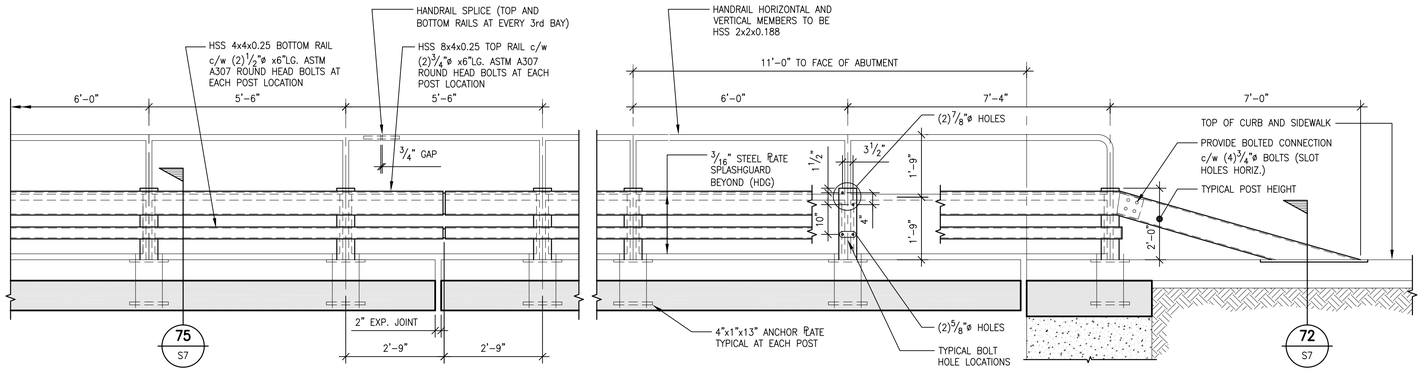
DATE	TEMP °F	LOCATION & MEASUREMENT							
		A'	AS	BN	BS	CN	CS	DN	DS
	59	1/8"	0	1/8"	1/8"	1/8"	1/8"	0	1/16"
	32	1/4"	0"	3/16"	3/16"	7/64"	1/8"	1/8"	3/16"
FEB 4/74	8	23/64"	0"	1/4"	5/16"	7/16"	25/64"	3/16"	1/4"

REV NO	DESCRIPTION	DRN	DATE
THE UNIVERSITY OF WESTERN ONTARIO			
PHYSICAL PLANT DEPARTMENT		SCALE NIL	DATE
MEASUREMENTS OF UNIVERSITY BRIDGE		DRN FDS	6/2/74
		CHK	
		APPD	
		DRAWING NO	10-02-2-2

UDB\02-SK1

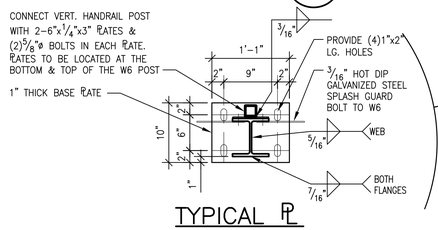
APPENDIX

D BRIDGE DRAWINGS, 2002 REPAIRS

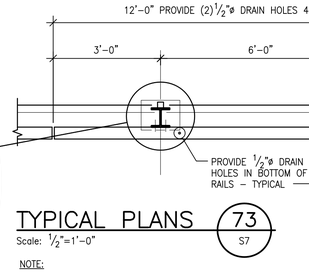


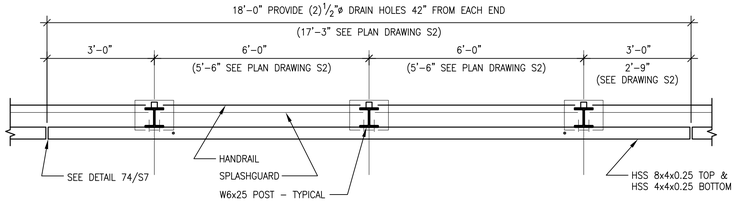
ELEVATION 71
S2

Scale: 1/2"=1'-0"



TYPICAL PL



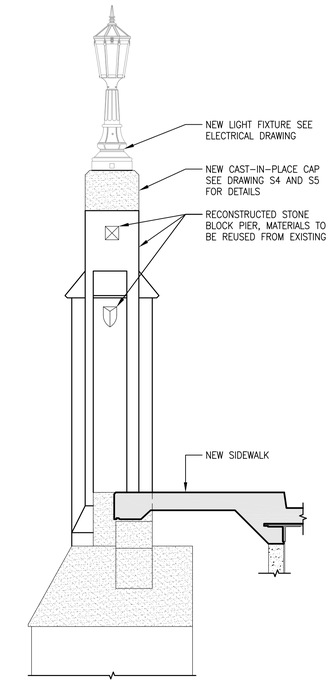


TYPICAL PLANS 73
S7

Scale: 1/2"=1'-0"

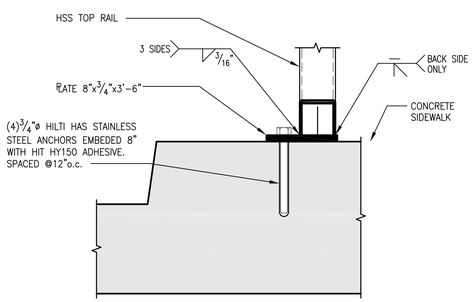
NOTE:

1. EVERY OTHER W6x25 POST TO BE ALIGNED WITH EXISTING SIDEWALK CANTILEVERS. DIMENSIONS SHOWN TO BE FIELD VERIFIED.



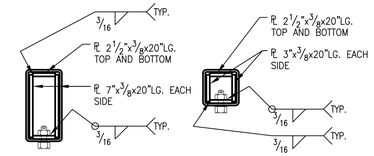
WEST PEIR ELEVATION
EAST ELEVATION SIMILAR

Scale: 3/8"=1'-0"



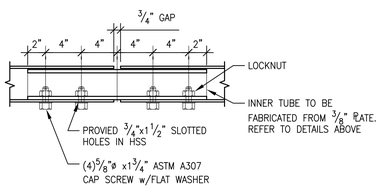
SECTION 72
S7

Scale: 1 1/2"=1'-0"



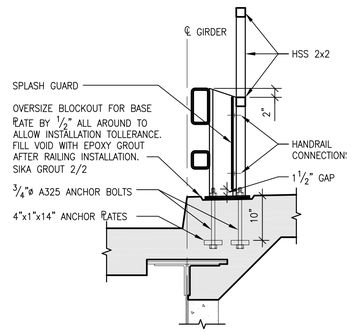
TOP RAIL

BOTTOM RAIL



TYPICAL RAIL SPLICE 74
S7

Scale: 1 1/2"=1'-0"



SECTION 75
S7

Scale: 1/2"=1'-0"

No.	Revisions	Date
2	AS BUILT	NOV 25, 2002
1	ISSUED FOR TENDER	APR 15, 2002

AS-BUILT

ORIGINAL DRAWING SEALED BY G.J. WEBSTER P.ENG

7046

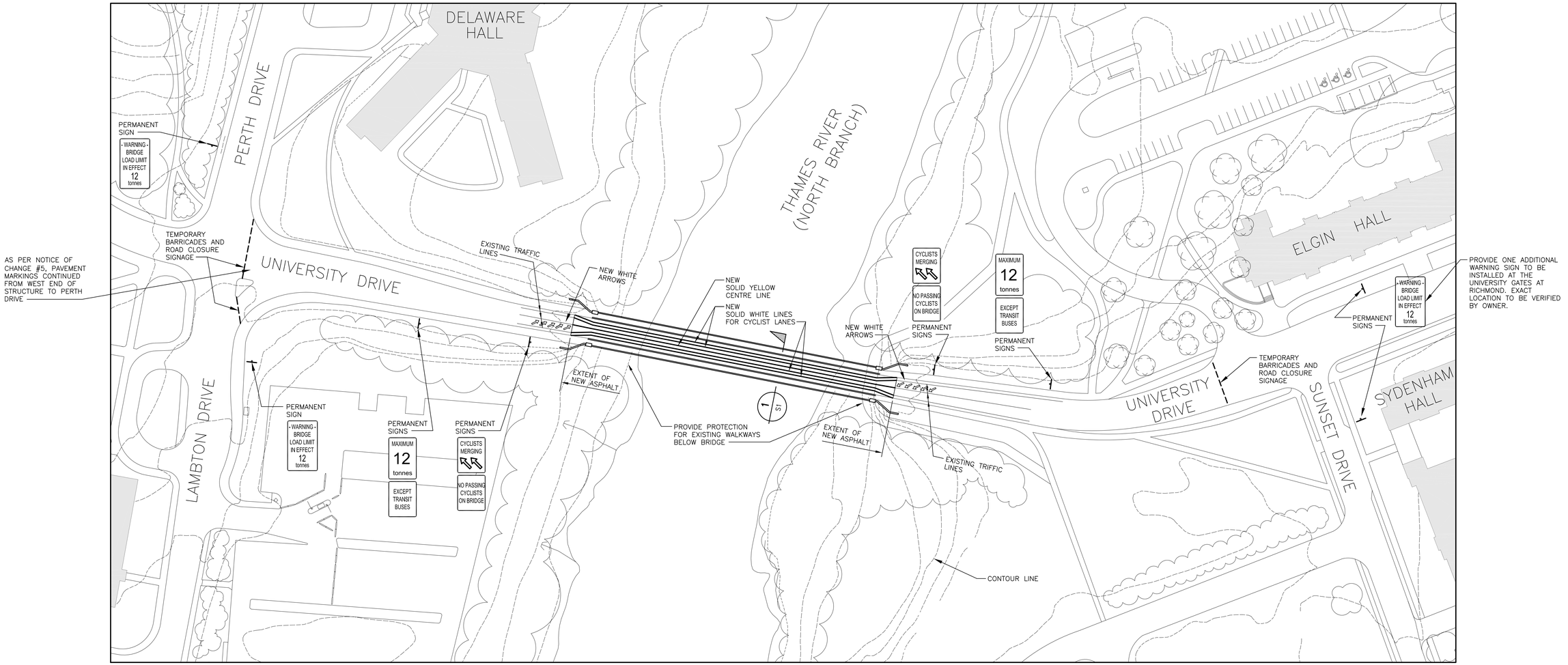
HASTINGS & AZIZ LTD
Consulting Structural Engineers
200 Queens Ave. Suite 400
London, Ontario
N6A 1J3
tel (519) 439-0161
fax (519) 439-6949

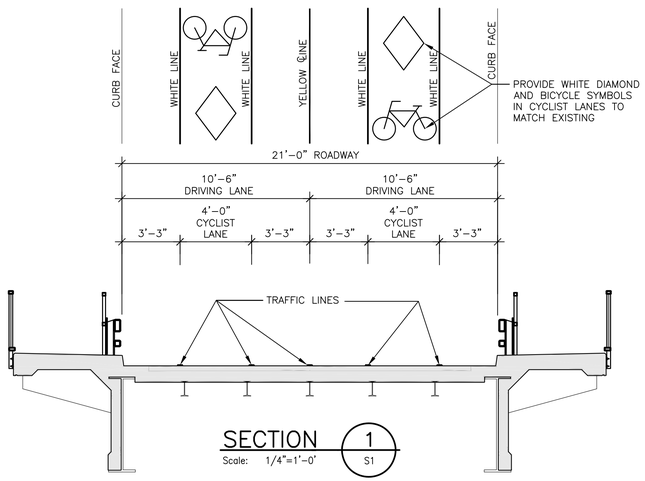
UNIVERSITY DRIVE BRIDGE REPAIRS

THE UNIVERSITY of WESTERN ONTARIO
PHYSICAL PLANT & CAPITAL PLANNING SERVICES
Facilities Engineering

RAILING DETAILS 2

DRAWN	A.M.M.
DATE	APRIL 2002
SCALE	AS NOTED
DWG. FILE No.	7046
CKD.	G.J.W
PROJ. No.	2215
APP'D	—
SHEET	S7





SECTION 1
Scale: 1/4"=1'-0" S1

ALL SIGNS & SIGN POSTS (INCLUDING CONNECTION HARDWARE) SUBMITTED TO U.W.O. FOR INSTALLATION AS REQUESTED.

SITE PLAN
Scale: 1"=50'-0"

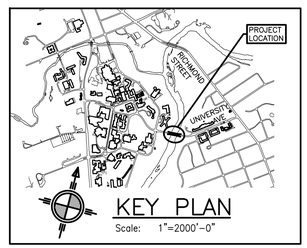
NOTES

1) PROVIDE TEMPORARY CONCRETE NEW JERSEY BARRIERS TO BARRICADE THE ROAD DURING CONSTRUCTION. THE CONTRACTOR SHALL INCLUDE A LOCKABLE GATE, AS REQUIRED, TO ALLOW ACCESS DURING CONSTRUCTION.

2) THE CONTRACTOR SHALL PROVIDE BARRIERS TO DIVERT PEDESTRIAN TRAFFIC, AS REQUIRED, DURING CONSTRUCTION.

3) THE CONTRACTOR SHALL PROVIDE TEMPORARY SIGNS, AS REQUIRED AND AS DIRECTED BY THE ENGINEER, TO DIRECT PEDESTRIAN TRAFFIC.

4) PERMANENT LOAD LIMIT AND LOAD LIMIT WARNING SIGNS ARE TO BE SUPPORTED WITH A NEW HOT-DIPPED GALVANIZED STEEL PIPE DN-65-STD 12'-0" LONG EMBEDDED IN A 4'-0" DEEP x 16" DIAMETER CONCRETE FOOTING.



KEY PLAN
Scale: 1"=2000'-0"

No.	Revisions	Date
2	AS BUILT	NOV 25, 2002
1	ISSUED FOR TENDER	APR 15, 2002

AS-BUILT

ORIGINAL DRAWING SEALED BY G.J. WEBSTER P.ENG

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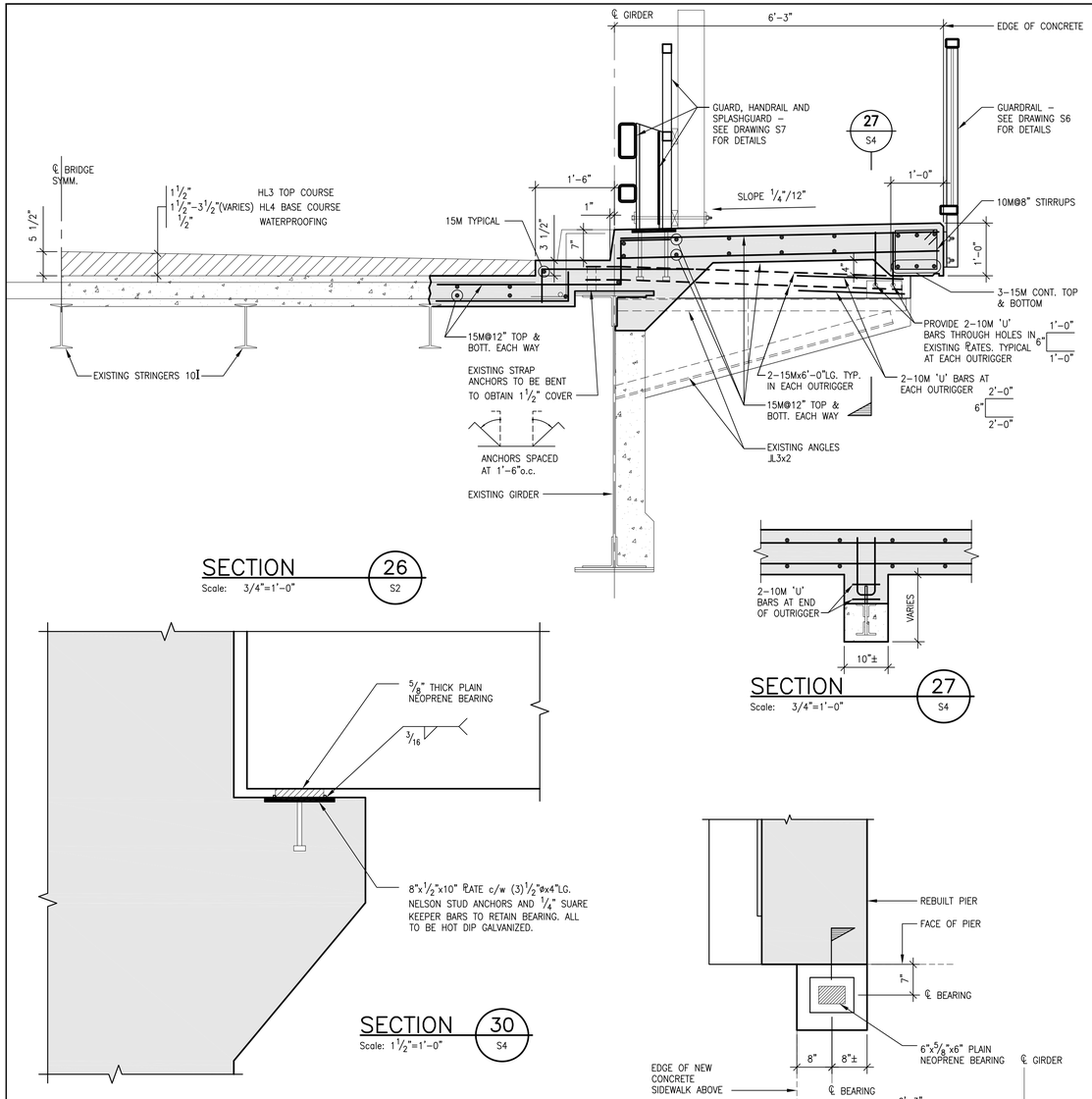
200 Queens Ave. Suite 400
London, Ontario
N6A 1J3
tel (519) 439-0161 fax (519) 439-6949

UNIVERSITY DRIVE BRIDGE REPAIRS

THE UNIVERSITY of WESTERN ONTARIO
PHYSICAL PLANT & CAPITAL PLANNING SERVICES
Facilities Engineering

SITE PLAN

DRAWN LB	DATE APRIL 2002
SCALE AS NOTED	DWG. FILE No. 7046
CKD. G.J.W	PROJ. No. 2215
APP'D –	SHEET S1



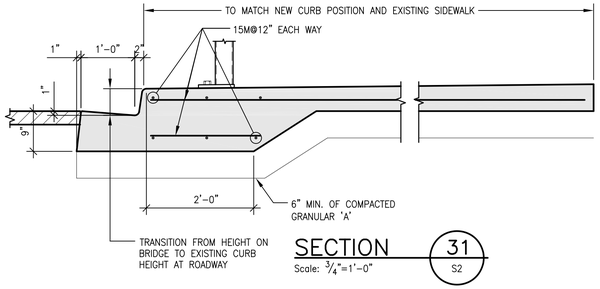
SECTION 26 (S2)
Scale: 3/4"=1'-0"

SECTION 27 (S4)
Scale: 3/4"=1'-0"

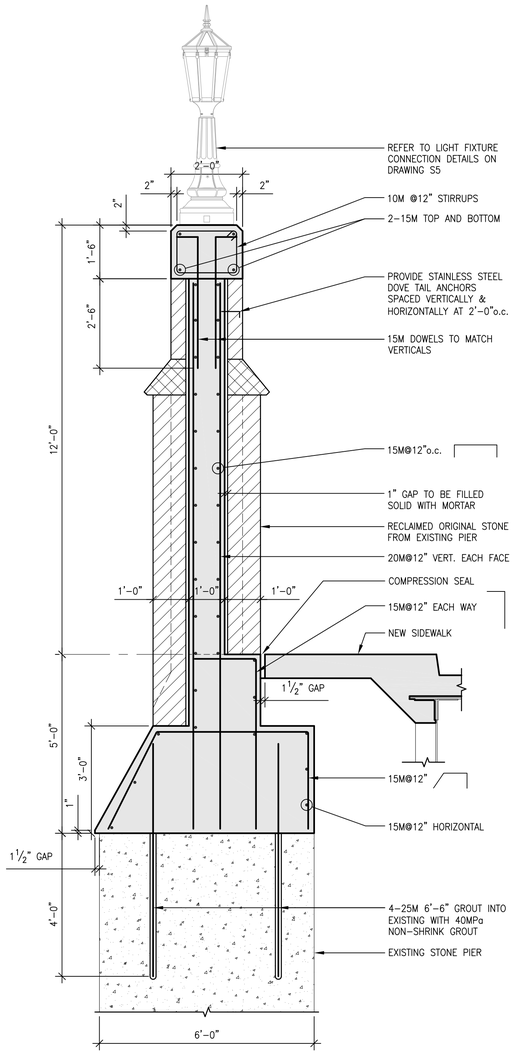
SECTION 30 (S4)
Scale: 1 1/2"=1'-0"

30 (S4)

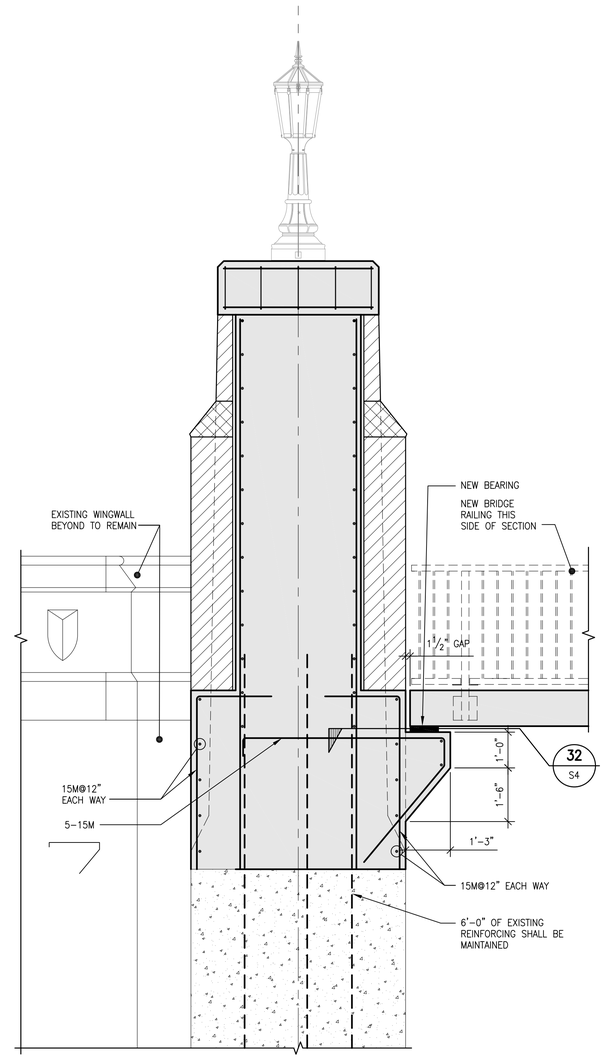
SECTION 32 (S4)
Scale: 3/4"=1'-0"



SECTION 31 (S2)
Scale: 3/4"=1'-0"



SECTION 28 (S2)
Scale: 1/2"=1'-0"



SECTION 29 (S2)
Scale: 1/2"=1'-0"

No.	Revisions	Date
2	AS BUILT	NOV 25, 2002
1	ISSUED FOR TENDER	APR 15, 2002

AS-BUILT

ORIGINAL DRAWING SEALED BY G.J. WEBSTER P.ENG

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fax (519) 439-6949

UNIVERSITY DRIVE BRIDGE REPAIRS

THE UNIVERSITY of WESTERN ONTARIO
PHYSICAL PLANT & CAPITAL PLANNING SERVICES
Facilities Engineering

SECTIONS AND DETAILS 1

DRAWN: A.M.M.	DATE: APRIL 2002
SCALE: AS NOTED	DWG. FILE No.: 7046
CKD.: G.J.W	PROJ. No.: 2215
APP'D: –	SHEET: S4