

WELLINGTON COUNTY

# CULTURAL HERITAGE EVALUATION REPORT

## CONESTOGO RIVER BRIDGE #5 (B109123)

October 04, 2021

FINAL





# CULTURAL HERITAGE EVALUATION REPORT CONESTOGO RIVER BRIDGE #5 (B109123) WELLINGTON COUNTY

DRAFT

PROJECT NO.: 17M-01271-01

DATE: OCTOBER 04, 2021

WSP

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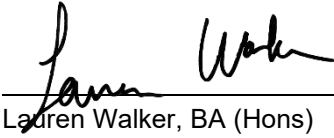
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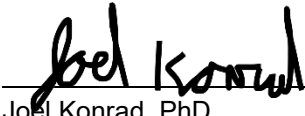


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October 4, 2021

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# EXECUTIVE SUMMARY

WSP Canada Inc. (WSP) was retained by Wellington County to complete the preliminary and detailed design of the Conestogo River Bridge #5 replacement. A Cultural Heritage Evaluation Report (CHER) is required to determine if the bridge has cultural heritage value.

The Conestogo River Bridge #5 (B109123) is a two-lane concrete barrel arch bridge, on Highway 109 located approximately 0.7 km west of Highway 6 in Wellington County. It was built in 1930 and has a length of 14 m and a width of 11.7 m. The purpose of this report is to establish the potential cultural heritage value or interest of the structure, which is greater than 40 years old.

Based on the results of research, site investigation, and application of Ontario Regulation 9/06 to evaluate the cultural heritage value or interest of the structure, the Conestogo River Bridge #5 does satisfy criteria under Ontario Regulation 9/06. Therefore, the bridge has been found to have cultural heritage value or interest and further heritage reporting is required.

The completion of this study has resulted in the following recommendations:

- 1 The Conestogo River Bridge #5 was determined to have cultural heritage value or interest. Therefore, a heritage impact assessment should be completed during detailed design.



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# PROJECT PERSONNEL

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# 1 INTRODUCTION

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## 1.1 PROJECT CONTEXT

WSP Canada Inc. (WSP) was retained by Wellington County to complete the preliminary and detailed design of the Conestogo River Bridge #5 replacement. A Cultural Heritage Evaluation Report (CHER) is required to determine if the bridge has cultural heritage value or interest.

The Conestogo River Bridge #5 (B109123) is a two-lane concrete barrel arch on Highway 109, located approximately 0.7 km west of Highway 6 in Wellington County (Figure 1). It was built in 1930 and has a length of 14 m and a width of 11.7 m. The structure is oriented in a generally northwesterly to southeasterly direction. For clarity in this report, the structure will be described as oriented west-east.

The purpose of this report is to establish the potential cultural heritage value or interest of the structure, which is greater than 40 years old. The site was evaluated using Ontario Regulation 9/06 (O. Reg. 9/06) to determine if the structure retains cultural heritage value or interest.

# 2 LEGISLATION AND POLICY CONTEXT

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## 2.1 PROVINCIAL AND MUNICIPAL CONTEXT AND POLICIES

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### 2.1.1 PROVINCIAL POLICY CONTEXT

This Cultural Heritage Evaluation Report (CHER) considers the identified potential built heritage resource in the context of proposed highway intersection improvements under the *Environmental Assessment Act* (1990), as well as the *Planning Act* (1990).

Under the *Environmental Assessment Act* (1990), environment is defined in Subsection 1(c) to include:

- Cultural conditions that influence the life of man or a community, and;
- Any building, structure, machine, or other device or thing made by man.

As part of the Municipal Class EA process, the Municipal Heritage Bridges Cultural, Heritage and Archaeological Resources Assessment Checklist (April, 2014) is required to identify whether a Cultural Heritage Report (CHER) and Heritage Impact Assessment (HIA) are required.

Ontario Regulation 160/02 amends the Public Transportation and Highway Improvement Act and specifies that bridges must be inspected every two years under the direction of a professional engineer and in accordance with the *Ontario Structure Inspection Manual*.

The Ministry of Heritage, Sport, Tourism and Culture Industries (MHSTCI; formerly the Ministry of Tourism, Culture and Sport) is charged under Section 2 of the *Ontario Heritage Act* with the responsibility to determine policies, priorities and programs for the conservation, protection and preservation of Ontario's built heritage resources and cultural heritage landscapes, and has published two guidelines to assist in assessing built heritage resources and cultural heritage landscapes as part of an environmental assessment:

- Guideline for Preparing the Cultural Heritage Resource Component of Environmental Assessments (1992), and
- Guidelines on the Man-Made Heritage Component of Environmental Assessments (1981).

Both guidelines have been utilized in this assessment process.

Additionally, the *Planning Act* (1990) and related Provincial Policy Statement (PPS; 2020), provide guidance on the identification and conservation of cultural heritage

resources. In Subsection 2.6 - Cultural Heritage and Archaeological Resources, the PPS states:

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

The PPS defines built heritage resources as:

a building, structure, monument, installation or any manufactured or constructed part or remnant that contributes to a property's cultural heritage value or interest as identified by a community, including an Indigenous community. Built heritage resources are located on property that may be designated under Parts IV or V of the Ontario Heritage Act, or that may be included on local, provincial, federal and/or international registers.

The PPS defines a cultural heritage landscape is as:

a defined geographical area that may have been modified by human activity and is identified as having cultural heritage value or interest by a community, including an Indigenous community. The area may include features such as buildings, structures, spaces, views, archaeological sites or natural elements that are valued together for their interrelationship, meaning or association. Cultural heritage landscapes may be properties that have been determined to have cultural heritage value or interest under the Ontario Heritage Act, or have been included on federal and/or international registers, and/or protected through official plan, zoning by-law, or other land use planning mechanisms.

Examples of cultural heritage landscapes may include, but are not limited to, farmscapes, historic settlements, parks, gardens, battlefields, main streets and neighbourhoods, cemeteries, railways, and industrial complexes of cultural heritage value or interest.

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### *2.1.2 WELLINGTON COUNTY OFFICIAL PLAN*

Wellington County Official Plan was adopted by Wellington County Council on September 24, 1998, approved by the Ministry of Municipal Affairs on April 13, 1999, came into effect on May 6, 1999 and was last updated on August 15, 2019. Policies relevant to this CHER include:

#### *4.1.1 Identifying Cultural Heritage Resources*

Cultural heritage resources include, but are not necessarily restricted to the following criteria under Ontario Regulations 9/06 issued under the Ontario Heritage Act.

a) 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.
- b) 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. 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.
- c) 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.

#### **4.1.2 Ontario Heritage Act**

Under the Ontario Heritage Act, a local Council may pass by-laws to:

- a) Designate individual properties of cultural heritage value or interest, in accordance with the criteria set out in Ontario Regulation 9/06. Such a by-law shall include a description of the property and a statement of cultural heritage value or interest and description of the heritage attributes;

#### **4.1.5 Policy Direction**

- a) significant built heritage resources and significant cultural heritage landscapes shall be conserved. Conserved means the identification, protection, use and/or management of cultural heritage and archeological resources in such a way that their heritage values, attributes and integrity are retained. This may be addressed through a conservation plan or heritage impact assessment in accordance with Section 4.6.7.

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## 2.2 METHODOLOGY

The recommendations of this CHER are based on an understanding of the physical values of the property, a documentation of its history through research, an analysis of its social and physical context, comparisons with similar properties and mapping.

This CHER is guided by key documents such as the Municipal Engineers Association's (MEA) Municipal Heritage Bridges, Cultural, Heritage and Archaeological Resources Assessment Checklist (2014), the Reference Guide on Physical and Cultural Heritage Resources (Government of Canada, 1996), the Ontario Heritage Toolkit (Ministry of Culture, 2006), and the Guidelines for Preparing the Cultural Heritage Resource Component of Environmental Assessments (Ministry of Culture and Communications, 1992).

A CHER examines a property in its entirety, including its relationship to its surroundings, as well as its individual elements – engineering works, landscape etc. This report will include:

- A summary of the history of the immediate context informed by a review of archival sources and historical maps;
- A summary of the land-use history of the property including key transfers of land and milestones informed by Land Registry records and additional archival research into prominent owners of tenants such as tax assessments or City Directories;
- Thorough photographic documentation of the bridge and context;
- A written description of the existing conditions and immediate context;
- An assessment of whether the property satisfies criteria under O. Reg. 9/06;
- A comparative analysis, using bridges of a similar age, style, typology, context and history to inform the assessment of CHVI; and
- A draft statement of CHVI if appropriate.

For the purposes of this CHER the following documents were also consulted:

- The Ministry of Transportation Ontario's (MTO) bridge list;
- Wellington County's Bridge Inventory; and,
- Arch, Truss and Beam: The Grand River Watershed Heritage Bridge Inventory.

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## 2.3 CONSULTATION

Wellington County was consulted as a part of this project for information regarding potential built heritage resource and cultural heritage landscapes. Details regarding the scope and timing of this consultation have been provided in Table 1.

**Table 1: Consultation Record**

CONTACT	CONTACT DETAILS	RESPONSE RECEIVED	RESPONSE
Michelle Innocente Senior Planner, Wellington County michellei@wellington.ca	By email on October 30, 2019; follow up on November 13, 2019.	November 13, 2019	Wellington County does not have a Heritage Register; Michelle suggested contacting the municipality's Clerk.
Karren Wallace Director of Legislative Services/Clerk kwallace@wellington- north.com	By email November 13, 2019	November 18, 2019	The bridges have no heritage status.

# 3 HISTORICAL CONTEXT

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## 3.1 LOCAL CONTEXT AND SETTLEMENT HISTORY

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### 3.1.1 *PHYSIOGRAPHIC CONTEXT*

The study area is located within a projection of the Stratford Till Plain physiographic region that otherwise encompasses the City of Stratford and stretches towards London in the south and Listowel to the north (Chapman and Putnam 1984: 133). One or two moraines modify the northern region of the Stratford Till Plain, whereas the southern portion of the region contains multiple ground and terminal moraines, resembling the Mount Elgin Ridges (Chapman and Putnam 1984: 133). Drainage is greatest within the Thames watershed, as it is the lowest point within the region. The soil is comprised of fairly uniform silty clay with few stone deposits, a product of the Huron ice lobe. Areas between moraines often contain sand and gravel (Chapman and Putnam 1984: 133). The soil allows the region to be one of the most productive in the Province for agriculture given a high supply of lime, good natural fertility, and easy opportunities for cultivation once proper drainage has been supplied (Chapman and Putnam, 1984: 134).

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### 3.1.2 *INDIGENOUS CONTEXT*

Paleoindian period populations were the first to occupy what is now southern Ontario, moving into the region following the retreat of the Laurentide Ice Sheet approximately 11,000 years before present (BP). The first Paleoindian period populations to occupy southern Ontario are referred to by archaeologists as Early Paleoindians (Ellis and Deller, 1990).

Early Paleoindian period groups are identified by their distinctive projectile point morphologies, exhibiting long grooves, or 'flutes', that likely functioned as a hafting mechanism (method of attaching the point to a wooden stick). These Early Paleoindian group projectile morphologies include Gainey (ca. 10,900 BP), Barnes (ca. 10,700), and Crowfield (ca. 10,500) (Ellis and Deller, 1990). By approximately 10,400 BP, Paleoindian projectile points transitioned to various unfluted varieties such as Holcombe (ca. 10,300 BP), Hi Lo (ca. 10,100 BP), and Unstemmed and Stemmed Lanceolate (ca. 10,400 to 9,500 BP). These morphologies were utilized by Late Paleoindian period groups (Ellis and Deller, 1990). Both Early and Late Paleoindian period populations were highly mobile, participating in the hunting of large game animals. Paleoindian period sites often functioned as small campsites where stone tool production and maintenance occurred (Ellis and Deller, 1990).

Climatic warming, approximately 8,000 BP, was accompanied by the arrival of the deciduous forest in southern Ontario. With this shift in flora came new faunal resources,

resulting in a change in cultural adaptations in the region. This change is reflected in new tool-kits and associated subsistence strategies referred to archaeologically as the Archaic period. The Archaic period in southern Ontario is divided into three phases: the Early Archaic (ca. 10,000 to 8,000 BP), the Middle Archaic (ca. 8,000 to 4,500 BP), and the Late Archaic (ca. 4,500 to 2,800 BP) (Ellis et al. 1990).

The Archaic period is differentiated from earlier Paleoindian populations by a number of traits such as: 1) an increase in tool stone variation and reliance on local tool stone sources, 2) the emergence of notched and stemmed projectile point morphologies, 3) a reduction in extensively flaked tools, 4) the use of native copper, 5) the use of bone tools for hooks, gorges, and harpoons, 6) an increase in extensive trade networks, and 7) the production of ground stone tools. Also noted is an increase in the recovery of large woodworking tools such as chisels, adzes (a tool similar to an axe with an arched blade, used for cutting or shaping large pieces of wood), and axes (Ellis et al., 1990).

The Archaic period is also marked by population growth. Archaeological evidence suggests that by the end of the Middle Archaic period (ca. 4,500 BP) populations were steadily increasing in size (Ellis et al., 1990). Over the course of the Archaic period, populations began to rely on more localized hunting and gathering territories. By the end of the Archaic period, populations were utilizing more encampments that are seasonal. From spring to fall, the archaeological record shows populations were shifting their settlement patterns on a regular, seasonal basis. From spring to fall, settlements would exploit lakeshore/riverine locations where a broad-based subsistence strategy could be employed, while the late fall and winter months would be spent at interior site where deer hunting was likely a primary focus with some wild edibles likely being collected (Ellis et al. 1990:114). This steady increase in population size and adoption of a more localized seasonal subsistence strategy eventually evolved into what is termed the Woodland period.

The beginning of the Woodland period is identified by archaeologists by the emergence of ceramic technology for the manufacture of pottery. Similar to the Archaic period, the Woodland period is separated into three primary timeframes: the Early Woodland (approximately 2,800 to 2,000 BP), the Middle Woodland (approximately 2,000 to 1,200 BP), and the Late Woodland (approximately 1,200 to 350 BP) (Spence et al., 1990; Fox, 1990).

The Early Woodland period is represented in southern Ontario by two different cultural complexes: the Meadowood Complex (ca. 2,900 to 2,500 BP), and the Middlesex Complex (ca. 2,500 to 2,000 BP). During this period, the life ways of Early Woodland populations differed little from that of the Late Archaic with hunting and gathering representing the primary subsistence strategies. The pottery of this period is characterized by its relatively crude construction and lack of decorations. These early ceramics exhibit cord impressions, likely resulting from the techniques used during manufacture (Spence et al., 1990).

The Middle Woodland period is differentiated from the Early Woodland period by changes in lithic tool morphologies (e.g. projectile points, expedient tools) and the increased elaboration of ceramic vessels (Spence et al., 1990). In southern Ontario, the Middle Woodland is observed in three different cultural complexes: the Point Peninsula Complex to the north and northeast of Lake Ontario, the Couture Complex near Lake St. Claire, and the Saugeen Complex throughout the remainder of southern Ontario. These groups can be identified by their use of either dentate or pseudo scalloped ceramic decorations. It is by the end of the Middle Woodland period that archaeological evidence begins to suggest the rudimentary use of maize (corn) horticulture (Warrick, 2000). The Point Peninsula tradition is characterized by Vinette II ceramics, small camp sites and seasonal village sites, and a clear influence from both northern Ontario and Hopewell cultures (Warrick, 2000).

The adoption and expansion of maize horticulture during the Late Woodland period allowed for an increase in population size, density, and complexity among Late Woodland populations. As a result, a shift in subsistence and settlement patterns occurred, with the adoption of a more sedentary village life and reliance on maize horticulture, with beans, squash, and tobacco also being grown. Nearing the end of the Late Woodland period (approximately 600 BP) villages reached their maximum size.

During this period, increased warfare resulted in the development of larger villages with extensive palisades. In the Eramosa River area, the shift from Point Peninsula tradition during the Middle Woodland period to the Late Woodland period Iroquoian lifeways is indicated by settlement in larger, more permanent village sites. Later in the Late Woodland period, the pre-contact Neutral tradition is defined by large villages (up to 5 hectares in size) with large populations and extensive farming of crops. Additional site types, including hamlets, cabins, camps and cemeteries are represented in the Late Woodland period as well (Munson and Jamieson, 2013).

Early contact with European settlers at the end of the Late Woodland period resulted in extensive change to the traditional lifestyles of most populations inhabiting southern Ontario. Trade with the Europeans lead to dependency on European goods and incited conflict between the Indigenous communities in southern Ontario (Warrick, 2000).

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### 3.1.3 *EUROCANADIAN CONTEXT*

The study area is located within in the Township of Wellington North in Wellington County.

#### 3.1.3.1 *WELLINGTON COUNTY*

In 1783, General Halidmand directed Sir John Johnson to purchase land on the north side of Lake Ontario from the Mississaugas. Land was purchased from the Mississaugas in May 1784. In October 1784, General Halidmand granted land six miles deep from each side of the Grand River extending from the mouth of the river at Lake



Erie to the head of the river to the Haudenosaunee (Six Nations of the Grand River, hereafter Six Nations). Due to a mistake in Augustus Jones' survey line from the Head of Lake (Burlington) to the Conestoga River at the present site of Arthur (that was mistaken for the Thames River), the land east of this line was not conveyed to the Six Nations as was intended in the original agreement. In the late eighteenth century, the Six Nations sold blocks of land including a portion of Wellington County to land purveyors. Parts of the Crown's purchases of December 7, 1792 (Between the Lakes Purchase) from the Mississaugas and July 10, 1827 (Huron Tract Purchase) from the Chippewas also make up Wellington County (Hutchinson, 1998; Kelsay, 1984).

The district of Wellington was created out of the Gore District in 1838. The District of Wellington was absorbed into the United Counties of Wellington, Waterloo and Grey in 1852. The following year, Wellington County separated from Waterloo County and by 1854 Wellington was a separate, independent county holding its county seat in the town of Guelph. This included the Towns and Townships of Amaranth, Arthur, Eramosa, Erin, Guelph, Garafraxa, Maryborough, Nichol, Peel, Pilkington and Puslinch. In 1857, Luther and Arthur Townships joined the county (Belden 1878).

Within Wellington County, the study area straddles the boundary between the Township of Wellington North and the Township of Centre Wellington and historically straddles the boundary between the Township of Luther and the Township of Garafraxa.

### 3.1.3.2 *TOWNSHIP OF WELLINGTON NORTH*

The Township of Wellington North was formed through the amalgamation of the Township of Arthur, Village of Arthur, the Township of West Luther and the Town of Mount Forest, effective January 1, 1999.

Named after the Arthur Wellesley the Duke of Wellington (1769-1852) and Prime Minister of Britain (1828-1830), the Township of Arthur was surveyed by John McDonald in 1841-42 and the Village of Arthur was laid out in 1846 by D.B. Papineau (Township of Wellington North, n.d.; Rayburn, 1997: 15). Most settlers were from Ireland, but some were also from Scotland and England. A post office was established in the Village of Arthur in 1848 and by 1871, there were 15 hotels between the Village of Arthur and the Town of Mount Forest.

In 1854, George McPhillips surveyed the land for the Township of Luther (Township of Wellington North, n.d). The Township was covered with timber and swamps which made settlement progress very slow. By 1867, Luther had three post offices, eight or ten schools, and a saw mill (Irwin & Burnham, 1867: xxiv). In the early 1870s during a dry summer, fires spread throughout the Township, drying off the land and leveling most of the timber. The construction of the Toronto, Grey Bruce Railway in 1871 also accelerated development in township. In 1881, the Ontario Legislature passed a bill to divide Luther Township into separate townships, West and East Luther. In 1883 East Luther was transferred to Dufferin County. In 1995, the Township of East Luther and the

former Village of Grand Valley amalgamated to become the Township of East Luther Grand Valley.

The Town of Mount Forest was situated on the South Saugeen River, but the surveyor John McDonald mistakenly assumed that the future site of Mount Forest was located on the Maitland River (Rayburn, 1997: 232). As such, early names for the Mount Forest site included Maitland Hills and Maitland Woods. In 1853, the post office was renamed Mount Forest. In 1864, the community was incorporated as a village with a population of about 1000 people and in 1879 it was incorporated as a town (Welch & Payne, 2015).

### 3.1.3.3 TOWNSHIP OF CENTRE WELLINGTON

The Township of Centre Wellington was formed by the amalgamation of the Town of Fergus, Village of Elora and the Townships of Nichol, Pilkington, West Garafraxa and a portion of Eramosa, effective January 1, 1999.

Fergus was laid out in 1834 by Scottish settlers, James Webster and Adam Fergusson. The area was originally called Little Falls, but was renamed Fergus after Fergusson when the post office opened in 1836 (Welch & Payne, 2015b). The first industry was a grist mill established in 1835 and population growth led to the area's incorporation as a village in 1858. An economic boost came in 1870 with the construction of the Wellington, Grey and Bruce Railway and again in 1880 with the construction of the Credit Valley Railway. It was not until 1952 that the Fergus became a town.

The Village of Elora was founded in 1832 by retired British captain William Gilkison who named the area after his brother John's ship *Ellora* which in turn was named after the seventh and eighth century cave temples and sculptures at Ellora, India. Elora became a Village in 1858. The limestone gorge was quarried until the 1870s and is responsible for the stone architectural landscape in Elora.

The Township of Nichol was named in 1822 after Robert Nicole (c.1780-1824), a merchant, military officer and member of the House of Assembly of Upper Canada (Rayburn, 1997: 242). By 1877 the population of the township was 2737.

The area that became the Township of Pilkington was acquired by Royal Engineer, Robert Pilkington in 1799. Pilkington returned to England in 1802 but kept an interest in the land, arranging for some immigrants from Northamptonshire and Warwickshire to settle in the area (Rayburn, 1997: 272). However, Pilkington was reluctant to sell any of his land and it was not until his death in 1834 that settlement of the area began in earnest (Thorning, 1992). Many early settlers lacked the capital to make improvements and investments necessary for settlement and were forced to abandon their farms (Thorning, 1992).

The Township of Garafraxa was surveyed and named in 1821. In 1869, the township, which was then spelt with only one "r", was split into East and West at the 9<sup>th</sup> concession. In 1874, East Garafraxa became part of Dufferin which became a county in

1881. West Garafraxa remained part of Wellington County. Early settlers were predominantly Irish protestants in the 1830s followed by British immigrants in the early twentieth century.

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### *3.1.4 ROADWAY TRANSPORTATION HISTORY IN ONTARIO*

The earliest transportation routes in Ontario consisted of the many waterways and paths utilized by Canada's Indigenous populations. These same routes were utilized by early European explorers during the fur trade as they were the most effective way to traverse the tree covered land (MTO, 2016). It wasn't until the growth of Euro-Canadian settlement that the need for cleared paths suitable for wagon travel led to the development of roadways.

The earliest roadways consisted of little more than dirt pathways cleared of stumps and boulders to a width that would allow for the passage of wagons and coaches. These roads were often built to varying levels of quality by settlers and quickly became pitted and washed out.

The introduction of corduroy roads, consisting of horizontal logs laid along the roadway and covered/chinked with dirt, provided an improvement upon basic dirt roads. They allowed for the construction of roadways over marshy, wet terrain that basic dirt roads could not pass through easily. However, these roads also experienced short periods of use before decaying and becoming impassable (MTO, 2016).

In the late 1700's there were no formal road workers responsible for the construction and maintenance of roadways. Instead, the construction of roads was the responsibility of township citizens and settlers who were required to contribute time in road work every year as statutory labour and overseen by the local 'Pathmaster'.

Techniques for roadway construction improved throughout the 1800's, with the invention of the plank road (sawed planks of wood laid horizontally perpendicular to the road alignment) in the 1830's. Similar to the previous corduroy roads, plank roads were prone to decomposition and deterioration (MTO, 2016). The macadam road (using various gravel sizes) provided better drainage, compaction, slope control, and longevity, but the initial construction cost posed an issue for many roadworks. The costly repair and maintenance of these early roads meant that in the latter half of the nineteenth century many of Ontario's roadways were in disrepair.

The arrival of the automobile in Ontario during the late 1800's – early 1900's, and the advocacy work of the bicycle lobby, resulted in a push for new and improved roadways. The use of cars and bicycles on roadways resulted in the development of improved gravel and macadamized dirt roadways, and the patent of modern tarmac technology in 1901 allowed for improved road conditions and longevity (MTO, 2016). By 1916,

roadways had become important enough to warrant the founding of the Department of Public Highways (what would eventually become the MTO).

The first half of the 20th century saw a number of developments on Ontario's roadways, despite the restrictions imposed by the great depression and two world wars. The 1920's saw the formalization of road systems, the passing of the provincial Highway Traffic Act, and the removal of municipal and regional road tolls. By the 1940's preliminary construction on numerous sections of 400 series highways were completed. Over the following decades numerous highway expansions were completed and older dirt roads upgraded to improved tarmac.

#### 3.1.4.1 *WELLINGTON ROAD 109*

Wellington Road 109 was originally a provincial highway known as Highway 9. In the early 1930's, Highway 9 was extended through the study area from its eastern terminus in Arthur to Orangeville to Wellington and Dufferin Counties. The road was a gravel surface when the Department of Highways of Ontario (DHO) acquired the road and paving work began in 1931 finishing in 1934 between Arthur and Orangeville (Bever, 2019).

In the late 1990's the provincial government downloaded many portions of Ontario highways to the municipalities. Wellington County became responsible for portions of highways 9, 23, 24 and 25 which are now named Wellington Road 109, 123, 124 and 125 respectively.

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#### 3.1.5 *BRIDGE CONSTRUCTION HISTORY IN ONTARIO*

The history of bridge construction in Ontario coincided roughly with the spread of Euro-Canadian settlers and surveyors and the expansion of Ontario's road systems (Bradford 2015, MTO 2016). These earliest bridges were rudimentary in construction, utilizing the abundance of large trees available to span waterways and covering the bridge top with a corduroy log cover and dirt flooring. With the decline of suitable large lumber came the introduction of wooden truss bridges.

Wooden truss bridges benefitted from the construction knowledge of early settlers, utilizing King and Queen trusses common in barn construction. The wooden truss bridge enjoyed a long lived popularity in southern Ontario, being commonly used until the 1890's.

Stone arch bridge construction began during the same period as the wooden truss bridges, being used throughout the 1850's to 1880's. However, stone bridges were never as common, due largely to the expensive and time consuming nature of quarrying, transporting, and crafting the raw material (Bradford 2015, MTO 2016). As such, stone bridges are more common for larger important bridge crossings and wealthier economic centres.

With the arrival of the railway came the use of iron in bridge construction. Introduced in the 1850's, early iron bridges were constructed using cast iron and were brittle. Later development of wrought iron bridges improved on the tensile strength of the material, thus improving its longevity (Bradford 2015, MTO 2016). However, iron's use in bridge construction was limited to the 1870's and 1880's, as the introduction of steel replaced it as the standard bridge material in the 1870s.

Numerous bridge technologies were used in the construction of wooden, iron, and steel bridges in the 1800's. These included the truss (1820's), suspension (1848), and cantilever (1883).

With the reintroduction of concrete as a building material in the twentieth century came a more efficient and effective way to build bridges. Concrete's malleability meant that the construction of slab and arch bridges could be produced relatively quickly and easily to span the many smaller waterways of Ontario. This resulted in the decline of steel in bridge construction, with concrete soon becoming the dominant material. The introduction of steel reinforcing concrete further improved its versatility, allowing for its use in larger building projects (Bradford 2015, MTO 2016). The result is the increased use of concrete in major roadworks throughout the 1940's and 1950's.

The most recent innovation to the use of concrete is the development of pre-stressed concrete, which provides better resistance to cracking and failure and can be either cast in place or pre-formed off site. This versatility has resulted in pre-stressed concrete's dominance in modern bridge construction.

#### 3.1.5.1 CONCRETE ARCH BRIDGES

The earliest reinforced concrete bridges were built in the late 1880s and 1890s in the United States. They consisted of closed spandrel deck arches where a solid, or closed, arch supported vertical sidewalls, or spandrels, and the roadway ran on a deck on top the arch (Billington, 1977). The most famous and prolific of the engineers who promoted such arches was Daniel B. Luten. Daniel Benjamin Luten (1869-1945) was an American engineer who patented the first reinforced concrete arch bridge in 1899. He built the second reinforced concrete arch bridge in United States and designed, constructed and supervised the construction of over 16,000 reinforced concrete arches across North America. The construction of concrete arch bridges peaked between 1900 and 1930. According to Luten in the *Proceedings of the Annual Convention of Cement Users* of 1912:

“A concrete arch in harmony with its surroundings but without ornamentation or embellishment of any kind is an exceedingly beautiful structure. A concrete girder under similar conditions may be an exceedingly ugly structure.”

The most common type of reinforced-concrete arch bridge was the solid-spandrel arch, consisting of solid walls of concrete. The earliest example of a concrete arch bridge in Canada is the Canal Lake Concrete Arch Bridge built in 1905 by the Federal Department of Railways and Canals as a part of the Trent–Severn Waterway (Historic Places, n.d.)a. It was designated a National Historic Site of Canada on 24 June 1988 for its early use of concrete in bridge construction, for being the earliest-known bridge in Canada to be constructed using reinforced concrete, and for its association with the Trent-Severn Waterway.

Concrete arch bridges were ornamented with raised or recessed panels, pilasters, stringcourses, and/or other decorative finishes (Billington, 1977). Railings were also decorative, with balustrades and recessed panels. The reinforced concrete arch form reached its aesthetic pinnacle in the 1910s and 1920s with the open spandrel arch, which differs from the closed spandrel arch in that spandrel columns are used to support a deck slab rather than spandrel walls holding back earth fill. Although open spandrels offered economy of material in comparison to closed spandrels, they also required more complicated formwork and were thus best suited to long-span crossings.

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### *3.1.6 CONESTOGO RIVER*

The Conestogo River is a river in Waterloo Region and Wellington County in Southwestern Ontario, Canada. The Conestogo River watershed drains approximately 820 km<sup>2</sup> of the western part of the Grand River. It is in the Lake Erie Basin and joins the Grand River as a right tributary at the community of Conestogo, ON.

The watershed is largely composed of Tavistock Till, and 72% of the land area it classified as Clayey Till. The most significant hydrological feature within the Conestogo River Watershed is Conestogo Lake and Dam, which was built in 1958 for flood control and low flow augmentation.

Fish species in the Conestogo River river include brown trout, pike, smallmouth bass, perch, walleye and carp. The area is also a part of the Rich Tract, an area of relatively high quality habitat is the within the The Stratford Till Plain, located between Fergus and Arthur along Highway 6. It has sub-boreal plant communities and bird species uncommonly observed in the Watershed.

The beauty and cultural richness of the Grand River watershed is reflected in the names of the rivers main tributaries: the Nith, the Conestogo, the Speed and the Eramosa Rivers. It is the Grand River that inspired aboriginal poet Pauline Johnson to write her frequently anthologised *The Song My Paddle Sings*.

Named after the Conestogo River in Pennsylvania by Mennonite settlers in the nineteenth century (Mercer, 2018), it is in the Lake Erie Basin and joins the Grand River as a right tributary. The river traverses through Waterloo Region and Wellington County.



The river was the natural power source that fueled the mills of St. Jacobs and Conestogo, drawing its first settlers. By the mid-1800s Conestogo and St. Jacobs were busy pioneer villages, with hotels, blacksmith shops, distilleries, foundries, flour and grain mills that crowded along the river's edge. It was the Conestogo river that first brought electricity to St. Jacobs, when the mill owner sold his surplus power to the rest of the village.

In the first half of the 20th century, many people considered the Grand River watershed to be an "open sewer". Improvements in sewage treatment, controls on discharge of industrial pollutants into water courses and changes on the landscape have led to a significant improvement in overall quality of the Grand River and its tributaries over the past 50 years. The result has been better water quality and a revival of the Grand system as a focal point of outdoor recreation and tourism.

In 1994, the Grand River and its major tributaries, the Nith, Conestogo, Speed and Eramosa rivers, were designated as Canadian Heritage Rivers for their cultural heritage and recreational values. The Grand River was the first non-wilderness river to be designated, as well as the first river to include the tributaries in the designation. The nomination was accepted because of the abundant nationally significant human heritage and recreational features associated with the river.

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## 3.2 CONESTOGO RIVER BRIDGE #5 BRIDGE HISTORY

The road that would become Highway 9 followed an already established local route which was identified in early Township maps in the 1850's and 1860's (Figure 2). The 1861 Map of Wellington County, 1877 Historical Atlas of the Wellington County, and the 1906 Historical Atlas of Wellington County also depict the road and surrounding large lots, but do not identify bridge crossings on the maps (Figure 3-5).

When Highway 9 was first assumed by the Department of Public Highways of Ontario (DPHO) in 1920, the entire length of the highway was either earth or gravel surfaced. Paving work began along Highway 9 between Kincardine and Walkerton in 1926, and between Walkerton and Arthur in 1927 (Bever, 2003). The last gravel section on Highway 9 between Walkerton and Arthur was paved in 1931, and the final gravel section remaining along Highway 9 between Kincardine and Walkerton was paved in 1935.

This section of Wellington Road 109 opened as a part of Ontario Highway 9 in 1931. Previous crossings at this site are unknown. The current Conestogo River Bridge #5 was constructed in 1930 and completed in 1931 (MISF, 2017). The Conestogo River Bridge #5 consists of a concrete barrel arch, located 0.7 km from Highway 6 within the historically surveyed Township of Luther, in West Garafraxa.

Shotcrete repairs to the fascia and barrel arch were likely completed by the MTO in 1989 under the same contract as adjacent bridge rehabilitations. In 2017 the bridge was inspected and deemed to require replacement.

On January 1, 1998, the entire section of Highway 9 between Harriston and Orangeville was downloaded to the Counties of Dufferin and Wellington (Bervers, 2003). The highway transfer resulted in the loss of 63 km of Highway 9 under provincial jurisdiction, in addition to the 5 km of non-assumed portions of the route passing through Orangeville and Harriston. The downloaded section of Highway 9 is now officially known as Wellington Road 109 and Dufferin Road 109.

# 4 EXISTING CONDITIONS

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## 4.1 DESCRIPTION OF STRUCTURE

The Conestogo River Bridge #5 is a two-lane concrete barrel arch structure on Wellington Road 109, located approximately 0.7 km from Highway 6 (Image 1, 2). It was built in 1930 and has a length of 14m and a width of 11.7m (Figure 1). Wellington County has provided drawings for the Conestogo River Bridge #5, including original drawings. Conestogo River Bridge #5 consists of a cast-in-place concrete barrel arch with concrete embankments and an asphalt paving surface. The bridge is oriented east to west.

Railings include concrete balustrade barriers, with a steel flex beam on steel post railing system, which appears to be spalling and is in a poor state of disrepair (Image 4, 7, 8). Part of the balustrade railing on the south side has collapsed (Image 3). Embankments on either end of the bridge consist of soil and overgrown, low lying vegetation (Image 2, 10). Approaches to the bridge on both sides are straight and flat, and both sides of the road are lined with steel barriers (Image 5, 6).

The superstructure and substructure were cast as one single unit. The substructure consists of reinforced concrete abutments that meet the river (Image 9, 10). The bridge deck consists of paved asphalt and both sides of the bridge have a reinforced concrete railing system.

Wellington County provided original bridge plans for the Conestogo River Bridge #5 (Appendix B).



**Image 1: South elevation Conestogo River Bridge #5 looking south.**



**Image 2: North elevation Conestogo River Bridge #5 looking south.**



**Image 3: Balustrade deterioration detail, looking northwest.**



**Image 4: Conestogo River Bridge #5, balustrade detail, looking southeast.**





**Image 5: Conestogo River Bridge #5, asphalt deck and concrete barrier detail, looking east.**



**Image 6: Conestogo River Bridge #5, asphalt deck and concrete barrier detail, looking west.**



**Image 7: Conestogo River Bridge #5 balustrade detail and Conestogo River, looking north.**



**Image 8: Conestogo River Bridge #5, solid spandrel and balustrade railing system.**





**Image 9: Conestogo River Bridge #5 view under arch, looking north, along Conestogo River.**



**Image 10: Conestogo River Bridge #5 solid wall and embankment detail, looking east.**



**Image 11: Conestogo River Bridge #5, substructure arched concrete with shotcrete repairs.**



**Image 12: Conestogo River Bridge #5, arched concrete wall with formwork detail.**



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#### 4.1.1 DESIGN AND CONSTRUCTION

<b>Structure Name</b>	Conestogo River Bridge #5	<b>Road Name</b>	109
<b>County</b>	Wellington County	<b>Road Type</b>	Municipal Road
<b>Municipality</b>	Wellington	<b>Owner</b>	Municipal
<b>Bridge or Culvert</b>	Bridge	<b>Overall Structure Width (m)</b>	11.7
<b>Structure Type</b>	Rectangular Box	<b>Roadway Width (m)</b>	
<b>Span (m)</b>	14	<b>Total Deck Length (m)</b>	14
<b>Height (M)</b>		<b>Total Deck Area (s.m)</b>	164
<b>Direction of Structure</b>	EAST/WEST	<b>Heritage Recognition</b>	None
<b>Year Built/Rehabilitated</b>	Built 1930		
<b>Current Load Limit</b>		<b>Designer/Construction Firm</b>	Unknown
<b>Waterway</b>	Conestogo River		

A site visit to the structure was completed to record existing conditions. An inspection of the bridge and the landscape context was conducted on November 4, 2019. The weather allowed for good visibility of the landscape and structural features. Access to the bridge was gained via Wellington Road 109. Field notes and photographs of the property were taken during the inspection and the locations and directions were noted and all photographs were catalogued.

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## 4.2 DESCRIPTION OF STUDY AREA AND LANDSCAPE CONTEXT

The Conestogo River Bridge #5 is located in Wellington County along Wellington Road 109 immediately east of Arthur, Ontario. The study area consists of the current bridge, approaches to the bridge and the embankments supporting the bridge. The study area

consists of the current bridge, a predominantly agricultural area surrounded by farmers fields, and topography generally described as hilly with river shoreline environs. Highway 35 consists of a two-lane divided highway with gravel shoulders. Conestogo River is a tributary of the Grand River that crosses Wellington Road 109 multiple times.

Wellington Road 109 consists of a two lane-divided road with gravel shoulders that was formerly the provincial Highway 9. The Conestogo River flows underneath the bridge and is a tributary of the Grand River. The Conestogo River is a narrow, shallow and winding river that crosses Wellington Road 109 multiple times. The approaches to the Conestogo River Bridge #5 are straight and flat, and include steel guardrails on both sides of the road on either end of the bridge. The area surrounding the bridge includes cultivated agricultural fields lined with interspersed deciduous and coniferous trees parallel to the road.



**Image 1: Conestogo River valley, and surrounding environs, looking northeast.**



**Image 2: Conestogo River valley, and surrounding environs, looking southwest.**

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## 4.3 COMPARATIVE ANALYSIS

A comparative analysis was undertaken to establish a baseline understanding of similar bridges in the Central region of Ontario, and to determine if the materials, bridge type, or size is uncommon within the region. Given that the Conestogo River Bridge #4 was originally constructed and owned by the DPHO predecessors, comparative examples were drawn from the MTO bridge inventory for Central Region (See Appendix A for a list of comparative examples) as well as from Wellington County's Bridge Inventory (See Appendix A for a list of comparable examples).

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#### *4.3.1 CENTRAL MTO BRIDGE LIST*

Of the structures reviewed, 6 similar reinforced cast-in-place concrete arch bridges/culverts were identified in Central region, built between 1947 and 1972. Total span lengths vary between 7.3 m to 24 m.

The oldest MTO owned, reinforced concrete barrel arch bridge in Central Region is the Humber River Bridge which was constructed in 1947. As the subject structure was constructed in 1930, it is older than the oldest MTO owned cast-in-place concrete arch bridge.

The longest total span of a reinforced concrete barrel arch structure in Central Region is 24 m and belongs to the Twin Culverts of Highway 400. Accordingly, the Conestogo River Bridge #5 is not the longest spanning bridge of this type.

Of the 6 comparable examples, 6 have one span. As such, the Conestogo River Bridge #5 has the typical number of spans for closed-spandrel, reinforced concrete arch bridges owned by MTO in Central Region.

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#### *4.3.2 WELLINGTON COUNTY BRIDGE LIST*

Wellington County's Bridge List identifies three concrete arch bridges in Wellington County, built between 1940 and 1967. Lengths vary between 8.5 m and 14 m and the number of spans are not listed.

The second oldest Wellington County owned concrete arch bridge is the West Credit River Bridge which was constructed in 1940. The Conestogo River Bridge #5 is the oldest rigid frame bridge constructed in 1931.

The second longest reinforced concrete barrel arch bridge owned by Wellington County is the West Credit River Bridge which is 10.3 m long. Of the 3 concrete arch bridges in Wellington County, none are longer than the Conestogo River Bridge #5. Therefore, the Conestogo River Bridge #5 is the longest concrete arch bridge in Wellington County.

# 5 HERITAGE ASSESSMENT

The Conestogo River Bridge #5 is owned by Wellington County. Therefore, O. Reg. 9/06 was used to assess the cultural heritage value or interest of the bridge. A bridge that satisfies at least one criteria under O. Reg. 9/06 is considered to be of cultural heritage value or interest and eligible for designation under Part IV of the *Ontario Heritage Act*.

**Table 2: O. Reg. 9/06 Assessment - Conestogo River Bridge #5**

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 Conestogo River Bridge #5 is a reinforced concrete arch bridge, and one of the oldest of its type in Wellington County and Central Region. The bridge is also the longest bridge of its type in Wellington County. Accordingly, it represents an early example of a concrete arch bridge, and therefore meets this criterion.
	Displays a high degree of craftsmanship or artistic merit	Y	The design of the Conestogo River Bridge #5 demonstrates an attention to aesthetics, visible in its arched design and design of the concrete balustrade railings. Therefore, this criterion is satisfied. Accordingly, the structure meets this criterion.
	Demonstrates a high degree of technical or scientific achievement	N	The structure displays a typical design for its era and uses common technologies, approaches and techniques for a reinforced concrete arch bridge. Accordingly, the structure does not meet this criterion.

Historical/ Associative Value	Has direct associations with a theme, event, belief, person, activity, organization or institution that is significant to a community	N	While the structure is associated with the construction of Highway 9 in 1931-35, and with the Department of Public Highways Ontario, the bridge does not significantly express this association. Accordingly, the structure does not meet this criterion.
	Yields, or has the potential to yield, information that contributes to an understanding of a community or culture,	N	The structure does not have the potential to yield any further information that may contribute to an understanding of its context, community or culture. Accordingly, the structure does not meet this criterion.
	Demonstrates or reflects the work or ideas of an architect, artist, builder, designer or theorist who is significant to a community	N	The structure was designed and built by the Department of Public Highways Ontario. However, the overpass is a typical design and does not demonstrate or reflect the work of this former government agency. Accordingly, the structure does not meet this criterion.
Contextual Value	Is important in defining, maintaining or supporting the character of an area	Y	The structure is located east of Arthur, Ontario, along Wellington Road 109 between Arthur and Orangeville. It is located within a predominantly agricultural area. The bridge is consistent with its context, is important in defining, maintaining or supporting the character of the area. Accordingly, the structure meets this criterion.

	Is physically, functionally, visually or historically linked to its surroundings	Y	While the Conestogo River Bridge #5 provides a functional purpose in allowing traffic to cross over the Conestogo River, this is not considered a significant link beyond that of any other river crossing bridge. The bridge is also not considered to have a visual link with its surroundings. However, it is considered to have a historical link with its surroundings given this road was originally Highway 9, acquired by the DHO in 1930, and paved between 1931 and 1934. Accordingly, the structure meets this criterion.
	Is a landmark	N	The structure is not a landmark. Accordingly, the structure does not meet this criterion.

# 6 CONCLUSIONS

Based on the evaluation of background historical research, site investigation and application of criteria from *Ontario Regulation 9/06*, the Conestogo River Bridge #5 was determined to have significant cultural heritage value or interest. Accordingly, the following Statement of Cultural Heritage Value or Interest and list of Attributes has been prepared.

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## 6.1 STATEMENT OF CULTURAL HERITAGE VALUE OR INTEREST

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### 6.1.1 DESCRIPTION OF PROPERTY

The Conestogo River Bridge #5 is a two-lane concrete barrel arch structure on Wellington Road 109, which crosses the Conestogo River, located approximately 0.7 km from Highway 6, east of Arthur, Ontario. The area consists of the subject structure, located within a predominantly agricultural area surrounded by farmers fields, and topography generally described as hilly with river shoreline environs.

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### 6.1.2 CULTURAL HERITAGE VALUE

The Conestogo River Bridge #5 has design or physical value as an early example of a reinforced concrete arch bridge in Wellington County. Conestogo River Bridge #5 was built in 1930, and represents the oldest of its type in the area. The construction of concrete arch bridges peaked between 1900 and 1930. Conestogo River Bridge #5 consists of a cast-in-place concrete barrel arch with concrete embankments and an asphalt paving surface. The bridge was built by the Department of Highways, Ontario (DHO). Railings include concrete balustrade barriers, with a steel flex beam on steel post railing system.

The subject bridge exhibits a simple but aesthetically pleasing design that also supports the character of the surrounding rural area. The Conestogo River Bridge #5 also demonstrates a contextual relationship with Wellington Road 109, as it was built shortly after the DHO acquired the road and designated it Provincial Highway 9.

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### 6.1.3 DESCRIPTION OF HERITAGE ATTRIBUTES

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

- Single span length crossing the Conestogo River;
- Reinforced concrete arch design;

- Solid arch supported vertical sidewalls;
- Concrete balustrade barriers;



# 7 RECOMMENDATIONS

The Conestogo River Bridge #5 is a two-lane concrete barrel arch on Highway 109, located approximately 0.7 km west of Highway 6 in Wellington County. It was built in 1930 and has a length of 14 m and a width of 11.7 m.

Based on the results of research, site investigation, and application of the criteria in O. Reg. 9/06 it was determined that the Conestogo River Bridge #5 has cultural heritage value or interest. As such, a Heritage Impact Assessment should be completed during detailed design.

The completion of this study has resulted in the following recommendations:

- 1 The Conestogo River Bridge #5 was determined to have cultural heritage value or interest. As such, a heritage impact assessment should be completed during detailed design.

# 8 HISTORICAL MAPPING



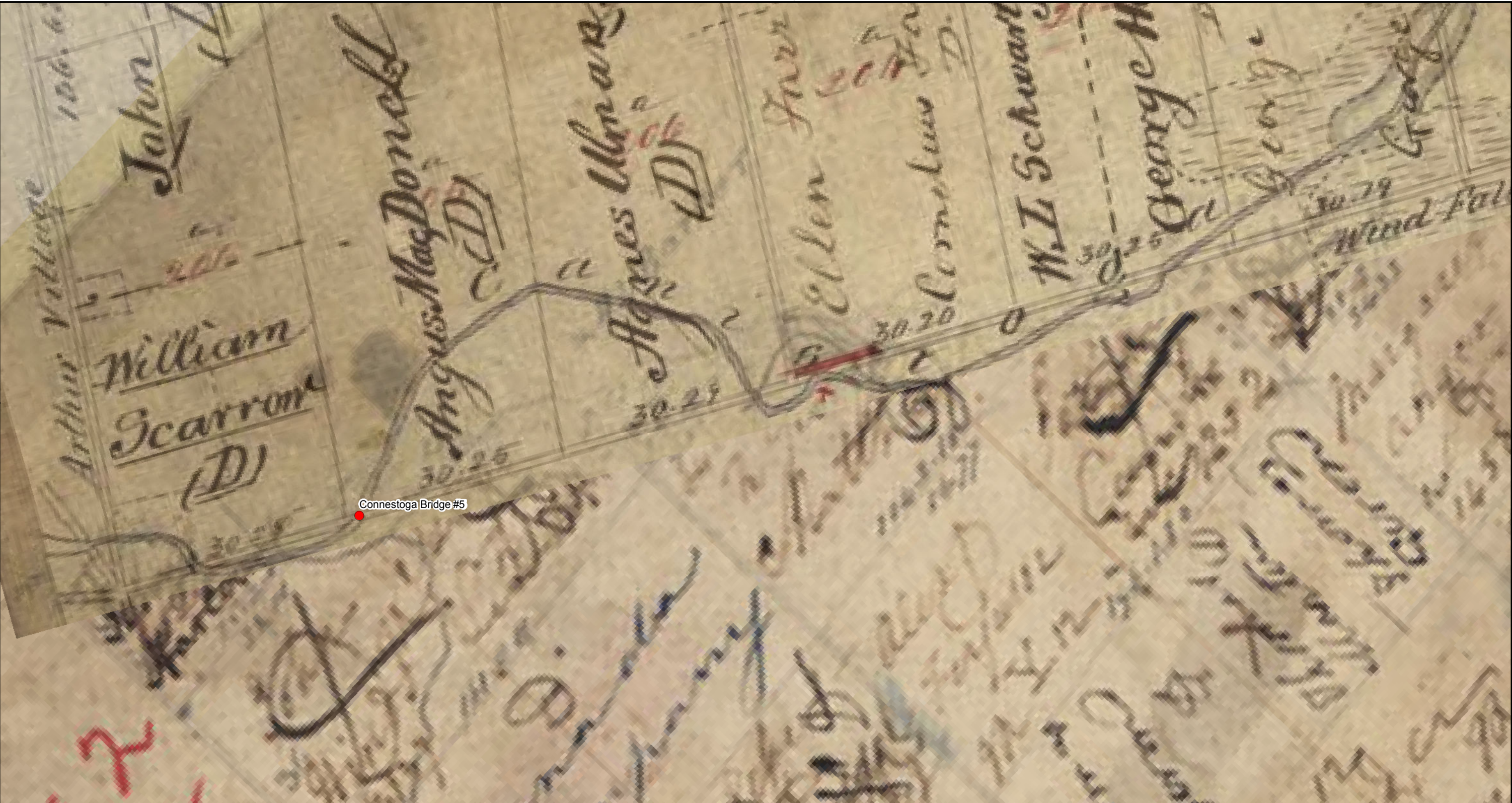



LEGEND

● Connestoga Bridge 5

TITLE:  FIGURE 1: PROJECT LOCATION	SCALE: 1:5,000	PROJECT NO: 17M-01271-01	DATE: NOVEMBER 2019
	DRAWN BY: AST	CLIENT: WELLINGTON COUNTY	
PROJECT:  CONNESTOGA BRIDGE #5 CHER		CREDITS:  LAND INFORMATION ONTARIO	
0130260 m		N	








**LEGEND**

● Connestoga Bridge 5

TITLE:	FIGURE 2: HISTORIC MAPPING (1857/1860)		
SCALE:	1:10,000	PROJECT NO:	17M-01271-01
DRAWN BY:	AST	CLIENT:	WELLINGTON COUNTY
PROJECT:	CONNESTOGA BRIDGE #5 CHER		
0 300 600 m			





## LEGEND

- Connestoga Bridge 5

TITLE:

### FIGURE 3: HISTORIC MAPPING (1861)

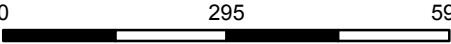
PROJECT:

# CONNESTOGA BRIDGE #5 CHER

0

295

590 m



SCALE:

1.10,000

DRAWN BY:  
AST

PROJECT NO:

17M-01271-01

T: WELLINGTON COUNTY

DATE:

NOVEMBER 2019

**CREDITS:**

MAP OF THE COUNTY OF WELLINGTON  
(LESLIE AND WHEELLOCK, 1861)










LEGEND

● Connestoga Bridge 5



TITLE:  FIGURE 3: HISTORIC MAPPING (1861)	SCALE: 1:10,000	PROJECT NO: 17M-01271-01	DATE: NOVEMBER 2019
	DRAWN BY: AST	CLIENT: WELLINGTON COUNTY	
PROJECT:  CONNESTOGA BRIDGE #5 CHER		CREDITS:  HISTORICAL ATLAS OF THE COUNTY OF WELLINGTON, ONTARIO (F. LLOYD, 1906)	
0 300 600 m 			







**LEGEND**

● Connestoga Bridge 5

TITLE:	FIGURE 6: 1954 AERIAL IMAGERY	SCALE: 1:5,000	PROJECT NO: 17M-01271-01	DATE: NOVEMBER 2019
PROJECT:	CONNESTOGA BRIDGE #5 CHER	DRAWN BY: AST	CLIENT: WELLINGTON COUNTY	
<div><div>0</div><div>150</div><div>300 m</div><div><div>N</div><div>▲</div></div></div>		CREDITS:  AERIAL IMAGE (1954)		



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## **Provincial Standards and Resources**

Ontario Heritage Tool Kit

[http:// www.culture.gov.on.ca/english/heritage/Toolkit/toolkit.ht](http://www.culture.gov.on.ca/english/heritage/Toolkit/toolkit.ht)

Ontario Ministry of Tourism, Culture and Sport: Heritage Conservation Principle's for Land Use Planning

[http://www.culture.gov.on.ca/english/heritage/info\\_sheets/info\\_sheet\\_landuse\\_planning.htm](http://www.culture.gov.on.ca/english/heritage/info_sheets/info_sheet_landuse_planning.htm)

Ontario Ministry of Tourism, Culture and Sport: Eight Guiding Principles in the Conservation of Historic Properties

[http://www.culture.gov.on.ca/english/heritage/info\\_sheets/info\\_sheet\\_8principles.htm](http://www.culture.gov.on.ca/english/heritage/info_sheets/info_sheet_8principles.htm)

Ontario Ministry of Culture, Tourism and Sport: Archaeological Assessments

[http://www.mtc.gov.on.ca/en/archaeology/archaeology\\_assessments.shtml](http://www.mtc.gov.on.ca/en/archaeology/archaeology_assessments.shtml)

Municipal Heritage Bridges Cultural, Heritage and Archaeological Resources Assessment Checklist (Revised April 11, 2014)

Ontario Heritage Act (2005)

*Ontario Heritage Bridge Guidelines for Provincially Owned Bridges - Interim* (2008)

Reference Guide on Physical and Cultural Heritage Resources (1996)

Guidelines for Preparing the Cultural Heritage Resource Component of Environmental Assessments (1992).

MTO Environmental Guide for Built Heritage and Cultural Heritage Landscapes (2007).

Ontario Realty Corporation Heritage Management Process (2007)

## **National and International Standards and Resources**

Canadian Register of Historic Places

[http://www.historicplaces.ca/visit-visite/rep-reg\\_e.aspx](http://www.historicplaces.ca/visit-visite/rep-reg_e.aspx)

Parks Canada Standards and Guidelines for the Conservation of Historic Places in Canada

[http://www.pc.gc.ca/docs/pc/guide/nldclpc-sgchpc/index\\_E.asp](http://www.pc.gc.ca/docs/pc/guide/nldclpc-sgchpc/index_E.asp)

Parks Canada National Historic Sites of Canada

[http://www.pc.gc.ca/progs/lhn-nhs/index\\_e.asp](http://www.pc.gc.ca/progs/lhn-nhs/index_e.asp)

International Council of Monuments and Sites (ICOMOS): Appleton Charter

<http://www.international.icomos.org/charters/appleton.pdf>



# *APPENDIX A – BRIDGE INVENTORIES*

# APPENDIX A

Table 3: Central MTO Bridge List Comparative Examples

Structure ID	Structure Name	Type	Material	Road	Year	Spans	Span Length
B025072	West Credit River Bridge	Concrete Barrel Arch	Re-Enforced Concrete	Wellington Road 25	1940	1	10.3
C109123	Conestogo River Bridge #5	Concrete Barrel Arch	Re-Enforced Concrete	Wellington Road 109	1930	1	14
C261080	Lot 32, Conc I Erin	Concrete Barrel Arch	Re-Enforced Concrete	Wellington Road 26	1967	1	8.5
C861180	Kirkland Creek Culvert No. 3	Concrete Barrel Arch	Re-Enforced Concrete	Wellington Road 86	1964	1	9
18 - 221/	40 Mile Creek Bridge At Olive St	Concrete Barrel Arch	Re-Enforced Concrete	1	1972	1	12.2
21 - 173/	Wilmot Ck Struc. In Clarke Twp	Concrete Barrel Arch	Re-Enforced Concrete	35	1954	1	12.2
22 - 182/	Harmony Creek Arch	Concrete Barrel Arch	Re-Enforced Concrete	401	1952	1	7.3
24 - 81/	Snelgrove Ck Br	Concrete Barrel Arch	Re-Enforced Concrete	10	1964	1	15
30 - 400	Twin Culvert Highway #400 (2-16x10 Dia)	Concrete Barrel Arch	Re-Enforced Concrete	400	1954	1	24
37 - 29/	Schomberg Crk. Arch	Concrete Barrel Arch	Re-Enforced Concrete	9	1970	1	10.7

Table 4: Wellington County Bridge List Comparative Examples

Structure name	Year built	Location	Main highway	Total deck length (m)	Structure type	Structure material
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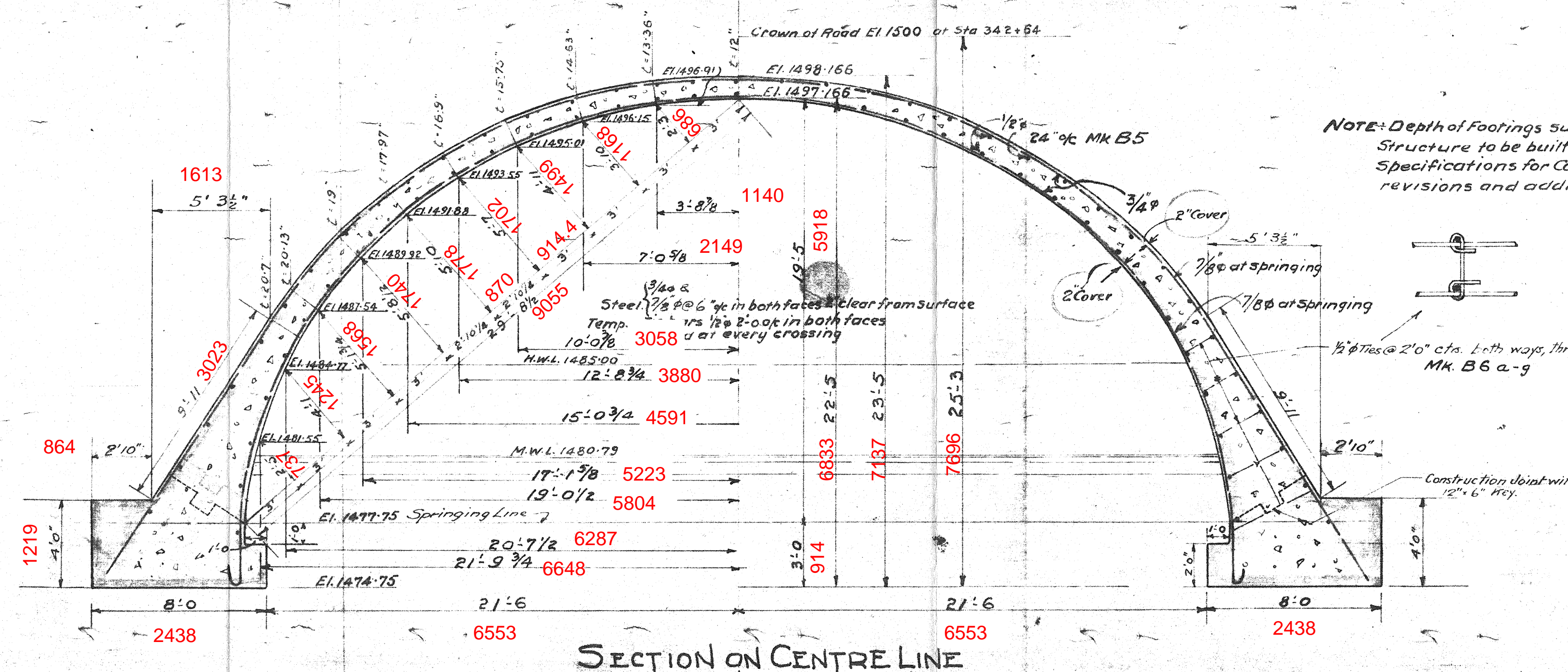
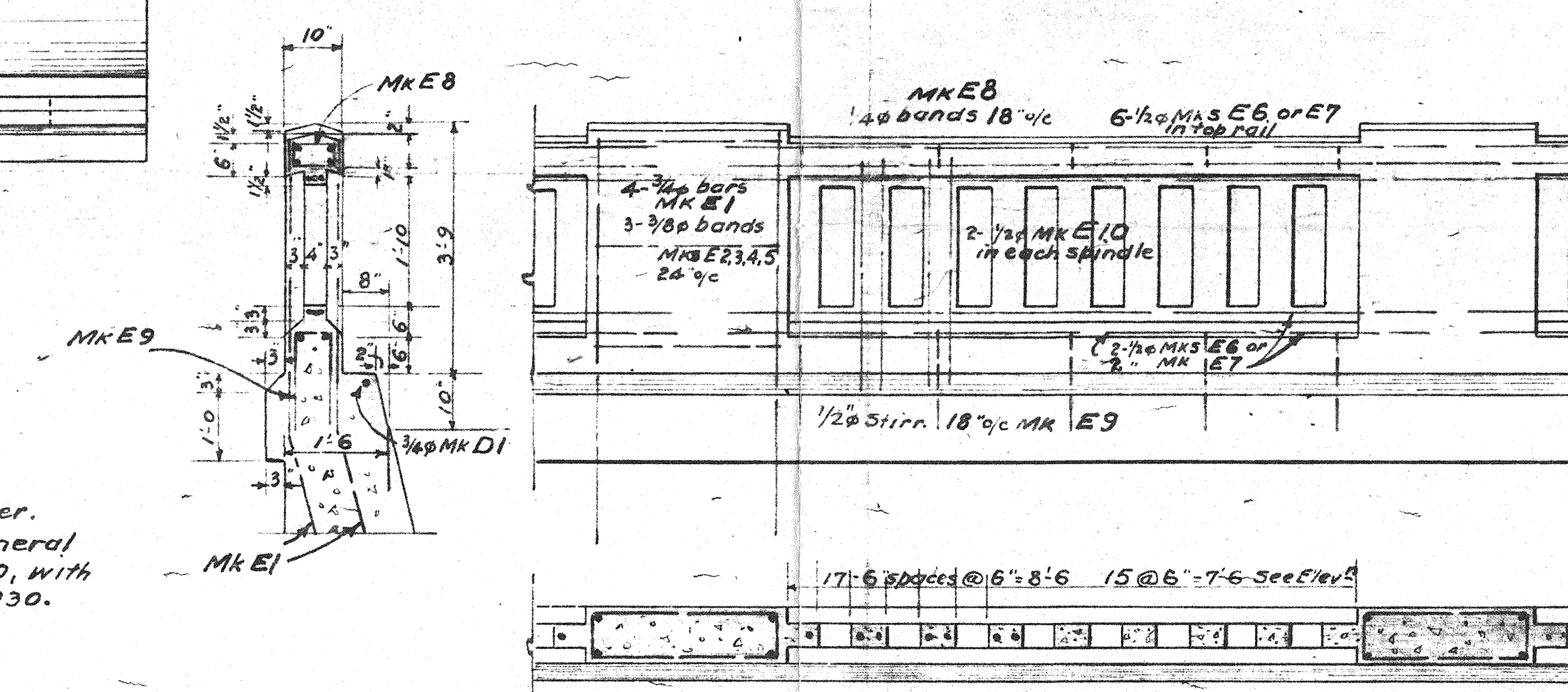
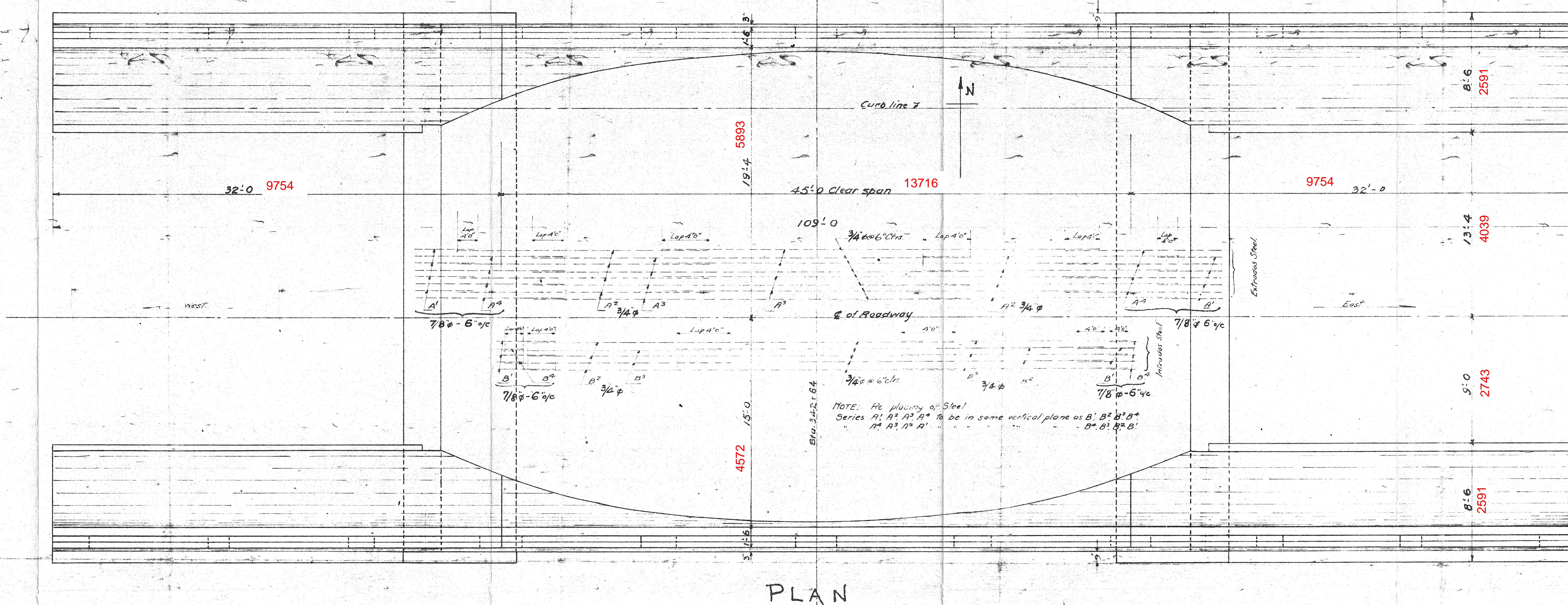
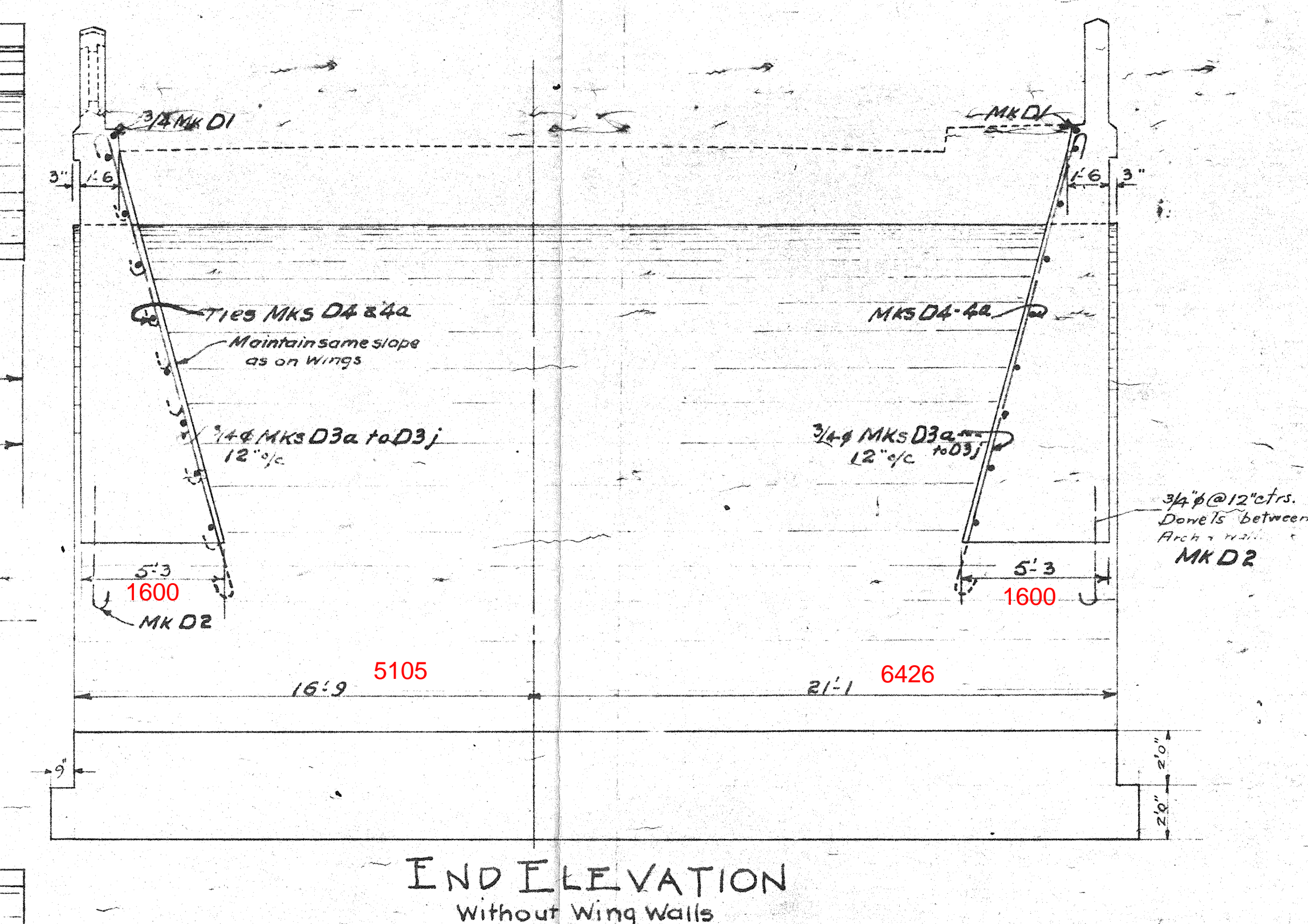
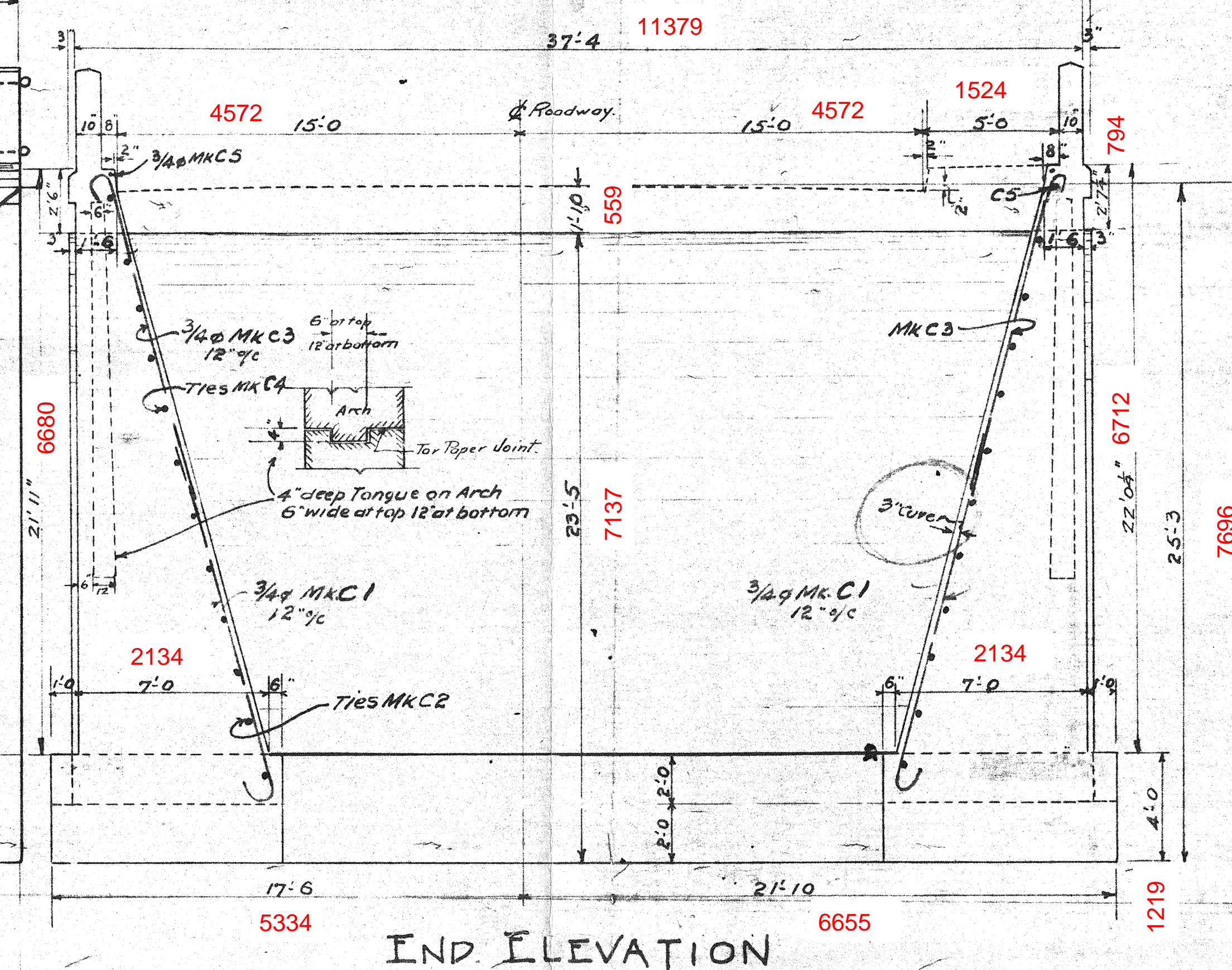
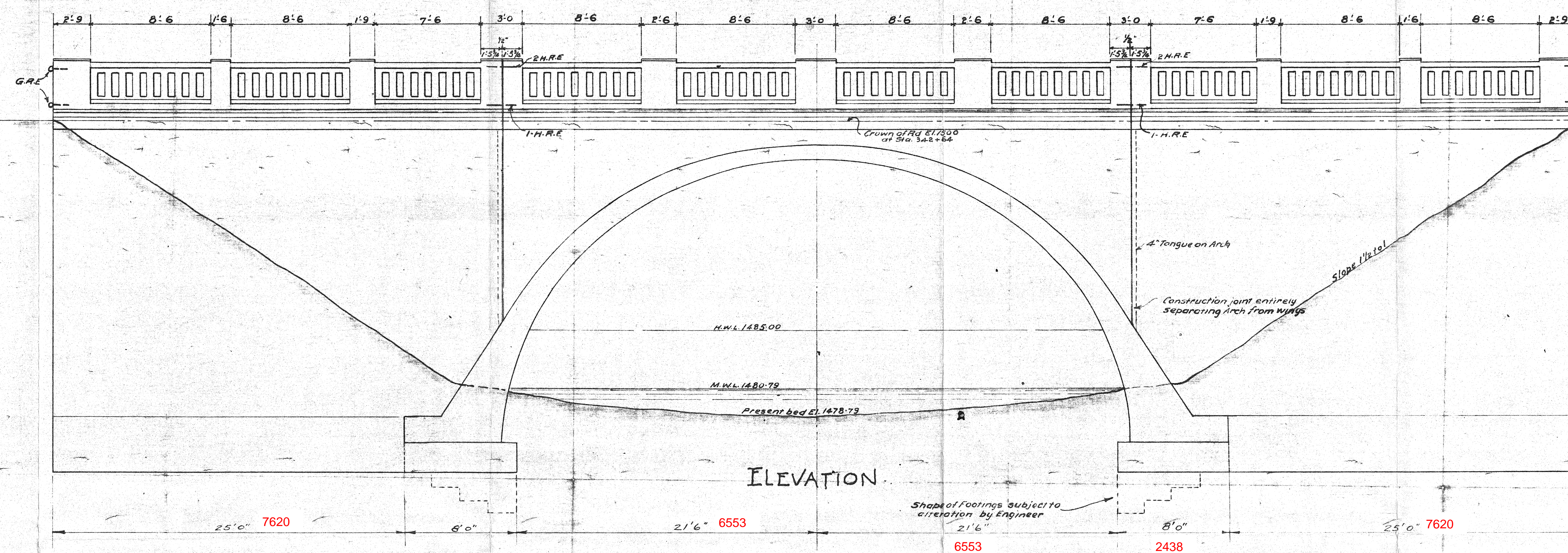
# APPENDIX A

West Credit River Bridge	1940	0.3 km N of Wellington Road 52	Wellington Road 25	10.3	Concrete Barrel Arch	Concrete
Conestogo River Bridge #5	1930	0.7 km E of Hwy 6	Wellington Road 109	14	Concrete Barrel Arch	Concrete
Lot 32, Conc I Erin	1967	3.8 km S of Wellington Road 18	Wellington Road 26	8.5	Concrete Barrel Arch	Concrete
Kirkland Creek Culvert No. 3	1964	3.8 km E of Wellington Road 12	Wellington Road 86	9	Concrete Barrel Arch	Concrete

## APPENDIX A

## *APPENDIX B – BRIDGE PLANS*





*NOTE: Depth of Footings subject to revision by the Engineer.  
Structure to be built in accordance with D.H.O. General  
Specifications for Concrete Highway Bridges 1920, w/  
revisions and additions as per Form N°9, 1930.*

Concrete Mix: For Arch Section 1-2-3/2  
For wings, excepting handrails

DETAIL OF HANDRAIL  
Scale  $\frac{1}{2}" = 1'-0"$

35-132

330 C109123

**CONTRACT NO 30-44**  
**PROPOSED BRIDGE**  
**ARTHUR NO 5**  
**THE KING'S HIGHWAY NO 9**  
TWP. LUTHER WEST CONI. LOT 2  
TWP. GARAFRAXA WEST CONI. LOT 37  
**CO. W. WELLINGTON**  
APPROVED

Bridge Engineer      Chief Engineer

Deputy Minister

DEPARTMENT OF PUBLIC HIGHWAYS ONTARIO  
Toronto July 1931  
Scale  $\frac{1}{4}$ " = 1'-0"  
DRAWING NO D2179-1