# Spanning the Generations

A Study of Old Bridges in Waterloo Region
October 2007

Region of Waterloo

Phase 3: Heritage Assessment of Truss Bridges

# TRUSS BRIDGES OF WATERLOO REGION

Region of Waterloo

Chamber's Bridge

Winterbourne Bridge

Wellesley Bridge #6

Conestogo Bridge

Blackbridge Road

Shade Street Bridge

Holland Mills Road Bridge

Hartman Bridge

Bridge Street Bridge

Piper Street Bridge

Nithvale Bridge

Oxford-Waterloo

Elmira
Linwood
Woolwich
Winterbourne
Conestogo
Wellesley
Crosshill
St. Jacobs
Maryhill
St. Clements
Heidelberg
Bloomingdale
Bamberg
Waterloo
Breslau
Wellesley
St. Agatha
Wilmot
Petersburg
Kitchener
Baden
Mannheim
Cambridge
New Hamburg
New Dundee
North Dumfries
Branchton
Ayr

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***Please note that all efforts were made to make this document as accurate and reliable as possible. However, this document may only be used as a guide to identifying truss bridges in Waterloo Region and to provide a general outline of the bridges' attributes. We do not guarantee full accuracy of the dates and/or information provided.***

# Executive Summary

**Title:** Spanning the Generations: A Study of Old Bridges in Waterloo Region
Phase 3: Heritage Assessment of Truss Bridges

## Background

In 2004, as a result of their concern for the destruction of old bridges, the Heritage Planning Advisory Committee (HPAC) of the Region of Waterloo undertook a research study which would locate and identify bridges with heritage value in Waterloo Region. This involved creating a region-wide bridge inventory, encompassing the seven area municipalities. In Phase 1 of the study, research was then collected in order to assess older bridges for their heritage potential. The Inventory lists those bridges built primarily before 1950 in Waterloo Region and ranks the heritage bridges using an adopted set of criteria from the *Ontario Heritage Bridge Program*, a 1991 publication produced by the Ministry of Culture.

Phase 2, *Spanning the Generations: Heritage Assessment*, contains a brief history of bridges in Waterloo Region, the assessment methodology, preservation strategies and provides research information on the top ten heritage bridges.

## Summary

The report, *Spanning the Generations: Heritage Assessment of Truss Bridges*, is the third phase of the research study. This report contains similar information to Phase 2 with a specific focus on the twelve truss bridge structures located in the Region of Waterloo. These bridges are:

| | | |
|---|---|---|
| Nithvale Bridge | (1873) | North Dumfries Township |
| Conestogo Bridge | (1886) | Woolwich Township |
| Holland Mills Road Bridge | (1910) | Wilmot Township |
| Wellesley Bridge #6 | (1910) | Wellesley Township |
| Oxford-Waterloo Bridge | (1912) | Wilmot Township |
| Bridge Street Bridge | (1913) | Wilmot Township |
| Winterbourne Bridge | (1913) | Woolwich Township |
| Piper Street Bridge | (1915) | North Dumfries Township |
| Blackbridge Road Bridge | (1916) | City of Cambridge |
| Chamber's Bridge | (1930) | Woolwich Township |
| Hartman Bridge | (1936) | Wilmot Township |
| Shade Street Bridge | (1953) | Wilmot Township |

## Conclusion

This information will assist planners, engineers, and heritage, environmental and recreational organizations in the conservation, rehabilitation or maintenance of historic bridges before they are lost as a valuable heritage resource to the community. It is believed that increased knowledge of updated planning approaches will aid in this overall goal. This study provides the necessary background information to assist in defining future actions to preserve bridges and will support the objectives of Regional Council, promote the goals of the Heritage Planning Advisory Committee, and enhance heritage preservation in general.

# Section 1: Introduction

## 1.1 Background

In 1997, the Region of Waterloo set up a Project Team to undertake a planning study of the Bender Bridge, an old steel truss bridge. The Bender Bridge was located on Regional Road 1, over the Nith River, west of New Hamburg. The team assessed the structural integrity, environmental impact, and the archaeological/heritage merit of this bridge. Unfortunately, after careful consideration, the team recommended replacement with a modern structure, noting that other steel bridges remain.

Spurred on by the loss of the Bender Bridge, the Heritage Planning Advisory Committee (HPAC) acted on their concern about the gradual disappearance of old bridges in the Region of Waterloo. They requested the Planning and Culture Department to undertake a research study that would identify and document bridges with heritage merit throughout the Region.

The Committee believes that bridges form an integral part of our local heritage. The importance of these bridges is not only in their utilitarian aspects but also in the history which they represent. The Region of Waterloo lies entirely within the watershed of the Grand River, a nationally designated Heritage River. The Grand River, along with its tributaries, was designated on the basis of its human heritage elements. As a component of the cultural mosaic, bridges and their contribution to the development of Ontario are an important part of the built heritage of this nationally recognized resource.[1]

## 1.2 Purpose of the Bridge Study

The purpose of this study is to locate, identify and document bridges in Waterloo Region having significant heritage value, and to provide information to be used in their preservation. This comprehensive data will assist planners and engineers in the conservation, rehabilitation, and maintenance of these structures. The report provides the necessary background information to assist in defining future actions to preserve bridges.

## 1.3 Organization of the Information

The Study is organized into three phases. *Phase I: Inventory* is a broad inventory of bridges built primarily before 1950 in the Region of Waterloo. The *Inventory* contains basic information, photographs and maps of the bridges. The *Inventory* was required since no comprehensive bridge inventory was available at the time.

*Phase II: Heritage Assessment* investigates the heritage potential of the bridges in the *Inventory*. It provides a more comprehensive understanding of the nature and types of bridges in Waterloo Region, as well as their context in local history. It also describes the methodology used to evaluate the

[1]Regional Municipality of Waterloo, *Heritage Planning Advisory Committee Minutes,* April 9, 1998, p. 17. "Bridge Policy- first draft", Elizabeth Waters Heinrichs.

heritage merits of the bridges, and provides in-depth detail regarding the ten most significant bridges in the Region.

*Phase III: Heritage Assessment of Truss Bridges* contains similar information to Phase II, with more detailed research that focuses on the twelve truss bridges located in the Region.

# Section 2: Cultural Context

## 2.1 Summary of Bridge Importance

Heritage bridges are an important non-renewable resource for several reasons:

- Bridges possess historic value that contributes significantly to understanding our local heritage beyond their original utilitarian function.
- Bridges have contributed to the social and economical development of the Region.
- Bridges reflect the technology of their times and the needs of society.
- Identifying heritage bridges is the crucial first step toward their future preservation.

## 2.2 Pre-History, History and Heritage

The study of history is the systematic study, analysis and interpretation of the documented events of the past; in the case of this study the recorded past of the Region of Waterloo. The prehistory of the region is the period prior to that of which we have written documentation. It has its own documentation in the oral history passed down from earlier inhabitants and in the archeological record left on the land. Heritage refers to both tangible objects and intangible characteristics, which are passed down or remain from our past. Bridges are a component of the built heritage from our historic past; they are both tangible objects and intangible markers of cultural characteristics of our area. In addition, because of the importance of water crossings, they may also be built on sites that have pre-historic significance.

## 2.3 Local Settlement Activity

Before the arrival of ethnic Europeans, First Nations peoples occupied the land that became the area townships within the County of Waterloo, now the Region of Waterloo. However, settlement in this case refers to the arrival of ethnic European migrants, predominantly of Pennsylvania Mennonite and Tunker (later known as Brethren in Christ) origin beginning around 1800. After about 1830, immigrants of non-Mennonite origin soon outnumbered them and their descendants.[2]

At the time of their arrival, the region was a wooded area, part of the northern fringes of the Carolinian Forest. As a result, settlement involved clearing trees from much of the land in order to make it suitable for the agricultural activities of the settlers. The harvesting of timber furthered the economic development of the area, but it had a deleterious effect on the areas around the natural watercourses.[3] Considerable run-off from the denuded riverbanks contributed to soil erosion and the pooling of water in low-lying ground. Spring thaws also brought flooding to areas adjacent to the rivers.
The most serious constraint on settlers was the Grand River itself since other physical features were relatively benign. Both natural phenomena, such as spring flooding and flooding as the result of heavy

[2] For Detailed discussion of settlement, see: Elizabeth Bloomfield, *Waterloo Township Through Two Centuries*, (Region of Waterloo - St Jacobs Printery: Waterloo Historical Society, 1995.)
[3]Timber was used as a building material; as fuel for homes and then railways; ash from the burnt stumps was used in the production of potash.

rainfall, as well as the results of human activity along its banks, made the Grand River unpredictable. At times, it was difficult to cross. For this reason, bridges were particularly significant in the development of the region.

## 2.4 Early Bridges in the Region of Waterloo

Bridges have always been of considerable importance to the economic and social life of the inhabitants of the region. Settlers wanting wood or grain milled had to take their goods to one of the mills along the river. Crossing the river via bridges was easier than fording the river. Small settlements began to spring up where there were mills serviced by bridges.

The creation of the railways in the 1850s made it necessary to have reliable bridges able to withstand the heavy load of the locomotives and the variable stresses of a seasonally changing waterway. Once there was regular rail service, it became important to have good road bridges so that farm produce could be transported to the local railway stations for distribution to cities such as Toronto.

After World War I, the increase in personal ownership of motorized vehicles meant that stronger bridges became necessary to accommodate the traffic. Some of the stronger concrete bridges constructed in the 1930s formed part of the "Depression Era" Public Works Programs that made work for the unemployed. In the post World War II building boom, many older bridges and culverts were strengthened or replaced as traffic continued to increase.

Bridges, as heritage structures, reflect the technology of their times. Early wooden bridges were replaced by more durable wrought iron, and then by steel, and later, by reinforced concrete. Some later bridges were made from stone. Without an awareness of their heritage significance, old bridges are likely to be replaced rather than maintained or rehabilitated.

# Section 3: Methodology

## 3.1 The Inventory: Phase I[4]

The goal of the inventory is to identify all of the existing heritage bridges and related built heritage. Included are all road and river crossings that have heritage potential, ranging from culverts to railway overpasses and viaducts. Knowing how many bridges existed in this Region and where to find them was a priority in case a heritage bridge was overlooked. Unfortunately, a region-wide bridge inventory was not available. The inventory phase was necessary before evaluation of heritage merit could proceed. For this reason, the work plan was divided into two phases, inventory and assessment.

### 3.1.1 Contents of Inventory

A region-wide bridge inventory was assembled in the first phase. It contains current photographs, maps and general statistics for bridges in Waterloo Region. The information was gathered and consolidated into a publication entitled *Spanning the Generations: Phase I: Inventory*. The *Inventory* is set up in a chronological fashion that presents the bridges in clusters of similar types according to the date they were built.

### 3.1.2 Excluded Structures

Given the time constraints and the nature of the study, the "master inventory" does not include every bridge in the Region. The *Inventory* focused on structures that were likely to have some heritage potential (pre-1950). Abandoned bridges, ancient bridge abutments and old bridges on "unmarked"[5] roads were generally not included in the *Inventory* since these structures were not the focus of the study.

### 3.1.3 Included Structures

A number of culverts and railway overpasses were included in the *Inventory* because these structures were deemed to be part of the built heritage along the Grand River. The *Inventory* includes all bridges built before 1950, and historically significant or unique bridges built after 1950. The *Inventory* focuses on pre-1950 bridges, and it could be expanded in the future to cover all "crossing" structures within the Region or the Grand River corridor, both old and new.

### 3.1.4 Finding the Bridges

Information for the *Inventory* was obtained from the following sources:

- road superintendents
- bridge appraisals
- local historians
- local Architectural Conservation Advisory Committees (LACAC's)
- public works departments

[4] Text from 2004 Report

[5] "Unmarked" roads include Mennonite roads, paths, driveways, and township road extensions.

- railway companies
- "Ontario Road Needs" studies
- road maps

Area municipalities are responsible for the maintenance of the bridges under their jurisdiction. Thus the road superintendents were the source for most of the information. Road superintendents hire consultants every five years to assess the structural integrity of the bridges in their area. The consultants' bridge appraisals were the best sources for statistical information. They were stored in the MBADES data format and contained information such as length, width, load limit, location, type, and age.

Local historians were also valuable information sources. Historians monitor the older structures and are intimately familiar with the history of their community. Local Architectural Conservation Advisory Committees (LACACs) keep an inventory of designated buildings, are likely to know the historians, and can provide other useful contacts. Public Works departments store information about pedestrian bridges. Railway crossings are owned and operated by their respective companies, CPR or CNR. The Ministry of Transportation also publishes "Ontario Road Needs" studies approximately every ten years. These reports list the locations of every road bridge in use. Mapped river and road crossings were investigated in person. All of these sources were used to complete the *Inventory*.

### 3.1.5 "1950, the 'Heritage Divider"

After World War II, large-scale building programs and transportation improvements were initiated to rebuild and upgrade the nation (e.g., construction of Highway 401). Old bridges, and bridges which had not been maintained during the depression, were replaced with new bridges. The year 1950 was chosen as the "heritage bridge divider" because of the major changes that took place during that decade.

## 3.2 Heritage Assessment: Phase II

In the second phase of the study, the heritage significance of every bridge structure in the *Inventory* was assessed. The procedure for evaluating a heritage structure is to apply a set of criteria. The criteria, outlined in the 1991 publication *Ontario Heritage Bridge Program* (Ontario Heritage Foundation), were selected to evaluate the bridges in Waterloo Region. This set of criteria was chosen because it:

- specifically deals with bridges
- is the most comprehensive set of criteria
- covers all aspects of bridges, including the history, architecture and technology
- is available at public libraries
- is simple and thus easy to understand, easy to apply and easy to interpret
- is used by the provincial government and is widely accepted
- avoids confusion over what may or may not be a heritage bridge

The full set of criteria is included in this report (Appendix C).

### 3.2.1 Scoring of the Criteria

The criteria were used as an analytical tool to quantify the heritage merits of every bridge in the study. The criteria are divided into 12 categories, and each category is given a numerical score. The numerical total represents the relative heritage potential of the bridge. The scoring ranges from 0 to 100 points and heritage bridges usually achieve a score within the range of 50 to 80 points.

### 3.2.2 Application of the Criteria

Preliminary research was conducted in order to satisfy the criteria, particularly in the categories pertaining to the documentation and history of the bridge. The information contacts and sources used in this study are listed in Appendix E. Further research may uncover additional facts that may alter the heritage potential of a bridge.

In some cases, the application of the criteria was a simple process. For instance, if the bridge was built in 1881 then it would be assigned a numerical value of 12 under the "Age" category. However, other criteria were designed for the general assessment of bridges throughout the province. After studying the collected data, the provincial criteria did not seem to adequately express the specific nature of the local bridges. The following categories have been modified to be more representative of the heritage merit of bridges in Waterloo Region.

**Builder**

There were no large bridge-building firms located in Waterloo County. Any builder, therefore, who built more than one bridge in the County is considered a *c) Known; prolific builder/designer* (See "c."under the above category).

**Materials**

Steel bridges are comparatively rare in this Region; therefore, steel bridges score 4 points in *c) Other (not normally in use).*

**Design/Style**

There are only twelve steel truss bridges out of approximately 500 bridges in Waterloo Region. Their scarcity justifies *b) Typical; but rare as a survivor. Editors' note: As of 2000, there are only 11 steel truss bridges remaining.*

**Prototype**

Any bridge in the *Inventory* that is earlier by more than 10 years than the others of its type was given *b) Early example.*

### 3.2.3 Additional Criteria

The Ontario Heritage Bridge Program Criteria appeared comprehensive except for considering groups of bridges or the spectrum of bridge types. For this reason HPAC chose to include the following category, although it was not given a numerical value:

**Bridge Group**

Is this bridge part of a group of similar bridges/structures? (e.g., clusters of steel bridges)
The question should be answered yes/no with an explanation for the choice.

**Explanation**

Bridge aesthetics and environment contribute to the particular "look" of the area or region. A group of historically associated bridges or theme of similar structures contributes to the aesthetic appeal of the environment. This group may be totally within the region or may be part of a larger group within the context of the Grand River as a nationally designated Heritage River. Similarly, a bridge might exemplify a bridge type in the spectrum of bridges along the Grand River.

A "yes" response is particularly significant. Efforts must be made to retain and preserve bridges identified as part of this group.

### 3.2.4 Interpretation

The criteria were designed so as to distinctly separate bridges by their heritage value. Heritage bridges typically score above 50 points, usually averaging 60, because the categories are not weighted evenly. Those scoring points in both the *Design/Style* and *History* categories (26 points) attained significantly higher scores than those that did not receive these points**.** Small differences in scoring may occur due to the subjectivity of the question (e.g., Is this bridge visually appealing?, Does it contribute to the character of the town?); however, this subjectivity does not usually "make or break" a heritage bridge. Of course, there are exceptions, particularly if there is a lack of information.

A score of 50 points or more indicates a heritage bridge. The reasons are:

- It was empirically proven, both in this evaluation and for those bridges tested by David Cuming, the creator of the criteria, that a properly researched heritage bridge is unlikely to score below 50 points.
- When the criteria were applied to provincially designated bridges, the scores ranged from 50 to 78 points.

## 3.3 Heritage Assessment: Phase III

In the third phase of the study, further research on a group of truss bridges was undertaken. The heritage significance of every truss bridge in the region was assessed. The procedure for evaluating a heritage structure was similar to the second phase with special emphasize on the significance of truss structures as a rare type of bridge building method. The Waterloo Region is fortunate to be graced by a large number of truss bridges that are unique in their structural design and are important part of the region's heritage as well as the heritage of Ontario.

Unfortunately, neither Canada nor Ontario has a comprehensive historic bridge inventory that would allow us to compare the number and types of truss bridges in Waterloo Region with the rest of Ontario or Canada. However, this study can be considered as a model to be followed in classifying and evaluating historic bridges.

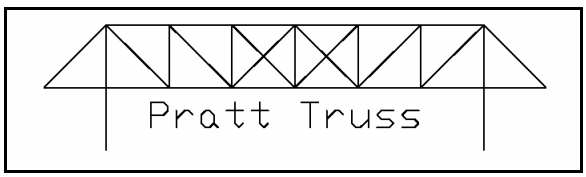
# Section 4: Bridge Profiles

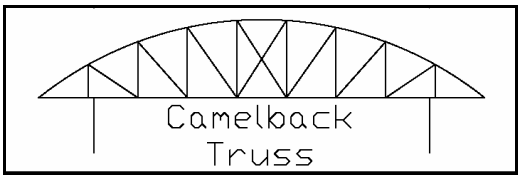
## 4.1 Truss Bridges

Truss bridges come in variety of designs, shapes, and sizes. They consist of an assembly of triangles and are commonly made of a series of straight steel bars. Most Truss bridges can be considered historic bridges due to the time "period" of their construction. Most Truss bridges were constructed around the turn of the 20th century[6]. Truss bridges in Waterloo Region presented in this study were all built between 1873 and 1953.

### 4.1.1 Evolution of Truss Bridges

Early bridges in Waterloo Region were known as corduroy road bridges consisting of "two parallel logs stretching from one bank to the other and overlaid with logs at right angles." However, these bridges proved inadequate when spanning larger areas. Therefore, early pioneers used their knowledge of roof and wall building in their homes and barns and developed the first truss design, the King Post Truss bridge, which later evolved from this structure with the Queen Post Truss bridge. Over time these original truss structures have evolved into many other truss forms. The two truss designs that are evident in the Region are the Pratt and Camelback Truss bridges.




The following will provide a brief description of both of these structures, along with detailed information about twelve Pratt and Camelback truss bridges that still exist within Waterloo Region.

### 4.1.2 Pratt Truss Bridges

Thomas and Caleb Pratt patented the Pratt Truss bridge design in 1844. The Pratt Truss structure was the reverse design of the Howe Truss Bridge that was patented in 1840 by William Howe. The original materials used in the Pratt Truss bridge design were wood and wrought iron. The vertical beams were made of timber and placed in compression while the diagonal tie rods were made with wrought iron and placed in tension. More recent structures still use the same designs but are constructed of steel.

[6] *Historic Bridges of Michigan and Elsewhere*, Historic Bridges Encyclopedia. "An Introduction to Historic Truss Bridges."

***To identify a Pratt Truss structure the diagonal members on either side point downward towards the center of the structure. When there are an odd number of panels the centre panel often has two diagonally crossing members.***

*Holland Mills Road Bridge, Wilmot Township*

*Wellesley Bridge #6, Wellesley Township*

*Piper Street Steel Truss Bridge, North Dumfries Township*

*Nithvale Bridge, North Dumfries Township*

*Shade Street Bridge, Wilmot Township*

*Conestogo Bridge, Woolwich Township*

*Hartman Bridge, Wilmot Township*

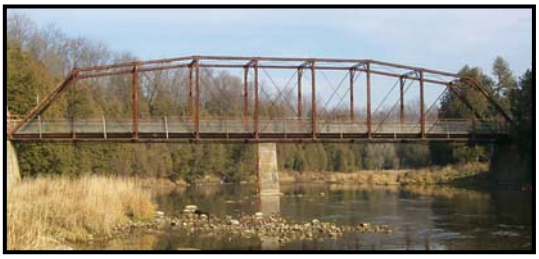
*Blackbridge Street Bridge, City of Cambridge*

### 4.1.3 Camelback Truss Bridges

The Pratt Truss bridge was modified by Charles H. Parker into the Camelback Truss design. This bridge can be identified the same way as a Pratt Truss bridge however its different in that its bottom chord has a curved top with five different slopes that aren't parallel to the top chord like the Pratt Truss. This would allow less material to be used when building the structure and allow the structure to maintain the same strength as a through Pratt Truss structure. This bridge design also allows less dead load at either of the ends and more strength concentrated in the centre. The only downfall to its design is the fact that it is complicated to build as the web members have different lengths for each panel. The Camelback Truss bridge design was used mostly from the late 19th to the mid 20th century.

*Oxford-Waterloo Road Bridge, Wilmot Township*

*Chamber's Bridge, Woolwich Township*



*Bridge Street Bridge, Wilmot Township*

*Winterbourne Bridge, Woolwich Township*

## 4.2 Detailed Bridge Profiles

This chapter contains the profiles of the twelve truss bridges located in the Region of Waterloo. The bridge profiles consist of research information which follows the format of the assessment criteria, photographs, maps and general statistics extracted from the Inventory, and a bibliography pertaining to research on the specific bridge.

**4.2.1**

# Nithvale Bridge

**Score: 60**

**North Dumfries Township**

## Documentation

### Builder

The builder of the original wooden Nithvale Bridge is unknown. The replacement bridge constructed in 1857 was designed and built by Mr. William Scrimger of Galt. The current bridge built in 1873 was constructed by Mr. Alex Mathison for $1,426.00.[7]

### Age

In 1847, the original wooden truss bridge was built. This bridge was replaced in 1857 and later replaced again in 1873 with the current truss bridge. The current Nithvale Bridge was built at the beginning of the truss bridge era and is very important because it is the oldest of all of the truss bridges in the Region. [8]

## Technology

### Materials

The current bridge deck is made of 2x4 planks covered with pitch and tar."[9] The bridge frame is made of iron and steel.[10] Using both steel and iron makes this bridge important as most older bridges built with iron have now been replaced.

[7] Taylor, Andrew W. Our Today's and Yesterdays. Ontario Canada: 1970.
[8] Taylor, Andrew W. Our Today's and Yesterdays. Ontario Canada: 1970 &
Historic Bridges of Michigan and Elsewhere, "Promoting the Preservation of our Transportation Heritage", January 20, 2006.
[9] Spanning the Generations – Phase 1: Inventory, "Nithvale Bridge," May 2004, p. 1.03 -1.04.
[10] Robinson, Stephen & Seedhouse, Tracie. Grand Old Bridges: The Grand River Watershed Bridge Inventory Report Prepared for the Grand River Conservation Authority. April 6, 2004.

## Design/Style

The Nithvale Bridge is an 8-paneled, single span, pin-jointed, Pratt Through Truss bridge.[11] Being a pin-jointed bridge, the Nithvale Bridge was easily constructed by hand. If it were riveted together, it would have required the work of highly skilled bridge crews and equipment.[12]

## Prototype

The Nithvale Bridge is one of the first built (1873) steel Pratt Truss bridges still in existence within the Region. The late 1800s was a time of transition in material usage, where wrought iron was being superceded by steel.[13] This is probably why the current bridge has been constructed with both materials.

## Structural Integrity

In 1856, the Nithvale Bridge was repaired at the same time that the Ayr (Piper Street) bridge was being replaced: a saw miller, "Robert Anderson supplied planks and timbers, and Robert Hall put them in."[14] In 1883, Lachlan McIntosh received $125 for repairing the Nithvale Bridge after severe flooding on the Nith River damaged the structure.[15] In 1914, the Hamilton Bridge Company added a span to the south end of this bridge – a short steel girder bridge.[16] Since 1967 the bridge has been closed to vehicular traffic due to safety concerns. In 1990, it was stated that it was in poor condition: "the north end (of the bridge) had dropped about ten inches" and "some of the metal support beams [had] rusted

[11] Historic Bridges of Michigan and Elsewhere, "Promoting the Preservation of our Transportation Heritage" & Spanning the Generations – Phase 1: Inventory, "Nithvale Bridge," May 2004, p. 1.03 -1.04.
[12] Spanning the Generations – Phase 1: Inventory, "Nithvale Bridge," May 2004, p. 1.03 -1.04.
[13] David Cuming, Discovering Heritage Bridges on Ontario's Roads, 1988 Part 2, p. 41.
[14] Andrew W. Taylor. Our Today's and Yesterdays. Ontario Canada: 1970, p. 224
[15] Andrew W. Taylor. Our Today's and Yesterdays. Ontario Canada: 1970, p. 224 & Ayr News. "Ayr's Bridge over Untroubled Waters Gets Regional Historical Designation," February 15, 2006.
[16] Spanning the Generations – Phase 1: Inventory, "Nithvale Bridge," May 2004, p. 1.03 -1.04 & North Dumfries Township Local Government, "LACAC Historic Ayr Walking Tour", February 11, 2003.

through." Soon after it was decided that the bridge should be repaired, and these repair costs would be paid for by government subsidies.[17] Now, the bridge is in such poor condition that transport ministry engineers recently declined to perform a "stress test" on the bridge because they were concerned that the bridge could not withstand the weight of the testing equipment.[18] Also, it would fall on the water pipe located directly below it and temporarily shutdown the wastewater treatment facility that it feeds.[19] Therefore, the bridge is only used as a pedestrian bridge.[20]

## Bridge Aesthetics and Environment

### Visual Appeal

Presently, the Nithvale Bridge is difficult to view and even find because it is almost fully hidden by foliage along Piper Street. This provides a sense of mystery to the viewer, where one can only see parts of the truss structure. This intrigues people to go and see what is actually located there.[21]

It has also been said that the Nithvale Bridge is located in one of the "most picturesque locations in Southern Ontario", that represents the former location of the settlement of Nithvale, now a part of the village of Ayr.[22]

### Integrity

The bridge has been replaced several times, however there is no evidence indicating that the Nithvale Bridge location has been moved.

### Landmark

The Nithvale Bridge is a landmark because it is the only remaining feature that reminds people of the previous existence of the Village of Nithvale.[23] The settlement of Nithvale and the bridge are both identified in the North Dumfries Historical Driving Tour and the LACAC Walking Tour of Ayr.

### Gateway

The Nithvale Bridge crosses the Nith River and previously connected Township Road 11 (Nith Road) to Piper Street to the north.[24]

[17] The Cambridge Reporter. "Township worried bridge may be dangerous", November 14, 1990.
[18] Cambridge Reporter, "Ayr Bridge to be Closed," December 5, 1990.
[19] Ibid.
[20] Spanning the Generations – Phase 1: Inventory, "Nithvale Bridge," May 2004, p. 1.03 -1.04 & Cambridge Reporter "Ayr Bridge to be Closed," December 5, 1990.
[21] Spanning the Generations – Phase 1: Inventory, "Nithvale Bridge," May 2004, p. 1.03 - 1.04.
[22] North Dumfries Township Local Government, "LACAC Historic Ayr Walking Tour", February 11, 2003.
[23] Lynda Schneider, Personal Interview, January 31, 2006.
[24] Spanning the Generations – Phase 1: Inventory, "Nithvale Bridge," May 2004, p. 1.03 -1.04.

## Character Contribution

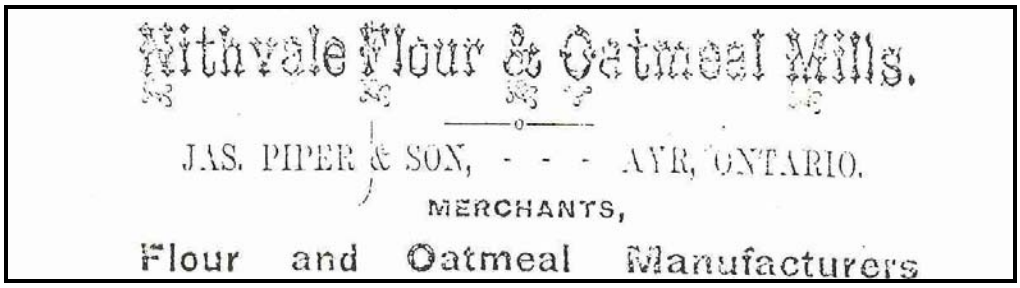
The Nithvale Bridge is one of a series of bridges at the same location. The other bridges in the same area include the Stanley - Piper Street and Piper Street Steel Truss (Slabtown/Nithvale) bridges.[25] All of these bridges are built using the design techniques and materials available during the time of their construction.

## History of Nithvale

Today, the Nithvale Bridge is the only remaining evidence of the previous existence of the Village of Nithvale.[26] The history of Nithvale is relevant to the understanding of the development of Ayr.

In 1822, Absalom Shade was the only recorded landowner in Nithvale.[27] He chose Nithvale because "apparently he was impressed by the prospects for good water power" located there.[28] In 1824, Abel Mudge, a squatter, built a sawmill at the intersection of Smith's Creek (Nith River) and Cedar Creek dam. The village later located north of Nithvale was called Mudge's Mills. To the east of Mudge's Mills was Jedburg, and to the west, Nithvale.[29] Nithvale was home to two sawmills and a flourmill.

In 1861, Mr. James Piper, after whom Piper Street in Ayr was named, opened and operated a mill called Nithvale Mill. "He had a capital investment of $14,000; used water power; employed three men and had a total monthly payroll of $24. He used 24,000 bushels of oats valued at $6,000 and he produced 2,000 barrels of oatmeal valued at $8,000."[30]




In 1876, it was stated that Nithvale's flourmill was called "Clarks."[31] Then, shortly after the Nithvale flourmills electrical equipment was removed in 1912, owner Mr. Walter A. Upton decided that he wanted to use the building to manufacture woolen and other goods. At this time, he constructed a larger dam that moved water through the race of the flour mill and solely manufactured flour, where he produced almost fifty barrels a day and marketed it under the slogan, "Pride of the Nith." This enterprise lasted until Mr. Upton's death in 1930.[32]

[25] Andrew W. Taylor. Our Today's and Yesterdays. Ontario Canada: 1970.
[26] Lynda Schneider: Heritage Planning Advisory Committee North Dumfries. Personal Interview. January 31, 2006.
[27] Scarlett E. Janusas. An Archaeological Perspective of an Historic Overview of the Regional Municipality of Waterloo. "Ayr." p. 38.
[28] Andrew W. Taylor. Our Today's and Yesterdays. Ontario Canada: 1970, p. 15.
[29] John Fisher, A guide to pleasant places and journeys of historic interest within the County of Waterloo. Waterloo Trust and Savings Company: 1967.
[30] Andrew W. Taylor. Our Today's and Yesterdays. Ontario Canada: 1970, p. 219.
[31] Andrew W. Taylor. Our Today's and Yesterdays. Ontario Canada: 1970, p. 235.
[32] Ibid., p. 237-238.

Despite all of its mills, Nithvale's location was never well known or considered to be "thriving." One interesting fact is that it was known as the "meeting and drilling place for Mackenzie's followers during the attempted revolution of 1837."[33] It was in Nithvale where Captain Rich, Captain Wilson and the Galt and Guelph volunteers were sent to arrest the alleged ringleaders including Hill, Webb, Kenny, Foster and Church. Foster, Webb and Hill were all caught. However, Foster was released along with Webb, although he was released only on the condition that he would keep the peace for a three-year period. Hall on the other hand died while in jail waiting on the results of his sentence. As well, a previous township tax collector, Mr. Sylvanus Wrigley spent time in prison for "having had the courage of his convictions, sufficient to join the rebel army."[34]

Eventually Mudge's Mill and Jedburg grew into larger settlements whereas Nithvale did not. Nithvale eventually amalgamated into these other settlements as new housing developments were built along Piper Street. Today, these three settlements now form the Village of Ayr.[35]

# Historic Association

## Bridge Group

The Nithvale Bridge and the Piper Street Steel Truss Bridge (Slabtown/Nithvale Bridge) form a set of two truss bridges in North Dumfries Township. The other bridges that also fall into the same group as the Nithvale Bridge within the Region are Wellesley Bridge #6, Holland Mills Road Bridge, Blackbridge Road Bridge, the Conestogo Bridge, the Haysville (demolished) Bridge, the Hartman Bridge and Shade Street Bridges.[36]

## Other Points of Interest

On January 9th of 1852, the United Counties of Halton, and Wentworth decided that the first funds that were raised were to be put towards the Nithvale Bridge. The council provided £12/10 for the bridges construction and appointed, James Piper, Walter Gladstone and Robert Anderson to ensure that it was correctly spent.[37]

The current Nithvale Bridge is the older of the two abandoned trusses in Ayr.[38] The other abandoned truss bridge in Ayr is the Piper Street Steel Truss (Slabtown/Nithvale) Bridge, located just south of the Nithvale Bridge on the Nith River.[39]

[33] Andrew W. Taylor. Our Yesterday's. Ontario Canada: 1952, p. 97-98.
[34] Ibid.
[35] North Dumfries Township Local Government, "LACAC Historic Ayr Walking Tour", February 11, 2003.
[36] Spanning the Generations – Phase 1: Inventory, "All Bridges," May 2004.
[37] Andrew W. Taylor. Our Today's and Yesterdays. Ontario Canada: 1970, p. 45-46.
[38] Spanning the Generations – Phase 1: Inventory, "Nithvale Bridge," May 2004, p. 1.03 -1.04 & Ayr News. "Nithvale's Bridge's Days are numbered for Vehicular Traffic." November 14, 1990.
[39] Spanning the Generations – Phase 1: Inventory, "Piper Street Steel Truss," May 2004, p. 1.09 -1.10.

# Nithvale Bridge (Abandoned)

**Location** At the end of North Dumfries Township Road 11/Nithvale Road (now Nith Road), Concession VII, Lot 38, 0.05 km. south of Piper St, in Ayr, Township of North Dumfries.

**General Information**

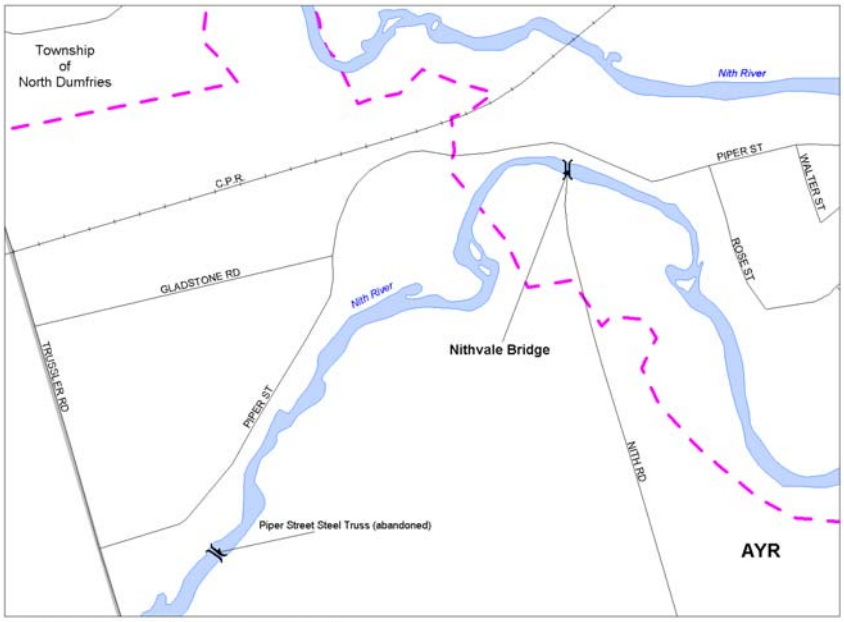
| | |
|---|---|
| *Bridge No* | N/A |
| *Jurisdiction* | Not known |
| *Year built* | 1883 |
| *Drawings* | Not available |

**Physical Components**

| | |
|---|---|
| *Type* | through Truss |
| *Spans* | 1 |
| *Dimensions* | Length 30 m<br>Width 5 m |
| *Load Limit* | None posted |

**Descriptive details**

This bridge is almost completely concealed by the Piper Street foliage. In 1967 this bridge was closed to vehicular traffic, but remains in use for pedestrians. The deck consists of 2x4 planks covered with pitch and tar. Of the two abandoned trusses in Ayr, this bridge is most likely the older of the two. The difference is in the nature of its construction, since this bridge is pin-jointed rather than riveted. Riveting bridges together required highly skilled bridge crews and equipment whereas pin-jointed bridges could be fastened by hand. In 1914 the Hamilton Bridge Company added a span to this bridge–a short steel girder bridge at the south end of the truss.



Source: Planning Housing and Community Services, Region of Waterloo

# Nithvale Bridge (Abandoned)

## East View

## Detail of Wooden Planks

# Nithvale Bridge Bibliography

Ayr News. Ayr's Bridge Over Untroubled Waters Gets Regional Historical Designation.. 15 February, 2006.

Cambridge Reporter. Ayr bridge to be closed. 5 December 1990.

Cambridge Reporter. Township worried bridge may be dangerous. 14 November 1990.

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Historic Bridges of Michigan and Elsewhere. "Promoting the Preservation of our Transportation Heritage." http://www.historicbridges.org/. January 30, 2006.

Janusas, Scarlett E. An Archaeological Perspective of an Historic Overview of the Regional Municipality of Waterloo. "Ayr." August 1988, p. 38.

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Region of Waterloo: Planning Housing and Community Services Department. Spanning the Generations - Phase 1: Inventory – Nithvale Bridge. May 2004, p. 1.03 -1.04.

Robinson, Stephen & Seedhouse, Tracie. Grand Old Bridges: The Grand River Watershed Bridge Inventory Report Prepared for the Grand River Conservation Authority. Ontario: Robinson Heritage Consulting: 6 April, 2004.

Schneider, Lynda. Personal Interview. 31 January, 2006.

Taylor, Andrew W. Our Today's and Yesterdays. Ontario Canada: 1970.

Taylor, Andrew W. Our Yesterdays. Ontario Canada: 1951.

4.2.2

# Conestogo Bridge

**Score: 60**

**Woolwich Township**

## Documentation

### Builder

The Conestogo Bridge was built by the Hamilton Bridge and Tool Company. [40] See Appendix A for more information about the Hamilton Bridge and Tool Company.

### Age

The original Conestogo Bridge spanning the Conestoga River was built in 1886. The current Conestogo Bridge was built in 1928. [41]

## Technology

### Materials

The Conestogo Bridge, also known as Bridge #25 is a "wood–and-metal bridge."[42] It has a transverse laminated timber deck, with steel cables and steel welded trusses.[43]

[40] Spanning the Generations – Phase 1: Inventory, "Conestogo Bridge," May 2004, p. 1.35 – 1.36.
[41] Ibid.
[42] The Record. "Woolwich Seeks Money for Bridge," July 4, 1991 & "Engineers list Conestogo bridge options", January 31, 1991.
[43] Spanning the Generations – Phase 1: Inventory, "Conestogo Bridge," May 2004, p. 1.35 – 1.36.

### Design/Style

This bridge is a "twin span through double truss bridge" that has a single driving lane spanning the Conestogo River.[44] The bridge is connected by pin-joints.[45]

### Prototype

The Conestogo Bridge is a prototype of a double span through truss bridge in the Region because it is the only such bridge that exists within the Region. It was also one of the first steel truss bridges because it was built during the era when steel was first being used in bridge construction.[46]

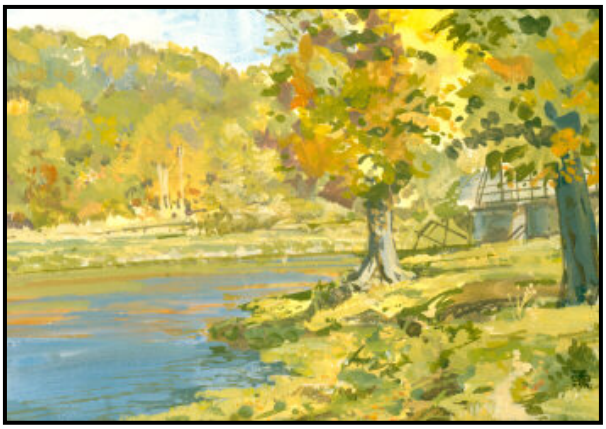
### Structural Integrity

In 1989, five options were proposed to deal with the bridge's natural deterioration. These were either "doing nothing, closing the bridge to traffic, repairing the bridge, tearing the bridge down and replacing it with a new two-lane bridge at the same location, or building an entirely new route and bridge to direct traffic away from Township Road 44." With further research, the decision was to have the bridge temporarily restored.[47] Also at this time, a sign was posted on the bridge with a load limit of 5 tonnes, preventing school buses and heavy farm equipment from using the structure.[48]

## Bridge Aesthetics and Environment

### Visual Appeal

The beauty of the Conestogo Bridge was so intriguing that it attracted two local artists to depict pictures of it: Mr. Carl Hiebert and Mr. Peter Etril Snyder. The following photo displays one painting done by Mr. Peter Etril Snyder entitled, "Conestogo Flats."[49] The Conestogo Bridge can be viewed in the right corner of the painting.



**"Conestogo Flats"** - By Peter Etril

[44] The Record. "Initial Public Notification: Class Environmental Assessment Bridge #25, Township Road 44 Township of Woolwich" January 18, 1991.
[45] The Record. "Old steel bridge in Conestogo closed for repairs; [Final Edition]", May 22, 2002
[46] Spanning the Generations – Phase 1: Inventory, All Bridges. May 2004.
[47] The Record. "Engineers list Conestogo bridge options." January 31, 1991.
[48] The Elmira Independent. "Bridge in Conestogo needs major repair." May 29, 1990.
[49] Snyder, Peter Etril, Online Gallery. "Conestogo Flats" February 10, 2006.

As well, one writer from the Kitchener-Waterloo Record newspaper indicated that she believes that "the prettiest rural panorama in the whole Region is the one seen from this bridge." She feels it is a very important view because, "such vantage points are rare in this relatively flat part of Ontario." She also likes bridges like these because "there's always something going on: patient fishermen, ever hopeful of better luck with the next cast; great blue herons waiting with motionless intensity for a frog or minnow to appear beneath their ready beak; [and] children skipping stones or throwing sticks for their dog to retrieve." It was also said that these views are important on and near "old bridges [because they] offer welcome glimpses of both our present and our past." [50]

### Integrity

The bridge has high integrity. The same bridge crossing has been used since the bridge's first construction in 1886.

### Landmark

This bridge has also been known as "Bridge 25."[51] It is located in a historic hamlet with framed views in Mennonite country. The area also has a large floodplain, and a steep hill, which can be seen when you approach the bridge from the north. It also is the only double span Pratt through truss bridge in the Region, which also makes it a significant landmark.

### Gateway

The Conestogo Bridge joins Conestogo with Lexington Road in northern Waterloo.[52] Also, being close to the countryside line, it provides a gateway from the urban to the rural setting.

### Character Contribution

The Conestogo Bridge is located on a scenic road that is a rural heritage landscape consisting of a beautiful and pristine environment. The Conestogo Bridge does add to this unique cultural landscape, being a single lane, narrow bridge it calms traffic that travels through this pristine environment.

## Historic Association

### Bridge Group

There are two other truss bridges in Woolwich, the Winterbourne (two-span) and Chamber's (single span) Bridges, but they are built using the Polygonal or Camelback Truss style.[53] So, the Conestogo Bridge is not part of any through Pratt Truss bridge group in Woolwich Township; it is the only significant through Pratt Truss Bridge left there.

[50] The Record. "Old bridges add such character." December 17, 1994.
[51] Ibid.
[52] The Elmira Independent. "Bridge in Conestogo needs major repair", May 29, 1990.
[53] Historic Bridges of Michigan and Elsewhere, "Promoting the Preservation of our Transportation Heritage."

In the Region, the Conestogo Bridge belongs to the larger group of Through Pratt Truss bridges. These other bridges include the Nithvale, Piper Street Steel Truss, Wellesley Bridge #6, Holland Mills Road, Haysville (demolished), Hartman, Shade Street and Blackbridge Road Bridges.[54]

## Development Pressure

The bridge is located near the Region's countryside line where there is a sharp transition from urban to rural lands. Within the next 20 years it is predicted that the population will increase as well as bridge usage (from 1,000 to approximately 7,000 vehicles using it per day). This increase in bridge use is going to have a significant impact on the future structural integrity of the bridge. Currently there are new plans to build another bridge elsewhere to deal with this increase in "inter-regional traffic."[55]

[54] Spanning the Generations – Phase 1: Inventory, All Bridges, May 2004.
[55] The Record. "Engineers list Conestogo bridge options." January 31, 1991.

# Conestogo Bridge

**Location** MTO Site No. 033-0194, Woolwich Twp. Rd. No. 44 (now Glasgow Street S.), 0.3km south of King Street, Conestogo, Township of Woolwich.

**General Information**

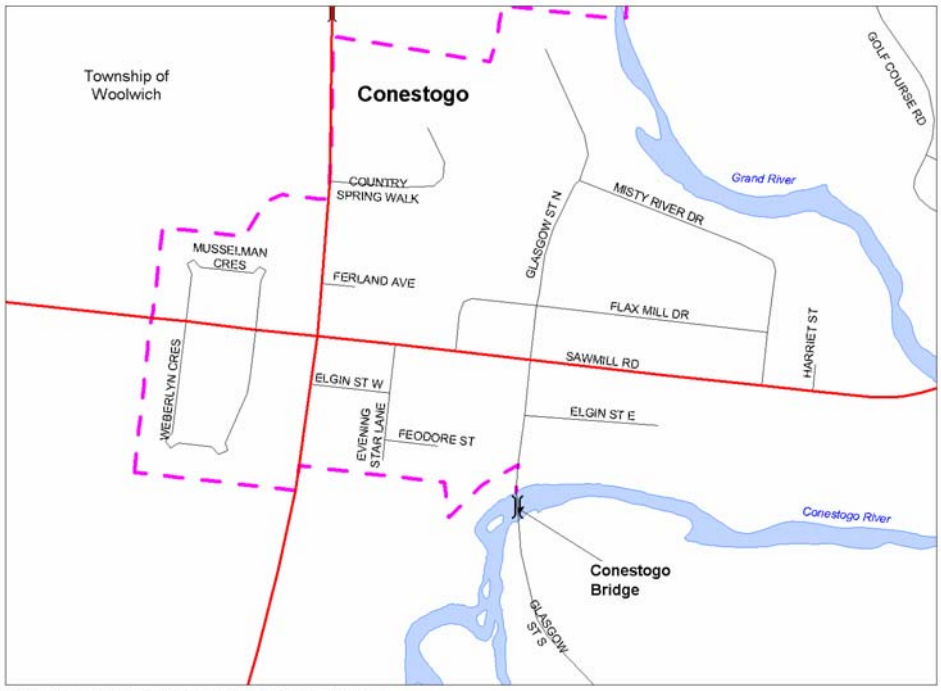
| | |
|---|---|
| *Bridge No.* | 320144 |
| *Jurisdiction* | Township of Woolwich |
| *Year built* | 1886, 1928 |
| *Drawings* | Not available |

**Physical Components**

| | |
|---|---|
| *Type* | Through Truss |
| *Spans* | 2 |
| *Dimensions* | Length 39.8 m<br>Width 5.5 m<br>Vertical Clearance 4.5 m |
| *Load Limit* | 5 tonnes |

**Descriptive details**

This is a two-span through truss bridge, made by the Hamilton Bridge and Tool Co. in 1886. The trusses were welded and steel cables form the boundary walls. The worn surface is made of transverse laminated timber.



Source: Planning Housing and Community Services, Region of Waterloo

# Conestogo Bridge

## South View


## West View

# Conestogo Bridge Bibliography

Historic Bridges of Michigan and Elsewhere - Slideshow." http://www.historicbridges.org, 25 January, 2006.

Region of Waterloo: Planning Housing and Community Services Department. Spanning the Generations - Phase 1: Inventory – Conestogo Bridge. May 2004, pp. 1.35-1.36.

Snyder, Peter Etril. Online Gallery: Conestogo Flats. http://www.snydergallery.com . 18 July, 2007.

The Elmira Independent. Bridge in Conestogo needs major repair. 29 May 1990.

The Record - Kitchener, Waterloo & Waterloo Region. Engineers list Conestogo bridge options. 31 January 1991.

The Record - Kitchener, Waterloo & Waterloo Region. Initial Public Notification: Class Environmental Assessment Bridge #25, Township Road 44 Township of Woolwich. 18 Jan. 1991.

The Record - Kitchener, Waterloo & Waterloo Region. Old bridges add such character. 17 December, 1994.

The Record - Kitchener, Waterloo & Waterloo Region. Old steel bridge in Conestogo closed for repairs; [Final Edition]. 22 May 2002.

The Record - Kitchener, Waterloo & Waterloo Region. Woolwich Seeks Money for Bridge. 4 July 1991.

**4.2.3**

# Holland Mills Road Bridge

**Score: 60**

**Wilmot Township**

## Documentation

### Builder

The Holland Mills Road Bridge was built by the Hamilton Bridge and Tool Company.[56] See Appendix A for more information about this Company.

### Age

The Holland Mills Road Bridge was built in 1910.[57] However, it is believed that the bridge may be even older because of the way the bridge truss has been hammered together.[58]

## Technology

### Materials

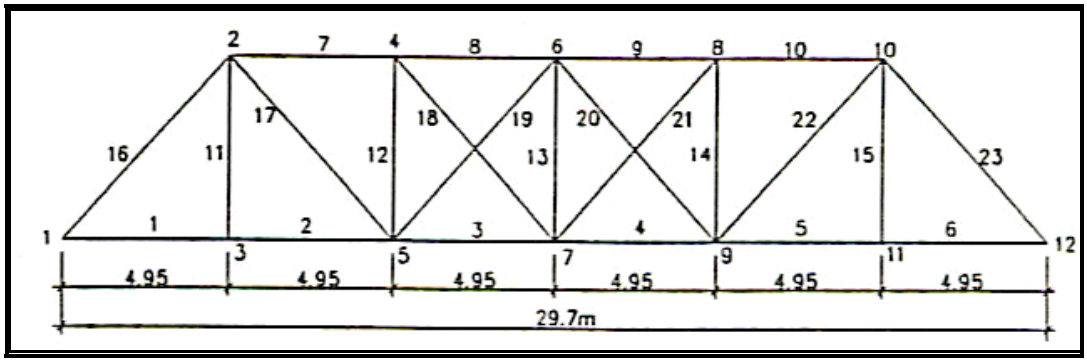
This bridge has a metal (steel) span and a timber deck.[59] Steel was the preferred material during the time of the bridge's construction as opposed to wrought iron because it was cheaper to produce and much stronger which worked well in compression and tension.[60]

### Design/Style

The bridge is a single span, pin-jointed, steel through Pratt Truss bridge.[61] To be more precise, the single-span truss bridge has six panels each 4.95m long (for a total span of 29.7m) and has a width of 5.11m measured between the centerlines of the trusses, permitting only single lane traffic. The trusses support transverse steel S380x64 floorbeams (380 mm in depth; unit mass 64 kg/m) at each panel

[56] Hamilton Bridge and Tool Company, Highway Bridge 88 span 16' roadway, scales ¾" & 1 ½" = 1 ft", Date Unknown.
[57] Spanning the Generations – Phase 1: Inventory, "The Holland Mills Road Bridge," May 2004, p. 1.07 – 1.08.
[58] Junker, Al. Personal Interview. Thursday June 7, 2006.
[59] Ernie Ritz. Wilmot Bridges 1998, November 2, 1998. & Stephen Robinson and Tracie Seedhouse. Grand Old Bridges: The Grand River Watershed Bridge Inventory Report Prepared for the Grand River Conservation Authority. April 6, 2004.
[60] David Cuming, Discovering Heritage Bridges on Ontario's Roads, 1988 Part 2, p. 41.
[61] Spanning the Generations – Phase 1: Inventory, "The Holland Mills Road Bridge," May 2004, p. 1.07 -1.08.

point. These floorbeams in turn support eight steel S150x19 stringers (150 mm in depth; unit mass of 19 kg/m) and seven 89mm x 146mm (nominal 4" x 6") wood stringers. The stringers support a nail-laminated wood deck fabricated of 38mm x 89mm (nominal 2" x 4") timber. Along the length of the bridge there is a 185 mm x 75 mm wood curb fastened on top at each side. The entire bridge is supported by steel roller bearings situated on the north and south concrete abutments. The following diagram displays the exact measurements and bridge style.[62]




*Source:* Archaeological Assessment of Proposed Realignment of Bridge #16, Wilmot Township.

## Prototype

The Holland Mills Road Bridge is not one of the first steel truss bridges built in Wilmot Township, the bridge was built in another location in northern Ontario and only came to Holland Mills Road between 1925 and 1930. Other through truss bridges in Wilmot Township are: Shade Street Bridge – 1953, Hartman Bridge – 1936, Haysville Bridge (demolished) – 1930, Oxford-Waterloo Road Bridge– 1912, and Bridge Street Bridge – 1913. Of these, Oxford-Waterloo Road Bridge is the existing prototype, even though the Holland Mills Road Bridge was likely constructed earlier.

## Structural Integrity

The Holland Mills Road Bridge has been repaired several times; however there have been no significant modifications. Currently, the bridge has a 3-tonne load limit, that forces emergency vehicles attempting to access the thirteen residences and two businesses situated along the route to take a long additional four-minute detour which could pose problems in an emergency.[63] This 3-tonne load limit was placed on the bridge after a Structural Evaluation Study in 1990. [64] At one time, engineers planned to replace the poor and deteriorating bridge however the cost of doing so exceeded the Township's budget.[65]

62 Mayer, Poulton and Associates Incorporated. Archaeological Assessment of Proposed Realignment of Bridge #16, Wilmot Township, Waterloo Regional Municipality. Nov 29, 1991.

63 The Record. "Wilmot residents press for bridge," June 5, 1991.

64 Paragon Engineering Limited, "Class Environmental Assessment and Preliminary Design Study, New Bridge Crossing of Nith River and Road Realignment: Township Road 13, 1992.

65 Gary Charbonneau, Personal Interview. February 8, 2006.

# Bridge Aesthetics and Environment

## Visual Appeal

The bridge is located on a scenic road called Holland Mills Road. It has been said that "this flat section [of road] winds through the beautiful countryside and crosses a beautiful iron bridge," referring to the Holland Mills Road and bridge.[66]

## Integrity

It is believed that the Holland Mills Road Bridge was not always in its current location.[67] According to local residents, the bridge was re-erected at the current site sometime between 1925 and 1930, having been relocated from a previous site in northern Ontario.[68]

## Landmark

The Holland Mills Road Bridge is also significant as it is the oldest bridge in Wilmot Township that has been pin-jointed together.

## Gateway

Approaching the bridge from the south there is a "dirt road, which has a 90 degree turn"[69] that connects people to the Town of New Hamburg. If approaching the bridge from the north it will lead one to Haysville.[70]

## Character Contribution

Steel bridges were reproduced rapidly after the year 1900.[71] In 1910, the Holland Mills Road Bridge was constructed.[72] This bridge is significant because it represents the time period in which it was built.

## History of Holland Mills Road

Holland Mills used to have a woolen and gristmill on a small stream or raceway adjoining two points on the Nith River near the Holland Mills Road Bridge. Evidence of these two mills can be seen on the 1861 Tremaine Map of Waterloo Region. Today, the Holland Mills Road Bridge is the only remaining structure along Holland Mills Road that reminds people of these past developments.[73]

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[66] The Record. "Iron bridge, deer sanctuary accent quiet country pedal; [Final Edition]" May 25, 2002
[67] Ritz, Ernie, Wilmot Bridges 1998, November 2, 1998.
[68] Mayer, Poulton and Associates Incorporated. Archaeological Assessment of Proposed Realignment of Bridge #16, Wilmot Township, Waterloo Regional Municipality. Nov 29, 1991.
[69] Spanning the Generations – Phase 1: Inventory, "The Holland Mills Road Bridge," May 2004, p. 1.07 -1.08.
[70] Ibid.
[71] David Cuming, Discovering Heritage Bridges on Ontario's Roads, 1988, pp. 41.
[72] Spanning the Generations – Phase 1: Inventory, "The Holland Mills Road Bridge," May 2004, p. 1.07 -1.08.
[73] Region of Waterloo, "Historic Place Names of Waterloo County - Holland Mills, Wilmot Township."

# Historic Association

## Bridge Group

The Holland Mills Road Bridge belongs to the group of similar Through Pratt Truss bridges in Wilmot Township. These include the Shade Street, Hartman, and Haysville (demolished) bridges. This group of bridges symbolizes Wilmot's farming community.[74] The other truss bridges in Wilmot Township that fall into this group include the Oxford-Waterloo Road, and Bridge Street bridges, however these are camelback rather than Pratt truss bridges.

## Other Points of Interest

The Holland Mills Road Bridge was going to be replaced and the approaching road realigned due to safety concerns. [75] However, the bridge was never replaced and the road was never realigned due to cost restrictions and the impact on neighbouring properties.[76]

[74] Spanning the Generations – Phase 2: Heritage Assessment, "Hartman & Haysville Bridges," May 2004, p. 30-34 & 47-53.
[75] Paragon Engineering Limited. Class Environmental Assessment and Preliminary Design Study New Bridge Crossing of Nith River and Road Realignment: Township Road #13, 1992.
[76] Charbonneau, Gary. Personal Interview. February 8, 2006

# Holland Mills Road Bridge

**Location** Wilmot Township Road No. 13 (now Holland Mills Road), 0.3 km South of Bleams Road, Concession SBR, Lot 20 Block A, east of New Hamburg, Township of Wilmot.

**General Information**

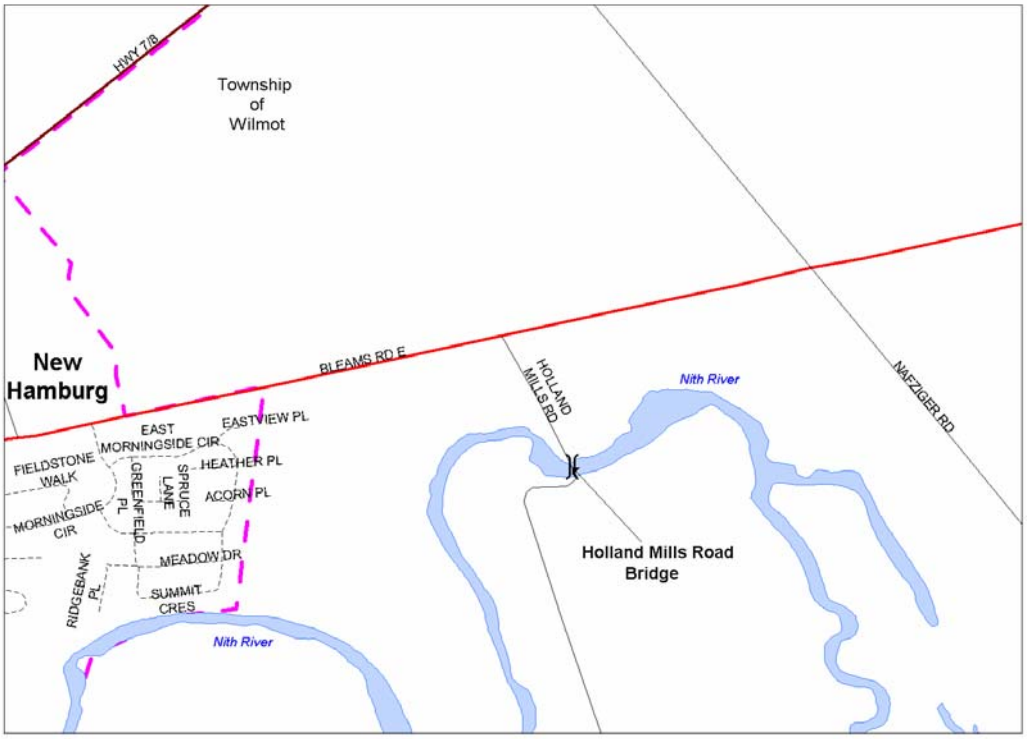
| | |
|---|---|
| *Bridge No* | 13016 |
| *Jurisdiction* | Township of Wilmot |
| *Year built* | 1910 |
| *Drawings* | Not available |

**Physical Components**

| | |
|---|---|
| *Type* | Through Truss |
| *Spans* | 1 |
| *Dimensions* | Length 30.5 m<br>Width 4.9m |
| *Load Limit* | 4 Tonnes |

**Descriptive details**

This is a single lane, pin-jointed through truss bridge. The southern approach is a dirt road, which has a 90-degree turn. In 1978 the 2x4 wooden deck was replaced. The wooden piles of a previous bridge lie 40 meters northwest of the bridge.



Source: Planning Housing and Community Services, Region of Waterloo

# Holland Mills Road Bridge

## South East View

## West View

# Holland Mills Road Bridge Bibliography

Charbonneau, Gary. Wilmot Township Director of Public Works. Personal Interview. 8 February, 2006

Cuming, David. Discovering Heritage Bridges on Ontario's Roads. Ontario: Boston Mills Press, Erin, Ontario, 1983.

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Region of Waterloo: Planning Housing and Community Services Department. Spanning the Generations - Phase 1: Inventory – Holland Mills Road Bridge. May 2004, p. 1.07-1.08.

Region of Waterloo: Planning Housing and Community Services Department. Spanning the Generations - Phase 2: Heritage Assessment. May 2004, p. 1.07-1.08.

Ritz, Ernie. Wilmot Bridges – 1998. 2 November, 1998.

Robinson, Stephen & Seedhouse, Tracie. Grand Old Bridges: The Grand River Watershed Bridge Inventory Report Prepared for the Grand River Conservation Authority. Ontario: Robinson Heritage Consulting: 6 April, 2004.

The Record - Kitchener, Waterloo & Waterloo Region. Wilmot residents press for bridge. 5 June 1991.

**4.2.4**

# Wellesley Bridge #6

**Score: 60**

**Wellesley Township**

## Documentation

### Builder

The builder of Wellesley Bridge #6 is unknown.

### Age

Wellesley Bridge #6 was built in the beginning of the 20th century.[77] The approximate date of construction is 1910 +/- ten years.[78]

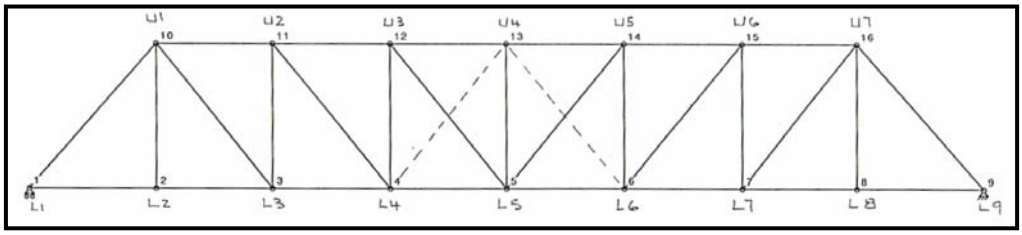
## Technology

### Materials

The bridge truss is made of steel.[79] The bridge deck is made of 2 x 4 inch laminated timber with a tar and chip-wearing surface except for the south end where the original pony truss deck was replaced with concrete.[80]

[77] Township of Wellesley, Engineering Report on Bridge #6 MTO Structure No. 33-17.
[78] Spanning the Generations – Phase 1: Inventory, "Wellesley Bridge #6," May 2004, p. 1.05 -1.06.
[79] Township of Wellesley, Engineering Report on Bridge #6 MTO Structure No. 33-17.
[80] Spanning the Generations – Phase 1: Inventory, "Wellesley Bridge #6," May 2004, p. 1.05 -1.06

## Design/Style




*Source:* Engineering Report on Bridge #6.

Wellesley Bridge #6 is a single – lane, single span, very slim, pin-jointed, steel through and pony truss bridge.[81] The structure consists of a steel Through Truss main span, and a steel beam approach span. The main span is approximately 34 m and the trusses are at 5.2 m on centers. The deck is laminated timber with a coat of asphalt paint. The following diagram gives an outline of the through truss part of the bridge's design.

## Prototype

Wellesley Bridge #6 is the only existing through Pratt Truss bridge in Wellesley Township. However, it is not the earliest existing example of through Pratt Truss bridges in the Region. The Nithvale Bridge (1873) in North Dumfries is the oldest existing through Pratt Truss bridge in the Region.[82]

## Structural Integrity

Bridge #6 has been modified. In 1974 there were concerns about the bridge's safety and thoughts of bridge closure were considered.[83] So, in January 1978 under the direction of the Ministry of Transportation the bridge was closed until the laminated timber deck in the main and southern approach span was restored.[84] Then in 1981, when one of the steel pony trusses on the south end failed, new steel beams and a concrete deck were installed in its replacement. [85] Around 1989, the substructure of the bridge had been scoured by a boat and its truss had been damaged by a vehicle.[86] Then, in November of the same year, K. Smart Associates Limited inspected Bridge #6 and submitted a report on the condition and loading capacity of the bridge. The bridge was found to be in poor condition and in 1990 the bridge was repaired by XDG Limited for $32, 675.[87] It was again repaired sometime in 1998.

In 2003, another inspection was done on the bridge by K. Smart Associates Limited. After this inspection, it was decided that the bridge at its 5-tonne load limit [88] was no longer safe and needed to

[81] Township of Wellesley, Engineering Report on Bridge #6 MTO Structure No. 33-17.
& Historic Bridges of Michigan and Elsewhere, "Promoting the Preservation of our Transportation Heritage", February 10, 2006.
[82] Spanning the Generations – Phase 1: Inventory, "All Bridges." May 2004.
[83] Ibid.
[84] Duke, Susan. Personal Interview, June, 15, 2006
[85] Spanning the Generations – Phase 1: Inventory, "Wellesley Bridge #6," May 2004, p. 1.05 -1.06 & Township of Wellesley, Engineering Report on Bridge #6 MTO Structure No. 33-17."
[86] Township of Wellesley, Engineering Report on Bridge #6 MTO Structure No. 33-17."
[87] Township of Wellesley, Engineering Report on Bridge #6 MTO Structure No. 33-17 & Kitchener-Waterloo Record. "Kingwood Bridge being repaired for $32, 675", July 10, 1990.
[88] Ibid.

be closed to vehicular traffic.[89] The bridge has been closed since this time. Today, the bridge remains closed to all traffic. Its main beams have rotted through, the lower parts of the abutments are in poor condition, and the wood is beginning to show from underneath the tar and chip-wearing surface.[90] Also, Wellesley Township Council has passed a motion to support in principal a fact-finding meeting by Waterloo Regional Heritage Planning Advisory Committee (HPAC) to review the future of the bridge for non-vehicular traffic.


## Bridge Aesthetics and Environment

### Visual Appeal

This bridge has strong visual appeal. Jane Urquhart, an author inspired by this bridge, indicates that she "loves the fact that it's a surprise when you come down the hill, and there it is."[91] This provides the viewer with a sense of mystery and is like visiting a secluded retreat. For Urquhart, the bridge is one of the many treasured-and sometimes hidden places that she explored. See the photo below for better visual representation of the view of the bridge from the top of the hill.

The bridge is also unique because it has character. It is "showing its age, its asphalt surface is worn away in places, revealing the narrow wooden planks below. A cement support rising out of the river

[89] New Hamburg Independent. "Wellesley considers heritage designation for closed bridge," March 16, 2005.
[90] McLaughlin, Willis. Personal Interview. May 2006
[91] The Record. "A sense of place." August 9, 2003.

no longer reaches its target [and] there is a large gap separating the bridge's deck from the crumbling pillar."[92]

### Integrity

Wellesley Bridge #6 has strong integrity. The river crossing has not been moved from its original location. More research is needed on the origins of the bridge structure as it is believed to have been constructed and used elsewhere before being moved to the current location.

### Landmark

This bridge is a literary landmark because it has been featured in an award winning Canadian novel. It provided a source of inspiration to author, Jane Urquhart for her novel, "The Stone Carvers." She describes the Wellesley Bridge #6 as the place where a young boy named Tilman on a journey through southwestern Ontario lives for the summer, "swimming and fishing in the Nith River by day and taking shelter in a hiding spot formed under the bridge by night."[93] The following description of the bridge is found in her novel, "The Stone Carvers:"

> "*Made of iron girders and shaped like the back of a large animal whose skeleton was being presented to the boy in profile, every part of the structure delighted Tilman. He ran back and forth over its planked floor, across the shadows of its steel beams several times, though he was breathless and covered with sweat…The view from the bridge was extensive in all directions, hills and fields and orchards being cut into geometric shapes by the angles the steel girders made, and the sound of water was soothing*"[94]

### Gateway

Wellesley Bridge #6 previously provided a connection across Chalmers-Forrest Road (previously Township Road 18 South). The bridge spans the Nith River, south of the Hamlet of Kingwood[95].

## Historic Association

### Bridge Group

The bridge group that Wellesley Bridge #6 falls into is the group of Through Pratt Truss bridges.[96] In Wellesley Township it is the only significant Through Pratt Truss bridge. However, there are other Through Pratt Truss bridges in the Region. They include: the Nithvale and Piper Street Steel Truss (Slabtown/Nithvale) Bridges in North Dumfries, the Haysville (demolished), Hartman, Shade Street and Holland Mills Road Bridges in Wilmot, the Blackbridge Road Bridge in Cambridge, and the Conestogo Bridge in Woolwich.[97]

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[92] The Record. "A sense of place." August 9, 2003.
[93] Ibid.
[94] Jane Urquhart. The Stone Carvers. Toronto: McClelland & Stewart, 1949.
[95] Spanning the Generations – Phase 1: Inventory, "Wellesley Bridge #6," May 2004, p. 1.05 -1.06
[96] Spanning the Generations – Phase 1: Inventory, "The Holland Mills Road Bridge," May 2004, p. 1.07 -1.08
[97] Ibid.

## Other Points of Interest

In the *Grand Old Bridges: Grand River Watershed Bridge Inventory*, Wellesley Bridge #6 scored '64', whereas in the Region of Waterloo's *Spanning the Generations* document it scored '60'. Both have rated the bridge with similar historical significance and both are "urging the bridge be preserved and hopefully repaired."[98]

In the middle of the bridge there is an abutment that does not attach to the bridge. Also, it is not located in the correct location to support this structure, as abutments are always located between each bridge span. This suggests that possibly a two-span structure existed at this site previously.

[98] New Hamburg Independent. "Wellesley considers heritage designation for closed bridge." March 16, 2005.

# Wellesley Bridge #6

**Location** MTO Site No. 33-17, Township Road 18 South (now Chalmers-Forrest Road) south of Kingwood, Township of Wellesley.

**General Information**

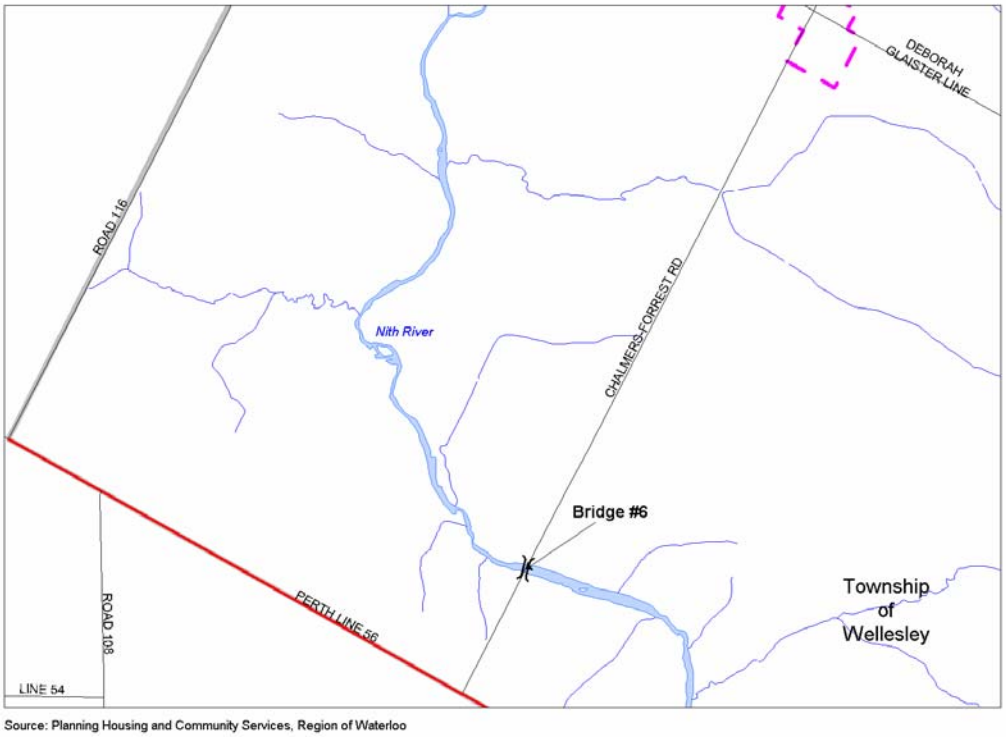
| | |
|---|---|
| *Bridge No* | 6 |
| *Jurisdiction* | Township of Wellesley |
| *Year built* | 1910 +/- 10 years |
| *Drawings* | Not available |

**Physical Components**

| | |
|---|---|
| *Type* | through Truss |
| *Spans* | 1 |
| *Dimensions* | Length 34 m<br>Width 5 m |
| *Load Limit* | 5 Tonnes |

**Descriptive details**

This is a very slender pin-jointed, one lane, steel through truss. Its deck consists of laminated timber with a tar and chip-wearing surface. The roadway approaches were reconstructed in 1981. It is approximately 90 years old and was last inspected in 1989. In the last 10 years there have been two major repairs. The Township has debated whether or not to close or replace this bridge since 1974.




Source: Planning Housing and Community Services, Region of Waterloo

# Wellesley Bridge #6

## North East View

## East View

# Wellesley Bridge #6 Bibliography

Duke, Susan. Director of Administration and Planning in Wellesley Township. Personal Interview. 15 June, 2006

Historic Bridges of Michigan and Elsewhere. Promoting the Preservation of our Transportation Heritage. http://www.historicbridges.org/

McLaughlin, Willis. Director of Public Works and Environment, Wellesley Township. Personal Interview. May, 2006

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Region of Waterloo: Planning Housing and Community Services Department. Spanning the Generations - Phase 1: Inventory – Wellesley Bridge #6." May 2004, p. 1.05 -1.06

The Record – Kitchener, Waterloo & Waterloo Region. A sense of place. 9 August, 2003.

The Record – Kitchener, Waterloo & Waterloo Region. Kingwood Bridge being repaired for $32, 675. 10 July 1990

Township of Wellesley. Engineering Report on Bridge #6 MTO Structure No. 33-17

Urquhart, Jane. The Stone Carvers. Goose Lane Editions: Ontario, August 2003.

**4.2.5**

# Oxford-Waterloo Road Bridge

**Score: 48**

**North Dumfries Township**

## Documentation

### Builder

The builder of the Oxford-Waterloo Road Bridge was the Hamilton Bridge and Tool Company.[99]

### Age

The Oxford-Waterloo Road Bridge was built in August of 1912.[100]

## Technology

### Materials

The bridge has a metal truss and an exposed concrete deck.[101]

### Design/Style

The bridge is a single span, 45.7metre, 8-paneled, welded, and camelback through Pratt truss bridge.[102]

### Prototype

The Oxford-Waterloo Road Bridge is the oldest existing through camelback truss bridge in the Region as it was built in 1912. The other through camelback trusses in the Region were built later on: the Winterbourne and Bridge Street through camelback trusses were built in 1913 and the Chamber's through camelback truss bridge was built in 1930.

### Structural Integrity

The Oxford-Waterloo Road Bridge's east abutment was reconstructed after Hurricane Hazel did damage to it in 1954.[103]

[99] W.E. Kelley & Associates Limited. Letter to Road and Bridge Committee, Township of Wilmot, October 10, 1984. In Wilmot Township Oxford-Waterloo Road Bridge Folder. Kitchener Ontario, 1984.
[100] Spanning the Generations – Phase 1: Inventory, "Oxford-Waterloo Bridge," May 2004, p. 1.11 – 1.12 & King, J. Peter C. "The Structural Evaluation of Bridge No. 32 for W.E. Kelley & Associates Limited." March 7, 1985.
[101] Ibid.
[102] Ibid & The Record. "Wilmot cuts bridge limit." October 16, 1984.

The bridge was inspected in 1979 by Mr. J. Peter E. King, 1985 and 1990 by W.E. Kelley and Associates, and in 1997 and 2005 by K. Smart Associates Limited. Each inspection included a detailed evaluation of the bridge's structural elements and proposed recommendations for fixing the structure.

In the 1979 inspection it was found that the truss was "in good condition with minor surface corrosion and no visible evidence of delamination."[104] However, the deck was "in very poor condition with major surface spalls and exposed reinforcing steel in several areas."[105] Also, "the slab was severely cracked in [many] areas with water seepage visible from the underside of the deck…and the substructure was sound with a relatively new east abutment."[106]

On September 17, 1984 the bridge was struck by a farm tractor hauling a liquid manure tank that "punched a hole in the bridge deck at the westerly end of the structure."[107] Following this, the bridge deck was inspected and many weak areas were found. Soon after, these weak areas were mended with new reinforced concrete patches.[108] On October 16, 1984 the safety concern of the bridge became so high that it was decided to decrease the bridge's load limit from 11 to 9 tonnes.[109]

In the 1985 inspection there were similar findings to the 1979 inspection, and plans were made to completely replace the structure however there was not enough funding to do so.[110]

In 1989, the bridge was struck by a snowplough, which had bent the members and had introduced some twisting at the point of impact. This was indicated in the January 1990 inspection report as well as the bridge's current poor condition. However, in May of that year Wilmot and Blandford-Blenheim Townships managed to receive funding in the amount of $60, 000 from the Ministry of Transportation to repair the bridge. It was repaired shortly thereafter. [111]

In the 1997 inspection report the bridge was stated to be in excellent condition.[112] It was inspected again in November 2005. Following this inspection it was concluded that the bridge should be posted at a lower load limit and that the 15 tonne load limit is not safe enough to "support a full Ontario Highway Truck Loading" capacity.[113] However, the load limit was increased back to 15 tonnes in February of 2006 following repairs done to it in January.

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[103] W.E. Kelley & Associates Limited. Letter to Road and Bridge Committee, Township of Wilmot. October 10, 1984. In Wilmot Township Oxford-Waterloo Road Bridge Folder. Kitchener Ontario, 1984.
[104] King, J. Peter C. "The Structural Evaluation of Bridge No. 32 for W.E. Kelley & Associates Limited." March 7, 1985.
[105] Ibid.
[106] Ibid.
[107] W.E. Kelley & Associates Limited. Letter to Road and Bridge Committee, Township of Wilmot. October 10, 1984. Wilmot Township Oxford-Waterloo Road Bridge Folder. Kitchener Ontario, 1984
[108] W.E. Kelley & Associates Limited. Letter to Road and Bridge Committee, Township of Wilmot. October 10, 1984. Wilmot Township Oxford-Waterloo Road Bridge Folder. Kitchener Ontario, 1984 & The Record. "Wilmot cuts bridge limit." October 16, 1984.
[109] The Record. "Wilmot cuts bridge limit." October 16, 1984.
[110] W.E. Kelley & Associates Limited. "Engineering Report – Bridge no. 32, Wilmot Blandford-Blenheim Township. March 20, 1985.
[111] W.E. Kelley & Associates Limited. Letter to Mr. Bruce Cannon, Wilmot Township Engineer. January 8, 1990. Wilmot Township Oxford-Waterloo Road Bridge Folder. Kitchener, Ontario 1990.
[112] K. Smart Associates Limited. "Engineering Inspection Report for Bridge no. 0028 and 0032 MTO site no. 33-119 and 23-49 Township of Wilmot, July 10, 1997.
[113] K. Smart Associates Limited. "Structural Report: Oxford-Waterloo Road Bridge. November 18, 2005.

Today the Oxford-Waterloo Road Bridge still stands in its current location. Over the years it has received repairs since replacement costs have always been too high.

## Bridge Aesthetics and Environment

### Visual Appeal

The bridge has strong visual appeal as it is near "a succession of empty spaces, lofty trees and silent manmade landmarks."[114]

### Integrity

The bridge has high integrity, as it has not been moved from its original location since its construction in 1912.

### Landmark

The bridge is a significant landmark as it represents the transition between Wilmot and Blandford-Blenheim Townships.

### Gateway

It is not a gateway.

## Historical Association

### History of the Oxford-Waterloo Road Bridge

A bridge spanning the Nith River could have existed before the current structure because the Waterloo County Minutes on Roads and Bridges state that $300.00 was spent on a "Bridge between Wilmot and Blenheim" on January 23, 1908.[115] However, this could also be referring to Bridge #30 or 31, also located on the Wilmot Blandford-Blenheim boundary.[116]

### Bridge Group

The bridge belongs to the group of other significant through camelback truss bridges in the Region including the Winterbourne and Chamber's Bridges in Woolwich Township and the Bridge Street Bridge located in Wilmot Township. [117]

### Other Points of Interest

The bridge has also been known as "Bridge No. 37/B-OXF" and "Bridge #32."[118]

[114] The Record. "Taking the Scenic Route." May 14, 2005.
[115] Region of Waterloo, County Minutes. "Road and Bridges." Court House Berlin, January 23, 1908, p. 34.
[116] Spanning the Generations – Phase 1: Inventory, "Oxford-Waterloo Bridge," May 2004, p. 1.11 – 1.12.
[117] Spanning the Generations – Phase 1: Inventory, "Oxford-Waterloo Bridge," May 2004, p. 1.11 – 1.12.

# Oxford-Waterloo Road Bridge

**Location** Concession 4-A, Lots 20 & 21, (now Oxford -Waterloo Road), south of Haysville, Township of Wilmot.

**General Information**

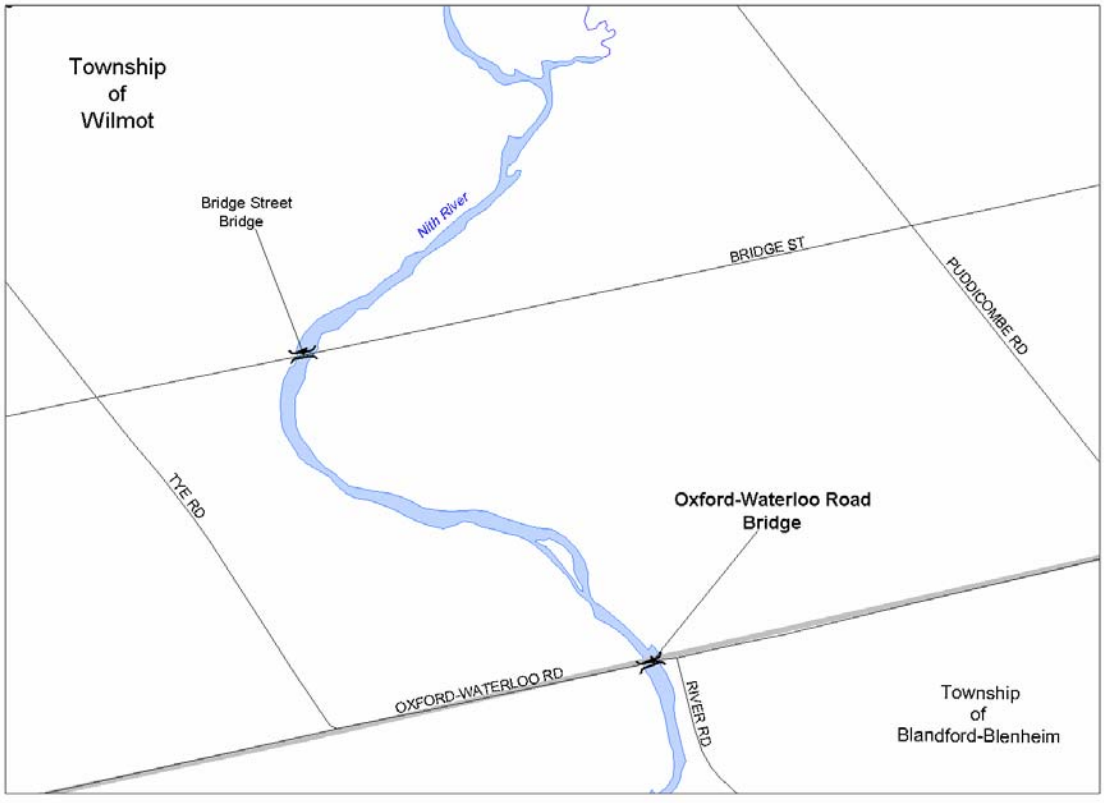
| | |
|---|---|
| *Bridge No* | 00032 |
| *Jurisdiction* | Township of Wilmot |
| *Year built* | 1912 |
| *Drawings* | Not available |

**Physical Components**

| | |
|---|---|
| *Type* | through Truss |
| *Spans* | 1 |
| *Dimensions* | Length 46.6 m<br>Width 3.7 m |
| *Load Limit* | 9 tonnes |

**Descriptive details**

This is a single lane through truss bridge. The maintenance costs are shared with the Township of Blandford-Blenheim and the Township of Wilmot. This bridge appears to be welded.




Source: Planning Housing and Community Services, Region of Waterloo

[118] K. Smarts Associates Limited. "Structural Report: Oxford-Waterloo Road Bridge. November 18, 2005.

# Oxford-Waterloo Road Bridge

## South East View

## South View

# Oxford-Waterloo Road Bridge Bibliography

Charbonneau, Gary. Letter to Jane Steller. 16 July 1997. Re: Bridge Weight By-Laws. Wilmot Township Oxford-Waterloo Road Bridge Folder. Wilmot Township, Ontario, 1997.

County of Waterloo 15 April, 1912. The 48th Session of Wilmot Township Council. The Region of Waterloo Archives, p. 123.

K. Smart Associates Limited. Engineering Inspection Report for Bridge no. 0028 and 0032 MTO site no. 33-119 and 23-49. Township of Wilmot. 10 July, 1997.

K. Smart Associates Limited. Structural Report: Oxford-Waterloo Road Bridge. 18 November, 2005.

King, J. Peter C. The Structural Evaluation of Bridge No. 32 for W.E. Kelley & Associates Limited. 7 March, 1985.

Region of Waterloo, County Minutes. Road and Bridges. Court House Berlin. 23 January, 1908, p. 34.

Region of Waterloo: Planning Housing and Community Services Department. Spanning the Generations – Phase 1: Inventory – Oxford-Waterloo Bridge. May 2004, p. 1.11 & 1.12.

The Record – Kitchener, waterloo & Waterloo Region. NOW SAFE FOR LIGHT LOADS: Wilmot to test strength of bridges. 13 February, 1979

The Record – Kitchener, waterloo & Waterloo Region. Taking the Scenic Route. 14 May, 2005, P.4.

The Record – Kitchener, waterloo & Waterloo Region. Wilmot cuts bridge limit. 16 October, 1984.

Township of Wilmot. Bridge Weight By-Law. 21 November, 2005.

W.E. Kelley & Associates Limited. Engineering Report – Bridge no. 32, Wilmot Blandford-Blenheim Township. 20 March, 1985.

W.E. Kelley & Associates Limited. Letter to Mr. Bruce Cannon, Wilmot Township Engineer. 8 January, 1990. Wilmot Township Oxford-Waterloo Road Bridge Folder. Kitchener, Ontario 1990.

W.E. Kelley & Associates Limited. Letter to Road and Bridge Committee, Township of Wilmot. 10 October, 1984. Wilmot Township Oxford-Waterloo Road Bridge Folder. Kitchener Ontario, 1984.

**4.2.6**

# Bridge Street Bridge

**Score: 48**

**Wilmot Township**

## Documentation

### Builder

The Bridge Street Bridge was built by the Hamilton Bridge Works Company Limited. The plans for the bridge are dated August 1912.[119]

### Age

The Bridge Street Bridge was built in 1913.[120]

## Technology

### Materials

The bridge truss is made of metal and it has a 150mm concrete deck.[121]

### Design/Style

The Bridge Street Bridge is a single span, 8-paneled, welded, through camelback truss bridge.[122] It also has a "concrete deck [resting] on steel I-Beam stringers."[123] The bridge's span is 45.7 metres long and it has a width of 4.1 metres.

### Prototype

The Bridge Street Bridge is not the first existing prototype through camelback truss bridge in Wilmot Township as the Oxford-Waterloo Road Bridge, also located in Wilmot, was built a year earlier.[124]

[119] W.E. Kelley and Associates Limited. Letter to Road and Bridge Committee, Township of Wilmot. October 20, 1981. Wilmot Township Bridge Street Bridge Folder. Kitchener Ontario, 1981.
[120] Spanning the Generations – Phase 1: Inventory, "Bridge Street Bridge," May 2004, p. 1.13 – 1.14.
[121] Ibid.
[122] Ibid.
[123] W.E. Kelley and Associates Limited. Letter to Road and Bridge Committee, Township of Wilmot. October 20, 1981. Wilmot Township Bridge Street Bridge Folder. Kitchener Ontario, 1981.
[124] Spanning the Generations – Phase 1: Inventory, "Bridge Street Bridge & Oxford-Waterloo Road Bridge" May 2004, p. 1.13 – 1.14 & 1.11 – 1.12.

### Structural Integrity

In October of 1981 the Bridge Street Bridge was inspected. At this time it was found that the concrete deck no longer had deck drains, it was spalling, cracking and had been patched previously with other concrete and asphalt. The stringers had some deterioration, and the truss had some surface rusting, and substantial amounts of debris. Also, the ballast walls were cracked throughout, the expansion joints were considered to be in poor condition, and the bearings were covered with debris.[125]

Following this inspection it was decided that the bridge should be repaired as opposed to replaced because it was more economically feasible and would only cost 20% of the cost of replacement. The repairs that the bridge received in 1982 are listed below.[126]

1. Deck removal
2. Insertion of new concrete deck
3. Strengthening the steel for the deck
4. Changing the expansion joints
5. Fixing spalling beneath the bearing seats
6. Fixing other "spalling and deterioration on abutments and wing walls"
7. Changing the I-beam stringer
8. Field cutting and welding
9. Fixing of the handrails

In 1990, a vehicle hit the bridge bending the "vertical member on the north side of the truss at the west end" as well as damaging the handrails located there. This was repaired shortly after.[127] In 1997, another engineering inspection and report was done on the structure. It indicated that the bridge was in relatively good condition and only the bridge's abutments should be refaced within the next five years.[128] In 2005 the bridge was considered to be unsafe, and until repairs were made, its load limit was to remain posted at 11 tonnes.[129]

## Bridge Aesthetics and Environment

### Integrity

The bridge has high integrity, as it has not been moved since its original construction in 1913.

[125] W.E. Kelley and Associates Limited. Letter to Road and Bridge Committee, Township of Wilmot. October 20, 1981. Wilmot Township Bridge Street Bridge Folder. Kitchener Ontario, 1981.
[126] W.E. Kelley and Associates Limited. Letter to Road and Bridge Committee, Township of Wilmot. October 20, 1981. Wilmot Township Bridge Street Bridge Folder. Kitchener Ontario, 1981.
[127] W.E. Kelley and Associates Limited. Letter to Mr. Bruce Cannon, Wilmot Township Engineer. January 8, 1990. Wilmot Township Bridge Street Bridge Folder. Kitchener Ontario, 1990.
[128] K. Smart Associates Limited. "Engineering Inspection Report for Bridge No. 0028 & 0032 MTO site no. 33-119 and 23-49 Township of Wilmot. July 1997.
[129] K. Smart Associates Limited. "Structural Report: Bridge Street Bridge." November 18, 2005.

### Landmark

The bridge is a significant landmark as it is one of a pair of nearly identical through camelback truss bridges in Wilmot Township. The other bridge is the Oxford-Waterloo Road Bridge just south of this location.

### Gateway

The bridge provides a gateway on Bridge Street in Wilmot Township. It also provides a connection from New Dundee to Haysville.[130]

## Historical Association

### Bridge Group

The bridge belongs to the group of other significant through camelback truss bridges in the Region. These other bridges include the Chambers and Winterbourne Bridges in Woolwich Township and the Oxford Waterloo Road Bridge located to the south in Wilmot Township.

### Other Points of Interest

This bridge is located upstream from the Oxford-Waterloo Road Bridge and is identical except for its higher load limit of 11 tonnes. [131] The Oxford-Waterloo Road Bridge only has a load limit of 9 tonnes.[132]

The Bridge Street Bridge has also been known as "Bridge #28" and "Bridge #34/B-T9."[133]

[130] Spanning the Generations – Phase 1: Inventory, "Bridge Street Bridge," May 2004, p. 1.13 – 1.14.
[131] Ibid.
[132] Spanning the Generations – Phase 1: Inventory, "Oxford-Waterloo Bridge," May 2004, p. 1.11 – 1.12.
[133] W.E. Kelley and Associates Limited. Letter to Road and Bridge Committee, Township of Wilmot. October 20, 1981. Wilmot Township Bridge Street Bridge Folder. Kitchener Ontario, 1981. & K. Smart Associates Limited. "Structural Report: Bridge Street Bridge." November 18, 2005.

# Bridge Street Bridge

**Location** Wilmot Township Road 9, Lot 21, Concessions 3 & 4 Block A (now Bridge Street), south of Haysville, Township of Wilmot.

**General Information**

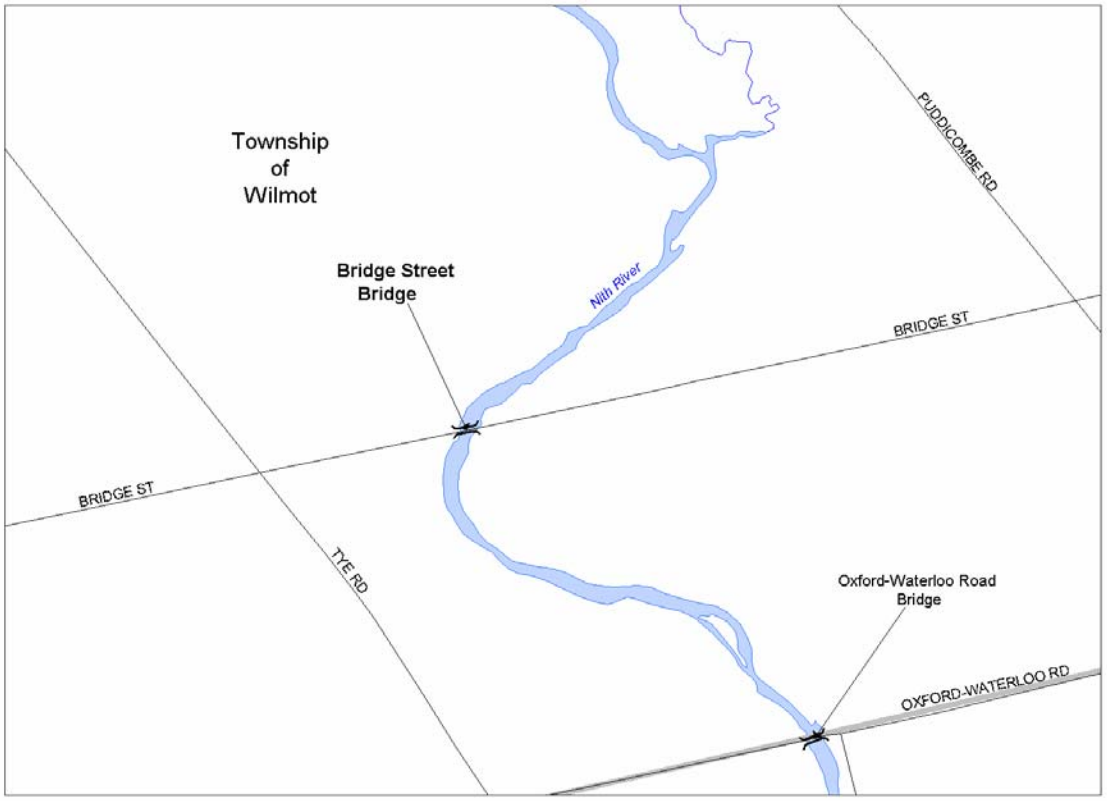
| | |
|---|---|
| *Bridge No.* | 28 |
| *Jurisdiction* | Township of Wilmot |
| *Year built* | 1913 |
| *Drawings* | Not available |

**Physical Components**

| | |
|---|---|
| *Type* | through Truss |
| *Spans* | 1 |
| *Dimensions* | Length 45.7 m<br>Width 4.1 m |
| *Load Limit* | 11 tonnes |

**Descriptive details**

This bridge is identical in design to the Oxford - Waterloo Bridge, except that it has a higher load limit.




Source: Planning Housing and Community Services, Region of Waterloo

# Bridge Street Bridge

## South East View


## East View

# Bridge Street Bridge Bibliography

K. Smart Associates Limited. Engineering Inspection Report for Bridge No. 0028 & 0032 MTO site no. 33-119 and 23-49 Township of Wilmot. July 1997.

K. Smart Associates Limited. Structural Report: Bridge Street Bridge. 18 November, 2005.

Region of Waterloo: Planning Housing and Community Services Department. Spanning the Generations – Phase 1: Inventory – Bridge Street Bridge & Oxford-Waterloo Road Bridge. May 2004, p. 1.11 – 1.12 & 1.13 – 1.14.

Township of Wilmot. Bridge Weight By-Law. 21 November, 2005.

W.E. Kelley and Associates Limited. Letter to Mr. Bruce Cannon, Wilmot Township Engineer. 8 January 1990. Wilmot Township Bridge Street Bridge Folder. Kitchener Ontario, 1990.

W.E. Kelley and Associates Limited. Letter to Road and Bridge Committee, Township of Wilmot. 20 October, 1981. Wilmot Township Bridge Street Bridge Folder. Kitchener Ontario, 1981.

**4.2.7**

# Winterbourne Bridge

**Score: 52**

**Woolwich Township**

## Documentation

### Builder

The builder of the Winterbourne Bridge is unknown.

### Age

The Winterbourne Bridge was built in 1913.[134]

## Technology

### Materials

The bridge has a steel frame and a transverse laminated timber deck. Also, the bridge has "light steel rails" for barriers.[135]

### Design/Style

This bridge is a two-span, steel through camelback truss bridge.[136]

### Prototype

The Winterbourne Bridge is the oldest existing through camelback truss bridge in Woolwich Township. However, in the Region of Waterloo, the Oxford-Waterloo Road Bridge located in Wilmot Township is the oldest existing through camelback truss bridge being built in 1912, a year earlier than the Winterbourne Bridge.

### Structural Integrity

In 1900, the previous Winterbourne Bridge received new flooring at a cost of $352.[137] In 1983, a decision was made by council to give the current Winterbourne Bridge a $28,000 facelift. This

[134] Spanning the Generations – Phase 1: Inventory, "Winterbourne Bridge," May 2004, p. 1.19 – 1.20.
[135] Ibid.
[136] Ibid.
[137] Region of Waterloo Archives. Grand River Bridge at Winterbourne, 1800s-1900s, p. 37.

involved replacing the oak deck as opposed to spending $650,000 to build a new bridge.[138] In early July 2001 the "bridge deck was seen to have large holes" in several places. This occurred because drivers began to use the bridge more often because of the closure of the Conestogo Bridge. [139] However, these holes were soon repaired by a crew of Old Order Mennonites.[140] The cost of this repair was between $30,000 to $35,000. Later on that summer the bridge's wooden deck was coated with a tar and chip surface to extend its lifespan.[141] Currently the bridge is in need of repair with its 10-tonne load limit and 20km/hr speed limit. [142]

## Bridge Aesthetics and Environment

### Visual Appeal

Winterbourne Bridge has a very strong visual appeal. It has been captured by a local aerial photographer, Mr. Carl Hiebert. He describes the Winterbourne Bridge aerial photo that he took as:

"WINTERBOURNE – Every year, for a few mornings late summer, I am treated to mesmerizing "steam fog" along lakes and rivers. The water has reached its maximum seasonal temperature while, the land, with shorter days, begins to cool. By nightfall, the river is a warm moisture source for the cooling air mass above. With clear skies and no winds, heavy fog is virtually guaranteed. Finally, the morning sun reveals a fantasy land where bridges are ghostly apparitions and the world ends just a few feet past my wingtip."[143]

Also, the bridge is so beautiful that it has even been painted by a famous local artist Mr. Peter Etril Snyder. His painting and description of the bridge is following.

**Iron Bridge, Winterbourne Area**
By Peter Etril Snyder

[138] The Record. "Bridge Receives facelift. May, 1983.
[139] Elmira Independent. "Detour causing havoc on peel Street Bridge. July 13, 2001.
[140] The Record. "Closures spark bridge rage." July 9, 2001.
[141] The Record. "Winterbourne – Grand River Bridge may open Monday." July 14, 2001.
[142] Ibid.
[143] Carl Hiebert. The Grand River: An Aerial Journey, 2003, p. 8.

> *"I realize that sadly it will be only a few years until this elegant skeletal bridge will be dismantled and replaced by a concrete model that more resembles a bunker spanning the river. Endangered by rust and rulings, this once elegant long-lined thoroughbred now straddles the water with more grit than grace. A crossing shows the structure to be arthritic, emitting a tuberculean rumble from her decking as cars cautiously proceed. I have tried to paint my version of so many of these creatures from the early nineteen hundreds. Their days are numbered and so are mine*."[144]

It has also been said by Samm Mackay of the Kitchener-Waterloo Record that "the best views by far, are from the old fashioned, high, iron bridges [like the Winterbourne Bridge] on our country roads. They offer superb glimpses of both streams and valleys."[145] The view was so beautiful that artist Mr. Peter Etril Snyder decided to paint the view seen from the Winterbourne Bridge.

**Bordering the Grand near Winterbourne**
By Peter Etril Snyder

## Integrity

The bridge has high integrity, as it has not been moved from its original location in 1913.

## Landmark

The bridge is a prominent landmark as it is the only significant double span camelback Pratt through truss bridge in the Region. Also, the bridge "has an imposing iron superstructure…[when] a Mennonite buggy clip clops across, [one] can easily imagine that [they've] just been transported backward in time a hundred years or so ago."[146]

## Gateway

It is a gateway to the village of Winterbourne.

[144] Snyder, Peter Etril, Online Gallery, "Iron Bridge, Winterbourne Area", March 3, 2006.
[145] The Record. "Old bridges add such character." December 17, 1994.
[146] Ibid.

## Character Contribution

The rustic steel bridge strongly contributes to the peaceful environment of the surrounding area.

## History of Winterbourne

Between 1834 and 1837 is when most Scottish settlers moved into the Winterbourne area. At this time, Winterbourne was called, "Cox's Creek" after Michael Cox, a "blacksmith who lived on the south side of the creek."[147] In 1854, a Mr. Thomas Lamphier moved into the area and renamed the village Winterbourne, after his hometown in England.[148] Mr. Lamphier was the first to dam Cox's Creek and build a saw and gristmill at the site. The following photograph shows where Cox's Creek has been dammed. Then in 1855 he had his land surveyed and divided into individual building lots. The village started off with these two mills until other developments on his lots began to grow around them including a post office, hotel, general store, Presbyterian and Methodist churches and other services. Today Winterbourne is located along Katherine Street at Peel Street, in Woolwich Township.[149]

*Winterbourne Dam, Waterloo County Scenic Calendar, 1944*

*Source:* Region of Waterloo Website: Historic Place Names of Waterloo County.

[147] Robert Mackie, The Northern Grand River, 2002, p. 8.
[148] John Fisher, A Guide to Pleasant Places and Journeys of Historic Interest within the County of Waterloo., 1867-1967, pp. 30.
[149] Region of Waterloo Website, "Historic Place Names of Waterloo County - Winterbourne, Woolwich Township", March 28, 2006.

## History of the Winterbourne Bridge

The first mention for construction of a bridge in Winterbourne over the Grand River was on February 25, 1856, when a petition was submitted to council by a Mr. James Burnett and others. After this petition was submitted, it was stated that by the next council session there should be plans brought forward for a bridge to be built at Winterbourne where the most suitable plans would be offered a premium of £7.10. In May of 1856 a plan submitted by Mr. D.W. Gingrich was selected by council for construction at the Winterbourne location. Then on December 27 of the same year tenders were received from Messrs John Tyson and William Baldwin, however they were too high, and new tenders were sought that were no more than £400 to $1,600. In the summer of 1889, this bridge was deemed unsafe, and in November and December of the same year new tenders were submitted for the construction of a new bridge. In 1890 a new bridge was constructed at the site by a Mr. Michael Boyle for $2,909. On April 25, 1893 Mr. James Stall and Mr. Samuel S. Snyder were charged with contracting for the rebuilding of the bridge as it had been swept away by the spring freshet. The cost of rebuilding was $2,962.28. In October of 1903, measurements indicated that the bridge was 348 feet long by 16 feet wide. This bridge must have been demolished sometime between 1903 and 1913 to make a way for the current Winterbourne Bridge, constructed at the site in 1913.[150]

## Historic Association

## Bridge Group

The Winterbourne Bridge belongs to the group of through camelback truss bridges in Waterloo Region. The other through camelback truss bridges in the Region includes the Oxford-Waterloo Road, the Chamber's and the Bridge Street Bridges.[151] The main difference between these bridges and the Winterbourne Bridge is that the Winterbourne Bridge is a two-span and the others are single span bridges.

[150] Region of Waterloo Archives. Grand River Bridge at Winterbourne, 1800s-1900s, p. 19-37.
[151] Spanning the Generations – Phase 1: Inventory, "The Oxford-Waterloo, Chambers & Bridge Street Bridges." May 2004.

# Winterbourne Bridge

**Location** MTO Site No. 033-0049, Peel Street, west of Winterbourne, Township of Woolwich.

**General Information**

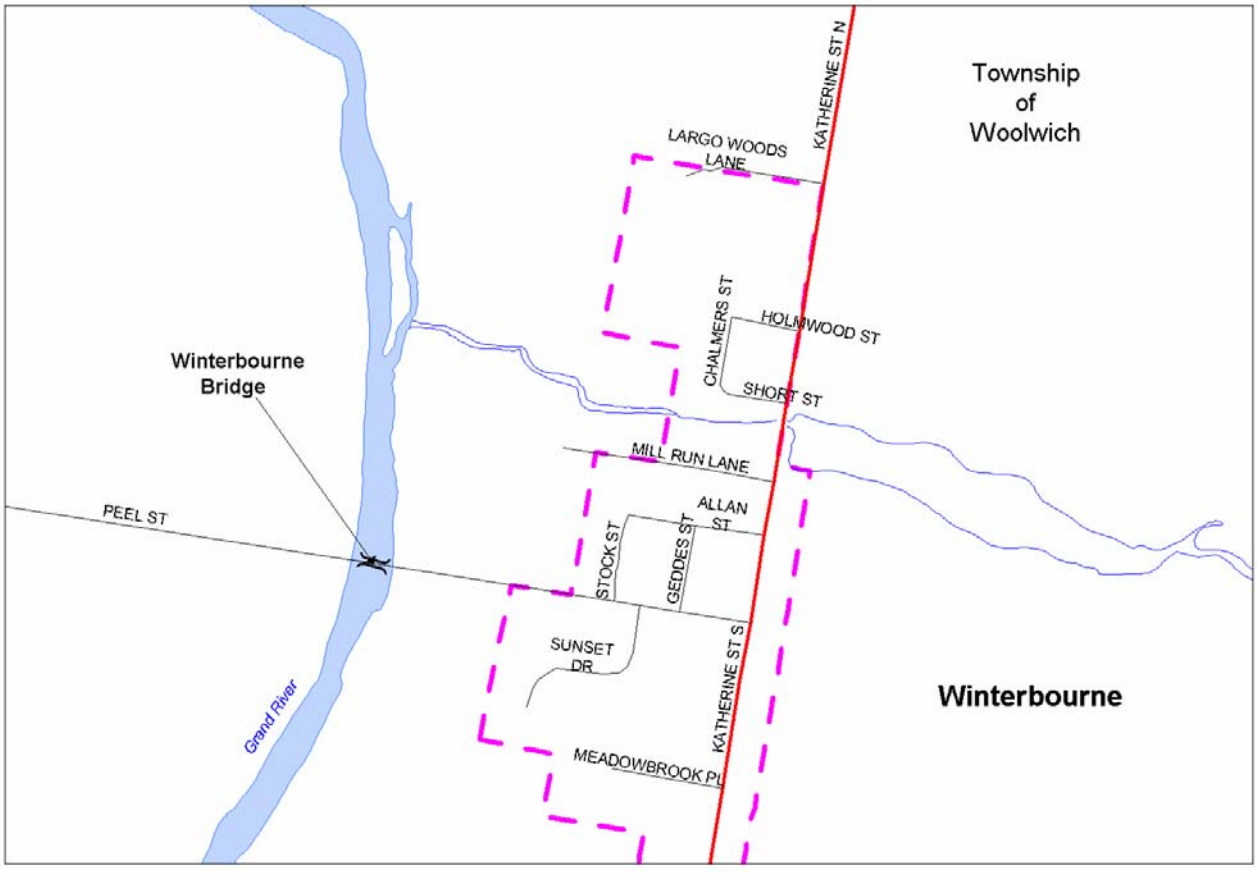
| | |
|---|---|
| *Bridge No.* | 270148 |
| *Jurisdiction* | Township of Woolwich |
| *Year built* | 1913 |
| *Drawings* | Not available |

**Physical Components**

| | |
|---|---|
| *Type* | through Truss |
| *Spans* | 2 |
| *Dimensions* | Length 95 m<br>Each span 46.9 m<br>Width 4.3 m |
| *Load Limit* | 10 tonnes |

**Descriptive details**

This is a two-span steel through truss bridge. The deck consists of transverse laminated wood. Light steel pipes act as barrier rails.




Source: Planning Housing and Community Services, Region of Waterloo

# Winterbourne Bridge

## North View

## North West View

# Winterbourne Bridge Bibliography

Elmira Independent. Detour causing havoc on Peel Street Bridge. 13 July, 2001.

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Hiebert, Carl. The Grand River: an aerial journey. Cambridge Ontario: Grand River Conservation Foundation, 2003, p. 8.

Mackie, Robert. Waterloo Historical Society Tour Guides. The Northern Grand River. 2002, p. 8

Region of Waterloo Archives. The Grand River Bridge at Winterbourne. Waterloo, Ontario, 1800s-1900s.

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Region of Waterloo: Planning Housing and Community Services Department. Spanning the Generations - Phase 1: Inventory – Winterbourne Bridge. May 2004, p. 1.03 -1.04.

Snyder, Peter Etril, Online Art Gallery. Iron Bridge, Winterbourne Area. http://www.snyder-gallery.com/, 18 July, 2007.

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The Record – Kitchener, Waterloo & Waterloo Region. Closures spark bridge rage. 9 July, 2001.

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The Record – Kitchener, Waterloo & Waterloo Region. WINTERBOURNE – Grand River bridge may open Monday. 14 July, 2001.

**4.2.8**

# Piper Street Steel Truss

## Slabtown

**Score: 58**

**North Dumfries Township**

## Documentation

### Builder

The builder of the Piper Street Steel Truss Bridge is unknown. The bridge was maintained by North Dumfries Township, until it became privately owned by Mr. Harold G. Taylor around 1950 although it is believed that he never did prove his ownership of the bridge. From 1965 to 1985 it was owned by a Mr. John G. Welsh and since 1985 it has been privately owned by Lyle and Theresa St. Peter of Ayr.[152]

### Age

The exact age of the current Piper Street Steel Truss Bridge is also unknown but it is believed that it was built in 1915 +/-10 years.[153]

## Technology

### Materials

The Piper Street Steel Truss Bridge trusses are made of steel pipe/rods 2.5 X 3 inches run from corners back into the ramping and its deck is made with 2 x 4 inch wooden planks as stringers. Also, the bridge has been riveted together; therefore it probably needed a highly skilled bridge crew to assemble it. If it had been pin-jointed together, it could have been easily secured by hand.[154]

[152] Spanning the Generations – Phase 1: Inventory, "Piper Street Bridge," May 2004, p. 1.09 – 1.10 & Andrew W. Taylor, Our Today's and Yesterdays, 1952, p. 224.
[153] Spanning the Generations – Phase 1: Inventory, "Piper Street Bridge," May 2004, p. 1.09 – 1.10.
[154] Spanning the Generations – Phase 1: Inventory, "Nithvale Bridge," May 2004, p. 1.03 – 1.04 & Grand Old Bridges: The Grand River Watershed Bridge Inventory, Appendix A, Grand River Watershed Bridge Inventory, A Preliminary Listing of Bridges with Significant Heritage Value Contributing to the Heritage River designation of the Grand, Speed, Eramosa, Conestogo and Nith Rivers, April 5, 2004, p. 22.

## Design/Style

The Piper Street Steel Truss Bridge is a single lane, single span, riveted through Pratt truss bridge.[155]

## Prototype

The Piper Street Steel Truss Bridge is not the prototype of Pratt truss bridges in North Dumfries Township or in the Region of Waterloo because the Nithvale Bridge, also located in North Dumfries Township was built earlier in 1873. However, it is the oldest surviving riveted truss bridge in North Dumfries.[156]

## Structural Integrity

A bridge must have preceded the current Piper Street Steel Truss structure as documentation was found that indicated that the Bridge was repaired in 1856. It also said that a saw miller, Mr. Robert Anderson and a Mr. Robert Hall assisted in this repair by supplying the deck planks and by placing them in respectively. It also said that in 1872 a Mr. William Hall removed the structure and a contractor, named Mr. Richard Lewis, built a new bridge. In 1880, the Bridge became the responsibility of the County.[157] This bridge may have been the last bridge to exist at the site before the current structure was built around 1915.

Around 1950, North Dumfries Township no longer took responsibility for the maintenance of the bridge and ownership was believed to be given to a Mr. Harold G. Taylor.[158] He, apparently did not own the bridge as he never had any deeds to prove it.[159] In 1965 Mr. John G. Welsh acquired ownership of the structure and the land until it was sold to the current owners, Walter and Theresa Bildstein in 1985 or 1986 and then Lyle and Theresa St. Peter in year 2000.

Since 1985, the bridge has been repaired numerous times. In 1997, they replaced the bridge deck and added a 3" thick ash surface 4 X 24 X 16 inches. However deck repair has always been an ongoing process: as deck planks would become lose they would be replaced. Around 1998, the foundation of the bridge's abutments was crumbling and additional cement fill was placed in the cracks to help support them. However, this did not hold for very long and in 2003, the St. Peter's received a letter from the Grand River Conservation Authority, indicating that they were concerned that the bridge abutments were crumbling and unsafe and reminded the St. Peter's that they would be liable for any bridge related accident that could occur. The St. Peter's agreed to mend the abutments. In 2004, they did major foundation work on the faces of the abutments and there have been no significant repairs done to the structure since that time.[160]

[155] Spanning the Generations – Phase 1: Inventory, "Piper Street Bridge," May 2004, p. 1.09 – 1.10.
[156] Spanning the Generations – Phase 1: Inventory, "Nithvale Bridge," May 2004, p. 1.03 – 1.
[157] Andrew W. Taylor, Our Today's and Yesterdays, 1952, p. 224.
[158] Ibid.
[159] St. Peter, Theresa (Current Bridge Owner). Personal Interview. May 11, 2006
[160] Ibid.

# Bridge Aesthetics and Environment

### Visual Appeal

The bridge has strong visual appeal with its old rustic appearance. It also acts as a focal point on the St. Peter's farm. This can be viewed in the following photograph.

### Integrity

It is believed that Piper Street Steel Truss Bridge has not been moved from its original location

### Landmark

The Piper Street Steel Truss Bridge is a significant landmark as it reminds people of the previous settlement of Slabtown that held a sawmill and smaller houses surrounding it to house its workers.[161]

### Gateway

The bridge spans the Nith River and connects to Piper Street in the north, which eventually leads to the village of Ayr.

### Character Contribution

The bridge's rustic appearance provides a strong sense of character that contributes to its surrounding rural landscape. The following photo depicts this.

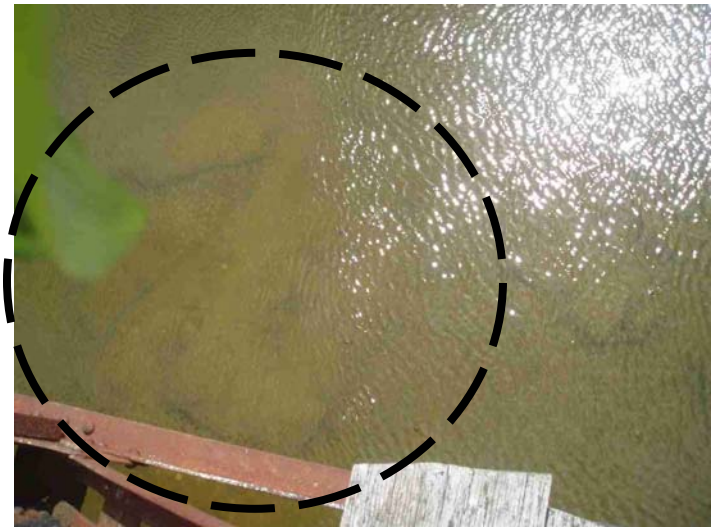
[161] Andrew W. Taylor, Our Today's and Yesterdays, 1952, p. 224.

## History of Piper Street Area

The bridge is located just past J & R Hall Transport in a place that used to be called Slabtown. Slabtown was a historic hamlet just west of Nithvale and was not well known except for the fact that it had a sawmill with shelters beside it for its workers. [162] It is thought that the owner of this mill was possibly a Mr. Wilks Lamberton, since found documentation indicates that in 1842 he was listed as owning a mill at Slabtown."[163] Just east of Slabtown but west of Nithvale along the south bank of the Nith River a Mr. Walter Gladstone had a chair factory, called "Nithvale Chair Factory."[164]

## History of the Piper Street Steel Truss Bridge

Current owner, Theresa St. Peter believes that there was definitely a previous structure located at the site of the Piper Street Steel Truss Bridge as there are vast amounts of cement located in the river below the structure. She believes that there may have been a central pier that existed at the site and therefore the bridge also could have been a double span structure.[165] This is shown in the following photograph. A local resident also said that the bridge had been relocated from another site to its present location either in 1928 or 1929.



## The Site of the Bridge

The earliest found documentation of ownership of the land on which the bridge sits, was on July 1, 1824 where a Mr. "Wilks Lamberton purchased 260 acres, which was lot 38, concession 7" in Ayr.[166] It is known that he still owned the site until 1842 as it was said that in this year he was listed as owning a mill on the site. However, looking at the 1861 Tremaine map it is evident that Mr. Lamberton no longer owned the property as land ownership on this map showed a Mr. Robert Morton

[162] Heidi Ostner, Personal Interview, January 27, 2006 & Andrew W. Taylor, Our Today's and Yesterdays, 1952, p. 224.
[163] Andrew W. Taylor, Our Today's and Yesterdays, 1952, p. 218.
[164] WHS, 1951, p. 19.
[165] St. Peter, Theresa (Current Bridge Owner). Personal Interview. May 11, 2006
[166] Andrew W. Taylor, Our Today's and Yesterdays – Early Land Deals, 1952, p. 218.

and Mr. James Edgar having ownership. [167] Mr. Robert Morton owned this site in 1860 too as it was said that after a river washed away a good part of the township, "Robert Morton was paid $75 for which he agreed to take down his fences and let people travel through his field for as long as such a roadway was needed." Mr. Robert Morton must have still owned the site until at least 1881, as the 1977-1881 Parsell Map shows that he occupied the site. We are unsure of who owned the land after 1881 until around 1950 when Mr. Harold G. Taylor was indicated as owning the site. From 1965-1985 Mr. John G. Welsh owned the site and since 1985, Lyle and Theresa St. Peter have occupied the site.

The present site has the bridge located in the middle of the St. Peter's 50-acre property as this is where the Nith River flows. There is a large green barn at the north end of the site located approximately 100 yards from the bridge, and about 25 feet from the road. The site also has some old animal farm pens, horse shelters, farm equipment and ruins from the original saw mill that was located there. The building that you see in the above photograph (page 68) is the home of Brian Stapleton located on the adjacent property to the St. Peters.

**The House Beside the Bridge (1860)**

This five or six acres of land was originally owned by a Mr. Hall around the 1800's who constructed a wooden house on the site around 1860 near the river. It is possible that the "Hall" that lived on this site could have been either Robert Hall who repaired the deck planks of the Piper Street Steel Truss Bridge in 1856, or he could have been the William Hall that removed the structure in 1872. However, this is not certain. Following the Hall ownership, the site was then acquired by Courtney Gillard, then a Mr. Harold G. Taylor and now the site is currently owned by Mr. Brian Stapleton.[168]

## Historic Association

The location of the Piper Street Steel Truss Bridge has a connection to an event that happened during the Mackenzie Raiders Rebellion of 1837. This rebellion of Upper Canada was between the rebels and the redcoats who wanted to remove the power of the wealthy and English nobles. At Nithvale there was a drilling station, by the park where milling station was, demolished in 1824, for this battle, and near the Piper Street Steel Truss Bridge. It is believed there was a battle and blood was shed.[169]

**Bridge Group**

The Piper Street Steel Truss Bridge is one of two Pratt Truss bridges located in North Dumfries Township. The other bridge that belongs to this set is the Nithvale Bridge. Being in close proximity to each other, "during major flood periods on the Nith River, [both] usually suffered the same fate." "When the river damaged one, it often damaged [them both]."[170] However, the Piper Street Steel Truss Bridge has been built with heavier construction than the Nithvale Bridge.[171]

[167] Waterloo County 1861, Tremaine Map.
[168] St. Peter, Theresa (Current Bridge Owner). Personal Interview. May 11, 2006
[169] Ibid.
[170] Andrew W. Taylor, Our Today's and Yesterdays, 1952, p. 224.
[171] St. Peter, Theresa (Current Bridge Owner). Personal Interview. May 11, 2006

## Other Points of Interest

The Piper Street Steel Truss Bridge has also been called Nithvale and Slabtown Bridge in the past. The bridge was often called the Piper Street Bridge since it was located close to Piper Street. The name Slabtown was used as local slang name for the bridge because once there was a sawmill located by it with roughly constructed shelters for the workmen surrounding it. Or, it also could have been called "Slabtown" because around the site of the sawmill there were 15-20 foot long slabs of wood. Today, the ruins of the sawmill including the old millrace located near the bridge can still be seen.

In the past, North Dumfries and Blandford-Blenheim Townships were dually responsible for the Piper Street Steel Truss Bridge because of its close proximity to the county line. This meant that Council from both townships would have to agree on when the bridge would receive maintenance.[172]

The bridge that is often confused with the Piper Street Steel Truss Bridge is the Village of Ayr's main street bridge, the Stanley-Piper Street Bridge located on Piper/Stanley Streets. This is because both bridges have been called the Piper Street Bridge and since both cross the Nith River they usually suffered the same fate during flood periods.

## Current Condition

The bridge is no longer open to the public since its road closure and with the construction of two new Nith River bridges along the town line between North Dumfries and Blenheim in 1965 and 1966. However, the bridge, with its 3-tonne load limit, is still privately used by its owner to drive farm equipment over the river regularly.

## Future Plans for the Bridge

Theresa St. Peter would like a new plaque made for the bridge that indicates the builder of the structure, the year it was constructed and the name "Nithvale Bridge." She wants the bridge to be recognized as the Nithvale Bridge and not the Piper Street Steel Truss or Slabtown Bridge. She also wants to ensure that people that walk over and view the structure see its importance and know its real name: The Nithvale Bridge.[173]

[172] Andrew W. Taylor, Our Today's and Yesterdays, 1952, p. 224.
[173] St. Peter, Theresa (Current Bridge Owner). Personal Interview. May 11, 2006

# Piper Street Steel Truss (Abandoned)

**Location** Located 0.2 km East of the Town Line (now Trussler Road) and 0.05 km south of Piper Street, near Ayr, Township of North Dumfries.

**General Information**

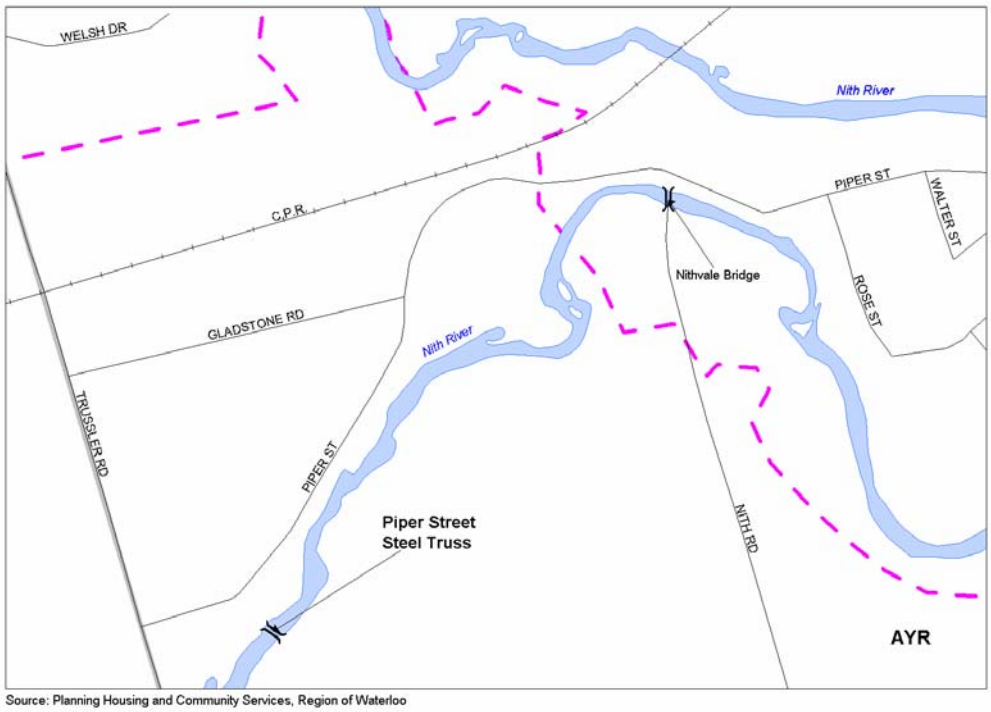
| | |
|---|---|
| *Bridge No* | N/A |
| *Jurisdiction* | Private Owner |
| *Year built* | 1915 +/- 10 years |
| *Drawings* | Not available |

**Physical Components**

| | |
|---|---|
| *Type* | through Truss |
| *Spans* | 1 |
| *Dimensions* | Not known |
| *Load Limit* | None posted |

**Descriptive details**

This is a single lane, riveted through truss bridge. It is no longer maintained by the North Dumfries Township, but by a private land owner. The owner has replaced the old deck with 2x8 wooden planks within the past year, and there is ongoing interest by the GRCA that the crumbling abutments be repaired. The deck has a load limit of at least three tonnes for the owner drives farm tractors across the river quite regularly. This bridge is of the Pratt Truss bridge design, the same as the other early trusses, only this bridge is welded, rather than pin-jointed. This bridge was referred to as the Slabtown Bridge.



Source: Planning Housing and Community Services, Region of Waterloo

# Piper Street Steel Truss (Abandoned)

## East View

## West View

# Piper Street Steel Truss Bridge Bibliography

Author Unknown (Located in Piper Street Bridge File, Region of Waterloo). Piper Street Bridge. 1971, pg. 43.

Grand River Conservation Authority. Grand Old Bridges: The Grand River Watershed Bridge Inventory, Appendix A, Grand River Watershed Bridge Inventory, A Preliminary Listing of Bridges with Significant Heritage Value Contributing to the Heritage River designations of the Grand, Speed, Eramosa, Conestogo and Nith Rivers." 5 April, 2004, pp. 22.

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St. Peter, Theresa (Current Bridge Owner). Personal Interview. 11 May, 2006

Stockton, Margaret. Rebellion on the Townline 1837, the Blenheim-Dumfries Rebels. Woodstock Ontario: 1992.

Taylor, Andrew W. Our Today's and Yesterdays. Ontario, Canada: 1952.

Taylor, Andrew W. Our Today's and Yesterdays. Ontario, Canada: 1970, p.p. 224.

Waterloo County. Tremaine Map. 1861.

Walter Gladstone. WHS. 1951:19.

**4.2.9**

# Blackbridge Road Bridge

**Score: 62**

**City of Cambridge**

## Documentation

### Builder

The designer and builder of the bridge are unknown.

### Age

Blackbridge was probably built circa 1916, but this has not been confirmed by a primary source[174]. During the 1989 repairs to the bridge, a wooden timber with '1916' stamped on the bottom was uncovered, suggesting that the bridge was built during this year or after. The 1989 repairs included the re-planking of the wooden deck, which was last replaced in 1931. Also, the single-lane, steel truss design suggests it was built at the beginning of the 20th Century, making it one of our oldest bridges.

## Technology

### Materials

Blackbridge is made of steel.

### Design/Style

The bridge is a single-lane, pin-jointed, steel truss bridge.

### Prototype

The design of Blackbridge Road Bridge was common 100 years ago. However, in today's standards it could be considered unique in that it uses steel truss construction with riveted joints[175].

[174] Spanning the Generations – Phase 1: Inventory, "Blackbridge Road Bridge," May 2004, p. 1.21 – 1.22.
[175] "Cambridge Landmarks: Black Bridge Road" Cambridge Times, January 11, 1997.

### Structural Integrity

In 1984, it was determined that the bridge was in poor shape and in need of repair. The supporting walls were weak and needed reinforcement, and all concrete areas needed stabilization to assure safety. Therefore, $25,000 was allocated for needed repairs to the bridge with the expectation that these repairs would last for five years[176]. The bridge was reconstructed in 1996 in light of its impending heritage designation. Later on the bridge got new concrete abutments and steel girders holding up a concrete deck[177]. Although repairs to the bridge were significant, they were unobtrusive and the bridge has maintained its original form.

## Bridge Aesthetics and Environment

### Visual Appeal

The Blackbridge is an excellent example of structural engineering of its time, and the open-concept allows an unrestricted view of the landscape.

### Integrity

It remains at its original location.

### Landmark

The bridge is locally known because of the publicity generated from oil truck accident in 1987.

### Character Contribution

The Blackbridge's appearance contributes to the scenic countryside and makes an important contribution to the streetscape[178].

## Historic Association

The Blackbridge Road was part of the historic Block Line. The Block Line was generally the southern boundary of the German Company Tract. The future Waterloo Township was purchased from the Six Nations Indians on May 10th, 1798, by Richard Beasley, James Wilson and John B. Rosseaux. Much of the land was later purchased by the German Company. The Block Line was a very important boundary in Waterloo County, and is shown in several historic maps[179].

The Blackbridge has been repaired over the years as needed. The wooden deck was re-planked in 1931. The steel structure was repaired in 1976, and again in 1982. In 1984 Blackbridge was repainted

[176] "Black Bridge gets $25,000 facelift" Cambridge Reporter, July 5, 1984.
[177] "Almost Done…" Cambridge Reporter, September 21, 1996
[178] "Committee wants to protect bridge" Cambridge Reporter, February 18, 1997
[179] Nagel, James "The Block Line" WHS, 1959:46.

at a cost of $25,000. The wooden deck was replaced in 1989. The repairs cost $675,000 in 1996. On February 22, 1997 the City of Cambridge declared Blackbridge as a heritage site[180] and started the process to get the bridge designated under the Ontario Heritage Act[181].

**Bridge Group**

Blackbridge Road Bridge is the only steel bridge in the City of Cambridge.

**Human Interest**

In 1987, a very large oil truck rumbled down Town Line Road in winter and made a left turn onto Blackbridge Road. The truck weighed 70 tonnes, and the bridge load limit was posted as 4.5 tonnes. The truck jack-knifed up the hill towards the railway bridge and slid backwards. Stranded, the driver called a taxi, left his truck and went home, leaving the truck imprisoned between the bridges (the Blackbridge Road Bridge and the Railway Bridge). The next day the oil was pumped into smaller trucks to lighten the load[182].

According to Cambridge's local Architecture Conservation Advisory Committee the bridge is a well-preserved example of a construction style now rarely used. It dates from city's early history and it "makes an important contribution to the streetscape[183]."

[180] "Bridge named heritage site." Cambridge Times, February 25, 1997
[181] "Council wants to protect bridge." Cambridge Reporter. February 25, 1997
[182] "Trucker tempts fate with 70-tonne tanker." Cambridge Reporter. February 2, 1987.
[183] "Committee wants to protect bridge" Cambridge Reporter, February 18, 1997

# Blackbridge Road Bridge

**Location** Blackbridge Road over Speed River, 2.4 km East of Regional Road 24 (now Hespeler Road), north end of Cambridge**.**

**General Information**

| | |
|---|---|
| *Bridge No.* | Blackbridge Road |
| *Jurisdiction* | City of Cambridge |
| *Year built* | 1916 |
| *Drawings* | Not available |

**Physical Components**

| | |
|---|---|
| *Type* | Single Lane Pratt Truss |
| *Spans* | 1 |
| *Dimensions* | Length 35 m |
| *Load Limit* | 4.5 tonnes |

**Descriptive details**

This is a single lane Pratt truss bridge on an old gravel road that connected Cambridge to Guelph. The bridge crosses the Speed River at the north end of Cambridge and is located at the bottom of a gully. The deck consists of laminated wooden timbers covered with tar and chip. (There is some confusion among the media sources as to whether or not this is a steel or iron structure. At a glance the red oxidation of the metal would indicate wrought iron but wrought iron erodes in bubbles whereas steel erodes in layers. This bridge is most likely made of steel). It has undergone extensive repairs in the last 13 years.

Source: Planning Housing and Community Services, Region of Waterloo

# Blackbridge Road Bridge

## South View

## East View

# Blackbridge Road's Bridge Bibliography

Brewster, W. La Rue de Commerce. The Lower Block. Cambridge Archives, 1954: 16-17

Cambridge Times. Cambridge Landmarks: Black Bridge Road. 11 January 1997.

Cambridge Reporter. Committee wants to protect bridge. 18 February, 1997

Cambridge Reporter. Trucker tempts fate with 70-tonne tanker. 2 February, 1987.

Cambridge Reporter. BLACK BRIDGE To close in fall. 10 June 1995.

Cambridge Reporter. Almost Done… 21 September, 1996

Cambridge Times. Bridge named heritage site. 25 February 1997.

Cambridge Reporter. Black Bridge gets $25,000 facelift. 5 July, 1984.

Cambridge Reporter. Council wants to protect bridge. 25 February 1997.

Cambridge Reporter. Council wants to protect bridge. 25 February, 1997.

Cambridge Reporte. Bridges pose problems head on. 11 February, 1989.

Cambridge Reporter. Black Bridge gets $25,000 facelift. 5 July 1984.

City of Cambridge. Corporate Archives. Blackbridge Road Sepia Photograph. Circa 1910.

M. M. Dillon. Black Bridge Road Bridge Structural Evaluation. Kitchener, Ontario. 1994.

Nagel, James. The Block Line. WHS, 1959:46.

Region of Waterloo: Planning Housing and Community Services Department. Spanning the Generations - Phase 1: Inventory – Blackbridge Road Bridge. May 2004, P. 1.21 – 1.22

Region of Waterloo: Planning Housing and Community Services Department. Spanning the Generations - Phase 2: Heritage Assessment – Blackbridge Road Bridge. May 2004, P. 64-67

Seiling, Ken. Early building in Bridgeport, Ontario area. Waterloo Lutheran University, Waterloo. 1969:8.

**4.2.10**

# Chambers Bridge

**Score: 48**

**Woolwich Township**

## Documentation

### Builder

The builder of the Chamber's Bridge is unknown.

### Age

The current Chamber's Bridge believed to be built in 1930.[184]

## Technology

### Materials

The bridge truss is made of steel and the deck is made of wood. [185]

### Design/Style

This bridge is a single span, 156 foot long, single lane, through Camelback Pratt Truss bridge.[186]

### Prototype

The Chamber's Bridge is not a prototype in Woolwich Township nor in the Region, as the Winterbourne Bridge in Woolwich Township was built earlier (1913).

### Structural Integrity

In 1929, it was said that Road 6 "Pilkington Township, 20 foot span bridge had its approaches graded and surfaced and road graded to fit the bridge.[187]

[184] Spanning the Generations – Phase 1: Inventory, "Chamber's Bridge," May 2004, p. 1.47 – 1.48.
[185] The Record, "Woolwich closes bridge over Grand." January 18, 1991 & Spanning the Generations – Phase 1: Inventory, "Chamber's Bridge," May 2004, p. 1.47 – 1.48.
[186] Spanning the Generations – Phase 1: Inventory, "Chamber's Bridge," May 2004, p. 1.47 – 1.48. & Wellington Advertiser. "Townline bridge expected to open soon: Woolwich to re-open; capacity is three tons; speed 5km/hour." November 15, 2002.

The Chamber's Bridge was built in 1930, but the structure may not have been situated at its current location until 1946, the same year that the west abutment was added.[188]

On January 18, 1991, a 30 cm strip of the wood deck lifted and the bridge was closed for the rest of the day until it was repaired.[189]

On May 29, 1992, it was said that the bridge was severely corroded in areas and was to be restricted to use by light vehicles only. Three weeks later the bridge was repaired.[190]

On September 19, 1994, the bridge was deemed unsafe again with its deteriorating deck and rusting steel supports. Plans were prepared for repairs to be undertaken in 1995.[191] In August of 1995 the bridge was temporarily closed. At a council meeting in March of 1996, councillors agreed to pass a by-law that would officially close the bridge for the next three years. This was presented again at a council meeting on June 17, 1996, where it also re-stated that repairs would be postponed for three years because the cost so was too high.[192] Also at this time there were concerns that the bridge was not safe, even for pedestrians. To keep people off the structure, piles of gravel were placed in front of the bridge and the Township placed welded rails at either end. This attempt was not very successful as people still managed to cross the bridge. Council then had signs placed on either end of the bridge informing people that by using the structure, they would do so at their own risk. [193]

The bridge remained closed until 2002. The Wellington Advertiser newspaper article indicated that the Township planned to have the bridge re-opened to light and slow moving traffic before Christmas 2002. This was to occur after repairs were complete, including deck work, and additional diagonal braces. [194]

## Bridge Aesthetics and Environment

### Visual Appeal

The bridge has strong visual appeal as it is located in an "attractive area for fishing, hiking, or just a Sunday afternoon retreat." [195]

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[187] Wellington County Council Minutes: 1929-1931. "Report of the County Road Superintendent to the Warden and Council of the County of Wellington", December 12, 1929, p.61.
[188] Ibid.
[189] The Record, "Woolwich closes bridge over Grand." January 18, 1991.
[190] The Record, "Bridge restricted to light vehicles." May 29, 1992.
[191] The Record. "Extensive repairs needed to Woolwich-Pilkington Bridge." September 19, 1994.
[192] The Record, "Woolwich, Pilkington boundary bridge will be officially closed for three years." March 27, 1996. & The Record, "NO MONEY TO FIX GRAND RIVER BRIDGES: Pilkington, Woolwich councils struggle to span financial gap." June 17, 1996.
[193] The Record. "Hikers, bicyclists press Woolwich to allow use of Grand bridge on road 60." June 22, 1996.
[194] Wellington Advertiser. "Townline bridge expected to open soon: Woolwich to re-open; capacity is three tons; speed 5km/hour." November 15, 2002.
[195] The Record. "Hikers, bicyclists press Woolwich to allow use of Grand bridge on road 60." June 22, 1996.

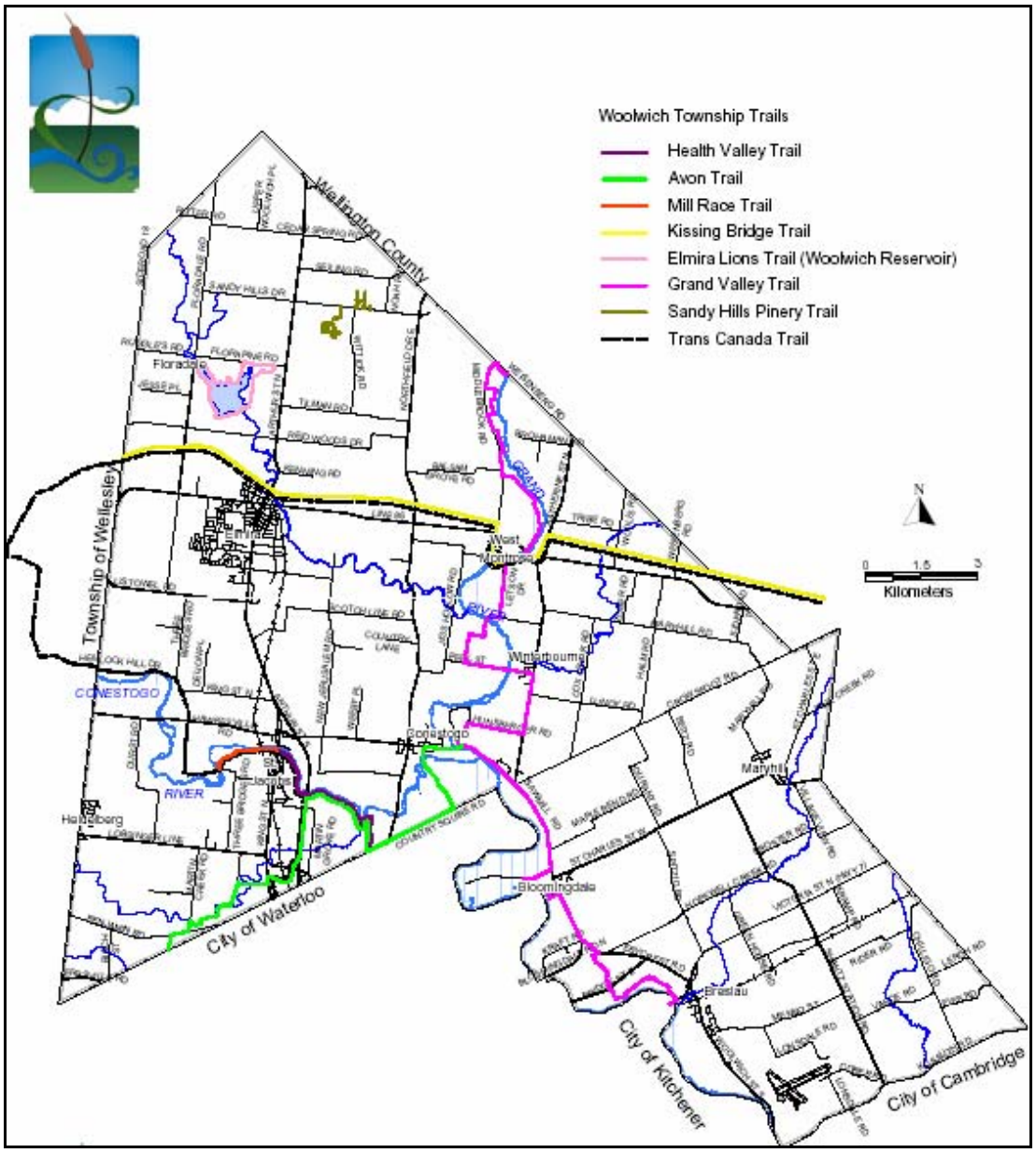
## Integrity

It is believed that the "steel superstructure was brought to the Grand River from another location in 1946." Therefore the bridge has low integrity.[196]

## Landmark

The bridge is a significant landmark along the Grand Valley Trail, which follows the west end of the Grand River until it approaches the bridge. In 1996, it was found that people often liked to cross the bridge while approaching it from the trail because the terrain on the east end was much safer.[197] The following map displays all of Woolwich's Trails including the Grand Valley Trail near the Chamber's Bridge.

[196] Wellington Advertiser. "Townline bridge expected to open soon: Woolwich to re-open; capacity is three tons; speed 5km/hour." November 15, 2002.
[197] The Record. "Hikers, bicyclists press Woolwich to allow use of Grand bridge on road 60." June 22, 1996 & Spanning the Generations – Phase 1: Inventory, "Chamber's Bridge," May 2004, p. 1.47 – 1.48.




*Source:* Planning Housing and Community Services Department, Region of Waterloo.

### Gateway

The bridge is not a gateway, but it is an integral part of the Township Line road.

## Historical Association

### Bridge Group

The bridge belongs to the larger group of camelback through Pratt Truss bridges in Waterloo Region. The other significant bridges in this group include the Winterbourne Bridge also in Woolwich Township and the Oxford-Waterloo Road and Bridge Street Bridges in Wilmot Township.

## History of Chamber's Bridge

The first Chamber's Bridge was made of wood and must have been constructed around 1845. A blueprint dated March 1845, describes a "proposed plan of a bridge over the Grand River on the site where the new line of road in the Township of Woolwich crosses the river."[198] Now this bridge existed until 1900 as County by-laws of the year refers the Chamber's Bridge over the Grand River being made of wood with a crib foundation. [199] This bridge was removed around 1905 because on July 13, 1905 a contract was signed to "build a bridge across the Grand River on the road forming the boundary line between the Townships of Pilkington and Woolwich, [where] said bridge [is] known as the Chamber's Bridge." This bridge was to be completed no later than August 15, 1905. [200] This bridge was slated for replacement around 1925 because it was stated that a "1925 design drawing for a replacement superstructure indicated using the existing east abutment and pier." In 1929, it was said that Road 6 "Pilkington, 20 foot span bridge had its approaches graded and surfaced and road graded to fit the bridge.[201] This bridge probably existed at the site until 1946 as the present bridge was built in 1930, but did not move to its current location until 1946.[202]

## Human Interest

People "often use[d] the bridge for nature walks" especially when walking the Grand Valley Trail. As well, hikers, bikers and fisherman have been known to use the bridge.[203]

## Other Points of Interest

In a 1906 Atlas, the bridge was seen located next to John Chamber's land. This is probably why it was named the "Chamber's Bridge." [204]

This bridge has also been called Bridge #16 and the Pilkington-Woolwich Bridge as it borders both Townships and its maintenance costs are subsidized by both. [205]

The Chamber's Bridge is a single span bridge and "single span bridges are only supported by the abutments at either end of the structure." However, this bridge has an abutment located in the middle of the structure that is technically not related for this bridge design. This could indicate that a previous structure located there may have been a double span bridge.[206]

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[198] Wellington County Museum and Archives. "BLUEPRINT: Proposed plan of a bridge over the Grand River: Chamber's Bridge." March 1845.
[199] County of Waterloo By-laws etc. 1852-1900. 1900---County Bridges. The Region of Waterloo Archives, p. 107.
[200] Wellington County Museum and Archives. "Chamber's Bridge Contract." July 13, 1905. Retrieved from archives: Thursday, April 20, 2006.
[201] Wellington County Council Minutes: 1929 – 1931. "Report of County Road Superintendent to the Warden and Council of the County of Wellington", December 12, 1929, p. 61.
[202] Spanning the Generations – Phase 1: Inventory, "Chamber's Bridge," May 2004, p. 1.47 – 1.48.
[203] The Record. "Hikers, bicyclists press Woolwich to allow use of Grand bridge on road 60." June 22, 1996.
[204] Historical Atlas of Wellington County. "Townships of Nichols and Pilkington." Historical Atlas Publishing Co.: Toronto, 1906.
[205] The Record. "Extensive repairs needed to Woolwich-Pilkington Bridge." September 19, 1994. & County of Waterloo By-laws etc. 1852-1900. 1900---County Bridges. The Region of Waterloo Archives, p. 107.
[206] "Historic Bridges of Michigan - Slideshow." Promoting the Preservation of Our Transportation Heritage.

# Chamber's Bridge

**Location** Woolwich Twp. Rd. No. 60 (now Weisenburg Road), 2.4 km west of Katherine Street N., north of Zuber Corners, Township of Woolwich.

**General Information**

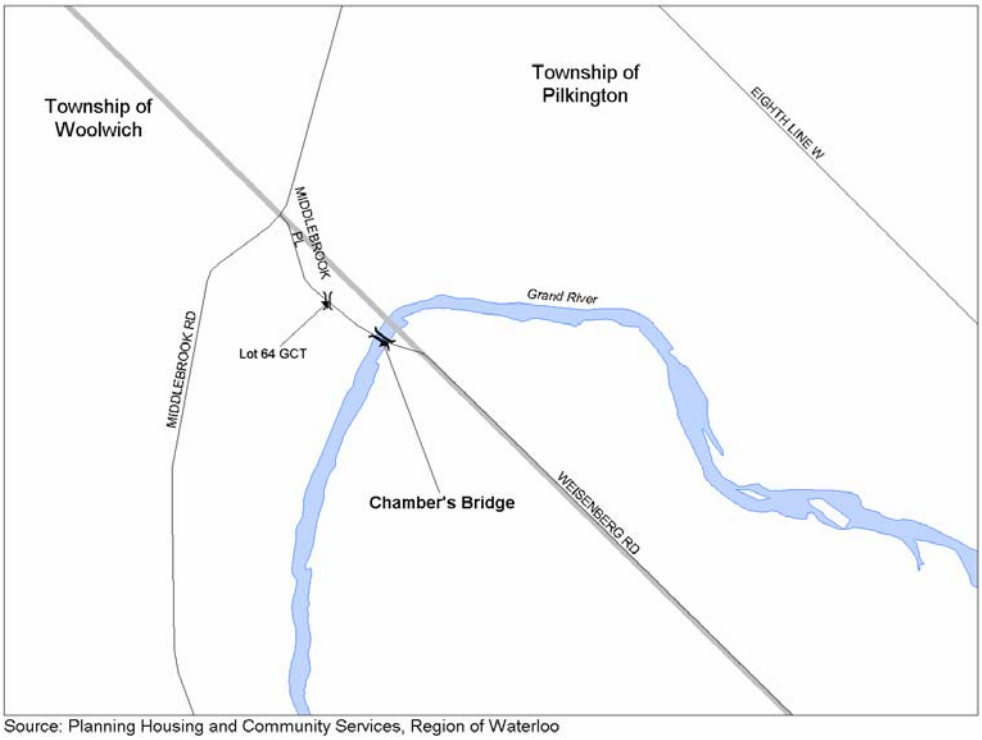
| | |
|---|---|
| *Bridge No.* | 180160 |
| *Jurisdiction* | Township of Woolwich |
| *Year built* | 1930 |
| *Drawings* | MTO (west abutment) |

**Physical Components**

| | |
|---|---|
| *Type* | through Truss |
| *Spans* | 1 |
| *Dimensions* | Length 47.5 m<br>Width 4.3 m |
| *Load Limit* | 3 tonnes |

**Descriptive details**

This is a single span single lane through truss bridge. The maintenance costs are subsidized between the Township of Woolwich and Pilkington Township (now Centre Wellington). The MTO had drawings of the west abutment and have given copies to the Municipality for evaluation. A 1925 design drawing for a replacement superstructure indicated using the existing east abutment and pier. The west abutment was constructed around 1946, and the truss was likely moved slightly at this time, making the middle pier superfluous. The deck of the bridge was deemed "unsafe" by Woolwich Township, even for pedestrians.



Source: Planning Housing and Community Services, Region of Waterloo

# Chamber's Bridge

## West View


## North View

# Chamber's Bridge Bibliography

County of Waterloo. By-laws etc. 1852-1900. 1900---County Bridges. The Region of Waterloo Archives, p. 107.

Historic Bridges of Michigan. Slideshow. http://www.historicbridges.org. 25 January, 2006.

Historical Atlas of Wellington County. Townships of Nichols and Pilkington. Historical Atlas Publishing Co.: Toronto, 1906.

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Region of Waterloo: Planning Housing and Community Services Department. Woolwich Trails Map. http://www.township.woolwich.on.ca. 5 April, 2006.

The Record – Kitchener, Waterloo & Waterloo Region. Bridge restricted to light vehicles. 29 May, 1992.

The Record – Kitchener, Waterloo & Waterloo Region. Hikers, bicyclists press Woolwich to allow use of Grand Bridge on road 60. 22 June, 1996.

The Record – Kitchener, Waterloo & Waterloo Region. NO MONEY TO FIX GRAND RIVER BRIDGES: Pilkington, Woolwich councils struggle to span financial gap. 17 June, 1996.

The Record – Kitchener, Waterloo & Waterloo Region. Woolwich closes bridge over Grand. 18 January, 1991.

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The Record – Kitchener, Waterloo & Waterloo Region. WORK POSTPONED TO 1995: Extensive repairs needed to Woolwich-Pilkington Bridge. 19 September, 1994.

Wellington Advertiser Newspaper. Townline Bridge Expected to open soon: Woolwich to re-open; capacity if three tons; speed 5km/hour. 15 November 2002.

Wellington County Council Minutes: 1929 – 1931. Report of County Road Superintendent to the Warden and Council of the County of Wellingto.

Wellington County Museum and Archives. "Chamber's Bridge Contract." July 13, 1905. Retrieved from archives: Thursday, April 20, 2006

Wellington County Museum and Archives. BLUEPRINT: Proposed plan of a bridge over the Grand River: Chamber's Bridge. March 1845.

**4.2.11**

# Hartman Bridge

**Score: 70**

**Wilmot Township**

## Documentation

### Builder

The Hartman Bridge was named after the Hartman family who initially owned the land across the river and donated it toward the bridge's construction. It was built by the Hamilton Bridge and Tool Company[207]. See Appendix A for more information about this company.

### Age

The bridge was built in 1936, during the depression.[208] The age and the builder are stamped on a bronze plaque attached to one of the main beams.


## Technology

### Materials

The Hartman Bridge is made of steel. Concrete was the popular building material at the time but the steel was cheaper and a utilitarian bridge was required.[209]

### Design/Style

The bridge was designed by J. D. Emery, Waterloo County Engineer.[210] It is a single span, eight panel Pratt Through Truss bridge with riveted connections.[211] It imitates this popular bridge design of the 1910s but is built with thick riveted stringers. The two traffic lanes

[207] Spanning the Generation – Phase 2: Heritage Assessment, "Hartman Bridge," May 2004, p. 30-34.
[208] Ibid.
[209] Ibid.
[210] "Hartman Bridge - Ontario Heritage Bridge List Nomination Form." Region of Waterloo. April 19, 2005.
[211] Historic Bridges of Michigan and Elsewhere, "Bridges by County: Waterloo Region, Ontario." March 14, 2007

indicate it was designed to hold automobiles.

### Prototype

The Hartman Bridge is not a prototype. In fact the design was quite old (26 years), but the bridge was built during the depression and thus an inexpensive and utilitarian structure was needed.

### Structural Integrity

The Hartman Bridge has eight panels of Pratt Through Truss with riveted connections, the unusual deck is slightly arched. The portal brace has a V-laced design. V-lacing is also present within the steel of the portal bracing, as well as on the sway bracing and the verticals. There is lattice under the top chord and end spots. The western portal bracing was damaged in the past, and portions of it were replaced prior to 2006.

In 2006, the Region of Waterloo rehabilitated the bridge while preserving its architecture and heritage.[212] The rehabilitated bridge has an "Exodermic" deck and sidewalk, which is a composite of steel granting and concrete. The asphalt wearing course was replaced by a concrete finish.

## Bridge Aesthetics and Environment

### Visual Appeal

The Hartman Bridge illustrates an excellent example of structural engineering of the 1930s. The bridge is not enclosed which allows one to see through the bridge, and to have an attractive view of the surrounding landscape. The Bridge is utilitarian and was not designed to be attractive, although some might argue otherwise.[213]

### Integrity

The bridge has high integrity; it remains at its original location since it was first built. Also, it is the last remaining steel truss bridge on the Regional road system.

### Landmark

The bridge is a distinctive landmark. It forms an attractive centerpiece of New Hamburg.[214] It is hard to miss the large superstructure when passing through the town. In 1992, the Township of Wilmot designated a Heritage Conservation District in the heart of the Town of New Hamburg[215] including the bridge. And in 2005 the bridge was nominated to the Ontario Heritage Bridge List.

[212] Township of Wilmot, "New Hamburg Steel Truss (Hartman) Bridge Rehabilitation and Peel Street/Huron Street Reconstruction. Notice of Completion. February 11, 2005
[213] Spanning the Generation – Phase 2: Heritage Assessment, "Hartman Bridge," May 2004, p. 30-34
[214] Historic Bridges of Michigan and Elsewhere, "Bridges by County: Waterloo Region, Ontario" March 14, 2007
[215] Township of Wilmot. "A By-Law to Designate an Area Situated in the Settlement Area of New Hamburg in the Township of Wilmot as A Heritage Conservation District." By-Law NO. 92-90. October 13, 1992.

### Gateway

The Hartman Bridge divides the east and west sides of the town. Crossing the bridge, the eastbound traveler enters the commercial district of New Hamburg which also is the oldest part of the town.

### Character Contribution

This steel bridge contributes to the character of New Hamburg and Wilmot Township. Wilmot possesses the majority of the steel truss bridges in Waterloo Region. There are five steel truss bridges in Wilmot, which contribute to the rustic and rural image of the Township.[216]

## Historical Association

### Bridge Group

The Hartman Bridge is part of the group of similar truss bridges in the surrounding area. The other bridges are Shade Street, Holland Mills, Haysville, Oxford-Waterloo, and Bridge Street.[217]

### History of Hartman Bridge

The current Hartman Bridge replaced the original Hartman Bridge. The first Hartman Bridge was built around 1900 and named after a prominent merchant. A bridge has existed in this location since New Hamburg was founded. As a local landmark, the bridge attracted filmmakers to use it in making movies. The bridge was used twice in the past for filming. The first time was in the 1980's,[218] and later in 1995 when a Kitchener-based film production company chose the bridge for filming a family movie.[219]

### Human Interest

Wilmot Township is very rich in through Pratt Truss bridges. It has Shade Street, Holland Mills Road, and Haysville (demolished) bridges in addition to the Hartman Bridge. This group of bridges symbolizes Wilmot's farming community.[220] Also, there is another style of Truss bridges in the Township, the Camelback Truss bridges; this group includes the Oxford-Waterloo Road Bridge, and Bridge Street Bridge.

### Other Points of Interest

The Hartman Bridge is part of the Heritage Conservation District in the Town of New Hamburg. It provides the connection to the heritage core of New Hamburg. The bridge also complements the riverfronts of Kirkpatrick and Scott Parks. It is an integral part of the landscape and has therefore been

[216] Spanning the Generation – Phase 2: Heritage Assessment, "Hartman Bridge," May 2004, p. 30-34.
[217] Ibid
[218] Ritz, Ernst. Personal Interview. November 23, 1998.
[219] New Hamburg Independent, "Bridge to be closed for film." August 23, 1995
[220] Spanning the Generation – Phase: 2 Heritage Assessment, "Hartman & Haysville Bridges" May 2004, p. 30-34 & 47-53

designated as part of the New Hamburg Heritage Conservation District by the Township of Wilmot under Part V of Ontario Heritage Act. This designation will ensure that the bridge cannot be demolished, removed or altered without a permit issued by the Township Council.

The 2006 rehabilitation work of the bridge took that into consideration; the architectural and heritage value of the bridge was respected and preserved. The bridge had to be closed for a period of time for rehabilitation purposes, and that affected daily life in town. People had to take longer routes and business owners were afraid of trade slowing down. However, after rehabilitation was finished, residents of New Hamburg were happy to save the bridge by means of restoration and not replacement by a new concrete bridge.[221]

[221] New Hamburg Independent, "A bridge apart." September 13, 2006

# Hartman Bridge

**Location** MTO Site No. 33-117, Huron Street, 0.2 km east of Waterloo Street, Village of New Hamburg, Township of Wilmot.

**General Information**

| | |
|---|---|
| *Bridge No.* | 000404 |
| *Jurisdiction* | Regional Municipality of Waterloo |
| *Year built* | 1936 |
| *Drawings* | Regional HQ |

**Physical Components**

| | |
|---|---|
| *Type* | through Truss |
| *Spans* | 1 |
| *Dimensions* | Length 41.5 m<br>Width 11.4 m |
| *Load Limit* | None posted |

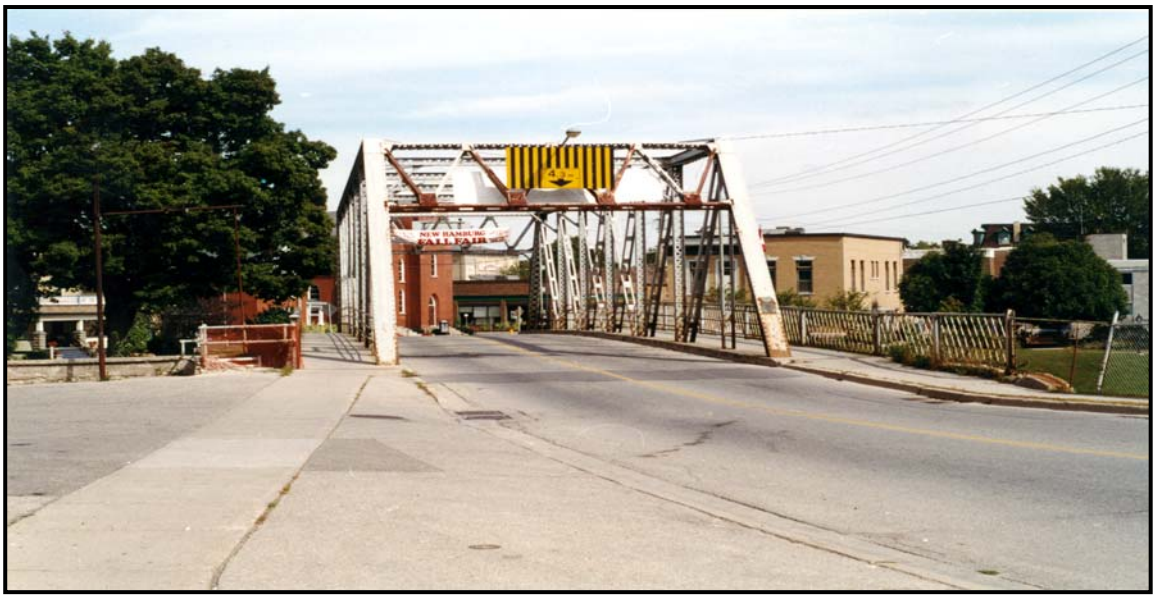
**Descriptive details**

This is a single span structural steel through truss bridge with a concrete deck and asphalt wearing surface. It spans a length of 41.5 m with a deck width of 11.4 m over the Nith River.
It has a concrete sidewalk with a steel-latticed handrail. In relative terms this bridge is better preserved than the other truss bridges in the area and according to the 1993 bridge appraisal report there is no serious evidence of structural distress. Most of the structure is intact but slightly modified. The Hamilton Bridge Company built this bridge in 1936. At the time D.J. Emery was the County Engineer.[222]


[222] Spanning the Generation – Phase 1: Inventory. "Hartman Bridge," May 2004, p. 1.81-1.82

# Hartman Bridge

## East View



## North View

# Hartman's Bridge Bibliography

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New Hamburg Independent. Bridge to be Closed for Film. 23 August, 1995

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Region of Waterloo: Planning Housing and Community Services Department. Spanning the Generations - Phase 1: Inventory – Hartman Bridge. May 2004, P. 1.81 – 1.82

Region of Waterloo: Planning Housing and Community Services Department. Spanning the Generations - Phase 2: Heritage Assessment – Hartman Bridge & Haysville Bridges. May 2004, P. 30-34 & 47-53.

Ritz, Ernst. Personal Interview. 23 November, 1998.

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Township of Wilmot. By-Law NO. 92-90. A By-Law to Designate an Area Situated in the Settlement Area of New Hamburg in the Township of Wilmot as a Heritage Conservation District. 13 October, 1992

**4.2.12**

# Shade Street Bridge

**Score: 58**

**Wilmot Township**

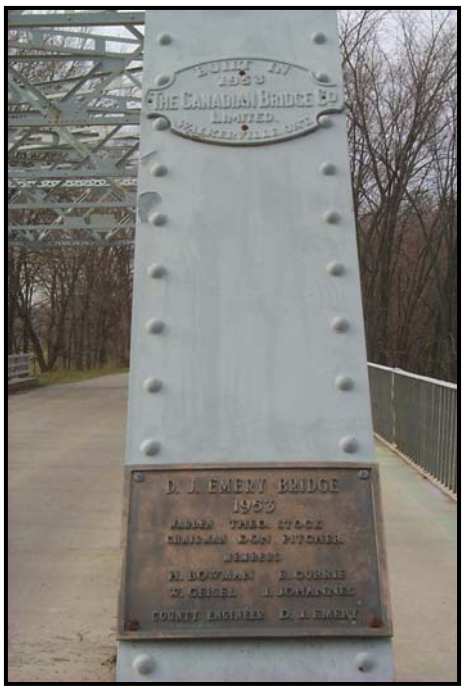
## Documentation

### Builder

The Shade Street Bridge was built by the Canadian Bridge Company.[223]

### Age

The Shade Street Bridge was built in 1953.[224] At this time, it was not common to see bridges constructed of steel as concrete was the new material of the time.[225]




## Technology

### Materials

The Shade Street Bridge truss is made of steel and reinforced concrete and has been riveted together.[226]

### Design/Style

The Shade Street Bridge is a single span steel through truss with reinforced concrete deck.[227] The bridge is 150' long, 20' wide, with a vertical clearance of 14'10" and has a 4' wide sidewalk on its north side.[228]

[223] Spanning the Generations – Phase 1: Inventory, "Shade Street Bridge," May 2004, p. 2.01- 2.02.
[224] Ibid.
[225] Cuming, David, "Discovering Heritage Bridges on Ontario's Roads."
[226] Spanning the Generations – Phase 1: Inventory, "Shade Street Bridge," May 2004, p. 2.01- 2.02. & .E. Kelley & Associates Limited, Shade Street Bridge Rehabilitation: New Hamburg, Ontario, June 15, 1988.
[227] Spanning the Generations – Phase 1: Inventory, "Shade Street Bridge," May 2004, p. 2.01- 2.02.
[228] London Free Press. "New Hamburg Span Opening Slated Today." December 9, 1953. & W.E. Kelley & Associates Limited, Shade Street Bridge Rehabilitation: New Hamburg, Ontario, June 15, 1988.

### Prototype

This bridge is not a prototype as it is built in similar design to the Hartman Bridge, which was built at an earlier date of 1936.[229]

### Structural Integrity

In June of 1988, W.E. Kelley and Associated Limited, Consulting Engineers and Planners were asked to evaluate the state of the Shade Street Bridge and recommend what should be done to rehabilitate the structure. They discovered that there were three main issues with the bridge: it was rusting which was weakening the structure, its deck drains were not deep enough which contributed to the rusting of the substructure and the expansion joint on the west end of the bridge was missing. So, in August of the same year, the bridge was closed for approximately four weeks and was rehabilitated by Reymer Construction Limited. Repairs included: sandblasting, painting, extension of the deck drains, and the installation of a new expansion joint.[230] In December of 1989, W.E. Kelley inspected what had been done to the bridge previously and told Dyna-Blast, who had fixed part of the structure, that there were "some signs of rusting underneath the coating" and that they would like this "touched up when weather conditions permitted."[231]

## Bridge Aesthetics and Environment

### Integrity

The current Shade Street Bridge is in its original location. Therefore it has high integrity.[232]

### Landmark

The Shade Street Bridge is not a very significant landmark as the Hartman Bridge located east of the Shade Street Bridge is more well-known. However, it was plaqued as the "D.J. Emery Bridge" after the death of the Waterloo County Engineer, who worked for the County from 1932 until 1953. The Bridge provides remembrance of him.[233]

### Gateway

The Shade Street Bridge spans the Nith River on Shade Street in New Hamburg. It provides a gateway to New Hamburg.

### Character Contribution

The Shade Street Bridge contributes to the character of Wilmot. It has a similar design to the Hartman Bridge, and it also contributes to the rustic and rural image of Wilmot Township.[234]

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[229] Spanning the Generations – Phase 1: Inventory, "Shade Street Bridge & Hartman Bridge," May 2004, p. 2.01 - 2.02.
[230] Corporation of the Township of Wilmot. "Shade Street Bridge Restoration Contract 88-10." August 1988.
[231] W.E. Kelley & Associates Limited. Letter to Dyna Blast, Cambridge, Ontario. December 7, 1989. In Wilmot Township Shade Street Bridge Folder, Township of Wilmot, Ontario, 1989.
[232] London Free Press. "New Hamburg Span Opening Slated Today." December 9, 1953.
[233] Ibid.
[234] Spanning the Generations – Phase 2: Heritage Assessment, "Hartman Bridge," May 2004

### History of Shade Street Bridge Crossing

The Shade Street Bridge that existed prior to the current 1953 bridge was originally at the Hartman Bridge location and was 100-feet long.[235] This iron bridge was built in 1882, and was tossed away from its abutments after a flood on the Nith River in 1883. It wasn't until 1903 that the Bridge was moved to Shade Street. It is assumed that this bridge was demolished sometime around 1953 because that is when the current Shade Street Bridge was built. It is known that the current bridge was repainted in 1985.[236] In 2004, there were concerns about local youths jumping off of the bridge on hot summer days. At this time signs were placed on the bridge "reminding local youth that jumping is prohibited." [237]

## Historic Association

### Bridge Group

The Shade Street Bridge is similar in design to the Hartman Bridge although it has been found to be sturdier.[238]

### Other Points of Interest

This bridge has also been called Bridge #15.

[235] London Free Press. "New Hamburg Span Opening Slated Today." December 9, 1953
[236] Spanning the Generations – Phase 1: Inventory, "Shade Street Bridge," May 2004, p. 2.01- 2.02.
[237] New Hamburg Independent. "Fines for bridge jumping." December 1, 2004.
[238] Spanning the Generations – Phase 1: Inventory, "Shade Street Bridge," May 2004, p. 2.01 - 2.02.

# Shade Street Bridge

**Location** Shade Street, New Hamburg, Township of Wilmot.

**General Information**

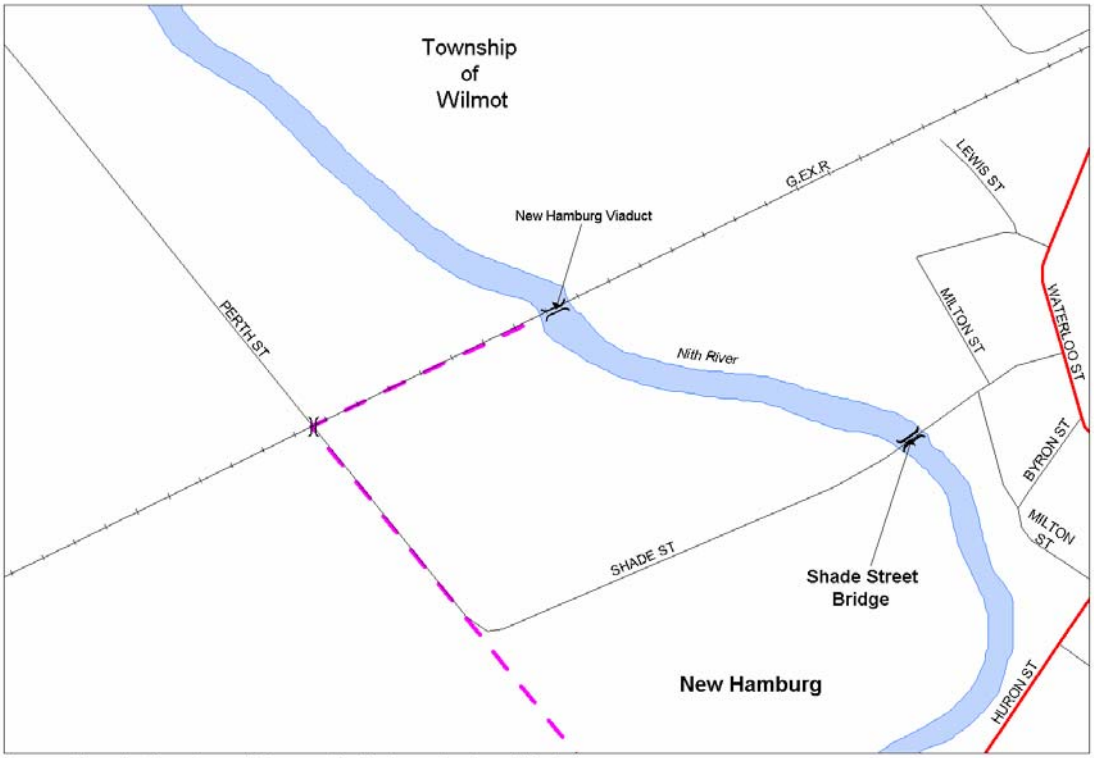
| | |
|---|---|
| *Bridge No.* | 20015 |
| *Jurisdiction* | Township of Wilmot |
| *Year built* | 1953 |
| *Drawings* | Not available |

**Physical Components**

| | |
|---|---|
| *Type* | Through Truss |
| *Spans* | 1 |
| *Dimensions* | Length 46.9 m<br>Width 10.4 m |
| *Load Limit* | None posted |

**Descriptive details**

This bridge is plaqued as the "D.J. Emery Bridge." D.J. Emery was the Waterloo County Engineer from 1932 until his death in 1953. The bridge was built by the Canadian Bridge Company. This bridge is similar in design to the Hartman Bridge but sturdier. It was repainted in 1985.



Source: Planning Housing and Community Services, Region of Waterloo

# Shade Street Bridge

## West View


## South View

# Shade Street Bridge Bibliography

Corporation of the Township of Wilmot. Shade Street Bridge Restoration Contract 88-10. August 1988.

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W.E. Kelley and Associates Limited. Shade Street Bridge Rehabilitation: New Hamburg Ontario. Wilmot Township Shade Street Bridge Folder. 15 June, 1988.

# Section 5: Future Actions[239]

It is important to identify heritage bridges. It is equally important to examine strategies to preserve them. This section looks at preservation methods and lists a number of options and possible recommendations. The key to any successful preservation strategy is public involvement.

## 5.1 The Importance of Public Awareness

Raising public awareness about heritage bridges is a crucial step toward their long term preservation. To this end it is important that people understand that these structures are not solely utilitarian. Heritage bridges are aesthetically pleasing, possess historic value, and have contributed to the development of the Region.

Any bridge preservation campaign should focus on public awareness; promoting the historical, architectural and cultural context of the bridge. First, the public must be made aware that the heritage bridges in question are in danger of being removed in the near future. They must also understand that heritage bridges contribute to the development of the Region and are priceless in comparison to their monetary value.

Second, the popularity and profile of the bridge must be increased. Heritage bridges must become commonplace names and people should be familiar with their image and location. For example, the West Montrose Covered Bridge has a high profile and heritage value and is likely one of the most photographed and printed structures in the Region. The public is familiar with its name, image and location. As a result it would be extremely difficult to neglect, remove or replace this bridge.

## 5.2 Threats to Heritage Bridges

Heritage bridges are threatened primarily by growth and the demand for improved transportation. For instance, threats to heritage bridges are increased use, expanding land use and development for: agricultural, commercial centres, industrial traffic and housing expansion. Other threats are accidents, pollution, flooding, ice, salt use and weather. Government policy decisions and financial constraints which contribute to lack of maintenance are also serious threats.

## 5.3 Protection Strategies

A protection strategy could be bridge-specific or region-wide and consist of a combination of different methods and tactics.

### 5.3.1 Maintenance Strategies

The best strategy is continual maintenance, rehabilitation and conservation, which can preserve a bridge indefinitely.

[239] Text from 2004 Report - Phase 2 with updates.

The wear and tear on a bridge is proportionate to the amount of use it receives. Frequently used bridges will require more maintenance than those used infrequently. Maintenance allows the historic bridge to be used by the public in a high profile area and at its original location.

### 5.3.2 Protection Strategies

- **Creating by-passes or using alternate routes.** This option preserves the original location of the bridge and its profile within the community.
- **Reduction of Load Limit**. There can be a reduction of the load limits, or traffic, or traffic can be reduced to pedestrians only. Planning strategies can then be employed to encourage alternate routes of travel.
- **Incorporation**. Include the bridge into the development scheme. This might involve constructing a new bridge near the existing one.
- **Relocation.** The bridge may be moved to a safer location. However, removing the bridge from its original location reduces its heritage value.

## 5.4 Preservation Protection Strategies

Listed below are some options that either promote public awareness or protect bridges. A combination of these options could be used in a preservation campaign.

### Option No. 1: Municipal Designation

A municipal designation can be used to promote awareness or to delay the intent to demolish a heritage structure. Designation under the Ontario Heritage Act requires a municipal bylaw which grants protection to heritage structures or property. Municipal designation does not necessarily provide long term protection, but it does raise the bridge's profile.

### Option No. 2: Heritage Easement

A conservation easement is a private agreement registered on title to a heritage property. A heritage easement is one of the most comprehensive and flexible forms of heritage protection.

- It ensures that the heritage building or structure is prudently maintained.
- It ensures that the heritage building or structure is adequately insured.
- It ensures adequate protection from demolition for the heritage structure
- It ensures that any work, which affects the appearance of the structure covered by the easement, receives the meaningful input of the easement holder.
- Easements can be tailor-made to suit the characteristics of the heritage resource they protect.

A heritage easement provides long term protection and ensures preservation. It is a binding agreement and long term commitment.

### Option No. 3: Provincial Plaque

The Federal government provides plaques for heritage sites which are designated as national historic sites by the Historic Sites and Monuments Board of Canada. This type of designation does not confer any heritage protection to privately-owned heritage structures by the Federal Government, but it may make the building/site eligible for cost-sharing programs administered by the Federal Department of Canadian Heritage. There are more than 1,300 sites across Ontario which have been recognized by the Ontario Heritage Foundation or its predecessors which administer the provincial historical plaquing program. The erection of a provincial heritage plaque provides a means of public appreciation and recognition for important heritage sites around Ontario.

### Option No. 4: Ontario Heritage Bridge List

Bridges may also be recognized through nomination to the Ontario Heritage Bridge List maintained by the Ministry of Culture. The list of close to 100 bridges of provincial significance helps ensure that the significance of these bridges is taken into account when municipalities undertake road projects covered by the *Environmental Assessment Act*.

### Option No. 5: Amending the Regional Official Policies Plan

Section 6.3.2 in the Regional Official Policy Plan of Waterloo Region (ROPP) supports built heritage, but does not specify bridges as part of non-renewable heritage resources. Many of these bridges are maintained by the area municipalities. Their inclusion in the Official Plan would signal a Regional interest in their preservation. Guidelines, options, or plans could be issued to the road superintendents concerning heritage bridges in their jurisdiction.

### Option No. 6: Heritage Focused Tourism and Education

In an attempt to promote public awareness, tours could be developed if the heritage bridges were comprehensively researched. A partnership with the Chambers of Commerce and the Planning Department, for example, could provide scenic bridge tour pamphlets based on the material provided in this Study. Heritage bridges could be incorporated into existing tours, scenic roads or hiking trails. This tourism could be raised to the Provincial or National level. Sufficient care/monitoring would be needed to ensure that although the bridges were publicized, the use was not excessive and, therefore, detrimental to the preservation of the bridges. A tourism initiative increases both the profile of the bridges and public education. Every effort should be made to work with educators to ensure that heritage bridge structures become part of classroom curriculum.

### Option No. 7: Public Partnerships

A preservation campaign might initiate a "Friends of the Bridge" program in which volunteers give support to our heritage and boost internal morale by caring for a bridge.

## 5.5 Documentation

If all else fails, documentation of the bridge is a must. Sometimes it is impossible to preserve a heritage bridge. Documentation involves:

- Measured drawings
- Photographic documentation, both past and present
- The recording of historical and contextual data
- An archaeological assessment

The demolition of the structure will remove its connection to the community, but the bridge will be preserved on paper.

## 5.6 Heritage Bridges Recognition Program

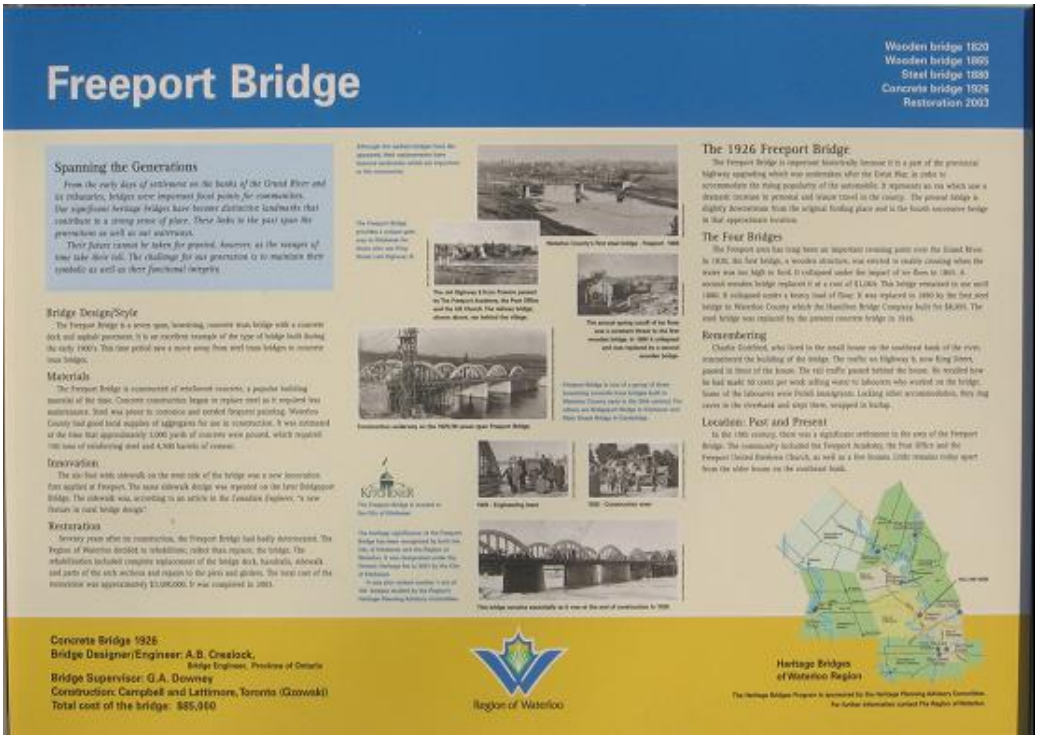
In 2004, the Waterloo Region's Heritage Planning Advisory Committee (HPAC) started the Heritage Bridge Recognition Program focusing on the top 10 significant heritage bridges in the Region. Heritage significance is based on the findings of "Spanning the Generations: A Study of Old Bridges in Waterloo Region" *Phase II,* completed in 2004. The program consists of creating individual historic interpretive plaques that both tell the story of each bridge and display interesting historic photos of the crossing. The HPAC Committee members' research the history of these bridges, develop the written content and collect significant historic photographs.

The interpretive historic plaque for Freeport Bridge in Kitchener was unveiled in 2005; the historic plaque for Hartman Bridge in the Wilmot Township was unveiled in 2007; and, the historic plaque for Mill Creek Bridge in Cambridge is planned for unveiling in the fall of 2007. More historical plaques will be developed for another two top historic bridges in 2008, the Main Street Bridge in Cambridge and Bridgeport Bridge in Kitchener.

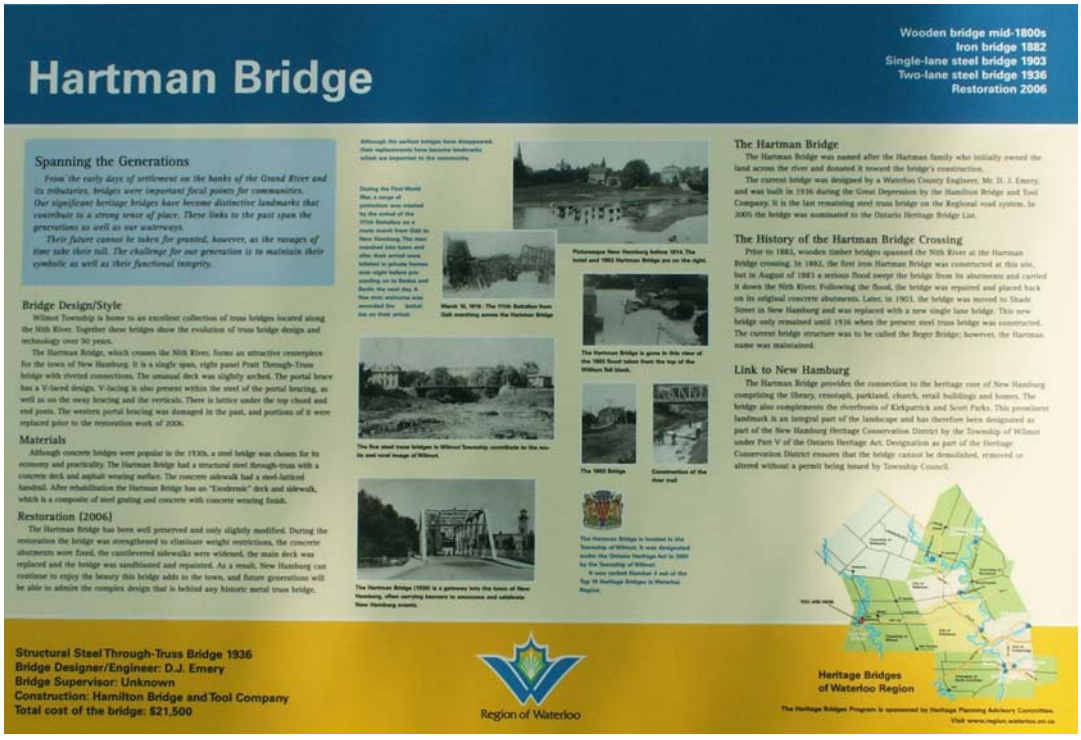
The Heritage Bridges Recognition Program is a very important tool to create public awareness and bring attention to heritage bridges, their historic value and their significant role in shaping our communities. Furthermore, the program raises the importance of preserving and restoring heritage bridges and discourages demolition.

Each new plaque is celebrated with an unveiling ceremony. These ceremonies are great opportunity to raise public awareness. By celebrating these wonderful structures local residents, elected officials, historians, engineers, planners, all levels of government and the media are brought together to celebrate and cherish historic bridges and to convey the message of the importance of protecting the rest of heritage bridges in Waterloo Region.

The Freeport Bridge and Hartman Bridge historic interpretive plaques are shown on the following page.




Historic Interpretive Plaque, Freeport Bridge in Kitchener




Historic Interpretive Plaque, Hartman Bridge in New Hamburg, Wilmot Township

# Appendix A

**The Hamilton Bridge and Tool Company**

The Hamilton Bridge and Tool Company existed from 1863 – 1984, manufacturing and providing steel for the fabrication of many bridges and buildings.[240] However, it was the most "prolific bridge - building company- between 1910 and 1950, specializing in steel truss bridges."[241] The companies that formed this larger company included:

The Hamilton Bridge Company (1910-1950)
The Hamilton Bridge Works Company (1900-1920)
The Hamilton Bridge and Iron Works Company (1800-1900).[242]

"Waterloo County purchased steel, and steel bridges, from these companies because they were always able to underbid their competitors."[243]

In 1913, this company was also selected to create the Canadian Pacific Railway Building in Toronto. This was Canada's very first skyscraper.[244]

[240] Industrial Hamilton: A Trail to the Future, "Hamilton Bridge Works (Bridge and Tank Company of Canada)." http://collectiopns.ic.gc.ca/industrial/bridgeworks.htm.
[241] Spanning the Generations – Phase 2: Heritage Assessment, "Hartman Bridge," May 2004, p. 30.
[242] Ibid.
[243] Ibid.
[244] Industrial Hamilton: A Trail to the Future, "Hamilton Bridge Works (Bridge and Tank Company of Canada)." http://collectiopns.ic.gc.ca/industrial/bridgeworks.htm.

# Appendix B

## Truss Bridges in Waterloo Region

**by date / details of Construction**

| Bridge Name | Location | Date of Construction | Details of Construction | Page |
|---|---|---|---|---|
| Nithvale Bridge | North Dumfries Township | 1873 | Iron & Steel, Pin-jointed | 16 |
| Conestogo Bridge | Woolwich Township | 1886/1928 | Metal, Pin-jointed/ Welded | 24 |
| Holland Mills Road Bridge | Wilmot Township | 1910 | Steel, Pin-jointed | 31 |
| Wellesley Bridge #6 | Wellesley Township | 1910 | Steel, Pin-jointed | 38 |
| Oxford-Waterloo Bridge | North Dumfries Township | 1912 | Metal, Welded | 46 |
| Bridge Street Bridge | Wilmot Township | 1913 | Metal, Welded | 52 |
| Winterbourne Bridge | Woolwich Township | 1913 | Metal, Riveted | 58 |
| Piper Street Bridge | North Dumfries Township | 1915 | Metal, Riveted | 66 |
| Blackbridge Road Bridge | City of Cambridge | 1916 | Steel, Pin-jointed | 75 |
| Chamber's Bridge | Woolwich Township | 1930 | Metal, Riveted | 81 |
| Hartman Bridge | Wilmot Township | 1936 | Steel, Riveted | 89 |
| Shade Street Bridge | Wilmot Township | 1953 | Steel, Riveted | 96 |

# Glossary

**Abutments:** The piers that supports the mass of an entire bridge structure. They are often made with concrete.[245]

**Bearings: "**Device used to attach bridge to foundations. Several types are available, steel on steel, Teflon on stainless steel, and electrometric. Combinations of the above types are also possible."[246]

**Bottom Chords: "**The bottom longitudinal structural member of a truss."[247]

**Expansion Joints: "**Side or set of rollers, at the end of bridge truss, to support it but allow end play."[248]

**Floor Beams: "**The structural steel beams that connect the trusses of a bridge and support the floor stringers and floor system."[249]

**Handrail: "**A longitudinal member attached to the inside truss, for use as an aid for pedestrians. Placement is normally dictated by the requirements in the American with Disabilities Act."[250]

**Panel Number:** The number of spaces between consecutive vertical steel members and the ends.

**Stringers or Struts:** A wooden or metal support that provides support or acts as a connector. "Structural members running the length of the bridge used to provide structural support of the floor deck."[251]

**Substructure:** "the supporting part of a structure"[252]. Generally the part of the structure that is below the bridge deck.

**Superstructure:** The parts of the structure above the foundation or deck of the bridge.

**Suspension Bridge:** It is referred to as a cable stayed bridge where the deck is held up by cable, rope or eye bars.[253]

**Top Chord:** The top longitudinal structural member of a truss.[254]

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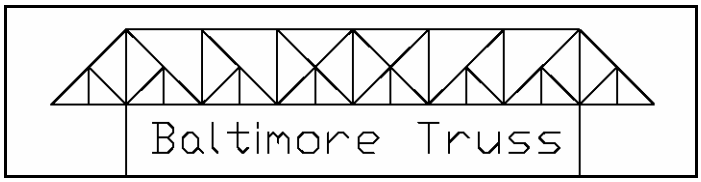
[245] Steadfast Bridges.com. "Frequently Used Bridge Terms." http://www.steadfastbridges.com May 5, 2006.
[246] *Ibid.*
[247] *Ibid.*
[248] Dictionary.com. "Substructure." http://www.dictionary.com. , May 5, 2006.
[249] Steadfast Bridges.com. "Frequently Used Bridge Terms." http://www.steadfastbridges.com May 5, 2006.
[250] *Ibid.*
[251] *Ibid.*
[252] Dictionary.com. "Substructure." http://www.dictionary.com., May 5, 2006.
[253] "Construction Types in Iowa." http://www.ole.dot.state.ia.us/historicbridge/construction.asp
[254] Steadfast Bridges.com. "Frequently Used Bridge Terms." http://www.steadfastbridges.com, May 5, 2006.

**Truss**: "A rigid framework, which is either wooden beams or metal bars, designed to support a structure, such as a roof."[255] The following provides and explanation and some drawings of the many truss bridge designs.

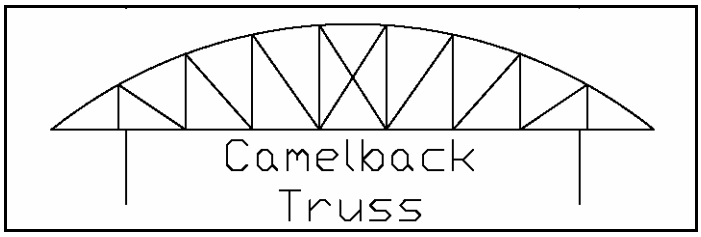
*Kingpost Truss Bridge:* The simplest type of bridge design. It originated from the design of pitched roofs on buildings. They were usually made of pipe and wood.[256]

*Queenpost Truss Bridge:* One of the first truss bridge structures. This bridge design was derived from the king post truss bridge.[257]

*Baltimore Truss:* "The Baltimore truss changed the basic Pratt configuration by adding additional, auxiliary members, like the Pennsylvania truss, but does not have an inclined upper chord. The upper and lower chords of a Baltimore truss are the parallel like the Pratt truss. Both the Baltimore and the Pennsylvania truss types were developed by engineers of the Pennsylvania Railroad in the 1870s. Both bridges were also used for highway bridges."[258]

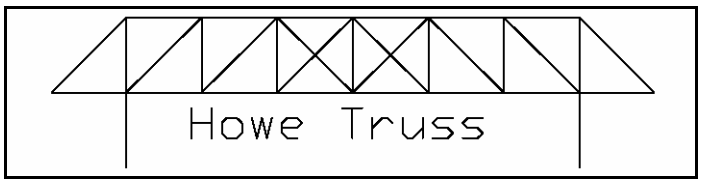



*Camelback (Polygonal) Pratt Truss:* It is much like the Pratt truss structure however its design was modified by a Mr. Charles H. Parker so that the top chord is not parallel to the top chord.



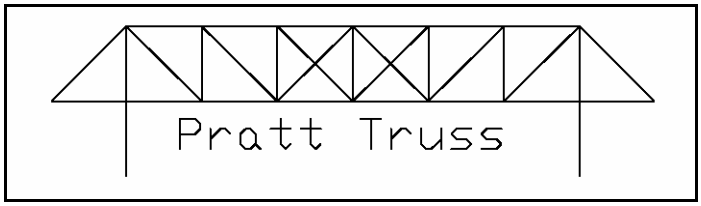

*Howe Truss:* The Howe truss structure was designed by William Howe and was first used in 1840. Basically, he altered Colonel Long's wooden truss design by making the vertical king post tension members of cast iron. The design of a Howe truss bridge is displayed following. It is the opposite design of a Pratt truss bridge.[259]

[255] Steadfast Bridges.com. "Frequently Used Bridge Terms." http://www.steadfastbridges.com, May 5, 2006.
[256] Cuming, D. Discovering Heritage Bridges on Ontario's Roads, Ontario: Boston Mills Press, 1988, p. 36.
[257] Ibid.
[258] "Construction Types in Iowa." http://www.ole.dot.state.ia.us/historicbridge/construction.asp
[259] Brown, David J. Bridges. Macmillan Publishing Co.: New York: 1993.

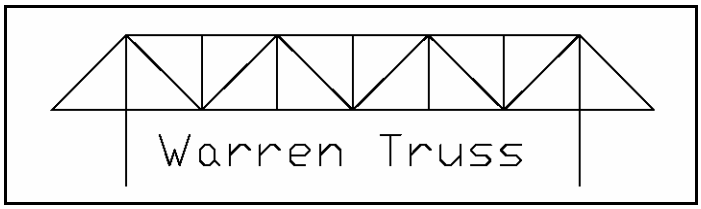



*Pony Truss:* A pony truss bridge has cross bracings on either side of it but does not have it on the top of the main structure.[260]

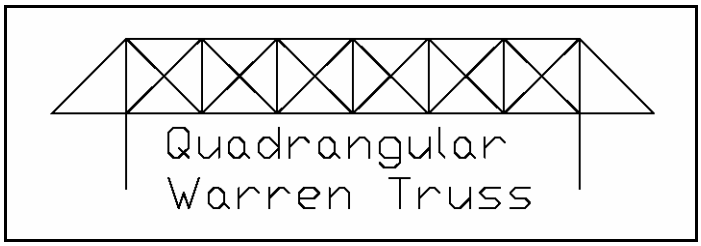
*Pratt Truss:* The Pratt truss structure was used four years after (1844) the introduction of the Howe truss (1840). Its design consists of "vertical timber beams in compression and diagonal wrought iron tie rods in tension" just like the Howe truss only its design is opposite. [261]




*Warren Truss:* The Warren truss design was first established in 1848 by British engineers James Warren and Willoughby Monzoni. Its original design illustrates a series of equilateral triangles. "Later modifications included subdivision by verticals or addition of alternate diagonals." "The Warren truss was widely built throughout most of the United States from about 1860 to the 20th century."[262]




[260] Historic Bridges of Michigan and Elsewhere. http://www.historicbridges.org, May 5, 2006.
[261] "Construction Types in Iowa." http://www.ole.dot.state.ia.us/historicbridge/construction.asp
[262] Ibid.




*Whipple Pratt Truss:* Often also called the Dowle intersection Pratt truss. Adds additional diagonals spanning two panels to the original Pratt truss structure. The top and bottom chords are parallel just like in the Pratt truss bridge design.[263] "The Whipple Pratt truss was widely used for long span railroad bridges."[264]

[263] Ibid.
[264] Ibid.

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