CULTURAL HERITAGE EVALUATION REPORT
BARRIE COLLINGWOOD RAILWAY ACTIVE TRANSPORTATION TRAIL:
MAD RIVER BRIDGE, PINE RIVER BRIDGE, AND NOTTAWASAGA RIVER BRIDGE

FORMER NORTHERN RAILWAY ALLANDALE TO COLLINGWOOD BRANCH
OVER THE MAD RIVER, PINE RIVER, AND NOTTAWASAGA RIVER

TOWNSHIP OF ESSA
COUNTY OF SIMCOE, ONTARIO

DRAFT REPORT

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EXECUTIVE SUMMARY

ASI was contracted by R.J. Burnside and Associates Ltd. on behalf of the County of Simcoe to prepare a Cultural Heritage Evaluation Report (CHER) for the Mad River Bridge, the Pine River Bridge, and the Nottawasaga River Bridge as part of the Barrie Collingwood Railway Active Transportation Trail project. These three bridges are each riveted steel deck plate girder structures resting on stone masonry block abutments that were constructed in the 1860s to carry a single track of the former Northern Railway Company of Canada's (hereafter the Northern Railway) Allandale to Collingwood Branch over the Mad, Pine, and Nottawasaga rivers in the County of Simcoe, Ontario. The Barrie Collingwood Railway Active Transportation Trail project involves converting the existing railway alignment between Angus to Stayner into a multi-use trail, with each of the three subject bridges anticipated to require additional decking and railings at deck level to ensure public safety.

This report includes an evaluation of the cultural heritage value of each of the three bridges as determined by the criteria in *Ontario Regulation 9/06* of the *Ontario Heritage Act*, which considers the design/physical, historical/associative, and contextual values of the bridges in the County of Simcoe.

The Mad River Bridge is a single-span riveted deck plate girder structure resting on stone masonry abutments, constructed in 1866. The bridge does not have any existing heritage recognition at the municipal or provincial level. An evaluation using *Ontario Regulation 9/06* determined that the Mad River Bridge has physical and design value as an early and representative deck plate girder bridge in a railroad context, historical and associative value as an original permanent structure on the Allandale to Collingwood Branch of the Northern Railway, and contextual value due to its functional and historical links to the Allandale to Collingwood Branch and the family of similar structures on the rail corridor.

The Pine River Bridge is a single-span riveted deck plate girder structure resting on stone masonry abutments, constructed in 1861. The bridge does not have any existing heritage recognition at the municipal or provincial level. An evaluation using *Ontario Regulation 9/06* determined that the Pine River Bridge has physical and design value as an early and representative deck plate girder bridge in a railroad context, historical and associative value as an original permanent structure on the Allandale to

Collingwood Branch of the Northern Railway, and contextual value due to its functional and historical links to the Allandale to Collingwood Branch and the family of similar structures on the rail corridor.

The Nottawasaga River Bridge is a three-span riveted deck plate girder structure resting on stone masonry abutments and piers, constructed in 1861. The bridge does not have any existing heritage recognition at the municipal or provincial level. An evaluation using *Ontario Regulation 9/06* determined that the Nottawasaga River Bridge has physical and design value as an early and representative deck plate girder bridge in a railroad context and is significant as the longest bridge in the comparative sample. It has historical and associative value as an original permanent structure on the Allandale to Collingwood Branch of the Northern Railway, and contextual value due to its functional and historical links to the Allandale to Collingwood Branch and the family of similar structures on the rail corridor.

As the evaluations using the criteria in *Ontario Regulation 9/06* of the *Ontario Heritage Act* determined that the Mad River Bridge, the Pine River Bridge, and the Nottawasaga River Bridge each have cultural heritage value or interest at the local level, and there are potential impacts anticipated as part of the Barrie Collingwood Railway Active Transportation Trail project, the following recommendations should be implemented:

1. A Heritage Impact Assessment (HIA) should be completed for each the Mad River Bridge, the Pine River Bridge, and the Nottawasaga River Bridge as early as possible during the detailed design phase. These HIAs will help to identify alternatives as well as mitigation and monitoring commitments to avoid or lessen impacts on the heritage attributes of the bridges, based on the proposed Statements of Cultural Heritage Value. These assessment should be completed by a qualified person who has relevant and recent experience in the conservation of rail bridges (see Section 3.0 of the *Standards and Guidelines for Conservation of Provincial Heritage Properties* [MHSTCI 2014] as a guide for best practice) and submitted to heritage staff at the County of Simcoe for review and approval and to the Ministry of Heritage, Sport, Tourism and Culture Industries (MHSTCI) for review.

2. The proponent should submit this report for review and comment to planning staff at the County of Simcoe, the MHSTCI, and to any other relevant stakeholder that has an interest in the heritage of the subject bridges. Any feedback will be incorporated into this report prior to finalization.

PROJECT PERSONNEL

Senior Project Manager:	Annie Veilleux, MA, CAHP Senior Cultural Heritage Specialist | Manager - Cultural Heritage Division
Project Coordinator:	Jessica Bisson, BFA(Hon), Dip. Heritage Conservation Project Administrator – Cultural Heritage Division
Project Manager:	John Sleath, MA Cultural Heritage Specialist | Project Manager - Cultural Heritage Division
Historical Research:	John Sleath
Field Review:	John Sleath
Report Production:	John Sleath
Graphics Production:	Andrew Clish, BES Senior Archaeologist | Senior Field Director - Operations Division
Report Reviewer(s):	Annie Veilleux
	Kirstyn Allam, BA (Hons), Dip. Advanced Museum Studies Cultural Heritage Technician – Cultural Heritage Division

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1.0 INTRODUCTION

ASI was contracted by R.J. Burnside and Associates Ltd. on behalf of the County of Simcoe to prepare a Cultural Heritage Evaluation Report (CHER) for the Mad River Bridge, the Pine River Bridge, and the Nottawasaga River Bridge as part of the Barrie Collingwood Railway Active Transportation Trail project. These three bridges are each riveted steel deck plate girder structures resting on stone masonry block abutments that were constructed in the 1860s to carry a single track of the former Northern Railway Company of Canada's (hereafter the Northern Railway) Allandale to Collingwood Branch over the Mad, Pine, and Nottawasaga rivers in the County of Simcoe, Ontario. The Barrie Collingwood Railway Active Transportation Trail project involves converting the existing railway alignment between Angus and Stayner into a multi-use trail, with each of the three subject bridges anticipated to require additional decking and railings at deck level to ensure public safety.

The Mad River Bridge is a single-span riveted deck plate girder structure resting on stone masonry abutments with a northwest-southeast orientation that carries a single track of the former Northern Railway alignment over the Mad River (Figure 1). The bridge was constructed by the Northern Railway in 1866 based on standardized railway designs, and measures 14.73 m in span length (County of Simcoe n.d.). The bridge does not have any existing heritage recognition at the municipal or provincial level.

The Pine River Bridge is a single-span riveted deck plate girder structure resting on stone masonry abutments with an east-west orientation that carries a single track of the former Northern Railway alignment over the Pine River (Figure 1). The bridge was constructed by the Northern Railway in 1861 based on standardized railway designs, and measures 17.68 m in span length(County of Simcoe n.d.). The bridge does not have any existing heritage recognition at the municipal or provincial level.

The Nottawasaga River Bridge is a three-span riveted deck plate girder structure resting on stone masonry abutments and piers with an east-west orientation that carries a single track of the former Northern Railway alignment over the Nottawasaga River (Figure 1). The bridge was constructed by the Northern Railway in 1861 based on standardized railway designs, and measures 48.74 m in span length (County of Simcoe n.d.). The bridge does not have any existing heritage recognition at the municipal or provincial level.

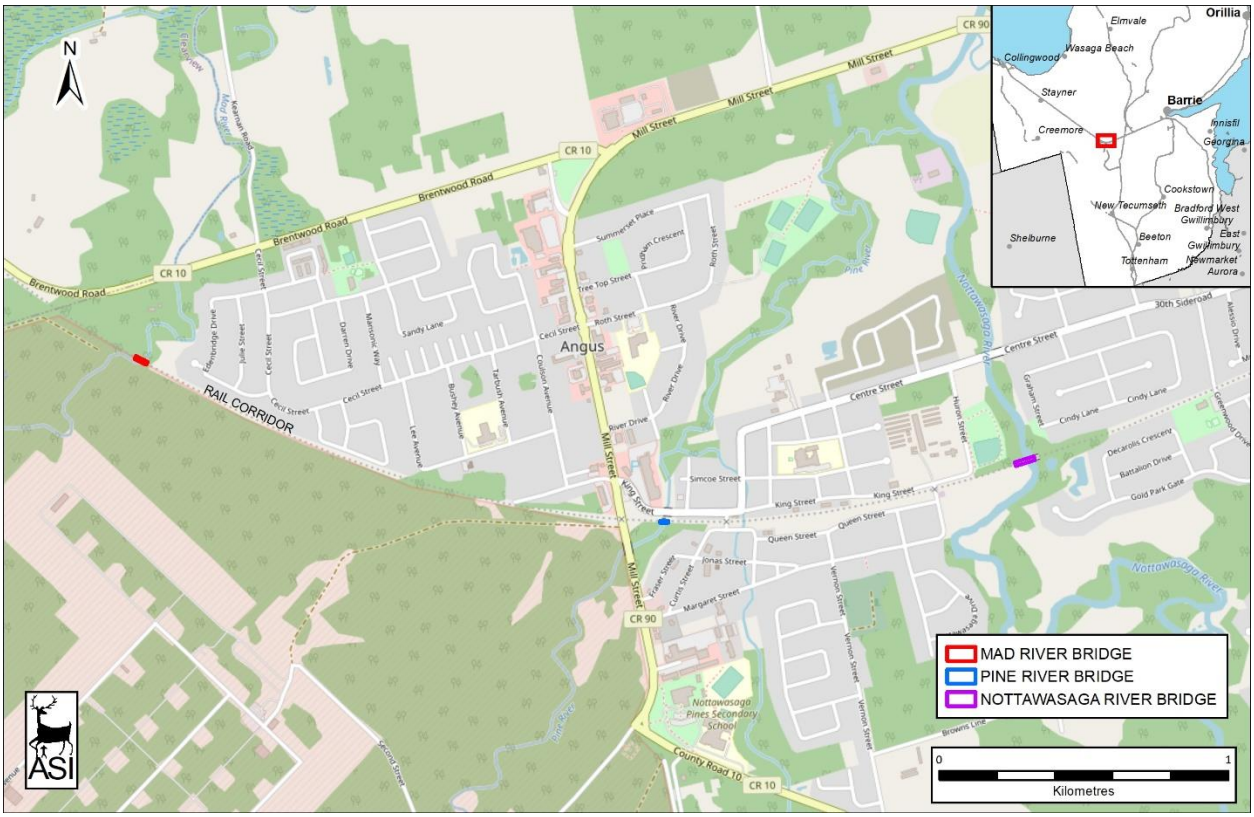


Figure 1: Location of the subject bridges
Base Map: ©OpenStreetMap and contributors, Creative Commons-Share Alike License (CC-BY-SA)

As these structures were constructed prior to 1956, a CHER is required to determine if the bridges retain cultural heritage value (Municipal Engineers Association 2014). Research was completed to investigate, document, and evaluate the cultural heritage value of the subject bridges. The CHER and fieldwork were conducted by John Sleath, Cultural Heritage Specialist, under the senior project management of Annie Veilleux, Manager of the Cultural Heritage Division, ASI.

The principal aims of this report are to:

- Describe the methodology that was employed and the legislative and policy context that guides heritage evaluations of bridges;
- Provide detailed research outlining a historical overview of the design and construction of the bridges within the broader context of the surrounding township and bridge construction generally; and
- Evaluate the bridges using *Ontario Regulations 9/06*, *Criteria for Determining Cultural Heritage Value or Interest*, of the *Ontario Heritage Act* and the Ontario Heritage Bridge Guidelines and draw conclusions about the cultural heritage value or interest of the structures.

The information contained in this report is organized in such a way to inform the evaluation of the subject bridges against criteria outlined in *Ontario Regulations 9/06*. These criteria are divided into three sections: Historical and Associative Value, Design and Physical Value, and Contextual Value.

1.1 Location and Study Area Description

A field review was undertaken by John Sleath, Cultural Heritage Specialist, ASI, on 3 December 2021 to conduct photographic documentation of the bridge crossings from the existing rail corridor right-of-way, now owned by the County of Simcoe, and to collect data relevant for completing a heritage evaluation of the structures.

1.1.1 Mad River Bridge

The Mad River Bridge carries one abandoned rail track over the Mad River in the west side of Village of Angus, County of Simcoe (Figure 2). The bridge is single-span riveted deck plate girder structure resting on stone masonry abutments (Figure 3). The surrounding area consists of naturalized and wooded area in the Mad River floodplain, with residences in the Village of Angus to the east and Canadian Forces Base (CFB) Borden to the immediate south.

Figure 2: Satellite imagery depicting the location of the Mad River Bridge.

Base Map: ESRI

Figure 3: The north elevation of the Mad River Bridge (ASI 2021)

The Mad River Bridge is a single-span riveted deck plate girder structure resting on stone masonry abutments located approximately 590 m east of the Sunnidale Tosorontio Townline in the Village of Angus (Figure 2). According to information provided in the 1907 Grand Trunk Railway (GTR) *Buildings and Bridges Inventory* for the Northern Division,14th District- Allandale to Meaford (GTR 1907:98) included in Figure 4, the subject bridge is Structure 291 at Mile 74.80 on the GTR Meaford Subdivision. The bridge carried a single track of railway traffic over the Mad River from its construction in 1866 until the railway (later the CN Meaford Subdivision) was abandoned in 2011. The bridge has a northwest-southeast alignment crossing the Mad River, which broadly travels along a northeast-southwest orientation. Original structural drawings of the bridge were not available and so the engineer responsible for its design are unknown, however it is assumed to have been designed in-house by engineers at the Northern Railway, the railway company that owned and operated the rail line at the time of construction. The bridge measures 14.73 m in span length (County of Simcoe n.d.), was six feet above waterline in 1907, and is noted to have had the timber ties at deck level replaced in 1907 (GTR 1907:98). No information regarding additional rehabilitations were available at the time of report submission. Photographic plates (Plate 1 to Plate 10Plate 9) are provided in Appendix A, and representative structural drawings of similar stone masonry abutments are provided in Appendix B.

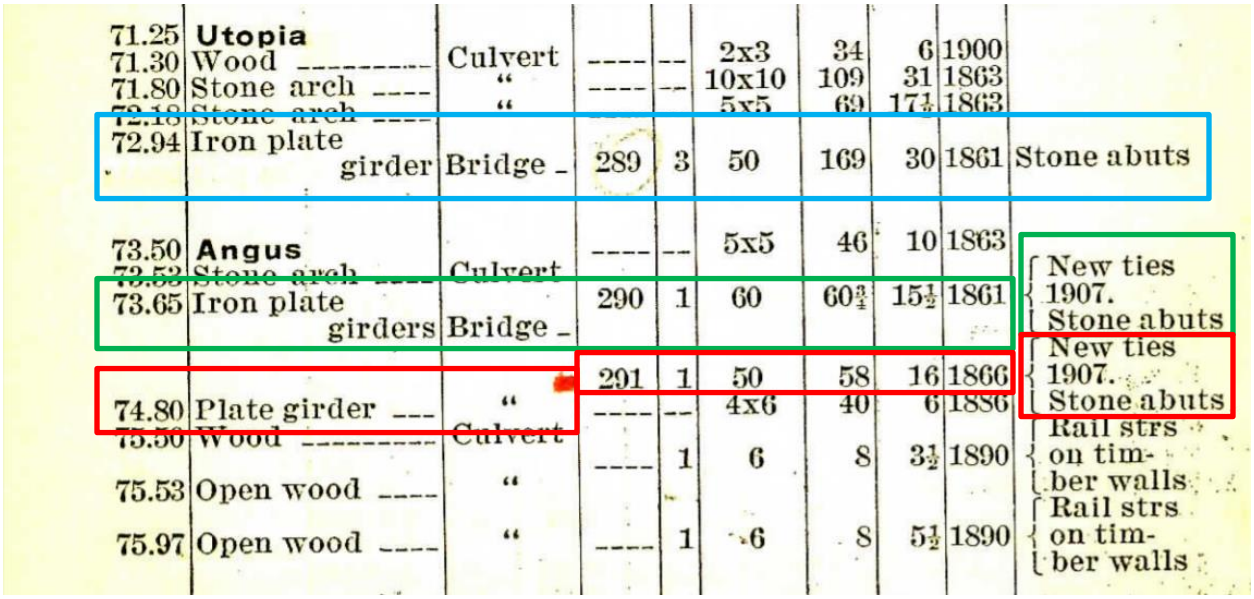
The single-span superstructure of the Mad River Bridge features an unballasted, open deck, with wooden rail ties supporting the main track and secondary bridge rails. The structure lacks railings or barriers at deck level. The deck ties rest on two riveted plate girders that are the main structural support elements perpendicular to the crossing. These girders are reinforced with transverse diaphragms and diagonal cross-bracing. Structural steel elements are primarily riveted plate girders and beams, although some smaller elements are rolled steel. Most connections are riveted, although some elements are bolted. The superstructure rests on the abutments on bearings, however the type is unknown as they were obscured from view by debris at the time of field review (3 December 2021).

The substructure of the subject bridge features two abutments that consist of limestone masonry blocks that are generally cut to a uniform size and shape. The abutments are generally rectangular in plan and

elevation with wingwalls and stacked timbers supporting the rail berm of the approaches on both sides. The abutments feature deep bearing plates to support the deck plate girder superstructure. Representative design drawings of similar stone masonry abutments are provided in Appendix B.

According to the bridge information provided by the County of Simcoe (County of Simcoe n.d.), the bridge has a span length of 14.78 m and a deck width of 3.96 m.

The rail corridor is largely overgrown in the vicinity of the bridge, with tall grasses and small shrubs in the rail right-of-way and between the rail ties. A large pile of rail ties are stacked to the southeast of the bridge, and a large tree has fallen and is blocking the rail corridor to the west of the crossing. An informal pedestrian pathway is evident in the rail corridor on both sides of the bridge, and hikers and dog walkers were noted in the vicinity of the bridge during the field review. CFB Borden is located directly south of the bridge, and signs indicating this are noted on the banks of the river adjacent to the bridge.



71.25	**Utopia**								
71.30	Wood	Culvert	----	--	2x3	34	6	1900	
71.80	Stone arch	"	----	--	10x10	109	31	1863	
[illegible]	[illegible]	"			5x5	69	17½	1863	
72.94	Iron plate girder	Bridge	289	3	50	169	30	1861	Stone abuts
73.50	**Angus**								
[illegible]	[illegible]	Culvert	----	--	5x5	46	10	1863	
73.65	Iron plate girders	Bridge	290	1	60	60¾	15½	1861	New ties 1907. Stone abuts
			291	1	50	58	16	1866	New ties 1907. Stone abuts
74.80	Plate girder	"	----	--	4x6	40	6	1886	
[illegible]	[illegible]	Culvert							Rail strs
75.53	Open wood	"	----	1	6	8	3½	1890	on timber walls
75.97	Open wood	"	----	1	6	8	5½	1890	Rail strs on timber walls

Figure 4: Excerpt of the 1907 GTR *Buildings and Bridges Inventory* of the Northern Division, 14th District, Meaford Subdivision (GTR 1907). The Nottawasaga River Bridge is noted in blue, the Pine River Bridge is noted in green, and the Mad River bridge is noted in red (emphasis added by ASI).

1.1.2 Pine River Bridge

The Pine River Bridge carries one abandoned rail track over the Pine River in the central portion of Village of Angus, County of Simcoe (Figure 5). The bridge is a single-span riveted deck plate girder structure resting on stone masonry abutments (Figure 6). The surrounding area consists of naturalized and wooded area in the Pine River floodplain, with King Street and commercial and retail properties in the Village of Angus to the north, residences to the southeast, and wooded areas to the southwest.

Figure 5: Satellite imagery depicting the location of the Pine River Bridge.
Base Map: ESRI

Figure 6: The north elevation of the Pine River Bridge (ASI 2021)

The Pine River Bridge is a single-span riveted deck plate girder structure resting on stone masonry abutments located approximately 140 metres east of the Mill Street in the Village of Angus (Figure 5).

According to information provided in the 1907 GTR *Buildings and Bridges Inventory* for the Northern Division,14th District- Allandale to Meaford (GTR 1907:98) included in Figure 4, the subject bridge is Structure 290 at Mile 73.65 on the GTR Meaford Subdivision. The bridge carried a single track of railway traffic over the Pine River from its construction in 1861 until the railway (later the CN Meaford Subdivision) was abandoned in 2011. The bridge has an east-west alignment crossing the Pine River, which broadly travels along a northeast-southwest orientation. Original structural drawings of the bridge were not available and so the engineer responsible for its design are unknown, however it is assumed to have been designed in-house by engineers at the Northern Railway, the railway company that owned and operated the rail line at the time of construction. The bridge measures 17.68 m in span length (County of Simcoe n.d.), was 15 ½ feet above waterline in 1907, and is noted to have had the timber ties at deck level replaced in 1907 (GTR 1907:98). No information regarding additional rehabilitations were available at the time of report submission. Photographic plates (Plate 11 to Plate 20) are provided in Appendix A, and representative structural drawings of similar stone masonry abutments are provided in Appendix B.

The single-span superstructure of the Pine River Bridge features an unballasted, open deck, with wooden rail ties supporting the main track and secondary bridge rails. The structure lacks railings or barriers at deck level. The deck ties rest on four riveted plate girders that are the main structural support elements perpendicular to the crossing. These girders are reinforced with transverse diaphragms. Structural steel elements are primarily riveted plate girders and beams, although some smaller elements are rolled steel. Most connections are riveted. The superstructure rests on the abutments on an unknown bearings type.

The substructure of the subject bridge features two abutments that consist of limestone masonry blocks that are generally cut to a uniform size and shape. The abutments are generally rectangular in plan and elevation with stone masonry wingwalls and stacked timbers supporting the rail berm of the approaches on both sides. The abutments feature deep bearing plates to support the deck plate girder superstructure. Representative design drawings of similar stone masonry abutments are provided in Appendix B.

According to the bridge information provided by the County of Simcoe (County of Simcoe n.d.), the bridge has a span length of 17.68 m and a deck width of 3.96 m.

The rail corridor is largely overgrown in the vicinity of the bridge, with tall grasses and small shrubs in the rail right-of-way and between the rail ties. An informal pedestrian pathway is evident in the rail corridor on both sides of the bridge, and pedestrian traffic is assumed to use this crossing as the bridge is located in close proximity to the commercial core of Angus on King Street directly north of the crossing.

1.1.3 Nottawasaga River Bridge

The Nottawasaga River Bridge carries one abandoned rail track over the Nottawasaga River in the central portion of the Village of Angus, County of Simcoe (Figure 7Figure 2). The bridge is a three-span riveted deck plate girder structure resting on stone masonry abutments (Figure 8). The surrounding area consists of naturalized and wooded area in the Nottawasaga River floodplain, with residences in the

Village of Angus to the northeast, a recreational park to the northwest, an undeveloped wooded area to the southwest, and a residential subdivision to the southeast.

Figure 7: Satellite imagery depicting the location of the Nottawasaga River Bridge.

Base Map: ESRI

Figure 8: The south elevation of the Nottawasaga River Bridge (ASI 2021)

The Nottawasaga River Bridge is a three-span riveted deck plate girder structure resting on stone masonry abutments located approximately 1.3 km west of Line 5 in the Village of Angus (Figure 7). According to information provided in the 1907 GTR *Buildings and Bridges Inventory* for the Northern Division,14th District- Allandale to Meaford (GTR 1907:98) included in Figure 4, the subject bridge is Structure 289 at Mile 72.94 on the GTR Meaford Subdivision. The bridge carried a single track of railway traffic over the Nottawasaga River from its construction in 1861 until the railway (later the CN Meaford Subdivision) was abandoned in 2011. The bridge has an east-west alignment crossing the Nottawasaga River, which broadly travels along a north-south orientation. Original structural drawings of the bridge were not available and so the engineer responsible for its design are unknown, however it is assumed to have been designed in-house by engineers at the Northern Railway, the railway company that owned and operated the rail line at the time of construction. The bridge measures 48.74 m in span length (County of Simcoe n.d.), was 30 feet above waterline in 1907 (GTR 1907:98). No information regarding additional rehabilitations were available at the time of report submission. Photographic plates (Plate 21 to Plate 31) are provided in Appendix A, and representative structural drawings of similar stone masonry abutments are provided in Appendix B.

The three-span superstructure of the Nottawasaga River Bridge features an unballasted, open deck, with wooden rail ties supporting the main track and secondary bridge rails. The structure lacks railings or barriers at deck level. The deck ties rest on two riveted plate girders that are the main structural support elements perpendicular to the crossing. These girders are reinforced with transverse diaphragms and diagonal cross-bracing. Structural steel elements are primarily riveted plate girders and beams, although some smaller elements are rolled steel. Structural steel connections are primarily riveted. The superstructure rests on the abutments on bearings, however the type is unknown as they were not visible at the time of field review (3 December 2021).

The substructure of the subject bridge features two abutments and two piers that consist of limestone masonry blocks that are generally cut to a uniform size and shape. The abutments are generally rectangular in plan and elevation with stone masonry wingwalls and stacked timbers supporting the rail berm of the approaches on both sides. The abutments feature deep bearing plates to support the deck plate girder superstructure. The piers are rectangular in plan and section, and both the upstream and downstream faces are rectangular and lack ice floe protection. Concrete parging with scored joints indicating stone coursing is evident on the fact of the piers, and poured concrete pier caps are evident on the top of the piers. Representative design drawings of similar stone masonry abutments and piers are provided in Appendix B.

According to the bridge information provided by the County of Simcoe (County of Simcoe n.d.), the bridge has an overall length of 48.74 m with spans measuring 17.68 m, 16.97 m, and 14.10 m (west to east), and a deck width of 3.96 m.

The rail corridor is largely overgrown in the vicinity of the bridge, with tall grasses and small shrubs in the rail right-of-way and between the rail ties. An informal pedestrian pathway is evident in the rail corridor on both sides of the bridge, and hikers and dog walkers were noted in the vicinity of the bridge during the field review.

1.2 Policy Framework

The authority to request this CHER arises from the *Ontario Heritage Act* (1990), *Environmental Assessment Act* (1990), the *Official Plan of the County of Simcoe* (Simcoe County 2008) and the *Official Plan of the Township of Essa* (Township of Essa 2001).

The following resources were among those reviewed in the preparation of this CHER:

- *Environmental Assessment Act* (Ministry of the Environment 1990)
    - *Guideline for Preparing the Cultural Heritage Resource Component of Environmental Assessments* (Ministry of Culture and Communications and Ministry of the Environment 1992)
    - *Guidelines on the Man-Made Heritage Component of Environmental Assessments* (Ministry of Culture and Recreation 1981)
    - *Municipal Heritage Bridges: Cultural, Heritage and Archaeological Resources Assessment Checklist* (Municipal Engineers Association 2014)
- *Ontario Heritage Act* (1990) and the following documents prepared by the Ministry of Tourism and Culture (MTC), now administered by the Ministry of Heritage, Sport, Tourism and Culture Industries (MHSTCI):
    - The *Ontario Heritage Tool Kit* (Ministry of Culture 2006) provides a guide on how to evaluate heritage properties that are subject to or are being considered for municipal designation and/or listing under sections 27, 29, or 41 of the *Ontario Heritage Act*
    - MTCS *Criteria for Evaluating Potential for Built Heritage Resources and Cultural Heritage Landscapes* (Ministry of Tourism, Culture and Sport 2016)
- Ministry of Transportation's (MTO) *Ontario Heritage Bridge Guidelines for Provincially Owned Bridges* (2008)

1.3 Cultural Heritage Evaluation Process

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

The scope of a CHER is guided by the *Ontario Heritage Tool Kit* (Ministry of Culture 2006). Generally, CHERs include the following components:

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

- Historical mapping and photographs; and
- A location plan.

Using background information and data collected during the site visit, the property is evaluated using criteria contained within O. Reg. 9/06 of the *Ontario Heritage Act*. The criteria are grouped into the following categories which determine the cultural heritage value or interest of a potential heritage resource in a municipality:

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

Should the structure meet one or more of the above-mentioned criteria, a Heritage Impact Assessment (HIA) is required.

When evaluating the cultural heritage significance of the subject bridge, the *Ontario Heritage Bridge Guidelines for Provincially Owned Bridges* (OHGB) (Ministry of Culture and Ministry of Transportation 2008) and the *Ontario Heritage Bridge Program* (Ministry of Culture and Communications 1991) were consulted as points of reference.

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

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

Additionally, during the site visit and as part of the evaluation process, attention is paid to surrounding cultural heritage resources that are situated in close proximity to the bridge. The identification of cultural heritage resources within the study area is based on the following definitions and concepts:

> *Built heritage resources* mean one or more buildings, structures, monuments, installations or remains associated with architectural, cultural, social, political, economic, or military history, identified as being important to a community, or reflective of contextual values.
>
> *Cultural heritage landscapes* mean a defined geographical area of heritage significance that has been modified by human activities. Such an area is valued by a community and is of significance to the understanding of the history of a people or place.

The term “significant” in the context of cultural heritage and archaeology resources refers to those that have been determined to have cultural heritage value or interest for the important contribution they

make to our understanding of the history of a place, an event, or a people. Processes and criteria for determining cultural heritage value or interest are established by the Province under the authority of the *Ontario Heritage Act*.

1.4 Project Consultation

The following organizations, websites, online heritage documents, and online heritage mapping tools were consulted to confirm the existing or potential cultural heritage value of the subject bridge and to request additional information generally:[1]

- The *Ontario Heritage Act Register* (Ontario Heritage Trust n.d.);
- The inventory of Ontario Heritage Trust easements (Ontario Heritage Trust n.d.);
- The *Places of Worship Inventory* (Ontario Heritage Trust n.d.);
- The Ontario Heritage Trust's *Ontario Heritage Plaque Database* (Ontario Heritage Trust n.d.);
- Database of known cemeteries/burial sites curated by the Ontario Genealogical Society (Ontario Genealogical Society n.d.);
- Parks Canada's *Canada's Historic Places* website (Parks Canada n.d.);
- Parks Canada's *Directory of Federal Heritage Designations* (Parks Canada n.d.);
- Canadian Heritage River System (Canadian Heritage Rivers Board and Technical Planning Committee n.d.); and
- United Nations Educational, Scientific and Cultural Organization (UNESCO) World Heritage Sites (UNESCO World Heritage Centre n.d.).

The following stakeholders were contacted with inquiries regarding the heritage status and for information concerning the Mad River Bridge, Pine River Bridge, and Nottawasaga River Bridge and any additional adjacent cultural heritage resources (Table 1).

Table 1: Results of Stakeholder Consultation

Contact	Organization	Date(s) of Communications	Description of Information Received
Joshua Mueller, Planning Technician	Township of Essa, Planning and Development	12 and 13 January 2022	Information on the subject bridges, including information on existing heritage recognition and a copy of the municipal heritage register was requested. A was response provided, however no additional information was available at the time of report submission.

[1] Reviewed 10 January 2022

Contact	Organization	Date(s) of Communications	Description of Information Received
Jenn Huddleston, Archivist	Simcoe County Museum and Archives	12, 14, and 19 January 2022	Information on the subject bridges, including archival photographs and original structural drawings, and general information on the Allandale to Collingwood Branch of the Northern Railway was requested. A response provided confirmed that the archives were closed to the public due to COVID 19 restrictions, but that archives staff would search for information available in their physical holdings. No additional information was available at the time of report submission.
Karla Barboza, (A) Team Lead, Heritage	Ministry of Heritage, Sport, Tourism and Culture Industries	12 and 17 January 2022	Response received. Confirmed that there are no properties designated by the Minister and no provincial heritage properties adjacent to the subject bridges.
Registrar, Ontario Heritage Trust	Ontario Heritage Trust	12 January 2022	Response was outstanding at the time of report submission.

2.0 HISTORICAL AND ASSOCIATIVE RESEARCH

A review of available primary and secondary source material was undertaken to produce a historical overview of the study area, including a general description of Indigenous and Euro-Canadian settlement and land-use. The following section provides the results of this research.

The Mad River Bridge was constructed by the Northern Railway in 1866 and is a single-span riveted deck plate girder structure with stone masonry abutments that carries the Allandale to Collingwood Branch of the Northern Railroad [originally the Ontario Simcoe and Huron Union Railroad (OS&HU)] over the Mad River in Simcoe County, Ontario. The bridge has not been identified as a heritage bridge in the Ontario Heritage Bridge inventory and does not currently have any status under the *Ontario Heritage Act*.

The Pine River Bridge was constructed by the Northern Railway in 1861 and is a single-span riveted deck plate girder structure with stone masonry abutments that carries the Allandale to Collingwood Branch of the Northern Railroad (originally the OS&HU) over the Pine River in Simcoe County, Ontario. The bridge has not been identified as a heritage bridge in the Ontario Heritage Bridge inventory and does not currently have any status under the *Ontario Heritage Act*.

The Nottawasaga River Bridge was constructed by the Northern Railway in 1861 and is a three-span riveted deck plate girder structure with stone masonry abutments and piers that carries the Allandale to Collingwood Branch of the Northern Railroad (originally the OS&HU) over the Nottawasaga River in Simcoe County, Ontario. The bridge has not been identified as a heritage bridge in the Ontario Heritage Bridge inventory and does not currently have any status under the *Ontario Heritage Act*.

2.1 Summary of Early Indigenous History in Southern Ontario

Southern Ontario has been occupied by human populations since the retreat of the Laurentide glacier approximately 13,000 years ago, or 11,000 Before the Common Era (B.C.E.) (Ferris 2013).[2] During the Paleo period (c. 11,000 B.C.E. to 9,000 B.C.E.), groups tended to be small, nomadic, and non-stratified. The population relied on hunting, fishing, and gathering for sustenance, though their lives went far beyond subsistence strategies to include cultural practices including but not limited to art and astronomy. Fluted points, beaked scrapers, and gravers are among the most important artifacts to have been found at various sites throughout southern Ontario, and particularly along the shorelines of former glacial lakes. Given the low regional population levels at this time, evidence concerning Paleo-Indian period groups is very limited (Ellis and Deller 1990).

Moving into the Archaic period (c. 9,000 B.C.E. to 1,000 B.C.E.), many of the same roles and responsibilities continued as they had for millennia, with groups generally remaining small, nomadic, and non-hierarchical. The seasons dictated the size of groups (with a general tendency to congregate in the spring/summer and disperse in the fall/winter), as well as their various sustenance activities, including fishing, foraging, trapping, and food storage and preparation. There were extensive trade networks which involved the exchange of both raw materials and finished objects such as polished or ground stone tools, beads, and notched or stemmed projectile points. Furthermore, mortuary ceremonialism was evident, meaning that there were burial practices and traditions associated with a group member's death (Ellis and Deller 1990; Ellis et al. 2009).

The Woodland period (c. 1,000 B.C.E. to 1650 C.E.) saw several trends and aspects of life remain consistent with previous generations. Among the more notable changes, however, was the introduction of pottery, the establishment of larger occupations and territorial settlements, incipient horticulture, more stratified societies, and more elaborate burials. Later in this period, settlement patterns, foods, and the socio-political system continued to change. A major shift to agriculture occurred in some regions, and the ability to grow vegetables and legumes such as corn, beans, and squash ensured long-term settlement occupation and less dependence upon hunting and fishing. This development contributed to population growth as well as the emergence of permanent villages and special purpose sites supporting those villages. Furthermore, the socio-political system shifted from one which was strongly kinship based to one that involved tribal differentiation as well as political alliances across and between regions (Ellis and Deller 1990; Williamson 1990; Dodd et al. 1990; Birch and Williamson 2013).

The arrival of European trade goods in the sixteenth century, Europeans themselves in the seventeenth century, and increasing settlement efforts in the eighteenth century all significantly impacted traditional ways of life in Southern Ontario. Over time, war and disease contributed to death, dispersion, and displacement of many Indigenous peoples across the region. The Euro-Canadian population grew in both numbers and power through the eighteenth and nineteenth centuries and treaties between colonial administrators and First Nations representatives began to be negotiated.

The subject property is within the Nottawasaga Purchase (Treaty 18), a provisional agreement sometimes called the Lake Simcoe-Nottawasaga Treaty, signed on October 17, 1818, by representatives

[2] While many types of information can inform the precontact settlement of Ontario, such as oral traditions and histories, this summary provides information drawn from archaeological research conducted in southern Ontario over the last century.

of the Government of Upper Canada and the Anishinaabe (Ministry of Indigenous Affairs, 2020; Williams Treaties First Nations, 2021). Treaty 18 encompassed 1,592,000 acres of land between the District of London in the west, Lake Huron in the north, the west limit of the Penetanguishine Purchase (1815) in the east, and the west shore of Lake Simcoe, Cook's Bay, and the Holland River in the northwest. In exchange for the land, the Crown agreed to pay an annual sum of £1200 in goods at the "Montreal price" (Crown-Indigenous Relations and Northern Affairs, 2016; Ministry of Indigenous Affairs, 2020). The Nottawasaga Purchase territory includes the present-day communities of Wasaga, Bradford, and Collingwood.

2.2 Township and Settlement History

The first Europeans to arrive in the area were transient merchants and traders from France and England, who followed Indigenous pathways and set up trading posts at strategic locations along the well-traveled river routes. All of these occupations occurred at sites that afforded both natural landfalls and convenient access, by means of the various waterways and overland trails, into the hinterlands. Early transportation routes followed existing Indigenous trails, both along the lakeshore and adjacent to various creeks and rivers (ASI 2006). Early European settlements occupied similar locations as Indigenous settlements as they were generally accessible by trail or water routes, and would have been in locations with good soil and suitable topography to ensure adequate drainage.

Historically, the subject bridges are in the former Township of Essa, County of Simcoe, with the Mad River Bridge in Lot 21, Concession I, the Pine River Bridge in Lot 30, Concession III, and the Nottawasaga River Bridge in Lot 30, Concession IV.

2.2.1 County of Simcoe

The area within what is now Simcoe County was inhabited by the ancestral Huron-Wendat at the time of European contact. European goods reached the area before 1600 and missionaries and Jesuits arrived soon after. Sainte Marie was established in 1639 and became the first European settlement in Upper Canada. In 1798, the County of Simcoe was formed as part of the "Home District". The boundaries of the county were refined in 1821. Almost 20 years later, in 1843, the area was declared a separate district, attaining county status in 1850, with Barrie as the county seat. At this time Simcoe County included portions of Grey and Dufferin Counties, and Muskoka and Parry Sound Districts. In 1881 the borders of Simcoe County were again redefined and the present townships of Tiny, Tay, Matchedash, Flos, Medonte, Orillia, Nottawasaga, Sunnidale, Vespra, Oro, Tosorontio, Essa, Innisfil, Adjala, Tecumseth, and West Gwillimbury were contained within. As of the late twentieth century, Simcoe County had two cities, seven towns, and eight villages (Mika and Mika 1983:394-398).

2.2.2 Township of Essa

Situated southwest of the City of Barrie, Essa Township was first survey in 1820. The first settlers arrived in Essa shortly after the survey, locating on the 1st Concession in the southeast corner of the township. They were George Donwoody, Thomas Duff, and Samuel McClain, all from County Monaghan, Ireland.

Donwoody took up Lot 10 where a log shanty was erected on the property. These first settlers lived there until they could clear sufficient land to build their own shelters (Mika and Mika 1977).

2.2.3 Village of Angus

One of the first settlers in Angus was a farmer named Jonas Tarbush. Settlement began slowly following the construction of the Sunnidale Road during the 1830s. Further impetus for settlement followed after the construction of the Northern Railway in 1857. The plan for the village was laid out by Tarbush and William Proudfoot, in February 1857. This plan showed a number of details, including views and the location of the sawmill, engine house, grist mill, store and tavern. It was named "Angus" in honour of Angus Morrison, a Member of Parliament and director of the railway. The first post office in this village was opened in August 1856, with John B. Curtis appointed to serve as postmaster. By 1873, it was referred to as a "flourishing" village. It then contained seven saw mills, three grist mills, "several stores and hotels," a printing office, and two telegraph offices. A tavern had been erected in the village sometime before 1857 by one "Mr. Harper." The population numbered approximately 400 at that time (Crossby 1873; Rayburn 1997; Scott 1997; Yarnold 1857).

2.2.4 Ontario, Simcoe, and Huron Union Railway

The conceptual planning for a railway following the original portage route that connected Lake Ontario, Lake Simcoe and Lake Huron originated in the 1830s when Toronto businessmen were devising ways to improve trade to the north of the city. Renowned bridge engineer Casimir Gzowski and Frederick Chase Capreol spearheaded the drive to have a railway for the north incorporated, and in July 1849 the Toronto, Simcoe & Lake Huron Union Railroad Company was formed (WSP 2019). As the original charter did not specify a northern terminus, the Governor General of Canada, Lord Elgin, referred the charter to the legal authorities in London for review. In an attempt to prevent the significant time delays that this would cause, Capreol travelled to London and petitioned for Royal Assent, which was received on July 20th, 1850 (Brown 1952). The company was renamed the Ontario, Simcoe, and Huron Union Railroad Company (OS&HU) and construction commenced.

The rail line opened on May 16,1853 with a formal ceremony that included dignitaries and a ceremonial sod-turning by Lady Elgin. The inaugural trip on May 16, 1853 from Toronto to Aurora is commemorated by a plaque at Toronto's Union Station, as it was the first steam locomotive operated in Ontario (Mika and Mika 1977). The original route connected Toronto to Aurora (formerly Matchell's Corners) via a 48 kilometre track (Andreae 1997). The line was expanded with service to Bradford beginning June 13, 1853, and further expanded to Barrie at Allandale on October 11, 1853 (forming the path for the present GO Barrie rail corridor). The railway was further extended from Allandale into Collingwood to provide access to shipping on Lake Huron, with the official opening on January 2, 1855 (Brown 1952).

In 1858, the OS&HU underwent a third name change becoming the Northern Railway Company of Canada, or simply the Northern Railway. In 1881 the section of the rail line between Allandale and Meaford, which passed through Collingwood, was converted from Provincial gauge (66 inches) to Standard gauge (56 ½ inches) (Smith 2019). Each of the three subject bridges was constructed during this period of ownership. In 1888 the Northern Railway amalgamated with the Grand Trunk Railway Company of Canada (GTR), with the subject railway branch from Allandale to Meaford designated the

Meaford Subdivision. Rail tracks were quickly laid across Ontario by large companies such as the GTR, as well as other parts of the country linking settlements and provinces. The population of Canada doubled between 1851 and 1901 but the miles of rail laid increased exponentially from 159 to 18,294 miles (Andreae 1997). The Northern Railway was a major draw factor for businesses in the Counties of York and Simcoe and caused many communities with a station to thrive and those without to dissipate (Town of Newmarket 2018). An 1877 map of the North Simcoe Railway, a subsidiary of the Northern Railway, depicts the location of the railways in the area at the time (Figure 9).

In 1923, the railway company was again amalgamated, this time with the government-owned Canadian National Railway (CN). In 1989 CN applied to the National Transportation Authority for permission to abandon the 33.23 mile section of the Meaford Subdivision from north of Barrie to Meaford due to lack of traffic, however this request was denied as the operation of the line was found to be in the public interest (Smith 2019). The section of rail line between Barrie and Collingwood on which the subject bridges are located was abandoned by CN in 2011 and purchased by the County of Simcoe in 2018 (WSP 2019; Cooper 2014).

The mainline from Toronto to Barrie (Allandale) is 105 km and the branch from Allendale to Collingwood is 52 km. Principal stations were located at Toronto, Aurora, Newmarket, Holland Landing, Bradford, Allendale Junction and Barrie. At Allandale Junction the railway diverted into the Collingwood Branch to the west and the Muskoka Branch to the northeast. The Allandale to Collingwood line included stations at Angus (Figure 10), New Lowell (Figure 11), Stayner (Figure 12), and Collingwood (Figure 13) (WSP 2019).

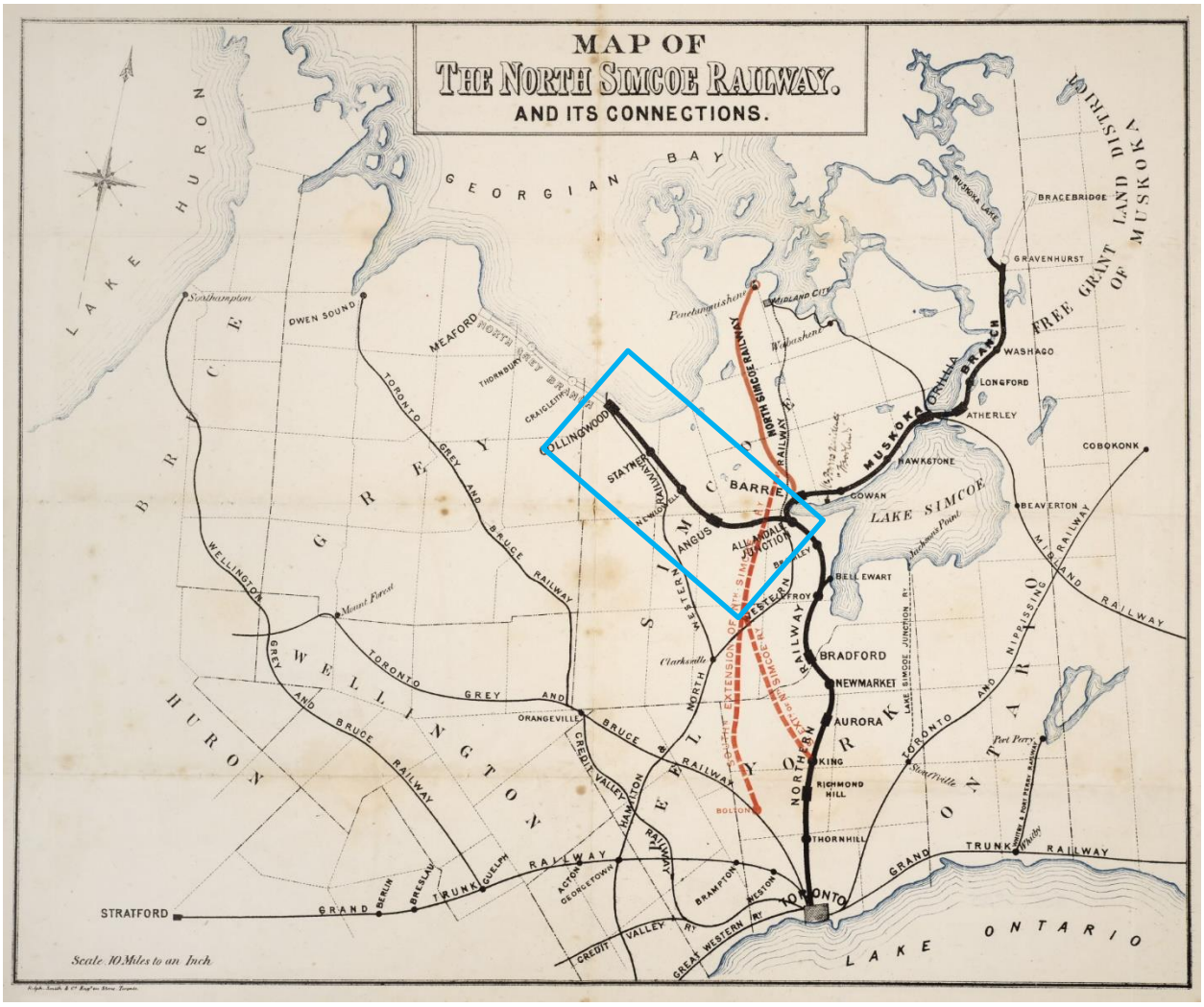


Figure 9: The Northern Railway in 1877, with the subject Allandale to Collingwood Branch noted in blue (emphasis added by ASI) (Ralph Smith and Co, Engineers 1877)

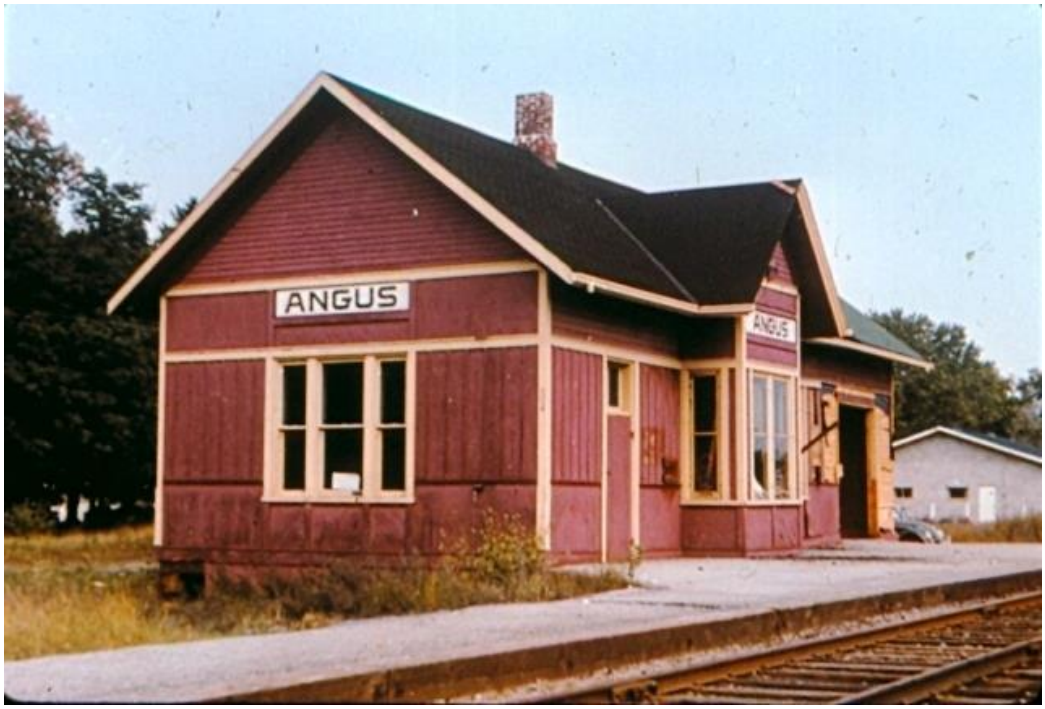


Figure 10: Photograph of Angus Station on the former OS&HU, unknown date (Cooper 2014)


Figure 11: Photograph of New Lowell Station on the former OS&HU, unknown date (Cooper 2014)

Figure 12: Photograph of Stayner Station on the former OS&HU, unknown date (Cooper 2014)


Figure 13: Photograph of train shed in Collingwood that served as the terminus of the OS&HU/ Northern Railway, c.1856-1873 (Cooper 2014)

2.2.5 Review of Nineteenth and Twentieth-Century Mapping

Historically, the subject bridges are located in the former Township of Essa, County of Simcoe, with the Mad River Bridge in Lot 21, Concession I, the Pine River Bridge in Lot 30, Concession III, and the Nottawasaga River Bridge in Lot 30, Concession IV. The subject bridges are located in generally undeveloped, wooded contexts in the Village of Angus.

The 1871 Hogg's *Map of the County of Simcoe* (Hogg 1871) and the 1881 *Illustrated Historical Atlas of the County of Simcoe* (Belden 1881), were examined to determine the presence of historical features within the study area during the nineteenth century.

It should be noted, however, that not all features of interest were mapped systematically in the Ontario series of historical atlases. For instance, they were often financed by subscription limiting the level of detail provided on the maps. Moreover, not every feature of interest would have been within the scope of the atlases. The use of historical map sources to reconstruct or predict the location of former features within the modern landscape generally begins by using common reference points between the various sources. The historical maps are geo-referenced to provide the most accurate determination of the location of any property on a modern map. The results of this exercise can be often imprecise or even contradictory, as there are numerous potential sources of error inherent in such a process, including differences of scale and resolution, and distortions introduced by reproduction of the sources.

The 1871 Hogg's Map (Figure 14) and the 1881 Illustrated Historical Atlas (Figure 15) depict the study area in a rural agricultural context on the rail corridor bisecting the Village of Angus. The rail line is depicted, as are the Mad, Pine, and Nottawasaga rivers, however no bridges are illustrated at the subject river crossings. The Pine River and the Nottawasaga River crossings are located within the Village of Angus, with the Mad River crossing in an agricultural context outside of the village. Streets within the village are depicted in a grid pattern both north and south of the rail corridor.

In addition to nineteenth-century mapping, historical topographic mapping and aerial photographs from the twentieth century were examined. This report presents maps and aerial photographs from 1928, 1954, and 1986 (Figure 16 to Figure 18). These do not represent the full range of maps consulted for the purpose of this study but were judged to cover the full range of land uses that occurred in the area during this period.

The 1928 topographical map (Figure 16) depicts the rail line as the Canadian National Railway, and each of the Mad, Pine, and Nottawasaga rivers are illustrated. The Village of Angus is depicted as smaller in size compared to the nineteenth century mapping with surveyed roads generally to the south of the railway. The Mad River Bridge is depicted to the west of the settlement, the Pine River Bridge is noted at the west limit of the village, and the Nottawasaga River Bridge is at the east limit. The Nottawasaga and Pine River bridges are both noted to be iron structures, although no material type is noted for the Mad River Bridge. A survey benchmark is located on each of the three subject bridges. The Village of Angus is noted to have a telegraph and telephone office, a sawmill on the Pine River south of the subject bridge, two schools, two churches, and a cemetery. A CN rail line is also depicted connecting to the subject rail line both west and east of the Pine River Bridge.

The 1954 aerial photograph (Figure 17) captures the subject bridges in a similar context as earlier mapping, with the Nottawasaga and Pine River bridges are at the edges of Angus and the Mad River

Bridge is to the west. The Village of Angus is noted to have undergone considerable development north of the rail corridor compared to the 1928 mapping. The area surrounding Angus retains its rural agricultural context. The 1986 NTS map (Figure 18) demonstrates continued development in Angus, while the rail line and subject bridges are each noted.

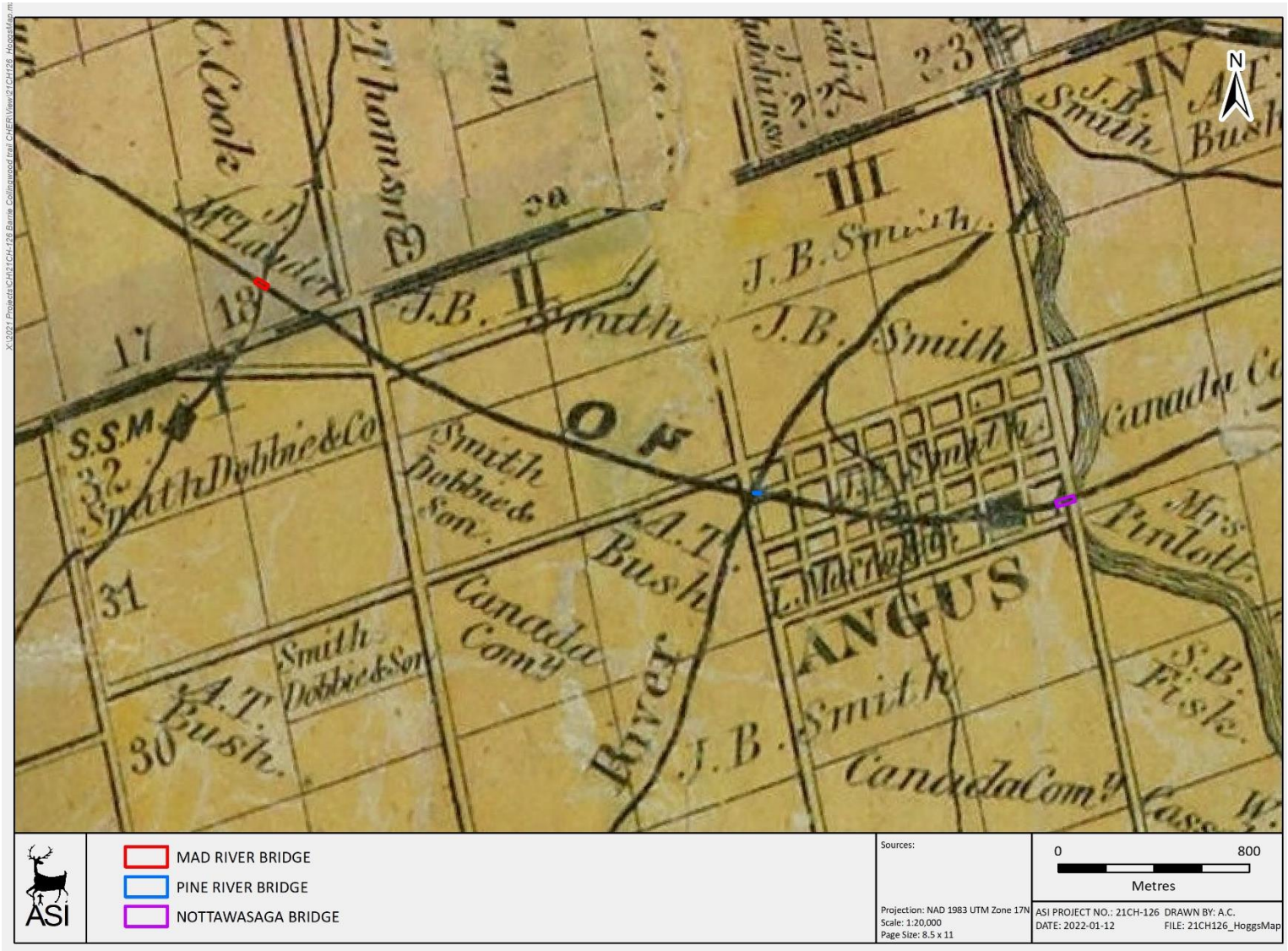


Figure 14: The subject bridges overlaid on the 1871 *Hogg's Map of the County of Simcoe*

Base Map: (Hogg 1871)

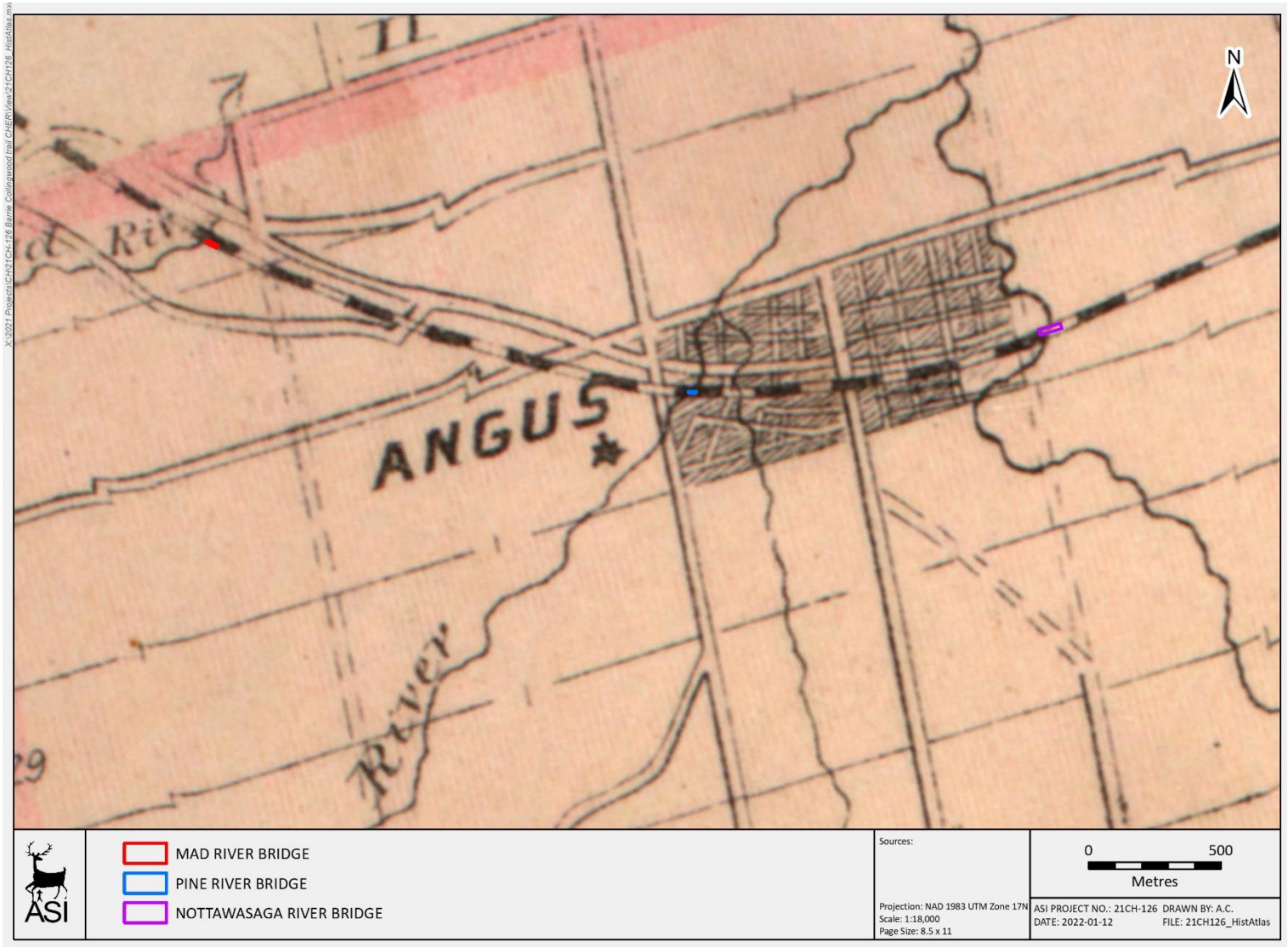


Figure 15: The subject bridges overlaid on the 1881 *Illustrated Historical Atlas of the County of Simcoe*

Base Map: (Belden 1881)

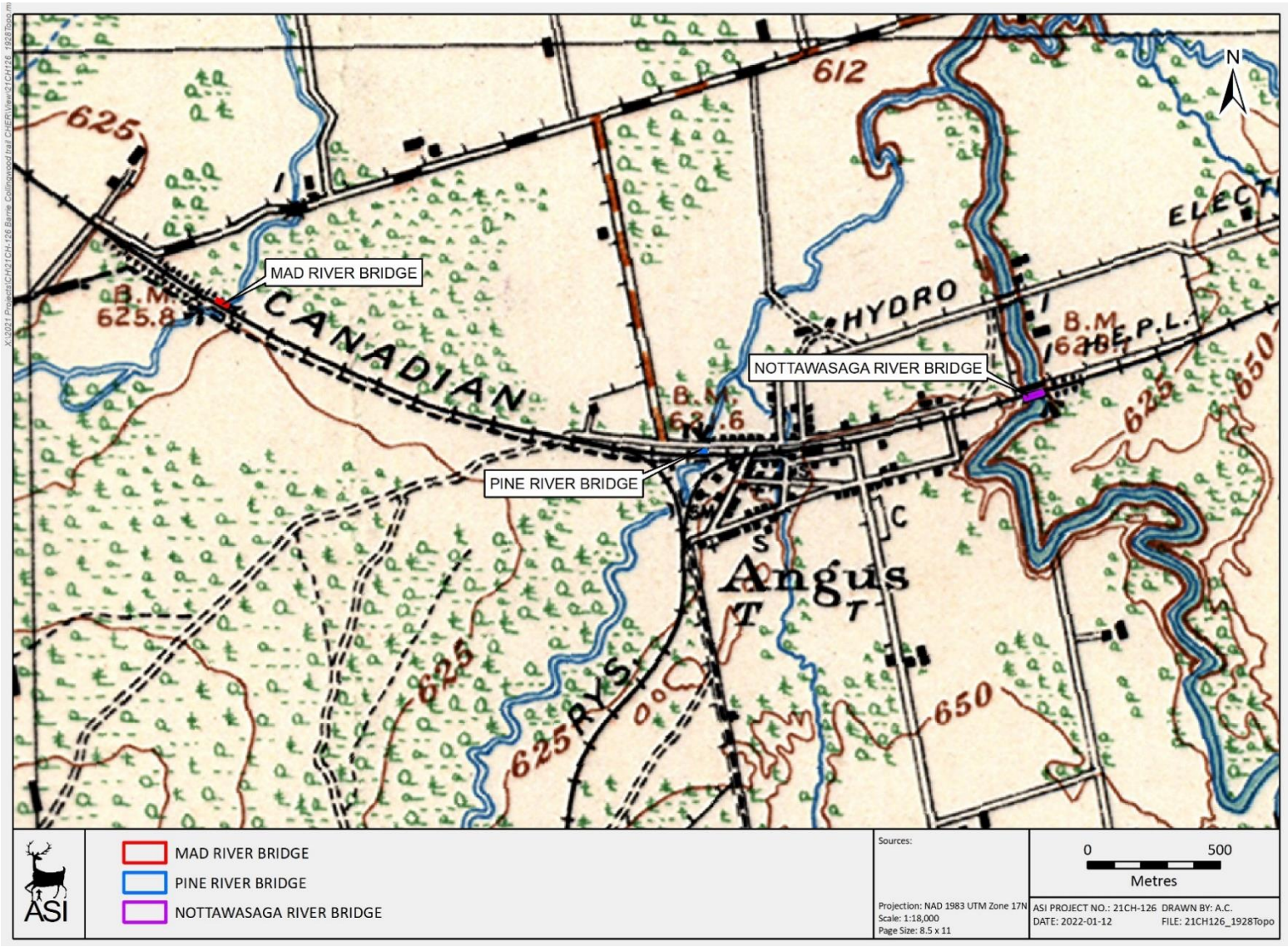


Figure 16: The subject bridges overlaid on the 1928 topographic map of Barrie

Base Map: (Department of National Defence 1928)

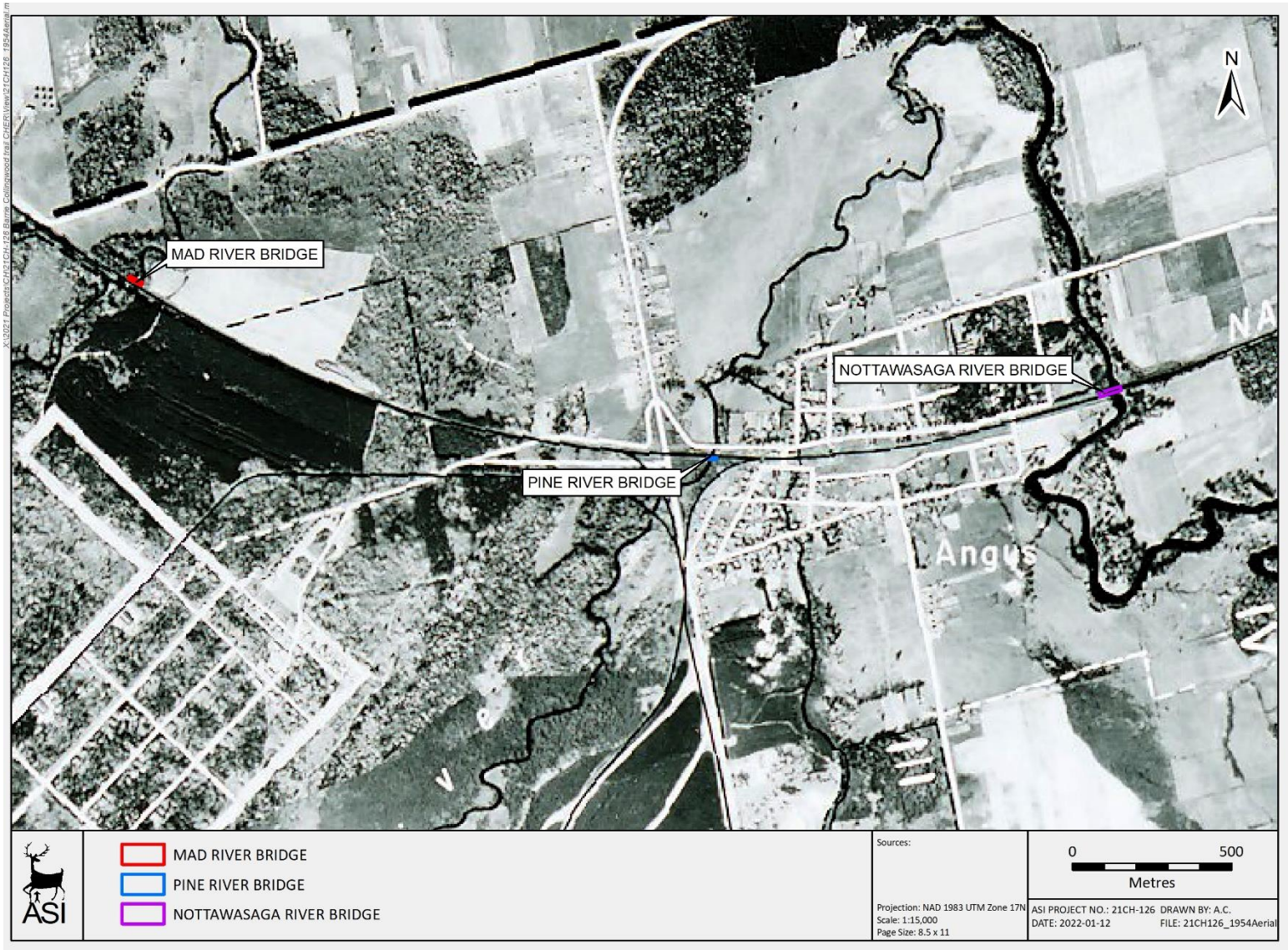


Figure 17: The subject bridges overlaid on the 1954 aerial photograph

Base Map: (Hunting Survey Corporation Limited 1954)

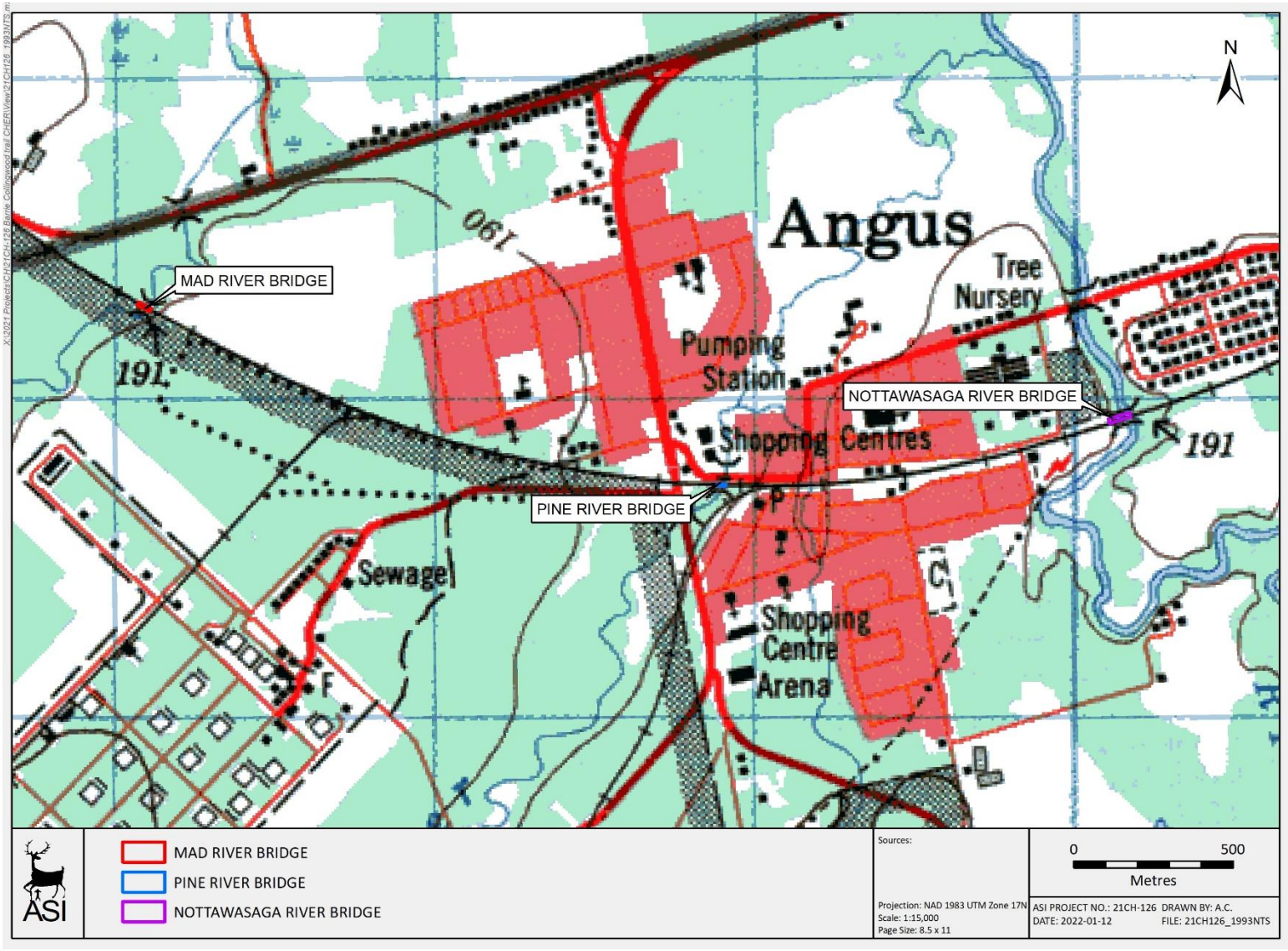


Figure 18: The subject bridges overlaid on the 1986 NTS map of Barrie

Base Map: (Department of Energy, Mines and Resources 1986)

2.3 Transportation History

2.3.1 Previous Bridges

As the OS&HU Allandale to Collingwood Branch was constructed in 1855 and the Mad River Bridge was constructed in 1866, the Pine River Bridge was constructed in 1861, and the Nottawasaga River Bridge was constructed in 1861, previous temporary bridges that were expedient to construct are assumed to have been the original constructions at these crossings. The subject bridges are assumed to have been intended to be the first permanent structures on the line at these crossings. As designing and constructing permanent rail bridges could be complex and time consuming depending on the nature of the crossing, temporary wooden structures that featured timber piles were occasionally first constructed at river crossings to enable the passage of train traffic on the rail line as quickly as possible. The timber piles at the bridge approaches would later be filled with gravel to create a sturdy rail berm, and the trestle spans would then be replaced with more durable bridges featuring stone abutments to retain the fill added to create the approaches (Figure 19 and Figure 20). With the temporary bridge in place, heavy construction materials like steel girders and stone masonry blocks as well as heavy machinery like cranes could then more easily be transported to the building site to construct the permanent structure. No information on the previous temporary bridges at these crossings was available at the time of report preparation, however they are expected to have been simple timber structures such as these in Figure 19 and Figure 20.

Figure 19: Trestle bridge infilling on the Ottawa, Arnprior, and Parry Sound Railway, in present day Algonquin Park, c. 1895 (Algonquin Park Archives item 125, in MacKay 1998:22)

Figure 20: Trestle bridge piling being driven into a lake for the on the Ottawa, Arnprior, and Parry Sound Railway, in present day Algonquin Park, 1896 (Algonquin Park Archives item 146, in MacKay 1998:25)

2.3.2 Early Railway Bridge Building in Ontario

The first railway bridges to be built in England were stone arch bridges in the eighteenth and nineteenth centuries. The first stone arch bridge in North America was built in 1829 by the Baltimore and Ohio Railroad at Gwynns Falls, Maryland, with a span of 280 m. By the time railway bridges were under construction in Ontario, during the 1850s, iron truss bridges supporting plate girders above had become the preferred railway bridge design as they were stronger and cheaper than stone arch bridges. However, the vast majority of railway bridges built in Ontario in the 1850s were wooden trestle bridges given the lower cost and availability of wood as a raw material (Brown 2013).

By the 1890s, steel was becoming the material of choice when constructing bridges given that it was less expensive and more durable than its wood and wrought iron predecessors. Steel truss structures were very common by 1900, as were steel girder bridges. The use of concrete in constructing bridges was introduced at the beginning of the twentieth century, and by the 1930s, it was challenging steel as the primary bridge construction material in Ontario.

In Ontario, railway bridges were first built to span natural obstacles, such as rivers and valleys. As the population increased and communities prospered, railway bridges were built to span other railways and to carry roads over, or under, the railroads. In the early twentieth century, many at-grade rail crossings were eliminated through the construction of overhead bridges (ASI 2017).

2.3.3 Beam and Girder Bridge Construction

Beam or girder technology was commonly used for bridge construction in Ontario. This bridge type is comprised of girders, members placed perpendicular to the ford, supported by abutments and piers, when necessary. Simple girder bridges were constructed in the nineteenth century out of wood to support rail, pedestrian, and vehicular traffic primarily across water obstacles. At the turn of the twentieth century, steel beams were introduced and were supported by stone and then concrete abutments and piers. However, the large, rolled steel girders were difficult to transport and thus more costly. Plate girders afforded an economic and logistical solution as they consisted of smaller steel segments that could be put together on site (Cleary 2007). This type of bridge consists of a series of solid members that run longitudinally for the length of the span, with additional bracing between the parallel members for support. The plate girder bridge typically consists of I-beams made up from separate structural steel plates. Early steel plate bridges were connected by rivets and bolts, while later designs were welded. Plate girder bridges proliferated throughout the mid-twentieth century and were commonly used to support railways in both urban and rural settings (Cleary 2007).

When a road or rail line is carried on top of the girders, the bridge is called a deck plate girder bridge. When the road or rail line passes between girders, the structure is called a through plate girder bridge (Cleary 2007).

The abutments and piers used to support steel plate girder substructures have historically featured timber, stone masonry blocks, and later, cast-in-place concrete. The materials used in the substructure would depend on a number of factors including costs, availability of materials, intended loading of the bridge, and the specifics of the bridge crossing. Railway bridges often featured stone masonry abutments and piers in the mid and late nineteenth century due to their high strength, ability to transport them to the bridge crossing on the rail line, and the ease in design afforded by their uniform constructed shape and size. Prominent railway engineer Sir Sanford Fleming promoted the use of stone masonry block substructures for steel plate girder bridges in his 1869 *Intercolonial Railway, General Plans of the Most Commonly Occurring Structures* due to their ease of construction, high strength, and low maintenance requirements (Fleming 1869). Representative pier and abutment drawings prepared by Fleming are included in Appendix B.

3.0 DESIGN AND PHYSICAL VALUE RESEARCH

Original structural drawings, rehabilitation drawings and archival photographs were requested by ASI from several sources (Section 1.4), however they were not available at the time of report preparation. Structural assessment reports were in preparation by R.J. Burnside and Associates Ltd. when this CHER was prepared, and were not available for review by ASI as part of this assessment. A field review was undertaken by John Sleath, Cultural Heritage Specialist, ASI, on 3 December 2021 to conduct photographic documentation of the bridge crossings and to collect data relevant for completing a heritage evaluation of the structures. The following descriptions of the construction, including the dates of the interventions, are based on a combination of the results of the field review and historical background research on the subject bridges. While no original structural or rehabilitation drawings were available for review, a selection of representative stone masonry pier and abutment drawings are provided in Appendix B.

3.1 Construction and Integrity of the Mad, Pine, and Nottawasaga River Bridges

To construct these deck plate girder bridges, the stone masonry block substructures were placed with individual limestone blocks stacked to the required height to support the superstructures. The rail berms in the approaches were supported with stacked timber retaining walls, where required. Once the abutments and the stone masonry piers in the case of the Nottawasaga River Bridge were prepared, the deck plate girder superstructures were installed. As no additional background information on the construction of these bridges were available, it is unclear if the superstructures were constructed at the bridge sites, if they were constructed and transported to the crossings, or if they were constructed with a combination of pre-fabricated and site-fabricated components. Following the placement of the steel superstructures the timber rail ties were laid, and then rail tracks were fastened to the rail times.

No original structural drawings were available for review and so the engineers responsible for the bridge design and the contractors responsible for construction are unknown. The structures are assumed to have been designed in-house by engineers at the Northern Railway, the company responsible for the railway at the time of bridge construction. Deck plate girder railway bridges were commonly constructed in the mid and late nineteenth century due to their ease of construction, relatively low cost, and durability, as noted in the representative substructure drawings included in Appendix B.

According to the 1907 GTR inventory (GTR 1907) depicted in Figure 4, the rail ties on the Mad River Bridge and the Pine River Bridge were replaced in 1907. No additional information regarding rehabilitations was noted, however there is evidence of gunite application with score lines on the Nottawasaga River Bridge. Gunite is a type of concrete that could be sprayed on stone masonry and brick masonry to increase the service life of structures, and is known to have been applied by CN on structures beginning in the 1920s (ERA 2016). It is unknown when this gunite was applied to the Nottawasaga River Bridge. No additional information regarding any rehabilitations were available at the time of report preparation.

3.2 Comparative Analysis

The Mad River Bridge is a single-span riveted deck plate girder structure resting on stone masonry abutments with a northwest-southeast orientation that carries a single track of the former Northern Railway alignment over the Mad River. The bridge was constructed by the Northern Railway in 1866 based on standardized railway designs, and measures 14.73 m in span length (County of Simcoe n.d.).

The Pine River Bridge is a single-span riveted deck plate girder structure resting on stone masonry abutments with a east-west orientation that carries a single track of the former Northern Railway alignment over the Pine River. The bridge was constructed by the Northern Railway in 1861 based on standardized railway designs, and measures 17.68 m in span length(County of Simcoe n.d.).

The Nottawasaga River Bridge is a three-span riveted deck plate girder structure resting on stone masonry abutments and piers with a east-west orientation that carries a single track of the former Northern Railway alignment over the Nottawasaga River. The bridge was constructed by the Northern Railway in 1861 based on standardized railway designs, and measures 48.74 m in span length (County of Simcoe n.d.).

Each of these riveted deck plate girder bridges with stone masonry substructures were compared with similar structures found in the BCRY Structure Summary, an inventory of bridges on the former Allandale-Collingwood Branch of the Northern Railway provided by the County of Simcoe (County of Simcoe n.d.). This structure summary provides information and photographs of six bridges on this branch of the subject railway and is the main basis for this comparative analysis. Information in the 1907 GTR Inventory (GTR 1907) was used to supplement this structure summary and provides additional information including construction dates for some of the bridges. The historical bridge inventory on *Historicbridges.org* was also consulted for examples of other deck-plate girder bridges in the County of Simcoe, and the Metrolinx Bridge Inventory was consulted for information on comparative bridges on the original OS&HU railway mainline from Toronto to Allandale (presently operating as the GO Barrie rail corridor). According to these resources, there are 11 known deck plate girder structures available in this comparative sample (list of comparative bridges in Appendix C). Of these, 11 plate girder structures, seven are known to have stone masonry substructures.

Comparable structures on the Allandale-Collingwood Branch of the Northern Railway that are believed to have also been constructed by the Northern Railway include:

- Structure 1, a single span through plate girder structure that carries the former Northern Railway over the Pretty River near Raglan Street in the Town of Collingwood. This bridge measures 22.6 m in length (County of Simcoe n.d.) and was constructed in an unknown year (Plate 32).
- Structure 2, a single span deck plate girder structure that carries the former Northern Railway over the Pretty River near Poplar Sideroad Street in the Town of Collingwood. This bridge measures 11.6 m in length (County of Simcoe n.d.) and was constructed in an unknown year (GTR 1907) (Plate 33).
- Structure 3 (GTR structure 293 at Mile 93.01), a single span deck plate girder structure that carries the former Northern Railway over Batteaux Creek near Batteaux Road in Batteaux. This bridge measures 6.9 m in length (County of Simcoe n.d.) and was constructed in 1863 (GTR 1907) (Plate 34).

Three plate girder bridges are also located on the former OS&HU alignment and are included in the Metrolinx Bridge Inventory. All three of these bridges are in the City of Toronto, and one is a through plate girder bridge and two are deck plate girder brides. These include:

- Lansdowne Ave Bridge (Mile 3.12), a single span deck girder bridge constructed with steel I girders in 1906. The bridge features reinforced concrete abutments and measures 22.8 m in length.
- Queen St West Bridge (Mile 2.46), single span through plate girder constructed in 1887. This bridge measures 29.6 m in length and rests on stone masonry blocks abutments.
- Brock Avenue Bridge (Mile 2.79), two span deck girder structure constructed in 1914. This bridge measures 28.6 m in length and features reinforced concrete abutments and a steel bent.

The two comparative railway bridges on the inventory at *Historicbridges.org* include:

- South Simcoe Railway Overpass, which carries the former Canadian Pacific Railroad over the South Simcoe Railway in New Tecumseh, Simcoe County. The bridge is a two-span through girder bridge with an overall length of 39.3 m built at an unknown date.
- Nottawasaga River Railway Bridge, which carries the former Canadian Pacific line over the Nottawasaga River south of Angus in Simcoe County. The bridge is a nine-span deck girder bridge with an overall length of 205.7 m built at an unknown date and features reinforced concrete piers and abutments and steel bents.

The subject bridges are part of a family of structures on the former Northern Railway Allandale to Collingwood Branch. Of the six bridges included in this segment of the rail corridor, five of the structures are deck plate girder bridges, with only Structure 1 (Pretty River Bridge) being a through plate girder bridge. All six of these bridges feature stone masonry abutments and are assumed to have been constructed in generally the same time period when the rail line was operated by the Northern Railway. The Nottawasaga River Bridge is the longest of this family of bridges at 48.74 m in length, and the only structure that features more than one span. All of these bridges are assumed to have been constructed in the 1860s, and each is considered to be the original permanent structure built at each crossing.

When the subject bridges are compared to the other plate girder structures in this comparative sample including plate girder bridges on the former OS&HU mainline and other in Simcoe County, the Nottawasaga River Bridge is the 3rd longest in terms of overall length, with the CP Nottawasaga River Railroad Bridge the longest at 205.7 m (Holth 2022).

Based on the review and comparison of the available bridges in this comparative sample, the Nottawasaga River Bridge is significant in terms of overall length and overall number of spans on the Northern Railway Allandale to Collingwood Branch, and each of the three bridges are considered to be significant in terms of age as they are original permanent structures on one of the earliest rail corridors in Ontario.

Images are included to provide a comparison between the subject bridge other deck plate girder structures in Southern Ontario in Appendix A (Plate 32 to Plate 34).

4.0 CONTEXTUAL RESEARCH

4.1 Setting and Character

4.1.1 Mad River Bridge

The Mad River Bridge carries one abandoned rail track over the Mad River in the west side of Village of Angus, County of Simcoe. The surrounding area consists of naturalized and wooded area in the Mad River floodplain, with residences in the Village of Angus to the east and CFB Borden to the immediate south.

The Mad River Bridge is one of five deck plate girder bridges with stone masonry abutments on the former North Railways Allandale to Collingwood Branch, all of which are believed to have been constructed in the 1860s. While deck plate girder bridges were commonly constructed on railroads in the nineteenth century due to their relatively simple and standardized design, ease of construction, and durability, the subject bridges represent a family of original, largely unaltered structures on one of the earliest railways in Ontario. As such, their physical and functional connection to the railway as original permanent structures is regarded as a significant contributor to their contextual value. The Mad River Bridge has contextual value as an original structure on an early railroad in the local context.

4.1.2 Pine River Bridge

The Pine River Bridge carries one abandoned rail track over the Pine River in the central portion of Village of Angus, County of Simcoe. The surrounding area consists of naturalized and wooded area in the Pine River floodplain, with King Street and commercial and retail properties in the Village of Angus to the north, residences to the southeast, and wooded areas to the southwest.

The Pine River Bridge is one of five deck plate girder bridges with stone masonry abutments on the former North Railways Allandale to Collingwood Branch, all of which are believed to have been constructed in the 1860s. While deck plate girder bridges were commonly constructed on railroads in the nineteenth century due to their relatively simple and standardized design, ease of construction, and durability, the subject bridges represent a family of original, largely unaltered structures on one of the earliest railways in Ontario. As such, their physical and functional connection to the railway as original permanent structures is regarded as a significant contributor to their contextual value. The Pine River Bridge has contextual value as an original structure on an early railroad in the local context.

4.1.3 Nottawasaga River Bridge

The Nottawasaga River Bridge carries one abandoned rail track over the Nottawasaga River in the central portion of the Village of Angus, County of Simcoe. The surrounding area consists of naturalized and wooded area in the Nottawasaga River floodplain, with residences in the Village of Angus to the northeast, a recreational park to the northwest, an undeveloped wooded area to the southwest, and a residential subdivision to the southeast.

The Nottawasaga River Bridge is one of five deck plate girder bridges with stone masonry abutments on the former North Railways Allandale to Collingwood Branch, all of which are believed to have been constructed in the 1860s. While deck plate girder bridges were commonly constructed on railroads in the nineteenth century due to their relatively simple and standardized design, ease of construction, and durability, the subject bridges represent a family of original, largely unaltered structures on one of the earliest railways in Ontario. As such, their physical and functional connection to the railway as original permanent structures is regarded as a significant contributor to their contextual value. The Nottawasaga River Bridge has contextual value as an original structure on an early railroad in the local context.

4.2 Community Landmark

4.2.1 Mad River Bridge

The Mad River Bridge is located within a naturalized and wooded area in the Mad River floodplain, obscured by vegetation from most vantage points throughout the area. No roadways or public spaces permit visibility of the structure, and no formalized trails or paths are in the immediate area. As the subject rail corridor has been abandoned since 2011 and did not carry a significant volume of passenger traffic in the years prior to its abandonment, it is not considered to be a familiar structure to operators and passengers of the former railroad. While the structure is visible to hikers that informally use the rail corridor, the bridge is not considered to be in a highly visible location. Further, the bridge is not considered to be a gateway feature or to act as a significant physical or contextual division between neighbourhoods or streetscapes. The Mad River Bridge is not considered to be a significant community landmark.

4.2.2 Pine River Bridge

The Pine River Bridge is located within a naturalized and wooded area in the Pine River floodplain, with King Street and commercial and retail properties in the Village of Angus to the north. While somewhat visible in the winter months when the leaves have fallen, the subject bridge is largely obstructed from the view of pedestrians and motorists on King Street due to dense tree cover, with no clear vantage points in the area. As the subject rail corridor has been abandoned since 2011 and did not carry a significant volume of passenger traffic in the years prior to its abandonment, it is not considered to be a familiar structure to operators and passengers of the former railroad. While the structure is visible to hikers that informally use the rail corridor, the bridge is not considered to be in a highly visible location. Further, the bridge is not considered to be a gateway feature or to act as a significant physical or contextual division between neighbourhoods or streetscapes. The Pine River Bridge is not considered to be a significant community landmark.

4.2.3 Nottawasaga River Bridge

The Nottawasaga River Bridge is located within a naturalized and wooded area in the Nottawasaga River floodplain, obscured by vegetation from most vantage points throughout the area. No roadways or public spaces permit visibility of the structure, and no formalized trails or paths are in the immediate area. As the subject rail corridor has been abandoned since 2011 and did not carry a significant volume of passenger traffic in the years prior to its abandonment, it is not considered to be a familiar structure to operators and passengers of the former railroad. While the structure is visible to hikers that informally use the rail corridor, and to paddlers on the Nottawasaga River, the bridge is not considered to be in a highly visible location. Further, the bridge is not considered to be a gateway feature or to act as a significant physical or contextual division between neighbourhoods or streetscapes. The Nottawasaga River Bridge is not considered to be a significant community landmark.

5.0 CULTURAL HERITAGE VALUE

5.1 Ontario Regulation 9/06 Evaluations

5.1.1 Mad River Bridge

Table 2 contains the evaluation of the Mad River Bridge within the framework set out in *Ontario Regulation 9/06*. Within the Municipal EA process, *Ontario Regulation 9/06* is the prevailing evaluation tool when determining if a heritage resource, in this case a bridge, has cultural heritage value.

Table 2: Evaluation of Mad River Bridge using *Ontario Regulation 9/06*

1. The property has design value or physical value because it:	
Ontario Heritage Act Criteria	Analysis
i. is a rare, unique, representative or early example of a style, type, expression, material or construction method;	The Mad River Bridge is a single-span riveted deck plate girder structure resting on stone masonry abutments that measures 14.73 m in span length. The bridge has a northwest-southeast orientation that carries a single track of the Allandale-Collingwood Branch of the former Northern Railway alignment over the Mad River. The bridge was constructed by the Northern Railway in 1866 based on standardized railway designs and is an original permanent structure at this crossing. Deck and through plate girder bridges proliferated throughout the mid-late nineteenth century and were commonly used to support railways in both urban and rural settings. The subject bridge is a good representative example of this bridge type with a surviving stone masonry substructure in the local context. Further, the subject bridge is a representative example of an unaltered bridge in the context of the family of similar structures on the Northern Railway's Allandale to Collingwood Branch. While once common, stone masonry substructures are becoming increasingly rare as they are replaced with cast-in-place concrete examples that meet modern design and safety codes. As the subject bridge, constructed in 1866, is the second earliest bridge in the comparative sample (Section 3.2), it is considered to be an early example of a deck plate girder bridge with stone abutments in the local context. Based on a review of the available data, the Mad River Bridge is an early and representative example of mid nineteenth-century railroad construction methods in the local context.
ii. displays a high degree of craftsmanship or artistic merit, or;	The Mad River Bridge is a common example of a deck plate girder structure and does not display a greater than industry standard for the time in either its material, tooling, or assembly. Accordingly, there is no evidence of exemplary craftsmanship or artistic merit in the design or construction of this structure. The subject bridge does not meet this criterion.
iii. demonstrates a high degree of technical or scientific achievement.	The Mad River Bridge is in an easily accessible rural setting, constructed from common materials, and designed according to established railroad bridge designs. The subject bridge does not demonstrate a high degree of technical or scientific achievement.
2. The property has historical value or associative value because it:	
Ontario Heritage Act Criteria	Analysis

Table 2: Evaluation of Mad River Bridge using *Ontario Regulation 9/06*

i. has direct associations with a theme, event, belief, person, activity, organization or institution that is significant to a community;	The Mad River Bridge has direct historical associations with the Allandale to Collingwood Branch of the Northern Railway, originally the OS&HU, one of the earliest rail lines in operation in Ontario. Built in 1866 to presumably replace the original temporary OS&HU rail bridge at the crossing, the subject bridge is an original permanent construction on the rail line. The OS&HU Allandale to Collingwood Branch began operations in 1855, only two years after the OS&HU mainline from Toronto to Allandale opened and became the first steam locomotive line in Ontario. The OS&HU and later the Northern Railway provided a direct connection for shipping traffic from Lake Ontario to Lake Huron which significantly contributed to the nineteenth-century commercial and industrial growth and development of settlements along its route. The subject bridge meets this criterion.
ii. yields, or has the potential to yield, information that contributes to an understanding of a community or culture, or;	The Mad River Bridge is one of many bridges constructed by the Northern Railway in the mid-late nineteenth century. As this bridge is a common type of bridge structure, it is not anticipated to have the potential to yield information that contributes to an understanding of a community or culture.
iii. demonstrates or reflects the work or ideas of an architect, artist, builder, designer or theorist who is significant to a community.	The engineer responsible for the design of the Mad River Bridge is unknown, and it is assumed to have been designed in house by engineers at the Northern Railway. Similarly, the foundry that provided the steel for construction and the contractor responsible for construction are also unknown. Accordingly, the subject bridge does not meet this criterion.
3. The property has contextual value because it:	
Ontario Heritage Act Criteria	Analysis
i. is important in defining, maintaining or supporting the character of an area;	The Mad River Bridge is located in a naturalized recreational riverine context on the Mad River outside of Angus, Simcoe County. This bridge is not significant to defining, maintaining, or supporting the character of its surroundings, and this character would not be significantly impacted if the subject bridge were altered or removed. The subject bridge does not meet this criterion.
ii. is physically, functionally, visually or historically linked to its surroundings, or;	The Mad River Bridge physically and functionally supports the use of the Allandale-Collingwood Branch of the Northern Railway. The structure is historically and functionally linked to the rail corridor as the first permanent structure at the crossing that carried rail traffic from its construction in 1866 until the railway was abandoned in 2011, a period of approximately 145 years. The subject bridge is also functionally and physically related to the Allandale to Collingwood Branch as a member of a family of similar plate girder and stone masonry structures constructed in the 1860s on the rail corridor. The subject bridge meets this criterion.
iii. is a landmark.	The Mad River Bridge is located within a naturalized and wooded area in the Mad River floodplain, obscured by vegetation from most vantage points throughout the area. No roadways or public spaces permit visibility of the structure, and no formalized trails or paths are in the immediate area. As the subject rail corridor has been abandoned since 2011 and did not carry a significant volume of passenger traffic in the years prior to its abandonment, it is not considered to be a familiar structure to operators and passengers of the former railroad. While the structure is

Table 2: Evaluation of Mad River Bridge using *Ontario Regulation 9/06*

	visible to hikers that informally use the rail corridor, the bridge is not considered to be in a highly visible location. Further, the bridge is not considered to be a gateway feature or to act as a significant physical or contextual division between neighbourhoods or streetscapes. The subject bridge meets this criterion.

The Mad River Bridge meets the criteria outlined in *Ontario Regulation 9/06*, which considers the subject structure within the local context. The Mad River Bridge has physical and design value as an early and representative deck plate girder bridge in a railroad context, historical and associative value as an original permanent structure on the Allandale to Collingwood Branch of the Northern Railway, and contextual value due to its functional and historical links to the Allandale to Collingwood Branch and the family of similar structures on the rail corridor.

5.1.2 Pine River Bridge

Table 3 contains the evaluation of the Pine River Bridge within the framework set out in *Ontario Regulation 9/06*. Within the Municipal EA process, *Ontario Regulation 9/06* is the prevailing evaluation tool when determining if a heritage resource, in this case a bridge, has cultural heritage value.

Table 3: Evaluation of Pine River Bridge using *Ontario Regulation 9/06*

1. The property has design value or physical value because it:	
Ontario Heritage Act Criteria	Analysis
i. is a rare, unique, representative or early example of a style, type, expression, material or construction method;	The Pine River Bridge is a single-span riveted deck plate girder structure resting on stone masonry abutments that measures 17.68 m in span length. The bridge has a east-west orientation that carries a single track of the Allandale-Collingwood Branch of the former Northern Railway alignment over the Pine River. The bridge was constructed by the Northern Railway in 1861 based on standardized railway designs and is an original permanent structure at this crossing. Deck and through plate girder bridges proliferated throughout the mid-late nineteenth century and were commonly used to support railways in both urban and rural settings. The subject bridge is a good representative example of this bridge type with a surviving stone masonry substructure in the local context. Further, the subject bridge is representative example of an unaltered bridge in the context of the family of similar structures on the Northern Railway's Allandale to Collingwood Branch. While once common, stone masonry substructures are becoming increasingly rare as they are replaced with cast-in-place concrete examples that meet modern design and safety codes. As the subject bridge, constructed in 1861, is the earliest bridge in the comparative sample (Section 3.2), it is considered to be an early example of a deck plate girder bridge with stone abutments in the local context. Based on a review of the available data, the Pine River Bridge is an early and representative example of mid nineteenth-century railroad construction methods in the local context.

Table 3: Evaluation of Pine River Bridge using *Ontario Regulation 9/06*

ii. displays a high degree of craftsmanship or artistic merit, or;	The Pine River Bridge is a common example of a deck plate girder structure and does not display a greater than industry standard for the time in either its material, tooling, or assembly. Accordingly, there is no evidence of exemplary craftsmanship or artistic merit in the design or construction of this structure. The subject bridge does not meet this criterion.
iii. demonstrates a high degree of technical or scientific achievement.	The Pine River Bridge is in an easily accessible rural setting, constructed from common materials, and designed according to established railroad bridge designs. The subject bridge does not demonstrate a high degree of technical or scientific achievement.
2. The property has historical value or associative value because it:	
Ontario Heritage Act Criteria	Analysis
i. has direct associations with a theme, event, belief, person, activity, organization or institution that is significant to a community;	The Pine River Bridge has direct historical associations with the Allandale to Collingwood Branch of the Northern Railway, originally the OS&HU, one of the earliest rail lines in operation in Ontario. Built in 1861 to presumably replace the original temporary OS&HU rail bridge at the crossing, the subject bridge is an original construction on the rail line. The OS&HU Allandale to Collingwood Branch began operations in 1855, only two years after the OS&HU mainline from Toronto to Allandale opened and became the first steam locomotive line in Ontario. The OS&HU and later the Northern Railway provided a direct connection for shipping traffic from Lake Ontario to Lake Huron which significantly contributed to the nineteenth-century commercial and industrial growth and development of settlements along its route. The subject bridge meets this criterion.
ii. yields, or has the potential to yield, information that contributes to an understanding of a community or culture, or;	The Pine River Bridge is one of many bridges constructed by the Northern Railway in the mid-late nineteenth century. As this bridge is a common type of bridge structure, it is not anticipated to have the potential to yield information that contributes to an understanding of a community or culture.
iii. demonstrates or reflects the work or ideas of an architect, artist, builder, designer or theorist who is significant to a community.	The engineer responsible for the design of the Pine River Bridge is unknown, and it is assumed to have been designed in house by engineers at the Northern Railway. Similarly, the foundry that provided the steel for construction and the contractor responsible for construction are also unknown. Accordingly, the subject bridge does not meet this criterion.
3. The property has contextual value because it:	
Ontario Heritage Act Criteria	Analysis
i. is important in defining, maintaining or supporting the character of an area;	The Pine River Bridge is located in a naturalized recreational riverine context on the Pine River in Angus, Simcoe County. This bridge is not significant to defining, maintaining, or supporting the character of its surroundings, and this character would not be significantly impacted if the subject bridge were altered or removed. The subject bridge does not meet this criterion.
ii. is physically, functionally, visually or historically linked to its surroundings, or;	The Pine River Bridge physically and functionally supports the use of the Allandale-Collingwood Branch of the Northern Railway. The structure is historically and functionally linked to the rail corridor as the first permanent structure at the

Table 3: Evaluation of Pine River Bridge using *Ontario Regulation 9/06*

	crossing that carried rail traffic from its construction in 1861 until the railway was abandoned in 2011, a period of approximately 150 years. The subject bridge meets this criterion.
iii. is a landmark.	The Pine River Bridge is located within a naturalized and wooded area in the Pine River floodplain, obscured by vegetation from most vantage points throughout the area. No roadways or public spaces permit visibility of the structure, and no formalized trails or paths are in the immediate area. As the subject rail corridor has been abandoned since 2011 and did not carry a significant volume of passenger traffic in the years prior to its abandonment, it is not considered to be a familiar structure to operators and passengers of the former railroad. While the structure is visible to hikers that informally use the rail corridor, the bridge is not considered to be in a highly visible location. Further, the bridge is not considered to be a gateway feature or to act as a significant physical or contextual division between neighbourhoods or streetscapes. The subject bridge meets this criterion.

The Pine River Bridge meets the criteria outlined in *Ontario Regulation 9/06*, which considers the subject structure within the local context. The Pine River Bridge has physical and design value as an early and representative deck plate girder bridge in a railroad context, historical and associative value as an original permanent structure on the Allandale to Collingwood Branch of the Northern Railway, and contextual value due to its functional and historical links to the Allandale to Collingwood Branch and the family of similar structures on the rail corridor.

5.1.3 Nottawasaga River Bridge

Table 4 contains the evaluation of the Nottawasaga River Bridge within the framework set out in *Ontario Regulation 9/06*. Within the Municipal EA process, *Ontario Regulation 9/06* is the prevailing evaluation tool when determining if a heritage resource, in this case a bridge, has cultural heritage value.

Table 4: Evaluation of Nottawasaga River Bridge using *Ontario Regulation 9/06*

1. The property has design value or physical value because it:	
Ontario Heritage Act Criteria	Analysis
i. is a rare, unique, representative or early example of a style, type, expression, material or construction method;	The Nottawasaga River Bridge is a three-span riveted deck plate girder structure resting on stone masonry abutments and piers that measures 48.74 m in span length. The bridge has a east-west orientation that carries a single track of the Allandale-Collingwood Branch of the former Northern Railway alignment over the Mad River. The bridge was constructed by the Northern Railway in 1861 based on standardized railway designs and is an original permanent structure at this crossing. Deck and through plate girder bridges proliferated throughout the mid-late nineteenth century and were commonly used to support railways in both urban and rural settings. The subject bridge is a good representative example of this bridge type with a surviving stone masonry substructure in the local context. Further, the subject bridge is a representative example of an unaltered bridge in the context of the family of similar structures on the Northern Railway's Allandale to Collingwood Branch. While once common, stone masonry substructures are becoming

Table 4: Evaluation of Nottawasaga River Bridge using *Ontario Regulation 9/06*

	increasingly rare as they are replaced with cast-in-place concrete examples that meet modern design and safety codes. As the subject bridge, constructed in 1861, is the earliest bridge in the comparative sample (Section 3.2), it is considered to be an early example of a deck plate girder bridge with stone abutments in the local context. Further, the subject bridge is the only three span structure in the comparative sample, and accordingly is considered to be significant in terms of overall length. Based on a review of the available data, the Pine River Bridge is an early and representative example of mid nineteenth-century railroad construction methods in the local context.
ii. displays a high degree of craftsmanship or artistic merit, or;	The Nottawasaga River Bridge is an example of a deck plate girder structure and does not display a greater than industry standard for the time in either its material, tooling, or assembly. While the subject bridge is the longest example in the comparative sample, there is no evidence of exemplary craftsmanship or artistic merit in the design or construction of this structure. The subject bridge does not meet this criterion.
iii. demonstrates a high degree of technical or scientific achievement.	The Nottawasaga River Bridge is in an easily accessible rural setting, constructed from common materials, and designed according to established railroad bridge designs. The subject bridge does not demonstrate a high degree of technical or scientific achievement.
2. The property has historical value or associative value because it:	
Ontario Heritage Act Criteria	Analysis
i. has direct associations with a theme, event, belief, person, activity, organization or institution that is significant to a community;	The Nottawasaga River Bridge has direct historical associations with the Allandale to Collingwood Branch of the Northern Railway, originally the OS&HU, one of the earliest rail lines in operation in Ontario. Built in 1861 to presumably replace the original temporary OS&HU rail bridge at the crossing, the subject bridge is an original construction on the rail line. The OS&HU Allandale to Collingwood Branch began operations in 1855, only two years after the OS&HU mainline from Toronto to Allandale opened and became the first steam locomotive line in Ontario. The OS&HU and later the Northern Railway provided a direct connection for shipping traffic from Lake Ontario to Lake Huron which significantly contributed to the nineteenth-century commercial and industrial growth and development of settlements along its route. The subject bridge meets this criterion.
ii. yields, or has the potential to yield, information that contributes to an understanding of a community or culture, or;	The Nottawasaga River Bridge is one of many bridges constructed by the Northern Railway in the mid-late nineteenth century. As this bridge is a common type of bridge structure, it is not anticipated to have the potential to yield information that contributes to an understanding of a community or culture.
iii. demonstrates or reflects the work or ideas of an architect, artist, builder, designer or theorist who is significant to a community.	The engineer responsible for the design of the Nottawasaga River Bridge is unknown, and it is assumed to have been designed in house by engineers at the Northern Railway. Similarly, the foundry that provided the steel for construction and the contractor responsible for construction are also unknown. Accordingly, the subject bridge does not meet this criterion.

Table 4: Evaluation of Nottawasaga River Bridge using *Ontario Regulation 9/06*

3. The property has contextual value because it:	
Ontario Heritage Act Criteria	Analysis
i. is important in defining, maintaining or supporting the character of an area;	The Nottawasaga River Bridge is located in a naturalized recreational riverine context on the Nottawasaga River in Angus, Simcoe County. This bridge is not significant to defining, maintaining, or supporting the character of its surroundings, and this character would not be significantly impacted if the subject bridge were altered or removed. The subject bridge does not meet this criterion.
ii. is physically, functionally, visually or historically linked to its surroundings, or;	The Nottawasaga River Bridge physically and functionally supports the use of the Allandale-Collingwood Branch of the Northern Railway. The structure is historically and functionally linked to the rail corridor as the first permanent structure at the crossing that carried rail traffic from its construction in 1861 until the railway was abandoned in 2011, a period of approximately 150 years. The subject bridge meets this criterion.
iii. is a landmark.	The Nottawasaga River Bridge is located within a naturalized and wooded area in the Nottawasaga River floodplain, obscured by vegetation from most vantage points throughout the area. No roadways or public spaces permit visibility of the structure, and no formalized trails or paths are in the immediate area. As the subject rail corridor has been abandoned since 2011 and did not carry a significant volume of passenger traffic in the years prior to its abandonment, it is not considered to be a familiar structure to operators and passengers of the former railroad. While the structure is visible to hikers that informally use the rail corridor, and to paddlers on the Nottawasaga River, the bridge is not considered to be in a highly visible location. Further, the bridge is not considered to be a gateway feature or to act as a significant physical or contextual division between neighbourhoods or streetscapes. The subject bridge does not meet this criterion.

The Nottawasaga River Bridge meets the criteria outlined in *Ontario Regulation 9/06*, which considers the subject structure within the local context. The Nottawasaga River Bridge has physical and design value as an early and representative deck plate girder bridge in a railroad context and is significant as the longest bridge on the Allandale to Collingwood Branch. It has historical and associative value as an original permanent structure on the Allandale to Collingwood Branch of the Northern Railway, and has contextual value due to its functional and historical links to the Allandale to Collingwood Branch and the family of similar structures on the rail corridor.

5.2 Proposed Statement of Significance

5.2.1 Mad River Bridge

Description of Property

The Mad River Bridge is a single-span riveted deck plate girder structure resting on stone masonry abutments that measures 14.73 m in span length. The superstructure features riveted steel deck plate

girders and connections with other structural steel elements are primarily riveted. The deck carries one rail track with an additional bridge rail for safety and features an open deck with timber ties. The superstructure rests on unknown bearings on top of stone masonry abutments. The bridge has a northwest-southeast orientation and carries a single track of the Allandale-Collingwood Branch of the former Northern Railway alignment over the Mad River approximately 590 metres east of the Sunnidale Tosorontio Townline in the Village of Angus. The surrounding area consists of naturalized and wooded area in the Mad River floodplain, with residences in the Village of Angus to the east and CFB Borden to the immediate south.

The bridge was constructed by the Northern Railway in 1866 and is an original permanent structure at this crossing. The subject bridge was designed by an unknown engineer at the Northern Railway based on standardized railway designs and built by an unknown constructor. According to information provided in the 1907 GTR Buildings and Bridges Inventory for the Northern Division,14th District-Allandale to Meaford (GTR 1907:98) the subject bridge is also known as Structure 291 and is at Mile 74.80 of the former GTR Meaford Subdivision.

Draft Statement of Significance

The Mad River Bridge is significant for having physical/design value as an early and representative example of a deck plate girder bridge with stone masonry bridge abutments in a railway context in the County of Simcoe. Deck and through plate girder bridges proliferated throughout the mid-late nineteenth century and were commonly used to support railways in both urban and rural settings. The subject bridge is a good representative example of this bridge type with a surviving stone masonry substructure in the local context. Further, the subject bridge is a representative example of an unaltered bridge in the context of the family of similar structures on the Northern Railway's Allandale to Collingwood Branch. While once common, stone masonry substructures are becoming increasingly rare as they are replaced with cast-in-place concrete examples that meet modern design and safety codes. As the subject bridge, constructed in 1866, is the second earliest bridge in the comparative sample (Section 3.2), it is considered to be an early example of a deck plate girder bridge with stone abutments in the local context.

The Mad River Bridge is significant for having historical/associative value as it has direct historical associations with the Allandale to Collingwood Branch of the Northern Railway, originally the OS&HU, one of the earliest rail lines in operation in Ontario. Built in 1866 to presumably replace the original temporary OS&HU rail bridge at the crossing, the subject bridge is an original permanent construction on the rail line that carried rail traffic from its construction in 1866 until the railway was abandoned in 2011, a period of approximately 145 years. The OS&HU Allandale to Collingwood Branch began operations in 1855, only two years after the OS&HU mainline from Toronto to Allandale opened and became the first steam locomotive line in Ontario. The OS&HU and later the Northern Railway provided a direct connection for shipping traffic from Lake Ontario to Lake Huron which significantly contributed to the nineteenth-century commercial and industrial growth and development of settlements along its route.

The Mad River Bridge is one of five deck plate girder bridges with stone masonry abutments on the former Northern Railway's Allandale to Collingwood Branch, all of which are believed to have been

constructed in the 1860s. While deck plate girder bridges were commonly constructed on railroads in the nineteenth century due to their relatively simple and standardized design, ease of construction, and durability, these Allandale to Collingwood Branch bridges represent a family of original, largely unaltered structures on one of the earliest railways in Ontario. As such, their physical and functional connection to the railway as original permanent structures is regarded as a significant contributor to their contextual value. The Mad River Bridge has contextual value as an original structure on an early railroad in the local context.

Description of Heritage Attributes:

Key heritage attributes that embody the heritage value of the subject bridge include:

- Deck plate girder superstructure including girders, deck beams, stringers, diaphragms, and other structural steel components;
- Riveted connections within and between structural steel elements;
- Open deck with timber ties, rail track, and bridge rails; and
- Stone masonry abutments on the banks of the Mad River.

5.2.2 Pine River Bridge

Description of Property

The Pine River Bridge is a single-span riveted deck plate girder structure resting on stone masonry abutments that measures 17.68 m in span length. The superstructure features riveted steel deck plate girders and connections with other structural steel elements are primarily riveted. The deck carries one rail track with additional bridge rails for safety and features an open deck with timber ties. The superstructure rests on steel plate bearings on top of stone masonry abutments. The bridge has an east-west orientation that carries a single track of the Allandale-Collingwood Branch of the former Northern Railway alignment over the Pine River approximately 140 metres east of the Mill Street in the Village of Angus. The surrounding area consists of naturalized and wooded area in the Pine River floodplain, with King Street and commercial and retail properties in the Village of Angus to the north, residences to the southeast, and wooded areas to the southwest.

The bridge was constructed by the Northern Railway in 1861 and is an original permanent structure at this crossing. The subject bridge was designed by an unknown engineer at the Northern Railway based on standardized railway designs and built by an unknown constructor. According to information provided in the 1907 GTR Buildings and Bridges Inventory for the Northern Division,14th District-Allandale to Meaford (GTR 1907:98) the subject bridge is also known as Structure 290 and is at Mile 73.65 of the former GTR Meaford Subdivision.

Draft Statement of Significance

The Pine River Bridge is significant for having physical/design value as an early and representative example of a deck plate girder bridge with stone masonry bridge abutments in a railway context in the

County of Simcoe. Deck and through plate girder bridges proliferated throughout the mid-late nineteenth century and were commonly used to support railways in both urban and rural settings. The subject bridge is a good representative example of this bridge type with a surviving stone masonry substructure in the local context. Further, the subject bridge is a representative example of an unaltered bridge in the context of the family of similar structures on the Northern Railway's Allandale to Collingwood Branch. While once common, stone masonry substructures are becoming increasingly rare as they are replaced with cast-in-place concrete examples that meet modern design and safety codes. As the subject bridge, constructed in 1861, is the earliest bridge in the comparative sample (along with the Nottawasaga River Bridge), it is considered to be an early example of a deck plate girder bridge with stone abutments in the local context.

The Pine River Bridge is significant for having historical/associative value as it has direct historical associations with the Allandale to Collingwood Branch of the Northern Railway, originally the OS&HU, one of the earliest rail lines in operation in Ontario. Built in 1861 to presumably replace the original temporary OS&HU rail bridge at the crossing, the subject bridge is an original permanent construction on the rail line that carried rail traffic from its construction in 1861 until the railway was abandoned in 2011, a period of approximately 150 years. The OS&HU Allandale to Collingwood Branch began operations in 1855, only two years after the OS&HU mainline from Toronto to Allandale opened and became the first steam locomotive line in Ontario. The OS&HU and later the Northern Railway provided a direct connection for shipping traffic from Lake Ontario to Lake Huron which significantly contributed to the nineteenth-century commercial and industrial growth and development of settlements along its route.

The Pine River Bridge is one of five deck plate girder bridges with stone masonry abutments on the former Northern Railway's Allandale to Collingwood Branch, all of which are believed to have been constructed in the 1860s. While deck plate girder bridges were commonly constructed on railroads in the nineteenth century due to their relatively simple and standardized design, ease of construction, and durability, these Allandale to Collingwood Branch bridges represent a family of original, largely unaltered structures on one of the earliest railways in Ontario. As such, their physical and functional connection to the railway as original permanent structures is regarded as a significant contributor to their contextual value. The Pine River Bridge has contextual value as an original structure on an early railroad in the local context.

Description of Heritage Attributes:

Key heritage attributes that embody the heritage value of the subject bridge include:

- Deck plate girder superstructure including girders, deck beams, stringers, diaphragms, and other structural steel components;
- Riveted connections within and between structural steel elements;
- Open deck with timber ties, rail track, and bridge rails; and
- Stone masonry abutments on the banks of the Pine River.

5.2.3 Nottawasaga River Bridge

Description of Property

The Nottawasaga River Bridge is a three-span riveted deck plate girder structure resting on stone masonry abutments and piers that measures 48.74 m in span length. The superstructure features riveted steel deck plate girders and connections with other structural steel elements are primarily riveted. The deck carries one rail track with additional bridge rails for safety and features an open deck with timber ties. The superstructure rests on steel plate bearings on top of stone masonry abutments and piers. The bridge has an east-west orientation that carries a single track of the Allandale-Collingwood Branch of the former Northern Railway alignment over the Nottawasaga River approximately 1.3 km west of Line 5 in the Village of Angus. The surrounding area consists of naturalized and wooded area in the Nottawasaga River floodplain, with residences in the Village of Angus to the northeast, a recreational park to the northwest, an undeveloped wooded area to the southwest, and a residential subdivision to the southeast.

The bridge was constructed by the Northern Railway in 1861 and is an original permanent structure at this crossing. The subject bridge was designed by an unknown engineer at the Northern Railway based on standardized railway designs and built by an unknown constructor. According to information provided in the 1907 GTR Buildings and Bridges Inventory for the Northern Division,14th District-Allandale to Meaford (GTR 1907:98) the subject bridge is also known as Structure 289 and is at Mile 72.94 of the former GTR Meaford Subdivision.

Draft Statement of Significance

The Nottawasaga River Bridge is significant for having physical/design value as an early and representative example of a deck plate girder bridge with stone masonry bridge abutments in a railway context in the County of Simcoe. Deck and through plate girder bridges proliferated throughout the mid-late nineteenth century and were commonly used to support railways in both urban and rural settings. The subject bridge is a good representative example of this bridge type with a surviving stone masonry substructure in the local context. Further, the subject bridge is a representative example of an unaltered bridge in the context of the family of similar structures on the Northern Railway's Allandale to Collingwood Branch. While once common, stone masonry substructures are becoming increasingly rare as they are replaced with cast-in-place concrete examples that meet modern design and safety codes. As the subject bridge, constructed in 1861, is the earliest bridge in the comparative sample (along with the Pine River Bridge), it is considered to be an early example of a deck plate girder bridge with stone abutments in the local context. Further, the subject bridge is the longest bridge on the Allandale to Collingwood Branch and the only three span structure in the comparative sample, and accordingly is considered to be significant in terms of overall length in the local context.

The Nottawasaga River Bridge is significant for having historical/associative value as it has direct historical associations with the Allandale to Collingwood Branch of the Northern Railway, originally the OS&HU, one of the earliest rail lines in operation in Ontario. Built in 1861 to presumably replace the original temporary OS&HU rail bridge at the crossing, the subject bridge is an original permanent construction on the rail line that carried rail traffic from its construction in 1861 until the railway was abandoned in 2011, a period of approximately 150 years. The OS&HU Allandale to Collingwood Branch

began operations in 1855, only two years after the OS&HU mainline from Toronto to Allandale opened and became the first steam locomotive line in Ontario. The OS&HU and later the Northern Railway provided a direct connection for shipping traffic from Lake Ontario to Lake Huron which significantly contributed to the nineteenth-century commercial and industrial growth and development of settlements along its route.

The Nottawasaga River Bridge is one of five deck plate girder bridges with stone masonry abutments on the former Northern Railway's Allandale to Collingwood Branch, all of which are believed to have been constructed in the 1860s. While deck plate girder bridges were commonly constructed on railroads in the nineteenth century due to their relatively simple and standardized design, ease of construction, and durability, these Allandale to Collingwood Branch bridges represent a family of original, largely unaltered structures on one of the earliest railways in Ontario. As such, their physical and functional connection to the railway as original permanent structures is regarded as a significant contributor to their contextual value. The Nottawasaga River Bridge has contextual value as an original structure on an early railroad in the local context.

Description of Heritage Attributes:

Key heritage attributes that embody the heritage value of the subject bridge include:

- Deck plate girder superstructure including girders, deck beams, stringers, diaphragms, and other structural steel components;
- Riveted connections within and between structural steel elements;
- Open deck with timber ties, rail track, and bridge rails;
- Stone masonry abutments on the banks of the Nottawasaga River; and
- Stone masonry piers within the Nottawasaga River.

6.0 CONCLUSION AND RECOMMENDATIONS

This report includes an evaluation of the cultural heritage value of each of the three bridges as determined by the criteria in *Ontario Regulation 9/06* of the *Ontario Heritage Act*, which considers the design/physical, historical/associative, and contextual values of the bridges in the County of Simcoe.

The Mad River Bridge is a single-span riveted deck plate girder structure resting on stone masonry abutments that measures 14.73 m in span length. The superstructure features riveted steel deck plate girders and connections with other structural steel elements are primarily riveted. The bridge has a northwest-southeast orientation and carries a single track of the Allandale-Collingwood Branch of the former Northern Railway alignment over the Mad River approximately 590 metres east of the Sunnidale Tosorontio Townline in the Village of Angus. The bridge was constructed by the Northern Railway in 1866 and is an original permanent structure at this crossing. The subject bridge was designed by an unknown engineer at the Northern Railway based on standardized railway designs and built by an unknown constructor.

The Mad River Bridge meets the criteria outlined in *Ontario Regulation 9/06*, which considers the subject structure within the local context. The Mad River Bridge has physical and design value as an

early and representative deck plate girder bridge in a railroad context, historical and associative value as an original permanent structure on the Allandale to Collingwood Branch of the Northern Railway, and contextual value due to its functional and historical links to the Allandale to Collingwood Branch and the family of similar structures on the rail corridor.

The Pine River Bridge is a single-span riveted deck plate girder structure resting on stone masonry abutments that measures 17.68 m in span length. The bridge has an east-west orientation that carries a single track of the Allandale-Collingwood Branch of the former Northern Railway alignment over the Pine River approximately 140 metres east of the Mill Street in the Village of Angus. The bridge was constructed by the Northern Railway in 1861 and is an original permanent structure at this crossing. The subject bridge was designed by an unknown engineer at the Northern Railway based on standardized railway designs and built by an unknown constructor.

The Pine River Bridge meets the criteria outlined in *Ontario Regulation 9/06*, which considers the subject structure within the local context. The Pine River Bridge has physical and design value as an early and representative deck plate girder bridge in a railroad context, historical and associative value as an original permanent structure on the Allandale to Collingwood Branch of the Northern Railway, and contextual value due to its functional and historical links to the Allandale to Collingwood Branch and the family of similar structures on the rail corridor.

The Nottawasaga River Bridge is a three-span riveted deck plate girder structure resting on stone masonry abutments and piers that measures 48.74 m in span length. The bridge has an east-west orientation that carries a single track of the Allandale-Collingwood Branch of the former Northern Railway alignment over the Nottawasaga River approximately 1.3 km west of Line 5 in the Village of Angus. The bridge was constructed by the Northern Railway in 1861 and is an original permanent structure at this crossing. The subject bridge was designed by an unknown engineer at the Northern Railway based on standardized railway designs and built by an unknown constructor.

The Nottawasaga River Bridge meets the criteria outlined in *Ontario Regulation 9/06*, which considers the subject structure within the local context. The Nottawasaga River Bridge has physical and design value as an early and representative deck plate girder bridge in a railroad context and is significant as the longest bridge in the comparative sample. It has historical and associative value as an original permanent structure on the Allandale to Collingwood Branch of the Northern Railway, and has contextual value due to its functional and historical links to the Allandale to Collingwood Branch and the family of similar structures on the rail corridor.

As the evaluations using the criteria in *Ontario Regulation 9/06* of the *Ontario Heritage Act* determined that the Mad River Bridge, the Pine River Bridge, and the Nottawasaga River Bridge each have cultural heritage value or interest at the local level, the following recommendations should be implemented:

1. A Heritage Impact Assessment (HIA) should be completed for each the Mad River Bridge, the Pine River Bridge, and the Nottawasaga River Bridge as early as possible during the detailed design phase. The HIAs will help to identify alternatives as well as mitigation and monitoring commitments to avoid or lessen impacts on the heritage attributes of the bridges, based on the proposed Statements of Cultural Heritage Value. These assessment should be completed by a qualified person who has relevant and recent experience in the conservation of rail bridges (see

Section 3.0 of the *Standards and Guidelines for Conservation of Provincial Heritage Properties* [MHSTCI 2014] as a guide for best practice) and submitted to heritage staff at the County of Simcoe for review and approval and to the Ministry of Heritage, Sport, Tourism and Culture Industries (MHSTCI) for review.

2. The proponent should submit this report for review and comment to planning staff at the County of Simcoe, the MHSTCI, and to any other relevant stakeholder that has an interest in the heritage of the subject bridges. Any feedback will be incorporated into this report prior to finalization.

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APPENDIX A: PHOTOGRAPHIC PLATES

MAD RIVER BRIDGE

Plate 1: North elevation of the Mad River Bridge, looking south. Note: the image has been altered by ASI to block offensive graffiti.

Plate 2: Oblique view of the south elevation, looking northeast. Note: the image has been altered by ASI to block offensive graffiti.

Plate 3: Oblique view of the north elevation and the east abutment, looking southeast. Note: the image has been altered by ASI to block offensive graffiti.

Plate 4: East abutment plate supporting the superstructure, looking southeast. Note: the image has been altered by ASI to block offensive graffiti.

Plate 5: North elevation of the west abutments, looking south.

Plate 6: Detail of riveted plate girder, looking south with the west abutments at far right.

Plate 7: Riveted structural steel connections in the superstructure, looking east from the west abutment.

Plate 8: Open bridge deck with timber ties, rail track, and a single bridge rail, looking west towards the west approaches. Note the fallen tree blocking the rail track in the background.

Plate 9: Rail corridor, looking east towards the subject bridge.

Plate 10: Mad Creek south of the subject bridge, with grasses and shrubs in the floodplain and mature trees at rear left, looking southwest.

PINE RIVER BRIDGE

Plate 11: North elevation of the Pine River Bridge, looking southeast.

Plate 12: Oblique view of the south elevation, looking northeast.

Plate 13: Oblique view of the north elevation and the east abutment, looking southeast.

Plate 14: Oblique view of the south elevation and the east abutment, looking northeast. Note: the image has been altered by ASI to block offensive graffiti.

Plate 15: West face of the east abutment and the superstructure soffit, looking east. Note: the image has been altered by ASI to block offensive graffiti.

Plate 16: Superstructure soffit showing riveted connections and diaphragms between girders.

Plate 17: Detail of riveted plate girder on the north elevation.

Plate 18: Open bridge deck with timber ties, rail track, and single bridge rails, looking east from the west approaches. Note the south wingwall of the west abutment and timber retaining wall at near right.

Plate 19: Pine Creek south of the subject bridge, with grasses and shrubs in the floodplain, looking south.

Plate 20: Pine Creek north of the subject bridge, with the King Street Bridge at rear, looking north.

NOTTAWASAGA RIVER BRIDGE

Plate 21: South elevation of the Nottawasaga River Bridge, looking northeast.

Plate 22: Oblique view of the stone masonry piers, looking northeast.

Plate 23: North elevation, looking southwest.

Plate 24: Oblique view of the north elevation and the east elevation of the piers, with the west abutment at rear right, looking southwest.

Plate 25: South elevation of the west abutments, looking north.

Plate 26: East face of the west abutments, showing deteriorated parging with score lines on the stone masonry, looking west.

Plate 27: North elevation of the east abutment, looking south.

Plate 28: West face of the west pier, looking east. Note the deteriorated concrete or gunite parging.

Plate 29: South elevation of the south girder, with riveted connections, looking north.

Plate 30: The bridge deck, looking east from the west approach. Note the timber ties, rail track, and bridge rails at deck level.

Plate 31: Nottawasaga River north of the subject bridge, with mature trees lining the river banks, looking north.

COMPARATIVE BRIDGES ON THE ALLANDALE TO COLLINGWOOD BRANCH

Plate 32: Barrie-Collingwood Railway Structure #1, Raglan Street, Collingwood though plate girder bridge (County of Simcoe n.d.)

Plate 33: Barrie-Collingwood Railway Structure #2, Poplar Sideroad, Collingwood deck plate girder bridge (County of Simcoe n.d.)

Plate 34: Barrie-Collingwood Railway Structure #3, Bateaux Road, Batteaux deck plate girder bridge (County of Simcoe n.d.)

APPENDIX B: REPRESENTATIVE STRUCTURAL DRAWINGS

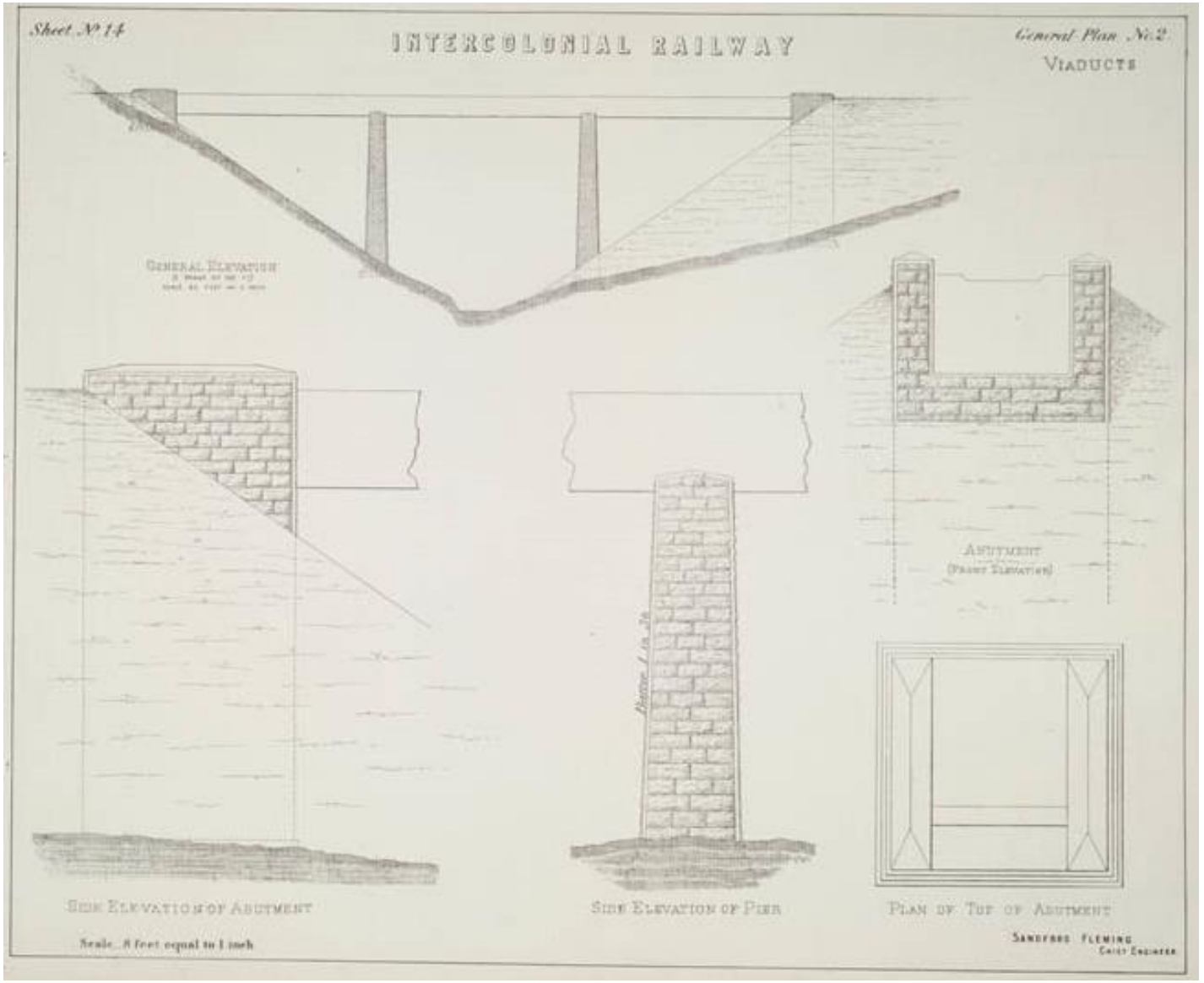

Figure 21: Representative design drawing of a structure comparative to the Nottawasaga River Bridge (Fleming 1869)

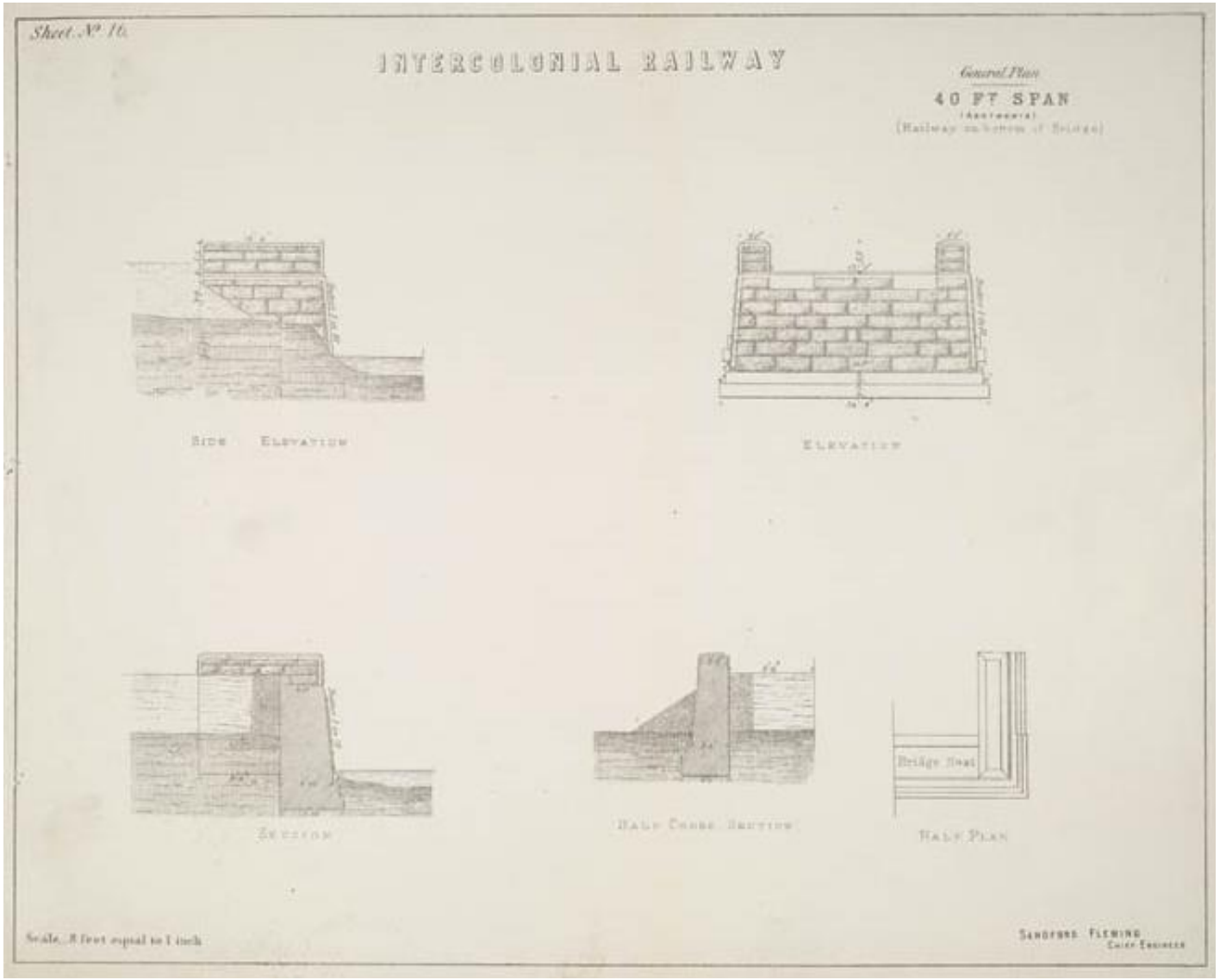

Figure 22: Representative design drawings of comparative abutments to the Mad River Bridge and Pine River Bridge (Fleming 1869)

APPENDIX C: COMPARATIVE PLATE GIRDER TYPE BRIDGES

Compiled by ASI from the Barrie-Collingwood Railway (BCRY) Structure Summary, an inventory of bridges on the former Allandale-Collingwood Branch of the Northern Railway provided by the County of Simcoe (County of Simcoe n.d.), bridges located on the former OS&HU alignment included in the Metrolinx Bridge Inventory (Metrolinx 2019), and information available at Historicbridges.org.

Table 5: Comparative Plate Girder Bridges in the BCRY Structure Summary

No.	Name	Year Constructed	No. Spans	Deck Length
BCRY Structure #1	Raglan Steet, Collingwood through plate girder bridge	unknown	1	22.6 m
BCRY Structure #2	Poplar Sideroad, Collingwood deck plate girder bridge	unknown	1	11.6 m
BCRY Structure #3	Batteaux road, Batteaux deck plate girder bridge	1863	1	6.9 m
BCRY Structure #4	**Mad River Bridge, deck plate girder bridge**	**1866**	**1**	**14.73 m**
BCRY Structure #5	**Pine River Bridge, deck plate girder bridge**	**1861**	**1**	**17.68 m**
BCRY Structure #6	**Nottawasaga River Bridge, deck plate girder bridge**	**1861**	**3**	**48.74 m**

Table 6: Comparative Plate Girder Bridges in the Metrolinx Bridge Inventory on the Barrie Rail Corridor (former OS&HU)

Name	Bridge Type	Year Constructed	No. Spans	Deck Length
Lansdowne Avenue Bridge (Mile 3.12)	Deck plate girder	1906	1	22.8 m
Queen Street West Bridge (Mile 2.46)	Through plate girder	1887	1	29.6 m
Brock Avenue Bridge (Mile 2.79)	Deck plate girder	1914	2	28.6 m

Table 7: Comparative Plate Girder Bridges in Simcoe County found in Historicbridges.org.

Name	Location	Year Constructed	No. Spans	Deck Length	Notes
South Simcoe Railway Overpass, which carries the former Canadian Pacific Railroad	Over the South Simcoe Railway in New Tecumseh, Simcoe County	Unknown	2	39.3 m	This bridge's plate girders appear to have been replaced, but it retains an original riveted steel bent.
Nottawasaga River Railway Bridge, which carries the former Canadian Pacific line	Over the Nottawasaga River south of Angus in Simcoe County.	unknown	9	205.7 m overall	This tower and girder style railway bridge has some alterations. Some of the plate girders have been replaced, and some of the bents have been replaced with concrete and steel.