HISTORY OF THE SR 68/70 STONE CULVERT OVER THE FARMINGTON CANAL TOWN OF CHESHIRE, NEW HAVEN COUNTY, CONNECTICUT

Prepared under contract to Connecticut Department of Transportation by

Anne Jennings and Emma Waterloo, Architectural Historians
AECOM, One World Financial Center, 25th Floor, New York, NY 10281
and
Robert Stewart & Fern Wildman-Schrier, Photographers
Historical Technologies, 1230 Copper Hill Road, West Suffield, CT 16093

Introduction

The State Route (SR) 68/70 Stone Culvert over the Farmington Canal in the Town of Cheshire, New Haven County, Connecticut is a single-span masonry culvert that was constructed by the town circa (ca.) 1866 (Figure 1). The Farmington Canal was listed in the National Register of Historic Places (NHRP) in 1985, and is significant for its historical, engineering, and archaeological importance. The nomination form does not include the culvert because it post-dates the period of significance of the canal, which corresponds to its years of operation, 1828-47.

However, like the canal, the culvert also appears to be significant for its historical, engineering, and archaeological importance. Constructed of masonry blocks and slabs, it is a rare surviving example of a ca. 1866 culvert over the Farmington Canal. Located along a major east/west route in the Town of Cheshire, it is also significant for its associations with the evolution of transportation technology over the course of the 19th-century in Cheshire. Furthermore, the culvert may have incorporated elements of a prior canal crossing, such as stone abutments.

Because the culvert is located on a state route, the Connecticut Department of Transportation (CTDOT) is responsible for its maintenance and repair. The culvert is in poor condition, and portions of the north face have collapsed. Therefore, during the Summer of 2011, CTDOT intends to replace it, and be completed with the project by the Fall of 2011. In compliance with Section 106 of the National Historic Preservation Act (NHPA), CTDOT and the Connecticut State Historic Preservation Office (CTSHPO) have concurred that the culvert replacement would affect the integrity of the NRHP-listed Farmington Canal. However, the action would not constitute an adverse effect on the canal provided that CTDOT prepare a CTDOT Historic Bridge Inventory Form which was completed and submitted to CTSHPO in 2010; prepare this article for the CTDOT website; and prepare a synopsis of this article for publication in the *Society for Industrial Archeology (SIA) New England Chapters Newsletter*.

Description

During the Fall of 2009, a field view was conducted to document the SR 68/70 Stone Culvert in the Town of Cheshire, Connecticut. The following description is based on that field view.

Project Location

Source: USGS Southington, CT Quadrangle, 1984.

1,200 0 1,200 Feet

400 0 400 Meters

N

Figure 1

The SR 68/70 Stone Culvert is a two-lane, single-span, masonry culvert that measures approximately 65 feet (ft) long, and has a curb-to-curb width of 46 ft-6 in. The culvert carries SR 68/70 (West Main Street) east/west over the north/south flowing Farmington Canal. The former New Haven & Northampton Railroad right-of-way (ROW) runs north/south west of the culvert (Photo 1).

The substructure of the culvert is constructed of random-course ashlar masonry. The upstream, or north face, of the culvert has been rehabilitated with a concrete slab and stem walls that allow water to be conveyed downstream. However, elements of the north face, including the original rock slab, stem walls, and masonry blocks have partially collapsed, and currently obstruct the flow of water through the culvert. The rehabilitated portion of the opening extends 6 ft north from the north face, and consists of a 6-in thick vertically laid, pre-cast concrete slab which rests atop two concrete stem walls. The stem walls extend 6 ft in length, are 3 ft wide, and 2 ft-6 in high. Loose rocks are scattered atop the slab. Two 20-in diameter ceramic pipes pierce the north face east and west of the opening.

The downstream, or south face, has remained relatively intact, although masonry blocks and mortar are deteriorating, and covered with vines. The opening is formed by a vertically-laid, 8-ft long rock slab of varying thickness, which rests atop two 2 ft-10 in high and 18-in thick rock stem walls. Only a 1 ft-10-in portion of the stem walls is visible above the water. Two 20-in diameter ceramic pipes pierce the south face, east and west of the opening. A concrete-capped masonry wingwall is located in the southeast quadrant. The wingwall extends 14 ft south along the east bank of the canal, and its southern end has been removed. The wingwall is pierced by a 24-in reinforced concrete pipe (RCP).

The superstructure consists of the north and south parapets and culvert deck. The north parapet has partially collapsed and is obstructed by a Jersey barrier on the south side. The east and west portions of the parapet are visible on the north side of the barrier, and consist of random-course ashlar-masonry capped with concrete. The south parapet is also constructed of random-course ashlar-masonry capped by concrete, and remains intact. A steel-pipe railing composed of three-sections is appended to the south parapet. A Jersey barrier is situated perpendicular to the parapet in the northwest corner. The culvert deck features an asphalt-paved, two-lane road, with shoulders north and south of the travel lanes, and an asphalt sidewalk protected by an asphalt curb on the south side of the culvert. Historically, the culvert deck featured a graded dirt road without sidewalks.

Canal Construction in the United States

The first proposal to construct a canal to improve transportation in the United States occurred in the 1670s. Father Dablon, a Jesuit priest based in Quebec, proposed to construct a canal in Illinois that would connect Lake Michigan to the Illinois River, a tributary of the Mississippi River (Charette, 2000). The canal was never constructed, and it was not until 1794 that the first two canals were built in the United States. They were located around the falls of the Connecticut River in South Hadley, Massachusetts, and the Carondelet Canal in New Orleans, Louisiana. Following the completion of the canals, sporadic attempts to build and operate other canals were largely unsuccessful (Harte, 1938). These early attempts at canal building stagnated from a lack

Photo 1

View looking northwest toward south face of the SR 68/70 Stone Culvert. Note high water level which obscures inlet.

Source: Robert Stewart, 2010.

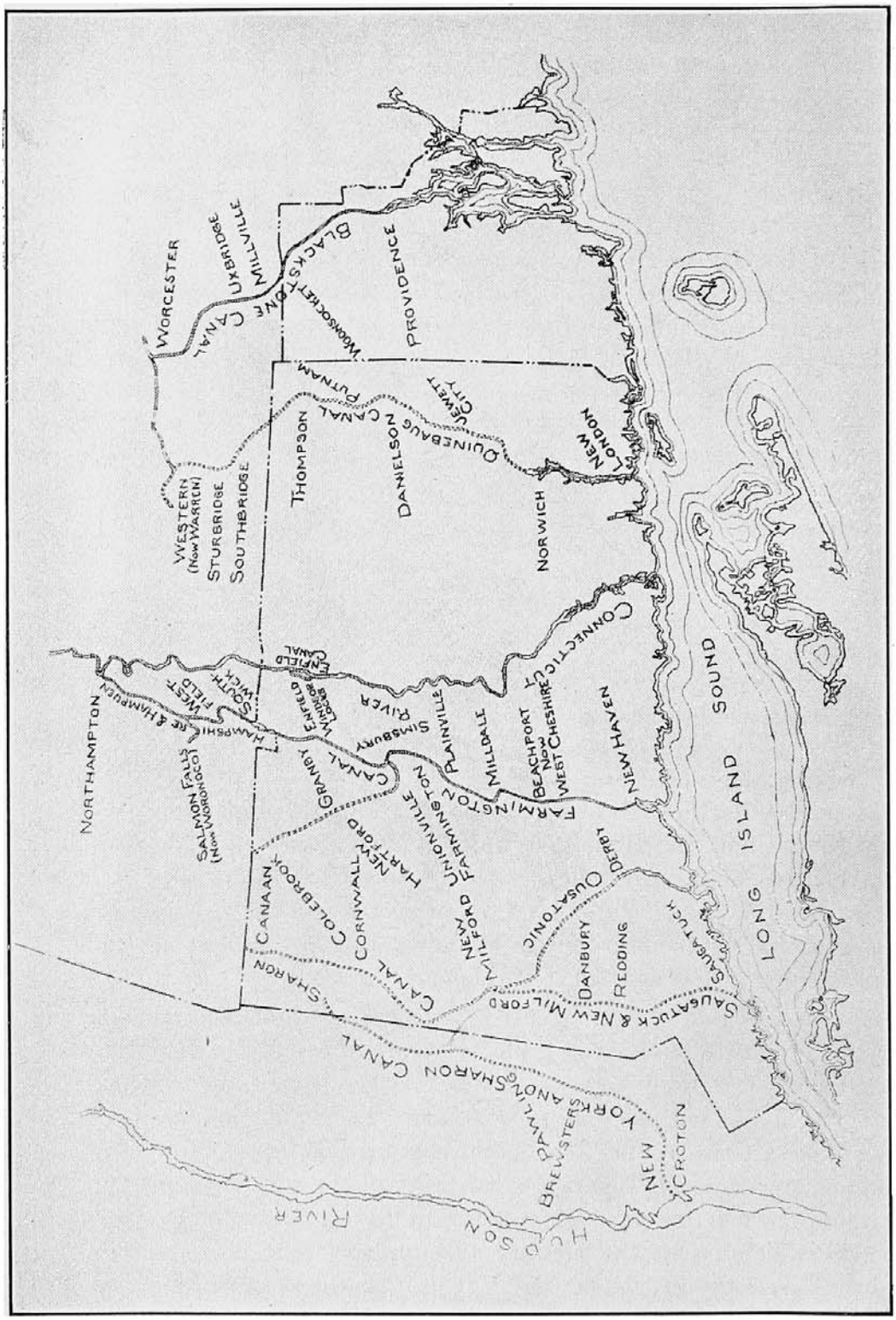
of experienced engineers, slow construction, and underfunding (Shaw, 1990). It was not until the first sections of the Erie Canal were put into operation in 1820 that the profitable use of canals to transport goods was demonstrated (Harte, 1938).

Initially proposed in 1807, the Erie Canal was the first transportation system that linked the eastern seaboard with the Great Lakes. Funding for the Erie Canal was assembled in 1816. The following year in 1817, Benjamin Wright was named Chief Engineer (Finch, 1925). By the time of his appointment, Wright already had considerable experience working with waterway improvements. In 1794 at the age of 24, Wright had been hired as a surveyor and planner by the well-known English canal designer working in the United States, William Weston. Under Weston's supervision, Wright laid out the locks and canals along the Mohawk River in upstate New York. After Weston returned to England, Wright was asked to survey the Mohawk River from Schenectady, New York to the Hudson River. As a result, Wright was technically qualified to serve as Chief Engineer of the Erie Canal, and had a working knowledge of the topography of upstate New York (Weingardt, 2005). Construction on the Erie Canal began on July 4, 1817 (Finch, 1925).

Officially opened in October 1825, the Erie Canal proved that canals could provide a means of transportation superior to anything previously known. It was the first canal of commercial importance, and immediately became a source of revenue, documented by the fact that it entirely paid for itself within ten years of operation. The Erie Canal shortened the trip between Buffalo, New York and the Hudson River from 20 days to eight days, and reduced the cost of shipping from $100/ton to $25/ton (Bogart, 1914). Equally important to its impacts on transportation was its economic impacts on the communities along its route. Buffalo and Albany, its terminals, grew rapidly, and it launched New York City as the premiere port in the country (Bogart, 1914). Enthusiasm for canals and canal building swept upstate New York as communities scrambled to build feeder canals for economic gain. Investment in canals also spread quickly across the northeast and mid-Atlantic portions of the country (Harte, 1938).

Immediately following the opening of the Erie Canal, Connecticut witnessed its own series of canal proposals, but speculation lacked the feverish aspect displayed in other areas. This was, in part, because Connecticut's rolling topography did not lend itself to canal construction. In addition, Connecticut had one of the most developed toll road networks in the country, including the Cheshire Turnpike (present-day Route 10) which was established in 1801 between the City of New Haven and the Town of Farmington (Connecticut Heritage, 2003). Though initially unpopular among the residents of Cheshire and neighboring towns, the turnpike eventually proved to be a social and economic success. The construction and continual maintenance of turnpikes in Connecticut were overseen by a committee of three state officers charged with the responsibility of ensuring that roads were managed appropriately, a policy that was later applied to canal construction. Despite their many successes, however, early-19th-century highways had numerous limitations, including the use of horse-drawn coaches and wagons; inclement weather; and the high costs of maintenance (Beard, 1976).

In total, Connecticut would see proposals for six canals, of which only two would be brought to completion: the Farmington Canal and the Enfield Canal (Figure 2). The Farmington Canal in Connecticut connected to the Hampshire & Hampden Canal in Massachusetts, and formed an 86-



CONNECTICUT'S CANALS
Figure 2

mile long canal which linked New Haven, Connecticut to Northampton, Massachusetts. (The earthen canal is described in detail in the following section). The Enfield Canal, completed in 1829, bypassed the shallows of the Enfield Falls on the Connecticut River adjacent to the towns of Suffield and Windsor Locks in Hartford County, Connecticut. The four canals planned but not executed were the Housatonic Canal; the Saugatuck & New Milford Canal; the Sharon Canal; and the Quinebaug Canal. These four canals were issued charters by the State of Connecticut, but the companies sponsoring the canals failed to act, and consequently lost their construction rights. Discussion of building canals in Connecticut spawned similar plans for canals and river improvements in Massachusetts, New Hampshire, and Vermont (Harte, 1938).

Construction of the Farmington Canal

In 1822, the routes of the Farmington Canal and the Hampshire & Hampden Canal were surveyed by Benjamin Wright, Chief Engineer of the Erie Canal, and his son, Henry Wright. On July 4, 1825, a ground-breaking ceremony was held at the Massachusetts/Connecticut border to commence construction of the Farmington and Hampshire & Hampden canals. The earthen, unlined canal, with its stone-and-wood locks, bridges, and culverts, was built in sections by local contractors according to specifications and designs of canal engineers (Trout, no date [nd]; Raber, November 30, 1984).

By 1827, the portion of the Farmington Canal was completed through Cheshire, and on November 24, water was let into the canal. A celebration was held at the site of a store and warehouse owned by Richard Beach (present-day Ball and Socket Manufacturing Company on SR 68/70). The canal was wider in this location, permitting the creation of a basin that served as a shipping port. Beach's warehouse was utilized as a canal depot at the basin, and overhung it which allowed for freight to be loaded and unloaded from the warehouse to canal boats. To commemorate the opening of the canal, a bottle of pink water was tossed into the canal, a cannon was sounded, three boats took to the waters, and the port was christened Beachport, in honor of Richard Beach. Thus, Beachport functioned as an important stop along the canal (Cheshire Historical Society, nd).

According to an 1828 map of the Farmington Canal prepared by Henry Farnam, a bridge spanned the canal at the location of present-day SR 68/70 Stone Culvert, west of Richard Beach's store and warehouse. Present-day SR 68/70 is depicted on the map as an east/west-oriented road, but it is not named. The map depicts the bridge as narrower than the road itself, typical of canal road bridges. The Farmington Canal was crossed by 90 road bridges and 45 farm bridges (Farnam, 1828). Both types of bridges were 42-ft long. However, the road bridges were 14-ft wide, and the farm bridges were 12-ft wide. Both types of bridges were constructed of timber, and were set atop rubble abutments that were approximately 30-ft wide and 9-ft high (Raber, November 30, 1984).

These high, narrow bridges were a source of contention among some Cheshire residents. Although many appear to have welcomed the canal and backed its construction, many farmers viewed the canal unfavorably. Construction of the canal divided their lands. Furthermore, the bridges, in addition to being high and difficult to cross with animals and goods, were often poorly constructed and ill-repaired. On at least one occasion, a farm bridge in Cheshire collapsed

as a Cheshire resident with oxen was crossing it. Many farmers also felt they had not been fully compensated for the use of their land, and the earthen, unlined-canal frequently flooded, ruining farmer's crops. As retribution, the farmers sporadically vandalized the canal (O'Hara, 1996).

The Farmington Canal was completed by 1829, and quickly had a favorable impact on the economy of many of the towns it bisected, including Cheshire. However, the Farmington Canal Company was not a financial success in part because the canal was inadequately financed. Construction costs almost doubled the initial estimate, and on-going maintenance was costly (Raber, November 30, 1984). Income generated was insufficient to accommodate routine maintenance, and the frequent repairs necessitated by damage caused by flooding and vandalism. In addition, the canal was rendered inoperable in the winter months by ice, and in the summer months by drought.

In 1835, the Hampshire & Hampden Canal was completed through Massachusetts, and the Farmington Canal Company and the Hampshire & Hampden Canal Company merged to form the New Haven & Northampton Canal Company (Beard, 1976). The canal became known as the New Haven & Northampton Canal, although it was commonly referred to as the Farmington Canal. The canal continued to be plagued by financial troubles under the new company. Between 1836-40, canal maintenance and repairs cost more than four times the income it generated (Stephens, April 28, 1963). In addition to the financial troubles associated with repair and maintenance, by this time a new threat emerged in the form of developing railroads.

Rise of the Railroads

The origins of railroads in the United States can be traced back to the 1760s, when a cable-operated tramcar system that ran on grooved logs was developed in Lewiston, New York. Advances in locomotive and steam engine technology during the first decade of the 19th century paved the way for railroads to become a practical means of rapid transportation. In 1826, New England's first railroad, the Quincy Granite Railroad, was constructed for the express purpose of transporting granite blocks 4 miles from the quarry to the Neponset River in Massachusetts. These granite blocks were then transported to the City of Boston, Massachusetts, and used to construct the Bunker Hill Monument. The first successful freight and passenger railroad in the United States was the Baltimore & Ohio Railroad (B&O), chartered by the City of Baltimore, Maryland on February 28, 1827 (Public Archaeology Lab, Inc. [PAL], 2001).

In the early 1830s, small railroad companies began building lines radiating out from Boston. Shortly after these companies were chartered, plans were created to link the cities of Boston and New York by rail. One of these companies was the Providence & Stonington Railroad which ran from Providence, Rhode Island to Stonington, Connecticut where a steamer ferried passengers across Long Island Sound to New York City. Chartered in 1832 and completed in 1837, the "Stonington Road" was 47 miles long. The southern 6 miles of the railroad constituted the first operational railroad in Connecticut (PAL, 2001).

In 1833 the Hartford & New Haven Railroad was chartered to construct a railroad between the two Connecticut cities. J.P Morgan's grandfather was one of the initial investors, starting a long association between the Morgan family and New England's railroads (Weller, 1969). Alexander

Twining, a Yale instructor, was hired to plot the route for the railroad. In 1837, the Hartford & New Haven Railroad was incorporated, and by 1839 the railroad had opened, and came into direct competition with canals (Withington, 1935). As railroads were established throughout the United States and Connecticut, it quickly became apparent that they provided a less-costly, faster, more reliable form of transportation that could be utilized year-round.

Decline in the Commercial Use of Canals

The Farmington Canal, like a majority of the canals built in the 19th century, was an infrastructure improvement necessary for the continued growth of the country. They were constructed in regions in need of transportation facilities to import and export raw materials and goods. Although canals were able to meet those needs, railroads provided an improved transportation method that was faster, had less expense and maintenance issues, and operated with the advantage of not being impeded by winter freeze/thaw cycles and summer droughts common to the northeast.

As a result, existing canals, such as the Farmington Canal, withered under the intense competition from a superior means of transportation (Harte, 1938). Railroad companies were then able to take advantage of the faltering canals, using the relatively flat, pre-graded tow-paths for their alignments. This was seen not only at the Farmington Canal, as described below, but also at canals across the northeast including the Genesee Valley Canal in upstate New York between Rochester and Dansville, and the Erie Extension Canal of the Pennsylvania Canal which ran through Conneaut in northwestern Pennsylvania (Palmer, Spring 1999; CVAHS, Winter 2003/2004).

The Farmington Canal continued to operate throughout the 1840s, and while it did experience at least one year of financial success in 1844, much of the decade proved to be a financial loss for the New Haven & Northampton Canal Company. In 1845, Alexander Twining, who had laid out the Harford & New Haven Railroad twelve years earlier, was hired by the company to survey the canal to determine the feasibility of converting it into a railroad ROW.

Twining's report recommended that a new railroad be established primarily along the canal tow-path, and noted that the income generated by a railroad would double, or even triple earnings generated by the canal. While his report lauded the benefits of the railroad, it also indicated that the canal would continue to be utilized in conjunction with the railroad. This would be accomplished by transferring freight to the railroad which would in turn, free up the canal locks for water power, and enable industry to develop along the railroad. Increased industry translated into more goods being shipped via rail, resulting in increased revenue for the railroad (Twining, 1845).

Therefore, in 1847, the New Haven & Northampton Canal Company began construction of a railroad ROW along the canal. The canal remained in use during construction, however it appears its maintenance was overlooked. Numerous bridges that spanned the canal were in disrepair, likely including the bridge at Beachport. It was the responsibility of the New Haven & Northampton Canal Company to repair the bridges, and they were thus notified by the Town of

Cheshire Board of Selectmen (Town of Cheshire, June 12, 1847). As a result, it is possible that the canal bridge at Beachport may have been repaired during this time.

Despite Twining's suggestion that the canal and railroad operate concurrently, by the end of 1847, the last barge floated down the canal through Cheshire. By January 1848, the railroad bisected Cheshire along the tow-path of the canal. The tracks crossed the east/west-oriented road (present-day SR 68/70), west of the canal bridge at Beachport (Beard, 1976). Based on its prominence as a canal shipping port, the railroad likely stopped in Beachport from its inception. However, with the advent of the railroad, usage of the name Beachport declined in favor of Cheshire.

By the early 1850s, a train station was located on the south side of present-day SR 68/70, west of the railroad and canal bridge (Whiteford, 1852). Residential, commercial, and industrial properties began to develop, spurred on by the establishment of the railroad. In 1850, the Cheshire Manufacturing Company (present-day Ball and Socket Manufacturing Company on SR 68/70) was formed, utilizing Richard Beach's former canal depot and warehouse (Cheshire Bicentennial Committee, 1976).

Although the canal was no longer in use, the New Haven & Northampton Railroad continued to be responsible for maintenance and repair of canal bridges within its ROW. Meeting minutes from an 1852 Town of Cheshire gathering indicated that the Board of Selectmen, on behalf of the town, was responsible for repair and maintenance of town highways and bridges, with the exception of the bridge over the Quinnipiac River and canal bridges (Town of Cheshire, January 12, 1852). However, in 1866, the Town of Cheshire assumed responsibility for at least one canal bridge. At a town meeting held in May, Cheshire residents voted in favor of allowing the Board of Selectmen to authorize construction of a 60-ft long stone bridge over the canal, the present-day SR 68/70 Stone Culvert (Town of Cheshire, May 26, 1866).

Town of Cheshire records do not indicate specifically when the culvert was constructed, or by whom. However, as a main road in need of a safe crossing, it is likely that work would have been accomplished quickly. Town meeting minutes indicate that local contractors were commonly hired to perform highway and bridge maintenance and repair, and it is likely that local labor was used to construct the culvert. Although the culvert was wider than the predecessor canal bridge, the structure may have incorporated some of the canal bridge's stone abutments. A historic photograph available on the Cheshire Historical Society's website depicts the south parapet of the culvert (Photo 2).

The canal remained a prominent fixture in the Cheshire landscape, and was utilized for recreation for several years after the construction of the culvert. Some sections of the canal remained filled with water and were used for recreational purposes, such as short pleasure cruises in the summer. During the winter months, children used the frozen canal for ice skating. However, with the construction of the culvert, the Farmington Canal was rendered impassable at Cheshire, reinforcing the closure of the canal as a means of transportation, and the shift to railroads and roads (Beard, 1976).

Photo 2

SR 68/70 Stone Culvert in late-19th or early-20th century.

Source: Cheshire Historical Society, Cheshire, Connecticut.

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