

**National Register Assessment of the
Brecksville Diversion Dam
(SUM-3253-1)
Cuyahoga Valley National Park
Summit and Cuyahoga Counties, Ohio**

Submitted to

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ABSTRACT

Hardlines Design Company (HDC) was contracted in June 2006 to complete a National Register of Historic Places (NRHP) inventory and evaluation of the Brecksville Diversion Dam (SUM-3253-1) in the Cuyahoga Valley National Park in Summit County, Ohio. The dam sits in the Cuyahoga River near the Cuyahoga-Summit County line.

The surrounding area has historical significance as the location of the Pinery Feeder, which was constructed in 1827 to provide water for the portion of the Ohio and Erie Canal from Brecksville to Cuyahoga Heights. The feeder consisted of a dam, feeder channel, and a gate. Portions of the feeder dam were rebuilt in 1857 and 1875 and it is possible that the dam's underwater remains survive about 120 ft south of the present dam. In 1949, the American Steel and Wire Company (AS&W) leased water rights for this part of the Ohio and Erie Canal and constructed a new dam north of the old dam. This concrete weir, the Brecksville Diversion Dam, facilitated water supply to AS&W's Cuyahoga Works, an iron mill six miles north in Cuyahoga Heights.

The area has several historic districts. NRHP districts nearby include the Cuyahoga Valley Scenic Railroad District and the Ohio and Erie Canal District. A section of the Ohio and Erie Canal south of the Brecksville Diversion Dam has also been designated as a National Historic Landmark (NHL). The dam is located within the Cuyahoga Valley National Park, which a 1993 study concluded is eligible as a National Heritage Corridor. However, the Brecksville Diversion Dam does not fall within the boundaries of any NRHP or NHL districts and its construction date, 1951, is not within the period of significance for the nearby districts. The dam therefore must be evaluated on its own merits.

The dam has a good level of integrity but does not have a high level of historical and engineering significance. By the time the dam was built, the Ohio and Erie Canal was no longer an important transportation artery. The dam is a small structure that helped supply the AS&W Cuyahoga Works with water, but played a fairly minor role in the overall history and operation of the works. The peak production years for the Cuyahoga Works were 1911-1932; by 1952, when the dam was completed, the number of active blast furnaces at the works had been cut in half. The dam therefore does not have a high level of significance under Criterion A for its association with the Cuyahoga Works. The dam does not appear to be associated with important historical persons under Criterion B. And the dam has low significance under Criterion C: as a small concrete low-head fixed crest dam, the Brecksville Diversion Dam represents a common dam type, with little engineering significance.

Due to the dam's late construction date and its purpose related to industrial water supply rather than canal navigation, it does not appear to contribute to the significance of the overall Ohio and Erie Canal NRHP listings. It is the recommendation of HDC that the dam does not have the necessary historical or engineering significance for NRHP eligibility on an individual basis.

ACKNOWLEDGMENTS

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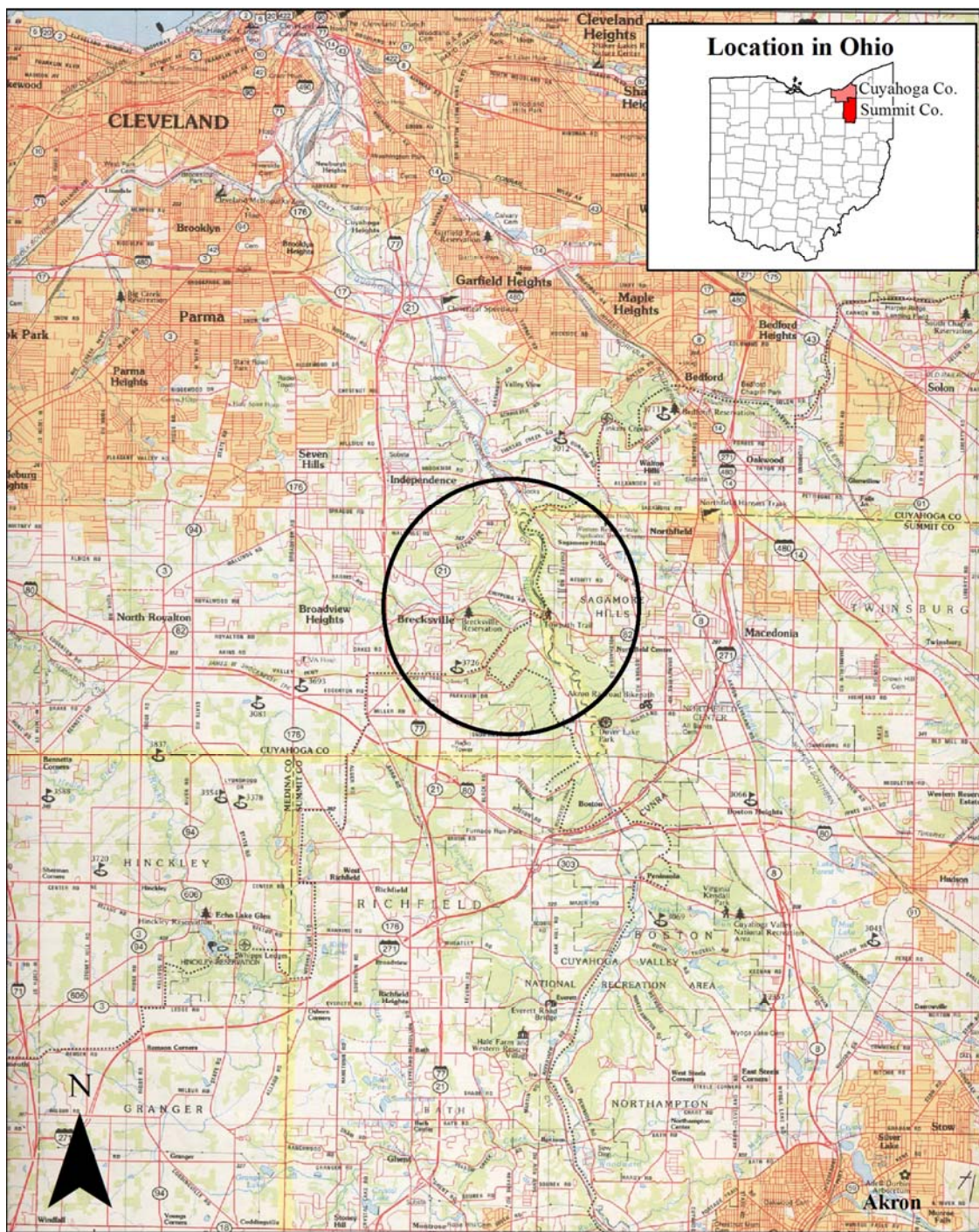
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PROJECT OVERVIEW

Scope of Project

HDC was contracted by the Friends of the Crooked River in June 2006 to complete an NRHP eligibility evaluation of the Brecksville Diversion Dam (SUM-3253-1) in the Cuyahoga Valley National Park (Figure 1). The dam is located on the Cuyahoga River near Brecksville, Ohio, and is within the boundaries of the Cuyahoga Valley National Park (Figure 2). The dam is close to an older timber crib dam and the Brecksville-Northfield High Level Bridge. Several historic structures in this area are associated with the old Ohio and Erie Canal, and an NRHP district encompassing the course of the canal also crosses through the Cuyahoga Valley National Park, but the Brecksville Diversion Dam is not within this district.

The dam is a simple low-head poured concrete weir with poured concrete abutments. Due to poor hydraulics, the dam is no longer considered safe and has been evaluated as deficient. If the dam is to remain in place, alterations must be made. Before this is done, the dam must be evaluated to see if it has the integrity and the historical or engineering significance for eligibility for the NRHP. Since the dam was built in 1951-1952, it has reached the fifty-year mark that is the cutoff point for NRHP eligibility under the normal criteria (A, B, C, and D).



Source: Ohio Atlas & Gazetteer, DeLorme 2001.

Figure 1. Location map showing Cuyahoga Valley National Park in relation to Cleveland and Akron

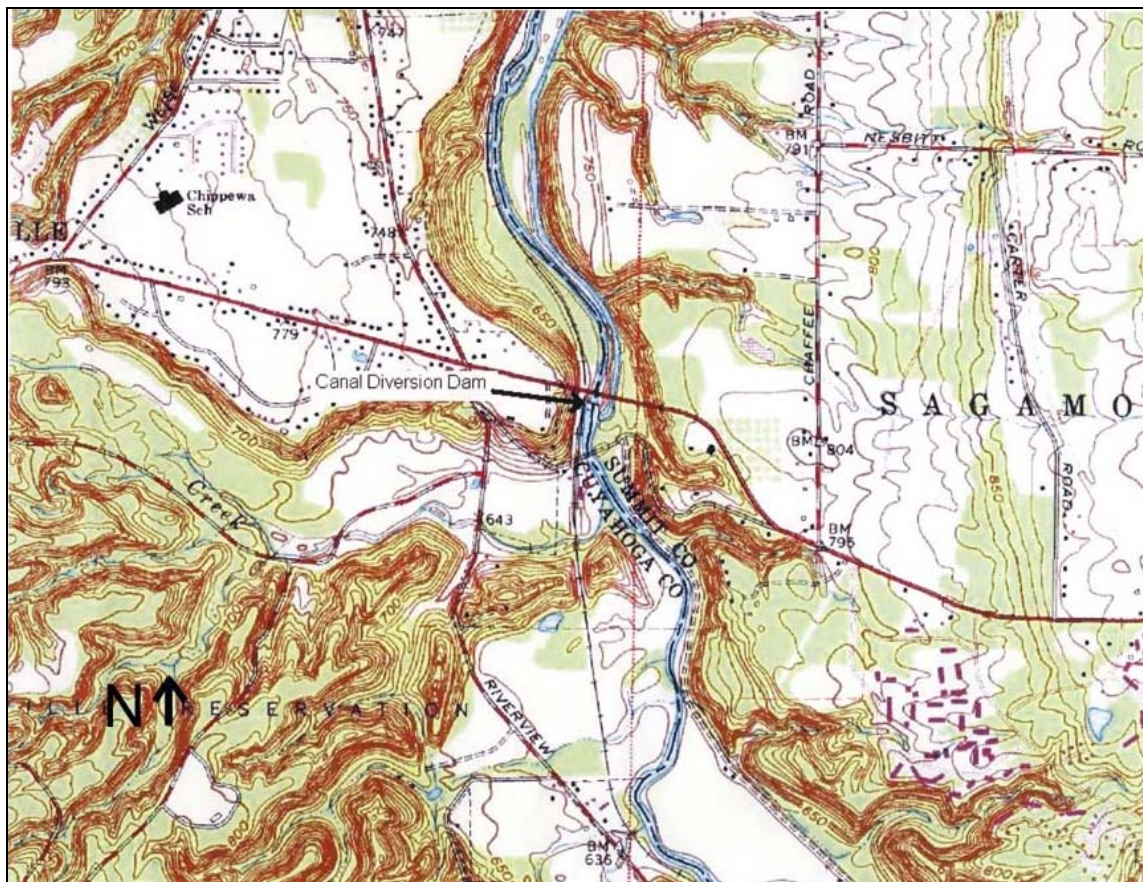


Figure 2. Current USGS map of the project site with the location of the Brecksville Diversion Dam marked

RESEARCH AND FIELD METHODS

Research Methods

Sources Reviewed

HDC historians reviewed the following sources for this report:

The Ohio Historic Preservation Office (OHPO):

- NRHP files
- Determination of Eligibility files
- Eligibility survey report files
- Ohio Historic Inventory (OHI) inventory files
- Online resource mapping

Other sources:

- Construction drawings held by the Ohio Environmental Protection Agency (EPA)
- Online literature concerning the Cuyahoga Valley National Park
- Secondary source histories of dam and dam construction
- Various sources on American Wire and Steel and its Cuyahoga Works
- A 2003 NPS cultural resources report on of the dam

OHPO files were searched for any existing documentation of the dam and to determine whether the dam is within an NRHP district. These files were also consulted to provide background history on the dam and the Cuyahoga Valley National Park.

Review of cultural resource records held by the OHPO indicated that the Brecksville Diversion Dam is not listed in the NRHP and is not within an NRHP-listed or NRHP-eligible historic district. No past determinations of NRHP eligibility were found for the dam.

The dam was recorded on an OHI form in 2000 by the NPS and was assigned the OHI number SUM-3253-1. A request for any additional information on the dam and its context was made to the NPS, but the request had not been filled by the due date for the draft of this report.

Although the dam is not listed in the NRHP nor is it within the boundaries of an NRHP district, it is within the Cuyahoga Valley National Park and is close to four NRHP-listed resources:

1. The Cuyahoga Valley Scenic Railroad NRHP district is located west of the dam, with its boundary following the railroad bed.
2. The Ohio and Erie Canal NRHP District is east of the dam; its boundary follows the canal channel and towpath.

3. The Brecksville and Northfield High Level Bridge north of the dam is an NRHP-listed resource.
4. The final NRHP-listed resource in the area is the iron Station Road Bridge, built 1881-1882. This double intersection Pratt truss bridge is the oldest surviving bridge in the Cuyahoga Valley. The bridge sits south of the gate for the diversion channel that funnels water from the river into the Brecksville to Cuyahoga Heights portion of the Ohio and Erie Canal.

Field Methods

The field team for HDC completed its field survey at the Cuyahoga Valley National Park on July 7, 2006. The field work involved examining and documenting the dam. Specifically, the field team examined the dam for integrity and significant engineering features, noted significant features of the dam, and took high-quality digital photographs of the structure. Since an OHI form had been filled out for the dam by NPS staff in 2003, the HDC field team completed an OHI update form rather than a full OHI form.

The field team also coordinated with the Ohio EPA to research records on the history of the dam, including an existing NPS cultural resource history of the dam and the construction drawings.

NRHP Eligibility Methods

The property was evaluated, physically and through intensive literary research, for its eligibility for inclusion in the National Register of Historic Places (NRHP). To be eligible, a property must possess integrity of location, design, setting, materials, workmanship, feeling, and association, and the property must meet one of the four criteria listed below:

- A) Be associated with events that have made significant contributions to the broad patterns of our history
- B) Be associated with the lives of persons significant in our past
- C) Embody the distinctive characteristics of type, period, or method of construction, or represent the work of a master, or possess high artistic values, or represent a significant and distinguishable entity whose components may lack individual distinction
- D) Yield, or be likely to yield, information important in prehistory or history

Given the architectural nature of the resources, the criteria considered for the property were A, B, and C. At times, historians cite Criterion D for standing buildings and structures in terms of the ability of the resource to provide additional significant historical information. This use of Criterion D did not appear to be appropriate for the small dam covered in this report.

HISTORIC CONTEXT

Summit County and the Cuyahoga Valley

What is now Summit County was originally part of Portage County (Manner and Corbett 1990:88). The area was part of the Western Reserve, an area that had been claimed by various states. When Ohio became a state in 1803, the Western Reserve was included within its boundaries. The Brecksville area was home to members of the Chippewa Tribe during the late eighteenth century (Manner and Corbett 1990:87). Ownership of these lands by native Americans was terminated by the 1795 Treaty of Granville, and the land was surveyed by Moses Cleaveland in 1796-1797.

Settlement proceeded at a rapid rate after the survey, but was initially somewhat hampered by poor transportation. Although the area was home to some industries, including brick and lime production, glassworks, and charcoal ovens, many of the early settlers practiced subsistence farming and squatters commonly occupied land illegally. Isolated subsistence farmers occupied much of the land in the area until the construction of the Ohio and Erie Canal brought economic development and Irish immigrant laborers to the area. The construction of the canal spurred the local timber and stone industries and also pushed the area from a barter-based economy to a system more reliant on cash. The canal boosted industry and agriculture in the Cuyahoga Valley through the 1850s, when its importance began to be eclipsed by railroads (Manner and Corbett 1990:91-96). Cleveland and Akron grew into large cities during the course of the nineteenth century, but Brecksville and the other towns along the Cuyahoga River and the Ohio and Erie Canal north of Akron remained small.

Ohio and Erie Canal

In the early 1820s, commerce in Ohio, including the Cuyahoga Valley, was hampered by the difficulty of getting raw materials and manufactured products to the large markets on the eastern seaboard: transportation along dirt roads and log turnpikes was slow and unreliable. The success of the Erie Canal in New York State inspired planning for the Ohio and Erie Canal, which was originally designed as a transportation link spanning the length of the state from Portsmouth on the Ohio River at the south up to Cleveland on Lake Erie at the north (Poh Miller 1979b:sec 8 p. 1). Ground was broken for the canal on July 4, 1825.

The Akron to Cleveland portion of the canal was the first part to be built. Local reports indicate that Irish workers were in the area to work on the canal by July 1825, with over 2,000 men engaged in the construction of the canal by September 1825. The canal was to be built according to the specifications for the Erie Canal, with main channels 4' deep and 26' wide at the bottom and 40' wide at the water line. The canals were designed to be navigated by wooden canal boats towed by mules that would walk along a towpath that ran parallel to the canal. The course of the canal dropped over 400 feet in the Cuyahoga Valley area,

requiring the construction of 42 lock and dam complexes. Sluices were also built at regular intervals in the canal; these structures drained away excess water from the canal channel during rainstorms and other high flow conditions (Poh Miller 1979b:sec. 8 p. 5-6).

The section from Akron to Cleveland was the most expensive part of the canal to build; it was completed in 1827, with a dedication ceremony on July 4 of that year. The entire canal, from Portsmouth to Cleveland, was finished in 1832. The high tide of the canal's success was from 1827-1860; during this time it was a prime transportation route for agricultural products, raw materials, manufactured goods, and passengers. Products transported on the canal included wheat, corn, oats, iron ore, pork, flour, lard, whiskey, lumber, and finished goods (Poh Miller 1979b:sec. 8 p. 7).

In the 1850s and 1860s, the canal was still viable, but it was beginning to face competitive pressure from the rapidly expanding railroad system. The decline of the canal is evidenced by the drop in its toll revenue, which totaled \$190,000 in 1850 but only \$16,000 in 1861. The canal's decline continued in the post-Civil War years as railroads added routes and capacity. By 1900, the canal was considered a quaint reminder of Ohio's history. However, the Ohio Legislature did appropriate funds to rebuild portions of the Akron to Cleveland portion of the canal in 1904, with work carried out between 1905 and 1909. The canal was mostly used for pleasure boat traffic at that time. The canal was heavily damaged during the 1913 flood, and much of the northern portion of the canal was abandoned and allowed to fall into decay (Miller 1979b:sec 8 p. 8). However, the portion of the canal between Brecksville and Cleveland was used throughout the 1900s to supply industrial water to Cleveland area factories (Tamburro 2003:5).

Water rights for the portion of the canal from Brecksville to Cuyahoga Heights were leased from the State of Ohio by the American Steel and Wire Company (AS&W), and AS&W maintained the canal structures. In 1951, AS&W funded construction of a new dam on the Cuyahoga River at Brecksville to supply water to the canal. U.S. Steel, the parent company of AS&W, continued to maintain the Brecksville to Cuyahoga Heights portion of the canal into the 1980s (Tamburro 2003:6). Today, the Akron to Cuyahoga Heights portion of the canal is listed in the NRHP and is part of the Cuyahoga Valley National Park, operated by the NPS.

Early History of the Site: The Ohio and Erie Canal's Pinery Feeder Complex, 1827-1950

As part of the construction of the Ohio and Erie Canal, two feeder channels were constructed within the Cuyahoga Valley to provide water for the stretch of the canal from Brecksville, Ohio, north to Locks 43 and 44 in Cleveland's industrial flats area. This section of the canal was operational by the summer of 1827, but low water flow was a problem. As a result, two feeder channels were added that could release water from the Cuyahoga River into the canal during times of low flow in the canal. One feeder was built near Lock 21 at Old Portage, and the second was built south of Lock 36 in an area of the Cuyahoga Valley known as the Pinery Narrows (Tamburro 2003:2-3).

The feeder complex near Lock 36 was located near Brecksville and the dam associated with this complex was at one time known as the Pinery Dam. A temporary feeder was completed at Brecksville in July 1827; on July 26, 1827, Henry R. Burnham was given a contract to build a permanent feeder complex, known later as the Pinery Feeder Dam Complex. The contract called for a dam across the Cuyahoga River near the head of some rapids that sat below the mouth of Chippewa Creek. The dam was to be a timber crib structure bolted to the stone riverbed, probably with long iron pins. A feeder channel would then be built that would take water from the river and redirect it into the canal near Lock 36. The guard walls for the gates of the feeder channel were to be built of stone masonry (Tamburro 2003:3).

Apparently, Burnham's contract was cancelled and a second contract was awarded to William Brown and Merrick Sawyer to complete the feeder complex. The permanent feeder complex was operational by fall 1827 and complete by the time of release of the January 1833 canal commissioners' report. The feeder operated successfully until it was damaged by flooding in 1856-1857. In 1857, the west half of the dam was rebuilt, with the dam slope reshooted and one stone abutment replaced. In 1877, the entire feeder complex was rebuilt. After flooding in 1884, additional portions of the feeder were rebuilt.

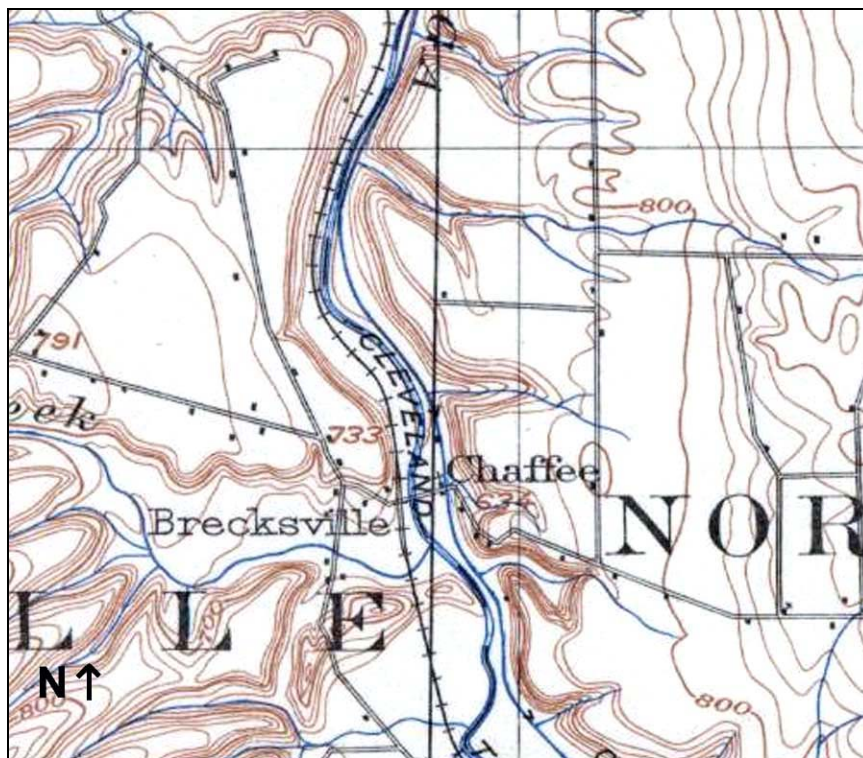


Figure 3. Archival USGS map of project area, portion of 1903 Cleveland Quadrangle.

The Ohio & Erie Canal appears on the map but the feeder channel and dam were not mapped by the USGS surveyors.

The feeder appears on an 1892 Ohio and Erie Canal map. The dam appears as a V-shaped structure and a fish chute is identified in the center. From the map, the old dam appears to be south of the existing dam (Tamburro 2003:4). In 1902, the old dam was raised one foot to

impound a larger amount of water. The dam and feeder channel were omitted from a 1903 USGS map but this may have been due to surveyor error (see Figure 3). The Ohio Board of Public Works rehabilitated the portion of the canal in the vicinity of the Pinery Feeder from 1905-1909. Work on the Pinery Feeder Complex seems to have focused on the sluice, weirs, and head gates of the feeder. Repairs to the dam were minimal (Tamburro 2003:5). An archival photograph of the Pinery Feeder complex dating to 1907 seems to be documentation of the 1905-1909 construction, and shows the feeder channel and the old feeder dam (Figure 4).

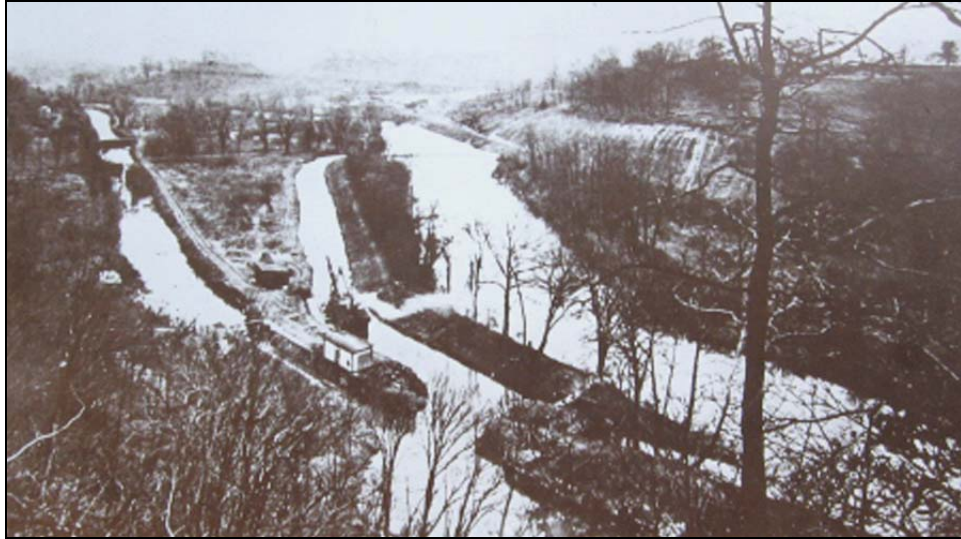


Figure 4. Archival photo of the Pinery Feeder looking south (1907).

The Cuyahoga River is the large body of water on the right, the Pinery feeder channel is at the center, and the Ohio and Erie Canal channel is at the left. The original Pinery Dam appears near the top of the photo as a faint line across the river. This photo indicates that in 1907 the dam was located at the north edge of the feeder channel, while the current concrete dam is positioned about 120 ft north of the feeder. Photo courtesy of National Park Service.

The Pinery complex was damaged by the 1913 flood. The flood largely destroyed the Ohio and Erie Canal between Akron and Brecksville, but the canal's Brecksville to Cleveland stretch was salvageable. It is not clear whether the Pinery dam was rebuilt immediately after the 1913 flood, but it appears on a 1916 canal survey map (Tamburro 2003:5).

The Pinery dam remained in place through the 1940s. In October 1943, AS&W secured a lease with the State of Ohio Department of Public Works to obtain water that was not needed for the canal. The segment of the canal mentioned in the lease included several locks, two aqueducts, and the old Pinery Feeder complex at Brecksville. AS&W wanted the canal water for operation of its Cuyahoga Works in Cuyahoga Heights, Ohio, a Cleveland suburb. Since AS&W was using water impounded by the Pinery Dam, the company maintained the dam and feeder structures. In 1949, the head gates at the Pinery were replaced by a new concrete structure commissioned by AS&W (Tamburro 2003:6).

Brecksville Diversion Dam, 1951-Present

In 1951, the lease for the water rights in the area was amended to allow for a new concrete dam with embankments to replace the old wood crib Pinery Dam. AS&W budgeted \$95,000.00 for construction of the new dam. Although the project was funded by AS&W, the Ohio Department of Public Works oversaw construction. Construction drawings completed by the State of Ohio Department of Public Works are dated March 2, 1951. The surviving drawings include site plans for the dam, diagrams for the placement of rip-rap shore protection, and wall elevations and sections.

The new structure was called the Brecksville Diversion Dam. This dam is located about 120 ft north of the old Pinery Dam. The new dam was built to an elevation 1 ft higher than the Pinery Dam, and a small channel was cut into the center of the Pinery Dam to allow water to flow through to the new pool. The old Pinery Dam is likely still intact, submerged in the pool created by the Brecksville Diversion Dam (Tamburro 2003:6-7). The Brecksville Diversion Dam was a fairly typical low-head dam for its time, and consisted of a simple rectilinear concrete weir with concrete abutments.

AS&W continued to maintain the Brecksville Diversion Dam from its completion in 1952 through the late 1980s. In 1988, the Ohio Department of Natural Resources transferred the Ohio & Erie Canal properties within Cuyahoga Valley National Park to the National Park Service (Tamburro 2003:7). The dam was recorded on the Ohio Historic Inventory by NPS staff in 2000. Additional research on the dam's history was completed and a cultural resources history of the dam was completed by Sam Tamburro of NPS in 2003.

Concrete Low-Head Dams in Northeast Ohio

Dams have been used to support industry in northeast Ohio since the early nineteenth century. Prior to the Civil War, timber crib dams were commonly built to impound water to fill navigation canals, or to power grist and flour mills and other industries. Later, with the rise of electrical power use and municipal water systems, some dams were built to impound water for city water supplies. Several dams were built solely to provide hydroelectric power, and some municipal water supply dams also doubled as hydroelectric facilities. Industries also continued to build dams for water supply during the first half of the twentieth century.

The Brecksville Diversion Dam consists of a low wall of concrete extending across the river, with a stepped concrete abutment wall at each end of the dam. A sloped concrete embankment on the west side of the bank at the dam provides erosion protection, and rip-rap stone provides bank protection on the other side. The dam is similar to small concrete weirs constructed by various industrial plants on the Mahoning River during the 1920s-1950s to impound water for industrial processes. Concrete weir low-head dams are fairly common on many of the streams and rivers of Ohio.

The type of construction materials used in dams in northeastern Ohio depends largely on the dam's age, use, and location. During much of the nineteenth century, larger dams tended to be stone masonry structures, while smaller dams were often timber crib dams. The Pinery

Dam, predecessor of the Brecksville Diversion Dam, was a timber crib dam. Dams were built during this period at many locations to support river or canal navigation or to impound water for mills and other industries. These dams consisted of a series of box-like heavy timber constructions, often filled with stone and held together with iron pins and spikes.

As the nineteenth century progressed, technological advancements allowed dams to be constructed of concrete rather than timber or stone. One early example in the northern Ohio region is the Warren Water Works Dam, which dates from ca. 1884-1900. Located on the Mahoning River in Warren, Ohio, this arched concrete structure produced hydroelectric power and also provided the city's municipal water supply (Hampton 2005:30-31).

During the first half of the twentieth century, northern Ohio industries needed more water to keep up with increased demand for steel and other industrial products. Several low-head concrete weirs were built on the Mahoning River for this purpose, some of which were similar in design to the Brecksville Diversion Dam. A smaller concrete dam across the Mahoning River was built from 1908-1915 by the Ohio Iron and Steel Company at Lowellville, just outside Youngstown. It was somewhat more elaborate than the Brecksville Diversion Dam, being composed of several concrete piers connected by sections of concrete weir (Hampton 2005:13-14). A similar structure was the Youngstown Sheet and Tube Dam at Struthers, Mahoning County, Ohio (ca. 1908-1915), a series of concrete piers that supported a train trestle, again connected by sections of concrete fixed weir that formed a low-head dam (Hampton 2005:15-16). One of the largest concrete dams in the region was the 1916 Liberty Dam (now Girard Dam), an openwork concrete dam that was built by a private water utility to establish a reservoir.

More similar to the Brecksville Diversion Dam was the Carengie-Illinois Steel Company Ohio Works Dam at Youngstown (ca. 1915-1937), a simple chevron-shaped concrete weir stretching across the Mahoning River (Hampton 2005:22-23). The dam most similar in form to the Brecksville structure was the Republic Steel Warren Works Dam (c. 1915-1937), a simple, straight concrete weir across the Mahoning River with wall-like concrete abutments (Hampton 2005:28).

The plain concrete weir is thus a common form of dam in northeast Ohio; several examples from the first half of the twentieth century exist in Mahoning County, and other examples are located in Summit and Cuyahoga counties.

The American Steel and Wire Company, Cuyahoga Works

Another component of the historic context of the Brecksville Diversion Dam is its association with providing industrial water to the Cuyahoga Works of AS&W, via the Ohio and Erie Canal's Brecksville to Cuyahoga Heights segment. AS&W was formed largely for the production of barbed wire, which was used extensively for fencing in the American West. After the Civil War, intense competition and overproduction had caused the price of barbed wire to drop. To maximize profits in the industry, secret production limitation agreements were reached by groups of producers, but production continued to exceed demand, and prices remained low. In a typical gilded age move to drive prices up by creating a near-monopoly, Elbert Henry Gary purchased many of the barbed wire factories in the United States, creating

the giant AS&W firm. Gary used the conglomerate to cut prices to the point that competitors were no longer able to compete against AS&W. Once most of the competition had been bought out or destroyed in price wars, Gary then used his conglomerate to reduce production to make the product scarce, which allowed for price hikes. In 1901, the United States Steel Corporation (U.S. Steel) purchased AS&W. The steel giant then operated AS&W as one of the divisions of its mammoth industrial operations (OHS 2005).

The AS&W Cuyahoga Works has its origins in 1880, with purchase of land at 4300 E. 49th St. in Cuyahoga Heights by the Cleveland Rolling Mill Company. The purpose of the new facility built at this location was to produce pig iron for the company's other operations. By 1882 or early 1883, a blast furnace was operational (Miller 1979a:4), and a second blast furnace was added from 1886-1887. In 1899, AS&W purchased the plant. Starting in 1900, the Cuyahoga Works was expanded with a third blast furnace and renovation of the two existing furnaces. A fourth furnace was completed in 1911. The plant was at the height of its production from 1911-1932. The main purpose of the plant was to supply pig iron to AS&W's Newburgh Works, which produced steel. The steel could then be formed into ingots and shipped to another factory for conversion into strips, rods, or wire (Poh Miller 1979a:5-7).

The steel industry consolidated in the 1920s: inefficient small plants were closed to concentrate operations at larger facilities. The Great Depression brought a major construction slowdown to the United States, leading to the closure of some iron and steel facilities. In 1932, the Newburgh Works was closed, resulting in a decline in demand for pig iron. In response, the Cuyahoga Works demolished two of its blast furnaces in 1933 and operated two furnaces for most of the rest of its history, including the time of the 1951-1952 construction of the Brecksville Diversion Dam. In 1954, a new furnace was constructed, which allowed the Cuyahoga Works to provide pig iron to the Ford Motor Company's Cleveland Engine Plant. However, by 1962, one of the older furnaces at the Cuyahoga Works had been demolished, once again leaving the works with two blast furnaces (Poh Miller 1979a:7).

From 1964-1978, the Cuyahoga Works had approximately 365 employees. In 1974, one of the blast furnaces was shut down in response to declining demand for pig iron and competition from foreign iron producers (Poh Miller 1979a:8). By the end of the 1970s, many of the steel and iron plants in the Cleveland and Youngstown areas were shut down in an effort to eliminate older, less efficient facilities in response to the decline of the steel industry in the United States and increased competition from foreign steel producers. The Cuyahoga Works was shut down by U.S. Steel Corporation in 1978. The company's reasons for shutting down the plant included a declining market for pig iron, increasing costs, and higher expenditures necessary to modernize the plant and bring it up to current pollution control standards (Poh Miller 1979a:7).

Currently, the site of the old Cuyahoga Works is being used by Charter Steel, Incorporated. The current rolling mill at the Cuyahoga Works site was built in 1996, and was acquired by Charter Steel in 2002. While the current rolling mill buildings appear to date from the 1996 reconstruction, some brick buildings that appear to have been associated with the original Cuyahoga Works are still on the site. These buildings are currently vacant or are rented to business and government tenants.

RESOURCE EVALUATION

Introduction

This section includes a brief description of the Brecksville Diversion Dam (SUM-3253-1) and is followed by a discussion of the resource within the context of the NRHP eligibility criteria. The dam is recommended as not eligible for the NRHP.

The Brecksville Diversion Dam was built very late in the history of the Ohio and Erie Canal; much of the canal had long been abandoned due to flood damage, and the canal was no longer used for industrial transportation, as it originally had in the early twentieth century. By the time of the dam's construction, the portion of the canal from Brecksville to Cuyahoga Heights was used mainly to channel water to industrial plants in the Cleveland area, specifically AS&W's Cuyahoga Works. Therefore, any historical significance the dam might have would be related either to the history of the Ohio and Erie Canal in its mid-twentieth century role as a water supply conduit, or to the dam's association with the Cuyahoga Works of AS&W. Potential engineering significance could be related to low-head concrete weirs as a dam type. No evidence of associations with important individuals was found as part of the project.

The Brecksville Diversion Dam is a fixed-crest concrete weir. Most dams are categorized as either storage dams, which store water for long-term use, or diversion dams, which redirect the flow of water. Diversion dams can redirect all or part of the water flow of a stream or river. Most diversion dams are also designed to withstand, during certain conditions, overtopping, a condition where water flows over the dam (Jackson 1988:41). Dams designed to have water flowing over them are also known as overflow dams.

The purpose of the Brecksville Diversion Dam is to divert water from the Cuyahoga River into the feeder channel leading to the Ohio and Erie Canal, which makes the structure a fairly classic example of a diversion dam. The dam also diverts only a portion of the normal flow of the Cuyahoga for use in the canal, so as a fixed crest weir, the dam's normal condition is to be overtopped by the Cuyahoga River.

Description

The Brecksville Diversion Dam is located on the Cuyahoga River near Brecksville, and is within the Cuyahoga Valley National Park. The area around the dam includes localities that have been returned to a largely natural state, along with grassy areas and an asphalt bike path associated with the towpath trail that runs along the Ohio and Erie Canal. East of the river, two water features are visible: the diversion channel and the canal bed. The diversion channel carries water to the Ohio and Erie Canal, and the dam still diverts water into this channel (Figure 5). East of the diversion channel, the Ohio and Erie Canal bed is still visible but is

filled with a shallow marsh. In this area, the asphalt towpath bike trail is positioned between the river and the diversion channel.



Figure 5. Context view of area around Brecksville Diversion Dam, looking north from towpath bike trail.

The diversion gate is at the left, the feeder channel is at the center, and the Brecksville-Northfield High Level Bridge is visible in the background.

Several above-ground structures exist near the dam in addition to the canal and diversion channel. A concrete gate structure is located where the diversion channel splits off from the Cuyahoga River. The visible portion of the structure consists of a concrete bridge with a large concrete box with three stem-like valve structures extending out of the top (Figure 5 and Figure 6). The gate controls the amount of water that flows from the river into the diversion channel. The structure appears to date from approximately the same era as the Brecksville Diversion Dam. Other structures in the area are the Cuyahoga Valley Scenic Railroad tracks on the west side of the river and, north of the dam, the Brecksville-Northfield High Level Bridge, an open spandrel concrete arch bridge completed in 1931 (Figure 6).



Figure 6. Diversion gate looking northeast.

Cuyahoga River is in the foreground. The structure sits at the mouth of the diversion channel visible in Figure 1. The structure is about 130 ft south of the Brecksville Diversion Dam.

The Brecksville Diversion Dam is a fixed-crest concrete dam consisting of a concrete weir across the Cuyahoga River, two abutments with wing walls, and a sloped concrete embankment on the west side of the river. The weir is a simple concrete wall that goes across the river and impounds water behind it (Figure 7 and Figure 8). Water constantly flows over the weir. The river was fairly muddy at the time of the site visit, so the weir itself was not highly visible. No evidence was found of wooden flashboards or other remnants of movable crests on top of the dam.

Field measurement of the weir was not possible because most of it is underwater. Construction drawings indicate that the dam is 160 ft long, measuring the weir from end to end, and the weir structure is 17 ft 6 in wide. The main weir extends about 6 ft above the riverbed level below the dam; it has a steep slope on the upstream side and a curved profile on the downstream side. The actual weir is 8 ft 6 in wide. On the downstream side of the weir, a 9 ft wide section of concrete apron on the bottom of the river protects the dam from erosion.



Figure 7. Brecksville Diversion Dam, context view looking south



Figure 8. Brecksville Diversion Dam, weir looking west from bank of Cuyahoga River

Each end of the dam has a wall-like concrete abutment that extends well above the top of the weir. The east wall is a straight concrete wall, stepped on its north end (Figure 9). The dam's west abutment is also a high concrete wall, but part of the wall is angled to the northeast once it passes north of the weir (Figure 10 and Figure 11). Bank protection on the west bank of the river north of the dam is provided by a poured concrete embankment (Figure 12). The embankment has a layer of concrete poured directly on the sloped riverbank, and is roughly S-shaped. North of the concrete embankment rock and concrete fragments protect the riverbank from erosion. The concrete pier bases of the Brecksville-Northfield High Level Bridge are positioned along the banks of the river a short distance north of the dam.



Figure 9. Brecksville Diversion Dam, east abutment looking north



Figure 10. Brecksville Diversion Dam, detail of west abutment, looking west from east abutment

The 2003 NPS report on the Brecksville Diversion Dam indicates that the original Pinery Diversion Dam was located about 120 ft south of the existing Brecksville Diversion Dam, at the downstream side of the diversion channel gate. According to the report, the only modification of the Pinery Dam as part of the 1951-1952 Brecksville Diversion Dam construction project was cutting a small flow channel in the middle of the dam (Tamburro 2003:6-7). The plans indicate that a 24 ft breach was to be made in the center of the old dam to facilitate water flow (State of Ohio 1951).

The 1951 construction drawings for the Brecksville Diversion Dam contain a site plan that shows the location and configuration of the old dam as it existed in 1951. The old dam was chevron-shaped, with one 104 ft section on the east and a 90 ft long section of weir to the west. However, examination of the riverbanks between the existing dam and the diversion channel gate did not reveal any evidence of the original nineteenth-century dam. Due to the muddy condition and relatively high flow of the Cuyahoga River during the time of the site visit, the weir of the original dam was not visible under the surface of the existing pool. It is therefore unknown whether the original Pinery Dam is still in place.



Figure 11. Brecksville Diversion Dam abutments and weir, looking southeast, with west abutment wall in foreground



Figure 12. Brecksville Diversion Dam, detail of west abutment wing wall, weir, and concrete bank protection, looking south

NRHP Eligibility

Criterion A Significance

The Brecksville Diversion Dam was built from 1951-1952, and therefore is not associated with the history of the Ohio and Erie Canal during the period (ca. 1827-ca. 1860) when the canal was a vital transportation artery in Ohio. The historical associations of the dam that could be significant are its role in the later years of the Ohio and Erie Canal (roughly 1951-1963) and its role in supporting the operation of the Cuyahoga Works of the American Steel and Wire Company.

Association with the Ohio and Erie Canal

The Ohio and Erie Canal in its later years appears to have minor historical significance. When it was constructed, the canal was a revolution in transportation, providing reliable transport that was far better than the crude, slow highway routes that had previously been Ohio's primary transportation option. The zenith of the canal system historically was from its establishment in the late 1820s through the early 1850s. In the decade prior to the Civil War, the canal was still important, but railroads were being quickly established across Ohio. The railroads were faster, easier to maintain, and not as susceptible to disruption from external factors; low water flow or flooding could completely disrupt transportation on the canal system. After the Civil War and through the twentieth century, the railroad system continued to expand, leaving the state's canal system to wither away slowly. Damage from the severe 1913 floods destroyed much of the remaining canal infrastructure, and only the parts of the canal useful to industry were rebuilt; the remainder of the canal system fell into disuse and dilapidation. Many channels leading into major cities such as Columbus were eventually filled in to accommodate other types of development.

By the time the Brecksville Diversion Dam was built in 1951, the era of canals as an important transportation component in Ohio was a century in the past. Much of the canal in this part of the state had been ruined by the 1913 flood and was allowed to deteriorate in an abandoned condition. The section of the canal from Brecksville to Cleveland remained in service because it was useful to Cleveland area industries for water supply. Although the part of the canal from Brecksville to Cleveland was useful for this purpose, it was not vital: if the canal not been available, industries probably would have drawn water directly from the Cuyahoga River or would have encouraged local utilities to develop more reservoirs. The dam and canal benefited industry in the area but do not appear to have played an important role in establishment or growth of industry in the Cleveland area.

It is the recommendation of HDC that the later (1951-1963) history of the Brecksville to Cleveland portion of the Ohio and Erie Canal was not important in the history of Cleveland, Cuyahoga and Summit Counties, or industries of the region. HDC recommends that NRHP eligibility of the 1951-1952 Brecksville Diversion Dam for the NRHP on an individual basis is not appropriate in connection with the later history of the NRHP-listed Ohio and Erie Canal.

Association with the Cuyahoga Works

A second related historical theme for the Brecksville Diversion Dam under Criterion C would be its association with the Cuyahoga Works of the American Steel and Wire Company. The dam was completed in 1952 to assure a steady supply of water to the plant, which at the time was running two blast furnaces to produce pig iron. The Cuyahoga Works, established in 1882, reached the zenith of its production from 1911-1932, when it was running four blast furnaces and supplying pig iron to AS&W's Newburgh Works. The dam was built much later, when production at the plant was scaled back and only two furnaces were in operation. The Cuyahoga Works built a third furnace in 1954, but then retired one of the old furnaces to return to a total of two furnaces. While the plant was still an important producer of pig iron in the 1950s and 1960s, its most important period of significance appears to be the four-furnace era of 1911-1932. The Brecksville Diversion Dam was built well after this date. In addition, as only a small part of the plant's water supply network, the Brecksville Diversion Dam did not play a large role in the operation of the Cuyahoga Works.

Moreover, several resources remain that better represent the history of the Cuyahoga Works. Some brick buildings associated with the plant can still be found along E. 49th Street in the Cuyahoga Heights area of Cleveland (Figure 13). In addition, a small concrete dam and a small powerhouse on the Ohio and Erie Canal supplied power and water to the Cuyahoga Works. While the concrete dam appears to have been replaced by a recently constructed earth dam, the powerhouse is still intact in its original location (Figure 14).



Figure 13. Building near 4300 E. 49th St., Cuyahoga Heights, Ohio.

This building was originally associated with the AS&W Cuyahoga Works. It is one of several pre-1940 buildings that remain at the plant site.



Figure 14. Current view of the AS&W powerhouse, looking northeast.

Although no longer in use, the powerhouse is still intact, and the site includes the original concrete shipping dock on the Ohio and Erie Canal.

The Brecksville Diversion Dam was a fairly minor component of the water supply utility operation during a fairly late period of decline of the Cuyahoga Works, and other resources in the region better represent the history of the plant. Due to the relatively low significance of the dam in the operation of the plant and the survival of more significant resources associated with the Cuyahoga Works, HDC recommends that NRHP eligibility for the Brecksville Diversion Dam on an individual basis through association with the history of the Cuyahoga Works is not appropriate.

Criterion B Significance

No evidence was found indicating that the dam has significant associations with any persons of historical importance. The dam is recommended as not eligible under Criterion B.

Criterion C Significance

The dam is a small, fairly late example of one of the most common dam types in Ohio, the concrete low-head fixed weir dam. The dam is simply a concrete slab stretching across the river with wall like-abutments on each of the banks. Dams like this on major rivers are common across the state. At least five similar dams are present in northeastern Ohio. Several similar dams exist on the Mahoning River in the Warren/Youngstown area; they were built during the twentieth century to supply water for industrial development in the area. Several of these dams were surveyed by HDC in 2005.

Two additional examples of concrete low-head dams exist on the Cuyahoga River. In Summit County, the Ohio Department of Natural Resources (ODNR) database of dams lists the Cuyahoga Falls Low Head Dam, a 175 ft long weir, and an unnamed low-head dam at Stow. The Sonoco Low Head Dam at Stow, an arch-shaped weir, is a third Cuyahoga River dam listed in the database, but Bill Zawiski of the Ohio EPA confirmed that this dam has been demolished.

The Brecksville Diversion Dam represents a fairly standard design and use of a common material, and is not distinguished in terms of engineering, materials, construction technique, form, or aesthetics. With at least six concrete low-head dams in northeastern Ohio and two on the Cuyahoga River, the Brecksville Diversion Dam does not represent a rare dam type for this part of Ohio. It is recommended that the dam is not eligible for the NRHP under Criterion C.

Criterion D Significance

The dam does not appear to be capable of revealing any additional significant information about dam construction or engineering techniques of the 1950s. Archaeological research and testing was not part of the scope of this project. Criterion D significance is not recommended for this resource under the scope of this survey.

Summary of NRHP Evaluation

<i>Recommendation</i>	Not eligible for the NRHP
Integrity	Dam appears to have good material integrity and good integrity of setting.
Criterion A	Low historical significance in association with late history of Ohio and Erie Canal and later history of the AS&W Cuyahoga Works water supply system
Criterion B	No association with important historical persons
Criterion C	Low significance as a common functional concrete low-head fixed crest dam of the early 1950s
Criterion D	No potential to yield further information

SUMMARY OF NRHP ELIGIBILITY

HDC found that the Brecksville Diversion Dam is a fixed crest low-head dam of poured concrete built from 1951 to 1952. The dam was commissioned by AS&W, a division of the U.S. Steel Corporation, to impound water for the Ohio and Erie Canal so the water could be used by AS&W's Cuyahoga Works. The Cuyahoga Works was located six miles to the north in the Cuyahoga Heights area of Cleveland. The plant produced pig iron for its entire operational life, and was producing iron with two furnaces when the Brecksville Diversion Dam was completed in 1952. The Cuyahoga Works was shut down in 1978.

HDC concludes that the Brecksville Diversion Dam is not eligible for the NRHP. Under Criterion A, the dam is associated with the later history of the Ohio and Erie Canal, but by the time the dam was built, the canal no longer played an important role in Ohio's transportation network. The dam supported the AS&W Cuyahoga Works by impounding water used for industrial processes, but the dam was only one component in the plant's water system, and at the time of construction of the dam, the plant was in a state of decline, with its capacity reduced in 1932 from four blast furnaces to two. Other resources, such as the AS&W powerhouse in Cuyahoga Heights and remaining buildings associated with the Cuyahoga Works, are better representations of this iron works than the Brecksville Diversion Dam. The dam is recommended as not eligible under Criterion A.

Under Criterion B, the dam was not found to be associated with any persons of historical importance. The dam is recommended as not eligible under Criterion B.

Under Criterion C, the dam is an example of a common concrete low-head weir built in the 1950s. This type of dam was built frequently northern Ohio from the early to mid-twentieth century for industrial water supply and other purposes. The dam is an example of a conventional concrete structure and has no unusual aesthetic or engineering features. The dam is recommended as not eligible under Criterion C.

Overall, the Brecksville Diversion Dam is recommended as not eligible for the NRHP due to its low level of historical and engineering significance. No further work is recommended for the dam.

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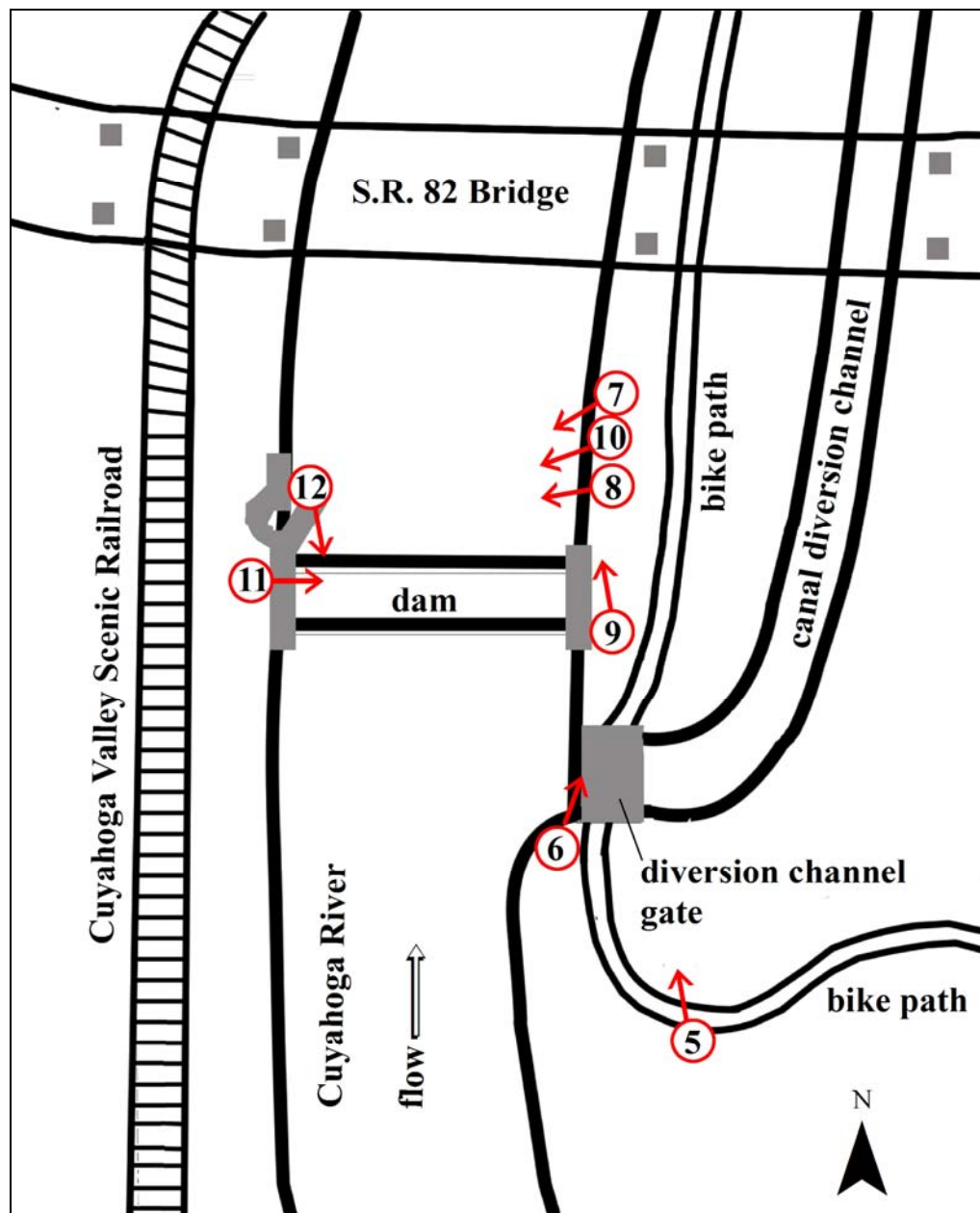
2000 *Ohio Historic Inventory Form, Brecksville Feeder (OHI No. SUM-3254-1)*. On file at Ohio Historic Preservation Office.

2000 *Ohio Historic Inventory Form, Brecksville Feeder Head Gate (OHI No. SUM-3246-1)*. On file at Ohio Historic Preservation Office.

APPENDIX A.
Existing OHI Form Completed by the
National Park Service

APPENDIX B.
OHI Update Form Completed by HDC

APPENDIX C. Photo Key for Field Photography

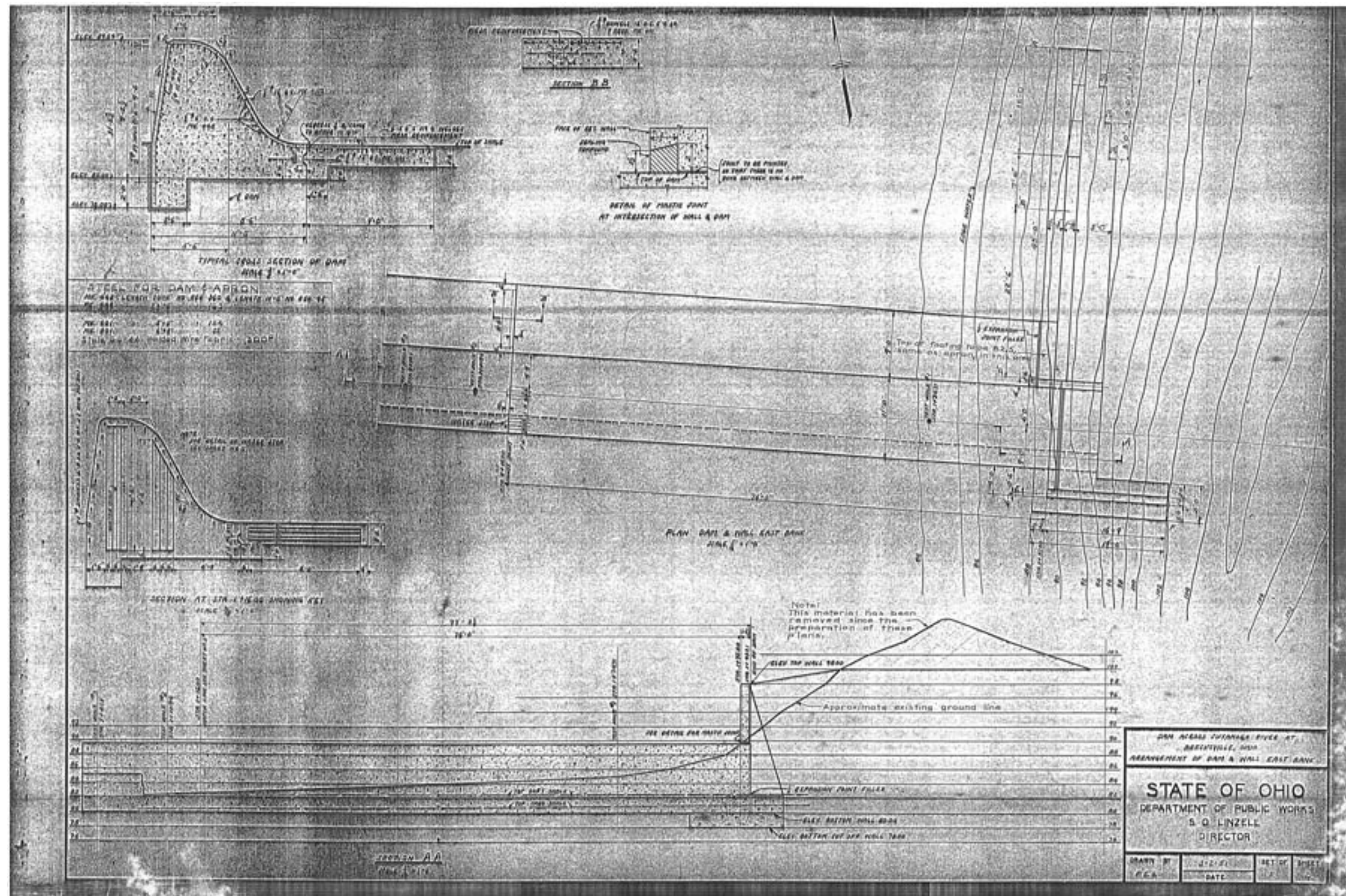


Key to field photos (numbers on key map are figure numbers in report)

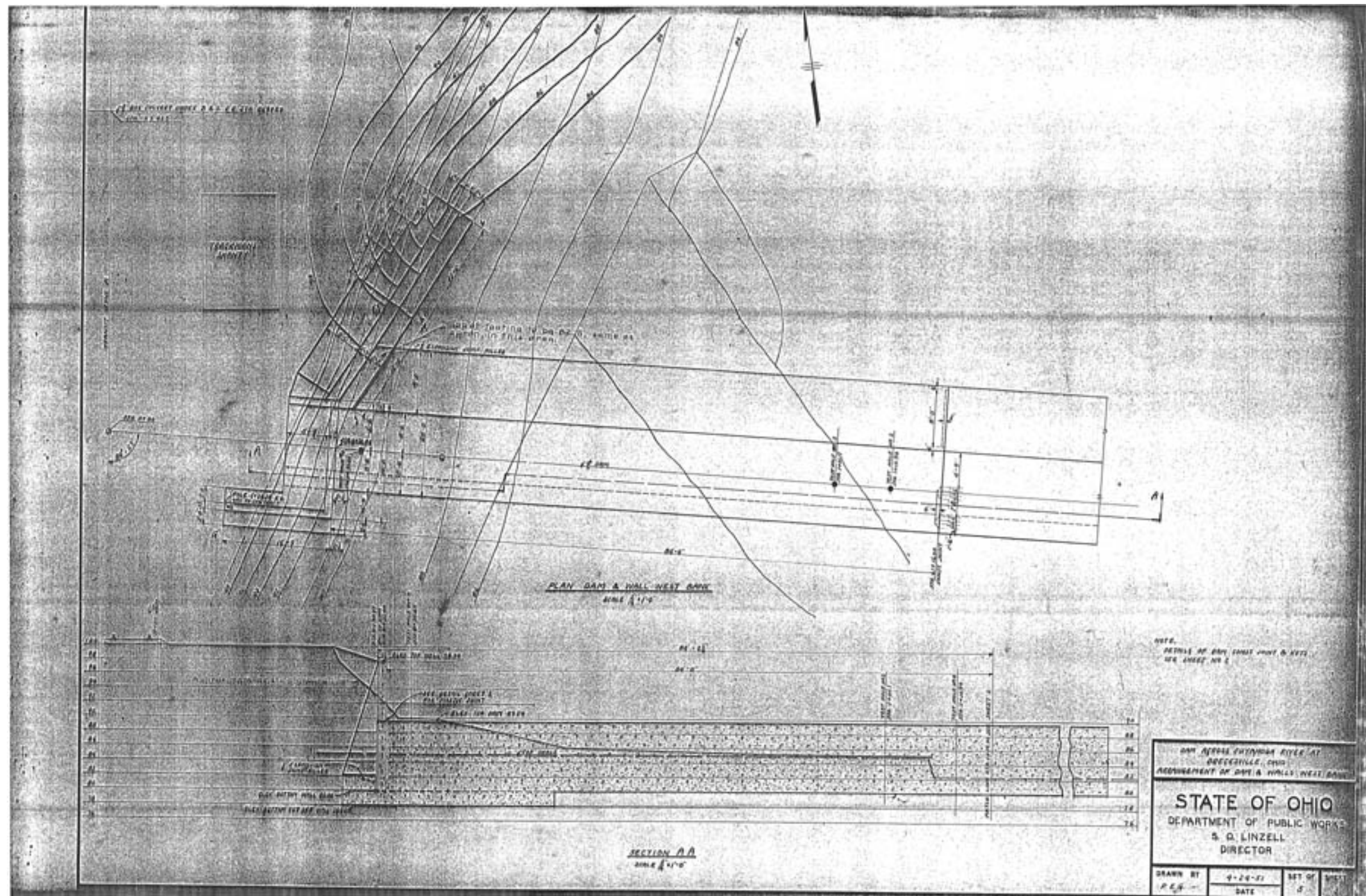
APPENDIX D.

Copies of Original Construction Drawings for the Brecksville Diversion Dam (1951)

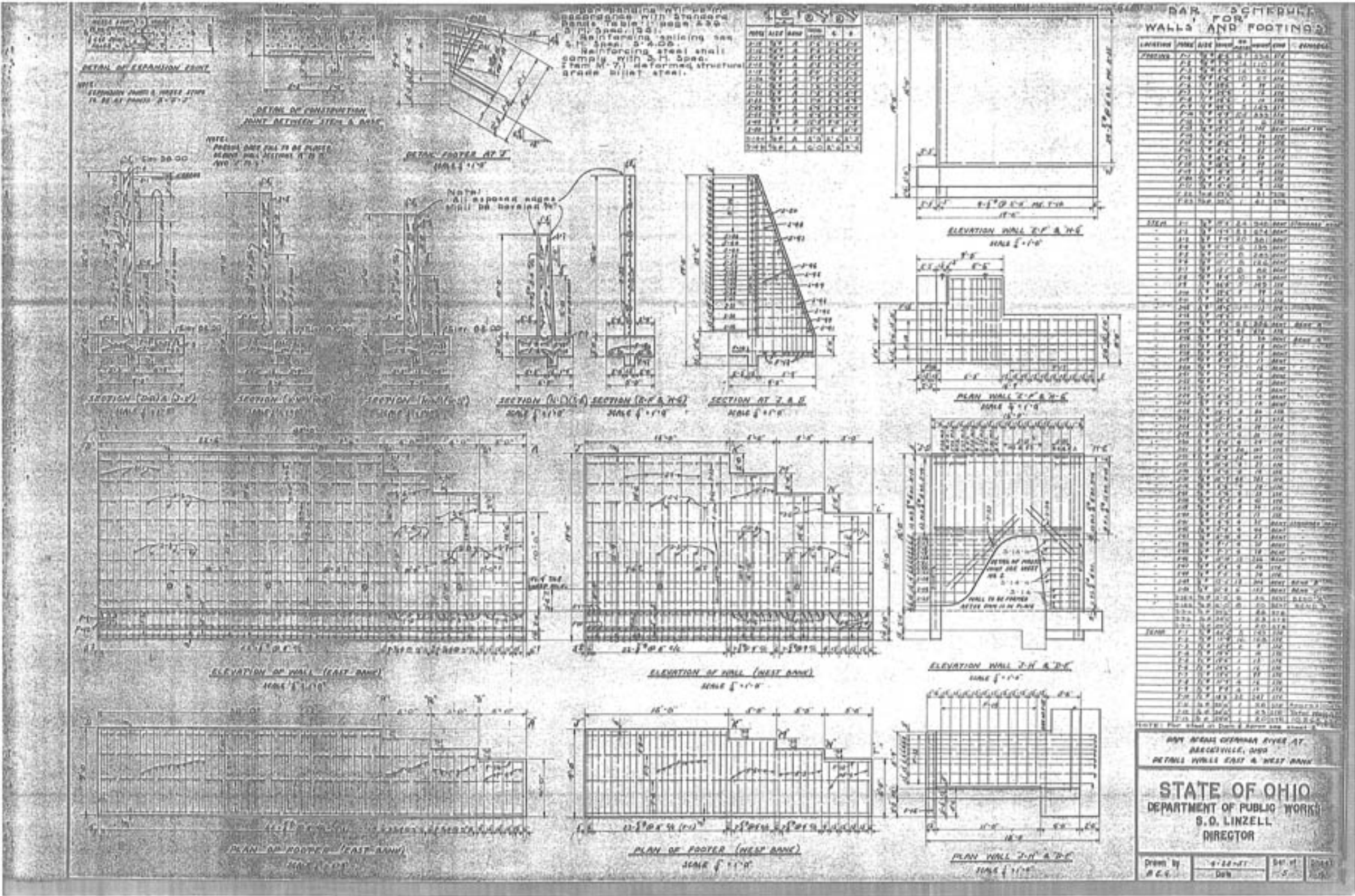
Drawing 1. Arrangement of dam walls, east bank	D-1
Drawing 2. Arrangement of dam and walls, west bank	D-2
Drawing 3. Details of walls, east and west banks	D-3
Drawing 4. Details of bank and rip-rap below the dam	D-4
Drawing 5. General arrangement	D-5



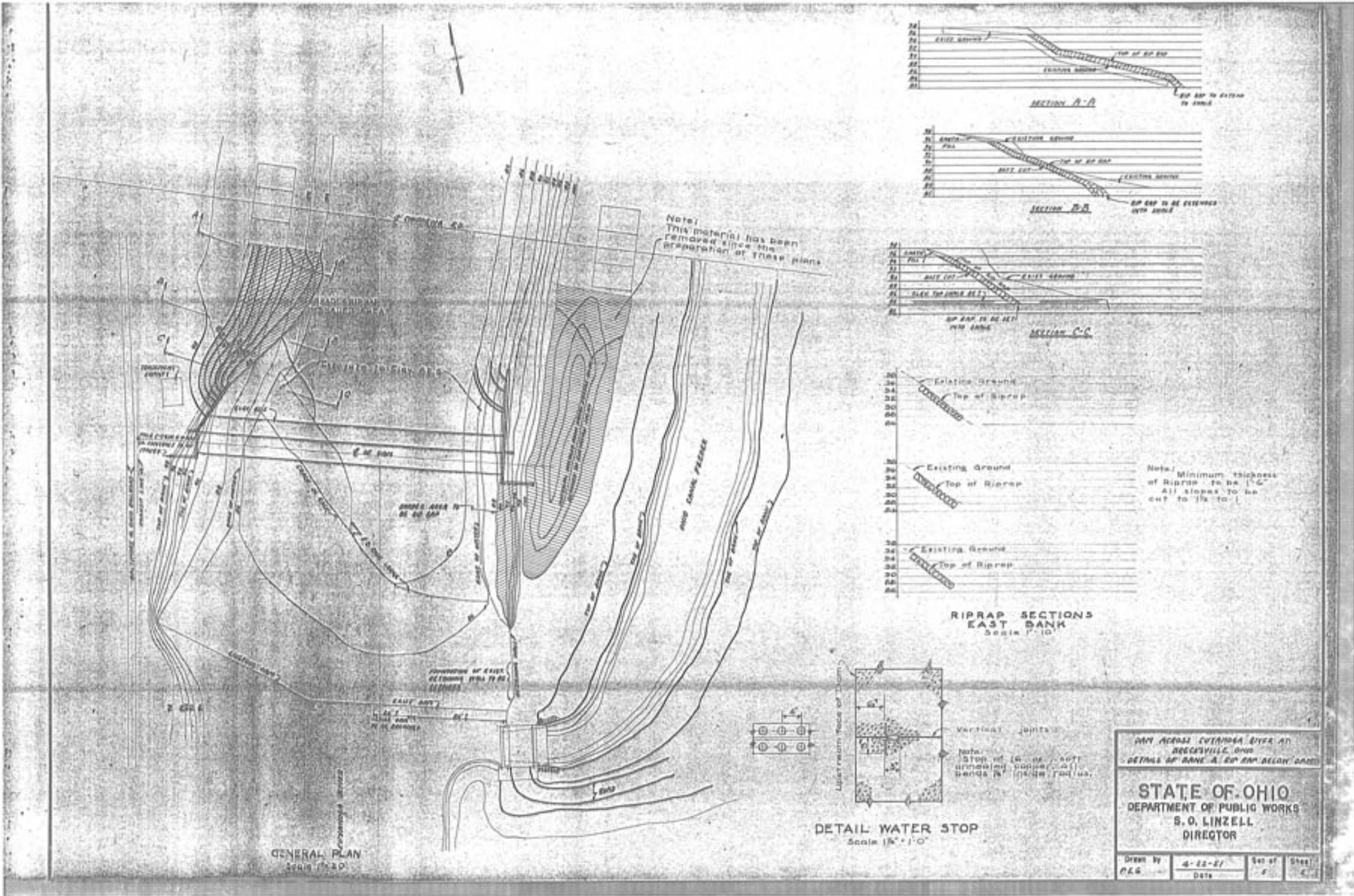
Drawing 1. Arrangement of dam walls, east bank



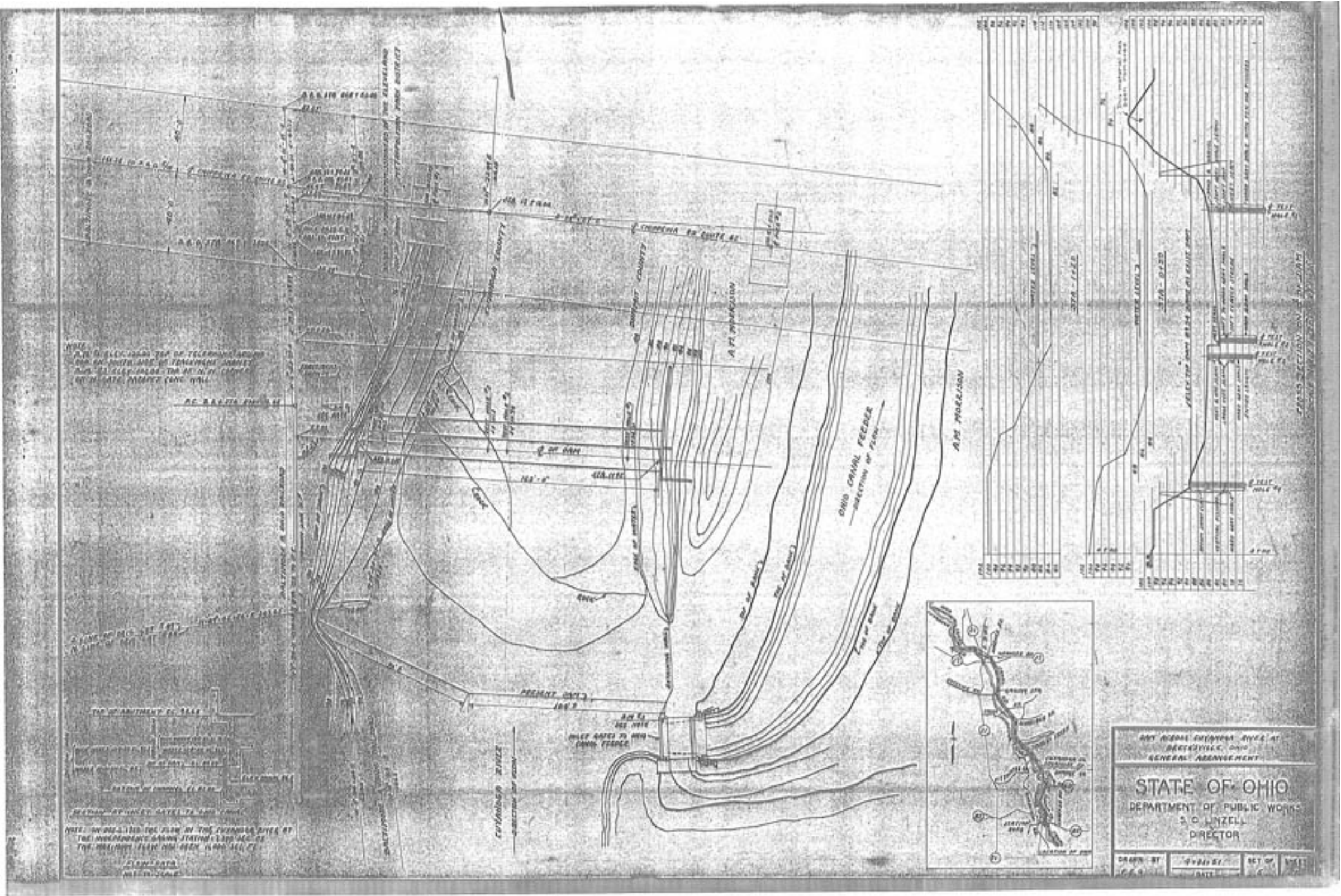
Drawing 2. Arrangement of dam and walls, west bank



Drawing 3. Details of walls, east and west banks



Drawing 4. Details of bank and rip-rap below the dam



Drawing 5. General arrangement