

Big Hole Pumping Station  
Old Highway #43  
Divide Vicinity  
Silver Bow County  
Montana

HAER No. MT-34

HAER  
MONT,  
47-DIVI.V,  
1-

PHOTOGRAPHS

WRITTEN HISTORICAL AND DESCRIPTIVE DATA

Historic American Engineering Record  
National Park Service  
Department of the Interior  
Washington, D.C. 20240

HAER  
MONT  
47-DIV. V,  
1-

HISTORIC AMERICAN ENGINEERING RECORD

Big Hole Pumping Station

MT-34

- Location: On the Big Hole River, 2 1/2 miles northwest of Divide, on Old Highway #43, Silver Bow County, Montana.
- Date of Erection: 1899; major addition 1906.
- Present Owner: Butte Water Company (original owner)  
124 West Granite Street  
Butte, Montana
- Present Use: To supply water for the Butte Mining District and the residential areas of Butte, Walkerville, East and South Butte.
- Significance: The Big Hole Pumping Station was a creative and far-sighted solution to the water supply problems faced by the mining industry and the residential community in the Butte area. The water system pumps over 15 million gallons a day over the Continental Divide to Butte and the surrounding areas, with a maximum distance covered of almost 28 miles.

Butte is the largest American city which began as a mining camp (in 1864) and the largest in close proximity to the Continental Divide. Due to high bedrock in the Silver Bow Basin the artesian effect is limited, and as mines dug deeper into the earth, the aquifer drained off into the mineshafts. Water quality was polluted at an early date from mine tailings, smelting slag, and residential sewerage. The water retrieved from the mines was a dilute sulfuric acid, unfit for any commercial or domestic use. The city's population tripled in the 1880's, with a corresponding increase in water demands from the mines, mills and smelters. Butte saw another tripling of population in the 1890's, and the water situation had become critical.

The Butte Water Company was established in 1898, and the pumping station was installed on the Big Hole River a year later. An 840 foot pump lift fed water sources to reservoirs on Divide Creek and over the Continental Divide to Basin Creek. The water was then allowed to drain by gravity through continuous stave redwood pipelines to the fifteen square mile area served by the Company, including Butte and its surrounding suburbs.

(continued)

Seven zones were established to maintain appropriate pressures in the distributing system. Pumping was minimized by establishing piping interconnections between the three independent water sources, the Yankee Doodle Creek, the Basin Creek and the Big Hole River.

The brick pumping station, on a concrete foundation, was completed in 1899, with an equally large addition finished in 1906. The station contains two 20,000 lb. traveling cranes (one in each pumproom) and a large repair shop. The original #1 pump was a horizontal triple expansion two stage plunger pump manufactured by the Nordberg Manufacturing Company of Madison, Wisconsin. Installed in the original section of the pumping station in 1899, this pump was powered by steam produced by burning of coal. This pump was electrified in 1907 and remained in operation until 1946.

In 1906, the pumping station was expanded to accommodate the #2 pump, another horizontal triple expansion two stage plunger pump. Also manufactured by the Nordberg Company, #2 pump was installed and electrified by 1907. The pump was capable of pumping four million gallons per day. The electric motor is an 800 h.p. induction motor. The #3 pump is a Worthington five stage horizontal turbine, driven by a 1300 h.p. induction motor. This pump was installed in 1916 and is capable of pumping just over six million gallons per day. The #4 pump is a Cameron four stage 12" horizontal turbine, driven by a 1300 h.p. synchronous motor. Installed in 1930, #4 pump is capable of pumping seven million gallons per day. The #5 and #6 pumps are Ingersoll Rand four stage horizontal turbines driven by 700 h.p. squirrel cage motors. Both of these pumps were installed in 1954 and are each capable of pumping 3.5 million gallons per day. These pumps use the suction line from pump #1 (which was removed from the station in 1953).

A 150 foot riveted steel smokestack was erected in 1899 for the original steam boilers. A coal ramp was built onto the back of the building for the hauling and dumping of coal into the coal bins. The sterling boilers and the smokestack still exist but are no longer in use. The coal ramp has been removed.

(continued)

The Big Hole Pumping Station has consistently kept pace with the necessary technical improvements in the field, installing new pumps to increase its capacity, and it continues to meet the water demands of Butte and the surrounding area.

Reference: Bick, Patricia and Miles Tuttle; National Register Nomination Form, May 12, 1980.

Transmitted By: Kevin Murphy, Historian HAER, June 1984.

ADDENDUM TO:  
BIG HOLE PUMP STATION  
816 Pumphouse Road (Old Highway 43)  
Divide  
Silver Bow County  
Montana

HAER MT-34  
*HAER MONT,47-DIVI.V,1-*

PHOTOGRAPHS  
WRITTEN HISTORICAL AND DESCRIPTIVE DATA  
FIELD RECORDS

HISTORIC AMERICAN ENGINEERING RECORD  
National Park Service  
U.S. Department of the Interior  
1849 C Street NW  
Washington, DC 20240-0001

HISTORIC AMERICAN ENGINEERING RECORD

BIG HOLE PUMP STATION

This report is an addendum to a 3-page report previously transmitted to the Library of Congress in 1984.

Location: 816 Pumphouse Road, Divide, MT 59727  
(Old Highway #43, Divide vicinity, Silver Bow County, MT)  
USGS Topographic Quad: Dewey  
Township 1 South, Range 10 West, Section 12

GPS Coordinates: Latitude: 45°45'50.79" N, Longitude: 112°47'16.35"W  
This coordinate represents the center of the pump station building.  
Obtained November 10, 2010, using Google Earth (© 2010). The coordinate's datum is North American Datum 1983.

Present Owner: Butte–Silver Bow Water Utility Division

Present Use: To supply water for the Butte Mining District and the residential areas of Butte, Walkerville, East Butte, and South Butte.

Significance: The Big Hole Pump Station (HAER No. MT-34) and original rock-filled crib dam were constructed in 1899. Butte Water Company constructed the project to pump water from the Big Hole River, a pristine water supply located more than 27 miles from Butte, over the Continental Divide and into town. A concrete diversion dam and settling basin were constructed ca. 1929 to replace the original crib dam. The entire system serves as an ongoing solution to the water-supply problem faced by the mining industry and residential communities of Butte in the late nineteenth century.

Date: Constructed 1899, expanded 1906

Builder: Butte Water Company

Report prepared by: Natalie K. Perrin, M.S., and Heather Lee Miller, Ph.D.  
Historical Research Associates, Inc.  
1904 Third Avenue, Suite 240  
Seattle, WA 98101  
and  
Kristi Hager, Photographer

Submittal Date: April 15, 2011

## I. PROJECT DESCRIPTION

The Big Hole River is a source of raw water for the Big Hole Water Treatment Plant, which purifies and then delivers water to the citizens of the City and County of Butte-Silver Bow, Montana (a consolidated city-county governing unit commonly referred to as Butte-Silver Bow or BSB). The Big Hole Pump Station Complex, owned and operated by Butte-Silver Bow, Water Utility Division, is located approximately 27 miles southwest of Butte and approximately 2.5 miles west of Divide, Montana. The “Big Hole Pumpstation” (built in 1899, expanded in 1906), was listed on the National Register of Historic Places (NRHP) in 1980 (Smithsonian Trinomial 24SB257). The NRHP nomination included the diversion dam and settling basin as contributing resources, as well as employee dwellings; the employee dwellings are no longer extant. The Big Hole Pumpstation was listed in the NRHP as both building(s) and a structure, but not as a district.

The Big Hole diversion dam and settling basin, water intake, and cistern are scheduled for removal in conjunction with construction of a new water intake and diversion for the Big Hole Pump Station; no alterations are planned for the pump station building at this time. Future phases of construction include relocating existing cased pumps to a new pump house, to be constructed on the northeast side of the existing pump station. The new pump house will alleviate existing pump efficiency problems by installing pumps at proper elevations. The new pump station will require removal of water-delivery components from the existing pump station.

In anticipation of future construction of a new pump house, and in partial compliance with a Memorandum of Agreement between the U.S. Army Corps of Engineers, the Montana State Historic Preservation Office, and the City-County of Butte-Silver Bow for the Big Hole River Pump Station Complex, the original 1984 Big Hole Pump Station Historic American Engineering Record (HAER) documentation is updated with this addendum.

## II. HISTORIC CONTEXT

In 1805, when Meriwether Lewis and William Clark’s party of explorers passed through the region in which the Big Hole Pump Station is now located, they named the stream they encountered the Philanthropy River.<sup>1</sup> Later, French-Canadian trappers attracted to the region by its abundant local game christened the area “Le Grand Trou,” which literally translates as “the big hole.”<sup>2</sup> The name stuck and the region, as well as the river that supplies it, are today known as the Big Hole. After gold was first discovered in the region in 1862, cattle were brought to the Big Hole to rest along the trail to the gold camps and, by 1874, for winter grazing to fatten on the abundant grasses.<sup>3</sup>

---

<sup>1</sup> “Engineers Start Work Today on Route of New Railway,” *Butte Miner*, July 30, 1913, 11.

<sup>2</sup> Hubert H. Bancroft, *History Of Washington, Idaho, and Montana, 1845-1889*, Volume 31 (San Francisco: The History Company, Publishers, 1890), 593.

<sup>3</sup> U.S. Forest Service, “History of the Big Hole and Horse Prairie Valleys: Mining, Ranching and Settlement,” Nez Perce National Historic Trail, <http://www.fs.fed.us/npnht/skinnermeadow/bihohoprminingsettlement.pdf>.

In nearby Butte, Montana, the first prospectors relied on fresh water from Silver Bow Creek and its tributaries. During the 1880s, the population of Butte tripled, creating greater demands for potable water. Increased mining activity, however, meant water was diverted from human needs to those of the mining industry. Soon, the water of Silver Bow Creek was not drinkable due to the “general sewage of mines and inhabitants” being dumped into it.<sup>4</sup>

In 1898, the Butte Water Company was established from the previously named Butte City Water Company, which had purchased the Silver Bow Water Company in 1891. Supplying water to the ever-increasing residents of the area and mining interests presented challenges in a region nearly encircled by the Continental Divide. “Due to the high bedrock in the Silver Bow Basin the artesian effect is limited, and as mines dug deeper into the earth, the aquifer drained off into the mine shafts. The water retrieved from the mines was a dilute sulfuric acid, unfit for any commercial or domestic use.”<sup>5</sup> While the Silver Bow Basin obtains a fair amount of water from the drainage of annual precipitation upon the surrounding mountains, the ever-increasing population of Butte – which tripled from 1880 to 1890, then tripled again from 1890 to 1900 – combined with the dangerously polluted ground water led to a critical water need in the late 1890s.<sup>6</sup>

The solution to the growing problems was “both creative and far sighted[,] . . . a significant engineering accomplishment” that enabled the town and mining industry to continue to grow.<sup>7</sup> Butte Water Company constructed a project to pump water from the Big Hole River, a pristine water supply located more than 27 miles from Butte, over the Continental Divide and into town. The Big Hole water system would encompass miles of continuous stave redwood and fir pipelines, five separate distribution systems, reservoirs, dams, pump stations, and treatment centers.<sup>8</sup> Although it was built more than a century ago, the system continues to serve as Butte’s main water source. Arguably, the most important component in the system is the Big Hole Pump Station.

When the Big Hole Pump Station was completed in 1899, it was “capable of lifting 15 million gallons of water a day [800 feet in elevation and approximately ten miles in distance] over the Continental Divide to reservoirs on Basin Creek.”<sup>9</sup> When constructed, the pump station building housed a single triple-expansion two-stage plunger pump manufactured by Nordberg Manufacturing Company of Madison, Wisconsin.<sup>10</sup> Feeding the entire system was a diversion

---

<sup>4</sup> “Butte, Montana, Water Works,” *Mueller Record* 221 (January 1931): 21, Folder VF2145, Utilities: Butte Water Company General Information, Butte–Silver Bow Archives, Butte, Montana (hereafter BSBA)

<sup>5</sup> Kevin Murphy, Big Hole Pump Station HAER No. MT-34, 1984. Library of Congress Historic American Engineering Record Data Pages, Accessed November 10, 2010, [http://memory.loc.gov/ammem/collections/habs\\_haer/](http://memory.loc.gov/ammem/collections/habs_haer/).

<sup>6</sup> Miles Tuttle and Patricia Bick, “Big Hole Pumpstation (24SB257),” National Register of Historic Places Inventory Nomination Form, listed September 24, 1980, 7-2, Montana State Historic Preservation Office, Helena, Montana (hereafter Montana SHPO).

<sup>7</sup> Ibid.

<sup>8</sup> Ibid.

<sup>9</sup> Ibid.

<sup>10</sup> Ibid.

dam and intake system that funneled water into the pump station for transfer into the Big Hole system and, eventually, delivery to the people and industries of Butte and its surrounds. The original dam, built in 1899, was a low-profile structure built of rock and timber. Water trapped behind the rock-filled crib dam flowed through a conduit and into a concrete suction well just south of the pump station. From there, water was diverted through pipes to the pumps in the pump station building. The pumps forced the water through redwood-stave pipelines that transported the water up and over the Continental Divide.<sup>11</sup>

Due to the isolated location of the pump station, buildings for the use of engineers and workmen were constructed on site. Seven buildings, providing housing and storage, were included in the 1980 NRHP nomination of the Big Hole Pumpstation. The Chief Engineer's House, constructed in 1900, and associated garage (ca. 1920) were located east of the pump station. The Boarding House, built in 1912, housed up to fifteen workers and was located west of the pump station. Employee House 1, built in 1916, and Employee Houses 2 and 3, built in 1937, were also located west of the pump station.<sup>12</sup> Today, a hose house is the only surviving ancillary building from the turn of the twentieth century, though it has been moved from its original location northeast of the pump station to a spot northwest of the pump station. The building still houses the original hand-pulled fire cart.

The original Nordberg pump (Pump No. 1) was powered by a coal-fired steam system, and operated solo until the pump station building was expanded in 1906. At that time, a second pump was installed and, in 1907, both pumps were electrified.<sup>13</sup> A third pump was added to the system ca. 1916, providing an additional 6 million gallons to the approximately 8 million gallons already entering the system daily.<sup>14</sup>

In general, apart from construction of employee housing and necessary upgrades for new pumps, the configuration of the pump station complex, including the rock-filled crib dam and water intake, remained relatively unchanged from 1906 through ca. 1929. Lack of historic documentation renders vague the sequence of events leading to the development of the concrete Big Hole diversion dam. What is known is that the extant concrete dam, settling basin, and intake structure were developed between 1927 and 1930, at least partially, as a reaction to a flood. On June 14, 1927, heavy snow melts and swollen creeks led to the failure of the Pattengail Dam. The Pattengail Dam, built in 1903 and located on a tributary of the Wise River, stored

---

<sup>11</sup> Ibid., 7-1.

<sup>12</sup> Ibid.

<sup>13</sup> Ibid.

<sup>14</sup> Ibid. The National Register nomination states that Pump No. 3 was installed in 1916. Historic blueprints dated January 1917 depict the foundations of Pump Nos. 1 and 2 and the associated suction and discharge lines, but do not depict Pump No. 3. It is probable, therefore, that Pump No. 3 was ordered in 1916 and installed after the January 1917 drawings were commissioned. See "Foundation Plans Big Hole Pump Station Showing Location of Suction and Discharge Lines," January 16, 1917, Butte Water Company, Butte, MT.

12,000 acre feet of water, which created a reservoir over 2 miles long.<sup>15</sup> Following failure of the Pattengail Dam, the Wise River, a tributary of the Big Hole, flooded the valley, causing at least four deaths and significant damage. On June 15, 1927, the *Butte Miner* reported that “the disaster, tragic as it was, would have been incalculably more serious if the Butte Water Company’s dam at Divide had failed to hold. The pumping plant was flooded, but has been closed for some time. Several empty buildings at Divide floated off.”<sup>16</sup>

The Montana Power Company assumed responsibility for expenses incurred at the Big Hole pump station in connection with the flood.<sup>17</sup> The costs associated with repairs were recorded on monthly balance sheets for the Butte Water Company, beginning in July 1927 at a cost of \$6,648.90 and totaling over \$17,335 by November 1928.<sup>18</sup>

Three more pumps were added to the pump station, specifically Pump No. 4 in 1930, likely simultaneous with construction of the new concrete dam and settling basin, and Pump Nos. 5 and 6 in 1954. Pump No. 1 was removed in 1953. Pump No. 2 operated until ca. 1960, and is still extant in the pump station building. New pumps were installed in the 1990s concurrent with automation of the pump station and construction of the Feely Water Treatment Facility, located approximately 10 miles north of the Big Hole pump station. At that time, Pumps Nos. 5 and 6 were decommissioned but left in place as a backup.

The Big Hole pump station and diversion dam continue to provide necessary drinking water to the community of Butte.

### III. PHYSICAL DESCRIPTION

The Big Hole Pump Station Complex is located in the canyon of the Big Hole River, approximately 27 miles southwest of Butte, Montana, and 2.5 miles west of Divide, Montana. The site comprises the pump station and stack, diversion dam and settling basin, intake pier and raceway, water intake, cistern, and hose house. A bungalow style residence is located west of the pump station, but is not affiliated with the facility and is not one of the original worker’s residences.

The pump station building is roughly L-shaped in plan, and sits on a poured concrete foundation. The building is constructed of structural brick in a common, or American, bond. The building as initially constructed in 1899 was rectangular in plan, with the boiler room located to

---

<sup>15</sup> Denine Schmitz, Selita Ammondt, Matt Blank, and Duncan T. Patten, “Using Historic Aerial Photography and Paleoflood Hydrology to Assess Long-Term Ecological Response to Two Montana Dam Removals,” Land Resources and Environmental Science, Montana State University, 2005, <http://landresources.montana.edu/hydroecology/Documents/Schmitz-Patten%20USGS%20104b%202005%20final%20report.pdf>.

<sup>16</sup> “River Dam Breaks Taking Heavy Toll,” *Butte Miner*, June 15, 1927, 2.

<sup>17</sup> Butte Water Company, Manager, to Frank M. Kerr, Vice President of the Montana Power Company, July 18, 1927, Vertical Files, Bottom Drawer, File 25, FWTF.

<sup>18</sup> Butte Water Company, Balance Sheets by month, Big Hole Pump Station – Flood Damage, Vertical Files, Bottom Drawer, Loose Records (no file), FWTF.

the north and the pump room to the south. The boiler room is two stories and has a shed roof. The pump room is one story tall, also with a shed roof; a shed-roof monitor with banks of multi-light wood sash windows on both the north and south elevations allows additional light into the interior of the space.<sup>19</sup> In 1906, the pump station building was expanded on the south elevation, and a second pump room was added; the expansion roughly doubled the size of the pump station building, and features a butterfly roof.

The pump station features segmental arches over both window and door openings. Some original multi-light wood sash windows are still extant on all elevations. Two window openings have been insensitively filled on the south elevation with modern single-light windows, and other window openings have been filled with brick. One original wood door is intact on the east elevation; all other doors are modern infill.

The interior of the pump station is dominated by an array of different types of pumps, including Pump No. 2 in the south pump room. The central (original) pump room contains several generations of pumps and other equipment. The boiler room still features the original cast iron coal furnace and steel discharge pipe, which leads to the steel smoke stack outside and west of the pump station building. Also west of the building is a wood hose house with a shed roof; the building still houses the original hand-pulled fire cart.

The Big Hole Pump Station Complex has changed significantly since the 1920s. Which outbuildings “floated off” during the 1927 flood as the *Butte Miner* described is unknown. Similarly unclear is whether outbuildings damaged in the 1927 flood were removed at that time or later. At least some of the residential buildings constructed between 1900 and 1937 were extant at the time of the 1980 NRHP nomination, though none remains today. Of the ancillary buildings from the 1920s, only the hose house is extant; the hose house is mentioned in the NRHP nomination in the section on employee dwellings.<sup>20</sup> Based on photographic evidence from August 1911, the hose house was relocated from its original site northeast of the pump station to its current site northwest of the pump station.

At the time of this report, the Big Hole River Pump Station complex functioned by drawing water from the Big Hole River into pumps in the pump station, which then pumped the water over the Continental Divide and eventually into the Butte area. Water from the river either bypasses the pump station via three open (uncontrolled) spillways on the diversion dam, or it is channeled through the raceway and into the settling basin. Water can enter the raceway via two raceway gates on the south side of the raceway wall and just downstream of the intake pier. Once in the raceway, water may be diverted directly through the raceway and out, to continue traveling downstream in the river, or it can be channeled into the settling basin via a gate on the north wall at the east end of the raceway.

Water that enters the settling basin from the raceway flows upstream, allowing sediment to settle in the basin, before being channeled into the sluice gate on the north side of the intake pier. Water flows into the hollow cavity under the intake pier, where a series of trash racks remove

---

<sup>19</sup> The monitor may have been added in 1906 as part of the pump station expansion.

<sup>20</sup> Miles Tuttle and Patricia Bick, “Big Hole Pumpstation (24SB257),” National Register of Historic Places Inventory Nomination Form, listed September 24, 1980, 7-1, Montana SHPO.

any additional debris before the water is channeled into the water intake. The water intake then diverts water beneath the settling basin and into the cistern. Water can also be released from the settling basin via two gates on the east wall of the settling basin. A third gate, located on the west wall of the settling basin, allows additional water to enter the settling basin; this gate is used primarily when large quantities of water are needed to flush debris downstream.

Water channeled through the water intake and into the cistern then flows through underground pipes into the pump station. Modern pumps, operated and monitored remotely from the Feely water treatment facility, create pressure that enables the water to flow up and over the Continental Divide at an elevation gain of approximately 800 feet. Once over the Continental Divide, the water completes the journey to the Feely water treatment facility via gravity flow. At Feely, water from the Big Hole River and other reservoirs is treated before continuing to Butte and the surrounding area.

#### IV. CONSTRUCTION AND MAINTENANCE

The Big Hole pump station was initially constructed in 1899. At that time, the facility consisted of the rock-filled crib dam and the pump station, a structural brick masonry building with a concrete foundation. The pump station building housed a Nordberg triple expansion two-stage plunger pump (Pump No. 1) and a cast-iron boiler. Smoke from the boiler was expelled through a tall metal stack on a rock foundation, located west of the pump station. Pump No. 1 remained in operation until 1946.

In 1906, the pump station building was expanded to accommodate Pump No. 2, a second Nordberg triple expansion two-stage plunger pump (still extant, though decommissioned ca. 1960). At that time, the pump station building was modified, with a large addition added to the south elevation. In 1907, both pumps Nos. 1 and 2 were electrified. Pump No. 3 was added ca. 1916.<sup>21</sup>

The 1927 failure of Pattengail Dam and consequent flood was the apparent catalyst for numerous changes to components of the Big Hole pump station. Notably, the flood destroyed most records of the early period of the pump station's history. According to a 2010 water rights claim, "Records of use from the Big Hole River by the Butte Water Company are available for the period 1927 to the present. Records showing such uses from 1901 to 1927 were lost in a flood during the latter year; newspaper clippings and the like support use by Butte Water Company from the date of first use relied upon for this filing."<sup>22</sup>

Following the flood, plans for the new concrete diversion dam were finalized. Simultaneous to the new dam being designed, the efficiency of the Big Hole system was being analyzed in anticipation of installing a fourth pump.

---

<sup>21</sup> "Foundation Plans Big Hole Pump Station Showing Location of Suction and Discharge Lines," January 16, 1917 with modifications September 7, 1979. Drawing I-49, Blueprint No. 00281, Butte-Silver Bow Historical Society, Butte, MT.

<sup>22</sup> Statement of Claim (October 27, 2006), Water Right Number 41D 17053 00, State of Montana Department of Natural Resources and Conservation, 8, DNRC Water Rights Query System, <http://nris.mt.gov/dnrc/waterrights/>.

We have carefully checked the efficiency of the different pumps based on periods when each pump was used continuously for sometime, and we have arrived at the following results: Efficiency of #1, 305 gallons per KwH, #2, 306 gallons per KwH, and #3, 250 gallons per KwH. As #2 is the most economical pump in the Station, we use it whenever it is possible. We next use #1, which has a capacity of five million gallons and only use #3 in case of emergency, or at times when the demand requires six million gallons per day.<sup>23</sup>

On November 29, 1929, Carroll further outlined statistics at the Big Hole pump station. In a letter to Butte Water Company president A. H. Melin, Carroll wrote,

At present, the equipment of the Big Hole Pump Station consists of one rope drive plunger pump, having a rated capacity of four million gallons per day [M.G.D.], one geared plunger pump of five million gallons daily capacity and one five-stage turbine pump of six million gallons daily capacity. . . . When the 6 M.G.D. turbine pump was installed, connections were made for an additional unit to take care of the suction and discharge of another pump. I think the time has arrived for this installation, and I recommend another 6 M.G.D. turbine pump be installed. . . . At this time, I request permission to proceed with the preliminary work, and ask the approval of the Board of my recommendation to increase our capacity at this pumping station.<sup>24</sup>

Once the concrete diversion dam, settling basin, and installation of Pump No. 4 were complete, the Big Hole pump station had a daily capacity of 14 million gallons of water. The Big Hole provided approximately 50 percent of the water for Butte residents and industries, with the Basin and Moulton reservoirs making up the difference.<sup>25</sup>

Pump No. 1 was removed in 1953 to make way for Pump Nos. 5 and 6, added in 1954. New pumps were installed in the 1990s, concurrent with automation of the Big Hole system and the construction of a water treatment facility at Feely, located approximately 10 miles north of the pump station. The 1950s pumps were decommissioned, but left in place as a back-up system.<sup>26</sup>

Other maintenance and operations at the site were limited to changes that did not directly affect the water conveyance system. Employee housing and outbuildings were constructed and removed over time, though none remain today. Additionally, landscaping around the pump station was altered over time to accommodate pedestrian and vehicular access.

---

<sup>23</sup> Butte Water Company Manager to W. Stussy, Superintendent of the Montana Power Company, August 3, 1927, Vertical Files, Bottom Drawer, File 25, FWTF.

<sup>24</sup> Eugene Carroll to A. H. Melin, Butte Water Company, November 25, 1929, Vertical Files, Bottom Drawer, File 97, FWTF.

<sup>25</sup> "Water Supply of Butte," May 1933, Vertical Files, Bottom Drawer, File 14, FWTF.

<sup>26</sup> Miles Tuttle and Patricia Bick, "Big Hole Pumpstation (24SB257)," National Register of Historic Places Inventory Nomination Form, listed September 24, 1980, Montana SHPO.

## V. REFERENCES

Bancroft, Hubert H.

1890 *History of Washington, Idaho, and Montana, 1845-1889*. Volume 31. San Francisco: The History Company, Publishers.

*Butte Miner*

1913 "Engineers Start Work Today on Route of New Railway." July 30, 1913.

1927 "River Dam Breaks Taking Heavy Toll." June 15, 1927.

Butte–Silver Bow Historical Society Archives  
Butte, Montana

Butte Water Company Archives  
City and County of Butte-Silver Bow, Water Utility Division. 3<sup>rd</sup> Floor. Butte, Montana.

Feely Water Treatment Plant Archives  
Feely, Montana.

Mueller Record

1931 "Butte, Montana, Water Works," Volume 221. January 1931. Folder VF2145, Utilities: Butte Water Company General Information, Butte–Silver Bow Archives, Butte.

Murphy, Kevin.

1984 Big Hole Pump Station, HAER No. MT-34. Library of Congress Historic American Engineering Record Data Pages.  
[http://memory.loc.gov/ammem/collections/habs\\_haer/](http://memory.loc.gov/ammem/collections/habs_haer/).

Schmitz, Denine, Selita Ammond, Matt Blank, and Duncan T. Patten

2005 "Using Historic Aerial Photography and Paleoflood Hydrology to Assess Long-Term Ecological Response to Two Montana Dam Removals." Land Resources and Environmental Science. Montana State University.

<http://landresources.montana.edu/hydroecology/Documents/Schmitz-Patten%20USGS%20104b%202005%20final%20report.pdf>.

State of Montana Department of Natural Resources and Conservation

2006 Statement of Claim. Water Right Number 41D 17053 00. DNRC Water Rights Query System. <http://nris.mt.gov/dnrc/waterrights/>.

Tuttle, Miles and Patricia Bick.

1980 "Big Hole Pumpstation (24SB257)." National Register of Historic Places Inventory Nomination Form, listed September 24, 1980. Montana State Historic Preservation Office, Helena, Montana.

U.S. Forest Service.

u.d. "History of the Big Hole and Horse Prairie Valleys: Mining, Ranching and Settlement." Nez Perce National Historic Trail,  
<http://www.fs.fed.us/npnht/skinnermeadow/bihohoprminingsettlement.pdf>.

World Mining Museum Archives.  
Butte, Montana.



**Figure 1.** Butte Water Company Pump Station, Divide, Montana, on the Big Hole River, August 1911. Image courtesy of the World Mining Museum, Butte, MT.

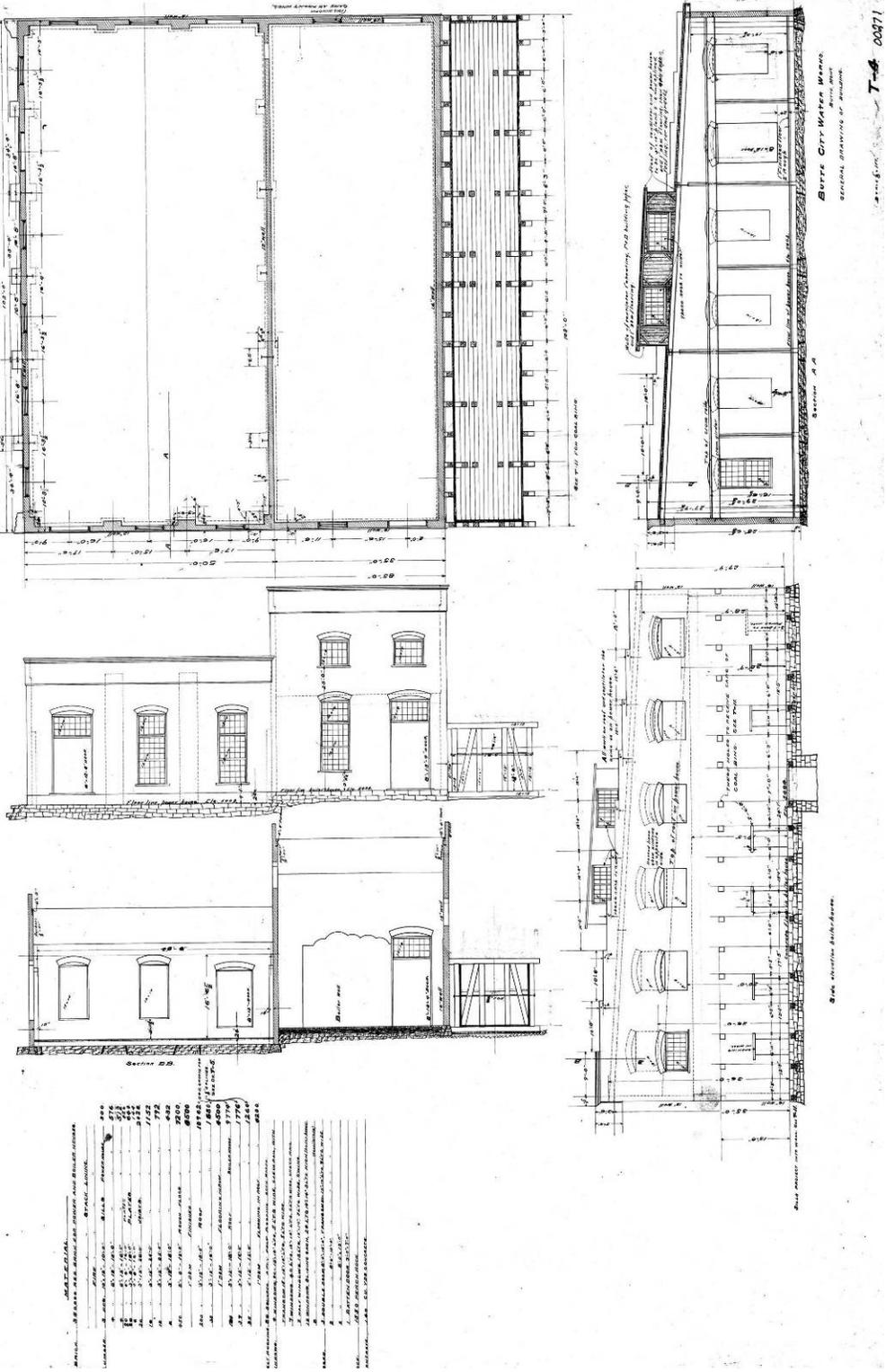
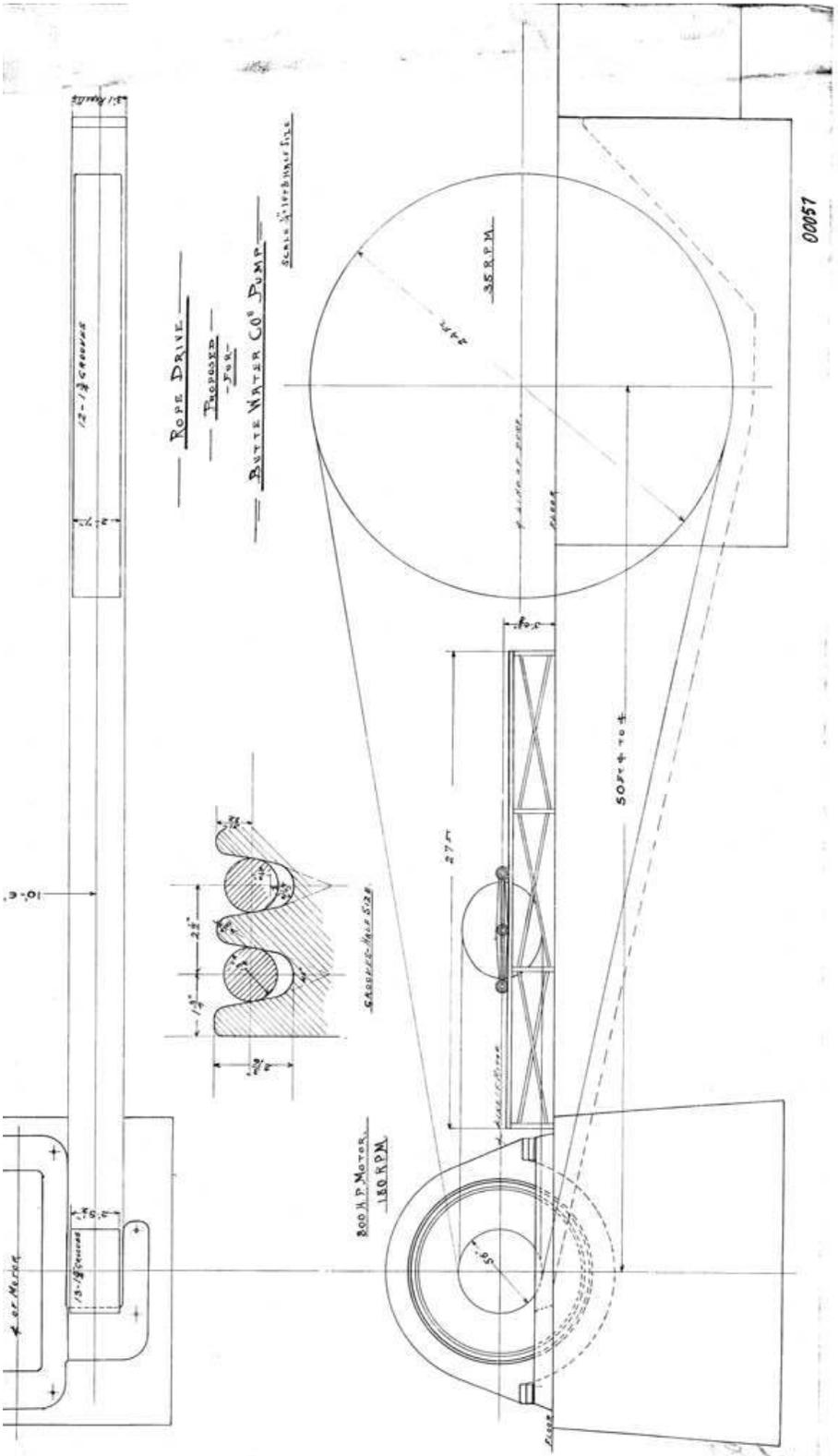


Figure 2. General Drawing of Building, ca. 1899. Image courtesy of the City and County of Butte-Silver Bow, Water Utility Division.



**Figure 3.** “Rope Drive Proposed for Butte Water Co. Pump,” ca. 1899. Image courtesy of the City and County of Butte-Silver Bow, Water Utility Division.

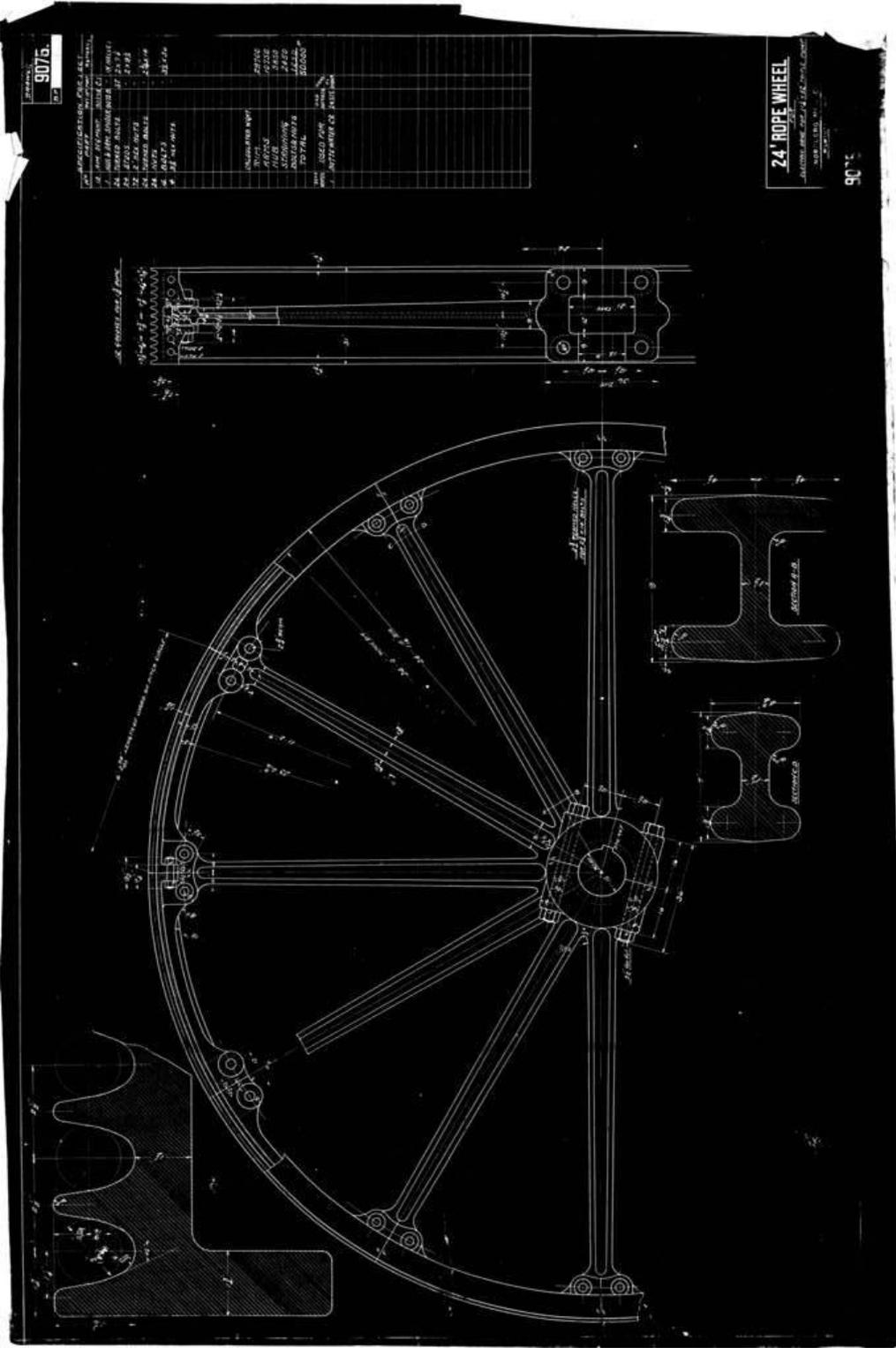
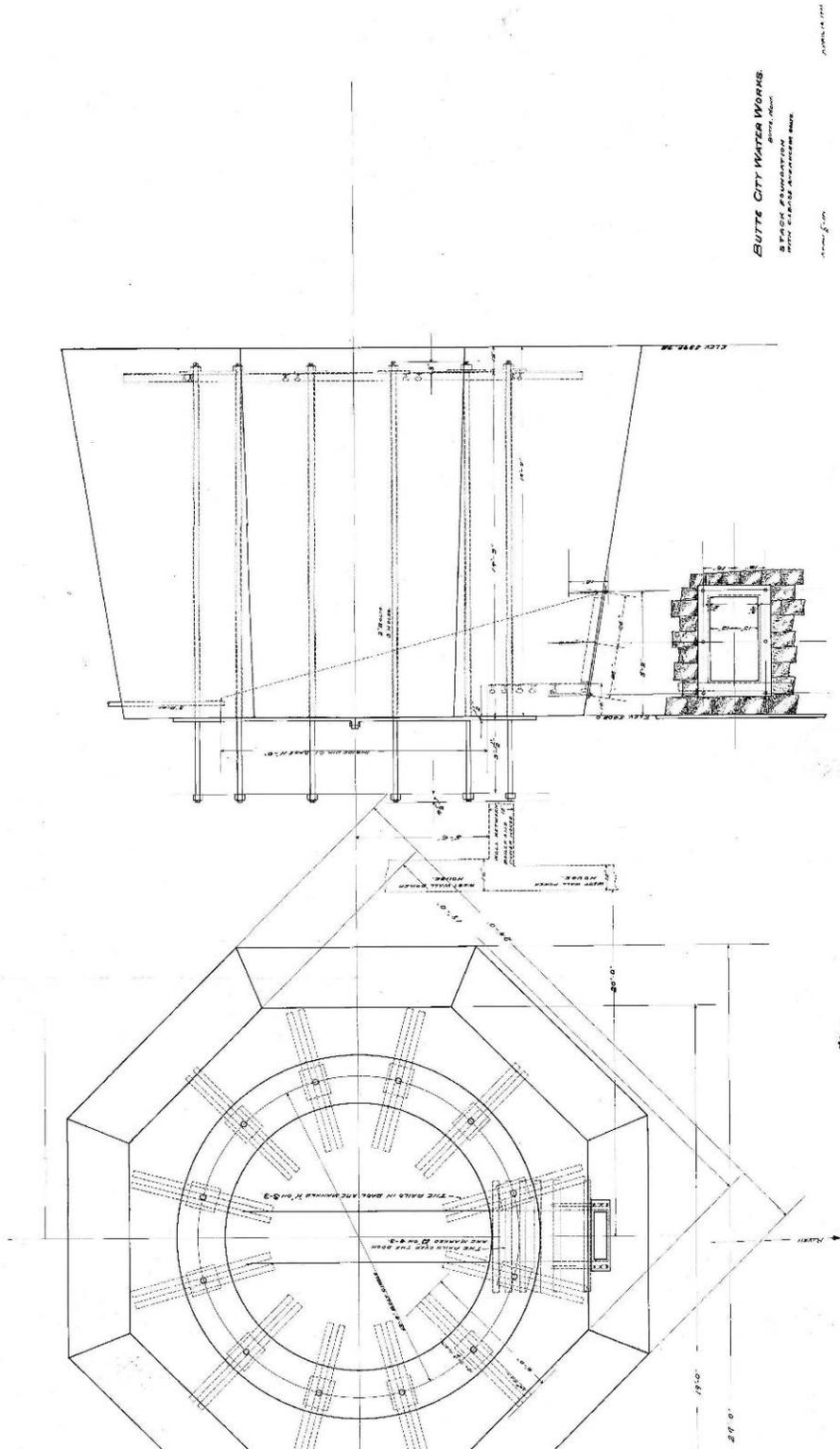
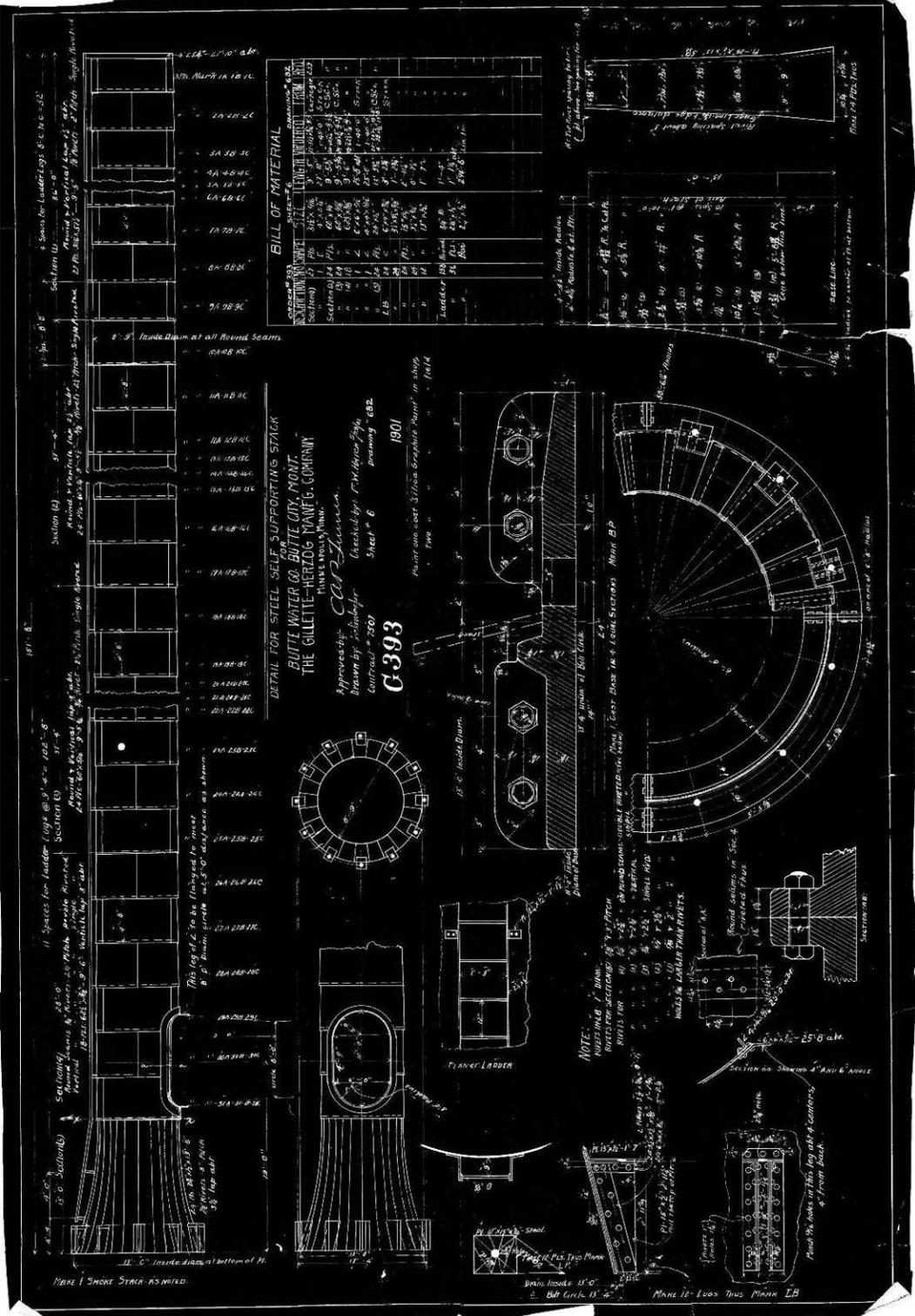


Figure 4. “24” Rope Wheel, Nordberg Manufacturing Company,” ca. 1899. Image courtesy of the City and County of Butte-Silver Bow, Water Utility Division.



**Figure 5.** “Butte City Water Works, Stack Foundation, April 16, 1901.” Image 00386, courtesy of Butte–Silver Bow Historical Society.



**Figure 6.** “Detail for Steel Self Supporting Stack for Butte Water Co., 1901” produced by the Gillette-Herzog Manufacturing Company. Image courtesy of the City and County of Butte-Silver Bow, Water Utility Division.

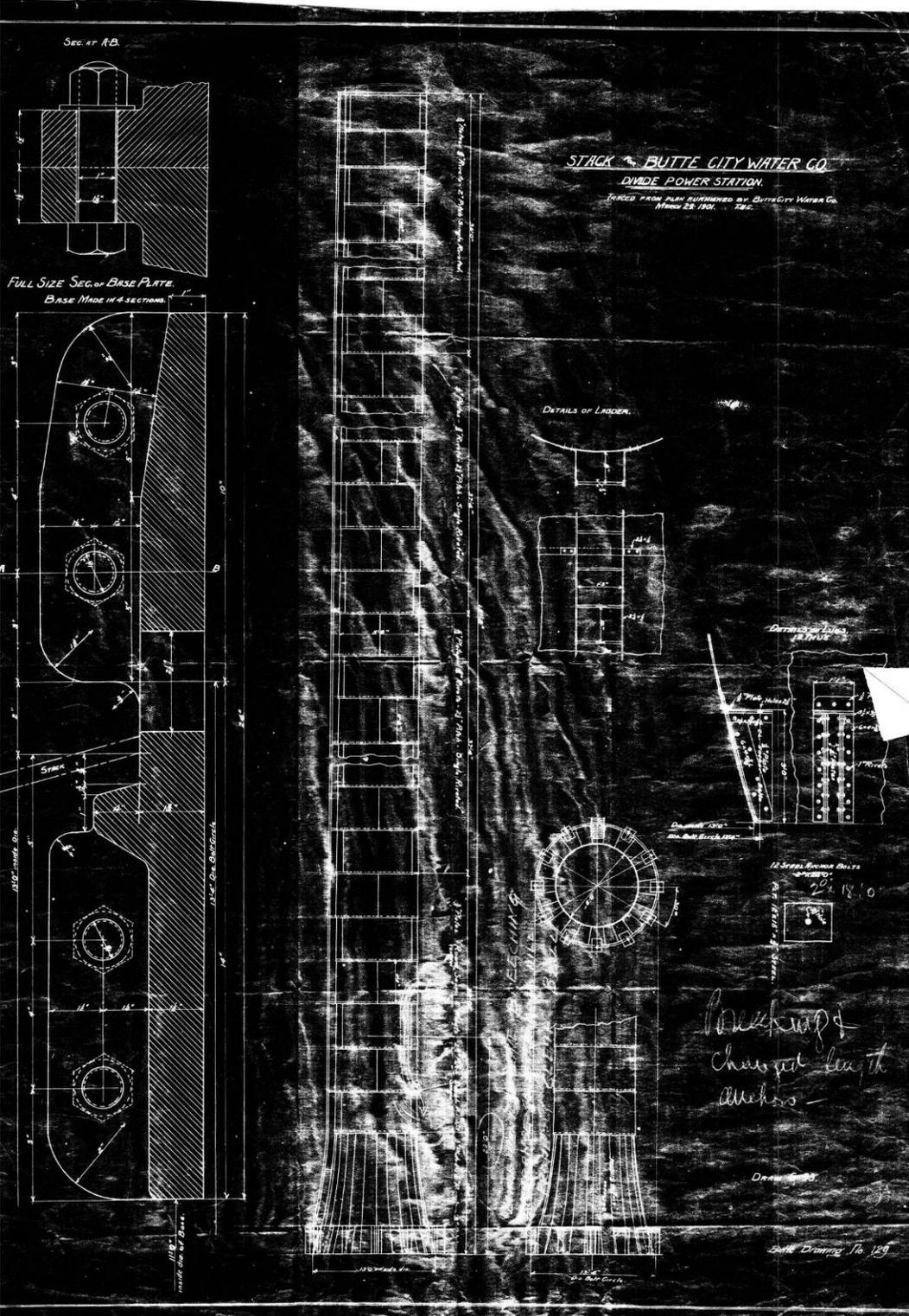
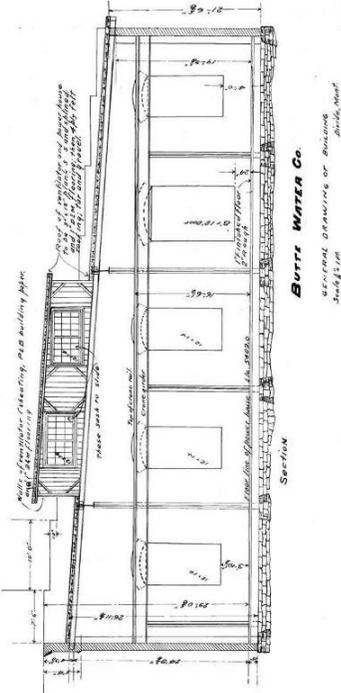
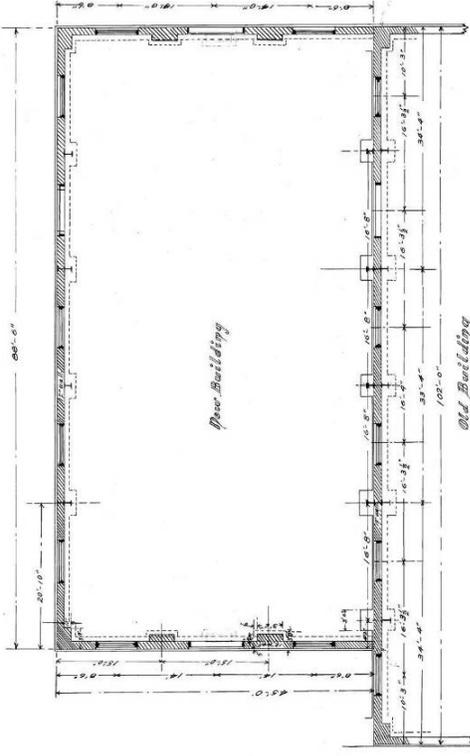
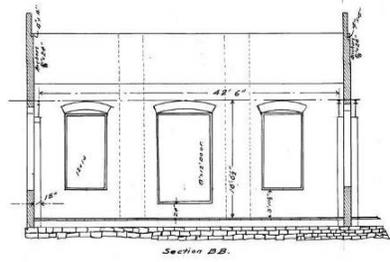


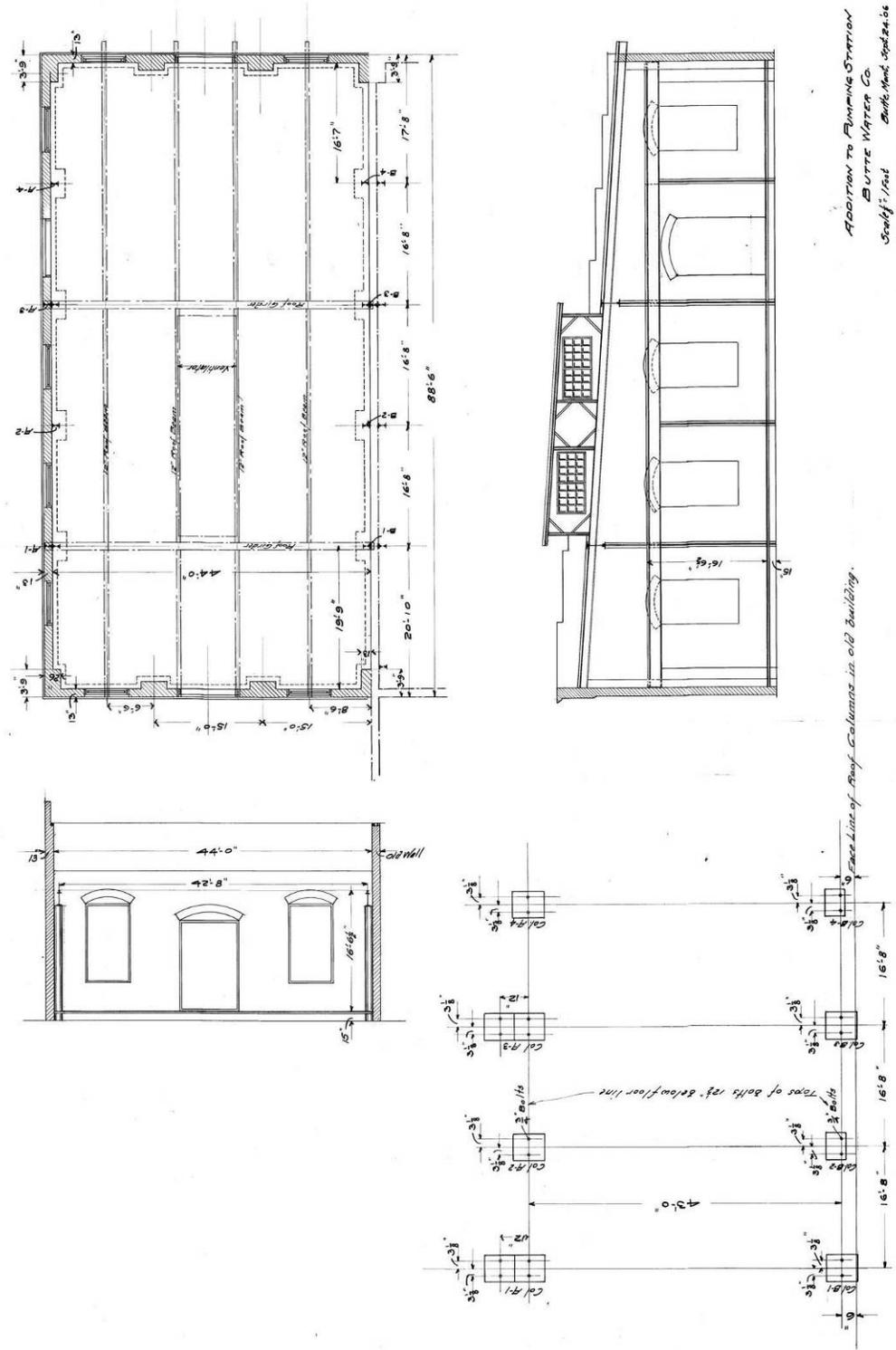
Figure 7. "Stack for Butte City Water Co. Divide Power Station, March 29, 1901." Image courtesy of the City and County of Butte-Silver Bow, Water Utility Division.



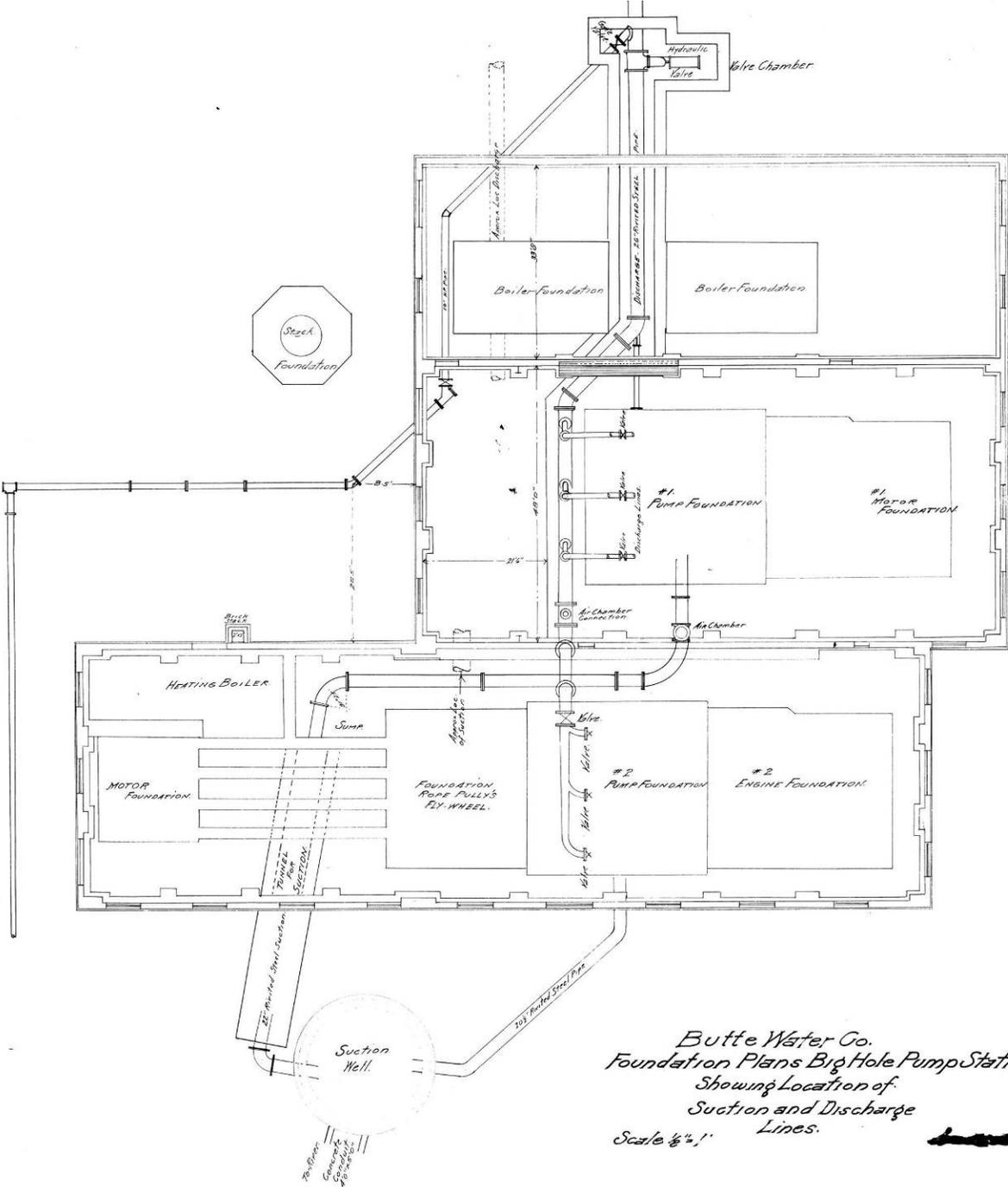
**BUTTE WATER CO.**  
 GENERAL DRAWING OF BUILDING  
 JUNE 1914  
**J-48**  
 Ref. 1106



**Figure 8.** “Butte Water Co., General Drawing of Building, August 11, 1906.” Image courtesy of the City and County of Butte-Silver Bow, Water Utility Division.

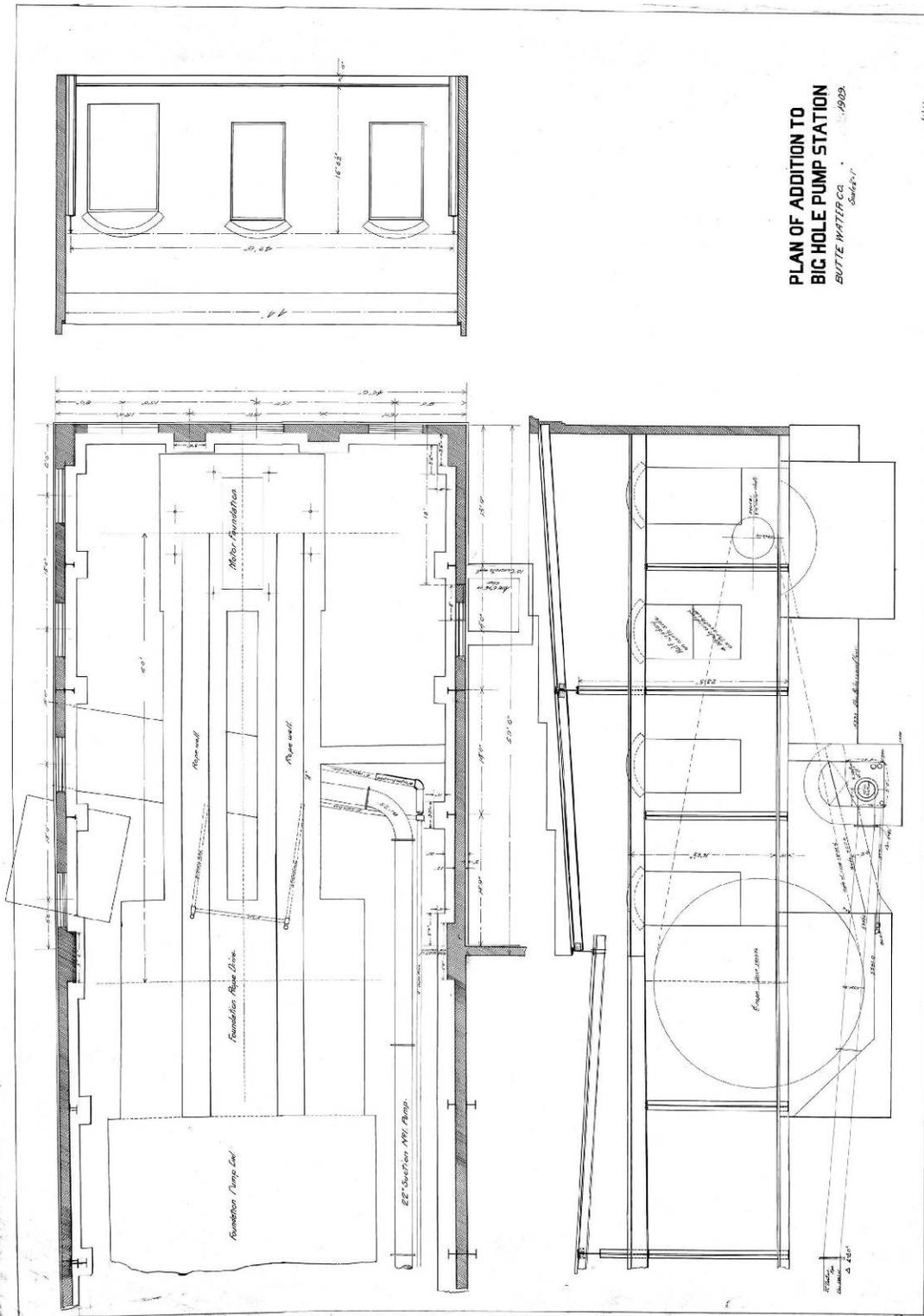


**Figure 9.** Addition to Pump Station, Butte Water Co., September 24, 1906. Image courtesy of the City and County of Butte-Silver Bow, Water Utility Division.



*Butte Water Co.  
 Foundation Plans Big Hole Pump Station.  
 Showing Location of  
 Suction and Discharge  
 Lines.  
 Scale 1/8" = 1'*

**Figure 10.** Foundation Plans for the Big Hole Pump Station, ca. 1917, showing Pump Nos. 1 and 2. Image courtesy of the City and County of Butte-Silver Bow, Water Utility Division.



**Figure 11.** Plan of Addition to Big Hole Pump Station, 1909. Image courtesy of the City and County of Butte-Silver Bow, Water Utility Division.



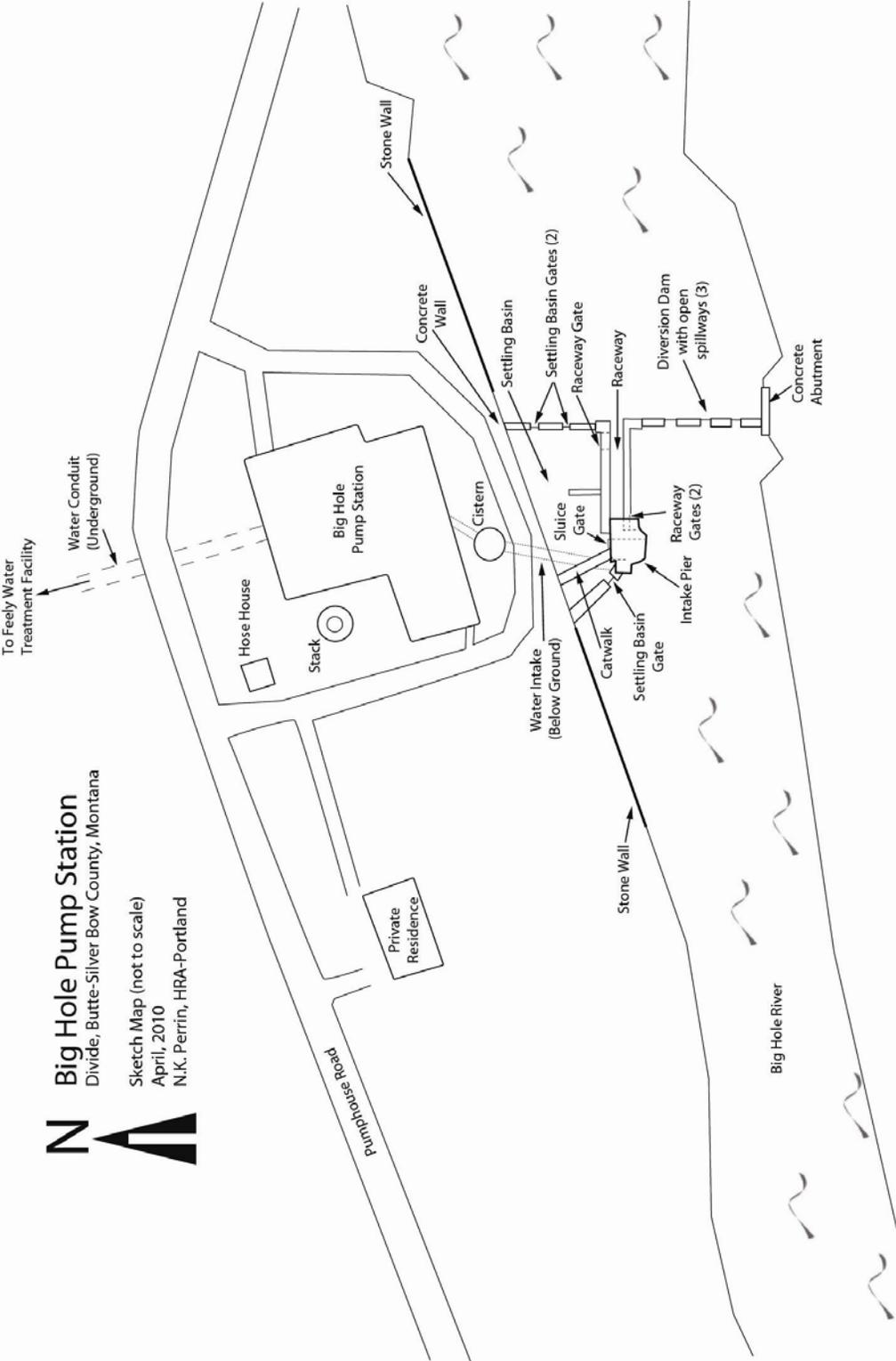
**Figure 12.** Photos of the Big Hole Pump Station building, west elevation, ca. 1925. Images courtesy of the City and County of Butte-Silver Bow, Water Utility Division.



**Figure 13.** Big Hole River Pump Station during Pattengail Dam flood, 1927. Image courtesy of the City and County of Butte-Silver Bow, Water Utility Division.



**Figure 14.** Big Hole River Pump Station during Pattengail Dam flood, 1927. Image courtesy of the City and County of Butte-Silver Bow, Water Utility Division.



**Big Hole Pump Station**  
Divide, Butte-Silver Bow County, Montana  
Sketch Map (not to scale)  
April, 2010  
N.K. Perrin, HRA-Portland

**Figure 15.** Big Hole River Pumping Station complex sketch map. Image courtesy of Historical Research Associates, Inc.

BIG HOLE PUMP STATION, HAER NO. MT-34

TIMELINE OF EVENTS

1899	Construction of Big Hole Pump Station and rock-filled crib dam Pump No. 1 installed.
1900	Construction of Chief Engineer's House (garage, ca. 1920).
1906-1907	Expansion doubles size of pump station building. Pump No. 2 installed. Pump Nos. 1 and 2 electrified.
Dec 1909	Blueprints indicate suction changes at Big Hole Pump Station.
ca. 1910	Construction of water intake and intake pier (HAER No. MT-34-B). Construction of cistern (HAER No. MT-34-C).
1912	Construction of Boarding House.
1916	Construction of Employee House 1.
1916-1917	Pump No. 3 installed.
June 15, 1927	Pattengail Dam bursts flooding Big Hole Pump Station.
ca. 1929	Construction of concrete diversion dam and settling basin (HAER No. MT-34-A).
1930	Pump No. 4 installed.
1937	Construction of Employee Houses 2 and 3.
1953	Pump No. 1 removed.
1954	Pump Nos. 5 and 6 installed.
ca. 1958	Installation of concrete catwalk to access intake pier.
ca. 1960	Pump No. 2 decommissioned.
1980	Big Hole Pumpstation listed in National Register of Historic Places.
1984	Big Hole Pump Station (HAER No. MT-34) receives HAER documentation.

- 1994 Pumps No. 5 and 6 decommissioned.  
Installation of new pumps.  
Construction of Feely Water Treatment Facility (Feely, MT).  
Automation of Big Hole Pump Station.
- 2010 Environmental Assessment of design alternatives for construction of new diversion structure at Big Hole Pump Station Complex indicates removal of extant concrete diversion dam and settling basin is the preferred alternative. A Memorandum of Agreement between the U.S. Army Corps of Engineers, the Montana State Historic Preservation Office, and Butte-Silver Bow requires HAER Level II documentation of the diversion dam and settling basin (HAER No. MT-34-A), water intake (HAER No. MT-34-B) and cistern (HAER No. MT-34-C).
- 2011 Anticipated completion of new diversion structure at Big Hole Pump Station Complex.