ARCHAEOLOGICAL ASSESSMENT REPORT
on the
COLORADO-YULE MARBLE CO. FINISHING MILL SITE

Town of Marble, Gunnison County, Colorado

ALPINE ARCHAEOLOGICAL CONSULTANTS, INC.

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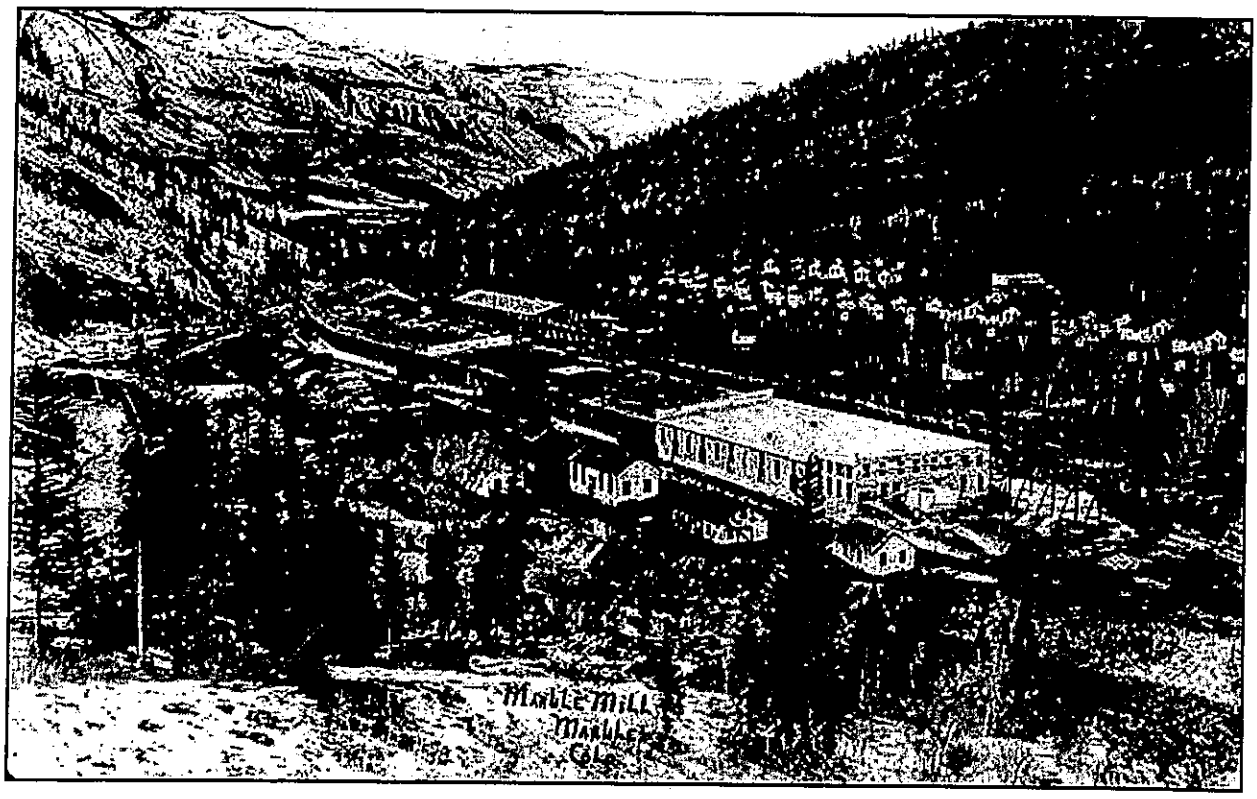

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Town of Marble, Gunnison County, Colorado

by

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ABSTRACT

In September 2002, Alpine Archaeological Consultants, Inc. (Alpine) conducted an archaeological assessment of the Colorado-Yule Marble Co. Mill Site (5GN270) on the south bank of the Crystal River in the Town of Marble, Gunnison County, Colorado. The project was conducted for the Marble Historical Society under the auspices of State Historical Fund Archaeological Assessment Grant No. 2003-AS-005. This project was conducted to facilitate the anticipated interpretive development of the mill site, which was listed on the National Register of Historic Places in 1976.

Mapping, detailed recording, and limited archaeological testing of the mill's remains were conducted over five days of field work. Identifying the architectural, technological, and archaeological features of the site provided a composite of current conditions and remains. Areas of past and present disturbance were identified in anticipation of the future development of visitor's facilities. Comparative historic analysis of these field data allowed for the accurate description of most features and explained their function and their placement within the technological process. Specific interpretive recommendations were provided for each feature following an assessment of its historic context, integrity, and interpretive potential. It was found that, despite the site's overgrown condition, it has a high level of integrity, established historic significance, and a high degree of interpretive potential. An integrated format for interpretation was suggested based on these findings and the present condition of the landscape.

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INTRODUCTION

Between September 16 and October 7, 2002, Alpine Archaeological Consultants, Inc. (Alpine) conducted an archaeological assessment of the Colorado-Yule Marble Co. finishing mill site. The work was conducted under contract to the Marble Historical Society, which had obtained funding for the project through State Historic Fund Archaeological Assessment Grant No. 2003-AS-005. Jonathon C. Horn served as the Principal Investigator. Fieldwork was conducted by Gianfranco Archimede, assisted by Diana Gansemer and John Eckert. Field notes and photographs resulting from the project are on file at Alpine Archaeological Consultants, Inc., Montrose, Colorado. No artifacts were collected during the project.

The Marble Historical Society is interested in developing the Marble Mill Site (5GN270) for public interpretation. The mill site was listed on the National Register of Historic Places in 1976. The information resulting from this assessment will be used by the Marble Historical Society in devising a plan for interpretive development of the site. Such a plan will then be utilized so that important archaeological deposits are not inadvertently impacted, remedial steps can be taken to reduce deterioration of the site or to stabilize important elements, and surviving historical elements can be accurately interpreted. Also, areas of the site that are potentially hazardous to visitors were identified and remedies suggested.

The public benefit to conducting an archaeological assessment of the Marble Mill Site will be primarily in facilitating future interpretive development. The site is one of the few marble processing mills in the country and is purported to have been the largest. Its connection with the Lincoln Memorial and the Tomb of the Unknown Soldier gives it national interest.

Location and Environmental Setting

The project area is in the Town of Marble, Colorado, in the northeast part of Gunnison County, Section 26, T11S, R88W, 6th PM (Figure 1). The parcel being considered for interpretation is owned by the Town of Marble and includes all but the far western end of the Marble Mill Site. It is bound on the north by Park Street, on the south by the Crystal River, on the east by a southward extension of West Third Street, and on the west by a line about 80 feet east of West Seventh Street that extends southward. In all, the parcel under consideration covers approximately 25 acres. Passing east to west through the center of the parcel are the remains of the Colorado-Yule Marble Co. finishing mill (Figure 2).

Geologically, the entire project area is within the Ragged Mountains of the Southern Rocky Mountains physiographic province. Elevations of the Ragged Mountains range between 8,000 to 13,000 feet (2,438 to 3,962 m). The terrain is characterized by high vertical relief, large rocky outcrops, and deeply entrenched drainages, including Yule Creek, Carbondale Creek, Lost Trail Creek, Raspberry Creek, and the Crystal River. Mountains of the area include Chair, Treasure, Whitehouse, Elk, Ragged, and Sheep. The area is geologically very complex. At the lowest elevations that includes the mill site, the geology is comprised of Cretaceous and Jurassic age sedimentary rock of the Dakota, Burro Canyon, Morrison, Wanakah, and Entrada formations. West of the mill site in the lower Crystal River area are Quaternary age landslide deposits. Whitehouse Mountain, situated immediately southeast of the mill site, is characterized by Permian and Pennsylvania age sedimentary rock of the Minturn and Belden formations at its base, followed by Precambrian metamorphic and Pre-Pennsylvanian Paleozoic age sedimentary rock of the Leadville formation. The marble deposits are part of the 1,700-1,800 million-years-old Leadville formation. At the highest elevations are Upper Tertiary intrusive rock less than 20 million years old. North and southwest of Marble, Chair and Elk Mountains are comprised entirely of Middle Tertiary Age intrusive rock between 20-40 million years old (Tweto 1979).

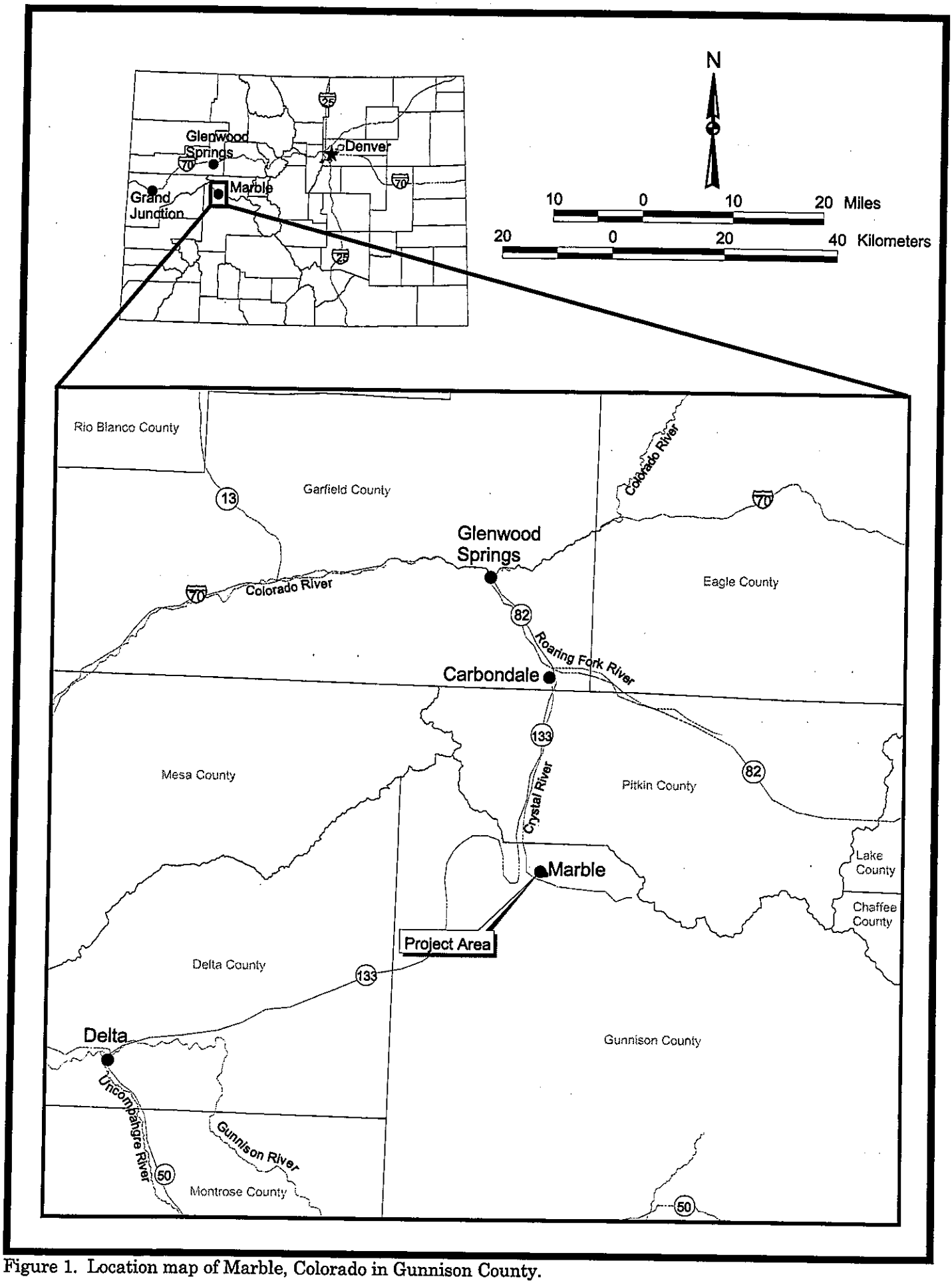

Figure 1. Location map of Marble, Colorado in Gunnison County.

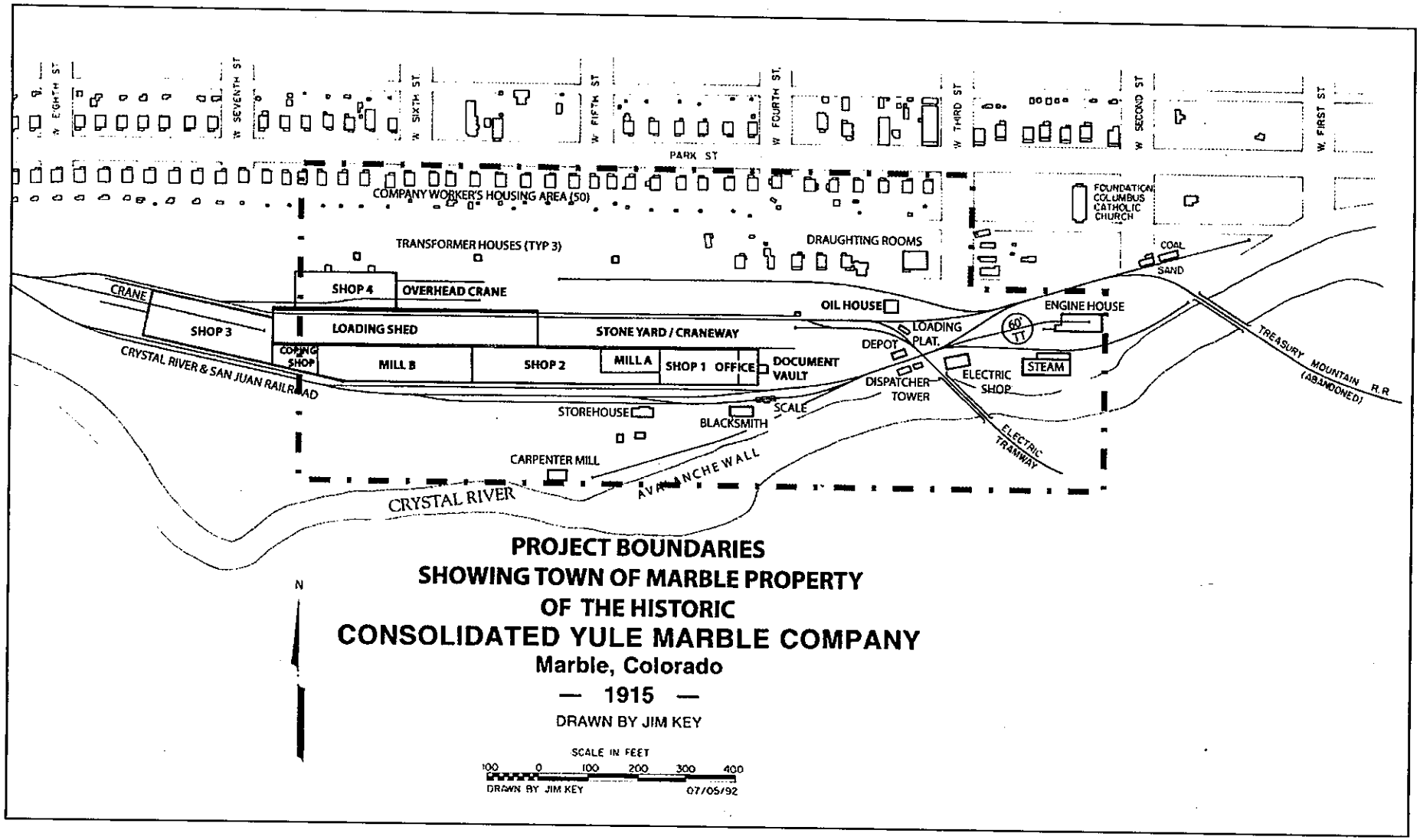

Figure 2. Location map showing project boundaries based on the mill's layout in1915 when it had reached its maximum development. Boundaries represented are the approximate extent of the Town of Marble's property in the mill area *(from McCollum 1993:131).*

The mill site (8,000 feet) is within the Douglas fir-aspen belt, which supports diverse plant species. Observed at the site were Douglas fir, aspen, spruce, ponderosa pine, narrow leaf cottonwood, common juniper, wild rose, dandelion, alder, snowberry, purple aster, clover, Oregon grape, and a variety of grasses. A wide variety of animal species also inhabits the area, including mule deer, elk, black bear, rock squirrel, and a wide variety of raptors and songbirds.

Historical Background

The following historical information is summarized from Vandenbusche and Myers, *Marble, Colorado: City of Stone*, 1970.

In 1873, Sylvester Richardson may have been the first to foresee the industrial potential of the vast deposit of marble along the Crystal River, but nothing would come of his speculation that "in time, the average citizen of Gunnison may yet dwell in a marble hall...at a trifling cost." (*Gunnison Daily Review*, Dec. 13, 1881 as quoted in Vandenbusche and Myers 1970:8). Soon after in 1874, George Yule, later to become the sheriff of Gunnison County, prospected along the creek that would be named for him where the large marble beds were eventually quarried. Although Yule "rediscovered" the marble outcroppings, it was an unknown individual who brought samples of the stone to Denver for analysis and the "Yule" marble made its first appearance outside of the Crystal River Valley.

The mining town of Schofield was established in 1879, about 14 miles southeast of the future site of Marble. Although Schofield disappeared after 1885, its establishment brought the attention of prospectors to the area. They were primarily in search of precious metals, but the immense marble deposits did not go unnoticed. The deposits of the area received attention in 1880 from the local newspapers and, on the national level, in the *Geological Survey of Mineral Resources*. There was still no attempt to quarry the stone, however, probably because of the foreseeable difficulty in its transportation. In 1885, Gunnison County attempted to win a contract to furnish stone from the large deposits at Rock Creek for the Colorado State Capitol that was to be built in Denver. The much larger deposit at Yule Creek prompted the first claims to be staked there by three prospectors: William D. Parry, John McKay, and G. D. Griffith, an experienced marble worker from Wales, England. Their claims would later become the center of operations at Yule Creek. Blasting began under Griffith's direction, but further development could not continue without financial backing.

Financial backing was secured in 1886 through bond purchases by the Colorado Midland Railroad and the White Brest Fuel Co., which allowed for further development of the marble claims along Yule Creek. Samples of Yule marble sent to London to be tested for quality and hardness returned highly favorable results. The Yule marble surpassed even the famed deposits in Carrara, Italy for hardness. As such, Yule marble was noted as the hardest marble on record in 1887. With this news, James J. Hagerman of the Colorado Midland Railroad patented the marble claims along Yule Creek that he had purchased from the original locators the year before.

The Denver and Rio Grande Railroad extended its line to reach Carbondale in 1888, where the Colorado Midland already had its terminus. There was optimism that soon thereafter these lines would be extended the 25 miles along the Crystal River to reach the marble quarries. Although this did not materialize, the Carbondale terminus provided the nearest rail link to the Marble area, which was an essential element for further development. In March 1890, a U.S. post office was established in the town of Marble, a loose community of about 150 people (Bauer et al. 1990:95). Meanwhile, Stephen W. Keene attempted to organize a Denver-based syndicate to buy out and operate the Yule Creek claims on a large scale. He was able to raise enough local interest to convince the Denver and Rio Grande Railroad to survey a route from Carbondale to Marble, but due to the extreme grades, the railroad declined to build. Keene was eventually successful in organizing the Colorado Marble and Mining Co. of Denver with Joseph Creswell as president and Keene as general manager.

John C. Osgood, one of the leading capitalists in Marble associated with the White Brest Fuel Co., brought a block of Yule marble to the 1893 Colombian Exposition held in Chicago, where it was appraised enthusiastically in the international press as the first place winner in its class. This action, together with S. W. Keene's past efforts, was key in publicizing the marble deposits to potential clients and investors, and Osgood filled enough orders for his marble at the exposition alone to last for the next decade. During the same year, the silver market crashed, resulting in the bust of Crystal, the nearest mining town to Marble. In contrast to the dying silver towns, Marble was just at its beginnings. The marble contract for the Colorado State Capitol building being constructed in Denver was awarded to the Yule Creek quarries in 1895. When delivery delays prompted an official visit from state inspectors late in the year, the difficulties in transportation of the marble between the quarries and the railhead at Carbondale were recognized as the main problem. Because of the state's interest in moving the contract along to keep the capitol's construction on schedule, the state inspectors moved to complete a 3½-mile-long road between the quarries on the Yule Creek into Marble. The marble was then transported 30 miles along the Crystal River via wagon road to Carbondale.

Over the next decade, interest in Yule marble and the development of the area continued, but not at the pace that hopeful entrepreneurs like Keene and Osgood would have liked. Gold, silver, and other metal mining was still the hot topic of the time, and transporting the marble efficiently was still an unresolved problem. Two silver/lead/zinc smelters opened in Marble in 1897: the Marble Smelting and Refining Co. and the Hoffman Smelter and Reduction Works. These were set up in response to the local mining activity of the time, but were closed by 1907 after local mines never reached high production. An attempt at building a railroad between Marble and Carbondale was made in 1898 when the Crystal River Railroad Co. was incorporated and construction plans were underway. The intense terrain and weather held construction back considerably, however, and the road remained incomplete. A year later, in 1899, the mining camp of Marble was incorporated as a town with 90 residents. In 1904, three new entrepreneurs came to the scene in Marble: Brothers I. A. and L. M. Strauss, and Thomas C. Hood. They incorporated the Crystal River Marble Co. at the same time Osgood and Hoffman, two leading capitalists in the earlier development of Marble, left the area to pursue other interests.

1905 was the fateful year for Marble when Colonel Channing Meek purchased land and claims in and around Marble in a plan to buy out and reconsolidate the major marble concerns there into a single, large corporation, of which he would be the president. The Colorado-Yule Marble Co. was incorporated on February 14, 1905 with Meek at the helm and a $2.5 million capitalization secured through stocks and bonds, marking the beginning of Marble's greatest boom. Meek realized the necessity of rail transportation to Carbondale and so began construction of the Crystal River and San Juan Railroad (CR&SJ), completed in 1906. Meek went on to construct the world's largest marble finishing mill at Marble, and moved Colorado from its position as the world's tenth largest marble producer in 1905 to its third. He spent $3 million in the total development of the quarries, mill, and transportation systems in order to accomplish this, but simultaneously left the company in a precarious financial position that would eventually be its undoing.

The completion of the CR&SJ railroad set the stage for the rapid development of other necessary projects to get the stone moving at a profitable pace. The town of Marble had grown to about 250 people, and a New York syndicate emerged to finance a $3 million stock venture for continued development of Meek's Colorado-Yule. A new power plant and a $75,000 mill were completed in August 1907. After all of this, however, the company had yet to secure a major contract. Instead, the mill put out thousands of small samples for use as advertisement. This paid off in late October with the company's first large contract for the Cuyahoga County Courthouse in Cleveland, Ohio, valued at $500,000. This and $100,000 of small contracts put the company into full operation and necessitated the expansion of the recently completed mill from 228 feet to 446 feet in

length. Worker population exploded and, by the end of the year, Marble could not house the more than 700 people who had arrived to work.

It was not long before others took notice of the Yule marble going into the Cuyahoga Courthouse, and, in 1908, the Colorado-Yule secured another large contract for the Mahoning County Courthouse in Youngstown, Ohio. This presented the need to expand their mill yet again to accommodate both large projects. In March 1908, C. Ramsey of Grand Junction was contracted to build an addition to the present mill to be completed by August. The total length of the expanded mill was 709 feet. In the continuing effort to facilitate handling of stone between the quarries and the mill, a 110-hp steam tractor was put into service to replace the nine horse-drawn wagons that were in use. The tractor pulled four cars, each with a capacity of 20 tons. Colonel Meek donated an Episcopalian church and small library to Marble, and the company constructed 50 four-room houses to help alleviate the housing shortage for their expanding workforce. These were rented at $4 a month. The company also provided electricity to the town and installed a telephone system. The workforce increased dramatically from 300 to 900 men by the close of the year, and a report by the Denver Real Estate Exchange published in local papers confirmed that the Colorado-Yule had invested $1.5 million in physical plant improvements to date. The company made international news by quarrying the largest block of marble in the world up to that time. It was 28 feet long and weighed 55 tons. Because it was too heavy for their 12½-ton crane to lift at the mill, it was cut down into four columns used in the Cuyahoga Courthouse.

As prospects looked up and Marble boomed, 500 mill workers went on strike in 1909 through the International Association of Marble Workers. The American Federation of Labor affiliated with the strikers and refused to handle Colorado-Yule's marble products across the nation. The strike lasted three months and resulted unfavorably for the predominantly Italian workers who returned to work, abandoned by their local union chapter, while also taking a wage cut across the board. Following the strike, the company continued to break its own production records while securing more large projects during 1911-1912, such as the Denver Post Office and the Montana State Capitol. The mill was again expanded an additional 200 feet, and a 4-mile-long electric tramway between the quarries and the mill was completed. The official census of Marble reported 782 people, but more realistic estimates placed the number at 2,000, for, after all, between 500 and 700 people were employed in marble operations alone.

An avalanche slammed the Colorado-Yule mill in the early morning of March 20, 1912 considerably damaging portions of the mill, but without casualty to workers. The rebuilding process began the very next day, and the mill was back on line by the beginning of summer. On August 12, Channing Meek and four other workers were involved in a severe accident on the recently completed electric tramway between the mill and the quarry. While transporting four marble blocks and the men, the tram lost its brakes at the beginning of a steep descent. All men leaped from the car and were knocked unconscious, but without apparent injury. Soon thereafter, however, it was obvious that Meek sustained some severe internal injuries. He died two days later on August 14. A month later, another runaway ended in similar tragedy with the death of four workers and an 8-year-old girl. Mortimer Mathews took over as the company's interim president following Meek's unfortunate death.

Early in 1913, the company's new president traveled to New York to secure a 20-year, $1.8 million loan for expansion and improvements to the marble works. When added to its original mortgage of $477,200 taken on in 1905, the company was seriously overextended. Good news came in April, however, when the company secured a $1 million contract for 1,200,000 square feet of marble slab to finish the interior of the Equitable Building in New York City. This was the largest contract the marble industry had ever known up to that time. In October 1913, Mathews was replaced by J. F. Manning, who had been with the company since 1906 working as its East Coast representative. Manning's personal connections and knowledge of the Washington political scene

were instrumental in convincing the Lincoln Memorial Commission to send Dr. George P. Merrill to the Colorado-Yule marble quarries for a close inspection of their stone. Henry Bacon, the Memorial designer and architect, called for the whitest, soundest marble available to be used, and Merrill was certain after his visit that the Colorado-Yule marble was unexcelled in meeting Bacon's requirements. In fact, Bacon considered just three of the five marbles submitted for consideration to be worthy, of which the Colorado-Yule marble was "immeasurably superior" to the others (McGee 1999:20). On September 26, 1913, after reviewing Dr. Merrill's report, the Memorial Commission voted to award the contract to the Colorado-Yule Marble Co. Arrangements were finalized over the next several months, and the company was officially awarded the contract on March 10, 1914. It called for 36 columns, each 46 feet high and 7 feet in diameter, valued at $15,000 each. The columns consisted of 12 large marble drums each placed one on top of the other that weighed between 15 and 35 tons each. The contract was stringent in its requirement for the highest-quality stone to be free of cracks, seams, and inclusions, which resulted in the final shipment of only about 10 percent of the stone quarried for the project. Manning estimated that 80,000 cubic feet of marble would have to be quarried every month to ship between 12,000-15,000 cubic feet of acceptable finished stock. In order to fulfill the Lincoln Memorial contract, it was necessary to expand Shop 4 at the mill for the turning and fluting of the large column drums. Six hundred freight cars were necessary to transport the marble to Washington in 40 trips. The contract was completed on June 8, 1916, several months ahead of schedule. Throughout the contract period, there was no apparent reason to believe that the company was in financial trouble, but with up to 1,000 people working on the project at once, the company's labor expenditure alone was as high as $95,000 per month.

Although two of the largest projects ever handled came between 1913 and 1917, and all outward appearances indicated that the company and the town were booming, the First World War was the harbinger of the company's imminent demise. The majority of the company's skilled laborers were Italian immigrants who were recalled back to their homeland to join in the fight against Austria and Germany. This dealt a hard blow to Marble and to the company and also created a good deal of animosity toward the Italian community that had developed there. The U.S. entrance to the war also affected the town, as marble was declared a nonessential industry and demand for the stone virtually ceased for the duration of the war. At this point, the company owed $3.5 million, mostly in bonds, and could not pay on them despite the recent boom. Shareholders on the East Coast filed suit in Denver, and the company was put into receivership in July 1916. Operations slowed even more at the mill and the quarries and, by September, only 200 men were on the payroll. The company was ordered not to accept new contracts, but was to finish those that were already in place. To further the company's dismal position, both a fire and a flood ripped through the struggling town in 1916, causing considerable destruction from which it would never fully recover. After the flood washed out portions of the railroad tracks, and because the marble business was already so slow, the CR&SJ petitioned the State Utility Commission to cease train service to Marble. With these events, there was a large exodus from the dying community of Marble over the next year. A meeting of bondholders in December 1916, however, resulted in the decision to keep operations running with just a skeleton crew in hope that another large contract would come through.

This decision was not fruitful, however, for one month later, in January 1918, the Colorado-Yule Marble Co. was put up for auction by the Gunnison County Sheriff for nonpayment of $50,000 of property taxes. M. S. Radetsky, a scrapper out of Denver, bid $25,000 for the property and equipment, worth over $2.5 million. Realizing this devastating position, Manning immediately worked with the Colorado National Bank to outbid Radetsky, and a legal battle ensued that lasted until April, when the court granted ownership to Manning. Although the company continued to exist under Manning, no recovery came. It was little more than a year later when, in July 1919, the Banker's Trust Company of New York foreclosed on the Colorado-Yule Marble Co. in order to recover some of the $13 million in stocks and bonds that had been sold by the company. The property and equipment went up for sale again at sheriff's auction in September 1919. The property was divided

into three parts to be auctioned individually in order to recoup the maximum amount possible. Parcel A consisted of the mill and the Crystal River and San Juan Railroad; Parcel B was the electric tram and the quarries; and Parcel C was the power plant, additional undeveloped marble claims, water rights, worker's housing, and auxiliary buildings. Although it was hoped that one group would purchase all three parcels with the intention of holding them all together for future reopening, this did not happen. Parcel A was purchased for $70,000 by the Colorado National Bank, Parcel B (quarries and tram) was purchased by East Coast stockholders for $283,000, and Parcel C was finally purchased by two individuals associated with Parcels A and B. The purchases were not finalized immediately pending a nine-month right-of-redemption granted to the Colorado-Yule company under Colorado law. Unfortunately, the company was still not able to recover, and the sales were finalized during the summer of 1920. After paying Gunnison County $57,456.11 in back taxes, the three controlling groups laid hopeful plans to begin operations again.

The new owners of the mill and railroad were the first to incorporate in August 1921 as the Yule Marble Co. of Colorado, followed by the owners of the quarries who incorporated in May 1922 as the Carrara Yule Co. By this time, the Town of Marble was virtually a ghost town. The local newspaper had closed in 1917, and the post office officially closed in 1919 for five days. The promise of a fresh-start provided by the agreement of the two new companies to work together for mutual benefit brought the town back to life in 1922, however, when the population swelled to 400 from just 50 the year before. The mill, railroad, and the quarries were brought into working condition and orders were taken. The demand for marble continued to increase, and, in 1924, Marble's population was near 500, with over 200 men employed in the marble business under a $25,000 monthly payroll. The two companies realized that it would be much to their benefit if they were to merge their operations, and, in July 1924, they did so as the Consolidated Yule Marble Co.

As prospects improved, however, tragedy struck on April 22, 1925, when a fire started in Shop No. 3 at the west end of the mill and worked its way east through much of the adjacent Mill B. Forty barrels of oil in Mill B added to the total destruction of 900 feet of the mill, more than half of its overall length. While damages were assessed at over half of a million dollars, fire insurance covered only $195,000. The company announced that the mill and all operations would close and be at least temporarily suspended on August 1, 1925. After the fire insurance money was paid, the Consolidated Yule Marble Co. resumed limited operations, but could not recover to its previous state. In December 1927, Jacob Smith of Buffalo, New York, purchased the company's property and equipment for $1 million to be operated as the Yule-Colorado Marble Co. Business continued to drag along for Smith, as it had for the Consolidated Co. before him. In less than a year, he sold half of his marble property to the Vermont Marble Co. of Proctor, Vermont, and a year later, in 1929, he sold the other half to them, while remaining on as the superintendent of the entire operation at Marble.

With the Vermont Marble Co. on the scene, great optimism was again restored to the recovery of the marble industry, but again it was taken away by ill fate. The stock market crash of 1929 signaled the beginning of the final end for the Yule marble industry, ushering in a depression over the next 10 years from which it could not fully recover. Although the quarries and mill remained in operation over the next decade and a number of large contracts were secured, production was extremely slow and the payroll was kept to the bare minimum. In 1930, however, the company's most prestigious project was awarded for the Tomb of the Unknown Soldier, which was to be erected in Washington. At the time, only 96 men were employed at the quarry and the mill. Yule marble was chosen for this project because it was the only quarry capable of cutting a single block of marble large enough for the design. It took 75 men working continuously for over a year to cut the block out of the quarry. The 124-ton block was cut down to its proper dimensions by a wire saw installed at the quarry just for this purpose so that the huge block could be transported. The finished block weighed 56 tons and was lifted 125 feet from the quarry floor to the surface by a special derrick brought in from Vermont. The 4-mile trek on the electric tramway to the mill from the quarry was made by using two locomotives and took four days. The block was transferred to a

standard flatcar on the main line for its trip across the country to Vermont, where it was finished and then shipped to Arlington Cemetery, where it was installed on November 11, 1932.

The Town of Marble barely hung on through the next few years of the Depression, when not more than 50 men were employed for an average wage of 40 cents and hour. In 1935, when the population had dropped to about 150, Marble was given a boost by a $107,000 contract for the Federal Office Building in Denver. The mill operated with 100 men employed for this time, and it appeared that business would continue on an upswing. The next big contracts did not arrive until 1937, though, for the State Office Building in Denver and for the Gunnison Post Office. As these contracts were coming to their completion in 1939, it was obvious that the end was imminent, as the cost of production and transportation increased and competition for a diminishing market paved the way for the company's final closure in December 1941. On October 25, 1941, the last block of marble came down from the quarries, and on November 15 the mill was shut down for good.

The machinery from the quarry, mill, and the railroad was purchased by the Morse Brothers Machinery Co. of Denver, who immediately began to scrap it. In 1943, the Crystal River and San Juan Railroad, which had served as the vital link between Marble and Carbondale, was torn up, and the Marble post office was closed on October 31, 1942. It was not until 1953 that activity resumed at the mill site when the Basic Chemical Co. was organized by a limestone producer from Missouri to crush the estimated 80,000 tons of waste marble lying around the mill site to be used for various industrial purposes, such as in roofing material, toothpaste, and chicken feed. The company also purchased mineral rights to 1,600 acres of marble lands in the area in anticipation of establishing a huge new industry of ground Yule marble, which was 99 percent pure calcium carbonate. The operation was short lived, however and, in 1954, the company ceased operations due to the high cost of transportation from the remote area of Marble to the limestone markets.

Previous Work

The Marble Mill Site was listed on the National Register of Historic Places in 1976 (U.S. Dept. of Interior, National Park Service 1976). Local interest in the site through the Marble Historic Society has been largely responsible for previous work carried out at the site, including the reuse of areas for recreational purposes such as a ball court, outdoor movie theatre, and an ice rink that is located directly on the mill site. A large placard was installed at the east end of the mill to introduce the site to visitors, and two smaller signs provide some historic details and photographs. A public toilet just west of the Oil House was maintained for a number of years, but has been sealed off. That structure is being reused as a storage shed for ice rink equipment, ice skates, and movie projection equipment. A gable roof was installed over the Document Storage Vault in order to protect it from further deterioration. To date, no archaeological research has been conducted at the site.

Project Objectives

The archaeological assessment was conducted to bring together historic research and field data to provide specific information about identified features such as their current condition, spatial arrangement, and historic function and context. The assessment was needed in order to facilitate future interpretive development. The primary goal of the assessment was to prepare a base map and to conduct a detailed recording of the mill site on Town of Marble property. The recording described and documented the architectural, technological, and archaeological elements of the site. In addition, areas of the site were identified where disturbances are ongoing, where potential for interpretation exists, and where the site has been disturbed and no longer retains integrity. An important element of this assessment was the correlation of historical information about machinery and technology to the physical evidence remaining at the site. The historical information utilized for this correlation was already gathered by Oscar McCollum in his two books, *Marble: A Town Built on Dreams*, volumes one and two. The information resulting from the assessment will be used by the

Marble Historical Society in devising a plan for interpretive development of the site. Such a plan will then be utilized so that important archaeological deposits are not inadvertently impacted, remedial steps can be taken to reduce deterioration of the site or to stabilize important elements of it, and surviving historical elements can be accurately interpreted. Also, areas of the site that are potentially hazardous to visitors were identified and remedies suggested.

Field Methods

Standard site recordation procedures were carried out on the appropriate Colorado Cultural Resource Survey forms. Site maps were prepared using a Trimble ProXR Global Positioning System (GPS) in conjunction with hand measurements and scaled detail maps of key features. Maps depicted site boundaries, structures and structural features, technological features, vegetation areas, and linear features such as foot trails. Overview photographs were taken of each mill component area along with detailed photographs of identified structures, features, and artifacts. Limited test excavation was used to remove small vegetation and soil covering features in order to determine their shape, structure, and dimensions. An attempt was made to record the site in its entirety. No artifacts were collected in the course of the project. All notes and maps resulting from fieldwork are on file at Alpine Archaeological Consultants, Inc., Montrose, Colorado.

Historical research was conducted before and after the field phase was complete and consisted of secondary source material based on primary sources. Two interviews were conducted with Marble Mayor Protempore Wayne Brown, and historian/author Oscar McCollum.

Overview of the Site Layout and Current Conditions

The Marble Mill Site is in the southern portion of the Town of Marble on the north bank of the Crystal River south of Park Street and west of Third Street. Park Street is the main street of Marble. It runs east to west and extends westward about 10 miles to Highway 133. The Marble firehouse is at the southwest corner of Park and Third Streets, and a public parking area for mill site visitation is just south of the firehouse on Third Street (Figure 3). West of the parking area is a small public park consisting of a cleared area with several picnic tables and benches made of scrap marble blocks and slabs. The west end of the park serves as an outdoor movie theater during the summer months. Just north of the park, behind the firehouse, is a basketball court. The Vermont Marble Company currently uses the area between the Crystal River and the park as a loading area and truck yard for its marble quarrying operations. The fully intact historic Oil House is included in the area occupied by the Vermont Marble Company. Immediately west of the Oil House is a recent pit toilet structure that is currently used for storage. A line of marble blocks marks the western edge of the marble yard operation and the eastern edge of the historic mill site. The eastern portion of the mill site property occupied by the Vermont Marble Company and the park retains little historic integrity due to the large amount of disturbance that has taken place there over the years. The most recent disturbance appears to be a wide bulldozed path south from the outdoor theater area into the Stone Yard/Craneway portion of the mill complex. Additional historic mill site features are present on the east side of Third Street. These are the marble foundation of a steam plant and the remains of a locomotive turntable.

The mill comprises the remains of four interconnected shop buildings, two mills, and a stone yard/craneway that together measured approximately 1,450 by 220 feet. These were part of a large industrial mill site complex that measured approximately 2,000 by 500 feet, oriented east to west, that included ancillary and railroad structures. Railroad tracks passed along the south side of the mill structure from the west and had spurs that entered the west end of the mill. Tramline tracks from the quarry entered the complex from the east. Three of the shops (Shops 1, 2, and 4), both of the mills (Mills A and B), and the Stone Yard/Craneway fall entirely within the parcel owned by the

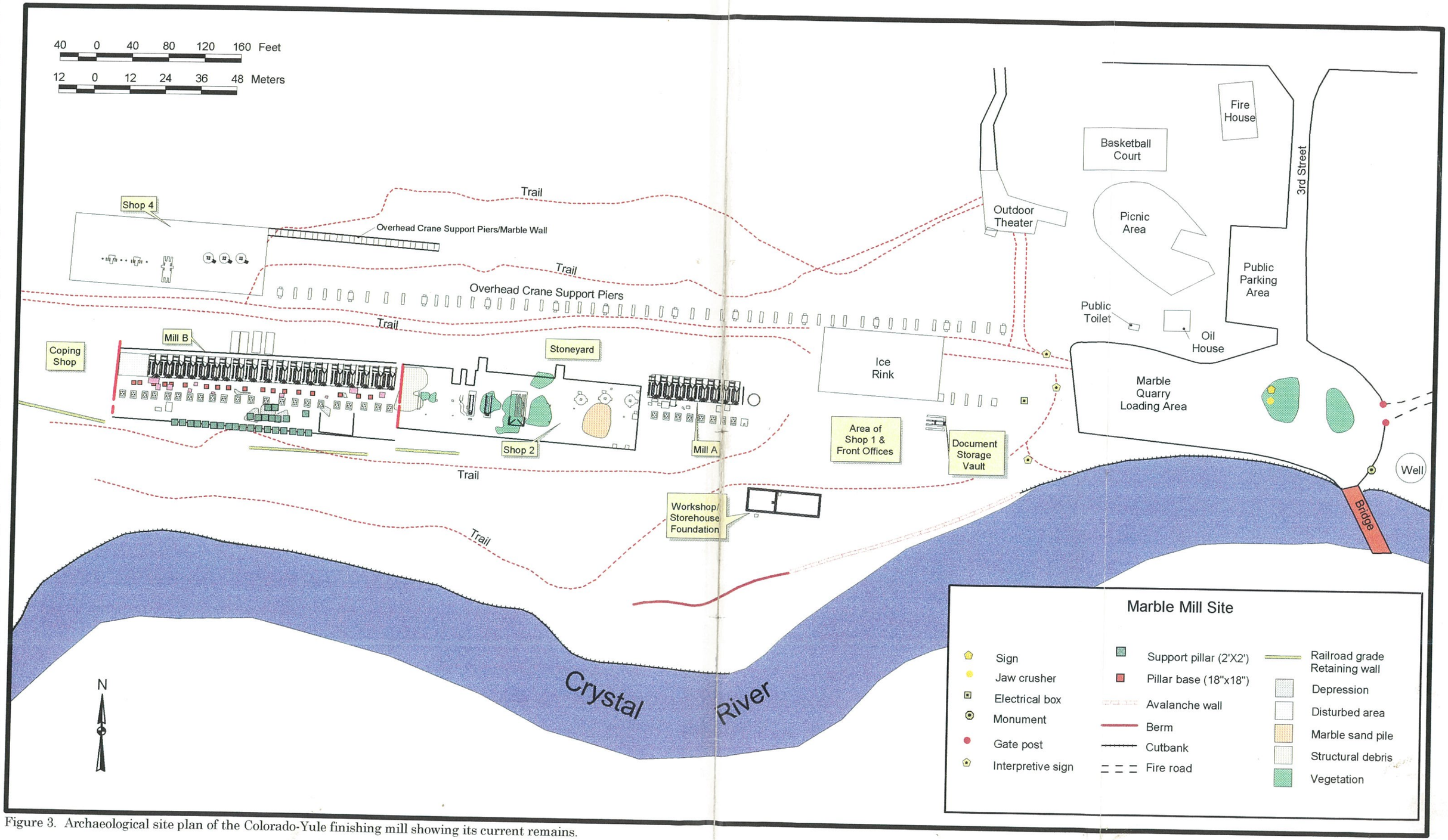

Figure 3. Archaeological site plan of the Colorado-Yule finishing mill showing its current remains.

Town of Marble (Figure 2). Shop 3 is mostly west of the town's parcel. Shop 1, measuring approximately 200 by 75 feet, was the easternmost of the shops and had the Front Offices and Document Storage Vault attached to its east end. Shop 2, measuring approximately 228 by 75 feet, abuts the west end of Shop 1, and included Mill A (124 by 50 feet) which fits into its northeast corner. Mill B measures approximately 314 by 75 feet and abuts the west end of Shop 2. It is truncated on its west end where the entire mill complex angled northwestward slightly. Attached to the west end of Mill B was the Coping Shop (generally 90 by 75 feet) that filled an irregularly shaped space between Mill B and Shop 3. Open space north of Shops 1 and 2 and Mills A and B was filled by the Stone Yard/Craneway. The Stone Yard/Craneway was on the east end of the area and measured 1,300 by 70 feet. A large 800-foot-long roof covered the western portion of the Stone Yard/Craneway after 1915. Shop 4 was north of the Stone Yard's west end. Shop 4 measured approximately 204 by 76 feet, oriented east to west, including a covered craneway added in 1914 to its east end. Three transformer houses were placed at regular intervals north of the mill complex to distribute electricity to the mill. A series of structures identified as draughting [drafting] rooms were present in and just west of the present picnic area. Most of these have been obliterated, but archaeological remains of the westernmost of these may still exist. Farther north, all along the south side of Park Street, are the remains of worker's houses and associated yards and outbuildings. The westernmost of these were obliterated with construction of the firehouse, but archaeological evidence exists of those farther west. The area south of the mill complex was historically occupied by several ancillary industrial structures, including a blacksmith shop, storehouses, and a carpenter mill. The foundation of a workshop or storehouse is still evident. An irregular wall of marble blocks, built to protect the mill from avalanches, extends above the north bank of the Crystal River for the entire length of the mill complex.

Structural and Land Use History of the Colorado-Yule Finishing Mill, Archaeological Assessment, and Interpretive Suggestions

Overview

The focus of the archaeological assessment was on the mill complex itself within Town of Marble property limits, with some effort expended on documenting ancillary structures to the south. The following section is organized to integrate historical research, archaeological data gathered in the field, and interpretive suggestions of the major mill components simultaneously. The intention is to provide a complete picture of the interpretive potential of each component up front, in a comparative and illustrative fashion of what existed and what remains. The major mill components are described in the chronological order in which they were constructed. This allows the complex to be best understood in terms of its growth and use history. Consequently, Shop 2 and Mill B will be discussed first, followed by the Stone Yard/Overhead Traveling Craneway, Coping Shop, Shop 3, early ancillary structures, Shop 1, Mill A, Front Offices, the Document Storage Vault, Shop 4, later ancillary structures, the Avalanche Wall, and the Stone Yard Roof. Figure 4 is a color-coded site development map that provides an overall visual reference of the mill's development chronology. Further consideration is given to historic events that altered the mill and its landscape, such as the avalanche of 1912, the fire of 1925, and the mill's closing and scrapping in 1941. The project Summary and Overall Interpretive Suggestions section will present how an overall interpretive scheme can tie all of the physical mill components together into an effective presentation.

Technological Processes at the Colorado-Yule Finishing Mill

In the way of introduction, it is important to understand the basic historic processes and technologies employed at the mill before looking at the specific history and remains. Two basic categories of products were prepared at the mill: 1) structural and architectural stone for use in buildings and large-scale monuments, and 2) small-scale monuments. Structural stone consisted of stone slabs from 1 to 3 inches thick of various dimensions used for facing and floors, and of structural size marble blocks. Architectural stone was for use in large-scale applications, such as

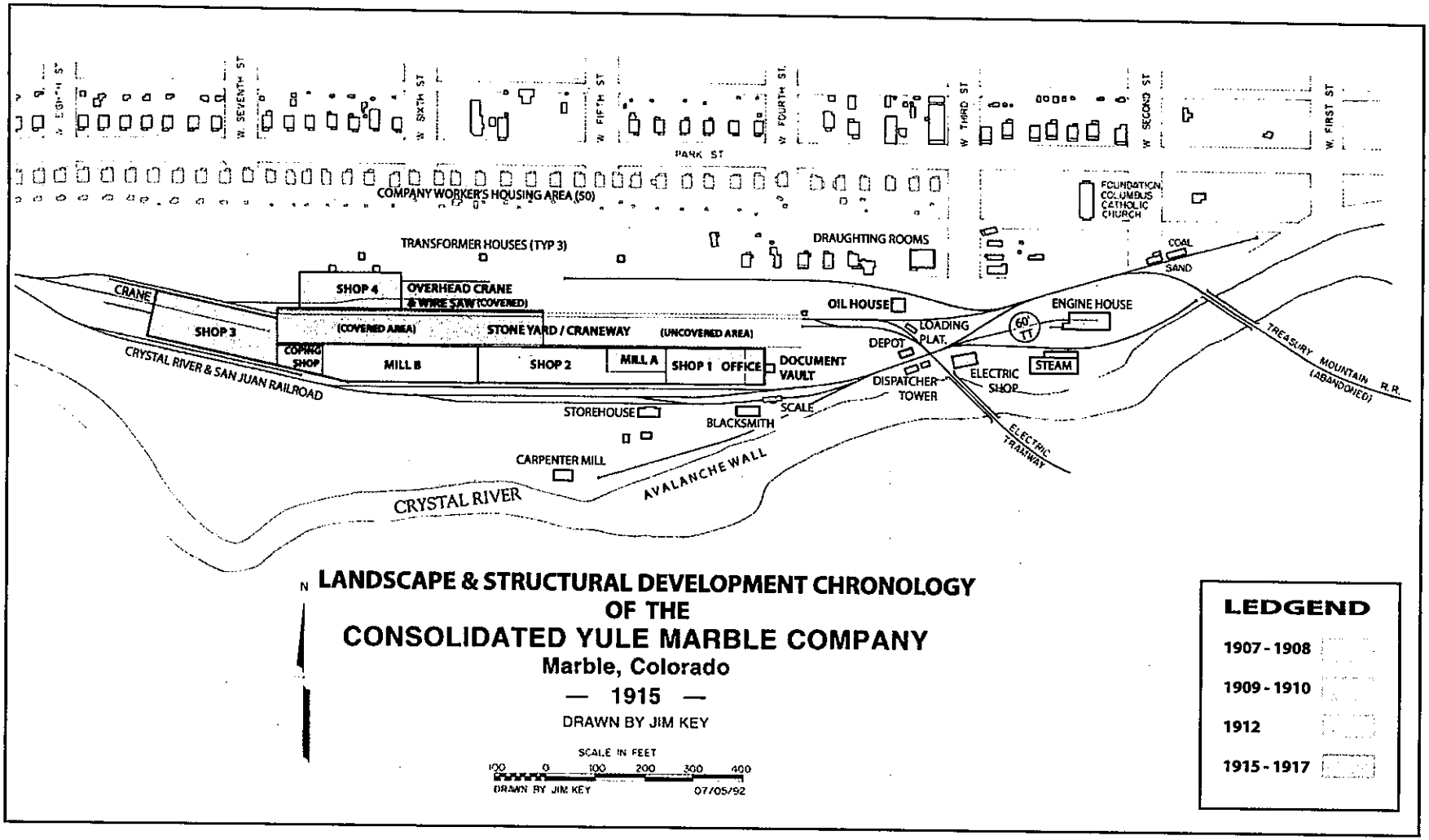

Figure 4. Site plan showing the chronological development of the Colorado-Yule finishing mill *(adapted from McCollum 1993:131).*

columns, staircases, entablatures, and so on. Architectural stone was cut, shaped, and polished at the mill prior to shipping. Small-scale monuments were usually one-piece products such as tombstones. Three processes were necessary to "finish" the marble at the mill. After quarrying and transporting a block to the mill, it was *cut*, *shaped*, and, finally, *polished*.

Cutting. There were three parts to the cutting process. The first involved a rough sizing of the block down to a manageable and appropriate scale for the project at hand. This was accomplished by the use of a large wire saw located at the east end of the Stone Yard. Another wire saw was installed in 1914 on the east end of Shop 4 for the Lincoln Memorial project. From here, the sized blocks were placed onto flatcars and wheeled into the appropriate saw bay for the second part of the sawing process that took place in either Mill A or Mill B. Here, gang saws were used to slice the block into slabs. The slabs were then cut down to dimensional sizes in Shops 2, 3, and 4 with a diamond or carborundum blade saw.

Shaping. After sawing, the stone was moved again by overhead crane to one of the four shops where it was shaped. What shop the work piece went to depended on its scale, shape, and size. Shaping consisted of one or several of the following processes: turning, planing, facing, engraving, and fluting. Turning was done with huge lathes capable of handling stock of up to 26 feet long and 7 feet in diameter. These were used to produce columns or column drums. Planers were used on broad, flat pieces such as slabs, to put a perfectly flat surface on them and to remove the rough cutting patterns left by the saws. Facing consisted of smoothing the outward surface (the "face") of smaller work pieces such as a blocks. Engraving or carring tools etched patterns and designs into the stone for decorative effect. The fluting of columns was accomplished through the use of specialized fluting machines that ran small circular saw blades along the length of a work piece at the appropriate depth and angle. Even with all of these large shaping tools at work, a substantial amount of shaping work was done with pneumatic chisels and grinders in the hands of hundreds of skilled workers. Large-scale monumental shaping was done in Shops 3 and 4, while smaller-scale architectural shaping was done primarily in Shop 2.

Polishing. The work pieces were polished in the final process before they were crated for shipment. Polishing took place in numerous areas throughout the mill. All four shops housed large, circular rubbing machines that were used for flat work pieces. Shops 1 and 2 were also dedicated to hand polishing, where hundreds of workers used stationary and hand-held pneumatic polishing machines to rub the surface of the marble to a glassy finish.

Initial Landscape and Technological Development

The Colorado-Yule Marble Co. was incorporated in February 1905 with Colonel Channing F. Meek named as its president and superintendent. He began the development work by securing key marble claims along Yule Creek and building a 7-mile-long railroad between the Marble and Placita, called the Crystal River and San Juan (CR&SJ). This railroad provided the vital link necessary to bring the marble via the Crystal River Railroad's (CRRR) terminus at Placida the 30 miles to the national shipping outlet provided by the Durango and Rio Grande at Carbondale. The CRSJ was completed in November 1906. Meanwhile, work on the finishing mill began during 1906 with an extensive pipeline from the Crystal River to the mill's power plant, where two waterwheels were used to generate electrical current. By early February 1907, pipeline construction was underway, contracts for the mill's two DeRemer waterwheels and the mill's General Electric power plant were signed, and the concrete foundations of the mill were being poured (Colorado-Yule Marble Co. correspondence, Meek to C.A. Bates, February 1907, reprinted in McCollum 1993).

Shop 2 and Mill B, 1907

History

The single-story, heavy timber construction mill was completed in August 1907, measuring 228 by 50 to 75 feet. This original mill, later known as Shop 2, was a shaping and finishing shop that contained four rubbing machines, one large double-platten, 14-foot-diameter diamond saw, one combination carborundum and diamond blade stone saw, nine polishing machines, one planer, one lathe, and one sizing and facing machine (Vandenbusche and Myers 1970:52; *Marble Booster*, March 14, 1914). Just six months later, beginning in March 1908, the mill was expanded westward shortly after the company secured its first big contract valued at $500,000 for the Cuyahoga County Courthouse in Cleveland, Ohio. This and $100,000 of smaller contracts put the company into full operation and necessitated the expansion of the recently completed mill from 228 feet to 446 feet (Figure 5). This part of the mill was later known as Mill B, which originally housed 30 gang stone saws and an air compressor. Eight of these saws were moved to Mill A in 1910, leaving Mill B with 22. The cost of the expansion was estimated at $200,000 for the building alone.

Archaeological Assessment of Shop 2

The overall outside dimensions of the shop are 268 by 75 feet. Shop 2's northern internal boundary is defined by the hard edge of the concrete floor. The building's 4½-foot-wide poured concrete north foundation wall is evident on the west end of the shop beginning at Firewall No.1. The southern boundary is defined by the continuous dry stone foundation wall that runs the length of the shop. The hard edge of the concrete floor corresponds with this foundation. The western boundary is Firewall No. 1, and the eastern boundary is the hard edge of the concrete floor defining the 1-foot gap between Shop 2 and Mill A. The current remnants of Shop 2 are substantial, although no standing structure remains. Figure 6 is a detailed archaeological plan of this shop. It is the only one of the four shops that has its concrete slab floor still fully intact, and its boundaries are the most clearly defined (Figure 7). The concrete slab floor is probably not original, as seen in historic photos of the shop where portions of the floor were obviously wood plank. Also, the current floor shows no evidence of the internal tram track that ran the length of the shop.

Footprints of three of the four rubbing machines are evident at the east end of the shop. The fourth is most likely underneath a marble sand pile adjacent to the others (Figure 6: features S2.1, S2.3, S2.5). This sand pile is probably a remnant of the marble grinding operation the Basic Chemical Co. was running in the early 1950s. Several historic photographs of these machines provide a great deal of information about their placement and how they operated (Figure 8; see Appendix B for an historic explanation of the machine's operation). Half of feature S2.3 was excavated to discover the shape of its smooth concrete base, which is pitched downward from both the center concrete support pier and from the outer edges toward the center of the circular base (Figure 9). The purpose of the pitch was to channel the rubbing compound slurry toward a drain on the east side of the machine. The slurry was then pumped into the two rectangular sumps adjacent to the machines (Figure 9) from where it was recirculated. Two rectangular footings with four mounting bolts each are on the east and west sides in line with each other. It is likely that these were the mounts for the horizontal wood beam that spanned the diameter machine as seen in Figure 8.

West of the rubbing machines, three large machine bases were discovered, obscured by dense patches of vegetation growing among them (Figure 6: features S2.8, S2.9, S2.13 and Figure 10). Some subsurface exploration revealed the shape and dimensions of the bases as shown on Figure 6. Several historic photos taken in 1909 are helpful in determining which machines corresponded with

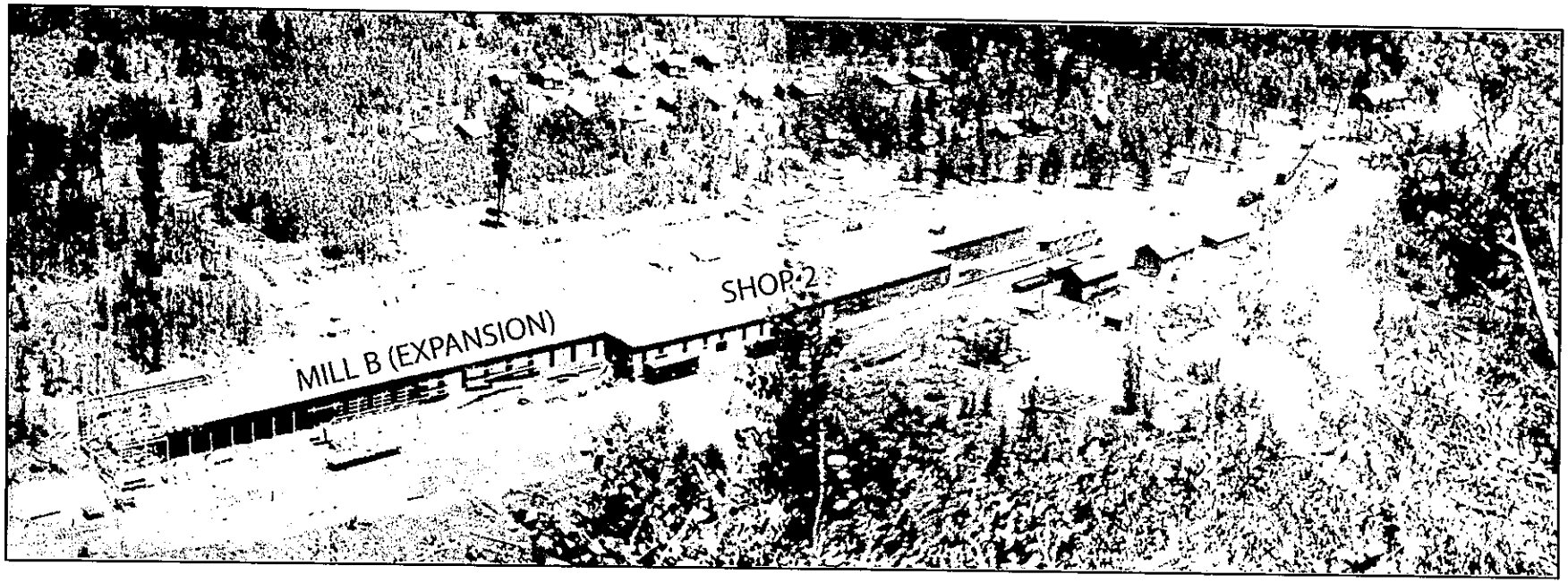

Figure 5. The mill's first expansion in 1908 doubled its size from 228 feet to 446 feet. This historic photo shows Shop 2 and Mill B, looking northeast *(Denver Public Library, Western History Collection, from McCollum 1993:20-21).*

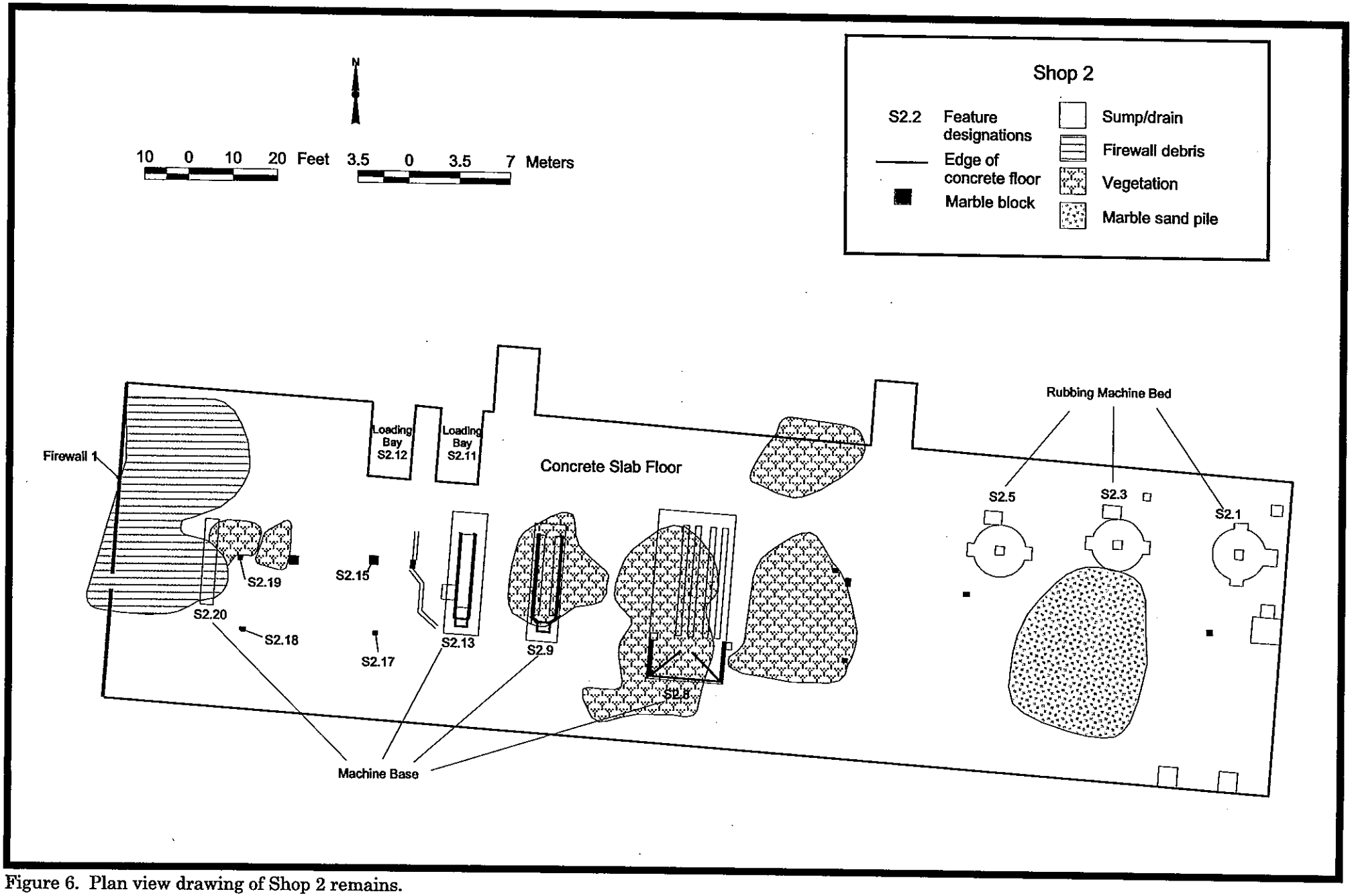

Figure 6. Plan view drawing of Shop 2 remains.

Figure 7. Overview of Shop 2, looking west. Concrete slab floor is intact and boundaries are well-defined.

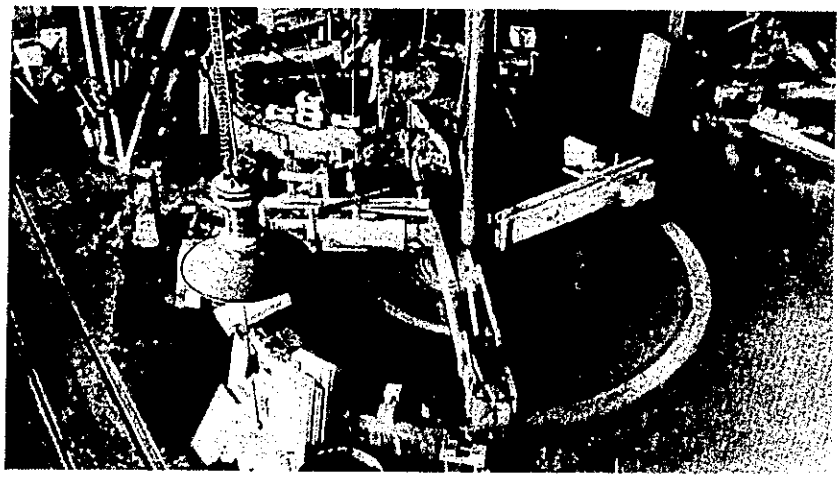

Figure 8. Overhead view of a Shop 2 rubbing machine in 1909 *(Henry L. Johnson, from McCollum 1993:82).*

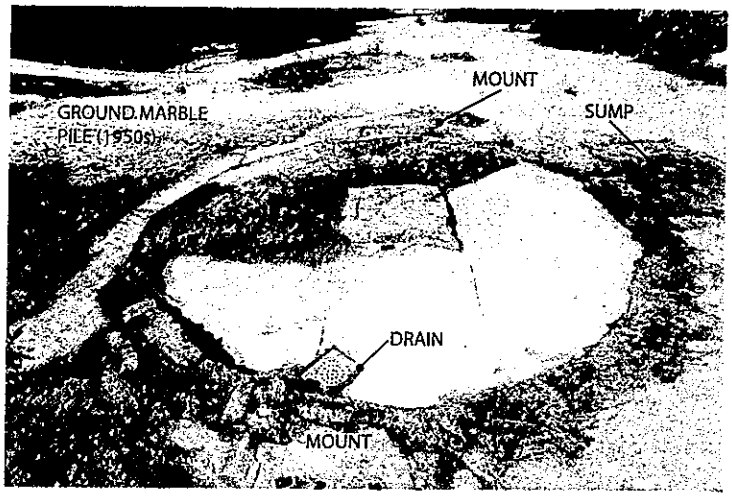

Figure 9. Half of rubbing machine base S2.3 in Shop 2 was excavated to expose its details. Photo looking west.

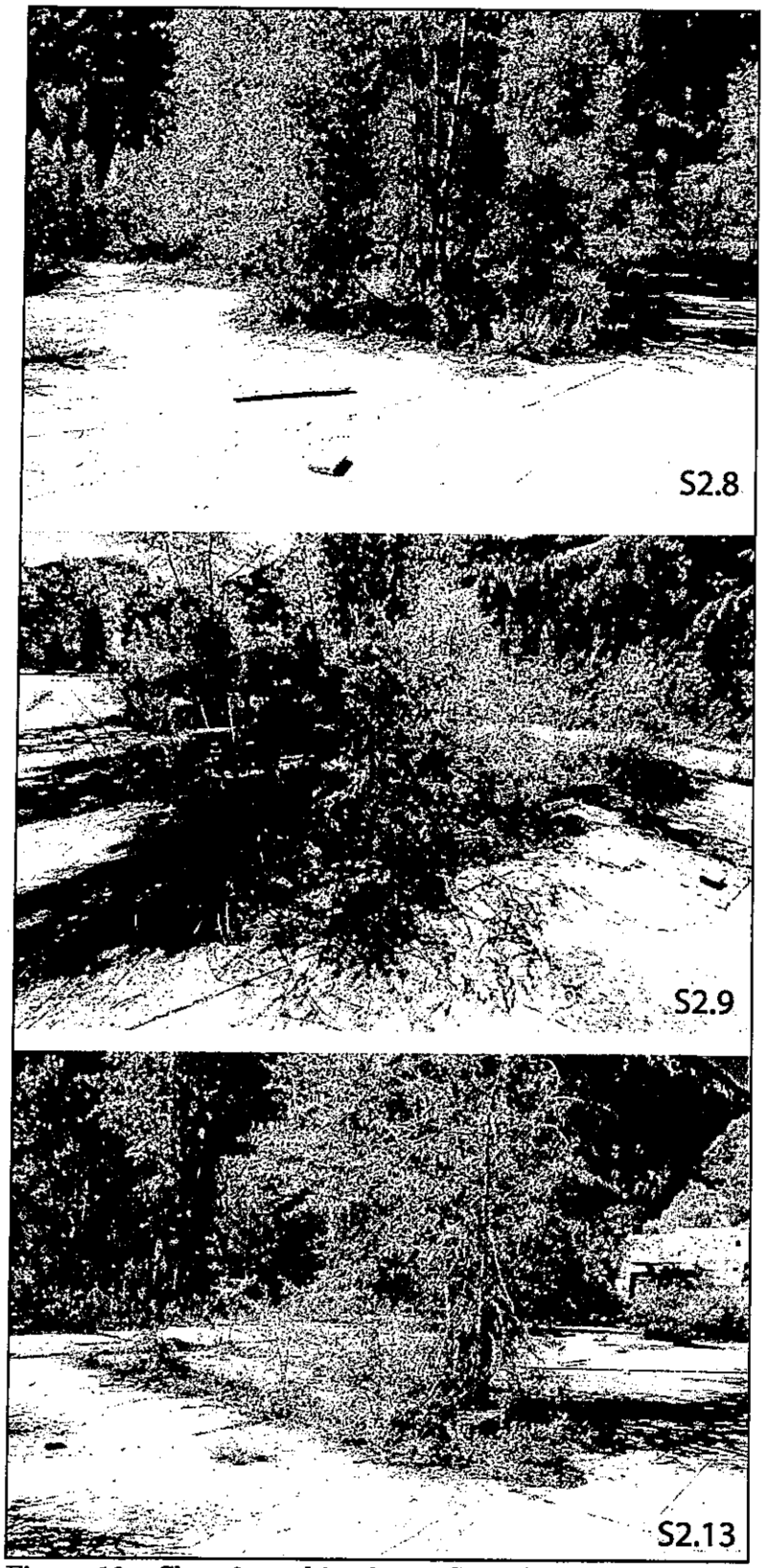

Figure 10. Shop 2 machine bases S2.8, S2.9 and S2.13 are obscured by heavy vegetation. Photo looking south-southwest.

these bases. Figure 11 is an overview taken looking southwest in Shop 2, showing the placement of several large machines situated along the southern side of the shop (left side of photo). The marble stock on the north side (right side of photo) was brought in by flatcar from the Stone Yard. One bay is obvious in the foreground. This bay may correspond with feature S2.11. The first machine at center left is possibly a combination saw or facing machine that may correspond with feature S2.9. The next machine to the west of feature S2.9 was a planer that may correspond with feature S2.13. Although it is difficult to see in the photo, the next machine west of feature S2.13 was a lathe that is oriented east to west, rather than north to south like the other machines. There are no remaining footings for this lathe; however, there is a rectangular pattern of marble blocks features S2.17-19 set into the concrete floor that forms a 16 by 32-foot area where the lathe may have been placed. Because the floor is not original, the lathe may have been moved after the 1909 photo was taken. The area occupied by the 38-foot-long machine base (feature S2.8) is not visible in the historic overview photo; however, it is possible that this was a diamond saw. Figure 12 is a reproduction of the same view in historic Figure 11 that illustrates the comparison of the shop then and now. Two additional machine bases that were not investigated: the area of thick vegetation east of feature S2.8, and another obvious base (feature S2.20) that is covered by marble firewall debris on the west end of the shop. The functions of these are unknown.

Interpretive Potential of Shop 2

The intact concrete floor of Shop 2 makes it a unique place on the mill site. The floor clarifies the mill's boundaries on all four sides, and evidence of outside walls is easily discerned. The function of the shop is easily interpreted by the machine bases, rubbing beds, and loading bays along the adjacent Stone Yard on the south side. Enough detail is available through historic photographs and documents to determine which machine was placed where in the shop, and how it functioned. Shop 2 exhibits the highest degree of integrity of the four shops; Shop 1 is gone, Shop 3 is on private land, and Shop 4 is densely overgrown and its boundaries more difficult to discern. Shop 2 is also the least difficult to clean up and maintain in the future, and the safest for visitor use.

The following suggestions are made for interpretation of Shop 2:

1. Remove all vegetation growing on the concrete floor.
2. Excavate and expose all of the machine bases by removing all organic material. Not only does the vegetation obscure these features, but roots and earth are damaging them. As shown with the excavated rubbing bed in Figure 9, much is to be gained from seeing the whole feature. Excavation should be supervised by a qualified person. Artifacts that are turned up should be properly analyzed and curated.
3. Place interpretive signs at each machine base with an historic photo of the machine when possible, and an explanation of how it worked. The signs should be placed so that visitors can look at the feature from the same perspective as the historic photo.
4. Place an interpretive sign at the east end of the shop with a site plan that highlights Shop 2, to let visitors know where they are in reference to the entire mill site.
5. Remove the pile of marble sand that covers the fourth rubbing machine base on the east end of the shop. Otherwise, leave it intact and use an interpretive sign to tell visitors about the other industrial uses of the 99 percent pure Yule marble that was ground up by Basic Chemical in the 1950s.
6. Remove some of the dense vegetation to expose the shop's south foundation wall. Removal of all vegetation is not necessary nor recommended. Remove some of the vegetation along the north side of the shop as well.

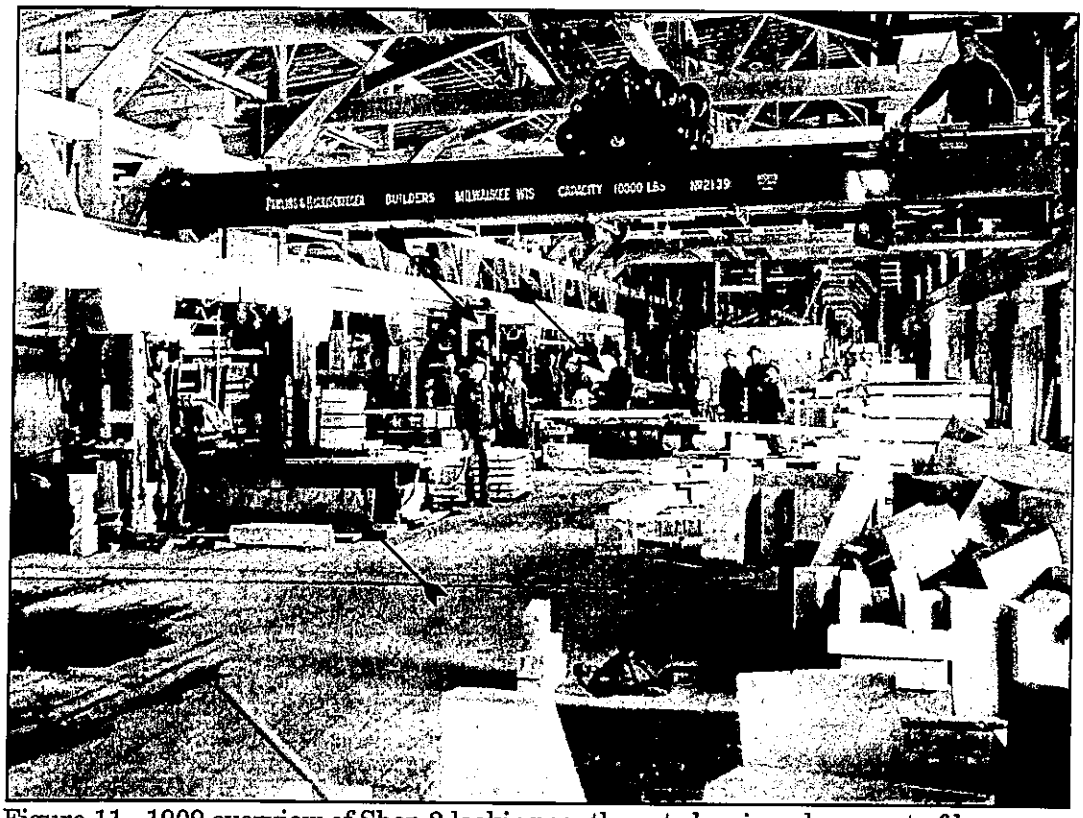

Figure 11. 1909 overview of Shop 2 looking southwest showing placement of large machines *(Henry L. Johnson, from McCollum 1993:86).*

Figure 12. Reproduction of the Shop 2 historic view in Figure 11 shows current conditions and locations of machine bases, looking southwest.

7. Do not remove the marble debris that has fallen from the firewall into the shop except to explore the remains of the machine base feature S2.20 and to clear the path to the doorway through the firewall.

Archaeological Assessment of Mill B

The overall dimensions of Mill B are 314 by 76 feet. Its eastern boundary begins on the west side of Firewall No. 1 adjacent to Shop 2. Its western boundary is the east side of Firewall No. 2. The same situation exists here as with Shop 2 where the southern boundary of the mill is clearly identified by its foundation wall, whereas the northern boundary is more obscure. The south foundation begins as a continuous dry-laid stone wall that becomes a line of 1½-foot square marble support pillars spaced about 5 feet apart. Remains of the north foundation wall are most clearly seen on the west side of Mill B, closest to Firewall No. 2. The majority of the north foundation wall is buried beneath massive marble blocks, structural and organic debris, and artifacts that were probably pushed there by bulldozer from the direction of the Stone Yard. This line of heaped debris covers most of Mill B's Stone Yard loading bays and many of the rear ends of the gang saw beds. The entire area of the mill is covered in dense vegetation, is severely disturbed, eroded, broken, or buried, and lacks a high degree of integrity. Figure 13 gives the archaeological plan of the remains at Mill B.

Although Mill B is quite large and its current condition is chaotic, it is not difficult to understand. It is easiest to divide the mill's area into five longitudinal sections from north to south, as indicated in Figure 13. A repetition of features and characteristics exists within each section. Section A begins at the south foundation wall and ends at the hard concrete edge of the machine base floor. This section is 27 feet wide. Its east end is characterized by a three-sided marble block enclosure adjacent to Firewall No. 1 and another enclosure of poured concrete just to the west. The rest of the section westward is characterized by partly filled depressions between rows of support piers. The interior piers are dry-laid stone, and exterior piers are wet-laid marble. The fill between the piers is highly organic and contains an abundance of structural debris and artifacts on the surface. It is expected that large numbers of artifacts are buried as well. The activity in this section of Mill B was hand polishing (Figure 14). Little remains of the concrete floor in this section. As shown in the photograph, an interior plank wall running east to west separated this section from the rest of Mill B. At the west end of Section A is a unique machine base (feature MB.62) that probably mounted an air compressor.

Section B begins at the south hard edge of the concrete machine base floor and ends at the north hard edge of the same floor. This section is 11 feet wide and runs the length of the mill. It contains 22 machine bases associated with powering the gang saws in Section D (Figure 15). The machine bases are of poured concrete, approximately 8½ by 6½ feet, and are spaced 12 feet apart, oriented north to south and aligned east to west. These bases mounted machines with a common mounting bolt pattern; however, they are not all identical. The bases on the west end of the mill are of the same concrete material and are badly deteriorated, whereas the bases on the east end are of variable material and are much more intact. Differences in the east end bases include different aggregate, concrete color and consistency, as well as variations in base sizes. It is likely that these bases represent later installations of new or different machinery as the mill evolved. Two explanations are possible for the differences in the machine bases on the east and west ends of the mill. In 1925, a fire devastated Shops 3, 4, and Mill B (Figure 16). These structures were not replaced, and only a small portion of Mill B's east end was reconstructed for continued use. The machine bases on the west end were first exposed to a fire and have been exposed to the elements since 1925. The east end bases may have been recovered and maintained between 1925 and 1941 before being abandoned to the elements. The machines on these bases were associated with driving gang saws that sat across from each one.

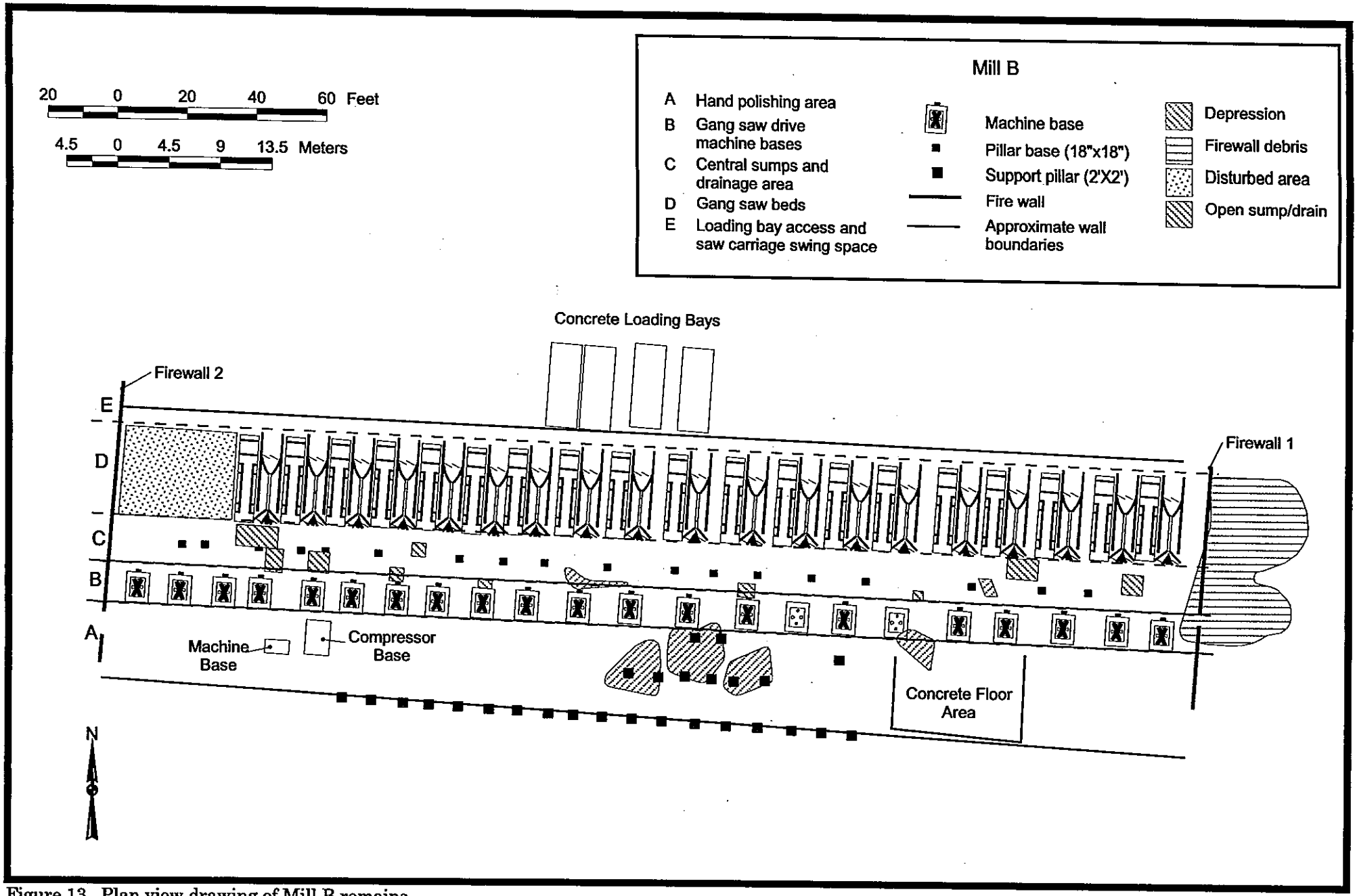

Figure 13. Plan view drawing of Mill B remains.

Figure 14. Workers hand polishing in Section A of Mill B, looking west. *(George L. Beam, from McCollum 1993:90).*

Exactly how they worked is unknown, but some ideas can be discerned from the historic photograph (Figure 16). Judging by their design, these might be the clutch mechanisms for driving the saws. Central power from the overhead line shaft running the length of the mill was captured through a belt attached to the flat drive wheel. A tensioning device (small pulley wheel) was activated to put the right amount of tension on the drive belt to control the speed of the saw or to completely disengage it. The larger, thicker wheel on the opposite side of the drive wheel was a fly wheel, made of heavy cast iron. The turning weight of this wheel generated centrifugal force to help add more power to the turning drive wheel to take the entire power burden off of the line shaft. How this whole apparatus transferred its power to the saw in front of it is unknown, but was likely by belt and pulley.

Section C lies between the machine bases in Section B and the saw beds in Section D. This area is 14 feet wide and runs the length of the mill. It is an area of collapsed concrete flooring, large and small rectangular drainage sumps, some of which are more than 5 feet deep (Figure 17). Section C comprised a complicated part of the sawing operation that involved water drainage and the collection and recirculation of cutting slurry. The subfloor of this section is concrete, approximately 4 feet under the mill floor. This space contained drain pipes that collected water and slurry from all of the saws and directed it to appropriate sumps from where it was discarded or pumped back up to the top of the saws for recirculation. Section C is in very poor condition and is difficult to fully understand without a substantial investment of time for the required archaeological work. It is heavily overgrown with trees and vegetation that have cracked and destroyed the concrete, and it contains a large amount of organic fill.

Figure 15. Long row of repetitive machine bases in Section B of Mill B, looking west.

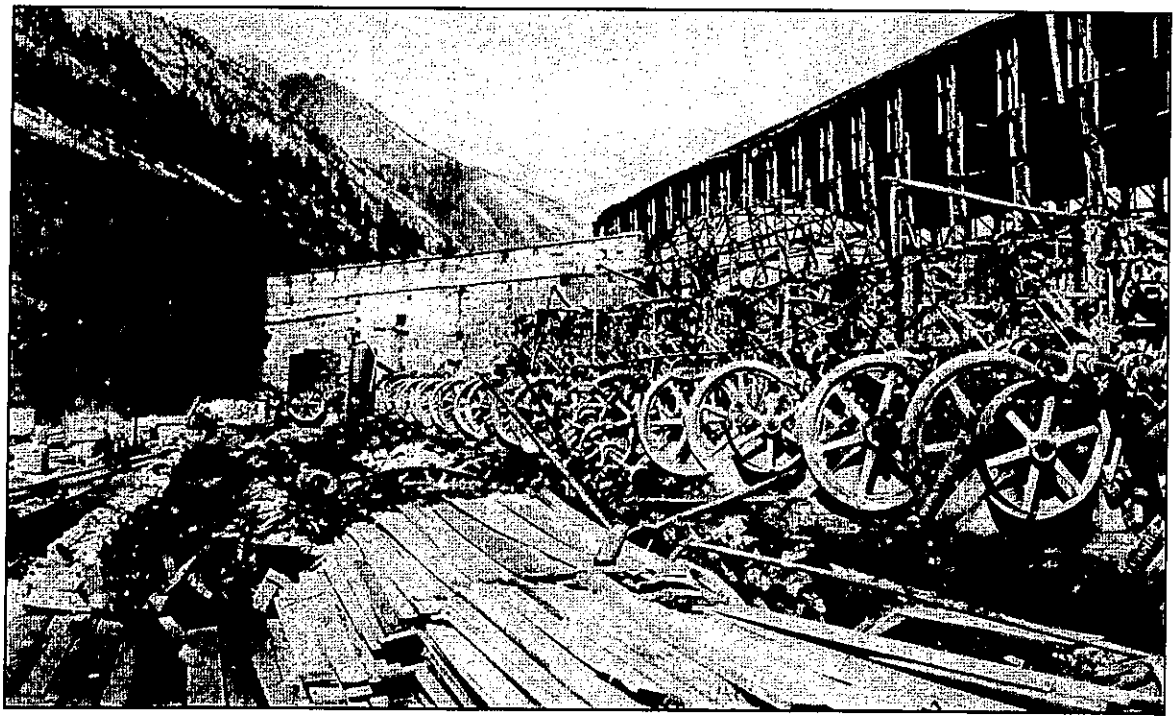

Figure 16. 1925 view of Mill B following a devastating fire, looking west. The machines in the foreground were mounted to the concrete bases remaining in Section B. These were the drive/clutch mechanism for the gang saws *(Henry L. Johnson, from McCollum 1993:138).*

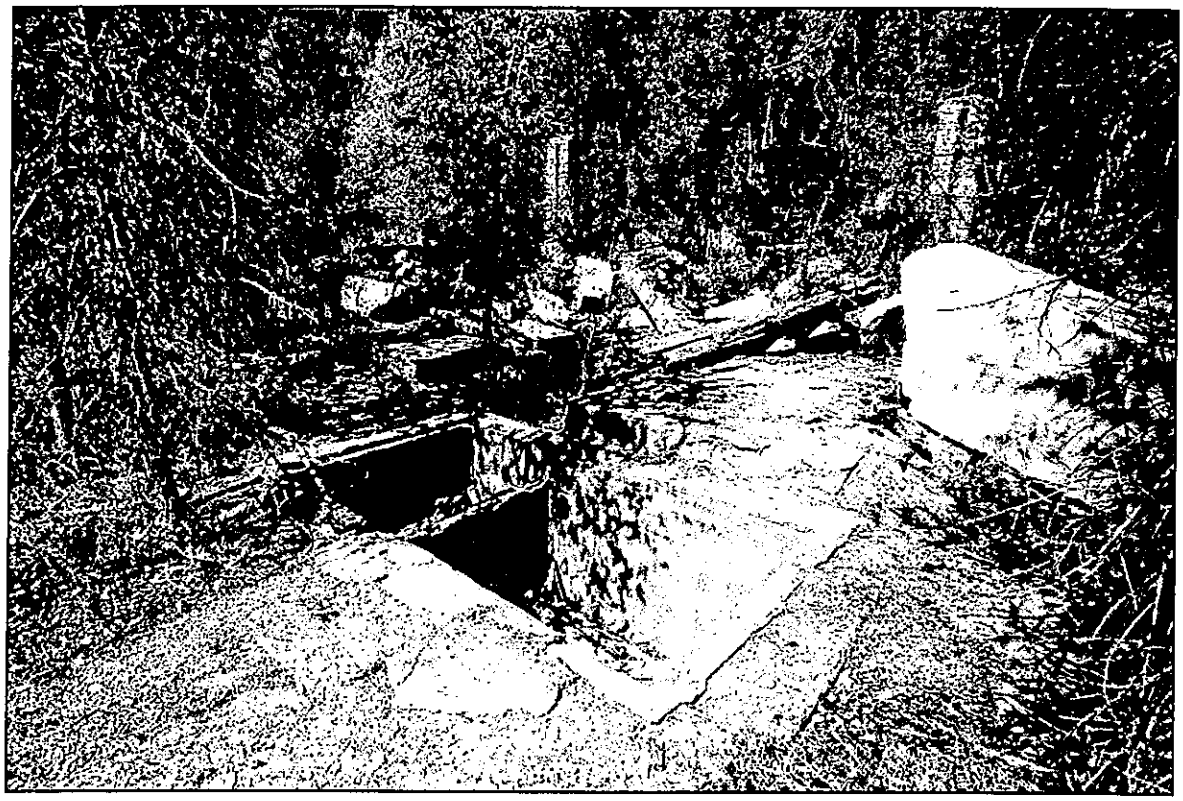

Figure 17. Large open drainage sumps and collapsed concrete flooring characterize Section C of Mill B, which make this area hazardous for visitors. Photo looking northeast.

Section D is defined by the 22 saw beds that are oriented north to south and aligned east to west. These measure approximately 10 by 15½ feet in the sunken part of the bed, and the raised area between each bed is 6 feet wide. The saw beds at the west end of the mill are almost completely buried by organic and debris fill, and the majority have their north ends buried by large blocks of marble and debris piles that were pushed over by bulldozer from the direction of the Stone Yard (Figure 18). A historic explanation of how these saws operated is given in Appendix B. Photos of gang saw bed remains are compared with historic photos under the discussion of Mill A, below. This information also applies to the saws in Section D of Mill B.

The last longitudinal section of Mill B, Section E, lies between the rear end of the saw beds and the north foundation wall. This area is approximately 8½ feet wide and runs the entire length of Mill B. It is predominantly disturbed and is only apparent in a few places where both the edge of the foundation wall and the saw beds are visible at the same time, and where there is no debris covering it. Section E contains the structural debris, artifacts, and marble block piles mentioned earlier that cover the rear of the saw beds and the north foundation wall. The places where Section E was free of debris show that the space probably allowed room for the swinging carriage of the gang saws, and was not occupied by anything other than incoming track from the Stone Yard.

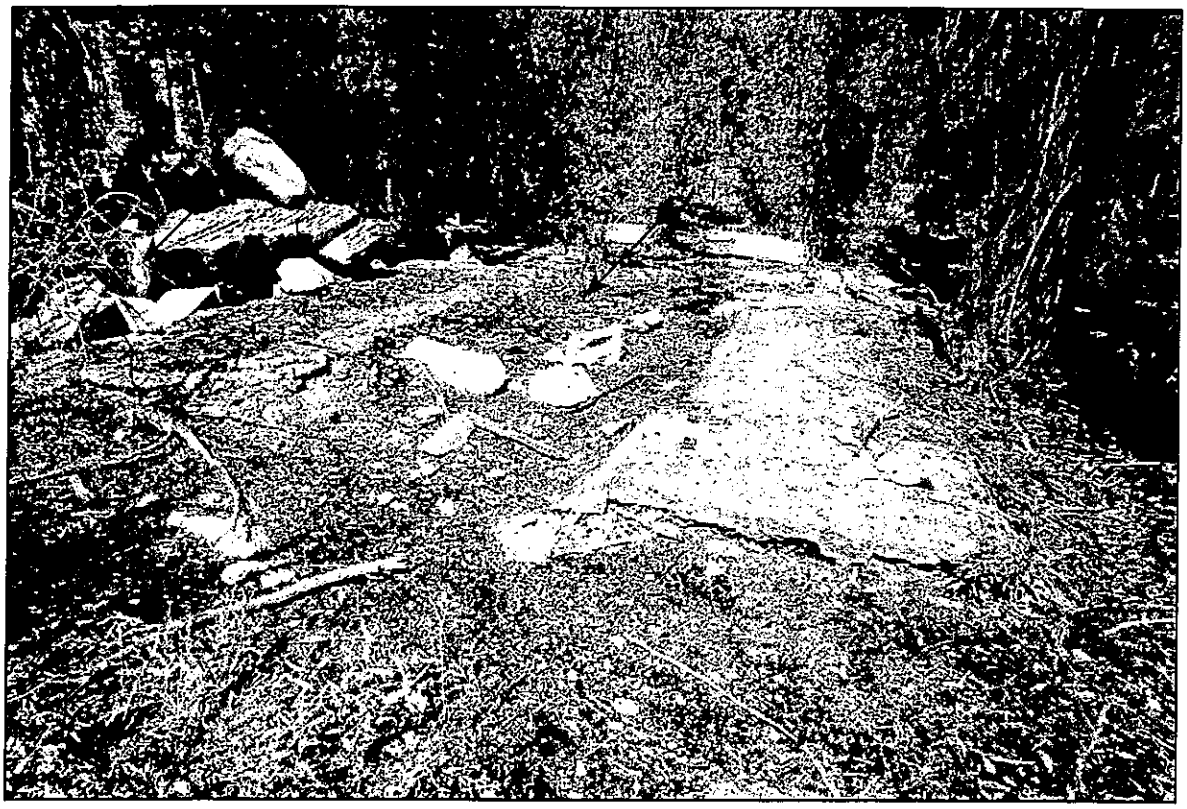

Figure 18. Three saw beds in Section D of Mill B illustrate the variability of their current conditions. Photo looking north-northeast.

Interpretive Potential of Mill B

The many difficulties with interpreting Mill B make it an undesirable prospect. First, its northern and southern boundaries are difficult to discern, especially due to the large amount of debris piled on the northern foundation wall. Second, most of the area has been exposed to the elements since 1925 and has filled in with vegetation, trees, and organic matter to a point of considerable obfuscation of the historic remains. Tree roots, vegetation and environmental exposure have damaged much of the concrete and rendered it unstable. Before 1925, the mill was exposed to an intense fire that also affected the condition of the concrete and the overall integrity of the mill. Third, there are too many obstacles and pitfalls in this area to consider it safe for visitor use. Vegetation, large holes created by floor collapse, deep sumps, sudden edge fall off on the south side, and the machine beds and bases themselves all present hazards that should be avoided. Lastly, Mill B contains redundant technologies that can be more effectively and safely interpreted in Mill A, where the features and artifacts have more integrity and are in better physical condition.

The following suggestions are made for interpretation of Mill B:

1. It would not make sense to ignore Mill B altogether, but it does make sense to limit access to it for safety reasons. Upon reaching Firewall No.1 from the direction of Shop 2, it would be practically irresistible for visitors not to want to know about what is on the other side of the doorway through the wall. Allow visitors to pass through the doorway and enter Mill B. Approximately 20 feet west from the firewall in Section C, there is a large open sump pit. Erect a barrier before the sump. It can be a single chain-and-post type, about 4 feet high, or a 4-foot-high chain link type. Put up an interpretive sign near the fence that tells about Mill B's contents, history, gives its dimensions, shows a couple

of historic photographs, and has a site plan that highlights its location (with a "You Are Here" arrow, for example). Explain why it is dangerous to go past the fence, and state that the contents of Mill B are the same as in Mill A, where there is a full interpretation of the technology. Ask visitors to turn around and exit back through the firewall doorway. The same fence and interpretive sign arrangement should be installed at the west end of the mill as well, so that visitors can enter from the west side of Firewall No. 2 and look eastward into Mill B.

2. To compliment the fence at the east and west ends, another fence can be installed in the Stone Yard area along the length of the northern boundary of Mill B, between the two firewalls. Once again, this type of fence is not designed to completely block access. An iron post, single-chain fence about 4½ feet high would be enough, and it would be visually unobtrusive. Hang signs along the fence that tell visitors to stay out of the Mill B area for safety reasons.

3. To help prevent visitor accidents in Mill B and to protect resources from further deterioration, it is advisable to fill open holes in Section C with clean sand. This includes sumps, areas of floor collapse, pits, drains, and so on.

Stone Yard and Overhead Traveling Crane, 1908-1909

History

The huge overhead travelling crane over the Stone Yard on the north side of the mill was initially constructed between 1908 and 1909. Two Pauling & Harnischfeger cranes were installed, one with a 12½-ton capacity and the other with a 7½-ton capacity. The cranes had a 70-foot traversing span across the width of the Stone Yard. Support for the craneway was provided by the edge of the mill building on the south side and by heavy timber support piers on the north side. In 1910, concrete footings were added underneath the north side pillars. Between 1913 and 1914, marble reinforcement piers were built around every fifth timber pier along the craneway's north side. The final length of the craneway reached about 1,300 feet. A wire saw was located at the east end of the yard, used for the initial sizing of marble blocks. The massive crane was essential for moving the marble blocks onto flatcars that ran into the many bays of the mill.

Archaeological Assessment of the Stone Yard

The Stone Yard spans the entire length of the project area from east to west. Its northern boundary is well defined by the 8½ by 6-foot, 23-foot-tall marble support piers and the 3 by 13-foot, 4-foot-tall concrete footings between the piers (Figure 19). The southern boundary should correspond with the edge of the mill buildings, but most of the foundation wall is covered by dense vegetation, debris, or is buried. The Stone Yard contains a small number of large marble blocks, structural debris, and artifacts, but is densely vegetated so that these are not apparent. One main path runs the length of the Stone Yard on its north side along what was the tram track grade. The important function of the Stone Yard was to move marble to the appropriate shop via the overhead cranes. After the stone was sized by the wire saw at the east end of the Stone Yard, it was graded and placed onto flatcars that were pushed into the mill's saw bays (Figure 20). At the west end of Mill B in the Stone Yard are the only intact rails and concrete bays where the flatcars were loaded for cutting. The remains of two flatcars are present along the north pier line of the Stone Yard in the vicinity of Shop 4 (Figure 21). These are in poor condition, and their wheels and axles are missing. Another feature of the Stone Yard that remains intact is a line of 4½-foot square concrete tie-off blocks installed along the length of the Stone Yard's floor at about 12-foot intervals. The center of these blocks had imbedded tie-down rings. No above ground remains exist of the wire saw that is noted on the ca. 1913 Sanborn maps, and the east end of the Stone Yard has been graded and graveled for use as an ice skating rink in the winters (Figure 19).

Figure 19. The east end of the Stone Yard is currently being reused as an ice rink in winters. The north side of the yard is defined by a row of marble support piers. Concrete footings between the piers are obscured by dense vegetation.

Figure 20. Historic photo looking southwest showing loaded flatcars in the Stone Yard. These were pulled into the adjacent saw bays of Mill B *(Denver Public Library, Western History Collection)*

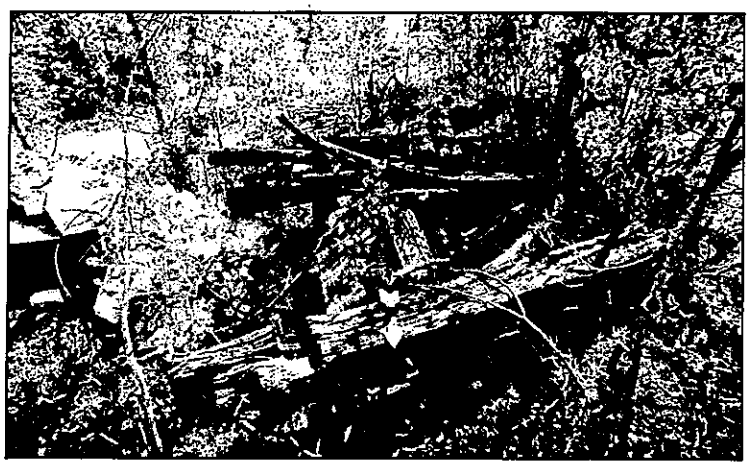

Figure 21. Remains of a flatcar located along the north pier line of the Stone Yard, near Shop 4. Photo looking south.

Interpretive Potential of the Stone Yard

The machines used in the Stone Yard– the overhead cranes, the wire saw, and railroad/tram equipment– are no longer intact. Vegetation has grown so thick in the Stone Yard that it is difficult to discern the marble piers to the north or the mill area to the south from the path itself (Figure 22). The long marble reinforcement piers are an impressive and memorable part of the site and are important in defining the mill's northern boundary. The Stone Yard and crane served an essential function in processing at the mill and should be interpreted.

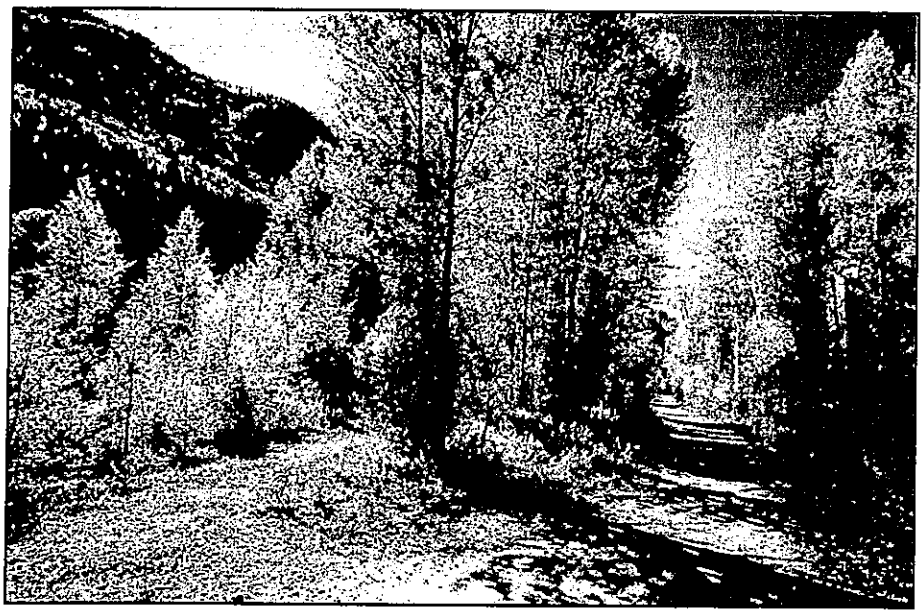

Figure 22. Thick vegetation in the Stone Yard obscures views of the mill area in all directions. Photo looking west-southwest.

The following suggestions are made for interpretation of the Stone Yard:

1. Remove all of the low vegetation and some of the trees from the yard area. This would recreate the impression of how large the mill really was strictly by length. It is important to remove the vegetation that obscures the mill area from the Stone Yard. If this vegetation were removed, it would be possible to look into the mill ruins while walking along the Stone Yard, which would give the opportunity for handicapped visitors to see the mill ruins.
2. Clear vegetation and organic material from around the north support pier wall, including the concrete pier footings and the marble piers. This will define these features and give them more continuity.
3. Do not remove the remaining large marble blocks, but some debris may be removed under professional archaeological supervision.
4. Pour and grade the area with a thin layer of smooth gravel. Do not cover the tie-down blocks or loading bays at the west end of Mill B.
5. Install interpretive signs explaining the history and use of the Stone Yard. Use historic photos at the spots they were actually taken so visitors can compare the historic views with the remains. Many of these photographs are available. Also include historic photos that show the 800-foot-long roof that covered the yard after 1912.

6. Install a 4-foot-wide concrete sidewalk along the south side of the yard for handicapped access. Place interpretive signs at vantage points to explain the different parts of the mill that can be seen from the path. This would be primarily Mill A, Shop 2, Mill B, and Shop 4. These signs could be copies of the ones used on the inside of each part of the mill.

7. Install a large interpretive display that gives historical information about the workers of the mill: where they came from, what they were paid, what kind of skills they had, and so on. Give an account of the strike that occurred in 1909-1910. Use historic photographs that illustrate these people at work and at home in Marble.

8. Install an interpretive display that shows as many photographs as possible of the monuments and construction projects that the mill produced. Give the numerous milestones that the mill reached, such as being the largest finishing mill in the world, quarrying the largest blocks of marble more than once, awards that were won, and so on.

9. Install an interpretive display that includes various blocks of marble that are still on the site. The display shall provide scientific facts about the Yule marble and interpret working marks on them from cutting, planing, fluting, etc. In particular, only one rough-cut hexagonal column drum remains on the site today. It is at the east end of Shop 4 near a marble crane pier and measures about 9 feet in diameter. This block would be of particular interest for interpretation in the Stone Yard or in Shop 4 where such shapes were turned on lathes, fluted, and then hand finished. Other marble blocks that are currently in the Stone Yard may also be of primary importance as examples of particular workmanship. Furthermore, it might be worthwhile to ask the current marble quarrying company or Vermont Marble (who presumably still owns milling facilities) if they would fabricate and donate examples of the different marble products that were historically produced at the mill to be put on display. This could be done under the direction of an archaeologist or architectural historian.

10. Install an interpretive display the tells about Colonel Meek's career and his work at the Colorado-Yule Marble Co. He played the primary role in establishing the mill, running the whole operation through personal management, and funded several important community projects. He was apparently highly respected and loved by the Marble community. Tell about his death in 1912 on the runaway tram car descending toward the mill from the quarries. There are many historic photos of Meek and his home in Marble that can be used.

11. Invite marble artists who work with Yule marble to put their sculptures on display in the Stone Yard. Contacts could probably be made through the Vermont Marble Co. or the current quarrying company.

Coping Shop, Shop 3 and Ancillary Structures, 1909

History

Another mill expansion occurred almost immediately after the construction of Mill B. It was completed in 1909, which brought the total length of the mill to 709 feet. Shop 3 was a 253-foot-long architectural stone finishing area on the west end of the works. It housed three rubbing machines, one 14-foot-diameter diamond blade stone saw, one combination carborundum and diamond blade stone saw, five or six open side planers (ranging from 9 to 16 feet in length), possibly one 18-foot-long turning lathe, and one wood working area for building shipping crates. The 90-foot-long area between Shop 3 and Mill B is indicated on a 1913 map as a Coping Shop. It probably housed a coping saw, but it is not known if it was a wood or stone saw. The construction of 50 worker's houses on the north side of the mill along Park Street also began in 1908.

Several ancillary structures and railroad service buildings were completed by 1909, including a blacksmith shop, two storehouses, and presumably a small lumber mill between the south side of the finishing mill and the Crystal River. The east end of the works was occupied by a 60-foot-diameter manual turntable, a dispatcher's tower, a loading platform, a small depot, and a wood frame engine house.

In 1908, the Knickerbocker Syndicate published a booklet on the Colorado-Yule Marble Co. stating that it owned about 100 acres in and around Marble containing $3 billion of pure white stone (Vandenbusche and Myers 1970:46). It is no wonder that with this kind of potential, the Syndicate secured $3 million in investments and reported that $1.5 million had been spent on physical development of the operation up to that time.

Archaeological Assessment of the Coping Shop and Shop 3

Shop 3 was a primary large-scale architectural and monumental milling, shaping, and finishing area (Figure 23). The portion of Shop 3 that is within the project area is about half of a 90 by 75-foot area that historically stood *between* Shop 3 and Mill B. Shop 3 was constructed as a stand-alone structure, not as a continuation of Mill B. The area between them was enclosed to join them. Firewall No. 2 later defined the end of Mill B and the beginning of Shop 3, which apparently included the connecting area. A 1913 map shows this area identified as the "Coping Shop," which indicates the use of a coping saw to cut scrollwork and intricate shapes, but it is not clear if this was a wood shop or stone shop (McCollum 1993:68). With the retooling of Shops 3 and 4 for the Lincoln Memorial project in 1914, it is possible that the function of this area as a Coping Shop was changed, and the current remains are not of a Coping Shop. Additional research and archaeological excavation are necessary to confirm this, however.

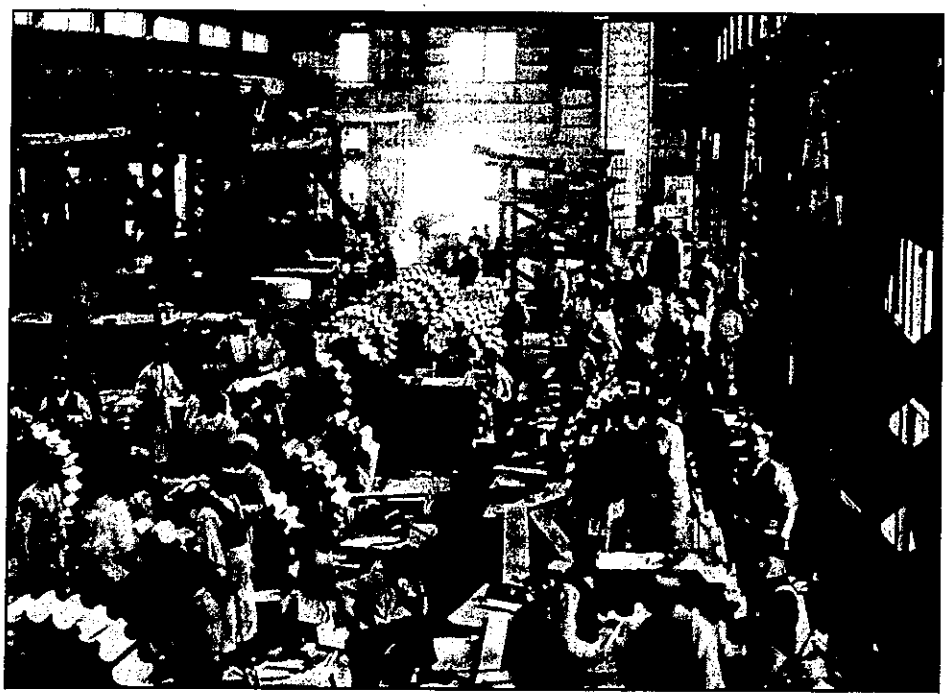

Figure 23. An impressive 1912 west-looking view of Shop 3, also known as the monumental shop, where column drums were prepared for large projects *(Frank Gertif collection, from McCollum 1993:94).*

The remains in this area include several substantial concrete machine footings and an unusual marble enclosure with stairs down that resembles a small interior building. West of the enclosure is a large pile of marble structural debris with mortar still attached. It is likely that this debris is from south side marble support piers for the Stone Yard's overhead crane, but there is more stone in this area than would be expected just from piers. On the opposite side, the north wall crane support piers are still intact, adjacent to Shop 4's west side (Figure 24). A close look at this north wall indicates that it was probably an enclosure with large windows set between the crane support piers. This is further supported by two factors: 1) the large amount of structural marble debris on the south side that was probably another wall, and 2) the discovery of an 18-foot-long concrete machine bed, complete with intact flatcar rails, in the space between the north wall and the debris of the south wall. Although it is not known why this area would have been enclosed, the function of the machine bed would provide an explanation.

Figure 24. Crane support piers are located adjacent to Shop 4's west side. The crane yard was covered in this area and a large machine bed is located between this wall and the north wall of the Coping Shop. Photo looking northwest.

It is unfortunate that virtually the entire area of the shop is outside of the Town of Marble's ownership. Because Shop 3 lies outside of the project boundary, it was not formally surveyed for inclusion in this report. A brief walkover of the area confirmed that large machine bases and concrete footings are still visible. The vegetation is dense, however, more so than in the other parts of the mill, and structural boundaries are difficult to see. It is also apparent that the area has been recently disturbed by the land owners, who have created open spaces within Shop 3's boundaries that include marble slab tables and benches.

Interpretive Potential of the Coping Shop and Shop 3

Not enough information is yet available about the portion of Shop 3 that lies within the project's west boundary. It is likely that visitors who pass through Firewall No. 2 and explore this area will at least be curious about what appears to be a small marble building with stairs down on the north and south sides. The machine bases, the standing north marble wall that probably corresponds to the large structural marble debris pile, and the 18-foot-long concrete machine bed

between them all contribute to a good amount of interpretive potential, but more research is necessary.

The following suggestions are made for interpretation of the Shop 3 area:

1. Conduct further archaeological research of the remains in this area to include exploratory excavation and historic documents, especially historic photographs. This will help determine the function of this small transitional area between Firewall No. 2 and Shop 3.
2. After the function of the area and the features have been identified, use an interpretive sign to explain the area.
3. Establish the actual western property boundary of the site and erect a 4-foot-tall iron post single chain barrier that keeps visitors from entering the private property to the west. Hang signs on the chain that indicate "Private Property."
4. Install an interpretive sign at the fence location that tells about Shop 3's functions, using historic photographs. Indicate that Shop 3 is beyond the fence on private land. Use the same site plan to indicate the location of Shop 3 and a "You Are Here" arrow.
5. Acquire the property west of the current property boundary that includes Shop 3. Once the property is under the Town's ownership, it can be preserved and interpreted as part of the historic site.

Archaeological Assessment of Ancillary Structures

None of the ancillary structures within the project boundaries from this period still stand. The railroad structures on the east end of the complex have been gone for some time, probably since the railroad was pulled up in the early 1940s, and the area has undergone a great deal of restructuring. Many of the historic rail grades have been obliterated, and the areas where structures such as the depot, dispatcher's tower, loading platform, and electric shop once stood have been paved over. The ancillary structures between the south side of the mill and the Crystal River from this period also prove difficult to locate because of the high level of disturbance of the area in recent times. If there are any remains of the blacksmith shop, they are buried beneath the marble blocks and rubble in that area.

Two ancillary structures were constructed during this area during 1907-1908 whose remains are visible today. As seen in Figure 25, they are distinguished by the dormer and large windows on the one closest to the blacksmith shop (east side), while the other has no windows and is not whitewashed (west side). The west side building is labeled on several maps as a storehouse, but the other building is not labeled. Because of the four large windows and the dormer, this structure probably functioned as a workshop and not as another storehouse. The structure was expanded westward in 1911, but was destroyed by an avalanche in 1912, along with the blacksmith shop. The blacksmith shop was rebuilt, but the other workshop was not. The marble foundation of the structure is visible today (Figure 26 and Figure 27). Its length is 82 feet, and its width is approximated at 25 feet. An internal concrete footing 30 feet from the west wall may mark the 1911 addition. A fair number of artifacts are visible on the surface within the foundation walls, including sheet metal, a large spool of one-inch-diameter wire rope, structural debris, wire nails, and structural hardware. A 3 by 4-foot, 6-foot-deep wood plank-lined shaft with an internal ladder on its west wall is located three feet from the foundation's southwest corner (Figure 26). The function of the shaft is unknown. Immediately west of the foundation wall is a 9 by 11-foot surface scatter of electrical transformer fins and what appears to be a large mound of disturbed earth farther to the west. It is likely that the remains of the storehouse building are just below the surface here. They should be left undisturbed.

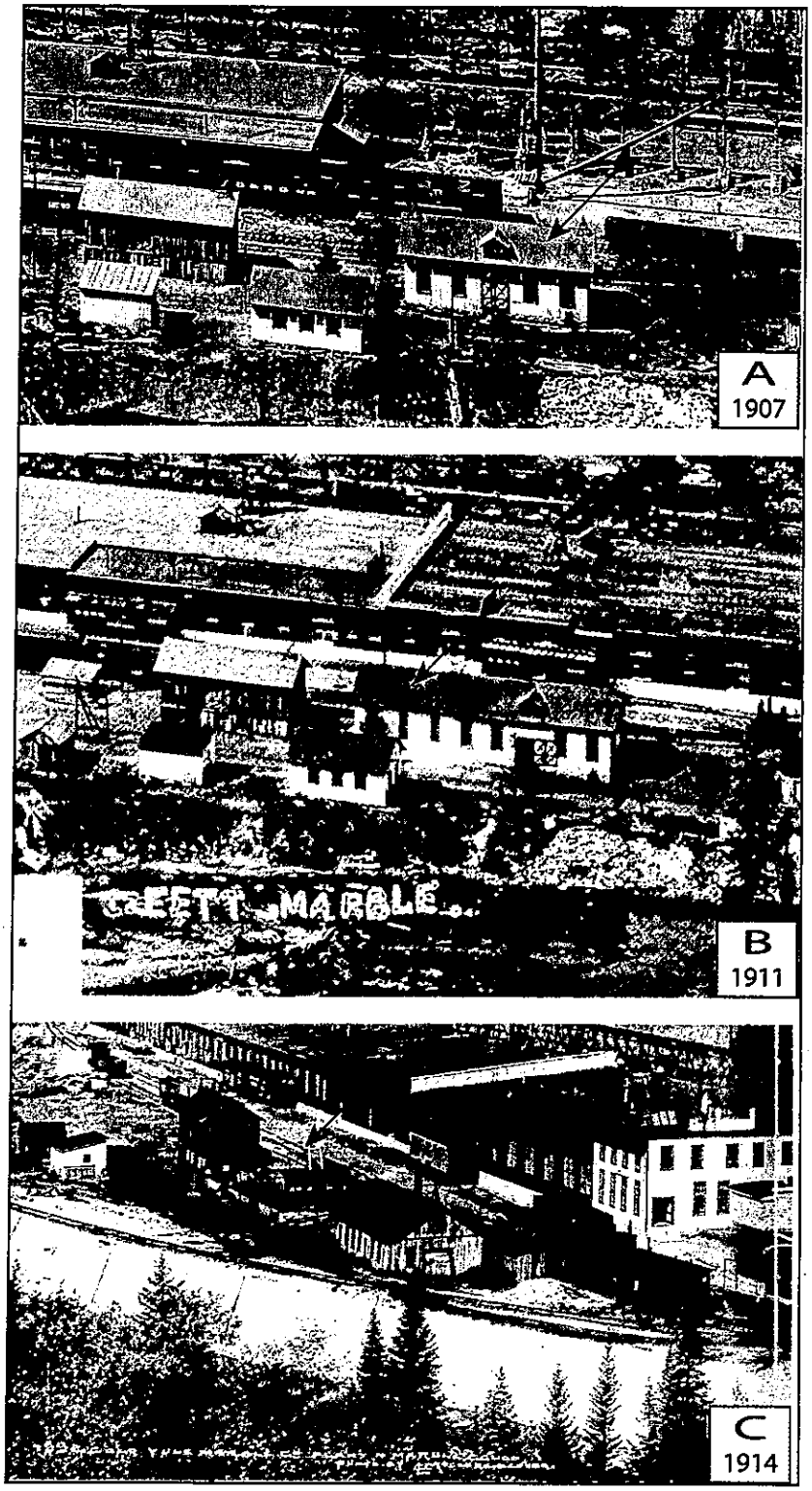

Figure 25. Three historic views of the ancillary structure west of the blacksmith shop. It was built in 1907(A), expanded in 1911(B), and destroyed by an avalanche in 1912 (C). Its marble foundation is one of the last south side structures still visible today. *(taken from McCollum 1993:38-39, 50, 112)*

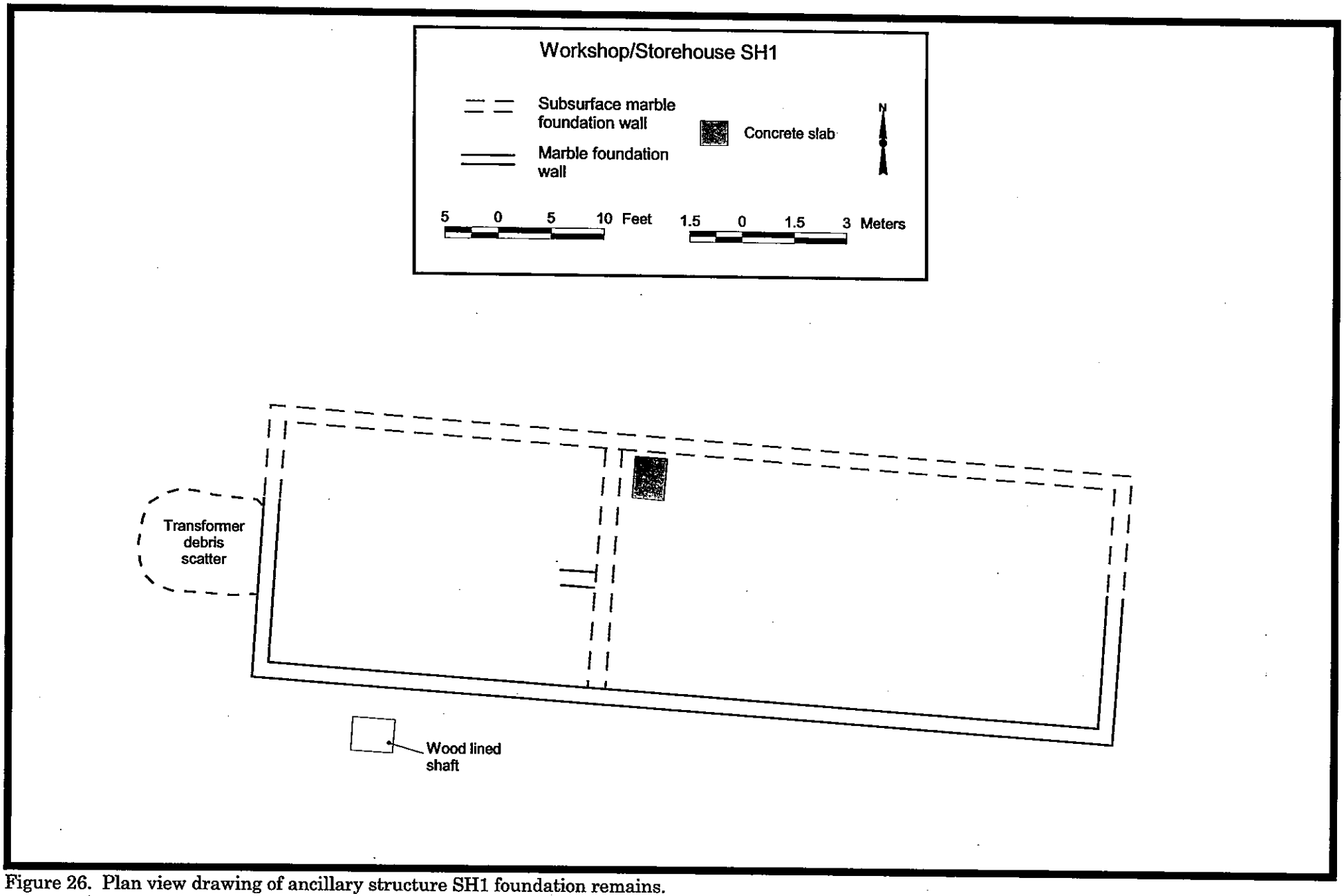

Figure 26. Plan view drawing of ancillary structure SH1 foundation remains.

Figure 27. Part of the south marble foundation wall of ancillary structure SH1, looking northwest. The remains of the north wall are buried, but the other three are obvious.

Interpretive Potential of the Ancillary Structure Foundation

Of the early ancillary structures, the foundation of the workshop is all that is still visible, and even this is more than half buried. The potential for interpretation of this structure is good, but additional archaeological research and preparation would be necessary to do an adequate job of it, for the function of the structure is still unknown.

The following suggestions are made for interpretation of the Ancillary Foundation:

1. Conduct further archaeological research of the foundation and its artifacts to include exploratory excavation and historic documents, especially historic photographs. This will help determine the function of the structure.
2. After the function and boundaries of the structure have been identified, install an interpretive sign to explain the structure and the others around it. Use historic photographs and a site map with a "You Are Here" arrow.
3. Collect surface artifacts, remove debris and vegetation, and expose the north wall of the foundation that is currently buried. Grade the fill within the foundation to level with the top of its walls.

Shop 1, the Front Offices, Document Storage Vault, and Mill A, 1910

History

Early expansion projects continued toward completion during 1909 while enduring a major worker's strike that finally broke in 1910. The company was booming with large projects, and another mill expansion of 200 feet in length was made east of Shop 2. This included the structures known as Shop 1, the Front Offices, and the Document Storage Vault. The east end of Shop 2 was converted into the area called Mill A with the addition of eight gang saws that were moved from Mill

B. These saws may have been moved to the cut work pieces for nearby Shop 1. Shop 1, called the Monumental Shop, housed two or three rubbing machines, one Patch carborundum machine, one air compressor, three polishing machines, two lathes, and two 5-ton electric cranes, with the rest of the shop probably used for hand finishing (*Marble Booster*, March 14, 1914). The document vault was the only structure of the works faced with marble, probably for fireproofing. Mill A housed eight stone gang saws to cut dimensional blocks for the nearby Monumental Shop (Shop 1), an air compressor, and a polishing area where work pieces were hand finished.

Archaeological Assessment of the Document Storage Vault, the Front Offices and Shop 1

The Document Storage Vault is the only remaining standing structure within the mill area proper. The 16 by 20-foot document vault is a flat roof concrete structure that was faced on three sides in marble, with its south side attached to the Front Offices (Figure 28). Figure 28 also shows the stairway down that reaches the passageway beneath the vault, connecting it to the Front Offices. The function of the structure was to store blueprints and plans for the company's projects. It was outside of the Front Offices and faced with marble block to fireproof it as much as possible. Today the structure has been robbed of most of its facing marble, leaving its concrete structure exposed (Figure 29). The entire structure is poured concrete, including the flat roof.

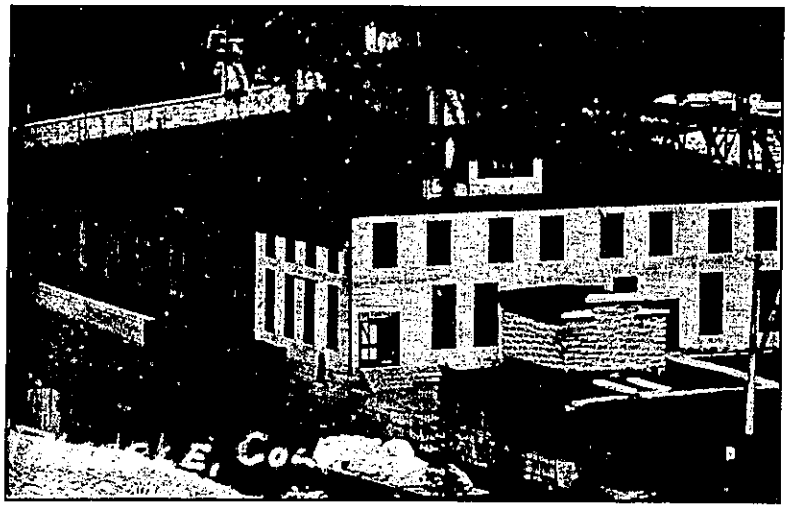

Figure 28. This 1915 historic view shows the Document Storage Vault adjacent to the Front Offices on the east side of the complex. It was the only marble-faced structure at the mill and kept separated from the other buildings for fireproofing. *(Marble Historic Society Collection, from McCollum 1993:127)*

Figure 29. The Document Storage Vault is one of two structures that remain standing today. Much of the marble facing has been robbed, and the window/doorway is not original. The gable roof was installed to protect the building from weathering. Photo looking south-southeast.

The gable roof on the vault today is clearly not original, but was installed to protect it from further water damage. There is a large 6-foot 7-inch by 7-foot 4-inch doorway on the north side and a 3-foot by 3-inch by 4-foot 8-inch window opening on the east side, neither of which are original. Their construction and reinforcement are roughly done, with little concern for finish or appearance. On the west side, an original 3 by 6-foot doorway that provided the only access to the vault from the Front Offices. The concrete foundation is exposed on three sides where it is obvious that the surrounding fill has been removed some time ago. The southwest foundation corner of the structure is exposed just over 7 feet from the ground level to bottom of the first course of stone. It is likely that most of the vault's foundation is exposed on the south and east sides. The foundation itself is of a curious design because it was left open at the rear (west) side of the building (Figure 30). The 3 by 5-foot corridor through the center of the foundation contains a 2-foot-high iron framework constructed of standard and narrow gauge rail. Its function was part of a conveyor system installed in the 1950s by the Basic Chemical Co. to move crushed marble from the Front Offices area into trucks for transportation to market.

The Front Offices building and Shop 1 can be considered together in terms of current conditions. The area occupied by these two structures is no longer historically definitive given the large amount of recent disturbance. There is but one visible portion of the south foundation wall, (feature OF1 indicated on Figure 31). A substantial amount of structural debris consisting of marble blocks, concrete, and wood from these buildings was pushed by bulldozer to the south side of the area The rear of the vault is the east boundary of this area, the edge of the ice skating rink is close to the north boundary, and the west boundary is the first machine base in the Mill A area, 193 feet from the rear wall of the vault. Most of the area has been leveled by bulldozer, probably at the time the ice rink was constructed. The surface here is embedded with structural debris, charcoal, and small artifacts. An artifact dump west of the leveled area contains wire rope, sizing screen, wooden structural debris, and a partly destroyed, rectangular bin that was matched to a similar bin in an historic photograph of the quarry floor. In the photo, the bin was being used as a trash receptacle. The marble firewall that stood between Shops 1 and 2 is gone, and its foundation is not visible. Of the machines formally situated in Shop 1, there is but one footing of a rubbing machine that is intact and barely visible above ground (Figure 32). This is the only remaining visible feature of Shop 1. A 1918 photograph shows an operator near one of the rubbing machines in Shop 1 with the marble firewall visible in the background (Figure 33).

Mill A is just west of the Shop 1/Front Offices leveled area described above. Its eastern boundary begins at feature S1.1 (Figure 34). The northern boundary is the mill building's north foundation wall, which is not visible above ground. Its southern boundary is defined by the hard concrete edge of the machine floor. This edge is not the mill building's south foundation wall, however, which is visible as an earth and stone berm with a soft edge. The western boundary is defined by the edge of the concrete floor that separates Mill A from Shop 2. As Mill A was constructed within Shop 2, there was no structural wall separating the two spaces; however, historic photos show that there may have been a plank wall separator. The overall dimensions of Mill A are approximately 124 by 50 feet.

The remains of Mill A consists of eight 6½ by 8½-foot concrete machine bases and one 7½ by 8-foot machine base on the south side; eight gang saw beds of various dimensions, approximately 20 by 10 feet on the north side; and one 12½-foot-wide area of collapsed concrete floor between these features (Figure 35). The eight similar machine bases on the south side of the mill each mounted a belt drive/fly wheel combination for driving a gang saw across from it on the north side. These bases have a similar bolt mounting pattern, but are different in their concrete structure. The difference is in color, aggregate, and texture, indicating that two were poured at different times than the other six. The six light grey ones are likely original installations, whereas the two light tan bases may have replaced earlier mounts. It is not certain when these replacements were made, but they also

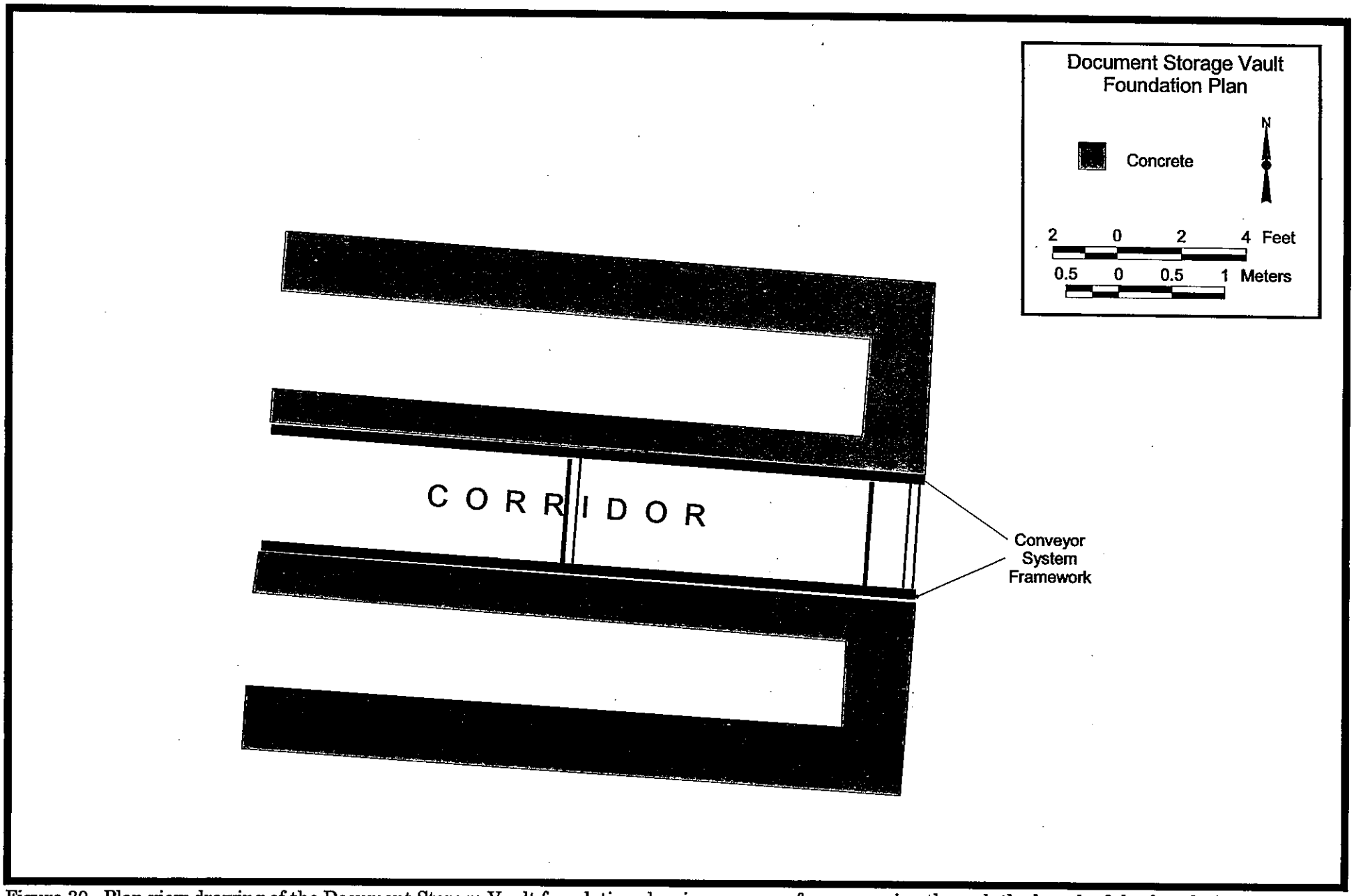

Figure 30. Plan view drawing of the Document Storage Vault foundation showing conveyor frame running through the length of the foundation.

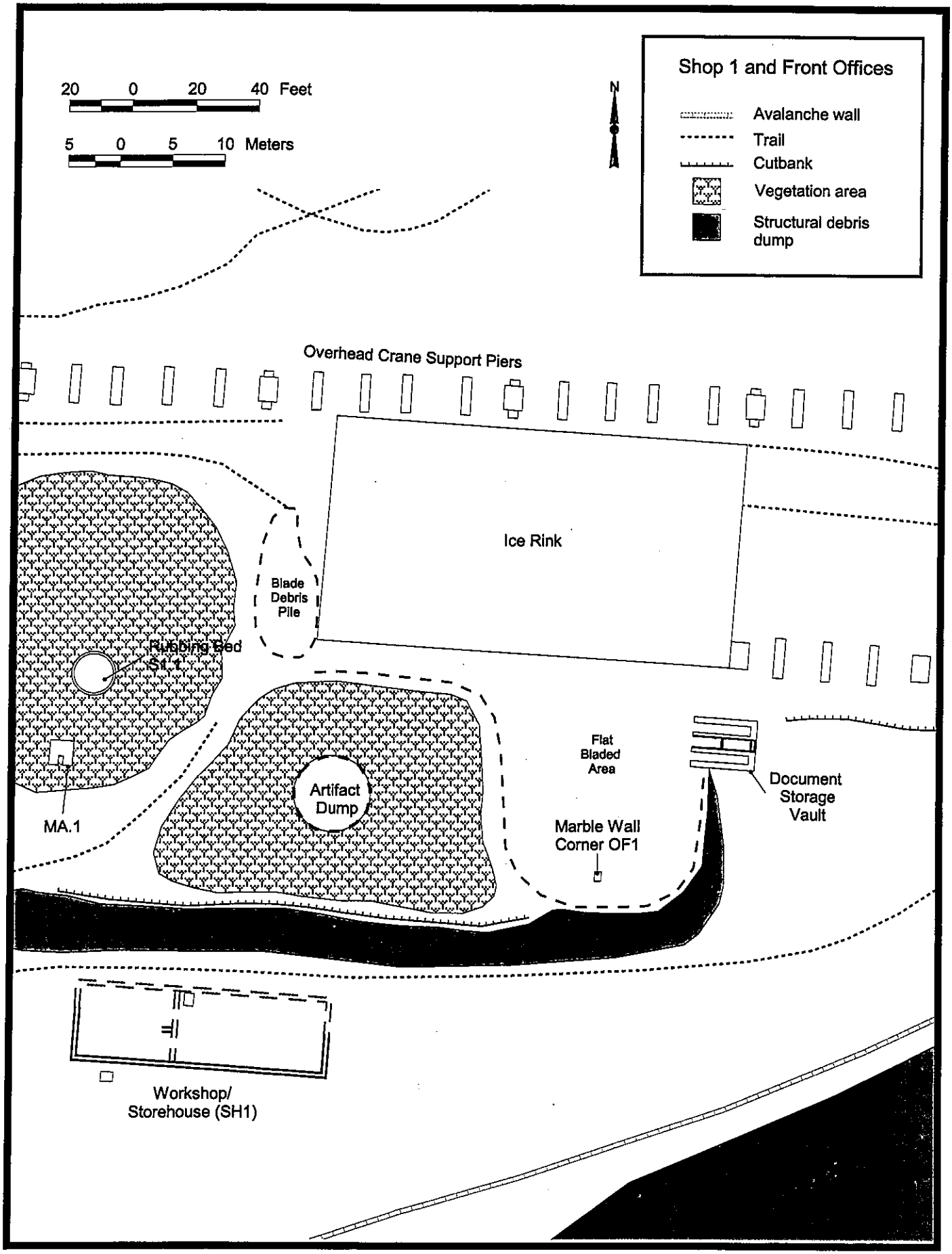

Figure 31. Plan view drawing of the Shop 1 and Front Offices area.

Figure 32. Ephemeral remains of a rubbing bed adjacent to Mill A are the only intact visible feature of Shop 1. Photo looking northeast.

Figure 33. 1918 photograph of one of the three rubbing machines in Shop 1 *(Marble Historical Society collection, from McCollum 1993:81).*

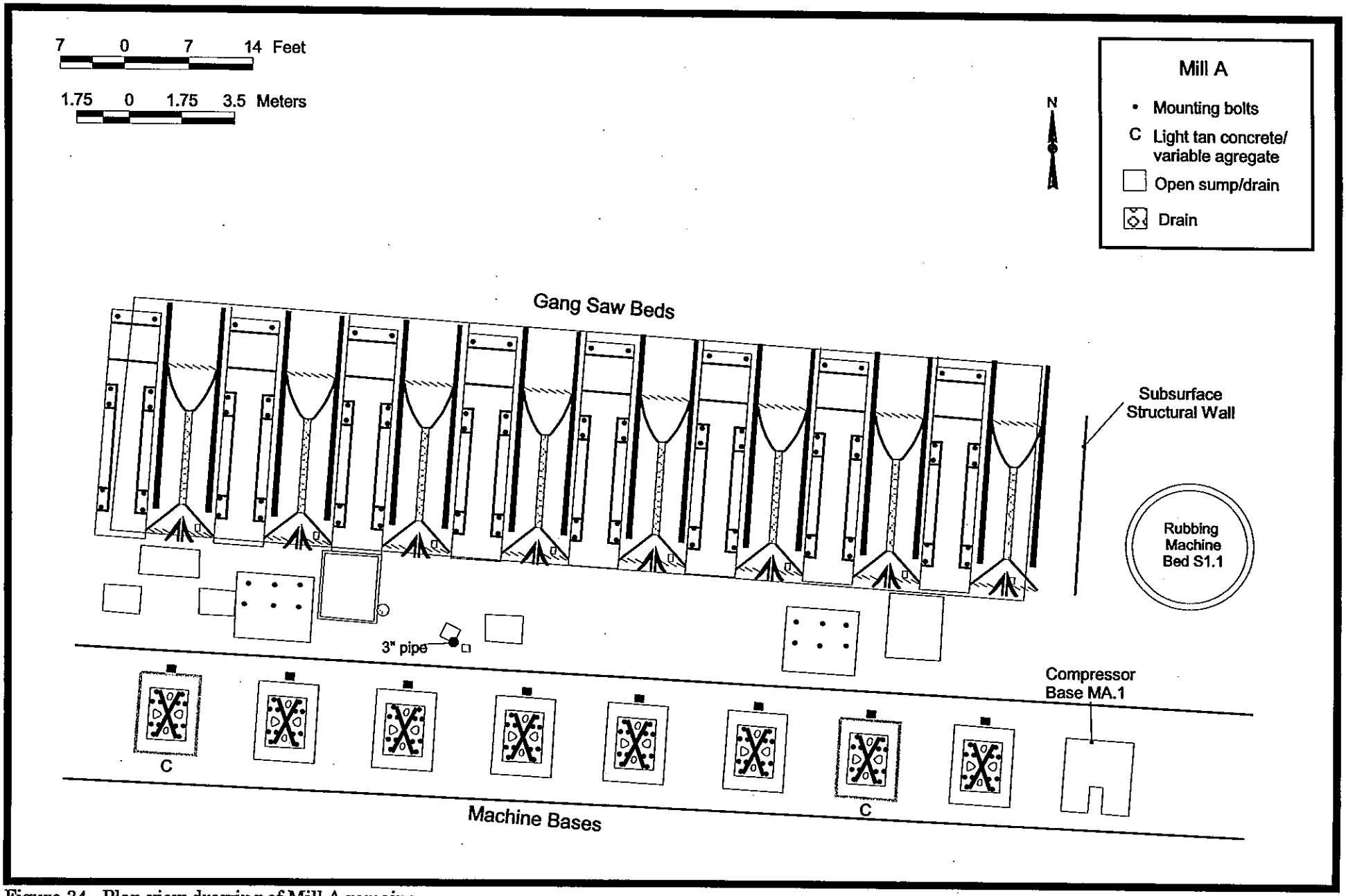

Figure 34. Plan view drawing of Mill A remains.

correspond with color differences in the concrete material of the saw beds across from them. The bases are in line from east to west and spaced approximately 8 feet apart. The last machine base on the east end of the line, the ninth one, is dissimilar to the others. A ca.1913 Sanborn Fire Insurance map shows an air compressor at the spot, and the last machine base may have been its mount.

The saw beds on the north side of the mill are identical in length, but vary in width. All are filled with organic material, wood debris, and artifacts such as hose, tin, pieces of saw blades, and the dogs that held each blade in place. The beds are pitched toward the center from all four sides where exploratory excavation revealed a 4-inch-wide by 10-foot-long iron drain strip at the bottom center (Figure 36). The purpose of this design was to collect and channel the cutting slurry that dripped down over the work piece in the saw. The slurry consisted of iron filings and quartz sand, which was dragged along the work piece by the back-and-forth swing action of the 1/8-inch-thick by 4-inch-wide, 10-foot-long saw blades. Historic photos show up to 28 of these blades were mounted on each saw (Figure 37). The slurry from all the saws was collected in sumps in the subfloor area between the machine bases and the saw beds. From there, it was pumped back up above the saws and was recirculated. The standard gauge rails embedded along the lengths of the saw beds are missing in all of them, but their locations are clearly defined in the concrete. The mounting bolt patterns and locations of the saws' iron beam frameworks are also apparent on the concrete. Figure 38 illustrates these details.

The concrete saw beds and the floor area between the saws and the machine bases are coated with a layer of hard reddish-brown material that strongly resembles rust (oxidized iron). At first glance, it seems that the concrete may have been coated in metal, but the characteristic of the material is such that it has the texture and consistency of stone. When broken, the cross section of the material is clearly identified by eye as having an iron content, but the iron is suspended within another hard substance. This material is most likely the hardened, solidified, and oxidized cutting slurry described above, consisting of iron filings and quartz sand. Most of the machine beds on the site contain some quantity of this material.

The floor area between the machine bases and the saw beds contains terra-cotta circular floor drain pipes of various dimensions, large and small rectangular sumps, and two 7 by 8-foot concrete mounting bases with identical mounting bolt patterns of six bolts. The purpose of these bases is unknown; however, it is suspected that they may have been structural. The concrete floor is broken and collapsed in most places, revealing the subfloor below. It appears that the upper floor was slanted from all directions toward the central floor drains, designed for channeling water and cutting slurry for recirculation over the saw beds.

Interpretive Potential of the Document Storage Vault, the Front Offices and Shop 1

As the only remaining standing structure of the mill itself, the Document Storage Vault is an important aspect of the site's identity. It provides a visual marker of the mill's beginning point and an introduction to the scale of the place. It is unfortunate that the building is so changed from its original appearance; however, this is not to discourage its need of preservation and rehabilitation. Interpretive potential of the Front Office and Shop 1 area is virtually none because of its lack of integrity. It is difficult to even point out the building's historic structural boundaries. The damage to these structures was apparently done during the Basic Chemical Company's occupation in the 1950s. The addition of the ice rink later had a major effect on the area as well, for grading was necessary, and it appears that any concrete floors or internal structures were pushed southward or buried in fill. This reuse of the space is not historically correct, but at this point there is little that can be done to restore what has been disturbed. If the ice rink were removed, the area would still be a flat open space with little interpretive value. If it were replaced by another activity, it may be rendered more obtuse than it appears now. At this point, it is of no particular consequence if the rink remains as is. Mill A exhibits a high level of integrity both structurally and technologically. It provides an excellent opportunity to introduce the milling process at a scale that is visually

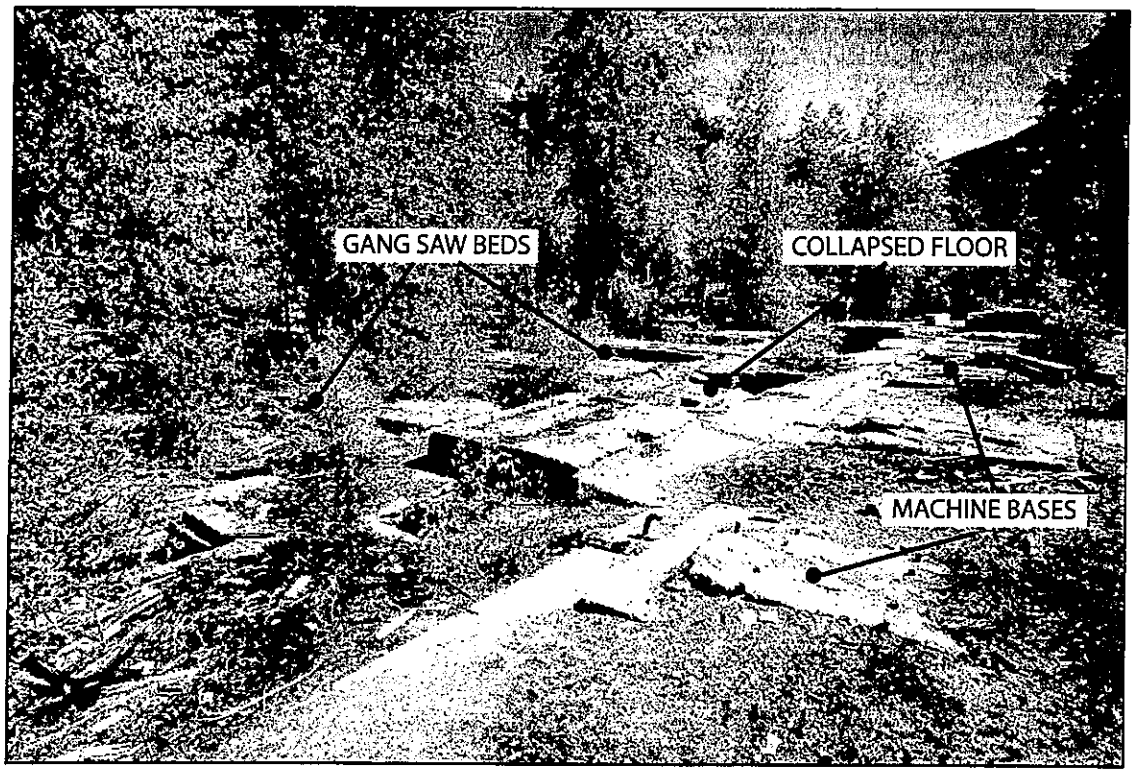

Figure 35. Overview of Mill A remains, looking east-northeast.

Figure 36. A 4 inch by 10 foot drain runs the length of each saw bed. The intact iron cover of this drain in Mill A was exposed through excavation. Photo looking north.

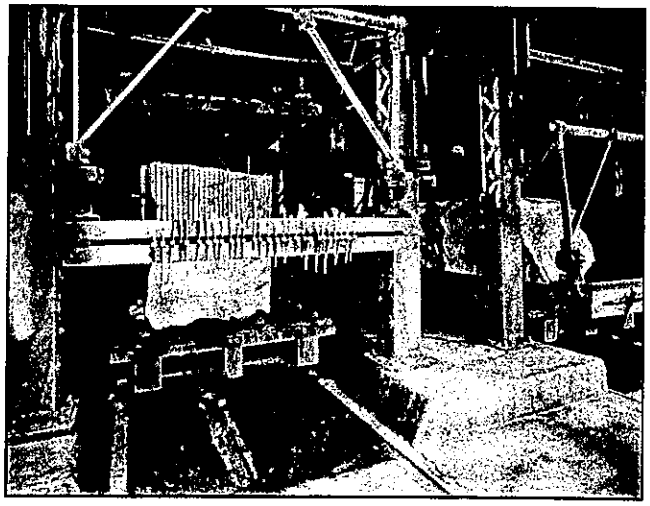

Figure 37. 1909 photograph gives an overview of a gang saw, including its bed, central drain, and the dogs that hold each blade taut. The marble block on the flatcar is sawn half way through *(Henry L. Johnson, from McCollum 1993:91).*

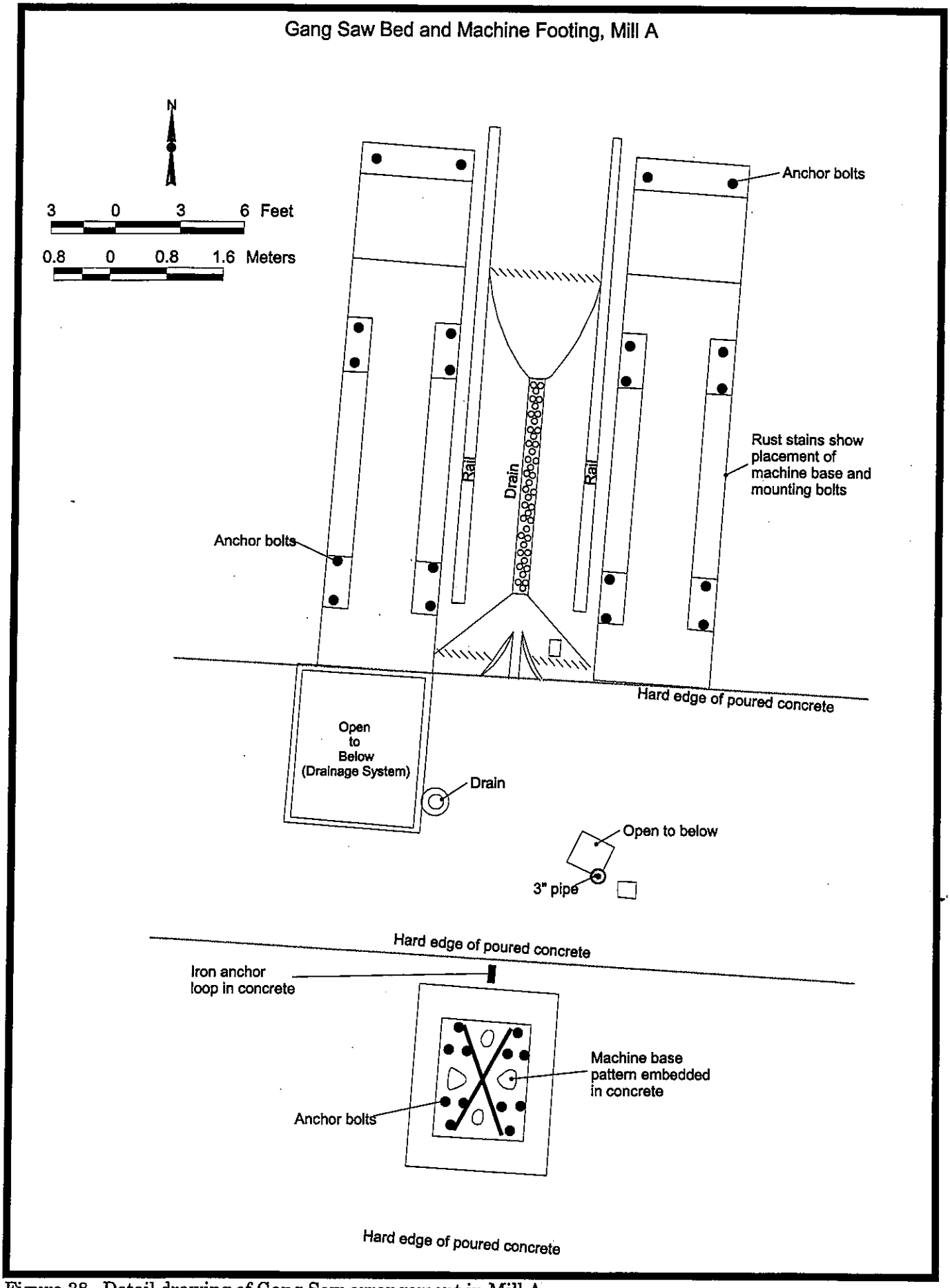

Figure 38. Detail drawing of Gang Saw arrangement in Mill A.

manageable for visitors. The gang saw remains here are practically identical to those in the much larger Mill B and are in better condition, are less hazardous, and do not require as much clean-up and maintenance of vegetation.

The following suggestions are made for interpretation of the Document Storage Vault:

1. Prepare a conservation/stabilization plan for the structure and put it into effect as soon as possible.
2. Use the vault as a place to post interpretive signage. A display of photographs of the structures and monuments throughout the country that were constructed of Yule marble might be appropriate for the vault, as the plans for these were stored there. Another appropriate display would be a detailed history of the Lincoln Memorial project, to include architectural drawings of the monument that are most likely available from the Library of Congress. Other ideas include a history of the quarries or the mill, geological facts about marble and the Yule marble deposit, and history of the people who worked and settled in Marble.

The following suggestions are made for interpretation of the Front Offices and Shop 1 area:

1. Install an interpretive sign that explains that, though the area is flat today, it was a structural part of the mill. Use historic photographs to illustrate what this part of the mill looked like and what processes took place there. Explain that the area with the different colored sand to the north is used as an ice rink.
2. Clear the vegetation from the rubbing bed adjacent to Mill A and install a sign with an historic photo that shows the rubbing machines and workers at work in Shop 1.

The following suggestions are made for interpretation of Mill A:

1. Remove the vegetation from the north side of the area to make it visible from the Stone Yard and to expose the concrete features.
2. Remove the organic material and any artifacts from the saw beds under the supervision of an archaeologist. Have the artifacts curated and perhaps displayed at the local museum.
3. Install an interpretive sign that explains the function of the mill and the gang saws. Use several historic photographs to illustrate the position and operation of the saws. Explain that the saws were taken from Mill B, which housed 22 additional saws. Show an historic photo that shows the drive mechanism that was installed on the machine bases across from each saw.
4. Fill the holes and sumps in the broken floor area with clean sand. This will improve the safety of the area for visitors and preserve the underlying elements with a distinctive soil if archaeological excavation is ever contemplated in the future.

Shop 4 and the Electric Tramway, 1910

History

The 200-foot-long stand-alone Shop 4 was also constructed during 1910 at the west end of the complex, on the north side of the Stone Yard/craneway. Both Shops 3 and 4 were specifically retooled in 1914 to handle the large stock required for preparing the 36, 7-foot-diameter columns for the Lincoln Memorial project. In 1914, Shop 4 housed three rubbing machines, one 16-foot-long, double-platten planer, one circular planer, one 18-foot-long turning lathe, one massive 26-foot-long turning lathe capable of turning 7-foot-diameter stock, and four large carborundum fluting lathes

designed and installed for the Denver Post Office project (1910). An additional 200-foot-long wire saw area was added to the east side of Shop 4 as well, bringing the entire structure to 75 by 400 feet, the largest structure of the mill (*Marble Booster*, Oct. 14, 1914). Two traveling cranes ran the length of the building to service the shop. Four interconnected air compressors were housed between the two shops used to drive 150 to 200 hand-held cutting tools. Both Shops 3 and 4 were also serviced by standard gauge rail that could pull directly into the center of them.

Another important addition came in 1910, with the completion of the electric standard gauge surface tram that ran the 4 miles between the quarries and the mill. This tram replaced the huge 110-hp steam tractor that had been doing the job for almost two years, because it was too slow to keep up with the demanding project schedule. The tram track was extended directly along the length of the Stone Yard's north side to facilitate unloading stock close to its desired place. Although the tramway was a great help to the operation, it was constructed over some very steep grades and was prone to disastrous "run aways." In fact, Colonel Meek was killed in one such accident during August 1912.

Archaeological Assessment of Shop 4

Shop 4's boundaries are difficult to discern due to the large amount of overgrowth and top soil deposit. None of its foundation wall remains are visible above ground, though its basic footprint is apparent. The western boundary of Shop 4 is the east end of the marble wall structure associated with the Coping Shop/Shop 3. The edge of the extreme slope on the north side of Shop 4 marks the approximate boundary. Fill from the driveway of a private home situated on top of the slope covers the northwest corner of Shop 4. The eastern boundary of the original shop is marked by the beginning of a marble wall running east against the northern slope. This marble wall and its 14 integrated crane piers most likely mark the expansion area of Shop 4 that occurred in 1914 for installation of a 200-foot wire saw. The exact southern boundary is unclear, but four large machine bays off of the Stone Yard leading into Shop 4 are still prominent between the concrete footings of the traveling crane (Figure 39). The overall dimensions of the original shop are approximately 214 by 76 feet. The east addition to the shop runs the length of the marble wall and measures approximately 190 by 76 feet.

Figure 39. One of four machine bays located on the south side of Shop 4. Large machines such as fluters were mounted over these. Photo looking south.

Of all of the heavy machinery once present in Shop 4, it is difficult to define their locations based on what little remains visible in the heavy overgrowth. Four large and distinctive concrete machine base areas in the shop. Exactly what machines were present at three of the four areas is unknown, but a *Marble Booster* newspaper article of October 17, 1914 gives this helpful eyewitness account:

> Entering the shop from the west end, on the left [north] side you find two of the immense lathes used in turning columns such as the Lincoln Memorial. Following on down the left side of the main aisle through the shop, you find next to the lathes a battery of fluting machines, each run with an individual 200-H.P. motor, several planers and rubbing beds and then the 4-strand wire-saw plant which has platforms for cutting fourteen immense blocks of marble at the same time. This plant is run on an individual motor also.
>
> Coming back through the shop, on the right hand [south] side, opposite the wire-saw, are tons of marble blocks ready of the wire-saw strands, next a small army of cutters, copers, and other artisans, all at work fashioning, shaping, and making ready for shipment parts of the big Lincoln Memorial. A railway track runs the full length of the shop, down the center, facilitating the movement of marble, and overhead are two electric cranes, or overhead travelers-one fifteen-ton capacity and the other of twenty-ton. The craneway runs the full 400 feet length of the shop, also.

Beginning close to the western boundary of the shop and moving east, Feature A is a flat concrete machine base approximately 10 by 25 feet that is barely discernible due to its deteriorated condition. Two 4-inch-wide flat iron bands sticking up near its south end are badly twisted. What mounted to this base is unknown. Feature B lies east of Feature A, consisting of two 7 by 10-foot T-shaped concrete pits, their associated 2-foot-diameter terra-cotta floor drains, and iron mounting plates with bolts on the east and west edges of the pits (Figure 40). A repetition of the pattern and dimensions of these features indicates that two machines were probably mounted in this area. A rough but obvious concrete floor is associated with these, but its edges are not visible due to the heavy organic fill and overgrowth. East of Feature B and in line with it is Feature C, a 28 by 10-foot badly deteriorated, concrete pit with several internal rectangular footings (Figure 40). The south end of the pit is not visible, as it is covered by large blocks of marble debris. The north and west edges are barely discernible and several of the internal concrete footings have been displaced by trees growing inside of the pit. Any concrete floor around the feature is not visible. Feature C is most likely a large concrete machine base, but it is not known what type of machine was mounted here. Finally, east of Feature C lies Feature D, an area occupied by three rubbing machine bases (Figure 40 and Figure 41). These are in line east to west. Although their pattern and 12-foot diameters are similar to the rubbing beds in Shop 2, these are different in construction. Instead of having shallow concrete bottoms at the shop floor level with wooden sides, Shop 4's rubbing beds are poured concrete pits excavated approximately 3 feet below the shop floor level. Each pit has three concrete stairs adjacent that lead into the pit from the shop floor. The stairs of all three are heavily encrusted with the solidified iron filings/sand slurry substance described earlier in Mill A. A 12-inch-diameter round drain covered by wire mesh is near the stairs on the south side of each bed.

The eastern most rubbing bed lies at the end of the original Shop 4. Although a structural wall is not apparent, it is likely that the area east of the rubbing beds is the addition made to Shop 4 in 1914 for the 200-foot-long wire saw. This area is well-defined by its north marble wall with integrated overhead crane piers (Figure 42). The east end of the shop ends at an earthen berm over which a foot trail passes. Although the ground cover is thick, there are two definite rectangular sumps in the floor near its west end. Their dimensions are obscure because they are mostly buried. The floor level of both sumps is faced with marble slabs thickly encrusted with the same hardened slurry substance found in the rubbing beds. The wire saw consisted of a single four-strand

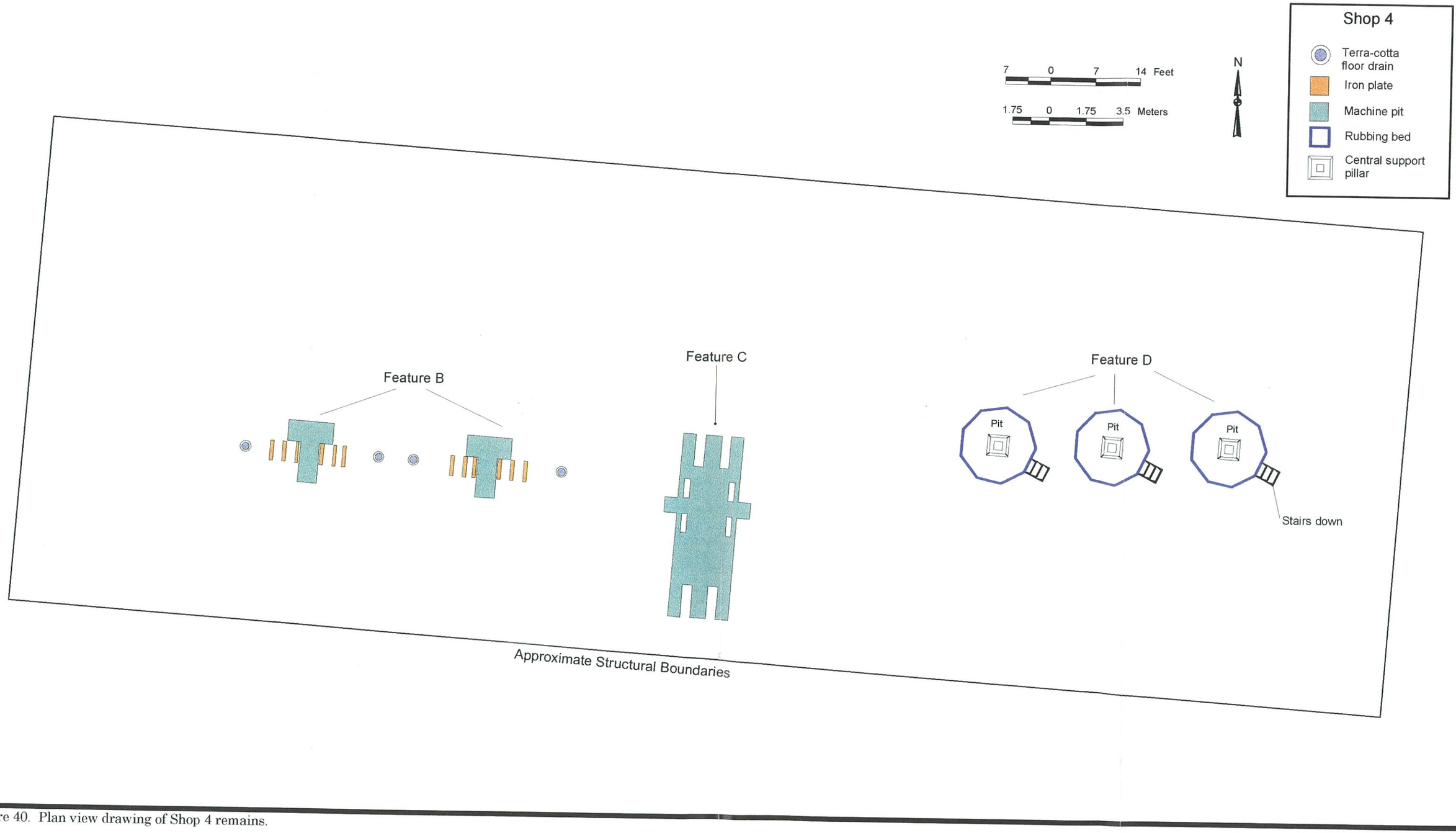

Figure 40. Plan view drawing of Shop 4 remains.

Figure 41. One of three rubbing machine bases in Shop 4, looking south-southwest. Note the stairway on left side.

Figure 42. Marble wall with integrated craneway support piers on the east end of Shop 4. Photo looking northeast.

continuous wire loop like a horizontal band saw that was moved across up to 14 blocks of marble simultaneously; it was driven by a 200-hp motor (*Marble Booster*, October 17, 1914).

Archaeological Assessment of the Electric Tramway

There is virtually no visible evidence of the tram's remains. In the mill area, the tram moved directly into the Stone Yard from the quarries. It ran the length of the Stone Yard along its north side. The present foot path along the marble piers of the Stone Yard is where the tram track was. Outside the boundaries of the mill, there has been a significant amount of change and ground

disturbance that has compromised the remains of the tram line. The tram was torn up at the same time that the mill was being scrapped in the early 1940s.

Interpretive Potential of Shop 4 and the Electric Tramway

Shop 4 was one of the structures consumed in the 1925 fire, and its area has remained open to the elements since then. Between the fire damage itself and more than 75 years of exposure, even the concrete features of the shop's floor have seriously deteriorated. From an interpretive perspective, this area is a difficult one. It has been virtually reclaimed by nature at this point, and looking across its area does not show it to be much more than a part of the natural landscape (Figure 43). This is unfortunate because the largest of the machines at the mill were housed here, and the largest and most prestigious project the mill had was carried out here. Although the shop's boundaries are obscure, they can be closely estimated on the ground. Enough visible features remain to warrant further historic and archaeological research to discern what they are and to discover others. It would help to clear this area of smaller vegetation in order to visually define its boundaries, but doing so would still not reveal the shop floor that is either buried or deteriorated. The question, then, is whether or not it is wise to disrupt the path of nature's reclamation for a limited number of interpretive features.

Figure 43. The visual boundaries of Shop 4 are difficult to discern due to its advanced state of natural reclamation. Photo looking west.

The tramway has fewer visible remains than Shop 4. Beyond locating where it ran by using terrain association and historic maps and conducting some test excavation for finding ties and artifacts in the Stone Yard area, there are no other obvious remains for interpretation.

The following suggestions are made for interpretation of Shop 4:

1. Conduct further archaeological and historical study to find out more about the remains of the shop. Limited excavations can determine the actual extent of the shop's boundaries, the placement of the central tramway rails, and the condition of other ephemeral concrete features. A sound archaeological map can also be developed at the same time. Historical research can reveal more exact information about each of the large tools that occupied the shop so that they can be placed by dimension or association with the actual remains. These are important first steps that will determine the potential for further interpretive development, ranging from removing a limited amount of vegetation to completely exposing the area.
2. A limited interpretation presents the area for what it is: the former Shop 4 that was first burned and then reclaimed by nature over more than 75 years. Signage can give the history of the shop with historic photos of it to illustrate the details of the massive tools and all of the people that worked there. Visitors can be informed that the natural reclamation process is well underway and that what little remains of the shop does not warrant interrupting this process. Ground surface organic material and small brush may be removed to give the features more visual definition.
3. Develop a single foot path through the area that passes by the concrete features described above. Encourage visitors to stay on the path. Add signage at each of feature as more evidence is discovered about what they are and how they worked.

The following suggestions are made for interpretation of the Electric Tramway:

1. Install signage in the Stone Yard's footpath that actually runs along the location of the tramway track. Tell visitors that they are standing on the tramway and show a photograph. Use a location map to show the path of the tramway between the quarry and the mill. This sign can tell the importance of transportation to the development of the quarry and mill and illustrate with photos the different methods used before the tramway was built: horse and wagon teams, a large steam tractor, and then the tramway. Tell also of the run away train accidents that cost many people their lives, including Colonel Meek who had the tramway built.

Ancillary Structures and Internal Firewalls, 1912

History

Business was booming when, in March 1912, an early morning avalanche destroyed Shop 1, some of Shop 3, and the east end of the overhead craneway. Reconstruction began immediately, and the mill was running again within months. Three marble firewalls were installed between the shops and mills during 1911-1912. The purpose of these was to prevent a fire from spreading from one part of the mill into the next. They were designed to extend above the roofline to also prevent fire from crossing from one roof to another. Marble was used for the firewalls, not only because of its abundance, but because of its fireproof qualities. A 1903 mill fire in New Jersey demonstrated that granite firewalls would crumble in the face of intense heat, while marble walls remained intact and unaffected (Vandenbusche and Myers 1970:41). An electric powerhouse and its associated steam plant were also put up in 1912 on the east end of the complex, near the railroad engine house to the east of the mill. The purpose of the new plant was to provide the mill with coal-fired steam power for electrical generation during periods when the Crystal River was low or frozen and could not adequately turn the water wheels at the two other power houses. Other ancillary structures added by 1912 were the marble Oil House and the drafting rooms complex on the northeast side of the works. A warehouse near the blacksmith's shop on the south side of the mill was destroyed by the

avalanche but not replaced. The remains of this structure are fully described in the previous Ancillary Structure section.

Archaeological Assessment of Ancillary Structures and the Oil House

As described in the previous section concerning earlier ancillary structures, the east end of the historic complex within the project boundaries has undergone a great deal of change and disturbance. The remains of the powerhouse are no longer extant; however the marble foundation of the steam plant is intact and prominent. This large foundation is up to 6 feet high in many places and measures approximately 100 by 40 feet. Its interior is filled to the top of the foundation walls, indicating that a concrete floor was constructed above ground level to leave enough space for a basement or crawl space for running and servicing pipes. Overall, the interior is heavily overgrown to the point of completely obscuring any potential floor features. Only one large machine pit is obvious within the entire structure. Just south of the southwest corner of the foundation, between the structure and the river bank, is an associated feature, a 15-foot-diameter marble-lined circular well. Although piping is not evident here, it is likely that the well was the water source for the steam plant.

The remains of the wood frame drafting room structures are on the northeast side of the mill (Figure 3). Several depressions give a moderate sense of structural boundaries, but no foundations are visible. Cut stone, small marble blocks, and artifacts such as tin, electrical insulators, and a few cans provide further evidence of occupation in this area. Little more can be discerned about the remains of these structures without further archaeological research.

The 30 by 24-foot, 18-foot-tall Oil House is fully intact and in excellent repair. It is used by an individual who is involved with the current marble quarry operations. Today it is electrified, has a stove installed, and is closed and locked most of the time. The building is constructed of smooth-faced, large marble stone blocks with a wood and sheet metal gable roof and a concrete floor. An 8 by 8-foot double door entrance is on the south side, and there are no windows. Historically, the building functioned as its name indicates, for the storage of combustibles in a fireproof building a good distance from the wood frame mill to prevent fires in the mill. Unfortunately, though, not all combustible materials were stored in the Oil House when 40 barrels of oil contained inside the mill heartily added to the blaze that started in Shop 3 and destroyed Mill B in 1925.

Archaeological Assessment of the Internal Firewalls

Of the three internal firewalls constructed, two remain. The firewall between Shop 1 and Shop 2/Mill A is missing, and none of its remnants are visible above ground. It is likely that the marble wall was ground up in the 1950s along with most of the marble in the Stone Yard. The firewall between the west end of Shop 2 and Mill B still stands, though it has partly collapsed (Figure 44). The continuous length of the still-standing portion measures 60 feet in length, including the doorway, and is approximately 20 feet high at its tallest point. Most of the stone from the north end of the wall has fallen eastward into Shop 2, whereas the stone from the south end of the wall has fallen westward into Mill B. This indicates that the collapses took place at different times. In an interview with Oscar McCollum, he suspected that the collapse was probably caused by severe winds that run through the valley. While a good portion of the wall has collapsed, the remainder is straight and appears stable. Almost the entire portion of the wall on the south side of the iron door frame has collapsed into Mill B, whereas several stone courses above the doorway and those north of the doorway are intact.

The second firewall stands at the west end of Mill B, separating it from the Coping Shop/Shop 3 area. The wall is almost completely intact as far as its approximate 30-foot height, but has been shorn off in length on both its north and south ends (Figure 45). The wall is also straight and apparently stable, having indeed survived a major mill fire in 1925. Although the wall has no

Figure 44. Although partially collapsed, Firewall No. 1 between Shop 2 and Mill B appears stable. Photo looking south-southwest.

Figure 45. Firewall No. 2 between Mill B and the Coping Shop is at its original height and appears stable. Photo looking east.

appearance of fire damage itself, both buildings on either side of it burned down. The stability of the doorway at the very south end of the wall is questionable. Only two courses of marble block on the south side of the opening provide support for the stone courses above the doorway (Figure 46). The south foundation wall of Mill B is missing in this area, appearing as if it has been removed. This activity may have also taken the south end of the firewall away as well, leaving it in its current condition. The blocks and mortar that remain appears to be stable; however, the ground below it will continue to erode over time if it is not stabilized, and the support will likely give out, causing the doorway and part of the wall to collapse. This could be a serious safety issue that should be addressed.

Interpretive Potential of Ancillary Structures and Internal Firewalls

Few features and structures have any remains or integrity on the east end of the mill site except for the Steam Plant foundation and the Oil House. These have a high level of integrity and are in excellent condition. Both are constructed of marble, which adds to their visual and interpretive appeal for visitors. It is important that these structures be well-maintained and interpreted to provide a visual scale for the east boundary of the works. The same ideas apply to the two firewalls that also exhibit a high level of integrity and stability. Even the collapsed material of the eastern firewall remains intact in the way that it fell from the top of the wall. These provide important interpretive visual references for helping visitors understand the boundaries of where in the building remains they are standing as they tour the mill ruins.

Figure 46. The stability of the doorway in the Firewall No. 2 is questionable due to foundation alteration and erosion. Photo looking west-southwest.

The following suggestions are made for interpretation of the Steam Plant foundation:

1. Prepare a conservation/stabilization plan for the structure and put it into effect as soon as possible. This may require the help of professional historic conservationists.
2. Conduct further archaeological investigation of both the inside and outside area of the foundation in order to discover more about its function and internal features. This would include excavations in selected areas and preparation of a map. The results will help determine what directions to take for interpretive treatment.
3. Remove most vegetation from around and inside the foundation walls. It is not necessary to remove all of the vegetation unless significant features with interpretive potential are discovered or unless it is causing structural deterioration.
4. Install signage that tells about the Steam Plant and how water power was turned into electrical power for running the machinery at the mill. Many historic photos are available on this topic. This foundation provides and excellent opportunity to describe an essential aspect of the mill's infrastructure: power generation.

The following suggestions are made for interpretation of the Oil House:

1. Prepare a conservation/stabilization plan for the structure and put it into effect as soon as possible. This may require the help of professional historic conservationists.
2. Install signage outside of the structure to tell its function and show its location on a site map. This would be a good opportunity to tell about the so-called fireproof features of the mill with its extant features like the Document Storage Vault and the internal firewalls. It would also make the best segue into the telling about the fire of 1925 that proved all of the fireproofing to be worthless, especially when 40 barrels of oil were stored in Mill B and not in the Oil House after all– although the marble construction of the firewalls demonstrated its resilience to fire by its unaltered condition.

The following suggestions are made for interpretation of the Internal Firewalls:

1. Prepare a conservation/stabilization plan for the firewalls and put it into effect as soon as possible. This may take the help of professional historic conservationists.
2. Install signage that tells about the purpose of the wall and shows historic photographs of the mill with the firewalls intact. Use a site map to show where the walls are situated. Use the opportunity to tell about the fire of 1925 using historic photographs. Three signs can tell the whole story of the fire. A sign at the Oil House can tell the methods of fireproofing and then introduce the fire, and signs at both firewalls can tell the story of the fire and its devastation to the mill.
3. It would be most beneficial to get professional advice and an opinion about its stability and safety of the south ground support under the doorway pillar of the west firewall.

The Avalanche Wall and Stone Yard Roof, 1915-1917

History

The Lincoln Memorial project was awarded to the company in 1914 and took two years to complete, nonetheless ahead of schedule. Two major structural additions were made to the works during this time beside the retooling of Shops 3 and 4 noted previously. In 1915, a massive marble avalanche wall was completed along the northern bank of the Crystal River. Although it was 50 feet above the river's surface and ran the length of the mill, it was necessary to add another 15 feet to its height in 1916 for it to be completely effective. A massive metal roof was constructed over the west end of the Stone Yard and overhead crane beginning in 1915. When it was expanded in 1917, it was finally 800 feet long and 70 feet wide (Figure 47).

Following the completion of the Lincoln Memorial project, the Colorado-Yule Marble Co. was ordered into receivership in 1916. With payment on its original 1907 10-year bond financing due along with recent mortgages, the company was seriously overextended. The finishing mill had reached its maximum development at this point and only decreased in size over the next two decades. By 1917, the mill had reached a total length of 1,430 feet, a little over a quarter mile. All of the buildings together totaled 150,000 square feet of floor space. Seven overhead cranes were present throughout the works, the largest of which could handle up to 12½-ton blocks.

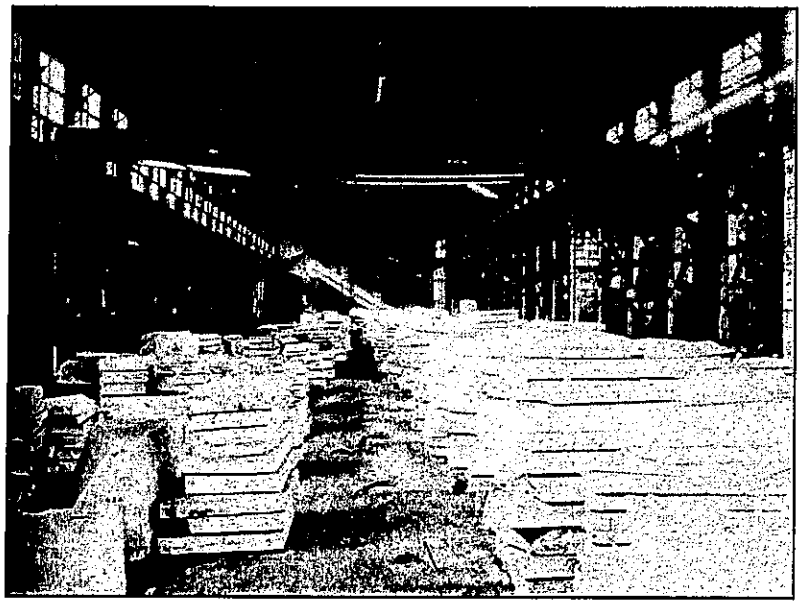

Figure 47. 1915 historic view of the Stone Yard that was covered by a massive 800-foot-long roof. Photo looking west. *(Henry L. Johnson, from McCollum 1993:135).*

Archaeological Assessment of the Avalanche Wall

Historic photographs show that the Avalanche Wall along the north bank of the Crystal River was not freestanding, but rather was a built up against the river's bank by dumping waste marble directly from tram cars from the quarries. A special spur was constructed along the bank of the river specifically for this purpose. When the bank was sufficiently covered, the lip of the bank was lined with massive blocks lifted from the tram cars by crane, giving the wall a terrific height and stature that was able to withstand the blows of avalanche after avalanche. Today a foot trail that is used by many visitors stretches along and on top of the wall's remains. Much of the massive amount of marble used in constructing the wall still remains, giving it a high degree of integrity and interpretive value.

Archaeological Assessment of the Stone Yard Roof

Nothing remains of the impressive 800-foot-long roof but many historic photos. It was one of the structures that was compromised in the fire of 1925. It did not completely collapse and was left standing until the mill was scrapped in the early 1940s. On its north side, Shop 4 was destroyed, as were Mill B and Shop 3 on its south side.

Interpretive Potential of the Avalanche Wall and Stone Yard Roof

The area between the south side of the mill and the bank of the Crystal River has been largely reclaimed by nature (Figure 48). Cultural remains primarily consist of large chunks of concrete and marble debris. The rail grades and structures that populated this area are, for the most part, ephemeral. A foot trail follows the rail grades close to the mill, and another follows along the avalanche wall. This area apparently gets considerable visitor use for walking and enjoying the river. The avalanche wall is the only prominent remaining mill feature in this area, and it is a major visitor attraction. It is yet another important visual marker for the mill that defines its southern boundary and provides a sense of the scale of the operation that took place within mill structures that no longer exist. The wall obviously provides the opportunity to tell about the avalanche that destroyed part of the mill in 1912 and how the threat was overcome for the future by constructing the wall.

Figure 48. The area between the south side of the mill and the bank of the Crystal River has been largely reclaimed by nature. Photo looking south-southwest.

The Stone Yard roof cannot be identified in terms of physical remains; however, it was a large visual component of the mill's roofline until it was torn down. It is advisable to describe the roof and show photographs of both its inside and how it looked as part of the mill's roofline. This can easily be accomplished while telling about the Stone Yard itself.

The following suggestions are made for interpretation of the Avalanche Wall:

1. Install signage along the path that leads from the parking area to the wall that tells about the avalanche of 1912 and the construction of the wall. Use historic photographs for illustrating the story.
2. Regularly inspect the path along the wall for integrity and safety issues that may arise.

The following suggestions are made for interpretation of the Stone Yard Roof:

1. Present the visual and practical aspects of the roof as part of the signage that describes the Stone Yard. Use historic photographs to illustrate just how massive it was. It could also be done as a separate sign farther along the Stone Yard path.

Fire of 1925 and Mill Closing, 1925-1943

History

The company survived the next two decades (1920-1940) with much difficulty. The only major event that reshaped the physical plant was a devastating fire in 1925 that began in Shop 3 and spread most of the way through adjacent Mill B, as well as the Stone Yard's massive roof. These structures and machinery were consumed and not rebuilt (Figure 49). A 1940 plan of the mill site shows that Shop 3, Mill B, and Shop 4 were no longer operating or standing, indicating that Shop 4

may have also been consumed by the fire (Figure 50). The company was fortunate enough to have some work throughout the Depression, mostly small contracts for monuments and tombstones, but did set yet another milestone in 1928 for the largest single block of marble to be quarried up to that time for the Tomb of the Unknown Soldier. The huge mill finally closed its doors exactly one week before the December 7, 1941 bombing of Pearl Harbor, marking the beginning of the Second World War for the United States. The entire mill and its machinery was sold and scrapped between 1942 and 1943.

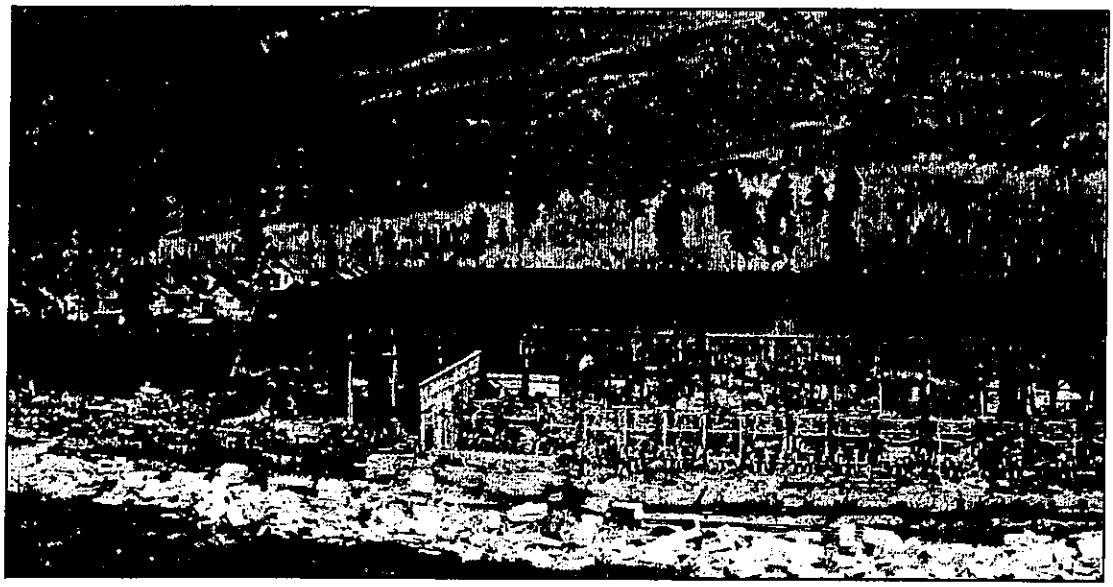

Figure 49. A devastating fire in 1925 began in Shop 3 and spread most of the way through adjacent Mill B, Shop 4, and the Stone Yard's massive roof. These structures and machinery were consumed and were not rebuilt. Photo looking north *(Henry L. Johnson, from McCollum 1993:136).*

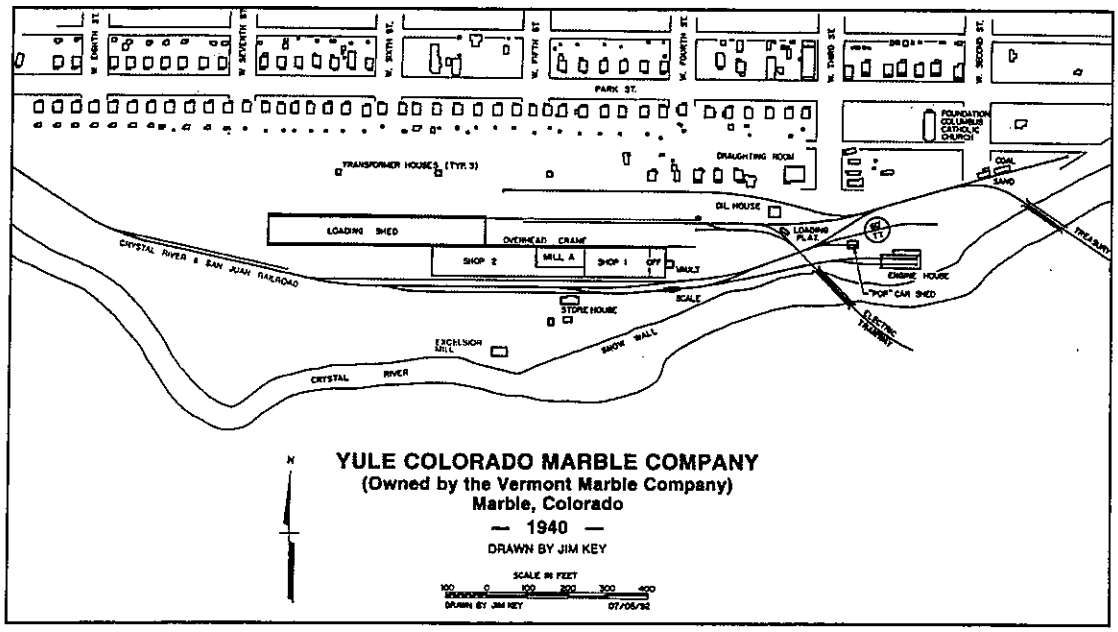

Figure 50. Site plan of the mill complex in 1940 just before its final closing in 1941. Note that Shop 3 and Shop 4 are missing due to the 1925 fire *(from McCollum 1993:150).*

Interpretive Potential of the Fire of 1925 and the Mill Closing

Refer to the previous sections about the internal firewalls and the Oil House for suggestions on presenting the history of the fire through associated artifacts. The period of time after the fire until the mill closing is not easily characterized through artifacts or remains, primarily because this was a slow unpredictable period that was not defined by structural additions or technological improvements on the ground. What better defines these years are the few major projects that were accomplished, such as the Tomb of the Unknown Soldier. These projects, along with the mill's economic struggle of that period, should be interpreted with its own signage in the Stone Yard or at the end of the self-guided tour path so that people leave with knowledge of what historic events brought the final demise of the mill, even though millions of tons of marble were available in the quarries above Yule Creek.

Technological Change at the Colorado-Yule Finishing Mill

History

The basic technological processes at the Colorado-Yule finishing mill changed little over its 35 years of operation. Mill expansions were necessary to accommodate project demands for handling larger stock and a larger scale of production. The growth of the mill itself did not necessarily reflect technological change as much as a repetition of current technologies; in other words, more identical machines were added in order to output more work, or larger ones of identical technology were installed to handle larger stock as called for by a project. The mill saw a relatively short and intensive expansion period between 1905 and 1915, by which time the boom period was reaching its end. This decade represents but one-third of the mill's standing history; the other two-thirds were characterized by a period of technological stasis in a diminished economy and scale of production at the mill. Little work was available for too many machines after 1916, and, therefore, there was no reason to update them.

These two points are supported by archaeological evidence in Mills A and B (Figure 3). Eight machine bases and gang saw beds are present in Mill A, and 22 similar features are present in Mill B. Mill A was constructed in 1910, and Mill B was added in 1907 to accommodate the Cuyahoga County Courthouse project. The machine bases in these two areas are not identical, in that their bolt patterns differ, but their overall dimensions, set-up, and placement are virtually the same. This indicates a repeated use of the same technology during a period of expansion. Evidence of the second point is found in the variations among the bases of both mill areas in three aspects: 1) their concrete material, 2) their size, and 3) their present condition. The majority of bases in both mills are of concrete that is similar in color, advanced state of deteriorated, aggregate consistency/material, and in overall size (Figure 15). It is not difficult to conclude that these were probably all poured at the same time. Similarly, a smaller number of bases share these same characteristics among themselves, yet are distinct from the other set of bases in the following respects: their concrete and aggregate is different, they have much more integrity, and they are larger in all dimensions. These bases also appear to have been poured at the same time, but their condition shows that they are more recent than the other set. In most cases, the saw beds directly across from the bases are of the same concrete material and in the same condition as the bases themselves. This evidence indicates two possibilities: 1) that when older, original equipment broke down, it was replaced with similar newer equipment, or that 2) if an updated or larger piece of equipment was needed, it was integrated by replacing an older one on the line.

Interpretive Potential of Technological Change

Archaeological and historic evidence show that the technological aspects of the milling operation were established during an intensive period of expansion and prosperity. The same technologies were used for the rest of the mill's productive history. The mill's expansion is best explained as operational growth in the scale of production as opposed to the result of technological

change. Technological change was probably thwarted after the expansion period (1905-1917) because of the company's indebtedness together with a drastic fall off of the demand for marble. When about half of the mill was destroyed by fire in 1925, the company did not rebuild much of the destroyed portion, nor did they expand again. The differences in machine base materials found in both Mill A and B can be used to illustrate that the milling operations were carried out with the same technologies over the standing history of the mill, and to show that older machines where probably replaced by similar ones.

Project Summary and Overall Interpretive Suggestions

The archaeological evaluation of the Colorado-Yule Marble Company finishing mill site was conducted for the Marble Historic Society through a State of Colorado Archaeological Assessment Grant No. 2003-AS-005. The goals of the research were threefold: 1) to identify and describe cultural resources within the project boundaries owned by the Town of Marble with particular attention to the mill area, 2) to evaluate the interpretive potential of the resources, and 3) to make suggestions for future interpretive development of the resources and of the site.

Field work consisted of comparing historic information in the way of maps, photographs, and secondary source material with actual remains on the ground insofar as was possible. Identified features were recorded on an archaeological site map created by combining GPS data with hand measurements and several scaled detail drawings of key features. Photographs were taken, and features were described. Historic research and comparative analysis continued after the field work in order to develop a specific technological understanding of the remains through their historic context, spatial arrangement, and chronological appearance at the mill. Because the mill was such a large-scale industrial facility, known in fact as the largest marble finishing mill in the world during its time, the size of site itself and the number of features requiring identification and recording were substantial.

Specific concentration was placed on the mill area and its immediate surroundings. Only two small ancillary structures still stand while the mill structures themselves are gone. Surprisingly little structural and technological debris is present across the site, considering its massive size and that it was standing and operational as late as 1941. Virtually all metal appliances and machinery, including structural and mounting hardware, railroad rails, and electrical wire, have been removed. What remains of the mill are its most permanent and difficult to remove features that are also the least valuable in terms of resale. These are its concrete shop floors, machine mounting bases, subfloor plumbing areas, and structural foundations. The remains endured a massive mill fire in 1925, between 50 and 75 years of vegetative growth and environmental exposure, and a great deal of human disturbance. The overall condition of the site indicates that it is in an advanced state of natural reclamation. Trees, small vegetation, soil accumulation, and organic deposition have buried, deteriorated, and damaged most of what remains.

Given these conditions, however, our research shows that most areas of the mill site have enough integrity to determine virtually all structural boundaries, the placement of specific machines, and a strong sense of the overall technological processes that took place in most areas of the mill. With the aid of historical resources such as maps, photographs, and documents, an accurate interpretation of what remains and what is missing is possible. The historical significance of the site has long been established with its listing on the National Register of Historic Places in 1976. Public interest in the place began before its national historic recognition, though, and since then thousands of visitors have passed through the site to take in its history and landscape. An estimated 5,000 people visit the mill site annually in recent times, according to Marble's Mayor Protempore Wayne Brown. The local community has expressed intimate interest and dedication to the site through its long-standing historical society and by the reuse of parts of the site as an outdoor movie theater, stage, picnic area, and ice rink for winter sport. The initiation of this report by the Marble

community is a further step toward a more thorough and organized effort to preserve and present the site to future visitors.

The findings of this report were presented in a way to provide comparative analysis of as many identified features as possible, followed by specific interpretive suggestions. These include the following: considerations for visitor safety, preservation of the resources, protection of the natural environment, and specific attention to the historical, archaeological, technological, and social contexts of the features themselves. The goal of the recommendations is to present a safe and less chaotic environment that helps visitors visualize what went on at the mill, how it worked, and what historic contributions its workers made to contemporary American culture. Suggested physical alterations for interpretation of the features and natural areas will change the current landscape. It is important that such alterations are administered responsibly and on balance so that they create an overall landscape that can be easily maintained and naturally reclaimed if necessary. The site is already in an advanced state of natural reclamation, and these suggestions are not intended to freeze this process by deforesting the site in an attempt to return it to its historic state. Moderate, well-planned and properly carried out alterations will not leave a visual sense of unbalance between cultural remains and the environment, and will enhance the visual understanding and historic sense of place of the site.

The mill site presents a unique and challenging opportunity for an integrated method of interpretation. What this means is that many visitors enjoy the experience of discovering ruins on their own and appreciate a site's relationship with the natural environment. Simultaneously however, they appreciate some factual information about what they are seeing. This is opposite of the proverbial Williamsburg-style reconstruction method of interpretation or that found on many national sites with paved walkways and rooms furnished with reproductions. Many visitors like to consider the environment and to puzzle over what they are seeing before being told or guided to the next spot. The "real world" deterioration and exploration aspect of industrial sites like the mill ask visitors to use their imagination even when viewing historic photos of the area they are in. These qualities in an historic site are often appreciated. An integrated approach for the mill's interpretation is suggested because it respects these qualities of the visitor's experience, but also provides guidance and information in the way of signage that visitors can use if they choose.

Because the mill was an industrial place, it almost requires technological explanations for the best understanding, and many visitors will expect and require some structured guidance. For this reason, a self-guided interpretive "trail" is suggested (Figure 51). The idea is to provide a structure for the visitor, but not require it of those who would rather be environmentally interactive. An introductory placard or brochure stand can be installed nearby the designated parking area or at the entrance of the site, such as the document vault. This should provide a basic history of the mill and suggestions of how to conduct a self-guided visit to orient visitors. The difficulty of using brochures instead of signage is that there is the constant expense of their printing and the need for continuous replenishment. If the site interpretation depends on a brochure, then if there are no brochures out, no interpretation happens. It is preferable if the "path" is unmarked. Signage at each location can direct visitors to the next area. The path should be very simple, beginning at the document vault, going east through Shop 1 and into Mill A, then continue east through Shop 2 and through the firewall into Mill B where a barrier will inhibit entrance to the entire area. Then back through the firewall and north along the firewall to the Stone Yard, then west along the south side of the Stone Yard to the second firewall and the Coping Shop. From here, north again across the Stone Yard and into Shop 4 and finally heading back east to the beginning along the north side of the Stone Yard. After returning to the beginning, visitors can then take the trail along the avalanche wall to see the river and the warehouse foundation, or go to the Oil House and the Steam Plant on the east side of the site.

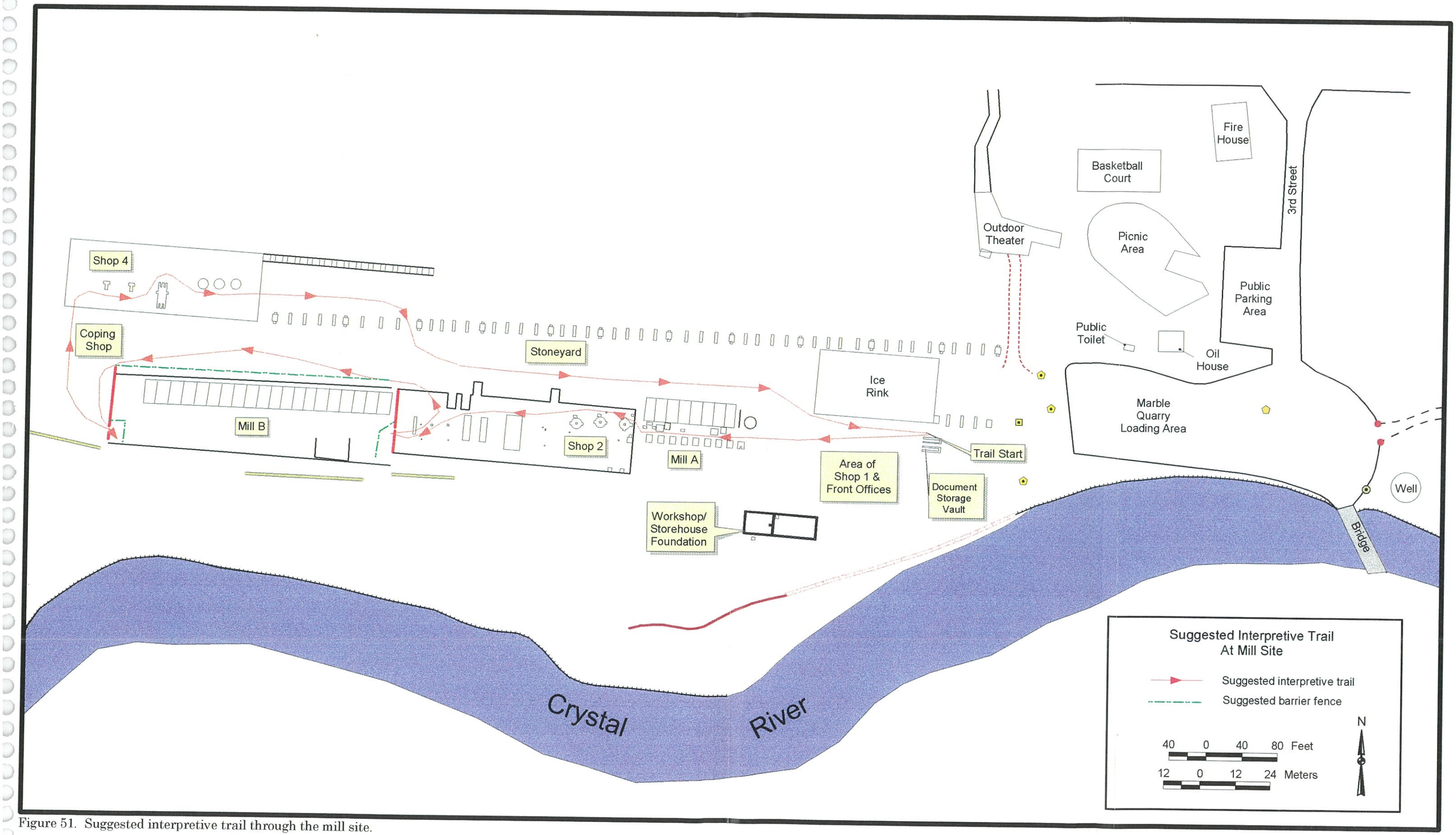

Figure 51. Suggested interpretive trail through the mill site.

An area for visitor parking should be designated on the east side of the mill site where considerable surface disturbance has already occurred. The current parking area adjacent to the fire house off of Third St. is appropriate in placement and size (Figure 3). It is not directly in front of the mill, nor is it at a distance that makes it a difficult walk for visitors. Signage is needed to direct visitors to the mill site from the parking area, however, as many who are looking for the site may mistake the RV park on the opposite side of the road as the mill site because of all the marble blocks that are displayed there. A second choice is the open area between the Oil House, the road, and the river at the east end of the site. This is the same area that is used as a loading station for the company that is currently quarrying marble. They have their trucks and skids there now, but in the future this highly disturbed area may also be used for parking. A public pit toilet was located adjacent to the Oil House. Recently, the underground tank was capped off and the building has been reused as a storage shed. If in the future there are plans for another toilet, it would be well-placed near the designated parking area.

This report provides a major step toward identifying visible components of the site within the immediate vicinity of the mill. Two areas within the project boundaries that contain both surface and subsurface historic features and artifacts were not assessed, however. The southern area between the mill and the avalanche wall has been disturbed and is mostly overgrown, but there is the strong possibility that ancillary structures not located in this survey would be found in a future survey of that area. The same applies for the area north of the mill up to Park Street. Rows of worker's housing, transformer houses, and the drafting rooms complex of structures are buried archaeological sites. Both of these areas are classified as archaeologically sensitive, and should be excluded from interpretive development until further research, including excavation, can be conducted. Information gathered from the future archaeology of the worker's housing area alone would add another very important component to the mill site's interpretation. After the area is researched, it may also be added to the interpretive trail.

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Appendix A

Colorado State Site Forms
(Limited Distribution- Under Separate Cover)

Appendix B

Historic Explanations of the Operation of Gang Saws and Rubbing Machines

1. Gang Saws

The function of the gang saws at the marble finishing mill was described in the following article from the *Marble Booster* on March 21, 1914. The information was provided to the newspaper by Harry D. Pratt, Company Superintendent and Thomas F. Burns, the Mill Superintendent, and is reprinted in McCollum 1993:123

> Mill A contained eight "gang" saws for cutting dimensional blocks for the monument shop. Mill B contained twenty-two gang saws, assigned to interior and exterior building operations. All the gangs were of the latest screw type. The two mills were about 450 feet long.
>
> A gang consisted of four upright posts, eighteen feet high, bottom ends being firmly fixed in concrete, surrounding a rectangular space or drain pit. Between these posts was suspended what was known as a gang frame varying from six to nine feet across and from twelve to sixteen feet in length, depending upon the size of the gang. This gang frame was connected at one end with a wooden rod about seventeen feet long, called a pitman. The pitman, in turn, was joined to a piece of machinery called a Hurst frame. This consisted of a counter balance and driving pulley, in turn connected with the main line shaft. This line shaft got its power from electric motors, served by the company's hydroelectric plant.
>
> Between the front end of the gang frame and the back end, where the pit man was connected, were suspended long, narrow, soft steel blades, one-eighth of an inch thick by about four inches high. This frame, with the blades, its long strips of steel being stretched at right angles, lengthwise to the stock to be sawed, swung back and forth, moving downward automatically by means of screw drives located at each of the posts. It was not the action of the soft steel blades on the marble that did the cutting. The cutting was accomplished by means of particles of sand, or crushed steel, that were held in suspension in a stream of water that played on the top of the block of marble. These abrasives, as they fell on the block, were caught by the bands of steel and drawn along its surface, causing it to wear away at the points of contact. The cutting so done was but a little wider than the thickness of the saw blades. The concrete foundations of these gang saws were from two feet to eleven feet thick, to eliminate vibration, which would deflect the blades.
>
> The gang beds were trough-shaped, which caught the water, crushed steel and sand, that was sucked up by a pump and elevated over the gang, where it again fell upon the marble as just described. This process was continued until the abrasives were worn out. The supply of crushed steel, or sand, was replenished from time to time to keep up the cutting efficiency. Where the stock of marble was even, it was possible to saw at the rate of two inches per hour. On particularly hard material one inch to the hour was average. If the automatic feed was crowded unduly, it resulted in irregular sawing, which wasted time and marble. Blocks for cutting were placed on carts, which ran on rails, by the cranes in the stone yard and pulled into the gang saws by cable through doors in the side of the building. After the first cuts were made, the blocks were pulled out into the yard, turned 90 degrees and sent back in for the other sides to be cut.
>
> In the stone yard all blocks were piled and graded. By grading was meant blocks that contained statuary material, others that carried Golden Vein, and still others with dark markings on clear white background. By sorting through the rough material as it came from the quarries, much time was saved in the mill. One of the

greatest difficulties in the business was to secure proper grading of stock and milling according to this grading.

2. Rubbing Machines and the Polishing Process

The function of the rubbing machines at the marble finishing mill was described in the following article from the *Marble Booster* on March 14 and 21, 1914. The information was provided to the newspaper by Harry D. Pratt, Company Superintendent and Thomas F. Burns, the Mill Superintendent, and is reprinted in McCollum 1993:124.

> The statuary grades of Colorado-Yule marble are very susceptible to a high polish owing to the fact that they contain 99.79 percent carbonate of lime, which is probably the largest percentage found in American marble. The process of polishing marble is divided into two divisions- machine polishing and hand polishing. A polishing machine is not a complicated affair but is so arranged with proper gears, wheels and uprights that a disk is made to revolve at a rapid speed. This machine is known as the gritting machine and the disk is known to the trade as the head. On this disk are attached the various stones that are used to smooth down the surface. After the marble has been properly sized on the rubbing beds it is placed under one of these gritting machines and the first head used is made of a carborundum wheel, grade 40. The machine is then started and the head is made to revolve at the proper speed and moved around over the slab by the workman in control. By careful sponging and watching the workman knows when this wheel has removed the scratches left from the rubbing bed.
>
> Then, in turn, a second wheel is applied, being composed of a finer material know as alundum. The third and last wheel which is used before shining is known as a hone head and brings the marble down to a perfectly smooth surface. We find that we have the best success in manufacturing these hone heads ourselves which are made by melting a half a pound of resin, six pounds of shellac, and when this is at a proper heat flour of emery is added and thoroughly mixed until the head is ready for cooling.
>
> Next comes the machine know as the buffer which is identical with the gritting machine except for the part known as the head, which is made of a circular piece of wood covered with felt from two to three inches in thickness. On the marble is sponged a small amount of water and there is then placed a small pinch of crushed oxalic acid and putty powder. The wheel is then placed in action and a friction or heat created which makes the gloss.
>
> Hand polishing is very similar to machine polishing and is made necessary by the fact that there has never been invented a machine to polish pieces of irregular surface. There are, however, various stones used for hand work such as red, blue, and brown grits, which are mostly imported from England, as there they are found to be free from small mineral materials. Another stone which is extensively used in hand polishing is lump pumice. Pumice stone is lava rock which contains so many air cavities that it will float on water. The best pumice comes from the Monte Angelo volcano on the island of Lipari, near Sicily. In all instances, where a high gloss is secured good putty powder is very essential which is made from tin oxide and the quality of the putty powder is governed by the amount of tin in the manufactured article. Good putty powder contains nothing but pure tin and a little lead litharge.