NPS Form 10-900 OMB No. 1024-0018

United States Department of the Interior
National Park Service

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National Register of Historic Places Registration Form

This form is for use in nominating or requesting determinations for individual properties and districts. See instructions in National Register Bulletin, *How to Complete the National Register of Historic Places Registration Form.* If any item does not apply to the property being documented, enter "N/A" for "not applicable." For functions, architectural classification, materials, and areas of significance, enter only categories and subcategories from the instructions.

1. Name of Property

Historic name: Mueller Electric Company Building
Other names/site number: N/A
Name of related multiple property listing:

(Enter "N/A" if property is not part of a multiple property listing

2. Location

Street & number: 1587 East 31st Street
City or town: Cleveland State: OH County: Cuyahoga
Not For Publication: N/A Vicinity: N/A

3. State/Federal Agency Certification

As the designated authority under the National Historic Preservation Act, as amended,

I hereby certify that this **X** nomination ___ request for determination of eligibility meets the documentation standards for registering properties in the National Register of Historic Places and meets the procedural and professional requirements set forth in 36 CFR Part 60.

In my opinion, the property _X_ meets ___ does not meet the National Register Criteria. I recommend that this property be considered significant at the following level(s) of significance:

___national ___statewide _X_local

Applicable National Register Criteria:

_X_A ___B ___C ___D

Barbara Power
DSHPO Inventory & Registration December 28, 2015

Signature of certifying official/Title: **Date**

State Historic Preservation Office, Ohio History Connection

State or Federal agency/bureau or Tribal Government

In my opinion, the property ___ meets ___ does not meet the National Register criteria.

Signature of commenting official: **Date**

Title : **State or Federal agency/bureau or Tribal Government**

4. National Park Service Certification

I hereby certify that this property is:

✓ entered in the National Register

___ determined eligible for the National Register

___ determined not eligible for the National Register

___ removed from the National Register

___ other (explain:) _____

Signature of the Keeper — Date of Action: 2.23.16

5. Classification

Ownership of Property

(Check as many boxes as apply.)

Private:	X
Public – Local	
Public – State	
Public – Federal	

Category of Property

(Check only **one** box.)

Building(s)	X
District	
Site	
Structure	
Object	

Number of Resources within Property
(Do not include previously listed resources in the count)

Contributing	Noncontributing	
1	0	buildings
		sites
		structures
		objects
1	0	Total

Number of contributing resources previously listed in the National Register 0

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6. Function or Use
Historic Functions
(Enter categories from instructions.)
INDUSTRY/PROCESSING/EXTRACTION: Manufacturing Facility

Current Functions
(Enter categories from instructions.)
VACANT

7. Description

Architectural Classification
(Enter categories from instructions.)
LATE 19th AND EARLY 20th CENTURYAMERICAN MOVEMENTS: Commercial Style

Materials: (enter categories from instructions.)
Principal exterior materials of the property: Brick, Stone, Limestone

Narrative Description

Summary Paragraph

The Mueller Electric Company Building is located at 1587 East 31st Street, Cleveland, Ohio in Cuyahoga County. The 1922-1976 Commercial style building was designed by The George S. Rider Co., a Cleveland based engineering/architectural firm specialized in manufacturing and industrial design.

The property is situated on Cuyahoga County Parcel # 10228109, with a lot size of 1.006 acres. The building resides on the east side of East 31st Street, between Superior and Payne Avenues in a predominantly residential neighborhood. The building is set along the sidewalk, in line with existing homes. An unnamed alley runs along the rear of the building and a paved parking lot is located to the south of the building. Today, the historic Mueller Electric Company Building is surrounded by residential buildings, with the William A. Howe Company Building to the south at 1625 East 31st Street just north of Waring Court N.E. as the only other non-residential building in the neighborhood.

Narrative Description

EXTERIOR (Photos 1-12)
The two-story post and beam, steel structure and red brick building is defined by the main entry's original raised parapet and monogrammed limestone letter "M", and steel industrial windows resting on stone sills. Construction of the building began in 1922 with the front of the building serving as offices with the second story of only two bays in depth with one-story

manufacturing space to the rear, as noted in the historic image (Historic Images, Figure 3). The 1922 building measured approximately 63' x 94'.[1] The façade (photos: 1,2,12) was originally five (5) bays wide, the north end bay serving as the main entrance, which is now the central bay as a result of additions. The chamfered wood post and beam construction rests on corbeled brick piers on the interior with the brick piers expressed on the exterior at each bay; indicative to the Commercial style. At the base of the building is a simple decorative brick pattern work of soldier and sailor courses. The first floor windows are steel industrial style windows with arrow point muntins and central operating ventilation awnings. The second floor windows are double hung wood windows of 6/1.

The building grew in conjunction with the company's growth of product applications and as neighboring property could be obtained. The first addition in 1925 added a second story to the one-story manufacturing space and an additional one-story lead coating space on the acquired south lot (photos: 7-9).[2] A freight elevator was also added at this time, along with a second utilitarian staircase to separate the administrative from the manufacturing. The occasional steel post and beam were introduced in this area at some point in time, most likely due to later machinery upgrades on the second floor. In 1936, a north one-story addition (photo: 2) was added, which also introduced a man door and truck dock at the northern most bay (photo: 3).[3] The architectural drawings, by The George S. Rider Co., allowed for a future second floor over the one-story 1936 addition, which was structurally built in 1946. Additionally, in 1946, a second story was added to the rear 1922 space and a three car garage was added to the rear 1925 south addition (photos: 8-9). [4] From 1936 through the 1946 the construction of the building remains wood posts and beams; most likely due to limited availability gearing up and as a result of war limitations on steel use in buildings. All of the additions were added seamlessly and for the purpose of manufacturing. From 1936 on, steel industrial style windows were employed. The 1946 additions have steel industrial style windows with flat stock muntins. Flat stock muntins continue forward through the rest of the phases of construction.

In 1956, a one-story addition was added to the south of the 1922 portion and west of the 1922/46 additions (photos: 10,11).[5] Again, the architectural language stays consistent, including the base brick pattern work (Historic Images, Figure 11). An additional dock door was added. In 1962, a one-story addition was added to the south (photo: 9).[6] This is the first time concrete block construction is employed on the building, while face brick creates the exterior architectural

[1] City of Cleveland Building Permit No. 27645-A, 23 January 1922.
[2] City of Cleveland Building Permit No. 40585-C, 14 January 1925.
[3] Cuyahoga County Auditor's Office. Property and Tax Records, Building Card; Mueller, 127.
[4] City of Cleveland Building Permit No. G-36851, 25 February 1946; City of Cleveland Building Permit Nos. G-36852, 15 February 1946.
[5] City of Cleveland Building Permit No. J-27447, 22 February 1956.
[6] City of Cleveland Building Permit No. K-33196, 25 July 1962.

vocabulary consistent with the design. This space has no internal posts. A raised man door is noted on the façade.

In 1964, a two-story addition occurred at the north, again employing concrete block construction with brick veneer (photo: 3). [7] A stair was also added in the northeast corner to provide additional circulation and egress from the upper manufacturing spaces. In 1972, a second story was added to the 1956 and 1962 southern portions, and evidence of the brick parapet from the one-story addition is visible on the interior (photo: 9).[8] A stair was added to the northeast corner of the 1962 section. The second floor façade wood windows matched previous wood windows as indicated on the architectural drawings.[9] The 1962 portion of the 1972 second floor addition are steel industrial flat stock muntins. The final phase of construction was built in 1976 at the north end of the building (photos: 4-6)(Historic Images, Figure 12).[10] The two-story addition is composed of concrete block, steel I-posts and I-beams, and steel industrial windows with a brick veneer, maintaining The George S. Rider Co. design for the building throughout. A second freight elevator was introduced as well.

INTERIOR (Photos 13-30)

The interior plan is open with exposed painted masonry perimeter walls of either concrete block or brick, wood chamfered posts and beams or steel I-posts and I-beams, and concrete floor at the first floor and wood or plywood decking on the second floor. Exterior walls with fenestration are throughout, demonstrating the conversion to interior walls as additions were constructed. A small basement is located in the 1922 southwest corner, and a pit is located in the 1936 section. A poured concrete switchback stair with metal nosing and cast-iron banister with wood handle rail greets the entrance (photos: 13,14). Three additional utilitarian stairways exist in the 1925, 1962 and 1964 sections. Freight elevators are found in the 1925 and 1976 sections as well. Vaults, utilitarian in design, are located on both the first and second floors of the 1922 section and were added in 1972.[11] A small alligator clip museum gallery was incorporated into the building during the 1972 renovation which measured approximately 8’6” x 22’. The gallery ran along the west windows two bays south of the main stair. According to the architectural drawings the walls were furred out with fire-rated gypsum and a display case. There is no evidence of the gallery space today. The overall interior space reflects an open industrial plan design utilitarian in design with painted masonry walls and exposed structure. Beyond the fire-rated gypsum that was added in a small area of the second floor addition, the building retains its historic appearance as a utilitarian non-finished space.

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[7] City of Cleveland Building Permit No. K-56617, 2 September 1964.

[8] The George S. Rider Company. *Architectural Plans for the Mueller Electric Company, 1971.* Available at City of Cleveland Archives.

[9] Ibid.

[10] City of Cleveland Building Permit No. M-48451, 21 March 1976.

[11] The George S. Rider Company. *Architectural Plans for the Mueller Electric Company, 1971.* Available at City of Cleveland Archives.

INTEGRITY

The Mueller Electric Company Building demonstrates little deterioration and minor modifications. It is in good condition and retains a significant level of historic architectural integrity. This is exhibited in both exterior and interior architectural elements such as The George S. Rider Co. Commercial style masonry elements of raised parapet, projecting piers, and recessed bays and through both the wood sash and steel industrial fenestration. The interior structural elements demonstrate the retention of historic fabric, materials, and craftsmanship, which were limited to exposed masonry walls, structural beams and concrete flooring. The lack of decoration and finished wall surface demonstrate that the space was employed for manufacturing, for which machines and people occupied the floor space. The earlier wood posts are chamfered to provide a degree of fire-rating to the space along with the general masonry construction. The steel I-beams that were employed later in construction demonstrate the intent to add additional levels in the future, as well as the confidence that Ralph S. Mueller had in his product development and future sales. The changes in roof assembly from wood decking to a metal decking system represent the need to span wider open spaces with respect to the manufacturing aspects of the design intent. Compiled over time, the building reflects changes in construction technique for manufacturing and industrial buildings at the mid-twentieth century. The building remains in its historic location and the architectural language retains the historic feeling and association as noted in historic images and architectural drawings of the building in its original historic setting and growth over time.

8. Statement of Significance

Applicable National Register Criteria
(Mark "x" in one or more boxes for the criteria qualifying the property for National Register listing.)

- [X] A. Property is associated with events that have made a significant contribution to the broad patterns of our history.
- [ ] B. Property is associated with the lives of persons significant in our past.
- [ ] C. Property embodies the distinctive characteristics of a type, period, or method of construction or represents the work of a master, or possesses high artistic values, or represents a significant and distinguishable entity whose components lack individual distinction.
- [ ] D. Property has yielded, or is likely to yield, information important in prehistory or history.

Criteria Considerations
(Mark “x” in all the boxes that apply.)

- [ ] A. Owned by a religious institution or used for religious purposes
- [ ] B. Removed from its original location
- [ ] C. A birthplace or grave
- [ ] D. A cemetery
- [ ] E. A reconstructed building, object, or structure
- [ ] F. A commemorative property
- [ ] G. Less than 50 years old or achieving significance within the past 50 years

Areas of Significance
(Enter categories from instructions.)
INVENTION
INDUSTRY

Period of Significance
1922-1966

Significant Dates

Significant Person
(Complete only if Criterion B is marked above.)

Cultural Affiliation

Architect/Builder
The George S. Rider Company

Statement of Significance Summary Paragraph

The Mueller Electric Company Building is significant at the local level under Criterion A in the areas of Invention and Industry**.** Ralph S. Mueller was co-inventor of the alligator clip, defined as a simple spring loaded metal clip with narrow jaws resembling those of an alligator. The alligator clip was initially developed for use in product testing and diagnosis for the repair of electrical components and circuits, as well as part of an electrical re-charging device (Historic Images, Figures 1,13). As electricity became the preferred form of energy beginning during the early years of the twentieth century, Ralph S. Mueller founded the Mueller Electric Company which grew to become the largest manufacturer and distributor of alligator type clips in the United States.

The period of significance begins in 1922 with the construction of the Mueller Electric Company Building at 1587 East 31st Street and continues until Mueller's death in 1966. This period of significance represents the company's dominant presence in the industry, exemplified through advancements, adaptations and the evolution of the alligator clips and their applications. During this period the company expanded exponentially both in distribution and production with the company producing at a record rate of 100 million clips annually by 1964 with sales in 76 different countries.[12]

Narrative Statement of Significance

The Mueller Electric Company was first formed in 1908 as the R.S. Mueller & Co. by Ralph S. Mueller and George Dusinberre, who together invented and patented the "alligator" type clip.
The alligator clip was ingenious in its simplicity and wide application for uses related to electrical circuits. Beginning in the early part of the twentieth century, the alligator clip revolutionized electronical testing within the vastly expanding market for electricity as the preferred form of energy. Virtually every electrically based device or piece of apparatus required field testing in preparation for introduction on the market, or for repair, thereby involving the use of alligator clips.[13] The clip by design allowed for creation of a temporary electrical connection with one jaw of the clip permanently crimped, bent or soldered to a wire enabling a non-permanent connection between an electrical circuit under testing and laboratory equipment or another electrical circuit. Later applications allowed for use of a larger version of the clips as battery or automotive clamps (Historic Images, Figures 1,13). These large clamps or "jumper cables" were made of copper for low electrical resistance and used with thick insulated copper cables to make connections between automobile batteries. They enabled the delivery of hundreds of amperes of current needed to directly power an automobile starter motor or transfer electrical energy from a charged battery to a discharged battery. As markets for electricity

[12] *Plain Dealer*, 27 December 1964.
[13] Mueller, 118.

expanded so did the applications for use of alligator clips ranging widely from: telephone line testing; automobile self-starters; ham radio operation; jumper cables; televisions; toys; household appliances; grounding to drain static from auto tank trucks; airplanes; during surgeries using anesthetic; military ships to avoid magnetic mine detection; electric fences; space satellites and more.[14] Other non-electrical uses emerged such as: a metal dental bib fixer allowing for equipment sterilization; clamping for workshop or craft uses; farm uses as practical as a holder for cows' tails during milking;[15] and also later known widely as a "roach clip" for holding the butt of a marijuana cigarette. The Cleveland based company grew to become the largest manufacturer and seller of insulated electric and alligator clips in the United States[16] demonstrating the entrepreneurial spirit of invention and industry in America during the Progressive years of early twentieth century America.

Located at East 31st Street in Cleveland and constructed beginning in 1922, the Mueller Electric Company office and factory building was repeatedly expanded to meet the need for increased production, just as the practical use of electricity continued to grow and new markets opened. By 1964, it was reported that during the previous three and one-half years the company had been producing at a record rate of 100 million clips annually – marking overall production of a half billion clips since the founding of the company. Company products were sold in 76 different countries producing 125,000 clips daily.[17] The Company remained under operation by Ralph Mueller as senior partner until his death in 1966. The company remained family run for over 100 years.[18] Mueller Electric Company was sold to Desco Corporation in 2011, with operations relocated to Akron, Ohio.[19]

Manufacturing and the Emergence of Electricity

The Progressive years in Cleveland were a time of confidence, metropolitan expansion, and industrial growth. The population of the city of Cleveland almost doubled between 1900 and 1910 making it the sixth largest city in the nation.[20] The Cleveland Industrial Exposition of 1909 put the city in the spotlight as one of the outstanding manufacturing centers of the world. The 1909 Census of manufacturers indicated that the Cleveland metropolitan district had 2,230 manufacturing establishments and ranked seventh in the country in the value of its products. The

[14] Mueller, 117, 225.
[15] Ibid.
[16] Mueller, 240-241.
[17] *Plain Dealer*, 27 December 1964.
[18] *Plain Dealer*, 16 February 1966.
[19] *Mueller Electric Acquired by Desco Corporation.* Desco Corporation Press Release 19 December 2011. Available at *uhttp://www.manufacturing.net/news/2011/12/mueller-electric-company-acquired-by-desco-corporation.*
[20] Miller, Carol Poh. Wheeler, Robert A. *Cleveland A Concise History 1796 – 1996*. Bloomington: Indiana University Press, 2cd ed., 1997, 100.

principle industry was iron and steel, closely followed by foundries and machine shops. Automobiles and automobile parts placed third. [21]

At the same time, electricity was becoming a new more widely accessible and desirable form of energy. Electrification grew rapidly at the start of the twentieth century modernizing many aspects of industry and home life. It replaced water and steam power as a more powerful and efficient source of energy. It first brought light to American homes and made possible modern technologies including the telegraph, light bulb, telephone and a revolution in household appliances including radios, televisions, refrigerators, vacuum cleaners and washing machines. In 1900, two-percent of households had electricity, contrasting with 80 percent by 1950.[22]

Early in the twentieth century, distribution of electrical power was largely concentrated in cities served by privately owned companies, known as investor-owned utilities. In order for electricity to accommodate widespread use, new industries needed to build generators to supply electric power.[23] In 1882, Thomas Edison launched the businesses that would later be known as General Electric, opening the first central power plant in lower Manhattan – the Pearl Street station. Pearl Street's central power plant design was an important shift from small scale, on-site generation to industrial scale power and became the model for the entire power generation industry. In order to make electricity affordable and accessible, the power grid attracted huge investors such as J.P. Morgan. Samuel Insul, who started as an assistant to Thomas Edison, had the managerial and business skills to create a new business model for electrical delivery. Insul was able to achieve the economies of scale by consolidating the mom-and-pop electricity providers and closing small generators in favor of larger, more efficient units manufactured by General Electric. The more customers he had, the more efficiently he could run his business delivering electricity to more and more people. Electrical usage spread from the city, to the countryside. Insul convinced the industry that statewide public utility regulation was the best way to provide low cost power. Wisconsin and New York were the first states to extend state-level rate regulation to the electricity industry in 1907. By 1914, 43 other states followed suit.[24]

Cleveland Electric Illuminating Co. (CEI) was formed in 1892 with a large power house constructed on Canal Street considered the most modern in the world. By 1910, the Cleveland Electric Illuminating Company had 31,000 customers in a service area that included East

[21] Miller, 101.
[22] Moore, Stephen, Simon, Julian L. *The Greatest Century that Ever Was 25 Miraculous Trends of the Past 100 Years*. Vol. No. 364, The Cato Institute Policy Analysis 15 December 1999; Institute for Energy Research. *History of Electricity*. 29 August 2014. Available at *http://instituteforenergyresearch.org/history-electricity*.
[23] Constable, George and Somerville, Bob. Greatest Engineering Achievements A Century of Innovation, *Electrification History 1 – Early Years.* National Academy of Engineering, 2015. Available at *www.greatachievements.org*.
[24] Ibid.

Cleveland, Euclid, Cleveland Heights, Lakewood and almost all of Cleveland. In 1915, the company moved to their new headquarters at 75 Public Square in the new 15-story Cleveland Electric Illuminating Company building designed by Hubbell and Benes.[25] The headquarters later moved to the 22-story 55 Public Square building in 1958, which was designed by Carson and Lundin. Between 1939 and1944, the Cleveland Electric Illuminating Co.'s output increased by 30%. In 1944, 76% of the power the company produced went to industry, with 90% of that being the war industry. By 1946, CEI had 370,000 customers, in contrast to the 1,400 customers it had at the turn of the century. Its service covered 132 communities with a total population of 1.5 million. Growth continued as relatively low power rates attracted new industries to the area. In 1954 the company was serving 465,000 customers in 137 communities.[26]

Electricity was becoming widely accessible with a strong complimentary manufacturing base in Cleveland. As a manufacturing city, Cleveland was an incubator for innovation related to electricity. Charles Brush introduced the arc light and its potential as a lighting system with the lighting of Public Square in 1879, forming Brush Electric Co. in 1880. The first electric streetcar in the nation was introduced to Cleveland in 1884.[27] By 1900, Cleveland ranked first in the production of electric automobiles. In 1906, the National Electric Lamp Association (NELA) centered much of their light bulb production in Cleveland becoming a division of General Electric based in Cleveland and taking a leading role in incandescent lighting from 1915 to 1935. By 1910, Cleveland became first in the production of carbons, lamps, and electrical hoisting apparatus. Its status as the site of a major exposition of the electrical industry in 1914 further promoted Cleveland's claim to primacy in the electrical industry.[28] In addition to lighting, traction and industrial applications, the electrical home appliance field was strongly represented in Cleveland by World War I. In 1919, Cleveland led the nation in the production of electric batteries and vacuum cleaners. In the mid-1920s, Cleveland ranked third in the producing of radios behind New York and Chicago. During World War II, Cleveland electrical firms organized around the needs of the military.

[25] Euclid Avenue Historic District, National Register Nominations (NR#s 02000702 and 07000524).

[26] Van Tassel, David R. and Grabowski, John J. eds. *The Encyclopedia of Cleveland History,* "Electrical and Electronics Industries." Bloomington: Indiana University Press, 1996. Also available at *www.ech.case.edu.*

[27] Orth, Samuel Peter. *A History of Cleveland, Ohio: Biographical*, Vol. I., Part 1 & 2. Chicago-Cleveland: The S. J. Clarke Publishing Co., 1910, 748; Toman and Hays, 33; *Plain Dealer* Historical Archives 1850-1959. Cleveland Public Library, 2 August 1884; Rose, William Ganson. *Cleveland The Making of a City*. Cleveland and New York: The World Publishing Company, 1950, 433.

[28] Van Tassel, David R. and Grabowski, John J. eds. *The Encyclopedia of Cleveland History,* "Electrical and Electronics Industries." Bloomington: Indiana University Press, 1996. Also available at *www.ech.case.edu.;* Van Tassel, David R. and Grabowski, John J. eds. *The Encyclopedia of Cleveland History,* "Cleveland Electric Illuminating Co." Bloomington: Indiana University Press, 1996. Also available at *www.ech.case.edu*

Invention of the Alligator Clip

The telephone industry was the start of the career for Ralph S. Mueller, who saw the widespread application of the alligator clip related to the boom in demand for electrical use. Mueller had attended the University of Nebraska where he chose a degree in a Bachelor of Science with a focus on electrical engineering, graduating in 1898. Commenting in his autobiography, he stated that, "[t]he talk of electrical development and the great future of the infant industry was then in the air, and I picked the field much as a youth of today would be attracted to the field of aviation."[29]

By the turn of the century, key basic telephone patents had recently expired and an independent telephone industry was springing up on a national level in opposition to the monopoly of the Bell System. In 1902, Mueller was employed by Kellogg Switchboard and Supply Company of Chicago as a sales engineer.[30] The Kellogg Company was the largest of several telephone manufacturing concerns. In 1904, Mueller was transferred as head of the Cleveland office for Kellogg. [31] As a stellar salesman for the company and during the four years as head of the Cleveland sales office, he produced a record of over $660,000 in orders. [32]

Mueller was introduced to the first prototype of the alligator clip in 1907 while still under the employ of the Kellogg Co. by John H. Williams, an employee of Cuyahoga Telephone Company.[33] The simple design was for a clip with spring steel sides. For Williams' first demonstration, he presented Mueller with a lamp bulb in a socket attached to a lamp cord, the ends of which were fitted with the spring clips. On the inside of one jaw of the clip was mounted a small brass cup which has been filled with phonograph needles soldered in place. To make contact with the insulated wire, the needles were applied to the wire and then, pressure from the thumb and fingers was made to pierce the insulation down to the conductor. Williams applied clips to the two sides of a 110 volt circuit and the lamp lighted. Williams' first idea for the clip was to use it to market a portable lamp for use in dark spaces by construction workers. Mueller took the Williams clip device to Mr. W.L. Carey, Jr., secretary of the United States Telephone Co. who had an office in the same building and offered it instead as a telephone line testing device. [34] Together with several others Williams and Mueller incorporated on December 4, 1907 as the Williams Test Clamp Co.,[35] while Mueller still worked as a sales agent for Kellogg Co. As a partner in the Williams Test Clamp Co., Mueller was in charge of sales at a 10%

[29] Mueller, 70.
[30] Mueller, 88.
[31] Mueller, 131.
[32] Mueller, 93.
[33] Mueller, 111.
[34] Mueller, 97.
[35] Mueller, 111-112.

commission. Shortly, it became apparent that the Williams clip was too expensive to manufacture for sale.

After being passed over for promotion at the Kellogg Co. and with the stalled Williams Test Clamp Co. business, Mueller decided to venture out in the sales agency business on his own in 1908. He set up an office first in the "Electric Building" and later in the Ellastone Building at the corner of Prospect Avenue and East Fourth Street in Cleveland sharing office space with George Dusinberre.[36] His new business included working as a manufacturer sales representative selling telephone products and later for electrical manufacturers with several product agencies. His agencies included: insulated wires, cords and cables for Alfred F. Moore, Philadelphia, PA; dry batteries and carbon products for Stackpole Battery Co., St. Mary's PA, telephone poles for Warner-Newton Lumber Co., Grand Rapids, MI.; and, shellac compound moldings for General Insulate and Machine Co., Brooklyn, NY. Mueller expanded as well into the re-sale of discarded office equipment including telephones and later the plug business, wire handles for auto storage batteries and other inventions.[37]

Still intrigued with the alligator clip, Mueller took the failed Williams clip to his office mate George Dusinberre, and the two of them worked on a re-design for ease of manufacture. According to Mueller, "after a few minutes of thought he [Dusinberre] took a couple of business cards and, with a pair of shears, cut out a model of a clip and asked me what I thought of it. I told him it looked good and that night at his home he made a crude model out of sheet iron." [38] Mueller took the Dusinberre design back to Williams who rejected it and promptly bought out Mueller's stock in the Williams Co.. Dusinberre and Mueller then proceeded to take their design to market.

Together in 1909, Dusinberre and Mueller went into the alligator clip business under the name R. S. Mueller & Co.. In 1910, George Dusinberre filed and received a patent under his name for the alligator clip, which Mueller declined, not seeing himself as the inventor.[39] While Dusinberre held the patent, Mueller was in charge of marketing and sales of this new invention. Mueller and Dusinberre ordered dies for the first alligator clips at a cost of $100.00 made by Mr. Konogslow who had a shop located on Hamilton Ave., west of West Sixth Street. The first clip, No. 1, was of steel with a "sherardized" finish which is the process of coating steel with zinc (Historic Images, Figure 1). The No. 2 clip finish was refined and changed to nickel plate. Early on a rubber insulator was offered for the No.2 clip as the first insulated clip, but was never patented (Historic Images, Figure 1). As Mueller worked with the clips, new applications presented

[36] Mueller, 93,97.
[37] Mueller, 98-99, 102, 110.
[38] Mueller, 112.
[39] Mueller, 113-115.

themselves such as: larger size current-carrying clips; use of a screw in place of a soldering connection in the design; clamp connections; lug connections; lead coating of clips and springs; and insulated clips. [40]

With Meuller's experience as a sales representative specifically in the telephone industry, the first market for the use of electronic insulated alligator clips were largely for telephone lineman employed for testing.[41] The process allowed for a line man to access the telephone wire to make connections in attempt to isolate trouble on a particular line. Under the brand name "Universal" the first customer order was placed on February 19, 1910 for ten (10) Universal Test Clips at 12 ½ cents each by the Detroit Insulated Wire Co., Detroit, MI.[42]

The new automobile industry with electric equipment on gasoline cars was a boon for the clip business. The Cadillac Company became one of the first large Mueller customers. Cadillac used an electric self-starter which incorporated the clip as part of the 17,000 automobiles it made in 1912. Other auto manufacturers soon followed suit. The advent of radio broadcasting and battery operated receiving sets became another large market for clips.[43]

One of the largest markets followed with the use of clips in charging storage batteries.[44] The first heavy current carrying larger clip rated at 100 amperes was introduced in 1913. It was the first clip made of copper with teeth on three sides of each jaw with one set of teeth nesting in another. The clips were manufactured by Cleveland Metal Stamping Co. resulting over time in payment to the company of over $1,000,000 before later taking the process in-house by 1923 after construction of the Mueller Electric Company Building on East 31st Street in 1922. The 300 ampere Big Brute Clip was reminiscent of the earlier Williams effort and was designed to clamp to a work bench with a lamp socket mounted on one of the jaws. The Big Brute Clip later took over the market for use as a ground connection. Jumper cables – an insulated wire with large clips at each end - were designed to ward off static electricity in railroad tank cars hauling gasoline or other volatile liquids. This created an extensive market for use to dissipate static electricity. [45]

As uses for electricity increased, markets continued to open. Automobiles, radio broadcasting, ham radio operation, television, electric fences and washing machines afforded a market for the ground clips. The trucking industry came to depend on using jumpers to carry current from the battery on the tractor back to the trailer lights. The markets and applications continued to grow.

[40] Mueller, 114-115.
[41] Mueller, 117.
[42] Mueller, 114.
[43] Mueller, 118, 132.
[44] Mueller, 118, 131.
[45] Mueller 116-117.

The company slogan became "Wherever electric current flows you will find Mueller clips serving mankind."[46]

Mueller Electric Company

By 1920, the market for clips was already rapidly expanding. Other clip manufactures had emerged, but the R.S. Mueller & Co. dominated the market. In 1919, Mueller bought out partner George Dusinberre to form the Mueller Electric Company.[47] On August 31, 1920 Mueller bought 75 feet of frontage on East 31st Street between Superior and Payne Avenues for construction of a new Mueller Electric Company Building, the nominated property.[48] He chose the site with an eye on staying close to Cleveland Metal Stamping Co., at the southeast corner of Payne and East 31st Street,[49] which at the time was doing a majority of the Mueller manufacturing work. In 1921, Mueller gave up his agency business and committed himself fully to the assembly and marketing of alligator clips.[50]

In 1922, the older homes on the East 31st Street property were demolished and the Mueller Electric Company Building built at a cost of $47,500 for the land and building.[51] The building, designed in the Commercial style by The George S. Rider Company, was completed in 1922[52] (Historic Images, 3). The George S. Rider Co. was an architecture and engineering firm specializing in industrial buildings, with their work found in the Cleveland area and Midwest such as: the 1919 Perfection Stove Company Building, 1200 Union Ave., Kansas City, Missouri (NR# 14000376); the 1907-1920 W.S. Tyler Company Building Addition, Building #38 and Building #38 additions at 1375 East 34th Street and 1379-91 East 34th Street, Cleveland; the 1917 National Acme Company at 170 East 131st Street, Cleveland; the 1921 Foote Burt Company Building at 13000 St. Clair Ave., Cleveland; and the 1906 Cleveland Worsted Mills in Ravenna (Historic Images, 4).

The two-story orange-brick Mueller Electric Company Building housed factory space on the first floor with office space on the second floor.[53] The 1922 portion of the building remains, including the projecting center two-story bay with double door entrance and paired four pane windows capped with a carved letter "M" set in the parapet's pattern brickwork. This center bay was connected to the south with what was originally a four-bay two-story office and factory space with one-story manufacturing space to the rear. Imbedded in the floor at the head of the

[46] Mueller 117-118.
[47] Mueller, 123.
[48] Mueller , 125; Cuyahoga County Deed Anna and August Schack to Ralph S. Mueller, 31 August 1920; Cuyahoga County Deed Magdalen M. Hitz to Ralph Mueller, 31 August 1920.
[49] Mueller, 125; G. M. Hopkins Maps, City of Cleveland 1920-22. Map Collection, Cleveland Public Library.
[50] Mueller, 110.
[51] Mueller , 125.
[52] City of Cleveland Building Permit No. 27645-A, 6 February 1922.
[53] Mueller , 125.

stairs leading to the office was installed a bronze plaque reading "THIS IS THE HOUSE THAT CLIPS BUILT. WELCOME" with a big clip biting jagged lightning in a storm cloudy sky at the center. Upon leaving the factory was a large sign at the stairwell reading "WHEREVER ELECTRIC CURRENT FLOWS YOU WILL FIND MUELLER CLIPS SERVING MANKIND."[54] The plaque and sign are no longer found in the building and were likely removed when the Mueller Electric Company left the premises in 2007.

The Manufacturing & Sales Process

The first in-house alligator clip production began in 1923 at the new Mueller Electric Company Building on East 31st Street with the "Pee-Wee" clip, the smallest test clip offered.[55] Mueller primarily focused on innovation and the design of alligator clips as the applications for electricity continued to expand. The stamping and manufacturing of the clips was outsourced during these early years. In 1925, a second floor factory was extended over the entire 40 x 60 structure of the Mueller Electric Company Building,[56] along with one-story additions to the rear east portion of the building designed by The George S. Rider Co. A one-story addition to the rear and south was leased to the Cleveland Lead Coating Company who did the lead plating and dipping for Mueller clip production. In 1927, Mueller acquired the Cleveland Lead Coating Company bringing it in-house. In 1929, son Scott Mueller entered the business as a partner and due to tax considerations a four way family partnership with his wife and two children was formed. [57]

Between 1929 and 1933, the company began to move more towards in-house clip production. By 1936, the Company introduced automatic and semi-automatic manufacturing operations. A one-story factory addition was added to the north in 1936, likely to allow for automated machining space.[58] This upgrade allowed for reduced cost and increased volume in clip production. Because of the generally small and simple size of the alligator clip, there was no justification for a factory assembly line.[59]

As the company was integrating its manufacturing processes, it also adopted a new sales technique. Instead of sending salesman for personal visits, sample clips were mailed to prospective purchasers with a pricing circular. Mueller focused on marketing and sales without the use of glossy printed materials, but instead on the idea of sending actual clip samples to prospective buyers or "sampling" noting that "a man in electrical work gets a sample clip in the mail, along with a descriptive circular and a price list, about as much is accomplished as though a high-grade salesman had made a personal call…There is an appeal to the actual device in the

[54] Mueller, 211.
[55] Mueller, 125-126.
[56] City of Cleveland Building Permit No. 40585-C, 14 January 1925.
[57] Mueller, 130.
[58] Cuyahoga County Auditor's Office. Property and Tax Records, Building Card; Mueller, 127.
[59] Mueller, 128.

hand that is utterly lacking in picture." [60] The only manufacturer representative sales agencies were set up for California in 1920 followed by agencies in Canada and Texas in 1930. No additional agents were brought on until 1938 when nine were added to cover territories throughout the United States.[61] This streamlining of sales and marketing processes by Mueller was successful, evidenced by the growth of the company.

In the early years of the alligator type clip, approximately 70 other different styles of competing clips were in the market, including one by Westinghouse and one by General Electric, none of which survived.[62] In 1933, Mueller for the one and only time bought a competitor – Besco brand battery charging clips made by Battery Equipment & Supply Co. For several years Mueller offered these clips and then let them die out.[63] By 1936 and despite being in the middle of the Great Depression, Mueller clips were being sold in every state and 73 foreign countries.[64] The basic Mueller clip design had evolved into the standard for test clip design. By 1936, clips were made under license in France and England and were being imitated in many other countries.[65]

By 1940, the Mueller Electric Company had manufactured 100 million clips (Historic Images, Figure 6). During World War II, the company manufactured 41 million clips of varying styles and sizes for the war effort.[66] War time uses included battleships, which called for the use of big current carrying clips on long jumpers for quick repair from battle or other damage to electrical circuits. Clips were also used for de-guassing ships to defeat magnetic mines. An added benefit was the military requirement that battleships place duplicate orders – one batch for immediate use and one for stock. Another application was for life jackets which were carried on every navel and merchant marine ship, each outfitted with a red-lensed flashlight held high on the shoulder by a clip. When torpedoed at sea the jacket light was used to disclose the wearer's location. Over one million clips were produced for this purpose. Many military trucks were outfitted as combined mobile machine and storage battery maintenance shops. Mueller furnished 250,000 clip jumpers to Russia related to this purpose. In 1942, 84% of Mueller clip production was for Army and Navy supply, leaving 16% to civilian uses. Shipments for civilian uses were secondary resulting in Mueller cancelling back orders of over 6 million clips during war time. [67] Alligator clips served an essential role in the War effort.

A second-story addition was built over the 1936 one-story portion of the Mueller factory building to the north in Post-War 1946. This addition completely re-modeled and doubled the

[60] Mueller, 129
[61] Mueller, 137.
[62] Mueller, 166
[63] Ibid.
[64] Mueller, 129.
[65] Mueller, 167.
[66] Mueller, 135.
[67] Mueller, 135-137.

size of the company office and was again designed by The George S. Rider Co.[68] The post-World War II years saw a boom in consumerism and housing construction creating an increased demand for household appliances and other electrically based products.

By 1949, Mueller Electric Company had manufactured 200 million clips, and by 1956, 300 million (Historic Images, Figure 7). In 1956, another one-story addition to the factory building was underway, adding space to the south.[69] The company, an industry leader, employed 100 people while occupying more than 36,000 sq. ft. of factory space and producing and shipping over 350 million clips.[70] The finishing department of the company was handling over 333,000 individual parts daily. The low number of workers likely decreased overhead and contributed to the company's financial success.

Although a complete description of the manufacturing process is not available, Ralph Mueller did describe some of the details of clip production in place at the Mueller Electric Company Building in 1957 including a variety of automated machinery and manual labor:

- A fully automatic machine formed the helical clip springs according to size. The smallest were produced at the rate of 190 per minute translating into 91,000 per day. A second automatic machine made small torsion springs at 120 per minute.
- Smaller clips were made with dies which blanked, formed and ejected complete clip halves at a rate of 4,000 per hour. The presses were fully automatic and great care was taken to protect the dies from being inadvertently smashed at a loss of $3,000 per die.
- The lead and cadmium plating was accomplished by the use of automatically timed rotating barrels, with a current supplied by metallic rectifiers. Centrifuges were used to dry the plated parts and throw off surplus lead.
- A one-ton lead pot controlled by a thermostat was used for coating springs and copper shunt metal. All copper clips were ball-burnished in a rotating barrel and given a thin coat of wax to protect the bright finish.
- The early spiral ratchet screw driver system was replaced by semi-automatic machines. Five machines had a capacity of 15,000 clips per hour.
- The assembly department was manned by 48 women who put together 85,000 clips per day. The work was done at benches with manually operated assembly

[68] City of Cleveland Building Permit No. G-36851, 25 February 1946; City of Cleveland Building Permit Nos. G-36852, 15 February 1946; Mueller 220.
[69] City of Cleveland Building Permit Nos. J-27447, 8 March 1956.
[70] Mueller, 238.

jigs (a device used for the attachment, securement and correct alignment of parts and modules) each designed for a particular clip to be assembled.

- A battery of three injection molding machines also produced a daily average of 23,400 vinyl clip insulators.

- Special copper and steel in ribbon form was ordered from the mill for smaller clips with oil tempered steel spring wire made to Mueller Specifications. Mill delivery took about eight to ten weeks, requiring a three month lead time to produce a five cent clip. [71] Could this information be used to conclude that Mueller very successfully utilized new technology to compliment his work force? This might be a reason he was so successful.

The company made 18 basic clips which were generally offered in steel and copper. These clips were then modified for many different uses. From the beginning, insulators were offered in two colors to distinguish leads – red for positive and black for negative and later white, blue, yellow and green for further differentiation of circuits terminating in clips. Stock included approximately 120 different items including 14 sizes of insulators.[72]

In 1962, another one-story addition was added to the south of the factory building[73] and in 1964 a two-story addition to the north [74] to accommodate booming production. Ralph Mueller at the age of 87 years continued to serve as senior partner with his son, Scott Mueller, serving as general manager. [75] In December 1964, it was reported that during the last three and half years the company had been producing at a record rate production of 100 million clips – marking overall production of a half-billion clips since the founding of the company. The company products were sold in 76 different countries producing 125,000 clips daily and more than 30 million clips annually. [76]

Ralph S. Mueller

Ralph Mueller remained involved in the company as a senior partner until his death in 1966.
Innovation in clip design and application continued. Patents awarded to Ralph Mueller throughout his career included:

- Test Clip U.S. Patent No. 55,524, 1920 (Historic Image, Figure 2)

- Copper Shunts for Clips, 1930

[71] Mueller, 132-134
[72] Mueller, 138.
[73] City of Cleveland Building Permit No.K-33196 25, July 1962.
[74] City of Cleveland Building Permit No. K-56617, September 1964.
[75] *Plain Dealer*, 27 December 1964.
[76] Ibid.

- Combination of Clip Flanges, Hinges and Shunts, 1930
- Stamped Metal Ground Clamp with U-Section, 1931
- Long Tailed Flexible Insulators for Clips, 1934
- Jumper for Charging Batteries, 1935
- Unique Alligator Clip, 1935
- Clip Insulator made from Plastic Tubing, 1947[77]

In 1957, Mueller authored his autobiography, titled "*The Skipper of the Clipper*" – a nickname he had acquired in earlier years. Mueller stated in his autobiography his thoughts on how the Mueller Electric Company came to dominate the market,

> *This business was never built up around a patent monopoly. There were clips on the market when we started and during the years literally dozens of competing clips of various designs made their appearance, but few persisted. Our own immodest idea is that we became the dominant factor in this limited field because we deserved to do so. We were the first in the field with many innovations in design, the first to sense new applications and offer suitable clips to meet them. Over the years we have learned a lot about making clips and, by passing on savings in production costs, have offered constantly improved clips at lower and lower prices until now our average selling price is about half of what it used to be. Today our designs are accepted as standard by the world as is evidenced by the fact that they have been appropriated in eight major countries abroad.* [78]

He also kept a Mueller Electric Company collection which later became a small museum gallery located on the second floor of the building in 1972.[79] The museum and archives are no longer on public display. [80] As a successful businessman and entrepreneur, Ralph Mueller also was a Cleveland philanthropist. He donated money for construction of the Ralph Mueller Planetarium at the Natural History Museum in Cleveland and for carillon bells at the Cleveland Zoo (Historic Images, Figures 13,14). He was former president of the Electrical League of Cleveland and the Citizens League. He served as vice president of the Cleveland Health Museum and as a trustee at the Cleveland Zoo. [81] His son, Scott Mueller; son-in-law, Ed deConingh; grandson Ted

[77] Mueller, 115-116.
[78] Mueller, 124, 240-241.
[79] *Plain Dealer,* 12 December 1972.
[80] Naylor, Wendy Hoge. *Oral History of Mueller Electric Company, former Senior Partner/President and great-grandson E. Scott Emerson,* June 2015
[81] *Plain Dealer,* 16 February 1966.

deConingh; and great grandson, E. Scott Emerson, each served in the leadership of the company.[82] Further additions were added to the Muller Electric Co. building in 1972 designed again by The George S. Rider Co.,[83] with the last addition in 1976[84] (Historic Images, Figure 12). In 2011, the company was sold to the Desco Corporation in Akron, Ohio where it continues to operate as the Mueller Electric Company.[85] The Mueller Electric Company Building on East 31st Street in Cleveland has remained vacant since 2007.

Conclusion

The Cleveland based Mueller Electric Company grew to become the largest manufacturer and seller of insulated electric and alligator clips in the United States[86] demonstrating the entrepreneurial spirit of invention and industry in America beginning in the Progressive years of early twentieth century America. With the sales and innovative engineering talents of Ralph S. Mueller, the emergence of electricity as the preferred form of energy, and Cleveland as a manufacturing center – the simple and ingenious alligator clip became a success with broad application. The alligator clip revolutionized electronical testing within the vastly expanding market for electricity during the early twentieth century. Virtually every electronically based device or component required field testing in preparation for introduction on the market, or for repair, thereby involving the use of alligator clips.[87] As markets for electricity expanded so did the applications for use of alligator clips ranging widely beginning with telephone line testing, then: automobile self-starters; ham radio operation; jumper cables; televisions; toys; household appliances; grounding to drain static from auto tank trucks; airplanes; during surgeries using anesthetic; military ships to avoid magnetic mine detection; electric fences; space satellites and more including non-electrical uses.[88] Located at East 31st Street in Cleveland and constructed beginning in 1922, the Mueller Electric Company Building was frugally expanded as profits were re-invested and production and manufacturing techniques improved to meet the need for increased production supporting the largest manufacturer of alligator clips in the United States, if not the world. [89]

[82] Naylor, Wendy Hoge. *Oral History of Mueller Electric Company, former Senior Partner/President and great-grandson E. Scott Emerson,* June 2015; Naylor, Wendy Hoge. *Oral History of Mueller Electric Company, former Senior Partner/President and grandson Ted deConingh,* June 2015.

[83] The George S. Rider Company. *Architectural Plans for the Mueller Electric Company, 1971*. Available at City of Cleveland Archives.

[84] City of Cleveland Building Permit No. M-48451, 21 April 1976.

[85] *Mueller Electric Acquired by Desco Corporation.* Desco Corporation Press Release 19 December 2011. Available at *uhttp://www.manufacturing.net/news/2011/12/mueller-electric-company-acquired-by-desco-corporation.*

[86] Mueller, 240-241.

[87] Mueller, 118.

[88] Mueller, 117, 225 .

[89] Mueller, 240-241.

9. Major Bibliographical References

Primary

City of Cleveland Building Permits. Available at City of Cleveland Building Department, Cleveland Landmarks Commission, Cleveland City Hall.

Cleveland Architects Database, Cleveland Landmarks Commission, *George Smith Rider*.

Cleveland Museum of Natural History. Available at *https://www.cmnh.org/about-the-museum/photo-galleries/Where-We%E2%80%99ve-Been*

Cuyahoga County Auditor's Office. Property and Tax Records, Building Card.

Cuyahoga County Tax Duplicate and Plat Maps. Cuyahoga County Archives.

Find a Grave Index, 1600s to Current. Available at *Ancestry.com*.

G. M. Hopkins Maps, City of Cleveland 1920-22. Map Collection, Cleveland Public Library.

Mueller Electric Acquired by Desco Corporation. Desco Corporation Press Release 19 December 2011. Available at *uhttp://www.manufacturing.net/news/2011/12/mueller-electric-company-acquired-by-desco-corporation*.

Mueller Electric Company. Available at *www.muellerelectric.com.*

Mueller, Ralph. *The Skipper of the Clipper,* Cleveland: Mueller Electric Company, 1957.

Naylor, Wendy Hoge. *Oral History of Mueller Electric Company, former Senior Partner/President and great-grandson E. Scott Emerson,* June 2015.

Naylor, Wendy Hoge. *Oral History of Mueller Electric Company, former Senior Partner/President and grandson Ted deConingh,* June 2015.

Plain Dealer Historical Archives 1950-1990. Cleveland Public Library.

Sanborn Fire Insurance Maps, 1951-1953. Cleveland Public Library.

The George S. Rider Company. *Architectural Plans for the Mueller Electric Company, 1971*. Available at City of Cleveland Archives.

U.S. Federal Population Census 1900-1940.

Secondary

Constable, George and Somerville, Bob. Greatest Engineering Achievements A Century of Innovation, *Electrification History 1 – Early Years.* National Academy of Engineering, 2015. Available at *www.greatachievements.org*.

Institute for Energy Research. *History of Electricity*. 29 August 2014. Available at *http://instituteforenergyresearch.org/history-electricity*

Miller, Carol Poh. Wheeler, Robert A. *Cleveland A Concise History 1796 – 1996*. Bloomington: Indiana University Press, 2cd ed., 1997.

Moore, Stephen, Simon, Julian L. *The Greatest Century that Ever Was 25 Miraculous Trends of the Past 100 Years*. Vol. No. 364, The Cato Institute Policy Analysis 15 December 1999.

Orth, Samuel Peter. *A History of Cleveland, Ohio: Biographical,* Vol. I., Part 1 & 2. Chicago-Cleveland: The S. J. Clarke Publishing Co., 1910.

Progress is Fine Blog. *Mueller Electric.* Available at *http://progress-is-fine.blogspot.com/search?q=ralph+s+mueller.*

Rose, William Ganson. *Cleveland The Making of a City*. Cleveland and New York: The World Publishing Company, 1950.

Toman, James A. and Hays, Blaine S. *Horse Trails to Regional Rails. The Story of Public Transit in Greater Cleveland.* Kent: The Kent State University Press, 1996.

Van Tassel, David R. and Grabowski, John J. eds. *The Encyclopedia of Cleveland History*. "Cleveland Electric Illuminating Co." Bloomington: Indiana University Press, 1996. Also available at *www.ech.case.edu.*

Van Tassel, David R. and Grabowski, John J. eds. *The Encyclopedia of Cleveland History*. "Electrical and Electronics Industries." Bloomington: Indiana University Press, 1996. Also available at *www.ech.case.edu.*

National Register Nominations

Perfection Stove Company Building, Kansas City, Missouri (NR# 14000376)

Euclid Avenue Historic District, National Register Nominations (NR# 02000702 and 07000524).

Previous documentation on file (NPS):

__X preliminary determination of individual listing (36 CFR 67) has been requested
____ previously listed in the National Register
____ previously determined eligible by the National Register
____ designated a National Historic Landmark
____ recorded by Historic American Buildings Survey #_____
____ recorded by Historic American Engineering Record # _____
____ recorded by Historic American Landscape Survey # _____

Primary location of additional data:

____ State Historic Preservation Office
____ Other State agency
____ Federal agency
____ Local government
____ University
__X_ Other
Name of repository: _Cleveland Public Library _____

Historic Resources Survey Number (if assigned): _____

10. Geographical Data

Acreage of Property __1.006 acres_____

Use either the UTM system or latitude/longitude coordinates

Latitude/Longitude Coordinates (decimal degrees)
Datum if other than WGS84:_____
(enter coordinates to 6 decimal places)

1. Latitude: Longitude:

2. Latitude: Longitude:

3. Latitude: Longitude:

4. Latitude: Longitude:

Or
UTM References
Datum (indicated on USGS map):

[X] NAD 1927 or [ ] NAD 1983

1. Zone: 17	Easting:	444243	Northing:	4595326
2. Zone:	Easting:		Northing:	
3. Zone:	Easting:		Northing:	
4. Zone:	Easting :		Northing:	

Verbal Boundary Description
The nominated property is situated in the City of Cleveland, County of Cuyahoga and State of Ohio. The boundary of the historic Mueller Electric Company Building follows the boundary of Cuyahoga County Parcel # 010228109; property addresses 1587 East 31st Street.

Boundary Justification
The nominated boundary includes the property historically associated with the Mueller Electric Co. Building since purchase of the parcel(s) and construction of the building and its additions.

11. Form Prepared By

name/title: Wendy Hoge Naylor and Diana Wellman
organization: Naylor Wellman, LLC
street & number: 92 East Washington Street
city or town: Chagrin Falls state: OH zip code: 44022
e-mail: naylor@naylorwellman.com; wellman@naylorwellman.com
telephone: 440-247-8319
date: September 14, 2015

Additional Documentation

Submit the following items with the completed form:

- **Maps:** A **USGS map** or equivalent (7.5 or 15 minute series) indicating the property's location.
- **Sketch map** for historic districts and properties having large acreage or numerous resources. Key all photographs to this map.
- **Additional items:** (Check with the SHPO, TPO, or FPO for any additional items.)

Photographs

Photo Log

Name of Property: Mueller Electric Co. Building

City or Vicinity: Cleveland

County: Cuyahoga State: Ohio

Photographer: Diana Wellman

Date Photographed: July, 2015

Description of Photograph(s) and number, include description of view indicating direction of camera:

1 of _30__.

1. (OH_Cuyahoga_Mueller Electric Co. Building_0001): Facade, west elevation, stone. Inscribed letter “M”, camera direction NE.

2. (OH_Cuyahoga_Mueller Electric Co. Building _0002): Facade, west elevation, main entry, camera direction NE.

3. (OH_Cuyahoga_Mueller Electric Co. Building _0003): Facade, west elevation (1936-46), camera direction NE.

4. (OH_Cuyahoga_Mueller Electric Co. Building _0004): Facade, west elevation, camera direction E.

5. (OH_Cuyahoga_Mueller Electric Co. Building _0005): North elevation, camera direction W.

6. (OH_Cuyahoga_Mueller Electric Co. Building _0006): East and north elevations, camera direction SE.

7. (OH_Cuyahoga_Mueller Electric Co. Building _0007): East elevation, camera direction NW.

8. (OH_Cuyahoga_Mueller Electric Co. Building _0008): East elevation, camera direction NW.

9. (OH_Cuyahoga_Mueller Electric Co. Building _0009): South and east elevation, camera direction W.

10. (OH_Cuyahoga_Mueller Electric Co. Building _0010): Facade, west elevation, (1956-72) camera direction NW.

11. (OH_Cuyahoga_Mueller Electric Co. Building _0011): Facade, west elevation, (1956-72) camera direction NE.

12. (OH_Cuyahoga_Mueller Electric Co. Building _0012): Facade, west elevation, (1922) camera direction NE.

13. (OH_Cuyahoga_Mueller Electric Co. Building_0013): Interior, Stair #1 detail, camera direction N.

14. (OH_Cuyahoga_Mueller Electric Co.Building _0014): Interior, Stair #1 detail, camera direction S.

15. (OH_Cuyahoga_Mueller Electric Co. Building _0015): Interior, First Floor (1922-25), camera direction NE.

16. (OH_Cuyahoga_Mueller Electric Co. Building _0016): Interior, Second Floor (1922), camera direction SE.

17. (OH_Cuyahoga_Mueller Electric Co. Building _0017): Interior, Second Floor (1922-25), camera direction W.

18. (OH_Cuyahoga_Mueller Electric Co. Building _0018): Interior, Second Floor (1922/25 exterior wall) in 1972 space, camera direction N.

19. (OH_Cuyahoga_Mueller Electric Co. Building _0019): Interior, First Floor (1936), camera direction W.

20. (OH_Cuyahoga_Mueller Electric Co. Building _0020): Interior, Second Floor (1946), camera direction W.

21. (OH_Cuyahoga_Mueller Electric Co. Building _0021): Interior, Second Floor (1946), camera direction NE.

22. (OH_Cuyahoga_Mueller Electric Co. Building _0022): Interior, Second Floor (1946), camera direction N.

23. (OH_Cuyahoga_Mueller Electric Co. Building _0023): Interior, First Floor (1956), camera direction E.

24. (OH_Cuyahoga_Mueller Electric Co. Building _0024): Interior, Second Floor (1972), camera direction S.

25. (OH_Cuyahoga_Mueller Electric Co. Building _0025): Interior, Second Floor (1972), camera direction SE.

26. (OH_Cuyahoga_Mueller Electric Co. Building _0026): Interior, First Floor (1964), camera direction W.

27. (OH_Cuyahoga_Mueller Electric Co. Building _0027): Interior, Second Floor (1972), camera direction S.

28. (OH_Cuyahoga_Mueller Electric Co. Building _0028): Interior, Second Floor (1972), camera direction S.

29. (OH_Cuyahoga_Mueller Electric Co. Building _0029): Interior, First Floor (1976), camera direction N.

30. (OH_Cuyahoga_Mueller Electric Co. Building _0030): Interior, Second Floor (1976), camera direction W.

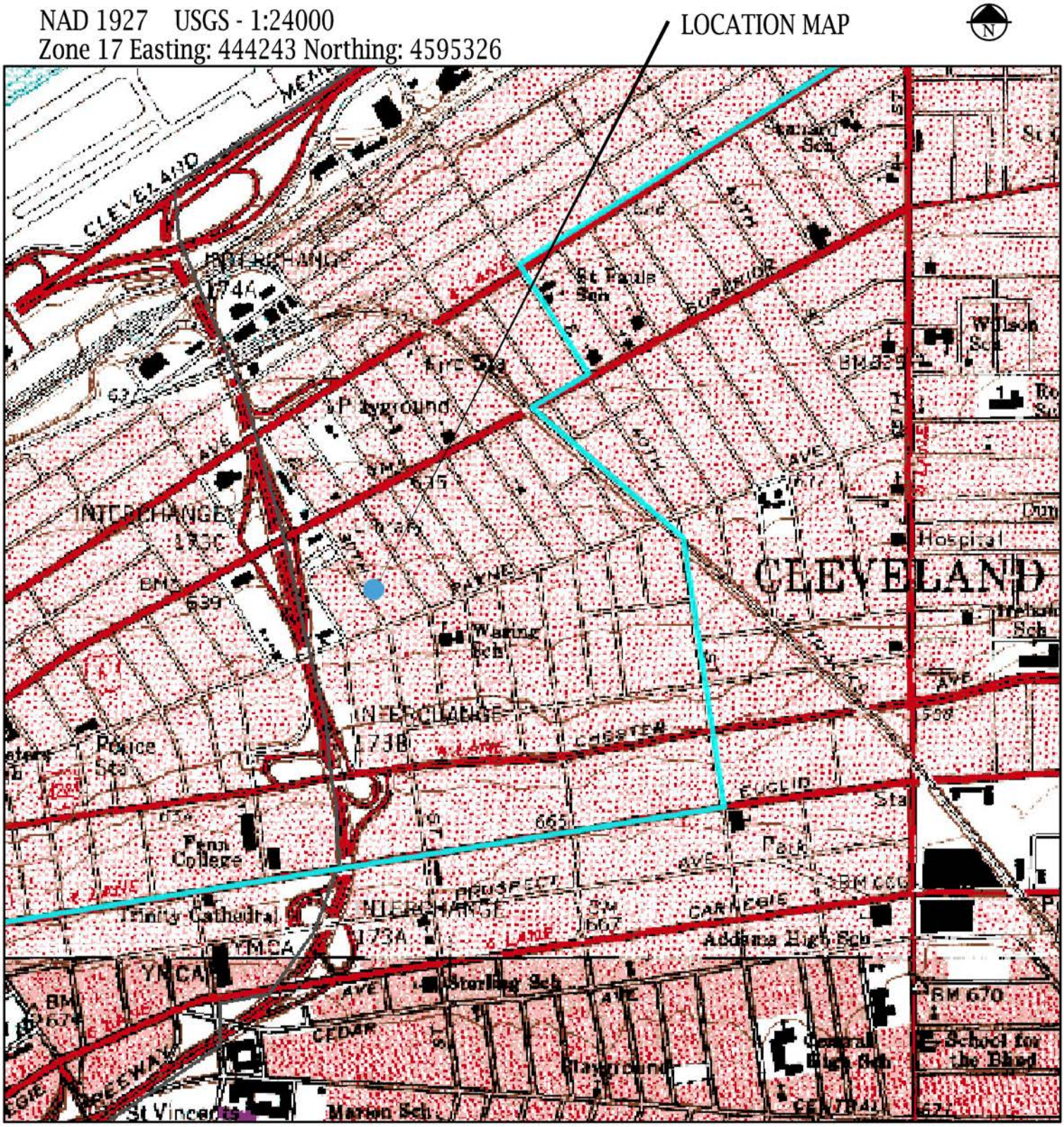
United States Department of the Interior
National Park Service

MUELLER ELECTRIC CO. BUILDING
Cuyahoga County, Ohio

National Register of Historic Places Continuation Sheet

Section number Additional Documentation - USGS Location Map Page 1

NAD 1927 USGS - 1:24000
Zone 17 Easting: 444243 Northing: 4595326

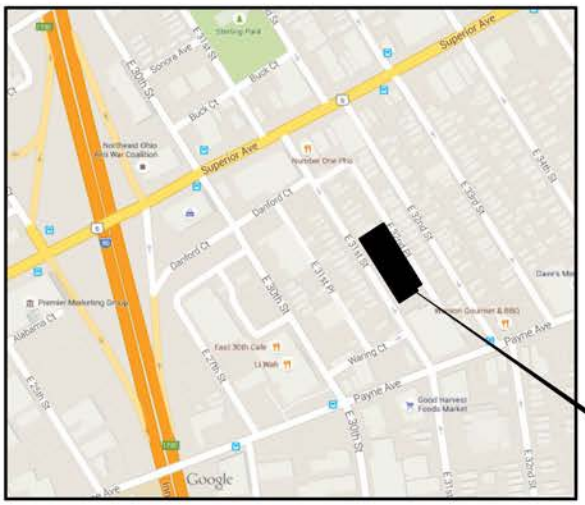


United States Department of the Interior
National Park Service

MUELLER ELECTRIC CO. BUILDING
Cuyahoga County, Ohio

National Register of Historic Places Continuation Sheet

Section number Additional Documentation - Location and Boundary Map Page 2



LEGEND
Not to Scale
BUILDING BOUNDARY
PARCEL BOUNDARY
P = XXXXXXXX PARCEL NUMBER
19xx DATE OF CONSTRUCT.

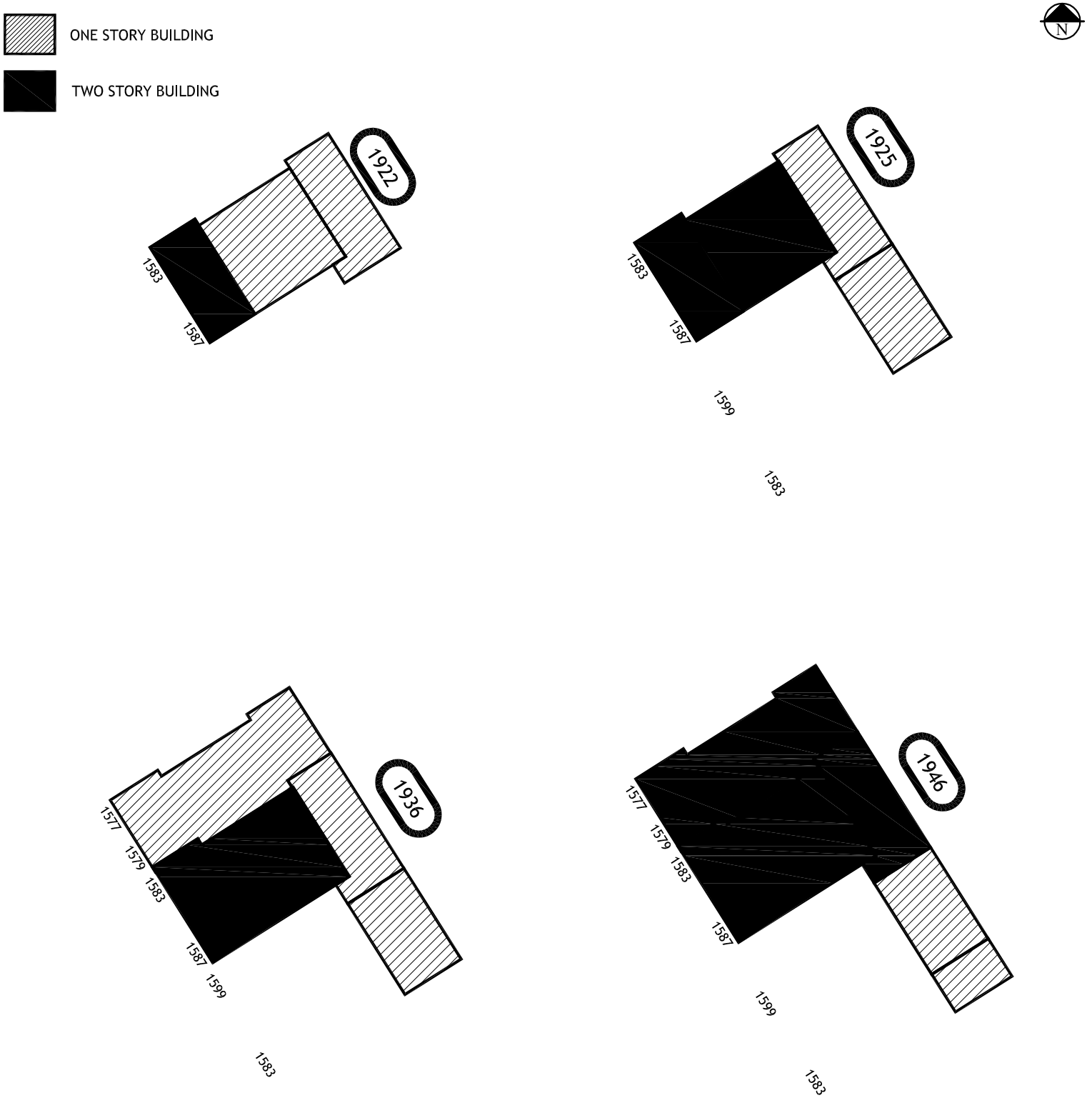
LOCATION MAP N

United States Department of the Interior
National Park Service

MUELLER ELECTRIC CO. BUILDING
Cuyahoga County, Ohio

National Register of Historic Places Continuation Sheet

Section number Additional Documentation - Construction Development Page 3



United States Department of the Interior
National Park Service

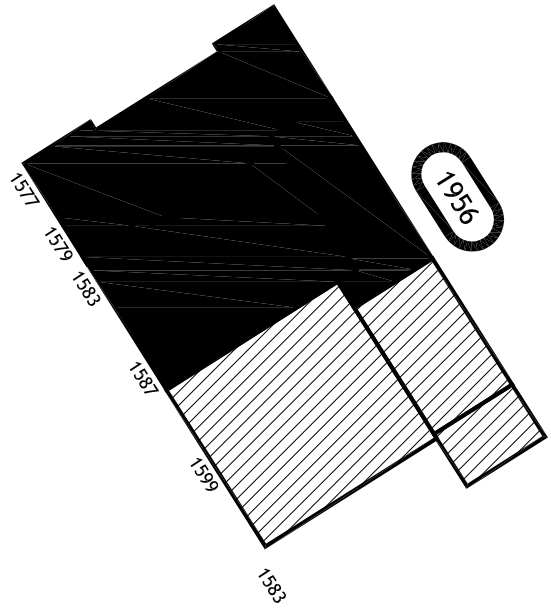
MUELLER ELECTRIC CO. BUILDING
Cuyahoga County, Ohio

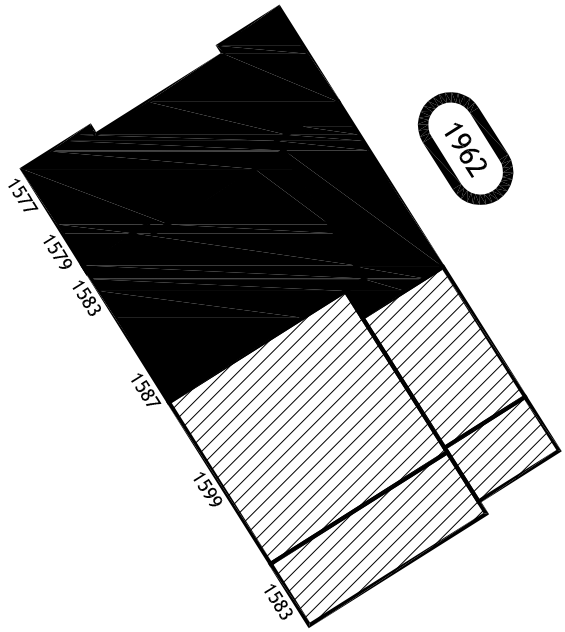
National Register of Historic Places Continuation Sheet

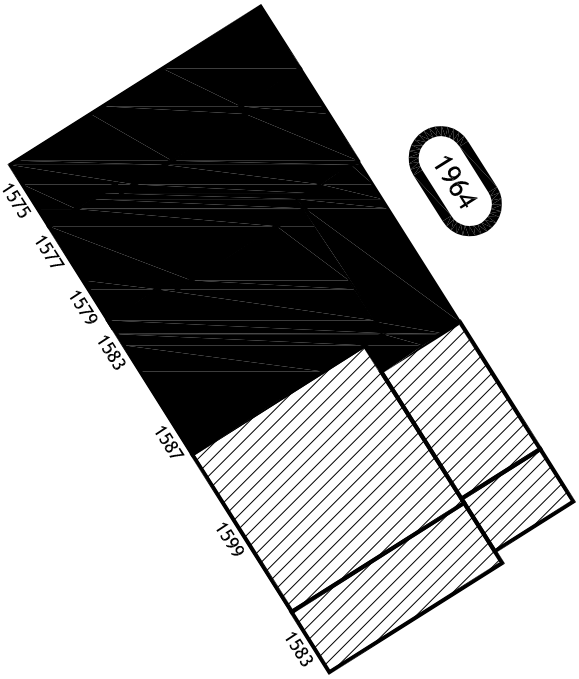
Section number Additional Documentation - Construction Development Page 4

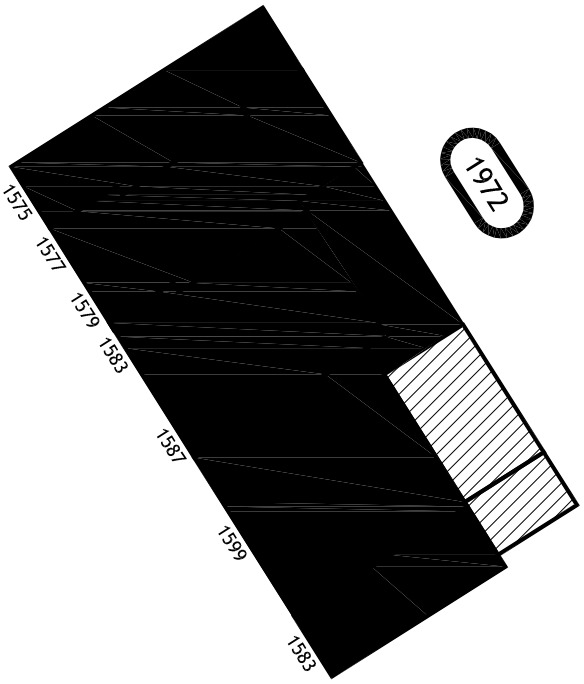
ONE STORY BUILDING

TWO STORY BUILDING









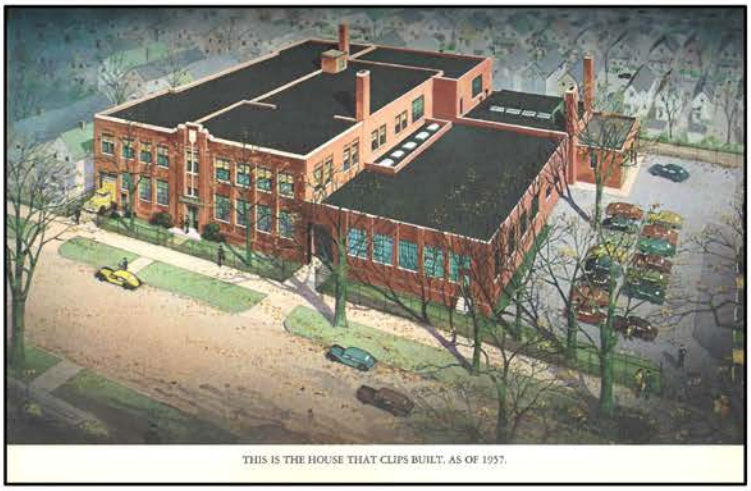
United States Department of the Interior
National Park Service

MUELLER ELECTRIC CO. BUILDING
Cuyahoga County, Ohio

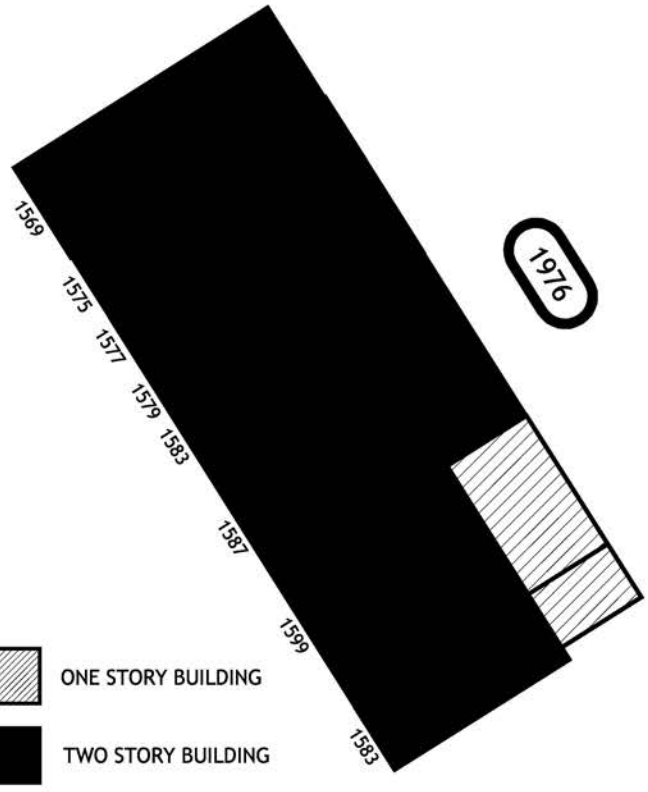
National Register of Historic Places Continuation Sheet

Section number Additional Documentation - Construction Development Page 5

The original factory building, 1922.


THIS IS THE HOUSE THAT CLIPS BUILT. AS OF 1957.


1977

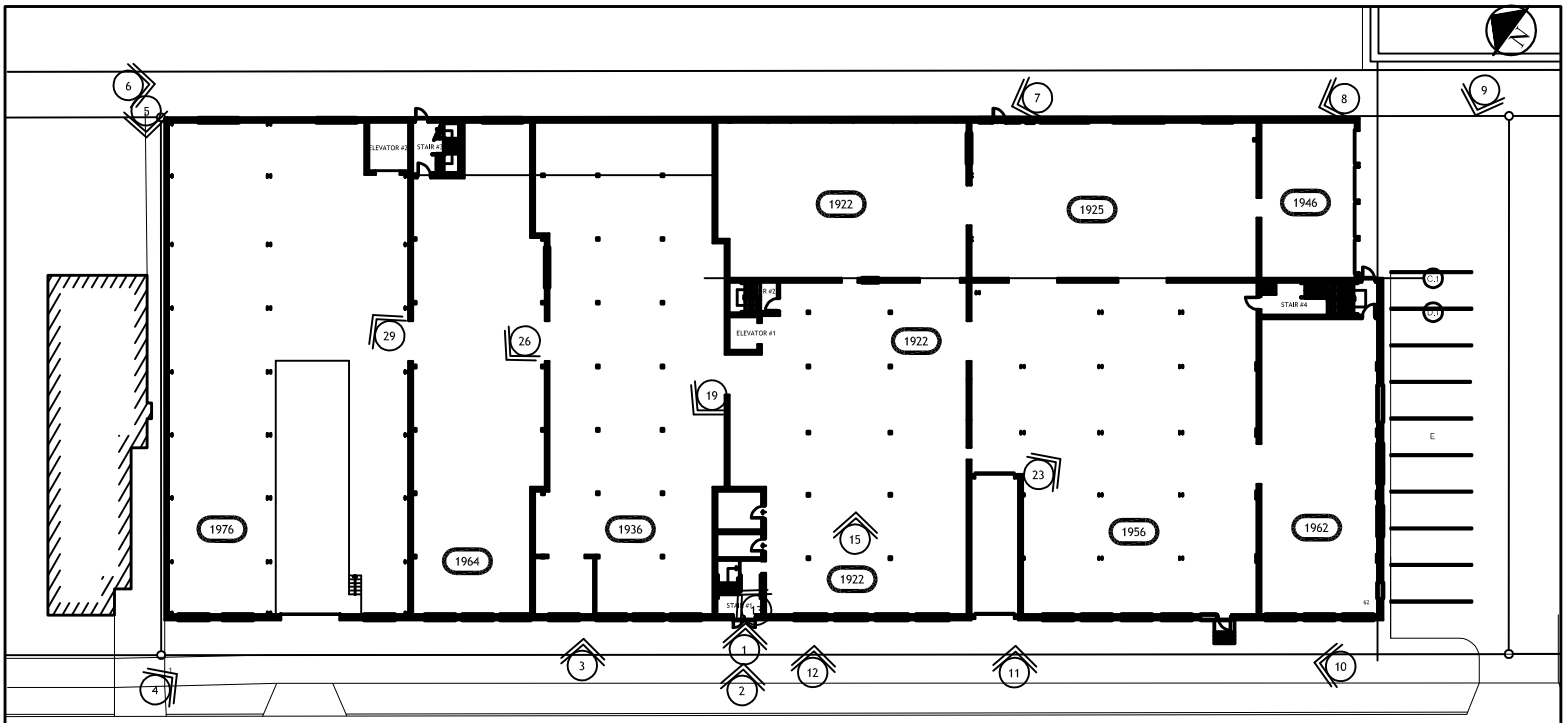


United States Department of the Interior
National Park Service

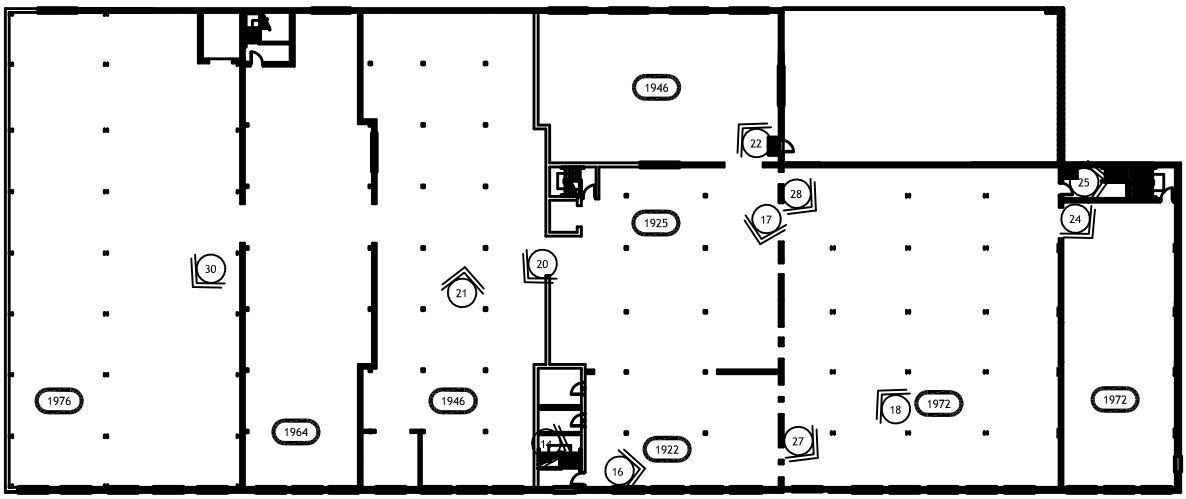
MUELLER ELECTRIC CO. BUILDING
Cuyahoga County, Ohio

National Register of Historic Places Continuation Sheet

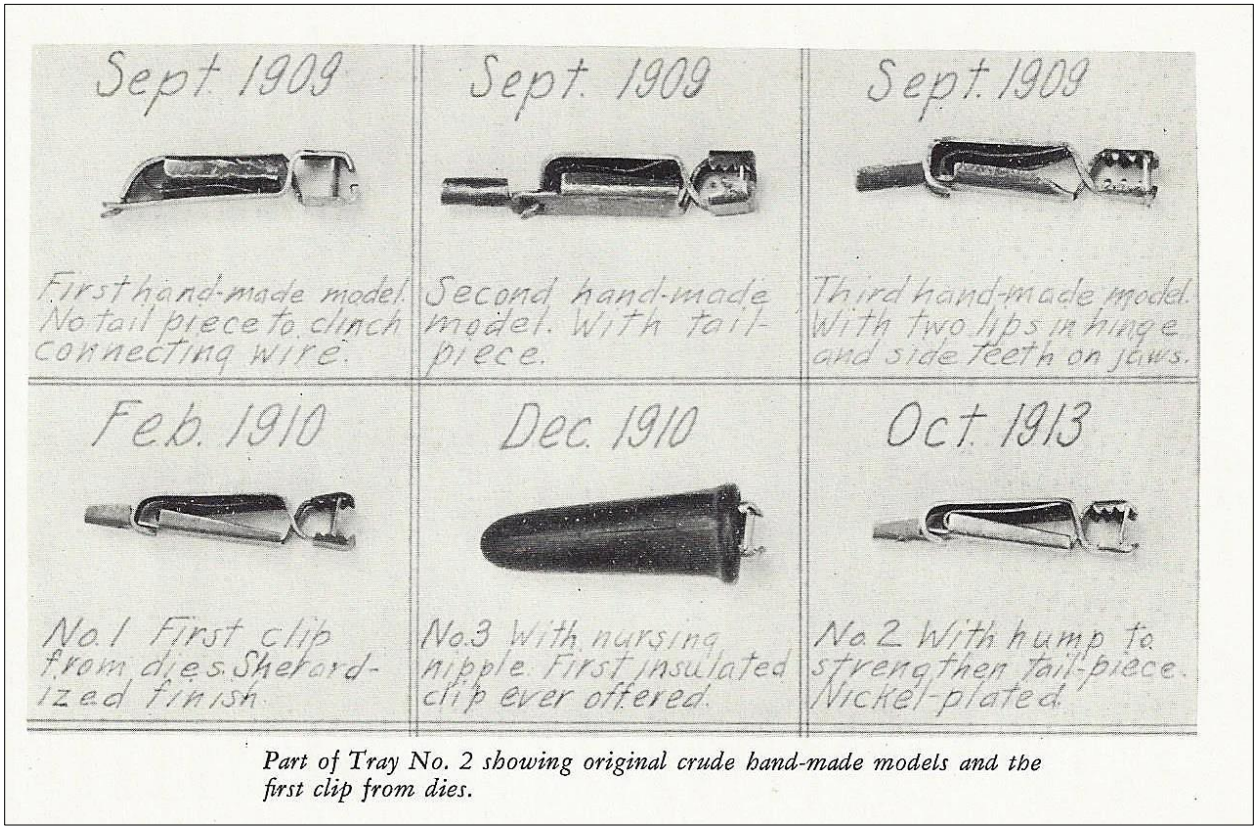
Section number Additional Documentation - Photo-Key Page 6



SITE PLAN & FIRST FLOOR



SECOND FLOOR

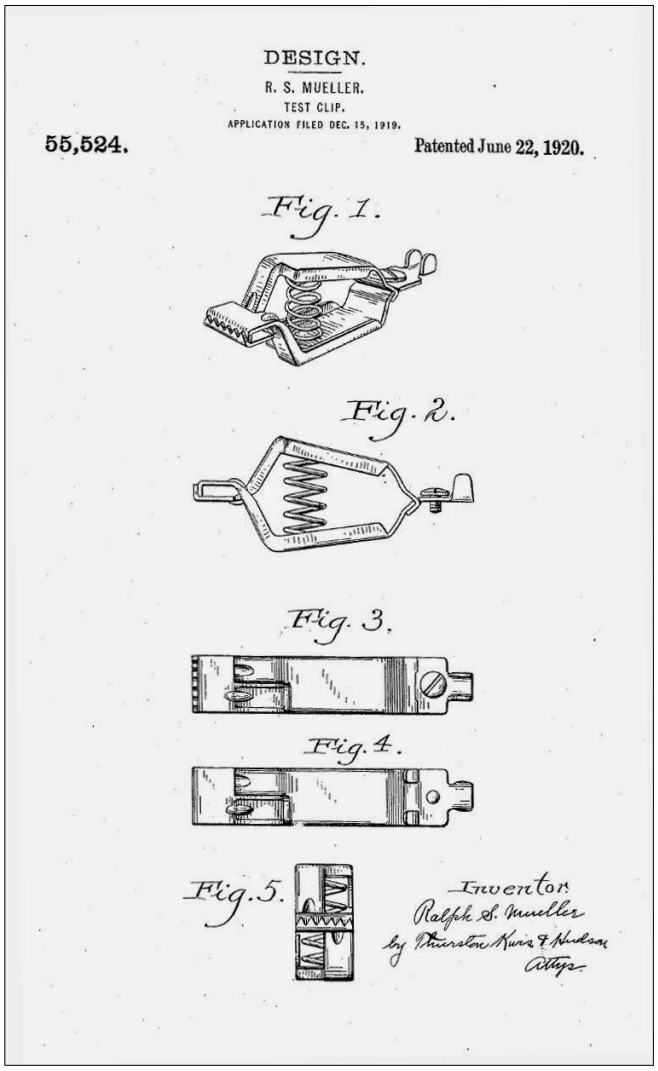


Part of Tray No. 2 showing original crude hand-made models and the first clip from dies.

Figure 1

Earliest Mueller Clips

Source: Mueller, Ralph, *The Skipper of the Clipper.* Cleveland: Mueller Electric Company, 1957.


DESIGN.

R. S. MUELLER.

TEST CLIP.

APPLICATION FILED DEC. 15, 1919.

55,524. Patented June 22, 1920.

Fig. 1.

Fig. 2.

Fig. 3.

Fig. 4.

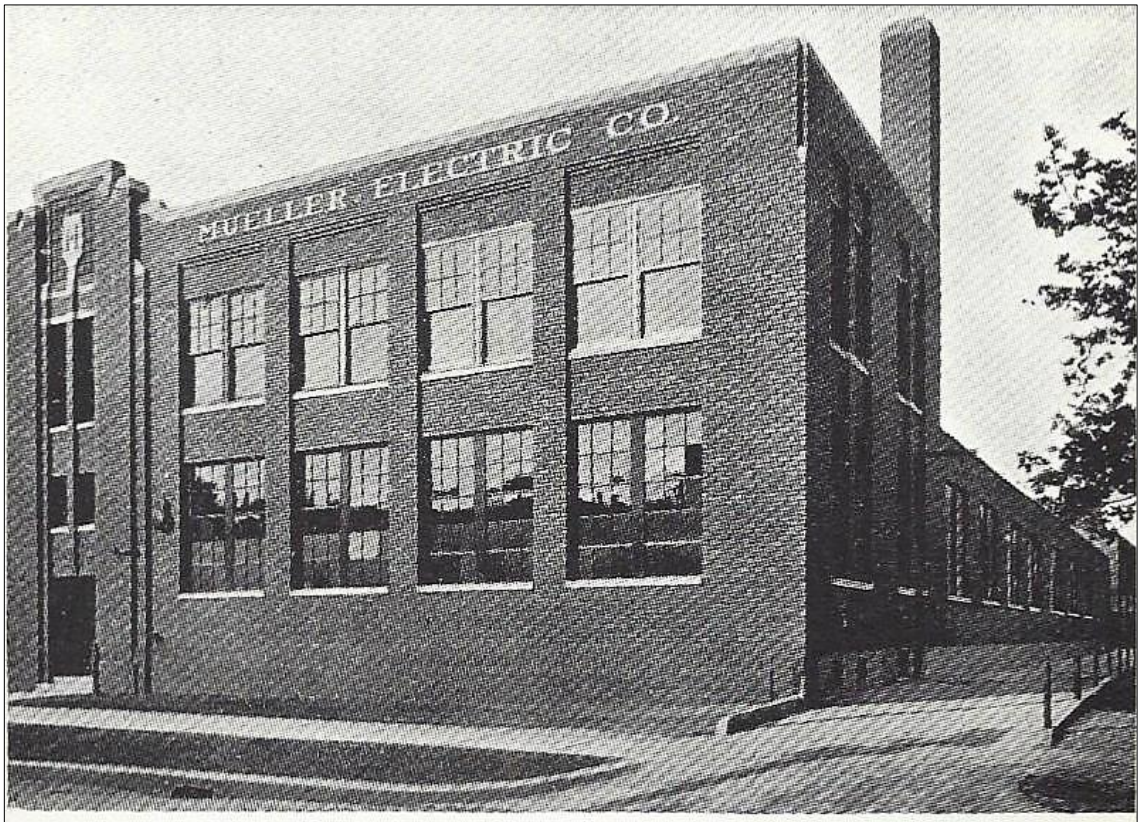
Fig. 5.

Inventor
Ralph S. Mueller
by Thurston Kerr & Hudson
Attys.

Figure 2

Test Clip Patent owned by Ralph S. Mueller, 1920

Source: Progress is Fine Blog. *Mueller Electric*. Available at *http://progress-is-fine.blogspot.com/search?q=ralph+s+mueller*.



The original factory building, 1922.

Figure 3

Mueller Electric Co. Building, 1922
Architect: The George S. Rider Co.

Source: Mueller, Ralph, *The Skipper of the Clipper.* Cleveland: Mueller Electric Company, 1957.

Cleveland Landmarks Commission

Cleveland Architects

George Smith Rider

Birth/Established: 1862 **Death/Dissolved:** September 11, 1917

Biography: The Rhode Island-born George S. Rider was an engineer. The company was responsible for many industrial structures throughout Cleveland and the region, and it had its offices in the Century Building, 197 Superior Avenue. After his death in 1917, the firm continued under his name, and Herman Neff served as President of the company. Offices would later move to the Marshall Building and the Terminal Tower. The George S. Rider Company was in business until 2007. George Rider is buried in Providence, Rhode Island.

Building List

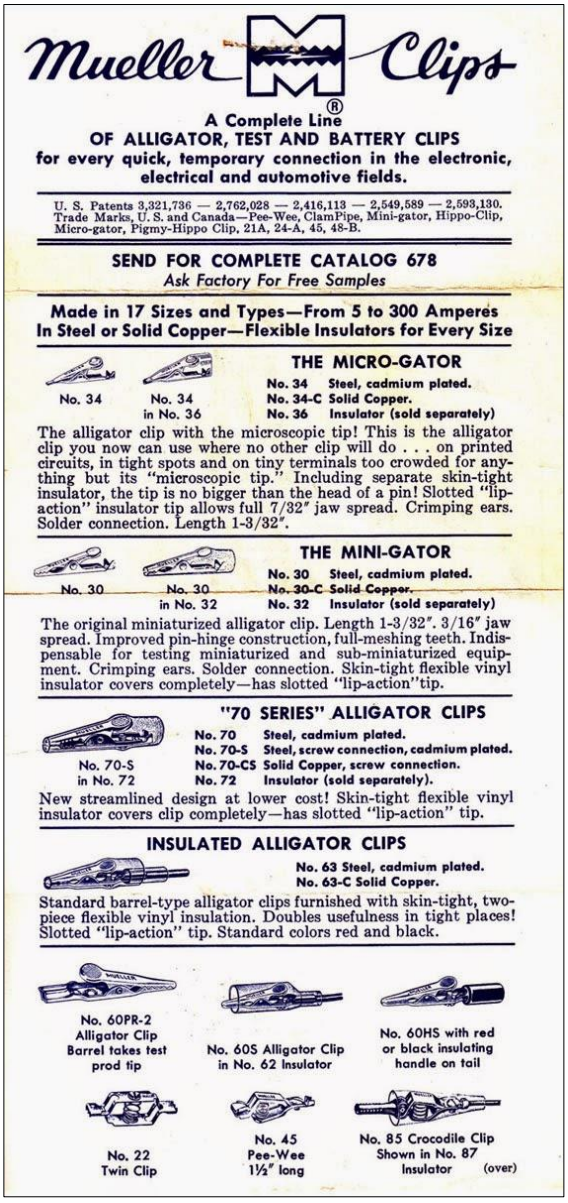
Structure	Date	Address	City	State	Status
Cleveland Worsted Mills	1906		Ravenna	Ohio	Standing
W.S. Tyler Company Addition	1907		Cleveland	Ohio	Standing
W.S. Tyler Company - Building # 38	1915	1375 East 34th Street	Cleveland	OH	Standing
W.S. Tyler Company - Building #38 additions	1916, 1918, 1920	1379 - 91 East 34th Street	Cleveland	OH	Standing
Factory	1917	3590 W. 58th Street	Cleveland	Ohio	Demolished
National Acme Company	1917	170 East 131st Street	Cleveland	Ohio	Standing
Factory addition	1917		Cleveland	Ohio	Unknown
Factory galvanizing shop	1917		Cleveland	Ohio	Unknown
Cleveland Worsted Mill Factory and Dye House	1917		Jamestown	NY	Demolished
Factory for Cleveland Tractor	1917	19201 Euclid Avenue	Euclid	OH	Demolished
Factory Addition for the National Acme Manufacturing Company	1918	7512 Sherman Avenue	Cleveland	OH	Demolished
Foote Burt Company	1921	13000 St. Clair Avenue	Cleveland	Ohio	Standing
St. Alexis Hospital Addition	1925		Cleveland	Ohio	Demolished
Charity Hospital Nurses Home	1927		Cleveland	Ohio	Demolished
St. Rita's Church	1929		Solon	OH	Demolished
Glenville Hospital	1929	701 Parkwood Drive	Cleveland	Ohio	Demolished
Salvation Army Home	1929		Cleveland	Ohio	Demolished
St. Vincent Charity Hospital	nd				Unknown
Cleveland Twist Drill	nd				Unknown
Ohio Bell	nd		Rocky River	Ohio	Unknown
Cleveland Worsted Mills	nd		Cleveland	Ohio	Demolished
Investment Plaza at Erieview	nd				Demolished

Sources:
Cleveland City Directories

Figure 4

George Smith Rider and The George S. Rider Co.

Source: Cleveland Architects Database, Cleveland Landmarks Commission.



Mueller Clips®

A Complete Line
OF ALLIGATOR, TEST AND BATTERY CLIPS
for every quick, temporary connection in the electronic, electrical and automotive fields.

U. S. Patents 3,321,736 — 2,762,028 — 2,416,113 — 2,549,589 — 2,593,130. Trade Marks, U. S. and Canada—Pee-Wee, ClamPipe, Mini-gator, Hippo-Clip, Micro-gator, Pigmy-Hippo Clip, 21A, 24-A, 45, 48-B.

SEND FOR COMPLETE CATALOG 678
Ask Factory For Free Samples

Made in 17 Sizes and Types—From 5 to 300 Amperes
In Steel or Solid Copper—Flexible Insulators for Every Size

THE MICRO-GATOR

No. 34 — No. 34 in No. 36

No. 34 Steel, cadmium plated.
No. 34-C Solid Copper.
No. 36 Insulator (sold separately)

The alligator clip with the microscopic tip! This is the alligator clip you now can use where no other clip will do . . . on printed circuits, in tight spots and on tiny terminals too crowded for anything but its "microscopic tip." Including separate skin-tight insulator, the tip is no bigger than the head of a pin! Slotted "lip-action" insulator tip allows full 7/32" jaw spread. Crimping ears. Solder connection. Length 1-3/32".

THE MINI-GATOR

No. 30 — No. 30 in No. 32

No. 30 Steel, cadmium plated.
No. 30-C Solid Copper.
No. 32 Insulator (sold separately)

The original miniaturized alligator clip. Length 1-3/32". 3/16" jaw spread. Improved pin-hinge construction, full-meshing teeth. Indispensable for testing miniaturized and sub-miniaturized equipment. Crimping ears. Solder connection. Skin-tight flexible vinyl insulator covers completely—has slotted "lip-action" tip.

"70 SERIES" ALLIGATOR CLIPS

No. 70-S in No. 72

No. 70 Steel, cadmium plated.
No. 70-S Steel, screw connection, cadmium plated.
No. 70-CS Solid Copper, screw connection.
No. 72 Insulator (sold separately).

New streamlined design at lower cost! Skin-tight flexible vinyl insulator covers clip completely—has slotted "lip-action" tip.

INSULATED ALLIGATOR CLIPS

No. 63 Steel, cadmium plated.
No. 63-C Solid Copper.

Standard barrel-type alligator clips furnished with skin-tight, two-piece flexible vinyl insulation. Doubles usefulness in tight places! Slotted "lip-action" tip. Standard colors red and black.

No. 60PR-2 Alligator Clip Barrel takes test prod tip

No. 60S Alligator Clip in No. 62 Insulator

No. 60HS with red or black insulating handle on tail

No. 22 Twin Clip

No. 45 Pee-Wee 1½" long

No. 85 Crocodile Clip Shown in No. 87 Insulator (over)

No. 50-C Needle Clip Pierces insulation

No. 48-B 2" long

No. 27 2 7/16" long

No. 25 Test Clip—40 amp. 3" long
No. 25-C Test Clip—75 Amp. 3" long

No. 24-A Bat. Clip—25 Amp. 2⅜" long
No. 21-A Bat. Clip—50 Amp. 4" long

LARGER SIZES
No. 21-C 100 amp. 4-1/2" copper
No. 11-A 100 amp. 6" steel
No. 11-C 200 amp. 6" copper
No. 33-C 300 amp. 7-3/4" copper

FLEXIBLE INSULATORS FOR CLIPS
Prevents shorts and shocks. There's a flexible insulator to fit each size of Mueller Clip. Patented design holds clip firmly. Packed ½ Red, ½ Black to indicate polarity. *Blue, White, Yellow, and Green also available.*

CLAMPIPE GROUND CLAMP
No. 58
For grounding appliances and all kinds of electrical devices. Will not lop over when applied. Point of large, pointed screw bites into clean metal.

THE HIPPO-CLIP
Hippo-Clip
For Battery Booster Cables and Fast Chargers
6" long. 1-9/16" jaw spread.
No. 41-A Steel, Bright Copper Plated, 100 Amp.
No. 41-C Solid Copper, 200 Amp.

PIGMY-HIPPO CLIP
For Battery Operated Equipment and Automotive Test
3" long. 1-1/8" jaw spread.
No. 46-A Steel, Bright Copper Plated, 50 Amp.
No. 46-C Solid Copper, 75 Amp.
Pigmy-Hippo Clip

Both clips feature lively spring action, built-in solder strap, crimping ears to support cable, vinyl handle insulators in red or black.

Quality
BATTERY BOOSTER CABLES
No. 8A6 8 ft. 6 ga. (No. 41-A Clips)
No. 12A6 12 ft. 6 ga. (No. 41-A Clips)
No. 12C4 12 ft. 4 ga. (No. 41-C Clips)

Pure copper cables, finely stranded, with *rubber* insulation for maximum flexibility and durability—even in coldest weather. Clips strongly clinched to cable *and soldered* — won't break off. A truly heavy-duty, professional design . . . for the man who *knows* what he wants.

You May Assort All Mueller Products to Obtain Quantity Prices

BUY FROM YOUR JOBBER
ASK FACTORY FOR FREE SAMPLES AND CATALOG 678

Mueller Electric Co.
1592 E. 31st Street
Cleveland, Ohio 44114
Phone: (216) 771-5225

Form 735 114 Litho in U.S.A. (over)

Figure 5

Ad for Mueller Electric Co. Clips

Source: Progress is Fine Blog. *Mueller Electric*. Available at *http://progress-is-fine.blogspot.com/search?q=ralph+s+mueller*.

Figure 6

Assembly of the 100,000,000th clip in 1940.

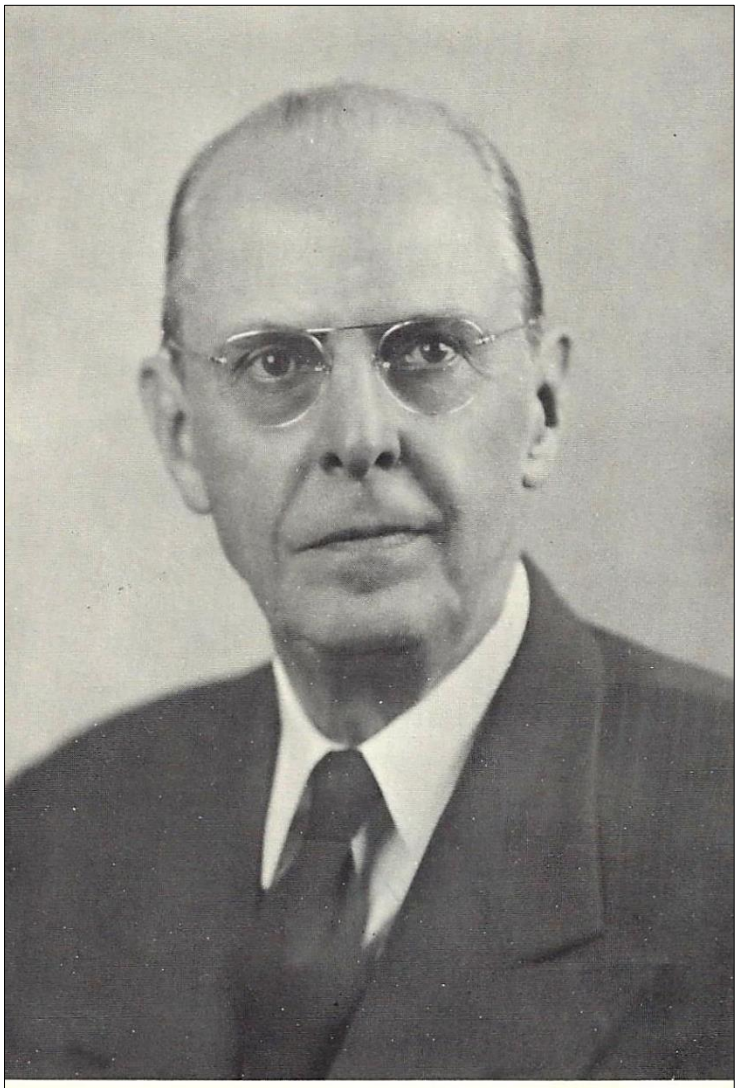
Left to right: Ralph S. Mueller; Son, Scott Mueller; Son-In-Law, Ed deConingh; Superintendent, Al Flynn; and, John Dromgold

Figure 7

Assembly of the 300,000,000th clip in 1956.

Left to right: Son-in-law, Ed deConingh; Son, Scott Mueller; Superintendent Al Flynn; Bob Dowd; Grandson, Ted deConingh; and Ralph S. Mueller

Source: Mueller, Ralph, *The Skipper of the Clipper.* Cleveland: Mueller Electric Company, 1957.



The Skipper

Figure 8

"Skipper of the Clipper" Ralph S. Mueller

Source: Mueller, Ralph, *The Skipper of the Clipper.* Cleveland: Mueller Electric Company, 1957.

Figure 9

Sanborn Fire Insurance Co. Map, 1951

Location of Mueller Electric Co. Building indicated in bold.

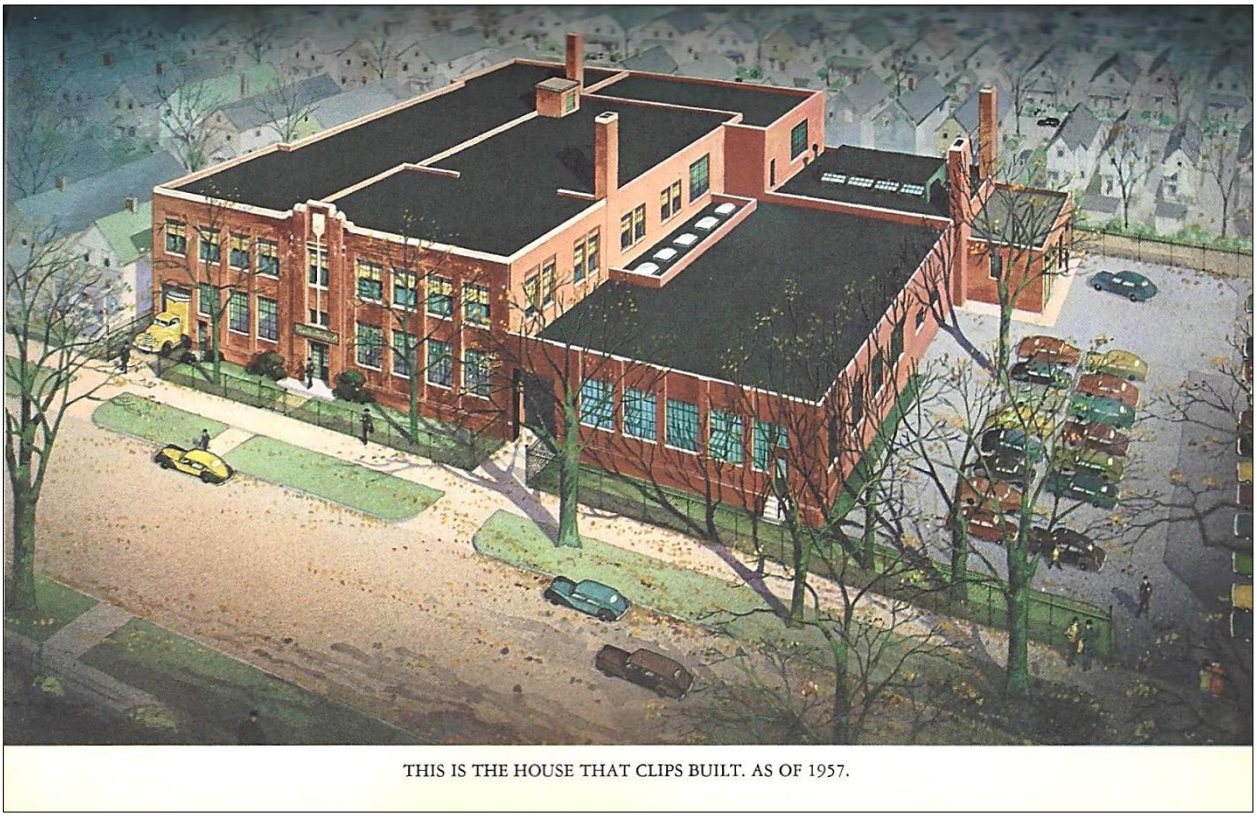
Source: Map Collection, Cleveland Public Library.

Figure 10

Sanborn Fire Insurance Co. Map, 1953

Location of Mueller Electric Co. Building indicated in bold.

Source: Map Collection, Cleveland Public Library.



THIS IS THE HOUSE THAT CLIPS BUILT. AS OF 1957.

Figure 11

Mueller Electric Co. Building, 1957

Source: Mueller, Ralph, *The Skipper of the Clipper.* Cleveland: Mueller Electric Company, 1957.

Figure 12

Mueller Electric Co. Building, 1977

Source: Mueller Electric Co. Available at *www.muellerelectric.com*.

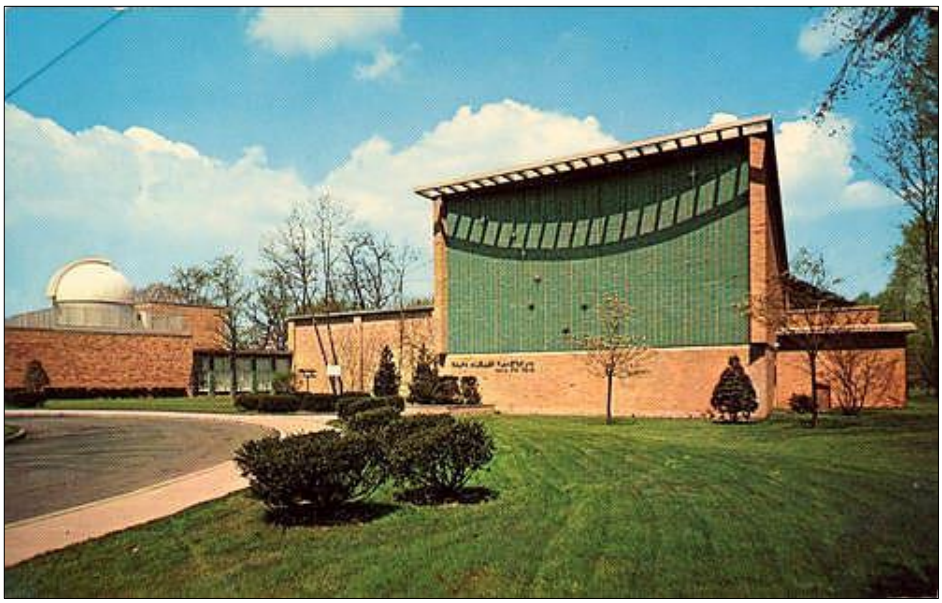


Figure 13

Ralph S. Mueller Planetarium & Observatory Natural History Museum, Cleveland ca. 1958

Source: Ohio Postcard, undated.

Figure 14

Ralph S. Mueller Planetarium & Observatory Natural History Museum, Cleveland ca. 1958

Source: Cleveland Museum of Natural History.

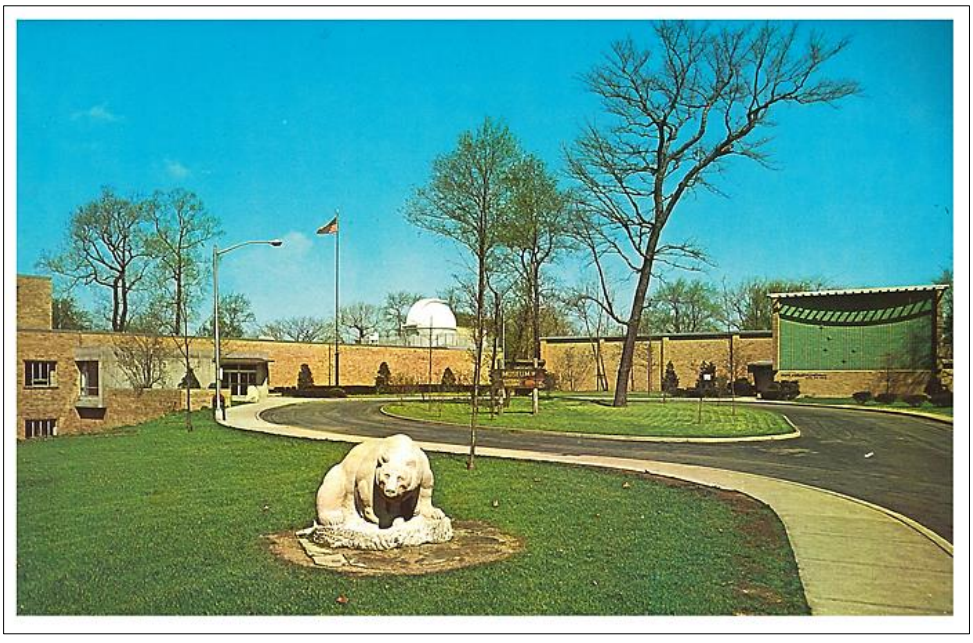


Figure 15

Mueller Electric Co. Engineered Clips & Insulators

Source: Mueller Electric Co. *www.muellerelectric.com*.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ANY
TIME


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A

UNITED STATES DEPARTMENT OF THE INTERIOR
NATIONAL PARK SERVICE

NATIONAL REGISTER OF HISTORIC PLACES
EVALUATION/RETURN SHEET

REQUESTED ACTION: NOMINATION

PROPERTY NAME: Mueller Electric Company Building

MULTIPLE NAME:

STATE & COUNTY: OHIO, Cuyahoga

DATE RECEIVED: 1/08/16 DATE OF PENDING LIST: 2/09/16
DATE OF 16TH DAY: 2/23/16 DATE OF 45TH DAY: 2/23/16
DATE OF WEEKLY LIST:

REFERENCE NUMBER: 16000042

REASONS FOR REVIEW:

APPEAL:	N	DATA PROBLEM:	N	LANDSCAPE:	N	LESS THAN 50 YEARS:	N
OTHER:	N	PDIL:	N	PERIOD:	N	PROGRAM UNAPPROVED:	N
REQUEST:	N	SAMPLE:	N	SLR DRAFT:	N	NATIONAL:	N

COMMENT WAIVER: N

✓ ACCEPT ___ RETURN ___ REJECT 2-23-16 DATE

ABSTRACT/SUMMARY COMMENTS:

Entered in
The National Register
of
Historic Places

RECOM./CRITERIA_____

REVIEWER_____ DISCIPLINE_____

TELEPHONE_____ DATE_____

DOCUMENTATION see attached comments Y/N see attached SLR Y/N

If a nomination is returned to the nominating authority, the nomination is no longer under consideration by the NPS.

OHIO HISTORY CONNECTION

December 29, 2015

J. Paul Loether, Deputy Keeper and Chief, National Register
and National Historic Landmark Programs
National Park Service
National Register of Historic Places
1201 Eye St. NW, 8th Fl. (2280)
Washington D.C. 20005

Dear Mr. Loether:

Enclosed please find six (6) new National Register nominations for Ohio. All appropriate notification procedures have been followed for the new nomination submissions.

NEW NOMINATION	COUNTY
Springfield Metallic Casket Company	Clark
Greenwood Farm	Cuyahoga
Mueller Electric Company Building	Cuyahoga
Baldwin Piano Building	Hamilton
Grant-Deneau Tower	Montgomery
Falls Stamping and Welding Building	Summit

The enclosed disks contain the true and correct copy of the nominations for the Mueller Electric Company Building and Grant-Deneau Tower nominations to the National Register of Historic Places.

If you have questions or comments about these documents, please contact the National Register staff in the Ohio Historic Preservation Office at (614) 298-2000.

Sincerely,

Barbara Powe

for Lox A. Logan, Jr.
Executive Director and CEO
State Historic Preservation Officer
Ohio History Connection

Enclosures

NATIONAL REGISTER OF HISTORIC PLACES
NPS TRANSMITTAL CHECK LIST

OHIO HISTORIC PRESERVATION OFFICE
800 E. 17th Avenue
Columbus, OH 43211
(614)-298-2000

The following materials are submitted on Dec. 29, 2015
For nomination of the Mueller Electric Co. to the National Register of Historic Places: Buildings, Cuyahoga Co, OH

✓ Original National Register of Historic Places nomination form
___ Paper ✓ PDF

___ Multiple Property Nomination Cover Document
___ Paper ___ PDF

___ Multiple Property Nomination form
___ Paper ___ PDF

✓ Photographs
✓ Prints ___ TIFFs

✓ CD with electronic images

✓ Original USGS map(s)
___ Paper ✓ Digital

✓ Sketch map(s)/Photograph view map(s)/Floor plan(s)
___ Paper ✓ PDF

___ Piece(s) of correspondence
___ Paper ___ PDF

___ Other _____

COMMENTS:

___ Please provide a substantive review of this nomination

✓ This property has been certified under 36 CFR 67

___ The enclosed owner objection(s) do _____ do not_____
Constitute a majority of property owners

___ Other: _____