PRESIDIO WATER TREATMENT PLANT
EAST OF LOBOS CREEK AT BAKER BEACH
SAN FRANCISCO PRESIDIO
GOLDEN GATE NATIONAL RECREATION AREA
SAN FRANCISCO
SAN FRANCISCO COUNTY
CALIFORNIA

HAER No. CA-155

PHOTOGRAPHS

WRITTEN HISTORICAL AND DESCRIPTIVE

HISTORIC AMERICAN ENCINEERINC RECORD
NATIONAL PARK SERVICE
WESTERN REGION
DEPARTMENT OF THE INTERIOR
SAN FRANCISCO, CALIFORNIA 94107

HISTORIC AMERICAN ENGINEERING RECORD

PRESIDIO WATER TREATMENT PLANT **HAER No. CA-155**

Location:	East of Lobos Creek at Baker Beach, San Francisco Presidio, Golden Gate National Recreation Area, San Francisco, San Francisco County, California
Construction Dates:	Original construction 1910 - ca. 1912; refer to descriptions of individual structures for later construction dates for some structures
Engineer/Builder:	Refer to descriptions of individual structures
Present Owner:	United States Army; ownership will transfer to the National Park Service on October 1, 1994
Present Use:	Water Treatment Plant
Significance:	The Presidio Water Treatment Plant has played a significant role in the Presidio's history by providing the post with a self-sufficient water supply, independent of city sources or facilities. As a complex, it appears much as it did at the time of its construction in 1910-1912. The Plant continues to draw its water supply from the Lobos Creek aquifer, which has been the Presidio's primary source of water since 1857. The Plant's site has housed water supply facilities of one sort or another since that time. The creek also provided the city of San Francisco with its water supply during the second half of the nineteenth century. Four of the extant Water Treatment Plant buildings, the Valve House (#1771), the Filtration Plant (#1773), the Chemical Storage Building (#1776), and the Head House (#1779), together with the Clearwell (#1770) and the Flocculation/Sedimentation Basins (#1778), date from the 1910 - ca. 1912 construction period. The buildings, particularly the Filtration Plant, Valve House, and Chemical Storage Building, are significant owing to their intact architectural features and water treatment equipment. Structures #1770, 1771, 1773, 1776, 1778 and 1779 are listed as contributing resources to the Presidio National Historic Landmark District.
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Summary

The Presidio Water Treatment Plant has provided the Presidio's primary water supply since 1910. Most of the original structures, with some original treatment equipment, remain in use. The Water Treatment Plant is comprised of the following 12 structures:

Thickener Tank	#1769
Clearwell	1770
Water Valve House	1771
Water Pump Station	1772
Water Filtration Plant	1773
Pump Station (Lift Station)	1774
Shed	1775
Chemical Storage Building	1776
Metal Storage Shed	1777
Flocculation/Sedimentation Basins	1778
Head House	1779
Lobos Creek Inlet Structure	1786

Location

The Presidio Water Treatment Plant is located on the shore of San Francisco Bay east of the mouth of Lobos Creek and adjacent to Baker Beach. It is accessed from Lincoln Boulevard via Gibson Road. The site has expansive views of the Golden Gate Bridge, the Marin headlands and the Pacific Ocean.

History and Description

The original fresh water supply at the Presidio during the Spanish period was a spring located below Infantry Terrace.[1] Additional water was obtained from a second spring in the West Cantonment north of the present Julius Kahn Playground (El Polin Spring).

During the early American period, a succession of private entities sought to develop the Presidio's water resources. In 1853, the Mountain Lake Water Company formed for the purpose of obtaining water from Mountain Lake. The company failed shortly thereafter and developers looked to other sources to supply the city with water.

In 1857, the San Francisco City Water Works (San Francisco Water Company) acquired land south of Lobos Creek, formerly called Arroyo del Puerto, from the Lobos Creek Ranch in an attempt to obtain water for the city. The company negotiated an agreement with the federal govemment to obtain rights to the creek, which the Army claimed was on federal land (In a court case, it was ruled that the federal government did indeed have half ownership of the stream by virtue of its ownership of the north bank[2]). The company, under the new name of Spring Valley Water Works, constructed a wooden plank flume that followed the cliffs along the shore, from the creek mouth to Fort Point, through a tunnel behind the counterscarp battery, and along the bluff to the location of the later Crissy Field Headquarters building. In exchange for the privilege of running the flume across government land, Spring Valley permitted the Army to draw a small amount of water from the system. Water for the post then was diverted into a 6" cement pipe running 2,600 feet along the south side of Crissy Field to the present site of the Post Exchange, where the

Army built a pumping plant for 2 reservoirs of 438,000 and 70,000 gallons respectively, in front of the commanding officer's quarters. Spring Valley Company water continued to a pump house at the foot of Van Ness Avenue where it was pumped into city mains. Thus, for many years Lobos Creek furnished the city of San Francisco with its only public source of water .

In 1862 the Spring Valley Company requested and was granted a permit from the Army to use Mountain Lake as a water source.

Between 1870 and 1887 there are some brief reports on the water system and its quality. In 1870 and again in 1875, it was reported that the water was "abundant and of excellent quality,"[3] and that windmill and mule power brought Spring Valley Company water from the flume to a reservoir at the south end of the post, and from there it was piped to individual buildings. A contradictory 1872 report stated that the post was "supplied by wagons and a pipe from the 'Tunnel Spring', 2,000 feet from a reservoir."[4] An 1877 description stated that Lobos Creek was supplying Spring Valley with 2 million gallons per day, via a 23,500 foot long wood and masonry flume to Fort Mason.

In 1887, a more detailed report on the water supply noted several weaknesses in the system. In addition to being vulnerable to the policies and fortunes of a private company, the system was unreliable. Fort Point and the National Cemetery obtained water from a spring southeast of the fort and from a reservoir on Telegraph (Rob) Hill via two often faulty windmills. When they broke down, Presidio wagons had to supply Fort Point with water. Two other windmills on the post supplied water for sprinkling roads and for irrigation. The report recommended that the entire supply be under government control. It also recommended digging new wells, installing new pumping machinery and constructing a large reservoir on Telegraph Hill for the entire Presidio.[5]

In 1893, slides along the ocean bluff caused Spring Valley to abandon its flume. The government maintained its own flume until 1894, when it built an almost entirely new system of wells at Mountain Lake, at a cost of $51,100.80. These provided the post with the majority of its water, about 250,000 gallons per day, until 1910. In 1894, Spring Valley surrendered its license to cross the Presidio with its flume.[6] However, according to a 1907 report, the company continued to view Lobos Creek as a viable water source for the city.

> "In 1901, the Spring Valley Company located an extensive pumping plant on the south bank of this creek near its mouth, and directed the entire flow of the creek into their pumps which were connected with the pipe system of the Richmond District of the city. Owing to hostility between the Spring Valley Company and the municipal authorities, opportunity was taken by the Board of Supervisors to condemn this water supply soon after its installation, as unfit for drinking purposes in its raw state. Although it had been used for years before without complaint, it was condemned after a number of tests had been made by their chemists. Tests made by the Spring Valley Company were just as positive on the other side that the water was pure, safe and potable. Whatever were the merits of this controversy, the result of these differences of opinion was the refusal on the part of the city to permit the water to be used as a city supply and from that time to this [1907], Lobos Creek water has poured into the Pacific Ocean at the rate of nearly 2,000,000 gallons per day, an utter loss."[7]

A 1904 description stated that the water from wells at Mountain Lake was of good quality. Some features of the system were as follows:

- 10 new wells (to a maximum depth of 110 feet) = 13,100 gallons per hour.
- pumps also carried water to the reservoirs at Fort Point for existing fortifications and those under construction and for troops stationed there.
- a pump supplied Mountain Lake water for fire and sprinkling, including the General Hospital.
- an artesian well supplied water for the quartermaster's mule stable (100 gallons per hour), while the public animal corrals received water from the post reservoir.
- water was carried via government steamer to Fort Baker and Angel Island, and supplied to the transport tug *Slocum*.
- the daily capacity of the government plant was 156,100 gallons domestic and 74,100 gallons for fire and sprinkling.
- the supply was insufficient; it became necessary to connect permanently with city mains
- the report listed reservoirs:
  1 cement and brick, capacity 438,000 gallons, elevation 60 feet,
  1 cement, capacity 112,000 gallons, elevation 60 feet,
  1 cement, capacity 140,000 gallons, elevation 246 feet (#1469) at Fort Point, and
  1 cement, capacity 80,000 gallons, elevation 100 feet at Fort Point.

The document also stated that the installation date and original cost of the first water system (previous to 1894) was unknown in 1904.[8]

A comprehensive analysis of the water system was included in Major William W. Harts' (Army Corps of Engineers) 1907 "Report upon the Expansion and Development of the Presidio of San Francisco." This report recommended construction of an independent, fully equipped plant:

> "1. Present needs. The necessity of an independent water system for the Presidio is fairly obvious. In the case of a bombardment or siege of San Francisco by a foreign enemy, it would be invaluable to have a self-contained water system on the post entirely under the control of the commanding officer....
> 2. Furthermore, if the water supplied by the city of San Francisco were to be relied upon as a future supply for this post, it would necessarily have to be again pumped after having been purchased in order to produce an adequate pressure for the service and fire protection for the various buildings to be occupied, as the pressures in the Spring Valley mains are only enough to reach the lower levels of the post as at present connected. This would increase the expense for water which in the case of the Spring Valley Company has been alrcady exorbitant.... With this amount enough could be saved by the government in a few years, by owning its own water plant, to fully equip a first class independent water works and maintain an efficient service in the mean time.
> 3. The water of the Spring Valley Company has also been questioned as to its purity.... All of the water furnished the city of San Francisco is at present gathered from open water sheds and none of it is filtered. An independent post system is therefore urgently needed: 1st. On the grounds of military necessity. 2nd. On the score of economy. 3rd. For the reason that a domestic supply will be under thorough control and its purity can be insured by proper filtration under the post authorities."[9]

Harts' report compared various potential water sources: artesian wells, tunneling, driven wells, and Lobos Creek. It concluded that Lobos Creek, with a flow of 2 million gallons a day, remained the best source. It recommended acquisition of the land on the south side of

the creek and construction of "a stone or concrete wall with an iron railing ... to divert the surface drainage and prevent trespass." The report finally went on to describe, in detail, the plant and its major equipment and to estimate the cost of construction, a total of $103,133, for buildings, reservoirs, pumps and piping.[10]

Between 1910 and 1912, the federal govemment sold the old plant at Mountain Lake and constructed a new pumping plant at the mouth of Lobos Creek. The new plant consisted of a valve house (#1771), filter building (#1773), chemical storage building (#1776), head house (#1779), flocculation/sedimentation basins (#1778), and a 1 million gallon reservoir (#1770). Adjacent to the plant a civilian residence (#1781) and garage (#1782) were also built. During the same period, a second new 6 million gallon reservoir was constructed on Presidio Hill (#313), with a valve house (#310) and pump house (#311) adjacent, and a pump house (#315) was built on the south side of the golf course. According to a 1911 inspection report, the new system supplied water to all of the Presidio except East Cantonment, and also to Fort Scott and Fort Mason, army transports and docks, Alcatraz, Angel Island and Fort Baker. According to another contemporary account, the government had rights to use one-half of the water in the creek — approximately 1 million gallons a day. During the second quarter of 1912, the plant produced 95,350,000 gallons, supplemented by over 2.6 million gallons from the Spring Valley Company.[11]

In 1925, another well (#1788) was drilled, and in 1930, a water pump house (#1784) was constructed.

By 1931, the Lobos Creek supply had diminished to the point where the Army found it necessary to institute rationing. A debate ensued as to the best method to augment the water supply. The Office of the Quartermaster General proposed a new "third shaft" at Lobos Creek, but the Presidio decided to connect with city water mains.[12] In spite of the shortage, a 1933 report indicated that Lobos Creek continued to supply the Presidio's water, including the Marine Hospital, Fort Scott, Fort Mason, Fort McDowell, Alcatraz, the National Cemetery, Letterman Hospital, Ninth Army Corps Headquarters, Crissy Field, transport services and harbor boats.

Additional wells were drilled in 1935 (#1789) and in 1939 (#1783). However, by this time, the Lobos Creek water supply had recovered naturally.

In 1941, the water supply inlet structure (#1786) was built.

Sometime after 1938, the plant was expanded from two to four filters. 1992 evidence indicates that major replacement and upgrading of the original system controls and electrical equipment took place in the late 1940s or 50s. Much of the major electrical and control equipment in service in 1992 dates from this period.

During the drought of 1977, the city relied on the Presidio's system to augment its weekly water supply.

As of 1992, Lobos Creek provides 60% of the Presidio's annual water requirements, or 495 million gallons per year. In addition, water is drawn from two wells in the Lobos Creek basin. This well water provides 10% of the annual needs, or 86 million gallons per year. The city provides the remaining 30% of the post's annual water needs.[13]

General Description

The Presidio Water Treatment Plant is comprised of a group of buildings and structures constructed of unreinforced brick, or concrete, with composition shingle roofing over wood sheathing on rafters. The Water Filtration Building (#1773) has steel roof trusses. "There are some records/drawings of building repairs made over the years, but there have been no apparent major [structural] renovations or additions to the Plant."[14]

"The Plant is located in an area of high seismicity, with a number of active faults within a radius of 25 miles, most notably the San Andreas Fault at approximately 5 miles to the west.

The soil conditions, per the Dames and Moore Seismic Evaluation Report, are such that there is a high potential for liquefaction in the vicinity of the Filtration Building (#1773), the Flocculation/Sedimentation Basins (#1778), and the Generator [Chemical Storage] Building (#1776)."[15]

The Plant's mechanical and control systems have various deficiencies leading to regulatory violations and obsolescence. The overall condition of Plant equipment ranges from fairly good to very poor. Some of the distribution piping, of cast iron, ductile iron, or asbestos cement, predates 1900. The quality of the treated water is not up to current acceptable standards.

There is no reliable documentation of the existing electrical system or the history of its evolution to the current configuration. Electrical power is delivered to the Water Treatment Plant via overhead, pole-supported wires. Low voltage power enters from pole-mounted transformers approximately 75 feet south of building #1773. From here it is routed overhead to all buildings and site lighting. High voltage power drops at a pole directly west of #1773 and passes underground to an interior transformer. There is no single meter for the plant. There is no backup system. Existing plant peak demand is estimated at 450KW/560KVA.

"In general, existing service entrance equipment and/or installations do not meet the requirements of the National Electrical Code."[16]

Process [17]

Water from Lobos Creek enters the treatment system at the Inlet Structure (#1786). From there, the raw water flows by gravity via underground piping to the Water Treatment Plant. At the Headhouse (#1779), a propeller meter and gate valves respectively measure and control the flow of the raw water into the flocculation basins. When the flow is too great, a by-pass allows excess water to be returned from here to the creek.

The first treatment of the water occurs at the Headhouse where alum is applied to water entering the flocculation/sedimentation basins (#1778). Theoretically, flocculation agglomerates particles and colloids into "floc" that can be settled and filtered; the process involves the addition of a coagulant chemical (alum) and gentle stirring of the water. However, the basins at the WTP have no flocculation equipment and are consequently ineffective for this purpose.

From the flocculation basin, water flows through a perforated concrete baffle into the sedimentation basin, where the floc particles are removed by gravity separation.

Sedimentation basins are normally sloped down toward the influent end of the basin, so that sludge deposited near the influent end can thus be periodically flushed out through a drain at the lower end. The WTP sedimentation basins are sloped in reverse and have no sludge cleaning equipment. Chlorine is applied to the effluent channel of the sedimentation basin to pre-chlorinate the water before filtration.

From there, the water flows by gravity to the filtration system housed in Building #1773, which consists of four approximately 15-foot diameter filters. The filtration process removes particulate material by passing water through a porous filter media where particulate matter accumulates. The filtration media consist of sand and gravel. A control system that maintains the water level in the filters through effluent control is inoperable, allowing periodic exposure and disturbance of the media.

When the filter media has become clogged with trapped solids, a metered backwash process flushes the filtered solids up from the bottom of the filters. The source for the backwash is treated water that is diverted from the system prior to its entry into the distribution system. The wash water exits from the filters where it joins with sludge from the sedimentation basins and is piped to a thickener/surge tank (#1769) and from there is discharged into the sanitary sewer system.

Filtered water flows by gravity to the clearwell (#1770), which has a high water level below the bottom of the filters. The flow of water into the clearwell is metered and controlled by valves housed in the Valve House (#1771). The clearwell serves as a storage tank for treated water prior to its distribution. Also, water is treated with fluoride as it enters the clearwell. Metered well water is pumped directly into the clearwell as an alternate water supply.

From the clearwell, the two high service pumps boost the finished water into the distribution system. The effluent water is again treated with chlorine as it exits the treatment system.

Site

The site is sparse and undeveloped. There are both native plant communities and exotic vegetation on the site. The Environmental Impact Statement of the October 1993 Draft General Management Plan Amendment (GMPA) describes several native plant communities, including rare plants, that exist on the beach portion of the site and along Lobos Creek. Preservation and restoration of these plant communities is a component of the GMPA.

Prehistoric remains have been found at the Presidio in the past; sites on the coast and near freshwater supplies are considered most likely for further discoveries. Although no remains have been found in the area, the Lobos Creek site is a reasonable possibility for prehistoric settlement, due to its shoreline location, availability of rocks (though less than in some other nearby locations), food (fish, seals), and fresh water. Historic archeological remains from earlier water supply features such as the nineteenth century flume may also be present on the site. The Environmental Impact Statement designates the Plant site as an area of high sensitivity for potential archeological resources.

Several structures have drainage problems due to grading of the surrounding site. There is currently an excessive amount of asphalt parking area for the plant's needs.

Both the Presidio's damp, foggy microclimate and the buildings' use for water treatment and storage have led to extensive deterioration of both building materials (particularly metals) and equipment. Corrosion of equipment has also been a serious problem at the plant. Indoor equipment and piping is in general very deteriorated, due to the damp environment in the unheated and poorly ventilated buildings. Likewise, exterior equipment, conduit, and piping have "practically been destroyed by the corrosive atmosphere."[18]

1769 Thickener Tank

Date of Construction:	1975
Engineer/Builder:	Army Corps of Engineers, Sacramento District
Historic Use:	Thickener tank
Current Use:	Thickener tank
Gross Square Footage:	576 square feet at surface
Number of Floors:	One, below ground
Exterior Materials:	Concrete, iron railing

The Thickener Tank (also called the Surge Tank) is a 50,000 gallon tank located on the northwest side of the site; it is 24 feet square at the top translating to a conical shape and descending 18 feet. Iron pipe railings form two enclosures on top of the tank. There are two roof-mounted ventilators, and hatches in the roof slab allow access into the tank. Adjacent vegetation has partially overgrown the west portion of the tank.

Sediment from the flocculation/sedimentation basin and backwash waste water from the filters are deposited here, and then discharged into the sanitary sewer system.

Chronology:

The Historical Summary is based on available information. It does not represent a comprehensive documentation of alterations to the building.

1975 Constructed.

1983 New sludge line pump and clean out installed.

1770 Clearwell

Date of Construction:	1910 - ca.1912
Engineer/Builder:	Office of Quartermaster General, Construction Division
Historic Use:	Water Reservoir
Current Use:	Water Reservoir
Gross Square Footage:	13,300 square feet
Number of Floors:	One, below ground
Exterior Materials:	Concrete, built-up composition roofing

The Clearwell is located to the east of the Filtration Plant (#1773), between Gibson Road and the beach. It is a 1,000,000 gallon below-ground reinforced concrete reservoir, with radiused corners and a middle wall dividing it into two basins. The reservoir is approximately 95 by 140 feet and has an interior depth of 13 feet. It is covered by a reinforced concrete slab supported by beams on a grid of reinforced concrete piers within the tanks. This cover slab, which is approximately at ground level, has built-up roofing

with two roof vents and two access hatches. Original design drawings show ten vents and as many as six hatches, although the number actually built is unknown. There is also access through hatches in the Pump Station (#1772), which is located above the southwest corner of the Clearwell.

Creek water goes here after it passes through the treatment plant; groundwater from wells is pumped here directly. Chlorine is added to the water here, from building #1772.

Chronology:

The Historical Summary is based on available information. It does not represent a comprehensive documentation of alterations to the building.

1910 Constructed of concrete with a concrete slab roof.

ca. 1986 Roof replaced.

1992 New sheet metal vent caps installed.

1771 Water Valve House

Date of Construction:	1910
Engineer/Builder:	Office of Quartermaster General, Construction Division
Historic Use:	Valve House, called "Gate House"
Current Use:	Valve House
Gross Square Footage:	219 square feet
Number of Floors:	One, with partial basement
Exterior Materials:	Concrete, hollow clay tile, cement plaster, wood, asphalt shingles

The building is located at the western edge of the Clearwell (#1770) and to the east of the Filtration Plant (#1773). There is a concrete stair and walkway up from the driveway to the door on the west side of the building.

The Valve House is small and simply massed, a single story, with a basement under the western two-thirds of the building. The eastern third of the building extends over the Clearwell. The building is approximately 14 by 16 feet with a hipped, wood frame roof with exposed decorative rafter ends and asphalt composition shingle roofing. The walls are unreinforced hollow clay tile, approximately 8.5 feet high, with a cement plaster exterior finish. The building is uninsulated and the roof structure is exposed on the interior. The interior is painted. The first floor is a reinforced concrete slab. The basement has a slab on grade and concrete walls and the east wall is common to the Clearwell. The ceiling height in the basement is approximately 16 feet. There are two eight over eight replacement double-hung wood windows in the east and west walls and a flush wood door on the north side.

The Valve House contains the valves that control the flow of treated water into the Clearwell. The floor mounted cast iron gate valves appear to be original to the building. Access openings in the floor with steel ladders access the basement valve chamber and the Clearwell.

The building does not have a mechanical system, domestic plumbing, a sprinkler system, or a fire alarm system. Plumbing within the building is limited to plant operations, i.e. the

gate valves and piping, mostly in the basement valve chamber. There are several electrical cabinets with surface mounted conduits on interior walls.

Character Defining Features:
- Exterior massing.
- Cement plaster wall finish.
- Hipped roof with decorative rafter ends.
- Hand operated gate valves and discharge pump.

Chronology:
The Historical Summary is based on available information. It does not represent a comprehensive documentation of alterations to the building.

1910 Constructed of stucco-covered hollow tile on a concrete foundation.

19-- Original door and door-frame replaced with a simple flush wooden door frame (original door was painted, with a wider door frame and was more prominent in building wall).

19-- Window and window frame on west wall replaced, probably due to harsh weather conditions on the west elevation; historic photos show the earlier west window panes were originally six over six.

19-- Antenna mounted to south wall roof.

19-- Water systems added, probably sometime after 1939; overflow pump spigot projecting from west elevation.

1772 Water Pump Station

Date of Construction:	1948
Engineer/Builder:	Unknown
Historic Use:	Pump House
Current Use:	Pump House
Gross Square Footage:	340 square feet
Number of Floors:	One
Exterior Materials:	Cement plaster, wood, asphalt shingles

Building 1772 is located above the Clearwell (#1770) at its southwest corner. A service road runs directly adjacent to the south elevation.

The Pump Station is a small building with gabled and hipped roofs with closed overhanging eaves and asphalt composition shingle roofing. The "L" shaped building is constructed of unreinforced hollow clay tile of approximately 23.5 by 18.5 feet overall dimensions, and is divided into two rooms. The larger room, in the south portion of the building, is approximately 13 by 18 feet and houses the high service pumps. The smaller north room is approximately 8.5 feet by 9.5 feet and is used for chlorinating equipment and storage. There are wood paneled doors on the west and east sides and double-hung wood windows with screens in the north, south and east walls. The floor is conerete installed directly on the roof of the Clearwell. There is an access opening and steel stair down into the Clearwell from the pump room.

The building is ventilated by a combination of fans and door grilles. There is no domestic plumbing system, but there is piping associated with the water pumps. Electrical panels and conduit are surface-mounted on the interior and exterior of the building. The equipment ranges from historic components to two new pumps installed in 1993.

Character Defining Features:

- Building massing.
- Hipped and gable roof form with overhanging enclosed eaves.
- Double hung wood sash windows and wood trim.
- Paneled wood doors and wood trim.
- Horizontal siding at gable end.
- Cement plaster exterior wall finish.
- Original pumping equipment components (piping and valves; pumps themselves are recent).

Chronology:

The Historical Summary is based on available information. It does not represent a comprehensive documentation of alterations to the building.

1948 Constructed of stucco-covered hollow tile on a concrete foundation.

19-- Replacement of water pumps.

19-- Addition of wood structural bracing within the building.

1993 Two new high service pumps installed.

1773 Water Filtration Plant

Date of Construction:	1910 - ca. 1912
Engineer/Builder:	Office of Quartermaster General, Construction Division
Historic Use:	Water Filtration
Current Use:	Water Filtration
Gross Square Footage:	7,132 square feet
Number of Floors:	One, on two levels, with mezzanine and partial basement
Exterior Materials:	Brick masonry, stone, concrete, wood, asphalt shingles

Building 1773 is the dominant building on the Plant site, located north of Gibson Road with a large parking area to the east. Its main entrance faces the parking lot. An elevated wood walkway with railings provides a direct link from a door on the west side of the building to the paved area east of Building 1776.

Building 1773 is a single story rectangular plan building approximately 47 by 145 feet, with a hipped roof with asphalt composition roofing. The exterior walls are unreinforced brick masonry with a header course at every seventh course. An approximately 36 foot section of the building near the north end has an elevated roof, also hipped, with its ridge perpendicular to that of the main roof. The roof is wood framed and supported by steel trusses. The foundation is a lightly reinforced continuous concrete footing with a concrete slab on grade.

There are four over four divided light, double-hung or fixed windows in segmental arched openings with stone sills. The east facade of the portion of the building with the elevated roof has a large circular arched opening that now contains a metal overhead door with wood frame infill above the door. This is flanked by two smaller circular arched openings with four over four divided light wood windows with stone sills and with wood infill panels above. At the west elevation of this section of the building, a similar pair of windows flanks a circular opening that has been infilled with brick. Both east and west facades have brick masonry comices, corbeling and pilasters which distinguish this portion of the building from the lower rectilinear form extending north and south. A small 19.5 by 17.5 foot bathroom/lounge addition on the west side with hollow clay tile walls and a shed roof with asphalt composition roofing is a non-original building addition. There is a second later addition, a small utility shed with corrugated metal siding and roofing on the east side. These additions are poorly constructed and not in keeping with the original architecture.

The main room is the south filtration room, approximately 45 by 95 feet, containing four concrete filtration tanks, approximately 19 feet in diameter and 8 feet deep, and several pumps and associated piping. The two rear (south) tanks are ca.1940 replacements for the original redwood tanks. The tanks are located in the southem portion of the space, where the floor level is depressed approximately 4 feet to accommodate them. A mezzanine above this area provides access to the open tops of the tanks. This has a wood floor supported on iron posts or by wood beams framed into the concrete tanks. Both the lower level and the mezzanine are reached via steel stairs. The clear area under the roof trusses is approximately 13 feet at the main level and 6 feet at the filtration tank mezzanine. An overhead roll-up metal door on the east side provides vehicle access to the interior. A stair at the north portion of the filtration room leads down to a partial basement area approximately 9 by 45 feet which runs the width of the building. North of the filtration room, the building plate line steps up to approximately 20 feet below the elevated roof and has brick masonry cross walls supporting wood roof framing and steel trusses. This portion of the building has a metal overhead door for vehicle access and an employee kitchen and lounge at the northwest comer. At the north end of the building three office/laboratory rooms of various sizes are housed in a second, lower section, similar in form to the south portion, with approximately 13-foot high ceilings and door openings onto the high ceiling space. The building interior has a distinctive industrial character, with the full height brick walls, roof trusses and sheathing all visible.

There is considerable original or early equipment in the building, including the tanks, the main pump, flow meter panels on the south wall, and the control and readout console for the pneumatic filtration chamber system.

Building 1773 is the only Water Treatment Plant building with plumbing, most of it dating after the original building construction. The building restroom has vitreous china fixtures, and a kitchen with stainless steel sink. The Filtration Plant is also the only building with a gas supply. Ceiling mounted gas-fired units provide heat. Ventilation is provided by small window-mounted exhaust fans, with no makeup air source. There is no air conditioning. Lighting throughout is pendant-mounted fluorescent fixtures. Building 1773 does not have a sprinkler system or fire alarm system.

Character Defining Features:

- Industrial character of the building and site.
- Building massing and simple hipped roof forms.

- Brick masonry walls with segmental and circular arched openings, brick cornice, corbeling and pilasters.
- Ghost of original boiler stack on west wall.
- Fenestration (double hung/fixed wood sash windows) and stone sills.
- Steel truss roof and exposed beveled tongue and groove sheathing at south portion of building.
- Exposed rafters and beveled tongue and groove sheathing at high ceiling portion of building.
- Concrete filtration tanks, raised wood framed floor structure and metal stair at south portion of building.
- Paneled wood interior doors.
- Historic water treatment equipment, including Pump No. 1, pressure gauge for pump, flow meters on south wall of existing filter room, and control and readout console for the pneumatic filtration chamber system.

Chronology:

The Historical Summary is based on available information. It does not represent a comprehensive documentation of alterations to the building.

1910 Constructed as the major building in the complex of buildings and structures that comprise the Post's water treatment complex; the complex, located at Lobos Creek, was built between 1910 and 1912 for approximately $131,000.

19-- Addition to southwest wall constructed (1930s plan shows addition but the difference in construction type from the rest of the building implies that it was built later than 1910).

19-- Original window glazing removed and replaced with security glass; metal grates added at a later date.

19-- Open tops of segmental and round-headed windows and entrances filled in with either metal or plywood.

19-- Original doors removed and replaced with metal rolling doors.

19-- Original roofing material removed and replaced with red asphalt shingles.

19-- New mechanical systems added; water treatment systems upgraded.

19-- Boiler stack removed from west elevation; round opening filled with brick masonry.

19-- The two original redwood filtration tanks removed and replaced with concrete tanks.

19-- Two additional concrete filtration tanks added to the north of the original tank location.

19-- Exterior fluorescent lamps placed over entrances on north elevation.

19-- Kitchen area constructed in northwest corner of new Filter Area.

1774 Pump Station (Lift Station)

Date of Construction:	1965
Engineer/Builder:	Unknown
Historic Use:	Pump Station
Current Use:	Pump Station
Gross Square Footage:	90 square feet
Number of Floors:	One
Exterior Materials:	Concrete

The Pump Station is an underground concrete structure approximately 8 feet deep. It houses pumping equipment for lifting domestic waste from restrooms in the Filtration Plant (#1773) and also from comfort stations at Baker Beach, to the sanitary sewer system. Adjacent to the Pump Station is a small structure with wood siding and asphalt shingle roofing, on a concrete slab, that houses electrical controls for the pump.

Chronology:

The Historical Summary is based on available information. It does not represent a comprehensive documentation of alterations to the building.

1965 Constructed.

1994 Small structure for electrical equipment constructed.

1775 Shed

Date of Construction:	1960
Engineer/Builder:	Unknown
Historic Use:	Transformer Enclosure
Current Use:	Transformer Enclosure
Gross Square Footage:	139 square feet
Number of Floors:	One
Exterior Materials:	Concrete, sheet metal

This small building has corrugated galvanized sheet metal walls and roof over a wood structural frame. Except for the electrical power for the transformer housed within, there are no utilities servicing this structure.

Chronology:

The Historical Summary is based on available information. It does not represent a comprehensive documentation of alterations to the building.

1960 Constructed.

19-- Painted.

1776 Chemical Storage Building

Date of Construction:	1912
Engineer/Builder:	Office of Quartermaster General, Construction Division
Historic Use:	Storage
Current Use:	Chemical Storage
Gross Square Footage	734 square feet
Number of Floors:	One
Exterior Materials:	Brick, wood, asphalt shingles

Building 1776 is located west of the Filtration Plant (#1773) and is reached via Gibson Road to the south.

The Chemical Storage Building is a single story building, with a rectilinear plan approximately 24 by 30 feet. Its exterior unreinforced brick walls have a header course every eighth course and are approximately 12 feet high. The building has a wood framed hipped roof with asphalt composition shingle roofing. Its four over four double-hung windows have segmental arched heads and brick sills, and pairs of paneled wood doors are also set into segmental arched openings in the east and west walls.

The interior is a single space with exposed unpainted brick walls and roof framing. The floor is a concrete slab on grade. The building houses water treatment chemicals and chemical feed facilities.

The mechanical system in the building consists of one continuously operating window-mounted exhaust fan. There is no makeup air source and no heat. The building is supplied with water, but has no sewer connection. Interior lighting is by pendant mounted fluorescent fixtures via surface mounted conduit.

Character Defining Features:

- Industrial character of the building and site.
- Brick masonry walls with segmental arched openings.
- Fenestration pattern.
- Paneled wood doors.
- Hipped wood framed roof.
- Interior wood truss and hoist structure.

Chronology:

The Historical Summary is based on available information. It does not represent a comprehensive documentation of alterations to the building.

1912 Constructed for $1,295, this building was originally used as a storeroom.

19-- Window openings boarded up with plywood; air vents installed in one window on the south side.

19-- New downspouts and gutters added.

19-- Hanging fluorescent lights added in the interior.

1777 Metal Storage Shed

Date of Construction:	1973
Engineer/Builder:	Presidio Facility Engineer Office
Historic Use:	Storage
Current Use:	"Facility Engineer Facility"
Gross Square Footage:	600 square feet
Number of Floors:	One
Exterior Materials:	Sheet metal, concrete, wood

Building 1777 is located east of and adjacent to the Flocculation/Sedimentation Basins (#1778). It is a prefabricated sheet metal structure on a raised concrete foundation. It has a metal roll-up door on the south side and a door on the east, reached by a set of wood stairs, on the east side. The building is supplied with electricity but no water or heat.

Chronology:
1973 Constructed

No records of alterations or additions to this structure have been located.

1778 Flocculation/Sedimentation Basins

Date of Construction:	ca. 1911
Engineer/Builder	Office of Quartermaster General, Construction Division
Historic Use:	Flocculation/sedimentation basins
Current Use:	Flocculation/sedimentation basins
Gross Square Footage:	3,444 square feet
Number of Floors:	One, below ground
Exterior Materials:	Concrete

The Flocculation/Sedimentation Basins are located at the westernmost part of the Plant site, adjacent to Buildings #1777 and #1779. They are reached via Gibson Road and are located at the end of this street.

These are two open reinforced concrete basins separated by a common wall; the top of the tank perimeter walls is a few feet above grade and surrounded by a chain link fence. The overall capacity of the basins is approximately 288,000 cubic feet. Water flows from the flocculation basin to the sedimentation basin where chlorine solution is applied.

Chronology:
The Historical Summary is based on available information. It does not represent a comprehensive documentation of alterations to the building.

1919 Proposed raising of dividing walls within each tank. (Not known if this work was completed)

19-- Turbulence reducing baffles installed.

1964 Perimeter safety fencing installed.

1975 New tank cover and ladder installed.

1779 Head House (Alum House)

Date of Construction:	1912
Engineer/Builder	Office of Quartermaster General, Construction Division
Historic Use:	Water Treatment
Current Use:	Water Treatment
Gross Square Footage:	245 square feet
Number of Floors:	One, with partial basement
Exterior Materials:	Concrete

Building 1779 sits at the south end of the Flocculation/Sedimentation Basins (#1778), at the southwest corner of the site.

It is a small rectangular plan structure constructed of reinforced concrete, which is unfinished on the exterior. It has a flat concrete slab roof. It has a door on the east side and a two over two double-hung window in the north and south exterior walls. The one room interior has a raised wood deck; control valves below the floor are reached by a wood stair. The concrete walls and ceiling are also exposed on the interior.

Building 1779 houses equipment to apply chlorine solution and alum, a chemical that coagulates and collects large particles of dirt, to raw water. It also houses a propeller meter to measure water flow, gate valves, and chemical diffusers.

The chlorine room is continuously ventilated by a through-wall exhaust fan. The building has no heat.

Character Defining Features:

- Industrial character of the building and site.
- Building form with flat roof.
- Unfinished reinforced concrete walls.
- Fenestration and wood door frame.
- Interior water pipes and valves below landing.

Chronology:

The Historical Summary is based on available information. It does not represent a comprehensive documentation of alterations to the building.

1912 Constructed for $1,285 as part of the water treatment system.

19-- Air vent system installed in roof.

19-- Metal grates installed over window panes.

19-- Water pipes run into the building on northeast elevation.

1786 Lobos Creek Inlet Structure

Date of Construction:	1941
Engineer/Builder:	Federal Works Agency, Public Roads Administration District No. 2, San Francisco
Historic Use:	Water Inlet
Current Use:	Water Inlet
Gross Square Footage:	approx. 1,030 square feet
Number of Floors:	One
Exterior Materials:	Concrete, Steel fencing

Chronology:

The Historical Summary is based on available information. It does not represent a comprehensive documentation of alterations to the building.

1941 Constructed

1970 General repairs and improvements, including addition of new headgates, fencing and riprap

Current Status

The goal of the National Park Service is to rehabilitate the Water Treatment Plant and upgrade the treatment processes to provide a reliable potable water supply for the Presidio. To accomplish this, an extensive program of rehabilitative work will be undertaken. Construction documents have been produced for the work. HAER documentation is being prepared to comply with Section 106 of the Historic Preservation Act in conjunction with the rehabilitation of the structures.

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1 O. W. Degen, "Development of the San Francisco Water Supply System; Part I - Original Sources; Part II - Spring Valley Co." unidentified newspaper clippings, General Correspondence Geographical Files 1922-1935, Office of Quartermaster General, Record Group 92, National Archives, cited in Erwin N. Thompson, *Special History Study, Presidio of San Francisco, An Outline of Its Evolution as a U. S. Army Post, 1847-1990* (Denver: National Park Service, 1992), p. 180

2 Maj. Wm. W. Harts, Corps of Engineers, *Report on the Expansion and Development of the Presidio of San Francisco*, January 1907, p. 24, General Correspondence, OQMG, RG 92, NA. The specific court case and its precise resolution are not recorded in this document.

3 Erwin N. Thompson. *Special History Study, Presidio of San Francisco, An Outline of Its Evolution as a U. S. Army Post, 1847-1990* (Denver: National Park Service, 1992), p 181.

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6 Harts, Report, 1907, p. 24.

7 Harts, Report, 1907, p. 25.

8 OQMG, *Outline Descriptions of Military Posts and Reservations in the United States and Alaska* (Washington: Government Printing Office, 1904), pp. 382-383.

9 Harts, Report, 1907, pp. 18-19.

10 *Ibid.*, pp. 39-46.

11 J. B. Aleshire, QMG, August 22, 1912, to Chief of Staff, U. S. Army, General Correspondence 1890-1914, OQMG, RG 92, NA.

12 Col. Geo. L. Hicks, AG, 9th CA, July 29, 1931, to AG, General Correspondence, 1890-1914, OQMG, RG 92, NA.

13 U. S. Army, *Final Environmental Impact Statement* (San Francisco: 1992), pp. 3/23-3/24.

14 Richard P. Arber Associates, *Basis of Design Report, Presidio Water Treatment Plant Improvements* (Denver: July 1993), p. 96.

15 *Ibid.*, p. 97.

16 *Ibid.*, p. 112.

17 The description of the water treatment process was taken from Richard P. Arber Associates, *Preliminary Design Report: Final Submittal*, (Denver: March 1994).

18 Arber, Basis of Design Report, p. 113.

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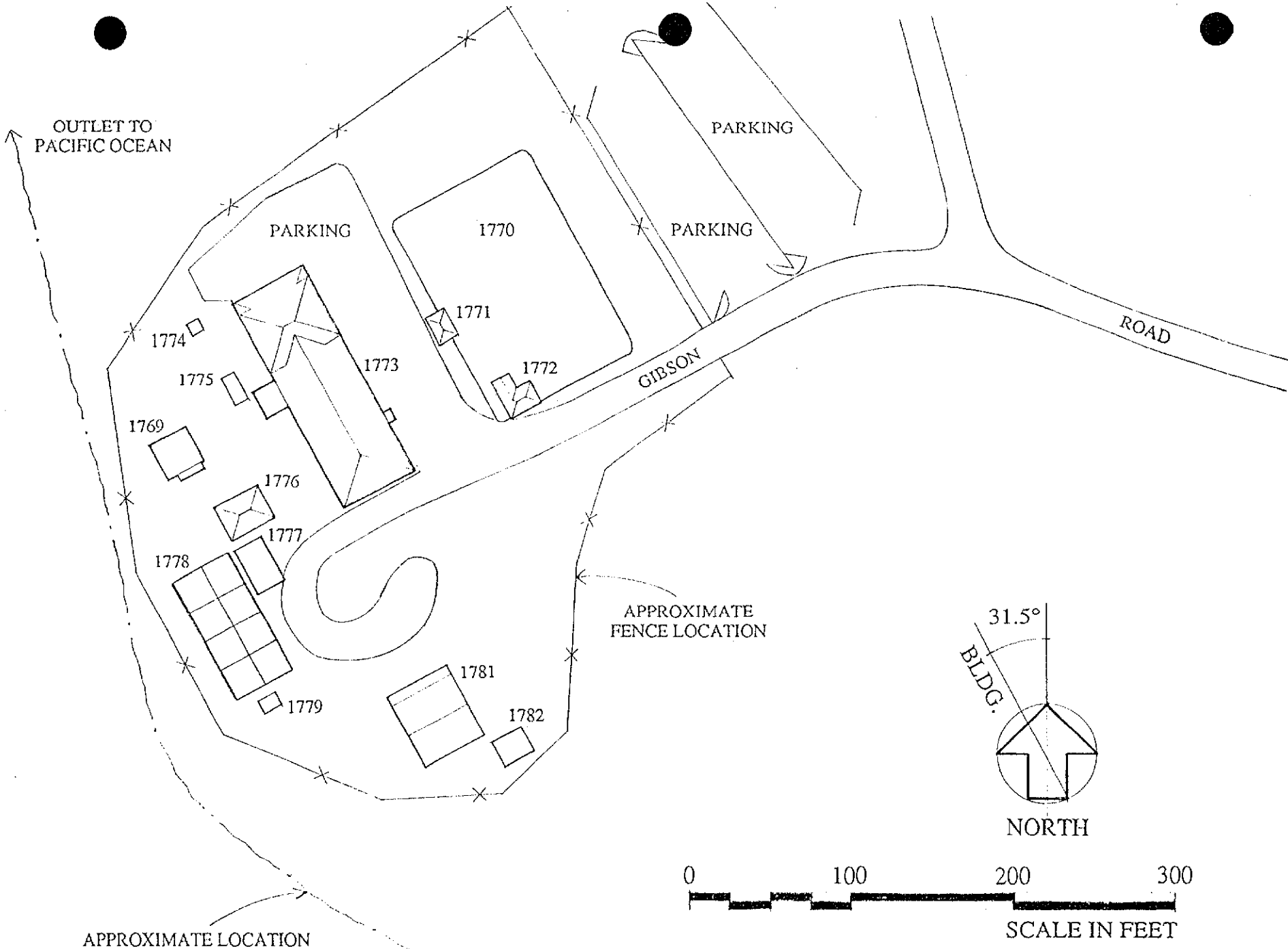
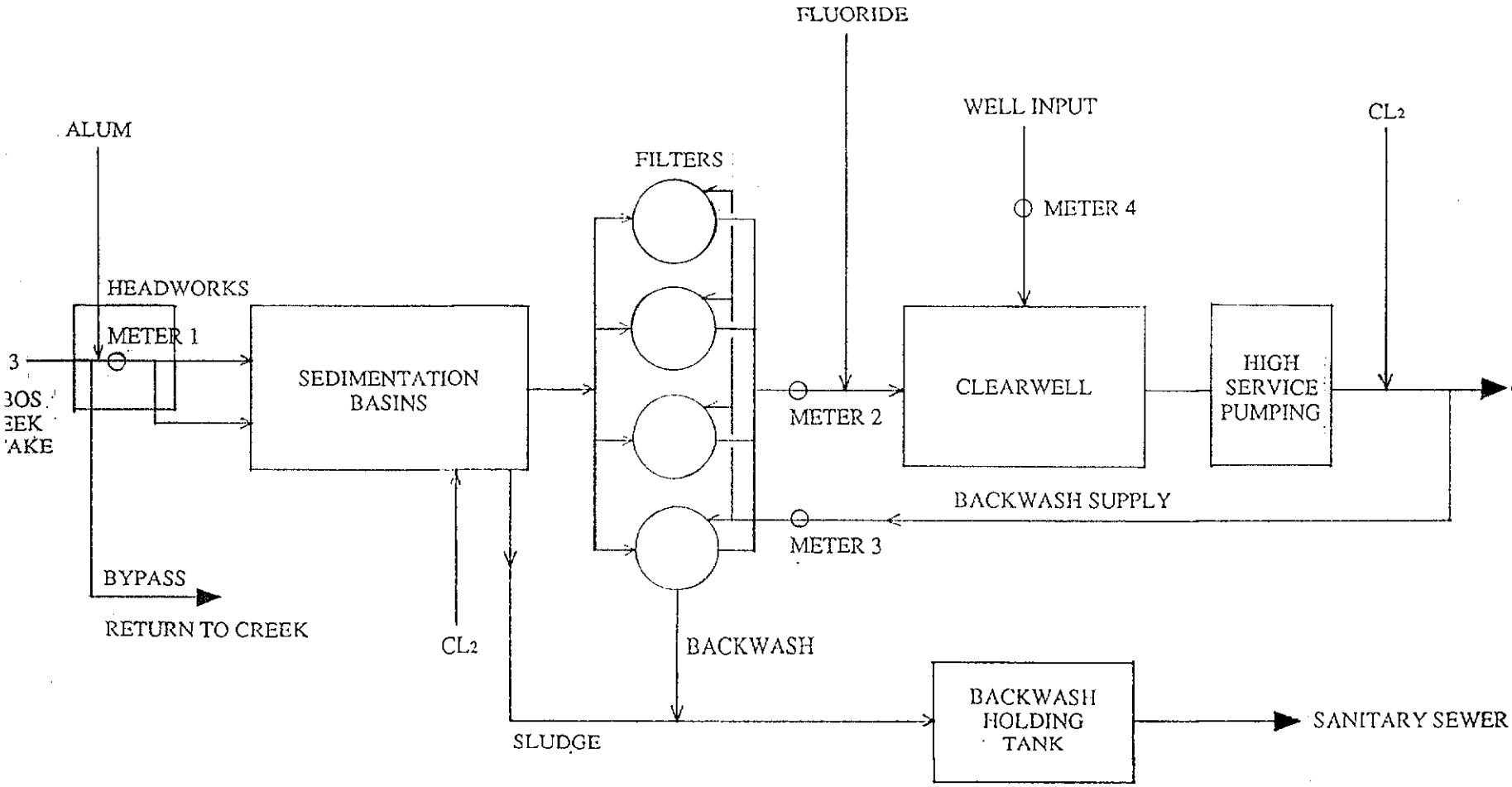


PRESIDIO WATER TREATMENT PLANT
SITE PLAN

Presidio Water Treatment Plant
HAER No. CA-155
Page 22
Figure 1



PRESIDIO WATER TREATMENT PLANT
SCHEMATIC PROCESS DIAGRAM

Presidio Water Treatment Plant
HAER no. CA-155
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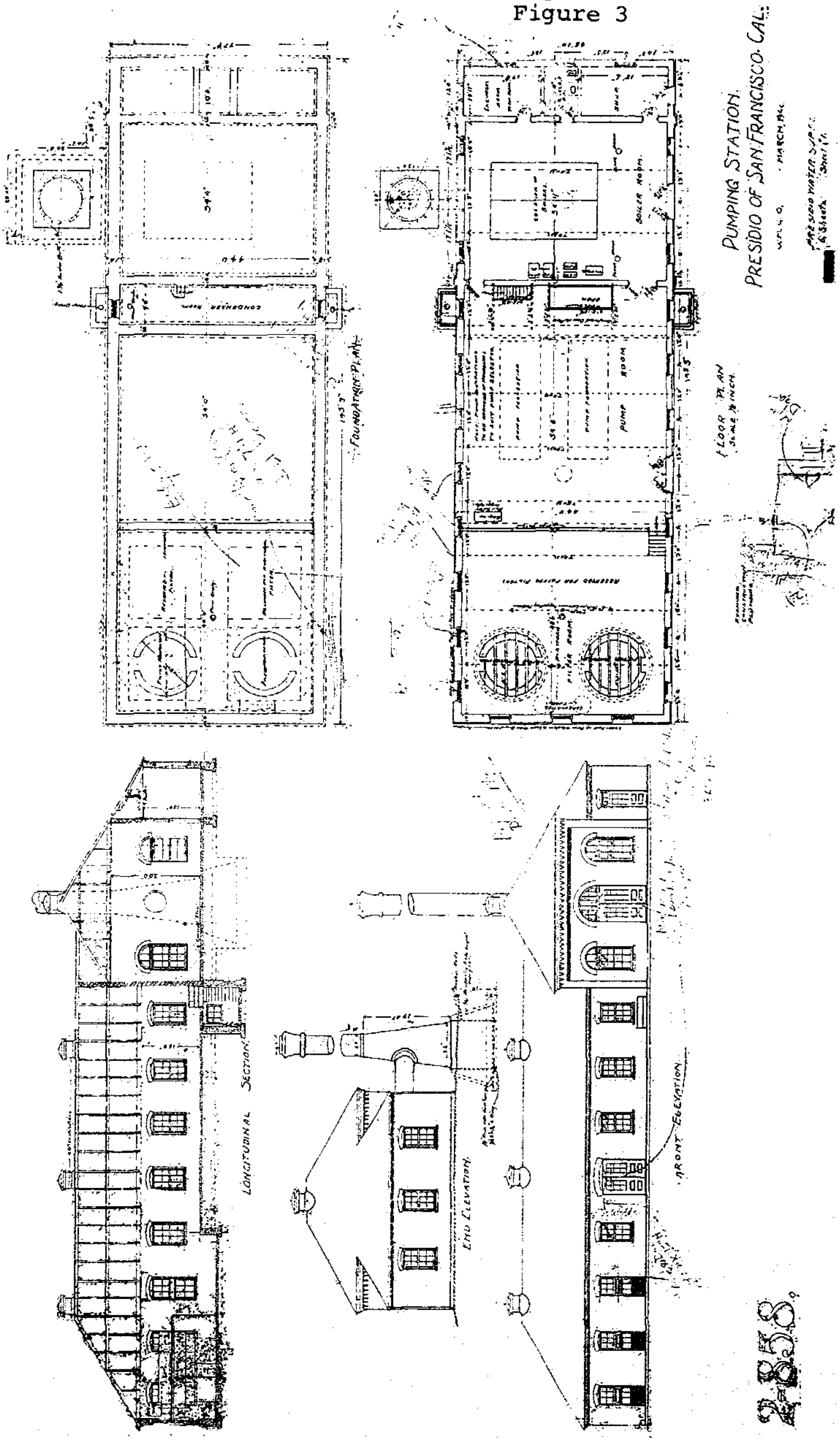
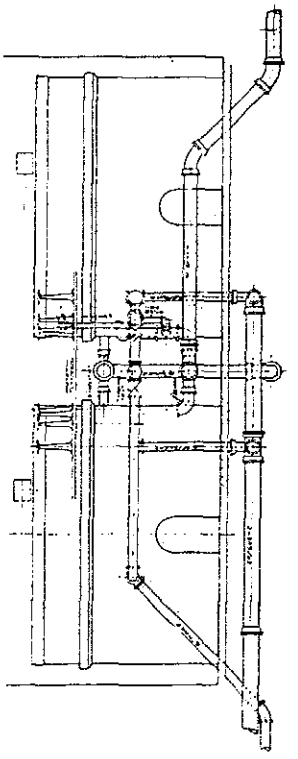
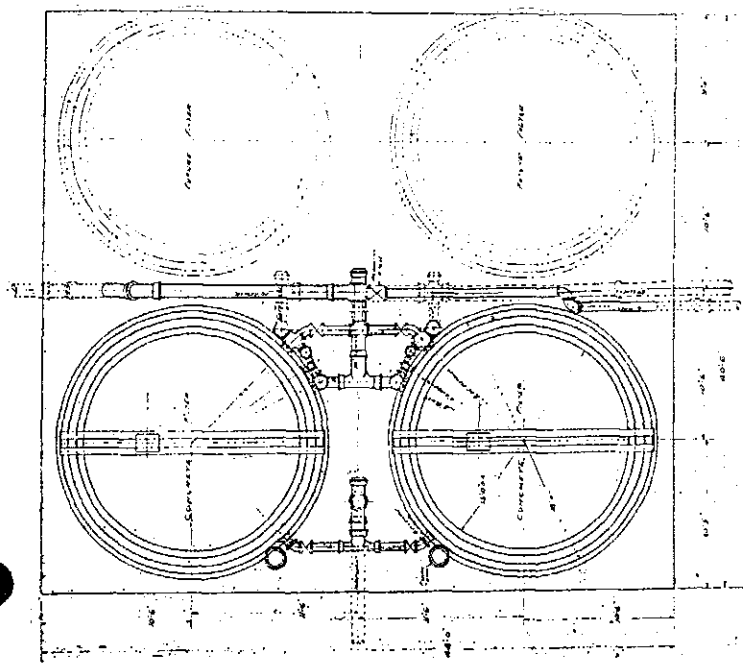
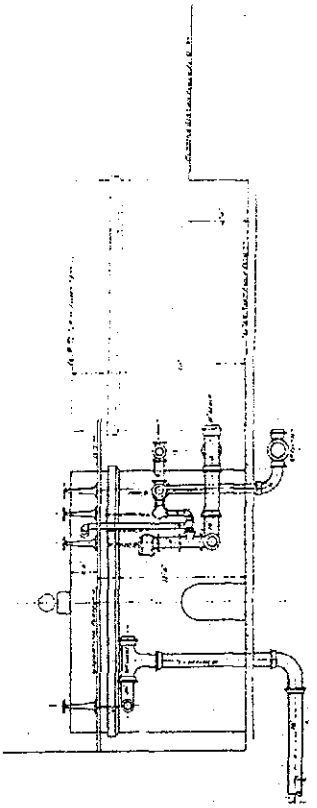
Figure 2

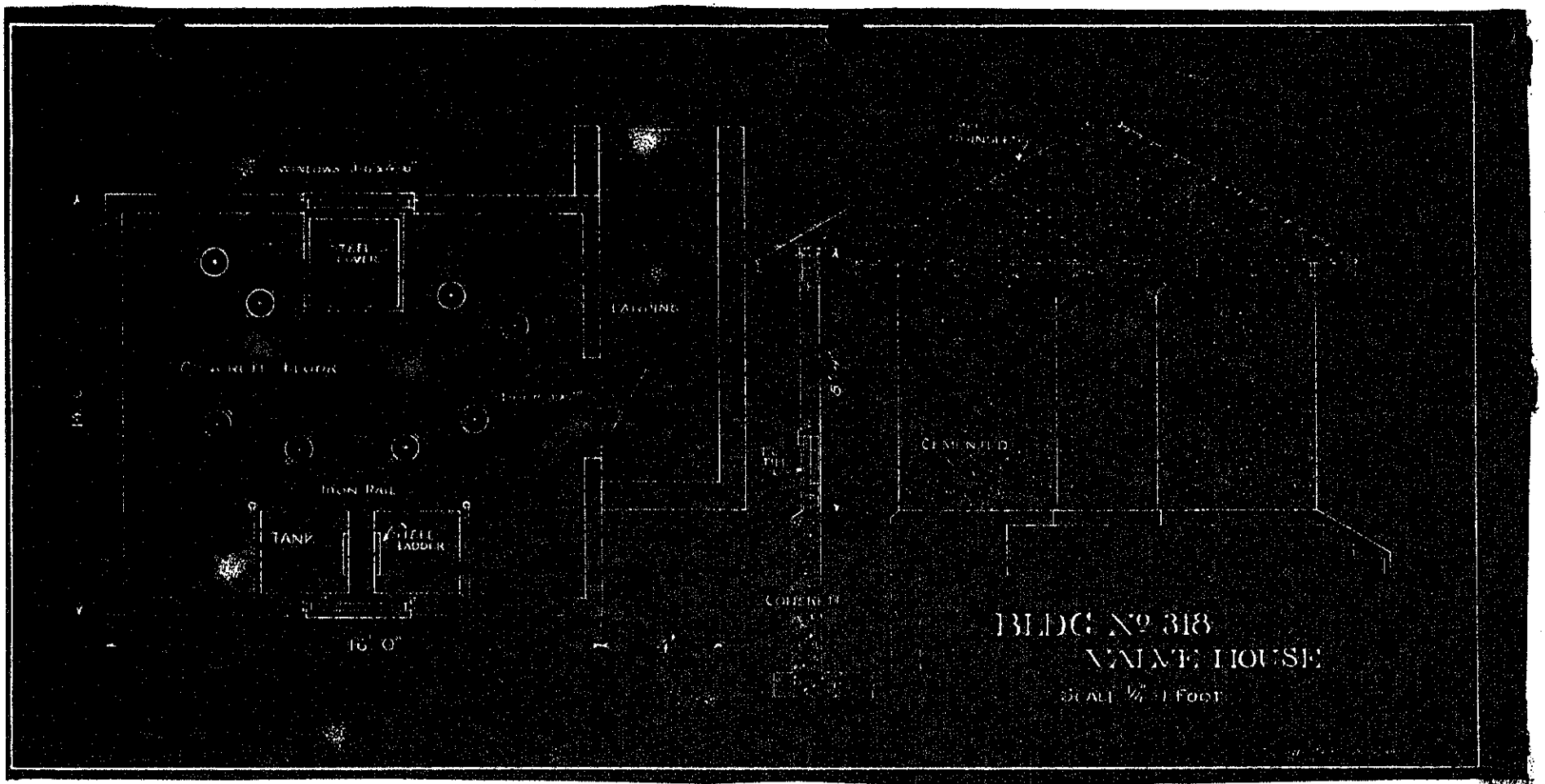
Figure 3


PUMPING STATION.
PRESIDIO OF SAN FRANCISCO, CAL.
FOUNDATION PLAN.
FLOOR PLAN
LONGITUDINAL SECTION.
END ELEVATION.
FRONT ELEVATION.









REMARKS

INSTRUCTIONS

If plans of building are available, forward copy of same showing information called for above. These plans should be checked against the building and any variations from same in the building as constructed should noted.

If plans are not available make sketch plans and elevation in spaces above. The plans shown are typical of "quarters." Similar plans may be made for all types of buildings. There are 10 squares to the inch. ch square will represent 1', 2', 4', or 8', etc., as may be necessary to show entire building in the space allowed. Show inside dimensions and designation of each room. Indicate location of water and sewer connections. space under heading "Details" show character of construction, story heights, etc.

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Presidio Water Treatment Plant
HAER No. CA-155
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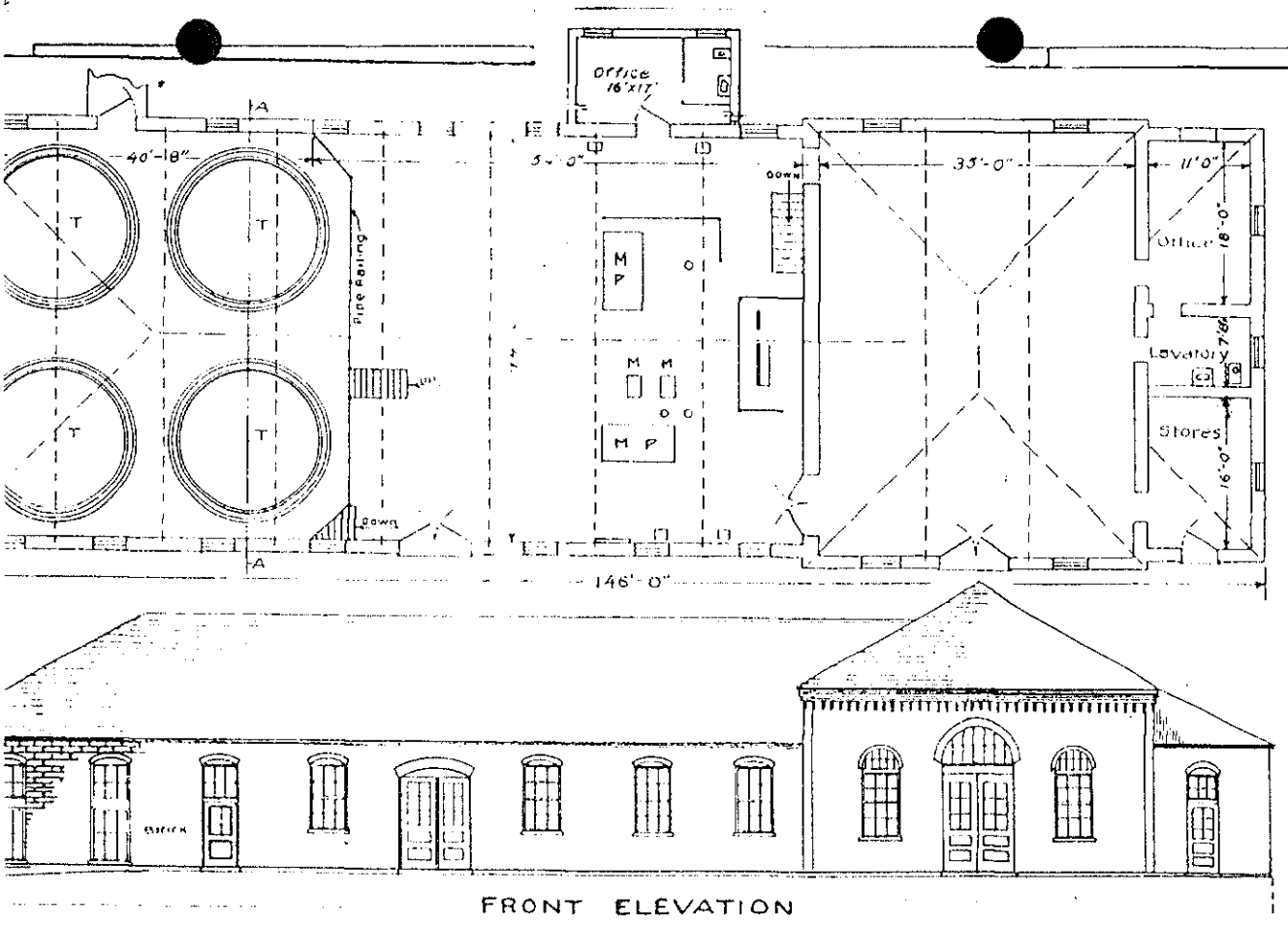
Figure 5



FRONT ELEVATION

- LEGEND -

WINDOWS (MAIN BLDG) 4'x7'x8'
WINDOWS (AT TANKS) 4'x3'x10'
S. DOORS 3'x7' - D. DOORS 8'-10'
M. P. - MOTOR PUMP
S. E. - SWITCH BOARD
W. T. - WATER TOWER
C. F. - CHLORINE FILTER
A. A. - AMMONIA APPARATUS
G. P. - GAUGE PANEL & CLOCK
V. D. - VERTICAL DRILL
A. C. - AIR COMPRESSOR & PRIM'G PUMP
W. C. - WATER COL.
T. - 4 TANKS: RAPID SAND FILTERS
STEEL STEPS TO PLATFORM
STEEL STEPS TO BASEMENT
STEEL ROOF TRUSSES 12'0" ON CENTERS
OREGON PINE RAFTERS 4"x6"
SLATE ROOF

BUILDING No. 352 ~~317~~

PUMPING PLANT.

Traced Mar 16-'40 F.C.B.

REMARKS

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U. S. GOVERNMENT PRINTING OFFICE 1940 3—6831

Presidio Water Treatment Plant
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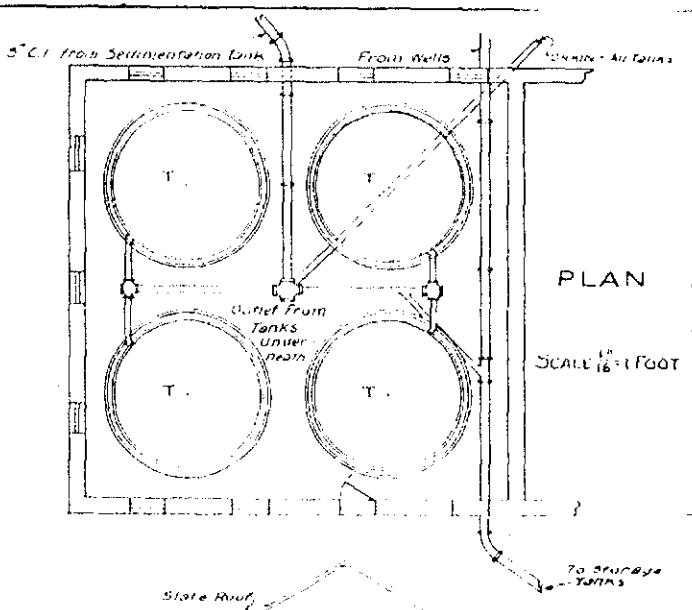
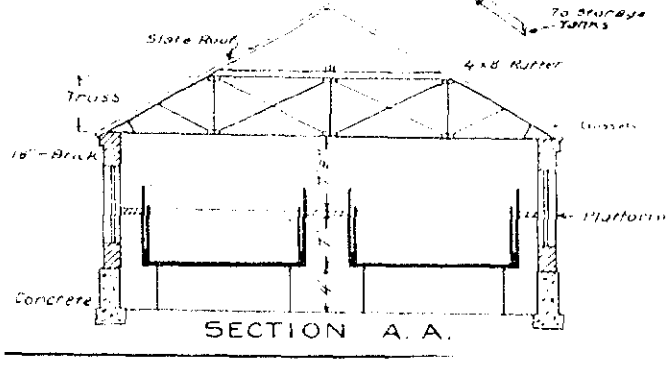
Figure 6

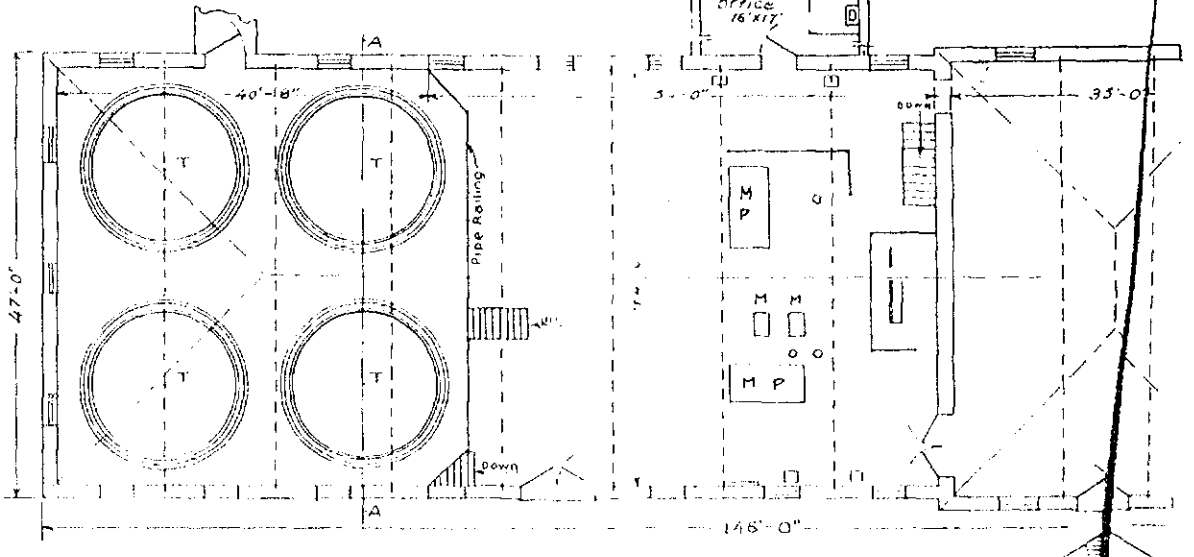


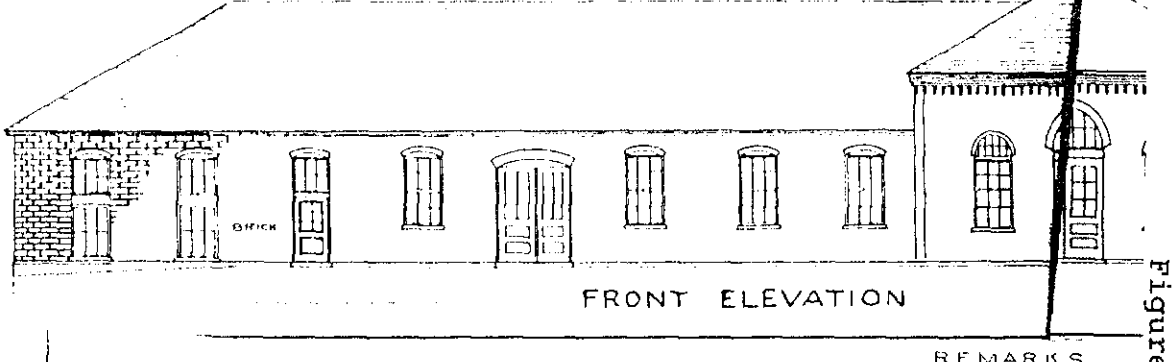
PLAN

SCALE 1/16" = 1 FOOT



SECTION A. A.





FRONT ELEVATION

REMARKS

INSTRUCTIONS

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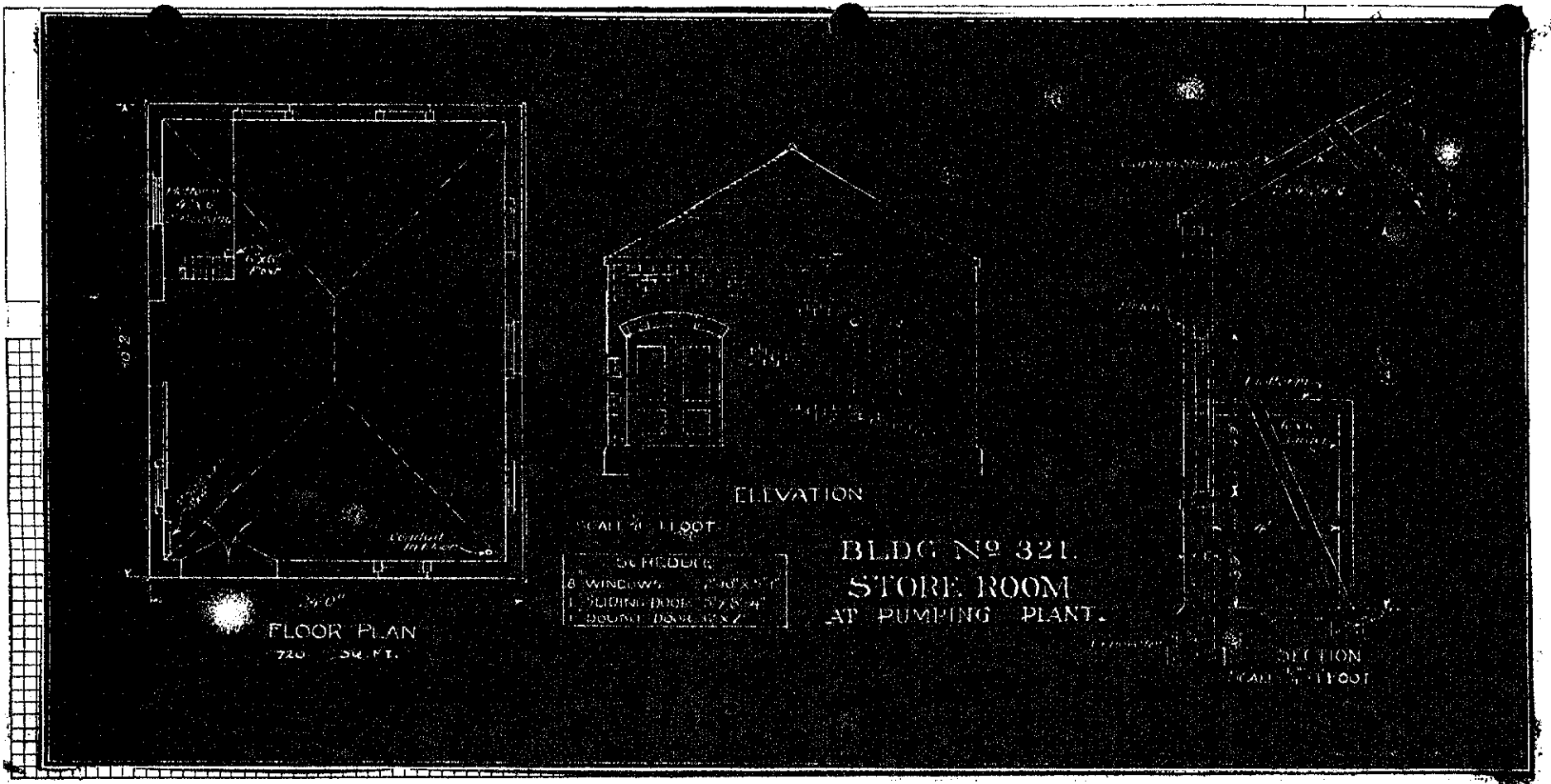
Presidio Water Treatment Plant
HAER No. CA-155
Page 28
Figure 7



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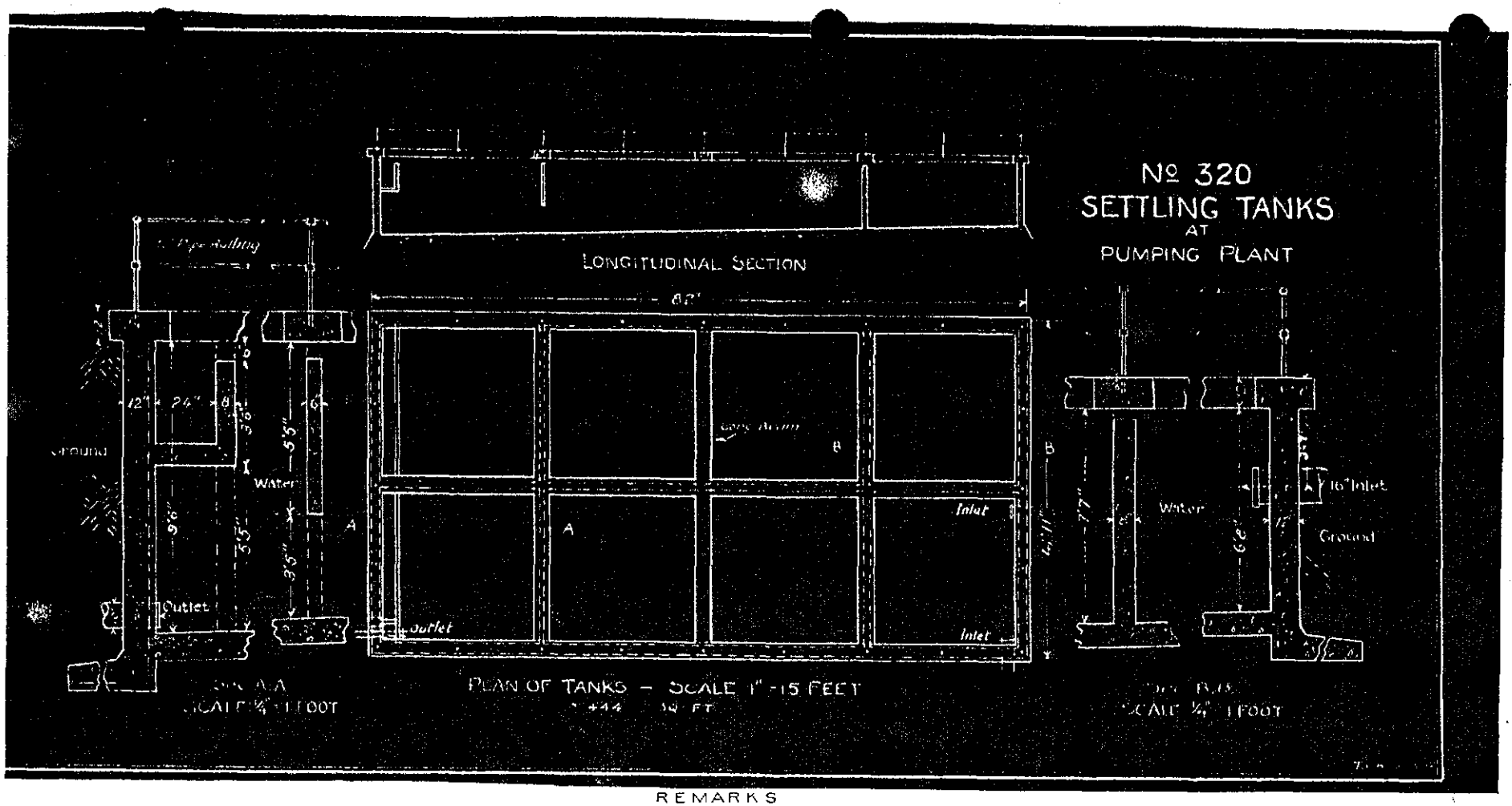

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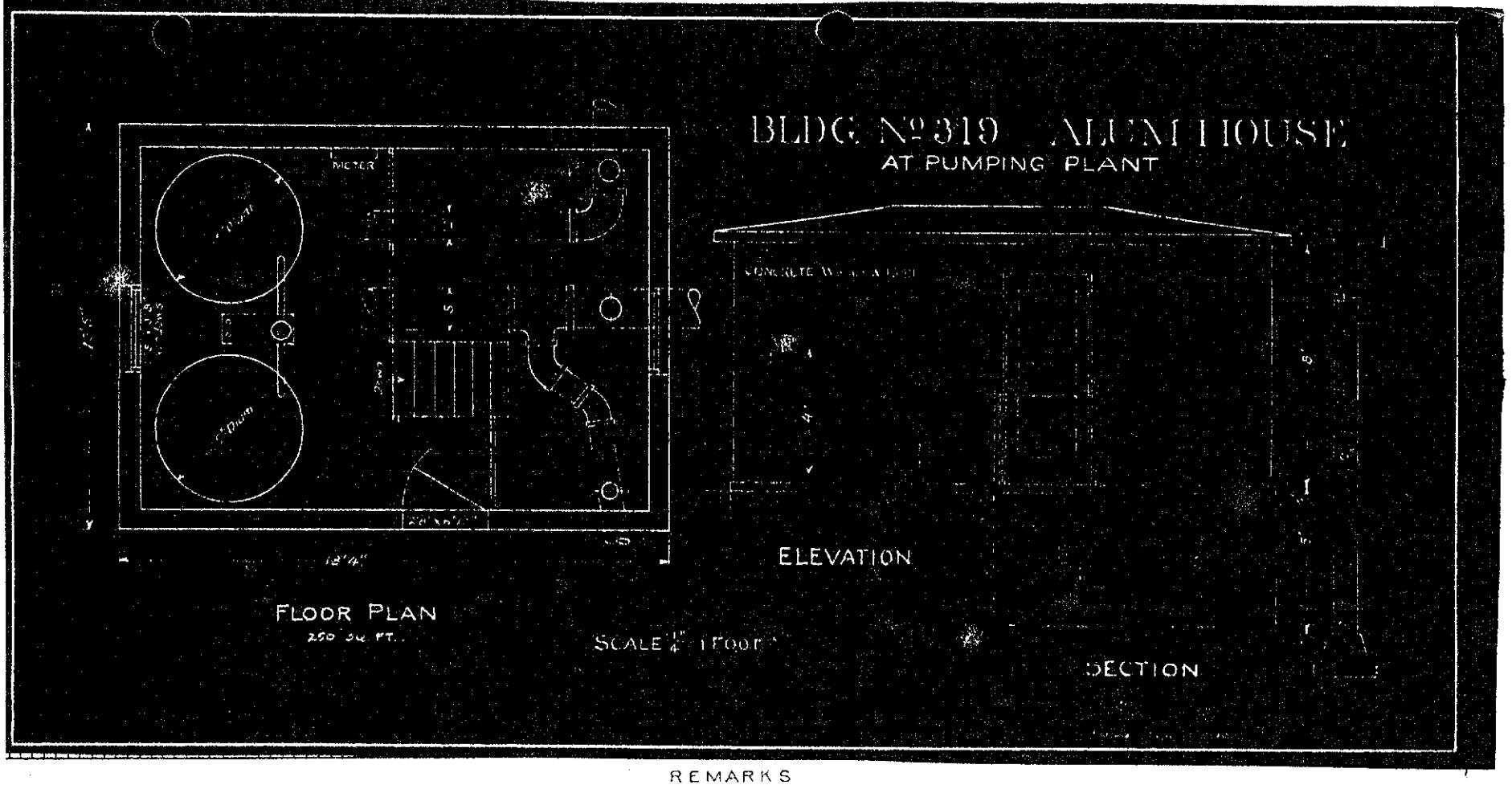

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Presido Water Treatment Plant
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Figure 10