LA-UR-98-4463

Decontamination and Decommissioning of Buildings 86 and 90 at Technical Area 33

Historic Building Survey Report No. 158

Los Alamos National Laboratory

September 30, 1998
Survey No. 762

Prepared for the Department of Energy
Los Alamos Area Office

prepared by

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Abstract

In August 1998, a historic building survey was conducted for two buildings proposed for decontamination and decommissioning (D&D). These buildings are situated on Department of Energy managed land at Los Alamos National Laboratory Technical Area (TA) 33.

Buildings TA-33-86 and TA-33-90 were built during the Early Cold War years at Los Alamos (1946–1956). TA-33-86, the Gas Handling Facility and, TA-33-90, a guardhouse, were built in 1954 and 1955. Because these properties were built during this significant time period at Los Alamos, historic building assessments have been included in this report.

Two other structures associated with these buildings are also proposed for D&D: an electrical transformer, TA-33-92, and a sanitary sewer septic tank, TA-33-93. These two structures, built during the same time period as the Gas Handling Facility and its associated guardhouse, lack any qualities to be considered significant historic properties.

Through documentation it has been determined that buildings TA-33-86 and TA-33-90, although they are less than fifty years old, are eligible for the National Register of Historic Places. This determination is made under Criterion A, due to their association with events of exceptional importance during the early cold War years at Los Alamos (criteria consideration G: properties that have achieved significance within the last fifty years) (U.S. Department of the Interior 1991).

The New Mexico State Historic Preservation Officer (SHPO) is requested to concur with the eligibility determinations contained in this report. Additionally, based on the information included in this report regarding the proposed effects and treatment of effects to both properties and the proposed accompanying memorandum of agreement (MOA), the SHPO is requested to concur with a "Determination of No Adverse Effect." The proposed MOA between the SHPO and the Department of Energy (DOE) stipulates the measures required to mitigate the adverse effects to the properties which would be resultant of the proposed D&D project.

As a result of this survey, this project complies with the National Historic Preservation Act of 1966 (as amended) and with Executive Order 11593.

Provenience and Environmental Setting

Location: Technical Area (TA) 33, Los Alamos National Laboratory

Land Manager: The Department of Energy

Legal Description: Township 18 North, Range 6 East, unplatted

Maps: USGS Frijoles 7.5 Minute Series (Appendix A, Map 1)

Topography: Frijoles Mesa

Nearest Drainage: Chaquehui Canyon to the southwest
Ancho Canyon to the north and northeast

Elevation: 1990.34 meters (6530 feet)

Current Land Use: Developed TA-33

Project Description

Los Alamos National Laboratory (LANL) proposes to decontaminate and decommission (D&D) two buildings and two structures. These buildings are located in Technical Area (TA) 33. The two buildings, TA-33-86 and TA-33-90, and the two structures, TA-33-92 and TA-33-93, were built in 1954 and 1955, during the Early Cold War years at Los Alamos (1946-1956). The proposed decontamination and decommissioning (D&D) project activities include the removal of all contaminated equipment and material from the interior and exterior of the buildings. Associated contaminated drain lines and utilities will also be removed. As a result of the decontamination phase, contaminated properties may be completely demolished.

Methods

In August 1998, historic building evaluations were conducted for buildings TA-33-86 and TA-33-90, and structures TA-33-92 and TA-33-93 (Appendix A, Map 2) by Kari L. Manz, archaeologist, Environment, Safety, and Health Division, Ecology Group (ESH-20), LANL.

The historic building evaluations were accomplished by first conducting a field visit to TA-33. Building TA-36-86, the Gas Handling Facility, and building TA-33-90, the associated guardhouse, were recorded on New Mexico Historic Building Inventory Forms and photographs were taken (Appendix B). Records research at LANL was also carried out, and existing drawings were compiled for both buildings.

Structures TA-33-92, an electrical transformer, and TA-33-93, a sanitary sewer septic tank, were not recorded on New Mexico Historic Building Forms because they lack qualities to be considered significant historic properties. However, photographs were taken and are on file at ESH-20, LANL (Appendix C).

Culture History Overview

Pre-World War II

Prehistoric land use on the Pajarito Plateau is characterized by Paleo-Indian and Archaic Period hunting and resource exploitation from about 10,000 B.C. to A.D. 600. A more formal Anasazi settlement of the Plateau occurred from A.D. 1100 until A.D. 1600, ending about the time of the arrival of the Spanish.

Historic land use on the Plateau begins during the Homesteading Period, from about 1890 to 1943, and was an outgrowth of earlier, undocumented, seasonal resource exploitation of the Plateau by Hispanics and Euro-Americans from neighboring communities. The Los Alamos Ranch School, a school for boys, was founded during this time period at present day Los Alamos.

World War II and Post-War

A. Site Selection, Acquisition

In 1942, Albert Einstein wrote a letter to President Franklin Roosevelt warning him of a possible German atomic bomb threat (Rothman 1992). President Roosevelt, acting on Einstein's concerns, gave approval to develop the world's first atomic bomb and appointed Brigadier General Leslie Groves to head the "Manhattan Project." Groves, in turn, chose Robert Oppenheimer to coordinate the design of the bomb.

A single research facility, isolated and secret, was proposed. General Groves had several criteria: security, isolation, a good water supply, an adequate transportation network, a suitable climate, an available labor force, and a locale west of the Mississippi located "at least 200 miles from any international border or the West Coast" (Rothman 1992). Oppenheimer, who had visited the Pajarito Plateau on a horseback trip, suggested the Los Alamos Ranch School.

B. Manhattan Project (1942 - 1945)

A suitable site selected, Oppenheimer and his staff moved to Los Alamos to begin work. The recruitment of the country's "best scientific talent" and the construction of technical buildings were top priorities. The University of California agreed to operate the site, code name "Project Y," under contract with the government (an arrangement that has continued to this day). Although the fission bomb was conceptually attainable, many difficulties still stood in the way of producing a usable weapon. Technical problems included the timing of the release of energy from fissionable material and the engineering aspects of having everything fit into a bomb casing. Nuclear material and high explosive (HE) studies were of immediate importance (Los Alamos National Laboratory 1995).

Two bomb designs appeared to be the most promising: a uranium "gun" type and a plutonium "implosion" type. The "gun-type" bomb involved bringing fissionable material together to form a critical mass by firing a mass of fissionable material at another mass of the same material, in this case uranium-235. This method led to the development of the "Little Boy" device. Scientists were less confident about the second "implosion-type" method, a design that necessitated the compression of fissionable material using explosives. The compression action would increase the density of a slightly sub-critical mass of plutonium-239 and would cause a critical reaction (Los Alamos National Laboratory 1995). In 1944, due to the uncertainties surrounding the second design, the search began for an appropriate test site for the implosion

method, later used in the "Fat Man" device. The Alamogordo Bombing Range in south-central New Mexico was selected. A trial run involving 100 tons of TNT was conducted at "Trinity Site" on May 7, 1945. This "dress rehearsal" provided measurement data and simulated the dispersal of radioactive products. The Trinity test was planned for July, and its objectives were "to characterize the nature of the implosion, measure the release of nuclear energy, and assess the damage" (Los Alamos National Laboratory 1995). The HE components of the "Trinity" device were test assembled in building TA-16-516 at Los Alamos in an area known as V-site. Other buildings at V-site were used to prepare and finish the HE components and to run preliminary tests on the "Trinity" bomb (Wilder 1991). The world's first atomic bomb was successfully detonated in the early morning of July 16, 1945. "Little Boy," the untested uranium gun-type bomb, was exploded over the Japanese city of Hiroshima on August 6, 1945. "Fat Man" was exploded over Nagasaki three days later on August 9, 1945, thus essentially ending the war with Japan.

C. Early Cold War Era (1946 - 1956)

The Manhattan Project had come to a close with the end of World War II (WWII), and many Los Alamos scientists and site workers went back to their pre-war existences. The future of Los Alamos was in question. With the beginning of the Cold War, continued weapons research was a top priority. Norris Bradbury had been appointed director of the Laboratory following Oppenheimer's departure from Los Alamos. Bradbury felt that the nation needed "a laboratory for research into military applications of nuclear energy" (Los Alamos National Laboratory 1993). In 1945, stockpiling and development of additional atomic weapons was an important mission. In 1946, the Laboratory became involved in the technical direction of the atmospheric testing program in the Pacific, dubbed "Operation Crossroads." Later in 1946, the U.S. Atomic Energy Commission (AEC) was established to act as a civilian steward for the new atomic technology born of WWII. The AEC formally took over the Laboratory in 1947, making a commitment to retain Los Alamos as a permanent weapons facility. Post-war weapons research revolved around the development of advanced fission weapons and, acting on an idea born in 1942, the development of the hydrogen bomb. The combined work of Edward Teller and Stanislaw Ulam led to the beginning of the Laboratory's thermonuclear research program (Los Alamos National Laboratory 1993).

In 1952, the first thermonuclear device, known as "Mike," was detonated at Eniwetok atoll in the Pacific (Los Alamos National Laboratory 1993). The Mike shot used liquefied deuterium fuel. The Castle-Bravo shot, conducted in the Pacific in 1954, was revolutionary in that it contained dry, solid thermonuclear fuel. Other early Cold War weapons-related developments include: 1) from 1952 to 1956, "improvements to the primary stage of a nuclear weapon" and 2) in 1956, "the first use of plastic-bonded explosives in a nuclear explosion" (Los Alamos National Laboratory 1995).

Technical Area 33 Historical Background

The two buildings discussed in this report were constructed from 1954 to 1955. The original activities carried out in these buildings were associated with the early Cold War weapons development program.

TA-33 (Hot Point [HP] Site) is comprised of five areas: 1) "Main Site" a laboratory and office complex near the entrance to the TA at State Road 4, 2) "Area 6" a western firing site, 3)

"South Site" a southern firing site, 4) "East Site" an eastern firing site, and 5) "NRAO" the current site of the National Radio Astronomy Observatory's Very Large Baseline Array (VLBA) antenna.

The TA-33 area began to be developed in 1947, for the Laboratory's weapons testing group, W-3, as a substitute test site for experiments that were then being conducted at Trinity Site in southern New Mexico. These tests used conventional high explosives, uranium, beryllium, and polonium radiation sources, and were conducted primarily to verify designs of nuclear weapons' components called initiators. This testing ended at TA-33 by 1972 (Los Alamos National Laboratory 1992:ES-3, 2-1). Later much of this area was obtained for offices, laboratories, and storage space for the Hot Dry Rock experiments being conducted at the Fenton Hill site in the Jemez Mountains. In 1989 the International Technologies Group, which engages in electronics design and fabrication, acquired the office/laboratory buildings (Los Alamos National Laboratory 1992:2-1, 3-22). During the reuse of the buildings some have undergone modifications. Currently some of the buildings are vacant/abandoned and while others are being solely used for storage.

The buildings at "Main Site" were constructed over a 13-year period (1949 to 1962) and do not relate to a specific weapons research initiative. Style of construction varies widely from a metal *Quonset* hut, cinder block buildings, reinforced concrete buildings, and other metal and wood buildings. From the late 1960s through the late 1980s many portable buildings, trailers, semi-trailers, transportainers, sheds, and small prefabricated storage buildings have been added to the TA. Additionally, the NRAOs, VLBA antenna and control building were installed in 1987.

The Gas Handling Facility, guard station, electrical transformer, and the sanitary sewer septic tank were built in 1954 and 1955. Most of the Main Site area is fenced and the area surrounding the buildings is paved with asphalt. The Gas Handling Facility, TA-33-86, is located at the southern portion of "Main Site", and it is surrounded by a separate fence. The guard Station, TA-33-90, and electrical transformer, TA-33-92, are also located inside the Gas Handling Facility fence. A material disposal area (MDA) "K" is to the east of this fence. The sanitary sewer septic tank, TA-33-93, also proposed for D&D, is situated within this MDA.

The Gas Handling Facility, TA-33-86, began operations in June of 1955. It was the first facility at LANL to handle "large" quantities of tritium gas for the nuclear weapon's development program. Its purpose was to conduct research and development on tritium handling technology that would feed into the Savannah River Plant (SRP) tritium production activity. However, during the mid 1960s the SRP was not ready to handle and fill gas reservoirs or "bottles", so LANL, (TA-33-86) took over the production work for a brief period of time. It processed tritium gas, repackaging tritium gas into small-volume high-pressure vessels "gas containers" which were used in several weapon systems and devices that were tested at the Nevada Test Site (NTS) (Ziemer 1991, Estrada 1998).

The building also housed a tritium decontamination facility that used benzene, acetone, and methanol in a chemical fume hood equipped with an exhaust fan (Shulte 1957). High-resolution mass spectrometry was also conducted in TA-33-86. It was "used to measure the purity of the tritium gas" (Estrada 1998). In 1960 a working model of a high-temperature uranium fluidized-bed reaction vessel, discharge stack, and fan was installed. This reaction vessel was later shipped to Brookhaven (Ahlquist 1983; LANL 1992:3-21).

TA-33-86 ceased operations in December 1990 (Los Alamos National Laboratory 1992:3-22).

Description of Buildings

Two buildings and two structures are proposed for demolition. Appendix A contains maps of locations of the buildings and structures proposed for demolition. Appendix B contains the Historic Building Inventory Forms and photographs of TA-33-86 and TA-33-90. Appendix C contains photographs of structures TA-33-92 and TA-33-93.

TA-33-86

Building Name: TA-33-86 Original Name: Gas Handling Facility, HP-86

Location:

City - Los Alamos, New Mexico

County - Los Alamos

UTMs - Zone 13 Easting 386561 Northing 3960331

Legal Description - Township 18 North, Range 6 East, Unplatted

Surroundings - TA-33 is a developed Laboratory technical area. There are five activity areas at TA-33: Main Site, Area 6, East Site, South Site, and NRAO Site.

Relationship to surroundings – Not similar

Construction Date: 1954 to 1955

Original Use: Building TA-33-86 was a gas handling facility where research and development was conducted on tritium gas handling technology for the nuclear weapon's development program (Estrada 1998).

Use History: Some portions of the building have been used for storage since it ceased tritium operations in late 1990.

Use at Time of Survey: TA-33-86 is currently abandoned and portions are used as storage.

Condition at Time of Survey: Fair-to-good condition, but the building itself is contaminated with tritium residue.

Building Description: (see also Appendix C)

Building style – Reinforced concrete with a slightly concave roof for drainage. Roof is constructed of tarpaper, tar, and gravel with metal edging "flashing" along all sides. Other laboratory and testing facilities at LANL are also constructed of reinforced concrete. Most of the buildings in the high-explosives exclusion zone at TA-16 are of reinforced concrete.

Foundation material - Concrete slab

Wall material/surface – Reinforced concrete

Architectural features - Building TA-33-86 is a roughly rectangular, reinforced concrete structure with a small utility/equipment room extending to the east from approximately the center of the east side of the building. The building has 19 rooms designated as rooms 1, 2, 2A, 3, 4, 5, 6, 7, 7A, 7B, 8, 9, 10, 10A, 11, 11A, 11B, 12, and 12A. These include restrooms, a janitorial closet, several utility/equipment rooms, several large shop type rooms, the tritium laboratory, the control room for the tritium laboratory, office space, and other work areas. The doors to the building have been painted green and interior walls have been painted either green or white.

On the east side of the building at the northern end, there are two inner metal pedestrian doors with exterior steel, safe/vault, combination lock, pedestrian doors for extra security. Towards the center of the east side there is also a single metal pedestrian door. On the south end of the east side there is a translucent, 90-paned "glass-brick" window.

A canopy of galvanized corrugated metal was added along the east wall of the building in 1963 to protect small gas cylinders stored along the wall.

The utility/equipment room extends east from the east side of the building. The north side of this extension has a double metal pedestrian door. A small cinder (pumice) block addition was constructed on the east side of the utility equipment room in 1958. There are double metal pedestrian doors with single-paned windows on the north side of the addition. On the east side of the addition there is a single metal pedestrian door and a three-paned, metal frame window.

The north side of the building has one metal pedestrian door and a translucent, 144-paned "glass-brick" window. The exhaust stack for the building is located several feet to the north of the north wall.

On the west side of the building, at the north end, there are three translucent, 120-paned "glass-brick" windows. Towards the south end of the west side there is one translucent, 144-paned "glass-brick" window. Additionally, there are two metal roll-up garage type doors on the west side.

On the south side of the building there is one metal roll-up garage type door. A metal loading dock with a low concrete barrier is adjacent to the south wall. This barrier enabled oxygen trucks to backup and connect hoses to the valves on the barrier, which fed into the building. The walkway allowed an operator to control the valves on the back of the truck.

There is a "penthouse" room on the roof of the north end of the building which houses additional utility equipment (pump motors for the buildings air stack).

Remodeling History: A small cinder "pumice" block addition was added, in 1958, to the east side of the east wall of the equipment room extension. In 1963, a canopy of galvanized corrugated metal was added along the east wall of the building.

Associated Buildings: TA-33-90, built in 1954 to 1955, is the inner guard station at TA-33 associated with the Gas Handling Facility. It is a wood frame structure with a flat roof, overlaid with "Transite".

District Potential: None. The area lacks integrity and does not represent construction geared to a specific weapons development initiative. The area contains the result of 40 years of accumulated permanent and temporary buildings and facilities.

TA-33-90

Building Name: TA-33-90, Original Name: HP-90

Location:

City - Los Alamos, New Mexico

County - Los Alamos

UTMs - Zone 13 Easting 386546 Northing 3960358

Legal Description - Township 18 North, Range 6 East, Unplatted

Surroundings - TA-33 is a developed Laboratory technical area. There are five activity areas at TA-33: Main Site, Area 6, East Site, South Site, and NRAO Site.

Relationship to surroundings – Not similar

Construction Date: 1954 to 1955

Original Use: TA-33-90 is a guard station for TA-33-86, the Gas Handling Facility.

Use History: This building has been used for storage since TA-33-86 ceased operations in 1990.

Use at Time of Survey: TA-33-90 is currently abandoned but has been used for storage.

Condition at Time of Survey: Fair-to-good condition, however, the building has "Transite," a nonfriable asbestos siding, on the exterior.

Building Description: (See also Appendix B)

Building style - Wood frame with a flat roof. The roof is constructed of tarpaper, tar, and gravel with metal edging "flashing" along all sides. This guard house is the same style as other guard houses throughout the laboratory, however construction material varies between wood and concrete.

Foundation material – Concrete slab

Wall material/surface – Wood covered with "Transite", a nonfriable asbestos siding.

Architectural features - Building TA-33-90 is a small, square, wood-frame building with the door and window frames painted green. The roof of the building overhangs the building by approximately 2-2 ½ feet. The 12 by 12-foot building has two rooms, the main room plus a small restroom.

All windows in the building have wood and metal frames. On the east side of the building there is a wooden pedestrian door with a large window, and a fixed single-paned window. The north side of the building has two side-by-side windows. One is fixed and single-paned and the other is a double-hung sash window with four panes. The west side of the building has two single-paned fixed windows. On the south side there are three side-by-side windows. The center one is a double-hung sash window and the two "outside" windows are fixed and single-paned.

Remodeling History: None.

Associated Buildings: TA-33-86. the Gas Handling Facility, was also built in 1954 to 1955. TA-33-90 is the inner guard station at TA-33 associated with the Gas Handling Facility.

District Potential: None. The area lacks integrity and does not represent construction geared to a specific weapons development initiative. The area contains the result of 40 years of accumulated permanent and temporary buildings and facilities.

TA-33-92

TA-33-92 is a fenced electrical transformer situated directly to the south and east of building TA-33-86. It is located to the south of the utility/equipment room extension and the small room addition on the east side of the building.

No historic building form was completed for this structure because it lacks any qualities to be considered an historic property. However, photographs were taken and are on file at ESH-20, LANL (Appendix C).

TA-33-93

TA-33-93 is an underground sanitary sewer septic tank is located approximately 250 feet to the east of building TA-33-86.

No historic building form was completed for this structure because it lacks any qualities to be considered an historic property. However, photographs were taken and are on file at ESH-20, LANL (Appendix C).

National Register Eligibility Determination

Based on the information gathered during this building survey, properties TA-33-86 and TA-33-90 are eligible for nomination to the National Register of Historic Places.

Both of these properties are less than fifty-years old and as such, must be associated with an event(s) of exceptional importance in order to be eligible for the National Register (criteria consideration G, under Criterion A) (U.S. Department of the Interior 1991).

Building TA-33-86 is associated with events of exceptional importance in the history of the nation and the world and is eligible under Criterion A (criterion consideration G). Activities conducted in TA-33-86, the Gas Handling Facility, played an integral role in the research and development of tritium-handling technology for the nuclear weapons program during the Cold War era. Even though this building has had two minor additions since it was built in 1954/1955, the small room added to the east side of the equipment room and a canopy on the northern end of the east side of the building, the operations conducted within never changed during its' time of operation 1955 through 1990. It always served as a research and development laboratory for the handling of tritium gas.

Building TA-33-90 is also eligible under Criterion A (criterion consideration G), even though it is only indirectly involved in the important scientific work at TA-33. It is eligible based on its association with security aspects in regard to access and safety of the Gas Handling Facility, TA-33-86.

Structures TA-33-92 and TA-33-93 are not eligible for the National Register of Historic Places because they lack any qualities to be considered historic properties.

While structures TA-33-92, the electrical transformer, and TA-33-93, the sanitary sewer septic tank, were constructed during the Early Cold War years at Los Alamos, they functioned

solely as utility support structures. Lacking any qualities to be considered historic properties, structures TA-33-92 and TA-33-93 are not eligible for the National Register.

Background Information – Potential for Contamination

TA-33-86 was associated with Cold War era tritium gas handling/high-pressure tritium processing for weapons research, development, testing, and production. Activities at TA-33 (Hot Point) firing sites in general, were tests conducted to verify designs of nuclear weapons' components called initiators. These tests used conventional high explosives, uranium, beryllium, and polonium radiation sources (Los Alamos National Laboratory 1992:ES-3, 2-1). As a result of the tritium research conducted in TA-33-86, this building is contaminated with tritium residues. The septic tank and system (TA-33-93) was primarily for sanitary wastes but it also received tritium and plutonium and possibly uranium-contaminated liquids (Los Alamos National Laboratory 1992:3-19). Other possible contaminants at TA-33-86 could be mercury molybdenum, nickel plated plutonium, boron, and beryllium oxide (Estrada 1998).

1986 soil, vegetation, and in field radiation surveys, to the east of TA-33-86, indicated elevated levels of tritium in both the soil and vegetation samples. Additionally, near-surface samples collected from near the septic tank also indicated elevated levels of tritium (Los Alamos National Laboratory 1992:3-27 to 3-28).

From radiation surveys conducted in 1995 through 1997, tritium contamination is known to exist on surfaces throughout all rooms of TA-33-86. Rooms 9 and 12, where actual work with tritium was conducted, have the highest levels of surface tritium contamination ranging from 10,000 to 200,000 dpm/100cm^2. The remaining rooms have surface tritium contamination levels less than 1,000 dpm/100cm^2. Radioactivity of a sample is reported in radioactive disintegrations per minute (dpm) and the standard sample area is typically 100 square centimeters (100cm^2) (Forrester 1998).

> Tritium ($_1H^3$) has unique properties that render total decontamination of tritium-contaminated material virtually impossible. Like hydrogen (i.e., protium/deuterium) gas, tritium gas interacts in some way with almost all materials. Tritium gas diffuses through porous and semi-porous materials (e.g., concrete, glass), permeates or reacts with metals (forms hydrides), and forms tritium oxide (T_2O) that behaves physically, chemically, and biologically like water (H_2O) (Forrester 1998).
>
> The DOE has established a free release criteria for removable tritium surface contamination as 10,000 dpm/100cm^2. However, LANL has established a "no radioactive material added" policy for free release of materials. This means that if any radioactivity is detected, LANL will not release the material (or area) for unrestricted public use (Forrester 1998).

Based on this information it is "doubtful that LANL could decontaminate TA-33-86 to the point that there will be no detectable tritium in the building." TA-33-86 is constructed of reinforced concrete that retains at least 5% water by mass. After exposure to tritium over the life of the building (44 years), "the hydrogen in the residual water has undoubted exchanged with the tritium gas to form T_2O." This "tritium would leach out of the concrete into the building and contaminate the inner surfaces," as well as the surrounding area. If the building is left standing, decontamination efforts to contain the leached tritium "would need to be conducted for many years into the future" (Forrester 1998).

Proposed Treatment of Effects

The proposed D&D activities at TA-33 will result in the destruction of buildings TA-33-86 and TA-33-90, and structures TA-33-92 and TA-33-93.

The two buildings documented in this report are deemed eligible for the National Register of Historic Places. Adverse effects to properties determined to be eligible for the National Register should be mitigated to the fullest extent possible. The following treatment proposal is based on documentation requirements contained in the Secretary of the Interior's Guidelines for Architectural and Engineering Documentation (Keune ed. 1984).

1) Historic American Building Survey/Historic American Engineering Record (HABS/HAER) quality as-built drawings will be drafted as needed; adequate drawings already exist for the guard station, TA-33-90. The measured drawings will be produced in ink on archivally stable material. A complete set of existing LANL drawings for each eligible building and for any associated equipment will also be compiled.

2) Large format, archival quality, black and white photographs will be taken. The negatives will be 4 by 5 inch, 5 by 7 inch, or 8 by 10 inch size. The photographs will be perspective-corrected and fully captioned. Original negatives will be archived at LANL's photographic archives.

3) A written history will be prepared. This document will include a use history of each National Register eligible building along with a historical account of the early years at TA-33 and Los Alamos' role during the Cold War era. This documentation will come from several sources: LANL engineering drawings and records, information from the Los Alamos National Laboratory and Los Alamos Historical Museum archives, published histories of the Cold War era, and possibly oral interview data from present and former LANL employees.

These guidelines are stipulated in the accompanying MOA between the SHPO and the Department of Energy (DOE).

Recommendations

As stated above the two buildings proposed for demolition are significant historic properties, and are eligible for nomination to the National Register of Historic Places under Criterion A (criterion consideration G). The State Historic Preservation Officer (SHPO) is requested to concur with the eligibility determinations contained in this report. Additionally, based on the information regarding the proposed effects and treatment of effects the SHPO is requested to concur with a "Determination of no Adverse Effect" for the decontamination and decommissioning of properties TA-33-86, TA-33-90, TA-33-92, and TA-33-93. Also, the SHPO is requested to sign the accompanying MOA between the SHPO and the DOE which stipulates the measures required to mitigate the adverse effects to the properties (see Proposed Treatment of Effects section above).

As a result of this archaeological survey, this project complies with the National Historic Preservation Act of 1966 (as amended) and with Executive Order 11593.

References Cited

Ahlquist, A. John

1983 "Conversations with Harlow Russ, Regarding TA-33, 10/27/83." Los Alamos National Laboratory Memorandum dated November 1, 1983, HSE-8/83-733 to File from John Ahlquist, Los Alamos, New Mexico.

Estrada, Joe

1998 "Interview Notes on TA-33-86." Commodore Advanced Sciences, Inc. Memorandum regarding interview with John Dougherty, dated September 17, 1998, to Kari Manz, ESH-20, Los Alamos National Laboratory, on file at ESH-20, Los Alamos National Laboratory, Los Alamos, New Mexico.

Forrester, Tim

1998 "Contamination in Building 86, TA-33." GTS Duratek Memorandum dated June 30, 1998, to Ellen McGehee and Kari Manz, ESH-20, Los Alamos National Laboratory, on file at ESH-20, Los Alamos, New Mexico.

Keune, Russell V. (ed.)

1984 *The Historic Preservation Yearbook 1984/1985.* Published in cooperation with the National Trust for Historic Preservation, Adler and Adler, Publishers, Inc., Bethesda, Maryland.

Los Alamos National Laboratory

1992 *RFI Work Plan for Operable Unit 1122: Environmental Restoration Program.* LA-UR-92-925, Los Alamos National Laboratory, Los Alamos, New Mexico.

1993 *Los Alamos: Beginnings of an Era 1943-1945.* Los Alamos Historical Society, Los Alamos, New Mexico.

1995 *Dateline: Los Alamos, Special Issue, LALP-95-2-6&7.* Los Alamos National Laboratory, Los Alamos, New Mexico.

Rothman, Hal

1992 *On Rims and Ridges, The Los Alamos Area Since 1880.* University of Nebraska Press, Lincoln.

Schulte, H.F.

1957 "Meeting held at TA-33, Building 86." Los Alamos Scientific Laboratory Memorandum dated February 25, 1957, to File from H. F. Schulte (H-5), Los Alamos, New Mexico.

U.S. Department of the Interior

1991 How to Apply the National Register Criteria for Evaluation. In *National Register Bulletin,* No. 15. U.S. National Park Service, Washington, D.C.

Wilder, Edward, Jr.

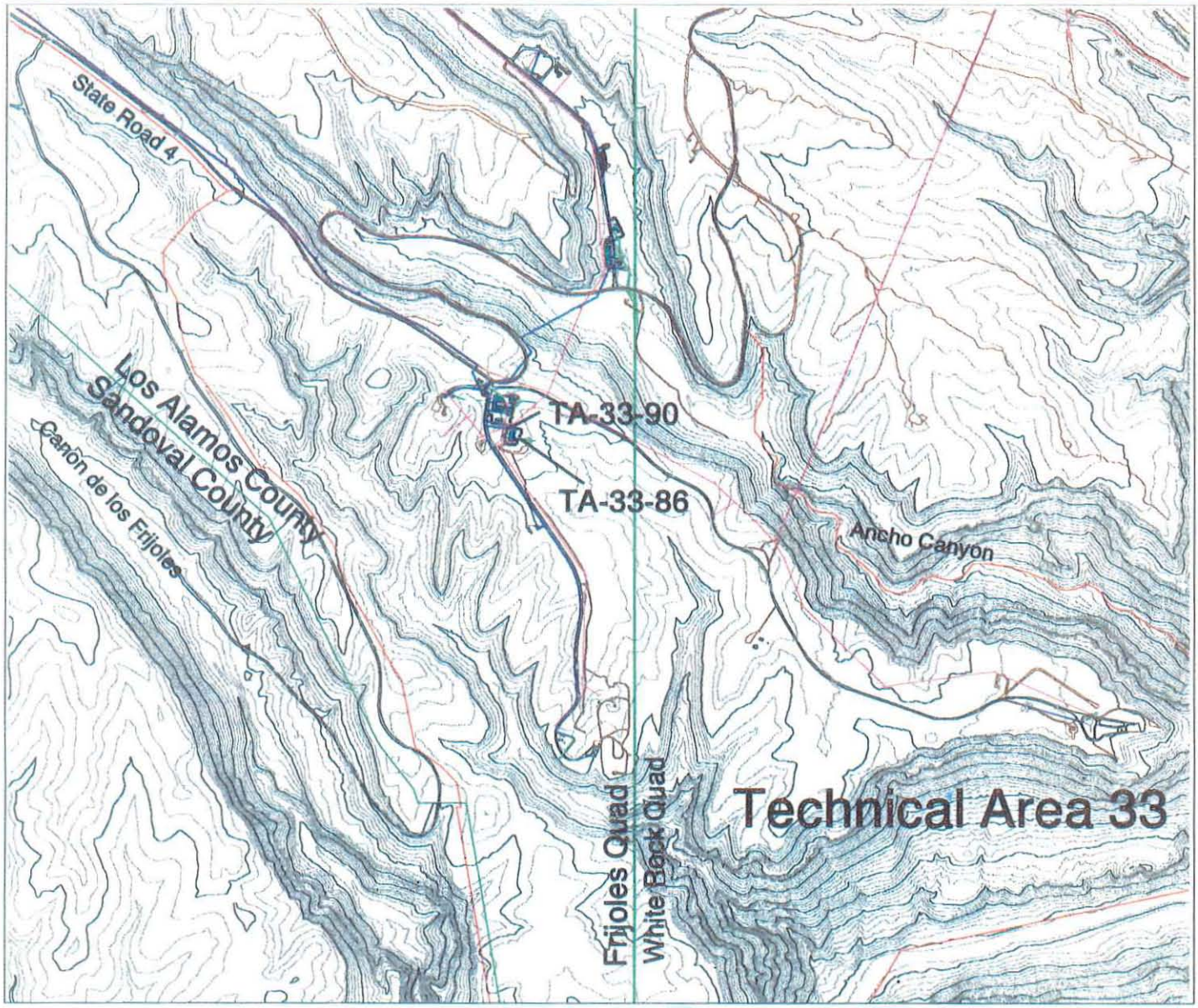
1991 Early S-site Experiences. In *Manhattan District History: Nonscientific Aspects of Los Alamos Project Y, 1942 through 1946.* Written by Edith C. Truslow, edited by Kasha V. Thayer. Los Alamos Historical Society, Los Alamos, New Mexico.

Ziemer, Paul L.

1991 "National Environmental Policy Act (NEPA) Determination for the Deactivation, Disassembly, and Decontamination of Building 86 at TA-33 at the Los Alamos National Laboratory (LANL)". Department of Energy Memorandum dated November 14, 1991, from Assistant Secretary, Environment, Safety and Health, (EH-25) to Richard A. Claytor, Assistant Secretary for Defense Programs, Washington D.C.

APPENDIX A

Maps



Los Alamos National Laboratory

Cultural Resources Team
ESH-20 Ecology Group

1:24000

500 0 500 1000 1500 Meters

1000 0 1000 2000 3000 4000 5000 6000 Feet

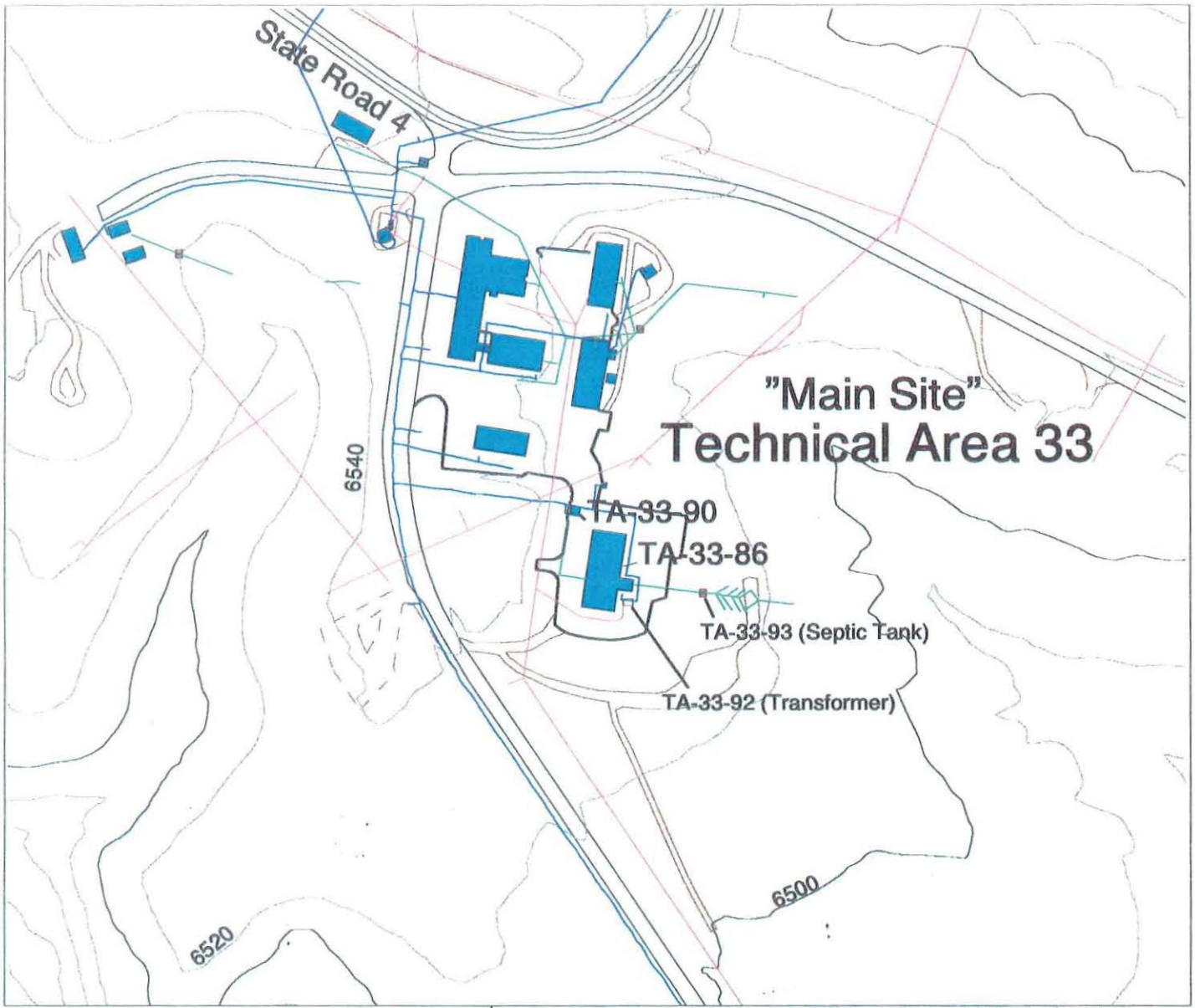
N
W E
S

- Boundaries - Technical Areas
- Township, Range, Section
- USGS 7.5 Minute Quadrangle
- Waterline
- Sewer
- Septic
- Elec/Hgh
- 20 Foot Contours
- 100 Foot Contours
- Roads - Paved
- Roads - Dirt
- Parking - Paved
- Parking - Dirt
- Structures - Perm Buildings

TA-33-6 Decontamination and Decomissioning

Public disclosure of archaeological site locations is prohibited by 36 CFR 296.18

Map 1



Frijoles 1984 7.5 Minute Quadrangle

Los Alamos
National Laboratory

Cultural Resources Team
ESH-20 Ecology Group

1:3000

50 0 50 100 Meters

200 0 200 400 Feet

Waterline
Sewer
Septic
Elechigh
20 Foot Contours
100 Foot Contours
Roads - Paved
Roads - Dirt
Parking - Paved
Parking - Dirt
Boundaries - Technical Areas

Building TA-33-86

Public disclosure of archaeological site locations is prohibited by 36 CFR 296.18

Map 2

APPENDIX B

Historic Building Inventory Forms

NEW MEXICO HISTORIC BUILDING INVENTORY FORM

LA#

building threatened? **Yes**	surveyed date **8/31/98** by **K. L. Manz**	County **Los Alamos**	ID no. **TA-33-86**

field map **LANL Orthotopo**	number **Sheet 18**	UTM reference: easting **386561** northing **3960331** zone **13**

location description **Technical Area (TA) 33, "Hot Point' (HP) site**	city/town **Los Alamos** land grant/reservation **n/a**

building name **TA-33-86, Original name: Gas Handling Facility, HP-86**	legal description **USGS Frijoles 7.5 Series** tnsp **18N** range **6E** sec **unplatted**

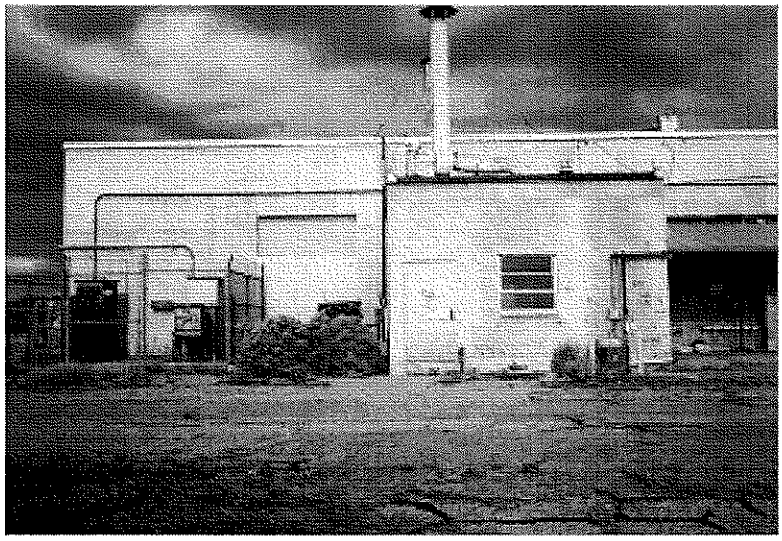
film roll by **ESH-20, LANL** nos. **511**	Negative nos. **15A, 20A, 21A, 22A, 23A, & 24A**	location of neg. **LANL, ESH-20**	date of construction _____ estimate **1954/1955** actual source **Facilities Engineering 9 (FE-9) records (LANL)**

Style **Reinforced concrete, industrial vernacular with slight concave roof (see below for more information)**	Foundation material **Concrete slab** Wall material/surface **Reinforced concrete**	use present residential ✔ other **abandoned** historic residential ✔ other **Gas Handling Facility**	Condition ___ excellent **X** fair to **X** good ___deteriorating

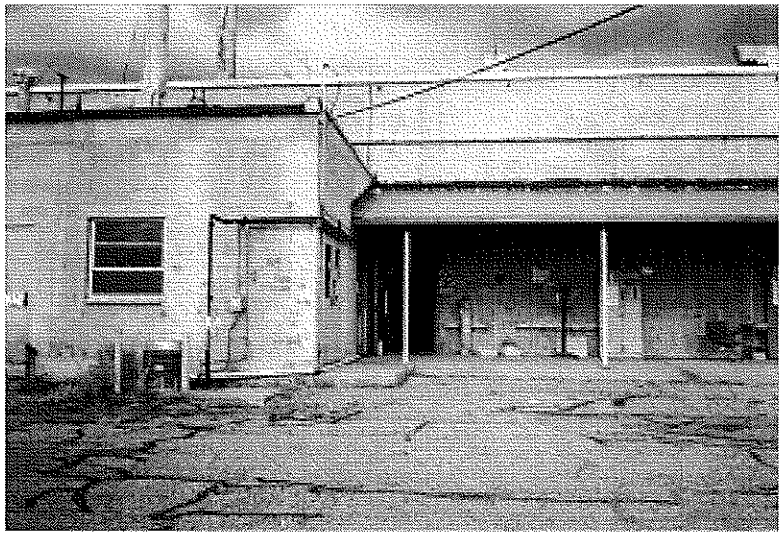
degree of remodeling **X** minor ___ moderate ___major describe: **A small cinder (pumice) block addition on east side of building added in 1958. A canopy of galvanized corrugated metal was added along east wall (northern portion) in 1963 to protect gas cylinders stored outside along the wall.**	Surroundings **Developed Laboratory Technical Area**	relationship to surroundings ___similar **X** not similar	district potential ___ yes **X** no

Significance _X_eligible ____of interest ____none if not eligible, why? **Building 33-86 is not exceptionally significant, in its architectural style. Many other "laboratory" buildings where testing and research has and is occurring are also built with reinforced concrete and have similar roofs. However, the building is significant for its contribution to important events at LANL during the Cold War (i.e. LANLs role in the research and development on tritium handling technology that supported the Savannah River Plant tritium production activity). This building for a short period of time processed tritium gas, repackaging tritium gas into small-volume, high-pressure vessels which were used in weapons systems and devices tested at Nevada Test Site. Building TA-33-86 is eligible under Criterion "A", criteria consideration "G", since it is associated with the research and development of the hydrogen bomb.**	Associated buildings? _X_ yes What type? **TA-33-90, second security check location for admittance to the Gas Handling Facility (TA-33-86).** if inventoried, list ID nos. **TA-33-90 also built during 1954/1955.**	Photos and plan drawings are on following pages **ENG-C 3316 Floor Plan - 1954** **ENG-C 3317 Elevations – 1954** **ENG-C 21363 New Addition – 1958** **ENG-R 3035 Floor Plan – 1982** **ENG-C 3316 Floor Plan - (modified 1998 showing the 1958 building addition)** **ENG-C 3317 Elevations – (modified 1998 showing the 1958 building addition)** size: **~6794 ft² (ground floor)** **391.5 ft² (penthouse)** **~7185.5 ft² (TOTAL)**

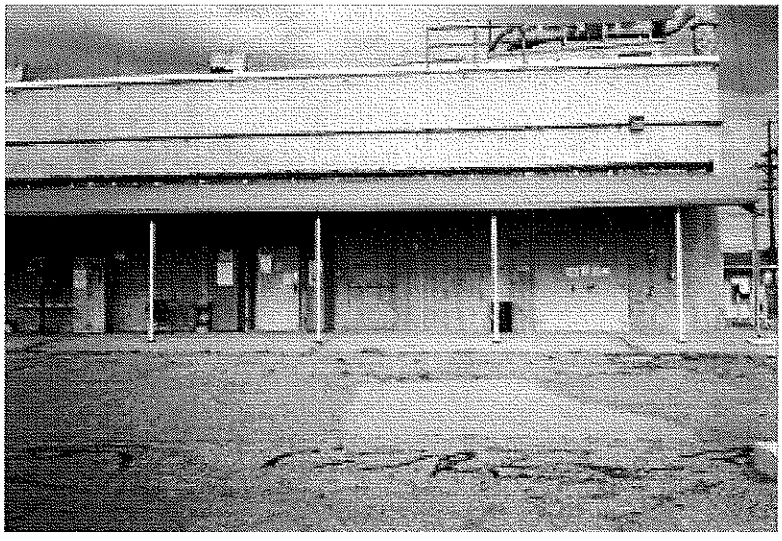
Architectural features	Comments
Building 33-86 is basically a rectangular, reinforced concrete structure with a small equipment room extending to the east from approximately the center of the east side of the building. Reinforced concrete, or hardened concrete is "poured", has an inner frame of rebar and is supported differently than regular concrete. The roof of the building is slightly concave for drainage. It is constructed of tarpaper, tar, and gravel and has metal edging "flashing" along all sides. The building has 18 rooms which includes several equipment rooms, a janitors closet, and restrooms. **On the east side of the building, at the northern end there are two inner metal pedestrian doors with exterior steel, safe/vault, combination lock, pedestrian doors for extra security. Towards the center of the east side there is also another metal pedestrian door. On the south end there is a translucent, 90-paned "glass-brick" window.** **A canopy of galvanized corrugated metal was added along the east wall of the building in 1963 to protect small gas cylinders stored along the wall.** **The utility equipment room extends east from the east side of the building. The north side of this extension has a double metal pedestrian door. A small cinder (pumice) block addition, was constructed on the east side of the utility equipment room in 1958. There is a set of double metal pedestrian doors with single–paned windows on the north side of the addition. On the east side of the addition there is a single metal pedestrian door and a three-paned, metal frame window.** **The north side of the building has one metal pedestrian door and a translucent, 144-paned "glass-brick" window. The exhaust stack for the building is located several feet to the north of the north wall.** **On the west side of the building at the north end there are three translucent, 120-paned "glass-brick" windows. There is one translucent, 144-paned "glass-brick" window towards the south end of the west side of the building. Additionally there are two metal roll-up garage type doors on the west side.** **On the south side of the building there is one metal roll-up garage type door and along the wall a metal loading dock with a low concrete barrier. This barrier enabled oxygen trucks to backup and connect with hoses to the valves on the barrier, which fed into the building. The walkway allowed an operator to control the valves on the back of the truck.** **There is a "penthouse" room on the roof of the north end of the building which houses additional utility equipment (pump motors for the buildings air stack).**	**Building was also designated as a fallout shelter.** **There is a fenced electrical transformer on the east side of the building. It is located to the south of the utility room extension and the small room addition.**



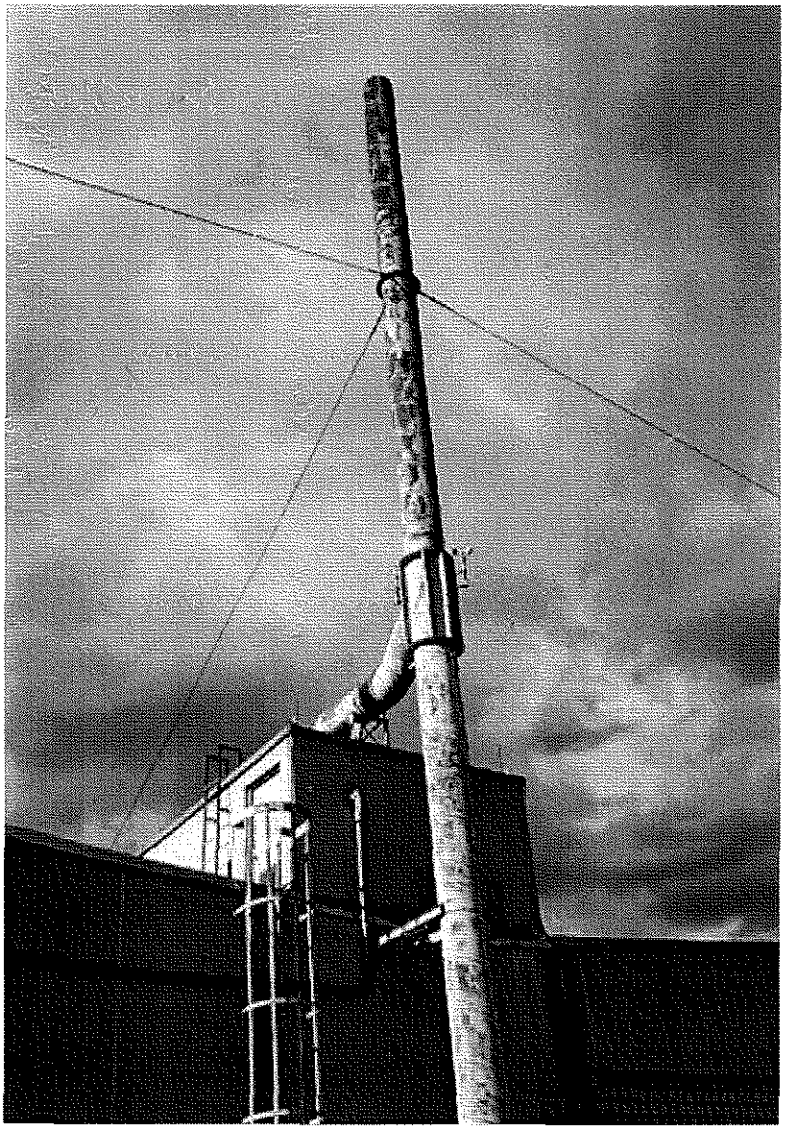
TA-33-86
East Side, South Portion



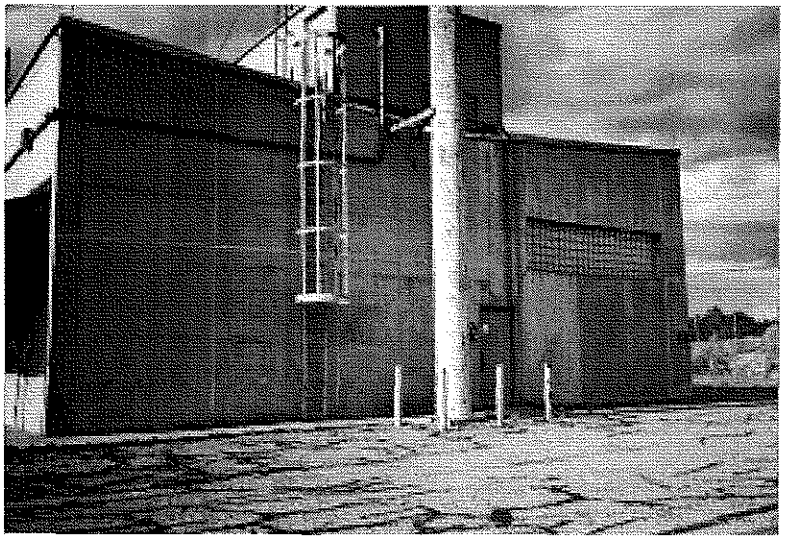
TA-33-86
East Side, Central Portion



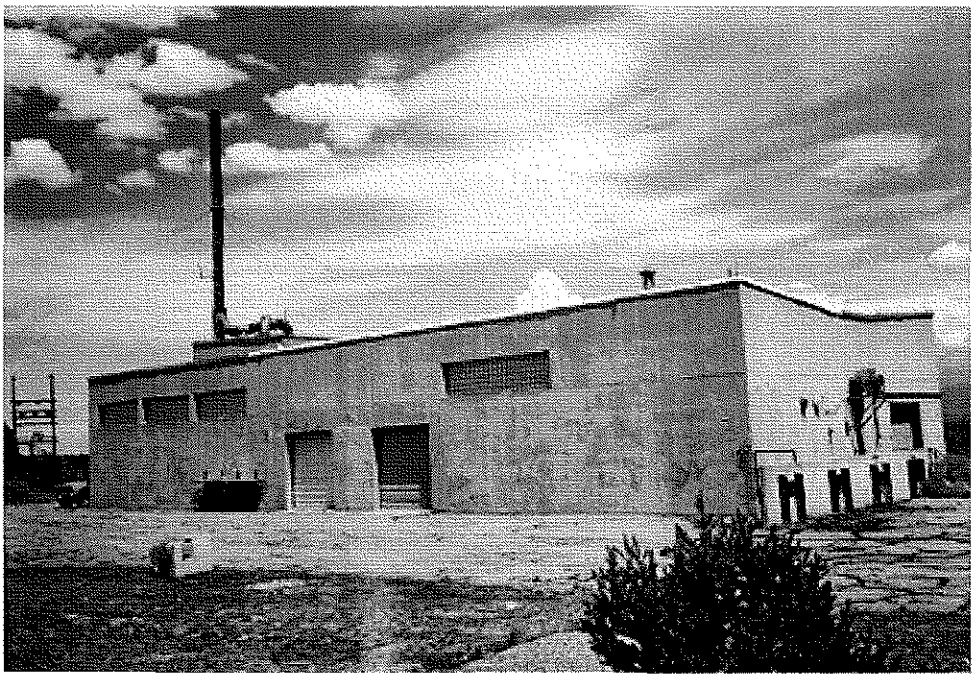
TA-33-86
East Side, North Portion



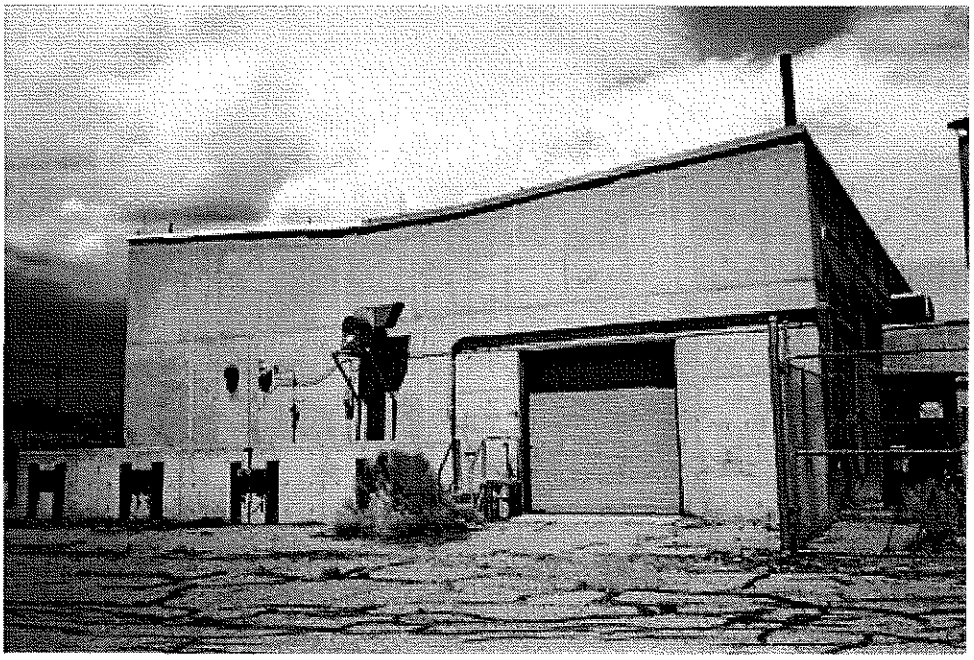
TA-33-86
North Side, Exhaust Stack



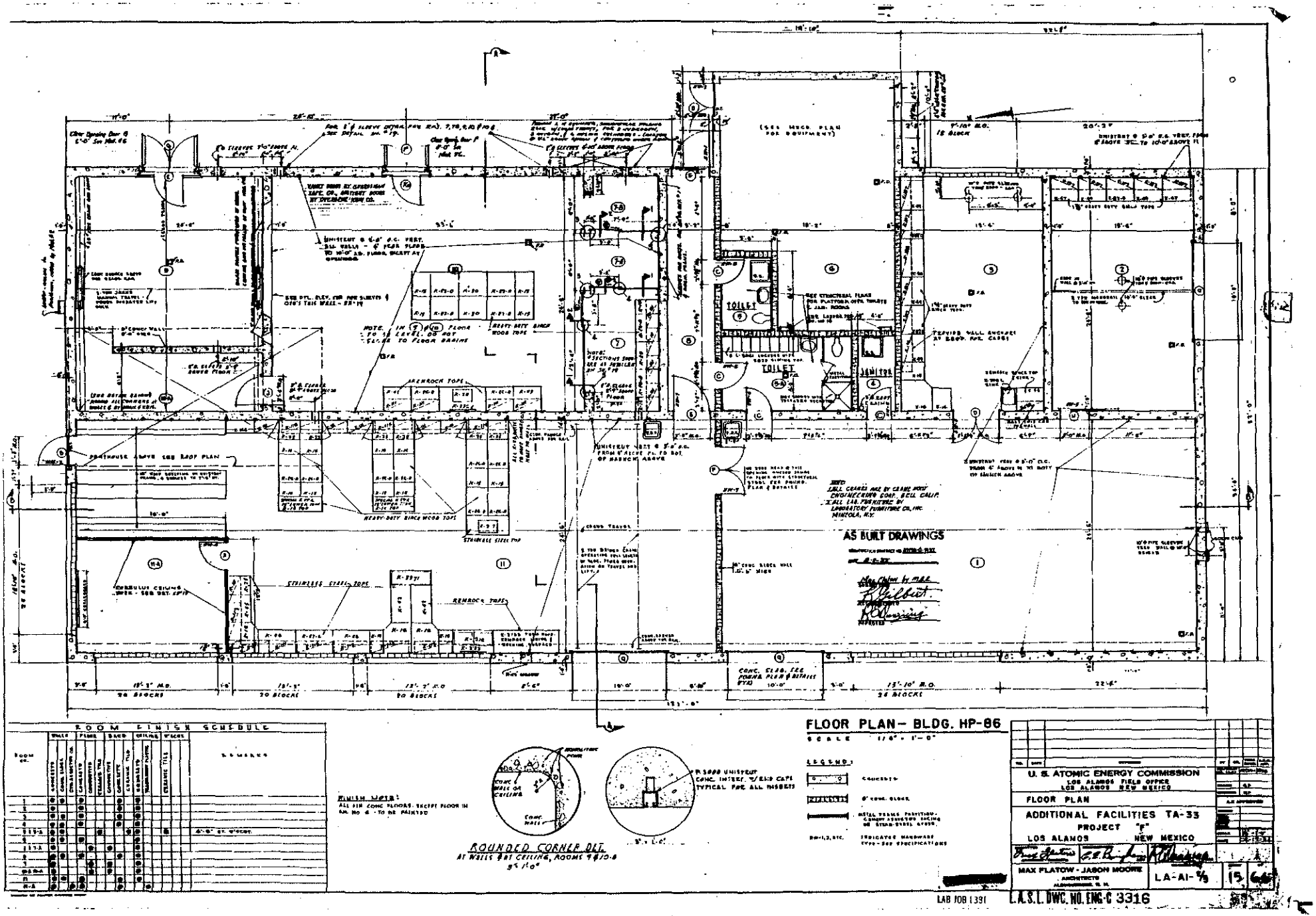
TA-33-86
North Side



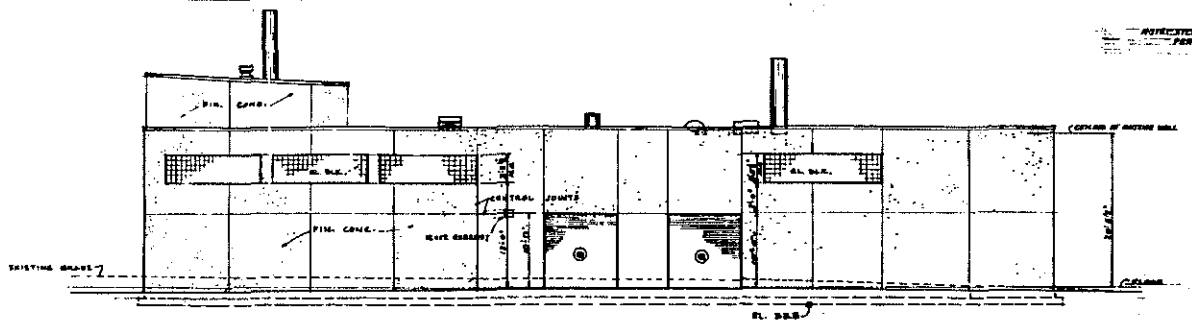
TA-33-86
West Side



TA-33-86
South Side

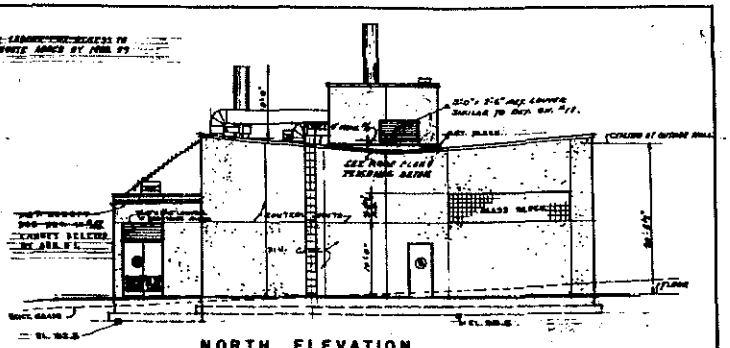


Building TA-33-86
LANL ENG-C 3316 (1954)
As Built Floor Plan



WEST ELEVATION

SCALE 1/8" = 1'-0"



NORTH ELEVATION

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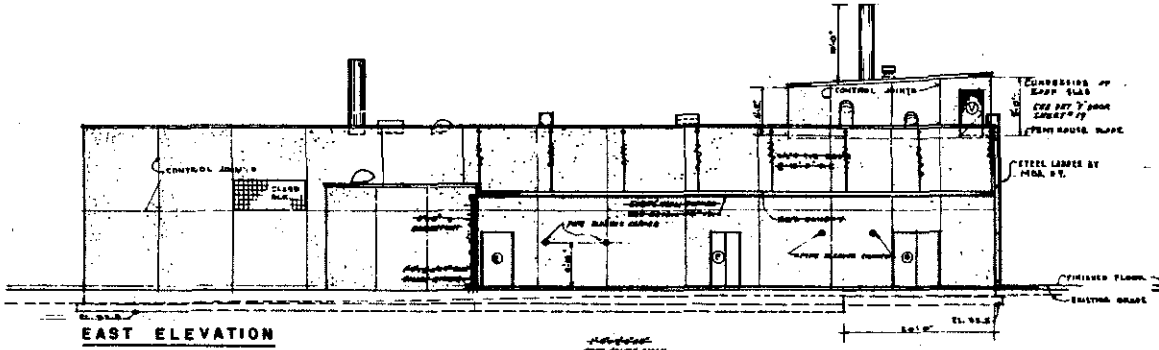

EAST ELEVATION

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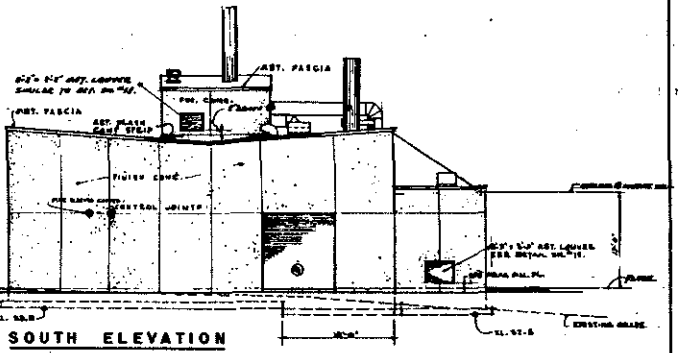

SOUTH ELEVATION

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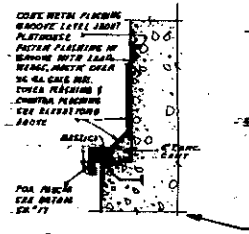
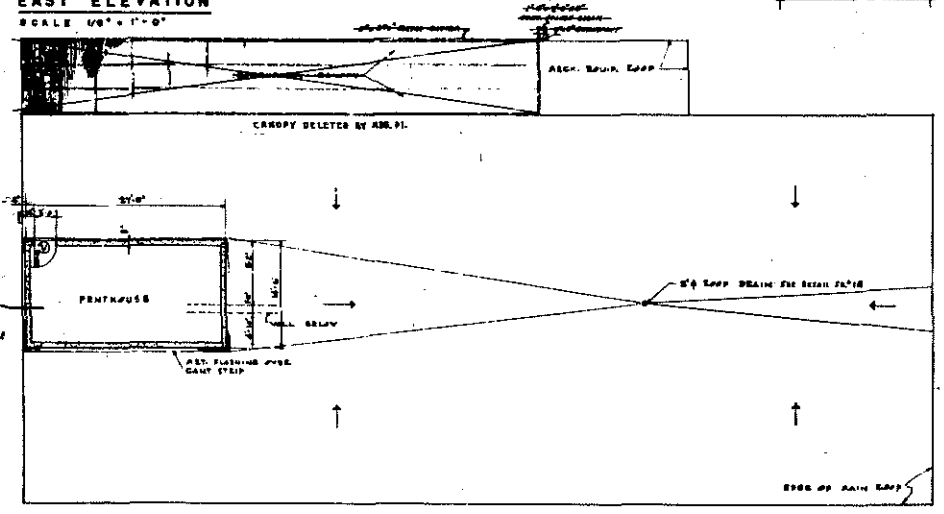


FLASHING DETAIL @ LOW POINT OF ROOF & PENTHOUSE

SCALE 1½" = 1'-0"



ROOF PLAN

SCALE 1/8" = 1'-0"

AS BUILT DRAWINGS

BLDG. HP-86

U. S. ATOMIC ENERGY COMMISSION
LOS ALAMOS FIELD OFFICE
LOS ALAMOS NEW MEXICO

ELEVATIONS & ROOF PLAN

ADDITIONAL FACILITIES TA-33
PROJECT "F"
LOS ALAMOS NEW MEXICO

MAX PLATOW - JASON MOORE
ARCHITECTS
ALBUQUERQUE, N. M.

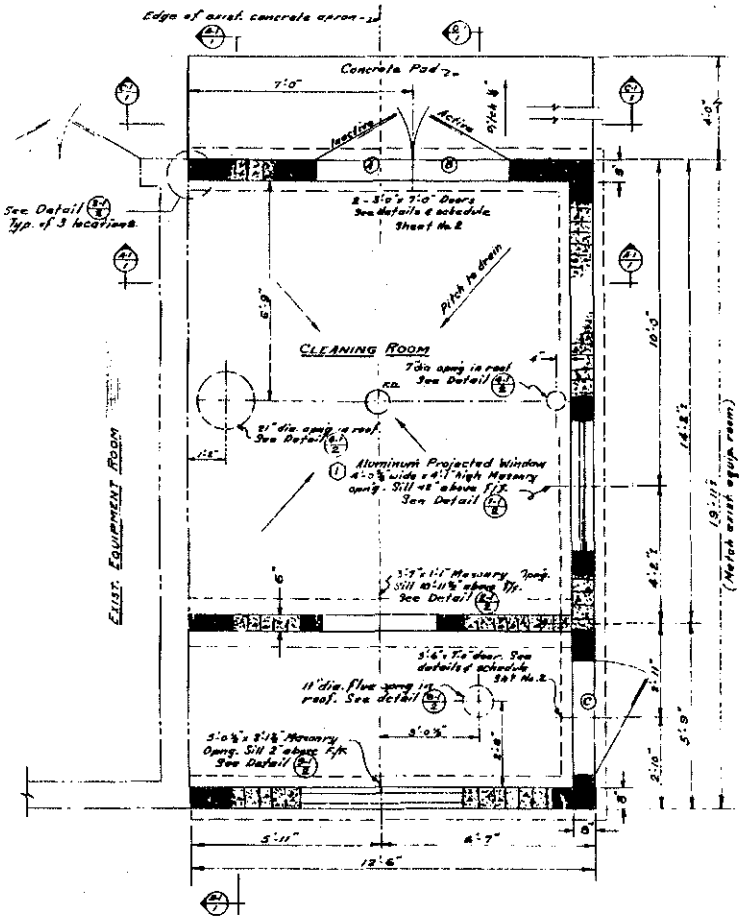
LA-AI-¾

16 | 66

LAB JOB 1381

L.A.S.L. DWG. NO. ENG-C 3317

Building TA-33-86
LANL ENG-C 3317 (1954)
As Built Elevations

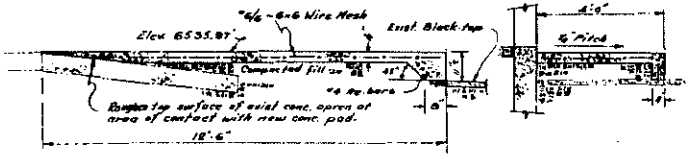


NEW ADDITION - FLOOR PLAN
Scale 1/4" = 1'-0"

LEGEND

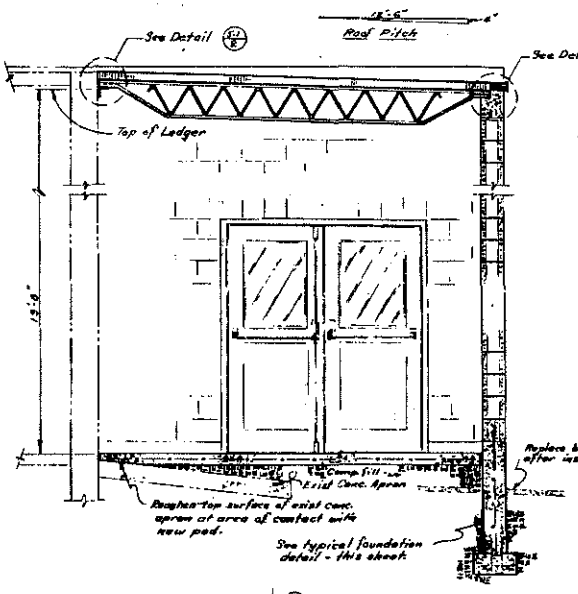
Pumice Block with concrete filled cores

Pumice Block with pumice filled cores.



SECTION
Scale 1/4" = 1'-0"

SECTION



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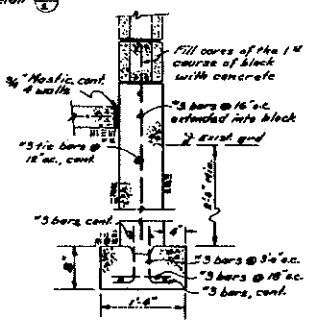
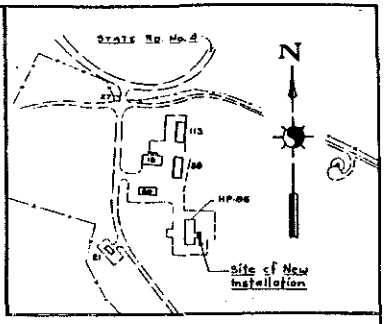
Scale 1/4" = 1'-0"

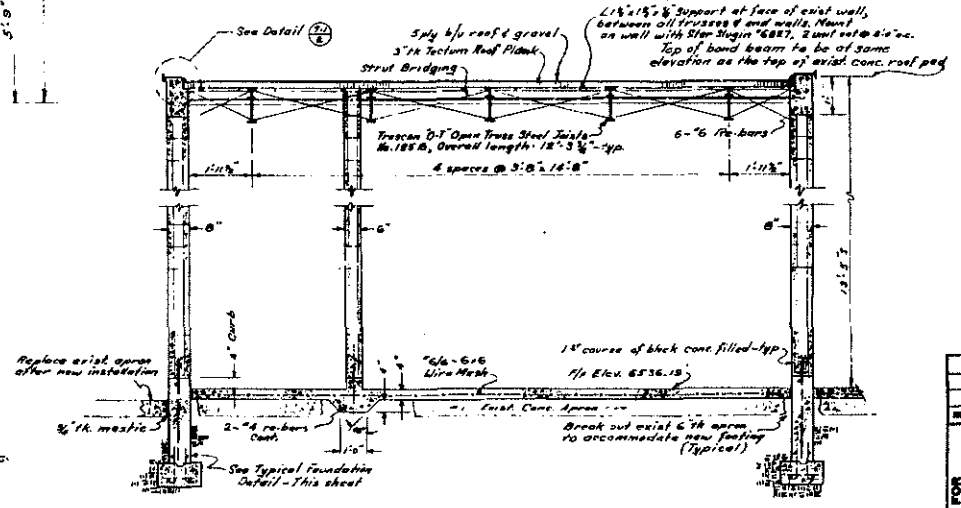


TYPICAL FOUNDATION DETAIL
Scale 1" = 1'-0"



LOCATION PLAN
BLDG HP-86 TA-33

Building TA-33-86
LANL ENG-C 21363 (1958)
Addition - Floor Plan



SECTION
Scale 1/2" = 1'-0"

STRUCTURAL ENGINEER
STRUCTURAL CONSULTANTS
7-9515

NO.	DATE	REVISIONS	BY	CHKD

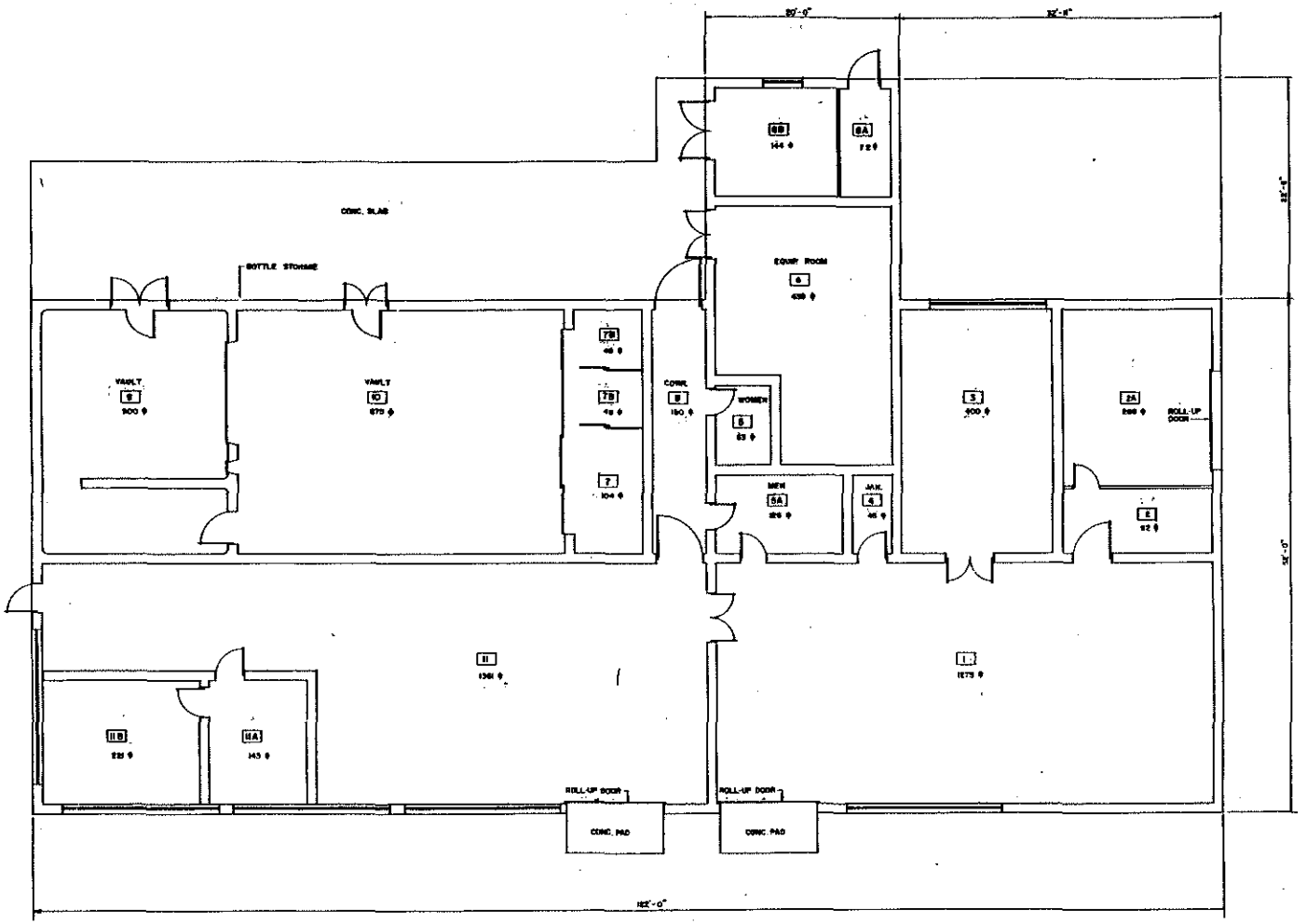
AUTHORIZED FOR
HEALTH
SAFETY
FIRE PROT.
ENG.
MECH.
ELEC.
H.S. Ward
W.S. Wood

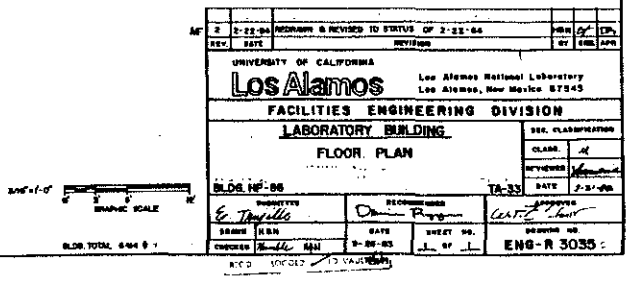
LOS ALAMOS SCIENTIFIC LABORATORY
ENGINEERING DEPARTMENT
UNIVERSITY OF CALIFORNIA — LOS ALAMOS, NEW MEXICO

GAS HANDLING FACILITY IMPROVEMENTS
ARCHITECTURAL PLAN
SECTIONS & GENERAL NOTES
BLDG HP-86 TA-33

CHECKED		APPROVED	
GROUP LEADER		ENG. DEPT. OFFICE	
DRAWN	DATE	DRAWING NO.	
T.B. Johnson	FEB. 13, 1958	ENG-C 21363	
SCALE Noted	SHEET 1 OF 7		

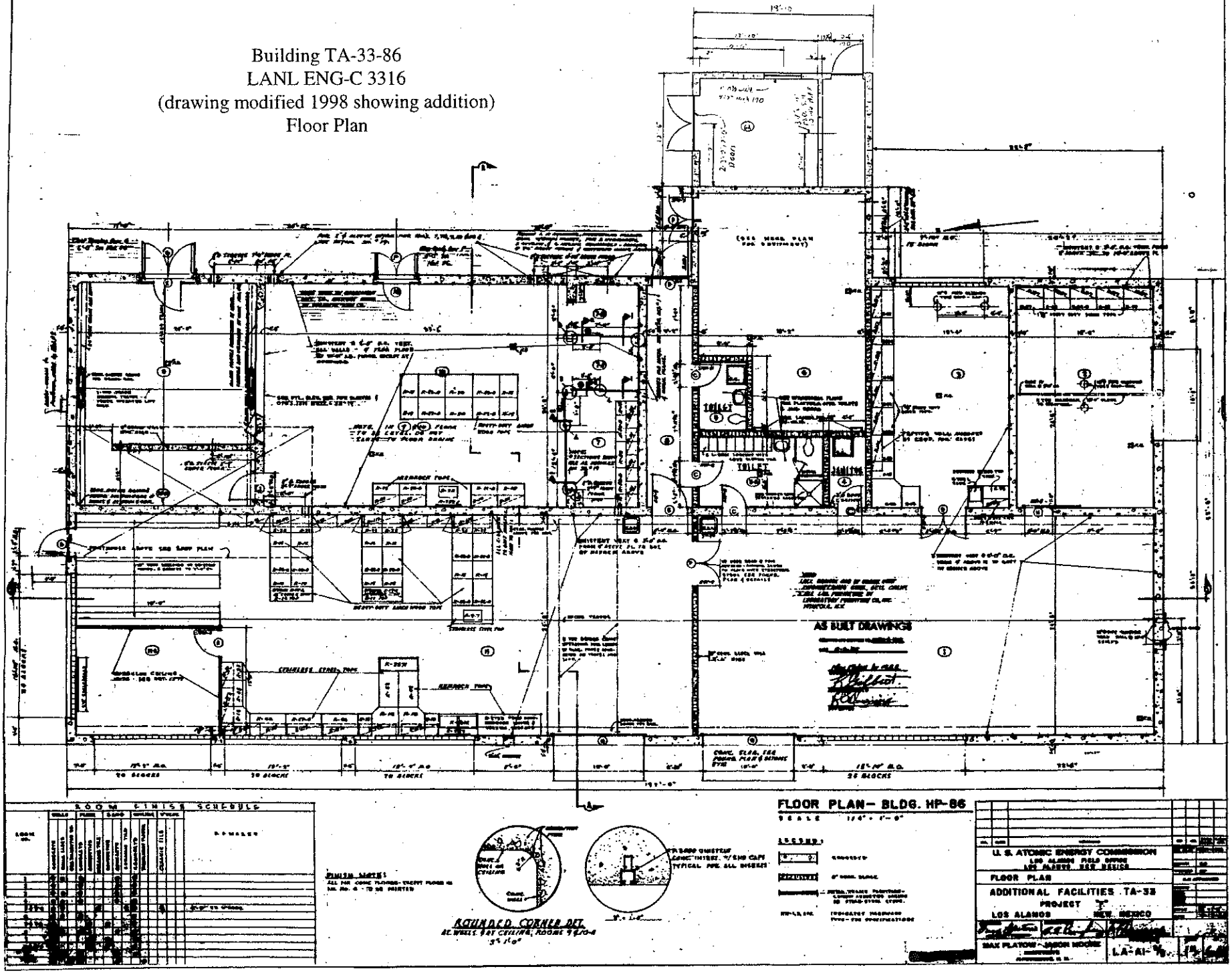
B. A. NO. _____ LAB. JOB NO. 1979

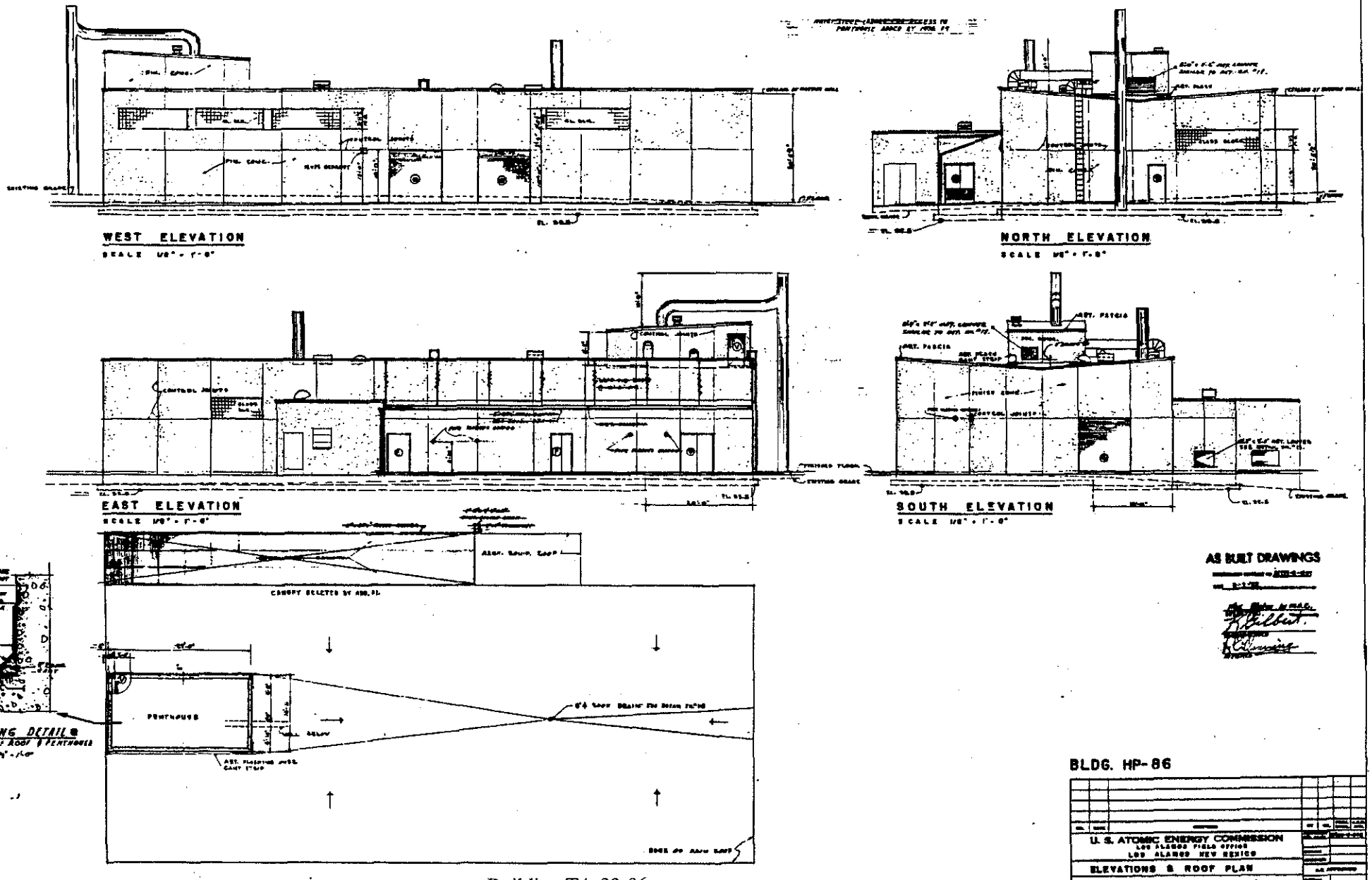




Building TA-33-86
LANL ENG-R 3033 (1982)
Floor Plan

Building TA-33-86
LANL ENG-C 3316
(drawing modified 1998 showing addition)
Floor Plan





Building TA-33-86
LANL ENG-C 3317
(drawing modified 1998 showing addition)
Elevations

NEW MEXICO HISTORIC BUILDING INVENTORY FORM

LA#

building threatened?	surveyed	County	ID no.
yes	date **8/19/98** by **K. L. Manz**	**Los Alamos**	**TA-33-90**

field map number	UTM reference:
LANL Orthotopo Sheet 18	easting **386546** northing **3960358** zone **13**

location description	city/town
Technical Area (TA) 33, "Hot Point" (HP) site	**Los Alamos** land grant/reservation **n/a**

building name	legal description **USGS Frijoles 7.5 Series**
TA-33-90, Original name HP-90	tnsp **18N** range **6E** sec **unplatted**

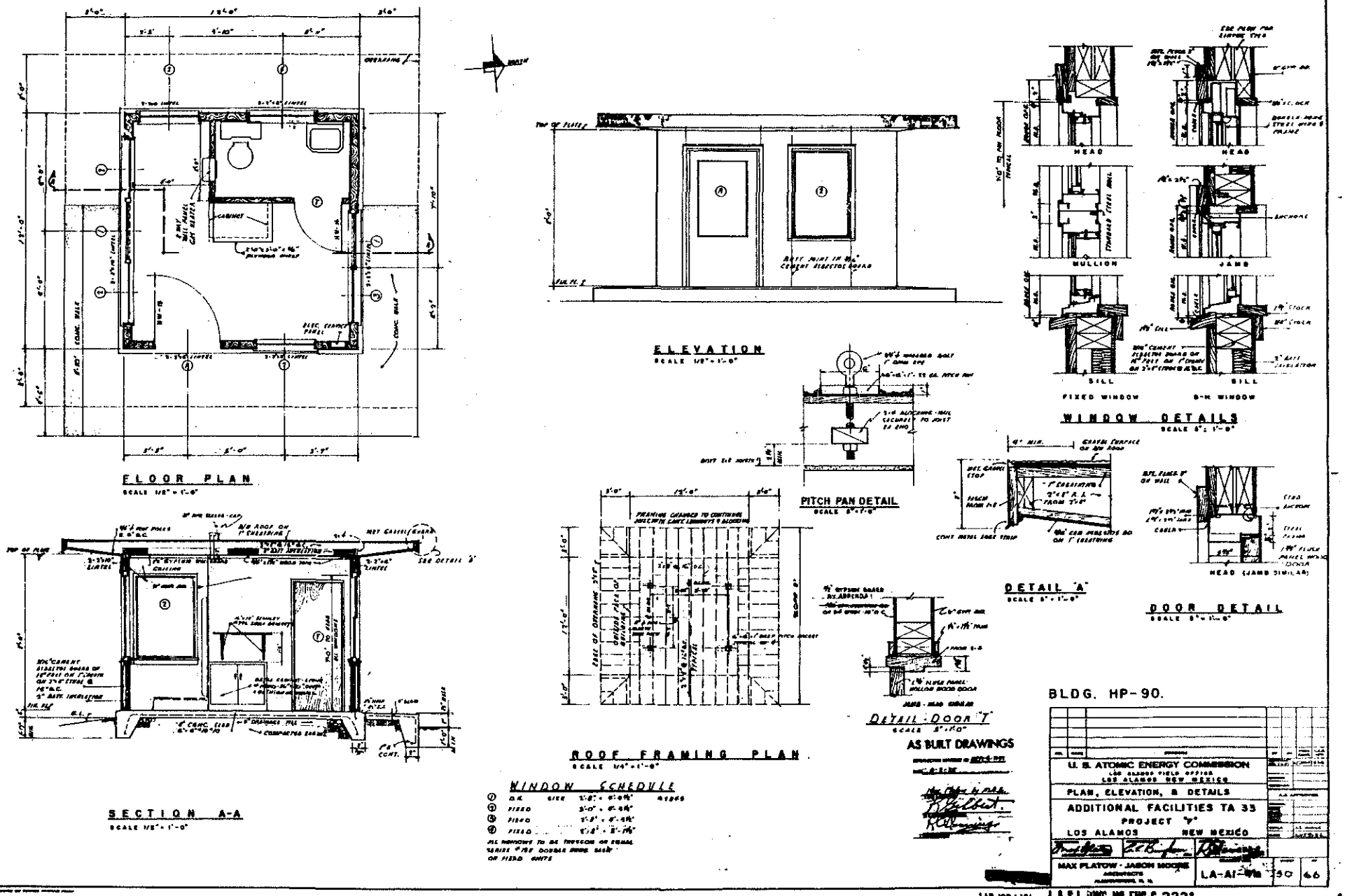
film roll	Negative nos.	location of neg.	date of construction
by **ESH-20, LANL** nos. **511**	**16A, 17A, 18A, and 19A**	**LANL, ESH-20**	_____ estimate **1945/1955** actual source **Facilities Engineering 9 (FE-9) records (LANL)**

Style	Foundation material	use	Condition
wood frame with flat roof (see below for more information)	**concrete slab** wall material/surface **wood**	present residential ✔ other **abandoned** historic residential ✔ other **guard house**	___ excellent **X** fair to **X** good ___ deteriorating

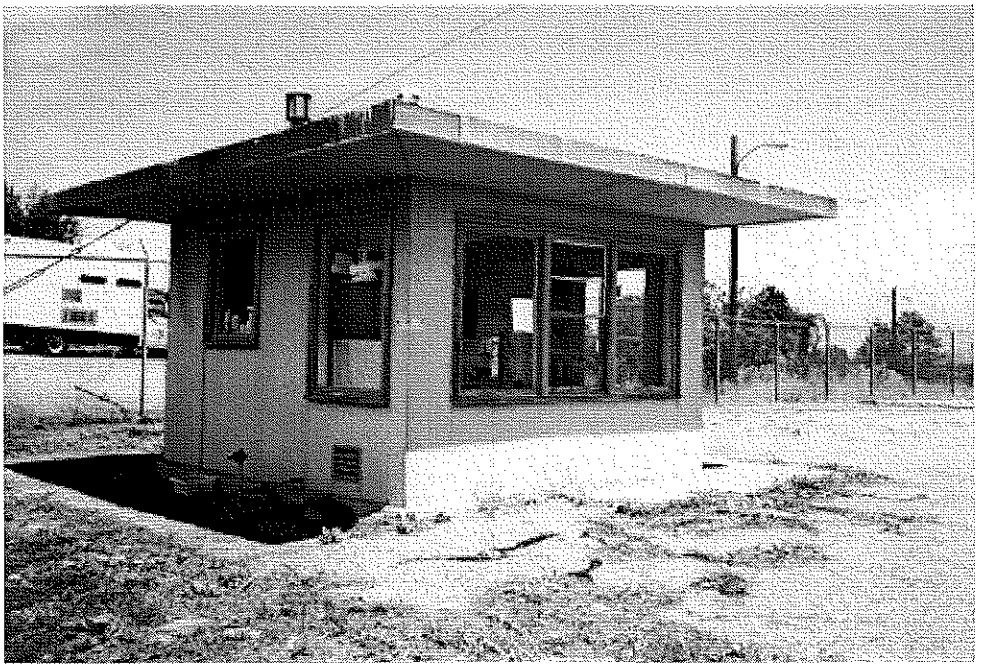
degree of remodeling	Surroundings	relationship to surroundings	district potential
___ minor ___ moderate ___major describe:	**Developed** **Laboratory** **Technical Area**	___similar **X** not similar	___yes **X** no

Significance	Associated buildings? **X** yes	Photos and plan drawings are on following pages
X eligible ____of interest ___ none if not eligible, why? **Building 33-90 is not exceptionally significant, for its architectural style. It is the same style as the guard house (TA-33-27) at the entrance to TA-33, which is like other guardhouses throughout the Laboratory. Its importance is in that it is associated with the Gas Handling Facility, TA-33-86. It served as support facility, a second security check location for admittance to the Gas Handling Facility.**	What type? **TA-33-86, the Gas Handling Facility** if inventoried, list ID nos. **TA-33-86 also built during 1954/1955**	**ENG-C 3331 plan, elevation, & details 1954** **No other plans or drawings are available.** size: **144 ft²**

architectural features	Comments
Building 33-90 is a small square, wood frame structure with a flat roof and a concrete foundation. The wood frame is covered with "Transite", a non-friable asbestos siding. The roof of the building extends (overhangs) the building by approximately 2-2 1/2 feet. It is constructed of tarpaper, tar, and, gravel and has a metal "flashing" edging along all sides. The 12 by 12 foot building has two rooms, the main room plus a small restroom. **On the east side of the building there is a wooden pedestrian door with a large window. There is also a fixed 3' by 4'5½" single-paned window.** **All windows in the building have wood and metal frames.** **The north side of the building has two side-by-side windows. One is a fixed 2'8" by 4'5½" single-paned window and the other is a double-hung sash window 2'8" by 4'5½" with four panes.** **The west side of the building has two single-paned fixed windows. One is 3' by 4'5½" and the other is 2'8" by 3'½".** **On the south side there are three side-by-side windows. The center window is a double-hung sash window, 2'8" by 4'5½". The two "outside" windows are 3' by 4'5½", single-paned and fixed.**	



Building TA-33-90
LANL ENG-C 3331 (1954)
As Built Floor Plan and Elevations



TA-33-90
West and South Sides

TA-33-90
East and North Sides

TA-33-90
East and North Sides

APPENDIX C

Photographs of Structures TA-33-92 and TA-33-93

TA-33-93
Sanitary Sewer Septic Tank

TA-33-92
Transformer