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# Replacement of Clerestory Windows at TA-03-0039 Technical Shops Building

## Los Alamos National Laboratory

Historical Facilities Survey Report No. 426

Survey No. 1245

NMCRIS Activity No. 156084

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# CONTENTS



## Figures

# EXECUTIVE SUMMARY

The U.S. Department of Energy, National Nuclear Security Administration, Los Alamos Field Office (Field Office) proposes an undertaking to replace 86 clerestory windows in Building 39 in Technical Area 3 (Technical Shops Building; TA-03-0039) at Los Alamos National Laboratory. TA-03-0039 was evaluated and determined eligible for listing in the National Register of Historic Places in a report titled *ESA Division's Five-Year Plan: Consolidation and Revitalization at Technical Areas 3, 8, 11, and 16*. This determination was concurred on by the State Historic Preservation Office on June 22, 2003 (McGehee et al. 2003).

The Technical Shops Building was constructed in 1953 to support the expansion of the Los Alamos Scientific Laboratory's early Cold War–era nuclear testing activities, including operations at the Nevada Test Site. The *E*-shaped building features multiple raised clerestories designed to provide ample daylighting for routine industrial operations in the facility's high bays. The single-pane windows in these clerestories are original to the building's construction. Because of their single-pane construction, the windows provide inadequate thermal efficiency. Routine use of the windows over the past 70 years has damaged many of the panes and frames to the point where they no longer sufficiently protect the building envelope from inclement weather or extreme wind events. Additionally, modern security features installed on the exterior of the windows impact their historic appearance (McGehee et al. 2003:39).

In compliance with the National Historic Preservation Act of 1966, as amended, and the *Programmatic Agreement among the U.S. Department of Energy, National Nuclear Security Administration, Los Alamos Field Office, the New Mexico State Historic Preservation Office, and the Advisory Council on Historic Preservation Concerning Management of the Historic Properties at Los Alamos National Laboratory, Los Alamos, New Mexico*, the Field Office is initiating consultation on the proposed undertaking to replace 86 clerestory windows at TA-03-0039. The Field Office is requesting concurrence with the determination of no adverse effect for this undertaking.

# ACKNOWLEDGMENTS

The authors gratefully acknowledge the assistance of National Security Research Center research librarian Amanda DeGiorgis in identifying and retrieving primary source documents essential to developing the history of the Technical Shops Building. For their technical insights into the design of the window replacement project, the authors offer respectful thanks to Engineering Services project engineer Jonathan Fischer and architect Cory Collins. And last, but not least, we thank Jeff Hyde and Daniel McDonald of E-3 Modern Manufacturing Methodologies for performing drone photography to capture current conditions. Their combined support has been instrumental in the development of this document.

# ACRONYMS, ABBREVIATIONS, AND TERMS

| Acronym, Abbreviation, or Term | Definition |
|---|---|
| AEC | Atomic Energy Commission |
| BCE | before the Common Era |
| CE | Common Era |
| DOE | U.S. Department of Energy |
| ERDA | Energy Research and Development Administration |
| Laboratory | Los Alamos Laboratory, Los Alamos Scientific Laboratory, or Los Alamos National Laboratory |
| LANL | Los Alamos National Laboratory |
| LANS | Los Alamos National Security, LLC |
| LANSCE | Los Alamos Neutron Science Center |
| LASL | Los Alamos Scientific Laboratory |
| NA-LA | (U.S. Department of Energy) National Nuclear Security Administration, Los Alamos Field Office |
| NASA | National Aeronautics and Space Administration |
| National Register | National Register of Historic Places |
| NMCRIS | New Mexico Cultural Resources Information System |
| NNSA | National Nuclear Security Administration |
| NNSS | Nevada National Security Site |
| NTS | Nevada Test Site |
| TA | Technical Area |
| Triad | Triad National Security, LLC |
| U.S. | United States |
| WIPP | Waste Isolation Pilot Plant |

# CHAPTER 1: INTRODUCTION

## Project Description

The U.S. Department of Energy (DOE), National Nuclear Security Administration (NNSA), Los Alamos Field Office (Field Office or NA-LA) proposes an undertaking to replace 86 clerestory windows in Building 39 in Technical Area 3 (Technical Shops Building; TA-03-0039) at Los Alamos National Laboratory (LANL). Building TA-03-0039 was evaluated and determined eligible for listing in the National Register of Historic Places (National Register) in a report titled *ESA Division's Five-Year Plan: Consolidation and Revitalization at Technical Areas 3, 8, 11, and 16*. This determination was concurred on by the State Historic Preservation Office on June 22, 2003 (McGehee et al. 2003).

The TA-03-0039 Technical Shops Building is approximately 138,000 square feet and is located in the center of TA-03 in the northwest part of LANL atop a mesa (unofficially called South Mesa) in the projected northeast quarter of Section 21, Township 19 North, bisecting Ranges 17 and 20 East, on the Frijoles, New Mexico, 1:24,000 quadrangle map (Figure 1-1 through Figure 1-3; Appendix A). Laboratory development of TA-03 dates to the 1950s, and the area has served as the administrative center of the Laboratory since the early Cold War.

The Technical Shops Building was constructed in 1953 to support the expansion of the Los Alamos Scientific Laboratory's (LASL's) early Cold War–era nuclear testing activities, including operations at the Nevada Test Site.[1] The *E*-shaped building features multiple raised clerestories designed to provide ample daylighting for routine industrial operations in the facility's high bays. The single-pane windows in these clerestories are original to the building's construction. Because of their single-pane construction, the windows provide inadequate thermal efficiency. Routine use of the windows over the past 70 years has damaged many of the panes and frames to the point where they no longer sufficiently protect the building envelope from inclement weather or extreme wind events. Additionally, modern security features installed on the exterior of the windows impact their historic appearance (McGehee et al. 2003:39).

LANL cultural resources managers Elliot Schultz and Cameron Townsend worked closely with the project team to reach appropriate solutions for the window replacement project, as described in this report.

[1] During the Manhattan Project, Los Alamos was operated by the Manhattan Engineer District as Project Y. When the Laboratory became part of the Atomic Energy Commission in 1947, it gained the name Los Alamos Scientific Laboratory. The name was subsequently changed to Los Alamos National Laboratory in 1981.

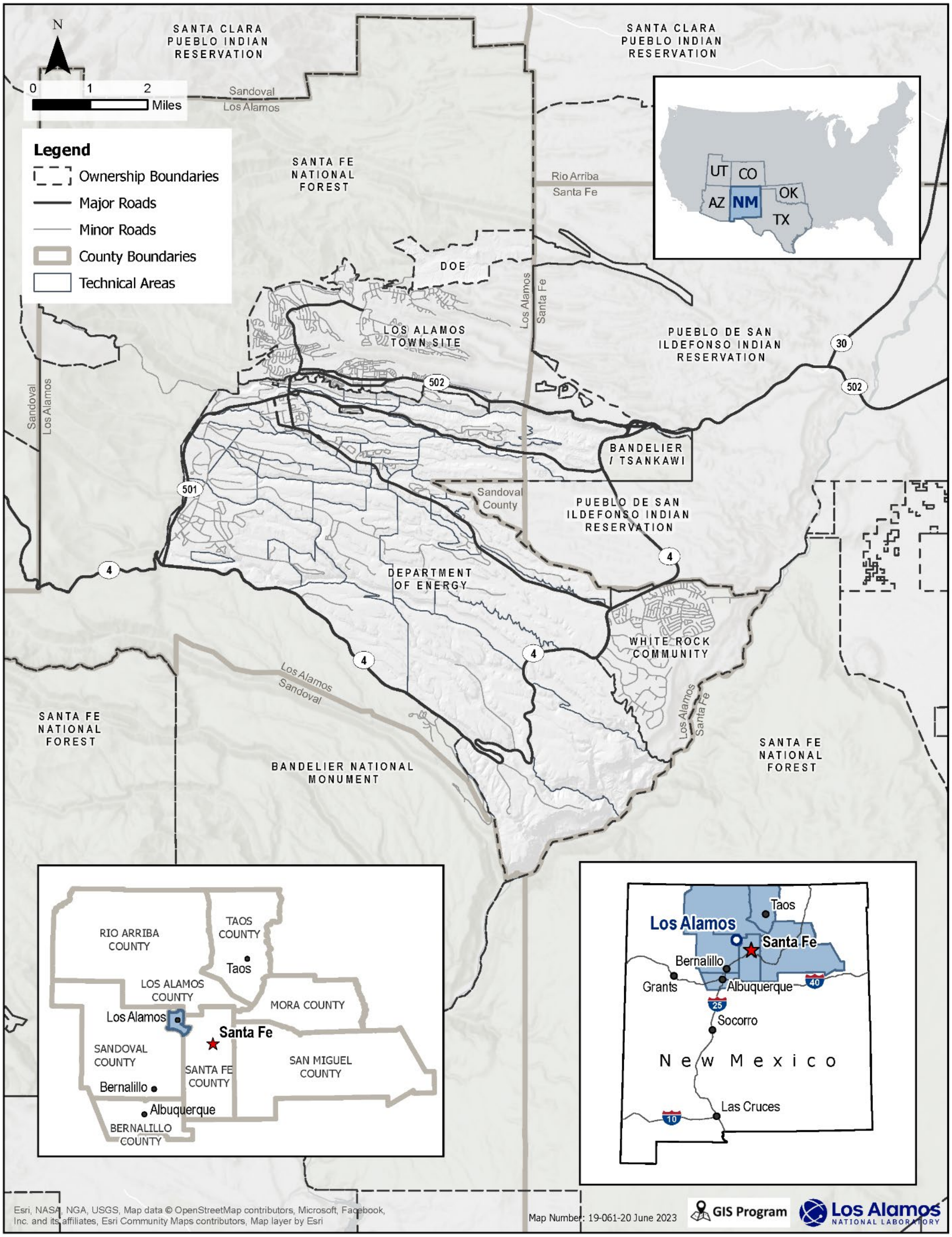


Figure 1-1. Location map of Los Alamos National Laboratory in context of the region, state, and Los Alamos County.

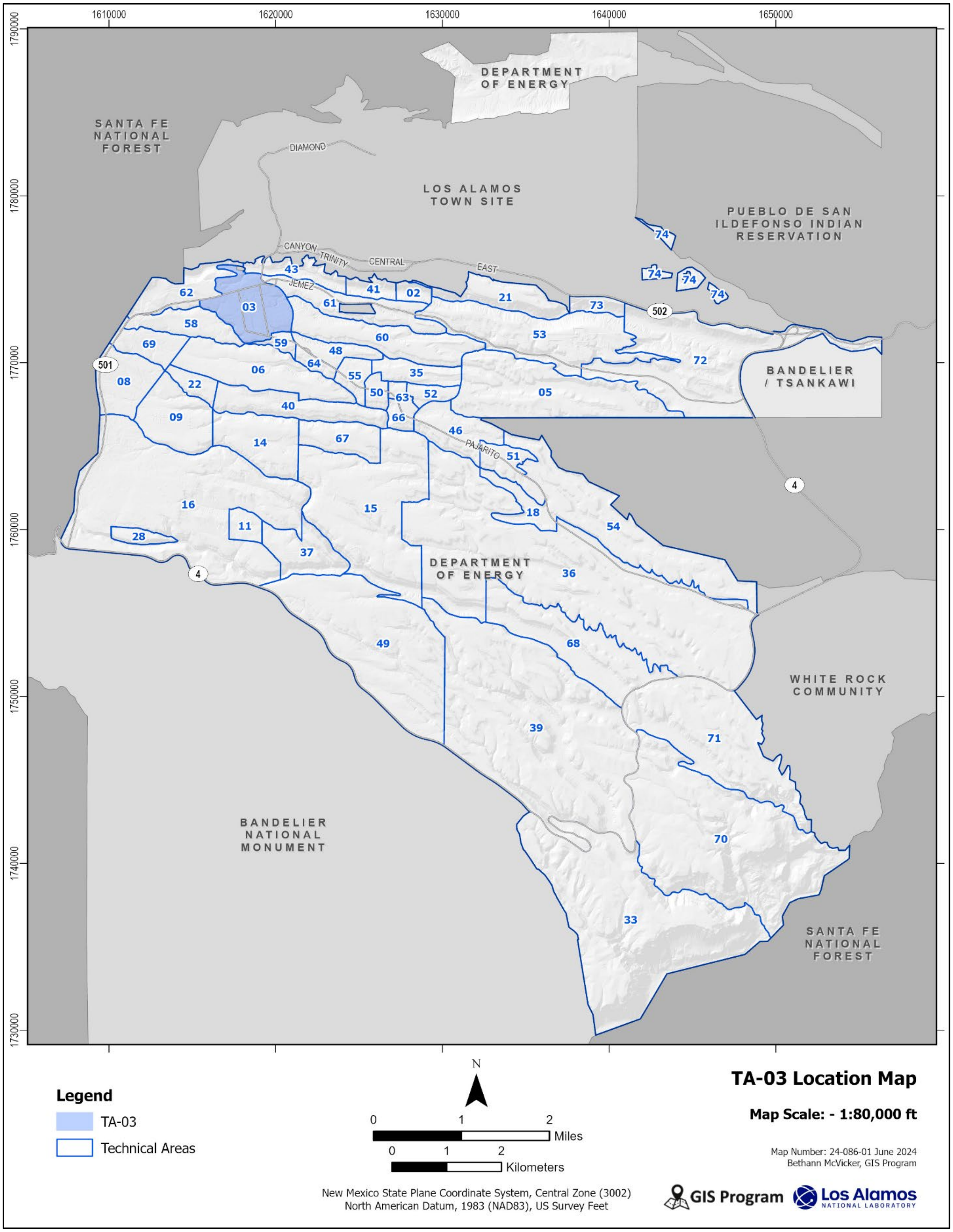


Figure 1-2. Technical Area 03 location map.

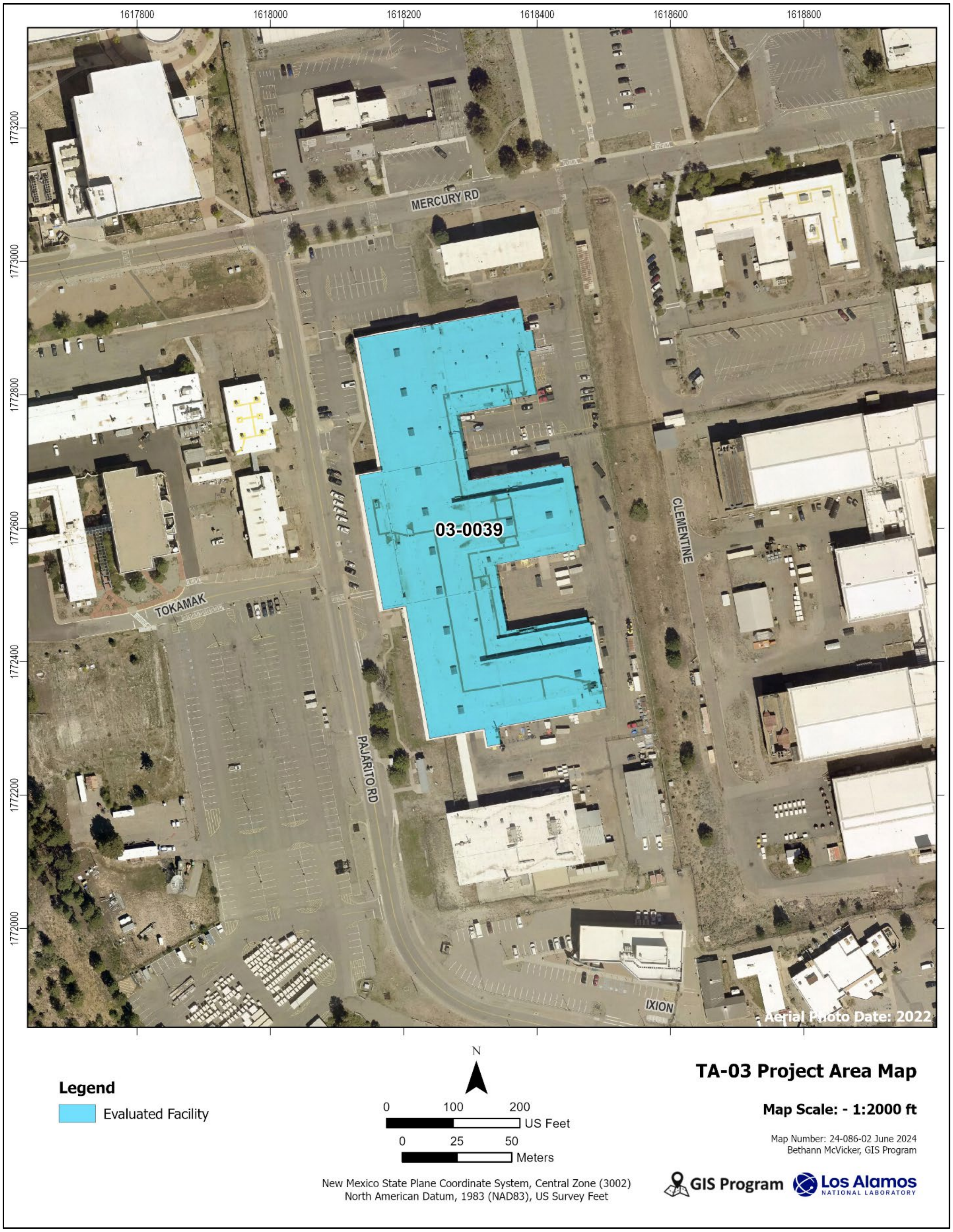


Figure 1-3. Project location map.

## Environmental and Cultural Setting

The Laboratory is located in north-central New Mexico on approximately 93 $km^2$ (36 $mi^2$) of land approximately 100 km (62 mi) northeast of Albuquerque and 40 km (25 mi) northwest of Santa Fe. The Laboratory is situated on the eastern flank of the Jemez Mountains along the Pajarito Plateau, which consists of a series of narrow mesas and deep canyons that trend east-southeast from the Jemez Mountains to the Rio Grande. Located at elevations ranging from 1,620 m (5,400 ft) to approximately 2,340 m (7,800 ft), the Laboratory includes several distinct environmental zones. The Bandelier National Monument, Santa Fe National Forest, Pueblo de San Ildefonso, and communities of White Rock and Los Alamos border the Laboratory.

Archaeological and ethnohistoric documentation of the Pajarito Plateau indicates a cultural record of more than 10,000 years. The cultural historical chronology comprises Paleoamerican (9500–5500 BCE) hunter-gatherers; Archaic (5500 BCE–600 CE) hunter-gatherer groups; Ancestral Pueblo (600–1600 CE) forager-farmers; and historical Pueblo, Hispanic, and Euro-American peoples (1600 CE–present). Formal homesteading on the Pajarito Plateau began in the late 1880s, with the first homestead application filed in 1887 (McGehee et al. 2006:132; Vierra and Hoagland 2000:3.1).[2]

[2] Homestead patents can be researched online through the Bureau of Land Management's website for General Land Office Records: https://glorecords.blm.gov/search/.

# CHAPTER 2: HISTORICAL CONTEXT

## Early Cold War Era (1947–1956)

The term *Cold War* was first used during a congressional debate by a presidential advisor. During the early part of this era, weapons research was a national priority. At the Laboratory, Edward Teller and Stanislaw Ulam spearheaded the effort and focused on the development of the hydrogen bomb. The simmering Cold War came to a full boil in late 1949 with the successful test of Joe I, the Soviet Union's first atomic bomb. In January 1950, President Truman ordered the Atomic Energy Commission (AEC) to develop the hydrogen bomb—a decision that led to the remobilization of the country's weapons laboratories and production plants. This year also marked the initial meeting of the Laboratory's "Family Committee," who was tasked with developing the first two thermonuclear devices in response to President Truman's directives (LANL 2002a; Machen et al. 2010:12).

In December 1950, President Truman approved of a continental test site in Nevada. Subsequently established as the Nevada Proving Ground (renamed Nevada Test Site [NTS] in 1955 and Nevada National Security Site [NNSS] in 2010) for nuclear testing, development of the site proceeded quickly. The detonation of the Able device on January 27, 1951, during Operation Ranger was the first atmospheric test conducted in the continental United States since the 1945 Trinity test. That same year, the Laboratory directed Operation Greenhouse in the Pacific and successfully conducted the first test of the thermonuclear principle with the George device. The Item device was the first detonation of a fission weapon boosted by a fusion reaction. In 1952, the United States detonated the first full-scale thermonuclear device (Mike) at Eniwetok (now spelled Enewetak) Atoll in the Pacific. The Soviet Union responded with a successful fusion demonstration in August 1953, followed by a test of a hydrogen bomb in 1955. Both signaled an acceleration in the arms race between the United States and the Soviet Union (Atomic Heritage Foundation 2023; DOE 2015; Fehner and Gosling 2006; LANL 2002a).

In 1955, the Laboratory began participating in a demonstration program to incorporate a nuclear-powered reactor into a rocket engine. Subsequently named Project Rover, the program would become a collaboration with the National Aeronautics and Space Administration (NASA) and continue until 1972. Although weapons research and development had always played a major role in the history of the Laboratory, other key themes for the years 1942 to 1956 included supercomputing advancements, fundamental biomedical and health physics research, high-explosives and reactor research and development, pioneering physics research, and the development of the field of high-speed photography. The early Cold War era at the Laboratory ended in 1956, a date that marked the completion of all basic nuclear weapons design. Later research focused on the engineering of nuclear weapons to fit specific delivery systems (Benegas 1995:29; Machen et al. 2010:13; McGehee and Garcia 1999:43–46).

## Late Cold War Era (1957–1990)

The beginning of the late Cold War–era marked the last year that the Laboratory was a closed facility; access controls into the Los Alamos townsite were removed in 1957. During this era, the Laboratory experienced a great diversification in scientific pursuits, even as staff continued to direct and support nuclear testing in the Pacific and in Nevada and testing for NASA's Project Rover. In 1956, the Laboratory successfully tested a new generation of high (plastic-bonded) explosives and began to make improvements to the primary stage of a nuclear weapon. Additionally, Laboratory scientists Frederick Reines (later Nobel Prize winner) and Clyde Cowan definitively detected the free neutrino, a subatomic particle. This discovery was critical to the development of the whole-body radiation counters pioneered at the Laboratory. In 1957, the Laboratory, along with the U.S. Department of Defense, conducted the first of many underground tests at NTS (present-day NNSS). The end of the decade saw another defense mission with the initiation of treaty and test ban verification programs (Benegas 1995:29–31; DOE 2015:2–3; LANL 2002a; Machen et al. 2010:13; McGehee and Garcia 1999:15–16).

In the 1960s, the Laboratory expanded its research endeavors. Key activities included the completion of a diagnostic tool to study the process of implosion and the development of the heat pipe; the latter was a passive heat transfer device that would have numerous future applications (Benegas 1995:31; Machen et al. 2010:13). In 1963, Laboratory scientists developed Vela satellite sensors—international "eyes in the sky" (Benegas 1995:32). These sensors detected nuclear explosions and were part of an effort to monitor international compliance with the recently signed Limited Test Ban Treaty. Also in this decade, the Laboratory completed the world's highest-voltage Van de Graaff accelerator and initiated research on radioisotope thermoelectric generators to provide electrical energy to NASA spacecraft (Benegas 1995:31–32; LANL 2002a; Machen et al. 2010:13, 69–70; McGehee and Garcia 1999:36).

New capabilities and organizational reforms dominated activities at the Laboratory during the 1970s. The Los Alamos Meson Physics Facility (present-day Los Alamos Neutron Science Center [LANSCE]) achieved a full-energy beam, and scientists shipped out the first medical radioisotope. The Laboratory also established both a Technology Transfer Office and the National Stable Isotope Resource. In 1974, the U.S. Congress passed the Energy Reorganization Act. The legislation abolished the AEC and established the U.S. Energy Research and Development Administration (ERDA) and the Nuclear Regulatory Commission. ERDA became the federal government's hub for energy research and development and took over the former AEC centers of research and laboratories. Notably, the Laboratory was designated a National Historic Landmark in 1975 and a National Environmental Research Park in 1976. The latter was an ERDA designation and provided opportunities to conduct environmental research at the Laboratory. The Department of Energy Organization Act of 1977 abolished ERDA and established DOE, which provided a framework for a national energy plan. The later part of the 1970s also saw the Laboratory's Weapons Neutron Facility and the Plutonium Processing Facility become operational (Benegas 1995:33–37; Buck 1982:1–2; DOE 2023; Greenwood 1977; LANL 2002a; Machen et al. 2010:71–73; Petersen and Sullivan 1977:91).

A resurgence of groundbreaking research and development occurred in the 1980s, in addition to a name change; in 1981, LASL became LANL. In this decade, the Laboratory established a branch of the Institute of Geophysics and Planetary Physics, a Center for Materials Science, the National Flow Cytometry Resource, an acquired immunodeficiency syndrome (or AIDS) database, a Center for Nonlinear Studies, an Advanced Computing Laboratory, and a Superconductivity Technology Center. Also during this decade, the Los Alamos Meson Physics Facility was dedicated; the Antares laser fusion facility became operational; and the Hot Dry Rock Project—started in the early 1970s—finally produced electricity. The Laboratory's establishment in the early 1980s of GenBank—a national repository for genetic sequence information—and the National Laboratory Gene Library Project led to the establishment of the first Center for Human Genome Studies at the Laboratory in 1988. That same year, the Laboratory discovered the human telomere (Benegas 1995:36–41; LANL 2002a; Machen et al. 2010:73–74; Whitacre 2020:26).

## Post–Cold War Era (1991–2005)

The transition from the Cold War era to the post–Cold War era, initiated by the collapse of the Soviet Union at the end of 1991, prompted a period of profound change throughout the Laboratory. Because international treaties restricted and then halted the testing of nuclear weapons, Laboratory scientists had to devise new methods of ensuring the safety and reliability of the nation's nuclear stockpile. The last underground nuclear test conducted by the United States occurred in 1992. In the years following, the Laboratory developed sophisticated methods of analyzing the viability of weapons as part of the stockpile stewardship program (DOE 2015; LANL 2002a; Machen et al. 2010:13, 19; Mitchell 2003:61; Walker 1994).

Although weapons research remained the Laboratory's prime mission, this program brought about new methods of experimentation and broadened the scope of scientific work. The Laboratory continued to make huge advances in computing capacity and capabilities, spurred by the need to solve the increasingly complex codes required for weapons certification. The Laboratory also made major advances in human-health research, culminating in increased bioforensic research aimed at thwarting biological terrorism. Multiple Laboratory experiments flew on satellites to conduct research in the space sciences, and Laboratory scientists began a formal program to provide scientific and technical expertise in support of homeland security issues. Prominent endeavors during this period included the Advanced Simulation and Computing Initiative in 1995, the expansion and renaming of the Los Alamos Meson Physics Facility to LANSCE in 1995, and the first test at the Dual-Axis Radiographic Hydrodynamic Test facility in 1999 (Machen et al. 2010:14; Pillai et al. 2022:93–96).

In response to the nation's need for alternative sources of energy, Laboratory scientists initiated studies aimed at investigating the hydrogen economy and broadening the use of fuel cells. Materials science research resulted in advances in understanding and manipulating the world of the very small—the nanosciences—and in developing energy-saving superconducting devices. By the end of this era, in research that underlined the environmental concerns of the times, Laboratory scientists were collaborating with others to improve evacuation planning and to model the effects of natural phenomena such as hurricanes, storm surges, floods, and wildfires (Machen et al. 2010:14).

As noted by the Laboratory's Director for Operations and Infrastructure Strategy Dr. Rekha Pillai and others (2022:102), "Not all major changes to the Laboratory came in the form of national policy or international politics." From May to July 2000, the Cerro Grande Fire, which began as a controlled burn by the National Park Service, burned 48,000 acres and became New Mexico's largest wildfire at that time. Within LANL, the fire burned across 8,000 acres, charred or destroyed 39 facilities (including significant Manhattan Project–period facilities), severed power and communication lines, and caused extensive smoke and ash damage to both facilities and the environment. The damage totaled $300 million. The fire resulted in the development and construction of a new Interagency Emergency Operations Center at TA-49 and a new pyramidal structure for operations (Coonley 2001; NA-LA 2001; Pillai et al. 2022:102–106).

The beginning of this era also saw the first underground repository for nuclear waste built in the United States. Completed in 1990, the Waste Isolation Pilot Plant (WIPP) was constructed across 16 square miles of salt beds in southeast New Mexico. WIPP was built to accept up to 175,565 cubic meters of transuranic waste from the United States' national laboratories and weapons facilities for 10,000 years. The first shipment of transuranic waste from the Laboratory arrived at WIPP on March 26, 1999 (Lopez 2014; Pillai et al. 2022:100–101; Weaver 2017). At an associated press event, Secretary of Energy and former New Mexico governor Bill Richardson stated, "This shipment to WIPP represents the beginning of fulfilling the long-overdue promise to all Americans to safely clean up the nation's Cold War legacy of nuclear waste and protect the generations to come" (WIPP 2022).

## More Recent Times (2006–2020)

The period after 2005 is represented by significant changes to LANL's organizational landscape, with transformations in both operations and missions. In 2006, DOE-NNSA awarded the Laboratory's management and operating contract to a new consortium, whereas the University of California had exclusively held the contract and run the Laboratory for the previous 60 years. The awardee was construction-focused Los Alamos National Security (LANS), which was a sole-purpose, dedicated, limited-liability corporation that comprised the University of California; Bechtel National, Inc.; Washington Group International; and BWX Technologies, Inc. The LANS contract transitioned LANL from a not-for-profit to a for-profit contract model. DOE-NNSA expected LANS to perform excellent science research and development; develop and construct infrastructure; manage Laboratory projects, programs, and business services; and remediate and manage the environment. LANS held the contract for a decade (Allen 2012:1; Chodos 2006; Pillai et al. 2022:125–126; Richardson 2011:2; Secretary of Energy 2004; U.S. Congress 2003).

Two 2014 events notably affected the Laboratory's operations and mission. The first was the establishment of a DOE Office of Environmental Management. Partially spurred by a 2014 LANL-caused incident at WIPP that closed down the facility for 5 years, DOE established this office to assume oversight of all legacy contamination at the Laboratory. This event significantly changed the amount of waste overseen by the Laboratory and the way waste was managed. The second event was a mission change that was initiated in 1993. DOE-NNSA's 2014 strategic plan mandated the Laboratory to produce at least 30 plutonium pits per year by 2026 and in perpetuity. At the time (and today), the Laboratory's Plutonium Processing Facility was the only physical plant in the United States equipped to do pit production (Duffy 1989; George 2018; Kornreich 2019:22–23; Kramer 2016:22; Lunn and Roark 2020; Pillai et al. 2022:131).

DOE-NNSA did not extend the LANS contract; in a circa 2015 performance review, LANS scored only satisfactorily in operations and infrastructure and fell short in safety, management systems, and cybersecurity. These assessed shortfalls were due to the 2014 WIPP incident, shipping and construction project issues, a 2012 contamination and a 2015 arc-flash accident at LANSCE, and a 2-year (2013–2015) pause in Plutonium Processing Facility operations (Chadwick 2019; Pillai et al. 2022:125). As presented in Pillai and others (2022:125), former Laboratory Director Robert Kuckuck observed, "the interests of the private sector and the university were not aligned" and noted a detrimental "culture difference" (Kramer 2016:23).

After 10 years, DOE-NNSA competed the Laboratory's management and operating contract for the second time in history. The awardee was Triad National Security, LLC (Triad)—a consortium of the Regents of the University of California, Battelle Memorial Institute, and Texas A&M University (Chadwick 2019; Pillai et al. 2022:126). NA-LA tasked Triad "with changing lab culture around safety, security, conduct of operations, contract assurance" (Chadwick 2019:8). Bringing in a new leadership team from outside of LANL, Triad took responsibility for the Laboratory on November 1, 2018, and implemented significant changes (Chadwick 2019; Pillai et al. 2022:126).

The new Triad leadership team was especially challenged on March 11, 2020, when the World Health Organization declared COVID-19 a pandemic, and the governor of New Mexico declared a state of public health emergency. Almost overnight, the Laboratory transitioned from more than 12,000 staff working on campus to more than 10,000 teleworking. The Laboratory remained in a similar posture for nearly 2 years. The outcomes of the pandemic at LANL were two-fold. First, the Laboratory became the leader in the DOE-NNSA complex in addressing the challenges of the pandemic. The event also provided a chance for the Laboratory to enhance operations and implement internal and external initiatives to employ all of the strengths of the organization. Second, the Laboratory was afforded the opportunity to support the national COVID-19 pandemic response. LANL, along with other research organizations, shared equipment (e.g., high-performance computing) and expertise (e.g., complex system-modeling capabilities) to study the virus's history, nature, genomics, and molecular structure; to predict the pandemic's progression; and to screen potential drug candidates (Beierschmitt 2020:30–34; Governor of New Mexico 2020; Mason 2021:10; Pasqualoni and Siegel 2020; Pillai et al. 2022:140–141; Tyler 2020, 2021). "The success and learning during the COVID-19 pandemic will be translated to improve all areas of the Laboratory, including delivering the pit production mission" (Pillai et al. 2022:142).

# CHAPTER 3: ARCHITECTURAL CONTEXT

## Modernism and Modernist Principles

Like many buildings at the Laboratory, the Technical Shops Building reflects the Modernism style, incorporating concepts first developed through International Modernism and continuing into Mid-Century Modernism. Though its roots date back to the nineteenth century, the International Modernism movement coalesced in the years after World War I under the guidance of architects Le Corbusier, Oud, Groupius, and Mies van der Rohe. The movement eschewed historical styles, rejected ornamentation, and embraced clarity, functionality, and new building technologies to create a new universal style for the future. True to its name, the International Style then spread across the globe by the mid-twentieth century (Hitchcock and Johnson 1966:38–48).

By the post-World War II period, cultural tastes had changed in the United States. Modernism surged in popularity, aided by new technologies and materials developed during the war. As architectural historian Mark Gelernter described it, “the immediate postwar era largely belonged to America and to Modernism” (2001:261). Modernism represented a shiny, new age with new technologies and rational efficiency. Cost-efficient construction afforded by mass-produced materials helped propel Modernism to become the standard for commercial, industrial, and institutional buildings. Gelernter notes that the Modernist style was particularly appealing to the government for its ability to convey their own self- image as “rational, efficient, the confident possessors of immense power and wealth, and yet not flashy or desirous of individual expression” (Gelernter 2001:263). Although the austere International Modernism maintained its popularity in postwar years, with a new sense of cultural optimism emerged a more expressive Mid-Century Modernism featuring renewed emphasis on form (Gelernter 2001:273–279).

## Defense-Oriented Architectural Styles

Historian Stephen D. Mikesell observed that during the Cold War, the military used two strategies for the design and construction of its built environment. They relied heavily on temporary and semi-permanent facilities while selectively investing in robust permanent facilities (Mikesell 200:8.53–8.54). As a government institution, the Laboratory followed the same trajectory. Because they are often so utilitarian, stylistic influences of military and Laboratory buildings can be difficult to identify and interpret. However, military architecture researchers Heather McDonald and Michelle Michael (2008:57) maintained that most facilities exhibit a particular architectural influence that is “evident in its shape, materials, details and other features that distinguish one building from another.”

Whereas the designs are generally primarily functional, the details often reflect the architectural trends of their day. Stylistic influences from Modernism were common in military and industrial architecture constructed into the twenty-first century. Character-defining features common among these buildings include simple geometrical massing, design regularity, lack of ornament, flat or low-pitched rooflines, exposed concrete or concrete masonry unit walls, exposed siding materials, and unornamented doors and windows (Gregory 2022:3.24–3.25).

## Design Principles at TA-03-0039 Technical Shops Building

The Technical Shops Building displays several modernist principles, such as form following function, separation of structure to permit free design of the interior and fenestration, and lack of ornament. The large structural bays facilitate expansive interiors and abundant clerestory windows, and the high ceilings allow for suspended bridge cranes (McGehee et al. 2003:38).

Built in 1953, the building reflects its time by melding the austerity of International Modernism with the low-pitched overhanging rooflines of Mid-Century Modernism. Its imposing scale and utilitarian design and materials convey the strength of the military amidst the uncertainty of the Cold War. Cold War buildings at the Laboratory are distinct from Manhattan-Project era buildings because they were clearly built to last. Character-defining features of the Technical Shops Building include its massing, low-pitched rooflines with deep overhangs, utilitarian materials, glass block and clerestory windows, the entry overhang, and the overhead bridge crane in the central spine of the *E*. A full building description and selected drawings are included in Appendix B.

Figure 3-1. Technical Shops Building, September 19, 2015 (LANL image, image no. 6S7A2000).

## Architect: Ralph M. Parsons Company

The Technical Shops Building was designed by the Ralph M. Parsons Company, which was founded in 1944 by the company's namesake. The company completed multiple projects at LANL, ranging from large projects such as TA-03-0040 (the Physics Building) and TA-03-0035 (the Sigma Press Building); small projects such as TA-35-0001 (the Guard Station); and waste treatment, sanitary sewer, and incinerator facilities. The company also completed numerous other nuclear-related projects outside the Laboratory during the 1950s. According to the company's foundation history, the list of completed projects reads like a history of industrial and urban development in the twentieth century and includes NASA facilities, airports, power plants, and more. Although Ralph Parsons had little formal training, he achieved great success by hiring top engineers and architects, partnering with other industry leaders, and possessing a good feel for business. Today, his company—now called Parsons—is an internationally known firm that specializes in defense, security, and infrastructure (The Ralph M. Parsons Foundation 2024).

# CHAPTER 4: HISTORICAL BACKGROUND OF TA-03-0039 TECHNICAL SHOPS BUILDING

## Historical Significance

Building TA-03-0039, also known as the Technical Shops Building, is a 138,000 $ft^2$ facility constructed in 1953 to serve as the primary machine shop and prototype fabrication facility for Los Alamos Scientific Laboratory. The Technical Shops Building supported Cold War weapons testing activities, including operations at the Nevada Test Site (McGehee et al. 2003:39–40).

Currently, TA-03-0039 is operated by the Prototype Fabrication Manufacturing Division (PF-MFG) and the Metrology Program and Calibration Laboratory (IQPA-MPCL). Current operations within the Technical Shops Building involve the calibration of scientific equipment for nuclear and nonnuclear operations; and the designing, machining, and inspection of custom parts. Machining operations in the Technical Shops Building involve a wide variety of common and specialized materials, including plastics, brass, aluminum, and titanium. Beryllium component machining also occurred in a specialized bay until early 2001, when operations were relocated to other facilities within the Laboratory. Throughout its history, the Technical Shops Building has seen continual upgrades to its equipment and manufacturing processes to meet changing requirements for manufacturing speed and precision (LANL 2002b:4.14; LASL 1966:10–14; McGehee et al. 2003:39).

## Technical Area Description

Technical Area 3, also known as South Mesa Site, is located on South Mesa across Los Alamos Canyon from the Los Alamos townsite. Originally used as a firing site and proving ground during the Manhattan Project, South Mesa was decommissioned and cleared of all facilities after the end of World War II. Today, TA-3 functions as LANL's administrative center, supporting a wide variety of activities, including public and corporate access, experimental sciences, theoretical and computational sciences, special nuclear material research, and physical support operations (Thompson and Boswell 2023:2-6; LANL 2002b:4.9).

Before 1950, nearly all of the Laboratory's administrative functions were concentrated in WWII-era facilities located around the Los Alamos townsite (then known as TA-1). Although the TA-1 campus had proven effective in supporting Project Y, sources contemporary to the early Cold War period noted that TA-1 was too "congested and hazardous" for postwar operations. Due to the high maintenance costs and temporary nature of TA-1's wartime construction, all of the existing facilities on Los Alamos Mesa were vacated and demolished, and new, permanent facilities were built (Brown et al. 2019:20; Manley 1949a).

The transition of Project Y from the military-oriented Manhattan Engineer District to the civilian-managed Atomic Energy Commission in 1947 encouraged the Laboratory's scientific leadership to examine the long-term strategic direction of the institution. Designed foremost as an institution of wartime expedience—with temporary facilities to match—the decision to develop Los Alamos into a permanent scientific institution prompted serious assessments about the safety and security of the Laboratory and its infrastructure (Machen et al. 2010:27; Manley 1949b).

Concerns about robustness of Los Alamos's infrastructure came to a head in February 1946, when the water infrastructure of Los Alamos froze solid, necessitating the transportation of 300,000 gallons of water a day by tanker truck for several weeks. Following this incident, community morale plummeted. Under the Directorate of Norris Bradbury, a dual-track effort was undertaken to improve the physical infrastructure of both Los Alamos's laboratory facilities and the surrounding community. Throughout 1946, with the support of General Groves and the Manhattan Engineer District, the basic infrastructure of Los Alamos was rapidly improved. Concerted measures to heat, light, and plumb the wartime Laboratory were replaced with more permanent facilities. The drilling of new wells; installation of increased electrical-generating capacity; and construction of schools, hospitals, and housing helped to dramatically improve the morale of the community (DOE-LM n.d.; Machen et al. 2010:69; Truslow and Kasha 1973:33, 35, 75).

However, even as the community's infrastructure improved, senior members of the Bradbury Directorate realized that the primary wartime technical area (TA-1) would not be sufficient to meet Los Alamos's growing needs for safety and security. By the end of 1947, the decision was made to relocate the Laboratory's administrative center across Los Alamos Canyon to a wartime-era firing site, known today as Technical Area 3 (Machen et al. 2010:27).

Between 1950 and 1963, nearly all of TA-1's administrative, scientific, and facility operations were relocated to TA-3. The speed of the move was dictated in large part by the pace of construction and technical necessity (Thompson and Boswell 2023:2-6).

Construction throughout South Mesa occurred within two main phases. The first phase, starting in 1950 and completed in late 1953, focused primarily on the construction of key mechanical and technical infrastructure to support the Laboratory's diversifying Cold War scientific mission. Facilities in this cohort include the Steam Plant (TA-03-0022), the Van de Graaff accelerator (TA-03-0016), the Communications Building (TA-03-0028), the Technical and Machine Shops Buildings (TA-03-0037, -0038, and -0039), and the Chemistry and Metallurgy Research Building (TA-03-0029) (Griggs and Martell 1993:2-5; Thompson and Boswell 2023:2-6).

The second phase of construction, starting in late 1954, saw the development of many of the Laboratory's prominent administrative and technical facilities. This phase included the construction of the new administration building (TA-03-0040), under the auspices of *Project O*, with personnel occupying the facility by March 1956. This phase of construction largely came to a close when the Sigma Building (TA-03-0066) was completed in 1959, although sporadic construction to complete the Sigma Complex was not completed until 1963, when the last technical facilities in TA-1 were ceremoniously decommissioned. Although additional construction, including the Oppenheimer Study Center (TA-03-0207) and the Otowi Building (TA-03-0261), took place in TA-3 from the late 1960s to the early 1980s, the majority of the TA-3 campus was in place by the close of the decade (Machen et al. 2010:23–24; Thompson and Boswell 2023:2-7).

## Construction and Design History

Associated with these early planning efforts, a centralized machine shop was seen as essential for the Laboratory's transition to a permanent nuclear research laboratory. The first earnest discussions concerning the construction of the current Technical Shops Building began in April 1948, when architect W.C. Kruger was contracted to create a master plan for Technical Area 3 (Williams 1948).

Initial estimates for LASL's proposed "Tech Shop" were 77,100 square feet, which constituted 25 percent more square footage than the facilities that were occupied by the postwar Shops Department. Between April and August 1948, LASL ENG (Engineering) Division estimates indicated that a significantly larger technical space would be required to meet the Laboratory's logistical needs. By the end of August, ENG Division had settled on a shop facility of approximately 130,000 square feet, extremely close to the current square footage of the Laboratory's Technical Shops Building (Williams 1948; LASL-ENG 1948:1–2, 4).

Between 1947 and 1950, as the Laboratory's weapons research mission began to expand, the need for skilled technicians and machinists grew significantly. However, the growth of the ENG Division to meet these needs was spotty and haphazard—severely limited by a constant lack of housing for staff and an equally inadequate amount of industrial floor space. Issues with maintenance costs and lack of available space to perform critical work within TA-1 were of immediate importance to ENG Division leadership (LASL 1951).

The first concepts for what would become the Technical Shops Building were outlined 1951, when the engineering department called for the construction of a "main shop, 180 × 590 ft. in plan" (LASL 1951). Overall designs put forward by ENG Division called for a "mill-type building with (a) central crane bay" designed to handle heavy industrial operations (LASL 1951). Technical capability estimates for the shop included provisioning space "for fabrication of all experimental equipment, gadgets, and components which may be needed by any of the laboratories" with adequate provisions for stock rooms, tool and shop floor rooms, and foundry facilities (LASL 1951).

By the end of 1951, the shops department employed 215 machinists, glassblowers, and instrument makers, spread throughout a variety of widely separated facilities in Technical Area 1, but the number of onsite staff were not sufficient to meet the day-to-day demands of the Laboratory. Due to shop space limitations, a substantive minority of ENG Division's technical staff worked outside of New Mexico, with more than a quarter of the division's skilled tradespeople located in Los Angeles, California. This dispersion of technical manpower, especially in security-critical matters such as weapons research, was of critical importance to senior Laboratory management. Efforts were made to expedite the move of ENG Division to South Mesa as soon as the new facilities on South Mesa were completed (LASL 1951).

In a memo to Max Roy, dated April 23, 1952, Director Norris Bradbury emphasized the importance of consolidating and expanding the ENG Division's presence in Los Alamos. According to Director Bradbury's assessment (Bradbury 1952),

- The Shop Department's core mission in the near future would be "…to increase the effort of the Laboratory in fundamental weapon research and development."
- To ensure the success of the Shop Department's core mission, the ENG Division should "…maximize the effectiveness of the Los Alamos Scientific Laboratory with (hiring) qualified personnel to the extent permitted by available housing at any given time."
- And to accomplish the above two points, the Shops Department was encouraged to hire more personnel beyond their proscribed limits because the "…housing presently in existence and available or promised…" would be able to accommodate the staff.

By 1953, a campus of three buildings had been built to support the Laboratory's engineering needs. In addition to TA-03-0039, LASL constructed an administration building to house ENG Division management (TA-03-0038) and a smaller machine shop (TA-03-0037) to support small-scale fabrication and prototyping efforts. All three facilities are still in operation and continue to broadly support the same scientific and technical missions as when they were originally constructed.

# CHAPTER 5: WINDOW REPLACEMENT PROJECT DRIVERS

## Building Description

The TA-03-0039 Technical Shops Building was designed by the Ralph M. Parsons Company and constructed in 1953 primarily of reinforced concrete and concrete masonry units. It was designed to house ultra-precision machining of elements for nuclear weapons production. The building is still used for machining today, although it has undergone continuous equipment upgrades, some interior modifications, and a minor 1962 addition on the south side. The building has an *E*-shaped footprint that serves as shop space and a projecting administration wing that runs along the spine of the *E*. The low-pitched gable roof of the spine overhangs the low-pitched shed roofs of the administration wing to the west and the three legs of the *E* to the east. A full building description and selected drawings are included in Appendix B (McGehee et al. 2003).

## Clerestory Windows

A predominant feature of the Technical Shops Building's massing is the multiple raised clerestories. Windowed walls extend above the surrounding roofs to provide plentiful, uniform daylighting to the shop spaces below (Figure 5-1 and Figure 5-2). Contemporary to guidance proposed and implemented by the Atomic Energy Commission, the windows mounted in the Technical Shops Building embody federally mandated principles of utilitarian construction with a corresponding economy of materials. AEC design criteria of the period for shop facilities emphasized the maximization of natural light, minimization of electrical illumination and motorized drives, and balanced ventilation regarding heat loss. These guidelines were put in place to ensure compliance with the Defense Production Act of 1950 and associated Korean War–era executive orders, which stressed the conservation of critical construction materials where possible to meet wartime mobilization efforts (Alger 1953:10.1; Dunning 1953:10.9).

To meet the AEC's material and design requirements, banks of four-lite, steel frame, awning style, single-pane clerestory windows line the walls between the upper and lower rooflines. Each lite was originally lined with a film-based coating to protect against solar heating and visual intrusion. In compliance with guidelines of the period to minimize the use of electrical components, the awnings are operated by means of mechanical chain drives to ventilate the building.

Figure 5-1. Interior of the Technical Shops Building, March 15, 2021 (LANL image).


Figure 5-2. Interior of the Technical Shops Building, 1968 (LANL image, image no. CN682097).

## Current Conditions

Overall, the exterior appearance of the clerestory windows remained unchanged until the early 2010s, when several units were covered with metal grates to meet Department of Energy security standards. Outside of the high bay "spine," several of the windows were modified to accommodate the installation of additional vent penetrations (Figure 5-3); however, the modifications led to damage, including the separation of individual sashes from the frame (Figure 5-4). For a comprehensive visual survey of current conditions of the clerestory windows at the Technical Shops Building, see Appendix C.

Figure 5-3. Example vent penetration, June 6, 2023 (LANL image, image no. DSC_0119).

Figure 5-4. Example damaged sash (center) June 6, 2023 (LANL image, image no. DSC_0120).

The condition of the clerestory windows is insufficient to support TA-03-0039's current technical activities. Many of the windows exhibit damage—largely as the result of routine use—where mechanical wear and exposure to the elements over the past 70 years have degraded their effectiveness in protecting the building envelope. A significant number of the intact window lights exhibit cracked and worn film coatings, which limit their ability to protect against sunlight and visual intrusion into the facility (Figure 5-5).

Figure 5-5. Example deteriorated window film coating (center) June 6, 2023 (LANL image, image no. DSC_0112).

Additionally, the windows lack modern features designed to limit energy losses involved with heating, cooling, and ventilating the high bays within the Technical Shops Building. Due to their single-pane construction and degraded film coatings, the current windows provide limited utility in providing a stable temperature environment and reflecting solar radiation. This deficiency, in turn, creates significant long-term technical challenges in designing improvements for the building's current heating, ventilation, and air conditioning infrastructure.

Refurbishment of the existing windows is not seen as tenable to the long-term use of the Technical Shops Building. Because of AEC-mandated construction guidelines of the early 1950s, the building was constructed to maximize the economy of materials at the expense of the building envelope. Of particular note, the chain drives that operate the awnings lack mechanical stops to secure and seal the windows in the event of inclement weather or extreme wind events. This specific choice (in compliance with AEC guidelines) has led to multiple cracked or broken windows, insufficient personnel protection, and degradation of the building's exterior visual characteristics (Figure 5-6 and Figure 5-7). In several extreme incidents, windowpanes have been ejected from their casements into the interior of the building, posing a significant health and safety risk to the occupants. These windows were repaired with temporary solutions or sealed entirely, which further limits the historic feeling of the building (Figure 5-6 and Figure 5-7). Due to the damage incurred, these temporary solutions to the building envelope do not provide adequate long-term protection against the weather or against potential releases of hazardous material elsewhere in the Laboratory.

Figure 5-6. Example of broken lites with various ad hoc repairs (note center bank of windows) May 24, 2024 (LANL image, image no. S1006637).

Figure 5-7. Example of broken lites with various ad hoc repairs, May 24, 2024 (LANL image, image no. S1006820).

Many of the intact, high-bay windows are showing signs of significant delamination to the glazing and caulking, caused by continual exposure to weather over the past 70 years (Figure 5-8). Most of caulking and glazing materials are original to the window's construction and contain asbestos. Removal and replacement of the individual materials with modern equivalents poses heightened health and safety risk, especially if the historic materials degrade to the point of becoming friable.

Superseding the health and safety considerations of asbestos remediation and disposal, the Technical Shops Building is an industrial environment that has also historically worked with beryllium. Because of these historic operations, LANL Engineering Services has determined that the existing clerestory windows would need to be treated as beryllium-contaminated waste, and refurbishment would require specially trained personnel. Based on LANL worker safety protocols, the refurbishment of the existing windows would be an unacceptable health and safety risk.

Recent updates to the Secretary of the Interior's Standards for the Treatment of Historic Properties provide guidance on the use of replacement materials in preserving, rehabilitating, and restoring historic buildings. According to these updated standards, replacement materials are acceptable in situations where replacement materials better comply with codes, provide resilience to natural hazards, minimize foreseeable loss and damage, and allow for maintaining a building in good condition (Grimmer 2017: 24, 166).

Considering this current guidance, the conditions and hazards outlined in this section justify the removal and replacement of the windows as entire units rather than replacement of individual components or preservation of the window units in situ.

Figure 5-8. Example of delamination to window glazing and caulking, May 24, 2024 (LANL image, image no. S1006820).

# CHAPTER 6: PLANNED SCOPE OF WORK

LANL will replace all of the clerestory windows (86 total) at TA-03-0039 with visually similar, anodized-aluminum storefront windows. These new windows will eliminate the current health and safety hazards, provide improved thermal efficiency, and—in many areas—restore the windows to a more historically appropriate visual appearance.

The new glass will feature a nonmirrored tint to reduce heat gain and, for security purposes, a privacy coating (see Appendix D, page 9) to prevent viewing inside the building. Where an existing duct will penetrate the windows, 1-inch-thick, rigid insulation panel with laminated aluminum facing will be used as infill for the affected lite (see Appendix E glazing schedule, sheet A-7000).

Employing an awning operation via an electric actuator, 31 of the new windows will swing open to allow heat to escape. Originally, all 86 of the clerestory windows at TA-03-0039 featured operable awning units in the two center sections of the windows. Due to budget constraints, the total number of operating windows will be reduced to 31. The remaining clerestory windows will be the same window product, only fixed. Although the number of operating awning windows will be fewer than originally provided, their awning operation and location in the two center sections of the windows is in keeping with the building's original design. Drawings that show the locations of the windows to be replaced and locations of new operating versus nonoperating windows are included in Appendix E.

Currently, the metal security cages on the exterior of the clerestory windows obscure the historic windows and add a visual element that is not original to the building's design. These cages will be removed from the windows and replaced with interior metal louvered screens (see Appendix E, drawing A4 on sheet A-7000). Combined with the historically appropriate appearance of the new windows, this cage removal will restore the visual of the clerestory windows to mimic their original appearance. Placing the new metal louver screens on the interior of the windows will still meet security requirements and allow the windows to swing open to the exterior. With the tint and privacy coating, the new interior screens should not be visible from the exterior.

## Cultural Resources Project Oversight

LANL Cultural Resources subject matter experts worked with project personnel to choose visually similar replacement windows—including their proportions, operation, and color—and to arrive at a creative solution to minimize the appearance of necessary security features. Subject matter experts from the Cultural Resources Program will visit the jobsite periodically during window removal and installation to ensure that work is performed in accordance with the Secretary of the Interior's Standards for the Treatment of Historic Properties.

# CHAPTER 7: CONCLUSION

## Determination of Effects

The Field Office has determined that the replacement of the clerestory windows in Building TA-03-0039 will not alter or adversely affect the integrity and characteristics that make this building eligible for listing in the National Register. In compliance with the National Historic Preservation Act of 1966, as amended, and the *Programmatic Agreement among the U.S. Department of Energy, National Nuclear Security Administration, Los Alamos Field Office, the New Mexico State Historic Preservation Office, and the Advisory Council on Historic Preservation Concerning Management of the Historic Properties at Los Alamos National Laboratory, Los Alamos, New Mexico,* the Field Office is initiating consultation on the proposed undertaking. Replacing the existing clerestory windows with modern units of a visually similar appearance will support the continued use of the facility for mission-critical research, ensure a safe and secure building envelope for current tenants, and contribute to the continued long-term preservation of TA-03-0039.

The Field Office is requesting concurrence with the determination of no adverse effect for this undertaking.

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# Appendix A: Project Location Map

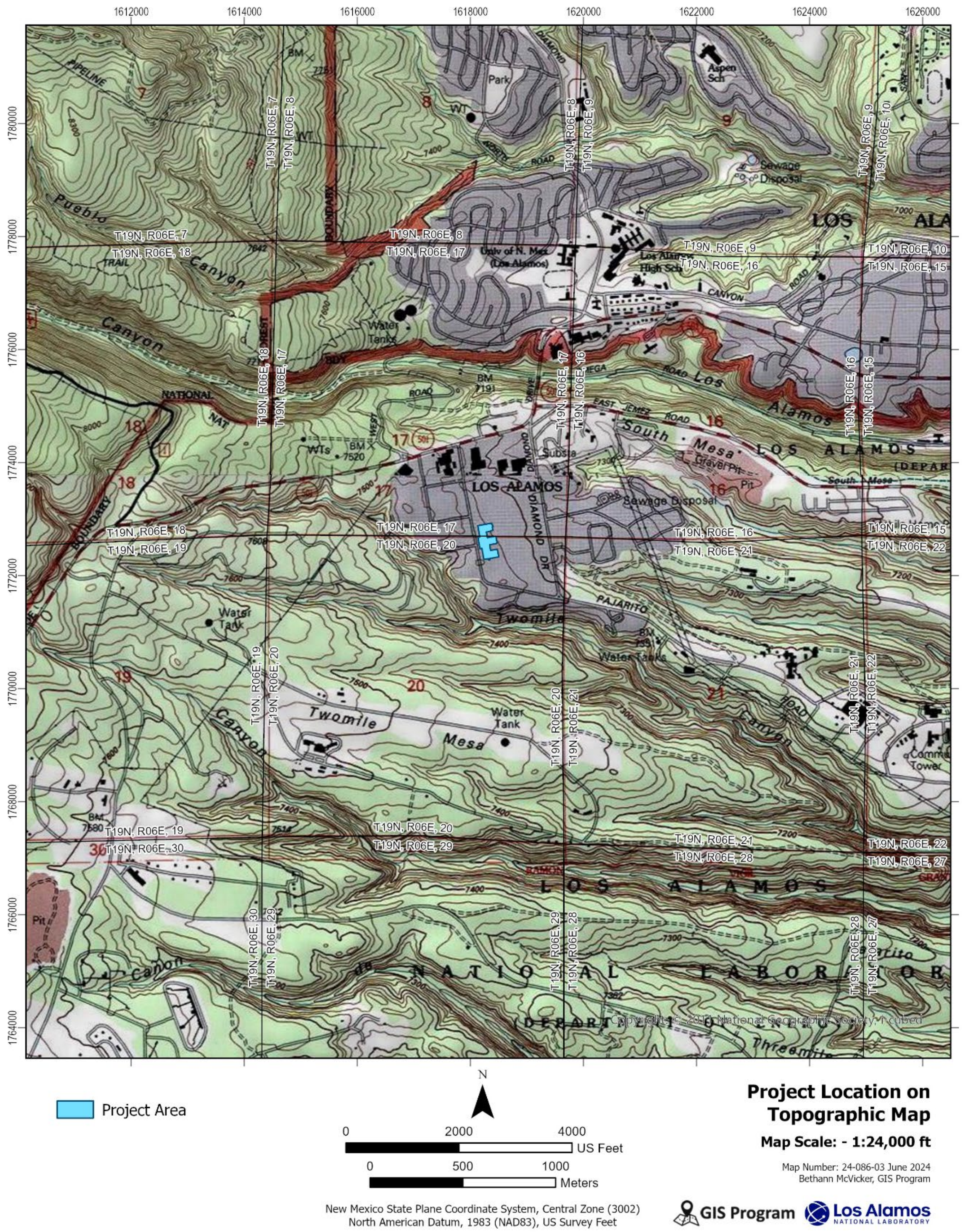



Figure A-1. Project location map.

# Appendix B: 2003 Building Description and Selected Building Drawings

**Technical Area:** 3
**Building Number:** 39
**Original Function:** Technical Shops Building
**Current Function:** Technical Shops Building
**Date Constructed:** 1953

**Associated Theme:** Processing
**Property Type:** Lab/Processing (1st Tier)
**Integrity:** Excellent
**Core:** Yes
**Eligibility:** Yes

**Buildings with same floorplan:** none

**Figure 1:** North end of west elevation.

**Figure 2:** South end of west elevation.

**Figure 3:** Oblique view of west and south elevations with corridor connecting TA-3-39 to TA-3-102.

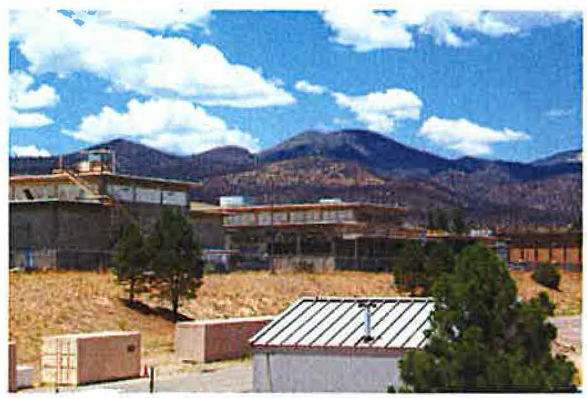


**Figure 4:** Partial oblique view of south and east elevations.

## Architectural Description:

When originally constructed, the 145,052 ft$^2$ Technical Shops Building provided ultra-precision machining of elements for nuclear weapons production. The combination two-story and three-story reinforced concrete building was constructed on a 20 ft by 30 ft grid with a reinforced concrete foundation, floor slab, concrete frame walls with both glass block and concrete masonry unit shear walls, and low-pitched gable and shed roof forms.

Building TA-3-39 has an *E*-shaped floorplan and projecting two-story administration wing. The building is divided into seven areas – Area 1: administration, 2: northeast corner (north leg), Areas 3, 4, and 5: the "spine" of the building, Area 6: southeast corner (south leg), Area 7: center leg. The main body of the Technical Shops Building (Areas 3, 4, and 5) measures 602 ft 4 in. long (north to south) by 122 ft 4 in. wide. Area 2, north leg, measures 122 ft 4 in. wide by 244 ft 1 in. long and Areas 6 and 7, the center and south legs, measure 122 ft 4 in. wide by 264 ft 1 in. long. Historically, each area was subdivided based on specific functions and tasks and included equipment such as grinders, lathes, mills, sheet metal breakers, welding shop, etc. Up until the late 1970s, fabrication was conducted 24 hours a day when it was changed to 16 hours-per-day "double shifts."

*Area 1*

Area 1, administration wing, is centrally located on the west façade. The two-story block was constructed with a reinforced concrete foundation and walls and flat roof. The entry vestibule with guard station has two pairs of aluminum and glass doors with stairs at the west side of the vestibule entering into the technical shops. The guard station controls access into the shop area from the more public space. The administration wing has double-loaded corridors on both floors, two enclosed staircases, restrooms, and large meeting areas. Bands of steel frame four-light awning style windows span both the first and second floors of the administration wing.

*Technical Shops Area*

The technical shops area (Areas 2, 3, 4, 5, 6, and 7) is predominantly a large, open, two-story space with three-story clerestory constructed on a 20 ft by 30 ft reinforced concrete column grid. This type of construction allows for large unencumbered work areas within the building. Any interior walls within the shops area are constructed of either concrete masonry units or 6 in. metal stud and gypsum board partitions. Exterior lighting is provided by 15 ft 9 in. glass block panels set within the sidewalls as well as from clerestory windows. The two-story clerestory area spans the entire length of the building as well as down both the center and south legs and contains groups of four-light steel frame awning style windows. Several places within the technical shops area are mezzanines.

*Area 2*

Area 2 forms the north leg of the building and originally housed the calibration area. The north, east, and south walls are insulated with 2 in. cellular glass insulation. A center corridor runs the length of the leg dividing the area into two unequal halves. The north side of the corridor is further divided into three smaller areas with several additional support spaces. A two-ton capacity monorail runs between Rooms 6 and 7. The south half of the leg is also divided into smaller areas and equipped with a two-ton capacity monorail as well as concrete pipe trenches. Both monorails converge in the central corridor and extend to the east to a roll-up overhead door and a covered dock.

*Areas 3, 4, and 5*

Areas 3, 4, and 5 form the "spine" of the *E* and were constructed as a 2½-story highbay with three-story doublewide clerestory down the center of the building. This area is predominantly one large open workshop with locker/restrooms in both Areas 3 and 5. Areas 3, 4, and 5 are equipped with a one-ton suspended bridge crane running down the entire length of the building as well as two additional one-ton suspended bridge cranes running along the interior column lines.

This area was also constructed with a 590 ft long by 7 ft wide electrical service tunnel in the basement spanning the entire length. Access into the basement tunnel is provided by two enclosed stairs at opposite ends of the building as well as from the equipment room. Four access hatches are also evenly spaced along the length of the service tunnel. A 6 ft wide escape tunnel was constructed in the basement and runs from the equipment room on the east side of Area 4 to an escape hatch near the front doors on the west side of the building.

Areas 3, 4, and 5 have numerous double and single metal doors both on the interior and to the exterior of the building. Several roll-up overhead doors were also installed within the areas. A concrete ramp with double doors was installed on south side of Area 5.

In 1962, a 20 ft by 30 ft cleaning room was constructed on the south side of Area 5. Access into the cleaning room from Area 5 is possible through a single fire door. Exterior access is provided by a single personnel door located on the south side and a roll-up overhead door on the west side of the addition. The cleaning room was constructed with a reinforced concrete foundation and floor slab, concrete masonry unit walls, and a flat concrete roof. The cleaning room is divided into two areas with the sump pit located at the south end. An external steam pit and a vent stack are located adjacent to the east wall of the cleaning room.

*Area 6*

Area 6 forms the south leg of the building. Area 6 is predominantly one large open area with smaller areas enclosed with chain link fencing. Three suspended crane rails span the length of the building and are located adjacent to the structural columns as well as the centerline of the clerestory. A covered dock area encompasses the north and east walls of Area 6. Multiple single personnel doors and overhead doors access the dock area.

*Area 7*

Area 7 forms the center leg of the building and was used as a model shop and metal stock store. Area 7, again, is predominantly one large open space with an enclosed area running the length of Area 7 on the north side. Three suspended crane rails span the length of the building and are located adjacent to the structural columns as well as the centerline of the clerestory. A concrete ramp with roll-up overhead door is located on the south side of Area 7. Two concrete slabs were constructed on either side of the loading dock for staging and storage purposes. A covered dock is also located on the east side of Area 7. This area now serves as records storage.

During the 1990s, the interior of the Technical Shops Building underwent modifications. In the early 1990s, some of the original offices were removed, areas subdivided, or new offices constructed. In 1993 a clean room/inspection room was constructed. The beryllium shop was moved from this building in 1999 and relocated in the Beryllium Technology Facility (TA-3-141).

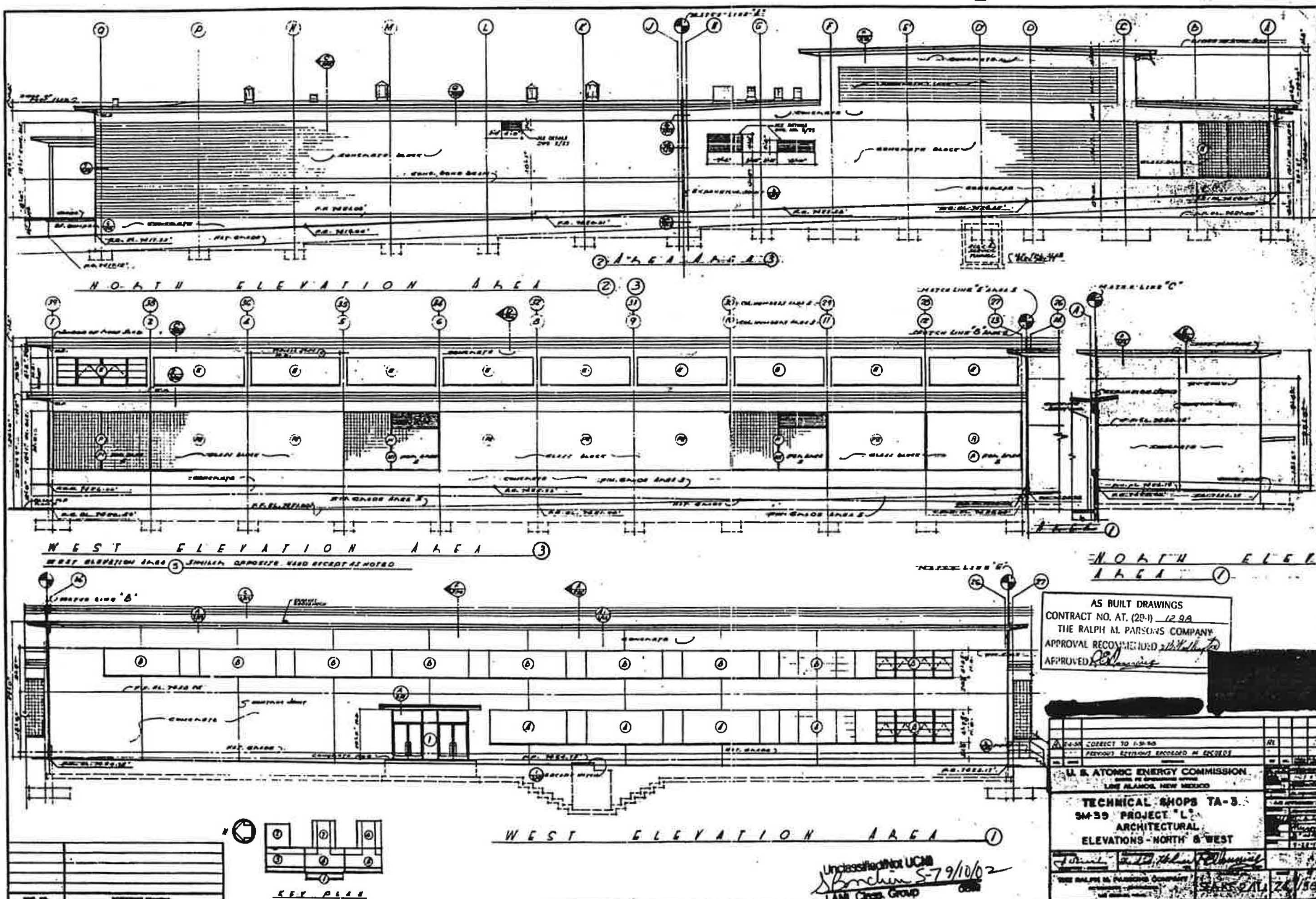
**Historical Background:**

The building served as a fabrication facility for the Laboratory. The equipment has been upgraded constantly to keep up with the changes in manufacturing requirements within the Laboratory. This technical machine shop supported Cold War weapons testing activities, including operations at the Nevada Test Site. The building continues as a technical machine shop.

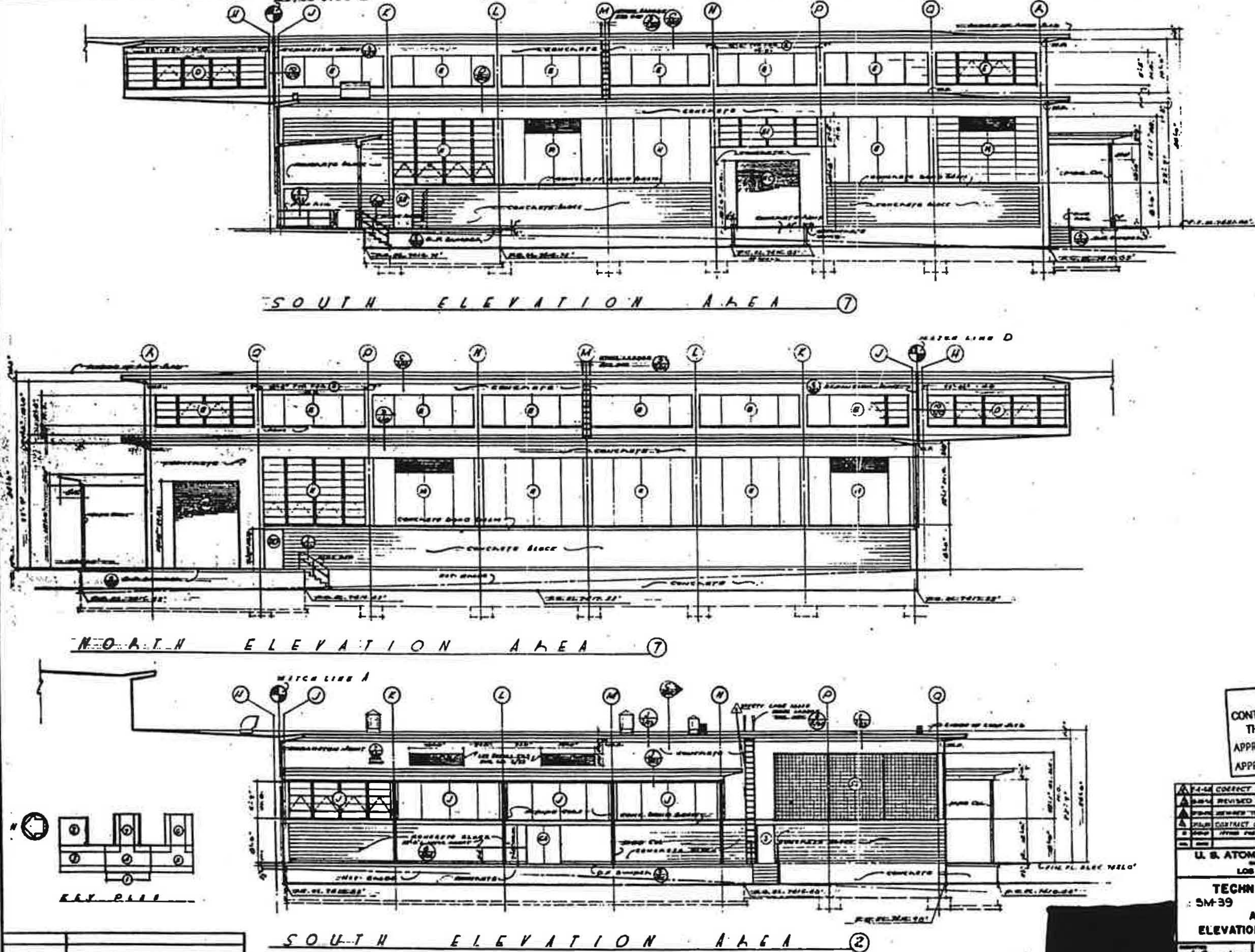
**Determination of Eligibility:**

This building meets National Register of Historic Places (Register) criteria in that it possesses integrity of location, design, setting, materials, workmanship, feeling, and association. In addition, the building is eligible for inclusion on the Register as a significant property within TA-3. The building is significant under Criterion A as it supported the early research and development of nuclear weapons during the beginning of the Cold War in the 1950s.

LA-U 02-6847



NORTH ELEVATION AREA 2 3
AREA AREA 3
WEST ELEVATION AREA 3
WEST ELEVATION AREA 5 SIMILAR OPPOSITE HAND EXCEPT AS NOTED
NORTH ELEV. AREA 1
WEST ELEVATION AREA 1
MATCH LINE "B"
MATCH LINE "C"
KEY PLAN
AS BUILT DRAWINGS
CONTRACT NO. AT. (29-1) 1298
THE RALPH M. PARSONS COMPANY
APPROVAL RECOMMENDED
APPROVED
[redacted]
CORRECT TO 1-31-56
PREVIOUS REVISIONS RECORDED IN RECORDS
U. S. ATOMIC ENERGY COMMISSION
LOS ALAMOS, NEW MEXICO
TECHNICAL SHOPS TA-3
SM-39 PROJECT "L"
ARCHITECTURAL
ELEVATIONS - NORTH & WEST
THE RALPH M. PARSONS COMPANY
Unclassified/Not UCNI
S-7 9/10/02
LANL Class. Group
LAB JOB 435 L.A.S.L. DWG. NO. ENG-C 14716




Unclassified/Not UCNI
LANL Class. Group
S-7 9/10/02 date

AS BUILT DRAWINGS
CONTRACT NO. AT. (29-1) 1285
THE RALPH M. PARSONS COMPANY
APPROVAL RECOMMENDED
APPROVED

[redacted]

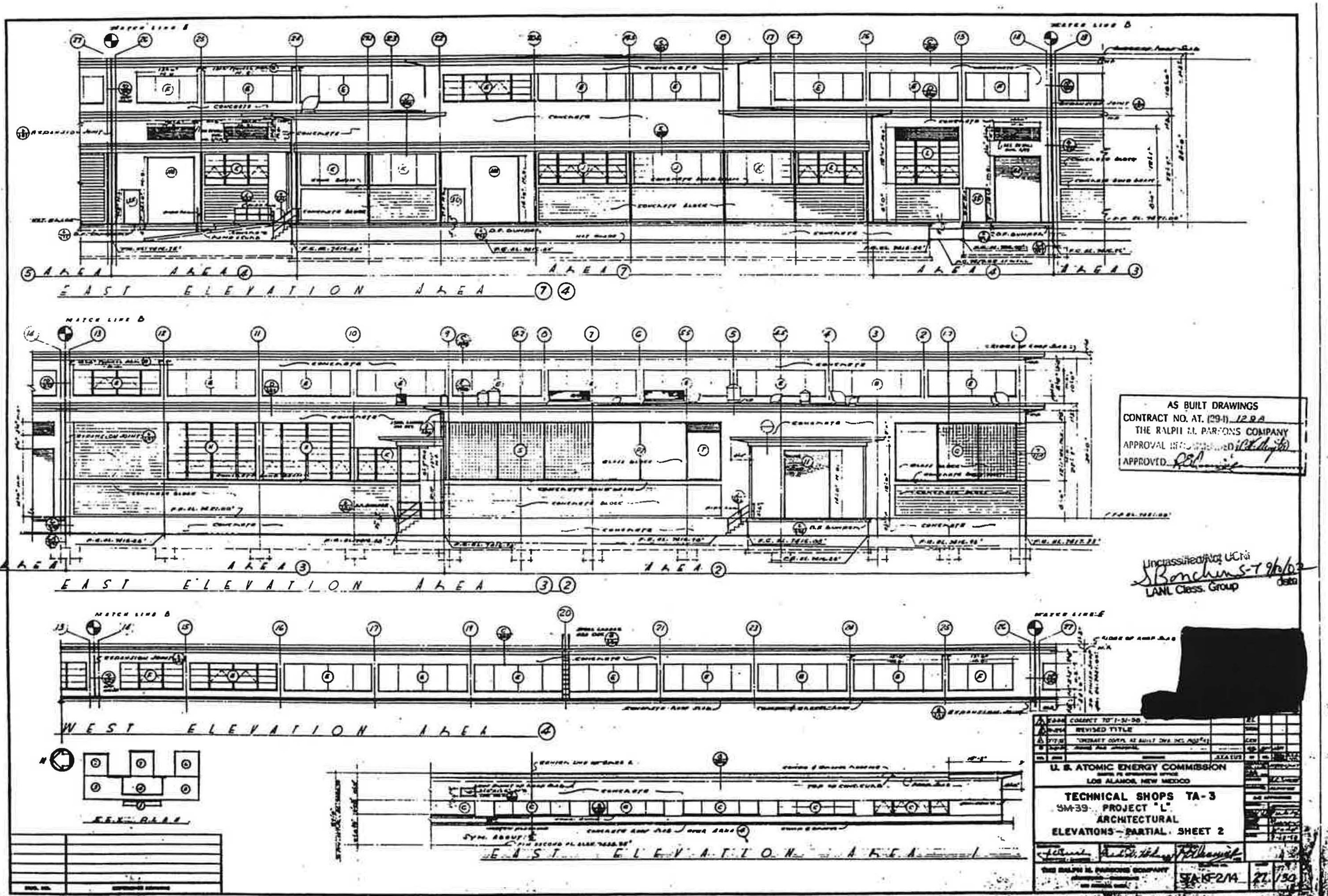
U. S. ATOMIC ENERGY COMMISSION
LOS ALAMOS, NEW MEXICO

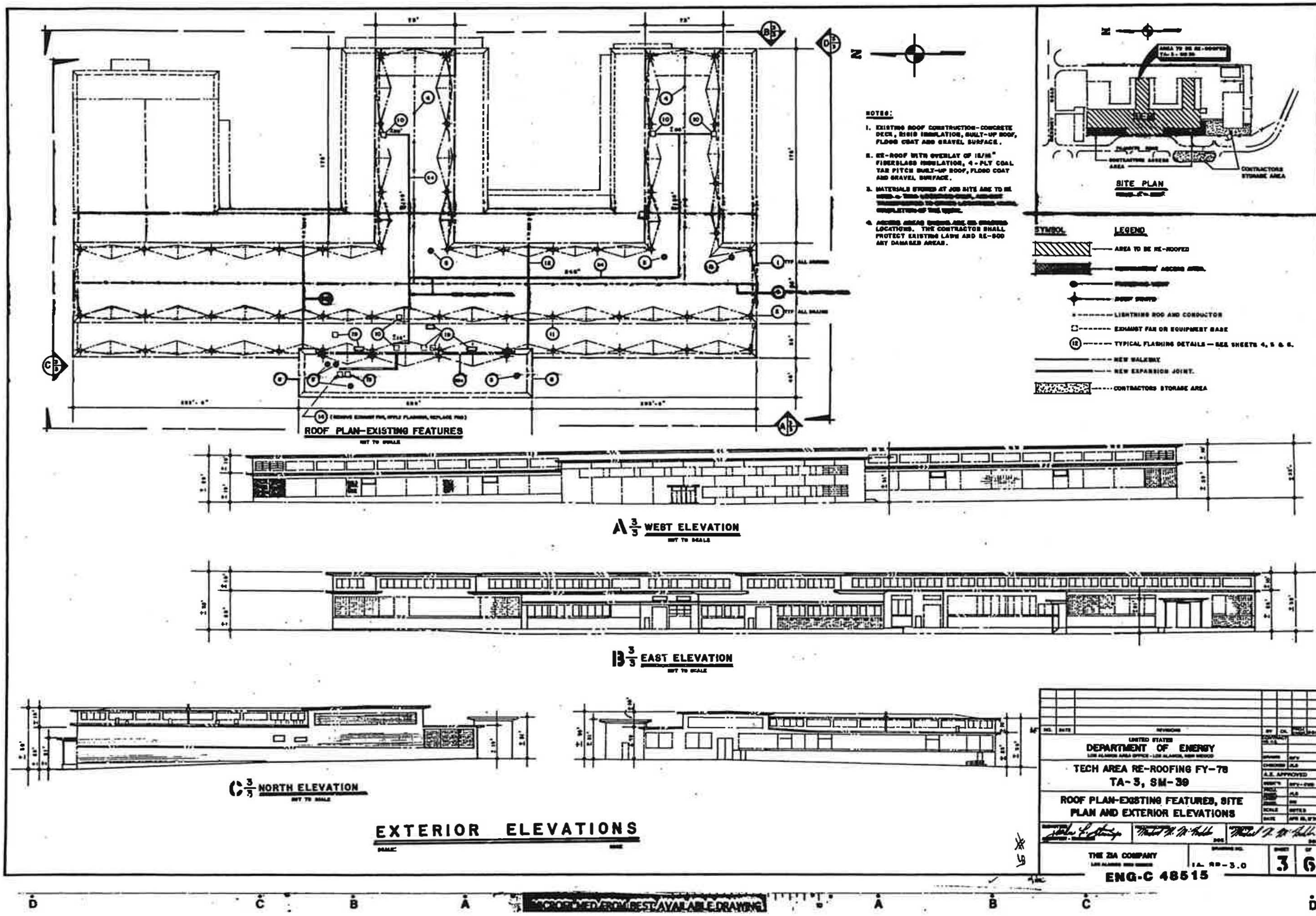
TECHNICAL SHOPS TA-3
SM-39 PROJECT "L"
ARCHITECTURAL
ELEVATIONS - PARTIAL SHEET I

THE RALPH M. PARSONS COMPANY

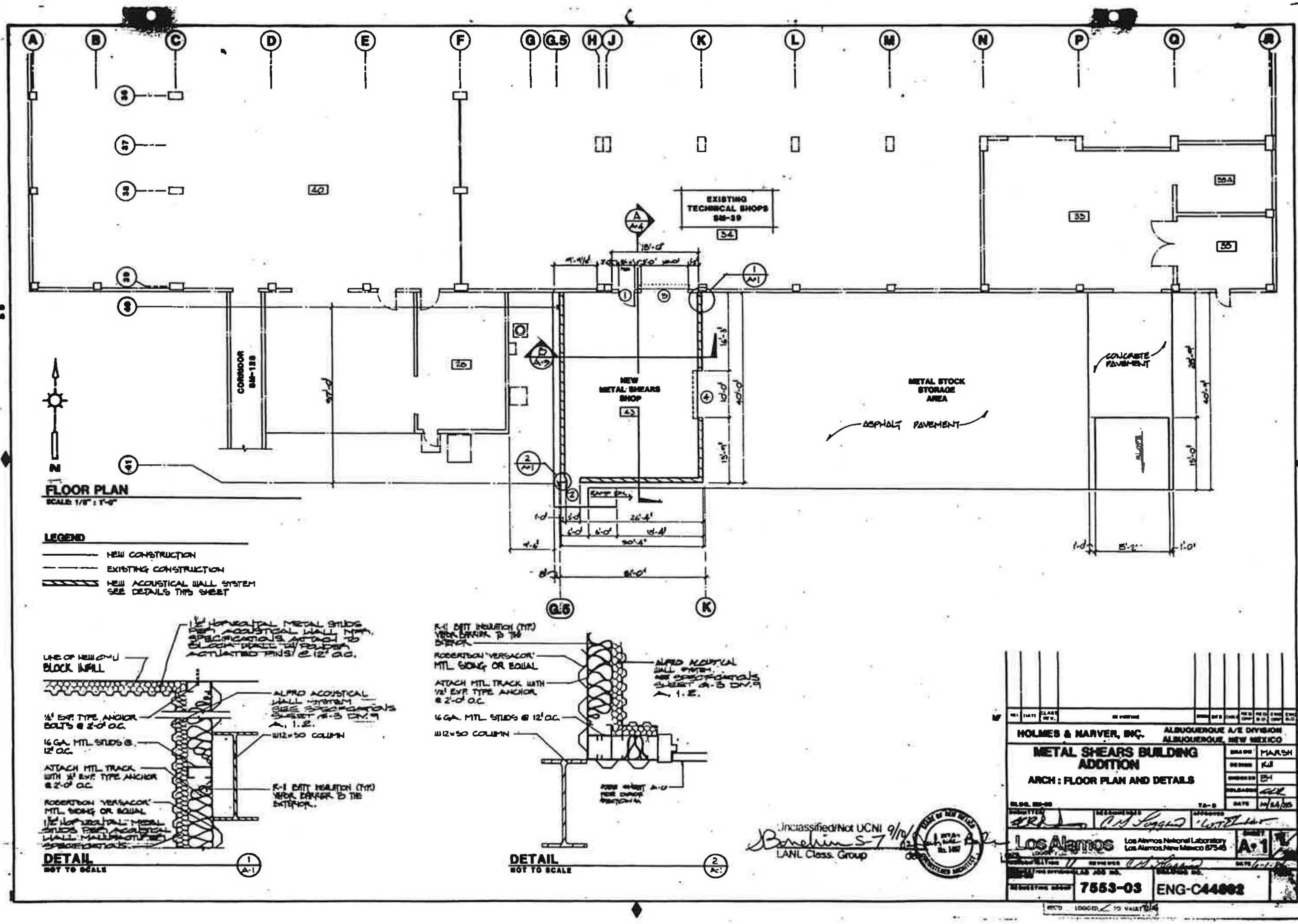
SEA-KF-2/13

ENG-C 1471

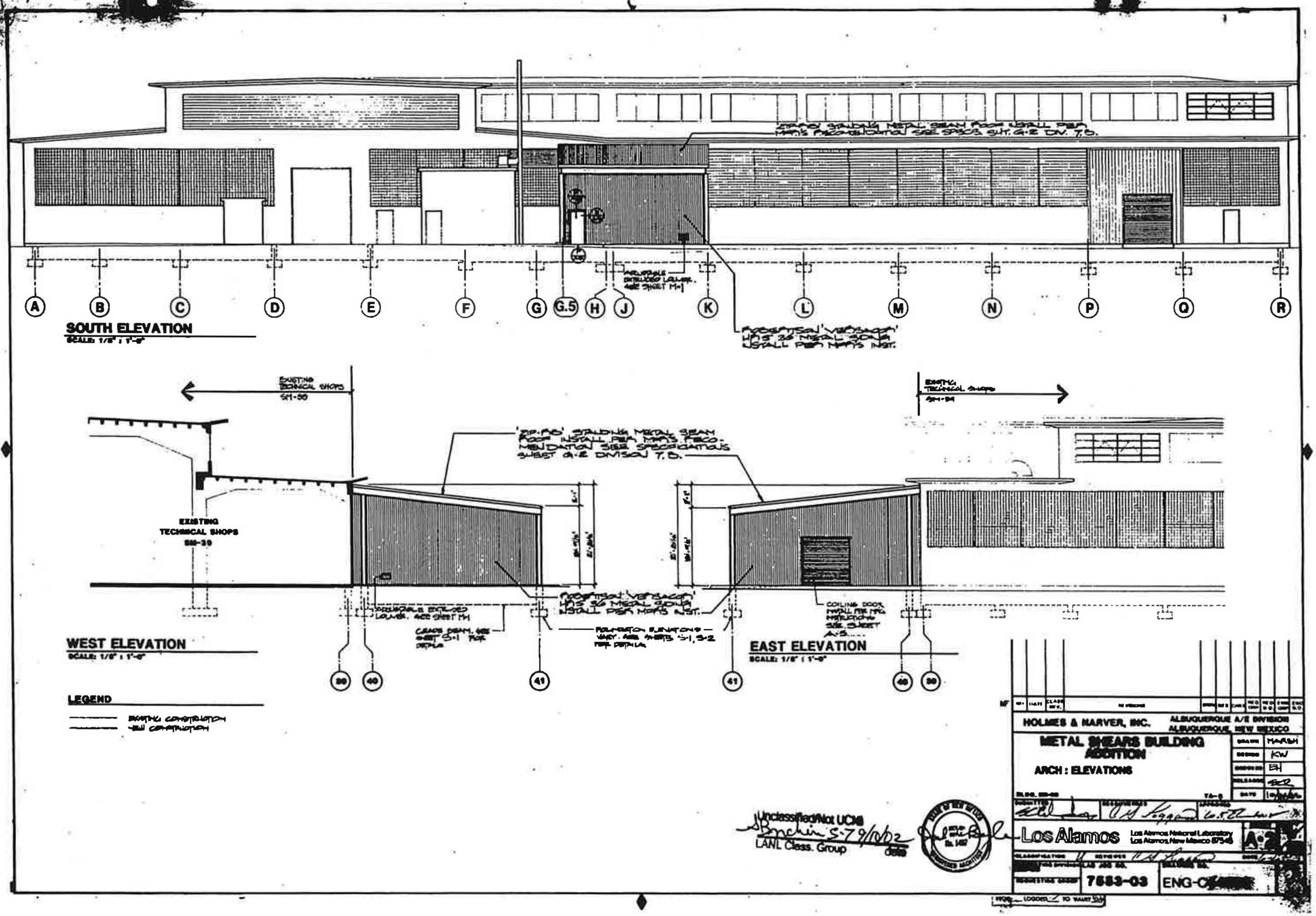

EAST ELEVATION AREA 7 4
EAST ELEVATION AREA 3 2
WEST ELEVATION AREA 4
EAST ELEVATION AREA
KEY PLAN
AS BUILT DRAWINGS
CONTRACT NO. AT. (29-1) 1298
THE RALPH M. PARSONS COMPANY
APPROVAL
APPROVED
Unclassified/Not UCNI
S Bonchin 5-7 9/10/03
LANL Class. Group
[redacted]
REVISED TITLE
U. S. ATOMIC ENERGY COMMISSION
LOS ALAMOS, NEW MEXICO
TECHNICAL SHOPS TA-3
SM-39 PROJECT "L"
ARCHITECTURAL
ELEVATIONS - PARTIAL, SHEET 2
THE RALPH M. PARSONS COMPANY
3A-KF2/14
27 /30
DWG NO. ENG-C 14717



ROOF PLAN-EXISTING FEATURES
NOT TO SCALE
N
NOTES:
1. EXISTING ROOF CONSTRUCTION-CONCRETE DECK, RIGID INSULATION, BUILT-UP ROOF, FLOOD COAT AND GRAVEL SURFACE.
2. RE-ROOF WITH OVERLAY OF 15/16" FIBERGLASS INSULATION, 4-PLY COAL TAR PITCH BUILT-UP ROOF, FLOOD COAT AND GRAVEL SURFACE.
3. MATERIALS STORED AT JOB SITE ARE TO BE
4. LOCATIONS. THE CONTRACTOR SHALL PROTECT EXISTING LAWN AND RE-SOD ANY DAMAGED AREAS.
SITE PLAN
CONTRACTORS STORAGE AREA
SYMBOL
LEGEND
AREA TO BE RE-ROOFED
LIGHTNING ROD AND CONDUCTOR
EXHAUST FAN OR EQUIPMENT BASE
TYPICAL FLASHING DETAILS — SEE SHEETS 4, 5 & 6.
NEW WALKWAY
NEW EXPANSION JOINT.
CONTRACTORS STORAGE AREA
A 3/3 WEST ELEVATION
NOT TO SCALE
B 3/3 EAST ELEVATION
NOT TO SCALE
C 3/3 NORTH ELEVATION
NOT TO SCALE
EXTERIOR ELEVATIONS
UNITED STATES
DEPARTMENT OF ENERGY
TECH AREA RE-ROOFING FY-78
TA-3, SM-39
ROOF PLAN-EXISTING FEATURES, SITE PLAN AND EXTERIOR ELEVATIONS
A.E. APPROVED
THE ZIA COMPANY
3
6
ENG-C 48515
MICROFILMED FROM BEST AVAILABLE DRAWING


FLOOR PLAN
SCALE: 1/8" = 1'-0"
LEGEND
NEW CONSTRUCTION
EXISTING CONSTRUCTION
NEW ACOUSTICAL WALL SYSTEM SEE DETAILS THIS SHEET
EXISTING TECHNICAL SHOPS SM-39
NEW METAL SHEARS SHOP
METAL STOCK STORAGE AREA
ASPHALT PAVEMENT
CONCRETE PAVEMENT
CORRIDOR SM-128
DETAIL
NOT TO SCALE
LINE OF NEW CMU BLOCK INFILL
1/2" EXP. TYPE ANCHOR BOLTS @ 2'-0" O.C.
16 GA. MTL. STUDS @ 12" O.C.
ATTACH MTL. TRACK WITH 1/2" EXP. TYPE ANCHOR @ 2'-0" O.C.
ROBERTSON 'VERSACOR' MTL. SIDING OR EQUAL
ALPRO ACOUSTICAL WALL SYSTEM SEE SPECIFICATIONS SHEET A-3 DIV.9 A. 1.2.
W12x50 COLUMN
R-11 BATT INSULATION (TYP) VAPOR BARRIER TO THE EXTERIOR.
HOLMES & NARVER, INC.
ALBUQUERQUE A/E DIVISION ALBUQUERQUE, NEW MEXICO
METAL SHEARS BUILDING ADDITION
ARCH: FLOOR PLAN AND DETAILS
MARSH
Los Alamos
Los Alamos National Laboratory Los Alamos, New Mexico 87545
A-1
7553-03
ENG-C44002
Unclassified/Not UCNI
LANL Class. Group
A-2

A-3



SOUTH ELEVATION
SCALE: 1/8" : 1'-0"
A
B
C
D
E
F
G
G.5
H
J
K
L
M
N
P
Q
R
WEST ELEVATION
SCALE: 1/8" : 1'-0"
EAST ELEVATION
SCALE: 1/8" : 1'-0"
EXISTING TECHNICAL SHOPS SM-39
39
40
41
LEGEND
EXISTING CONSTRUCTION
NEW CONSTRUCTION
HOLMES & NARVER, INC.
ALBUQUERQUE A/E DIVISION
ALBUQUERQUE, NEW MEXICO
METAL SHEARS BUILDING ADDITION
ARCH : ELEVATIONS
MARSH
KW
EH
Los Alamos
Los Alamos National Laboratory
Los Alamos, New Mexico 87545
7583-03
ENG-C
Unclassified/Not UCNI
LANL Class. Group

## ROOM INFORMATION CHART

| RM NO | NET SQ FOOTAGE | RM NO | NET SQ FOOTAGE | RM NO | NET SQ FOOTAGE |
|---|---|---|---|---|---|
| B1 | 2557 | B3 | 1013 | B5 | 1745 |
| B2 | 39 | B4 | 1858 | BSTW3 | 158 |

TOTAL ROOM NET SQUARE FOOTAGE (THIS SHEET) = 7,370

GROSS SQUARE FOOTAGE (THIS SHEET) = 9,243

TOTAL ROOM NET SQUARE FOOTAGE (BUILDING) = 148,455

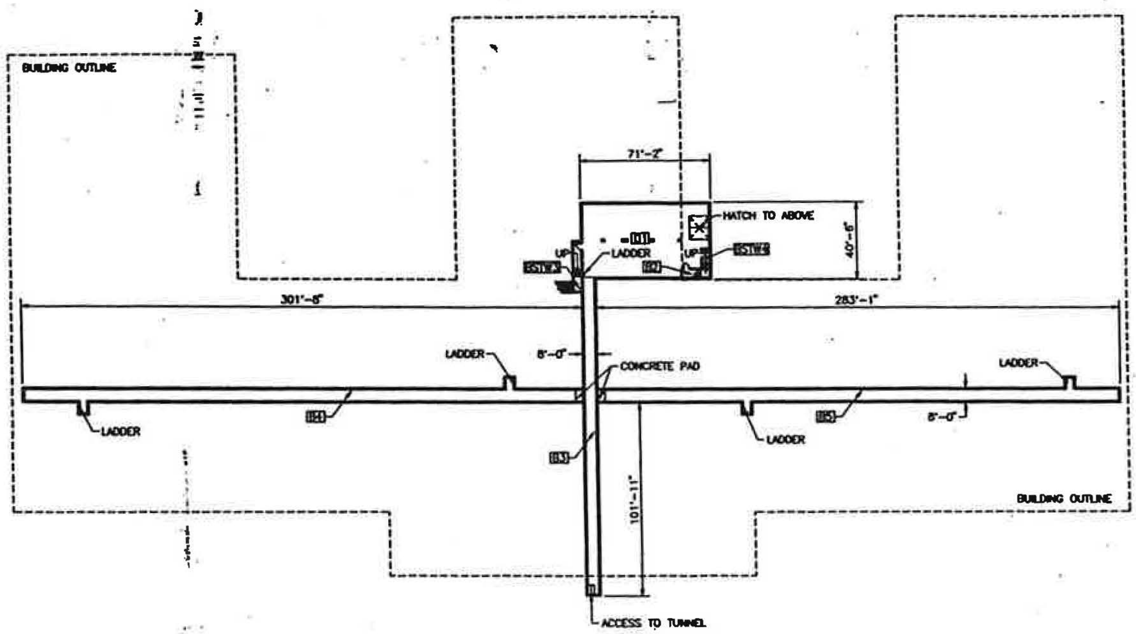
GROSS SQUARE FOOTAGE (BUILDING) = 152,567

## LEGEND

CONCRETE
LOUVER
COLUMNS

## NOTES

1. ALL EXTERIOR WALLS ARE 12" THICK UNLESS OTHERWISE NOTED.
2. ALL INTERIOR WALLS ARE 9" THICK UNLESS OTHERWISE NOTED.
3. REFERENCE DRAWING ENG-AB3.
4. ROOM NET SQUARE FOOTAGE IS COMPUTED BY MEASURING FROM THE INSIDE FACE OF EXTERIOR WALLS TO THE CENTERLINE OF ALL OTHER WALLS. AREAS SHOWN ARE ROUNDED TO THE NEAREST SQUARE FOOT.
5. GROSS SQUARE FOOTAGE IS EQUAL TO ALL FLOOR AREA (INCLUDING ALL OPENINGS IN FLOOR SLABS) MEASURED TO THE OUTER SURFACES OF EXTERIOR OR ENCLOSING WALLS, AND INCLUDES ALL FLOORS, MEZZANINES, HALLS, VESTIBULES, STAIRWELLS, SERVICE AND EQUIPMENT ROOMS, PENTHOUSES, VAULTS, AND ENCLOSED PASSAGES.
6. DIMENSIONS SHOWN ARE ROUNDED TO THE NEAREST INCH.
7. UNABLE TO FIELD VERIFY SERVICE TUNNELS. DIMENSIONS OF THEM TAKEN FROM DRAWING NUMBER C14709.




## BASEMENT FLOOR PLAN

SCALE: 1" = 30'-0"

30 15 0 30 60 120
GRAPHIC SCALE

N

Unclassified/not UCNI
S. Bruchin S-7 9/10/12
LANL Class. Group date

FIELD VERIFIED 8-2-96

| NO | DATE | CLASS REV | DESCRIPTION | DWN | VER | CHKD | SUB | APP |
|---|---|---|---|---|---|---|---|---|
| 1 | 8-19-98 | U | UPDATED RECORD FLOOR PLAN | DWT | DWT | CS | DV | LB |

JOHNSON CONTROLS

AS-BUILT RECORD FLOOR PLAN
TECH SHOPS

ARCH: BASEMENT FLOOR PLAN

BLDG 39 TA-3

DRAWN D. TIDEMAN
VERIFIED DWT
CHECKED D. SANDOVAL
DATE 8-19-9?

SUBMITTED DUANE VIGIL 10-10-96
APPROVED FOR RELEASE LARRY BAYS

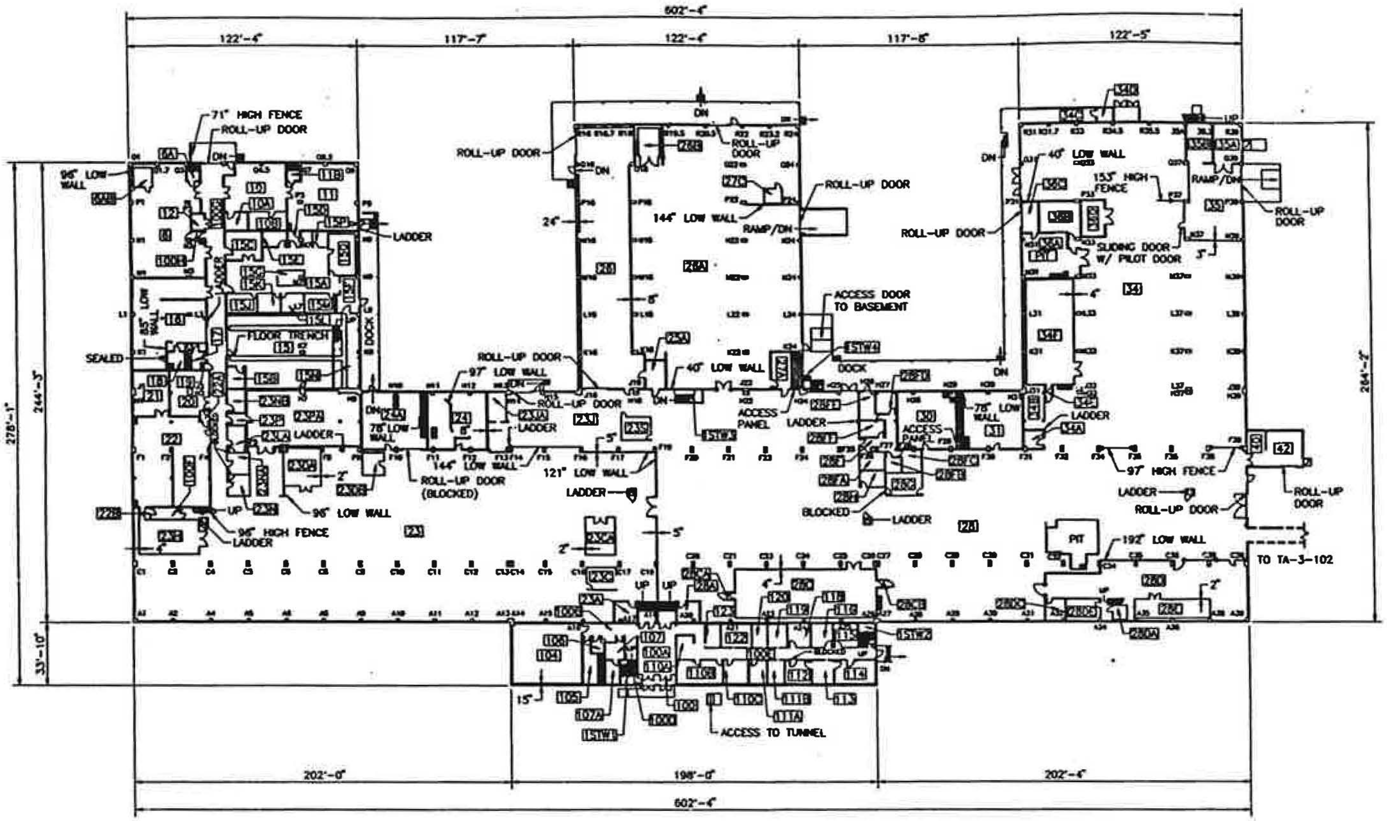
Los Alamos — Los Alamos National Laboratory, Los Alamos, New Mexico 87545

SHEET 1 — 1 of 3

CLASSIFICATION U REVIEWER T. GUSDORF DATE 12-19-96

PROJECT ID 7556
DRAWING NO AB3
REV 1

JCI NO 91-011




## ROOM INFORMATION CHART

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| 6A | 43 | 23N | 134 | 35 | 1243 |
| 6AB | 106 | 23NA | 135 | 35A | 321 |
| 10 | 811 | 23NB | 132 | 35B | 338 |
| 10A | 122 | 23P | 70 | 35C | 247 |
| 10B | 211 | 23PA | 1858 | 35D | 407 |
| 11 | 1259 | 23S | 200 | 35E | 155 |
| 11B | 46 | 24 | 625 | 35F | 223 |
| 12 | 63 | 24A | 1010 | 40 | 193 |
| 15 | 2160 | 25A | 175 | 42 | 326 |
| 15A | 1233 | 26 | 4008 | 100 | 103 |
| 15B | 121 | 26A | 11835 | 100A | 325 |
| 15C | 316 | 26B | 325 | 100B | 322 |
| 15D | 62 | 27A | 226 | 100C | 115 |
| 15E | 116 | 27C | 77 | 100D | 181 |
| 15F | 226 | 28 | 29576 | 100E | 185 |
| 15G | 118 | 28A | 149 | 100F | 1727 |
| 15H | 176 | 28B | 1984 | 100H | 35 |
| 15J | 134 | 28BA | 27 | 104 | 1221 |
| 15K | 179 | 28BB | 27 | 105 | 180 |
| 15L | 564 | 280 | 2439 | 106 | 62 |
| 15M | 74 | 280A | 65 | 107 | 116 |
| 15N | 381 | 28C | 136 | 107A | 192 |
| 15O | [illegible] | 28D | 235 | 110A | 127 |
| 16 | 1727 | 28E | 487 | 110B | 320 |
| 17 | 75 | 28F | 240 | 110C | 174 |
| 18 | 38 | 28FA | 155 | 111A | 128 |
| 19 | [illegible] | 28FB | 75 | 111B | 120 |
| 20 | 303 | 28FC | 140 | 112 | 183 |
| 21 | 478 | 28FD | 134 | 113 | 151 |
| 22 | 1937 | 28FE | 145 | 114 | 276 |
| 22A | 42 | 28FF | 124 | 115 | 133 |
| 22B | 40 | 28G | 238 | 116 | 159 |
| 23 | 21894 | 28H | 132 | 118 | 169 |
| 23A | 149 | 30 | 984 | 119 | 141 |
| 23AA | 150 | 31 | 982 | 120 | 153 |
| 23AB | 316 | 34 | 12089 | 122 | 224 |
| 23AC | 401 | 34A | 116 | 123 | 132 |
| 23B | 140 | 34B | 279 | 1STW1 | 133 |
| 23C | 407 | 34C | 345 | 1STW2 | 79 |
| 23D | 2800 | 34D | 99 | 1STW3 | 98 |
| 23DA | 168 | 34E | 99 | UTILITY 1 | 303 |

TOTAL ROOM NET SQUARE FOOTAGE (THIS SHEET) = 129,227

GROSS SQUARE FOOTAGE (THIS SHEET) = 131,082

TOTAL ROOM NET SQUARE FOOTAGE (BUILDING) = 148,455

GROSS SQUARE FOOTAGE (BUILDING) = 152,567

Unclassified/Not UCNI
S Bonelum 9/10/02
LANL Class. Group
date

## LEGEND

CONCRETE
CONCRETE BLOCK
LOUVER
UTILITY SPACE
WINDOW
WOOD OR METAL STUD
CHAIN LINK FENCE
COLUMNS

## FIRST FLOOR PLAN

SCALE: 1" = 30'-0"

30 15 0 30 60 120
GRAPHIC SCALE

N

## NOTES

1. ALL EXTERIOR WALLS ARE 8" THICK UNLESS OTHERWISE NOTED.
2. ALL INTERIOR WALLS ARE 6" THICK UNLESS OTHERWISE NOTED.
3. REFERENCE DRAWING ENG-AB3.
4. ROOM NET SQUARE FOOTAGE IS COMPUTED BY MEASURING FROM THE INSIDE FACE OF EXTERIOR WALLS TO THE CENTERLINE OF ALL OTHER WALLS. AREAS SHOWN ARE ROUNDED TO THE NEAREST SQUARE FOOT.
5. GROSS SQUARE FOOTAGE IS EQUAL TO ALL FLOOR AREA (INCLUDING ALL OPENINGS IN FLOOR SLABS) MEASURED TO THE OUTER SURFACES OF EXTERIOR OR ENCLOSING WALLS, AND INCLUDES ALL FLOORS, MEZZANINES, HALLS, VESTIBULES, STAIRWELLS, SERVICE AND EQUIPMENT ROOMS, PENTHOUSES, VAULTS, AND ENCLOSED PASSAGES.
6. DIMENSIONS SHOWN ARE ROUNDED TO THE NEAREST INCH.

| NO | DATE | CLASS REV | DESCRIPTION | DWN | CHKD | CS | DV | LB |
|---|---|---|---|---|---|---|---|---|
| 1 | 9-19-96 | U | UPDATED RECORD FLOOR PLAN | DWT | DWT | | | |

JOHNSON CONTROLS

AS-BUILT RECORD FLOOR PLAN
TECH SHOPS
ARCH: FIRST FLOOR PLAN

DRAWN D. TIDEMAN
VERIFIED
CHECKED C. SANDOVAL
DATE 9-19-96

BLDG 39 TA-3
SUBMITTED DUANE VICK
APPROVED FOR RELEASE LARRY BAYS

Los Alamos — Los Alamos National Laboratory, Los Alamos, New Mexico 87545

SHEET 2 of 3

CLASSIFICATION U REVIEWER T. DUSODRF DATE 12-19-96

PROJECT ID 7556 DRAWING NO AB3 REV 1

JCI NO 91-011

FIELD VERIFIED 8-2-96

| RM NO | NET SQ FOOTAGE | RM NO | NET SQ FOOTAGE | RM NO | NET SQ FOOTAGE |
|---|---|---|---|---|---|
| ROOM INFORMATION CHART | | | | | |
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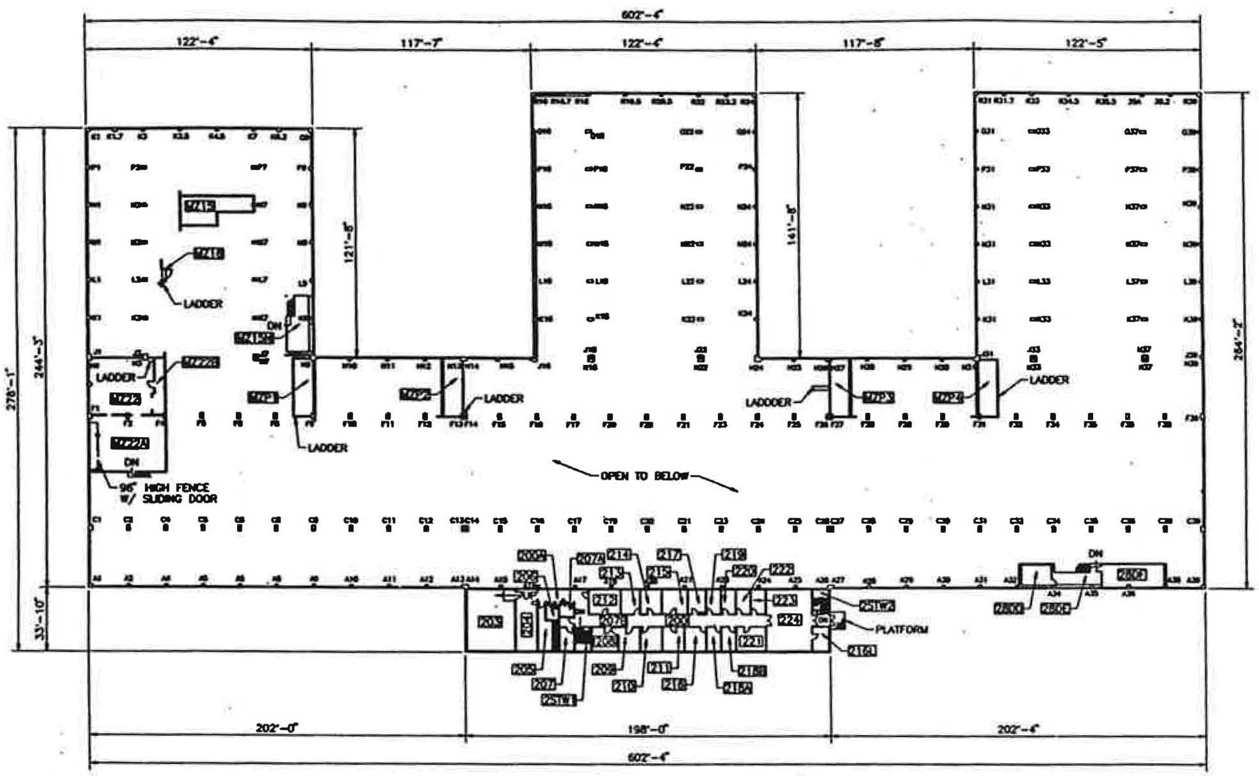
| 200A | 241 | 215 | 180 | MZ15 | 493 |
| 203 | 642 | 216 | 139 | MZ15N | 315 |
| 204 | 367 | 216A | 119 | MZ16 | 14 |
| 205 | 174 | 217 | 125 | MZ22 | 1036 |
| 206 | 62 | 218A | 104 | MZ22A | 1274 |
| 207 | 104 | 218B | 104 | MZ22B | 201 |
| 207A | 32 | 219 | 104 | MZP1 | 353 |
| 207B | 44 | 220 | 104 | MZP2 | 339 |
| 208 | 189 | 221 | 206 | MZP3 | 370 |
| 209 | 156 | 222 | 104 | MZP4 | 349 |
| 210 | 155 | 223 | 105 | 25TW1 | 121 |
| 211 | 155 | 224 | 405 | 25TW2 | 127 |
| 212 | 223 | 280D | 170 | UTILITY 2 | 64 |
| 213 | 136 | 280E | 193 | | |

TOTAL ROOM NET SQUARE FOOTAGE (THIS SHEET) = 11,858

GROSS SQUARE FOOTAGE (THIS SHEET) = 12,242

TOTAL ROOM NET SQUARE FOOTAGE (BUILDING) = 148,455

GROSS SQUARE FOOTAGE (BUILDING) = 152,567




## LEGEND

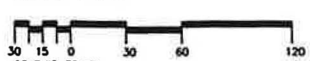
CONCRETE
CONCRETE BLOCK
UTILITY SPACE
WINDOW
WOOD OR METAL STUD
CHAIN LINK FENCE
COLUMNS

## NOTES

1. ALL EXTERIOR WALLS ARE 12" THICK UNLESS OTHERWISE NOTED.
2. ALL INTERIOR WALLS ARE 6" THICK UNLESS OTHERWISE NOTED.
3. REFERENCE DRAWING ENG-AB3.
4. ROOM NET SQUARE FOOTAGE IS COMPUTED BY MEASURING FROM THE INSIDE FACE OF EXTERIOR WALLS TO THE CENTERLINE OF ALL OTHER WALLS. AREAS SHOWN ARE ROUNDED TO THE NEAREST SQUARE FOOT.
5. GROSS SQUARE FOOTAGE IS EQUAL TO ALL FLOOR AREA (INCLUDING ALL OPENINGS IN FLOOR SLABS) MEASURED TO THE OUTER SURFACES OF EXTERIOR OR ENCLOSING WALLS, AND INCLUDES ALL FLOORS, MEZZANINES, HALLS, VESTIBULES, STAIRWELLS, SERVICE AND EQUIPMENT ROOMS, PENTHOUSES, VAULTS, AND ENCLOSED PASSAGES.
6. DIMENSIONS SHOWN ARE ROUNDED TO THE NEAREST INCH.
7. UNABLE TO FIELD VERIFY ROOM AT MZ16.

## SECOND FLOOR PLAN

SCALE: 1" = 30'-0"




N

Unclassified/Not UCNI
S-7 9/10/02
LANL Class. Group date

FIELD VERIFIED 8-2-96

| NO | DATE | CLASS REV | DESCRIPTION | DWN | VER | CHKD | SUB | APP |
|---|---|---|---|---|---|---|---|---|
| 1 | 9-19-96 | U | UPDATED RECORD FLOOR PLAN | DWT | DWT | CS | DV | LB |

JOHNSON CONTROLS

AS-BUILT RECORD FLOOR PLAN
TECH SHOPS

ARCH: SECOND & MEZZANINE FLOOR PLAN

DRAWN: D. TIDEMAN
VERIFIED: DWT
CHECKED: SANDOVAL
DATE: 9-19-96

BLDG 39 TA-3

SUBMITTED: DUANE VIGIL
APPROVED FOR RELEASE: LARRY BAYS

Los Alamos — Los Alamos National Laboratory, Los Alamos, New Mexico 87545

SHEET 3 OF 3

CLASSIFICATION U REVIEWER T. DUSDORF DATE 12-19-96

PROJECT ID 7556 DRAWING NO AB3 REV 1

JO NO 91-011

# Appendix C: Photographs of the Technical Shops Building (TA-03-0039)

TA-03-0039 center wing, east facade


TA-03-0039 south wing, east facade

TA-03-0039 south wing, east facade vent penetration and sash damage detail

TA-03-0039 south wing, east facade vent penetration and sash damage detail

TA-03-0039 center wing, south facade

TA-03-0039 south portion of spine, west facade

TA-03-0039 admin wing on left, spine on right facing north

TA-03-0039 center wing, north facade


TA-03-0039 center wing (foreground) and south wing (background), north facades


TA-03-0039 north wing (foreground) and center wing (background), north and east facades


TA-03-0039 center wing, north and east facades

TA-03-0039 north portion of spine, east facade


TA-03-0039 north portion of spine, east facade

TA-03-0039 center wing and north portion of spine, north and east facades

TA-03-0039 center and south wings, north facades

TA-03-0039 center and south wings, north facades


TA-03-0039 center wing, north facade

TA-03-0039 center wing and north portion of spine, north and east facades


TA-03-0039 north portion of spine, east facade


TA-03-0039 center wing, north facade


TA-03-0039 center wing (left), north portion of spine (right), north and east facades

TA-03-0039 center wing (left), north portion of spine (right), north east facades

TA-03-0039 north portion of spine (left, center), north wing (right), east and south facades

TA-03-0039 north portion of spine (left), north wing (right), east and south facades

TA-03-0039 center wing (foreground), south wing (background), east facade

TA-03-0039 center wing (foreground), south wing (background), east facade


TA-03-0039 south portion of spine (left), center wing (right), east facades

TA-03-0039 south wing (left), south portion of spine (right), north and east facades

TA-03-0039 south wing, north facade

TA-03-0039 south wing, north facade

TA-03-0039 south wing (left), south portion of spine (center), center wing (right), north and east facades

TA-03-0039 south wing (left), south portion of spine (right), north and east facades

TA-03-0039 south portion of spine (left), center wing (right), east and south facades

TA-03-0039 center wing, south and east facades

TA-03-0039 center wing, south facade

TA-03-0039 south portion of spine, east facade

TA-03-0039 south wing, north facade

TA-03-0039 south wing, east facade


TA-03-0039 south wing, east facade


TA-03-0039 south wing, east facade


TA-03-0039 south wing, east facade


TA-03-0039 south wing, east facade

TA-03-0039 south wing, east facade

TA-03-0039 south wing (left), south portion of spine, east facades

TA-03-0039 south wing, south facade


TA-03-0039 south wing, east facade

TA-03-0039 south wing, south facade

TA-03-0039 south wing, south facade

TA-03-0039 south wing, south facade

TA-03-0039 south wing, south facade

TA-03-0039 south wing, south facade

TA-03-0039 south wing, south facade

TA-03-0039 south wing, south and east facades

TA-03-0039 south wing clerestory, south and east facades

TA-03-0039 south wing clerestory, south facade

TA-03-0039 south wing clerestory, south facade

TA-03-0039 south wing (foreground), south portion of spine (center), center wing (right), north portion of spine (background, south and east facades

TA-03-0039 south wing (foreground), south portion of spine (left), center wing (center), north portion of spine (back left), north wing (background), south and east facades

TA-03-0039 south wing (foreground), center wing (background), south facade

TA-03-0039 south wing, north facade

TA-03-0039 south wing (foreground), center wing (background), south facade

TA-03-0039 south wing (foreground), center wing (background), south facade

TA-03-0039 south wing (foreground), center wing (background), south facade

TA-03-0039 center wing, south facade

TA-03-0039 south wing (foreground), center wing (background), south and east facades

TA-03-0039 south wing, east facade

TA-03-0039 center wing, south facade

TA-03-0039 south portion of spine, east facade

TA-03-0039 south wing (left), south portion of spine (right), north and east facades

TA-03-0039 center wing, south and east facades

TA-03-0039 center wing, east facade, cracked window coating and delaminated glazing detail

TA-03-0039 center wing, east facade, cracked window coating and delaminated glazing detail

TA-03-0039 center wing, east facade

TA-03-0039 center wing, east facade

## Appendix D:  Window Frame and Glass Product Selections

# WINDOW FRAMES & OPERATION

WINDOWS

# GLASSVENT® UT (ULTRA THERMAL) WINDOWS

Never has something so seamless offered so much thermal performance. GLASSvent® UT (Ultra Thermal) Windows are visually frameless concealed vents designed to provide a ventilation option for curtain wall with high thermal performance.

- 3-1/8″ (79.4mm) or 3-7/8 ″ (98.4mm) depth (CW)
- 4-3/8″ (111.1mm) or 5-1/8″ (130.2mm) depth (AW)
- Commercial grade window (CW) and architectural grade window (AW)
- Ultra-thermal performance
- Casement or projecting configuration
- Blast mitigation (AW only), hurricane resistance (AW only)



+2

Features

Sustainability

Documentation

Finishes

Specs

CAD Details

Revit / BIM

Warranty

Safety Data Sheets

- Tested to US and Canadian standards
- 45° mitered vent and frame corners
- Staked corner joinery
- Architectural anodized finishes and applied coatings
- Large missile and small missile hurricane impact tested – AW (deep) only
- Blast mitigation tested – AW (deep) only
- Trim cap available in #29 black anodized finish only

CONTACT

### Architectural Grade

- CW-PG70-AP / AW-PG90-AP – projecting
- CW-PG70-C / AW-PG90-C – casement

### Purpose built with accessibility in mind

Kawneer has a functional and aesthetically pleasing ADA-compliant operating handle option for GLASSvent® UT (Ultra-Thermal) Project Out Windows.

1. Available on AW Version (4 3/8″/111.1 mm depth), project-out awning GLASSvent® UT Windows up to standard AAMA gateway test size.
2. The handle has been laboratory-tested and proven.
3. The ergonomic and stylish Omni Drive™ operator from Caldwell features an attractive design with its easy-to-use horizontal handle movement and comes in two sizes: a 12″ handle size for ADA compliance and an 8″ handle size for other non-ADA applications.

This option provides a solution to meet the Americans with Disabilities Act (ADA) recommendation that operable windows require no more than a five-pound operating force* while also providing a complimentary handle for non-ADA applications.

*Laws and building and safety codes governing the design and use of glazed window products vary widely. Seller does not control the selection of product configurations, operating hardware or glazing materials, and assumes no responsibility.

### Thermal Technology

Find out more here.

### Blast Resistant

Find out more here.

CONTACT

### Hurricane Resistant

Find out more here.

### Related Product Approvals

- Florida Product or Application Search
  20500.1, 20501.1
- Texas TDI-Developed Evaluation Reports
  WIN-2642, WIN-2643

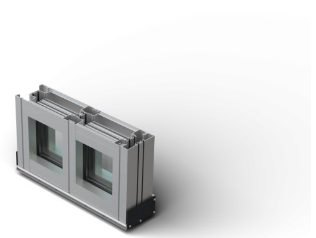
Find out more here.

CONTACT

## Related Products

Explore our product portfolio and determine which products are most suitable for your project.

ALL PRODUCTS



Trifab® VersaGlaze® 451/451T Framing System

190/350/500 Standard Entrances

# Best-in-Class Thermal Performance in a Visually Concealed Vent

Never before has something so seamless offered so much thermal performance. GLASSvent™ UT (Ultra Thermal) Windows are visually frameless concealed vents designed to provide a ventilation option for curtain wall with high thermal performance. The extraordinary thermal performance of GLASSvent™ UT Windows exceeds the thermal standards of many high-performing framing systems. Engineered for seamless integration with the 1600UT System™1 Curtain Wall, GLASSvent™ UT Windows can also be inserted into other Kawneer captured curtain walls and front set framing systems.

In addition to meeting code requirements, GLASSvent™ UT Windows are the ideal solution for architects and designers who want to provide fresh-air ventilation without sacrificing thermal performance in curtain wall or storefront applications. As with all Kawneer windows, this ultra thermal vent is made from material that will never rot, warp or buckle due to moisture and weather exposure.

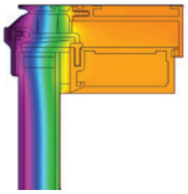
## PERFORMANCE

This high-performance vent is available for integration with curtain wall and framing systems to create a complete, advanced, thermally superior solution for commercial construction. GLASSvent™ UT Windows are engineered to meet or exceed the minimum requirements for the architectural window performance class, including life-cycle testing – the highest level attainable.

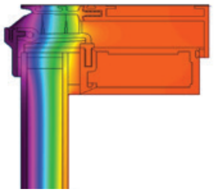
GLASSvent™ UT Windows have been rigorously tested to both AAMA and CSA standards for air, water, structural, thermal and condensation performance. Both 1" (25.4 mm) and 1-3/4" (44.5 mm) insulating glass options are available for superior sound and enhanced thermal benefits.

PERFORMANCE TEST STANDARDS

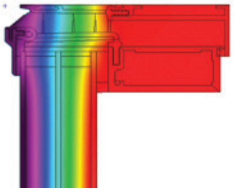
**Thermal simulations show temperature variations from exterior/cold side to interior/warm side of GLASSvent™ UT (Ultra Thermal) Windows.**



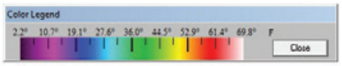
**Double Pane Clear Glass**



**Double Pane Low-e Argon glass**

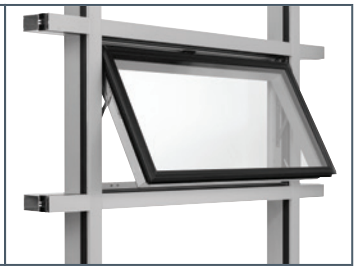


**Triple Pane Low-e Argon Glass**




**Exterior view of GLASSvent™ UT Window in curtain wall**

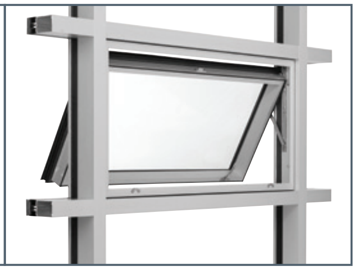
**Closed position**



**Open position**

**Interior view of GLASSvent™ UT Window in curtain wall**

**Closed position**



**Open position**

| | |
|---|---|
| Air Infiltration | ASTM E283 |
| Water | ASTM E331, E547 |
| Structural – Uniform Wind Load | ASTM E330 |
| Thermal Cycling | AAMA 501.5 |
| Thermal Transmittance – U-Factor | AAMA 1503, 507; NFRC 100 |
| Condensation Resistance (CRF, I, CR) | AAMA 1503; CSA A440.2; NFRC 500 |
| Overall Solar Heat Gain Coefficient (SHGC, VT) | AAMA 507; NFRC 200 |
| Sound Transmission (STC, OITC) | ASTM E90, E1425; AAMA 1801 |

## FABRICATION AND INSTALLATION

GLASSvent™ UT Windows are available with the option to buy the window factory glazed by Kawneer or open for glazing by the window installer.

The flexibility of GLASSvent™ UT Windows gives architects an ultra thermal option that combines high-performance vents with high-performance curtain walls and storefront systems, including the 1600UT System™1 Curtain Wall.

## AESTHETICS AND DESIGN OPTIONS

The innovative, patent-pending design of GLASSvent™ UT Windows provides a sleek ventilation alternative for Kawneer curtain walls and storefront framing systems. Vents are available as project-out or outswing casement windows without the exterior aluminum profile sightlines that come with typical operating vents. More than a streamlined appearance, GLASSvent™ UT Windows also deliver a convenient means for architects to ventilate with fresh air, which has been shown to improve indoor air quality, as well as improve occupant comfort, well-being and productivity.

Attractive stainless steel four-bar hinges provide positive control for trouble-free operation. Durable cast white bronze locking hardware delivers strength and security, and integral frame-mounted insect screens ensure building occupant comfort.

# KAWNEER ANODIZED FINISHES

Kawneer gives you a wide variety of anodized finishes with attractive alternatives. The benefit of a durable, anodized finish is married to the beauty of some very dynamic and exciting colors.

At the start of every design, there's a choice of how you want to finish. Contact your Kawneer sales rep for the information on these and other finishes available from Kawneer.

| | KAWNEER FINISH NO. | COLOR | ALUMINUM ASSOCATION SPECIFICATION | OTHER COMMENTS |
|---|---|---|---|---|
| | #14 | CLEAR | AA-M10C21A41 | Architectural Class I (0.7 mils minimum) |
| | #17 | CLEAR | AA-M10C21A31 | Architectural Class II (0.4 mils minimum) |
| | #40 | DARK BRONZE | AA-M10C21A44 | Architectural Class I (0.7 mils minimum) |
| | #29 | BLACK | AA-M10C21A44 | Architectural Class I (0.7 mils minimum) |




Technology Park/Atlanta
555 Guthridge Court
Norcross, GA 30092

770.449.5555 TEL

www.kawneer.com

# GLASS COATINGS

VIRACON®
GLASS IS EVERYTHING®

Viracon PLUS™ Products Gallery Applications Resources Company Careers Contact

Products

# 1" (25MM) INSULATING VE1-2M

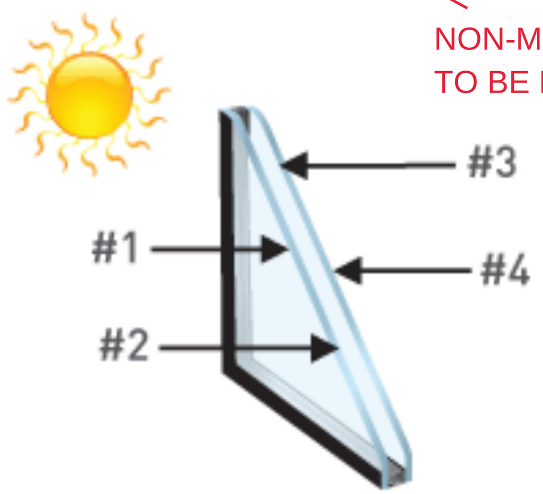
PRINTEMAILDOWNLOAD

Reflected Color



Transmitted Color

NON-MIRRORED, LOW-E COATING
TO BE PLACED ON SURFACE #2




## Performance Data

SHOW DATA AS:

METRIC | IMPERIAL

### Transmittance

| | |
|---|---|
| Visible Light | 70% |
| Solar Energy | 33% |
| UV | 10% |

### Reflectance

| | |
|---|---|
| Visible Light-Exterior | 11% |
| Visible Light-Interior | 12% |
| Solar Energy | 31% |


Enhancements

# PRINTING

Search for the perfect glass →

**Printing on glass is a great way to enhance both the appearance and performance of a building facade.**

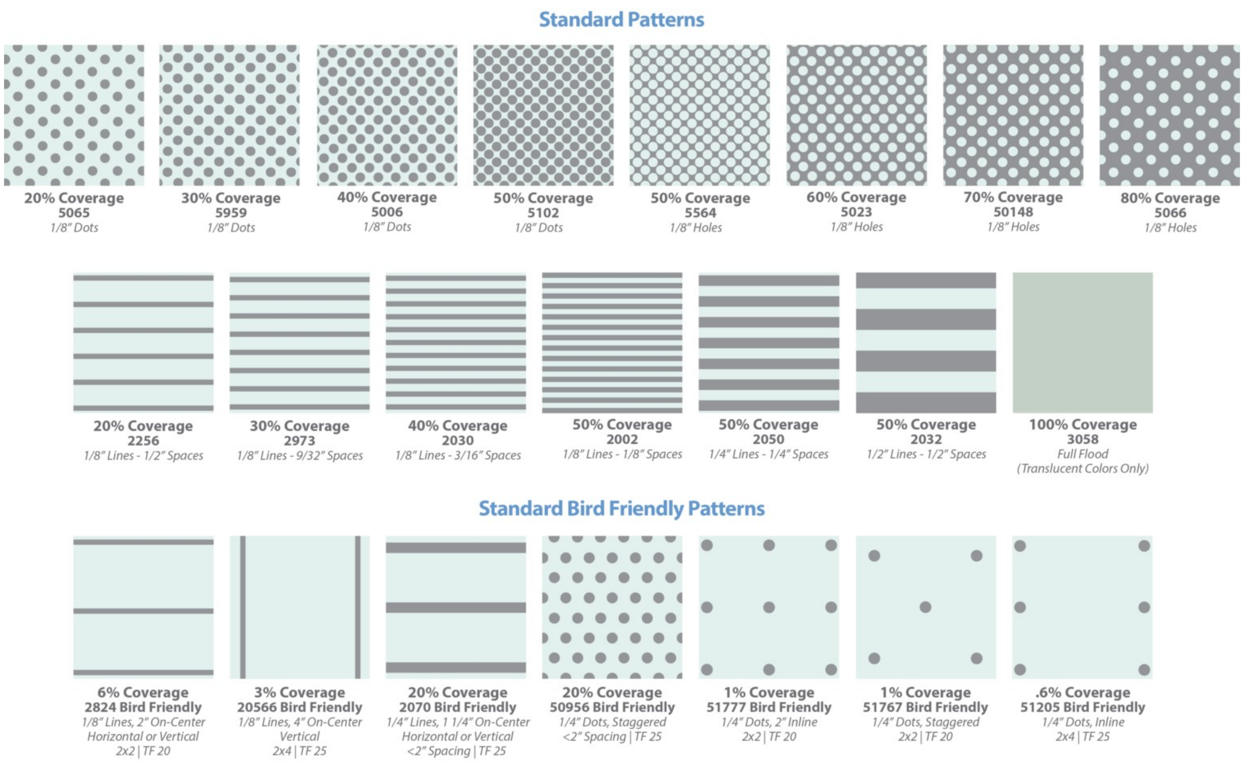
## DigitalDistinctions™ by Viracon

DigitalDistinctions combines the durability of ceramic enamel with the versatility of digital printing. Providing the ability to print multiple colors, graphics and simulate building materials on a single surface, the design possibilities are virtually unlimited. DigitalDistinctions also offers the opportunity to print an image on one side of the glass that is a different color or image than the other side of the glass. Please review our **Printing Design Guidelines** or contact us to discuss your design.

## Standard Printing on Glass

Standard printing with ceramic enamel creates a single-color, repetitive pattern such as lines, dots or holes. Designs with a border, graduation or special edge requirements require a custom print. For standard print pattern orientation information and guidelines for creating custom print patterns, see our **Printing Design Guidelines**. Printed glass with ceramic enamel is UV resistant, improves solar control, and Viracon's Low-E coatings can be applied over the ceramic enamel.

Viracon can offer a wide variety of standard and custom print patterns. Below is Viracon's Standard Print offering – any pattern not listed here would be considered a custom print pattern (contact Viracon to discuss custom print design options):




*Threat Factors listed are only achievable when all criteria are met.

For more information on Bird-Friendly glass, please visit our **Bird-Friendly** page.

## Color Options

The ceramic enamel materials used in the DigitalDistinctions Digital Print and the Standard Print processes are lead free and

## Standard Print Colors

Viracon offers 8 standard ceramic enamel colors to enhance your desired print design

### Opaque Ceramic Enamel Colors

| V951 | V952 | V953 | V954 | V955 | V957 |
|---|---|---|---|---|---|
| *White* | *Warm Gray* | *Medium Gray* | *Gray* | *Black* | *Subdued Gray* |

### Translucent Ceramic Enamel Colors

1' behind glass
5' behind glass

| V1092 | V1093 |
|---|---|
| *Simulated Acid-Etch* | *Simulated Sandblast* |

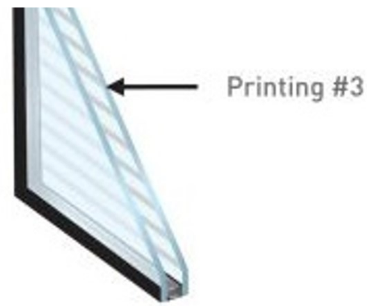
### Custom Opaque Ceramic Enamel Colors

If needed, Viracon also offers 25 custom ceramic enamel colors for an extra fee.
Contact Viracon to discuss optimum glass solutions to fit your design needs.

| VBC2109 | VBC2127 | VBC2015 | VBC2017 | VBC2019 | VBC2033 | VBC2034 | VBC2039 | VBC2073 |
|---|---|---|---|---|---|---|---|---|
| *Dark Gray* | *Stone Gray* | *Iron Gray* | *Gunmetal Gray* | *Smoke Gray* | *Cloud Gray* | *Pewter Gray* | *Timber Gray* | *Pebble Gray* |
| VBC2128 | VBC2002 | VBC2038 | VBC2067 | VBC2129 | VBC2007 | VBC2066 | VBC2104 | VBC2105 |
| *Light Blue* | *Slate Blue* | *Medium Blue* | *Midnight Blue* | *Emerald Green* | *Dark Green* | *Mustard Yellow* | *Dark Gold* | *Light Gold* |
| VBC2014 | VBC2113 | VBC2006 | VBC2055 | VBC2042 | VBC2029 | VBC2111 | | |
| *Alabaster White* | *Frost White* | *Brownish Beige* | *Golden Beige* | *Tan* | *Brown* | *Subdued Bronze* | | |


| | |
|---|---|
| VLT | 76% |
| Winter U-Value | 0.31 |
| Summer U-Value | 0.29 |
| SHGC | 0.55 |


| | |
|---|---|
| VLT | 55% |
| Winter U-Value | 0.31 |
| Summer U-Value | 0.29 |
| SHGC | 0.41 |




| | |
|---|---|
| VLT | 55% |
| Winter U-Value | 0.31 |
| Summer U-Value | 0.29 |
| SHGC | 0.45 |

SIMULATED SANDBLAST
TO BE ON SURFACE #3

## Moiré Pattern

Moiré is an optical phenomenon that typically appears as a wavy, rippled or circular pattern. It is formed when two regularly spaced, non-aligned patterns overlap. Moiré is not a defect in the glass or the printing process but rather a pattern formed by the eye. For additional information, please review **Viracon's Ceramic Enamel and Ink Visual Characteristics Tech Talk.**

Viracon cannot guarantee the future availability of component parts manufactured or supplied by others that are incorporated into Viracon products.

### PRODUCT RESOURCES

BIG Glass Brochure

# PHOTOS OF GLASS SELECTION SAMPLES FROM INTERIOR


Customer: Los Alamos National Laboratory
1" VE1-2M Insulating HS/HS
1/4" (6mm) Clear HS
VE-2M #2
1/2" (13.2mm) spacer - black - argon
1/4" (6mm) Clear HS
V1093 SIM. SANDBLAST Viraspan Print #3058 #3
Performance Data:
VLT: 50%
R Out: 25%
Winter U: 0.25
Summer U: 0.21
SC: 0.35
SHGC: 0.30
LSG: 1.67
Sample Viewed From Exterior

Customer: Los Alamos National Laboratory
1" VE1-2M Insulating HS/HS
1/4" (6mm) Clear HS
VE-2M #2
1/2" (13.2mm) spacer - black - argon
1/4" (6mm) Clear HS
V1093 SIM. SANDBLAST Viraspan Print #3058 #3
Performance Data:
VLT: 50%
R Out: 25%
Winter U: 0.25
Summer U: 0.21
SC: 0.35
SHGC: 0.30
LSG: 1.67
Sample Viewed From Exterior

Customer: Los Alamos National Laboratory
1" VE1 – 2M Insulating HS/HS
1/4" (6mm) Clear HS
VE-2M #2
1/2" (13.2mm) spacer - black - argon
1/4" (6mm) Clear HS
V1093 SIM. SANDBLAST Viraspan Print #3058 #3
Performance Data:
VLT: 50%
R Out: 25%
Winter U: 0.25
Summer U: 0.21
SC: 0.35
SHGC: 0.30
LSG: 1.67
Sample Viewed From Exterior
VIRACON

# PHOTOS OF GLASS SELECTION SAMPLES FROM EXTERIOR


VIRACON
1" VE1 — 2M Insulating HS/HS
Order #: 24042
Line #: 1
This is annealed glass for color evaluation only. For a specific project heat treated glass may be required. Color may vary slightly in actual production line applications.
800-533-2080
www.viracon.com
VIRACON
Customer: Los Alamos National Laboratory
1" VE3 — 2M Insulating HS/HS
Order #: 23591
Line #: 1
This is annealed glass for color evaluation only. For a specific project heat treated glass may be required. Color may vary slightly in actual production line applications.
800-533-2080
www.viracon.com


Order #: 24042
Line #: 1
This is annealed glass for color evaluation only. For a specific project heat treated glass may be required. Color may vary slightly in actual production line applications.
800-533-2080
www.viracon.com
Order #: 23591
Line #: 1
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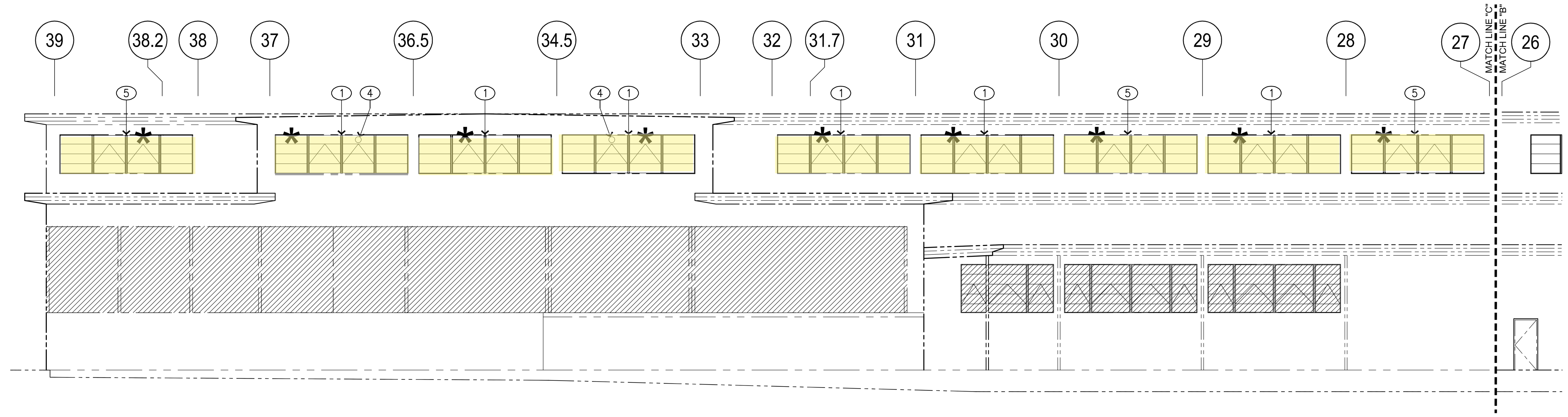
800-533-2080
www.viracon.com

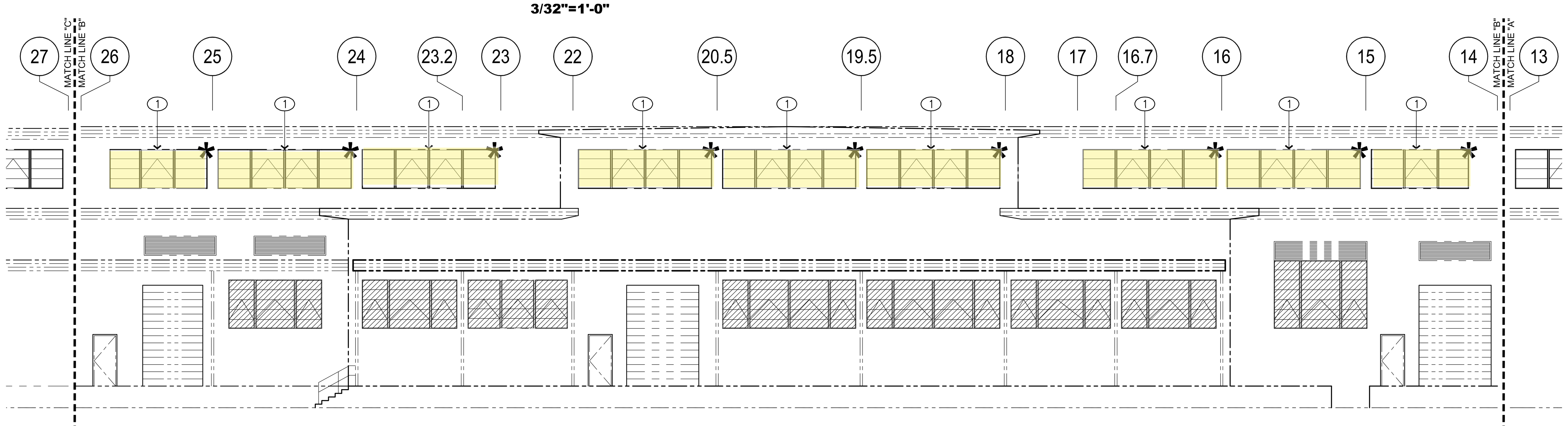

Order #: 24042
Line #: 1
Order #: 23591
Line #: 1
This is annealed glass for color evaluation only. For a specific project heat treated glass may be required. Color may vary slightly in actual production line applications.
800-533-2080
www.viracon.com

# Appendix E:  Selected Project Architectural Drawings



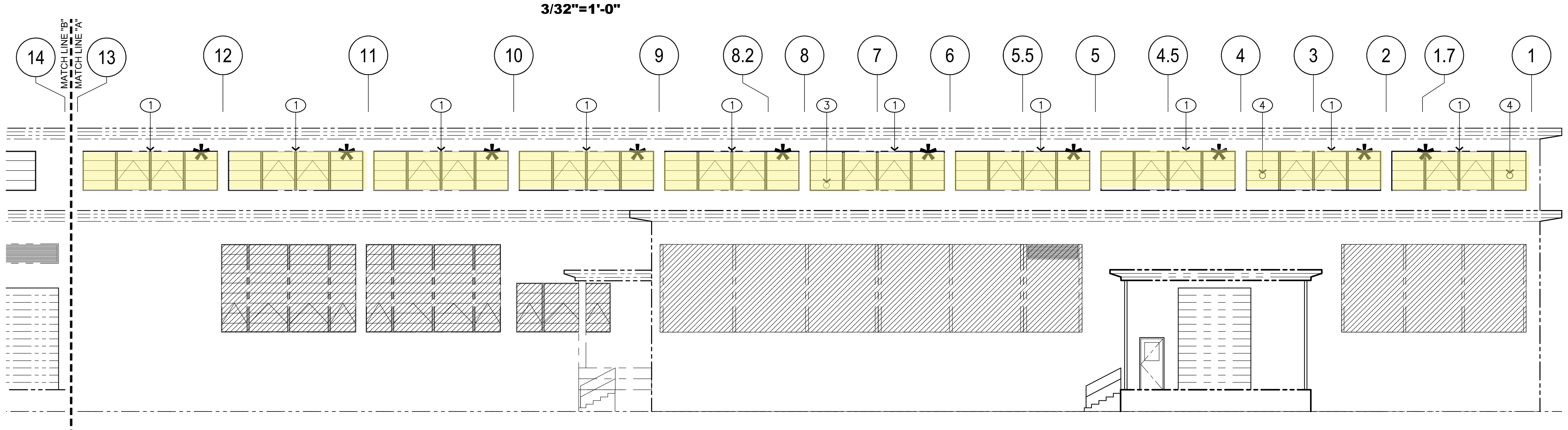

D2 A-2000 **PARTIAL EAST ELEVATION - DEMOLITION**

3/32"=1'-0"



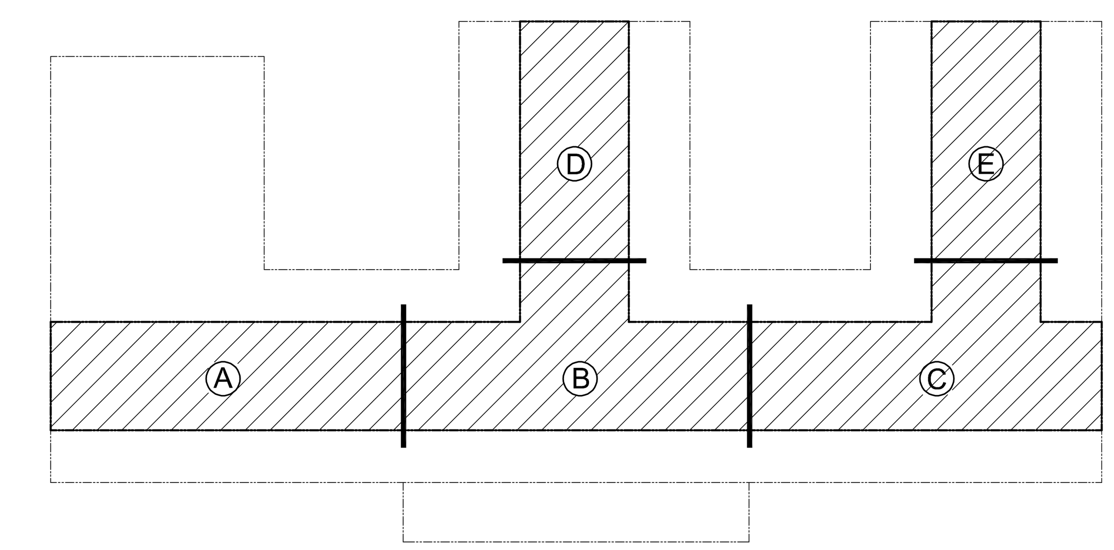

C2 A-2000 **PARTIAL EAST ELEVATION - DEMOLITION**

3/32"=1'-0"




B2 A-2000 **PARTIAL EAST ELEVATION - DEMOLITION**

3/32"=1'-0"




## KEY PLAN - HIGH BAY AREA

SCALE: NONE

## GENERAL NOTES:

A. IF THIS SHEET IS NOT 24"X36" USE GRAPHIC SCALE ACCORDINGLY.
B. REFER TO COMPLETE SET OF ISSUED CONTRACT DOCUMENTS FOR OTHER APPLICABLE NOTES, ABBREVIATIONS AND SYMBOLS.
C. REFER TO SHEET A-7000 FOR OPENING TYPES
D. REFER TO STRUCTURAL FOR DETAILED REQUIREMENTS.
E. COORDINATE INSTALLATION AND REMOVAL OF ALL DUCT PENETRATIONS WITH BUILDING MANAGER.

## KEYED NOTES:

1. REMOVE EXISTING GLAZING SYSTEM.
2. EXISTING STEEL LADDER TO REMAIN.
3. EXISTING EXHAUST DUCT TO REMAIN.
4. REMOVE EXISTING EXHAUST DUCT.

OPENINGS NOT IN SCOPE OF WORK

WINDOW TO BE REMOVED

| | | | |
|---|---|---|---|
| LBO-DESIGN PACKAGE REVIEWER N/A | | | |
| APPROVED FOR RELEASE MICHAEL MCEAHERN, ES-STO | | | |
| SUBMITTED ROBERT SANDERS | | | |
| CHECKED DAVID CHAVEZ | | | |
| DESIGN CORY W COLLINS | | | |
| DRAWN CORY W COLLINS | 0 | DCF-24-03-0039-5723 | 04/15/2024 |
| CLASSIFICATION UNCLASSIFIED | NO | REVISION DESCRIPTION | DATE |

**ENGINEERING SERVICES**

**SHOP WINDOW REPLACEMENT**

**PARTIAL EAST ELEVATIONS - DEMOLITION**

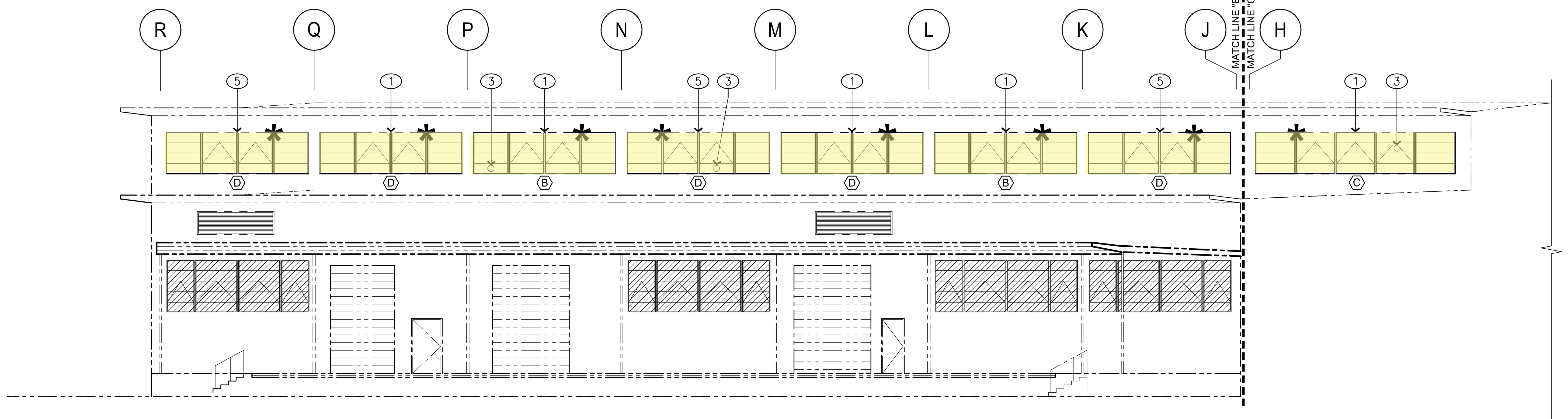
TA 03 BLDG 0039

Los Alamos NATIONAL LABORATORY

PO Box 1663
Los Alamos, New Mexico 87545

SHEET **A-2000** **13** OF **30**

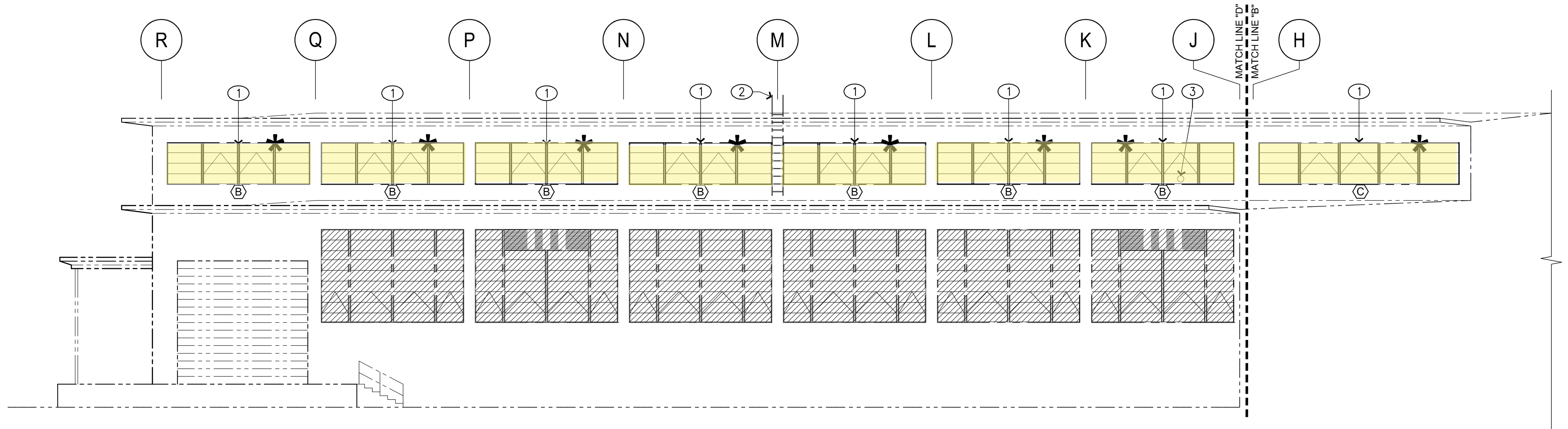
PROJECT ID **ESR 32050** DRAWING NO **C58583-DWG-03-0039-A-2000** REV **0**




D2 / A-2001 **PARTIAL NORTH ELEVATION - DEMOLITION**

2' 0' 4' 8' 16'

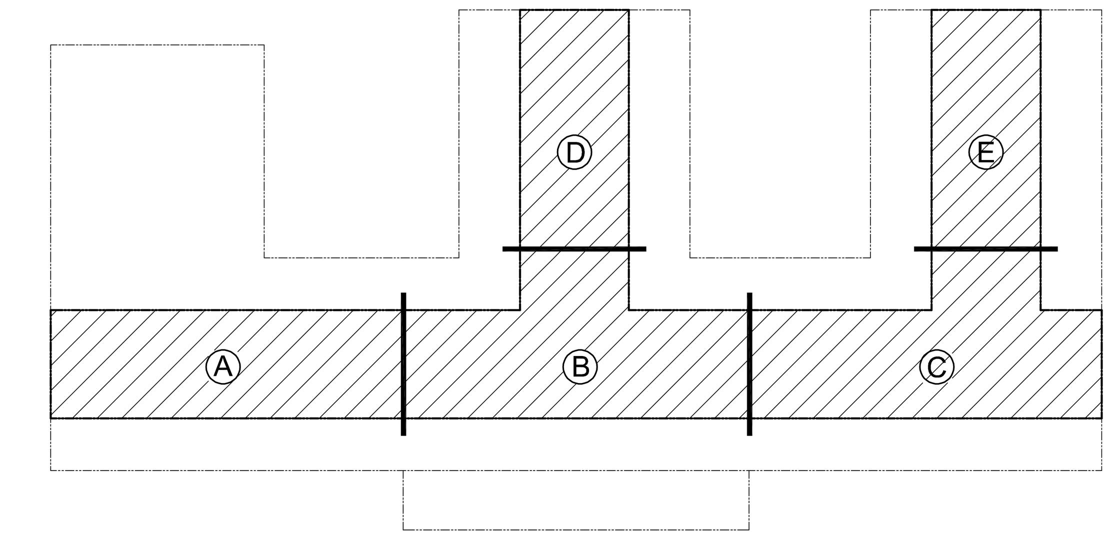
3/32"=1'-0"




C2 / A-2001 **PARTIAL NORTH ELEVATION - DEMOLITION**

2' 0' 4' 8' 16'

3/32"=1'-0"




## KEY PLAN - HIGH BAY AREA

SCALE: NONE

## GENERAL NOTES:

A. IF THIS SHEET IS NOT 24"X36" USE GRAPHIC SCALE ACCORDINGLY.
B. REFER TO COMPLETE SET OF ISSUED CONTRACT DOCUMENTS FOR OTHER APPLICABLE NOTES, ABBREVIATIONS AND SYMBOLS.
C. REFER TO SHEET A-7000 FOR OPENING TYPES
D. REFER TO STRUCTURAL FOR DETAILED REQUIREMENTS.
E. COORDINATE INSTALLATION AND REMOVAL OF ALL DUCT PENETRATIONS WITH BUILDING MANAGER.

## KEYED NOTES:

1. REMOVE EXISTING GLAZING SYSTEM.
2. EXISTING STEEL LADDER TO REMAIN.
3. EXISTING EXHAUST DUCT TO REMAIN.
4. REMOVE EXISTING EXHAUST DUCT.

OPENINGS NOT IN SCOPE OF WORK

WINDOW TO BE REMOVED

| | |
|---|---|
| LBO-DESIGN PACKAGE REVIEWER | N/A |
| APPROVED FOR RELEASE | MICHAEL MCEAHERN, ES-STO |
| SUBMITTED | ROBERT SANDERS |
| CHECKED | DAVID CHAVEZ |
| DESIGN | CORY W COLLINS |
| DRAWN | CORY W COLLINS |
| CLASSIFICATION | UNCLASSIFIED |

| NO | REVISION DESCRIPTION | DATE |
|---|---|---|
| 0 | DCF-24-03-0039-5723 | 04/15/2024 |

# ENGINEERING SERVICES

**SHOP WINDOW REPLACEMENT**

**PARTIAL NORTH ELEVATIONS - DEMOLITION**

TA 03 BLDG 0039

Los Alamos NATIONAL LABORATORY

PO Box 1663
Los Alamos, New Mexico 87545

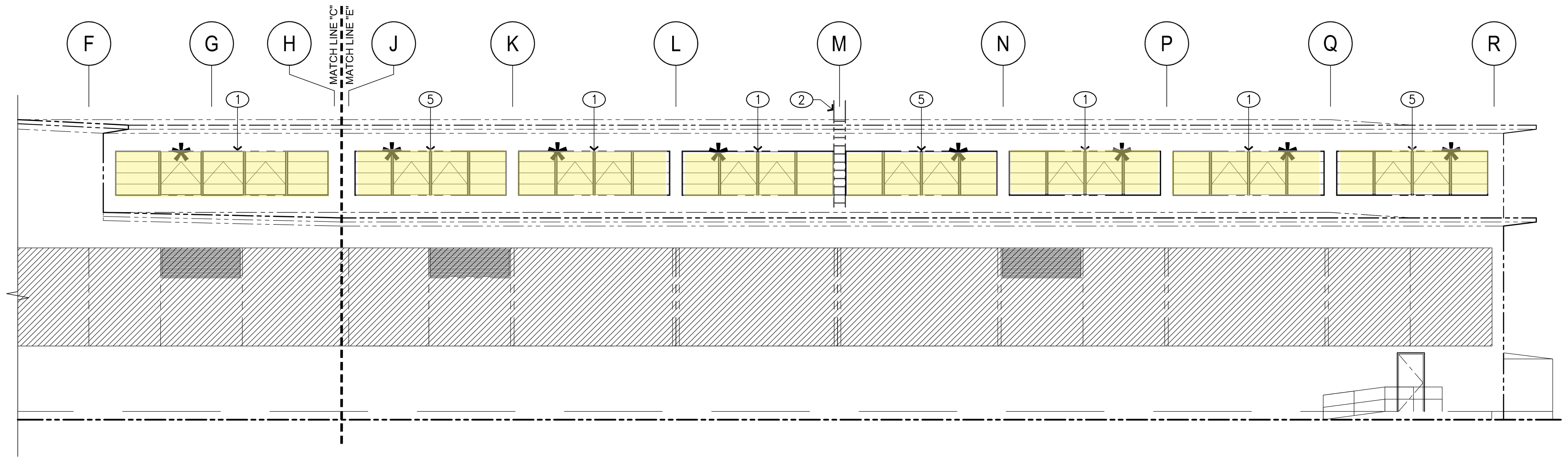
SHEET A-2001

14 OF 30

PROJECT ID ESR 32050

DRAWING NO C58583-DWG-03-0039-A-2001

REV 0

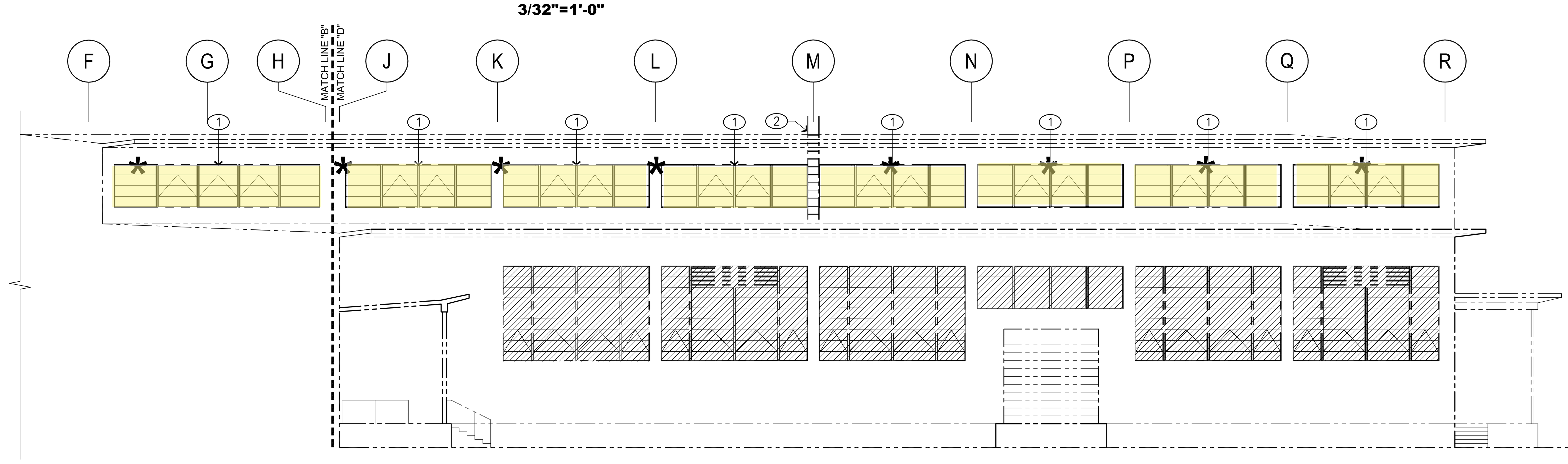



D2
A-2002

## PARTIAL SOUTH ELEVATION - DEMOLITION

2' 0' 4' 8' 16'

3/32"=1'-0"

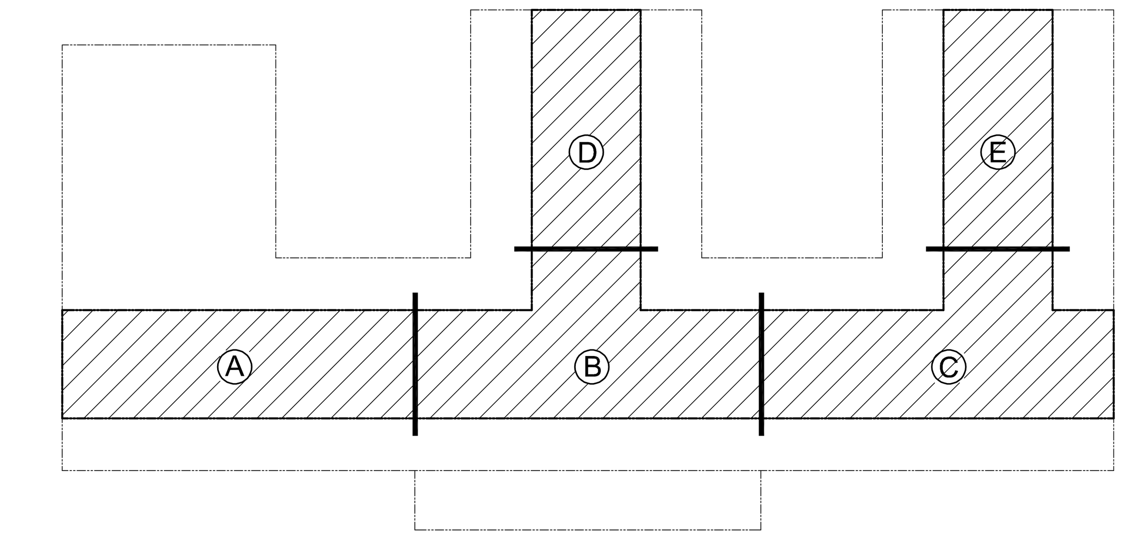



C2
A-2002

## PARTIAL SOUTH ELEVATION - DEMOLITION

2' 0' 4' 8' 16'

3/32"=1'-0"




## KEY PLAN - HIGH BAY AREA

SCALE: NONE

## GENERAL NOTES:

A. IF THIS SHEET IS NOT 24"X36" USE GRAPHIC SCALE ACCORDINGLY.
B. REFER TO COMPLETE SET OF ISSUED CONTRACT DOCUMENTS FOR OTHER APPLICABLE NOTES, ABBREVIATIONS AND SYMBOLS.
C. REFER TO SHEET A-7000 FOR OPENING TYPES
D. REFER TO STRUCTURAL FOR DETAILED REQUIREMENTS.
E. COORDINATE INSTALLATION AND REMOVAL OF ALL DUCT PENETRATIONS WITH BUILDING MANAGER.

## KEYED NOTES:

1 REMOVE EXISTING GLAZING SYSTEM.
2 EXISTING STEEL LADDER TO REMAIN.
3 EXISTING EXHAUST DUCT TO REMAIN.
4 REMOVE EXISTING EXHAUST DUCT.

OPENINGS NOT IN SCOPE OF WORK

WINDOW TO BE REMOVED

| | | | |
|---|---|---|---|
| LBO-DESIGN PACKAGE REVIEWER<br>N/A | | | |
| APPROVED FOR RELEASE<br>MICHAEL MCEAHERN, ES-STO | | | |
| SUBMITTED<br>ROBERT SANDERS | | | |
| CHECKED<br>DAVID CHAVEZ | | | |
| DESIGN<br>CORY W COLLINS | | | |
| DRAWN<br>CORY W COLLINS | 0 | DCF-24-03-0039-5723 | 04/15/2024 |
| CLASSIFICATION<br>UNCLASSIFIED | NO | REVISION DESCRIPTION | DATE |

# ENGINEERING SERVICES

**SHOP WINDOW REPLACEMENT**

**PARTIAL SOUTH ELEVATIONS - DEMOLITION**

TA 03 BLDG 0039

Los Alamos NATIONAL LABORATORY
PO Box 1663
Los Alamos, New Mexico 87545

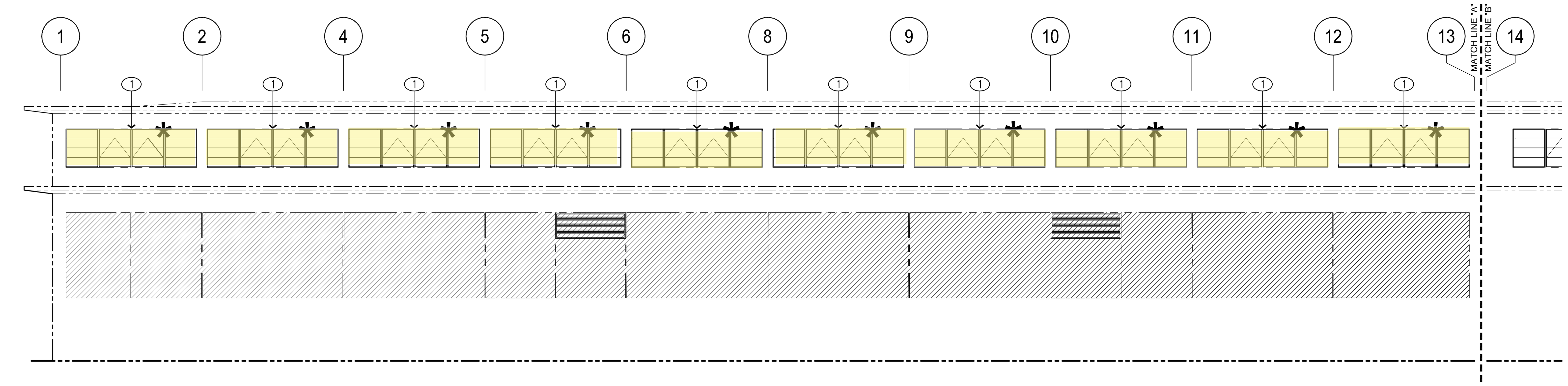
SHEET A-2002

15 OF 30

PROJECT ID ESR 32050

DRAWING NO C58583-DWG-03-0039-A-2002

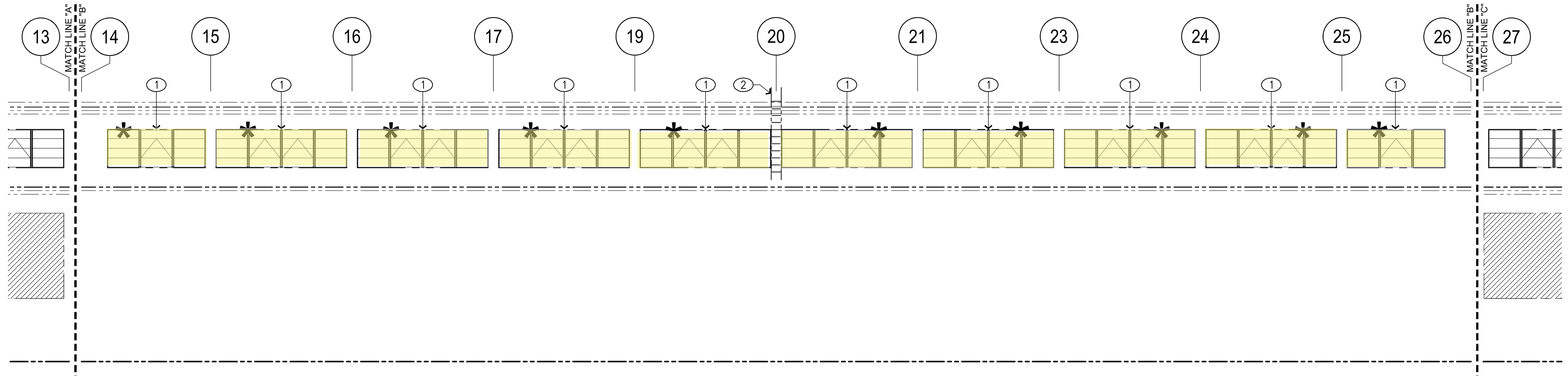
REV 0




D2 A-2003 **PARTIAL WEST ELEVATION - DEMOLITION**

2' 0' 4' 8' 16'

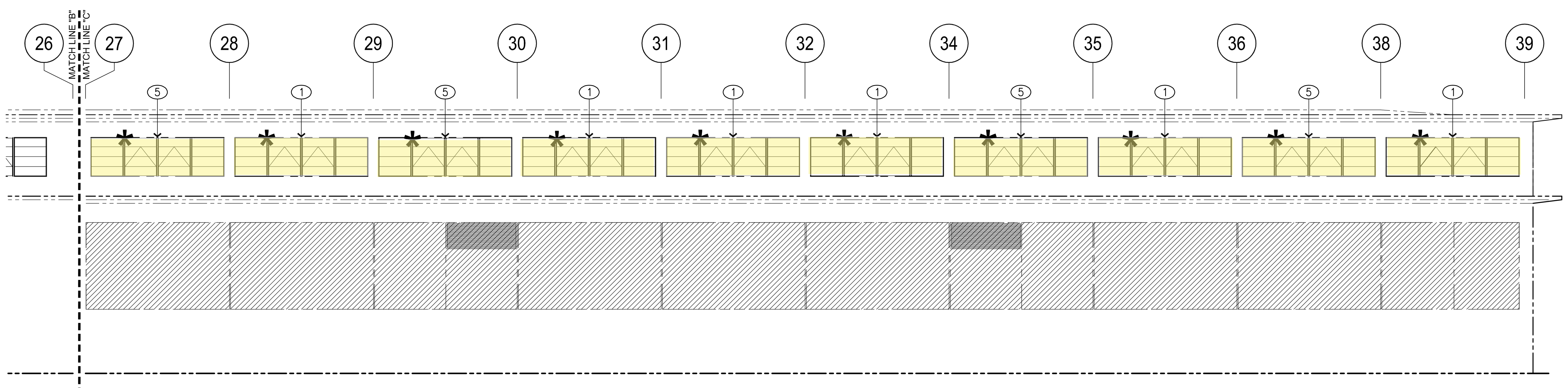
3/32"=1'-0"




C2 A-2003 **PARTIAL WEST ELEVATION - DEMOLITION**

2' 0' 4' 8' 16'

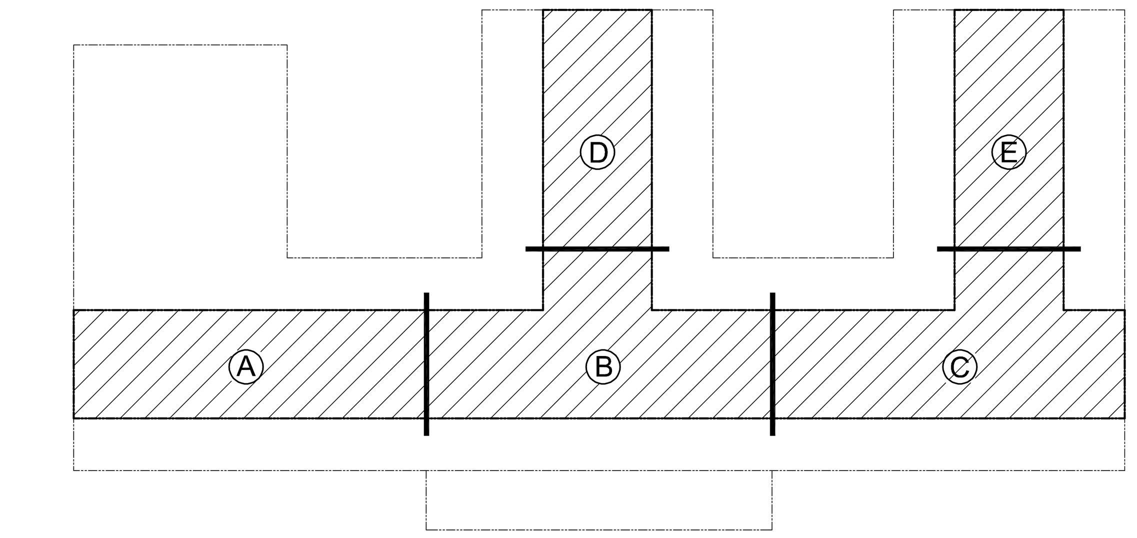
3/32"=1'-0"




B2 A-2003 **PARTIAL WEST ELEVATION - DEMOLITION**

2' 0' 4' 8' 16'

3/32"=1'-0"




## KEY PLAN - HIGH BAY AREA

SCALE: NONE

## GENERAL NOTES:

A. IF THIS SHEET IS NOT 24"X36" USE GRAPHIC SCALE ACCORDINGLY.
B. REFER TO COMPLETE SET OF ISSUED CONTRACT DOCUMENTS FOR OTHER APPLICABLE NOTES, ABBREVIATIONS AND SYMBOLS.
C. REFER TO SHEET A-7000 FOR OPENING TYPES
D. REFER TO STRUCTURAL FOR DETAILED REQUIREMENTS.
E. COORDINATE INSTALLATION AND REMOVAL OF ALL DUCT PENETRATIONS WITH BUILDING MANAGER.

## KEYED NOTES:

1 REMOVE EXISTING GLAZING SYSTEM.
2 EXISTING STEEL LADDER TO REMAIN.
3 EXISTING EXHAUST DUCT TO REMAIN.
4 REMOVE EXISTING EXHAUST DUCT.

OPENINGS NOT IN SCOPE OF WORK

WINDOW TO BE REMOVED

| | |
|---|---|
| LBO-DESIGN PACKAGE REVIEWER | N/A |
| APPROVED FOR RELEASE | MICHAEL MCEAHERN, ES-STO |
| SUBMITTED | ROBERT SANDERS |
| CHECKED | DAVID CHAVEZ |
| DESIGN | CORY W COLLINS |
| DRAWN | CORY W COLLINS |
| CLASSIFICATION | UNCLASSIFIED |

| NO | REVISION DESCRIPTION | DATE |
|---|---|---|
| 0 | DCF-24-03-0039-5723 | 04/15/2024 |

**ENGINEERING SERVICES**

**SHOP WINDOW REPLACEMENT**

**PARTIAL WEST ELEVATIONS - DEMOLITION**

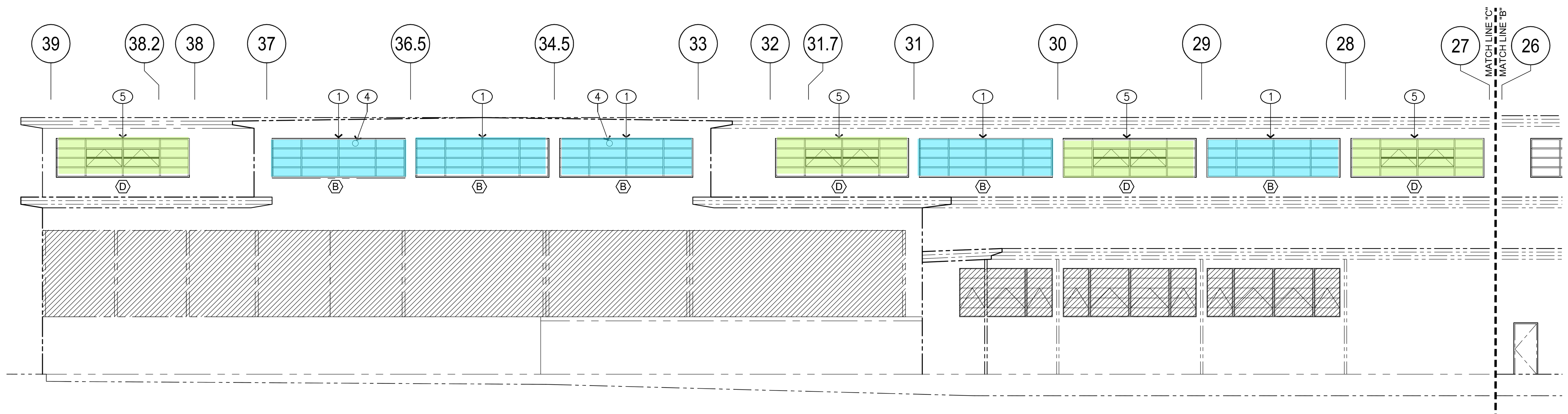
TA 03 BLDG 0039

Los Alamos NATIONAL LABORATORY

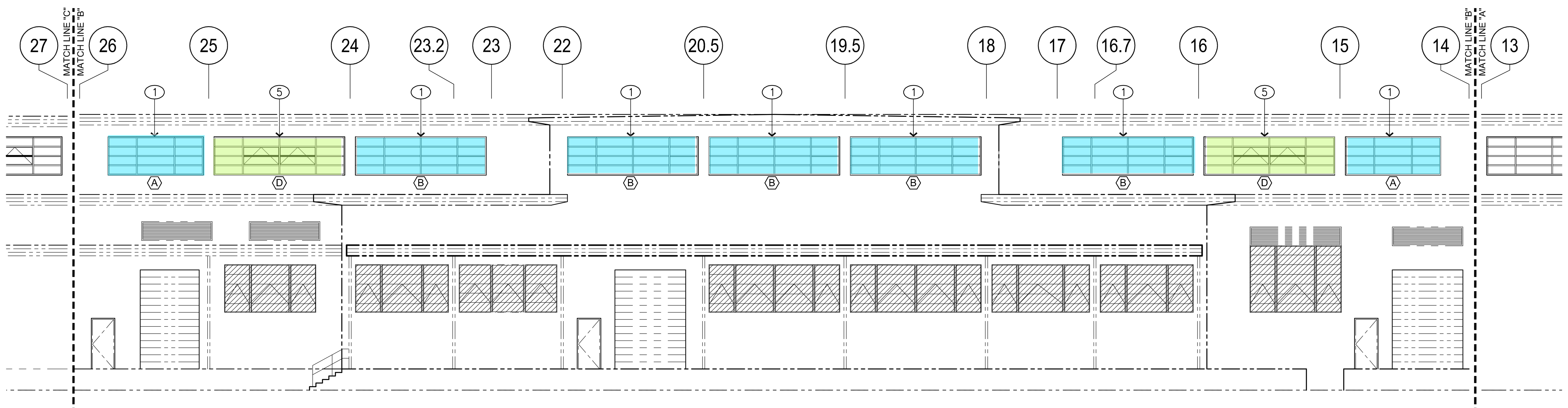
PO Box 1663
Los Alamos, New Mexico 87545

SHEET **A-2003** **16** OF **30**

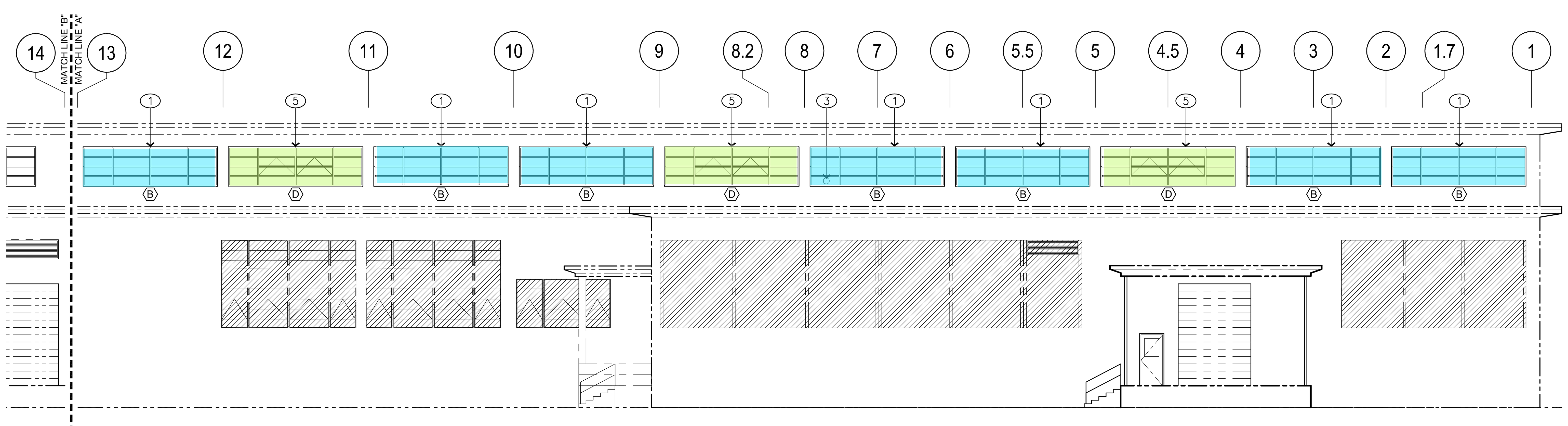
PROJECT ID **ESR 32050** DRAWING NO **C58583-DWG-03-0039-A-2003** REV **0**




D2
A-2004
## PARTIAL EAST ELEVATION - NEW CONSTRUCTION
2' 0' 4' 8' 16'
3/32"=1'-0"



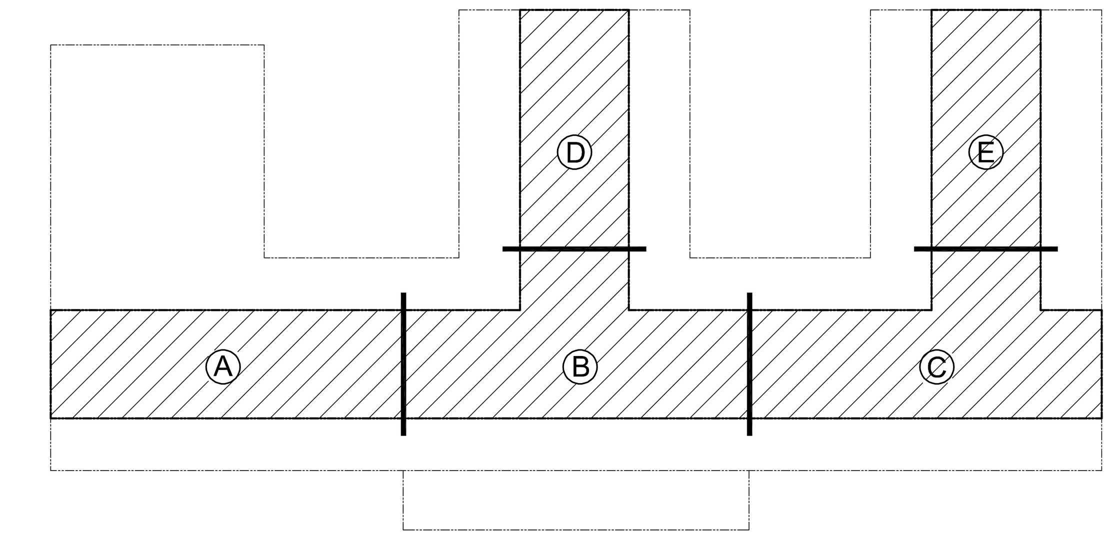

C2
A-2004
## PARTIAL EAST ELEVATION - NEW CONSTRUCTION
2' 0' 4' 8' 16'
3/32"=1'-0"




B2
A-2004
## PARTIAL EAST ELEVATION - NEW CONSTRUCTION
2' 0' 4' 8' 16'
3/32"=1'-0"

NEW OPERABLE WINDOW TO BE INSTALLED

NEW INOPERABLE WINDOW TO BE INSTALLED



## KEY PLAN - HIGH BAY AREA
SCALE: NONE

## GENERAL NOTES:
A. IF THIS SHEET IS NOT 24"X36" USE GRAPHIC SCALE ACCORDINGLY.
B. REFER TO COMPLETE SET OF ISSUED CONTRACT DOCUMENTS FOR OTHER APPLICABLE NOTES, ABBREVIATIONS AND SYMBOLS.
C. REFER TO SHEET A-7000 FOR OPENING TYPES
D. REFER TO STRUCTURAL FOR DETAILED REQUIREMENTS.
E. COORDINATE INSTALLATION AND REMOVAL OF ALL DUCT PENETRATIONS WITH BUILDING MANAGER.

## KEYED NOTES:
1 REMOVE EXISTING GLAZING SYSTEM.
2 EXISTING STEEL LADDER TO REMAIN.
3 EXISTING EXHAUST DUCT TO REMAIN.
4 REMOVE EXISTING EXHAUST DUCT.
5 NEW OPERABLE GLAZING SYSTEM AS SCHEDULED. REFER TO C1/A-7000.

OPENINGS NOT IN SCOPE OF WORK

## STRUCTURAL GENERAL NOTES:
A. ALL ANCHOR BOLTS FOR STOREFRONT FRAME SYSTEMS AND LOUVERS SHALL BE 1/4" DIA. HILTI KB-TZ2 SS304 3" LENGTH W/STD WASHER AND HEX NUT. INSTALL ANCHOR WITH 1-1/2" MIN EMBED. INSTALL AND INSPECT ANCHORS IN ACCORDANCE WITH ICC-ESR-4266 AND MANUFACTURER'S PRINTED INSTALLATION INSTRUCTIONS. MIN. SPACING = 1-1/2", MIN CONCRETE EDGE DISTANCE = 1-1/2", MIN PROJECTION = 1"
B. INSTALL (2) HILTI KB-TZ2 ANCHOR BOLTS, EQUALLY SPACED, AT VERTICAL EDGE OF STOREFRONT FRAME.
C. INSTALL HILTI KB-TZ2 ANCHOR BOLTS AT 5'-0" O.C. AT HORIZONTAL EDGE OF STOREFRONT FRAME.
D. FOR ALL ARCHITECTURAL LOUVER SCREENS USE 1/4" DIA. HILTI KB-TZ2 CS 3" LENGTH.

| | | | |
|---|---|---|---|
| LBO-DESIGN PACKAGE REVIEWER N/A | | | |
| APPROVED FOR RELEASE MICHAEL MCEAHERN, ES-STO | | | |
| SUBMITTED ROBERT SANDERS | | | |
| CHECKED DAVID CHAVEZ | | | |
| DESIGN CORY W COLLINS | | | |
| DRAWN CORY W COLLINS | 0 | DCF-24-03-0039-5723 | 04/15/2024 |
| CLASSIFICATION UNCLASSIFIED | NO | REVISION DESCRIPTION | DATE |

# ENGINEERING SERVICES

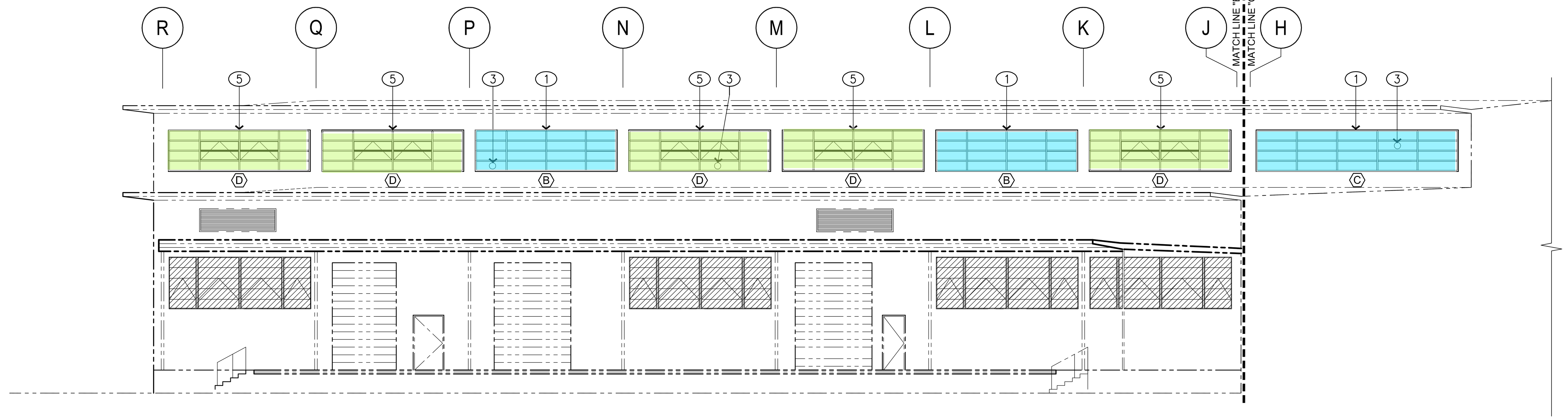
## SHOP WINDOW REPLACEMENT
PARTIAL EAST ELEVATIONS - NEW CONSTRUCTION

TA 03
BLDG 0039

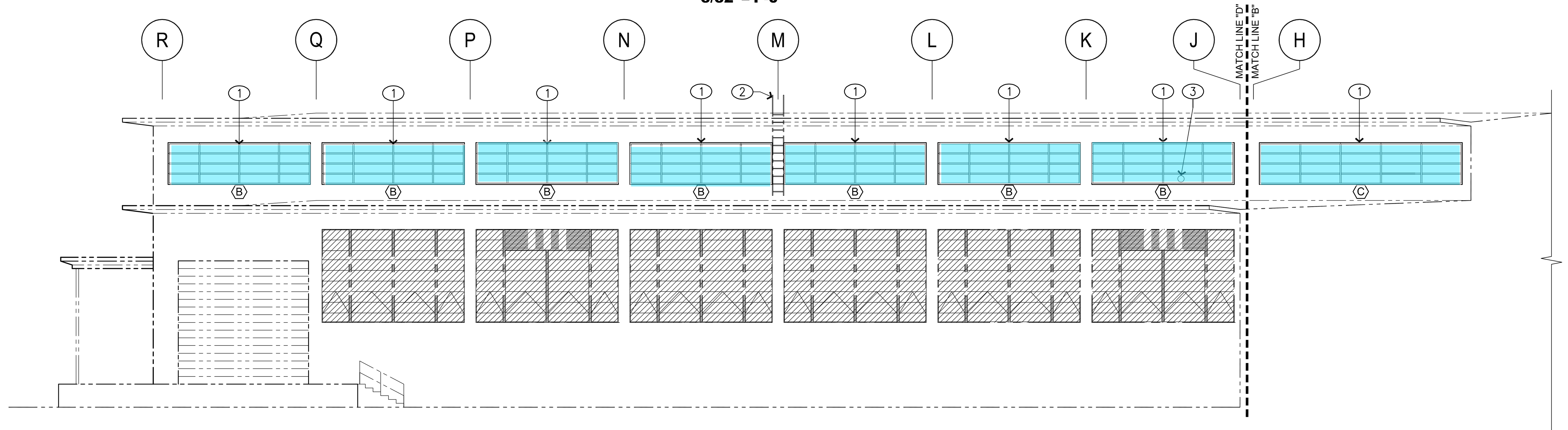
Los Alamos NATIONAL LABORATORY
PO Box 1663
Los Alamos, New Mexico 87545

SHEET A-2004
17 OF 30

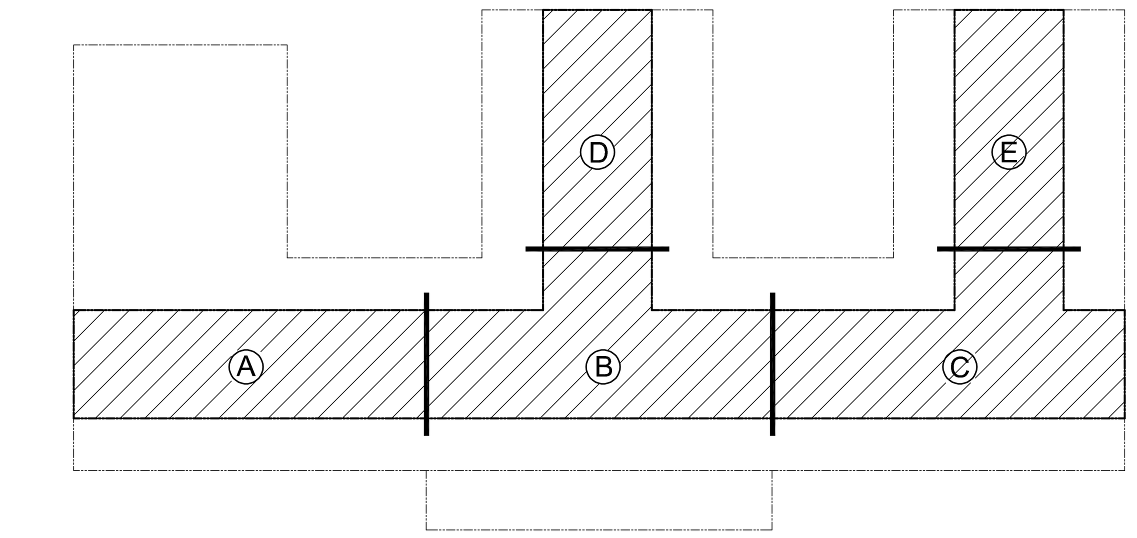
PROJECT ID ESR 32050
DRAWING NO C58583-DWG-03-0039-A-2004
REV 0



D2 A-2005
## PARTIAL NORTH ELEVATION - NEW CONSTRUCTION
2' 0' 4' 8' 16'
3/32"=1'-0"



C2 A-2005
## PARTIAL NORTH ELEVATION - NEW CONSTRUCTION
2' 0' 4' 8' 16'
3/32"=1'-0"



## KEY PLAN - HIGH BAY AREA
SCALE: NONE

## GENERAL NOTES:

A. IF THIS SHEET IS NOT 24"X36" USE GRAPHIC SCALE ACCORDINGLY.
B. REFER TO COMPLETE SET OF ISSUED CONTRACT DOCUMENTS FOR OTHER APPLICABLE NOTES, ABBREVIATIONS AND SYMBOLS.
C. REFER TO SHEET A-7000 FOR OPENING TYPES
D. REFER TO STRUCTURAL FOR DETAILED REQUIREMENTS.
E. COORDINATE INSTALLATION AND REMOVAL OF ALL DUCT PENETRATIONS WITH BUILDING MANAGER.

## KEYED NOTES:

1 REMOVE EXISTING GLAZING SYSTEM.
2 EXISTING STEEL LADDER TO REMAIN.
3 EXISTING EXHAUST DUCT TO REMAIN.
4 REMOVE EXISTING EXHAUST DUCT.
5 NEW OPERABLE GLAZING SYSTEM AS SCHEDULED. REFER TO C1/A-7000.

OPENINGS NOT IN SCOPE OF WORK

## STRUCTURAL GENERAL NOTES:

A. ALL ANCHOR BOLTS FOR STOREFRONT FRAME SYSTEMS AND LOUVERS SHALL BE 1/4" DIA. HILTI KB-TZ2 SS304 3" LENGTH W/STD WASHER AND HEX NUT. INSTALL ANCHOR WITH 1-1/2" MIN EMBED. INSTALL AND INSPECT ANCHORS IN ACCORDANCE WITH ICC-ESR-4266 AND MANUFACTURER'S PRINTED INSTALLATION INSTRUCTIONS. MIN. SPACING = 1-1/2", MIN CONCRETE EDGE DISTANCE = 1-1/2", MIN PROJECTION = 1"
B. INSTALL (2) HILTI KB-TZ2 ANCHOR BOLTS, EQUALLY SPACED, AT VERTICAL EDGE OF STOREFRONT FRAME.
C. INSTALL HILTI KB-TZ2 ANCHOR BOLTS AT 5'-0" O.C. AT HORIZONTAL EDGE OF STOREFRONT FRAME.
D. FOR ALL ARCHITECTURAL LOUVER SCREENS USE 1/4" DIA. HILTI KB-TZ2 CS 3" LENGTH.

NEW OPERABLE WINDOW TO BE INSTALLED

NEW INOPERABLE WINDOW TO BE INSTALLED

| | | | |
|---|---|---|---|
| LBO-DESIGN PACKAGE REVIEWER<br>N/A | | | |
| APPROVED FOR RELEASE<br>MICHAEL MCEAHERN, ES-STO | | | |
| SUBMITTED<br>ROBERT SANDERS | | | |
| CHECKED<br>DAVID CHAVEZ | | | |
| DESIGN<br>CORY W COLLINS | | | |
| DRAWN<br>CORY W COLLINS | 0 | DCF-24-03-0039-5723 | 04/15/2024 |
| CLASSIFICATION<br>UNCLASSIFIED | NO | REVISION DESCRIPTION | DATE |

# ENGINEERING SERVICES

## SHOP WINDOW REPLACEMENT
PARTIAL NORTH ELEVATIONS - NEW CONSTRUCTION

TA 03 BLDG 0039

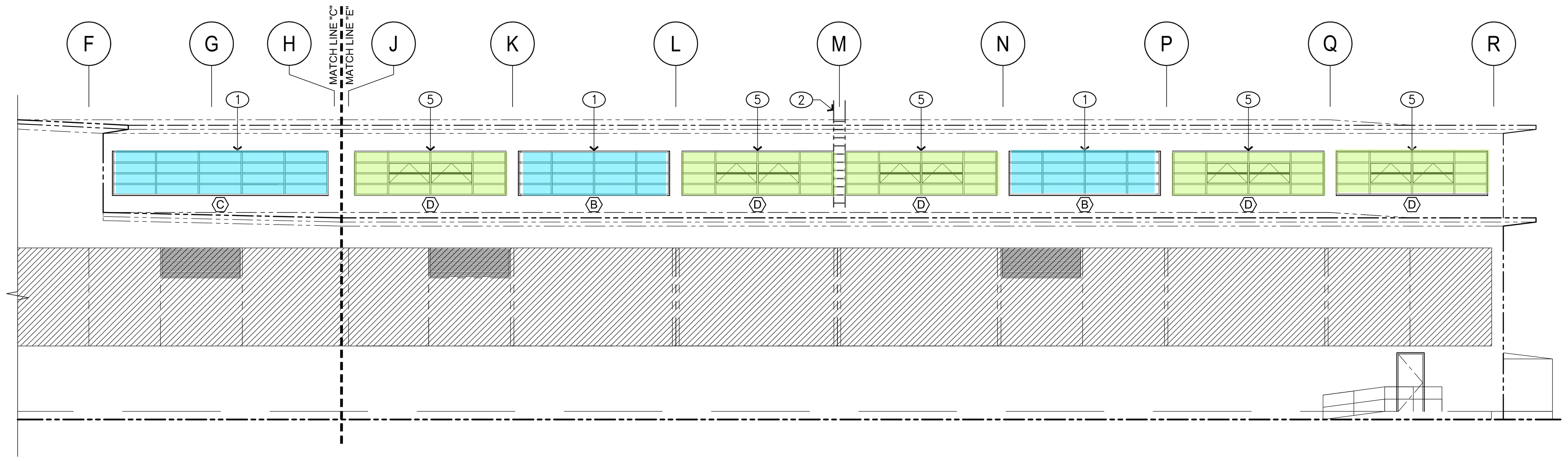
Los Alamos NATIONAL LABORATORY
PO Box 1663
Los Alamos, New Mexico 87545

SHEET A-2005
18 OF 30

PROJECT ID ESR 32050
DRAWING NO C58583-DWG-03-0039-A-2005
REV 0

1 2 3 4 5 6

D C B A

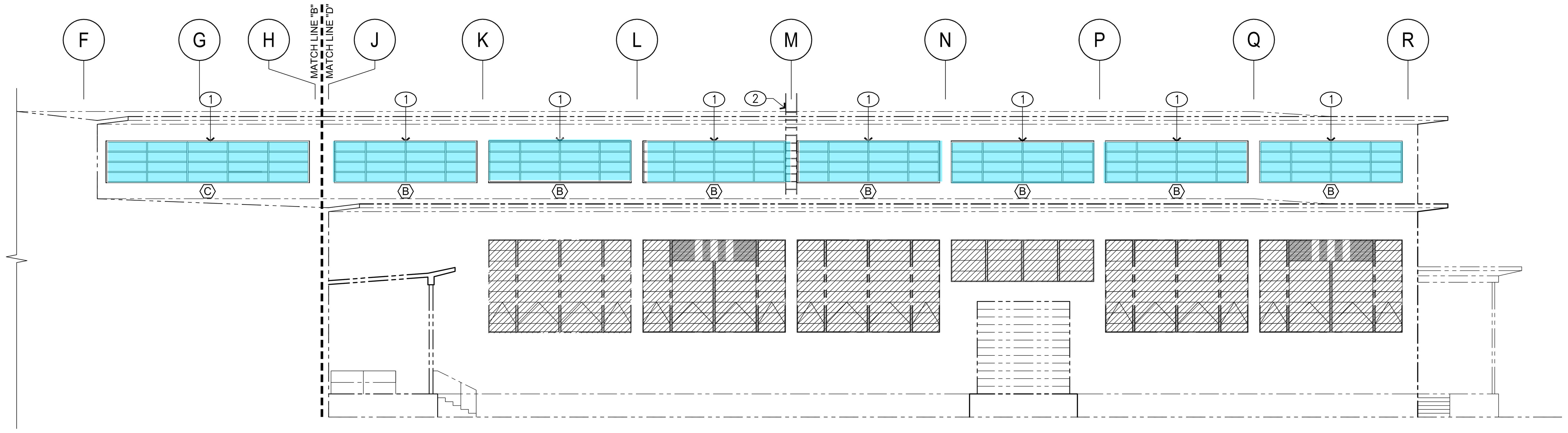



D2 A-2006

## PARTIAL SOUTH ELEVATION - NEW CONSTRUCTION

2' 0' 4' 8' 16'

3/32"=1'-0"



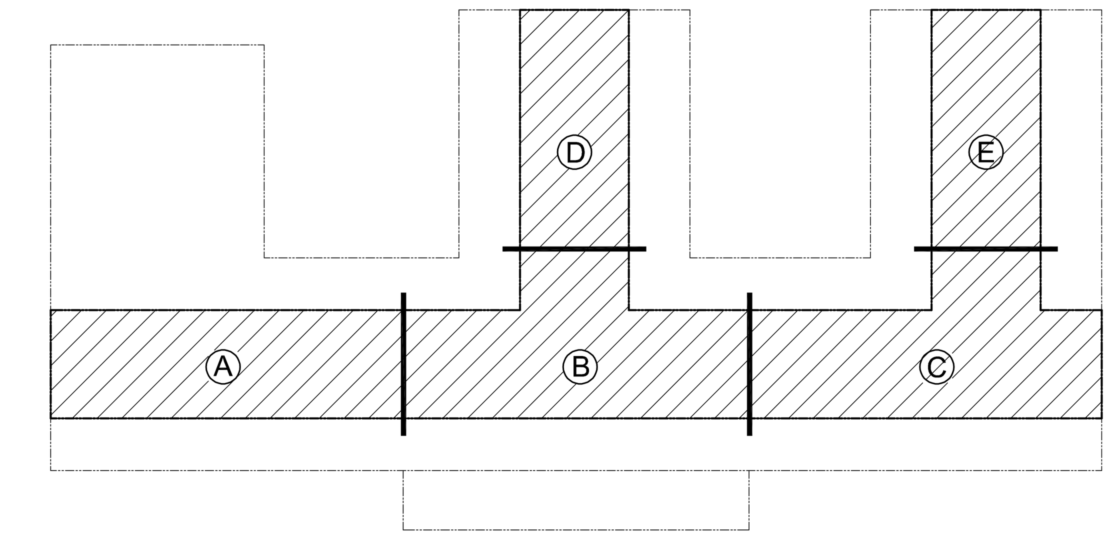

C2 A-2006

## PARTIAL SOUTH ELEVATION - NEW CONSTRUCTION

2' 0' 4' 8' 16'

3/32"=1'-0"

**EXTERIOR GLAZING EXAMPLE**




## KEY PLAN - HIGH BAY AREA

SCALE: NONE

## GENERAL NOTES:

A. IF THIS SHEET IS NOT 24"X36" USE GRAPHIC SCALE ACCORDINGLY.
B. REFER TO COMPLETE SET OF ISSUED CONTRACT DOCUMENTS FOR OTHER APPLICABLE NOTES, ABBREVIATIONS AND SYMBOLS.
C. REFER TO SHEET A-7000 FOR OPENING TYPES
D. REFER TO STRUCTURAL FOR DETAILED REQUIREMENTS.
E. COORDINATE INSTALLATION AND REMOVAL OF ALL DUCT PENETRATIONS WITH BUILDING MANAGER.

## KEYED NOTES:

1 REMOVE EXISTING GLAZING SYSTEM.
2 EXISTING STEEL LADDER TO REMAIN.
3 EXISTING EXHAUST DUCT TO REMAIN.
4 REMOVE EXISTING EXHAUST DUCT.
5 NEW OPERABLE GLAZING SYSTEM AS SCHEDULED. REFER TO C1/A-7000.

OPENINGS NOT IN SCOPE OF WORK

## STRUCTURAL GENERAL NOTES:

A. ALL ANCHOR BOLTS FOR STOREFRONT FRAME SYSTEMS AND LOUVERS SHALL BE 1/4" DIA. HILTI KB-TZ2 SS304 3" LENGTH W/STD WASHER AND HEX NUT. INSTALL ANCHOR WITH 1-1/2" MIN EMBED. INSTALL AND INSPECT ANCHORS IN ACCORDANCE WITH ICC-ESR-4266 AND MANUFACTURER'S PRINTED INSTALLATION INSTRUCTIONS. MIN. SPACING = 1-1/2", MIN CONCRETE EDGE DISTANCE = 1-1/2", MIN PROJECTION = 1"
B. INSTALL (2) HILTI KB-TZ2 ANCHOR BOLTS, EQUALLY SPACED, AT VERTICAL EDGE OF STOREFRONT FRAME.
C. INSTALL HILTI KB-TZ2 ANCHOR BOLTS AT 5'-0" O.C. AT HORIZONTAL EDGE OF STOREFRONT FRAME.
D. FOR ALL ARCHITECTURAL LOUVER SCREENS USE 1/4" DIA. HILTI KB-TZ2 CS 3" LENGTH.

NEW OPERABLE WINDOW TO BE INSTALLED

NEW INOPERABLE WINDOW TO BE INSTALLED

| | | | |
|---|---|---|---|
| LBO-DESIGN PACKAGE REVIEWER N/A | | | |
| APPROVED FOR RELEASE MICHAEL MCEAHERN, ES-STO | | | |
| SUBMITTED ROBERT SANDERS | | | |
| CHECKED DAVID CHAVEZ | | | |
| DESIGN CORY W COLLINS | | | |
| DRAWN CORY W COLLINS | 0 | DCF-24-03-0039-5723 | 04/15/2024 |
| CLASSIFICATION UNCLASSIFIED | NO | REVISION DESCRIPTION | DATE |

# ENGINEERING SERVICES

**SHOP WINDOW REPLACEMENT**

**PARTIAL SOUTH ELEVATIONS - NEW CONSTRUCTION**

TA 03 BLDG 0039

SHEET **A-2006**

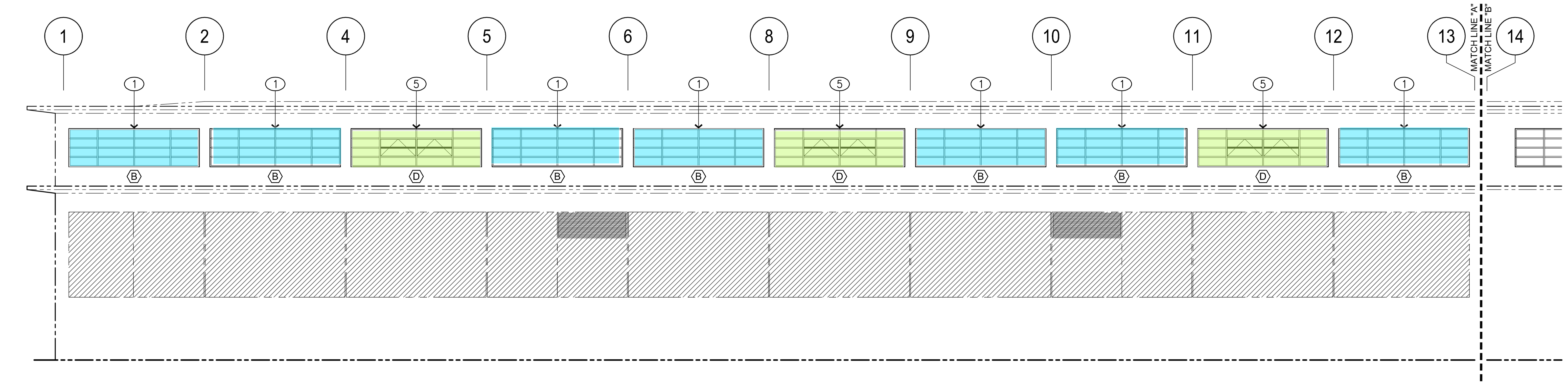
**19** OF **30**

Los Alamos NATIONAL LABORATORY
PO Box 1663
Los Alamos, New Mexico 87545

PROJECT ID **ESR 32050**

DRAWING NO **C58583-DWG-03-0039-A-2006**

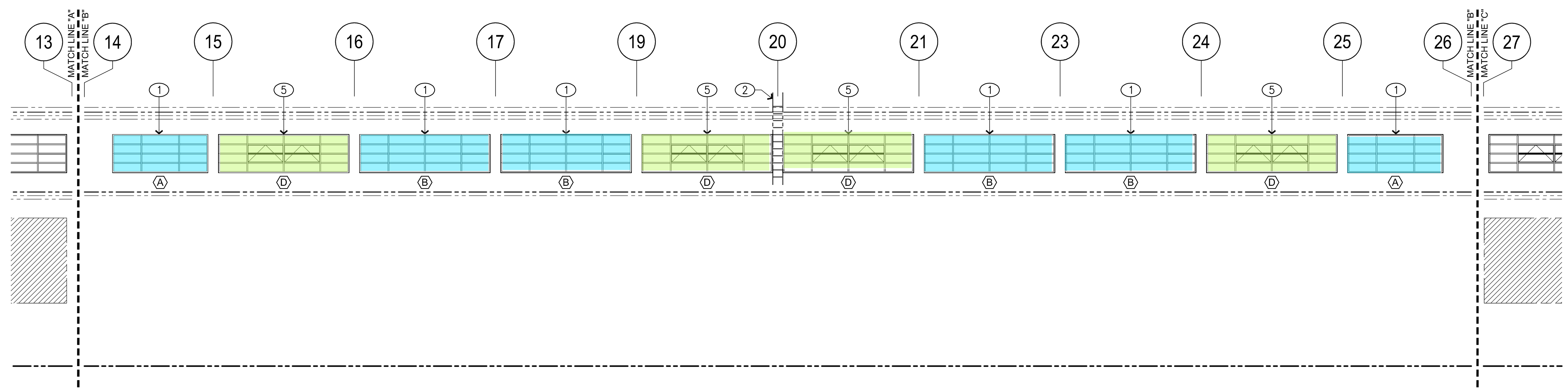
REV **0**




D2
A-2007

## PARTIAL WEST ELEVATION - NEW CONSTRUCTION

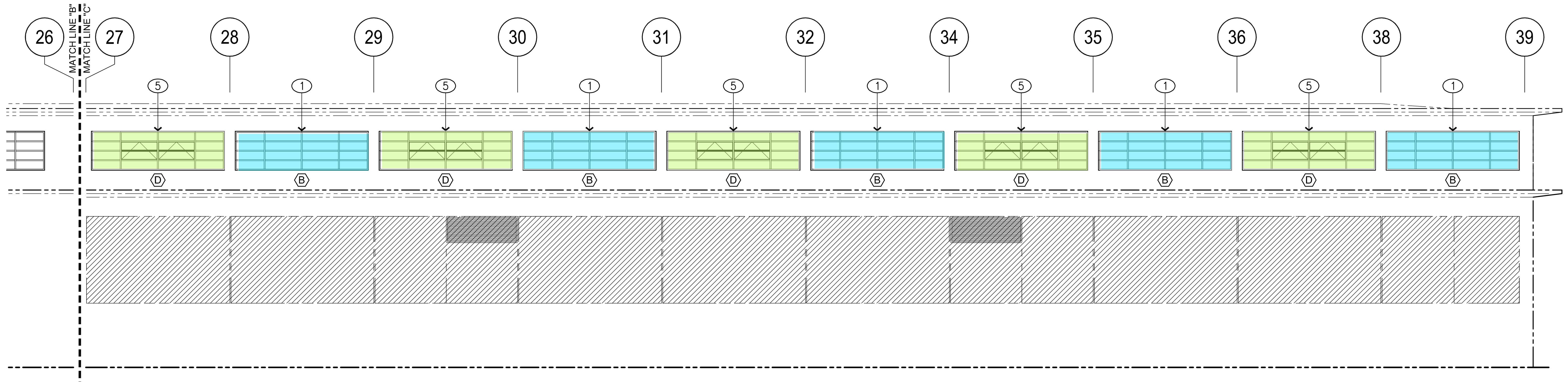
3/32"=1'-0"




C2
A-2007

## PARTIAL WEST ELEVATION - NEW CONSTRUCTION

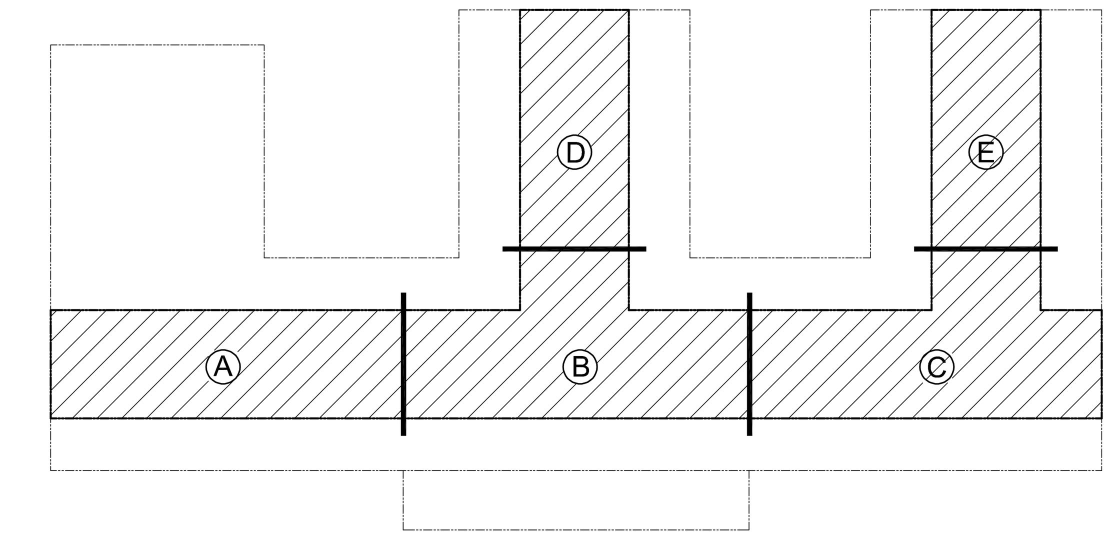
3/32"=1'-0"




B2
A-2007

## PARTIAL WEST ELEVATION - NEW CONSTRUCTION

3/32"=1'-0"




## KEY PLAN - HIGH BAY AREA

SCALE: NONE

### GENERAL NOTES:

A. IF THIS SHEET IS NOT 24"X36" USE GRAPHIC SCALE ACCORDINGLY.
B. REFER TO COMPLETE SET OF ISSUED CONTRACT DOCUMENTS FOR OTHER APPLICABLE NOTES, ABBREVIATIONS AND SYMBOLS.
C. REFER TO SHEET A-7000 FOR OPENING TYPES
D. REFER TO STRUCTURAL FOR DETAILED REQUIREMENTS.
E. COORDINATE INSTALLATION AND REMOVAL OF ALL DUCT PENETRATIONS WITH BUILDING MANAGER.

### KEYED NOTES:

1 REMOVE EXISTING GLAZING SYSTEM.
2 EXISTING STEEL LADDER TO REMAIN.
3 EXISTING EXHAUST DUCT TO REMAIN.
4 REMOVE EXISTING EXHAUST DUCT.
5 NEW OPERABLE GLAZING SYSTEM AS SCHEDULED. REFER TO C1/A-7000.

OPENINGS NOT IN SCOPE OF WORK

### STRUCTURAL GENERAL NOTES:

A. ALL ANCHOR BOLTS FOR STOREFRONT FRAME SYSTEMS AND LOUVERS SHALL BE 1/4" DIA. HILTI KB-TZ2 SS304 3" LENGTH W/STD WASHER AND HEX NUT. INSTALL ANCHOR WITH 1-1/2" MIN EMBED. INSTALL AND INSPECT ANCHORS IN ACCORDANCE WITH ICC-ESR-4266 AND MANUFACTURER'S PRINTED INSTALLATION INSTRUCTIONS. MIN. SPACING = 1-1/2", MIN CONCRETE EDGE DISTANCE = 1-1/2", MIN PROJECTION = 1"
B. INSTALL (2) HILTI KB-TZ2 ANCHOR BOLTS, EQUALLY SPACED, AT VERTICAL EDGE OF STOREFRONT FRAME.
C. INSTALL HILTI KB-TZ2 ANCHOR BOLTS AT 5'-0" O.C. AT HORIZONTAL EDGE OF STOREFRONT FRAME.
D. FOR ALL ARCHITECTURAL LOUVER SCREENS USE 1/4" DIA. HILTI KB-TZ2 CS 3" LENGTH.

NEW OPERABLE WINDOW TO BE INSTALLED

NEW INOPERABLE WINDOW TO BE INSTALLED

| | |
|---|---|
| LBO-DESIGN PACKAGE REVIEWER | N/A |
| APPROVED FOR RELEASE | MICHAEL MCEAHERN, ES-STO |
| SUBMITTED | ROBERT SANDERS |
| CHECKED | DAVID CHAVEZ |
| DESIGN | CORY W COLLINS |
| DRAWN | CORY W COLLINS |
| CLASSIFICATION | UNCLASSIFIED |

| NO | REVISION DESCRIPTION | DATE |
|---|---|---|
| 0 | DCF-24-03-0039-5723 | 04/15/2024 |

# ENGINEERING SERVICES

## SHOP WINDOW REPLACEMENT

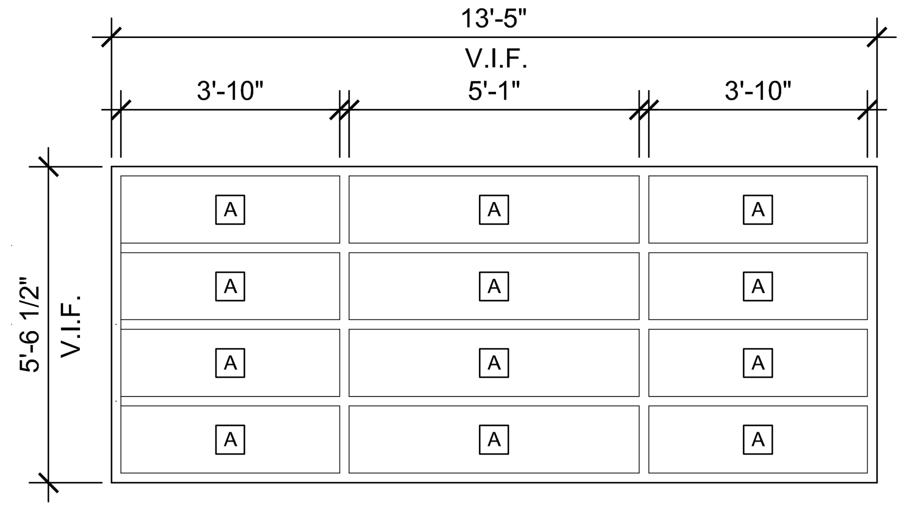
### PARTIAL WEST ELEVATIONS - NEW CONSTRUCTION

TA 03 BLDG 0039

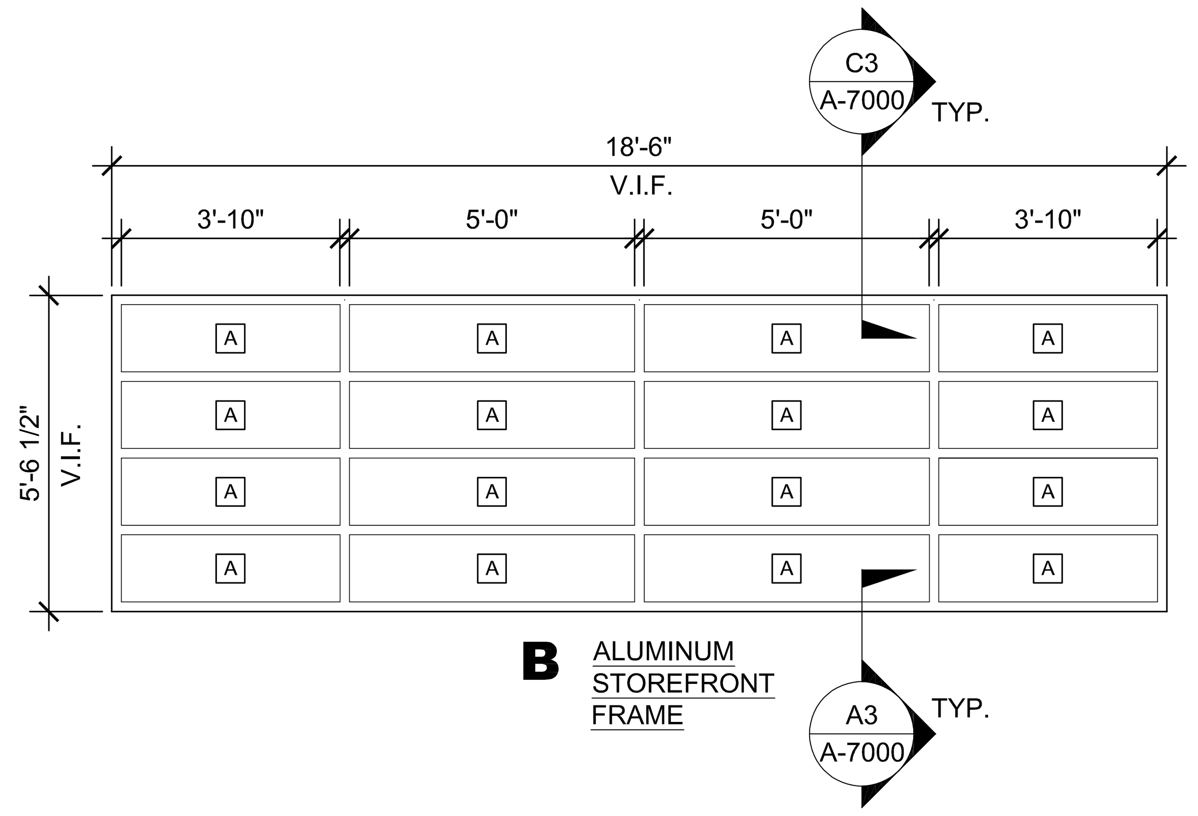
Los Alamos NATIONAL LABORATORY
PO Box 1663
Los Alamos, New Mexico 87545

SHEET A-2007
20 OF 30

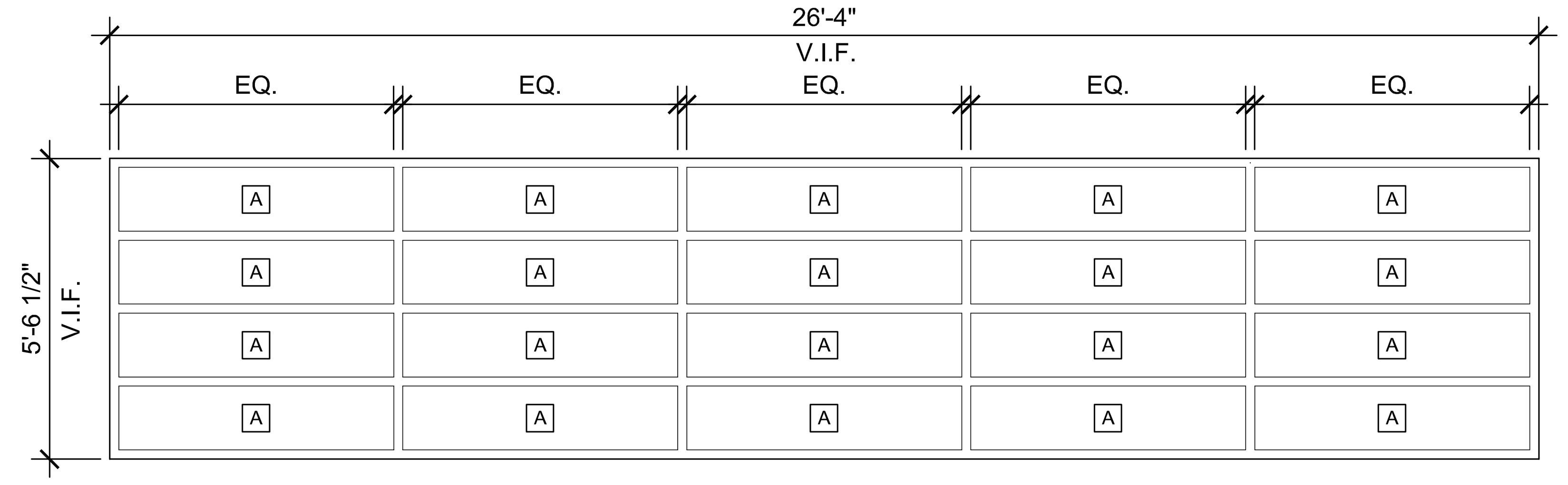
PROJECT ID ESR 32050
DRAWING NO C58583-DWG-03-0039-A-2007
REV 0



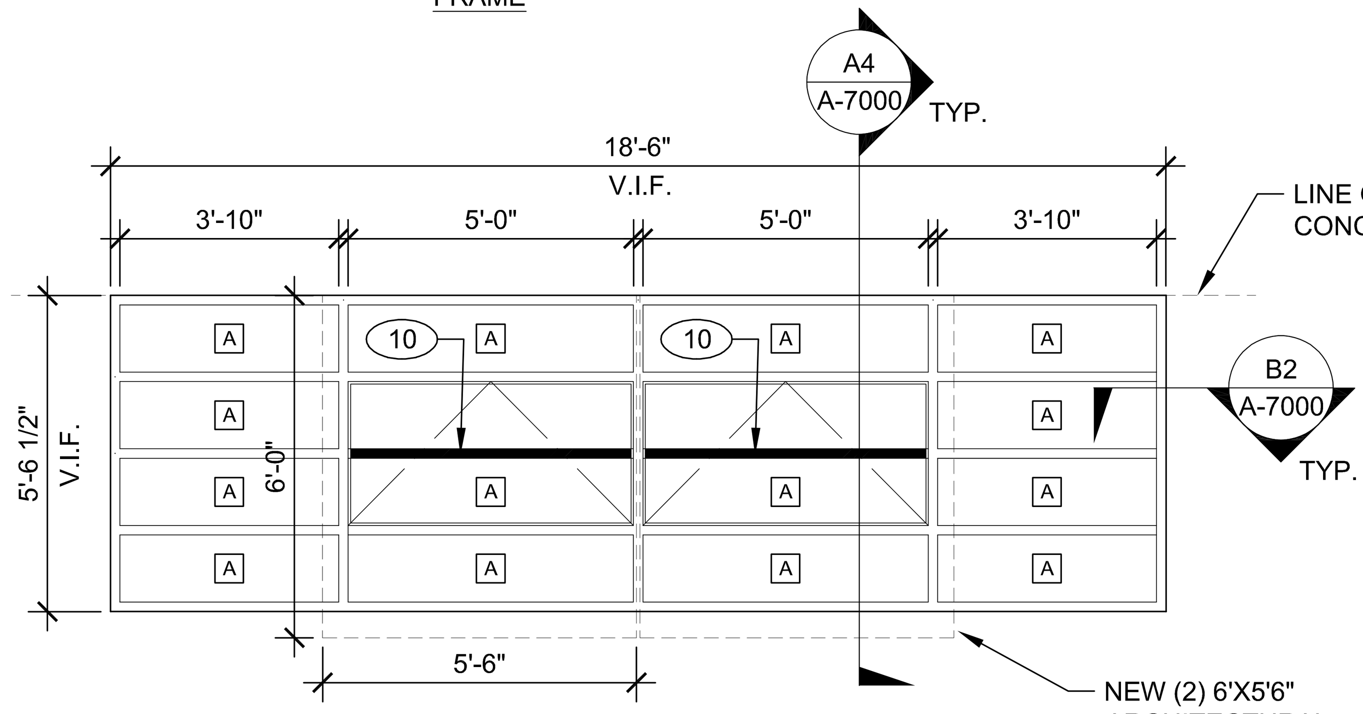

**A** ALUMINUM STOREFRONT FRAME




**B** ALUMINUM STOREFRONT FRAME



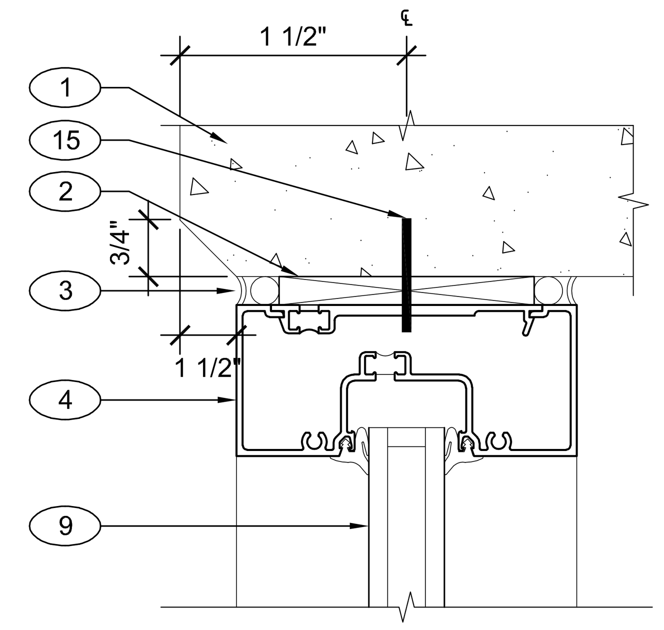

**C** ALUMINUM STOREFRONT FRAME



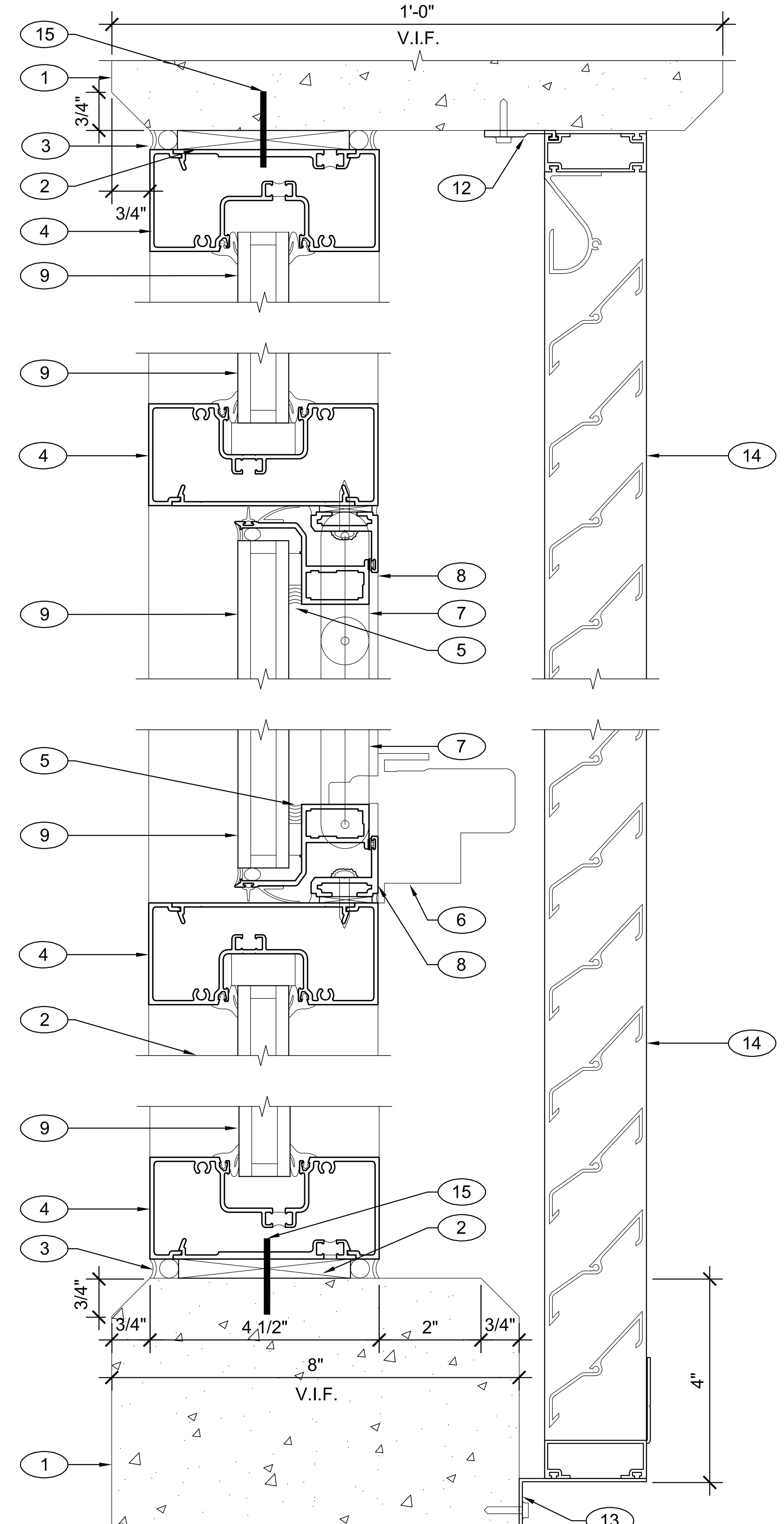

**D** ALUMINUM STOREFRONT FRAME

## C1 A-7000 OPENING TYPES

3/8"=1'-0"




## C3 A-7000 WINDOW HEAD, TYP.

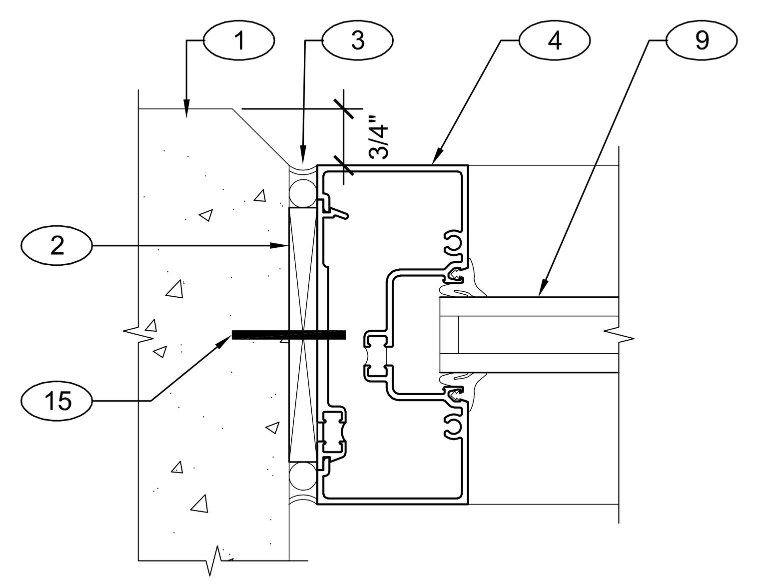



## GENERAL NOTES:

A. IF THIS SHEET IS NOT 24"X36" USE GRAPHIC SCALE ACCORDINGLY.
B. REFER TO COMPLETE SET OF ISSUED CONTRACT DOCUMENTS FOR OTHER APPLICABLE NOTES, ABBREVIATIONS AND SYMBOLS.
C. ALL DIMENSIONS ARE FRAME TO FRAME
D. VERIFY ALL OPENING DIMENSIONS BEFORE FABRICATION.
E. ALL INTERIOR AND EXTERIOR STOREFRONT MULLIONS SHALL BE 2" HIGH X 4-1/2" DEEP, UNLESS NOTED OTHERWISE.
F. ALL ALUMINUM (FRAMES, BREAK METAL, ECT.) SHALL BE CLEAR ANODIZED UNLESS NOTED OTHERWISE.
G. ALL GLAZING SHALL BE TYPE 'A' EXCEPT FOR LOCATIONS WHERE EXHAUST PENETRATIONS OCCUR, TYPE 'B' WILL BE USED. REFER TO ELEVATIONS FOR EXHAUST PENETRATION LOCATIONS AND DETAIL B1/A-7000.
H. INCLUDE ACCESSORY ALUMINUM SCREEN TO ALL GLASSVENT OPENINGS.

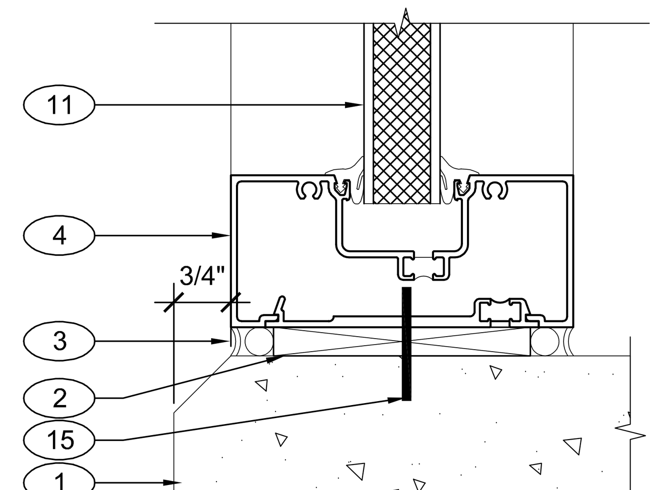
## STRUCTURAL GENERAL NOTES:

A. ALL ANCHOR BOLTS FOR STOREFRONT FRAME SYSTEMS AND LOUVERS SHALL BE 1/4" DIA. HILTI KB-TZ2 SS304 3" LENGTH W/STD WASHER AND HEX NUT. INSTALL ANCHOR WITH 1-1/2" MIN EMBED. INSTALL AND INSPECT ANCHORS IN ACCORDANCE WITH ICC-ESR-4266 AND MANUFACTURER'S PRINTED INSTALLATION INSTRUCTIONS. MIN. SPACING = 1-1/2", MIN CONCRETE EDGE DISTANCE = 1-1/2", MIN PROJECTION = 1"
B. INSTALL (2) HILTI KB-TZ2 ANCHOR BOLTS, EQUALLY SPACED, AT VERTICAL EDGE OF STOREFRONT FRAME.
C. INSTALL HILTI KB-TZ2 ANCHOR BOLTS AT 5'-0" O.C. AT HORIZONTAL EDGE OF STOREFRONT FRAME.
D. FOR ALL ARCHITECTURAL LOUVER SCREENS USE 1/4" DIA. HILTI KB-TZ2 CS 3" LENGTH.



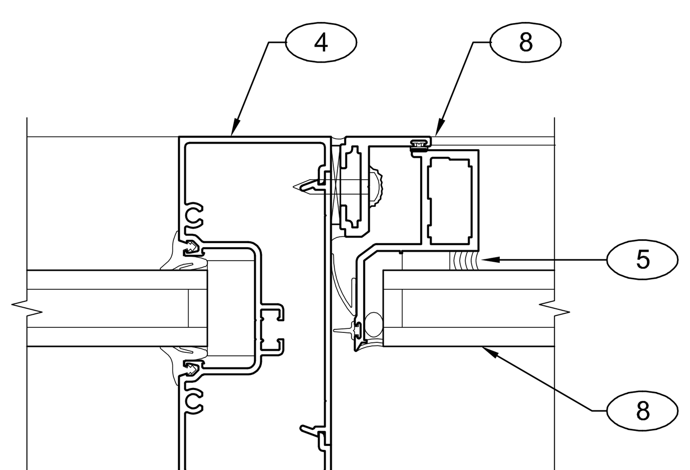

## B2 A-7000 WINDOW JAMB, TYP.

6"=1'-0"



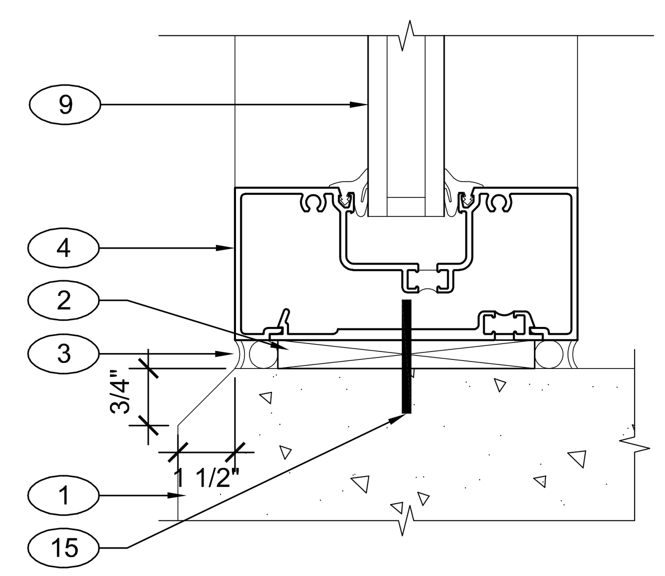

## B1 A-7000 WINDOW SILL, TYP.

6"=1'-0"



## A2 A-7000 OPERABLE JAMB, TYP.

6"=1'-0"




## A3 A-7000 WINDOW SILL, TYP.

6"=1'-0"

## A4 A-7000 OPERABLE WINDOW, TYP.

6"=1'-0"

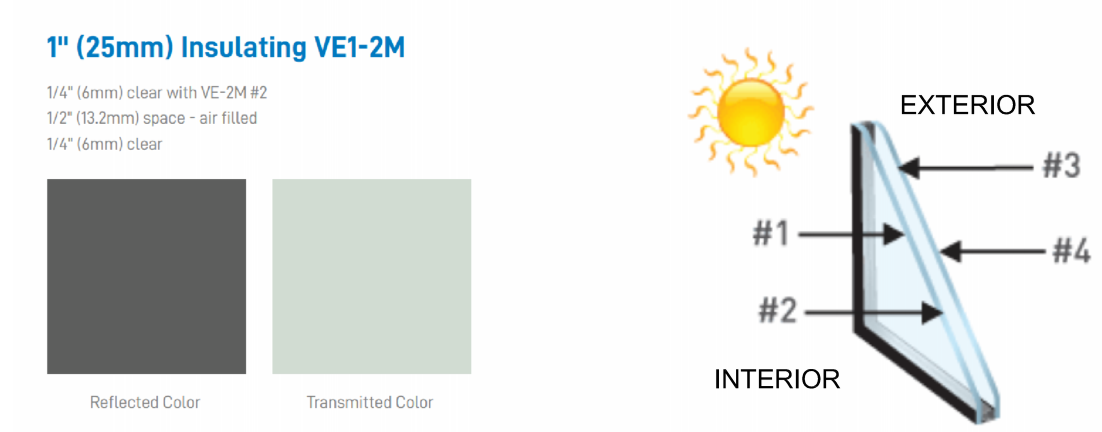
## KEYED NOTES:

1. EXISTING CONCRETE BEAM.
2. FIRE RETARDANT TREATED WOOD SHIM.
3. BACKER ROD AND SEALANT.
4. STOREFRONT SYSTEM AS SCHEDULED.
5. STRUCTURAL SILICON.
6. ACCUATOR, BY OTHERS. REFER TO ELECTRICAL.
7. STAINLESS STEEL HINGE BEYOND.
8. GLASSVENT SYSTEM W/ INTEGRATED ALUMINUM SCREEN AS SCHEDULED.
9. GLAZING SYSTEM AS SCHEDULED.
10. APPLIED ALUMINUM MUNTIN TO SIMULATE 2" STOREFRONT FRAMING.
11. TYPE 'B' GLAZING WHERE EXHAUST PENETRATIONS OCCUR,TYP.
12. CHANNEL 'C' FRAME W/ 2" LONG EZ MOUNTING CLIPS EVERY 18" OF LOUVER PERIMETER. FASTENERS BY OTHERS.
13. CAP 'Z' FRAME W/ FASTENERS EVERY 18" OF LOUVER PERIMETER. REFER TO STRUCTURAL GENERAL NOTES.
14. E2DS ARCHITECTURAL LOUVER (OR EQUAL) BY ARCHITECTURAL LOUVERS. REFER TO MANUFACTURER FOR ADDITIONAL INFORMATION.
15. 1/4" DIA. HILTI KB-TZ2 SS 304 3" LENGTH. REFER TO STRUCTURAL GENERAL NOTES.

## GLAZING SCHEDULE

| MARK | TYPE |
|---|---|
| A | VIRACON 1" V951 E1-2M INSULATING (TEMPERED). CERAMIC FRIT: FRIT COLOR - V1093 SIMULATED SANDBLAST ON #3 SURFACE. |
| B | 1" THICK RIGID INSULATIN PANEL W/ LAMINATED ALUMINUM FACING. |

## SURFACE DESIGNATIONS, TYP.




| | |
|---|---|
| LBO-DESIGN PACKAGE REVIEWER | N/A |
| APPROVED FOR RELEASE | MICHAEL MCEAHERN, ES-STO |
| SUBMITTED | ROBERT SANDERS |
| CHECKED | DAVID CHAVEZ |
| DESIGN | CORY W COLLINS |
| DRAWN | CORY W COLLINS |
| CLASSIFICATION | UNCLASSIFIED |

| NO | REVISION DESCRIPTION | DATE |
|---|---|---|
| 0 | DCF-24-03-0039-5723 | 04/15/2024 |

**ENGINEERING SERVICES**

**SHOP WINDOW REPLACEMENT**

**OPENING TYPES**

TA 03 BLDG 0039

Los Alamos NATIONAL LABORATORY

PO Box 1663
Los Alamos, New Mexico 87545

SHEET A-7000

21 OF 30

PROJECT ID ESR 32050

DRAWING NO C58583-DWG-03-0039-A-7000

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