Prepared for
Port of Portland

Flightcraft "A" Hangar aerial view, looking southwest, ca. 1973.

Oregon SHPO Documentation
Flightcraft "A" Hangar (Building 7505)

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INTRODUCTION

The following mitigation documentation is of Flightcraft "A" Hangar (Building 7505) at the Portland International Airport (PDX) 7000 NE Airport Way (Figures 1 and 2).

Flightcraft "A" Hangar (Building 7505) was recorded in a cultural resource report and a Section 106 evaluation conducted to meet requirements of Section 106 of the National Preservation Act (NHPA) and Oregon Revised Statute (ORS) 358.653(1). The Section 106 evaluation found the Flightcraft "A" Hangar to be eligible for listing in the National Register of Historic Places (NRHP) under Criterion A for its contribution to the history of commercial development at Portland International Airport and under Criterion C for its architectural significance (Heideman 2014). As the hangar is scheduled for demolition, Port of Portland has contracted with Willamette Cultural Resources Associates, Ltd. (WillametteCRA), to prepare mitigation documentation for the hangar.

Flightcraft "A" Hangar is located at the Portland International Airport (PDX) north of NE Airport Way, northeast of the current PDX Terminal, and south of the Columbia River in the NE1/4 of Section 8, Township 1 North, Range 2 East, Willamette Meridian, Portland, Multnomah County, Oregon (see Figure 1). Flightcraft "A" Hangar is situated on a larger land parcel previously leased from the Port of Portland at PDX.

Flightcraft "A" Hangar is a two and one-half story, wood framed, and glue-laminated (glulam) timber structure that was constructed in 1960 to house Flightcraft's Fixed Base Operator (FBO) facilities including a private aircraft distributorship, terminal, parts and service facilities, and offices. Although the hangar was remodeled in the 1980s and 1990s, overall, Flightcraft's "A" Hangar retains historical integrity. The hangar's center aircraft bay was used for aircraft maintenance and as a private aircraft showroom. The hangar's two-story wings provided space for sales and business offices, a parts department, workshops, and a terminal for passengers and pilots. Flightcraft ceased using the facility for maintenance after constructing new facilities to the east in 2001. The old hangar was used for aircraft storage and office space, and is currently in use for airport expansion construction projects (*Daily Journal of Commerce* 2001).

1.0 SETTING

Flightcraft "A" Hanger was built in 1960 for Flightcraft, Inc., on land developed by the Port of Portland in the late 1930s for use as the Portland Columbia Airport. The Port constructed the new airport facility to replace the Swan Island Airport, which could not support large modern aircraft. The Port acquired land parcels in 1936 within Multnomah County Drainage District No. 1 (MCDD) at the northern edge of Portland next to the Columbia River. MCDD is one of four drainage districts spanning the south bank of the Columbia River within Columbia River Slough bottomland consisting of a series of sloughs and wetlands extending from near Interstate 5 eastward to Troutdale, Oregon. Initially, when the four drainage districts were completed in the early 1920s, the

area remained relatively rural in nature supporting truck farming, dairies, and recreational facilities. With the construction of the Portland Columbia Airport in the late 1930s and the outbreak of World War II, the drainage district's open, reclaimed land and their proximity to transportation attracted war-related facilities. The Portland Air Base was established south of the airport, temporary housing, called Vanport City, was constructed for shipyard workers, and to the east, a landing strip developed near Troutdale along with the Troutdale Aluminum Plant (later Reynolds Aluminum Plant) (O'Brien and Allen 2006:15).

Port of Portland's former airport at Swan Island, completed in 1928, continued to house private aircraft facilities after the Portland Columbia Airport officially opened in 1940. Activities at Swan Island were curtailed in 1942 by Army orders limiting private aircraft activities and came to a complete halt when the U.S. Maritime Commission claimed the Swan Island Airport for building Kaiser Company shipyards (*Oregonian* 1942). A.W. Whitaker Co., a forerunner to Flightcraft, had a substantial stake at the Swan Island airport facility with three large aircraft hangars filled with aircraft to move or dismantle (*Oregonian* 1942). Whitaker's facility moved to the Portland Columbia Airport after World War II, later relocating to Pierson Airfield after the 1948 Flood. From this disaster, Silas King, a former employee of A.W. Whitaker Co., and of Western Skyways, established Flightcraft, Inc. in a World War II hangar used by Western Skyways (*Oregonian* 1978; Schreiber 2017).

Flightcraft relocated on several occasions as the Port of Portland worked on airport improvements and the U.S. Air Force exerted its rights for military uses. A new facility was completed in 1951 at the northeast corner of the airport where Flightcraft served as the Fixed Base Operation. Another expansion project in the late 1950s for Portland International Airport included a new passenger terminal, flight tower, runways, and a business/commercial area including the 1960-1961 facilities constructed along with Flightcraft "A" Hangar". Airport expansions have led to the loss of most of Flightcraft's circa 1960s buildings including three T-hangars and a previous hangar situated on the northern perimeter of the original Portland Columbia Airport airfield (Figures 3-5).

Flightcraft "A" Hangar is situated east of the PDX terminal; the south façade is oriented towards NE Airport Way and its north bay towards open airfields that parallel a raised levee adjacent to the Columbia River (Figure 6). Private businesses associated with PDX spread east to west along NE Airport Way's north frontage road. Modern private air facilities and hotels are replacing the older buildings including modern Flightcraft facilities situated east of the 1960s buildings. The area near the hangar is asphalted for vehicular parking on the west, south, and east sides and an asphalted tarmac extends northward towards the north runways.

2.0 AIRCRAFT HANGAR DEVELOPMENT; HISTORICAL OVERVIEW

Flightcraft "A" Hangar's design plan is similar to generic plans developed for World War II military aircraft hangars (Figure 7). Flightcraft "A" Hangar's resemblance to a standard World War II military aircraft hangar used by the USACE includes its large center bay, exposed roof trusses and

two-story attachments on the sides for offices and service areas. Exterior pocket housing for the massive sliding doors opening up to accommodate large aircraft was another common feature of World War II aircraft hangars (Aaron 2011:4-14).

Aircraft hangars evolved from the introduction of controllable aircraft by Orville and Wilbur Wright in 1903, at first resembling agricultural buildings. With the introduction of the first propeller monoplane in 1931 and later more sophisticated aircraft, facilities responded to the evolution of aircraft and its uses (Lorell 2003:5). Early aircraft in general and during World War I were typically "relatively fragile" fabric- or plywood-covered bi-planes with open cockpits and wood framing that required covered storage when not in use (Aaron 2011:4-2; McNiece et al. 2008:12). With the introduction of larger planes such as the Boeing B-9 bomber, more mechanically sophisticated and constructed of metal, hangar design branched from just storage to a complete aircraft facility for maintenance and in the case of the military aircraft also mission activities (Aaron 2011:4-1). During the intensive World War II buildup, generic types of military buildings including aircraft hangars were developed. The aircraft hangar design types typically reflected the activities and missions involved with the hangars (Sackett 2017:42). Several U.S. Air Corps squadron hangars were constructed in the early 1940s at the Portland Columbia Airport from U.S. Army Corps of Engineer generic plans (Figure 8). Flightcraft's "A" Hangar's architect, Raymond O. Marks, who worked for the U.S. Army Corps of Engineers Portland office in the early 1940s, would have been familiar with these plan types.

The main body of the "A" Hangar features bowstring trusses with glu-laminated top chords, with the exterior portals expressed with continuous glu-laminated arches reaching the ground. The bowstring glu-laminated arches allowed the open interior space to accommodate aircraft as large as a DC-7 as private aircraft increased in size. Lean-to west and east wings provided services for Flightcraft.

Glulam (glue laminated timber) structures and the arch form became popular for large open spaces after their first introduction in the U.S. in 1934 in an experimental building in Wisconsin (Bucher 2012:71-76). First patented in Germany by Otto Karl Freidrich Hetzer in 1901, German engineer Max Hanisch introduced the structure to the United States. Improvements to glu-laminated timber continued including water-resistant adhesives which allowed the engineered timbers to be exposed to the exterior elements. Glulam arched buildings gained attention for their strength, ability to span large open spaces, fire-resistance. Many were incorporated into many World War II building designs (Linville 2007). Glulam arches became an important engineering feature in churches, school facilities, warehouses, and aircraft hangars for their aesthetics and utility (Watters 1950:273).

3.0 FLIGHTCRAFT HISTORICAL OVERVIEW

Flightcraft has played a significant role in the Pacific Northwest private aircraft aviation industry as the PDX fixed base operator since after the end of World War II. Silas F. King established

Flightcraft in 1948 fulfilling his desire to operate his own aviation business. King built Flightcraft into a leading distributor and fixed base operator in the Pacific Northwest. Initially, King's business moved from location to location at PDX as the airport transitioned from wartime operations. As aircraft transportation demands accelerated in the 1950s, Port of Portland set out a plan for expansion and Flightcraft assisted in building a new Fixed Base Operator facility in 1960 east of the new Portland Airport terminal where it remained until 2001 and a new hangar was constructed.

Flightcraft, Inc. essentially grew out of Silas King's experiences working for a local private aircraft company, A.W. Whitaker Co. The owner, Arthur W. Whitaker established the private aircraft distributing company at the Swan Island Airport in the late 1920s. Whitaker, an early Oregon aviation pioneer, was instrumental in transforming local aviation from one of barnstorming mavericks into a legitimate commercial enterprise. Whitaker worked in the advancement of the aviation industry as a board member of the National Association of State Aviation officials and an Oregon State Aeronautics Board member. Whitaker was a successful entrepreneur, first selling Alexander Eaglerock aircraft and inventing aircraft landing equipment, crop dusting and spraying equipment, which he manufactured and marketed (*Oregonian* 1993).

World War II impacted A.W. Whitaker Co. and other local private aviation companies not long after Silas King entered the aviation industry in 1940 as Whitaker's employee. The Pearl Harbor attack on December 7, 1941, brought restrictions on flying private aircraft west of the Cascades. Known as the Western Air Defense Zone, the area near the Pacific coast was considered the most vulnerable to hostile attack (*Oregonian* 1944). Adding to the woes of the local aircraft industry and particularly A.W. Whitaker Co., aircraft businesses operating at Portland's old Swan Island Airport were given a 30-day notice by the Maritime Commission to relocate to repurpose the airfield into a shipbuilding facility for Kaiser Company. A.W. Whitaker Co. had an inventory of approximately 50 aircraft on Swan Island. Adding to this duress, the movement of private aircraft was restricted within the Western Air Defense Zone west of the Cascade Range and aircraft storage east of the Cascades was limited (Weave*r* 1942). Art Whitaker chose to enlist in the U.S. Army Corps in which he served training military pilots in Yakima, Washington. Silas King continued working at Whitaker's operation as a manager at the office on NE Union Avenue (current NE Martin Luther King Boulevard) while also working to build his own aircraft distributor business (R. L. Polk & Co. 1944; *Medford Tribune* 1944).

Silas King took a position with Western Skyways circa 1946, a company established at the Troutdale airfield by World War II veterans. The company began as a training school and branched out as a distributor as wartime restrictions on private aircraft lifted. As private aircraft restrictions were lifted at the Portland Airport, military facilities including two military hangars on the western edge of the aircraft field were planned for final disposition (Figure 9). The heavy aircraft division of Western Skyways relocated into the south hangar (Hangar 733) and A.W. Whitaker Co. moved into the north hangar (Hangar 732) (*Oregonian* 1947). Not long after this, the 1948 Flood completely inundated the

airport leaving airport facilities and the businesses within the hangars left with a massive clean up of six inches of mud (Schreiber 2017). Whitaker relocated a portion of his operations to a plant on NE Union Avenue and moved into a military hangar at the northeast corner of the airfield. Si King took over the south military hangar occupied by Western Skyways, where he established Flightcraft with Oregon aviation pioneer Harry K. Coffey, as a key investor. King worked to clean up Flightcraft's headquarters and build up his own new operation as the Pacific Northwest distributor of Beechcraft aircraft (*Oregonian* 1970; Richards 1961).

Flightcraft relocated to the north hangar to meet the needs of the U.S Air Force (*Sunday Oregonian* 1949). Eventually moving to six different locations in response to changes at the airport. Other challenges came with the expansion of an 8,800-ft-long runway running diagonally across the original airfield and when the U.S. Air Force requisitioned the two military hangars west of the airfield after a State of Emergency was declared December 16, 1950. For a time, Flightcraft settled at the northeast corner of the original airfield in a hangar previously occupied by A.W. Whittaker, near the original terminal buildings along airfield's north perimeter (*Sunday Oregonian* 1950a, 1950b). Flightcraft owners King and Coffey requested that the Port of Portland build a hangar specifically for their use to resolve these issues (*Oregonian* 1950). The Port responded by allowing $75,000 for construction of a new Flightcraft facility in April 1951. The new facility situated at the northeast corner of the airfield was completed in 1952 (Figure 10) (Schreiber 2017). The facility included a "new maintenance hangar, shop, ten T-hangars, a paved apron and taxiway connector" (Schreiber 2017). With a 30-year lease, Flightcraft was firmly established as Portland Airport's fixed base operator serving as Portland Airport's private plane terminal.

Post World War II expansion of population, the economy, and growing airport usage encouraged the Port to expand the airport to accommodate passenger "jetliners". Plans for the expansion began in the early 1950s and a new terminal opened in September 1958 east of the original airfield (Port of Portland Commissioners 1957-1958:1-4). Agreements were finally reached between the U.S. Air Force and the Port of Portland over the rights of use at the airport. The north portions of the airport were designated for civil uses, and the southern portions for military uses (Port of Portland Commissioner 1957-1958). The plans included a new commercial area for aircraft businesses east of the new terminal. Flightcraft facilities figured prominently in the plans for this area north of the two-lane entrance road (reconfigured into current NE Airport Way) (Port of Portland Commissioners 1957-1958).

Work on the Flightcraft's new facility began in 1960 once a lease agreement was reached between the Port and Silas King (*Sunday Oregonian* 1960). Flightcraft and the Port's agreement called for Flightcraft to construct the facility and then immediately selling it to the Port. A 30-year lease agreement confirmed Flightcraft's use of the new facility (Richards 1961). The hangar's construction plans were already underway by architect Raymond O. Marks in 1959. The new facility included the "A" Hangar, three T-hangars, and another hangar relocated from the Flightcraft's prior location to

west of "A" hangar (Port of Portland Commission 1961). Portland commercial building contractors, Teeples & Thatcher, completed the facilities for a reported sum of $250,000. Registered Engineer, James G. Pierson, who operated his own engineering firm from 1945 until his death in 1968, provided the specifications for the center span glulam truss design (Appendix A). A part owner of Flightcraft, C.D. Weyerhaeuser, sourced local lumber for the glulam arches from his family's Weyerhaeuser mills (Richards 1962:92).

Flightcraft's new facility celebrated with a grand opening in April 1961. A special aviation trade fair commemorated air travel with a display of historic aircraft. Flightcraft handled over 100 private aircraft at the new facility. Two of the t-hangars stored smaller aircraft and the other housed larger private aircraft. Tie-down capacity was expanded along the north apron near the newly finished 8,000-ft long north parallel runway (Port of Portland Commission 1961). In this period, C.D. Weyerhaeuser, served as the vice-president and part owner of Flightcraft, Inc., and Charles Miller served as the secretary and treasurer (Richards 1962:92).

Silas King retired in 1973 selling Flightcraft, Inc. to David R. Hinson and Vincent Mennella (*Oregonian* 1978). Under the new owners, Flightcraft, Inc. built a new facility in the 1970s at the Boeing's airfield in Seattle and acquired another at Spokane International Airport *(Oregonian* 1978). Flightcraft's sales and service spread across Oregon, Washington, Alaska, and Northern Idaho (*Oregonian* 1986a).

The 1980s economic woes and rising insurance and interest rates negatively impacted the private aircraft industry and Flightcraft's profits (Kronemer and Henneberger 1993). Flightcraft was forced to cut back its staff and several shifts in management and ownership occurred. Active management of Flightcraft, Inc. passed between its two owners Vincent A. Mennella and David R. Hinson in early 1985. Mennella took over the position of president and the Portland operation allowing Hinson to relocate to Midway Airlines in Chicago (*Oregonian* 1985). Mennella then sold his financial share of Flightcraft to Beech Holding, Inc., a subsidiary of Beechcraft Aircraft Corp., while remaining as Flightcraft's general manager. Beech Holding, Inc. took over Flightcraft, Inc. the following year under the leadership of Ernie Sturm, Beech Holding, Inc., President. The move to take over Flightcraft was merely temporary to ensure Beechcraft remained a key part of the Flightcraft operation until another owner for Flightcraft was secured. A deal was reached between Sturm and the Eugene-based company, Pape Bros. with Sturm as Flightcraft president in 1986 (*Oregonian* 1986). The Flightcraft Terminal was remodeled in this year, 1986 *(Oregonian* 1986b). Under Pape Bros., Flightcraft, Inc. purchased Eugene Aircraft facilities in 1987 and actively pursued other business opportunities to recover from the economic downtown (*Oregonian* 1987a). One such opportunity came in 1988 when the Federal Aviation Administration selected Flightcraft to offer specialized pilot training (Sorenson 1988).

Port of Portland Commissioners presented a master plan for a major expansion at PDX in 1990 (Figure 11). Port Commissioners also supported a $4,000,000.00 bond issue that included the

expansion and remodeling of Flightcraft, Inc. (Mayes 1990). This included "a new $1.5 million Business Aviation Terminal" completed in 1991 (Schreiber 2017). Architect Aron Faegre designed the new terminal and the remodeling plans for "A" Hangar.

Flightcraft built a new 72,000 square foot hangar in 2002, to accommodate larger aircraft. Flightcraft President Ernie Sturm also resigned in 2002 and Phil Botana replaced him May 1, 2002 (*Oregonian* 2002). A few of the businesses operating at Flightcraft included Seaport Airlines, established in 2008 (Siemers 2011).

Atlantic Aviation Services, a Texas-based FBO company, purchased Flightcraft, Inc. in 2011 from The Pape' Group, Inc. (Learn and Hunsberger 2011; Siemers 2011). Atlantic Aviation completely modernized their PDX operation building a new facility in 2017 (Bell 2017). Part of the new design incorporated arched glulam beams, perhaps a nod to the former Flightcraft hangar.

SILAS F. KING

Flightcraft, Inc.'s founder, Silas F. King, was remembered, when he died in 1987, as a "leader in Oregon's aviation industry" (*Oregonian* 1987b). Like many in the aviation business, he turned his passion for flying into a career.

Silas Fish King was an Oregon native, born in 1910 in Phoenix, Jackson County, Oregon, to George Warren and Dessie N. King. King's father worked in the mining industry and at the time of Silas King's birth worked as a placer miner (U.S. Bureau of Census 1910). In the 1920s, the King family moved to Butte, Montana, where George King worked in the copper mining industry living near other members of the King's extended family (U.S. Bureau of Census 1920; 1930). By the mid-1930s, the Kings had moved back to Phoenix where the young Silas King found employment working as a practical refrigeration engineer for Medford Ice and Storage Company (U.S. Bureau of Census 1940; *The Medford Mail Tribune* 1939). Silas met Marjorie L. Fish, a member of a prominent local Medford family, and they married in 1938.

In the same year King married, he enrolled in air training at Medford's airport where he obtained a private air pilot license (*Medford Mail Tribune* 1938). Within two years, King transformed his flying passion into a career relocating to Portland in 1940 to work for A.W. Whittaker Co., a Portland distributor of Piper aircraft (*Medford Mail Tribune* 1940). King and his family moved to Northeast Portland to be close to Whitaker's facilities at Portland's Swan Island Airport. While others enlisted for World War II, King continued working at A.W. Whitaker Co. as manager. Owner Art Whitaker enlisted and moved to Yakima to train military pilots. King's desire to run his own company took shape as the promise of lifting restrictions on private aircraft travel were in discussion in 1944 and were finally lifted in 1945 (Walker 1945:86).

King partnered with flight instructor Edward Tepper in 1944 and formed King-Tepper Company much on the same idea as was Flightcraft, as a distribution company, with parts, supplies, and

services (*Medford Mail Tribune* 1944). The partners scouted out locations for their business including Medford's airport where both had first trained as pilots. The venture apparently did not materialize as King continued working at A.W. Whitaker Company until taking a position with Western Skyways. Western Skyways moved to the Portland Airport not long before the 1948 Flood. King took over Western Skyway's hangar and established Flightcraft just before the 1948 Flood devastated the facility. King turned Flightcraft into the largest fixed base operator in the Pacific Northwest.

In addition to his business ventures, King promoted aviation by helping establish the Columbia Aviation Country Club (CACC) and serving as its president (Schreiber 2017).

King sold Flightcraft to David R. Hinson and Vincent Mennella in 1978 (*Oregonian* 1978). King's health deteriorated and he died at the age of 77 in 1987 (*Oregonian* 1987b)

HARRY K. COFFEY

Harry K. Coffey, an early investor in Flightcraft, played an important role in early aviation at the local and national level. Coffey took up aviation by building a glider in 1911 and obtained a pilot license in 1914. During World War I, Coffey served as an Air Corps pilot. After WWI, Coffey promoted aviation interests after establishing a successful insurance business where he incorporated his love of flying in his business travels.

Locally, Coffey was an early leader in the development of Portland Airport. Coffey purchased the first model 18 Twin Beechcraft airplane with which he made the first official landing at the Portland Columbia Airport. The Smithsonian Institute acquired his Beechcraft aircraft in 1970 for exhibition in Washington, D.C. (*Oregonian* 1970). Coffey served at the national level as President of the National Aeronautics Association and assisted in the development of the Civil Air Patrol, a group of volunteer pilots that served during World War II (*Sunday Oregonian* 1963). His interest in flying led to his investment in Silas King's Flightcraft operation. Coffey's influences were cut short by an air accident in the Columbia Gorge in 1954 (*Oregonian* 1970).

RAYMOND O. MARKS, ARCHITECT

Portland architect Raymond O. Marks completed the design and drawings for Flightcraft "A" hangar in 1960. Mark's private architectural practice spanned from the 1950s to circa 1985 completing plans for industrial, commercial, government, and religious buildings. The architect's experience working for the U.S. Army Corps of Engineers prior to World War II and his service during World War II in the U.S. Navy Seabees prepared him for his work for Flightcraft.

Raymond Otto Marks was born June 15, 1907, in Spokane, Washington to Gustav and Mary [Warm] Marks. Both Marks' parents emigrated separately from Germany in the early 1890s and married in 1906. Gustav Marks, born in Russia, worked as a teamster for a local brewery in Spokane (U.S.

Census 1910; State of Washington 1907). The family remained in Spokane where Ray O. Marks graduated from Spokane's Lewis and Clark High School in 1925.

After graduating, Marks moved to Portland where he apprenticed in several architectural offices while studying architecture through Oregon State College extension classes (*Oregonian* 1998). Marks gained a variety of experiences as he moved from office to office during the 1920s and 1930s, working in many notable architectural offices. Marks succession of positions included working for Lawrence & Holford (1926), Herman Brookman (1927), Roi L. Morin (1929-1930), Martin Schact Co. (1932), Jamieson Parker (1933), and Malarkey and Kallander (1934) (R. L. Polk & Co 1926, 1927, 1928, 1929, 1930, 1931, 1932, 1933, 1934). At times Marks worked independently or travelled elsewhere for work adapting to the challenges faced by other architects during the Great Depression.

In the early 1940s, Marks worked for the US Army Corps of Engineers as an associate architect before signing with the U.S. Navy Seabees during World War II (R. L. Polk & Co 1942, 1944; *Oregonian* 1998; Wesfelty 2008). In the Seabees, Marks was stationed in the Pacific where he helped build "airfields and bases" gaining the experience for future airfield projects (Wesfelty 2008).

After serving during World War II, Marks established a private practice in Portland, occasionally teaming up with other professionals. He worked with Harry Herzog in designing Portland City offices. Other buildings included: the Anchorage Restaurant along the Willamette River (1953), Curry County Courthouse (1958), and the subject Flightcraft "A" Hangar (1959-1960). In his later years, Marks operated a private practice from his residence until retiring circa 1985 (R. L. Polk & Co. 1985). Marks died in 1998, leaving behind his wife Violet [Olson] Marks (*Oregonian* 1998).

JAMES G. PIERSON

Flightcraft "A" Hangar's structural engineer, James G. Pierson, likely knew Marks from their associations both working for the USACE in Portland prior to World War II (U.S. Bureau of Census 1940). During World War II, Pierson worked as an engineer in the shipyards, and began his own firm, first known as Pierson and Tidball in 1945. Marks and Pierson teamed up on this project in the late 1950s. Pierson worked on many projects in Oregon, one of his most notable projects was Salishan Lodge near Lincoln City. Pierson died at the age of 57 in 1968 (*Oregonian* 1968).

PHYSICAL

Flightcraft "A" Hangar is a distinctive aircraft hangar with its exterior glulam portals aesthetically expressing its overall function. The glulam arches facing north and south and the italicized Flightcraft logo framed within the arches became a familiar landmark to those approaching the Portland International Airport. The hangar's east and west two-story wings flanking the central aircraft bay provided working spaces for office and shops. These wings are horizontally composed with ribbon windows on the first and second floors. The hangar's overall structure is built of wood

framing on a poured concrete foundation. The center aircraft bay measures approximately 120 by 180 feet long and stands two and one-half stories (30 feet) in height at its roof apex. The center interior space was built large enough to accommodate aircraft the size of DC-7s. The adjacent wings measure 24-ft wide and 180-ft long, except where the east wing lobby space projects from the east façade. The north and south walls are clad with corrugated-aluminum siding and lit by corrugated translucent fiberglass panels in the doors and arches. The west wing was originally subdivided into shop spaces. The hangar's east wing functioned as business area containing the commercial points of entry into the Flightcraft operation. The main entrance and lobby at the northeast corner of the building accessing business offices and the parts department. A second story loft above the main aircraft space provided storage. Open wood-framed stairs within the central space accessed the loft from the second floor. Overhead hoists allowed engines to be pulled from large aircraft and conveyed to second floor shops for servicing (Figure 12) (Richards 1962:92). An asphalt apron to the hangar's north provided parking for private aircraft. In the early 1990s, the east façade was updated with aluminum panel cladding to create a grid pattern along the east façade and the main entry was renovated.

SOUTH FAÇADE AND NORTH FACADES

The north and south facades are essentially the same design. Each facade features exterior glulam arches articulating the central aircraft bay with flanking east and west wings. The above arched transoms are also clad with translucent corrugated fiberglass panels historically featuring italicized Flightcraft logo lettering. The north and south exterior glulam arches stand outside of the exterior of the sliding door pockets supported on concrete bases. Each central aircraft bay is subdivided horizontally by a band of eight, plywood-clad vertical doors lit by a band of corrugated Fiberglas panels. External metal clad "door pockets" house the wood-framed sliding panels, each door measures approximately 15-ft wide by 20-ft tall. Metal tracking embedded into the poured concrete floor guides the rollers at the base of each door.

Along the north façade, an exterior line service tower, east of the central aircraft bay accessed by exterior stairs, was removed in a 1990s remodel of "A" Hangar (Aron Faegre & Associates 1991a:A2).

CENTRAL AIRCRAFT BAY

The aircraft bay interior is a two-story volume below an open wood-framed roof structure of trusses incorporating glulam lower and top chords. The trusses rest upon wood columns along the east and west walls. The interior space measures approximately 120 ft by 120 ft. A second story, wood-framed, loft space, measuring 40 by 100 feet, is suspended from the top chord of the trusses. The storage loft is accessed by two wood-framed stairs exposed to the interior space accessed from the east and west wings. Above, 24" stationary ventilators are inset to the roof. Radiant heat was built

into the poured concrete floors to keep the large open space heated. Plaster-coated plywood clads the central bay's east and west interior walls.

Hoist way doors located on the second floor of the west wall accessed the former second floor engine shop where a crane conveyed engines for repair and parts cleaning. The doors were infilled during 1992 improvements to meet the current 1 hr. fire safety standards. A one-story enclosed office area along the east wall was removed in the early 1990s remodel (Aron Faegre & Associates 1992a).

The central aircraft bay doors consist of eight vertical retractable panels, operating on tracking embedded into the concrete floor. They are housed within an outdoor wood-framed door pocket clad in corrugated metal (Appendix B). Exterior wood-framed door pockets attached to the north and south walls stand between the main structure and exterior glulam arches. Translucent corrugated fiberglass panels covering the vertical doors upper half allowing in natural light.

EAST WING FAÇADE

The east wing façade stands two-stories high and is capped by a gradually-sloped shed roof. The east façade design is horizontal in composition, defined by bands of windows on the first and second floors. Bands of windows on the first floor set off the main and secondary entries, while a single continuous band extends across the second floor. Pre-finished aluminum panels added to the exterior in the early 1990s create a gridded pattern along the east wing. A one-story attachment projecting at the north is the entry lobby. Above, an open balcony is accessed from a single door; its railing an enclosed knee wall/parapet.

The east façade has received the most exterior modifications, most notably in the early 1990s. Although retaining most of the original window and door openings, the former paired vertical glass windows were replaced by single, vertical fixed panes. The original entrance designs were similar in appearance, each featuring a flat canopy slightly slanted upwards supported by tapered exposed beams resting on slender steel pipe columns on a concrete slab. Wood tongue-and-groove decking capped each canopy. Exposure to the Columbia Gorge's occasionally brutal east wind, likely led to the construction of the projecting steel-framed vestibule under the main canopy with a window wall facing east. The canopy was later modernized in the early 1990s by encasing the original columns with metal-clad columns supporting a flat roof canopy built over the existing exposed roof beams and tongue-and-groove decking. The southernmost "Parts Department" canopy was removed and the main entrance canopy remodeled.

EAST WING

The primary entrance and lobby project from the east façade's north end. A smaller entrance at the east façade's south end originally entered the Parts Department. A corridor connected offices along the east wing from the lobby to the former Parts Department. Architect Marks' plans show that the

Sales offices were located near the primary entrance and accounting offices lined the corridor. The office partitions facing the corridor had horizontal fixed 1/4" plate glass windows and single-light wood doors. The interior offices were constructed with 2x4 studs sheathed with 5/8" gypsum board. From the lobby, wood paneled stairs lead to the second floor. Hardwood plywood panels and hardwood handrails were specified on the architectural drawings for the East Wing lobby stairway. The current stair detailing appears to be as originally constructed: with flush vertical sheets of hardwood paneling and the same hardwood handrail. Interior modifications were made in the early 1990s according to a phased plan prepared by Aron Faegre & Associates (Aron Faegre & Associates 1992b). Private offices were situated on the second floor. A door leads to an open deck on top of the entry canopy.

WEST WING FAÇADE

The west wing façade is fairly utilitarian in design and intact compared to the east facade. Much like the east façade, the composition is horizontal, expressed by a lengthwise single band of aluminum sash windows on the second floor and two ribbons of windows along the first floor. Corrugated aluminum cladding covers the exterior walls, much as it did originally. Several pedestrian door openings and service doors provide access the asphalted tarmac west of the hangar.

WEST WING INTERIOR

The west wing's first floor was originally subdivided into shop spaces. These were later converted into offices and later housed a parts repair shop, and a shipping services department. An engine repair facility was originally located on the second floor and took up most of the space except for a parts cleaning room at the north end. Offices replaced the second floor service area. Stairs were located at the south end and near the north end of the open space. A crane hoisted the aircraft engines from all sizes of aircraft and conveyed the engines to the second floor engine repair room. The double doors for the hoist into the second floor were filled in in the 1990s remodel to meet current fire safety codes.

ALTERATIONS

1980s

During the mid-1980s, amidst a series of changes in management, the "executive" Flightcraft Terminal was remodeled (*Oregonian* 1986b).

1990s

Portland architect Aron Faegre & Associates prepared Flightcraft Hangar "A" renovation plans in the early 1990s in part to meet current codes. Exterior renovations included new roofing, updating the east façade, replacing the original fiberglass panels in the archways and hangar doors with white

translucent fiberglass panels, some sound insulating glass in the offices, and the removal of the former line service tower. The exterior signage in the arch was removed, cleaned and reinstalled and a new roof overlay installed (Aron Faegre & Associates 1991a:A2). Other exterior modifications included the installation of pre-finished aluminum panel cladding on the east facade expressed in a gridded pattern across the east façade and at the entry vestibule. The columns supporting the entry canopy were clad by pre-finished aluminum panels essentially matching the façade in material (Aron Faegre & Associates 1991b). Office improvements were carried out in phased plan in the east and west wings (Aron Faegre & Associates 1992b:PP-1). Aron Faegre & Associates have since prepared a number of other plans for Flightcraft of offices and aircraft maintenance hangars (Aron Faegre & Associates 2019).

At the time of the documentation in 2019, Port of Portland housed a fabrication workshop for expansion projects. Most of the offices and spaces were not in use.

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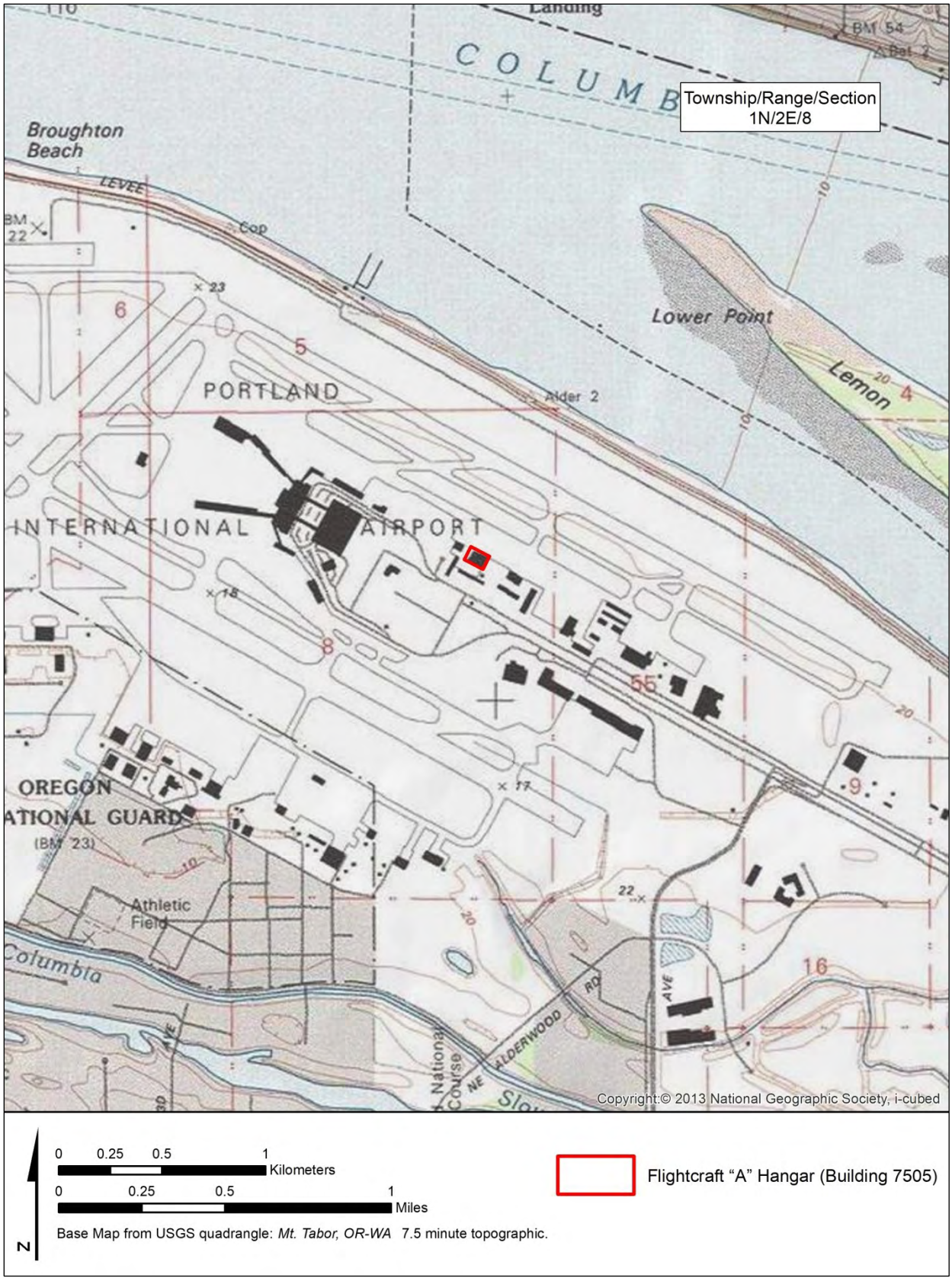


Figure 1. General location of PDX and Flightcraft "A" Hangar.

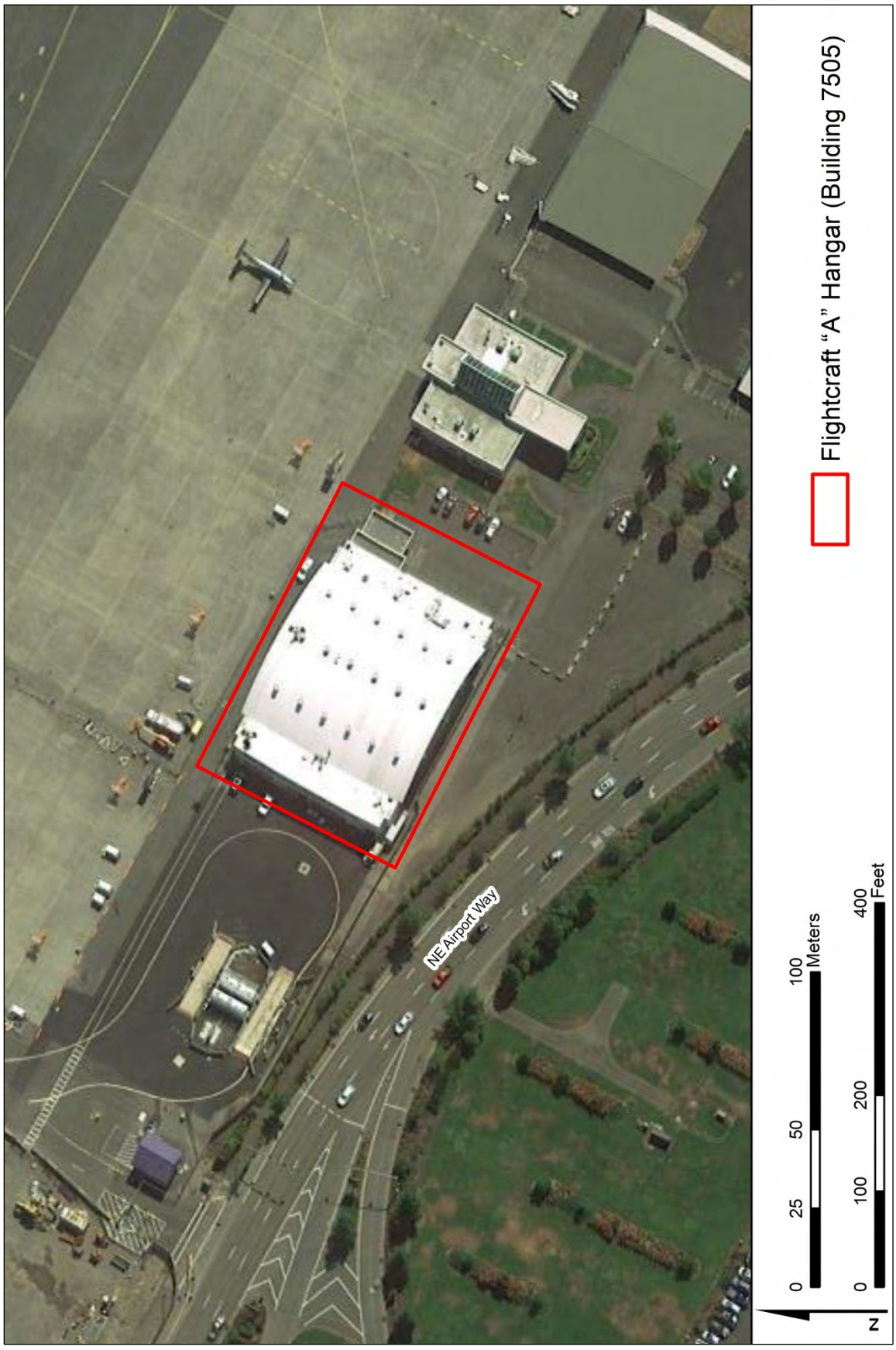


Figure 2. Flightcraft "A" Hangar's location.

Figure 3. Flightcraft facilities in 1962 (Photo courtesy of Oregon Historical Society).

Figure 4. A 1963 aerial view of Flightcraft's facilities looking westward towards the Portland International Airport terminal.

Figure 5. Another 1963 aerial view of Flightcraft's facilities showing the "A" hangar, the three rectilinear t-hangars, and the relocated hangar in the foreground.

Figure 6. Flightcraft "A" Hangar overview showing its east and north facades, the view is towards the southwest.

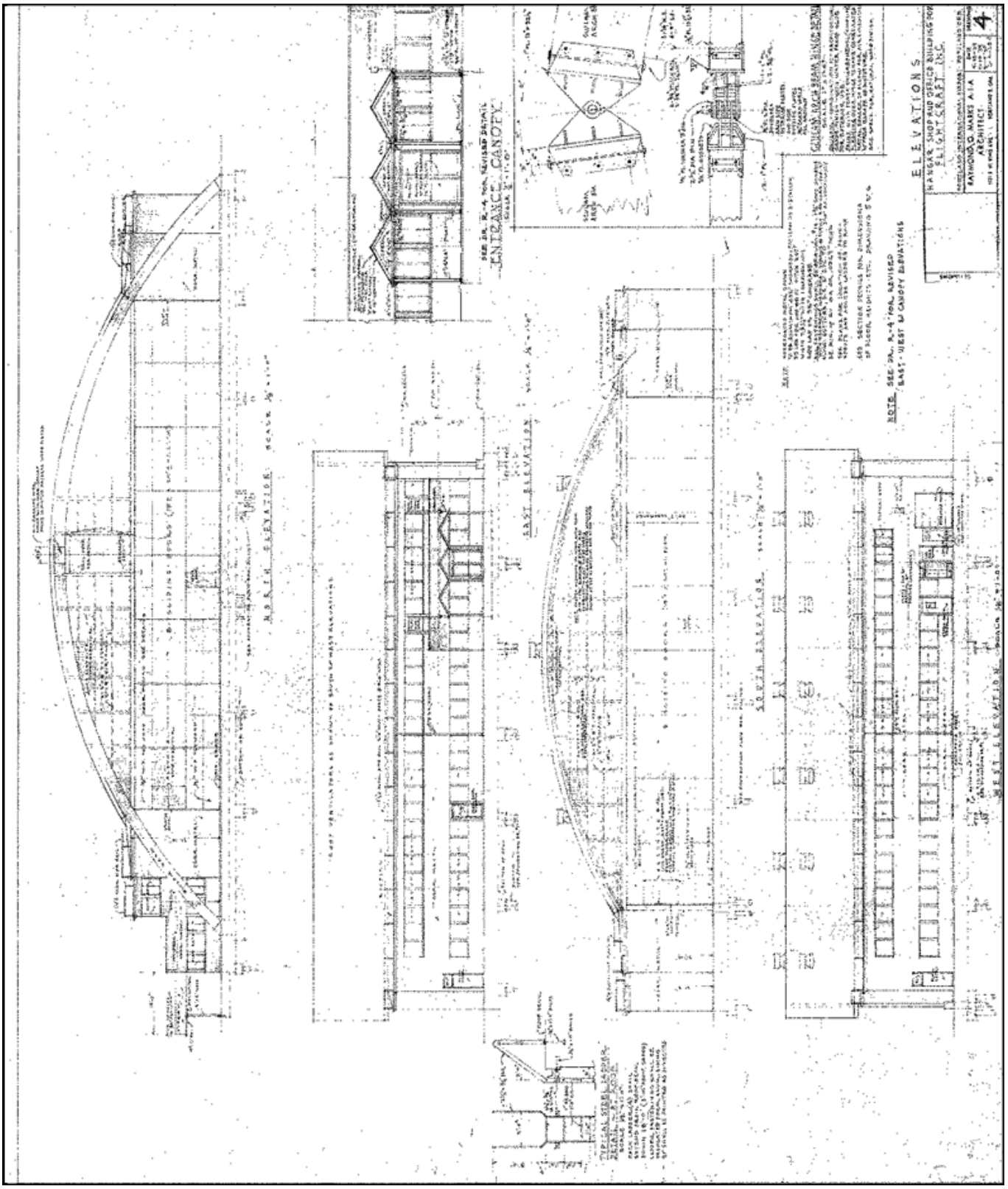


Figure 7. Elevations of Flightcraft "A" Hangar showing the service wings, and early entrance design that was revised before construction.

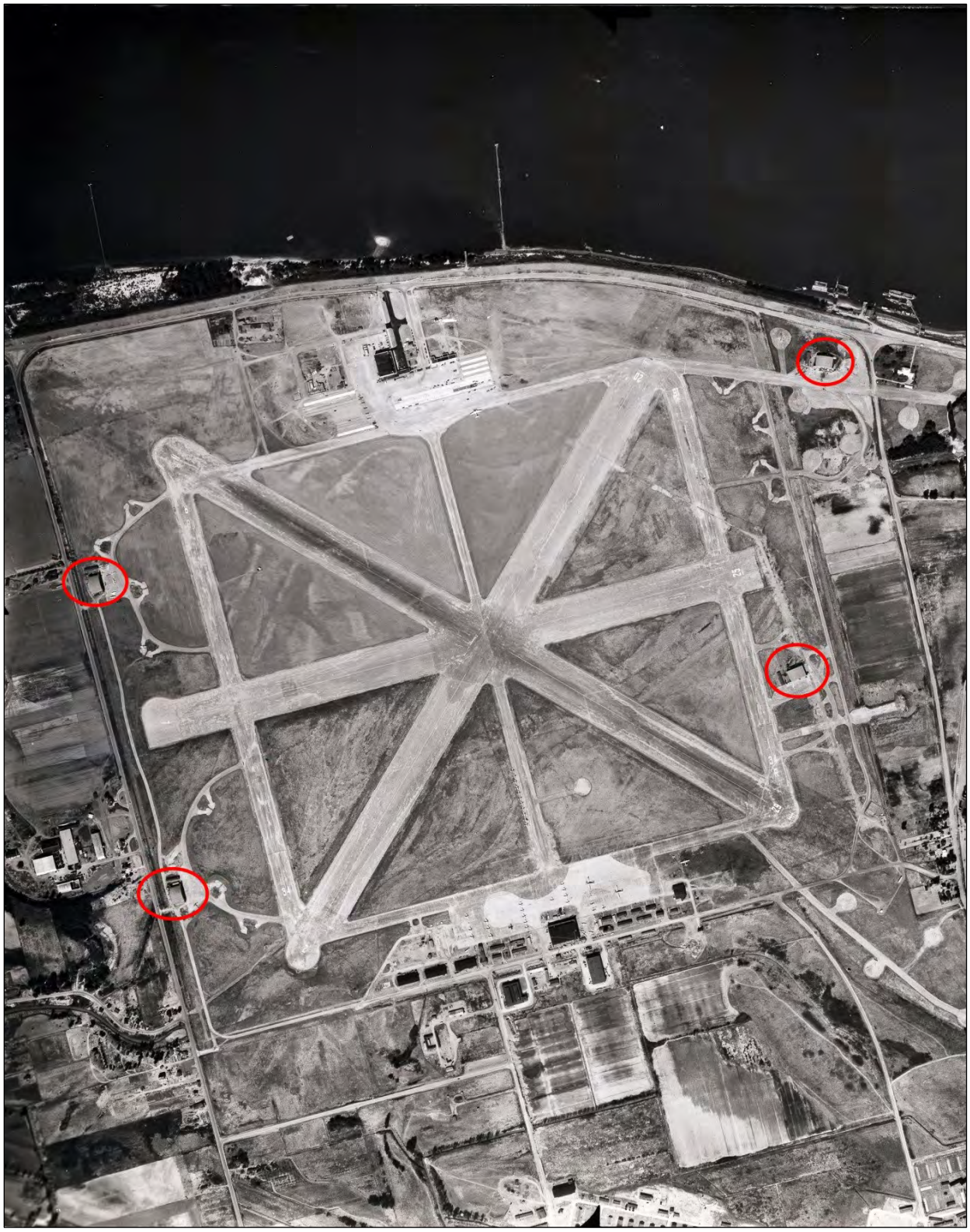


Figure 8. A 1948 aerial view of Portland Columbia Airport showing the locations of the World War II aircraft hangars, several of which housed Flightcraft in its early years (Courtesy of Steven Schreiber).

Figure 9. An aerial view of the two military hangars at the western edge of the field; both of which were home to Flightcraft in the late 1940s.

Figure 10. A 1952 aerial view of Flightcraft's 1950s location at the northeast corner of the airfield (Courtesy of Steven Schreiber).

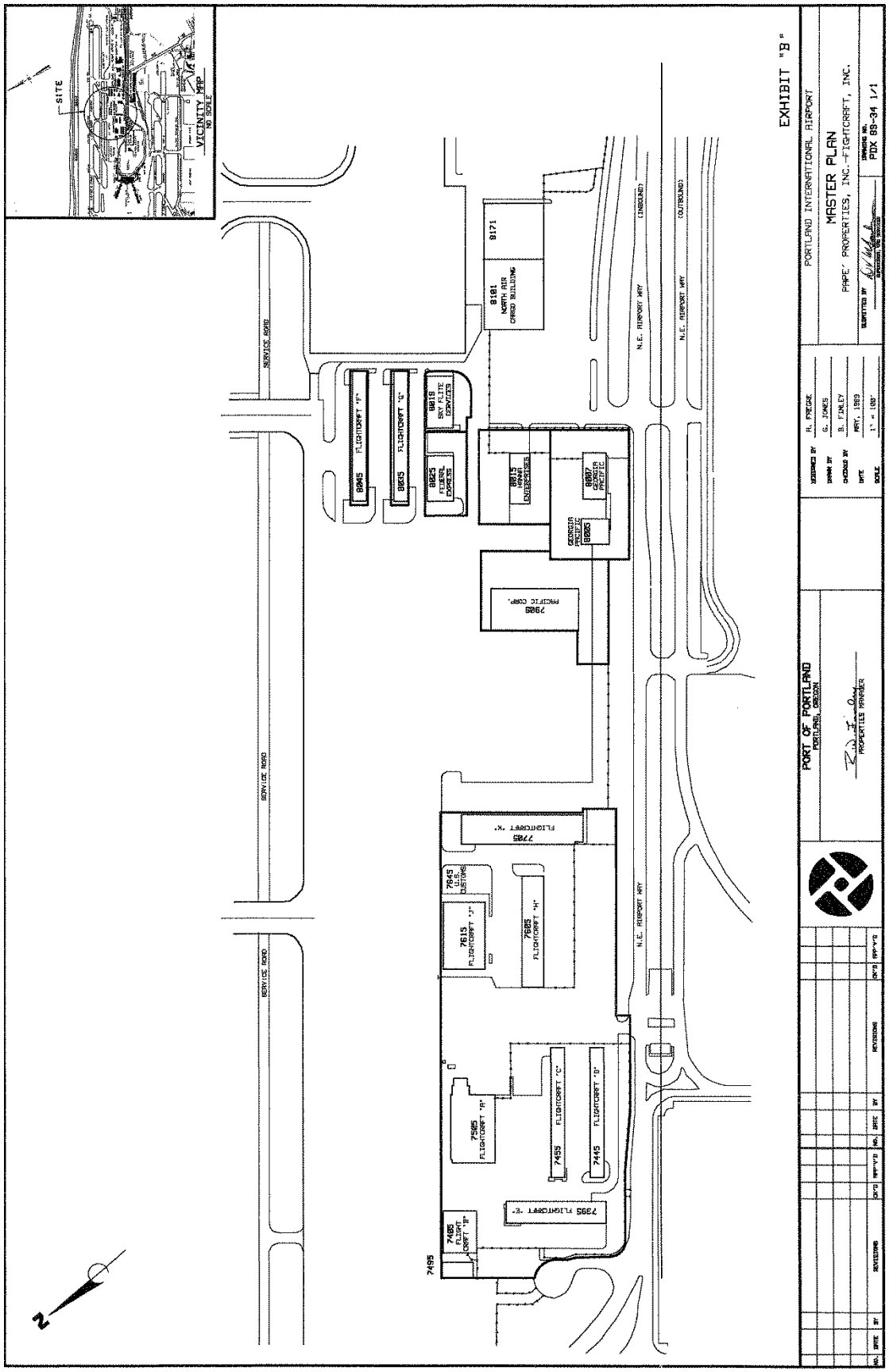


Figure 11. Flightcraft facilities map from Portland International Airport 1993 Master Plan.

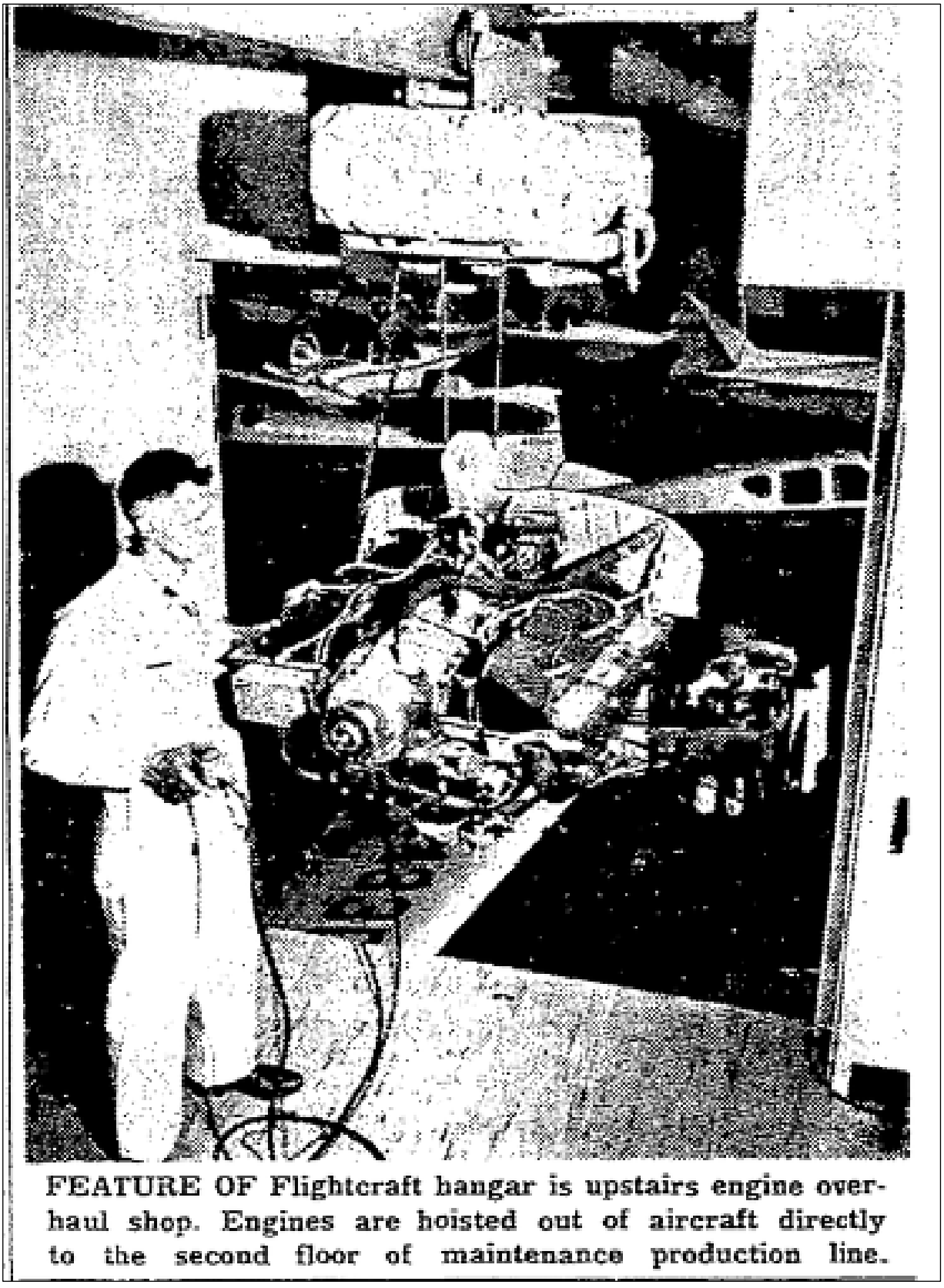


Figure 12. A *Sunday Oregonian* (1961) publicity shot showing the engine hoist in use.

APPENDIX A: ARCHITECTURAL DRAWINGS

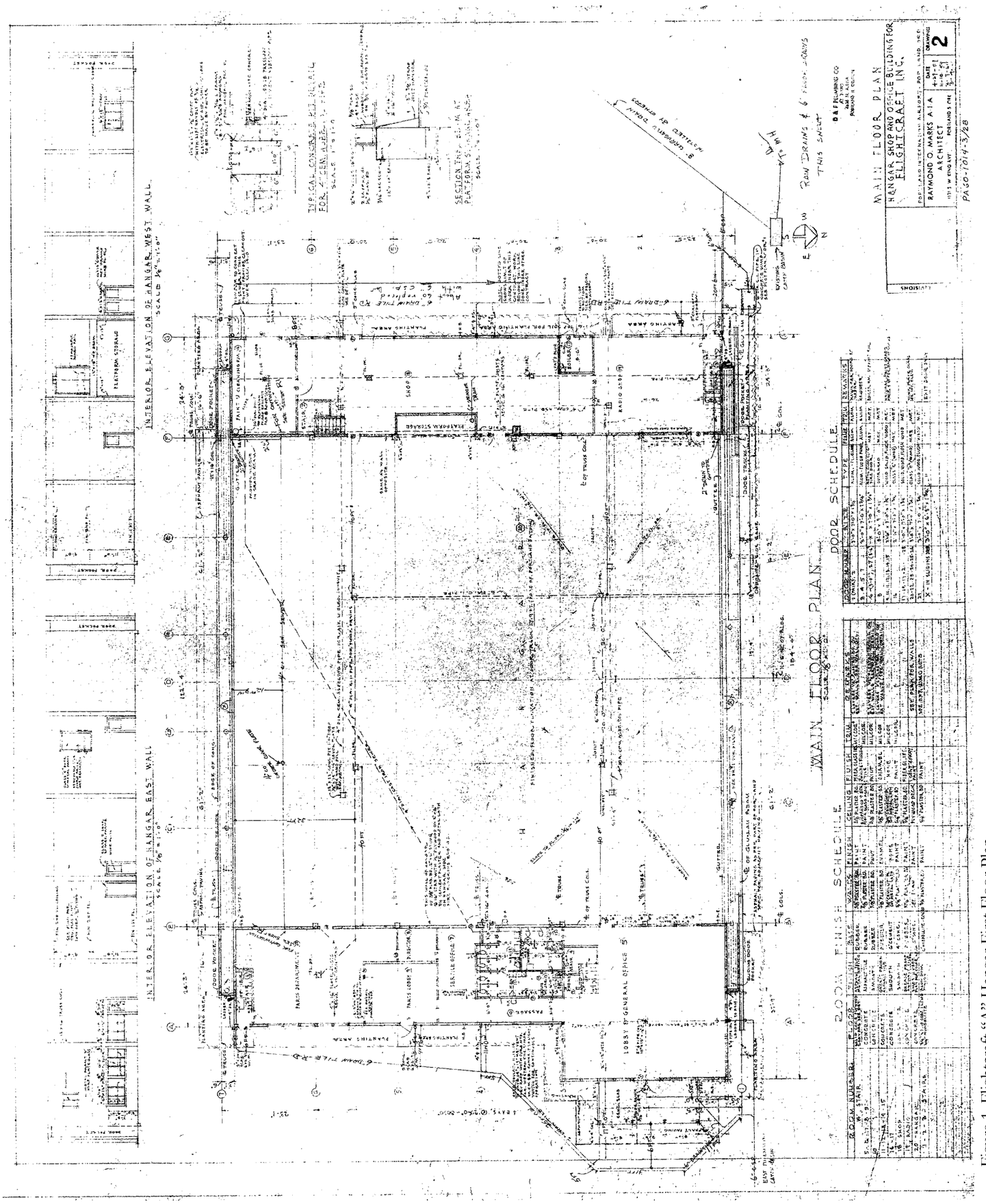


Figure 1. Flightcraft "A" Hangar First Floor Plan.

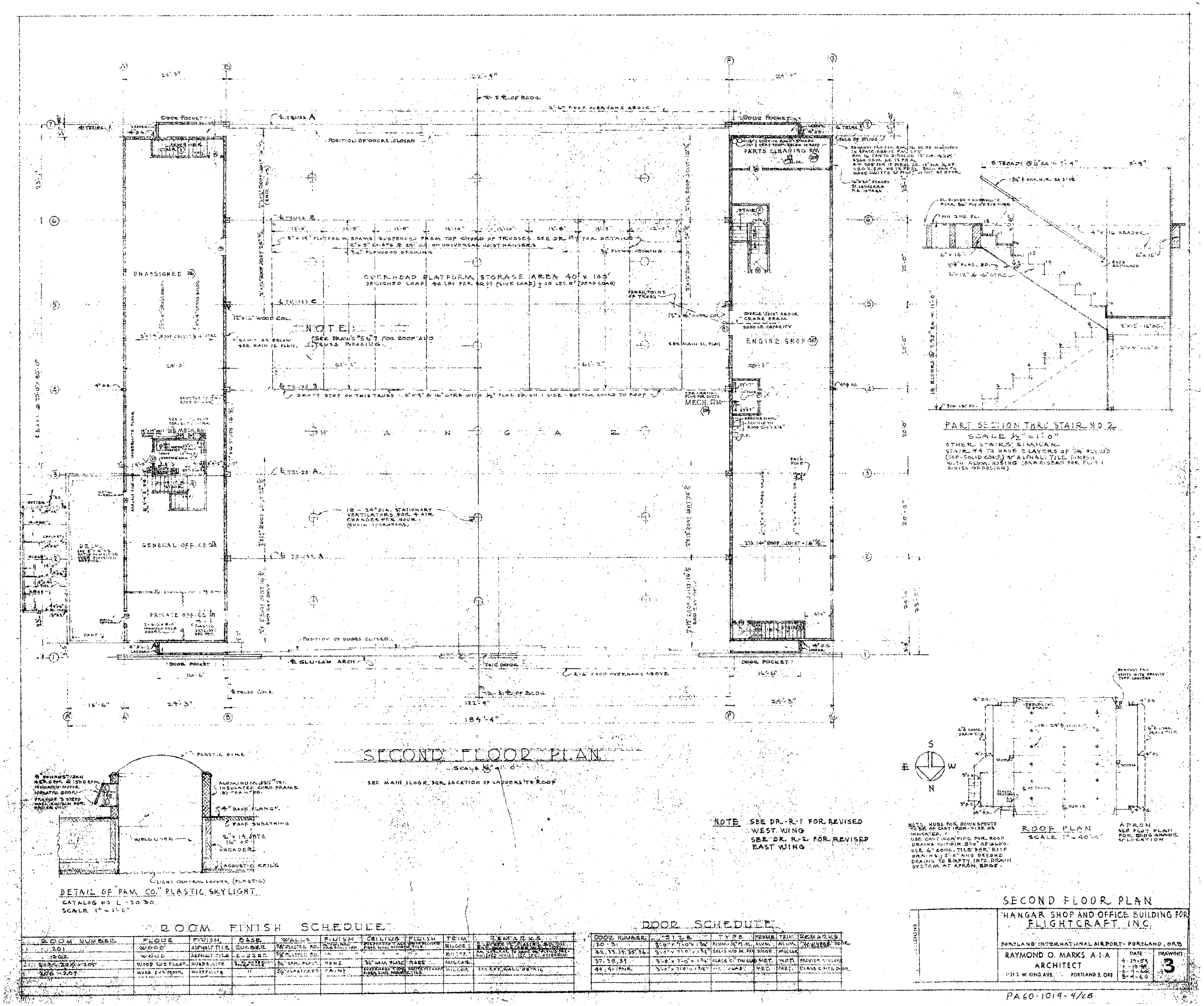


Figure 2. Flightcraft "A" Hangar Second Floor Plan.

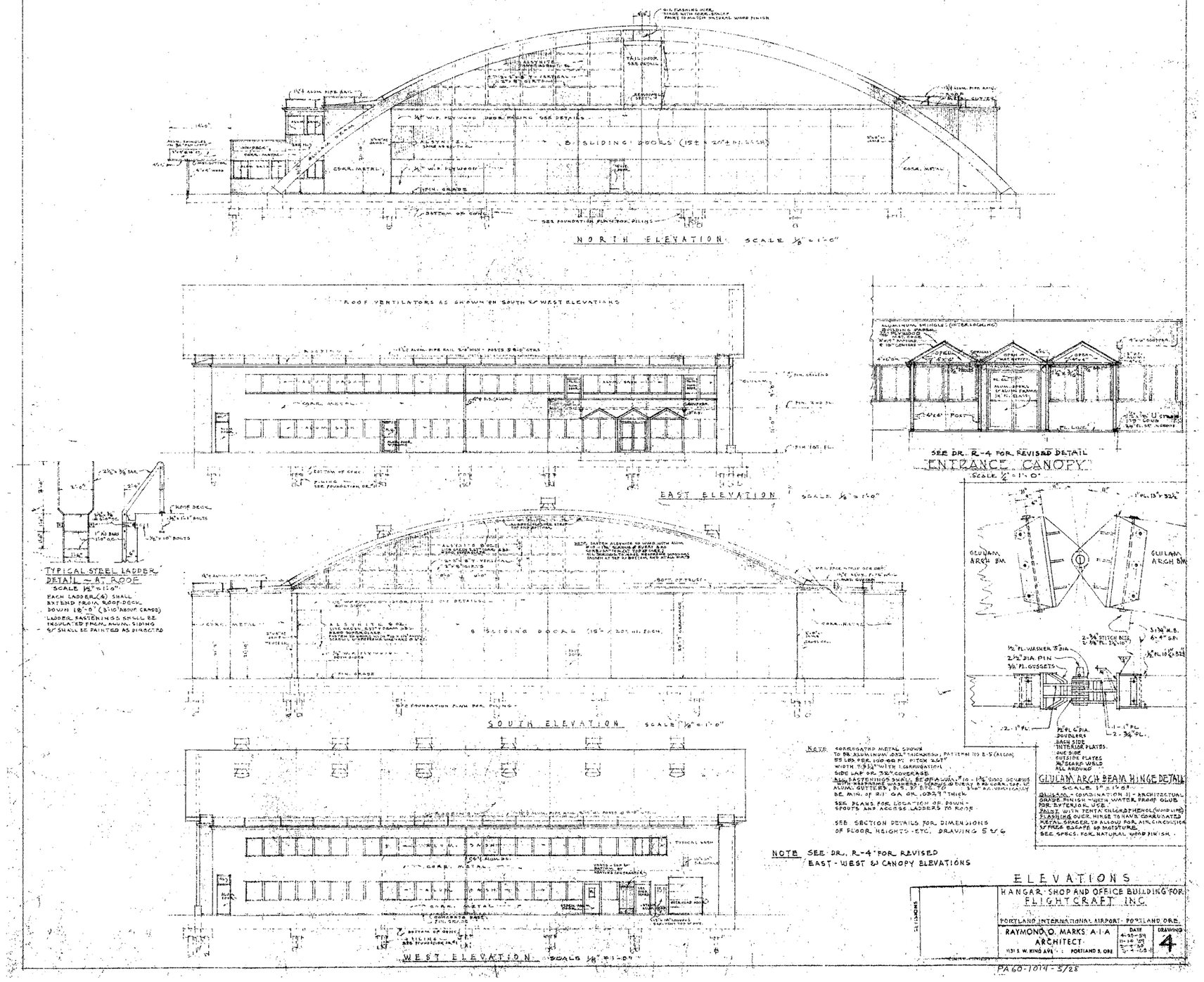
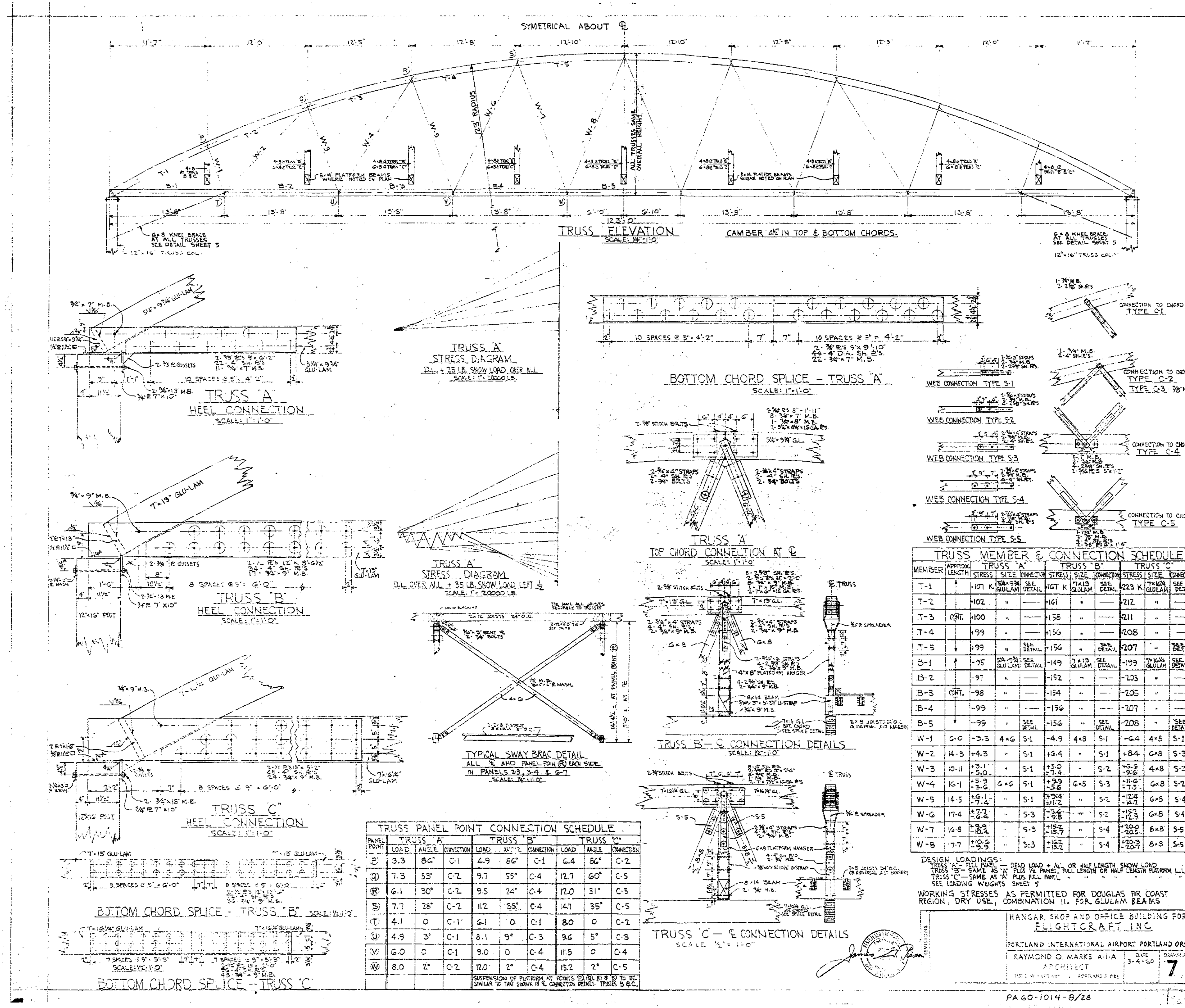


Figure 3. Flightcraft "A" Hangar Elevations.



TRUSS PANEL POINT CONNECTION SCHEDULE

PANEL POINT	TRUSS "A" LOAD	ANGLE	CONNECTION	TRUSS "B" LOAD	ANGLE	CONNECTION	TRUSS "C" LOAD	ANGLE	CONNECTION
Ⓟ	3.3	86°	C-1	4.9	86°	C-1	6.4	86°	C-2
Ⓠ	7.3	53°	C-2	9.7	55°	C-4	12.7	60°	C-5
Ⓡ	6.1	30°	C-2	9.5	24°	C-4	12.0	31°	C-5
Ⓢ	7.7	28°	C-2	11.2	35°	C-4	14.7	35°	C-5
Ⓣ	4.1	0	C-1	6.1	0	C-1	8.0	0	C-2
Ⓤ	4.9	3°	C-1	8.1	9°	C-3	9.6	5°	C-3
Ⓥ	6.0	0	C-1	9.0	0	C-4	11.8	0	C-4
Ⓦ	8.0	2°	C-2	12.0	2°	C-4	15.2	2°	C-5

SUSPENSION OF PLATFORM AT POINTS Ⓟ, Ⓠ, Ⓡ & Ⓢ TO BE SIMILAR TO THAT SHOWN IN ℄ CONNECTION DETAILS · TRUSSES B & C.

TRUSS MEMBER & CONNECTION SCHEDULE

MEMBER	APPROX. LENGTH	TRUSS "A" STRESS	SIZE	CONNECTION	TRUSS "B" STRESS	SIZE	CONNECTION	TRUSS "C" STRESS	SIZE	CONNECTION
T-1	↑	+107 K	5¼×9¾ GLULAM	SEE DETAIL	+167 K	7×13 GLULAM	SEE DETAIL	+223 K	7×16¼ GLULAM	SEE DETAIL
T-2		+102	"	—	+161	"	—	+212	"	—
T-3	CONT.	+100	"	—	+158	"	—	+211	"	—
T-4		+99	"	—	+156	"	—	+208	"	—
T-5	↓	+99	"	SEE DETAIL	+156	"	SEE DETAIL	+207	"	SEE DETAIL
B-1	↑	-95	5¼×9¾ GLULAM	SEE DETAIL	-149	7×13 GLULAM	SEE DETAIL	-199	7×16¼ GLULAM	SEE DETAIL
B-2		-97	"	—	-152	"	—	-203	"	—
B-3	CONT.	-98	"	—	-154	"	—	-205	"	—
B-4		-99	"	—	-156	"	—	-207	"	—
B-5	↓	-99	"	SEE DETAIL	-156	"	SEE DETAIL	-208	"	SEE DETAIL
W-1	6-0	-3.3	4×6	S-1	-4.9	4×8	S-1	-6.4	4×8	S-1
W-2	14-3	+4.3	"	S-1	+6.4	"	S-1	+8.4	6×8	S-3
W-3	10-11	+3.1 -5.0	"	S-1	+5.0 -7.4	"	S-2	+6.6 -9.6	4×8	S-2
W-4	16-1	+5.9 -3.6	6×6	S-1	+9.9 -5.6	6×8	S-3	+11.6 -7.5	6×8	S-2
W-5	14-5	+6.1 -7.4	"	S-1	+9.4 -11.2	"	S-2	+12.4 -14.7	6×8	S-4
W-6	17-4	+7.7 -6.4	"	S-3	+11.6 -9.8	"	S-2	+15.2 -12.9	6×8	S-4
W-7	16-8	+9.9 -10.4	"	S-3	+15.2 -15.7	"	S-4	+20.0 -20.5	8×8	S-5
W-8	17-7	+10.6 -9.9	"	S-3	+16.2 -15.2	"	S-4	+20.3 -20.7	8×8	S-5

DESIGN LOADINGS:
TRUSS "A" – FULL PANEL — DEAD LOAD + ALL OR HALF LENGTH SNOW LOAD
TRUSS "B" – SAME AS "A" PLUS ½ PANEL FULL LENGTH OR HALF LENGTH PLATFORM L.L.
TRUSS "C" — SAME AS "A" PLUS FULL PANEL
SEE LOADING WEIGHTS SHEET 5

WORKING STRESSES AS PERMITTED FOR DOUGLAS FIR COAST REGION, DRY USE, COMBINATION 11. FOR GLULAM BEAMS

HANGAR, SHOP AND OFFICE BUILDING FOR
FLIGHTCRAFT INC
PORTLAND INTERNATIONAL AIRPORT PORTLAND ORE.
RAYMOND O. MARKS A.I.A ARCHITECT
DATE 3-4-60
DRAWING 7
PA 60-1014-8/28

Figure 4. Flightcraft "A" Hangar Truss Drawings.

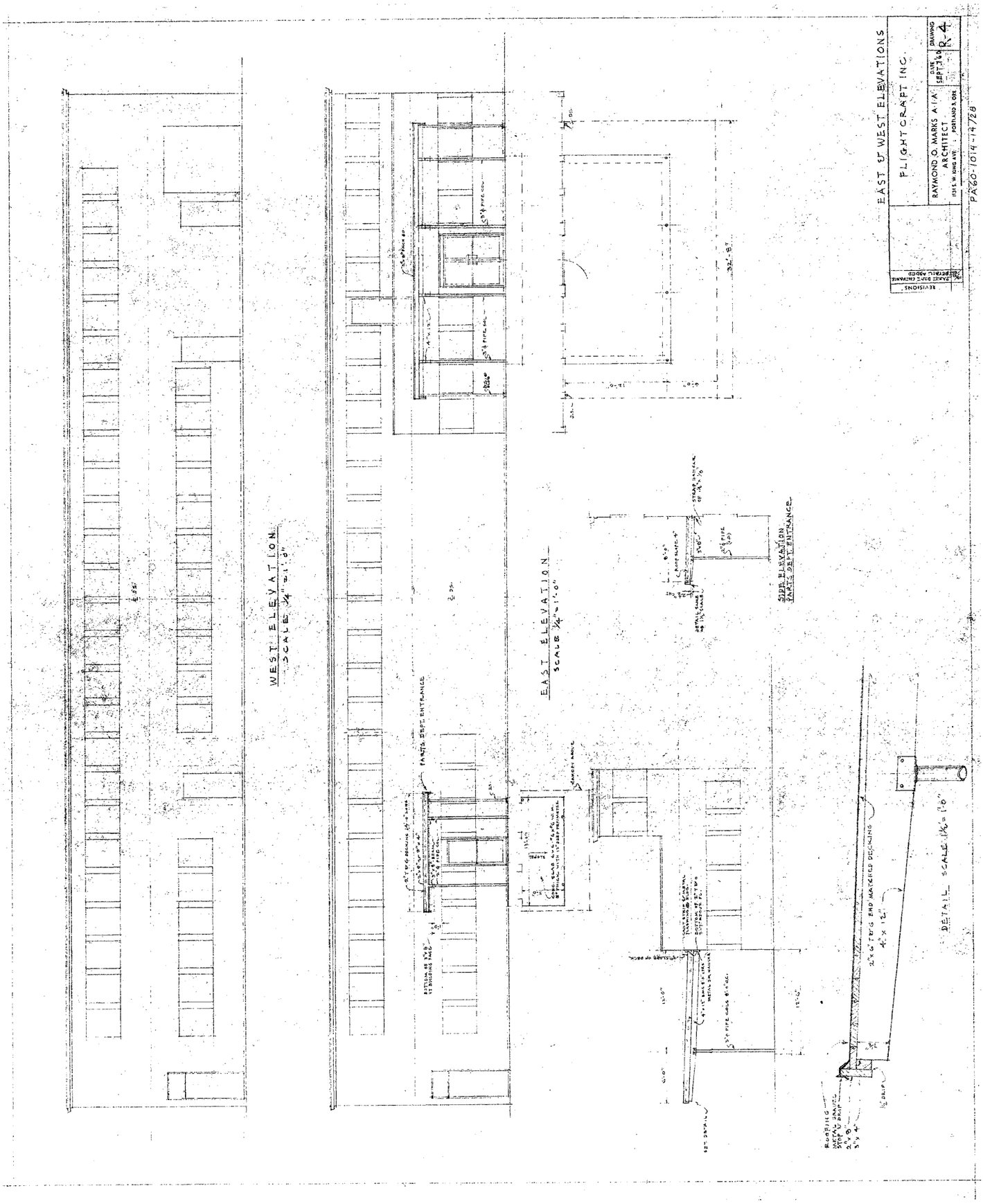


Figure 5. Flightcraft "A" Hangar East and West Wing Elevations.

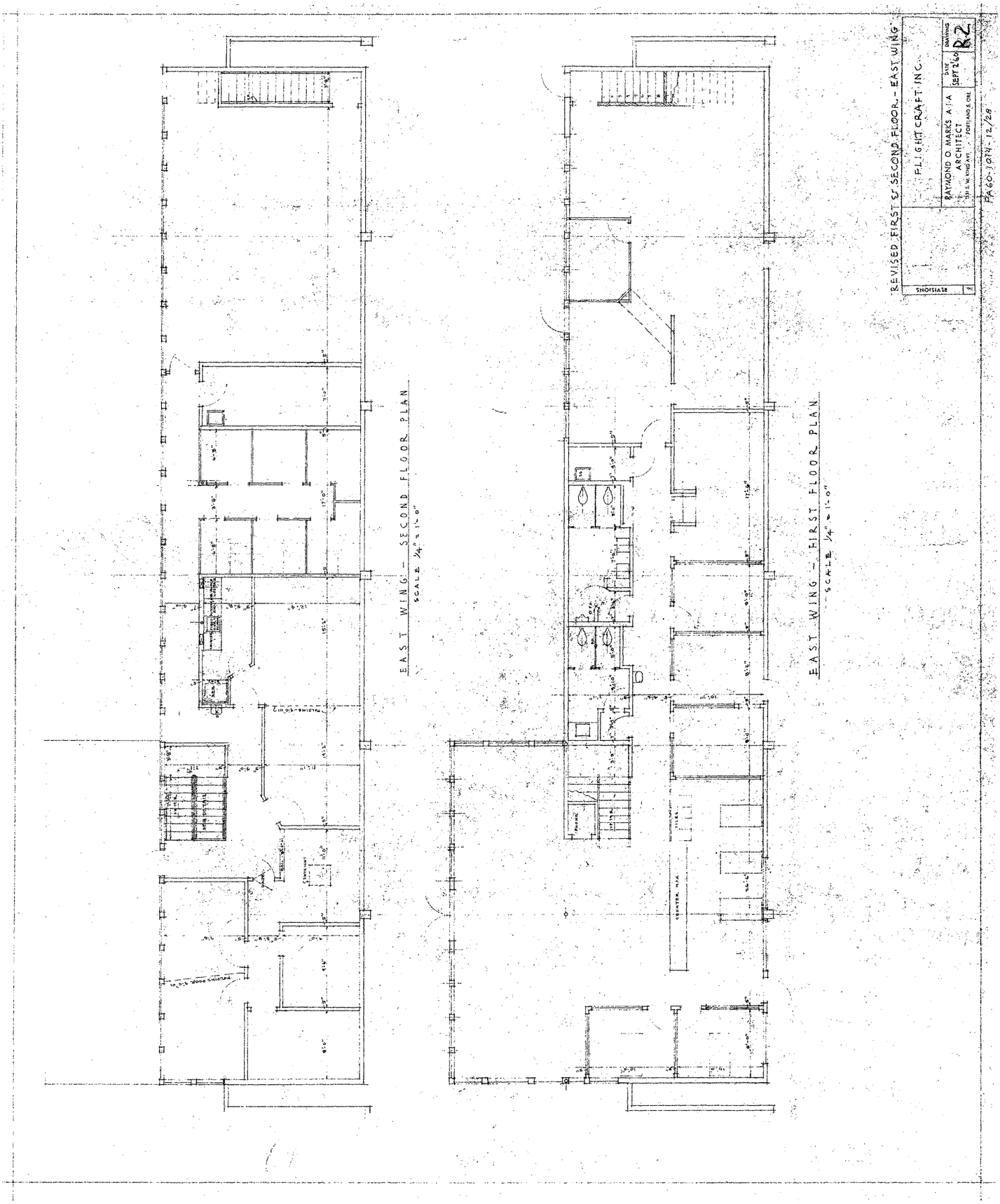


Figure 6. Flightcraft "A" Hangar East Wing Plans.

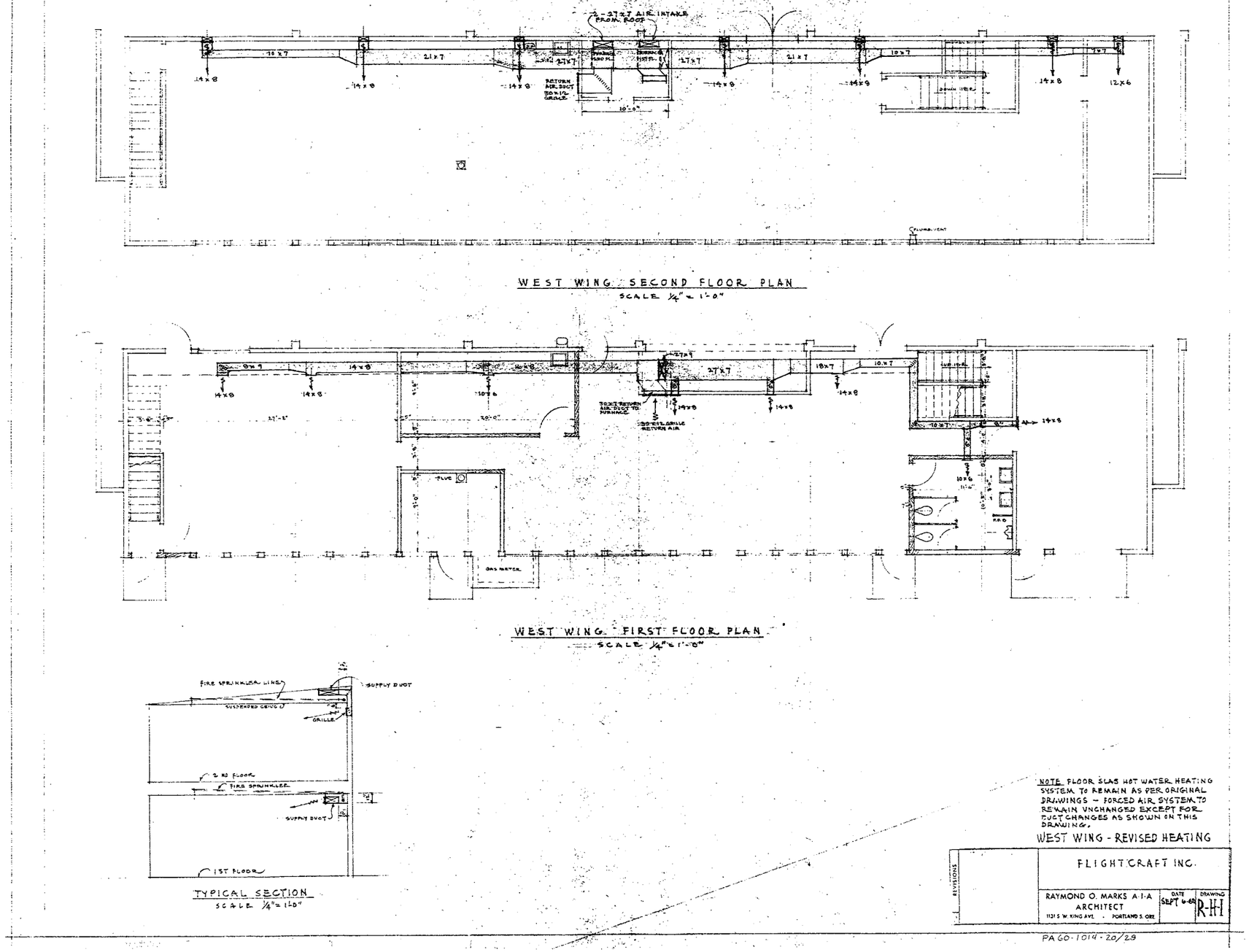


Figure 7. Flightcraft "A" Hangar West Wing Plans.

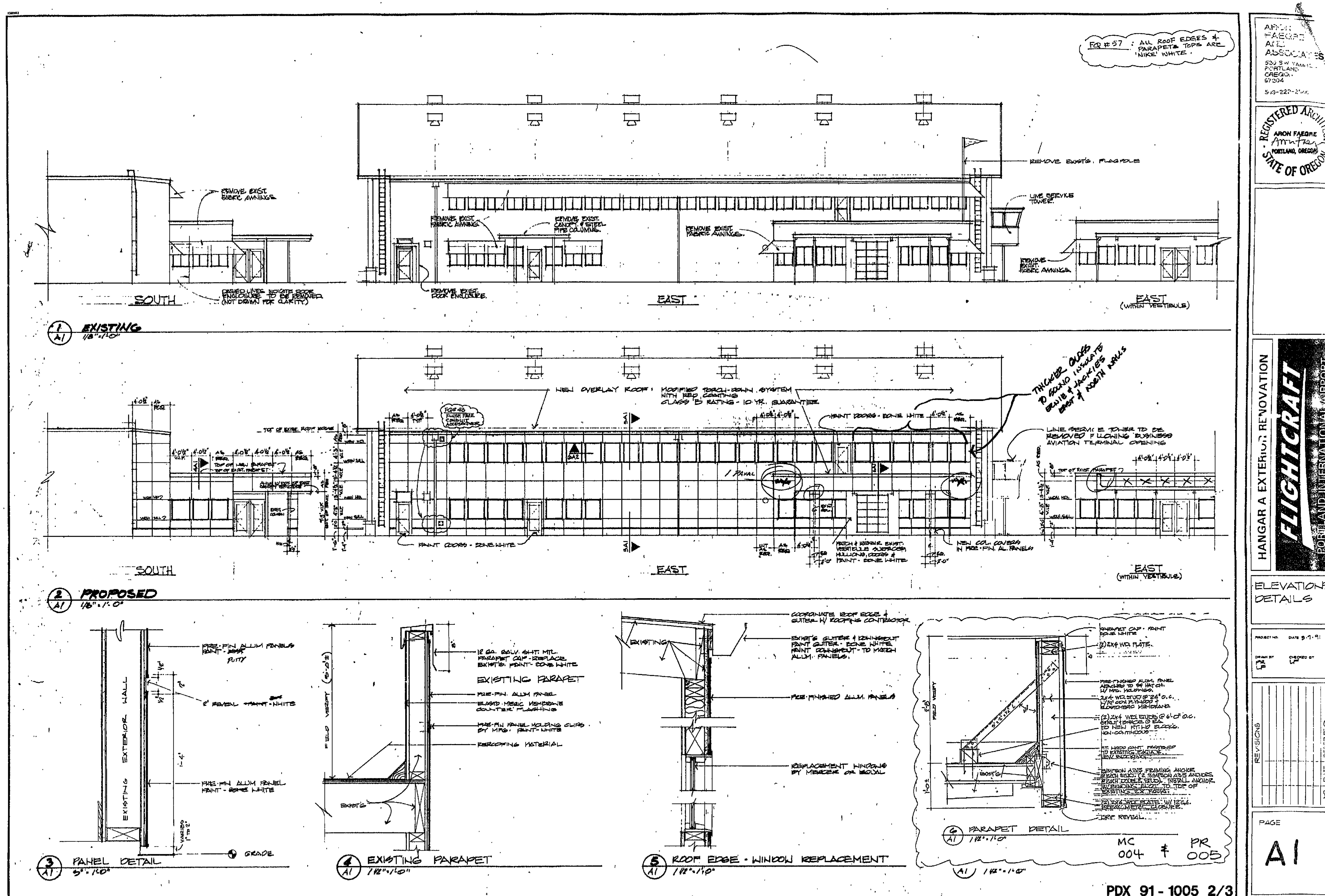


Figure 8. Flightcraft "A" Hangar 1991 Exterior Renovation Elevations.

APPENDIX B PHOTOGRAPHIC DOCMENTATION

Figure 1. An overview of "A" Hangar and Portland Airport in the background. The view is towards the southwest.

Figure 2. "A" Hangar's east and north facades; the view is towards the southwest.

Figure 3. "A" Hangar's north and south facades; the view is towards the southeast.

Figure 4. "A" Hangar's south facade; the view is towards the north.

Figure 5. "A" Hangar's north facade; the view is towards the south.

Figure 6. "A" Hangar's north façade showing the exterior glulam arch; the view is towards the east.

Figure 7. "A" Hangar's east façade showing the 1991 renovations; the view is towards the west.

Figure 8. "A" Hangar's east facade; the view is towards the northwest.

Figure 9. "A" Hangar's east primary entry; the view is towards the northwest.

Figure 10. A detail of the entry canopy showing the original roof decking and supports; the view is towards the north.

Figure 11. A view into the aircraft bay from the north door opening; the view is towards the southeast.

Figure 12. The central aircraft bay's north and east walls; the view is towards the northeast.

Figure 13. An interior view of the central aircraft bay's north wall; the view is towards the north.

Figure 14. An interior view of the central aircraft bay's west wall; the view is towards the west.

Figure 15. An interior view of the central aircraft bay's east wall; the view is towards the southeast.

Figure 16. A view of the timber roof trusses.

Figure 17. The timber framed loft that hangs from the roof trusses; the view is towards the east.

Figure 18. An interior view within the loft storage area; the view is towards the east.

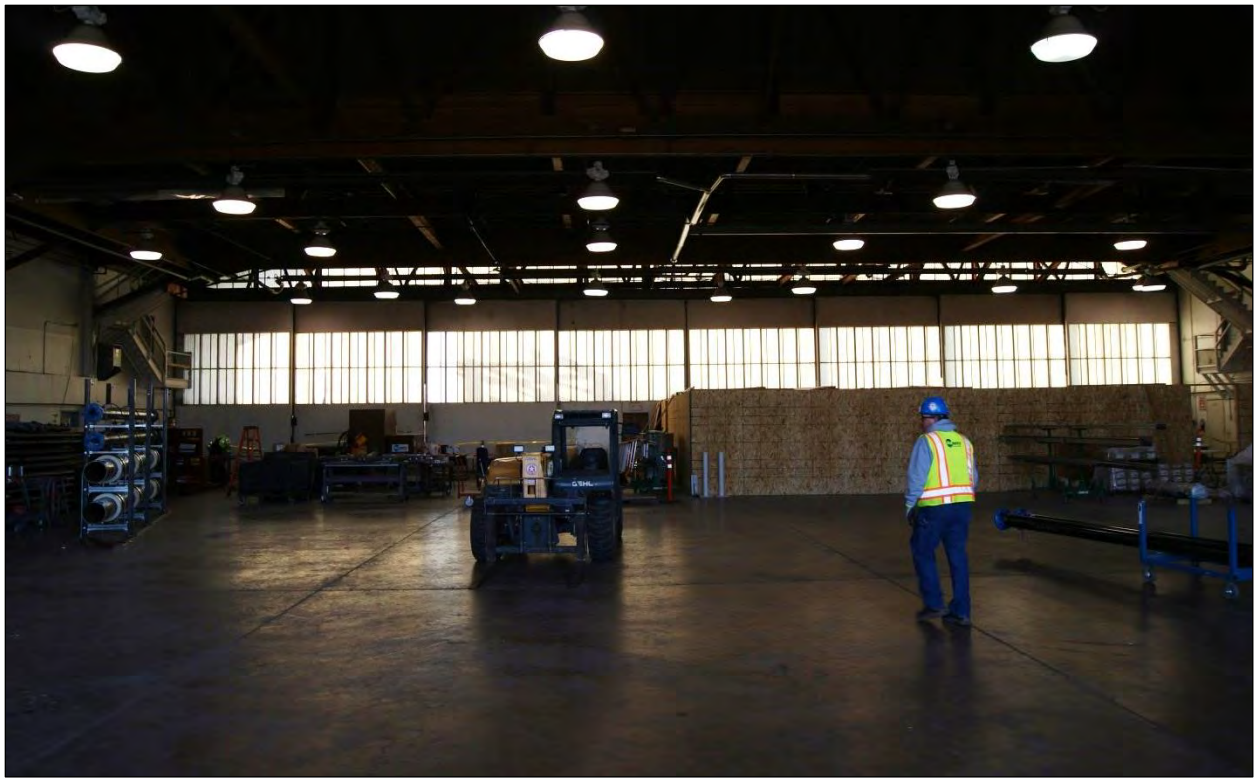


Figure 19. A view of the south wall doors; the view is towards the south.

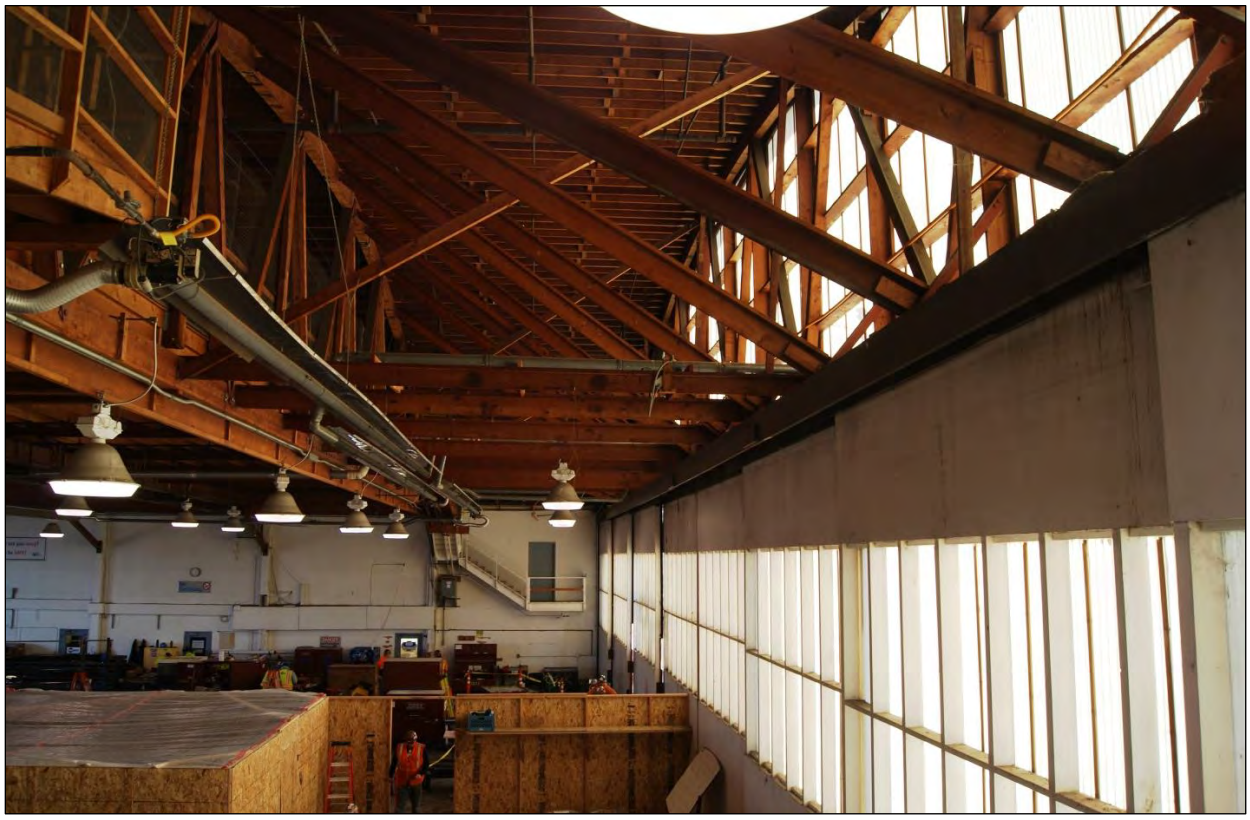


Figure 20. The south wall doors, transom, and the loft to the left; the view is towards the east.

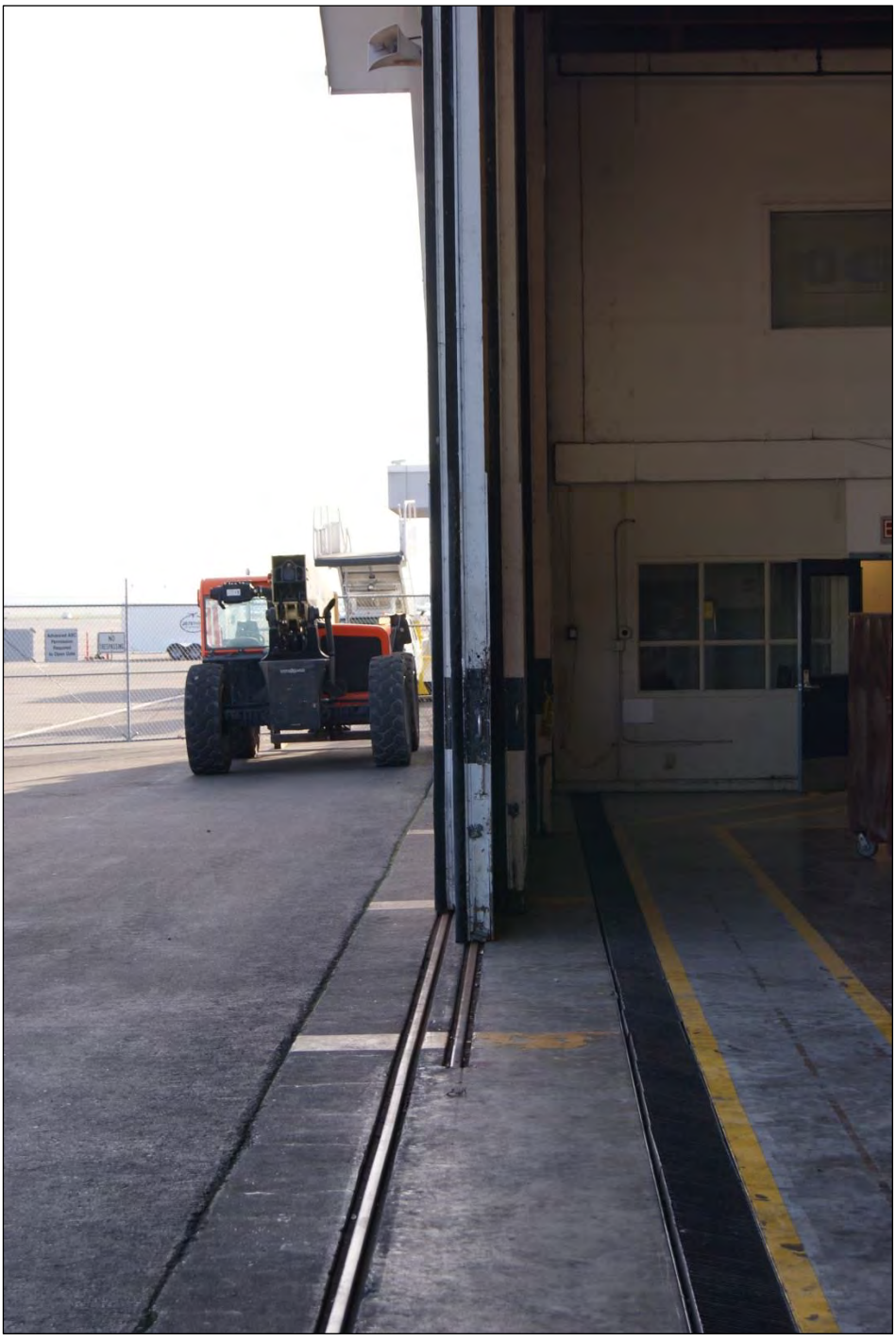


Figure 21. The sliding doors and the tracks set within the floor; the view is towards the east.

Figure 22. The center bays southwest corner showing the stairs that access the loft space; the view is towards the southwest.

Figure 23. The east entrance lobby and stairs to the right; the view is towards the southeast.

Figure 24. Looking towards the east wing corridor; the view is towards the south.

Figure 25. An office workspace on the west wing's first floor, the view is towards the south.

Figure 26. The original wood paneled stairs in the east wing; the view is towards the south.

Figure 27. A portion of the west wing's second floor office area; the view is towards the northwest.