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*FINAL*

**Building 181  
Airplane Storage Building**

**Historic American Buildings Survey  
Level I**

**2701 North Harbor Drive,  
San Diego, California 92101**

Prepared for

**San Diego Unified Port District (SDUPD)  
San Diego County Regional Airport Authority**

April 2010

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**CH2MHILL**

HISTORIC AMERICAN BUILDINGS SURVEY  
RYAN AERONAUTICAL COMPANY HISTORIC DISTRICT  
BUILDING 181 - AIRPLANE STORAGE BUILDING

Location:	2701 North Harbor Drive, San Diego, CA 92101, USA
Present Owner/Occupant:	San Diego County Regional Airport Authority
Present Use:	Vacant
Significance:	<p>Building 181 is located within the boundaries of the Ryan Aeronautical Company Historic District, a 46-acre complex containing 17 contributing resources and 30 non-contributing resources. The district is eligible on the local and national levels for the National Register of Historic Places (NRHP) under Criteria A, B, and C and for the California Register of Historical Resources (CRHR) under Criteria 1, 2 and 3. The historic district is eligible under NRHP Criterion A (CRHR 1) for its association with the contribution of aircraft manufacturers at Lindbergh Field to World War II defense production. It is also eligible for its association with Cold War research, development projects, and defense manufacturing. Under Criterion NRHP B (CRHR 2) the district is eligible for its association with aviation pioneer T. Claude Ryan and his aircraft aerospace manufacturing businesses. Ryan Aeronautical Company, under Mr. Ryan’s leadership, made significant contributions to national defense production during World War II, as well as important developments in aerospace research and development in the 1950s and 1960s. The historic district is eligible under NRHP Criterion C (CRHR 3) for its representation of industrial architecture associated with the 1930s and World War II. The district embodies the distinctive architectural characteristics of aircraft manufacturing buildings of the period in Southern California. The building and structures in the district illustrate the design fabrication concepts common to aircraft manufacturing plants from the 1930s to the 1960s. During this period, the aerospace industry played a dominant role in the economy of the region (URS Corporation, 2008).</p> <p>Building 181 is a contributing resource to the Ryan Aeronautical Company Historic District under NRHP Criterion C/CRHR Criterion 3. Building 181 is one of the original factory buildings that constituted the Ryan Aeronautical Company’s first plant. Visually distinctive, these buildings are representative of shops typically constructed for the earlier phases of aircraft manufacturing. Building 181 resembles factory buildings from the industrial facility during its period of significance, 1939 through 1969.</p>

Historian: Jessica Feldman

PART I. HISTORICAL INFORMATION

A. Physical History:

1. Date of erection: Building 181 was constructed in 1937-1938.
2. Architect: Frank L. Hope and Associates
3. Original and subsequent owners: Ryan Aeronautical Company signed a 50-year lease in 1939. Ryan Aeronautical Company sold to Teledyne Inc. in 1969, and the combined company became Teledyne-Ryan Aeronautical Company (TDY Industries). TDY Industries merged with Allegheny Ludlum Corporation in 1996, and Northrop Grumman Corporation acquired TDY Industries from Allegheny in 1999. Presently, the property is leased by the San Diego County Regional Airport and is under the Jurisdiction of the San Diego Unified Port District.
4. Original plans and construction: Building 181 was constructed as a one-and-a-half story building, open-interior, rectangular building measuring approximately 103 feet by 200 feet. The building sits on a concrete slab. Five-inch-by-7-inch steel “I”-beam posts placed approximately 12 feet apart onto the slab floor support a 2-inch-by-4-inch steel channel beam framing covered with corrugated sheet metal. Rows of multi-paned steel-framed windows are located below the roofline on the south side and the south two-thirds of the east and west elevations.
- The I-beam posts support arched steel roof trusses that span the 100-foot width of the building. The trusses hold 3-inch-by-12-inch steel I-beam roof joists covered with 1-inch-by-6-inch wooden board sheathing. The roof is covered with rolled asphalt roofing material. Mission Revival-style parapets form the roofline and a shield motif cast in stucco is located on the crest of the northern parapet. The north elevation has two rectangular openings with hanging steel roll-up doors. There is a large sliding door near the south side of the west elevation. To the north of this opening is a metal, hollow core single entry personnel door. There is a set of metal double entry doors off-center along the south elevation (URS Corporation, 2009).
5. Alterations and additions: Building 181, the third hangar Ryan constructed on Pacific Highway, was moved from its original location in 1944.

B. Historical Context:

1. San Diego’s Aviation History:
- During the first three decades of the 20<sup>th</sup> century, the aviation industry was established in San Diego and it became a focal point of San Diego’s activities and reputation. In 1912, the Army founded an air base and the first year-round military aviation school at Rockwell Field on Naval Air Station North Island, San Diego (Macaulay, 1928; Moore, 1960). The creation of the military air bases helped establish aviation in the region during the industry’s pioneering years. In 1928, the Army and Navy had invested \$5,500,000 in the air bases at North Island (Macaulay, 1928). The high profile attained by aviation in the local community during these years resulted in an awareness of the potential future of the industry by the inhabitants of the region. San Diego became the first U.S. city to establish a Municipal Board of Air Control in 1926, and was also the first to issue a complete set of air ordinances (Macaulay, 1928).
- In 1922, T. Claude Ryan, an aviation pioneer who began his career as an Army pilot, left the Army and moved to San Diego, where he began giving airplane rides and flying instructions. He soon established the Ryan Flying Company at the Dutch Flats Airfield in San Diego, which later became Ryan Airport. Dutch Flats Airfield was located at present-day Barnett Avenue and Midway Drive, off the current San Diego airport site and not within the current historic district boundaries. In the 1920s, Ryan Airport was the focal point for Ryan’s expanding aeronautical

enterprises (flying school, flying service, and an airplane manufacturing company). In the late 1920s, the use of the airport expanded as civil aviation came of age with other companies using Ryan’s field to operate air services. With the help of T. Claude Ryan, civilian aviation flourished in San Diego County during these decades.

In the mid-1920s, the Chamber of Commerce promoted San Diego as the “Air Capital of the West.” The development of what is now Lindbergh Field would be the central effort in this campaign. The committee realized that in order to maintain a leadership role in aviation, San Diego must have an adequate municipal airport. They wanted the location of the airport to be a place that would combine facilities for the operation of land and seaplanes, and be as near to the city of San Diego as possible. They selected an area at the north end of San Diego Bay on City-owned tideland; however, this area did not contain enough area to meet government requirements. Negotiations were made with the United States Navy to provide portions of the Marine Corps-owned tidelands for the airport expansion (URS Corporation, 2009).

Ryan was instrumental in the development of Lindbergh Field, San Diego’s nascent municipal airport, which was established in 1928. In 1929, 4,755 planes and over 20,000 passengers arrived or departed from the Dutch Flats Airfield (Leiser, 2000). Within a few years, the majority of these activities would move to Lindbergh Field. In 1939, Ryan established a manufacturing site on airport grounds, which is the location of the historic district.

2. Ryan Aeronautical Company:

T. Claude Ryan was born in Parsons, Kansas in 1898, but moved with his family to Orange, California in 1912. Ryan began a lifelong relationship with the aviation industry when, around the age of 19, he enrolled at the American School of Aviation in Los Angeles. In 1919, Ryan began studying mechanical engineering at Oregon State College. While in school, he applied to the Army for aviation cadet training and was accepted, but left the Army by January 1922 in hopes of flying as a civilian (National Aviation Hall of Fame, 2009). Ryan moved to San Diego to establish the Ryan Flying Company. The Ryan Flying Company changed its name to Ryan Airlines, Inc. when it was reorganized in 1924 to begin operating the first year-round, scheduled airline service in the United States from Dutch Flats (URS Corporation, 2009). Around the same time, in the mid-1920s, Ryan entered the aircraft manufacturing business with partner Frank Mahoney and created the Ryan M-1 Monoplane, which became one of the best-known air mail carriers in the country. A modified Ryan Monoplane became the *Spirit of St. Louis*, the plane Charles Lindbergh flew from New York to Paris in May 1927 on the first solo flight across the Atlantic Ocean. Ryan sold the company to Mahoney in 1926 and established the Ryan Aeronautical Corporation for the sale and manufacture of aircraft engines. The company changed its name to the Ryan Aeronautical Company in 1934.

Ryan Aeronautical Company signed a 50-year lease, starting in 1939, on land at the southeastern edge of Lindbergh Field along North Harbor Drive. Three buildings from the site of the previous company were relocated to this new location. The Ryan plant was one of several aircraft manufacturers located at Lindbergh Field that contributed to the nation’s war effort in the 1940s. At peak wartime production, the Ryan plant had 8,500 employees and annual production exceeded \$55 million. Following the war, workforce was reduced to 1,200 and annual production to \$8 million (URS Corporation, 2009).

The Korean conflict provided the Ryan Aeronautical Company the opportunity to work with electronics for aerospace applications. The role in aerospace electronics led to the development

of a variety of aircraft navigation and positioning equipment, including helicopter hovering devices, altimeters, and remote sensors (URS Corporation, 2009).

In 1947, the United States Navy awarded Ryan a contract to research the feasibility of reaction controls for jet aircraft. With jet engines and reaction controls handled by remote control, a Ryan vertical test rig lifted itself off the ground for the first time in 1950. In 1953, the Air Force awarded Ryan a contract to design and build two manned vertical takeoff jet research planes and 2 years later, the Ryan X-13 Vertijet was constructed. In the 1960s, Ryan continued target drone and electronic systems production and vertical takeoff and landing research (URS Corporation, 2009).

In 1969, the company was sold for \$128 million to Teledyne Inc. and became known as Teledyne-Ryan Aeronautical Company (TDY Industries). T. Claude Ryan remained with the company as chairman until his death in 1982. In 1996, TDY Industries merged with Allegheny Ludlum Corporation, and then later became a subsidiary of that company. In 1999, Northrop Grumman Corporation acquired TDY Industries from Allegheny and relocated the plant to a site in Ranch Bernardo, California, leaving the former plant site vacant. The site continues to be mostly vacant, with only a small portion of Building 100 used for administrative offices and several other buildings used for storage.

PART II. ARCHITECTURAL INFORMATION

A. General Statement:

1. Architectural Character: Building 181 was the third hangar constructed at the Ryan site and it shares many characteristics with Building 180. Building 181 is representative of shops that were typically used during the early phases of aircraft manufacturing. The rectangular building has a barrel roof, corrugated sheet metal cladding, concrete composition and wall-junction piers (north elevation), an open-interior, and is one-and-half stories in height. Building 181 also has unadorned personnel doors, hanging doors, metal roll-up doors, and rows of multi-paned steel-framed windows. Along the north elevation is a Mission Revival parapet form with shield motif cast in stucco at the crest of the parapet. Building 181 is significant as a contributing element to the Ryan Aeronautical Company District and for the California Historic Register. Visually distinctive, this building, along with Buildings 180 and 183, is representative of the use of the Mission Revival style in the design of factory buildings. Building 181 retains those architectural characteristics that exemplify the use of this style during its period of significance, 1937-39 through 1969.
2. Condition of Building Material: Building 181 is in fair condition.

B. Description of Exterior:

1. Overall Dimensions: Building 181 is approximately 100 feet by 200 feet.
2. Foundations: Building 181 sits on a concrete slab.
3. Walls: Building 181 has concrete composition walls and wall-junction piers (north elevation). The south, east, and west elevations of Building 181 have corrugated sheet metal cladding.



- 4. Structural System: Building 181 has wood-frame construction. Five-inch-by-7-inch steel I-beam posts placed approximately 12 feet apart onto the slab floor support a 2-inch-by-4-inch steel channel beam framing covered with corrugated sheet metal. The I-beam posts support arched steel roof trusses that span the 100 foot width of the building. Trusses hold 3-inch-by-12-inch steel I-beam roof joists covered with 1-inch-by-6-inch wooden board sheathing.
- 5. Openings:
  - a. Doorways: Building 181 has two rectangular openings on the north elevation equipped with hanging steel roll-up doors. Smaller hangar doors and single entry doors are located around the building’s exterior. There are double entry doors centered along the south elevation.
  - b. Windows: Building 181 has multi-paned steel-framed windows below the roofline on the south side and south two-thirds of the east and west elevations. Set in groups of two on the east and west elevations, these windows have a five-over-four light arrangement. The panes are rectangular and the center rows pivot. Some of the windows on the east elevation are obscured by the corrugated metal sheeting between Building 181 and Building 236. This has also occurred on the west elevation. Flanking the opening on the west elevation are paired windows, also with painted panes. The entire upper wall of the south elevation contains a continuous row of multi-light, steel-frame windows, but many of the panes have been painted.
- 6. Roof: Building 181 has a barrel roof constructed of rolled asphalt roofing material.

C. Description of Interior:

Floor Plans: Building 181 is a one-and-a-half-story rectangular building that measures approximately 103 feet by 200 feet and has an open interior. (URS Corporation, 2009).

D. Site:

Historic Landscape Design: None

PART III. SOURCES OF INFORMATION

- A. Early Views: N/A
- B. Interviews: N/A
- C. Bibliography

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San Diego Unified Port District. 1977. *San Diego Unified District Annual Report: 1976-77*. Carl Reupsch Collection, San Diego Historical Society, San Diego, CA.



Building 181 – Airplane Storage Building, Aerial view, Building 181 is in the lower portion of the image, San Diego, California, c. 1960. Annual Report 1960.



Building 181 – Airplane Storage Building, San Diego, California, Date unknown. Teledyne-Ryan Archives.



Building 181 – Airplane Storage Building, San Diego, California, Date unknown. Teledyne-Ryan Archives.



Buildings 183, 180, and 181, context view, facing Southeast, San Diego, California, October 2009.





Building 181 – Airplane Storage Building, North Elevation, San Diego, California, October 2009.



Building 181 – Airplane Storage Building, Southwest Oblique, San Diego, California, October 2009.



Building 181 – Airplane Storage Building, Northwest Oblique, San Diego, California, October 2009.



Building 181 – Airplane Storage Building, South Elevation, facing East, San Diego, California, October 2009.





Building 181 – Airplane Storage Building, Southeast Oblique, San Diego, California, October 2009.



Building 181 – Airplane Storage Building Interior, ceiling detail, facing North, San Diego, California, October 2009.



Building 181 – Airplane Storage Building Interior, facing Southeast, San Diego, California, October 2009.









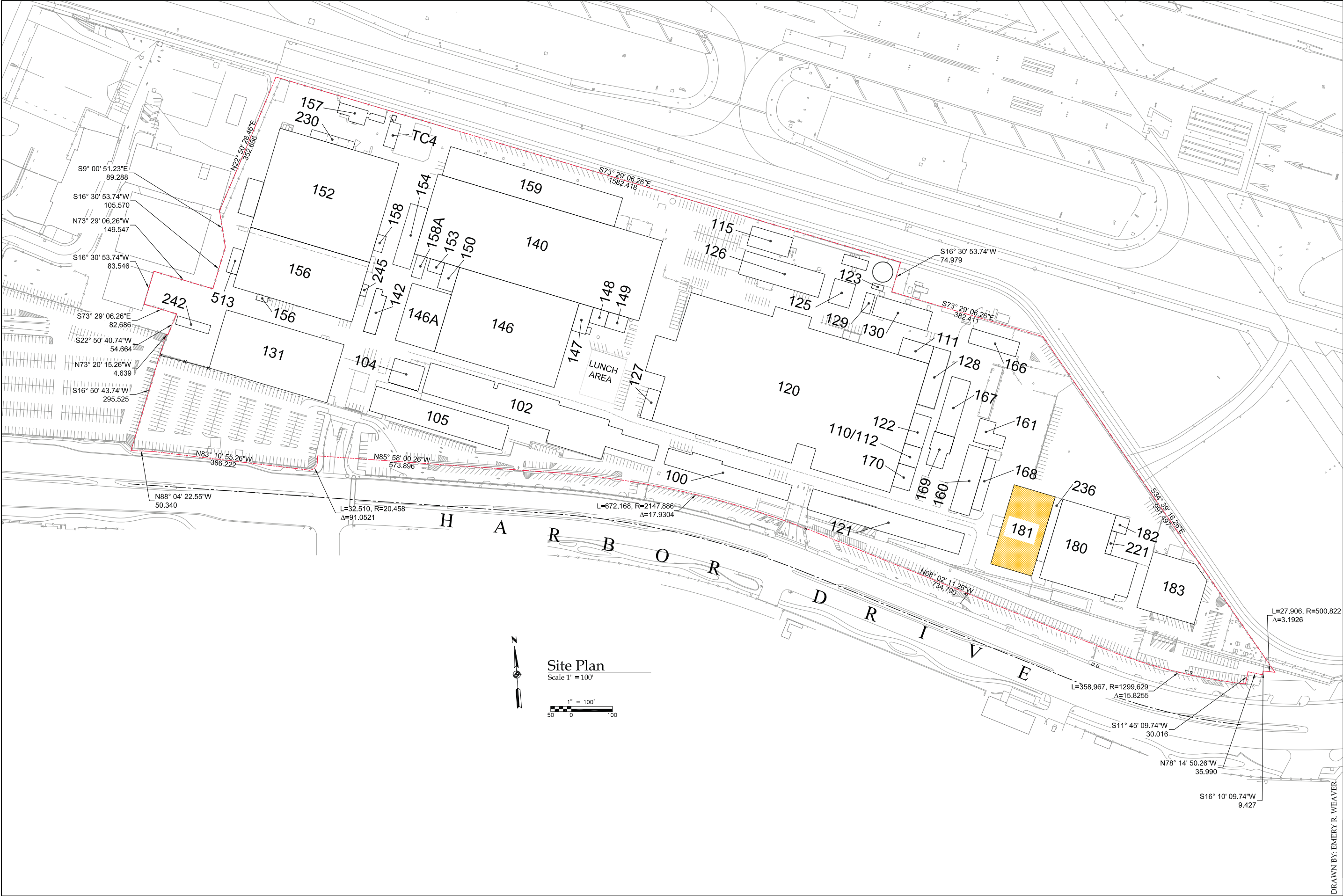






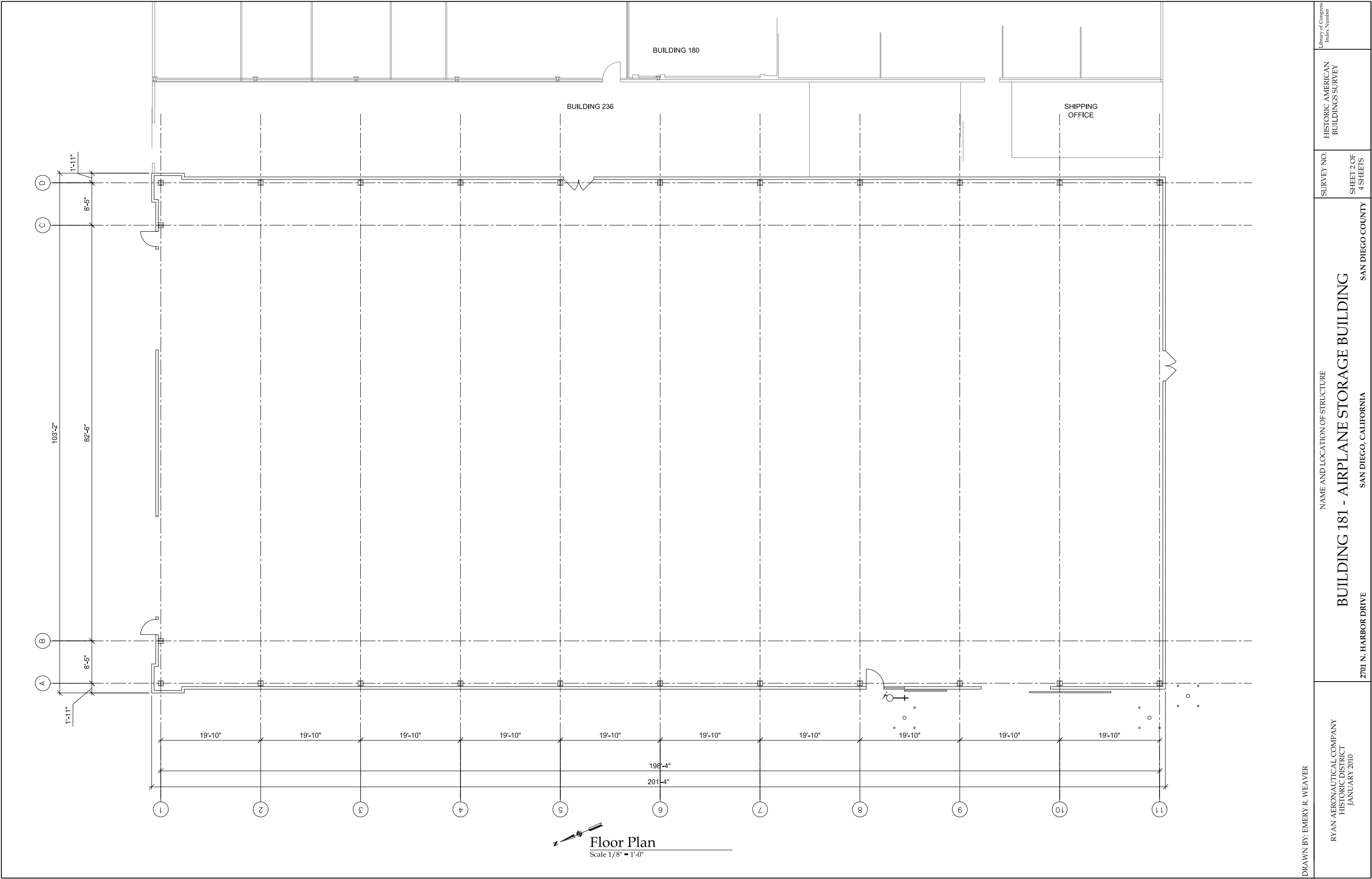




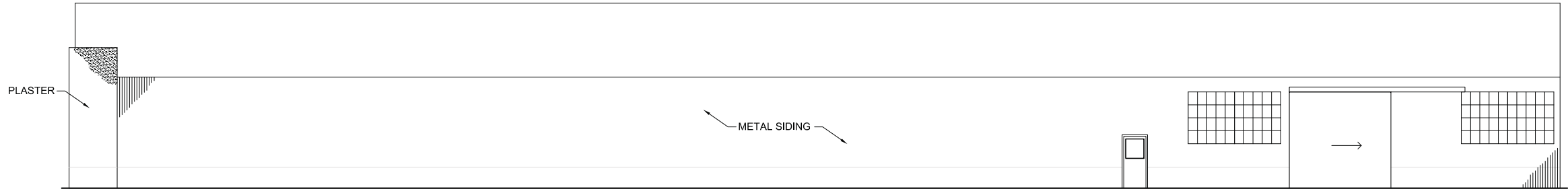


RYAN AERONAUTICAL COMPANY HISTORIC DISTRICT JANUARY 2010	NAME AND LOCATION OF STRUCTURE		HISTORIC AMERICAN BUILDINGS SURVEY	SURVEY NO.	SHEET 1 OF 4 SHEETS	Library of Congress Index Number
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	SAN DIEGO COUNTY					
2701 N. HARBOR DRIVE		SAN DIEGO, CALIFORNIA				

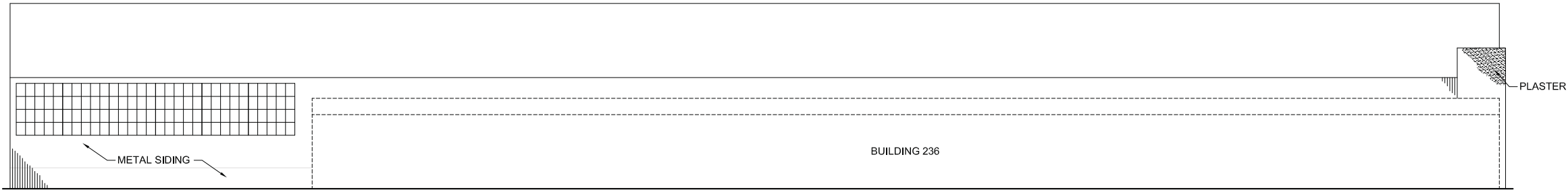




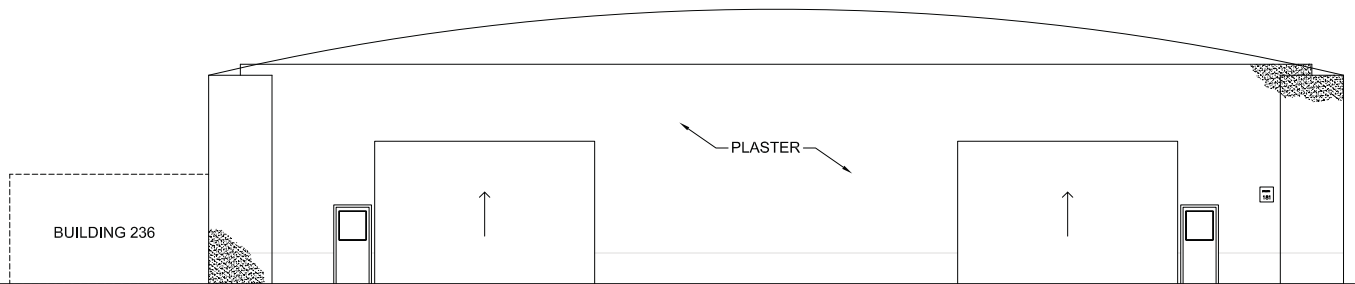




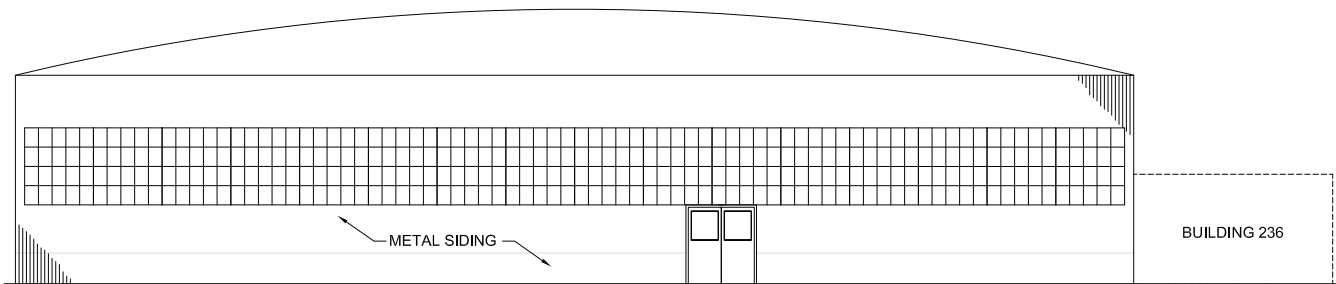
West Elevation  
Scale 1/8" = 1'-0"



East Elevation  
Scale 1/8" = 1'-0"



North Elevation  
Scale 1/8" = 1'-0"



South Elevation  
Scale 1/8" = 1'-0"

DRAWN BY: EMERY R. WEAVER

NAME AND LOCATION OF STRUCTURE

BUILDING 181 - AIRPLANE STORAGE BUILDING

SAN DIEGO, CALIFORNIA

2701 N. HARBOR DRIVE

SURVEY NO.

SHEET 3 OF 4 SHEETS

HISTORIC AMERICAN BUILDINGS SURVEY

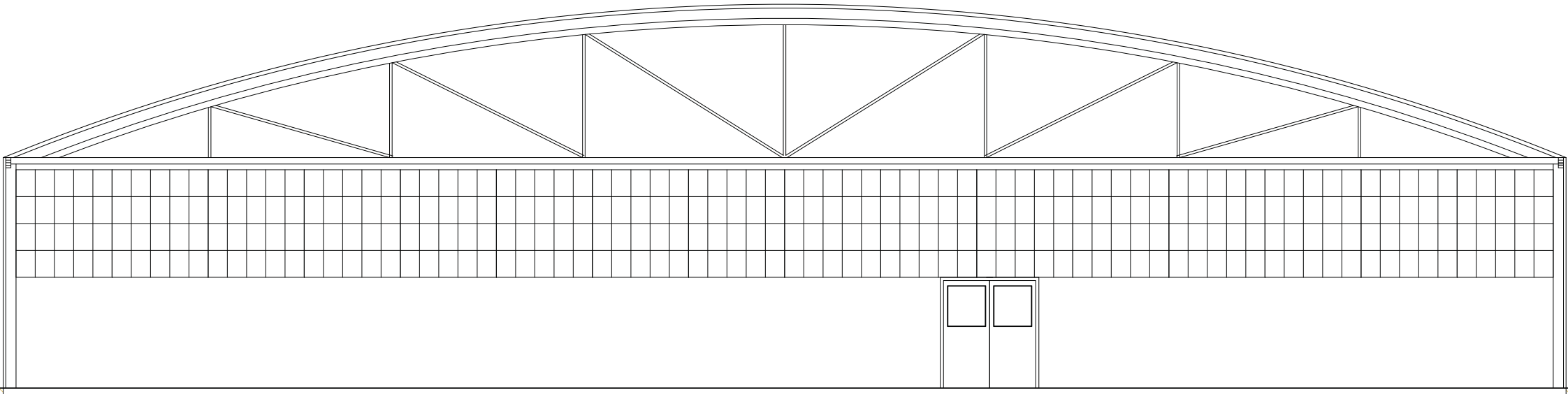
Library of Congress  
Index Number

RYAN AERONAUTICAL COMPANY  
HISTORIC DISTRICT  
JANUARY 2010



Section

Scale 1/4" = 1'-0"



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RYAN AERONAUTICAL COMPANY  
HISTORIC DISTRICT  
JANUARY 2010

NAME AND LOCATION OF STRUCTURE

BUILDING 181 - AIRPLANE STORAGE BUILDING

2701 N. HARBOR DRIVE

SAN DIEGO, CALIFORNIA

SAN DIEGO COUNTY

SURVEY NO.

SHEET 4 OF  
4 SHEETS

HISTORIC AMERICAN  
BUILDINGS SURVEY

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