

United States Department of the Interior
National Park Service

National Register of Historic Places Registration Form

This form is for use in nominating or requesting determination for individual properties and districts. See instruction in *How to Complete the National Register of Historic Places Registration Form* (National Register Bulletin 16A). Complete each item by marking "x" in the appropriate box or by entering the information requested. If an item does not apply to the property being documented, enter "N/A" for "not applicable." For functions, architectural classification, materials and areas of significance, enter only categories and subcategories from the instructions. Place additional entries and narrative items on continuation sheets (NPS Form 10-900a). Use a typewriter, word processor, or computer, to complete all items.

1. Name of Property

historic name Photography and Armament School Buildings, Lowry Air Force Base

other names/site number Rampart Campus; Buildings 376, 379 and 380

2. Location

street & number 125 and 130 Rampart Way and 7600 East First Place [N/A] not for publication

city or town Denver [N/A] vicinity

state Colorado code CO county Denver code 031 zip code 80220

3. State/Federal Agency Certification

As the designated authority under the National Historic Preservation Act, as amended, I hereby certify that this nomination request for determination of eligibility meets the documentation standards for registering properties in the National Register of Historic Places and meets the procedural and professional requirements set forth in 36 CFR Part 60. In my opinion, the property meets does not meet the National Register criteria. I recommend that this property be considered significant nationally statewide locally. ([] See continuation sheet for additional comments.)

Georgiana Cortiguera State Historic Preservation Officer December 11, 2001
Signature of certifying official/Title Date

State Historic Preservation Office, Colorado Historical Society
State or Federal agency and bureau

In my opinion, the property meets does not meet the National Register criteria.
([] See continuation sheet for additional comments.)

Signature of certifying official/Title Date

State or Federal agency and bureau

4. National Park Service Certification

I hereby certify that the property is:

- entered in the National Register
[] See continuation sheet.
- determined eligible for the
National Register
[] See continuation sheet.
- determined not eligible for the
National Register.
- removed from the
National Register
- other, explain
[] See continuation sheet.

John Poland Signature of the Keeper 4/2/02 Date of Action

Photography and Armament School Buildings
Name of Property

Denver County, Colorado
County/State

5. Classification

Ownership of Property
(Check as many boxes as apply)

- private
- public-local
- public-State
- public-Federal

Category of Property
(Check only one box)

- building(s)
- district
- site
- structure
- object

Number of Resources within Property
(Do not count previously listed resources.)

Contributing	Noncontributing	
2	0	buildings
0	0	sites
0	0	structures
0	0	objects
2	0	Total

Name of related multiple property listing.
(Enter "N/A" if property is not part of a multiple property listing.)

N/A

Number of contributing resources previously listed in the National Register.

0

6. Function or Use

Historic Function

(Enter categories from instructions)

Defense: Military Facility

Current Functions

(Enter categories from instructions)

Commerce/Trade: Business
Healthcare: Medical Business/Office

7. Description

Architectural Classification

(Enter categories from instructions)

Modern Movement: International Style

Materials

(Enter categories from instructions)

foundation Concrete
walls Brick
Glass
roof Synthetic
other

Narrative Description

(Describe the historic and current condition of the property on one or more continuation sheets.)

Photography and Armament School Buildings
Name of Property

Denver County, Colorado
County/State

8. Statement of Significance

Applicable National Register Criteria

(Mark "X" in one or more boxes for the criteria qualifying the property for National Register listing.)

- A** Property is associated with events that have made a significant contribution to the broad patterns of our history.
- B** Property is associated with the lives of persons significant in our past.
- C** Property embodies the distinctive characteristics of a type, period, or method of construction or represents the work of a master, or possesses high artistic values, or represents a significant and distinguishable entity whose components lack individual distinction.
- D** Property has yielded, or is likely to yield, information important in prehistory or history.

Criteria Considerations

(Mark "X" in all the boxes that apply.)

Property is:

- A** owned by a religious institution or used for religious purposes.
- B** removed from its original location.
- C** a birthplace or grave.
- D** a cemetery.
- E** a reconstructed building, object, or structure.
- F** a commemorative property.
- G** less than 50 years of age or achieved significance within the past 50 years.

Narrative Statement of Significance

(Explain the significance of the property on one or more continuation sheets.)

9. Major Bibliographical References

Bibliography

(Cite the books, articles and other sources used in preparing this form on one or more continuation sheets.)

Previous documentation on file (NPS):

- preliminary determination of individual listing (36 CFR 67) has been requested
- previously listed in the National Register
- previously determined eligible by the National Register
- designated a National Historic Landmark
- recorded by Historic American Buildings Survey
- # _____
- recorded by Historic American Engineering Record
- # _____

Areas of Significance

(Enter categories from instructions)

Architecture

Education

Military

Government

Periods of Significance

1942-1953

Significant Dates

1942

Significant Person(s)

(Complete if Criterion B is marked above).

N/A

Cultural Affiliation

N/A

Architect/Builder

United States Army

Primary location of additional data:

- State Historic Preservation Office
- Other State Agency
- Federal Agency
- Local Government
- University
- Other

Name of repository:
Colorado Historical Society

Photography and Armament School Buildings
Name of Property

Denver County, Colorado
County/State

10. Geographical Data

Acreage of Property 3.0

UTM References

(Place additional UTM references on a continuation sheet.)

1. 13 508740 4396520
Zone Easting Northing

3. _____
Zone Easting Northing

2. _____
Zone Easting Northing

4. _____
Zone Easting Northing

[] See continuation sheet

Verbal Boundary Description

(Describe the boundaries of the property on a continuation sheet.)

Boundary Justification

(Explain why the boundaries were selected on a continuation sheet.)

11. Form Prepared By

name/title Elaine Gallagher Adams, AIA, and Nancy Widmann (consultant)

organization David Owen Tryba Architects date 6-26-2001

street & number 1620 Logan Street telephone 303-831-4010

city or town Denver state CO zip code 80203

Additional Documentation

Submit the following items with the completed form:

Continuation Sheets

Maps

A **USGS map** (7.5 or 15 minute series) indicating the property's location.

A **Sketch map** for historic districts and properties having large acreage or numerous resources.

Photographs

Representative **black and white photographs** of the property.

Additional Items

(Check with the SHPO or FPO for any additional items)

Property Owner

(Complete this item at the request of SHPO or FPO.)

name see continuation sheet

street & number _____ telephone _____

city or town _____ state _____ zip code _____

Paperwork Reduction Act Statement: This information is being collected for applications to the National Register of Historic Places to nominate properties for listing or determine eligibility for listing, to list properties, and to amend existing listings. Response to this request is required to obtain a benefit in accordance with the National Historic Preservation Act, as amended (16 U.S.C. 470 *et seq.*)

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Photography and Armament School Buildings
Lowry Air Force Base
Denver County, Colorado

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PROPERTY OWNERS

Coughlin & Company, Inc.
140 E. 19th Avenue, Suite 700
Denver, CO 80203-1035

City and County of Denver
Attn: Public Works Manager
1437 Bannock Street, Room 379
Denver, Colorado

DESCRIPTION

The 1942 Photography and Armament School Buildings sit in the heart of the former Lowry Air Force Base in Denver, Colorado. The classroom buildings face each other across Rampart Way, mirroring features and proportion. In addition, the Armament School building also features a large attached hangar-like extension on the east side. These buildings are referred to as Building # 380 (Photography Classroom), Building #379 (Armament Classroom) and Building #376 (Armament Annex) in the Lowry Air Force Base documentation. The buildings are sited in landscaped grounds with large surface parking lots behind each. All site work was completed in 2001. New paired, curving, sloped sidewalks terminate at the raised entries, providing accessibility to these buildings. A small water feature is the focus of the front entry courtyard of each building. Large locust trees flank the street in front of the two buildings.

For the purposes of this description, the Photography School Building facade will be referred to as the east elevation and the Armament School Building facade will be referred to as the west elevation. In fact, the facades parallel Rampart Way which is oriented northwest-southeast (see fig. 1)

The flat roofed classroom buildings are 200'-0" wide, 60'-0" deep, and approximately 38'-0" high in three stories. They are constructed of concrete post and slab with brick and glass exteriors and flat roofs. The masonry is a sand-colored, modular brick with matching 1/2" mortar joints. The windows are painted steel, single-glazed, stacked awning units three (3) high, and generally four (4) per bay continuously in a horizontal ribbon. The buildings are raised approximately 3'-0" from ground level on a concrete base, and concrete copings cap the elevation parapets all around.

The Rampart Way facades are three-stories high. They are divided into eleven (11) structural bays, though only the center bays are articulated on the exterior as vertical elements. The remaining bays are overlaid with continuous horizontal ribbon window bands. Each floor of the facade features windows continuously spanning the five (5) flanking bays at four

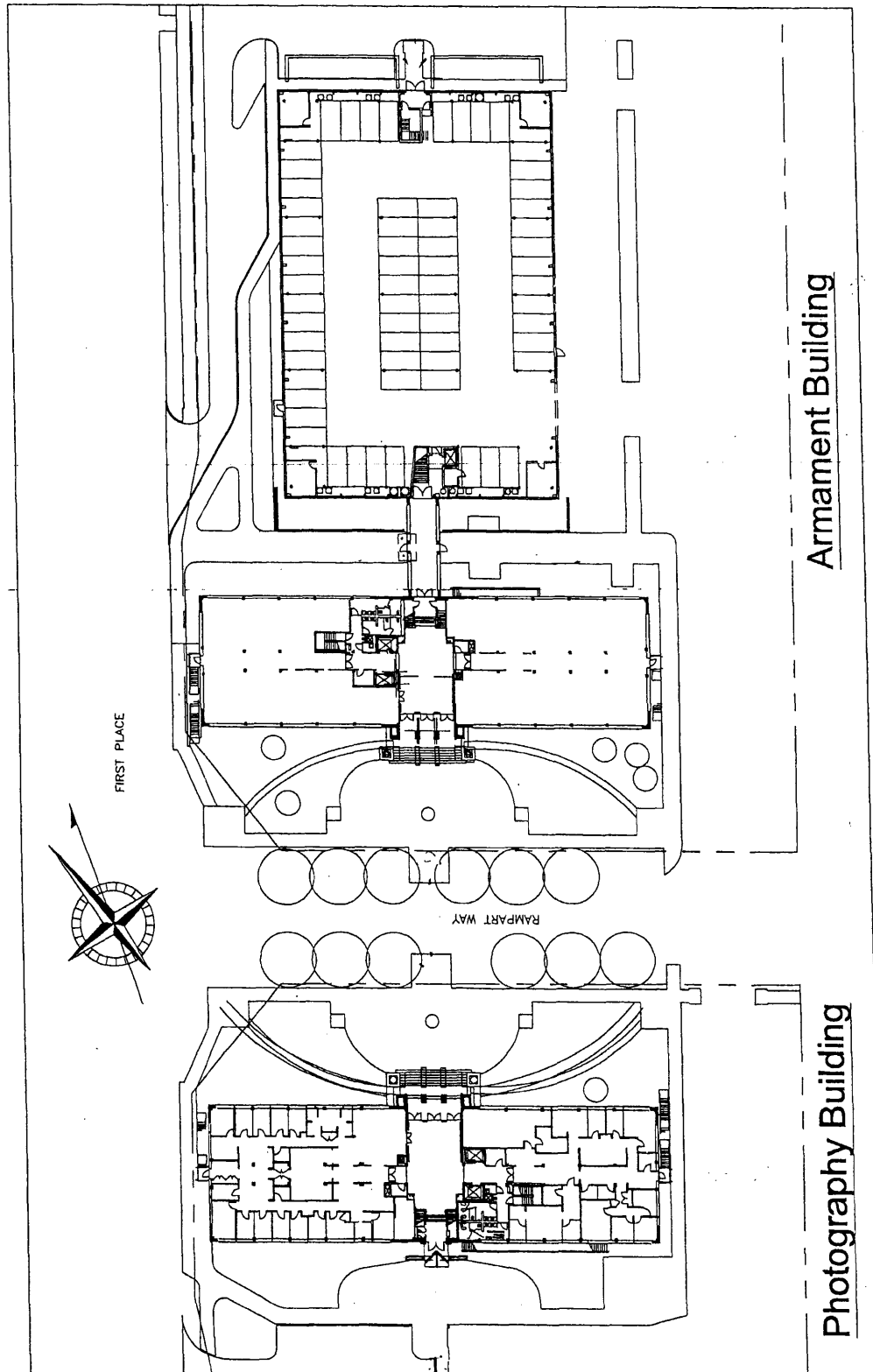
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Figure 1
SITE MAP



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(4) units per bay except for the bays closest to the center of the building, which have three (3) units. The center bay protrudes and is divided into three (3) minor bays defined by two (2) smooth rectangular concrete columns, with smooth granite bases, extending three stories high. A 4'-0" wide surround of alternating belt coursing, in sand-colored modular brick, frames the center bay on the sides, and the top, of the central bay. Three pairs of bronze and glass doors with four (4) bronze-framed, stacked, square transoms over each is set back from the protruding columns, forming a tall covered entry area. The columns and surround rest on a granite landing which spans the width of granite stairs leading down approximately 3'-0" to the sidewalk level. Flanking the stairs are two low granite cubes with raised bronze military stars imbedded horizontally (in plan) on top of each.

The north elevations consist of three (3) bays, which are not obvious from the exterior, but do line up the window units similar to the front with four (4) units in each bay except for the center bay, which has three (3). One window unit of the first and second floors has been altered to accommodate a fire exit door, with transom. On the top floors, the door was added to the end of the original window ribbon towards the rear of each building. These doors connect to contemporary painted-steel straight-run fire escapes, providing egress from all three floors. The south elevations mirror the north.

The rear elevations are different on the two buildings. These rear elevations are similar to the façades, with three stories of ribbon windows in the same locations. The center bays of these façades feature a continuous vertical ribbon of windows, two (2) units wide, expressing the interior stairwell, from the second floor through the third floor. This vertical band of windows is flanked on each side at the second and third floor levels by single window units. The Armament classroom building is attached by a short breezeway to the annex at the center bay of the first floor. The Photography classroom building features a freestanding, contemporary entry surround at the ground floor level central entrance.

The breezeway connecting the Armament classroom building to the annex is 44'-0" long and one-story high, built of sand-colored brick. Ribbons of four (4) windows on each side flank a single exit door. The windows are identical to the windows on the classroom wing previously described. Both sides of the breezeway are identical. A freestanding contemporary cantilevered entry cover is located over the door on the north side.

The hanger-like annex is 182'-0" long and 122'-0" wide. Eight (8) large tapered steel bents form seven (7) bays that clear span the width of the building. A 5'-0" high wall of sand-colored brick surrounds the structure with steel-framed windows filling in bays (five (5) units wide, seven (7) units high). A galvanized metal corrugated roof wraps over the top of the structure with raised ridge vents at the center. Each end of the annex is in-filled with glass similar to the sides and extending all the way to the underside of the structural steel bents. The east end of the annex features an oversized pair of steel doors with circular lites. A freestanding concrete

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slab floor separates a lower open parking garage from enclosed office space above. Vehicular access is gained through openings left from the original annex doors, which were one bay wide each.

Inside the classroom buildings, the three-story, main lobby areas have blue-green terrazzo floors with inset stone designs depicting a winged military crest with "*SUSTINEO ALAS*" imbedded in bronze. Bronze stars are inlaid into the terrazzo floor surrounding the crests. The walls are tiled in large blue ceramic tiles to a height of approximately 11'-6". Two large original light fixtures are imbedded in the ceiling of the atrium space. Two symmetric terrazzo stairs flank the rear areas, meeting at a common landing and continuing to the second floor. This configuration is repeated to the third floor level. At the lobby level, a short flight of stairs directs down between the two main flights up. These stairs lead out of the classroom buildings to the breezeway in the Armament Building and the rear entrance of the Photography Building. Two original phone-booth niches are located to one side of the lower landing in the Photography Building. The handrails at the stairs consist of low, solid walls with a streamlined bronze cap continuous to the third floor landing. Due to vandalism, some of the original bronze rails have been lost, and new bronze-painted steel rails have been installed as replacements. At the second floor landing, a similar guardrail edges the front atrium overlook. At the third floor level of the Armament Building, a wall was constructed to separate the open landing from the atrium. In the Photography Building, the third floor is open to the atrium space, similar to the second floor. The classroom spaces of the buildings have been altered a number of times but are currently organized into central axes with flanking office space. All three floors are similar.

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SIGNIFICANCE

The Armament and Photography School Buildings, located on the grounds of the former Lowry Air Force Base, are eligible for the National Register of Historic Places under Criterion A in the area of Military History. The period of significance begins in 1942, the year of construction, and extends through 1953, the end of the Korean War. While the buildings are associated with the significance of the general military history of Lowry Air Force Base military history, the buildings possess their own individual significance. The Armament School was the only Army armament school in the western United States. The Photography School was the Army's only such school in 1942 and later, the only Army Air Corps photography school in the western United States.

In 1942, the Armament Building served as the Army Air Corp's Armament School headquarters continuing the mission to train armament instructors nationwide for the Army, in addition to training servicemen for active duty on the warfront. Some armament technical training curricula were unique to this building. Armament maintenance classes and bombardier training, significantly including the early training on the top secret Norden bombsight, were coordinated and carried out in this building and its hanger-like annex. The building is associated with the training of thousands of armorers and bombardiers during W.W.II. and the Korean War.

The Photography School was the training center that initially trained aerial photographers for squadron duty but also to eventually staff three other Army aerial photography training schools. The building is associated with the W.W.II training of thousands of aerial photographers needed to gather intelligence for map-making, especially behind enemy lines to determine troop disbursement and installations.

The Photography and Armament School Buildings are also eligible under Criterion C for their architectural significance as an expression of the International style. The buildings are associated with military architecture that expressed the growing technological power of the United States Army during the 1940s, particularly in the Air Corps. The styles of the Modern Movement grew out of and then conveyed advances in construction and materials technology.

The Site of Lowry Field

The Armament School Building is located on the former Lowry Air Force Base in Denver, Colorado. Though Denver neighborhoods were built right up to its perimeter during Denver's post-W.W.II boom years, the site was quite remote from the city when chosen to be developed as an Army Air Field in the mid-1930s. Denver's nearby Montclair neighborhood was platted in 1885 as the Town of Montclair by Silesia-born developer Baron Walter von Richthofen.

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Montclair was far from Denver and buildup was very slow. Montclair remained a small cluster of homes built mainly along a streetcar link to Denver.

Another of Richthofen's development plans was to establish a spa for asthmatic patients. He was not successful, but on the site of Richthofen's proposed Carlsbad Spa, Lawrence Phipps, a wealthy tuberculosis sufferer, established the Agnes Memorial Sanatorium in 1904. This site was on a gentle ridge just east of Quebec St., with commanding views of prairie, the small town of Denver, and the Rocky Mountains beyond. The site evolved into the central core of Lowry A.F.B., the location of the Armament School Building.

Montclair's east limit was Quebec St. and its south limit was 6th Ave. (later 6th Ave. Parkway). In the mid-1930s, this southeast portion of Montclair, by then annexed by Denver, was still mainly prairie. That southeast corner was to become the main entry point to Lowry A.F.B. Quebec St. was Lowry's west boundary.

Quebec St. was an established road, however, in the 1890s. Quebec was the location of an old, one-and-one-half mile streetcar line that connected Denver with Fairmount Cemetery. Fairmount Cemetery was established in 1890 and was an excursion destination for family picnics in addition to its more somber role. The short-lived, single purpose streetcar line connected with a Denver Tramway Company line at 8th Ave. and Quebec St. Fairmount Cemetery became Lowry's southern neighbor.

The small town of Aurora officially claimed land from Yosemite St. east to Peoria St. and from 6th Ave. north to 26th Ave. The built-up area of Aurora in the 1930s was quite small and remote from the Lowry site.

Early History of Lowry

The forerunners of the Armament School and the Photography School were both located at Chanute Field, Rantoul, Illinois, since 1921. The technologies for both schools were advancing at an accelerating pace by the early 1930s and were increasingly dependent on better weather conditions to carry out their training courses. There was also a need for more space and relatively close varied terrain. A new location was needed.

Sites were evaluated nationwide. Denver was at the top of the list of desirable sites. The city of Denver notified the War Department of an interest in having the site in 1934. In 1935, Denver citizens passed a bond issue to purchase the land and buildings of the Agnes Memorial Sanatorium for donation to the Army as the site of the Army Air Corps Technical School. In August 1937, Congress and President Franklin D. Roosevelt approved the choice and authorized funding. By October 1937, the Works Progress Administration began

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converting the sanatorium buildings into a military facility, and adding hangars and other necessary buildings.

On 12 February 1938, two trains brought men and equipment of the Armament and Photography Departments to Denver from Chanute Field. On 26 February 1938, the Army officially activated the Denver Branch of the Air Corps Technical School. The next month, the Denver Branch became Lowry Field, named after Second Lieutenant Frances B. Lowry who died in a mission over France in World War I. Lowry was a Denver native and his name was previously given to Colorado's National Guard field at 38th and Dahlia. That field was closed and two of its hangars were moved to the new Lowry as part of the rapid build up of the facility.

The armament and photography classes were taught in existing sanatorium buildings on the site. This was the third site of the aerial photography department; the first was established at Langley Air Field, Virginia, in 1917, and then moved to Chanute Air Field, Illinois, in 1922. Photography classes started at Chanute were continued immediately at Lowry with 61 men and officers in the first class. The first armament class graduated 19 March 1938. No time was lost continuing both schools' programs. By 1940, bombardier instructors were needed. The first bombardier instructors began training at Lowry on 15 July 1940. At this time and through the early use of the 1942 Armament School Building, this was the army's only armament training program of its kind.

In May 1938, a B-18 bomber flew the first high altitude photography training flight out of the Denver field. Attaining an altitude of 25,000 feet, the students took photos of eastern Colorado and Kansas with a \$7,500 camera of five lenses. Later, flights would be made in the more refined B-17 bombers. This was the beginning of thousands of teaching flights over Colorado prairies and mountains and surrounding states. It was important to have Colorado's clear visibility at 25,000 feet altitude because that was the altitude needed to fly above enemy aircraft and be out of range of attack when doing aerial photography in combat zones. In August 1938, an experiment with night aerial photography again proved the wisdom of moving the photography department to Colorado. New courses were born that August when aerial cameras took photographs synchronized to the flare of the explosion of a fifty-pound flashlight powder bomb, exploded in mid-air. Citizens of Denver saw night flashes in their eastern skies and would continue to see them occasionally for many years. At this time and through the early use of the 1942 Photography School Building, this was the army's only aerial photography training program of its kind.

In 1938-39, Lowry photography personnel designed and tested the first "darkroom on wheels." The darkroom was in a trailer capable of generating its own electricity and supplying water so that photographs could quickly be developed in the field. The trailer was hauled to remote locations in the mountains where planes dropped film to student photographers below.

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Photograph development time was twenty minutes. With the functions and stature of the photography department expanding rapidly, a new permanent building specially designed for headquarters and photography classrooms was necessary

In 1938, construction plans for major new buildings were completed and prioritized. Runways and housing were top priorities initially. As the threat of war increased, some temporary buildings with projected life spans of about ten years were built. It was clear that aerial photography and the technology of armaments as applied to bombardier training and bombardier maintenance, as well as armorer's instruction, were going to be critically important if the United States went to war. The Photography and Armament School Buildings were under construction and almost completed when Pearl Harbor was attacked.

The History of the Photography and Armament School Buildings

The demands for trained personnel were so great that the training schools adopted two-shift, eighteen-hour day training schedules in August of 1941. By January 1942, Lowry was tasked by the War Department to train 55,000 men annually in the armament and photography school programs. In February 1942, the Photography and Armament School Buildings were completed and immediately in full use eighteen hours a day. The cost of the Armament School building was \$258,737 with equipment, and the Photography School Building cost \$389,669 with equipment. The hangar-like addition to the Armament School Building was completed the same year and provided the large spaces needed for bombardier training. The cost of the addition was \$6,819. (The addition was originally called an annex and was identified as Building #376.) In 1942, the Photography Building housed the Air Training Command Support

School headquarters (briefly), the Photography School headquarters, labs, classrooms, darkrooms, and workshops. There was an annex; recently demolished, connected to the rear that housed darkrooms, labs, and a theater for instructional purposes. The training in the school in 1942 gave courses for photo lab technicians, camera technicians, officer aerial photographers, enlisted aerial photographers, and public relations photographers

In 1942, the Army organized into four districts for its technical training mission. Denver was the headquarters for the fourth district, which included fifteen states from west of the Mississippi River to the Pacific Coast. Its primary publicized training mission was for armorers, bombardiers, and aerial photographers in early 1942. In October 1942, the photography and armament training schedule was accelerated to seven-day training, twenty-four hours a day—three shifts per day.

The Armament program was described in newspapers as training for men "who take care of aircraft armament, whether this be multi-mounted machine guns of flying fortresses or the devastating aerial cannons sticking out of the noses of lightning-like fighter planes." (*Denver*

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Post, 2 June 1942) But their role was much greater. Denver's armament training was recalled by veterans as being the unique location at first for some types of bombsight training, particularly the top secret Norden bombsight. The Sperry bombsight, the less sophisticated bombsight technology in use at the time, was more generally known and taught at Lowry and elsewhere.

By October 1942, orders also came to set up Lowry as a training center of bombardment armament. At this time, the fighter armament training was moved to Buckley, and for a time, the Armament School Building was used for bombardment armament training along with bombsight training and armorer training.

Newspaper reports throughout the war years gave praise to the massive, continual training contribution of the Photography and Armament School to air mission success in Europe and in playing a timely role in preparation for the Battle of Midway. Beyond reporting those direct contributions, the *Denver Post* reported on the previous year at Lowry on 31 December 1942:

The number of cadet students has increased five-fold over 1941. Training given them was in the photo and armament courses, a three-month course. Many Chinese and South American students studied the armament and photo courses, later returning to their native lands to instruct fellow countrymen in the ways of the United States army air forces. . . . Supervising the two schools are Lieut. Col. William F. Day, Jr., director of armament, and Col. Willard R. Shephard, director of the department of photography.

The number of photography students increased from 203 to 2,487 by the end of 1942. By 1943, over 200 new photography students were arriving weekly at Lowry Air Field. Small numbers of foreign servicemen came to Lowry for Photography School each year from 1938 to the early years of the war. Their numbers increased each year beginning in 1943. Most were from France and China, but men also came from Great Britain, Peru, Uruguay, Nicaragua, Brazil, Mexico, Canada, Egypt, Greece, the Philippines, the Netherlands, Australia, Turkey, and the Union of South Africa.

The Photography School also had a motion picture division. Their mission was to produce training films and orientation films. The staff of this division came primarily from Hollywood and had worked as cameramen before the war.

In 1942, newer camera configuration was the norm for aerial photography students to learn. Three cameras were laterally aligned in the fuselage nose. Together they covered the ground beneath from horizon to horizon. The three prints together more accurately depicted the hills and curves of the terrain. The students were always instructed in camera repair and

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maintenance, and by 1943, given real field experience to practice with makeshift implements. This was done at Lowry's Camp Bizerte, which recreated combat conditions.

Another change, in February 1942, brought female students to the Photography School Building. The first class of WACs started classes that month. In October 1942, twenty-four women civilians started classes to become Photography School instructors. Their selection was part of the effort to replace soldier instructors with civilians to free men for combat duty. The first African-American soldiers entered classes in the Photography School in January 1943. All were either college graduates or college students before joining the Army.

An October 1943 article clarified the role of the gunner who operates his weapon from the "bubble" gun turrets on bombers. The description was of a platform holding a mock turret with all the controls the gunner finds in a B-17 bomber. The gun turret and platform were located in the addition to the Armament School Building. The student learned to repair, install parts, locate trouble, and correct it. He also learned to dismantle and reassemble every type of gun and cannon utilized in the turret.

In February 1943, Marines were included in Armament School classes. This was also the time that bombardment training became an Army requirement for men completing aerial gunnery schools in other parts of the country. The graduates of gunnery schools came to Lowry for bombardment training to increase their effectiveness in combat zones. The training increased the ability of the men in combat to repair guns damaged in action rather than have to rely on trained armorers.

In April 1943, President Roosevelt visited Lowry. In July 1943, the Army merged its Flying Training and Technical Training commands. Lowry became the headquarters for one of three districts under this reorganization. Lowry was the headquarters for aerial photography and armament training for the whole of the western United States. In reviewing the year 1943, *The Rev-Meter*, the base newspaper, reported on 31 December 1943:

Both armament and photo---which remained the field's most important departments---saw changes in their programs The armament course, which since October 1942, specialized in heavy bombardment, saw the addition [again] of fighter armament to it. Additionally, the course was lengthened from nine weeks to 12 weeks. To the study of armament, too, were added two of the most important developments of fire-power in the entire war. One was the study of the 75 millimeter aircraft cannon, which was added to the regular armament course, and the other was the start here of the study of the highly important central fire control system, which became a course itself. . . .

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In advanced armament training dealing with the field's bombsight maintenance course, students coming here were schooled in both the Sperry and Norden bombsights, and also on both automatic pilots

An interesting and important feature of Lowry history during the year, too, was the training here of squadrons of heavy bombardment groups. These groups, coming here to be housed while taking their advanced courses in heavy bombardment, are now overseas.

This article reports a few of the many changes, constant adjustments, and training upgrades that occurred in the Armament School Building. One change in September 1943 was the addition of the first woman instructor in the Armament School. Her name was Fran McVey. Her selection was part of the effort to replace soldier instructors with civilians to free men for combat duty. McVey taught use and maintenance of machine guns.

In April 1944, the first all-African-American class was graduated from the power turret-training course. The turret division had previously graduated individual African-Americans, but this was the first all-African-American class to go through the training. African-Americans were in other Armament School training programs, but specific details were not readily available on this aspect of base history.

In 1945, Director of the Photography School, Major E. K. Speas, revealed that during the latter part of the war, the school worked on top-secret aerial radar. The radar was used as a navigation and target mapping aid. A course was developed in radarscope photography and was taught to selected groups of men assigned to B-29 operation in the Pacific with the

Twentieth air force. The school was continuing development of the technology and planned to continue classes in this area.

The Norden Bombsight

The Norden bombsight was an analog computer that calculated the trajectory of the bomb, given crosswind, altitude, and airspeed. It also released the bomb, since manual release was too slow. The bombsight also took over as the autopilot of the plane during the bombing run. The job of the bombardier using this device was of the utmost importance. His training was crucial and needed to be carried out in a secure and specially designed space.

Max B. Cook, Scripps-Howard Aviation Editor, had a column in the 2 June 1943 *Denver Post*, describing Norden bombsight training. It serves as a description of the kind of training that was given in the Armament School classrooms and hangar-like addition:

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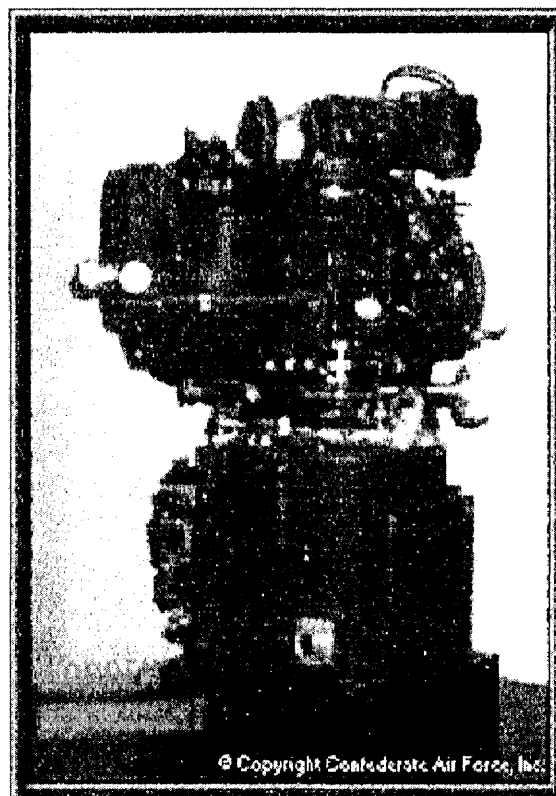
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High in the air on an electrically propelled platform a student in the AAF Technical Training Command [at the Armament School] kept eyes focused through the Norden bombsight. He was seated in the replica of an airplane cockpit and he steered the contraption with airplane controls. As it maneuvered across the hangar floor it approached a rectangular box atop which was a paper "bull's-eye" target, about six inches in diameter. As the "bomber" reached its objective, the bombardier released his "bomb." A metal plunger plowed down through the very center of the target. The objective was destroyed.

The student had repaired this bombsight. He was demonstrating to himself and his instructor that it worked, that it was ready to be installed in a bomber and that it would "hit the target." Here at Lowry Field thousands of soldier-students have and are specializing in photography, aircraft armoring, bombsight maintenance and power-operated gun turrets.

The Norden bombsight was top secret for many years. The bombardiers took a special oath not to reveal its operation and to protect it with their lives. They were required to be armed whenever they worked with it. A retired W.W.II airplane mechanic reported that neither he nor any of the other mechanics ever saw the bombsight while working on the planes. It was considered a key technology for winning the war. The United States shared the less accurate Sperry bombsight with some close allies, like England, but not even England was given the Norden bombsight. Burroughs Adding Machine Company won the contract to mass-produce the Norden under great security in 1942.

Understanding the importance of the Norden bombsight in the context of the times is necessary when considering its association with the Armament School Building. There was little reported about the specifics of the Norden bombsight. It was known by name at the time as a technology that could be relied upon to win the aerial war effort, and no doubt, the War Department wanted to inspire this confidence. As reported in the 1995 series, Engines of Our Ingenuity, University of Houston, it was, in fact, the most accurate bombsight developed at the



Norden Bombsight
Photo: Confederate Air Force

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time. However, it is now well known that its accuracy claims were a myth. Though the best that we had, it was not very good. From 20,000 feet, two-thirds of American bombs fell one-fifth of a mile from their targets. The options were saturation bombing and dive-bombing. The U. S. Army actually switched in part to saturation bombing during 1942. (It should be noted that it was a Norden bombsight that was used to drop the uranium bomb, *Little Boy*, from the B-29 Enola Gay 31,000 feet over Hiroshima in 1945.)

The other myth was the secrecy of the technology. Carl Norden, a Dutch-American, worked with Elmer Sperry on gyro-stabilizers, but left Sperry in 1913. While Sperry went on to develop the Army's bombsight, Norden developed his for the Navy. By 1928, Norden had a reliable version, superior to Sperry's. The Army bought the device from the Navy in the early 1930s, and Norden adapted it for use on bombers. To this point, in 1937, the secrecy was protected. It is now known that the Nazi's paid a Norden employee \$3,000 to steal the plans. The Germans never used the device, preferring the dive-bombing technique for their air campaigns.

None of this knowledge should diminish the mission of the Armament School as it related to this one facet of their work. The training on the Norden bombsight was seen as crucial, and the men were well trained to use it. This was only one facet of the Armament School mission. The others included providing training to keep equipment running in the field, which the school also accomplished admirably.

Photography and Armament Schools and Lowry Air Field After World War II

In 1945, at the conclusion of the war, five-day training schedules resumed. In 1946, the Army Air Forces Training Command became the Air Training Command. In 1947, the Air Intelligence School transferred to Lowry. This was the beginning of what would become Lowry's important intelligence interpretation role during the Cold War, and that role would affect the functions of both the Armament School Building and the Photography School Building.

In January 1948, the Photography School at Lowry was judged to be the best photography school in the world by editors of *U. S. Camera*. The editors toured schools around the country, spending four days at Lowry. Their February 1948 issue featured the school. The article reported that the Photography School qualified students for careers and that college credits were available for the courses. The editors listed many esteemed civilian photographers who were wartime graduates—especially, working on well-known magazines. The school graduated 21,000 students from 1941 to January 1948.

In June 1948, Lowry Field became Lowry Air Force Base after creation of the United States Air Force. In 1950, Lowry again accelerated its training schedule to respond to military manpower demands of the Korean War. In 1953, a regular schedule resumed and it was reported that ten

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communist Yugoslav military men completed an armament course. This was part of a program of promoting Marshall Tito's good will. The Defense Department said that the training was a fringe-training program dealing only with the use of weapons and equipment that Yugoslavia was receiving from the United States.

Over the succeeding years, technological advances made the World War II armament, bombardier, and bombsight training obsolete. The Armament School Building was thereafter continually in use with new functions assigned to it as Lowry A.F.B. carried out its changing missions.

A 1956 article reported that Lowry A.F.B. continued its original specialties in training photographic and armament technicians. The photography training continued in changing ways over the next decades. Most of the other wartime schools were eliminated or transferred to other bases. Over the succeeding years, technological and scientific advances made the old aerial photography methods obsolete. With U-2 planes capturing images early during the Cold War and then with satellite photography coming on the scene, the need was for specialists to interpret these images. In 1964, a new photographic training laboratory was dedicated at the base for processing the results of this aerial precision photography, as it was called. Special construction was required to house "clean rooms" for handling the images and, likely, to hold the computers. The work done at Lowry interpreting images helped build huge databases of information about the topography and military installations of countries around the world. The Photography School Building was used for this aerial interpretive purpose.

In the 1960s, the Navy, Air Force, and Marines consolidated their aerial intelligence gathering and training efforts by forming the Armed Force Air Intelligence Training Center. This new cooperative training program reported to the Defense Intelligence Agency in the Pentagon. The Photography School Building is where the three branches trained together. These air intelligence men and women had security clearance. The courses were from six to nine month's duration. The aerial interpretation training prepared servicemen to read the images and feed a giant database. The reservists assigned to this program from nearby Buckley A.F.B. were feeding information, for instance, for the Asian area for the Pacific fleet.

One Navy officer, John Clarke, who shared his experiences, went through the courses in 1974 in the Photography School Building as a student dispatched from his reserve unit at Buckley. Clarke had previously served in active duty as a Navy flyer. He eventually taught courses as part of the Navy Reserve Intelligence Unit. The classes were taught in the Photography School Building through the 1980s. In 1985, Clarke became the commanding officer of the Navy Reserve Intelligence Unit at Lowry. The reserve unit gave support to the intelligence efforts at Lowry by supplying fifteen officers and eighteen enlisted men. In the late 1980s,

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reorganization within the military moved the aerial intelligence training to Goodfellow A.F.B. in northeast Texas.

Denver and the Region: Post W.W.II

The Remington Corporation (later Kaiser Corporation) built the Denver Arms Plant in 1941 and employed 20,000. This plant evolved into the Federal Center in Lakewood, Colorado, a Denver suburb. Remington-Rand's Rocky Mountain Arsenal made ammunition and poison gas and employed another 20,000. Other military related industries also appeared around Denver because of the establishment of Lowry Air Field. This signaled the beginning of Denver's strategic military presence in the nation's defense and in aeronautics industries that later developed.

In addition to causing economic changes off the base, Lowry A.F.B. continued to have a positive effect on Denver and the region with its own payroll and presence. It was reported in 1955 that 19,000 were on the base payroll. Lowry contributed more than \$45 million to the local economy that year.

The Photography and Armament School Buildings were part of the critical center of Lowry Air Field. During World War II, Denver's population increased by 100,000. In the post war years, the population continued to increase dramatically. In no small part, this was due to two factors. First, many of the thousands of airmen who had passed through Denver for technical training returned to Denver after the war to live. Second, the expertise of the technical schools at Lowry encouraged technical industrial concerns to locate in Denver after the war. Government contracts began to come in to area companies like aero-space giant Martin-Marietta and the many smaller firms that supplied the Martin concern.

Architecture

The 1942 Photography and Armament School Buildings were designed in an expression of the International style. There were two factors at work that made this style the best choice. First, the Modern Movement in American architecture was relatively new, first appearing in the 1920s and 1930s. It conveyed society's perception of technological advances in industry. As a corollary, Modern Movement styles could be expressed with the use of new, cheaper to construct materials. Second, the military, namely the United States Army, was utilizing greater technology in airplanes, guns, bombing capability, and in the training of its manpower. The Army conveyed this through the architecture of the Photography and Armament School Buildings. The buildings embody the distinctive characteristics of a type, period and method of construction.

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These buildings were planned to be permanent structures, the headquarters for a technologically advanced Army Training Center. Before and during W.W.II, many temporary buildings went up around these buildings. The temporary buildings have been demolished, but these buildings symbolized the center of that training cluster of temporary classrooms and barracks. They were planned initially to house all the classrooms for photography and armament training, but the extraordinary needs of W.W.II ultimately required additional temporary space. Yet the buildings continued to serve as the center that coordinated not only the top secret and ordinary armament and photography training at Lowry, but all armament and photography training in the western United States during the war. As the space needs abated after the war, the buildings continued to accommodate changing technology and training of the standing Army and later the United States Air Force.

Details of the design, even within its style possibilities, convey a sense of central importance. The massive porticos at the central entries carry great authority. Control and security are conveyed by the buildings' symmetry. The International style was a style of choice for important public and commercial buildings where technology was a desirable association. The Photography and Armament School Buildings express authority. The buildings retain their original integrity and continue to convey their important role in United States military history.

The Architect and Builder

There is often some difficulty in discovering the architect or architects to credit with military building design. The architect for these buildings was not discovered for the State Preservation Office building inventory at the time of the base closure. It was not discovered when the application was made for designation as a Denver Landmark. The records for Lowry Air Force Base are currently in boxes at Maxwell Air Force Base, waiting to be accessioned into military collections. When those records are organized and made available, it is hoped that the architect for these buildings will be discovered. A search of the newspapers of the day related that two Denver construction companies had large construction contracts for Lowry buildings by the early 1940s. (The early construction at Lowry was done primarily through the Works Progress Administration.) The two companies were Kirchner Construction Company and Brown and Schrepfermann. The articles did not relate which company built these buildings. This information may also be found in the accessioned military records for Lowry A.F.B..

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GEOGRAPHICAL DATA

VERBAL BOUNDARY DESCRIPTION

Lot 8 and Lot 21, plus that portion of Rampart Way laying between the Lots 8 and 21, Block 1, Lowry Filing No. 5, City and County of Denver, State of Colorado.

BOUNDARY JUSTIFICATION

The nomination includes all the land historically associated with the two buildings as part of Lowry Air Force Base.

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PHOTOGRAPH LOG

The following information pertains to photograph numbers 1-29 except as noted:

Name of Property: Photography and Armament School Buildings
Lowry Air Force Base
Location: Denver County, Colorado
Photographer: Elaine Gallagher Adams
Date of Photographs: June 2001
Negatives: David Owen Tryba Architects

Photo No. Photographic Information

- 1 Armament School Building facade (west elevation); view to the northeast.
- 2 Armament School Building, south elevation; view to the northwest.
- 3 Armament School Building Annex, south elevation; view to the north.
- 4 Armament School Building, east elevation; view to the west.
- 5 Armament School Building connector to the Annex; view to the northwest.
- 6 Armament School Building, east elevation; view to the west.
- 7 Armament School Building Annex, south elevation; view to the southwest.
- 8 Armament School Building Annex, east elevation; view to the southwest.
- 9 Armament School Building Annex, north elevation; view to the east.
- 10 Armament School Building connector to the Annex; view to the southeast.
- 11 Armament School Building, north elevation; view to the southeast.
- 12 Photography School Building, facade (east elevation); view to the southwest.
- 13 Photography School Building, south elevation; view to the northwest.
- 14 Photography School Building, west elevation; view to the northeast.
- 15 Photography School Building, west elevation; entry; view to the east.
- 16 Photography School Building, west elevation, entry detail; view to the northeast.
- 17 Armament School Building connector to the Annex, interior; view to the north.
- 18 Armament School Building Annex, second-floor interior; view to the northeast.
- 19 Armament School Building Annex, second-floor interior; view to the northeast.
- 20 Armament School Building Annex, second-floor interior; view to the northeast.
- 21 Armament School Building Annex, second-floor interior; view to the northeast.
- 22 Armament School Building Annex, second-floor interior; view to the northeast.
- 23 Photography School Building, first-floor interior.
- 24 Photography School Building, first-floor interior.
- 25 Photography School Building, first-floor interior.
- 26 Photography School Building, first-floor interior.
- 27 Photography School Building, first-floor interior.
- 28 Photography School Building, first-floor interior.
- 29 Photography School Building, second-floor interior.

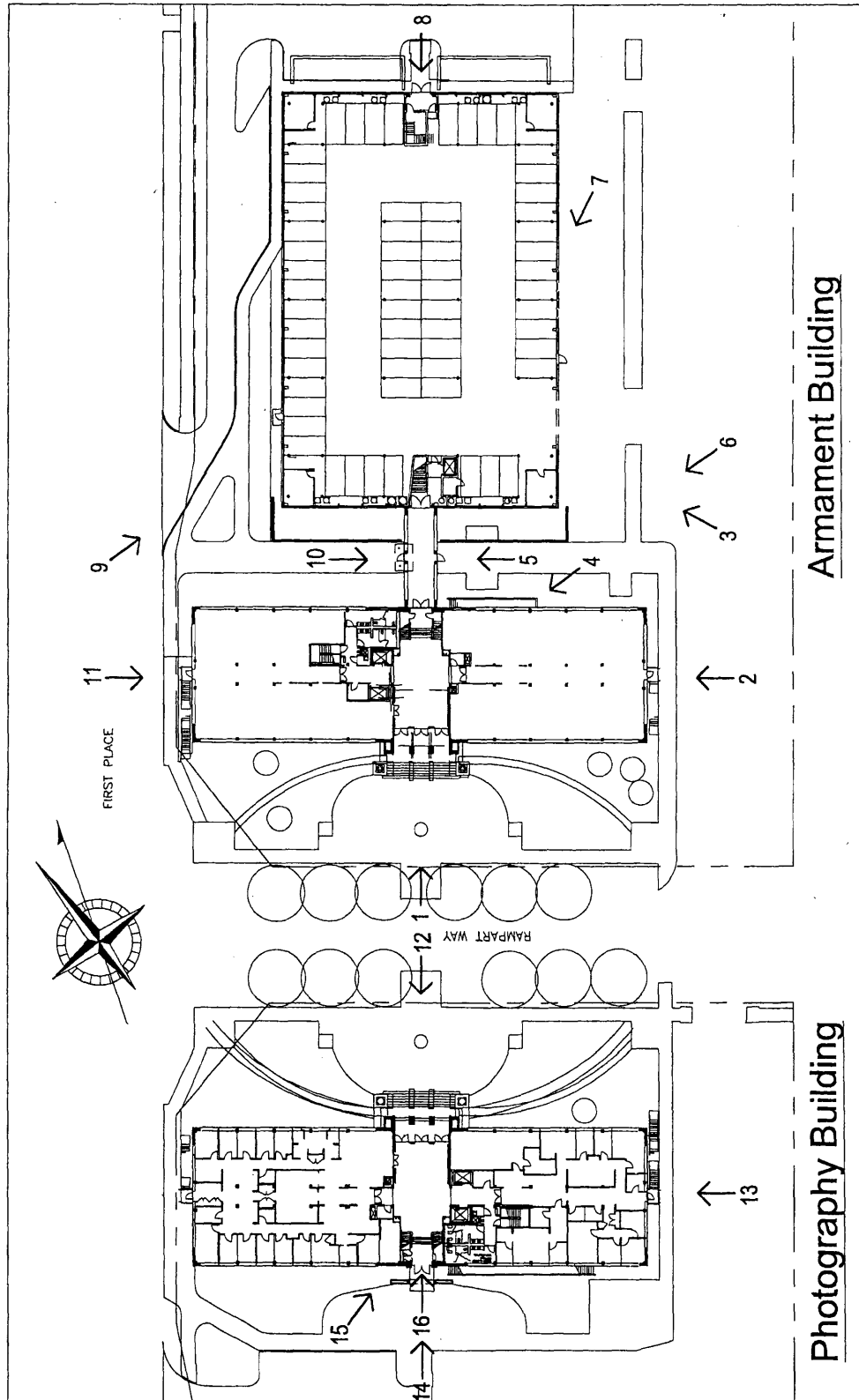
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Figure 2
PHOTO KEY



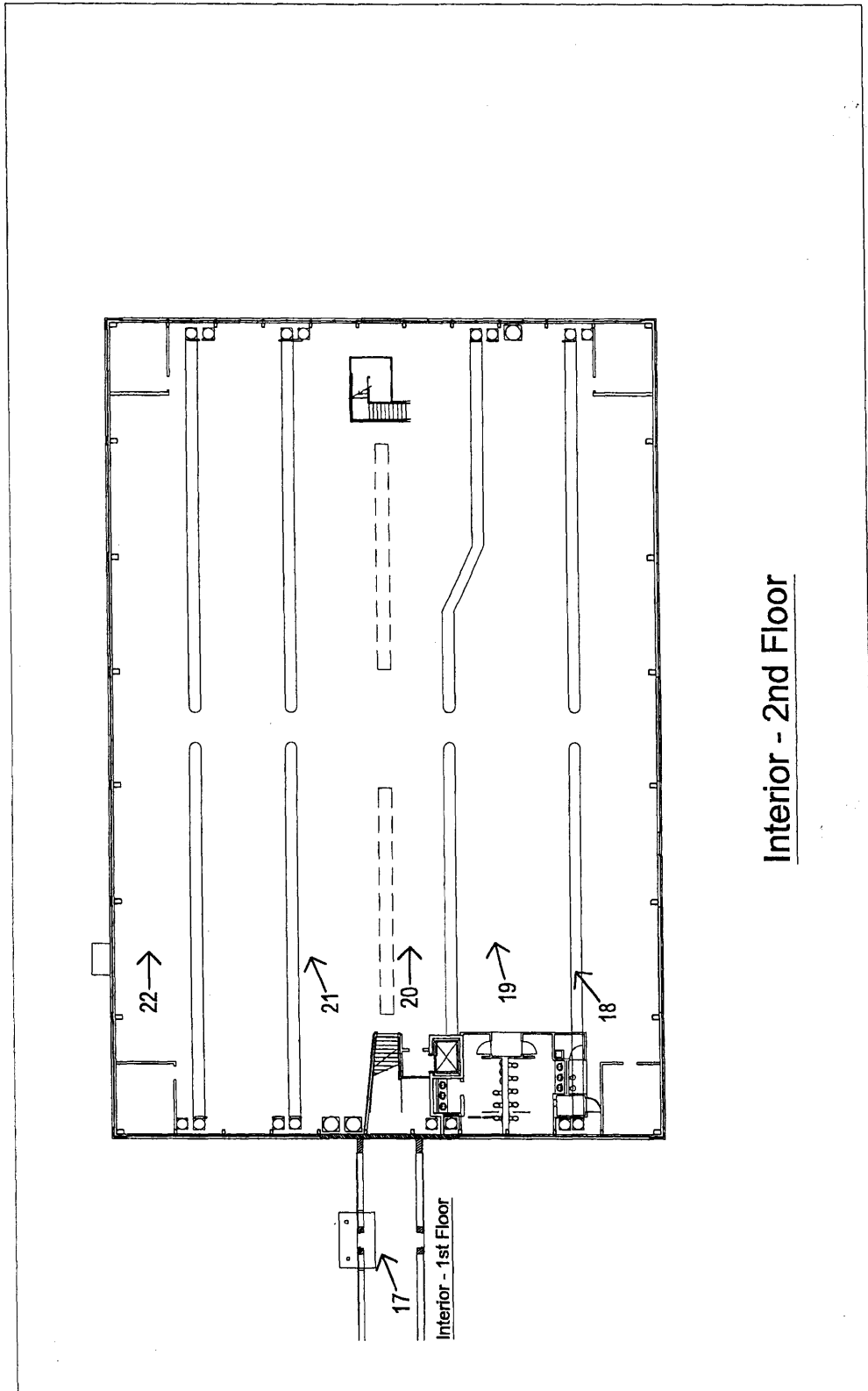
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Figure 3
PHOTO KEY



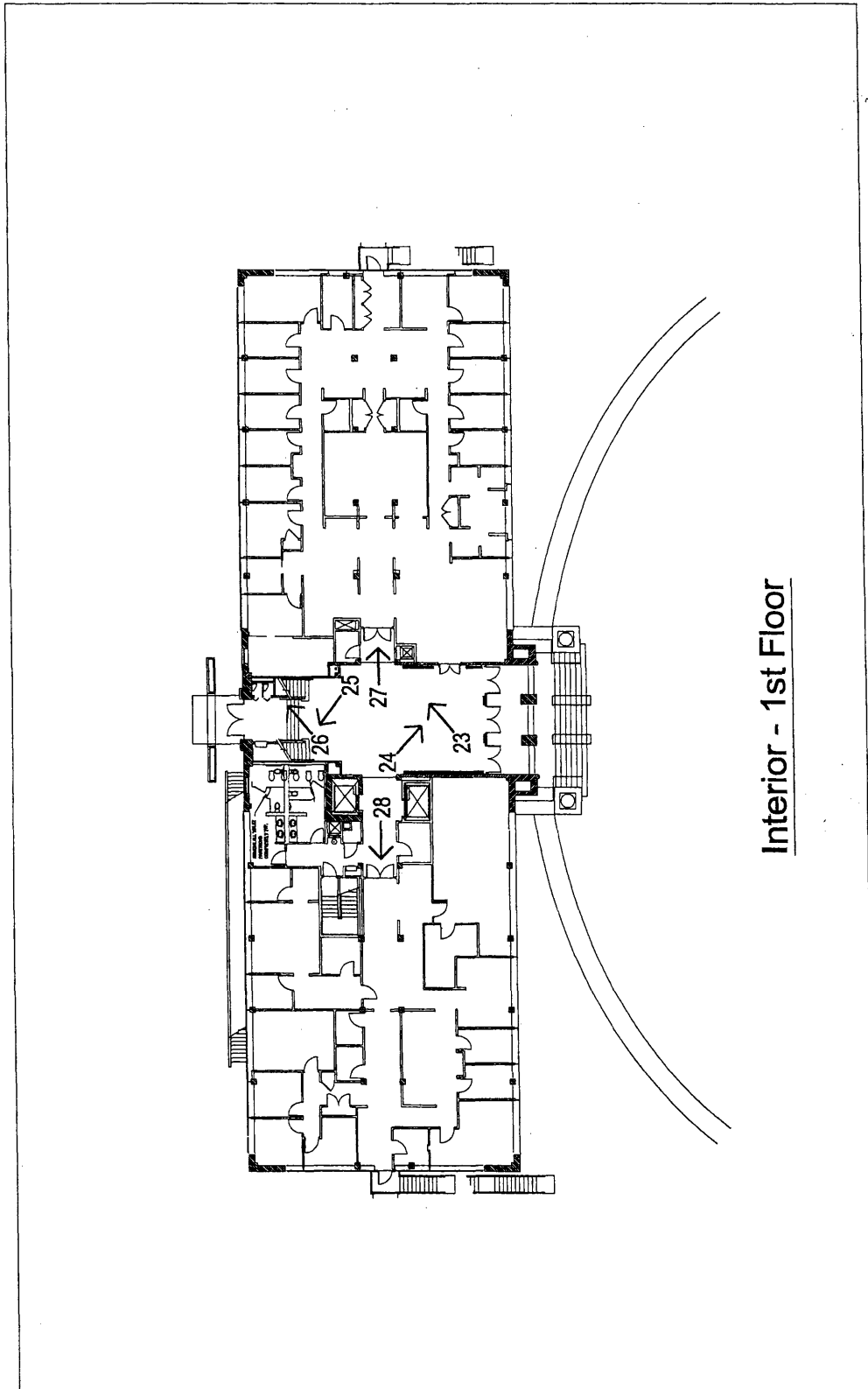
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Figure 4
PHOTO KEY



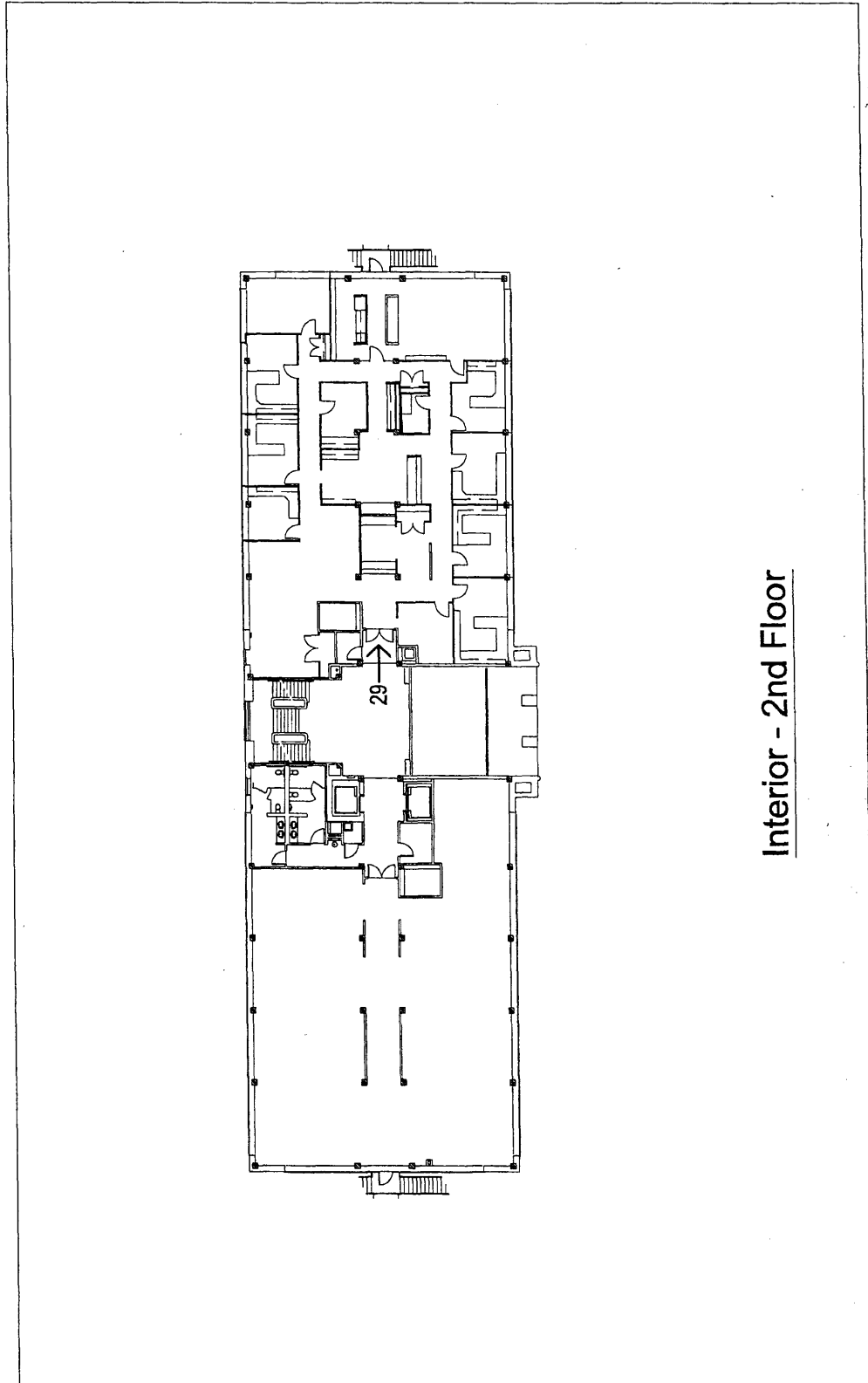
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Figure 5
PHOTO KEY



Interior - 2nd Floor

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USGS TOPOGRAPHIC MAP
Englewood Quadrangle, Colorado
7.5 Minute Series

