

Milo S. Ketchum: Structural Engineer to Denver and Beyond



Milo S. Ketchum Jr.

Photo from *Leadership and Management in Engineering*, October 2006

- Buildings engineered by Ketchum and his team
 - Firm names and locations
- Career timeline with awards and publications

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<https://www.thin-shell.net>

February 9, 2022

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Milo Smith Ketchum, Jr.

1910	Born March 8 - Denver, Colorado
1910 - 1917	Boulder, Colorado
1917 - 1919	Philadelphia, Pennsylvania
1919 - 1934	Urbana, Illinois
1931	B.S. University of Illinois
1932	M.S. University of Illinois
	U.S. Bureau of Reclamation (Denver)
	Portland Cement Association (Chicago)
	Case Institute (Cleveland)
1944	Married Gretchen Allenbach
	Floyd G. Brown Associates (Cleveland)
1945	Founded Milo S. Ketchum, Consulting Engineer (Denver)
1945 - 1989	Ketchum & Konkell; Ketchum, Konkell, & Hasting; Ketchum, Konkell, Ryan, & Fleming; Ketchum, Konkell, Ryan, & Hastings; Ketchum, Konkell, Barrett, Nickel, & Austin; KKBNA
1962 - 1966	Milo S. Ketchum & Partners (Connecticut)
1966	Pennsylvania State University - Visiting Professor
1967 - 1978	University of Connecticut - Professor
1979	University of Illinois Distinguished Alumni Award
1976	D. Sc. (hc) University of Colorado
1982	National Academy of Engineering
1982 - 1984	Editor, <i>Structural Engineering Practice</i>
1986	Honorary Membership, American Concrete Institute
1989 - 1999	Consulting Engineer, Denver
1999	Died December 8 - Denver, Colorado

From Milo Ketchum's personal web site!

<http://www.ketchum.org/milo/>

Milo S. Ketchum - Professional Accolades and Activities

a partial listing

Awards

American Concrete Institute, Henry C. Turner Medal, 1968

Listed as “Engineer of Distinction,” Engineers Joint Council, 1973

American Consulting Engineers Council, outstanding engineering achievement award for TWA airframe overhaul facility in Kansas City, 1973

American Consulting Engineers Council, outstanding structural engineering achievement award for University of Idaho football stadium, 1976

Honorary Doctorate, University of Colorado, 1976

Alumni Award for Distinguished Service, The Grainger College of Engineering, University of Illinois, 1979

Books and Articles

Paper in *Proceedings of the Eastern Photoelasticity Conference*, 1939

Types and Forms of Shell Structures, n.d.

Handbook of Standard Structural Details for Buildings, 1956

“Manpower for a Structural Engineer’s Office,” *Progressive Architecture*, 1959

IBM 650 computer program “for calculation of stresses in barrel shell roof structures,” 1960

Speaking Engagements

American Concrete Institute Convention, Denver, 1954

University of NE seminar on thin shell design and construction, Lincoln, 1956

University of NM concrete thin shell seminar, Albuquerque, 1956

Institute of Structural Engineers Fiftieth Anniversary Conference, London, 1958

American Society of Civil Engineers, Central IL Section, Allerton Park, 1958

University of MO structural concrete conference, Columbia, 1958

AIA, Southwest OR Chapter Craftsmanship Banquet, Eugene, 1958

University of Minnesota Concrete Conference, Minneapolis, 1958

University of Utah Concrete Shell Structures seminar, Salt Lake City, 1961

Yale University, two weeks as a lecturer

American Concrete Institute

Member since 1935; director, served on Nominating Committee, Technical Activities Committee, Committee 334 Concrete Shell Structures; arranged field trips and transportation for 1962 conference held in Denver

Firm Names and Addresses

FIRM NAME	CITY	ADDRESS	MILO KETCHUM'S ROLE
Milo S. Ketchum (1945 - 1954)	Denver	617 Insurance Building (1947)	Denver - Active in his firm (1945 - ca. 1961)
	Denver	342 Railway Exchange Building (1948)	
	Denver	700 Interstate Trust Building (1950)	
	Denver	1090 Fox Street (1951 - 1957)	
Ketchum and Konkell (1954 - 1959)	Denver	730 Kalamath Street (1957 - ca. 1974)	
Ketchum, Konkell & Hastings (1959 - ca. 1963)			
Ketchum, Konkell, Ryan & Fleming (ca. 1963 - 1966)			Connecticut - Started Old Saybrook branch office (ca. 1961 - ca. 1965)
Ketchum, Konkell, Ryan & Hastings (1966 - 1969)			<i>became today's GNCB Consulting Engineers, P.C.</i> University of Connecticut - professor of civil engineering (1967 - 1978)
Ketchum, Konkell, Barrett, Nickel, Austin, Inc. (KKBNA) (1969 - 1989)			
	Lakewood	7456 West 5th Avenue (ca. 1974 - ca. 1984)	
	Wheat Ridge	4251 Kipling Street (ca. 1984 - ?)	
KKBNA was purchased by Martin Associates Group in 1988			
Martin/Martin (1989 - present)	Lakewood	12499 West Colfax Avenue (? - present)	Denver - Consultant with KKBNA (1980 - 1999)

The Connecticut Connection - Firm Names in Old Saybrook, CT

FIRM NAME

Ketchum with Rudi Besier started Old Saybrook branch office
(ca. 1961 - ca. 1965)

(Milo Ketchum sold the practice to Rudi Besier ca. 1965)

Rudolph Bessier, Inc.
(Dec 1967 - Nov 1972)

Rudolph Besier & Kenneth Gible Consulting Engineers, Inc.
(Nov 1972 - Jan 1979)

Besier Gible & Quirin, Consulting Engineers, Inc.
(Jan 1979 - Sep 1985)

Besier Gible Norden Consulting Engineers, Inc.
(Sep 1985 - Nov 1996)

Gible Norden Champion Consulting Engineers, Inc.
(Nov 1996 - Jun 2001)

Gible Norden Champion Brown Consulting Engineers, Inc.
(Jun 2001 - Nov 2010)

Gible Norden Champion Brown Consulting Engineers, P.C.
(Nov 2010 - Feb 2011)

GNCB Consulting Engineers, P.C.
(Feb 2011 - present)

Just some of the people on Ketchum's team:

Milo S. Ketchum, Jr.

Albert E. Anderson (Associate)

V. Anderson (Vice President)

David E. **Austin** (Partner)

Michael H. **Barrett** (Partner, Chairman of the Board)

Rudolph F. "Rudi" Besier, P.E. (Partner)

John Bright

Howard B. Browning

Eugene N. Catalano (Project Engineer)

David E. **Fleming** (Partner)

Gary B. Gehrig (Associate)

Kenneth Gobble

Tom Haas (Project Engineer)

James M. **Hastings** (Partner)

Rayburn A. Horton (Associate)

Charles D. "Chuck" Keyes (Technical Director)

E. Vernon **Konkel** (President, Chairman of the Board)

Al Lunning (Office Manager)

Gary Lykken

Ole F. Melleby (Project Engineer)

Donovan D. **Nickel** (Partner, Secretary-Treasurer)

William B. O'Neal (Associate)

Martin (or Mike) Oldford

Joe Prinster (Project Engineer)

Don T. Pyle (Associate)

Alfred J. **Ryan** (Partner)

Earl F. Sorensen (Project Engineer)

Edward C. Stevenson

Gary Thomas

Richard E. "Dick" Thornburg, P.E.

Leroy Tobler (Supervising Engineer)

Nicholas V. Tsiouvaras (Associate)

Don Weber (Project Engineer)

Jack D. White (Structural Design)

Hilda L. Wildman (Manager)

**Structural Engineers Ketchum
met, corresponded with, and
worked on committees with:**

David P. Billington
Richard R. Bradshaw
Felix Candela
John V. "Jack" Christiansen
Richard M. Gensert
Phillip L. Gould
Stefan J. Medwadowski
Egor P. Popov
William C. Schnobrich
Alexander C. Scordelis
John B. Skilling
Anton Tedesko
Daniel F. Tully

Thin-Shell Concrete

- Relatively thin compared to span or radius**
 - Curved or folded to increase strength**
- Combines support and enclosure in one element**



Denver
730 Kalamath Street



Structural Engineer: Michael Barrett
Architect: Jerome K. Nagel

1957

Ketchum and Konkel Office

Mile-Hi Church of Religious Studies

Lakewood
9077 West Alameda Avenue



Architect: Tom Hite

1973

Frank R. Ross House

Arapahoe County



Architect: James T. Ream

1966

Ideal Cement Co. Hangar

Denver
8695 Montview Boulevard (former Stapleton Airport)



Architect: Fisher, Fisher and Davis

1959

Centennial Junior High School

Boulder
2205 Norwood Avenue



Architect: unknown

ca. 1960

I can't believe they tore that down....

R.I.P. Fan Fair Discount City

Aurora
333 Havana Street



2013 Photo (c) Atom Stevens, used with permission



Photo (c) Atom Stevens,
used with permission

Architect: William Muchow

1961 - 2013

R.I.P. Moore Equipment Company

Commerce City
5990 Colorado Boulevard



Building photos from *Architectural Forum*, February 1955

Architect: Thomas E. Moore

ca. 1954 - ca. 1981



Beyond Thin-Shell....

Alameda High School

Lakewood
1255 S. Wadsworth Boulevard



Architect: Wheeler and Lewis

ca. 1961



Arvada High School

Arvada
5751 Balsam Street



Architect: possibly Wheeler and Lewis

ca. 1960

Aspen Institute Health Center

Aspen
880 Meadows Road



Architect: Herbert Bayer and Fritz Benedict

1955



Aspen Institute Seminar Building

Aspen
1000 North 3rd Street



Architect: Herbert Bayer and Fritz Benedict

1953

Broadmoor International Center

Colorado Springs
21 Lake Circle



Structural Engineer: E. Vernon Konkel for Ketchum and Konkel
Architect: Edwin A. Francis and Carlisle Guy

1961

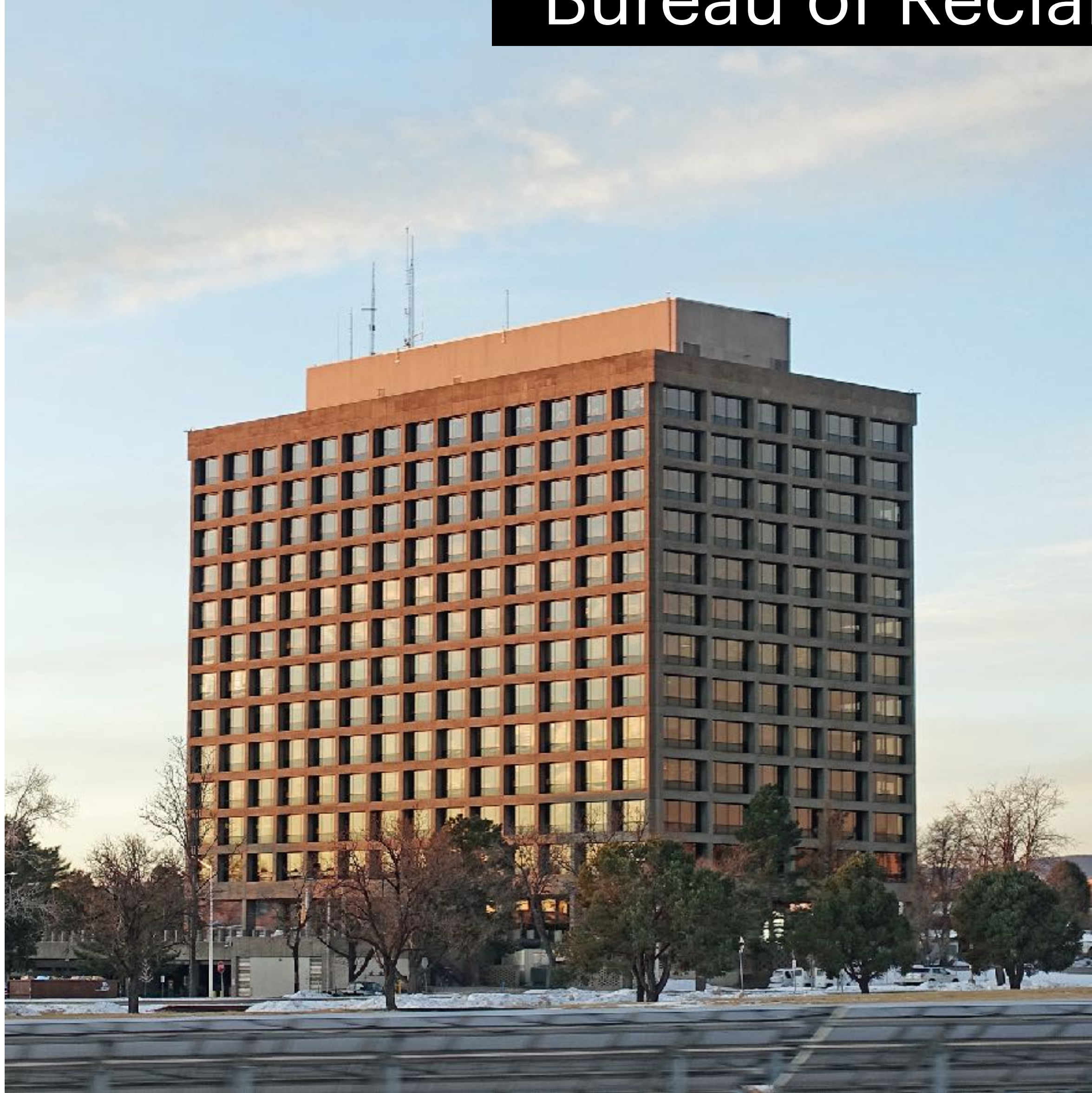
Roof is 188' x 192' or 36,096 S.F.

(May D&F canopy was 131'-6" x 112' or 14,728 S.F.)



Bureau of Reclamation Building

Lakewood
Denver Federal Center



Architect: Gyo Obata for Hellmuth, Obata & Kassabaum, Inc.

1965

Bath House

Aurora
Cherry Creek State Park



Architect: Cabell Childress

ca. 1975

Picnic Shelters

Aurora
Cherry Creek State Park



Architect: Cabell Childress

ca. 1975

Cheyenne Airport Terminal

(Thin-shell concrete roof was Replaced)
Cheyenne, Wyoming
Municipal Airport



Architect: Robert W. Postin
Engineers: Volk and Harrison of Casper with consultant Milo Ketchum

1960



Coca-Cola Bottling Plant

Colorado Springs
415 W. Pikes Peak Avenue



Architect: Carlisle Guy

1957

Colony Supermarket

Boulder

2614-2680 Broadway, Community Plaza Shopping Center



Architect: Hobart Wagener

ca. 1962



Continental Bakery

Denver
80 E. 62nd Avenue



Structural Engineer: David Austin
Architect: unknown

1962

R.I.P. Currigan Exhibition Hall

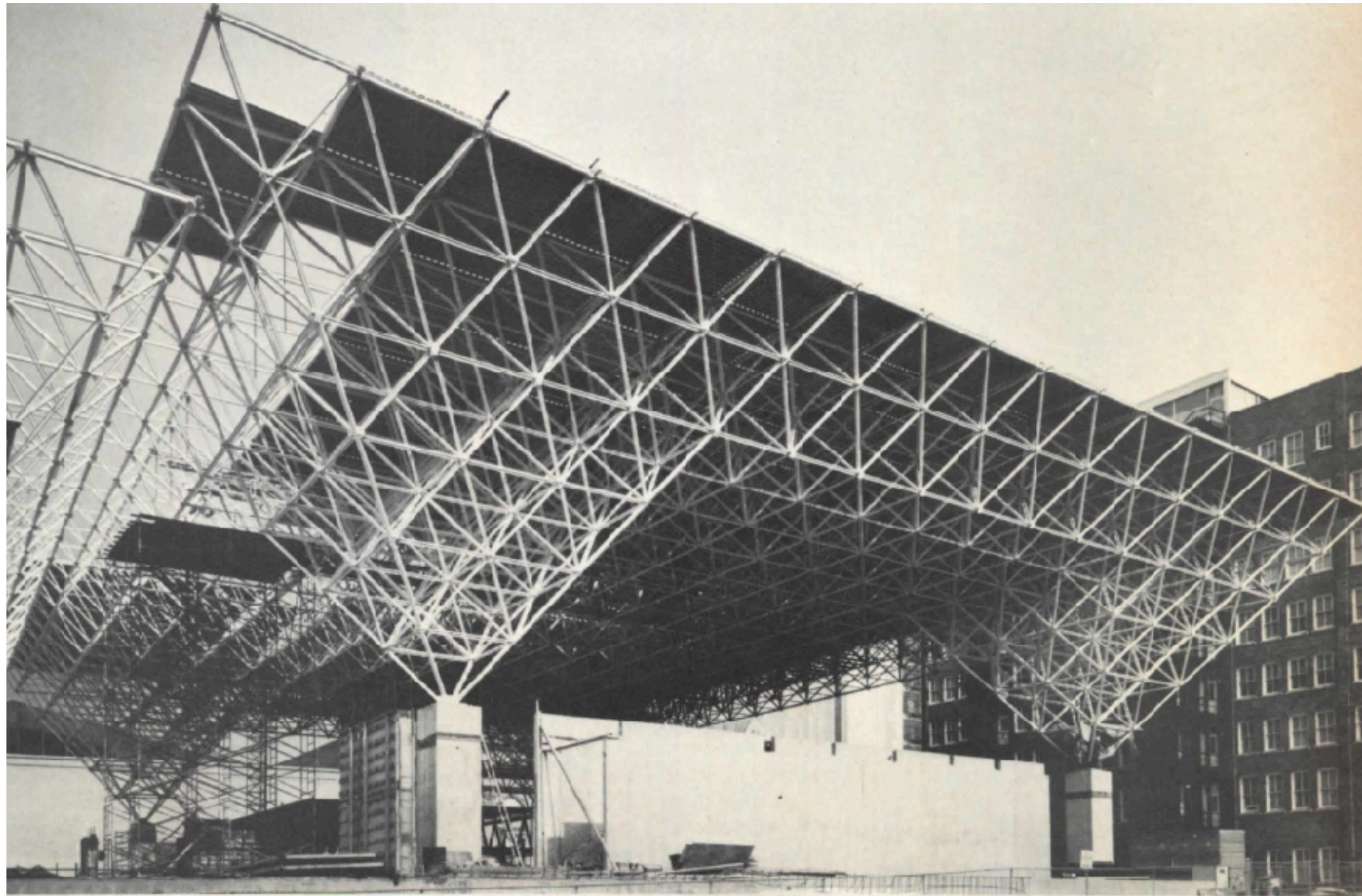


Photo from *Progressive Architecture*, October 1969



Photo from Bethlehem Steel advertisement, *Architectural Record*, January 1970

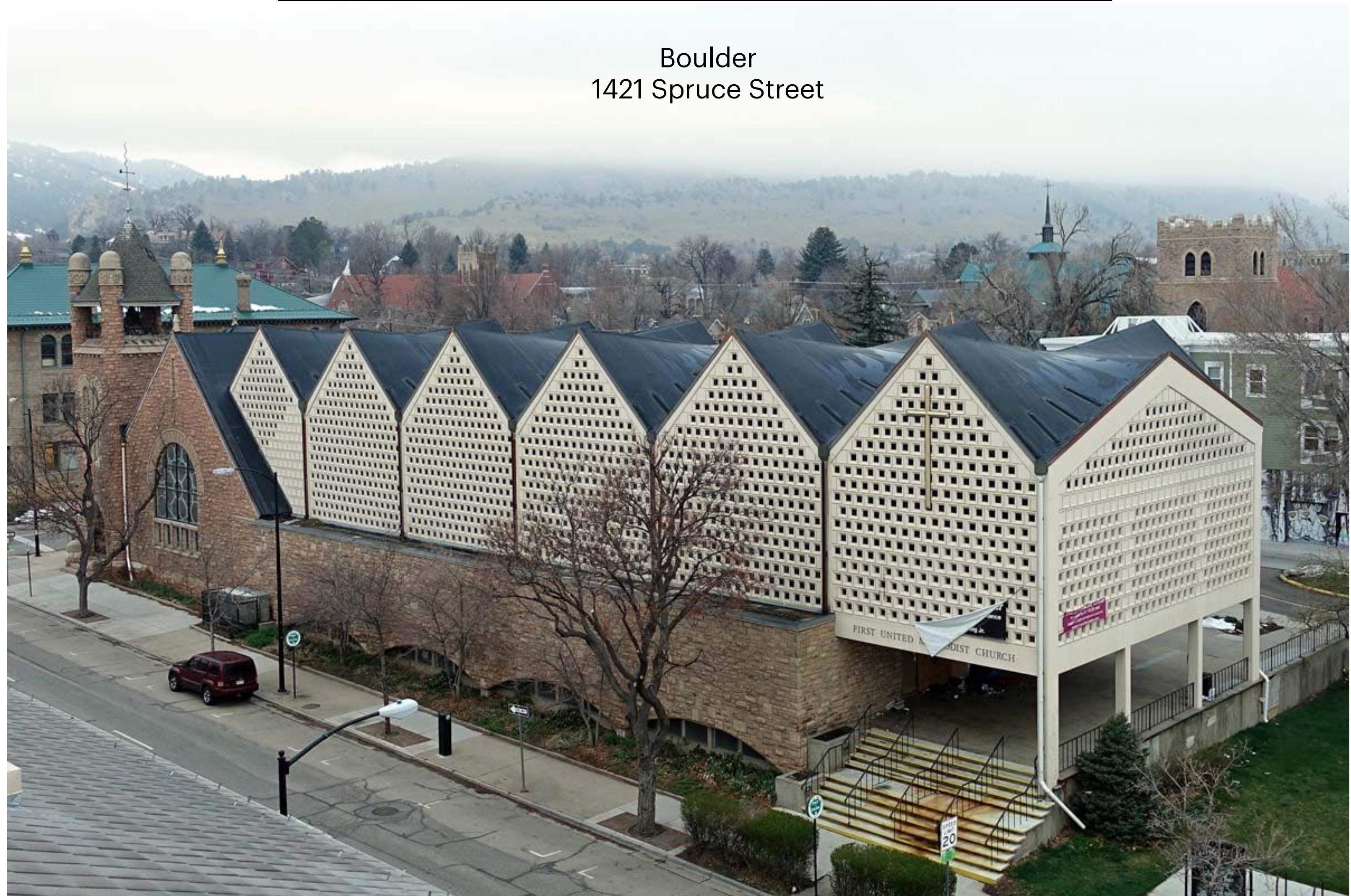
Denver
1324 Champa Street

Structural Engineers: Michael Barrett, Charles D. Keyes and William B. O'Neal
Architect: William Muchow Associates and Ream, Quinn & Associates

1969 - 2002

First Methodist Church

Boulder
1421 Spruce Street



Architect: uncertain but probably Thomas E. Moore or Hobart Wagener

ca. 1960

Grace Lutheran Church

Denver
875 Forest Street

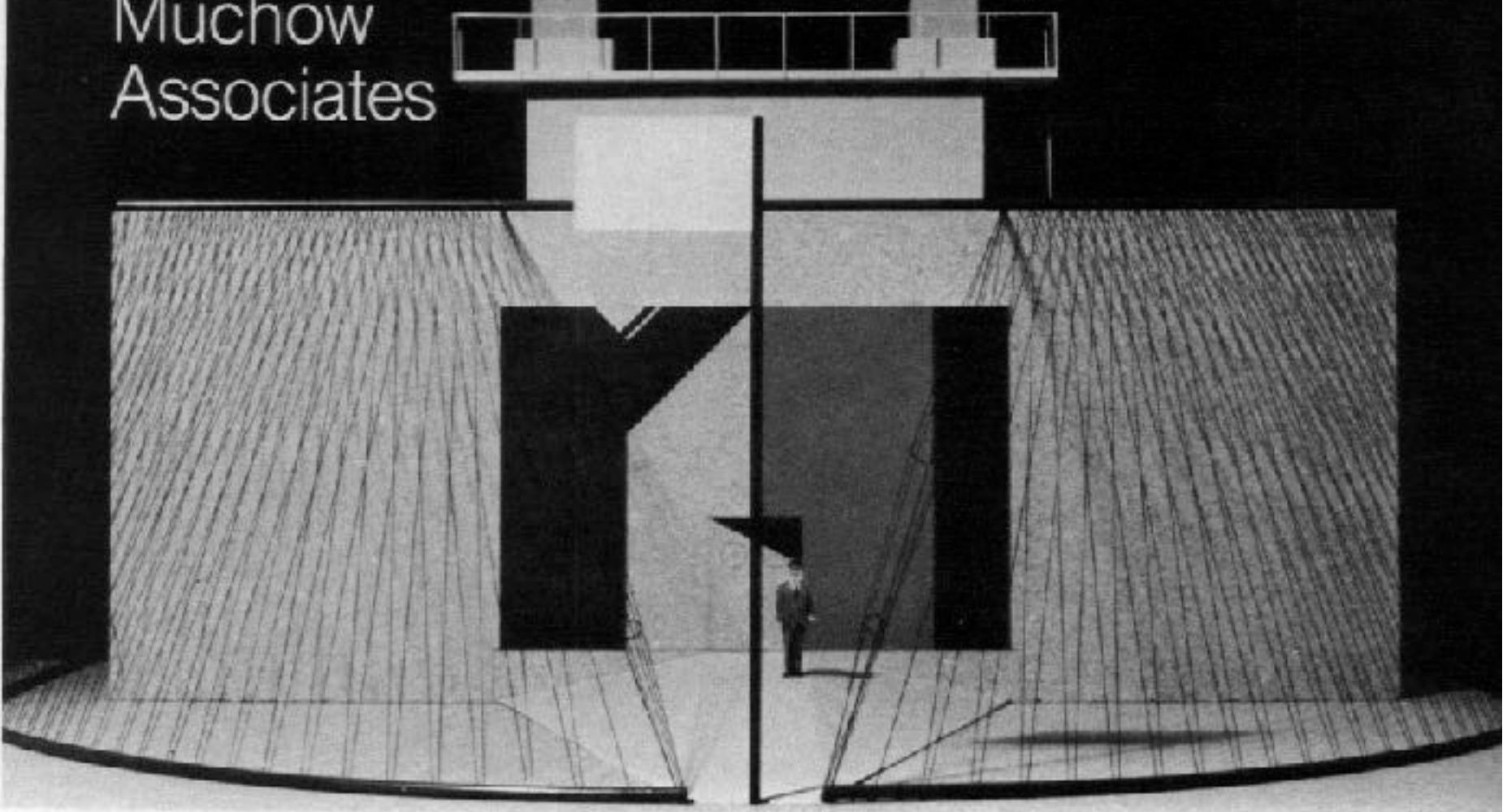


Architect: Baume & Polivnick

ca. 1958

Citation

Muchow Associates



KKBNA Office Building, Lakewood, Colorado. Greenery on a trellis provides a natural screen around a low-cost concrete building.

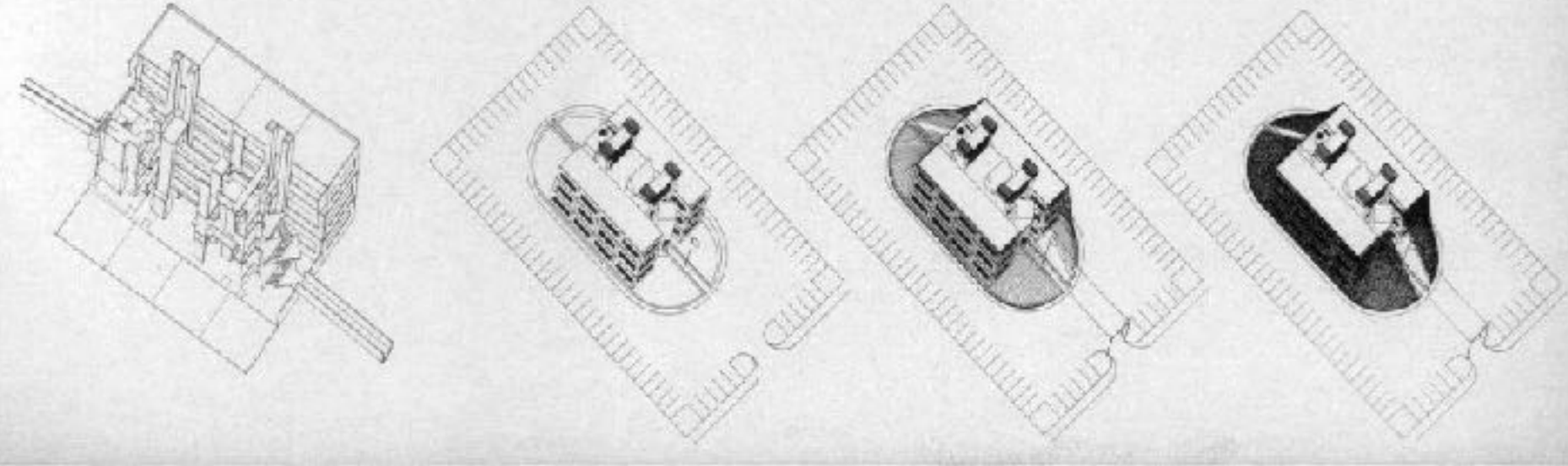
Program: Develop a low-cost 20,000-sq-ft office building for a firm of consulting engineers. The firm will occupy 66 percent of the building; the remaining 34 percent will be leased to others until needed for expansion of the engineering firm. **Site:** A flat rectangle of land, 180' x 325', one block from a suburban commercial strip. **Design solution:** Parking aisles and stalls are arranged to "fence" the site. For the building a 24' x 24' x 10' structural module was chosen; divisible into office or drafting space, it allows each person a desk by a window. The two blocks of the building are formed of 12 modules each; between the blocks is a labyrinth of complex spaces, bridges, ledges, and alcoves which houses building circulation, reception and waiting areas, lounge space, and services. Adding to the complexity of the labyrinth is lush indoor planting, and the roof is pierced to admit natural

light. Surrounding the building is a trellis—almost a tent—of steel rods, on which will be planted an abundance of vines to provide a natural screen for the building. **Construction and materials:** Site-cast concrete was chosen for economy; structural module is 24' x 24' x 10'. Rooftop multi-zone units supply heated and cooled air to an exposed distribution network. Estimated cost: \$13-\$15/sq ft.

Jury comments
Esherick: The thing I like about it is that it's an unpretentious attempt to solve a very difficult problem and about the only attempt that we have seen to really seriously solve the problem. He's trying to control the environment in an area that is very rough.
Robertson: Those outdoor lines are used to fragment, to obscure, to camouflage and enclose.
Myers: He goes through all that articulation (of the facade) and then he covers it up.
Robertson: Isn't that articulation a result of his system analysis?
Myers: Here's someone who just takes a simple

building and addresses himself to it in a factual way. Then he comes up with a thing that doesn't look like a standard building because he's got a big net draped around it. He builds it up and then finally, he just wraps it up. He encloses the people inside, because what would they have to look out on? □

Credits
Architects: Muchow Associates Architects, George Hoover, project architect/designer.
Associated architects: Adams & Associates, production.
Landscape architect: Chris Moritz.
Interior designer: Jay Bouton.
Structural engineers: Kelchum, Konkai, Barrett, Nickel, Austin/Donovan Nickel.
Mechanical engineers: McFall & Konkai.
Builders: Dorn Brothers Construction.
Model: Herbert Jensen.
Photographer: Michael Barber.
Rendering: Michael Barber/Jay Bouton.
Client: KKBNA (Kelchum, Konkai, Barrett, Nickel, Austin).





Architect: George Hoover for Muchow Associates with Adams & Associates

Rainbo Bakery

Commerce City
7300 Brighton Road



Architect: Thomas E. Moore with A.H. Bush associate

1956

St. Mary's High School Gym

(AKA Sacred Heart of Jesus Catholic School)

Boulder

1317 Mapleton Avenue



Architect: probably Thomas E. Moore

1958

Stanley Aviation

Aurora
2501 Dallas Street



Architect: unknown

1954

Field House

Laramie, Wyoming
University of Wyoming



Architect: Porter & Bradley, Goodrich & Wilking

1951

Valley Country Club

Aurora
14601 Country Club Drive



Architect: unknown

ca. 1960

Women's Club

Denver
940 Lincoln Street



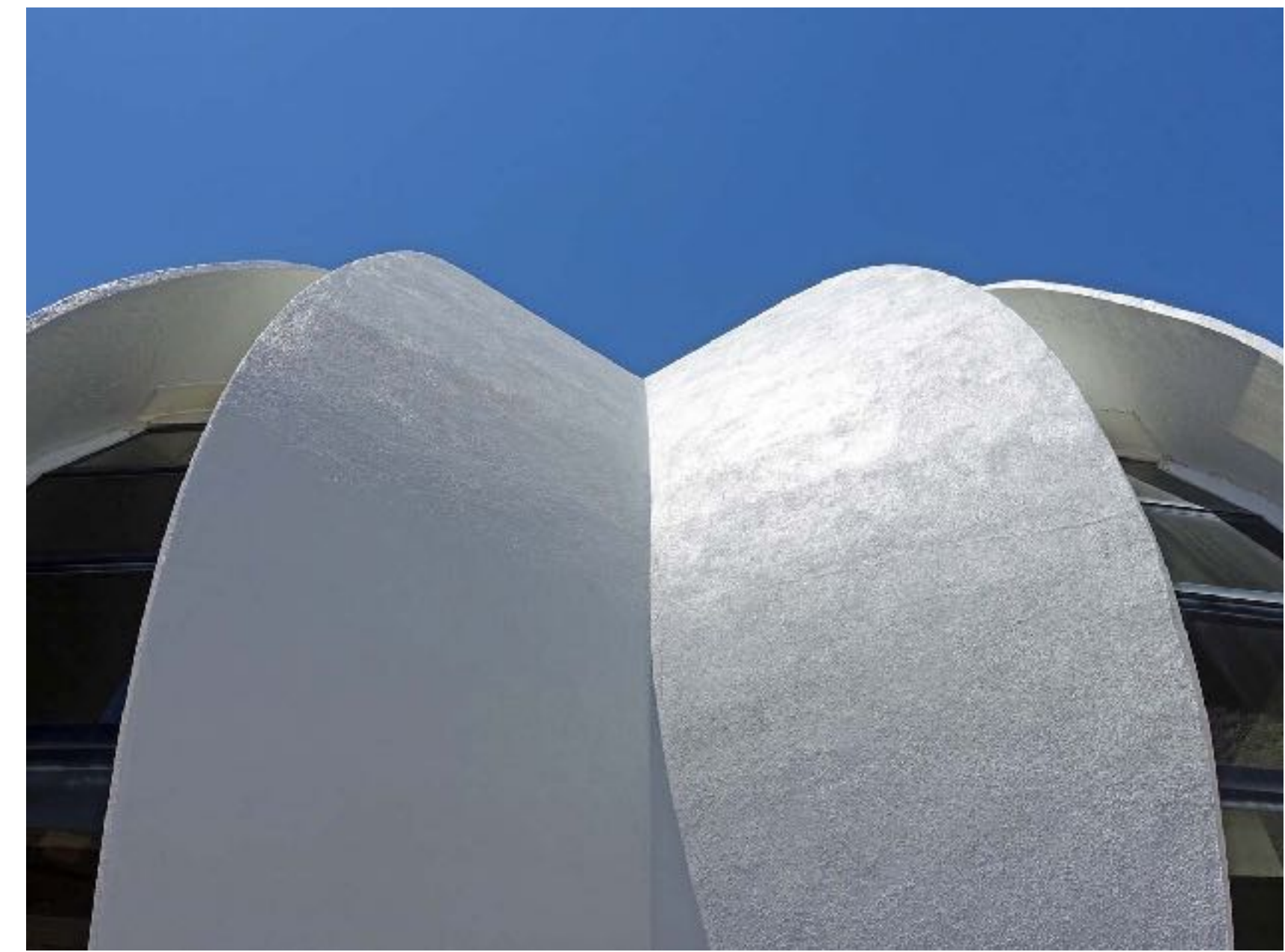
Architect: William C. Muchow

1961



Wyoming National Bank

Casper, Wyoming
234 E 1st Street



Architect: Charles Deaton

1964



Honorable Mention (I ran out of photos and time)

Antlers Plaza Hotel, Carlisle Guy, Colorado Springs, 1967
Bowl-Mor Bowling Alley, Toll and Milan, Colorado Springs, ca. 1958 (lost)
Chase Hotel Auditorium, Hugues Brussel, St. Louis, ca. 1957
Community College of Denver, John D. Anderson and Associates, Denver, 1975
Colgate College, Dana Arts Center, Paul Rudolph, Hamilton, New York, 1966
Currigan Exhibition Hall, James Ream for William Muchow Associates, Denver, 1969 (lost)
Denver 16th Street Mall, I.M. Pei, Denver, 1981
First Presbyterian Church, James Ream and Associates, Berkeley, California, 1974
Green Shield Life Building, Hobart D. Wagener, Boulder, 1959
Hennepin County Civic Center, John Carl Warnecke and Assoc. with Peterson, Clark and Assoc., Minneapolis, 1974
Holly Sugar Building, Carlisle B. Guy with Edwin A. Francis and associate Lloyd J. Lovegren, Colorado Springs, 1967
Kansas City TWA Hangar, Biggs & Drummond with Dutton Briggs of Aero Shell, Kansas City, Missouri, ca. 1972
Lincoln Park Football/Baseball Stadium, Thomas E. Moore for Smith, Hegner & Moore, Grand Junction, 1949
Madison Civic Center, Malcom Holzman for Hardy Holzman Pfeiffer Associates, Madison, Wisconsin, 1977
McNichols Arena, Charles Sink and Associates, Denver, 1975 (lost)
Morris A. Mechanic Theater, John M. Johansen, Baltimore, 1967 (lost)
William C. Muchow House, William C. Muchow, Denver, 1954
Orlando Public Library, John M. Johansen, Orlando, 1966
St. Louis Planetarium, Gyo Obata of Hellmuth, Obata & Kassabaum, St. Louis, 1963
University of Colorado Kittredge Complex, Architectural Associates-Colorado with Pietro Belluschi, Boulder, 1964
Washington University, Mark C. Steinberg Hall, Fumihiko Maki, St. Louis, 1960

And Many More!

Milo Ketchum's Legacy Lives On



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and quality



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Some of the architects who used the Ketchum firm

Wheeler and Lewis

Carlisle B. Guy

Herbert Bayer

George S. Hoover

William C. Muchow

Hobart D. Wagener

Toll and Milan

Edwin A. Francis

Cabel Childress

Thomas E. Moore

Fisher, Fisher and Davis

Baume and Polovnick

Jerome K. Nagel

Rodney S. Davis

Charles S. Sink

Charles Deaton

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Hardy Holzman Pfeiffer Associates

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James T. Ream

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I.M. Pei
James T. Ream
John Carl Warnecke
John M. Johansen
Gyo Obata
Pietro Belluschi

**Speaking of architects...
Milo Ketchum was a
member of the 1959
Progressive Architecture
Awards Jury with:**

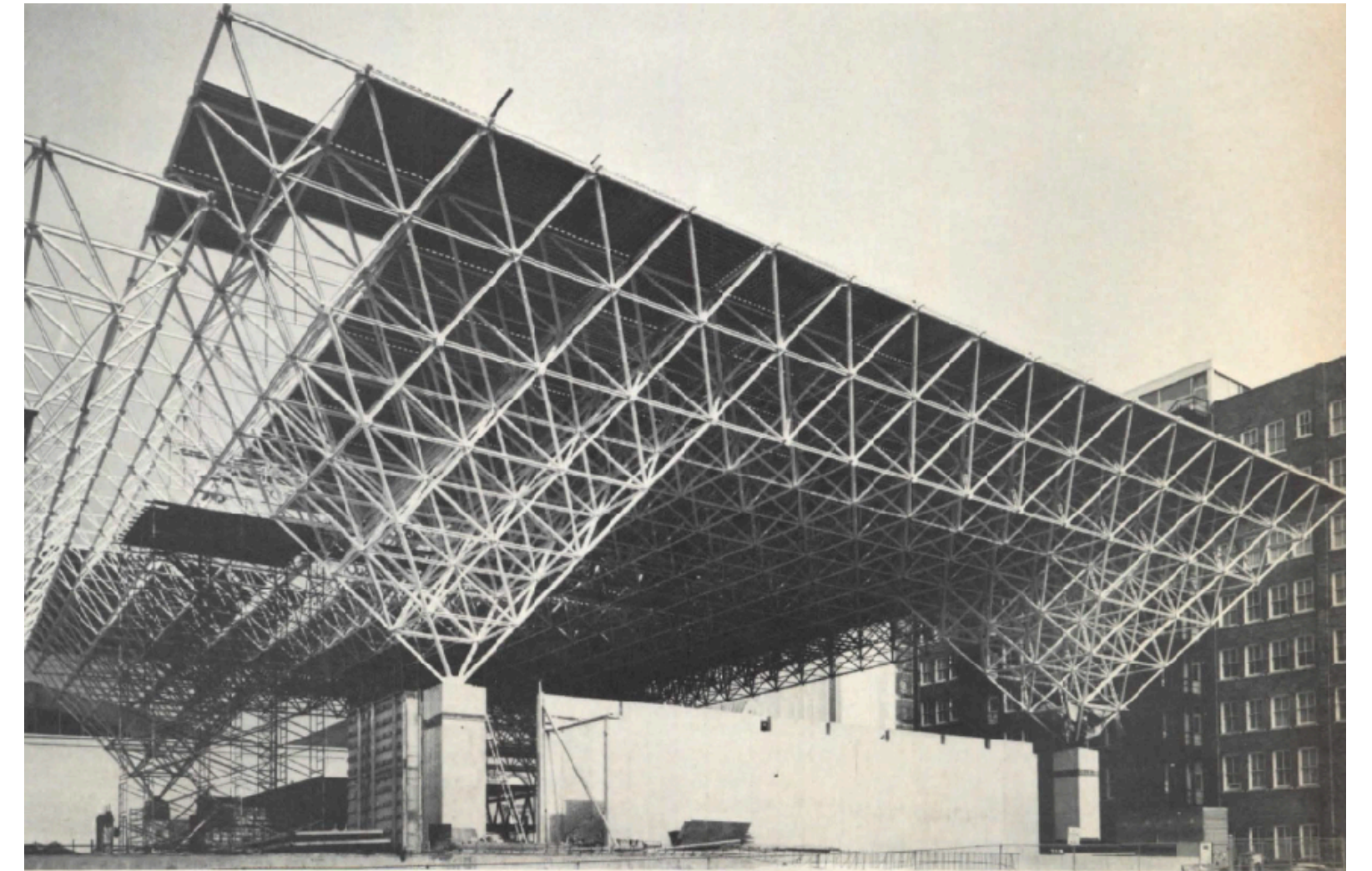
**Hugh A. Stubbins
Minoru Yamasaki
Ladislav L. Rado
Philip Will**

Seen in the movie *Sleeper*

Frank R. Ross House



Mile-Hi Church of Religious Studies



Currigan Exhibition Hall

Photo from *Progressive Architecture*,
October 1969

Sources for *Sleeper* locations

TheDenverEye. "The Modern Architecture of Sleeper." Accessed January 24, 2022. <http://www.thedenvereye.com/the-modern-architecture-of-sleeper/>

Young, Ricky. "SLEEPER HITS Buildings gave Allen's movie its futuristic flavor." *Denver Post*, September 13, 1998.

Questions?
Comments?
Additions?
Corrections?

References for More Information

Milo Ketchum Archive

<http://www.ketchum.org/milo/index.html>

The home page of Milo Ketchum, Retired Structural Engineer and College Professor

<http://www.ketchum.org/-milo/index.html>

Builders of Colorado Biographical Sketch

https://www.historycolorado.org/sites/default/files/media/document/2017/Builders_Milo_KetKetc.pdf

ASCE Library, Leadership and Management in Engineering, Engineering Legends, Milo Smith Ketchum Jr.

<https://ascelibrary.org/doi/10.1061/%28ASCE%291532-6748%282006%296%3A4%28166%29>

Martin/Martin Consulting Engineers

<https://www.martinmartin.com/>

GNCB Consulting Engineers, P.C.

<http://www.gncbengineers.com/>