DENVER
THE MILE HIGH CITY

DENVER LANDMARK PRESERVATION COMMISSION INDIVIDUAL STRUCTURE LANDMARK DESIGNATION APPLICATION

02.09.2021

This form is for use in nominating individual structures and districts in the City and County of Denver. If any item does not apply to the property being documented, enter "N/A" for "not applicable." Questions about the application or designation process can be directed to Denver Landmark Preservation staff at landmark@denvergov.org or (303) 865-2709.

Property Address: 401 North Madison Street, Denver, CO 80206

The following are required for the application to be considered complete:

- ☒ Property Information
- ☒ Applicant Information and Signatures
- ☒ Criteria for Significance
- ☒ Statement of Significance
- ☒ Period of Significance
- ☒ Property Description
- ☒ Statement of Integrity
- ☒ Historic Context
- ☒ Bibliography
- ☒ Photographs
- ☒ Boundary Map
- ☒ Application Fee

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1. Property Information

Name of Property

Historic Name: 401 N Madison Street

Other or Current Name: Crowther Home, Office and Laboratory for Architectural Ecology

Location

Address: 401 North Madison Street, Denver. CO 80206

Legal Description: L 10 BLK 22 HARMONS SUB

Number of resources:

# Contributing	# Non-Contributing	
1		Primary Structures
		Accessory Structures
		Features

Contributing and Noncontributing Features or Resources
Describe below how contributing and non-contributing features were determined.

The entire structure is contributing and is eligible for designation for preservation because of its significance. It has maintained its integrity, is more than 30 years old, is of exceptional importance and is qualified for Landmark designation under four of the 10 criteria;

C It embodies the distinctive visible characteristics of an architectural style or type

D It is a significant example of the work of a recognized architect or master builder

E It contains elements of design, engineering, materials, craftsmanship, or artistic merit which represent a significant innovation or technical achievement

J It is associated with social movements, institutions, or patterns of growth or change that contributed significantly to the culture of the neighborhood, community, city state or nation.

General Property Data

Date of construction: 1979

Architect (if known): Richard L. Crowther, FAIA

Builder (if known): Richard L. Crowther, FAIA

Original Use: Residential

Current Use: Residential (vacant)

Source(s) of information for above: Denver Assessor's Office; Sanborn Insurance Maps from

1929 (corrected to 1951), Denver City Directories; Federal Census Records 1940, 1950. Denver Post; Ancestry Records, Denver Public Library,

Previous documentation

List previous historic survey and/or if property is listed or eligible for listing in the State or National Register of Historic Places.

N.A.

2. Owner/Applicant Information

An application for designation may be submitted by:

- ☐ Owner(s) of the property or properties, or
- ☐ Member(s) of city council, or
- ☐ Manager of Community Planning and Development, or
- ☒ Three residents of Denver, if they are not owners of the property or properties

Owner Information

Name: ____

Address: ____

Phone: ____

Email: ____

Primary Applicant (if not owner)

Name: Thomas A. Hart, AIA

Address: 4530 East Cedar Avenue, Denver, CO 80246

Phone: w) 303-388-9498 m) 303-503-1364

Email: tomh@hartstudio.net

Prepared by

Name: Thomas A. Hart AIA

Address: 4530 East Cedar Avenue, Denver, CO 80246

Phone: w) 303-388-9498 m) 303-503-1364

Email: tomh@hartstudio.net

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Owner Applicant:

I / We, the undersigned, acting as owner(s) of the property described in this application for landmark designation do, hereby, give my consent to the designation of this structure as a structure for preservation.

I understand that this designation transfers with the title of the property should the property be sold, or if legal or beneficial title is otherwise transferred.

Owner(s):_________________________________ Date:
(Please print)

Owner(s) Signature:_______________

For individual designations, if the owner does not support the designation, the applicants must conduct outreach to the owner. Describe below the efforts to contact the owner to discuss designation and other possible preservation alternatives. Please provide dates and details of any communications or meetings with the property owner, or the property owner's representatives.

23 Aug 2022 - The Letter of Intent was written, signed and filed. The LOI was acknowledged on the same day by Becca Dierschow, Senior City Planner – Landmark Preservation.

23 & 24 Aug 2022 – Applicants are contacted by Steve Charbonneau, Mediator for the City.

29 Aug 2022 – Primary applicant (Thomas Hart) discusses process and timeline with Becca Dierschow. Applicant is informed that there is another applicant group (secondary applicants)

1 Sept. 2022 – First mediation held via Zoom with primary applicants, Dierschow, Michael Flowers of Historic Denver, mediator & owners. Owners describe their plan, which is to demolish the building and build two duplexes. This is their business model, and they are not interested in taking on any preservation efforts. They said they may be interested in selling the building. Applicants describe the significance of the building and its architect. Applicants are not anti-development and understand the owner's business goals. Agreement to meet in a week.

1 Sept thru 8 Sept – Applicants brainstorm with Historic Denver, research zoning and development possibilities. Applicants contact secondary applicants with the goal of combining efforts.

8 Sept 2022 – Primary and secondary applicants, owners, Dierschow, Flowers and mediator visit the building. The building has been vacant for some time. It has been broken into and vandalized; windows are broken, wiring has been stripped, finishes have been destroyed, walls have been graffitied, and homeless have encamped. The roof has leaked. Weeds have been allowed to grow. Owners reiterate their desire to demolish the building. Applicants share that through their outreach, feedback has been that the owners paid too much – buy in by other developers would not make financial sense. Applicants express that they will continue their outreach.

29 Sept 2022 – Third mediation held via Zoom with primary and secondary applicants, Dierschow, mediator & owners. Owners can't make the project work as a renovation. With the time and

acquisition costs constraints, applicants haven't been able to locate a buyer willing to purchase the property. Applicants will continue their outreach. In the meanwhile, applicants will submit the application for Landmarks designation. Dierschow outlined the next steps of the process and dates of meetings with various City agencies and City Council.

Other Applicant(s):

[Note: signed application provided separately in hard copy with original signatures]

Applicant Name: Michael Hughes Date: 29 September 2022
(Please print)

Applicant Signature:
Applicant Address: 40 South Bellaire Street, Denver, CO 80246

Applicant Name: Alan G. Gass, FAIA Date: 29 September 2022
(Please print)

Applicant Signature:
Applicant Address: 602 South Harrison Lane, Denver, CO 80209

Applicant Name: Thomas Hart AIA Date: 29 September 2022
(Please print)

Applicant Signature:
Applicant Address: 4530 East Cedar Avenue, Denver, CO 80246

3. Significance

Criteria for Significance

To qualify as a Landmark, a property must meet at least three significance criteria. Check the applicable criteria from the following list.

☐ A. It has a direct association with a significant historic event or with the historical development of the city, state, or nation;

☐ B. It has direct and substantial association with a recognized person or group of persons who had influence on society;

☒ C. It embodies the distinctive visible characteristics of an architectural style or type;

☒ D. It is a significant example of the work of a recognized architect or master builder;

☒ E. It contains elements of design, engineering, materials, craftsmanship, or artistic merit which represent a significant innovation or technical achievement;

☐ F. It represents an established and familiar feature of the neighborhood, community or contemporary city, due to its prominent location or physical characteristics;

☐ G. It promotes understanding and appreciation of the urban environment by means of distinctive physical characteristics or rarity;

☐ H. It represents an era of culture or heritage that allows an understanding of how the site was used by past generations;

☐ I. It is a physical attribute of a neighborhood, community, or the city that is a source of pride or cultural understanding;

☒ J. It is associated with social movements, institutions, or patterns of growth or change that contributed significantly to the culture of the neighborhood, community, city, state, or nation.

Statement of Significance

Provide a summary paragraph for each applicable criterion.

See Attachment: "Supporting Text – 3 Significance 4 Property Description 6 Historic Context 7 Additional Information"

Criterion C:

The structure at 401 Madison Street is significant under Criterion C, as it embodies the Late Modern architectural style. According to the book published by Historic Denver, "The Mid-century Modern House in Denver," (P. 89) written by architectural critics Michael Paglia and Diane Wray Tomasso, "Late Modern architecture was reductive and functionalist."

The residence is featured prominently in the book as an example of Late Modernism architecture. Additionally, the house has been featured by many architectural publications, architectural critics, and other commentators as the preeminent expression of Crowther's design philosophy.

See attachments: "Criterion C"

Criterion D:

The residence at 401 N Madison St is eligible under Criterion D as a significant example of architect Richard Crowther's Modernist residential design work. Crowther, who came to Denver in 1948, was an artist and an architectural pioneer in commercial modern green holistic passive solar design. From his early career, Crowther anticipated the energy issues generated by man-made climate change in his designs. The 401 Madison research residence is listed among Crowther's most important designs and embodies his guiding fossil fuel-free design philosophy. Although not his first passive solar design, it was completed at the height of his architectural career and served as his home and laboratory for many years. Crowther's dedication to sustainability in architecture and green design was well-known. He was a nationally renowned speaker on the subject, speaking at universities, museums, and institutes across the country.

See attachments: "Criterion D"

Criterion E:

The structure at 401 N Madison St is significant under Criterion E as it contains elements of design, engineering, materials, which represent a significant innovation in solar, and energy-conserving architecture -- what we now call passive house design.

Crowther spoke of his design and conservation philosophy as such:

"The traditional concept of architecture has been a 'shelter' – a shelter from climate, a shelter from predators and hostile persons, a shelter for valuables and a shelter for personal privacy. While these time-honored considerations remain of consummate value*, holistic architecture optimally would also use energies of the sun, earth, air, water, people, and architecture itself."*

As a whole, the design, engineering, and materials of 401 Madison St. were an innovative approach to "Green" architecture, long before the philosophy became popular in the architecture field.

See Attachments: "Criterion E"

Criterion J:

The structure is significant under Criterion J as an important example of a building constructed with the ethos of the environmental sustainability movement and sensitivity to the potentially disastrous effects of climate change, that continues to represent a danger to life on Earth. In the late 1960s, energy conservation and environmentalism "became a mass social movement ... drawing on a culture of political activism inspired in part by the civil rights and antiwar movements, thousands of citizens, particularly young middle-class white men and women, became involved with environmental politics." A series of well-publicized environmental disasters further legitimized the environmental movement, leading to the creation of the Environmental Protection Agency in 1970.

Crowther saw himself and the architecture field as an important part of this field. He authored numerous books on the subject of architectural environmentalism and gave many lectures across the country on solar design. He also sought to live a healthy lifestyle, which was integrated into his residential design, as evidenced by the solar-heated swimming pool and greenhouses featured prominently in the design of the structure.

See Attachments: "Criterion J"

Period of Significance

Period of Significance: 1979 - Late Modern Architecture Style

Provide justification for the period of significance.

According to the Historic Denver book, "The Mid-century Modern House in Denver," written by architectural critics Michael Paglia and Diane Wray Tomasso, "Late Modern architecture was reductive and functionalist."

Defining characteristics of Late Modernism include:

Horizontally oriented
Hooded or deep-set windows
Large areas without windows
Use of industrial materials such as structural steel and concrete as both structural and finish materials.
Dramatic and bold sculptural conception of building's volume. No ornament.
Walls eave-less or with boxed or cantilevered eaves. Decorative use of functional features.
Flat and shed roofs.

The residence at 401 Madison St embodies many of these characteristics. The house is horizontally oriented, except for large, angled windows to capture the sun's radiation, and the roof is predominately flat. The building has little ornament, but deeply hooded openings, which lend a sculptural quality to the building. It is constructed of concrete. Functional features, such as the solar and water collectors, clerestory windows, passive ventilation and the greenhouses are expressed architecturally in an almost decorative way.

4. Property Description

Describe the current physical appearance of the property, providing a statement for each of the following:

a. **Summary Paragraph** - Briefly describe the general characteristics of the property, such as its location, type, style, materials, setting, size, and significant features.

b. **Architectural Description** – Describe the architectural features of the structure(s) (i.e., building) in a logical sequence, from the ground up or façade by façade. Identify the key visual aspects or character-defining features of the structure.

c. **Major Alterations** - Describe changes or alterations to the exterior of the structure and dates of major alterations, if known:
There are no changes or alterations to the exterior of the historic building from the original design.

See Attachment "Supporting Text – 3 Significance 4 Property Description 6 Historic Context 7 Additional Information"

5. Integrity

Describe the structure's integrity, using the seven qualities that define integrity: location, setting, design, materials, workmanship, feeling and association.

The exterior of the house retains a remarkably high degree of integrity because of its substantial basic structure of reinforced concrete exterior walls and interior floor, notwithstanding recent cosmetic vandalism. The original features and architectural elements are intact, retaining the integrity of design, workmanship, and materials. The energy conserving features of the design are intact and can be reactivated. The shell of the building is a well-insulated concrete heat sink. As the property is still in its original location, situated in a residential neighborhood, on a corner lot, fronting Madison Street and 4th Avenue in the Cherry Creek North neighborhood, the property also maintains integrity of location, setting, feeling, and association.

6. Historic Context

Describe the history of the structure, including events, activities and associations that relate the structure to its historic, architectural, geographic, or cultural significance. Examine how patterns, themes, or trends in history affected the property and how it relates to the surrounding community, neighborhood, city, and/or nation.

See Attachment: "Supporting Text – 3 Significance 4 Property Description 6 Historic Context 7 Additional Information"

7. Additional Information

Bibliography

Provide a list of sources used in compiling this application.

Photographs

Attach at least four digital photographs showing the views of the property from the public right of way and any important features or details. If available, include historic photographs of the structure.

Historic black and white images of the property are shown in some of the attached publications, as well.

Boundary Map

Attach a map that graphically depicts the structure, the location of other significant features, and the boundaries of the designation.

See Attachments: "Supporting Text – 3 Significance 4 Property Description 6 Historic Context 7 Additional Information", "Crowther 401 Photographs", "Vicinity Map", and "Boundary Map"

Application Fee

Find the correct fee from the below table. (Make check payable to Denver Manager of Finance).

Application for designation of a structure for preservation (owner applicant)	$250
Application for designation of a structure for preservation (non-owner applicant)	$875

Supporting Text

3. Significance

<u>Statements of Significance</u>

Criteria C: It embodies the distinctive visible characteristics of an <u>architectural style or type</u>;

The structure at 401 Madison Street is significant under Criterion C, as it embodies the Late Modern architectural style. What is that? Here are a few opinions:

"What qualifies as "Late Modernism?" A few of the architectural features contributing toward that classification include a horizontally oriented building plan, ribbon windows, flat or shed roof, use of industrial materials like concrete, and very little exterior ornamentation." swca.edu

"HighTech Architecture also known as Late Modernism or Structural Expressionism, is an architectural style that emerged in the 1970s, incorporating elements of high industry and technology into building design." deanza.edu

Wikipedia says the following: "Late Modernist architecture is generally understood to include buildings designed (1968–1980) with exceptions. Modernist architecture includes the buildings designed between 1945 and the 1960s. The Late Modernist style is characterized by bold shapes and sharp corners, slightly more defined than Brutalist architecture."

In an article in "Curbed" titled: "Postmodern and Late Modern Architecture – The Ultimate Guide" by Patrick Sisson, "This awkward middle age—too young to landmark, not yet old enough to have a cherished re-appraisal—also applies to buildings loosely terms Late Modernist. Generally designed between 1968 and 1980 (although there are plenty of exceptions), these buildings, which emerged after Modernist architecture dominated between the end of WWII and the late '60s, can be harder to pin down stylistically. Curbed critic Alexandra Lange finds that they often "exhibit beefy bold shapes, wrapped in singular materials, sticking their sharp corners in our faces." They are "more refined than Brutalism, less picturesque than postmodernism," and now approaching architectural middle age."

According to the book, “The Mid-century Modern House in Denver,” written by architectural critics Michael Paglia and Diane Wray Tomasso, “Late Modern architecture was reductive and functionalist.”

Defining characteristics of Late Modernism include:

• • • • • • • • •

Horizontally oriented
Hooded or deep-set windows
Large areas without windows
Use of industrial materials like concrete
Dramatic sculptural conception of building’s volume No ornament
Walls eave less or with boxed or cantilevered eaves Decorative use of functional features
Flat and shed roofs

401 Madison St. Kathleen Roach, "Crowther House". Historic Denver

The residence at 401 Madison St embodies many of these characteristics. In a 1981 interview with Denver Post architectural critic, Max Price, Crowther noted “When I design for people, I try to lead them to the fact that function is key to design...” Price noted that the house’s form was directly impacted by Crowther’s dedication to capturing solar energy – thus, the function was key to its design. As such, the house was horizontally oriented, except for large, angled windows to capture sun light. The building has little ornament, but deeply hooded openings, which lend a sculptural quality to the building. The use of tinted concrete as the building material increases the solar gain of the structure, where desired. In other areas, lighter concrete or metal materials redirected unwanted solar heat.

The residence is featured prominently in the book “The Mid-century Modern House in Denver” as an example of Late Modernism architecture. Additionally, the house has been featured by many architectural publications, architectural critics, and other commentators as the preeminent expression of Crowther’s design philosophy.

See Attachment:

- “Criterions C, D & J – Crowther CV from FAIA files” & “7 Additional Information: Bibliography” below.

Criteria D: It is a significant example of the work of <u>a recognized architect or master builder</u>;

“Crowther, who came to Denver in 1948, was an artist and an architectural pioneer in commercial modern holistic solar design. He worked in residential, commercial, and civic contexts, and is especially noted for the design of the Cooper Cinerama movie theaters, which were located in Denver (on Colorado Blvd) and across the United States. He also designed buildings for Joslins, Fashion Bar, White Spot, King Soopers, and many other important Colorado businesses, and is noted to have first worked in Denver designing ride entrances and ticket booths for Lakeside Amusement Park.

His pioneering work in residential solar technology led to lectures at the Smithsonian Institution, solar conferences, and universities across the U.S. Crowther's architecture publications are still used to instruct students. His "Sun-Earth" text has a reputation for setting a benchmark in holistic architecture design, with arguments outlining economic and environmental benefits. He practiced what he preached, both by living and working in holistically designed spaces, and by a diet replete with organic and natural foods.

401 Madison is listed among Crowther’s most important designs and embodies his guiding design philosophy. Although not his first passive solar design, it was completed at the height of his architectural career and served as his home and laboratory for many years. Crowther’s dedication to sustainability in architecture and design was well-known. He was a nationally renowned speaker on the subject, speaking at universities, museums, and institutes across the country.”

The Denver Architectural Foundation’s “Guide to Denver Architecture – Second Edition,” by Mary Voelz Chandler says this, “Decades before the term “sustainable architecture” became popular, Denver architect Richard Crowther was a proponent of putting Colorado’s abundant sunlight to work in the service of Modernist design.”

A “Colorado Cultural Resource Survey” report from 1998 says the following: “One of Crowther’s greatest masterpieces is the 1978-1979 home and studio he designed for himself and his wife at 401 Madison Street on the northwest corner of 4th Avenue and Madison Street. (In a 1994 film that he made on his home and studio, entitled Ecologic and Solar Research Residence, Crowther said, “... responsible architecture requires an ecologic harmony. Every decision we make has an environmental consequence.”) The house was Crowther’s laboratory for working out his environmental theories. The elaborate forms of the place include a lively constructivist rhythm of rectilinear blocks set off by a wedge-shaped roofline with an integral canopy shielding a row of solar panels. Separated by flat roofs is another wedge and a long barrel vault. The severe looking painted concrete structure is definitely one of the most advanced residences from the period in Colorado, comparable to Charles Deaton’s Sculptured House in Genesee.”

Wikipedia’s page on Richard Crowther says the following: “**Richard Layton Crowther**, FAIA, (December 16, 1910 – December 25, 2006) was an architect and author who achieved international renown for his progressive holistic compositions, particularly his pioneering designs employing passive solar energy.

His pioneering work in residential solar technology led to lectures at the Smithsonian Institution, solar conferences and universities across the U.S. Crowther's architecture publications are still used to instruct students. His "Sun-Earth" text has a reputation for setting a benchmark in holistic architecture design, with arguments outlining economic and environmental benefits. He practiced what he preached, both by living and working in holistically designed spaces, and by a diet replete with organic and natural foods.

Crowther was a Fellow of the American Institute of Architects. Crowther's late modern style home at 401 North Madison Street in Denver, which he designed and had built in 1979, is, in 2022, being considered for historic preservation.”

See Attachments:

- “Criterions C, D & J – Crowther CV from FAIA files”,
- “Criterions D & J - Westword Michael Paglia – Crowther Home 17 Aug 2022”,

Criteria E. It contains elements of design, engineering, materials, craftsmanship, or artistic merit which represent a <u>significant innovation or technical achievement</u>;

“The structure at 401 N Madison St is significant under Criterion E as it contains elements of design, engineering, materials, which represent a significant innovation in solar, and energy-conserving architecture -- what we now call passive house design.

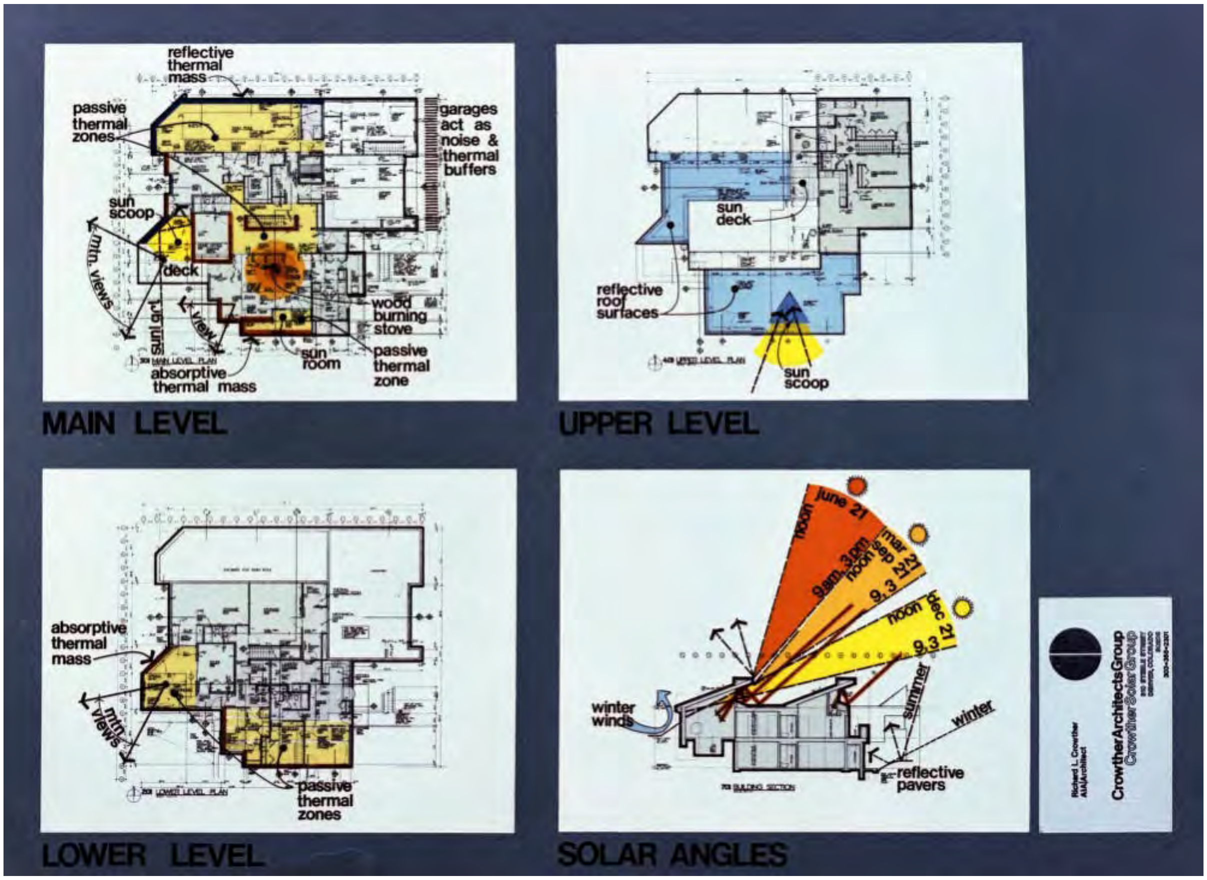

Figure 4 Example of Crowther's passive solar design at 401 Madison St. WH1504-2016-76

According to the EPA's website on Green Building: "Green building is the practice of creating structures and using processes that are environmentally responsible and resource-efficient throughout a building's life cycle from siting to design, construction, operation, maintenance, renovation, and deconstruction. This practice expands and complements the classical building design concerns of economy, utility, durability, and comfort. Green building is also known as a sustainable or high-performance building.

Green buildings are designed to reduce the overall impact of the built environment on human health and the natural environment by:

- Efficiently using energy, water, and other resources
- Protecting occupant health and improving employee productivity
- Reducing waste, pollution, and environmental degradation

For example, green buildings may incorporate sustainable materials in their construction (e.g., reused, recycled content, or made from renewable resources); create healthy indoor environments with minimal pollutants (e.g., reduced product emissions); and/or feature landscaping that reduces water usage (e.g., by using native plants that survive without extra watering).

Crowther spoke of his design and conservation philosophy as such:

"The traditional concept of architecture has been a 'shelter' – a shelter from climate, a shelter from predators and hostile persons, a shelter for valuables and a shelter for personal privacy. While these time-honored considerations remain of consummate value*, holistic architecture optimally would also use energies of the sun, earth, air, water, people, and architecture itself."*

As the 1981 Denver Post article about the house detailed;

"The Madison Street structure includes a residence for Crowther and his wife, a library, home office, a caretaker's apartment, solar test facilities, greenhouses, and indoor/outdoor recreational spaces, including a swimming pool.

Basic construction is of precast, prestressed concrete sections for thermal mass. The exposed external walls have polystyrene insulation applied over the building envelope and finished with a textured synthetic coating called 'Settef'. Light and dark tints were used selectively to both moderate and heighten heat gain in various parts of the structure.

Reflective, aluminized material – applied over polystyrene and wood fiberboard – was used on the roof. Below grade, the concrete walls were insulated with polystyrene board and made moisture proof.

Through the design/construction process, Crowther kept his goal in mind: "That the building, together with the topographic landscaping, internal occupant activities and interior furnishing, form a dynamic, interactive holistic energy system."

As a whole, the design, engineering, and materials of 401 Madison St were an innovative approach to "Green" architecture, long before the philosophy became popular in the architecture field.

See Attachments:

- "Criterion E – Crowther's house description from FAIA document",
- "Criterion E – Excerpts from Crowther's book Ecologic Architecture

Criteria J. It is associated with social movements, institutions, or patterns of growth or change that contributed significantly to the culture of the neighborhood, community, city, state, or nation.

"The structure is significant under Criterion J as an important example of a building constructed with the ethos of the environmental sustainability movement, which reached its peak in America in the 1960s and 1970s. In the late 1960s, environmentalism "became a mass social movement ... drawing on a culture of political activism inspired in part by the civil rights and antiwar movements, thousands of citizens, particularly young middle-class white men and women, became involved with environmental politics." A series of well-publicized and occasionally sensationalized environmental disasters further legitimized the environmental movement, leading to the creation of the Environmental Protection Agency in 1970.

According to the EPA's website on Green Building: "The contemporary green building movement arose out of the need and desire for more energy efficient and environmentally friendly building practices. The oil price increases of the 1970s spurred significant research and activity to improve energy efficiency and find renewable energy sources. This, combined with the environmental movement of the 1960s and 1970s, led to the earliest experiments with contemporary green building.
The green building field began to come together more formally in the 1990s."

Crowther saw himself and the architecture field as an important part of this field. He authored numerous books about architectural environmentalism and gave many lectures across the country on solar design. He also sought to live a healthy lifestyle, which was integrated into his residential design, as evidenced by the solar-heated swimming pool and greenhouses featured prominently in the design of the structure."

Michael Paglia, writing in the Westword newspaper in August 2022 wrote, "In the last twenty years, the "Built Green" movement has gone mainstream, with big developers such as Forest City at Stapleton promoting the environmentally friendly features being incorporated into their buildings. But a generation or two ago, only kooks or visionaries thought about such an issue.

Here in Denver, we had a pioneer of architectural ecology: Richard Crowther. As an architect, Crowther made the relationship of the structure to the environment a key part of his commercial and residential designs, and he became internationally famous for his theoretical writings on the subject. But unlike the works of so many others who have embraced the Built Green mantra, Crowther's are not ugly neo-traditional buildings; rather, they are shamelessly modern and breathtakingly beautiful. They show off groundbreaking technologies contained within vanguard formal expressions, and the best of them are as sophisticated as anything anywhere in the world."

Crowther described 401 Madison in his book Ecologic Architecture in this way:

"Ecologic Residential Research Facility
This 7000 square foot project included reference and test facilities for research, a home office, principal living quarters, two apartments with separate entries, and an indoor swimming pool area. Completed in 1980, it has served for weather, internal space temperature, and daylighting monitoring. In practical evaluation all systems (solar heating, inductive cooling, air tempering, day-lighting, outgassing, and drying of items and materials, earth and thermal mass air cooling and temperature stabilization, concordant humidification) function well and most notably better than originally calculated and predicted. The swimming pool as a central heat sink is 100% solar heated. All of these systems provide a research base. Within different space environs, various materials and products are tested under different conditions analogous to those of most commercial and residential architecture. Landscaping, architecture, interiors, and the interresponse to sun, earth, air, and water energies of the site interfaced in design with biophysical, psychoneural, and behavioral consequences. The holistic ecologic approach included a particular concern with the bio-effects of toxins, particulates, pathogenic microorganisms, bioelectromagnetism, and geologic electromagnetic fields."

In Ecologic Architecture (pp.11-14), Crowther explains the global environmental concerns that drove him to design and build the ecological residential research facility at 401 Madison. In 1992, 30 years before today's widely accepted concerns about climate change and carbon emissions, Crowther offered these observations about our ability to inhabit the planet:

Habitability

Global habitability is at risk from architecture, vehicles, technology, lifestyles, and the development and networks that serve them. The burden of this technologic erosion of Nature, petro-energy denigration of our global atmosphere and living systems, unbridled chemistry, and electromagnetic and radioactive ecologic assaults is a con-tinuum for catastrophe. No one likes to hear the "bad news," but we are all part of it. If our human destiny is worth a "plugged nickel," we are not giving destiny its value.

Sun, climate, and ecology follow Nature's functions. The *form of life* follows Nature's regenerative, sustaining, and vitalizing powers. Architecture has traditionally fol-lowed the form of shelter, protection, culture, space need, desire, and to beguile the ego and "manipulate" people.

"Form follows function" was the tenet of contemporary architecture. At present architectural form follows nostalgia, technology, lifestyles, hyper expectations, mar-keting, convenience, sinful comfort, and personal aggrandizement. The cost in ecologic terms is not presently weighed. For the most part in choice, purchase, and possession environmental cost is not part of the equation, and further is seldom part of the operational, maintenance, and other life- cycle costs occurring from what is acquired.

All of us are manipulated by the form of architecture, vehicles, and machines. How they are designed and how we perceive our role and position in society program us within illusions of self-will. We believe we determine choice and our fate. But in reality, with our techno-culture, conditioned societal responses, and exercised options, we are more pawns than masters of decision and of our destiny.

We live in the "land of the free." To be certain, the oppressions we suffer are not blatantly visible. But corporate power that brings us the goods, visions of the "good life," and expectations in progress for the "best" of what resources can give us is apt to favor corporate rather than ecologic and human well-being. As we are an indivisible part of Nature's ecosystems, what does not sustain Nature's ecology cannot as a bottom line sustain us.

Architecture is a major element of human life. It is a major concern, a major pur-chase, and has a major effect upon our lives. We spend over 90 percent of our time indoors. In the main our present techno- logic archetype of architecture is a com-posite of materials, energy, and systems synergistically counter to human vitality and health. Airborne toxic gases, noxious par-ticulates, anti-biologic chemicals, electromagnetism, and radioactivity are dominant in our environs of home, workplace, marketing, and places of learning, entertainment, and relaxa-tion.

No one "drops dead" instantly from the multifarious and multi-level assault upon our sensitivities, the integrity of our immune system, and general biologic fortitude. But the attrition is there and most visible in persons who suffer symptoms and maladies from their environs. All of us are subject to probability of physiologic and psychoneural disturbance, discomfort, or dysfunction from our compound exposure to and risk from ever-present environmental sources.

"Form follows function." Our own evolu-tionary biologic form is not so adaptable and well-tuned to meet the multi-levelled concentrations of aberrant stressors that exist in our "developed" (?) society. Every sense that we possess is under duress. Our environs are loaded with noise and hyper sound and overloaded with visual impressions and stressors that intrude upon our composure. Television and other media, population densities, and our vying for space compromise biologic well-being.

As form follows function in Nature, so should architecture follow, or at least notably align with, the natural resource and energy systems of our planet. Whether we like it or not, we must become responsible stewards of our local and global environment. Our wayward course that has largely ignored Nature's regenerative and life-sustaining atmosphere and dynamic planetary balance of interdependent ecosystems in bringing us close to the brink of disaster.

Design is the primary key in our worldly realm of energy and matter. Nature has no sacred vow nor responsibility to preserve us above all other species, nor to preserve us at all. From primal origins Nature's ecologic and ecosystemic design has kept our species provided and sustained. Our pre-emption *over* Nature has cause to haunt the providence of our species.

Our dominion *over* Nature has not only brought us to the "brink," but also our contrived minds and misapplied ingenuity with unconstrained libidos threaten the world with ever-escalating numbers of people. People require homes, buildings, transport, and the goods and services essential to life. More and more of our global land mass is being devitalized and made less habitable by expanding population.

To save ourselves from ourselves may yet be possible. But our ingrained desires and expectations that translate into per capita decimation of global habitability are critical threats to the probability of ecologic vitality and our concomitant survival.

> The ecologic necessity translates to ecologic coherence In design of architecture, its products, and its systems. Global systems sustainability and ecologic renewal are principal to our planet's habitability. Con-cept, planning, design, and specification of architecture, interiors, and all elements of the site and urban Infrastructure are critical to ecologic and biologic viability and vitality.

See Attachments:

- "Criterions C, D & J – Crowther CV from FAIA files",
- "Criterion D & J - Westword Michael Paglia – Crowther Home 17 Aug 2022",
- "Criterion E & J – Excerpts from Crowther's book Ecologic Architecture

4. Property Description

Describe the current physical appearance of the property, providing a statement for each of the following:

a. Summary Paragraph - Briefly describe the general characteristics of the property, such as its location, type, style, materials, setting, size, and significant features.

The Crowther Home, Office, and Laboratory for Architectural Ecology, at 401 N Madison Street, is located at the north-west corner of Madison Street and 4th Avenue in the Cherry Creek North neighborhood. It is an outstanding example of Late Modern architecture. The lot is 100' by 125'. It was platted as one parcel. In plan, the rectilinear shape reflects the city street grid. It is two stories with the lower level set into the earth with southern facing windows and greenhouses for solar exposure. Basic construction is of precast, prestressed concrete sections for thermal mass. The exposed external walls have polystyrene insulation applied over the building envelope and finished with a textured synthetic coating. Below grade, the concrete walls were insulated with polystyrene board and made moisture proof. The elaborate forms of the structure include a lively constructivist rhythm of rectilinear blocks set off by a wedge-shaped roofline with an integral canopy shielding a row of solar panels. Separated by flat roofs is another wedge and a long barrel vault. Noteworthy features include nine passive solar subsystems and eleven cooling, ventilation and air tempering passive systems, all are expressed architecturally. A sunken south courtyard, an active solar-heated swimming pool, roof-mounted solar collectors and various heat storage and circulation systems round out the expressive features of this home

b. Architectural Description – Describe the architectural features of the structure(s) (i.e. building) in a logical sequence, from the ground up or façade by façade. Identify the key visual aspects or character-defining features of the structure.

When viewing the building for the first time, one is struck by its unrelenting bold horizontal forms punctuated by wedge-shaped and barrel-vaulted roof forms. Most walls are flat and unornamented on this "form is function" structure.

The building is two stories; however, the lower level is set into the ground, "earth coupled" is how Crowther described it. Earth also encloses the north wall, sections of the side walls, and covers a portion of the roof. An early "green" roof!

The upper level includes a two-car garage, a vaulted entry "gallery," the main bedroom suite, a spare bedroom, and the main living area including a living room, dining room and kitchen. There is also a home office and library at this level. The lower level includes a large solar-heated swimming pool, a recreation room, study, and sauna. A separate apartment consisting of a living/dining/kitchen area and a bedroom and bathroom are included. Two greenhouses are arrayed along the southern elevation. Unique features include "dry storage and cold storage" rooms for the storage of thermal heat and for cooling.

The Madison Street elevation includes an unadorned garage door that is recessed from the front plane of the building. Adjacent to the garage is a recessed, covered main entrance. These recesses create dramatic voids in the otherwise flat, solid walls. Synthetic stucco material encloses all forms. The flat roof is dramatically interrupted by a wedge-shaped vault over the entry gallery. This form is multi-functional: it contains solar collectors, clerestory windows and acts to facilitate ventilation. To the south of the entrance is another roof interruption, this time a curved, barrel-shaped form whose southern face continues as the sloped roof of a greenhouse. The barrel roof form serves as a "solar inductive chimney and venturi roof wind flow ventilator" to stimulate the expulsion of interior air.

The southern, 4th Avenue elevation is where the true solar work happened. However, much of this was hidden from view, either taking place at the lower level adjacent to a sunken courtyard, which in turn was hidden behind a berm topped with vegetation or recessed under roof overhangs. Two greenhouses anchor each end of the elevation, one integrated into the previously mentioned barrel roof form. Broad windows admit light and solar energy into the house. These are often sheltered by strategically placed overhanging roofs that admit direct sunlight during the winter months but provide shade during the summer months.

The western elevation, where not earth sheltered, is an elaborate symphony of flat walls, eccentrically shaped and strategically placed windows, and flat and curved roof forms. Of interest are forms that were designed to melt rooftop snow, collect, direct and store water, and provide for passive ventilation.

c. Major Alterations - Describe changes or alterations to the exterior of the structure and dates of major alterations, if known.

Other than recent vandalism and a lack of maintenance, the structure has not changed nor have there been any alterations to the exterior of the structure.

6. Historic Context

Describe the history of the structure, including events, activities and associations that relate the structure to its historic, architectural, geographic, or cultural significance. Examine how patterns, themes, or trends in history affected the property and how it relates to the surrounding community, neighborhood, city, and/or nation.

Harmon's Subdivision of Arapahoe County was platted in 1882. This was annexed into Denver in 1894 and eventually became known as the Cherry Creek neighborhood. A business community began to be established early in the neighborhood's history around 3rd and Detroit.

Modern Cherry Creek began in 1925, when Temple Buell, architect and developer, purchased the property between Cherry Creek and 1st Avenue west of Steele St. and first proposed developing it. Delays happened due to reoccurring floods and the subsequent construction of dikes to contain the creek. In 1950 construction began on the Cherry Creek shopping center. Several additions later the center was completed in 1955. In the early 1960's, Cherry Creek North began marketing itself as an area of specialty shops. Commercial rezonings, renovations and new construction moved further east along 2nd and 3rd Avenues and started filling in along north-south streets.

Richard Crowther built his first passive solar home in 1943 near Balboa Park, San Diego, CA. He moved to Colorado in 1948 and started designing energy efficient houses. His architecture office also designed Cooper theatres and numerous energy conserving office buildings.

Crowther was instrumental in the promotion and development of the Cherry Creek neighborhood. In addition to 401 North Madison Street, he designed the following structures:

- 2735 East 7th Avenue (1961, passive solar residence)
- 419A St. Paul Street (1973-1975, research solar houses, demolished)
- 419B St. Paul Street (1973-1974, retrofit solar house, demolished)
- 435 St. Paul Street (1973-1974, retrofit solar duplex, demolished)
- 3201e East 3rd Avenue (1975, solar office buildings, pending demolition)
- 500 Cook Street (1979, passive solar duplex)

The structure at 401 North Madison Street was built on vacant land in 1979. It was designed as the home of Richard Crowther, his wife Pearl, and their family. It also served as his office and solar research laboratory. He occupied the house until he passed away on December 25th, 2006.

His interest in energy efficiency was sparked during the World War II years of 1942-1945, during which time he remarked that "a considerable amount of research and invention was required to compensate for a lack of materials". His architectural practice was always based on research and invention.

The 1970s energy crisis occurred when the Western world faced substantial petroleum shortages as well as elevated prices. The two worst crises of this period were the 1973 oil crisis and the 1979 energy crisis, when wars in the Middle East triggered interruptions in oil exports from that region.

The crisis began to unfold as petroleum production in the United States and some other parts of the world peaked in the late 1960s and early 1970s. World oil production per capita began a long-term decline after 1979. The oil crises prompted the first shift towards energy-saving (particular, fossil fuel-saving) technologies.

Finally, Crowther's research and interests aligned with historic events! During the 1970's and early '80's Crowther was extremely busy. While maintaining an architecture practice, he was also involved in numerous environmental and educational activities. He found himself receiving grants, giving lectures, and speaking across the country, including at numerous universities and the Smithsonian Institution, serving as a consultant for political legislation, serving on too many boards to list, and involved in research, writing and publishing. In 1976 he wrote and published the Sun/Earth book, for which he received 1977 Progressive Architecture citations. This text has a reputation for setting the benchmark in holistic architecture design. His architecture publications and research are still used to instruct students. His home at 401 Madison Street was designed near the end of this period and represents the culmination of his lifelong research and stands as a testament to his enduring values.

Concurrent with, and following in the footsteps of Crowther and his pioneering work here in Colorado, the following context should be noted:

- July 22, 1970 – The first Earth Day is launched.
- 1977 – The Solar Energy Research Institute is established in Golden, CO. Under the Jimmy Carter administration, its activities went beyond research and development in solar energy as it tried to popularize knowledge about already existing technologies, like passive solar. It became National Renewable Energy Labs in 1991.
- 1982 – The Rocky Mountain Institute is founded by Amery Lovins in Snowmass, CO. "Aiming to radically improve America's energy practices. RMI's data led focus on efficiency, whole systems analysis, and levering business to drive change has since extended their influence globally, transforming businesses, revolutionizing energy systems, and improving national economies along the way.

  For many supporters and visitors, the Rocky Mountain Institute is synonymous with Amory's private residence in Old Snowmass, Colorado. Completed in 1984 and upgraded continually since then, the 4,000-square-foot facility remains a showcase of efficiency ideas. Over the years, this house has received more than one hundred thousand visitors."

- 2009 - The Renewable and Sustainable Energy Institute is founded as a collaboration with CU –Boulder.
- Since the '80's, concerns about human caused climate change, global warming and environmental degradation have increased. Starting in the 1990's, there have been numerous international climate agreements and national and regional proclamations about these concerns. Laws have been written to address these concerns and increase the energy efficiency of buildings.
- 2000 – The International Energy Conservation Code was created by the International Code Council. Denver has adopted that code and subsequent updates.

- Denver, Colorado is an established city with aging building stock. It signed its first Climate Action Plan in 2007 with the initial low-carbon goal of reducing emissions per capita by 10% by 2012. Denver achieved this goal as a result of the passage of renewable portfolio standards by the State of Colorado and climate actions on the part of the city.
    - The city carefully tracked the progress of its climate action plans in detail and modelled the effects of its programs. They determined that low-carbon actions focusing on efficiency and conservation would be insufficient to reduce GHG emissions at the levels desired. In 2018, Denver changed its strategy to deep decarbonization. Denver is now proposing to make broad systemic changes with the goal of reducing emissions by 80% by 2050.
- Colorado's clean energy economy employed more than 58,000 workers at the end of 2020, according to an analysis of Bureau of Labor Statistics data and the findings of a national survey of more than 35,000 businesses across the U.S. economy.
- "The Greenest Building is One That Already Exists" - A report by the US National Trust for Historic Preservation in 2016 found, through a series of case studies, that 'it takes between 10 and 80 years for a new building that is 30 per cent more efficient than an average-performing existing building to overcome, through efficient operations, the negative climate change impacts related to the construction process'. The report concluded that 'reusing an existing building and upgrading it to be as efficient as possible is almost always the best choice regardless of building type and climate.'

7. Additional Information

Bibliography

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Rocky Mountain Institute - https://rmi.org/about/office-locations/amory-private-residence/

Architect's Journal – The Greenest Building is One That Already Exists" by Robert Adam, Sept 24, 2019.

Richard L. Crowther AIA
RESEARCH in Design and Invention

1930-1935	Research and energy form design. Design director, Luminad Corp., San Diego, California. High-voltage discharge architectural lighting research. Experimental work with the reflectivity of surfaces, parabolic beam projection and indirect lighting applications. First architectural fluorescent lighting installations in California. Design of the Ford Rotunda Balboa Park Building envelope as a luminous lighting form.
1938-1939	Industrial design work for innovative commerical architectural lighting under contract with lighting fixture manufacturer.
1939-1941	Architectural plastics utilization experiments for lighting transmission, buildings application and luminous signage.
1942-1945	Industrial design of modular and portable structures and cabinets. During these World War II years, a considerable amount of research and invention was required to compensate for a lack of materials.
1943	Architectural energy form design of owner-architect passive solar residence near Balboa Park, San Diego, California. Direct gain, full south glass to floor, dark tile over concrete thermal storage floor. Cooling by evaporative mist heads located as design elements in the south patio. Overhangs provide summer shading. Screen porch at rear aids ventilation.
1948-50	Recorded patents for modular store fixtures with built-in lighting systems. Research included market analysis.
1950-1960	Various residences, including owner's direct gain passive solar residence constructed in Denver in 1952. Inductive venturi ventilation and energy-responsive architecture.
1960-1962	Technologic studies of earth cut and fill. Research material given to University of Colorado Architectural School.
1961	Passive solar residence of the architect of approximately 4000 square feet at 2735 East Seventh Avenue, Denver. Solar direct gain, dark brick over concrete floors and insulated brick cavity walls. Prestressed concrete upper floor and partial roof system stabilizes year-round temperatures. House employs inductive cooling and stack action. Gravel trench within screened east patio cools house in summer by evaporation. Mist heads located on the front south patio within a landscaped berm wall cool air, which inductively enters and cools the house via stack action. House is set approximately 3 feet into the grade and performs well in all seasons.
1961-1962	Developed technology of sun-earth plateau city concept. Garden city open to the sun with cut and fill underground city core.
1969	Skylight research; subsequent invention of energy-conserving reflective skyshaft, which optimizes direct sunlight and produces changing light patterns.

1969-1972 Inventive development of air-type solar collectors, including working models. Various absorber plates and collector insulation experimentally evaluated.

1973 National Science Foundation research grant for active solar heating, lithium-bromide absorption cooling, and architectural design resolutions. Designed as a residence, but occupied as an office for project monitoring.

1973-1974 Research solar homes constructed by the architect, 419A and 419B Saint Paul Street, and 435B Saint Paul Street, Denver. The 419A three-level, 2000 square-foot structure was built as a prototype for a modular energy core and for either prefabrication or on-site construction of the building envelope. A below-grade greenhouse has a 360-gallon direct solar exposure water tank and a fin tube solar collector designed by the architect to augment the passive solar gains of the greenhouse. Main living room windows are regressed (for direct solar gains in winter and shade in summer). The greenhouse provides secondary daylighting to the interior. The roof has 560 square feet of fluid-type solar collectors with selective surface to heat a 1000-gallon vertical thermal storage tank and the domestic hot water. The entire form of the house acts as a vertical convection system that, in winter, mechanically destratifies the upper ceiling air to the lowest level. In other seasons, ventilation and cooling is achieved by a roof turbine and strategically-placed intake air vents. The greenhouse increases the air exhaust and intake flow. A round window and an interior reflective drywall form act together like an architectural daylight fixture. It is a super-insulated house that is extremely quiet in an urban environment. This house was open more than 6 months as an educational demonstration.

The 419B residence is a retrofit with air-type solar collectors and an old coal bin insulated and redesigned for heat storage. The old 1920 structure had 8"-thick brick walls with no insulation, a thin layer of blown-in attic insulation and double-hung windows and doors with excessive infiltration. An air-lock vestibule was added. The roof was angled for active solar effectiveness. A new northside envelope climatically shields the house and converts the former exterior northside masonry wall into an interior thermal inertia wall. The main floor is slotted for air passage and uses the existing basement as a heat sink. New Pella Slimshade windows were added to the south masonry wall, the exterior of which was painted dark to act as a thermal lag wall. East exterior walls have heat-absorbing double glazing and the west glass has reflective double glazing. The solar collection and gravel storage system is tied into the old forced-air furnace system for heat distribution.

The 435 Saint Paul Street project optimizes energy conservation in an older home and adds a mini-sized habitat as allowed under the R2 zoning. The rear unit of 800 square feet with 400 square feet on each level was designed by the nominee as a prototype to replace mobile homes or low-cost modular units that could form a duplex or townhouse development. This unit is an active air-type solar home with a rock bin centralized below the lower level bedroom, bath and den floor. The upper level is a one-room living space with a corner kitchen, living-dining room and small triangular greenhouse. Behind the solar collectors is ample storage for the penthouse space. This habitat has remarkable liveability. As a duplex, a young couple could live in 800 square feet or, as the family grew, move to more bedroom and/or recreation space. Children grown, the aging couple could again rent out 800 square feet. This habitat was ready for occupancy within 5 weeks at a cost of $19,500, including the solar collection system.

1975 The Cherry Creek solar office buildings at Third and Steele Streets were designed by the architect as two separate ownership entities joined by a centralized lobby. The north building, designed for research, is owned by and houses the architect's office. Energy conservation and daylighting were principal design concerns. Window shapes, forms and proportions were carefully designed to match with interior building functions and to respond to the seasonal changes of solar light. The roof surface of white marble chips and an angular reflector of white stucco embedded with mica concentrate solar gains onto a narrow band of clerestory windows and an array of air-type solar collectors. A sun scoop daylights the interior entry space of each building. The wood foundation structures are superinsulated, with greater insulation of the north exterior walls. Screened air intake vents work with a west-facing venturi gravel-filled solar plenum on one building and wind turbines on the other to inductively cool and ventilate. The north building solar research test section supplies solar gain, air-tempering and/or humidification with the aid of black-white reversible blinds. This passive system also has a hybrid capability to mechanically distribute heated air to occupant areas. These buildings have reverse cycle air-to-air heat pumps that can augment passive solar and active gains and act as destratification systems. During summer months, the heat pumps can provide refrigerated air conditions. Within 3-1/2 years, all of the initial costs for solar and heat pumps above the cost of furnaces were completely paid for. Each building of 4700 square feet is saving more than $3000 per year in utility costs.

1977-1981 Research and development of architectural applications of eutectic salts for solar thermal storage. Applications of negative ionization and of positive resonance electromagnetic fields.

1977-1981 Research and development of on-site applications of an industrial engineer's earth technologic evaluation and building construction system. Earth walls function as thermal mall or insulation as desired using solidification sawdust and other waste products.

1979 Architect-owner passive solar duplex, 500 Cook Street, Denver. Two-stage, shelf-type reflective ledge skydome provides northside solar gains. Minimal energy loss. Skyshafts for daylighting invented by architect. Solar inductive cooling and ventilating west-facing plenums with air intakes at floor level in a cross-ventilation pattern.

Mechanical destratification of ceiling line winter heat and stratification for optimal summertime mechanical cooling.

1980 Architect-owner two-level research resident facility at 401A Madison Street, Denver. Nine passive solar subsystems, eleven cooling, ventilation and air-tempering passive systems using inductive solar and internal subsystem energies, redistributed mechanically into lower level northside thermal mass. Prestressed concrete structure is earth-coupled on north, east and west sides. A sunken reflective-surface south courtyard augments wintertime solar gains. A centralized lower-level active-solar-heated swimming pool of 11,000 gallons acts as a passive and active solar thermal reservoir. Roof-mounted solar collectors serve a 1000-gallon basement concrete water tank that, by means of heat exchangers, in turn serves the pool and preheats domestic hot water and a sauna. Two vertical greenhouses integrated with the structure provide solar space heating of and secondary daylighting to the interior as well as inductive air tempering, cooling and ventilation. The southwest greenhouse can cool as required. Ground temperatures are used to moderate year-round intake air. A solar inductive chimney and venturi roof wind flow ventilator stimulate the expiation of interior air. A clerestory over a high-ceilinged gallery directs light onto a dark concrete mass wall over the clerestory glass and a south-facing roof deck reflect and concentrate light onto the bank of fluid-type solar collectors and, along with direct winter solar penetration, into the clerestory windows. A solar test deck is provided for experimenting, testing products, and outgassing materials. The facility has a weather station. A demand controller is wired from an instrument board to thermocouples located in selected areas. The facility abounds with energy conservation features. Concrete, eutectic salts and water provide the solar thermal storage.

1981 The Hotsy Corporation 30,000-square-foot holistic energy office building designed by the nominee integrates energy design and human biophysics and behavior. Holistic design includes site, architecture, interiors, wall plaques, topographic landscaping, and lateral and direct daylighting for transient circulation. Air-type solar collectors, a variable-volume economizer cooling system and radiant ceiling panels (to heat people instead of air) condition the building. The building is earth-coupled and has a large thermal mass. The research aspect dealt largely with psychoneural functional resolutions favoring human interaction and reducing human stress as well as holistic energy concerns. Esthetics were considered as an end product of energy and function design.

Richard L. Crowther AIA
RESEARCH in Education

1972-1975	Education and Research Commmittee member and subsequent director, Colorado Central AIA Chapter. Developed well-attended interdisciplinary continuing education programs.
1976	Sun/Earth book on use of sun, earth, air and water energies for architecture. Authored concepts and graphics; formed Solar Group team to assist. Won 1977 Progressive Architecture citation; used as text in numerous universities.
1975-1978	Member of AIA Research Corporation committee to develop Energy Notebook for continuing education at the national level. Case studies evaluation and energy information.
1978	Sun-Earth/Solar Architecture descriptive slide show based on Sun/Earth book and other material sold to universities by KaiDib Films International, Glendale California.
1980	Holistic Energy Architecture descriptive slide show. Holistic energy design relationships of site, building, interiors and people. Sold by KaiDib Films International.
1981	Daylight/Architecture, Interiors and Human Energy descriptive slide show. Nature of solar light, atmospheric, terrestrial, architectural, building interior and human response.
1981	Research work in progress for publication on subjects of daylighting, functional space use, interiors and architectural form.
1982	Contract with Van Nostrand Reinhold for new updated version of the Sun/Earth book. Extensive research relative to additional information and the development of additional graphics for case studies, inductive ventilation, climatic buffering, energy subsystems, passive solar strategies, passive cooling, ventilation, economics and bibliography.
Note:	Chapters by the nominee for other published books that required considerable research are:

"Urban Planning for Arid Zones," Use of Solar Energy, 1979
"Dimensions of Change," The Social Imperative, Vail 6, 1977
"The Solar Decision," Practical Guide to Solar Homes, 1978
"Solar Architecture," CRC Handbook, Economics of Energy Conservation and Solar Energy

RICHARD L. CROWTHER AIA

CROWTHER/ARCHITECTS GROUP
CROWTHER/SOLAR GROUP
310 Steele Street
Denver, Colorado 80206
303-355-2301

RESUME

Professional Experience

1930-35	Architectural and lighting research design - California
1935-36	Architectural and exhibit design, World's Fair - San Diego, California
1936-37	Architectural commercial design and World's Fair - San Francisco
1938-39	Architectural commercial design - Denver, Colorado
1939-41	Architectural residential and commercial design - San Diego
1941-46	Director, design, estimating, manufacturing - Wilson, Neukom Co., San Diego
1946-50	Commercial and residential architecture and interior design - Crowther & Marshall, San Diego and Denver
1951-61	Commercial and residential architecture and interior design - Richard L. Crowther, Denver
1961-66	Commercial and residential architecture and interior design - Richard L. Crowther & Associates, Denver
1966-70	Commercial and residential architecture and interior design - Crowther, Kruse, Landin & Associates, Denver
1970-75	Commercial and residential architecture and interior design - Crowther, Kruse & McWilliams AIA, Denver
1975-76	Commercial and residential architecture, optimized energy conservation, solar and life support systems - Solar Group, Inc., Denver
1976-81	Holistic solar and natural systems, architecture, autonomous community planning, energy consultation for government agencies, architectural and engineering firms - Crowther/Architects Group/ Solar Group, Denver
1979-81	Development of descriptive visual educational programs and architectural energy educational monographs

Professional Associations

Colorado Central Chapter - American Institute of Architects, Board of Directors, Commissioner for Research and Education, Commissioner for Environment, Chairman for Continuing Education, Chairman for AIA Solar Seminars 1972-75

AIA Research Corporation - Energy Notebook Committee, Energy Budget Committee, 1975-78

Environmental Activities

1952-75 Inventor and designer of passive energy solar energy systems, architectural components and new energy conserving greenhouse designs
1973 Editor of AIA Enviornmental Digest
1974-75 Consultant to AIA Research Corporation and National Academy of Science regarding energy conservation and solar energy
1974 Crowther Kruse McWilliams, architects for the National Science Foundation/CSU solar heated and solar lithium absorption cooled house at Fort Collins - Dr. George Lof was the project director
1973-75 Lecturer - University of Colorado/University of Wisconsin, NCAR; Midwest Research Institute - Kansas City; University of Denver; AIA Solar Conference; Political, business and enviornmental group; CU engineering classes covering optimized energy conservation, passive solar and mechanical solar systems, biophysics and behavior in space function
1973-75 Construction of demonstration passive and active energy conservation solar homes
1974-78 Consultant for political legislation at national and state level on solar and energy conservation measures
1974-75 Chairman - AIA Colorado Central Chapter Solar Building Code recommendations for City & County of Denver
1974-75 Engagement under CU/National Science Foundation Grant in solar marketing residence studies for Washington, D.C. and Denver and with Los Alamos Laboratories in integrated solar roof structures
1975 Development of "Passive Energy Portfolio"
1975-77 Instructor of passive and active solar architecture - University of Colorado, Department of Engineering
1976 Author and publisher of Sun/Earth, Progressive Architecture award winning book on sun, wind water, and earth energies
1976 Speaker at Los Alamos passive solar conference at Albuquerque, and at Vail Symposium
1976-79 Wright Ingraham Institute - Board of Advisory Consultants
1977 Colorado Solar Energy Society - Board of Directors
1977 Institute for Energy Concepts - Director
1977 Judge for Solar Architecture Competition, State of Illinois
1977 Lecturer - Smithsonian Institute, "Architecture in Crisis"
1976-78 Roaring Fork Resource Center - Board of Directors
1978 Colorado Solar Energy Association - Board of Directors

Environmental Activities (cont.)

1977	Lecturer - University of Kentucky
1978	Guest Lecturer - University of Colorado
1978	Educational Slide Show - Sun/Earth Solar Architecture
1978	Design for Sun Programs - Illinois Advisory Board
1978	Advisor to American Institute of Architects on Architectural Graphic Standards and solar codes
1978	Consultant to AIA Research Corporation Solar Monitoring Program
1978	Judge for The Governor's Colorado State Solar Competition
1978	Lecturer - University of Missouri
1978	Consultant - Religious Project in Maryland
1978	Lecturer - Colorado Office of Energy Conservation
1976-78	Metropolitan Science Center - Board of Directors
1979	SERI Federal Group Tour
1979	Participant - Colorado State Energy Office Seminar
1979	CSU/SERI Consultant "passive" systems building
1979	Lecturer - University of Michigan, Ann Arbor, Michigan
1979	Education session with French solar architects and engineers
1980	Advisory Participant - Western SUN evaluative seminar
1980	Lecturer - Denver Urban Planning Department
1980	Energy Consultant - Bank Project, Gilette, Wyoming
1980	SERI Solar Video Program
1980	Development of conceptual learning process systems
1980	Lecturer - Earth Technology Course, Las Vegas, Nevada
1980	Advisory Consultant - Rocky Mountain Hospital
1980	Continuing experiments with negative ionization and positive field resonance
1980	Advisory Participant - Center for Renewable Resources
1980	Lecturer - Denver Board of Realtors
1980	Lecturer and Panel Member - Minnesota Society AIA Design for the Decade
1980	Slide Show Presentation - Colorado Society AIA
1980	Educational Slide Show - Holistic Energy Architecture
1980	Judge - Pike's Peak Solar Contest
1980-81	Consultant - bank projects in Wyoming and North Dakota
1980-81	Member of Board of Advisory Consultants - Wright Ingraham Institute
1981	Member of Board of Directors - International Institute for Energy and Architecture

Environmental Activities (cont.)

1981 Interviewee - KVOD Radio
1981 Lecturer and Panel Member - University of North Carolina
1981 Visiting Critic - University of Nebraska

Publications - Books

SUN/EARTH, Author and publisher, 1976. Progressive Architecture citation award. Covers sun, wind, water and earth energies.

Publications - Chapters of Books

"Urban Planning for Arid Zones," Use of Solar Energy, 1979
"Dimensions of Change," The Social Imperative, Vail 6, 1977
"The Solar Decision," Practical Guide to Solar Homes, 1978
"Solar Architecture," CRC Handbook, Economics of Energy Conservation and Solar Energy

Publications - Articles and Examples of Work

"Architecture and Interior as an Energy System," Designer, 1978
"Letting the Sun Shine In," Horizon, March 1978
"Solar Style," Colorado Business, June 1978
"Energy and Design," Emissary Magazine, 1978
"Energy Efficiency," Sunset Magazine, September 1978
"Colorado Solar," Solar Age, August 1978
"Architecture as Energy," Design Quarterly
"3.8 Year Payback," Building Design & Construction, June 1977
"Going Solar, an Architect's View," The Denver Magazine, September 1978
Design for a Limited Planet, (chapter mention), 1976
Solar Heated Buildings in North America: 120 Outstanding Examples, 1978
Living with Energy, Crowther Solar Group, 1978
House Beautiful Building Manual, Fall-Winter 1974-75
Leisure Living Magazine, 1974
Popular Science, 1974
Christian Science Monitor, 1974
Alternative Energy Sources, 1975
ASHRAE Journal, November 1975
National Geographic, March 1975
Professional Builder, June 1976
Shelter Magazine, July 1976
Solar Age Magazine, July 1976

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Colorado Business Magazine, Fall-Winter 1976-77
American Painting Contractor, February 1977
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American Meterological Society, September 1977
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SUN/EARTH: SOLAR ARCHITECTURE, educational slide show - Kaidib Films
Appearances regarding solar energy on local television - Channels 6, 7 and 9
Public Service Announcement for national television as part of Tribute Series - American Association of Retired Persons, April 1977
"Holistic Architecture," West German television presentation, 1980

Education

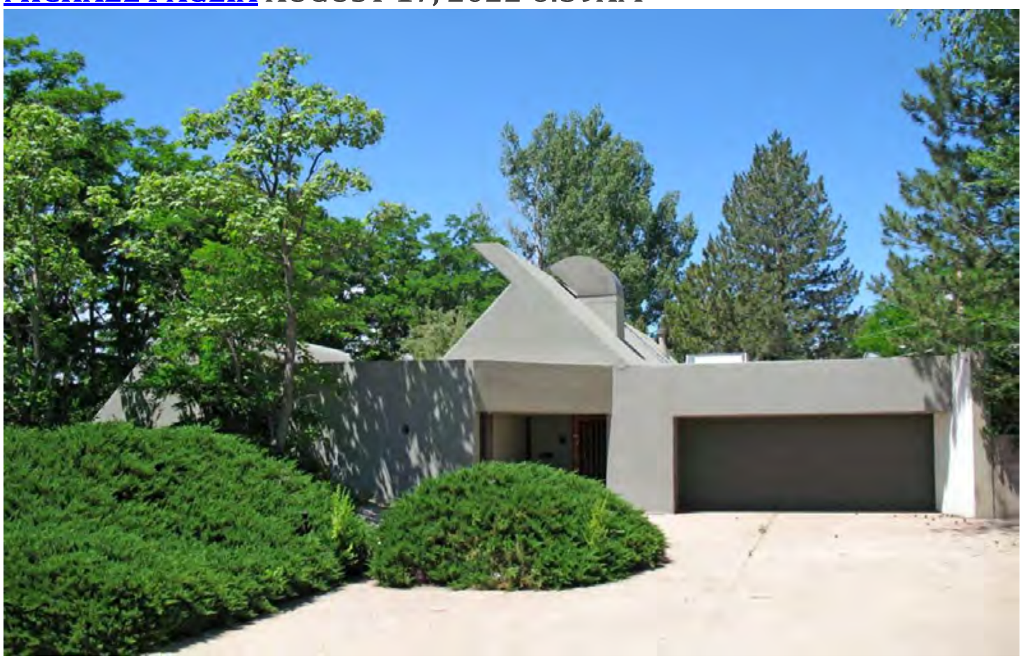
Newark School of Fine and Industrial Arts
San Diego State College
University of Colorado
University of Denver
Accredited Fallout Shelter Analyst

Architectural Registration

Colorado License - B111, November 1955
NCARB Registration

Richard Crowther's Home, a Lab for Architectural Ecology, Could Be Demolished

MICHAEL PAGLIA AUGUST 17, 2022 6:59AM



Richard Crowther designed his own house in Cherry Creek North in 1979. **Shannon Stanbro/5280mod**

*The groundbreaking structure that renowned architect Richard Crowther created at 401 Madison Street as his own home has been purchased by Denver-based Mag Builders, which wants to scrape the structure and build two duplexes — if the city determines it is not a landmark and issues a Certificate for Demolition Eligibility. You can see the Denver Community Planning and Neighborhood report **here**; keep reading for Michael Paglia's piece on Richard Crowther published on January 11, 2007, shortly after Crowther passed away.*

In the last twenty years, the "Built Green" movement has gone mainstream, with big developers such as ForestCity at Stapleton promoting the environmentally friendly features being incorporated into their buildings. But a generation or two ago, only kooks or visionaries thought about such an issue.

Here in Denver, we had a pioneer of architectural ecology: **Richard Crowther**. As an architect, Crowther made the relationship of the structure to the environment a key part of his commercial and residential designs, and he became internationally famous for his theoretical writings on the subject. But unlike the works of so many others who've embraced the Built Green mantra, Crowther's are not ugly neo-traditional buildings; rather, they are shamelessly modern and breathtakingly beautiful. They show off groundbreaking technologies contained within vanguard formal expressions, and the best of them are as sophisticated as anything anywhere in the world.

Crowther was born in Newark, New Jersey, in 1910, and moved to San Diego as a young man. Though he did have some formal training, Crowther, as was common to his generation, learned on the job, starting with lighting design for amusement parks and coming up through the profession. He arrived in Denver in 1948 and was hired by Lakeside owner Ben Krasner, who wanted him to give the park a partial facelift. It was a modest start, but within a few years, Crowther had a built a booming architectural business. He built several luxury homes in Cherry Creek North, an upscale neighborhood that he helped start. He also did several office and retail buildings in the same area. Set among the shops, for example, is a striking two-part office complex at 310 Steele Street and 3201 East Third Avenue. The sleek, low-slung buildings sport ribbon windows slashing across light-colored walls, flat roofs at different heights and triangular atriums marking the skyline.

Among Crowther's most important commissions were the three Cinerama theaters he did for the Cooper Trust in the early 1960s. One was built at 960 South Colorado Boulevard in Denver, with another in Minneapolis and a third in Omaha. The theaters were nearly identical, with the curved auditorium inside being expressed on the outside as a robust, drum-like form. Sadly, all three have been torn down — the one in Denver to make room for a Barnes & Noble parking lot. (To see photos of all three Crowther theaters, go to **cinematreasures.org**.)

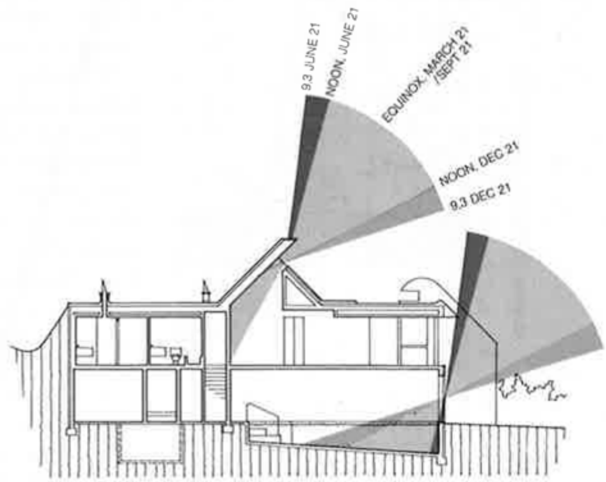
I've been lucky enough to visit a couple of Crowther houses — one in Cherry Creek North and the other in Greenwood Village — and believe me when I say that both were drop-dead chic. I've never been inside one of Crowther's greatest masterpieces, the 1979 home and studio he designed for himself and his wife that sits on the northwest corner of Fourth Avenue and Madison Street. The house was a laboratory for the working out of Crowther's environmental theories. The elaborate forms of the place include a lively constructivist rhythm of rectilinear blocks set off by a wedge-shaped roofline with an integral canopy shielding a row of solar panels. Separated by flat roofs is another wedge and a long barrel vault. The severe-looking painted concrete structure is definitely one of the coolest residences from any date in Colorado, right up there in the top tier with Charles Deaton's Sculptured House in Genesee.

Crowther, who was a Fellow of the American Institute of Architects, donated his plans, documents and drawings to the Western History Department of the Denver

Public Library. Crowther died on Christmas Day, 2006, at the age of 96, capping off a lifetime well spent in the single-minded pursuit of his art and science.

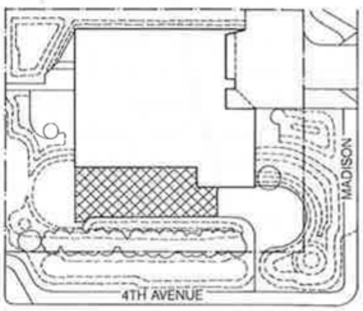
Solar house and research facility, Denver

This building is loaded



BUILDING SECTION THRU GALLERY

Solar architect Richard Crowther orchestrates his own new house and working space for optimum energy efficiency. The result is a lesson in solar options and an eyeful of building.



SITE PLAN N↑ 20'/ 6m

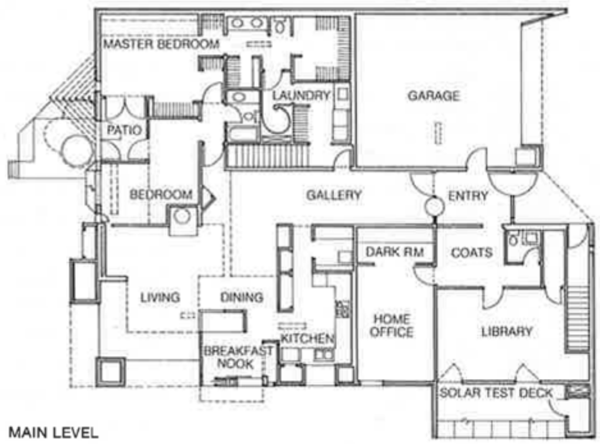
The American solar house is both part of the problem and part of the energy solution. Solar prophets and wisemen alike extol the merits of earth berms and sun for use in their new single-family dwelling. Regardless of the type of energy consumed or the efficiency of consumption, the single-family home is the worst possible fashion in which to live if the objective is optimization of energy usage. As tragic as it is, as per capita income increases, per capita energy consumption also increases. The most energy-conserving people in America are also the poorest. Conservation of energy is therefore not the top priority in choice of dwelling. When we, as architects, build a house, we accept energy waste and "space piracy."

The research and design which typifies all of Crowther's buildings is in greatest abundance in the houses. In his own new research facility home in Denver, he accepts the role of "space pirate." His laboratory-house-retreat-office keeps the paradoxical incongruities of the outside world at bay. Inside is a world where life makes more sense.

Like Dr. McGrew, author of the previous article, Crowther recognizes the importance of the human being in compensating and regulating energy consumption. He readily accepts the sensitivity of his own body to guide him in fine tuning his own interior environment. In a very real sense, he wears his building like clothes.

This is not the first home Crowther has built for himself. During 40 years of design and experimentation he has built five; his first one was built in 1943. All of his own houses have served as home offices, many have also been full-size test facilities, and some have been intended for multiple occupancy as this one is.

There were, however, two new programmatical explorations for this house that have had a rather large influence on the resulting form: first, the large solar-heated gallery space adjacent to the entry serves as a primary heat "accumulator" for the house; second, the cellular nature of the plan enables parts of the house to be thermally isolated. In keeping with the full-size laboratory function of the building, Crowther experimented with many different types of energy sources, as well as sizes and shapes of space. There are nine thermal zones in the building.

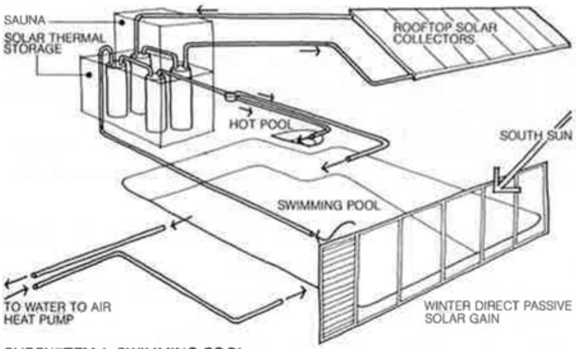


MAIN LEVEL

LOWER LEVEL N↑ 20'/6m

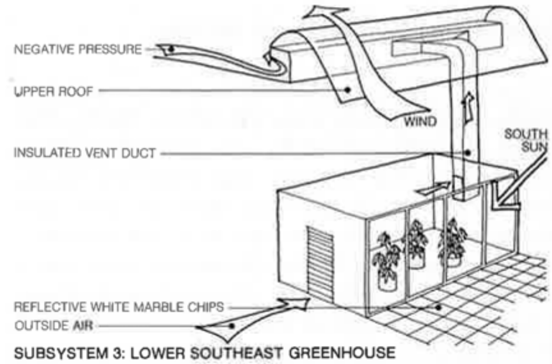
it more effectively." Direct and reflected sunlight enters through a narrow band of double-glazed clerestory windows at the apex of the shed roof space. The dark colored concrete surfaces store the direct-gain solar heat and radiate heat. A ceiling plenum in the kitchen also channels heat into the gallery from the appliances. Of course heat given off from the occupants using the space also rises in the gallery. Excess heat is destratified by a fan-and-duct system that draws off the upper layer of heated air and delivers it to the concrete thermal mass of a storage room in the basement below. In the heating season, there-

(Top right) The eastern elevation of the building includes the entry. After passing the entry air lock, one enters the gallery (above) and walks through the dining area (middle right) to the living room. From there (at right) both the gallery and dining space are in view.

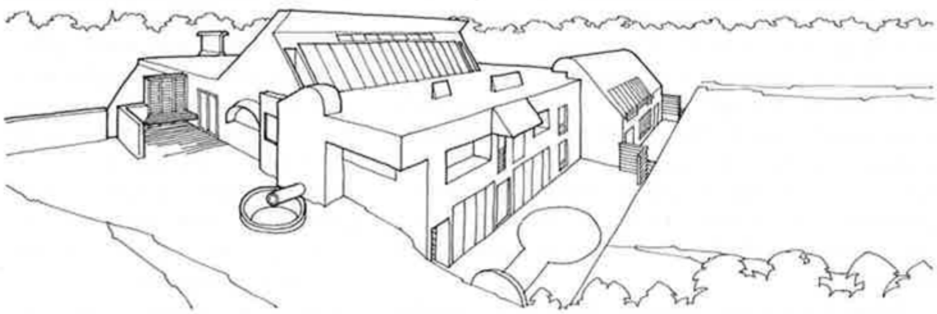


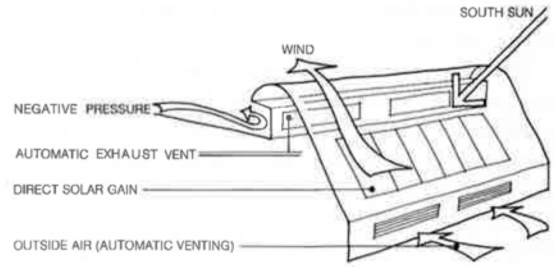
SUBSYSTEM 1: SWIMMING POOL

SUBSYSTEM 2: CLERESTORY

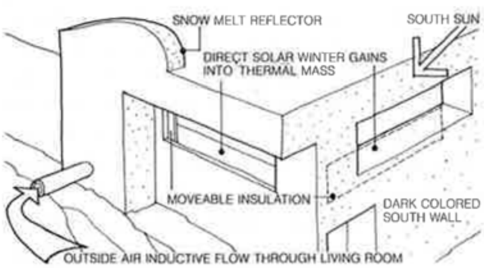


SUBSYSTEM 3: LOWER SOUTHEAST GREENHOUSE

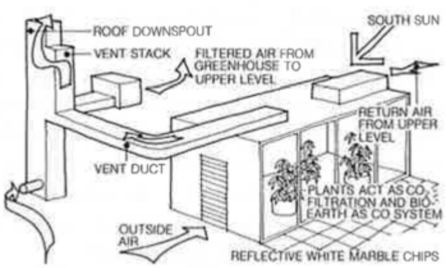




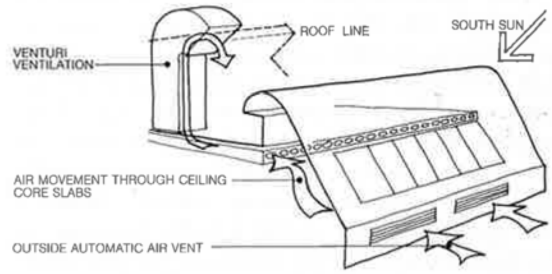
SUBSYSTEM 4A: SOLAR TEST SECTION FOR COOLING (MODE 1)



SUBSYSTEM 5: UPPER LEVEL LIVING ROOM



SUBSYSTEM 6: LOWER SOUTHWEST GREENHOUSE



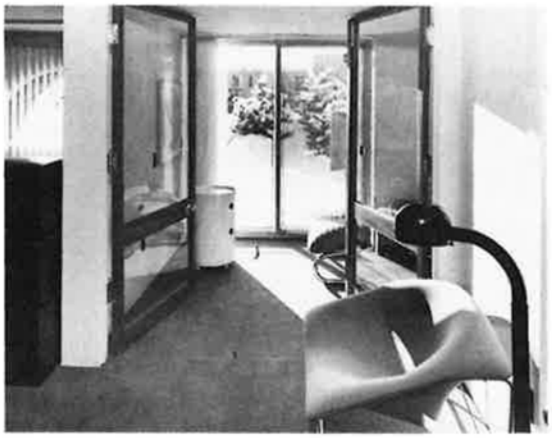
SUBSYSTEM 4B: SOLAR TEST SECTION (MODE 2)

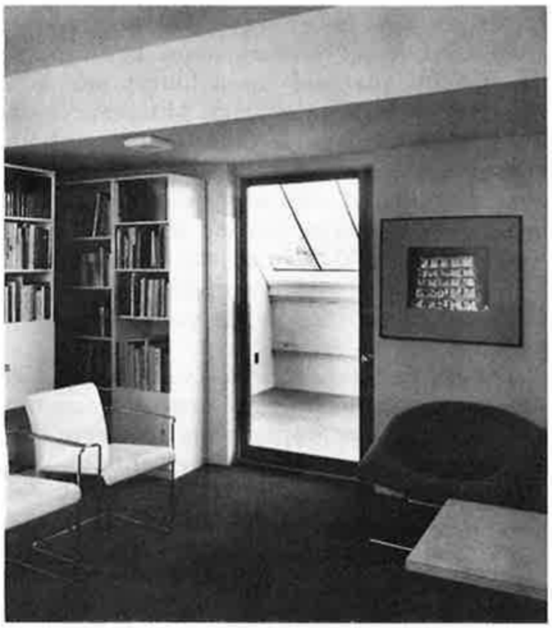
heat pump is installed to deliver tempered air to the spaces above, or it can be reversed to heat the pool in other seasons. The pool space is below the living room and its heat rises to the floor above.

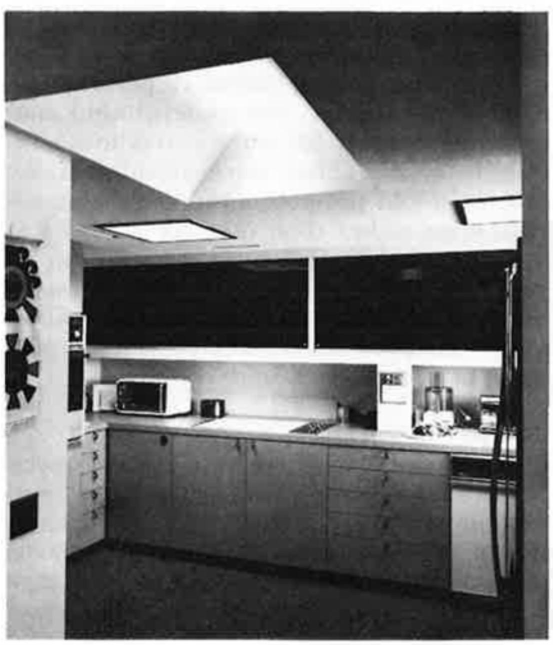
Another south-facing greenhouse services the recreation spaces adjacent to the pool, the sun entering the greenhouse through clear, cellular sheet plastic. The white marble-chip patio outside acts as a solar reflector adding to the solar gain of the greenhouse. The space can provide air tempering, heat, humidification, and ventilation for the recreation space and is intended to function as a natural air filtration system. Return air from the spaces above is ducted down into the greenhouse. Fresh air is added when necessary through outside vents. Air is circulated with the help of an induced air flow which terminates in the large downspout from the roof. Filtered air then is directed back into the upstairs spaces.

The total design: All of Crowther's buildings are designed from the inside out. There were fewer drawings for the Crowther house than for a normal building although the plan emerged only after several different versions. Crowther served as his own contractor and made running changes in the building as it was being constructed.

The spaces which need light and view are clustered to the south and west of the building. Earth berms protect the north exposure







Photos left to right and top to bottom: sunroom between bedrooms, dining and living rooms, library next to office, swimming pool space, kitchen, work space in guest bedroom.

Habitability

Global habitability is at risk from architecture, vehicles, technology, lifestyles, and the development and networks that serve them. The burden of this technologic erosion of Nature, petro-energy denigration of our global atmosphere and living systems, unbridled chemistry, and electromagnetic and radioactive ecologic assaults is a continuum for catastrophe.

No one likes to hear the "bad news," but we are all part of it. If our human destiny is worth a "plugged nickel," we are not giving destiny its value.

Sun, climate, and ecology follow Nature's functions. The *form of life* follows Nature's regenerative, sustaining, and vitalizing powers. Architecture has traditionally followed the form of shelter, protection, culture, space need, desire, and to beguile the ego and "manipulate" people.

"Form follows function" was the tenet of contemporary architecture. At present architectural form follows nostalgia, technology, lifestyles, hyper expectations, marketing, convenience, sinful comfort, and personal aggrandizement. The cost in ecologic terms is <u>not</u> presently weighed. For the most part in choice, purchase, and possession environmental cost is not part of the equation, and further is seldom part of the operational, maintenance, and other life-cycle costs occurring from what is acquired.

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Architecture is a major element of human life. It is a major concern, a major purchase, and has a major effect upon our lives. We spend over 90 percent of our time indoors. In the main our present technologic archetype of architecture is a composite of materials, energy, and systems synergistically counter to human vitality and health. Airborne toxic gases, noxious particulates, anti-biologic chemicals, electromagnetism, and radioactivity are dominant in our environs of home, workplace, marketing, and places of learning, entertainment, and relaxation.

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"Form follows function." Our own evolutionary biologic form is not so adaptable and well tuned to meet the multi-levelled concentrations of aberrant stressors that exist in our "developed" (?) society. Every sense that we possess is under duress. Our environs are loaded with noise and hyper sound and overloaded with visual impressions and stressors that intrude upon our composure. Television and other media, population densities, and our vying for space compromise biologic well-being.

As form follows function in Nature, so should architecture follow, or at least notably align with, the natural resource and energy systems of our planet. Whether we like it or not, we must become responsible stewards of our local and global environment. Our wayward course that has largely ignored Nature's regenerative and life-sustaining atmosphere and dynamic planetary balance of interdependent ecosystems is bringing us close to the brink of disaster.

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Our dominion *over* Nature has not only brought us to the "brink," but also our contrived minds and misapplied ingenuity with unconstrained libidos threaten the world with ever-escalating numbers of people. People require homes, buildings, transport, and the goods and services essential to life. More and more of our global land mass is being devitalized and made less habitable by expanding population.

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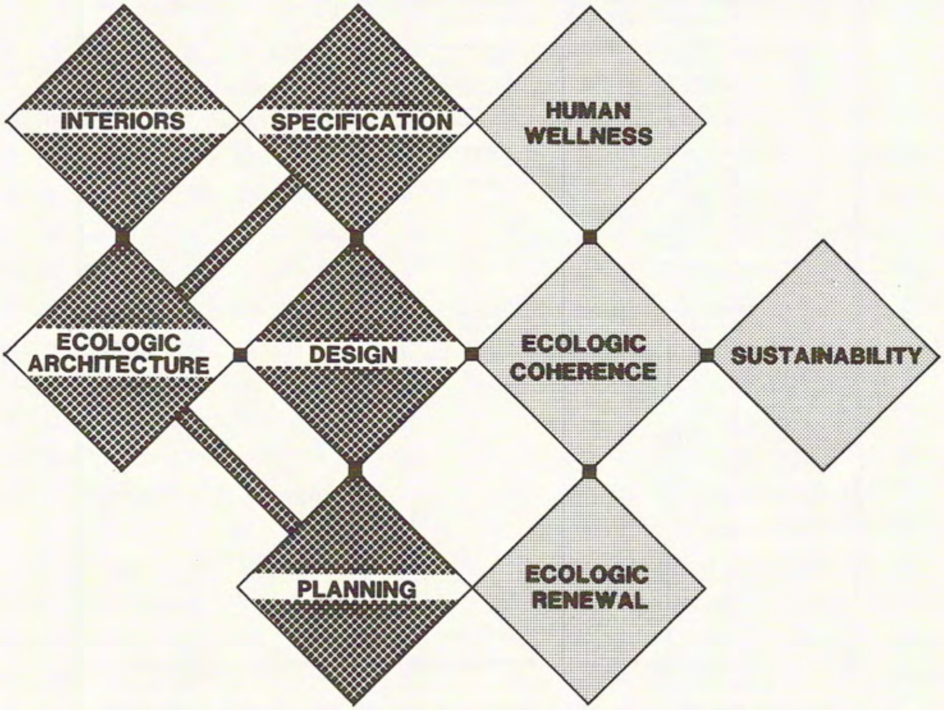
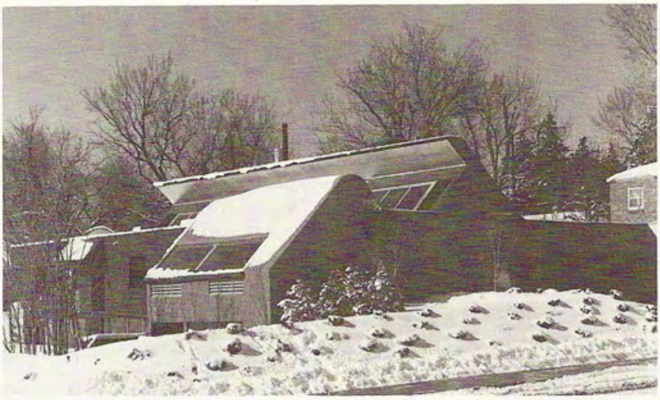


The ecologic necessity translates to ecologic coherence in design of architecture, its products, and its systems. Global systems sustainability and ecologic renewal are principal to our planet's habitability. Concept, planning, design, and specification of architecture, interiors, and all elements of the site and urban infrastructure are critical to ecologic and biologic viability and vitality.



Ecologic Residential Research Facility

This 7000 square foot project included reference and test facilities for research, a home office, principal living quarters, two apartments with separate entries, and an indoor swimming pool area. Completed in 1980, it has served for weather, internal space temperature, and daylighting monitoring.

In practical evaluation all systems (solar heating, inductive cooling, air tempering, daylighting, outgassing and drying of items and materials, earth and thermal mass air cooling and temperature stabilization, concordant humidification) function well and most notably better than originally calculated and predicted. The swimming pool as a central heat sink is 100% solar heated.

All of these systems provide a research base. Within different space environs, various materials and products are tested under different conditions analogous to those of most commercial and residential architecture.

Landscaping, architecture, interiors, and the interresponse to sun, earth, air, and water energies of the site were interfaced in design with biophysical, psychoneural, and behavioral consequence. The holistic ecologic approach included a particular concern with the bioeffects of toxins, particulates, pathogenic microorganisms, bioelectromagnetism, and geologic electromagnetic fields.

THE SOLAR CONCEPT APPLICATIONS

WATER:

- Solar-thermal water storage
- Solar hot water heating
- Solar-heated swimming pool (passive/active)
- Solar humidification
- Solar heat pump space heating (water to air)
- Solar-heated hot spa pool
- Solar-evaporative swim pool cooling
- Solar-reflective roof drain snow and ice melting
- Solar-reflective garage snow and ice melting

AIR:

- Solar space heating (thermal lag from pool)
- Solar air tempering
- Solar-desiccant dehumidification
- Solar-inductive convection and ventilation
- Solar-inductive space cooling
- Solar-preheating of sauna
- Solar-thermal destratification
- Solar-hybrid thermal redistribution
- Solar heat-pump space cooling (air to water)
- Solar-dehydration of food
- Solar-drying of clothes
- Solar-drying of adhesives and finishes
- Solar out-gassing of materials
- Solar-bleaching of materials
- Solar-sterilization of surfaces
- Solar greenhouses (air purification)

SUNLIGHT:

- Solar direct and indirect daylighting
- Solar skyshafts
- Solar-reflective intensification
- Solar-reading shaft
- Solar light control and shading devices
- Solar greenhouses (food production)
- Solar roof-reflectivity to sky (summer cooling)
- Solar/bio-therapeutics (full spectrum light)
- Solar visual accommodation
- Solar-heated garage door
- Solar photo cell exterior lighting control
- Sun dial
- Solar-photovoltaic energy for toys

RICHARD L. CROWTHER FAIA

1980 Architect-owner two-level research resident facility at 401A Madison Street, Denver, Nine passive solar subsystems, eleven cooling, ventilation and air-tempering passive systems using inductive solar and internal subsystem energies, redistributed mechanically into lower level northside thermal mass, Prestressed concrete structure is earth-coupled on north, east and west sides, A sunken reflective-surface south courtyard augments wintertime solar gains, A centralized lower-level active-solar-heated swimming pool of 11,000 gallons acts as a passive and active solar thermal reservoir, Roof-mounted solar collectors serve a 1000-gallon basement concrete water tank that, by means of heat exchangers, in turn serves the pool and preheats domestic hot water and a sauna, Two vertical greenhouses integrated with the structure provide solar space heating of and secondary daylighting to the interior as well as inductive air tempering, cooling and ventilation, The southwest greenhouse can cool as required, Ground temperatures are used to moderate year-round intake air, A solar inductive chimney and venturi roof wind flow ventilator stimulate the expiation of interior air, A clerestory over a high-ceilinged gallery directs light onto a dark concrete mass wall over the clerestory glass and a south-facing roof deck reflect and concentrate light onto the bank of fluid-type solar collectors and, along with direct winter solar penetration, into the clerestory windows. A solar test deck is provided for experimenting, testing products, and outgassing materials, The facility has a weather station, A demand controller is wired from an instrument board to thermocouples located in selected areas, The facility abounds with energy conservation features, Concrete, eutectic salts and water provide the solar thermal storage,

Crowther's House desc. from FAIA doc 1

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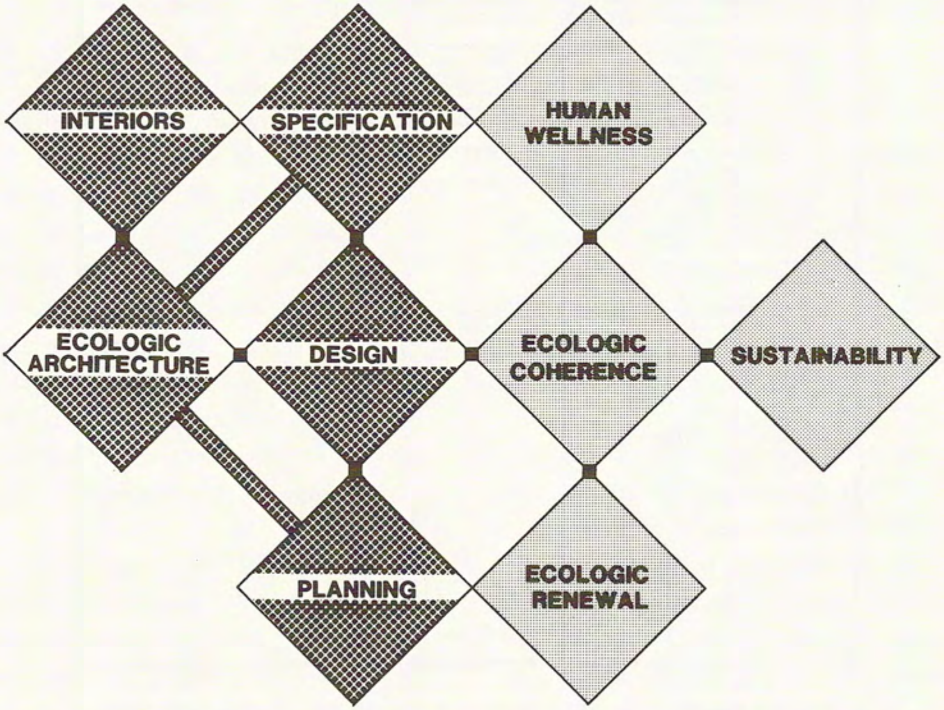

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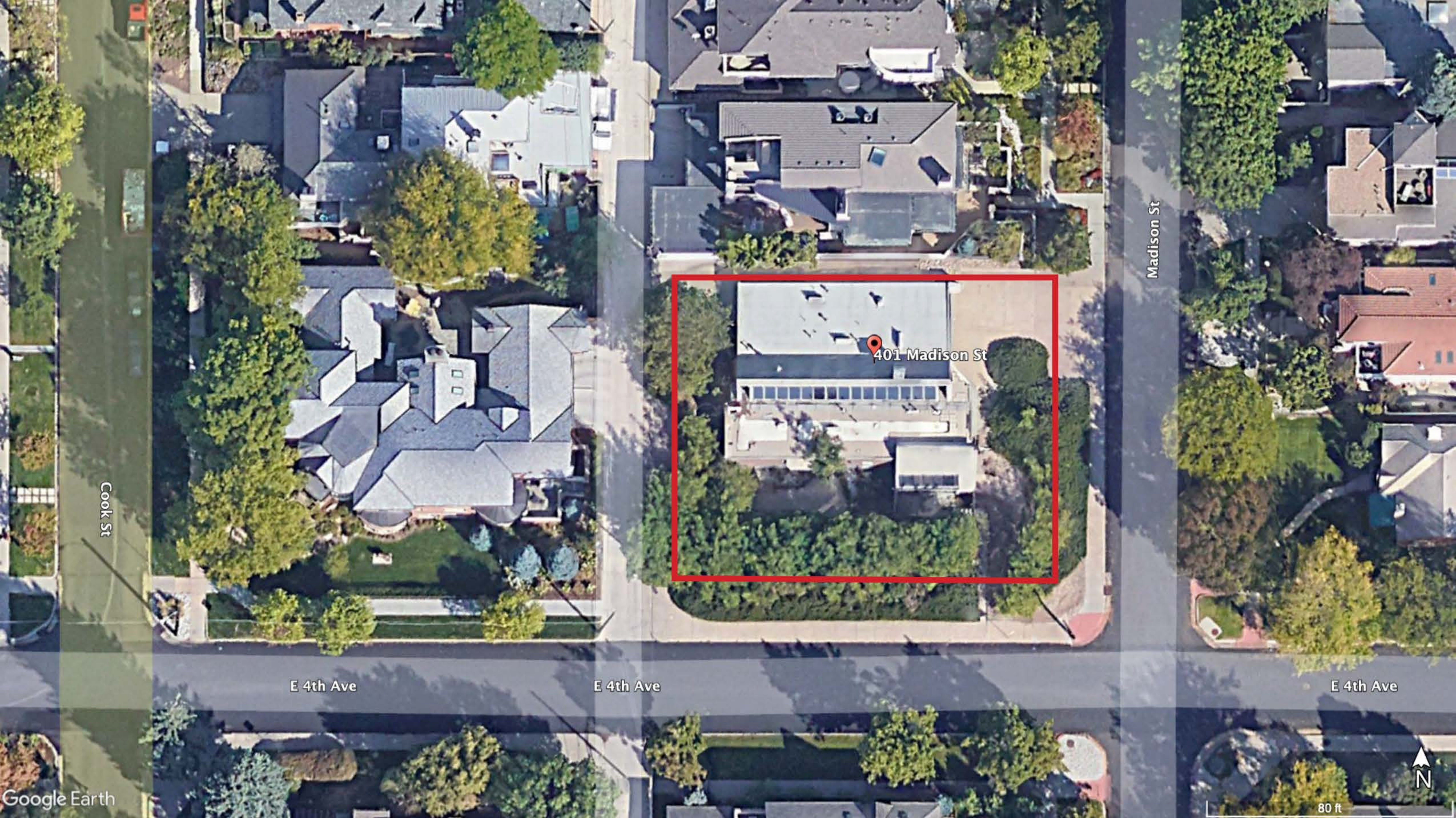
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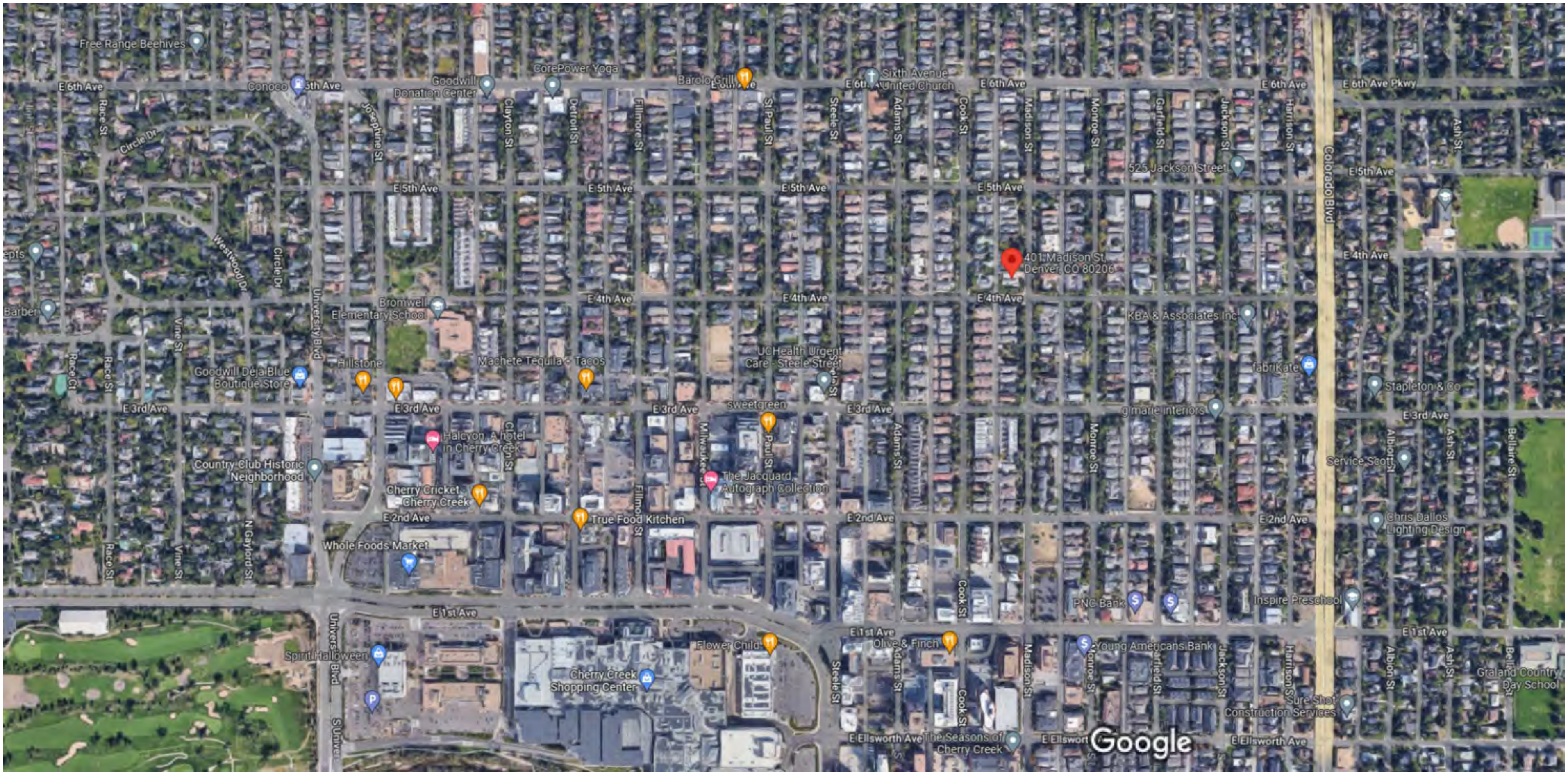

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401 Madison St, Denver, CO 80206

Photos