CASBA TIMELINE OF STRAW & NATURAL BUILDING MILESTONES

CASBA & PUBLICATION MILESTONES

MATERIAL TESTING & CODE MILESTONES

1880's

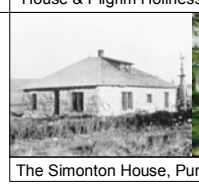
Straw Bale Construction is invented! Derived from the historical sod houses built by settlers in the wider region, blocks of straw took the place of stacked sod thanks to the sandy soils in the aptly-named Sandhills of Nebraska and the recently-invented baling machine. Reports of an early hay bale school house being eaten by cows leads to protecting straw walls with mud / clay plaster. Examples of this early building system can still be found standing today, and plaster over straw remains a typical build-up in contemporary straw bale construction

1880's-1930's

1925

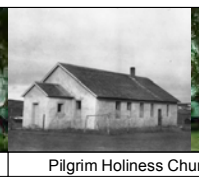
Straw as a building material has passed one test that can't be run in a lab, the test of time. Thanks to early efforts of settlers in Nebraska, we have examples of load-bearing straw bale structures from the 1920's that are still standing today, many w/ original wheat straw bales and "gumbo mud" plaster still intact, showcasing the durabilty and longevity of straw bale buildings. Two examples that can be visited today, the Simonton House & Pilgrim Holiness Church are pictured then & now below.

1928



The Simonton House, Purdham, Nebraska [1925]







Pilgrim Holiness Church, Arthur, Nebraska [1928]

1970's

"A Round House of Straw Bales" by Bob Doolittle in Mother Earth News (https://tinyurl.com/yn7u3bmm) — **1973**

Lloyd Kahn's book Shelter includes an article 'Baled Hay' by Roger Welsch, highlighting the historical buildings made of baled hay in the late 1800s in Nebraska where 'straw bale building' was born.

1979

"Hay Houses & Straw Buildings" by Mother Earth News editors (https://tinyurl.com/3t46p553) — **1981**

1980's



Inspired by the Shelter article, architect Jon Hammond builds a straw bale-insulated house in Winters, California. Its publication in Fine Homebuilding Magazine sparks the modern straw bale building movement, with many straw bale buildings constructed during the decade, mostly in the American SW

James Kalin invites Matts Myhrman, Judy Knox, David Bainbridge, Athena Swentzell-Steen, and Pliny Fisk to Oracle, AZ to construct a temporary load-bearing straw bale building in the Nebraska-style — **1989**

1991

"Houses the Cows Would Love to Eat" by Patricia Leigh Brown is published in the New York Times

1992

The California Rice Straw Burning Reduction Act is passed, forcing Rice Farmers to find alternative methods of disposing of their straw waste

Matts Myhrman & Judy Knox found The Last Straw Journal in Tucson, AZ — **1993**

The Straw Bale House by Athena Swentzell Steen, Bill Steen & David Bainbridge — **1994**

Build It With Bales: A Step-By-Step Guide to Straw-Bale Construction by Matts Myhrman and Steve MacDonald

1990's

1995

CA Assemblyman Byron Sher spearheads effort to help rice farmers find markets for their straw, CA State Guidelines for Straw Bale Structures (AB1314) is passed. These are voluntary, and must be adopted at the local level before being utilized or enforced. In CA, this is the closest thing to a straw bale 'Building Code' that exists.

The California Straw Building Assoc. (CASBA) is formed after a chance meeting of like minds at a Natural Building Colloquium in New Mexico and the plane ride home. Turko Semmes, Greg McMillan and Christopher Prelitz call the first meeting at a motel on the Carrizo Plain of San Luis Obispo County — **1996**

1996

CA Health & Safety Code HS18944.30 - Guidelines for the construction of Straw Bale Structures, effective Jan 1

Build It With Bales: A Step-By-Step Guide to Straw-Bale Construction V2 by Matts Myhrman and Steve MacDonald — **1997**

1997

Napa County, CA and the Tucson-Pima County region in AZ adopt the first official straw bale codes

Austin, TX and the State of New Mexico adopt straw bale building codes

Pamela Wadsworth-Goode & Kelly Lerner assemble CASBA's Building Officials' Guide to Straw-Bale Construction, a compilation of testing data, structural / moisture / fire info and other subjects to assist officials in permitting & inspecting straw bale buildings

CASBA hosts the First International Straw Building Conference in San Francisco, CA. Organized by members Ann Edminster and Bruce King, it is attended by over 120 straw bale building experts from around the world

CASBA publishes A Straw Bale Construction Sourcebook, a book of straw bale details and construction methods. The effort is led by architect, professor and straw bale pioneer Ken Haggard with many members contributing — **1999**

2000

2001

A straw bale seismic & moisture testing program is initiated with a Calif. Dept. of Food & Agriculture grant and contributions from CASBA fundraising. The $250,000 effort was led by CASBA member Bruce King, PE., with help from other members including engineers Mark Aschheim, David Mar and Kevin Donahue, architects Kelly Lerner and Dan Smith, and contractor Tim Owen-Kennedy and his company Vital Systems

Paul Lacinski & Paul Bergeron write Serious Straw Bale: A Home Construction Guide for all Climates, published by Chelsea Green — **2001**

2000's

Daniel Chiras writes The Natural House, a complete guide to healthy energy-efficient, environmentally-sensitive homes, with a chapter on straw bale

2002

After a two year concerted effort led by architect Martin Hammer, with the help of Bruce King and Dan Smith, California Senate Bill 332 (SB332) was signed by Governor Gray Davis. This Bill revised the previous California Guidelines because they contained 'requirements that . . . were either unnecessary or detrimental.'

Bill & Athena Steen write Beauty of Straw Bale Homes, published by Gibbs Smith — **2003**

Catherine Wanek write The New Strawbale Home, published by Gibbs Smith

2004-2007

Martin Hammer and other members worked diligently on 'Appendix L - Straw Bale Construction,' a proposed appendix which would officially incorporate straw bale into the California Building Code. After numerous disappointments, they turn their sites to the International Residential Code instead

Bill & Athena Steen write Small Strawbale, published by Gibbs Smith — **2005**

Chris Magwood & Peter Mack co-author More Straw Bale Building: A Complete Guide to Designing and Building with Straw, published by New Society Publishers. This covers the entire process of building a straw bale structure; from developing plans, code compliance, building details, construction methods, financing and zoning issues

Design of Straw Bale Buildings written by Bruce King; published by Green Building Press — **2006**

2006

Bruce King and his Ecological Building Network receive a grant from the Ayrshire Foundation and contributions from CASBA to fund ASTM E119-05a fire testing, an important step in the official testing requirements needed to satisfy building, lending & insurance officials. An earth plastered wall passes with a 1 hour rating, and a lime-cement plastered wall receives a 2 hour rating

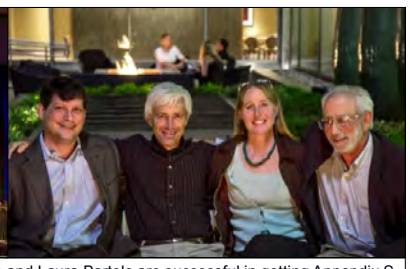
Ken Haggard and Polly Cooper co-author Fractal Architecture: Design for Sustainability, published by Booksurge — **2007**

Wayne Bingham & Colleen Smith write Strawbale Home Plans, published by Gibbs Smith

2012

The International Straw Builders' Conference (ISBC) takes place in September in Estes Park, Colorado. Hosted by the the Colorado Straw Building Association (COSBA, now part of the Natural Building Alliance)





2013

Martin Hammer, David Eisenberg, Mark Ascheim and Laura Bartels are successful in getting Appendix S - Strawbale Construction approved for inclusion in the IRC. ICC votes to adopt Oct 4, 2013



2010's

2015

Appendix S - Strawbale Construction appears in the 2015 IRC for the first time

CASBA's 20th Anniversary Conference is held on the Carrizo Plain with Bill & Athena Steen as keynote speakers…of course we brought a trebuchet — **2016**

2016

California Housing and Community Development (HCD) adopts Appendix S for mandatory statewide use in the 2016 California Residential Code (CRC). Appendix R - Light Straw-Clay is included for voluntary local adoption. Over a decade of CASBA-supported, building code-related work pays off - building a residence with straw bales no longer requires filing an Alternative Methods & Materials Request to get a building permit in California and several other states!

CASBA director, David Arkin, writes '*Fire-Resistive Strawbale Walls Survive North Bay Wildfires*.' Published in several places, including an article in Fine Homebuilding, it helped establish strawbale construction as a recognized fire resilient building material. Fire resistance becomes an annually-discussed topic at conferences going forward — **2017**

Bruce King authors New Carbon Architecture: Building to Cool the Climate, that makes the case for bio-based buildings being an opportunity for carbon storage



CASBA sponsors publication of a Straw White Paper, written by Massey Burke, covering how carbon is sequestered in plants and soil in regenerative systems. This illustrates the need for a straw LCA and EPD, work which CASBA and others continue to support. — **2018**

CASBA publishes Straw Bale Building Details: An Illustrated Guide for Design & Construction. Jim Reiland, Lesley Christiana and Rebecca Tasker help bring this true collaboration with dozens of member contributions across the finish line after 12 years of production — **2019**

2020

Martin Hammer, Anthony Dente, John Fordice and others are successful in getting Appendix AU - Cob (Monolithic Adobe) approved for the 2021 IRC

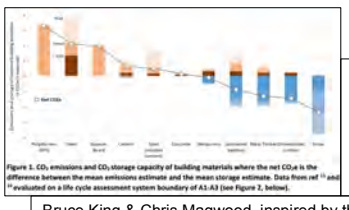


Figure 1. CO_2 emissions and CO_2 storage capacity of building materials where the net CO_2e is the difference between the mean emissions estimate and the mean storage estimate. Data from ref [1] and [2] evaluated on a life cycle assessment system boundary of A1-A3 (see Figure 2, below).

The Department of Energy, ARP-E (Advanced Research Projects) solicits grant applications for Carbon Storing Materials, including a graph showing carbon emissions associated with traditional building products compared with bio-based building products that store carbon. For the first time, the US Federal Government acknowledges straw as the best building material to minimize the carbon footprint of a building. — **2022**

2020's

2022

Appendix AU - Cob (Monolithic Adobe) appears in the 2022 CRC, but only for voluntary adoption by local jurisdiction. Updates appear in the Strawbale and Light Straw-Clay Appendices, now titled Appendix AS and Appendix AR respectively.

Bruce King & Chris Magwood, inspired by the increasing commitment to reduce our carbon footprint in the built environment and Massey's white paper publish Build Beyond Zero: New Ideas for Carbon-Smart Architecture

Verdant Building Products / Verdant Panel incorporates with grant money from the DOE, joining several other straw panel startups across North America and the world — **2023**

After hiring a consultant to begin an insurance-focused project to tackle underwriting, CASBA is proud to take part in UC Davis's first WiReS (Wildfire Resilient Structures) Conference, bringing Scientists, Researchers, Academics, Fire professionals, Insurance professionals, Community Leaders , Builders, etc... together for the first time to network on cross-disciplinary solutions for wildfire safety in the built environment

2024

CBSC approves revisions to Straw Bale Appendix, now named Appendix BJ, including acknow- ledging the "BOEBS" (Bales on-end between studs) system that uses plywood sheathing for lateral resistance. Light Straw Clay Appendix, now Appendix BI, and Cob (Monolithic Adobe), now Appendix BK, are adopted into the upcoming 2025 CRC

The Palisades / Eaton Fires in January, 2025 reignites a conversation around fire resistance and local availability of natural building materials. CASBA creates a Fire Rebuild Toolkit committee that gathers and collates testing data, builders, straw growers, code information and makes it available online for free with the hope of encouraging as much rebuilding with natural materials as possible — **2025**

CASBA launches a hands-on Professional Course in Straw Bale Construction in August 2026, in Cottage Grove, OR, to train the next generation of builders of straw and natural building materials — **2026**

CASBA's 30th Anniversary conference is held in conjunction with Cal Poly San Luis Obispo. The conference is held at El Rancho Chorro and Cal Poly's campus but a contingent of founders and new members returned to the Carrizo Plain to toast CASBA's enduring legacy, still spreading straw and natural building gospel after 30 years, and reinvigorated with a new generation of enthusiasts and cross-polination with like-minded organizations