

# Southwest Guide to Masonry

## Our Purpose

### BUILDING A STRONGER FOUNDATION FOR ARIZONA'S MASONRY INDUSTRY

The Arizona Masonry Council, Inc. (AMC) established in July of 2018 is a non-profit formed with the overall goal of promoting the interests of the concrete masonry industry in Arizona.

Our mission is to create significant and lasting positive change for the Arizona masonry industry and to reinforce that our systems provide the premier building envelope solution in the minds of public and private owners, developers, architects, engineers, general contractors, and the general public.

AMC represents and supports both Masonry Contractors and Block Producers in Arizona. AMC focuses on four main pillars:

- + Education & Promotion
- + Workforce Development
- + Building Code & Material Standard Advocacy
- + Government Relations

LAST Architects is a partnership formed by a shared belief in the potential of the built environment to uplift the lives of its inhabitants. With over 25 years of combined experience, Brad Lang and Eric Sterner established LAST as a practice dedicated to civic life and the public realm. Through a commitment to place-making rooted in a research-focused, collaborative, and performance-based approach, LAST seeks integrated design solutions in service of community and collective memory.

- + **LAST promotes a process of engagement**, facilitating conversations between all project constituents
- + **LAST distills disparate sets information**, from cultural & historical to financial & legal into cohesive project frameworks
- + **LAST reveals, discovering design solutions greater than our preconceptions**, devised to amplify meaning and clarity

At LAST, sustainable solutions are inherent to our process – with each project, we strive for meaning and purpose derived from the opportunity of place – designed to last, to the last detail, for a lasting impact.

## Executive Summary

### purpose + approach

*The Southwest Guide to Masonry is a comprehensive investigation of masonry and how its properties compare to other building materials across a range of considerations - labor and life-cycle costs, aesthetics, maintenance and durability, installation and detailing, sustainability and embodied energy, and insurance needs/ramifications, to name a handful. The purpose of the Guide is to be an evolving resource for the AEC Industry at large - targeting not only Architects, Engineers, and Contractors, but Owners, Client Representatives, and Facility Managers as well. **The document aims to provide accessible and understandable information to showcase the Total Package Value of masonry as a building material.***

# The Team

The Southwest Guide to Masonry was conceived and being led by the Arizona Masonry Council Technical Committee with LAST Architects serving as the Principal Investigators.

The 2022-23 Technical Committee members are:

- + **Canan D’Avela**, Director of Technology, Codes, Technical Sales, Concrete Products Group
- + **Dave Endres**, VP Technical Sales Superlite Block
- + **Ed Freyermuth**, Technical Consultant
- + **David Peloke**, Vice President of Operations, Masonry Division at Sun Valley Construction, Inc
- + **Paul Scott**, SE Partner, Caruso Turley Scott

LAST Architects is:

- + **Eric Sterner**, Co-Founding Principal
- + **Brad Lang** AIA, Co-Founding Principal
- + **Justin Trexler** AIA, Architect

# Exhibit

## Table of Contents

Working together with the Arizona Masonry Council Technical Committee, the below table of contents were derived as the information necessary for a holistic and meaningful guide that will be broad in its information, but focused and detail oriented in each sub-section.

The Southwest Guide to Masonry is an evolving document, with new articles, resources, and case studies added throughout its existence. The flexible nature of the document means it can exist online as a pdf, selectively printed as a pamphlet, or eventually bound as a book.

## Table of Contents

### HISTORY

- Origins +
- Vernacular +
- Contemporary +

Technical resources will go beyond standard shapes and bonds and address sustainability issues related life-cycle cost and energy, to budgetary performance both short and long-term.

### TECHNICAL

- Standards +
- code -
- Products +
- Resources +
- Sustainability +
- Cost +

Case Studies will be the premiere showcase for groundbreaking masonry work across the southwest. Case Studies will combine technical and aesthetic information with manufacturer and construction testimonials. The aim is to personalize the work capturing all aspects of its production and execution closing the gap between disciplines.

### CASE STUDIES

- Block +
- Brick +
- Stone +
- Veneer +
- Gabion +

Reference materials to include Design-Assist options, tradespeople, manufacturers, etc. in a single location, with the goal to reinforce AZ Masonry Council’s Southwest Guide to Masonry as the first stop for anyone seeking information.

### EDUCATION

- Institutions +
- Workforce Development +
- Promotion +

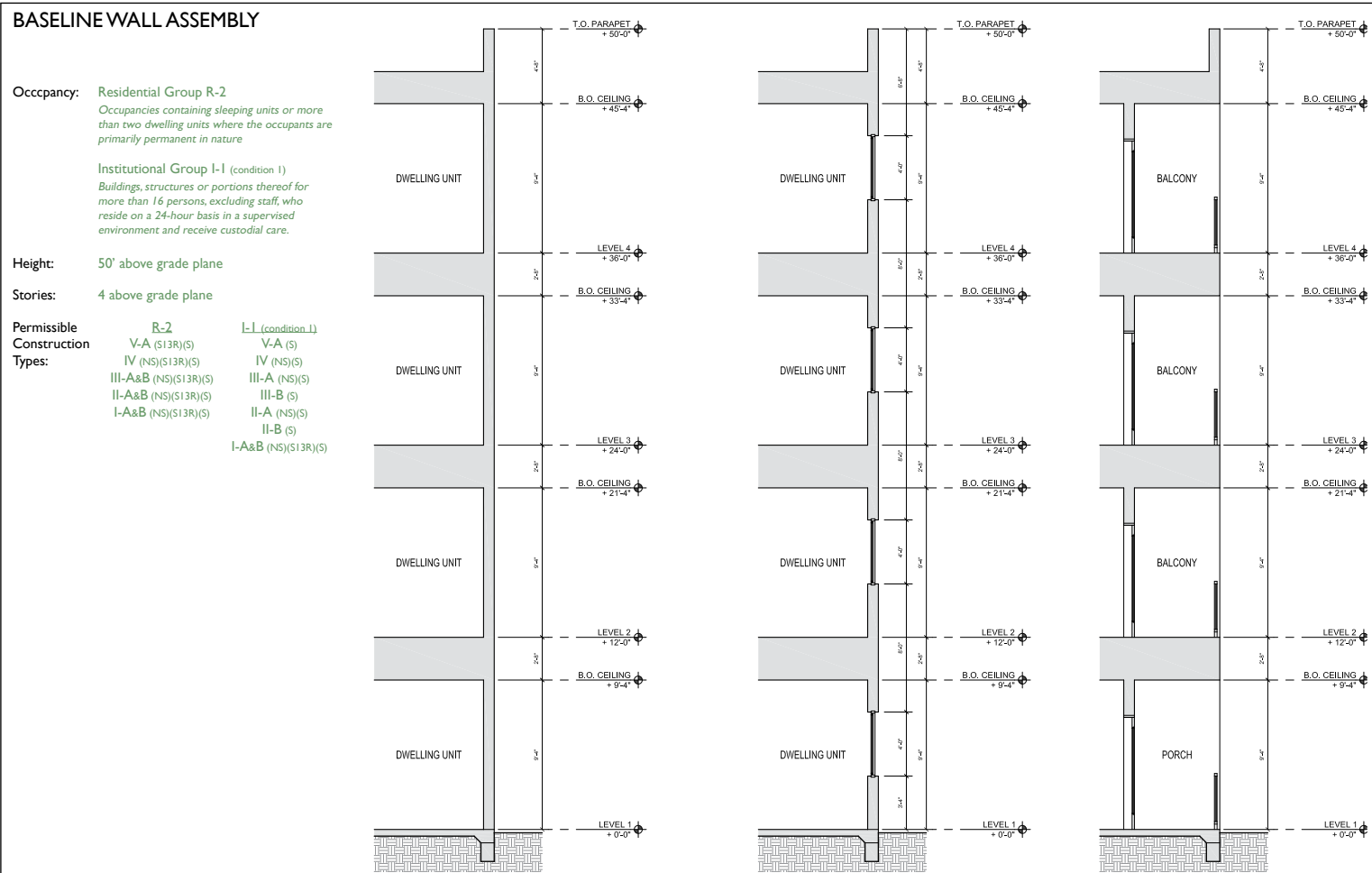
### REFERENCE

- Manufacturers +
- Suppliers +
- Contractors/Masons +
- Architects/Designers +
- Government +
- Bibliography +

# Exhibit

## Baseline Assembly and Comparison

In order to contextualize the various properties and conditions of masonry, the Guide adopts a comparative analysis methodology using a common baseline wall assembly. The wall assembly proposes a standard 4-story, multi-family structure with balcony. The multi-family model was chosen as the Guide's initial departure point given the growth of the southwest region and the current need for housing. From this common organization and assembly, various structural and enclosure pairings will be examined.



### How will the "Baseline Assemblies" be evaluated?

Through comparison of systems and materials, the above baseline assemblies will be examined and compared to and against the assemblies listed on the right that highlight framing and cladding, concrete, various forms of masonry and stone applications and metal panel. Common to the Southwest, these assemblies comprise most of the existing and new buildings in the area. It is the goal of the comparison not to highlight just the positives, but reveal where some applications render greater success as defined by several parameters discussed in the next section of the guide.

### COMPARATIVE ASSEMBLIES

systems + materials

#### FRAMING CLADDING

- + Cement Plaster
- + Metal Panel
- + Fiber-cement
- + Brick Veneer

#### MASONRY & STONE

- + Thin Cast Stone Veneer
- + Brick Veneer

From:  
<https://www.masoncontractors.org/pdf/Choosing-the-Right-Masonry-System-for-your-Budget.pdf>

- + Brick Veneer over a Reinforced Brick Bearing Wall
- + Brick Veneer over a Concrete Block Bearing Wall
- + Brick Veneer over a Steel Stud Structural Wall
- + Concrete Block Veneer over a Steel Stud Structural System
- + Brick Veneer over a Wood Stud Structural Wall
- + Concrete Block Veneer over a Wood Stud Structural System
- + Brick Single-Wythe Bearing Wall
- + Concrete Block Single-Wythe Bearing Wall

#### CONCRETE

- + Insulating Concrete Forms

6 construction steps in 1 simple package.

- + Precast Concrete Wall Panels
- + Tilt-up Concrete Panels

#### METAL

- + Insulated Metal Panels

# Exhibit

## Guide

Through comparative means through the lens of various wall assemblies, the guide will showcase not only technical information and best practices of building, but will also showcase current products and costs relative to date of publishing. Most importantly will be the "Assessment" where both pros and cons will be listed by the comparison as well as challenges and opportunities. The broadness of review allows for the readers to take points both pertinent to them but also reveal new information perhaps unknown or readily unavailable to them previously.

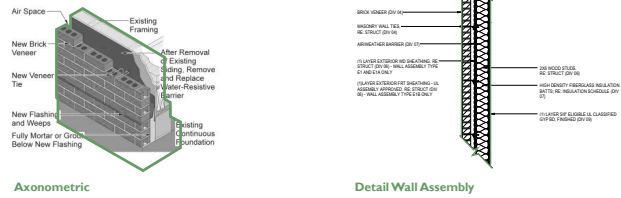
### How will the Guide communicate this information?

Through imagery, hyperlinks, text and of course case studies, the guide collects and organizes data for easy use for any type of user or during any phase of a project. The information in many cases will be monitored for accuracy as codes, pricing and products inevitably change. The ease of quickly updating hyperlinks makes the guide easily malleable for future updates.

### Will the Guide speak to the broad spectrum of approaches of using each type of assembly given the various climates in the Southwest?

Using the climate classifications given by the 2021 IECC, the Southwest uniquely has in common the fact that the warm, moist air that does approach and travel across the Southwest is converted to precipitation primarily by encountering the cold air masses that lie above the region's mountains, highlands and, to a lesser degree, high plateaus. Were it not for this dramatic topography, the Southwest would be much more of a desert than it is. That said, the various conditions that exist in the Southwest will apply to other regions around the United States and will apply on a national level. Using our Hot, Mixed, Warm and Cool dry climate designations we will evaluate each assembly with climate in mind.

## Wall Assembly | Brick Veneer over a Wood Stud Structural Wall



**Description:**  
This system gives you many of the advantages of more expensive systems with a lower cost. You still have a tough, beautiful skin and a weather-shedding cavity. However, Building Codes will not allow you to install relieving angles attached to a combustible structural system so this wall assembly cannot be used for walls over 30 feet in height.

**Notes:**

- + Be careful with window sills, flashings and weep systems. If water penetrates past the sheathing it can rot the wood studs.
- + The lintels over windows must bear on the brick veneer because it is non-combustible. They cannot be attached to the studs. This sometimes limits the size of the windows.

**Statistics:**

- + R-Value:
- + Cost (\$/sf):
- + Life Expectancy (years):
- + Embedded Energy:
- + Maintenance and Repair:
- + Quantities:

**Code Considerations:**

- + Construction Type
- + Height
- + Fire Rating/Separation

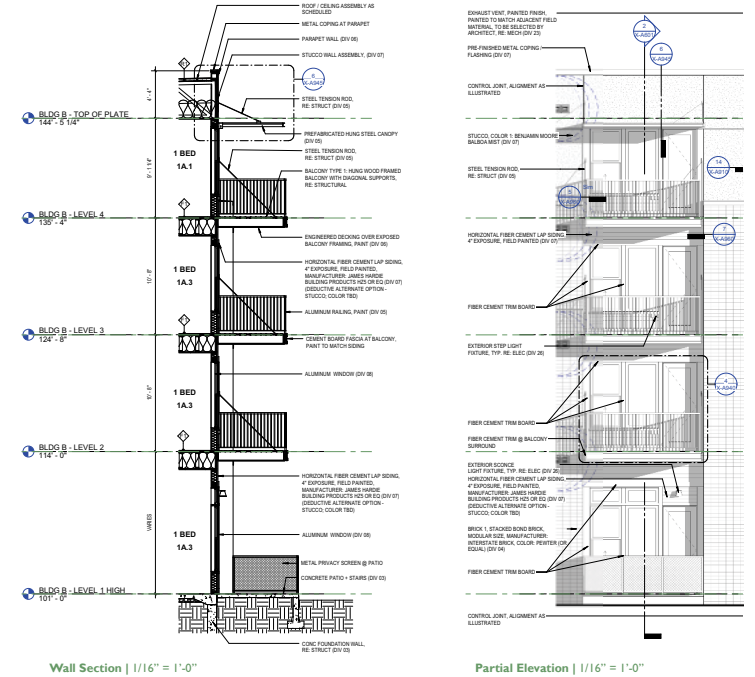
**Products:**

- + Brick
- + Insulation
- + Waterproofing



**Assessment:**  
This system gives you many of the advantages of more expensive systems with a lower cost. You still have a tough, beautiful skin and a weather-shedding cavity. However, Building Codes will not allow you to install relieving angles attached to a combustible structural system so this wall assembly cannot be used for walls over 30 feet in height.

+ Pros/Cons:  
+ Challenges/Opportunities



# WORLD OF CONCRETE PAVILION

2022



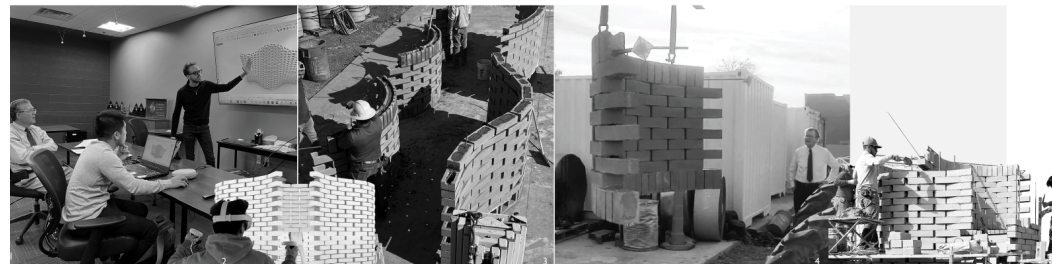
## Exhibit

### Case Study

The Case Studies will highlight thought-provoking work that reveals possibilities and clarifies our understanding of current means and methods. The Case Studies will showcase projects not only as glossy images, but tell the story of process, macro impact and micro solutions to affirm readers understanding or challenge preconceptions.

### How will the Case Studies be chosen?

Through the dynamic backgrounds of our technical committee, the Arizona Masonry Council, and a large connection with many contractors and architects in the southwest, we will seek projects internally that seek to reveal the possibilities or highlight the unique properties of masonry. The projects will be of any building type but must be located in the southwest. Additionally, the Arizona Masonry Council Southwest Masonry Awards allow for much access to some of the best projects in our area. While we will highlight many recently built projects, we also want to showcase projects that provide insight into the long-term benefits of masonry while also evaluating the ability for masonry to serve as a long-lasting material that withstands the intensities of our environment.



Images Above:  
 1 | LAST Architects and Paul Scott reviewing the digital model of the pavilion and modelled within Revit to showcase speed and design opportunities.  
 2 | Heri Escobar using 3D printers to map out potential areas of concern with the built as well as study spatial qualities.  
 3 | AMCO Masonry practicing the conventional and prefabrication wall build in their yard in Phoenix.  
 4 | Paul Scott reviewing the prefabricated panel lift.  
 5 | Moroni Mejia and the masonry team at World of Concrete 2022 taking the pavilion on site.

## UNIFYING BUILDING METHODS

PREFABRICATED + CONVENTIONAL MASONRY CONSTRUCTION

Schedule: Design Start | August 2021  
 Construction Start | October 2021  
 Construction Completion | January 2022

Size: 20x20'

Project Team: LAST Architects | Eric Sterner, Brad Lang, Van Escobar  
 Hobbs Masonry | Moroni Mejia, David Esquivel  
 Sutter Masonry | Mike Gray  
 Journeyman Masonry | Jacob Brooks  
 Caruso Turley Scott | Paul Scott  
 Arizona Masonry Council | Cassie Mejia, Dawn Rogers

### How will the Case Studies be showcased?

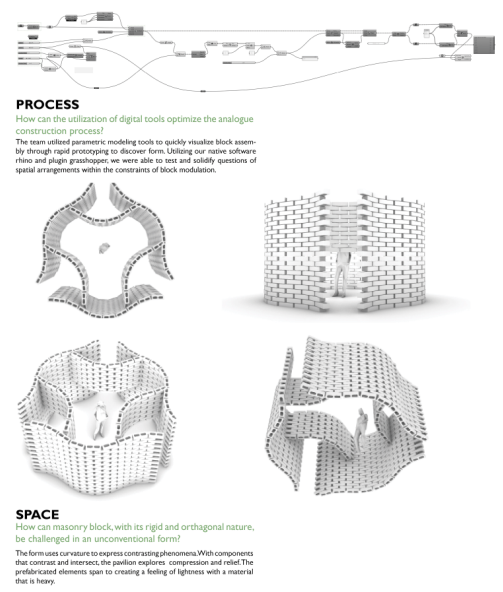
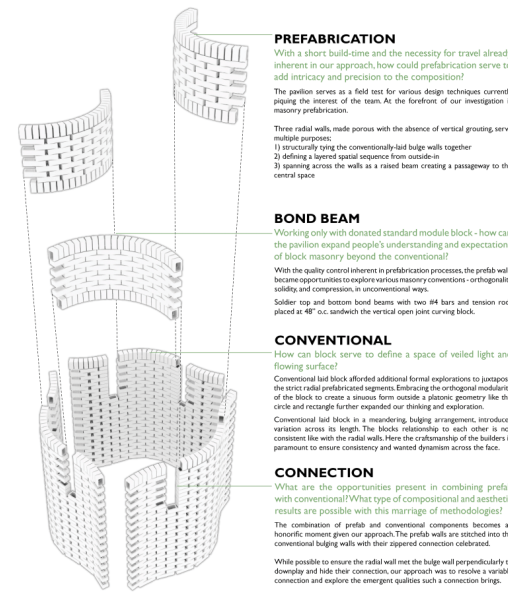
Through both digital and printed means, the Case Studies will be showcased both as standalone projects highlighted in the Southwest Guide to Masonry under "Case Studies." However, Case Studies will also serve as references to similar conditions in other topics of the book such as "History" or under the sub-section "Sustainability." While the Southwest Guide to Masonry is being assembled and created, the Arizona Masonry Council will be highlighting one project a month in their publications that are received widely via email to their members.

### Additional Case Studies already in progress:

+ Marfa House - DUST Architects



+ Jones Studio Office - Jones Studio Architects



# Question Responses

## Does the project address a major challenge facing the industry?

In the Southwest, masonry is seeing a shrinking market share in major markets like housing. The reasons for this change are many – more building system options, evolving performance goals, both short-term and long-term by owners and developers, and a general perception surrounding the accessibility and viability of masonry as a uniquely high-end product. **The Southwest Guide to Masonry is conceived to deal with this challenge on multiple fronts with a one-stop source for both technical, and inspirational masonry content.**

The industry is unarguably robust, with a lot of available information. However, the industry is often challenged by the accessibility and presentation of the information, creating a narrower audience for its message. **The Guide’s fundamental purpose is to be a broad resource for all stakeholders in the AEC industry – not just Architects and Contractors, but Owners, Client Representatives, and Facility Managers to present masonry as a potential solution in the early decision-making window of projects.**

## Are the goals and objectives and the plans and procedures for achieving them well-developed, worthwhile, and realistic?

The goal is to develop a Southwest Guide to Masonry with the objective to raise awareness and market share for masonry across the region. What could be seen as a formidable task becomes less so when broken down into its constituent parts. **The Guide is composed of two foundational research types – the Comparative Analysis and Case Studies.** Each is then supplemented by interviews, featurettes, product resources, etc. The component pieces guard against what is often a tripping point for major research initiatives – unrealistic deliverables.

For instance, as the more quantitative Comparison Analysis is being prepared, quarterly Case Studies are being delivered and shared. The work does not remain hidden for long stretches of time. The goal achieving strategy of a consistent roll out of sections and content keeps the research moving and fresh, allowing the team to address current industry issues and relevant projects as they arise.

**Please Note:** as of the time of this submission we have a complete Case Study, with multiple ones in various stages of development. (see “Exhibit - Case Study Example”)

## Is the project informed by research in teaching and learning, current issues, what others have done, and relevant literature?

The Southwest Guide to Masonry was conceived as the next evolution in Masonry understanding and promotion. We are not starting from scratch and are building upon industry knowledge and previous efforts to not only inform our approach, but to enhance our reach and audience.

The question regarding “what others have done” is an interesting one. Our involvement through previous design work exposed us to a similar and quite successful undertaking by another competing industry – the Tilt-up Concrete Association and their sponsored research publication: “Tiltwallism, A Treatise on the Architectural Potential of Tiltwall Construction.” We saw firsthand how this resource elevated an industry known for flat and repetitive architectural responses by expanding people’s perception of Tiltwall as a potential design solution.

While masonry’s challenges differ, the format of creating a comprehensive guide that presents more akin to an inspiration book filled with answers to the material’s most pressing and pertinent questions to decision makers looking to specify masonry in their projects.



## Does the project have the potential to provide fundamental improvements in teaching and/or learning through effective uses of technology?

We see technology as a means to overcoming the issue of access and relevancy. **Where traditional publications can stagnate, the flexibility provided by digital formats and the ease by which they can be shared, offered, and updated will be key to improving the educational mission of the Guide.** Digital formats offer other advantages as well – hyperlinking both within and to outside resources will only expand the Guide’s reach and usability.

## Question Responses continued

### Is the project supported by adequate facilities and resources, and by an institutional and department commitment?

The project has the full backing of the AZ Masonry Council who have already allocated resources to get the project started.

### What are the broader impacts of the proposed outcomes?

A broader impact inherent in the approach to the Guide is bridging the gap that often exists between various industry stakeholders. This is true especially between Owners, Architects, and the craftspeople in the field. This disconnect often comes at the expense of the project via misinterpretations or avenues unexplored. The Guide will focus on the entire ecosystem of masonry. Case studies will not only be explored through the Owner, Architect, and Contractor, but also the suppliers and masons themselves.

**Opening communication between all parties will be one of the more impactful outcomes of the Guide.**

### To what extent will the results of the project contribute to the improvement of the masonry industry as a whole?

The SW Guide to Masonry will result in a greater understanding as to the Total Value Package of masonry use in building projects. From this understanding, additional project opportunities will come. And those opportunities will be better informed from both an artistic and technical lens.

+ The guide will support strengthened dialogue across disciplines and encourage more engagement and input from masons during the early stages of project conception and development.

+ Case Studies will showcase the amazing work coming from the region, inspiring others to use masonry as a focal material for their projects in smart and creative ways.

### Are the plans for evaluation of the project appropriate and adequate?

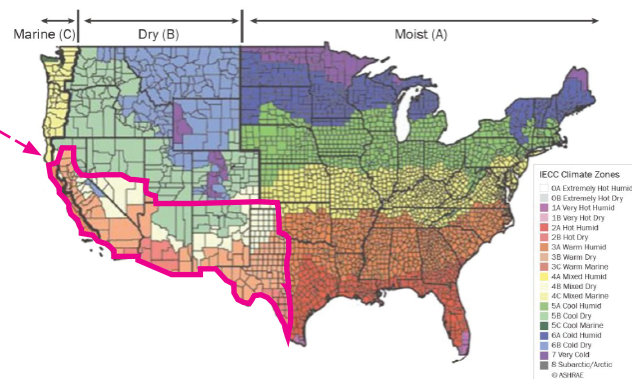
With quarterly deliverables, the Southwest Guide maintains its accountability through the life of the Grant. Quarterly evaluations for multiple points of engagement and feedback so we will continue to refine the work with our successive efforts.

### Are the results of the project likely to be useful nation-wide?

Building systems, especially enclosure systems perform at their peak when designed for the climate they inhabit. For this reason, the SW Guide to Masonry has a regional focus based on 2021 IECC Climate Zones

- + 2B; Hot Dry
- + 3B; Warm Dry
- + 4B; Mixed Dry
- + 5B; Cool Dry

→ Southwest



That said, the ideas and information provided will have national reach. Masonry projects from the Southwest continue to garner national interest through award programs and publications. The uniqueness of the Southwest climate informs design thinking and approaches that has historically pushed the bounds of masonry and its expression. The Southwest remains an epicenter of mason thought and experimentation and because so, maintains a national following.

## Question Responses continued

### **Is all budget information included? Is it complete and unambiguous?**

We have attempted to provide a complete and clear budget to meet the goals of the project. **The project relies heavily on the time of experts and specialists to document, organize, and present needed information.** Compensation for their time and efforts supporting the Masonry industry is needed.

### **Is the cost of the project realistic?**

As we have started the project, we come to the Masonry Foundation Grant Submittal with a clear understanding of the financial needs of the project. **With matching funds from the AZ Masonry Council, the project will have the resources necessary to carry through on the ambitious but focused nature of the project.**

### **How will the progress of the project be measured and reported?**

The Guide progress will be reported quarterly with a new Case Study and Wall System analysis available for review. **The approach we've taken is to ensure periodic updates with presentable/marketable work so there is a consistent engagement with the Masonry and affiliated AEC communities.**

### **How will the requested funds be needed, i.e., will start-up funds be needed, how are payments requested?**

Start-up funds have been provided by the AZ Masonry Council and the research project is underway. We require funding to continue our work with both the Comparative Analysis and Case Studies and are asking the funds to be distributed quarterly.