



OPEN AIR STEEL
STRUCTURES:
benefits of working
with a specialty
manufacturer

LEARNING OBJECTIVES



- Leveraging design expertise not found in the conventional design approach.
- Understanding the difference between specialty manufacturers and conventional steel fabricators.
- Reducing the landscape architect's (LA's) scope, saving time and money, yet still achieving the LA's design intent.
- Identifying which specialty manufacturer may be right for your project.



poligon®

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HISTORY



METEORS



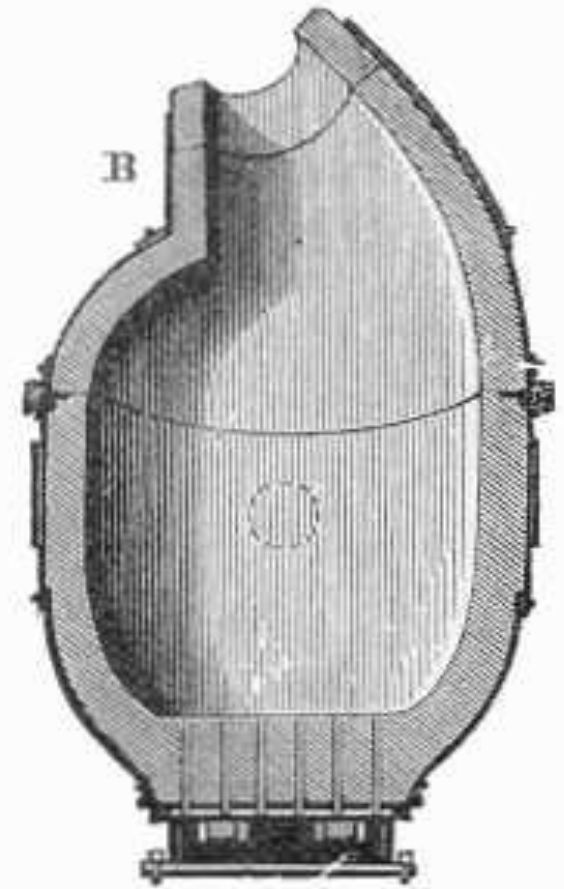
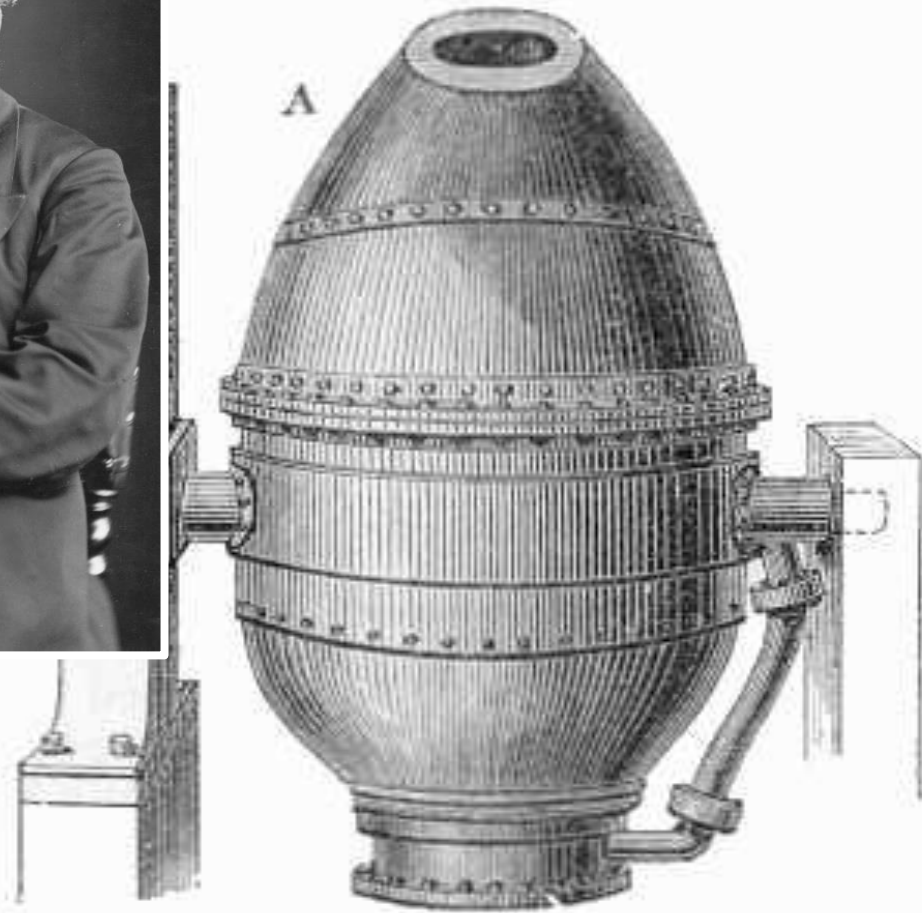
TOOLS



BESSEMER PROCESS



HENRY!!



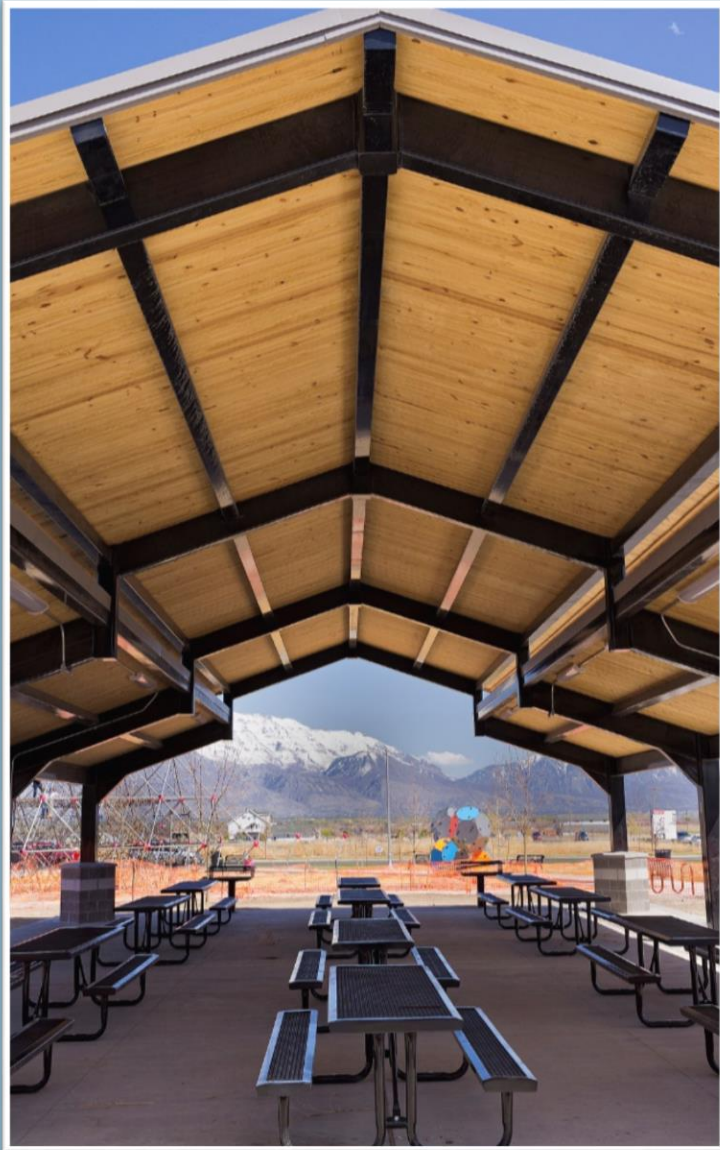
STEEL PRODUCTION



CONSTRUCTION



OPEN AIR STEEL STRUCTURES



DEFINED

Open Air (adj):

- +Exposed to the elements
- +No walls, windows, or doors

Steel Structures (n):

- +Structures in which the members are made of recycled steel (which provide LEED points for using a recycled material)
- +Joined by welding, riveting, or bolting

Open Air Steel Structures:

- +Beautifully engineered and architecturally crafted, one of a kind canopies – some with roofs, some partially covered, connected to buildings or free standing.

Specialty manufacturers have the entire process for design and fabrication

DESIGN TRENDS

Biophilic Design:

- + 'Architecture of life'
- + Designing places where we live, work, learn, and play which are connected to nature

Locations

- + Parks where people enjoy recreation & healthy activities
- + Schools where students score higher
- + Urban areas where people gather to interact
- + Communities where we know more of our neighbors

Open air steel structures provide us with a connection to nature, contributing to biophilic design.

APPLICATIONS & SECTORS



APPLICATIONS

+Parks & Recreation



APPLICATIONS

+Parks & Recreation

+Schools



APPLICATIONS

+Parks & Recreation

+Schools

+Urban Areas



APPLICATIONS

+Parks & Recreation

+Schools

+Urban Areas

+Public Spaces



APPLICATIONS

+Parks & Recreation

+Schools

+Urban Areas

+Public Spaces

+Performance



APPLICATIONS

+Parks & Recreation

+Schools

+Urban Areas

+Public Spaces

+Performance

+Rooftop



APPLICATIONS

+Parks & Recreation

+Schools

+Urban Areas

+Public Spaces

+Performance

+Rooftop

+Shade



SECTORS

+ Sports & Leisure

+ Education

+ Government

+ Commercial

+ Water Park

+ Military

+ Senior Living

+ Transportation



TYPES





Permanent roof (traditional materials)



Partial roof (trellis/pergola)



Partial roof (Parasoleil)



Permanent or seasonal roof (wood or fabric)

PERMANENT ROOF

(TRADITIONAL MATERIALS)



PERMANENT ROOF +SHINGLE



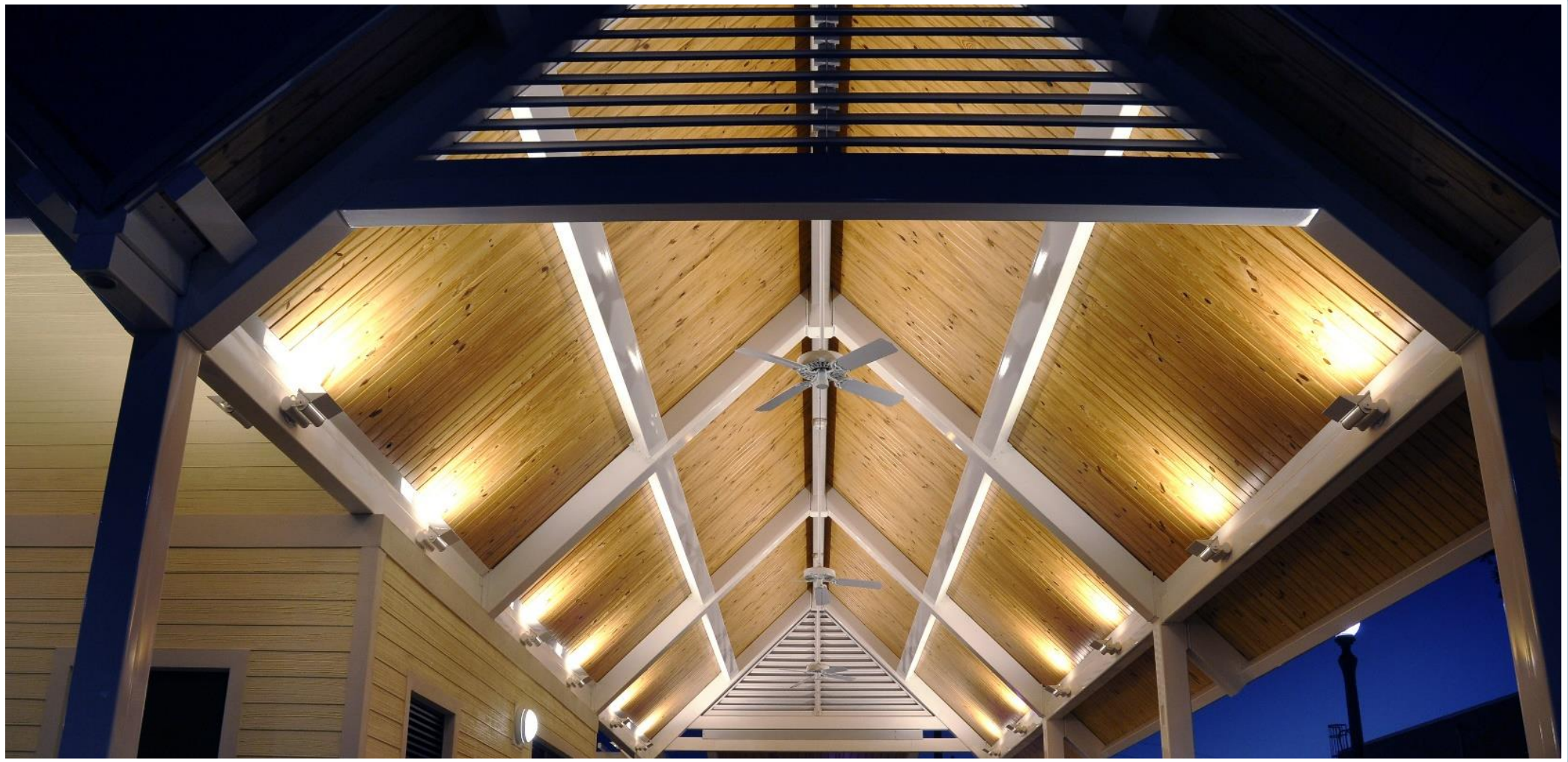
PERMANENT ROOF +METAL DECK



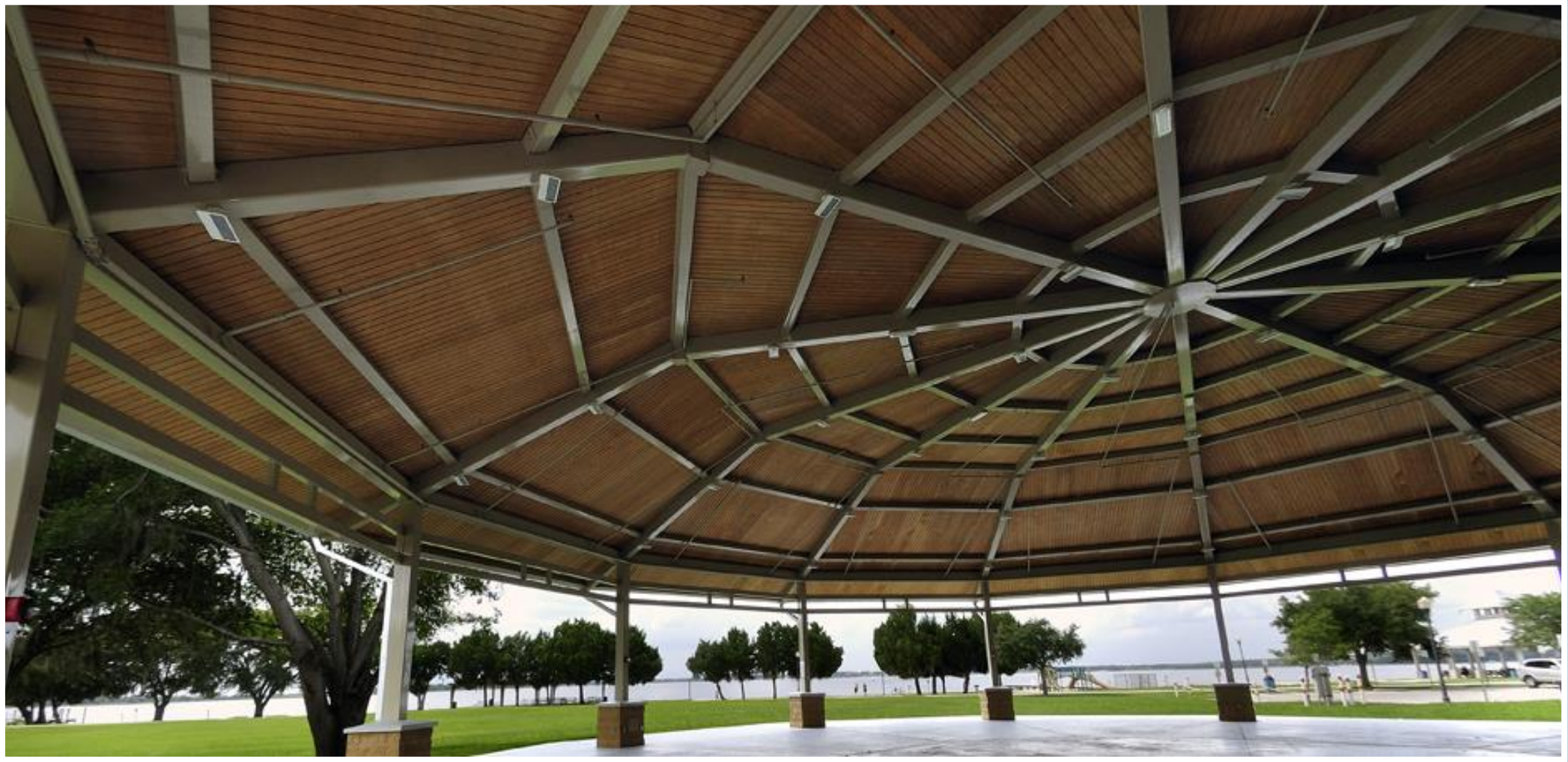
PERMANENT ROOF +STANDING SEAM



PERMANENT ROOF +TONGUE & GROOVE



PERMANENT ROOF +SIPs



PERMANENT ROOF +POLYCARBONATE



PARTIAL ROOF

(TRELLIS/PERGOLA)



PARTIAL ROOF (TRELLIS/PERGOLA)



PARTIAL ROOF (TRELLIS/PERGOLA)



PARTIAL ROOF (TRELLIS/PERGOLA)



PARTIAL ROOF (TRELLIS/PERGOLA)



PARTIAL ROOF (TRELLIS/PERGOLA)



PARTIAL ROOF (TRELLIS/PERGOLA)



SEASONAL ROOF

(SHADE FABRIC)



SEASONAL ROOF +HDPE



SEASONAL ROOF +HDPE



PERMANENT ROOF

(WOOD GLULAM)



PERMANENT ROOF +WOOD GLULAM



PERMANENT ROOF +WOOD GLULAM



UNIQUE DESIGN & CONSIDERATIONS



UNIQUE DESIGN CONSIDERATIONS

ENGINEERING

EXPOSED STRUCTURAL STEEL

SPECIALIZED CONNECTIONS

POWDER COATING

engineering

exposed
structural steel

specialized
connections

powder
coating

+Conventional:

- Walls & cross bracing resist forces



+Specialty manufacturer:

- Specialized connections of members to resist forces (wind pressure, vertical loads, seismic loads)



engineering

exposed
structural steel

specialized
connections

powder
coating

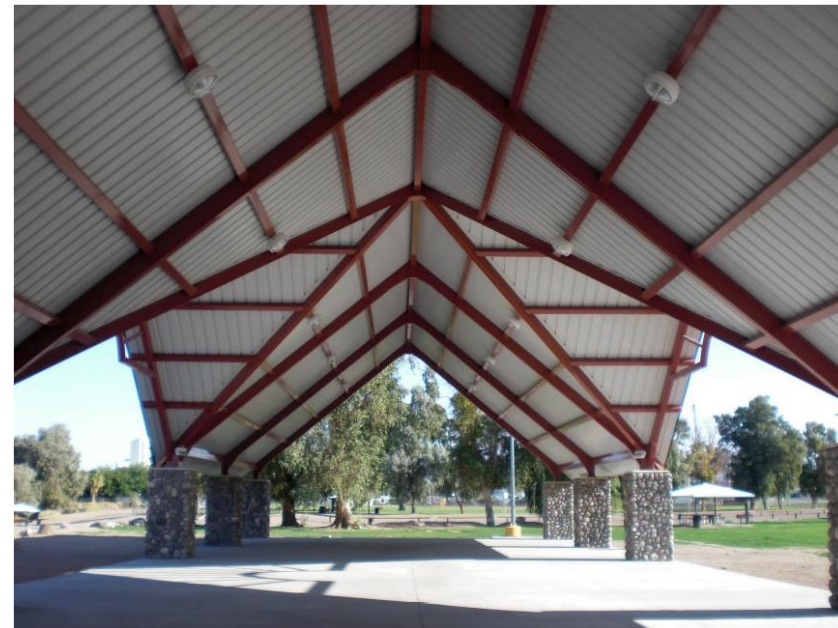
+Conventional:

- Steel is the backbone
- It's covered up
- There is no consideration for how the pieces come together aesthetically



+Specialty manufacturer:

- No cross bracing
- Same plane - no bird nesting
- Hidden connections
- Paint finish
- Utilities (wires)



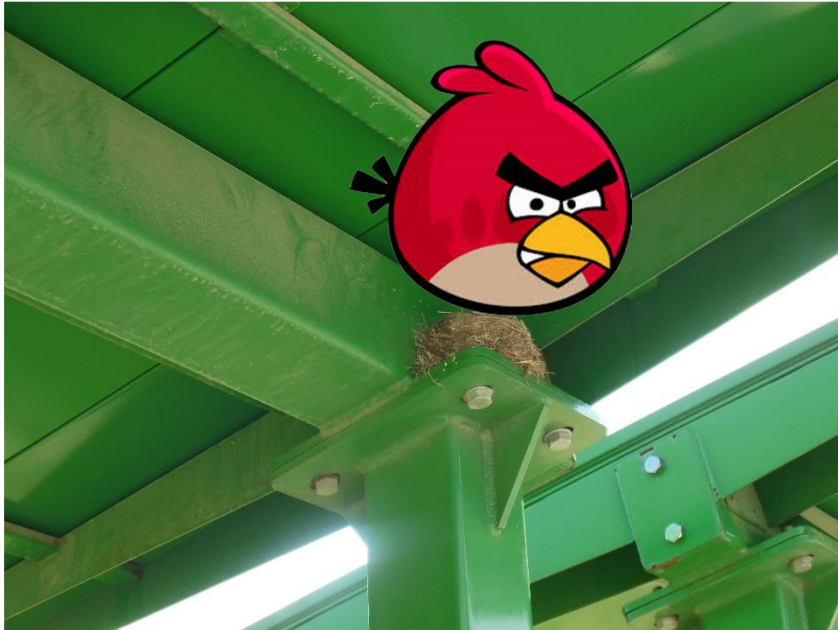
engineering

exposed
structural steel

specialized
connections

powder
coating

+Conventional



+Specialty manufacturer



engineering

exposed
structural steel

specialized
connections

powder
coating

+Referred to as “dry painting” due to the lack of liquid solvent or water in formula

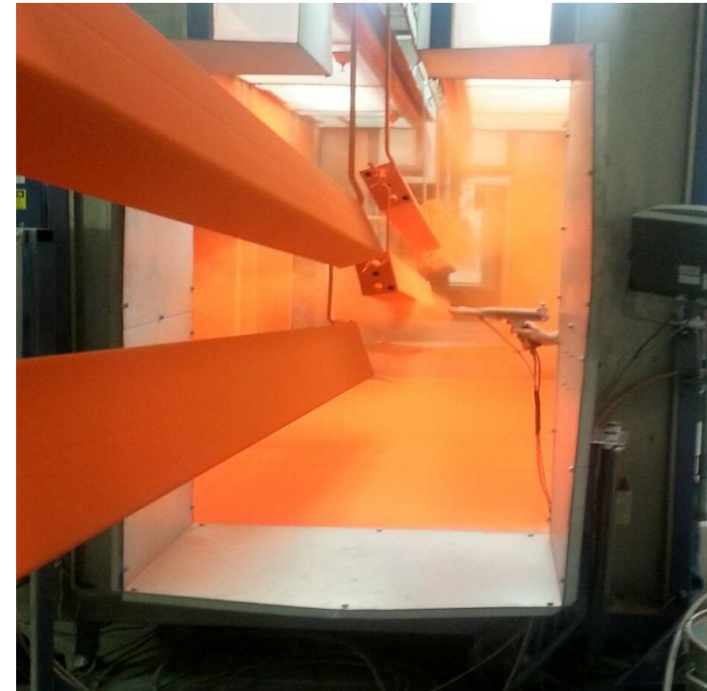
+A powder coating is made of 4 key ingredients:

- Resins
- Pigments
- Curing agents
- Additives

+Eliminates the need for field painting

+Superior performance and quality

+Environmental: little to zero VOC's released



PROCESS



design



engineer



fabricate

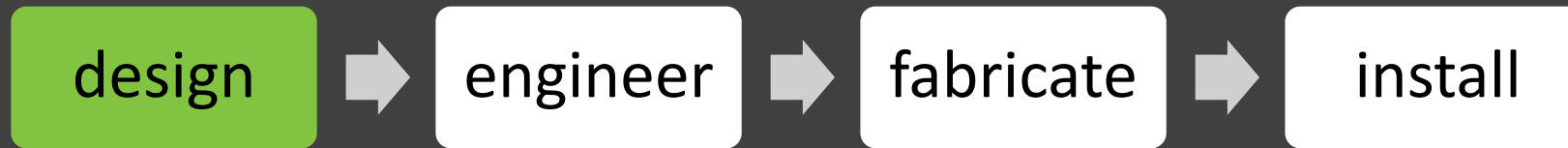


install

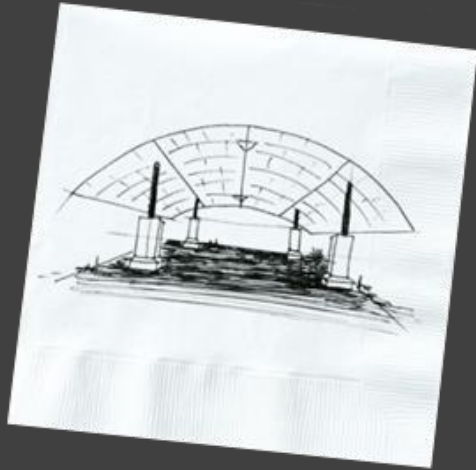
DEFI
convention

design
engineer
fabricate
install





It starts with a sketch...



A specialty manufacturer should:

- +Collaborate with landscape architect to define project requirements
- +Collaborate with other disciplines (electrical engineers, site engineers, etc.)
- +Realize the LA's vision
- +Provide dynamic pricing



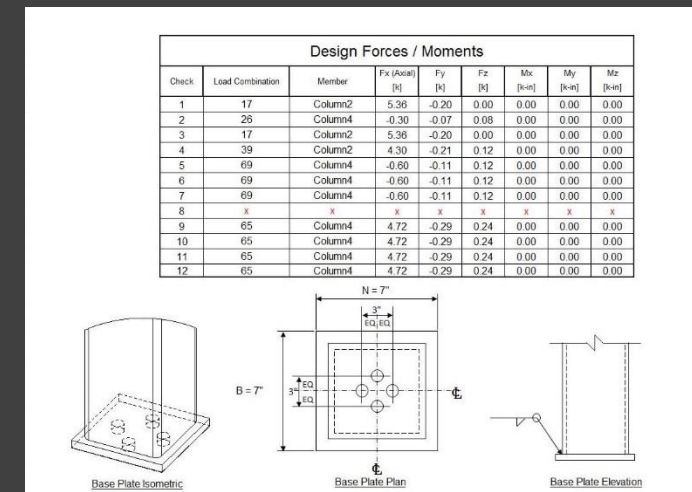
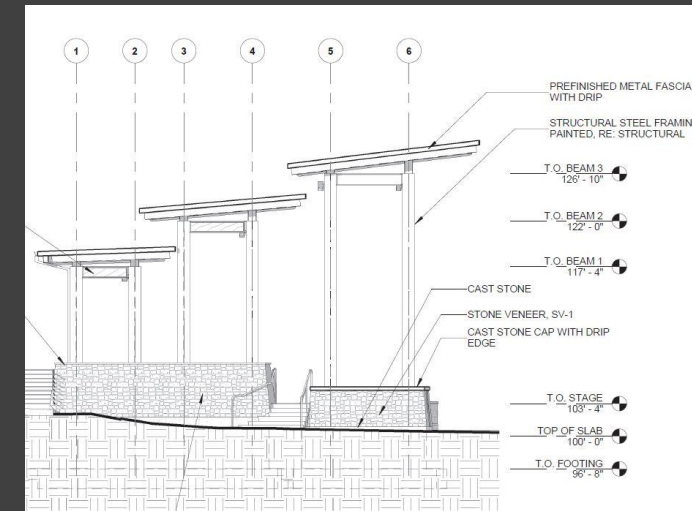


Considerations:

- +No walls or bracing
- +Everything is exposed
- +Snow, wind, seismic loads

A specialty manufacture should:

- +Provide sealed engineering documents
- +Respond to local review comments
- +Engage with building official as required



design



engineer



fabricate



install



+Welding

design



engineer



fabricate

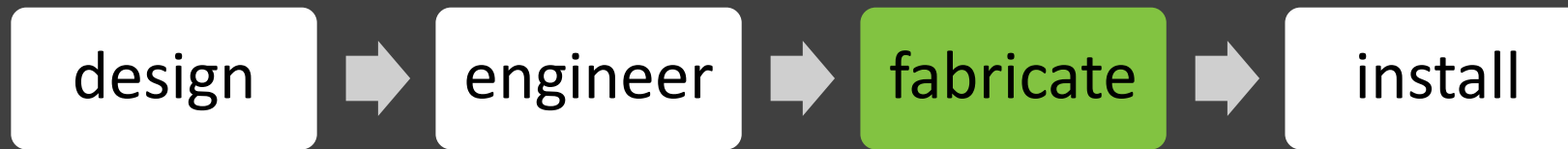


install



+Welding

+Laser cutting



+Welding

+Laser cutting

+Grinding

design



engineer



fabricate



install



+Welding

+Laser cutting

+Grinding

+Shot blasting

design



engineer



fabricate



install



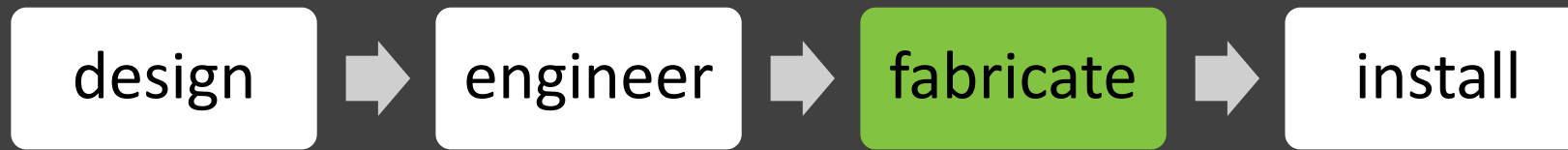
+Welding

+Laser cutting

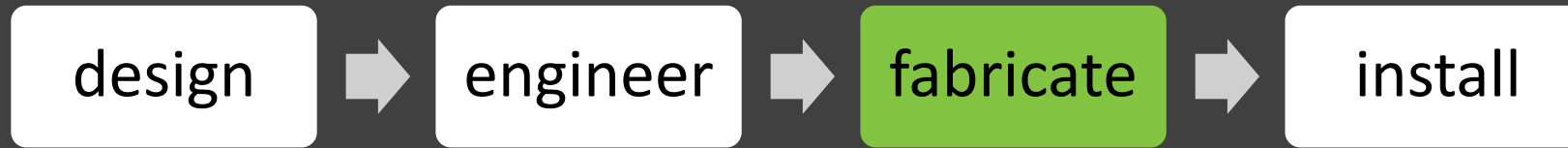
+Grinding

+Shot blasting

+Powder coating



- +Welding
- +Laser cutting
- +Grinding
- +Shot blasting
- +Powder coating
- +Quality control



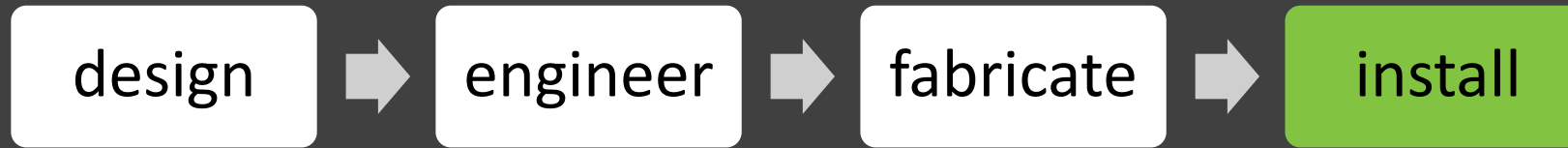
- +Welding
- +Laser cutting
- +Grinding
- +Shot blasting
- +Powder coating
- +Quality control
- +Superior finish



Combined shipment:

- +Frame
- +Roof material
- +Fasteners
- +Installation instructions





Combined shipment:

- +Frame
- +Roof material
- +Fasteners
- +Installation instructions

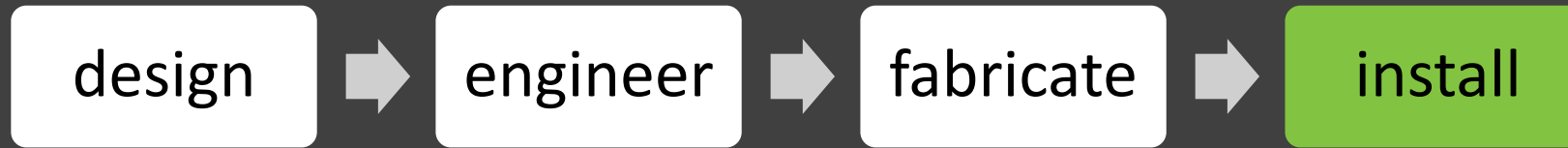
Rapid Installation:

- +Easy bolt together
- +No field painting
- +No field welding

Technical support:

- +Resolve field issues
- +Understand how structure was engineered





Combined shipment:

- +Frame
- +Roof material
- +Fasteners
- +Installation instructions

Rapid Installation:

- +Easy bolt together
- +No field painting
- +No field welding

Technical support:

- +Resolve field issues
- +Understand how structure was engineered



TIMELINE

Average Project: <6 months, Concept to Completion

+ Design 2-3 weeks

+ Engineer 4-6 weeks

+ Fabricate 10-12 weeks (includes detailing)

+ Install 1-2 weeks

CASE STUDY

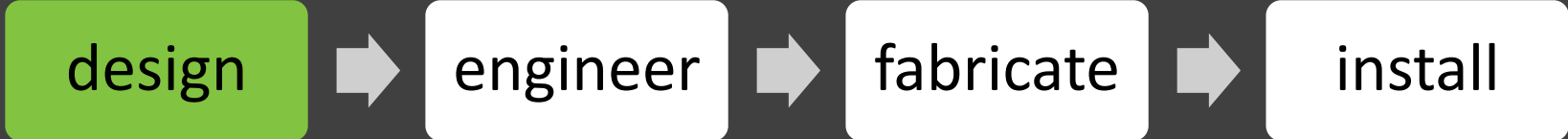


CASE STUDY: BULL HEAD CITY PAVILLION

Project Overview

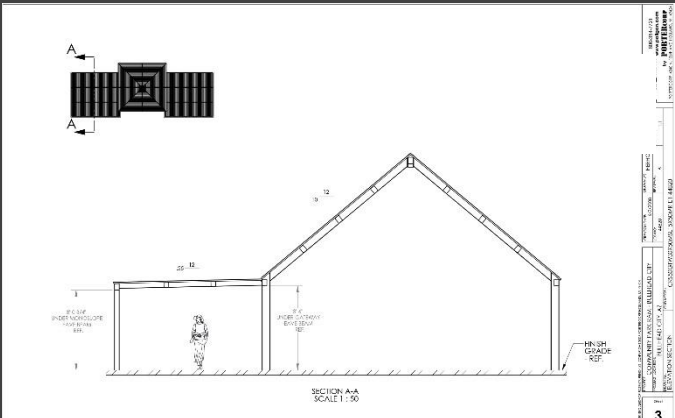
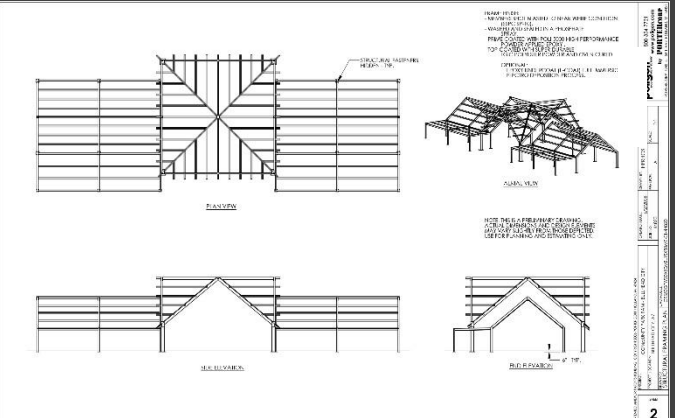
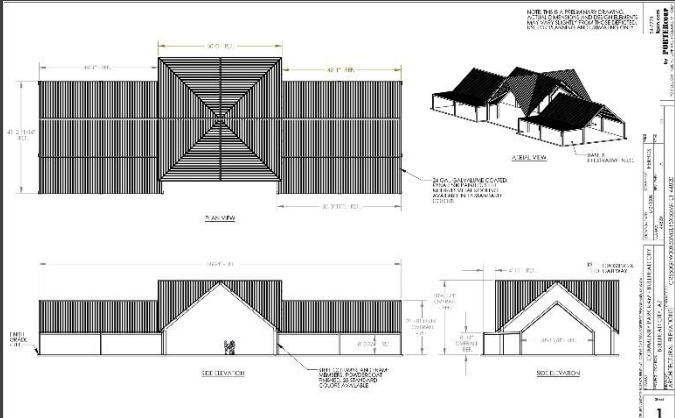
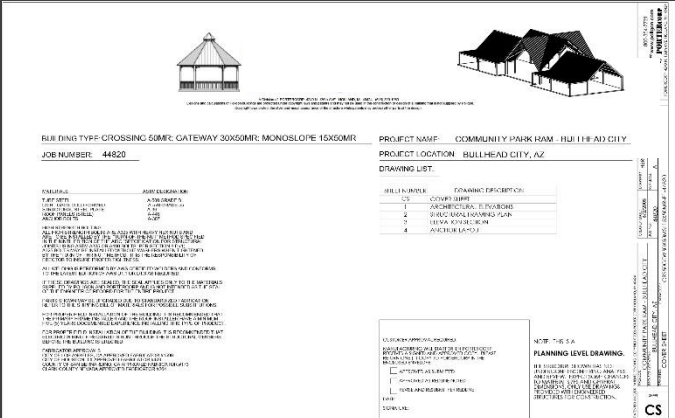
- + Application: Picnic and event center
- + Sector: Parks and Recreation
- + Location: Bull Head City AZ
- + Design Build Contract: LA, specialty manufacturer, city
- + Approximate Structure Value \$150K





+Architect provided
concept drawings

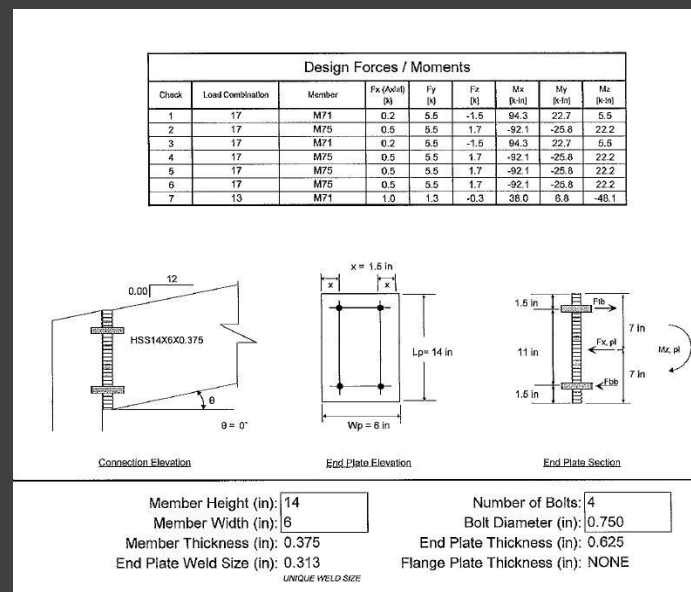
+Specialty
manufacturer
provided schematic
Drawings





11

+Specialty manufacturer created sealed calculation package



design



engineer



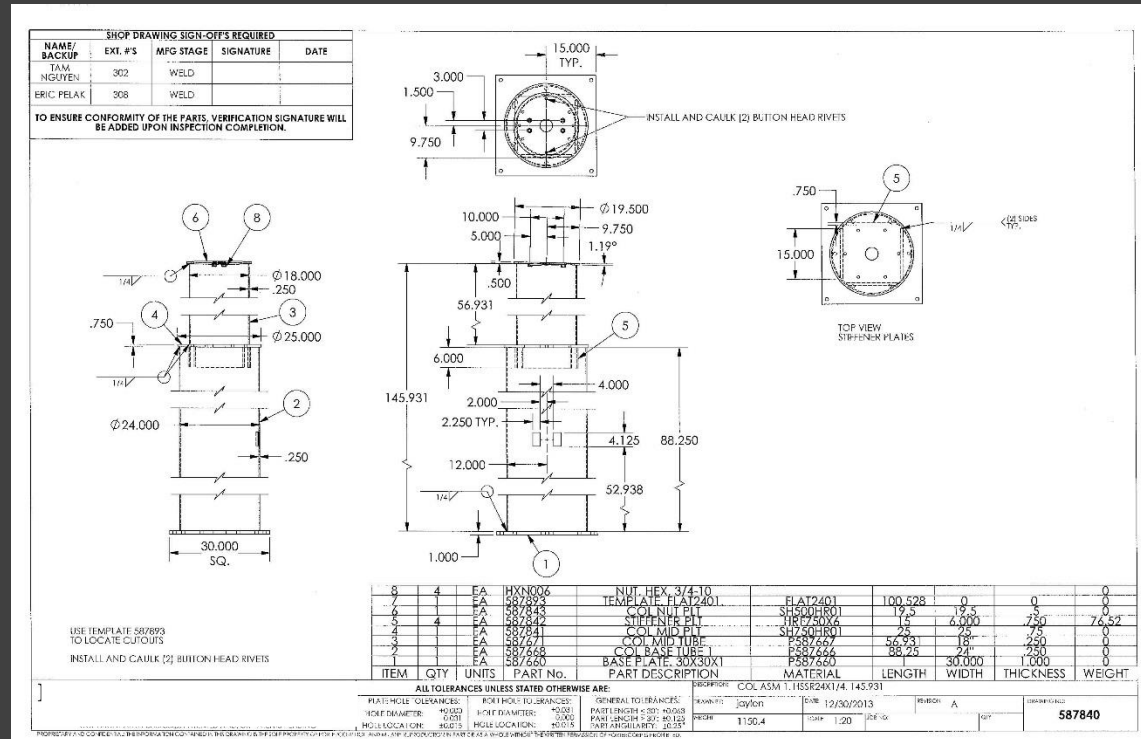
fabricate



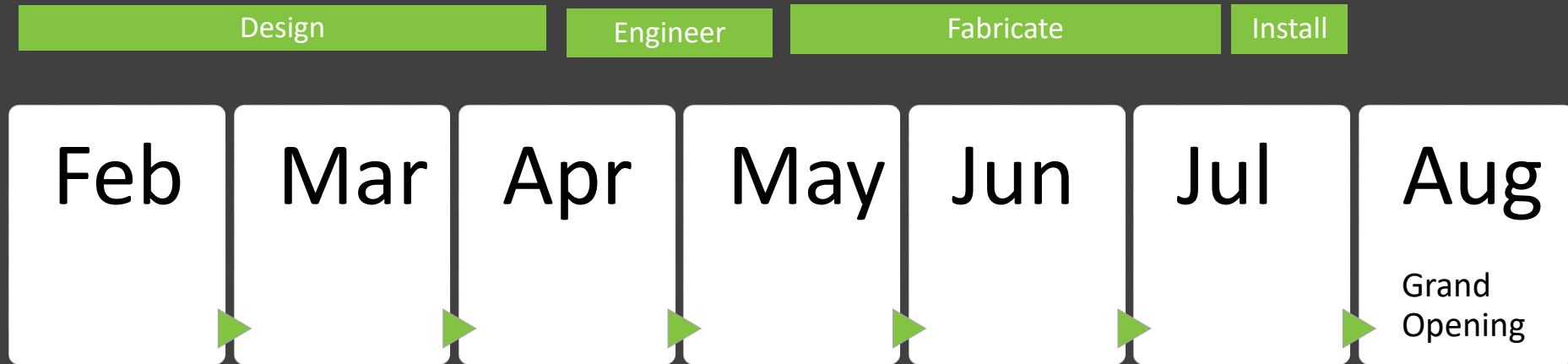
install

+No inefficient process of shop drawing approval!

+Specialty manufacturer created shop drawings



TIMELINE



INSTALLATION FOUNDATIONS



INSTALLATION SET COLUMNS



INSTALLATION EASY ASSEMBLE FRAME



INSTALLATION EASY ASSEMBLE FRAME



INSTALLATION ROOF & COLUMNS

Pre-cut roof panels



Stone wraps by others



INSTALLATION ELECTRICAL

Lights and wiring



COMPLETED PROJECT

Let the River Regatta after party begin!





IDENTIFYING THE RIGHT SPECIALTY MANUFACTURER

IDENTIFY THE RIGHT SPECIALTY MANUFACTURER

Conventional construction

- +Structural engineer
- +Architectural drafter
- +Estimator
- +Steel fabricator
- +Roofing supplier
- +Field welding
- +Field Painting
- +Welding inspection

VS.

Specialty manufacturer

+They handle it all.

Benefits:

- +Better value for money
- +Less stress
- +Peace of mind
- +Single point accountability
- +More time for other projects

IDENTIFY THE RIGHT SPECIALTY MANUFACTURER

The right questions to ask when quantifying the specialty manufacturer's capabilities:

+What materials do they specialize in?

+What is their typical project size?

+Do they seal drawings in the state where your project is located?

+What is their typical project complexity?

+Do they powder coat in house?

IDENTIFY THE RIGHT SPECIALTY MANUFACTURER

The right questions to ask when evaluating the specialty manufacturer's process:

+At what point in the process are they willing to engage?

+Do they offer free design consultation?

+Do they offer direct contact with a professional engineer?

+Do they provide dynamic pricing as the project evolves?

+Do they have a dedicated quality control department?



FRPA
**FLORIDA RECREATION
& PARK ASSOCIATION**

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