

Prefabrication in Construction

BUILDING CONFIDENCE WITH DPR



We Exist to Build Great Things.®



Company Overview

TECHNICAL BUILDERS

#1

DPR ranked No. 1 on Building Design + Construction magazine's science and technology facility contractors list. (2023)



\$9.6B

Global DPR revenue in 2023.

\$1.02B

Completed projects in the last 5 years.

9,224

DPR's global team includes 4,937 admin staff and 4,287 craft that self perform work in specific trades.

#4 ENR



Advanced Technology

#4 ENR



Healthcare

#8 BD+C



Higher Education

#1 ENR



Life Sciences

#4 ENR



Commercial

SELECT CLIENT LISTING



WHY

Prefabrication

PREFAB LEADERS



Ray Boff
DPR National
Prefab Leader



Toby Bartlett
Digital Building
Components
SurePods



Mark Thompson
EIG
National Partner



Garrett Langworthy
OES
EQUIPMENT

Leadership Sponsors



Matt Hoglund
MC Sponsor



Kall Bonnell
SE Sponsor

National Team



Charlie Walls
Prefab Product
Mgr.



David Evans
PAF Lead



Bonnie Lee
Strategic Implementation



Mika Reckers
Nat'l Prefab Precon



Justin Robbins
Prefab Product Mgr.



Janek Kneski
DfMA/PDM Lead



Belinda Carr
Research Coordinator



Scott Kiernan
Meta Prefab

Support Team



Charlie Dunn
Nat'l PSPP + Accts.



Chris Rippingham
Supply Chain Tech



Hasan Abbasi
Prefab Tech



Scott Brown
Nat'l Mass Timber SME

Entity Team



Nathan Lentz
AZ
DBC/SurePods



Paul Reibel
Nat'l SurePods



Steve Helland
Nat'l DBC/SurePods



Rudy Trujillo
EIG Modular



Dave Kloubec
Central
DBC/SurePods



Jessica DuBoise
NW DBC/SurePods



Matt Guidry
NW SPW Prefab Leader



Chris Neufeld
Bay Area Prefab Leader



Jake Dubenetzy
SW SPW Prefab Leader

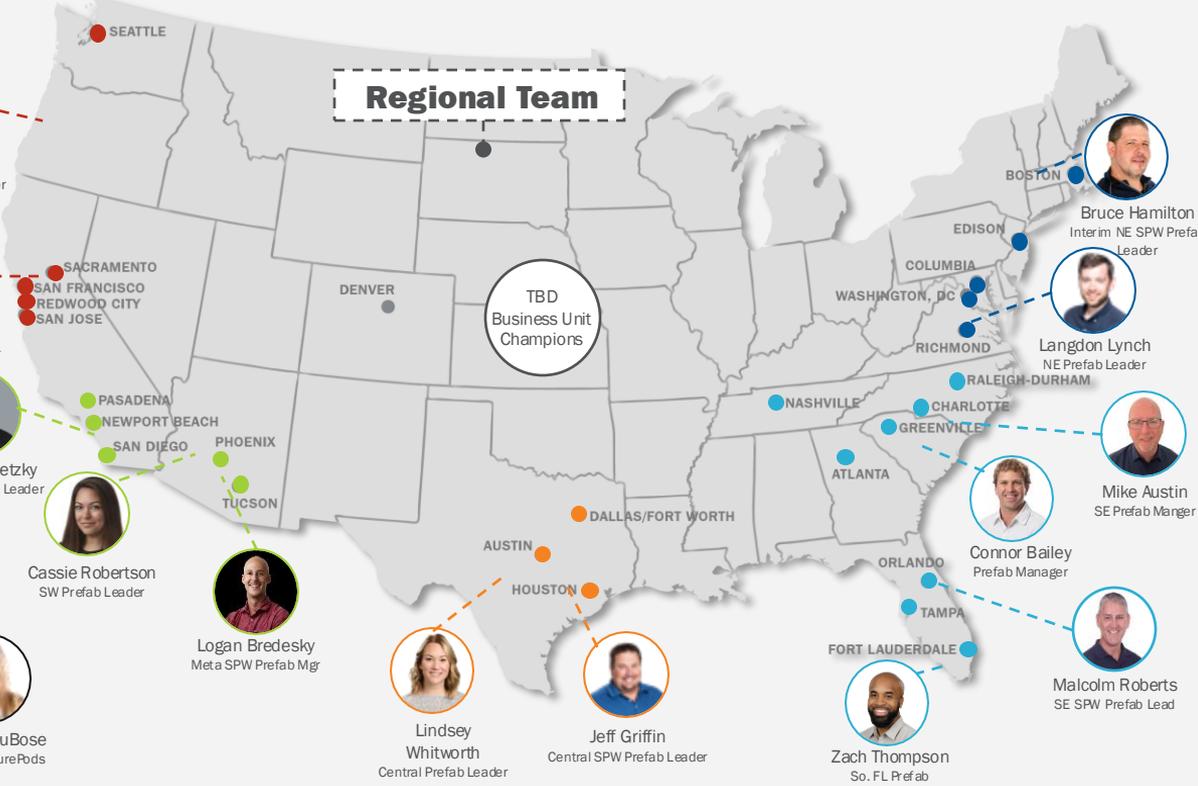


Cassie Robertson
SW Prefab Leader



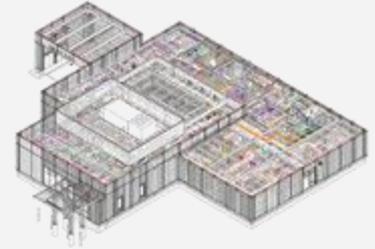
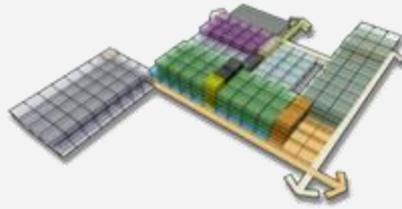
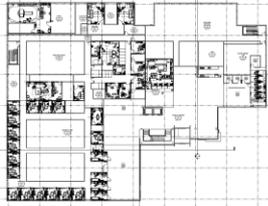
Logan Bredesky
Meta SPW Prefab Mgr

Regional Team



Prefabrication Program Strategies

Spectrum of Solutions



0

No Automation

Custom created each time, consuming intense use of resources without benefit of learned best practices

1

Design Task Automation

Application of standardized room templates and select systems utilizing best practices.

2

Layout Optimization

Facility template, organizing floor plate, department layouts and massing configurations

3

Layout Synthesis

Pre-engineered integration of predictive building components as products 'delivered to site'

4

Manufactured Building

A Digital Ecosystem: Offsite manufactured integration of ALL building elements and systems delivered for onsite assembly

Prefabrication Project Workflow

Optimal Prefabrication Integration

UPSTREAM



1

Identify, Qualify,
Align Prefab
Strategy in the
pursuit phase.

2



Configure, Price, Quote (CPQ)
prefab options and validate
through CBA process.

MIDSTREAM

4



Project Integration
+ Optimization of
prefab products.

DOWNSTREAM

6



Assemble on Site.
Capture Lessons
Learned. Tell The
Stories.

PURSUIT PHASE

SD PHASE

DD PHASE

GMP

CD PHASE

UNIT COSTS +
SCHEDULES

Prefab Design Integration

BUYOUT

TRACK KPIS



0

Learning about the
ecosystem,
understanding the value
equation, pre-positioning.

3



Select product line
solutions and
Commit to prefab
partners during SDs.

5

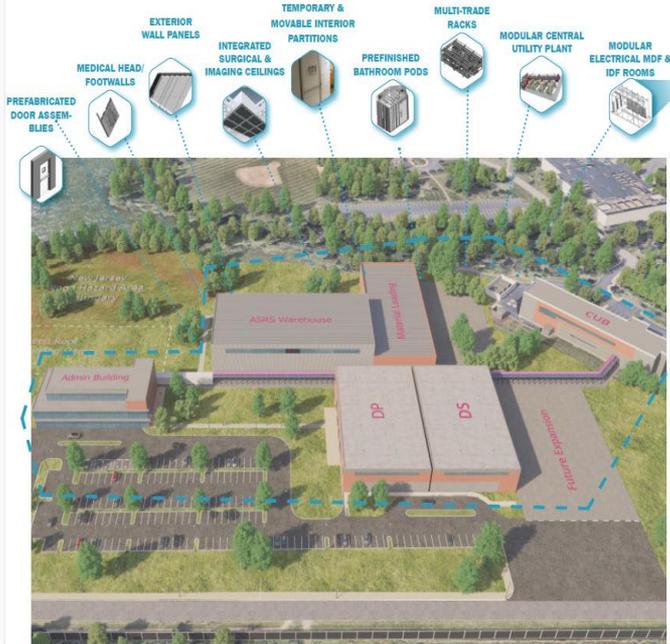


Procure or
Assemble.
Deliver to
Site.

Early Support and Viability Assessment

Assessing Prefab Options

DPR has identified the following prefabrication opportunities for your project. At the start of preconstruction, DPR will work closely with BSMH and the design team to determine which solutions would be most beneficial to the project. We will do this through a rating scale to determine each option's viability for the project.



The viability scoring is based on the following factors:



DPR Experience



Sourcing Options



Ease of Integration into Design



Schedule



Value to the Customer

THE BEST OPTIONS FOR ST. MARY'S

Integrated Surgical & Imaging Ceilings:

- Upgrades operating room suites to the latest technology quickly with shorter downtime
- Standardizes systems and connections to serve a broad range of surgical equipment
- Requires smaller interstitial space above ceiling
- Offers enhanced quality control and testing in the factory environment

Modular Electrical MDF & IDF Rooms:

- Turnkey solution providing single-source warranty
- Ability to bundle purchases across multiple project sites
- Shifts hundreds of man-hours offsite per unit
- Schedule improvement since fabrication commences in parallel with the building structure

Exterior Wall Panels:

- Achieves building dry-in faster
- Reduces installation durations
- Enhances quality
- Allows for standardized material interfaces with minimal design restrictions

Central Utility Plant:

- CEP is built off-site, in parallel (not sequential) to other on-site activities
- Reduces trade-stacking, entire CEP is factory-built and shipped to the jobsite ready to be re-connected and commissioned
- Reduces on-site labor, improving the safety profile of the entire project
 - Potential on-site insurance reduction
- Minimizes impact to the existing (and operational) hospital site - site installation of CEP is completed in a matter of weeks
 - Gives other trades the ability to focus on other critical path construction activities
 - Reduces timeline of temporary modifications such as on-site cranes, lifts, entry points, barriers, closures of on-site areas, etc.

PREFABRICATION VALUE ADD TO BSMH

There are over 20 viable prefabrication components on this project that DPR has identified. Each option will be evaluated to confirm it is the right choice. The five items indicated with a star, have been identified as the most likely viable options that will add substantial value to BSMH.

PREFABRICATION BENEFITS:

- Reducing cost
- Reduced schedule
- Reduced impact to the patient experience and facility operations
- Increased quality
- Reduced project risk
- Removing labor off-site

The screenshot shows a web page for 'EXTERIOR WALL PANELS'. It includes a 'SEE THEM IN ACTION' section with images and a video player. Below that, there are sections for 'CASE STUDY' and 'ADDITIONAL PROJECT EXPERIENCE'. A '5x' rating badge is visible in the bottom right corner.

The cover page of the 'Prefabrication Assessment Report' for the 'Universal Health Services Behavioral Health Study'. The report is dated 'November - 15/11/2021'. It includes a 'Table of Contents' with three items: 1. Prefab Kit of Parts, 2. Project Assessment Matrix, and 3. Prefabrication Line Structures. The DPR Construction logo is at the bottom right.

Prefab Around the Region

Prefabrication Integration



Steel



MTR



Stairs



VMTR



EXT Panels



DFH



USH System



INT Panels



Bathroom Pods



Arch Features

Prefab Project Execution Documents

Published for project team use

Guidebooks currently ready for project use:

- Multi Trade Racks
 - Modular Stairs
 - Exterior Wall Panels
 - Doors, Frames & Hardware
 - Headwalls
-
- Planning to setup specific grab and go links based on user associated with scope
 - Expanding appendices with current project info & best practices

Section A:

Typical Product Line Playbook: How to Prefab



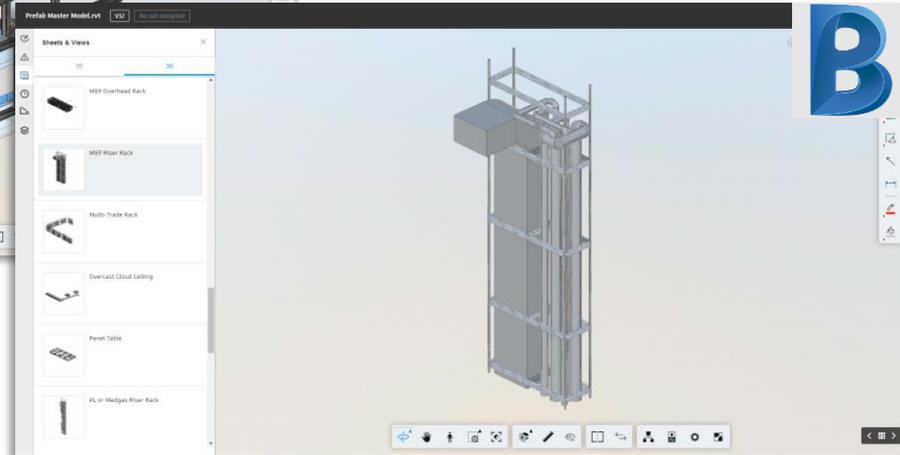
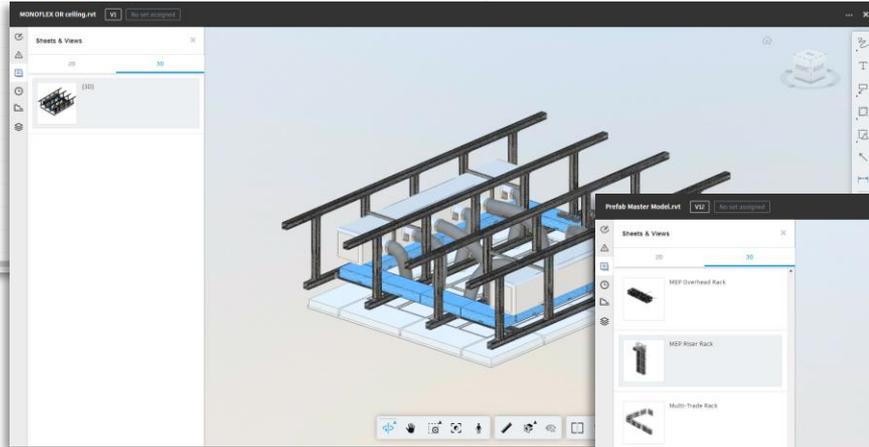
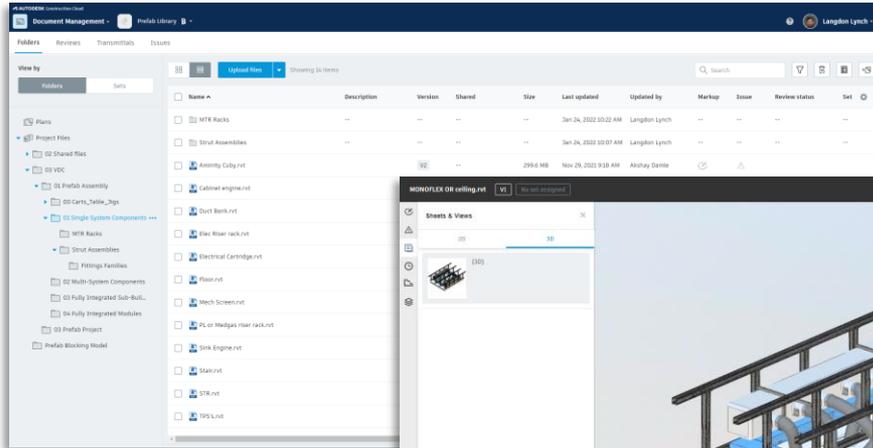
Section B:

List of Appendices



Prefab Library – Virtual Builder

Standard Details & Models



DPR Family of Companies



Current DPR Prefab Assembly Facilities + Products

David Evans

Fremont

- ACT
- Finish Carpentry
- Decon
- Concrete
- DFH
- HAC & Chimneys
- Milled Drywall
- Flex



MAZOO

- Strut Assemblies
- Panels
- DFH
- HAC & Chimneys
- Milled Drywall
- Flex



Austin

- Strut Assemblies
- Interior/Exterior Panels
- DFH
- Finish Carpentry
- Waterproofing & Insulation
- Milled Drywall
- Concrete Forms
- Div. 10 Kitting
- **EIG** Electrical Assemblies



GTN∞

- Strut Assemblies
- Interior/Exterior Panels
- DFH
- Milled Drywall
- HAC & Chimneys
- Div. 10 Kitting
- **EIG** Electrical Assemblies
- Incubation Space

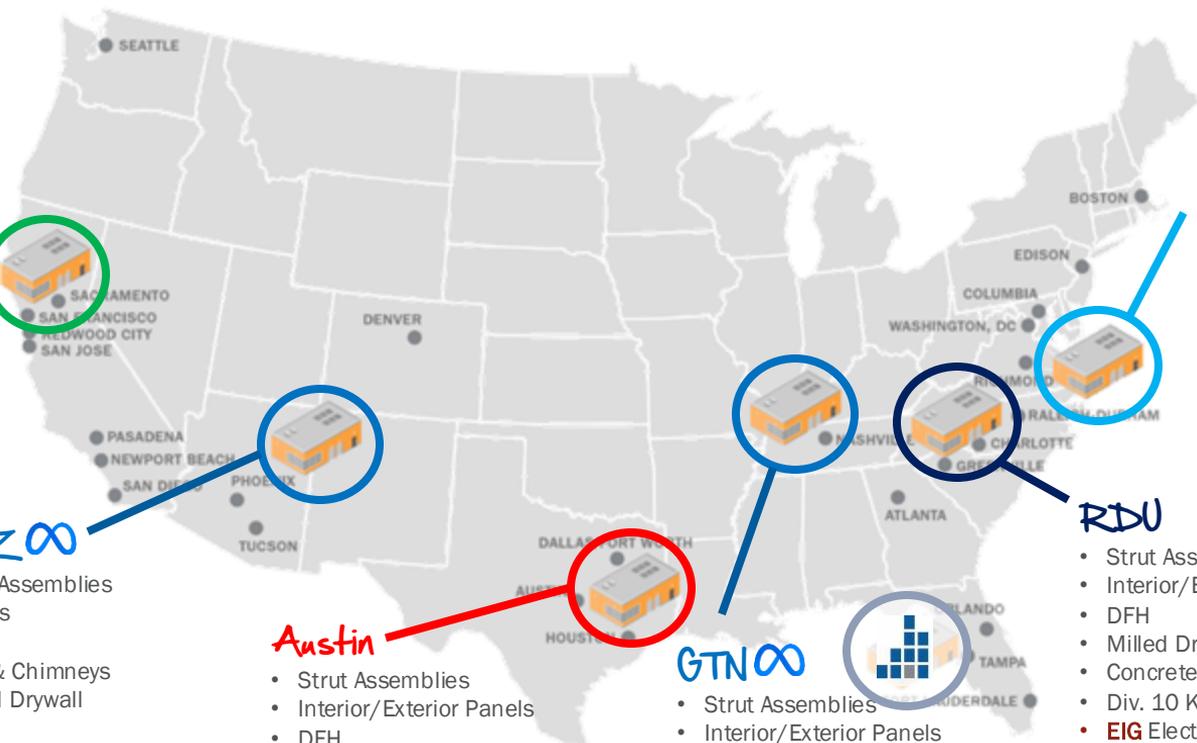


RDU

- Strut Assemblies
- Interior/Exterior Panels
- DFH
- Milled Drywall
- Concrete Forms
- Div. 10 Kitting
- **EIG** Electrical Assemblies
- Incubation Space

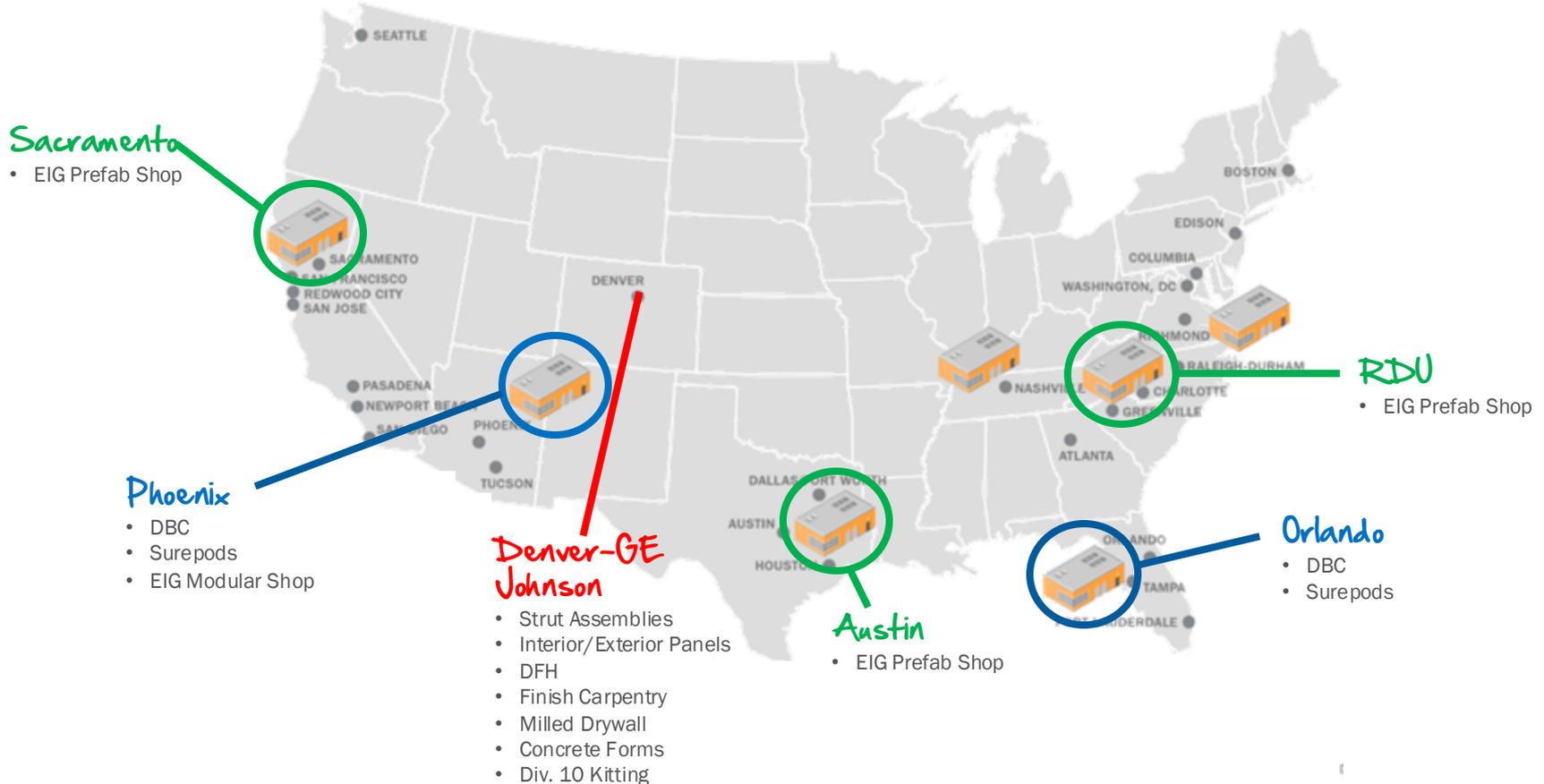
RVA

- Strut Assemblies
- Panels
- DFH
- Div. 10 Kitting
- HAC & Chimneys
- Milled Drywall
- Flex
- Concrete forms



DPR Subsidiaries Facilities

David Evans



DBC

Prefabrication Wall Systems

- Prefabrication wall systems
- Manufacturing facility in Phoenix
- 65+ prefab panel projects completed



SurePods

Prefabrication Wall Systems



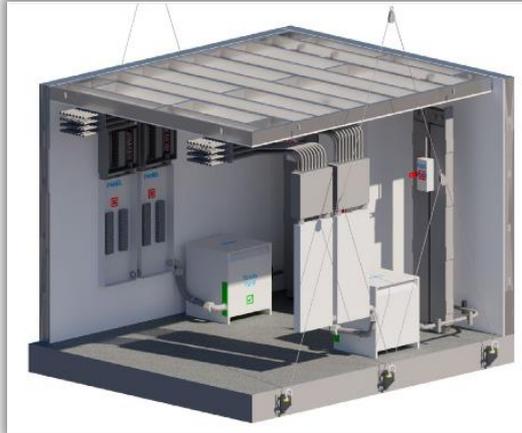
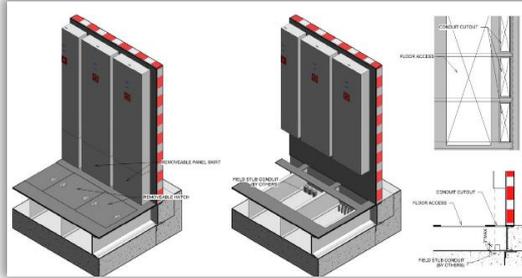
- Longest tenured manufacturer of prefabricated bathroom pods in North America
- Two manufacturing facility locations: Orlando & Phoenix
- 25,000+ bathroom pods installed
- Last Planner: Naturally supports demand pull system
- Steel, concrete and wood buildings



EIG

ETO, Electric room Modules

- No minimum order Qty
- Slab depression or integrated to building structure
- Includes floor, walls and interior finishes
- Interconnections & internal wiring included
- Removable access panels for feeder & branch connections

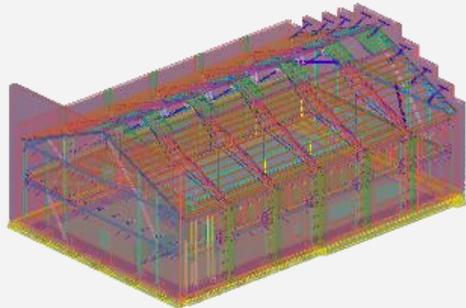


Structural Engineering as SEOR

- Performance Based Design
- Basis of Design Requirements
- System Selections & Permit Documentation
- Calculations & Specifications
- HD BIM – Fabrication-Level Design Models
- Design to Enable Pre-Fabrication & Modularization

Delegated Engineering

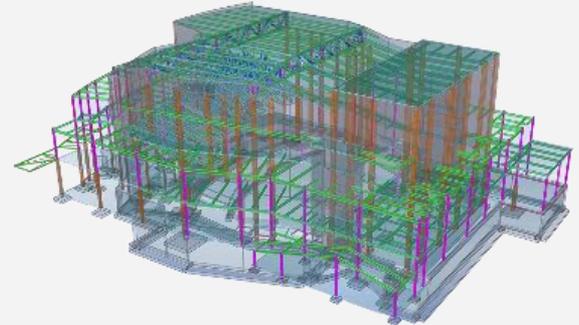
- Cold-formed Framing
- Connection Design
- Prefab Engineering
- Multi-Trade Racks



Construction Services

- Modeling & Detailing for Fab or Field
- Redistributing & Resizing Foundation Rebar for Prefab
- Structural Steel & Rebar Shop Drawings
- Means/Methods (Shoring, Loading, Platforms, Pads, etc)

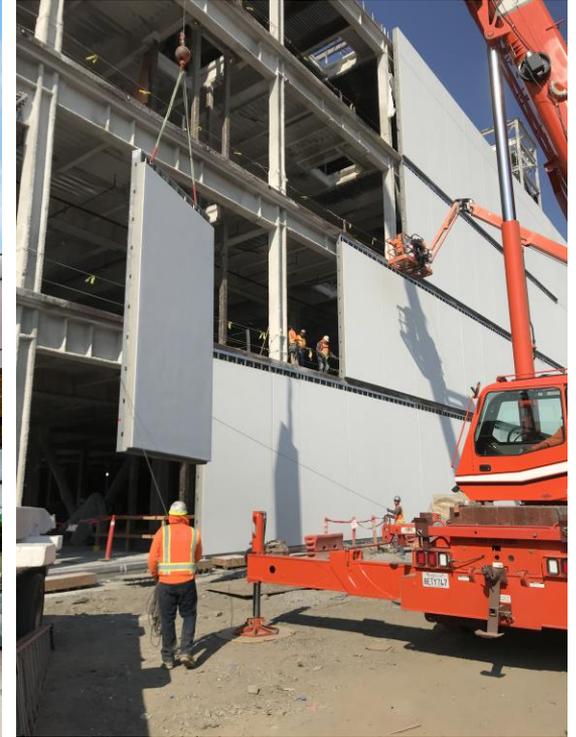
Engineering Constructability Reviews



PROJECT

Case Studies

DBC/SPW, Exterior Wall Panels



Confidential Healthcare Client | Clairemont Mesa MOB Replacement | San Diego, CA

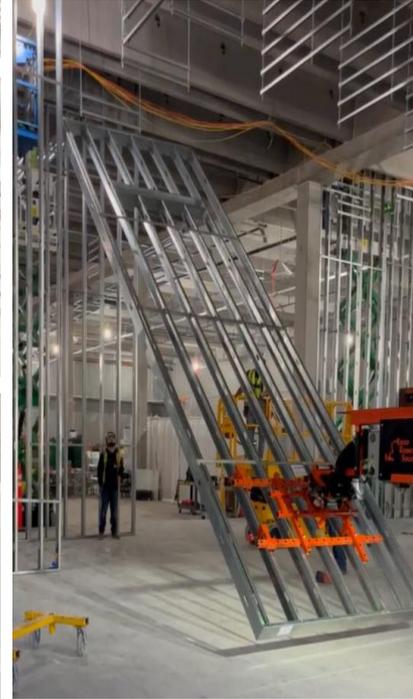
Rahway Biologics Development Center

Construction Specialties, Modular Stairs

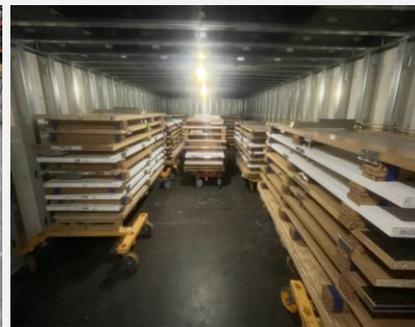


Confidential LS Customer | Rahway Biologics Development Center | Rahway, NJ

DBC/SPW, Interior Walls



Prefabricated Doors



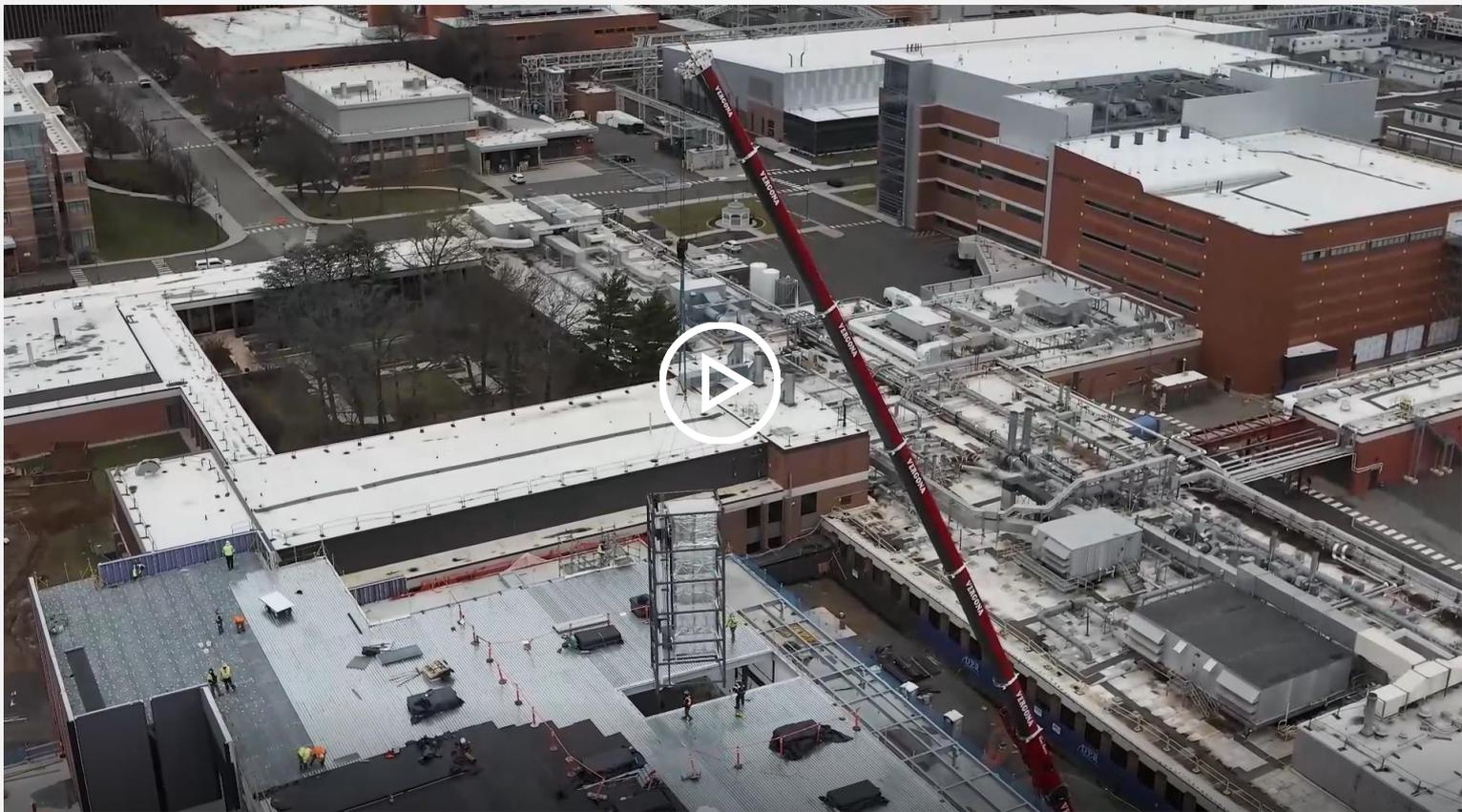
Strut Ceiling System



QTS | RIC1 DC2 211B & 311 | Richmond, Va.



Rahway Biologics Development Center



Confidential LS Customer | Rahway Biologics Development Center | Rahway, NJ

[VMTR Installation_Public.mp4 \(sharepoint.com\)](#)

DBC, Core Form structural Framing



Client: The Mathis Group

DBC/SPW, Interior Walls



Baystate Health | Medical Center Level 2 OR & PACU Expansion

SurePods, Prefinished Bathroom Pods



The RMR Group | 20 Mass Ave NW Repositioning | Washington, D.C.

Pharmadule, Volumetric Modules



U.S. Manufacturing & Clinical R&D Center | Pennington, NJ

Manufacturing & Clinical R&D Center



[BeiGene-Princeton-West-Campus-DS-DP-Day-by-Day-Progress.mp4 \(sharepoint.com\)](#)

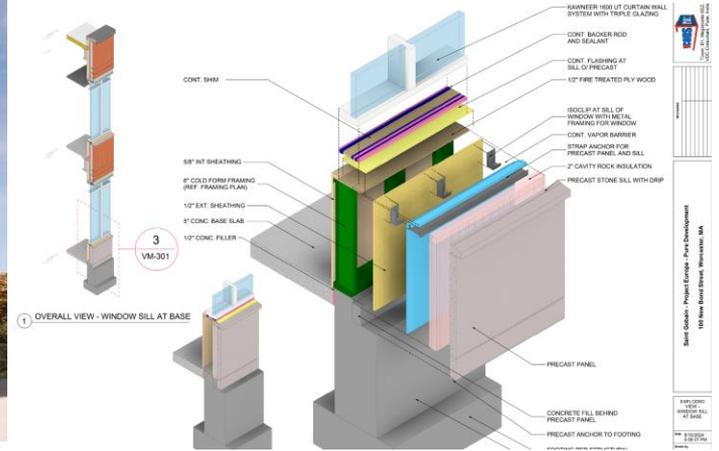
Multi Trade Involvement - Modular Pedestrian Bridge



VCU Health | Children's Hospital of Richmond at VCU | Richmond, VA.

GPLA

GPLA, Inc.
Structural Engineers and Builders



Pure Development | Ground-Up Administration Building | Worcester, MA

Product Showcase

MASS TIMBER/CROSS LAMINATED TIMBER

Sustainability. Using wood in construction can lower the carbon footprint of a building, increase the energy-efficiency of walls, and reduce waste.

About this Product

Mass timber construction uses large, solid wood panels and engineered wood products as the primary structural materials of the building. Mass timber is usually made of thick, compressed layers of wood products held together with glue, nails, or dowels. The results are large structural panels, posts, and beams with an architectural quality finish.

Mass timber continues to gain ground as an innovative and alternative building material. It is engineered for high strengths ratings like concrete and steel and can also be prefabricated as a "kit of parts" for ease of installation. It allows crews to build tall with a lighter, natural, low-carbon and high quality resource.



Discovery Meadows Child Development Center | Gaithersburg, MD

Benefits

- Enhances project productivity
- Sustainable solution

OTHER BENEFITS

- Lighter structures can save on foundation costs
- Easily prefabricated; suited for modular construction
- Quicker and safer to install, requiring smaller on-site crews
- Great for existing buildings with minimal modification
- Smaller carbon footprint than steel or concrete
- Structural performance is increasingly predictable
- Reduces need for interior finishes when left exposed
- Marketing tool for developers allowing them to lease space quicker and at a higher rate

25%
Structural schedule enhancement

- Partner Manufacture
- DPR Direct Sourcing
- DPR Install (self-perform work)



DPR Construction | Regional Office | Sacramento, CA

50%
Reduction of on-site labor, resulting in cost savings and increased safety

Proven Experience



Lincoln Property Company | Westside Yards | Atlanta, GA



Takeda | Towne Center R&D Labs | San Diego, CA



CASE STUDY

AJ CAPITAL | NASHVILLE WAREHOUSE CO.

The Nashville Warehouse Co. is a brownfield development of 5.2 acres in the bustling Wedgewood Houston neighborhood.

The 4 and 5 story tall, 190,000 sq. ft., three building office complex are mass timber structures and is the first large-scale mass timber structure in the City of Nashville.

The structure features Glulam columns and beams, dowel-laminated timber decks with up to 26-foot column bays, and concrete cores for stairs and elevators.

Watch the video: The DPR team and AJ Capital discuss the benefits of mass timber.
<https://link.dpr.com/3B1kXny>

MODULAR STAIRS

Schedule. Customizable, pre-engineered stair solutions for quick installation. A cost-effective alternative to traditional construction.

About this Product

Component-based and modular engineered-to-order stair solutions increase building resilience while also simplifying design and construction. Prefabricated, modular stairs are designed to be strong, durable and easy to install.

They are designed to fit commercial building and local building codes. They are fully customizable and have many build options including tread material, handrail type, and paint color to best fulfill the design intent. They are also available in a variety of sizes and configurations, including straight flights, spiral stairs and switchback stairs. They can be used for new construction, remodels or replacements in hotels, apartment buildings, offices, hospitals, parking garages and more.



Benefits

-  Enhanced project productivity
-  Easy to implement

OTHER BENEFITS

- Accelerates project delivery by taking an essential building system off the critical path
- Improves safety by reducing need for temporary stair towers
- Quicker installation than traditional stair systems
- Reduced material waste and less clean up
- Removes the need for form work in stairwell shaft

<1hr

Installation time per flight of stairs versus 2-3 days using conventional methods



Partner Manufacture



DPR Direct Sourcing



DPR Install (self-perform work)



20

Number of stories that can be stacked and self supported

Proven Experience



Confidential Biopharm Manufacturing Project | Rahway, NJ

MODULAR ELEVATORS

Schedule. Customizable, pre-engineered elevator solutions for quick installation, a cost-effective alternative to traditional construction.

About this Product

Component-based and modular engineered-to-order elevator solutions which increase building resilience while also simplifying design and construction. Prefabricated elevators are assembled in a climate controlled environment off-site and craned into place when the building is ready.

Since modular elevator systems are able to be self-supporting, they can be set into an existing building or even attached to the side of an existing structure. They are built to meet or exceed safety standards and are tested rigorously before leaving the factory to ensure their performance and reliability. Modular elevators are designed to fit commercial building and local building codes. They can be used for new construction, remodels or replacements in hotels, apartment buildings, offices, hospitals, parking garages and more.



Benefits

-  Enhanced project productivity
-  Easy to implement

OTHER BENEFITS

- Accelerates project delivery by taking an essential building system off the critical path
- Offers consistency, streamlines facility maintenance and service
- Shortens lead times
- Can be installed in a matter of days / weeks, rather than months
- Equipped with the latest safety features such as emergency lighting, alarms, and intercom systems
- Allows for off-site pre-inspection and quality checks

1 day

Time it takes to set each modular elevator

-  Partner Manufacture
-  DPR Direct Sourcing
-  Partner Install

75%

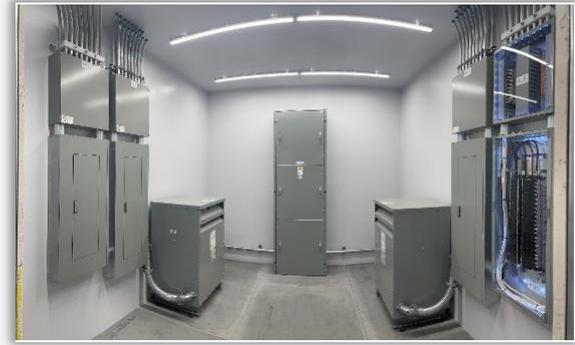
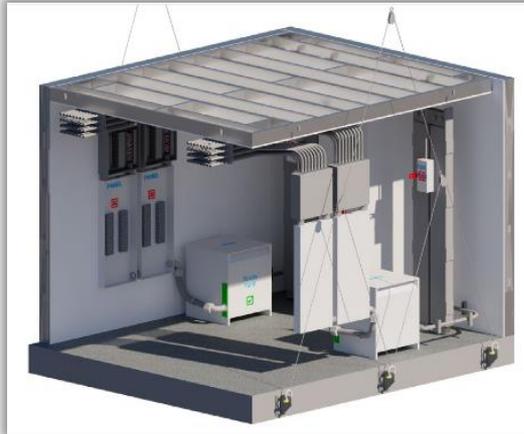
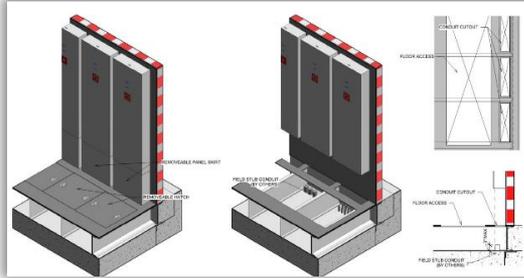
Up to 75% faster than traditional, stick-built elevators



EIG

ETO, Electric room Modules

- No minimum order Qty
- Slab depression or integrated to building structure
- Includes floor, walls and interior finishes
- Interconnections & internal wiring included
- Removable access panels for feeder & branch connections



PREFINISHED BATHROOM PODS

Simplification. Off-site, high quality bathroom pods mean less disruption on-site and faster installation.

About this Product

Factory-built bathroom pods are sized, designed and accessorized precisely to architectural plans, then built in controlled conditions. If needed, the pods are wrapped, sealed with weatherproofing and elevated on a pallet to withstand the elements that surround them before dry-in. The pods include all the fixtures and fittings like a shower, toilets, basins, lights, mirrors and cabinets.

Bathroom pod construction use BIM and lean manufacturing processes. They offer customers a wide range of styles and finishes. The pods are subjected to an electrical test and a pressure test to ensure there are no leaks. Bathroom pods are perfect for commercial office groups, hospitality projects, multi-family apartments, healthcare, student housing and assisted living.



Benefits

- Enhanced project productivity
- Mitigate supply chain issues; early procurement

OTHER BENEFITS

- Reduced on-site labor and waste, increased safety
- Reduces travel expenses
- Increased cost certainty
- Off-site testing on plumbing and electrical components
- Increased quality in controlled factory environment
- Eliminates issues with trade sequencing and punchlist
- Open your project 2-4 months earlier than traditional construction

4-6

Pods installed per day

- Partner Manufacture
- DPR Direct Sourcing
- DPR Install (self-perform work)



150

Average on-site manhours saved per bathroom pod



SIMPLIFYING THE PROCESS

On the KPMG Lakehouse project in Orlando, FL, DPR utilized modular bathroom pods fabricated off-site by their strategic partner, SurePods. 100% of the bathroom walls, mechanical, electrical, plumbing and interior finishes were completed in controlled indoor conditions. Teams had to deal with a tight schedule and local labor shortages. Using prefabricated bathroom pods reduced the construction schedule by three months.

They also allowed DPR to fully install the bathrooms in the three residential wings while the superstructure was topping out and before the curtain wall was completed. Installing the bathroom pods utilized less manpower than traditional construction. Since DPR self-performed the work, the team did not have to compete for labor with other large projects in the area.

Watch the video: <https://share.vidyard.com/watch/rCGCnh8CNYA6jP6dvXXzmnz>



SurePods

Modular Bathroom Pods

PROJECT REQUIREMENTS

- Standardized layout
- Repeatability of bathroom design
- 100+ units (50+ for healthcare)
- One dimension less than 8'
- Earlier decision is best
- NLT schematic phase
- Before MEP subs are contracted

AT SUREPODS PLANNING IS EVERYTHING

THE PRECON PLANNER



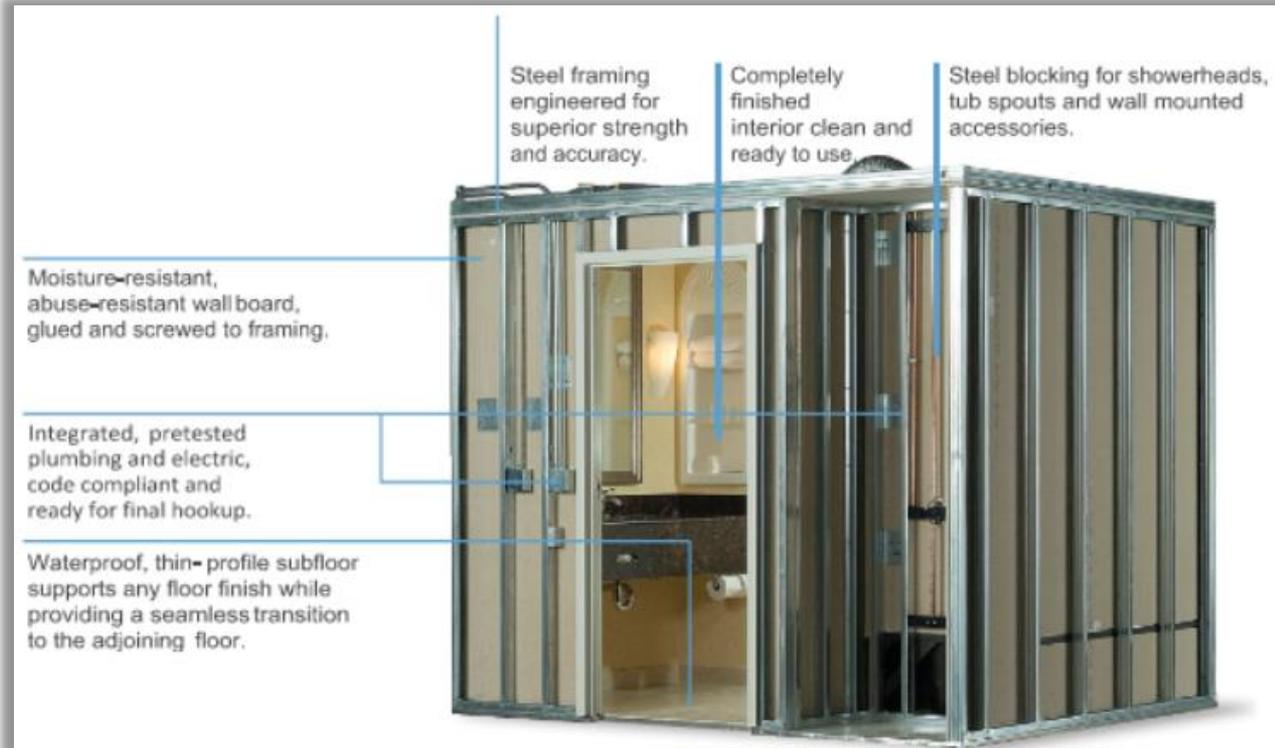
TECHNICAL INSPECTION DOCUMENT



SCOPE CLARIFICATION DOCUMENT



	Improved Drain Design	Reduced Depression Depth on Site/Thinner Slab requirements
	Simplified single depth depressions with only cores	Reduced Site work



EXTERIOR WALL PANELS

Quality. Prefab wall panels are inspected at every step of production to ensure proper quality control.

About this Product

Prefabricated exterior wall panels are fully engineered, tested and code compliant. They are built in climate-controlled facilities, offering higher quality than some systems built on-site. These prefab systems are durable, low-maintenance, sustainable and aesthetically pleasing.

Stylish and weather-resistant exterior wall solutions can be faster and more cost-effective than traditional construction. Engineered-to-order exterior wall panels are configurable exterior facades that use a variety of materials. In addition to the structural frame and exterior sheathing, they can include building vapor barrier, insulation, windows and exterior finish systems. These panelized building envelope systems simplify design, construction and maintenance.



Benefits

- Enhanced project productivity
- Easy to implement and widely available

OTHER BENEFITS

- Achieves faster building dry-in
- Allows for standardized material interfaces with minimal design restrictions; allows for customization
- Allows for a large variety of cladding options including EIFS, metal composite materials, etc.
- Enhances risk protection by single-source responsibility
- Provides potential cost and schedule savings
- Enhances quality
- Standardizes systems across portfolio

5x

Faster installation over conventional stick built platform framing

- Partner Manufacture
- DPR Direct Sourcing
- DPR Install (self-perform work)



UHS Carvon Ridge (Installed by DBC)



CASE STUDY

DESIGN FLEXIBILITY AND QUALITY

Nearly all the exterior and a significant amount of the interior full and ceiling height walls of the **Kaiser Permanente Clairmont** project were prefabricated off-site. The building is wrapped with a complex, curved façade that features inverse and outward radius segmented glass walls and decorative parapets. A four-level Thrive stair can be seen from outside the building and welcomes visitors into the office.

time-consuming rework after the walls were welded together.

The building exemplifies the design flexibility and quality that can be achieved with prefabricated components. The digitally fabricated exterior and interior wall panels made the building process safer and more efficient than traditional construction, while still allowing for design creativity.

Read more at DPR.com:

<https://www.dpr.com/projects/kaiser-permanente-clairmont-mesa-medical-office-building>

The prefabricated panels increased on-site efficiency during construction due to thoughtful and precise planning which allowed them to avoid

Q&A Discussion

