

FREEMANWHITE GUIDE
DESIGN-BUILD PROJECT DELIVERY







- 6 Do good fences make good neighbors?
- 7 Step 1: Design to 30% project delivery completion
- 12 Step 2: Through 100% project delivery completion





FreemanWhite asserts that design-build project delivery is the best option for delivering complex healthcare projects. By removing silos, design-build results in the lowest overall cost and fastest speed to market.

This integrated approach provides a framework to collect ideas from team members with divergent viewpoints and diverse backgrounds. These ideas are then woven into the fabric of a stronger collective solution than would have otherwise been developed.



In “Mending Wall,” first published in 1914, Robert Frost writes “Good fences make good neighbors”, metaphorically summarizing the traditional viewpoint of individual disciplines in design-bid-build construction administration.

It’s interesting to note the quote itself references an English proverb from the mid-17th century, a time when professional associations were taking shape and gaining prestige and influence in Northern Europe. These professions, including architecture, represented a massive move away from the Master Builder project delivery model used over thousands of years of human history. Certainly there are very good reasons why the fence metaphor and professional posture remain.

Many of us, however, harbored nagging questions over the years about an outlook that segregates disciplines. At its core, “good fences” make our profession directionless and static, and we have pondered a way that surpasses the defense of our traditional domain.

FreemanWhite embraces design-build as a preferred project delivery model in a move forward, ironically with an eye toward the Master Builder model of the distant past. As the healthcare industry shifts toward holistic medicine and disease-based care, those of us who develop facilities for healthcare must similarly remove our silos and integrate our approach.

Fairly recently, new delivery models such as Integrated Project Delivery (IPD) have started gaining traction in the market. Having worked within most project delivery methodologies, FreemanWhite has found that incorporating the general contractor into the team at the very beginning – before critical decisions are made solely between the owner and the architect – is the defining advantage of design-build. Building on our positive outcomes with design-build delivery, FreemanWhite has developed a two-step design-build process that utilizes lean principles to eliminate waste in schedules and budgets.



STEP 1: DESIGN TO 30% PROJECT DELIVERY COMPLETION

Team Member Selection

First, with the integrated approach FreemanWhite recommends, our clients realize the benefits of a truly integrated team. From pre-planning through owner occupancy, everyone works toward a common goal under a single agreement, aligned with and in service to the owner. This approach delivers the best possible project within established project budget and schedule parameters.

Our team members possess specialized knowledge in all facets of construction delivery. Key team members include:

- Market and data analysts
- Process and workflow specialists
- Architects & engineers
- General and sub-contractors
- Material suppliers/manufacturers
- Specialty installers

Not all firms, or even all staff members within firms, are well suited for design-build project delivery. Ideally, team members self-select based upon shared organizational values. When choosing partners, take care to select those that demonstrate an altruistic, openhanded mindset. Companies focused on maximizing short term profits may not be the right fit for the team.

Also, within each company, staff members who are well-suited for design-build teams tend to have proactive personality types and a bias for collaboration. In some instances, it may make sense to utilize professionally administered personality tests to help identify individuals within the organization who are most receptive to this delivery model.



A teaming agreement crafted with full team participation serves as a touchstone throughout the course of the project. Because the entire team is onboard from the first day and shares a baseline understanding of the project, we can avoid the waste that typically accrues through onboarding team members at different times or rethinking previous decisions. When working in concert, a properly formed team reaches enlightened decisions more rapidly.

Review of Owner's Program, Budget and Schedule

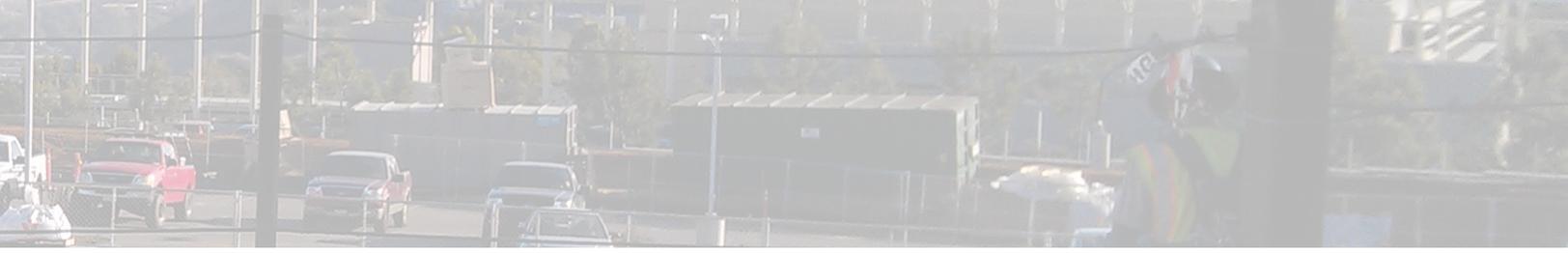
Whether considering potential building sites or opportunities to reduce schedule duration, we evaluate the impact of site location and attributes upon the patient experience. Instead of analyses occurring in redundant organizational silos as typically occurs in traditional delivery, it is to the client's and ultimately the patient's benefit to consider the following site factors as a team at the beginning of the project:

- Market studies
- Regional patient demographics and service line alignment to provide the greatest impact to patients in that region
- Acuity levels of care and network interconnectivity
- Geographic, cultural and built environment amenities that may positively impact healthcare provider recruitment
- Good public transportation access options
- Patient advocacy and neighborhood support networks
- Municipal zoning of surrounding area and corresponding impacts to quality of patient care, such as view corridors, green buffers, nodes and edges

ZOOMING IN TO A FEW MORE SPECIFIC SITE CONSIDERATIONS:

- Architectural design significance of neighborhood context and response related to the owner's market strategy
- Solar orientation, daylighting studies and shadow assessments, which are of particular concern in urban environments
- Air quality of surrounding area
- Noise generated by surrounding neighbors
- Relative geographic proximity to building material and supply sources
- Construction delivery access, equipment staging and lay down area
- Building excavation and required backfill area

While one might initially question the relevance of patient demographics to the contractor, a basic level of awareness provides an understanding of the "why" behind the "what." In addition, many of the items listed above affect budget and schedule. Specifying building materials based upon close geographic proximity should counterbalance with established relationships that exist between general contractors, sub-contractors, or owners with Group Purchasing Organization building material manufacturers.

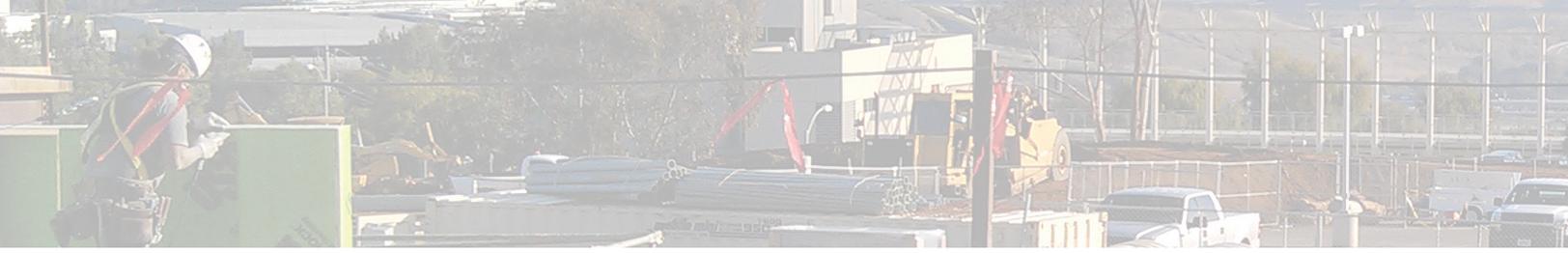


The clever selection and application of construction techniques can save the owner both time and money. In one recent project, we saved significant cost and time by evaluating a given site's capacity to allow for lay-down excavation area in lieu of sheet piling.



FreemanWhite recommends that the design-build team review the owner's budget and schedule with an eye toward improvement. As the team and owner consider potential acceleration options, tactics for fast-tracking design and construction are brought forth.

As one example, submitting incremental packages for permit review offers several advantages. Rather than experience "down time" during plan check review for one full set of documents, multiple small submittals trigger a continual review process so that other portions of work can advance. Early phases of pre-approved construction, such as grading and utility work, can begin prior to the receipt of final permits.



Initial Design

Single source responsibility means that risk associated with design errors and omissions (E&O) lies with the design-build team, not the owner. In this model, the owner no longer functions as a de facto arbitrator between the architect and the general contractor, shedding risk to the design-build team, which is, by definition, most qualified to manage this risk.

Through the entire design process, the two primary leaders of the design-build team – the architect and the contractor – attend every meeting together. Ideally, the architect and contractor will co-locate during the course of the project, with their physical workstations right next to each other. This co-location concept, also known as a “Big Room” design approach, is especially important in fast-track and/or complex construction delivery.

Our clients benefit from having key team members 100% dedicated to their project. These professionals aren’t juggling five other projects at the same time, reducing the mental ramp up time caused by starting and stopping different projects.





Along with the owner, key members of the integrated project team collectively develop a pull schedule after reviewing the proposed schedule. When all parties participate in decision-making, there are fewer surprises and more predictable results. Consensus agreement on commitments made during the pull scheduling workshop serve as the cornerstone for all subsequent 5D modeling (3D building modeling with the additions of construction cost and construction time). The team continues to meet in person once a week, at a minimum, during the project design. The owner has the option to attend these standing weekly meetings, if desired.

FreemanWhite uses our integrated suite of dashboard planning tools to validate lean process planning. For example, our Time Traveler[®] tool validates that a proposed design minimizes the number of steps caregivers take during the day. Any reduction in travel time or the amount of time spent searching for misplaced items benefits everyone by maximizing staff efficiency to allow for more time with patients.

Emergency Department TimeTravel[™]

Staff Support | Patient

Patient/RN Ratio **4.0** | Shift Length **12** (Click on values in blue to change)

Existing - S.F. 21,640 (sf)

Proposed 2 - S.F. 58,710 (sf)

Scenario

Staff Support to...	Average Distance (ft)	Trips per Shift	Total Distance Traveled by Shift (ft)	Average Distance (ft)	Trips per Pt per Shift	Total Distance Traveled by Shift (ft)	% Change (Total Distance)
RN Station	60	<input type="text" value="60"/>	3600	42	60	2520	-30% ↓
Nourishment	59	<input type="text" value="24"/>	1416	72	24	1728	22% ↑
Pneumatic Tube	76	<input type="text" value="40"/>	3040	63	40	2520	-17% ↓
Clean Supply	83	<input type="text" value="20"/>	1660	76	20	1520	-8% ↓
Soiled Linen	93	<input type="text" value="3"/>	279	72	3	216	-23% ↓
Equipment	103	<input type="text" value="20"/>	2060	81	20	1620	-21% ↓
Meds	77	<input type="text" value="45"/>	3465	65	45	2925	-16% ↓
General Rad.	95	<input type="text" value="30"/>	2850	218	30	6540	129% ↑
CT	352	<input type="text" value="15"/>	5280	232	15	3480	-34% ↓
Efficiency Comparison %							-2% ↓

Average Distance per RN (ft) **23,650**

Average Distance per RN (mi) **4.48**

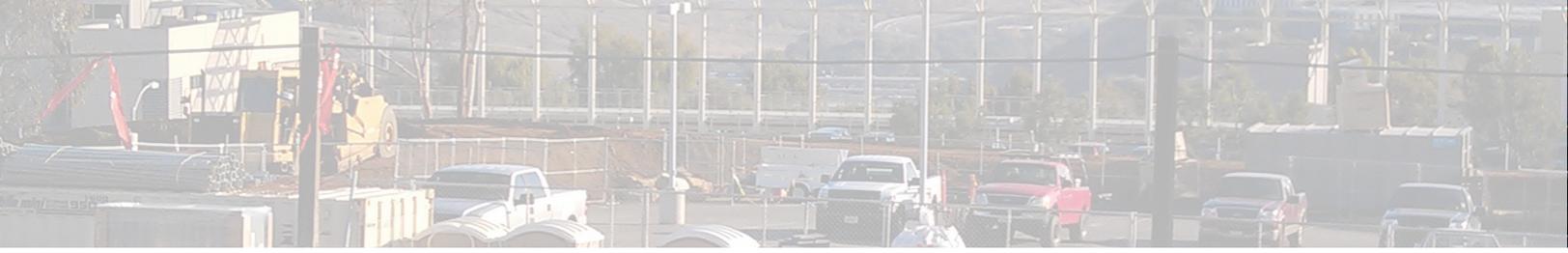
Average Distance per RN (ft) **23,069**

Average Distance per RN (mi) **4.37**

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TIMETRAVEL

Travel time can be a huge waste in a system. The TimeTraveler dashboard tracks patient and staff walking distances in existing clinical areas in a friendly, interactive format. At Florida Hospital in Orlando, the TimeTravel dashboard demonstrated that a new design with three times more square footage than the existing condition improved staff travel efficiency 10%.



STEP 2: THROUGH 100% PROJECT DELIVERY COMPLETION

Final Design

Autodesk® Revit® modeling (BIM-Building Information Modeling) is the centerpiece for 5D scheduling because it enables us to incorporate actual building and material data into active construction documents in real time. For instance, the number of steel studs drawn can be immediately translated into pricing, and we can see the consequences of questions such as “what happens to the budget if we increased the spacing by 2 inches?” during the design phase.

We are also able to eliminate duplicated efforts, another key tenet of lean practice. For example, the team is able to fully identify and fully integrate interstitial ceiling space zones, tolerances around architectural/structural items, and mechanical, electrical and plumbing distribution lines into the model. This eliminates conflicts and competition for space when the project moves into construction.

With this platform, the team works together during design, develops alternative solutions, and verifies cost, quantity, and schedule impacts in real time. The level of intelligence embedded within the model allows for cost benefit analysis related to evaluating non-traditional, time and cost reducing pre-fabrication options that span several disciplines.

Construction

Due to the truly integrated composition of the design-build team, the phase shift from design to construction is almost invisible when compared to traditional design-bid-build delivery. This difference becomes starkly apparent when projects are fast-tracked. Time traditionally allocated to bidding disappears, in some cases shaving months from project schedules. Because the team makes product decisions collectively, we eliminate the product surprise factor and lengthy product submittal reviews.

Co-location of the architect and general contractor means that field condition issues that may arise are immediately resolved. Because the owner has a single point of contact, response time is lean and immediate, in itself a huge improvement over lengthy back and forth initiation and rebuttal as seen in traditional project delivery. Time and energy otherwise spent negotiating conflicts of interest inherent in a traditional framework are now converted into positive, problem solving action.

At the conclusion of construction, we turn the Revit model over to the owner to continue its life as a lean facilitation engine in building maintenance. With intelligent quantity information embedded inside, the model provides automated life cycle project maintenance alerts, in service to the owner's facility staff.



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Troy Seanor is a leader of FreemanWhite's architectural group and a member of its management team. Healthcare facility design has been the sole focus of his professional career, and from initial conception to final detail coordination, he maintains quality control and design integrity through his continuous project involvement. In addition, Troy has faced the challenge of restrictive time schedules and budgets with successful, innovative designs that have exceeded client expectations.

